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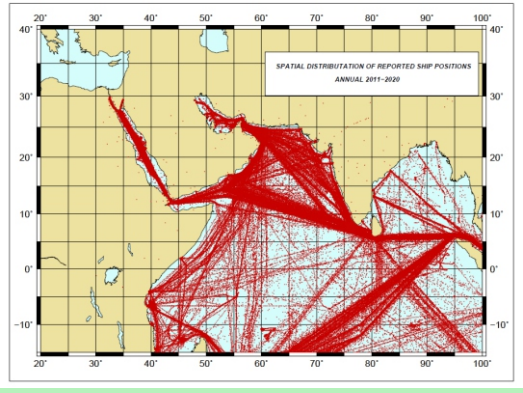
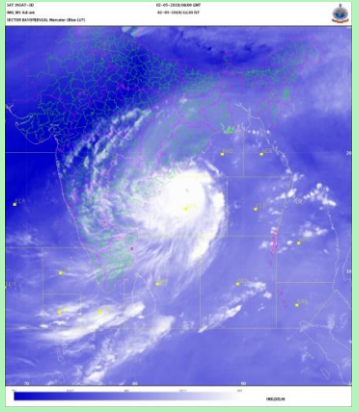
MINISTRY OF EARTH SCIENCES
भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT

Years of Service to the Nation
राष्ट्र सेवा के 150 वर्ष

Marine Climatological Summary (2011-2020)





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PUNE - 411 005

CREDITS

Marine Climatological Summary Charts

2011-2020

COMPILATION & EDITING: Climate Monitoring and Prediction Group

OFFICE OF THE
CLIMATE RESEARCH AND SERVICES
INDIA METEOROLOGICAL DEPARTMENT,
SHIVAJINAGAR, PUNE 411 005

P R E F A C E

One of the major obstacles that continue to be faced by the meteorological community in developing dynamical models for the weather and climate forecasting is the scarcity of data particularly from the vast areas of the global oceans. Knowledge of weather conditions over the oceans is also essential for operational planning for maritime activities, the design of vessels and coastal and offshore facilities, the exploitation of marine and sea-bed resources, the response to oil spills at sea, climate research etc. The valuable observations collected by the World Meteorological Organization (WMO)'s Voluntary Observing Ships (VOS) have been therefore vital for these important activities. The VOS Scheme is a cost effective international programme comprising member countries of the World Meteorological Organization (WMO). Under the aegis of WMO, India Meteorological Department has enlisted a Voluntary Observing Fleet (VOF) that are regularly visiting Indian shores to take marine meteorological observations and transmit them to shore at no cost to the ship. The VOF consists of merchant ships of Indian registry, some foreign merchant vessels and a few ships of the Indian Navy. The ships provide observations free of charge in return for the instrumentation and the forecasting and warning services.

Following the WMO recommendation, the decadal marine climatological summary is published in the chart form and while preparing the summary all available observations from that particular month for all years during the period of the summary is considered. This publication presents the Charts of Marine Climatological Summary over the Indian region prepared based on marine observations recorded during the decade 2011-2020.

India Meteorological Department acknowledges deep appreciation for the excellent efforts of the officers and staff of all the ships involved in the recording of marine data used in the preparation of this climatological summary.

Dr. O. P. Sreejith, Sc. F developed software for the computation, plotting and supervised the entire work, Smt. Bharati S. Sabade, Met.B, Dr. Somenath Mahato, Project Sc. III and Shri Divyesh Deshpande JRF helped in the compilation of the data. Shri. Sunil Narke, Met. A. and Smt. Manisha Vikam, Met. A have provided assistance in the various stages of this publication. The DTP & publication unit helped in the designing, typesetting and preparation of electronic copy of this publication.

I express my sincere appreciation to their efforts and overall guidance of Shri K. S. Hosalikar, Head, CRS Pune.

New Delhi
February, 2024

Dr. M. Mohapatra
Director General of Meteorology

INTRODUCTION

India is one of the eight responsible members (RMs) of Marine Climatological Summaries Scheme (MCSS) established by the WMO Commission for Marine Meteorology (CMM) in 1963. The objective of MCSS was to develop and maintain a joint effort of all maritime nations in the collection of marine data and production of climatological statistics. Each of the eight RMs was assigned a specific area of responsibility. Area of responsibility assigned to India was north of latitude 15^0 S and between longitude 20^0 E and 100^0 E of Indian Ocean. Following the revision of the MCSS, in line with Rec. 11, CMM-XI and Resolution 10, EC-XLV 1993, two Global Climate Centers (GCCs) for marine climatological data were established in 1994 at Germany and United Kingdom. GCCs collect Voluntary Observing Fleet (VOF) data from member countries of MCSS quarterly and after ensuring that these data meet the Minimum Quality Control Standards (MQCS) re-distribute the data to the RMs. The marine data regularly received from GCCs are archived at National Data Center (NDC), India Meteorological Department (IMD), Pune. As per the present practice, the decadal summaries are prepared in the chart form. IMD published first chart form of decadal marine climatological summary for the period 1971-80 in 1999. Subsequently, in 2002, a marine climate atlas based on the data of 1961-1990 was published. This volume of the decadal marine climatological summary was prepared using the data for the period 2011-2020.

At the end of climatological summary charts for each month and that for the annual, the spatial distribution of the ship positions from where the observations were recorded is presented. For the annual, the bar diagrams showing the country wise and year wise distribution of the number of observations contributed by the member countries of MCSS is given.

Data Sources & Computation of the Statistics

For the preparation of these climatological summary charts, all the data for the period 2011-2020 available in the data archive of NDC were used.

The statistics was computed at each spatial grid boxes of 5^oX5^o, latitude X longitude over the Indian Oceanic region under Indian responsibility. There were 96 such grid boxes. The computations were done using FORTRAN programs developed in house. For the computation of the statistics the following points were considered.

$5^{o}X5^{o}$, latitude X longitude over the Indian Oceanic region under Indian responsibility. There were 96 such grid boxes. The computations were done using FORTRAN programs developed in house. For the computation of the statistics the following points were considered.

1. The formula for calculating standard deviation (σ) is

$$\sigma = \sqrt{\frac{n\sum x^2 - \left(\sum x\right)^2}{n(n-1)}}$$

Where, x is the value of an individual observation and n is the number of observations.

2. Steadiness = (vector average) / (scalar average)
Calm winds were rejected in calculating the steadiness; wind speed of variable directions was taken as 0 in calculating the vector average but retained in calculating the scalar average. The steadiness is expressed in percentage.

3. The prevailing wind direction is the direction in which the number of occurrence is the greatest, irrespective of the associated wind speed. Winds of variable directions were rejected in the calculation.

4. When the sea and swell waves were reported simultaneously, only the group with the greatest height (or with the greatest period if the heights were equal) was included in the calculation.

Presentation of the Climatological Summary Charts

For the presentation of climatological data, a chart with spatial domain bounded between $15^{o}S$-$40^{o}N$ and $20^{o}E$-$100^{o}E$ has been used. The charts were prepared using Generic Mapping Tools (GMT). In each of the summary chart, 3 different statistical values of the eighteen elements as specified in the Table-A were plotted on each of the $5^{o}X5^{o}$ grid boxes. The charts are arranged in the order of month and annual charts are given in the end.

TABLE - A

Chart	Parameter	Details
I	1	Mean Air Temperature (0.1^0C)
	2	Standard deviation of air temperature (0.1^0C)
	3	Number of observation of air temperature
II	1	Mean Sea surface Temperature (0.1^0C)
	2	Standard deviation of sea surface temperature (0.1^0C)
	3	Number of observation of sea surface temperature
III	1	Mean dew point temperature (0.1^0C)
	2	Standard deviation of dew point temperature (0.1^0C)
	3	Number of observation of dew point temperature
IV	1	Mean air-sea temperature difference (0.1^0C)
	2	Standard deviation of air-sea temperature difference (0.1^0C)
	3	Number of observation of air-sea temperature difference
V	1	Median wind speed (f_{50}, 0.1m/s)
	2	Standard deviation of wind speed (0.1m/s)
	3	Steadiness of wind (0.1%)
VI	1	Prevailing wind direction (to the nearest 10 degrees)
	2	Number of total wind speed observations
	3	Number of measured wind speed observations
VII	1	Percentage of light winds ($\leq$ 3 m/s) (0.1%)
	2	Percentage of strong winds ($\geq$ 11 m/s) (0.1%)
	3	Prevailing direction of strong winds (to the nearest 10 degree)
VIII	1	Percentage of gales ($\geq$17 m/s) (0.1%)
	2	Prevailing direction of gales (to the nearest 10 degree)
	3	Maximum wind (direction in tens of degree, speed in m/s)
IX	1	Median wave height (to the nearest 0.5m)
	2	Standard deviation of wave height (0.1%)
	3	Number of observations
X	1	Percentage of wave $\leq$ 1.5 m (0.1%)
	2	Percentage of wave $\geq$ 4.0m (0.1%)
	3	Percentage of wave $\geq$ 6.0m (0.1%)
XI	1	Percentage of wave periods $\geq$ 6s (0.1%)
	2	Prevailing swell direction (to the nearest 10 degrees)
	3	Number of observations of swell
XII	1	Mean wave period (1s)
	2	Maximum wave height (0.5m)
	3	Period of highest wave (1s)
XIII	1	Mean sea-level pressure (0.1hpa)
	2	Standard deviation of mean-sea level pressure (0.1hpa)
	3	Number of observation of sea-level pressure
XIV	1	Percentage of observation with rain or drizzle (0.1%)
	2	Percentage of observation with other forms of precipitation (0.1%)
	3	Number of observation of present weather
XV	1	Percentage of observations with total cloud amount $\leq$ 2/8 (0.1%)
	2	Percentage of observations with total cloud amount $\geq$ 6/8 (0.1%)
	3	Number of observations of total cloud amount
XVI	1	Percentage of observation with visibility < 1km (0.1%)
	2	Percentage of observation with visibility $\geq$ 10km (0.1%)
	3	Number of observations of visibility
XVII	1	Mean latitude of observations (0.1degree)
	2	Mean Longitude of observations (0.1degree)
	3	Total number of observations
XVIII	1	Standard deviation of latitude of observations (0.1degree)
	2	Standard deviation of longitude of observations (0.1degree)
	3	Number of ship reports containing both wind speed and air temperature

N O T E

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The copies of the publication can be purchased from the office of the Climate Research and Services, India Meteorological Department, Pune – 411 005.

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Marine Climatological Summary Charts 2011-2020

CHARTS OF JANUARY 2011-2020

Marine Climatological Summary Charts 2011-2020

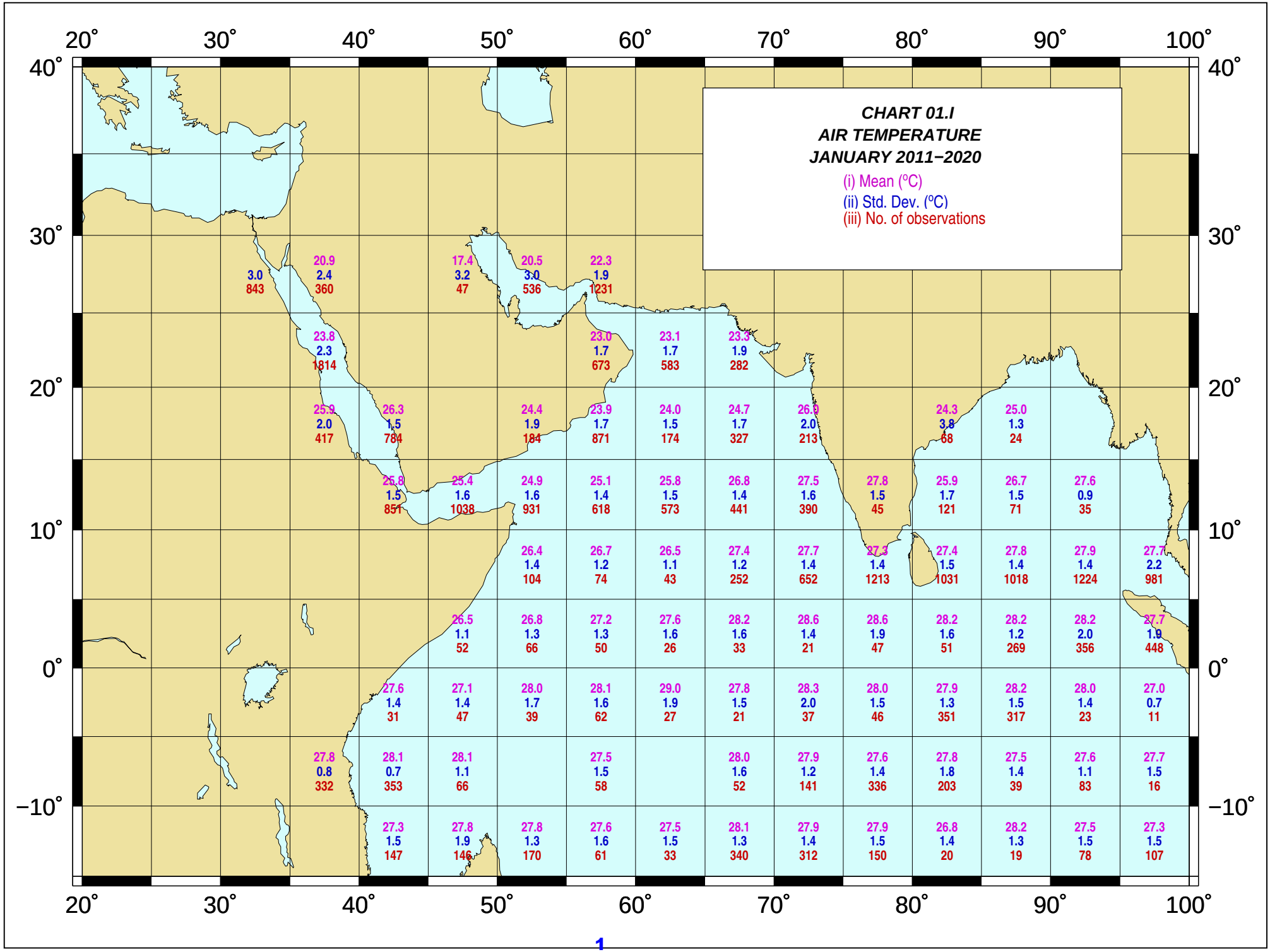


CHART 01.I
AIR TEMPERATURE
JANUARY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
3.0 843
20.9 2.4 360
17.4 3.2 47
20.5 3.0 536
22.3 1.9 1231
23.8 2.3 1814
23.0 1.7 673
23.1 1.7 583
23.3 1.9 282
25.9 2.0 417
26.3 1.5 784
24.4 1.9 184
23.9 1.7 871
24.0 1.5 174
24.7 1.7 327
26.9 2.0 213
24.3 3.8 68
25.0 1.3 24
25.8 1.5 851
25.4 1.6 1038
24.9 1.6 931
25.1 1.4 618
25.8 1.5 573
26.8 1.4 441
27.5 1.6 390
27.8 1.5 45
25.9 1.7 121
26.7 1.5 71
27.6 0.9 35
26.4 1.4 104
26.7 1.2 74
26.5 1.1 43
27.4 1.2 252
27.7 1.4 652
27.9 1.4 1213
27.4 1.5 1031
27.8 1.4 1018
27.9 1.4 1224
27.7 2.2 981
26.5 1.1 52
26.8 1.3 66
27.2 1.3 50
27.6 1.6 26
28.2 1.6 33
28.6 1.4 21
28.6 1.9 47
28.2 1.6 51
28.2 1.2 269
28.2 2.0 356
27.7 1.9 448
27.6 1.4 31
27.1 1.4 47
28.0 1.7 39
28.1 1.6 62
29.0 1.9 27
27.8 1.5 21
28.3 2.0 37
28.0 1.5 46
27.9 1.3 351
28.2 1.5 317
28.0 1.4 23
27.0 0.7 11
27.8 0.8 332
28.1 0.7 353
28.1 1.1 66
27.5 1.5 58
28.0 1.6 52
27.9 1.2 141
27.6 1.4 336
27.8 1.8 203
27.5 1.4 39
27.6 1.1 83
27.7 1.5 16
27.3 1.5 147
27.8 1.9 146
27.8 1.3 170
27.6 1.6 61
27.5 1.5 33
28.1 1.3 340
27.9 1.4 312
27.9 1.5 150
26.8 1.4 20
28.2 1.3 19
27.5 1.5 78
27.3 1.5 107

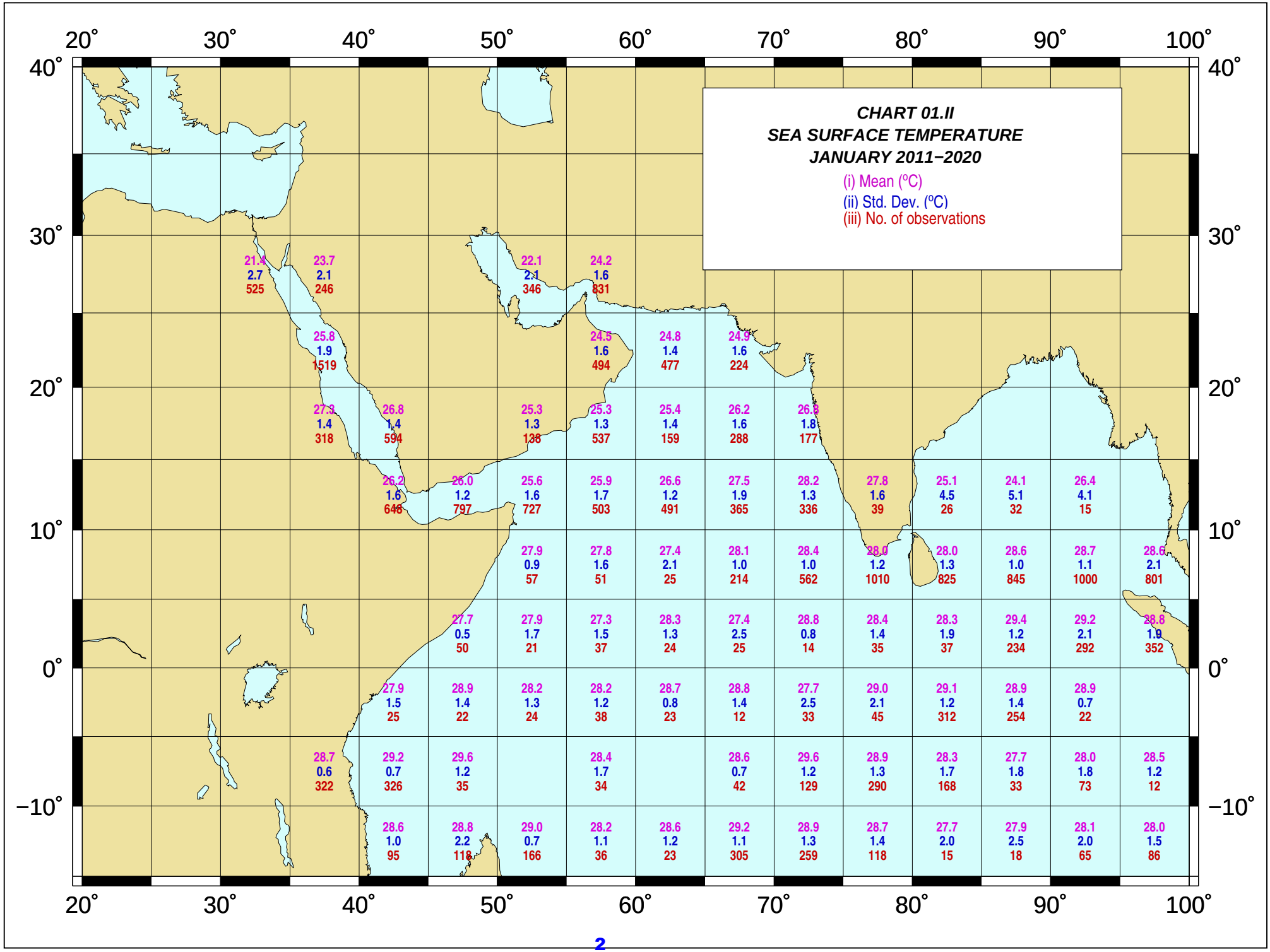


CHART 01.II
SEA SURFACE TEMPERATURE
JANUARY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
21.4 2.7 525
23.7 2.1 246
22.1 2.1 346
24.2 1.6 831
25.8 1.9 1519
24.5 1.6 494
24.8 1.4 477
24.9 1.6 224
27.3 1.4 318
26.8 1.4 594
25.3 1.3 138
25.3 1.3 537
25.4 1.4 159
26.2 1.6 288
26.9 1.8 177
26.2 1.6 646
26.0 1.2 797
25.6 1.6 727
25.9 1.7 503
26.6 1.2 491
27.5 1.9 365
28.2 1.3 336
27.8 1.6 39
25.1 4.5 26
24.1 5.1 32
26.4 4.1 15
27.9 0.9 57
27.8 1.6 51
27.4 2.1 25
28.1 1.0 214
28.4 1.0 562
28.0 1.2 1010
28.0 1.3 825
28.6 1.0 845
28.7 1.1 1000
28.6 2.1 801
27.7 0.5 50
27.9 1.7 21
27.3 1.5 37
28.3 1.3 24
27.4 2.5 25
28.8 0.8 14
28.4 1.4 35
28.3 1.9 37
29.4 1.2 234
29.2 2.1 292
28.8 1.9 352
27.9 1.5 25
28.9 1.4 22
28.2 1.3 24
28.2 1.2 38
28.7 0.8 23
28.8 1.4 12
27.7 2.5 33
29.0 2.1 45
29.1 1.2 312
28.9 1.4 254
28.9 0.7 22
28.7 0.6 322
29.2 0.7 326
29.6 1.2 35
28.4 1.7 34
28.6 0.7 42
29.6 1.2 129
28.9 1.3 290
28.3 1.7 168
27.7 1.8 33
28.0 1.8 73
28.5 1.2 12
28.6 1.0 95
28.8 2.2 118
29.0 0.7 166
28.2 1.1 36
28.6 1.2 23
29.2 1.1 305
28.9 1.3 259
28.7 1.4 118
27.7 2.0 15
27.9 2.5 18
28.1 2.0 65
28.0 1.5 86

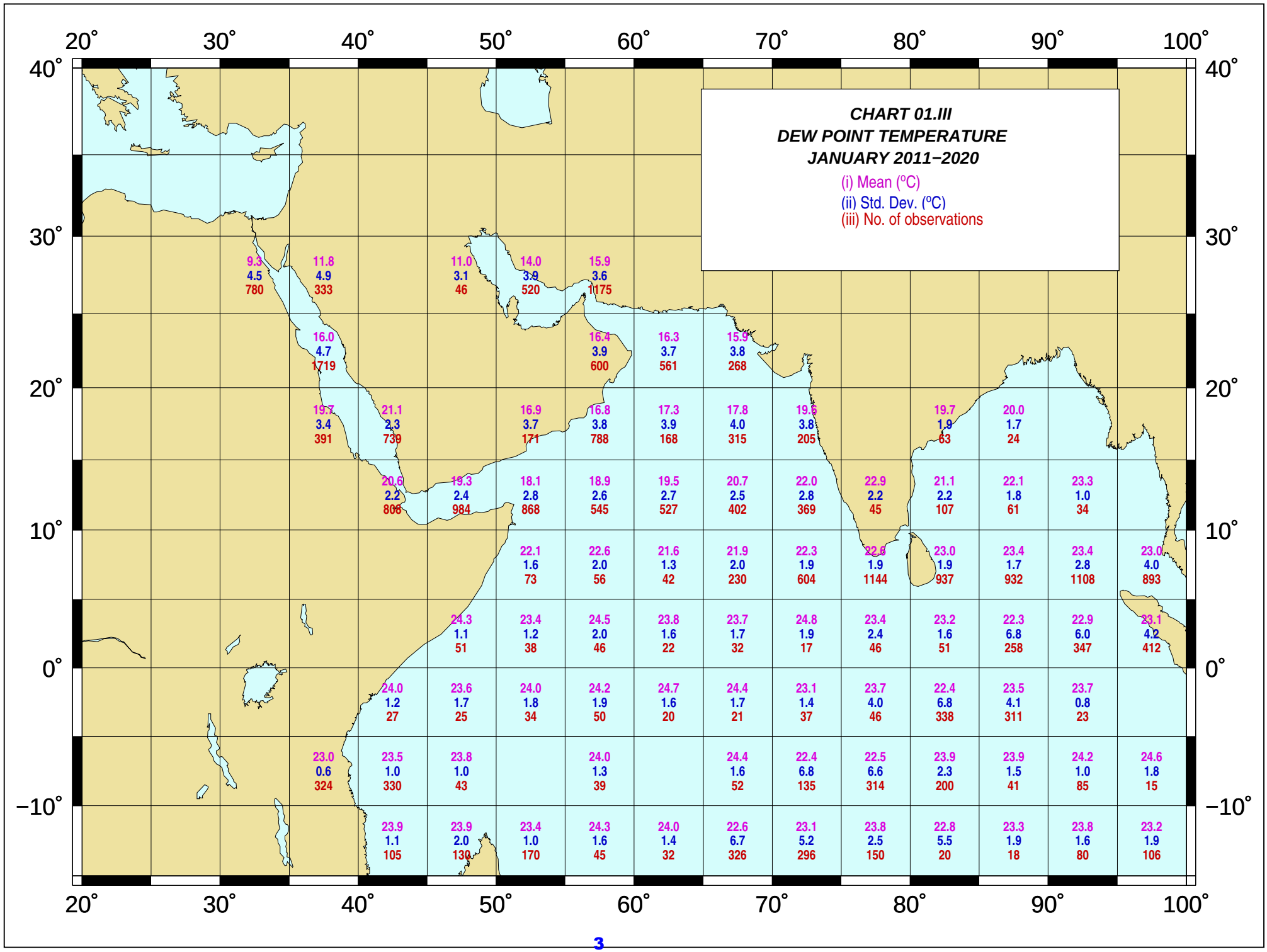


CHART 01.III
DEW POINT TEMPERATURE
JANUARY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
9.3 4.5 780
11.8 4.9 333
11.0 3.1 46
14.0 3.9 520
15.9 3.6 1175
16.0 4.7 1719
16.4 3.9 600
16.3 3.7 561
15.9 3.8 268
19.7 3.4 391
21.1 2.3 739
16.9 3.7 171
16.8 3.8 788
17.3 3.9 168
17.8 4.0 315
19.6 3.8 205
19.7 1.9 63
20.0 1.7 24
20.6 2.2 806
19.3 2.4 984
18.1 2.8 868
18.9 2.6 545
19.5 2.7 527
20.7 2.5 402
22.0 2.8 369
22.9 2.2 45
21.1 2.2 107
22.1 1.8 61
23.3 1.0 34
22.1 1.6 73
22.6 2.0 56
21.6 1.3 42
21.9 2.0 230
22.3 1.9 604
22.6 1.9 1144
23.0 1.9 937
23.4 1.7 932
23.4 2.8 1108
23.0 4.0 893
24.3 1.1 51
23.4 1.2 38
24.5 2.0 46
23.8 1.6 22
23.7 1.7 32
24.8 1.9 17
23.4 2.4 46
23.2 1.6 51
22.3 6.8 258
22.9 6.0 347
23.1 4.2 412
24.0 1.2 27
23.6 1.7 25
24.0 1.8 34
24.2 1.9 50
24.7 1.6 20
24.4 1.7 21
23.1 1.4 37
23.7 4.0 46
22.4 6.8 338
23.5 4.1 311
23.7 0.8 23
23.0 0.6 324
23.5 1.0 330
23.8 1.0 43
24.0 1.3 39
24.4 1.6 52
22.4 6.8 135
22.5 6.6 314
23.9 2.3 200
23.9 1.5 41
24.2 1.0 85
24.6 1.8 15
23.9 1.1 105
23.9 2.0 130
23.4 1.0 170
24.3 1.6 45
24.0 1.4 32
22.6 6.7 326
23.1 5.2 296
23.8 2.5 150
22.8 5.5 20
23.3 1.9 18
23.8 1.6 80
23.2 1.9 106

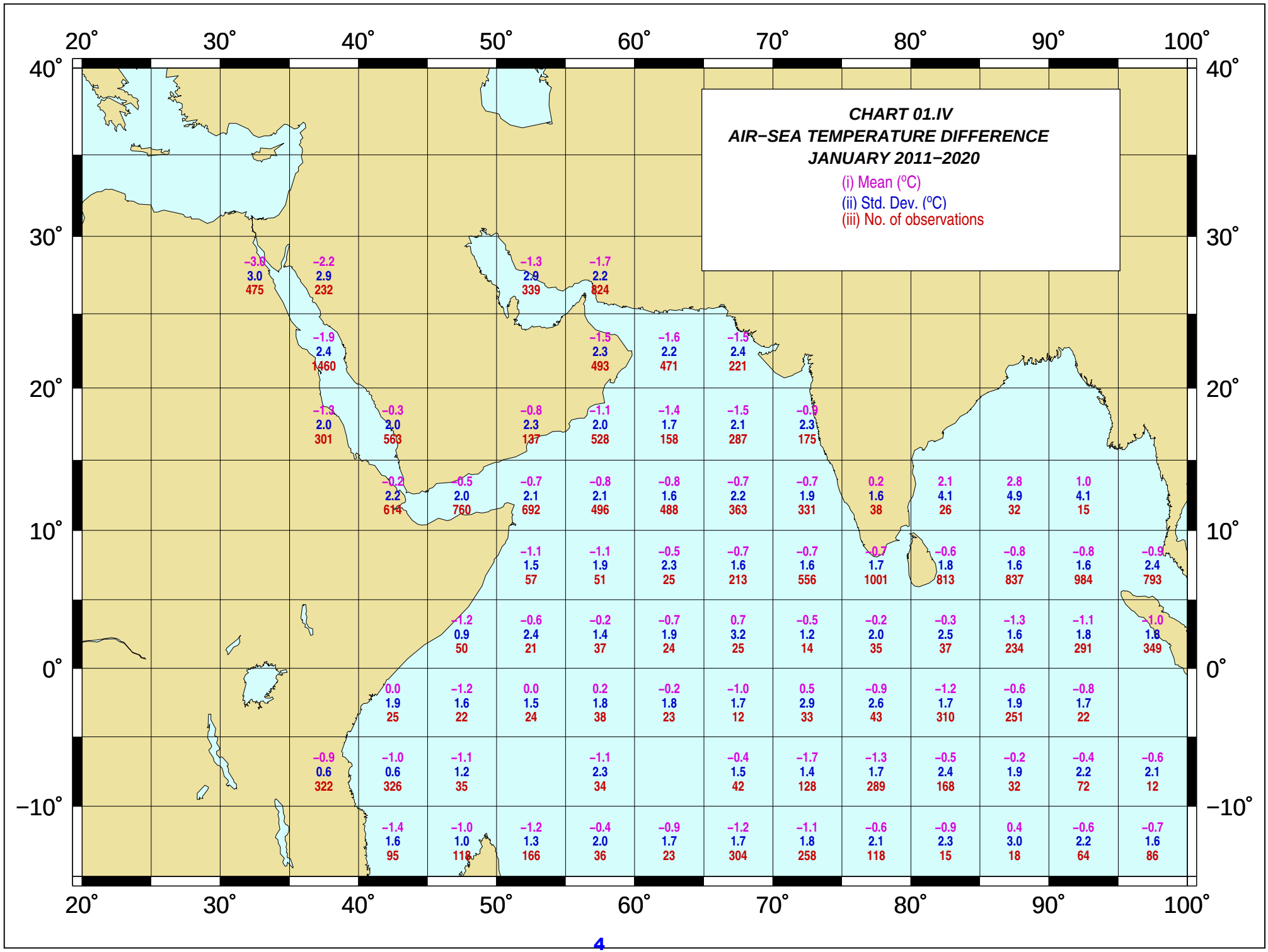


CHART 01.IV
AIR–SEA TEMPERATURE DIFFERENCE
JANUARY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
−3.0 3.0 475
−2.2 2.9 232
−1.3 2.9 339
−1.7 2.2 824
−1.9 2.4 1460
−1.5 2.3 493
−1.6 2.2 471
−1.5 2.4 221
−1.3 2.0 301
−0.3 2.0 563
−0.8 2.3 137
−1.1 2.0 528
−1.4 1.7 158
−1.5 2.1 287
−0.9 2.3 175
−0.2 2.2 614
−0.5 2.0 760
−0.7 2.1 692
−0.8 2.1 496
−0.8 1.6 488
−0.7 2.2 363
−0.7 1.9 331
0.2 1.6 38
2.1 4.1 26
2.8 4.9 32
1.0 4.1 15
−1.1 1.5 57
−1.1 1.9 51
−0.5 2.3 25
−0.7 1.6 213
−0.7 1.6 556
−0.7 1.7 1001
−0.6 1.8 813
−0.8 1.6 837
−0.8 1.6 984
−0.9 2.4 793
−1.2 0.9 50
−0.6 2.4 21
−0.2 1.4 37
−0.7 1.9 24
0.7 3.2 25
−0.5 1.2 14
−0.2 2.0 35
−0.3 2.5 37
−1.3 1.6 234
−1.1 1.8 291
−1.0 1.8 349
0.0 1.9 25
−1.2 1.6 22
0.0 1.5 24
0.2 1.8 38
−0.2 1.8 23
−1.0 1.7 12
0.5 2.9 33
−0.9 2.6 43
−1.2 1.7 310
−0.6 1.9 251
−0.8 1.7 22
−0.9 0.6 322
−1.0 0.6 326
−1.1 1.2 35
−1.1 2.3 34
−0.4 1.5 42
−1.7 1.4 128
−1.3 1.7 289
−0.5 2.4 168
−0.2 1.9 32
−0.4 2.2 72
−0.6 2.1 12
−1.4 1.6 95
−1.0 1.0 118
−1.2 1.3 166
−0.4 2.0 36
−0.9 1.7 23
−1.2 1.7 304
−1.1 1.8 258
−0.6 2.1 118
−0.9 2.3 15
0.4 3.0 18
−0.6 2.2 64
−0.7 1.6 86

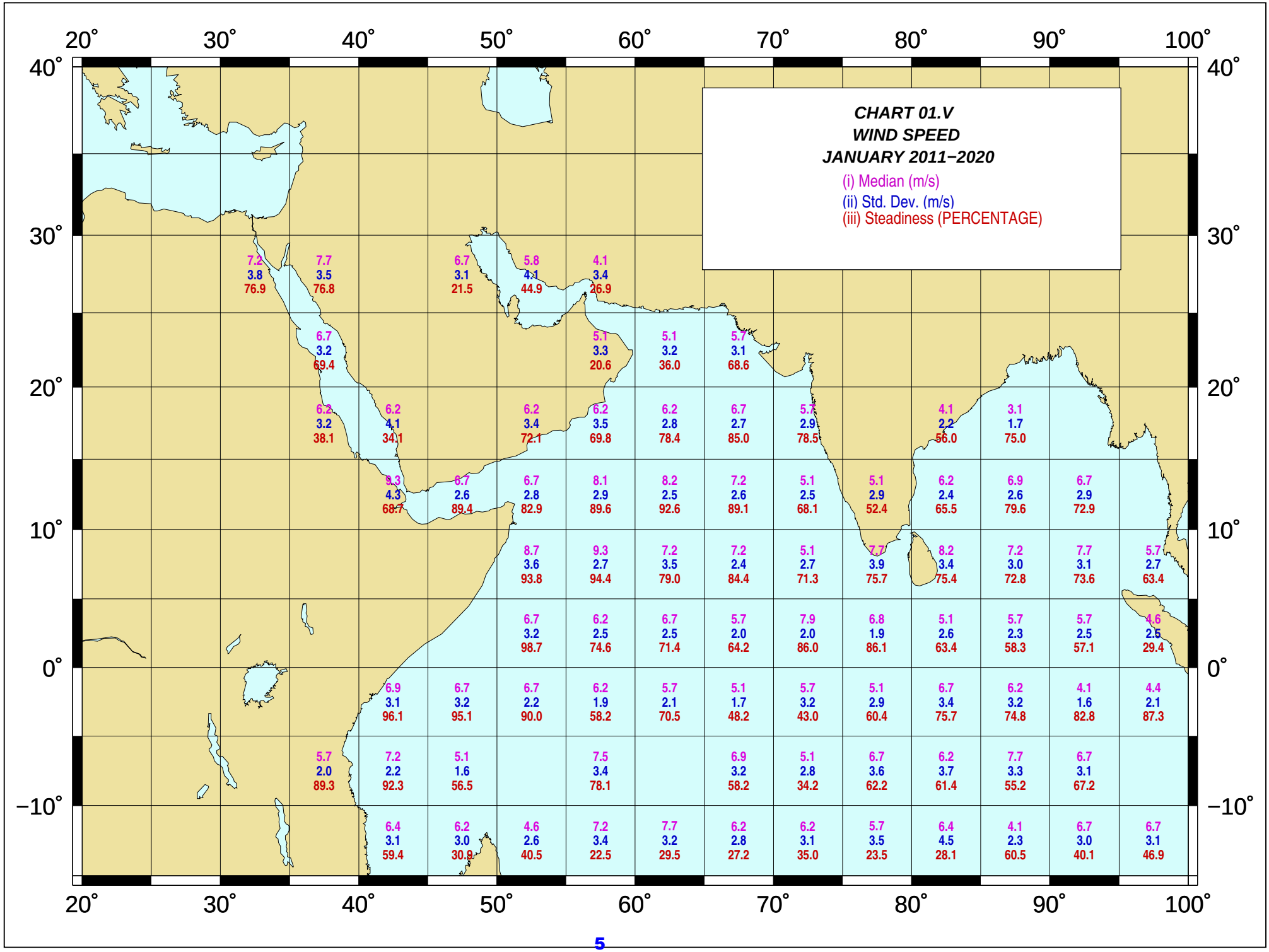


CHART 01.V
WIND SPEED
JANUARY 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
7.2 3.8 76.9
7.7 3.5 76.8
6.7 3.1 21.5
5.8 4.1 44.9
4.1 3.4 26.9
6.7 3.2 69.4
5.1 3.3 20.6
5.1 3.2 36.0
5.7 3.1 68.6
6.2 3.2 38.1
6.2 4.1 34.1
6.2 3.4 72.1
6.2 3.5 69.8
6.2 2.8 78.4
6.7 2.7 85.0
5.7 2.9 78.5
4.1 2.2 56.0
3.1 1.7 75.0
9.3 4.3 68.7
6.7 2.6 89.4
6.7 2.8 82.9
8.1 2.9 89.6
8.2 2.5 92.6
7.2 2.6 89.1
5.1 2.5 68.1
5.1 2.9 52.4
6.2 2.4 65.5
6.9 2.6 79.6
6.7 2.9 72.9
8.7 3.6 93.8
9.3 2.7 94.4
7.2 3.5 79.0
7.2 2.4 84.4
5.1 2.7 71.3
7.7 3.9 75.7
8.2 3.4 75.4
7.2 3.0 72.8
7.7 3.1 73.6
5.7 2.7 63.4
6.7 3.2 98.7
6.2 2.5 74.6
6.7 2.5 71.4
5.7 2.0 64.2
7.9 2.0 86.0
6.8 1.9 86.1
5.1 2.6 63.4
5.7 2.3 58.3
5.7 2.5 57.1
4.6 2.5 29.4
6.9 3.1 96.1
6.7 3.2 95.1
6.7 2.2 90.0
6.2 1.9 58.2
5.7 2.1 70.5
5.1 1.7 48.2
5.7 3.2 43.0
5.1 2.9 60.4
6.7 3.4 75.7
6.2 3.2 74.8
4.1 1.6 82.8
4.4 2.1 87.3
5.7 2.0 89.3
7.2 2.2 92.3
5.1 1.6 56.5
7.5 3.4 78.1
6.9 3.2 58.2
5.1 2.8 34.2
6.7 3.6 62.2
6.2 3.7 61.4
7.7 3.3 55.2
6.7 3.1 67.2
6.4 3.1 59.4
6.2 3.0 30.8
4.6 2.6 40.5
7.2 3.4 22.5
7.7 3.2 29.5
6.2 2.8 27.2
6.2 3.1 35.0
5.7 3.5 23.5
6.4 4.5 28.1
4.1 2.3 60.5
6.7 3.0 40.1
6.7 3.1 46.9

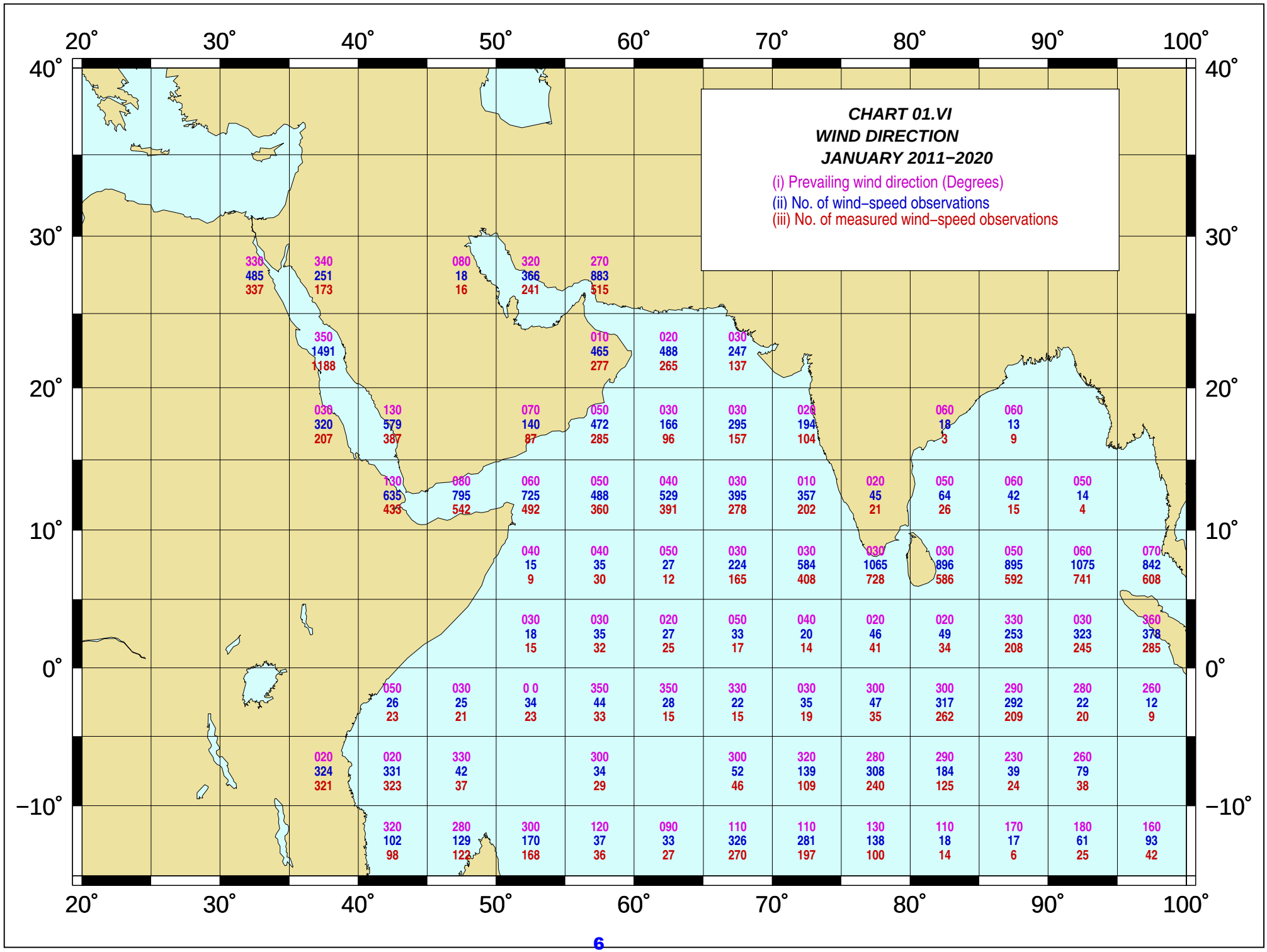


CHART 01.VI
WIND DIRECTION
JANUARY 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
330 485 337
340 251 173
080 18 16
320 366 241
270 883 515
350 1491 1188
010 465 277
020 488 265
030 247 137
030 320 207
130 579 387
070 140 87
050 472 285
030 166 96
030 295 157
020 194 104
060 18 3
060 13 9
130 635 433
080 795 542
060 725 492
050 488 360
040 529 391
030 395 278
010 357 202
020 45 21
050 64 26
060 42 15
050 14 4
040 15 9
040 35 30
050 27 12
030 224 165
030 584 408
030 1065 728
030 896 586
050 895 592
060 1075 741
070 842 608
030 18 15
030 35 32
020 27 25
050 33 17
040 20 14
020 46 41
020 49 34
330 253 208
030 323 245
360 378 285
050 26 23
030 25 21
0 0 34 23
350 44 33
350 28 15
330 22 15
030 35 19
300 47 35
300 317 262
290 292 209
280 22 20
260 12 9
020 324 321
020 331 323
330 42 37
300 34 29
300 52 46
320 139 109
280 308 240
290 184 125
230 39 24
260 79 38
320 102 98
280 129 122
300 170 168
120 37 36
090 33 27
110 326 270
110 281 197
130 138 100
110 18 14
170 17 6
180 61 25
160 93 42

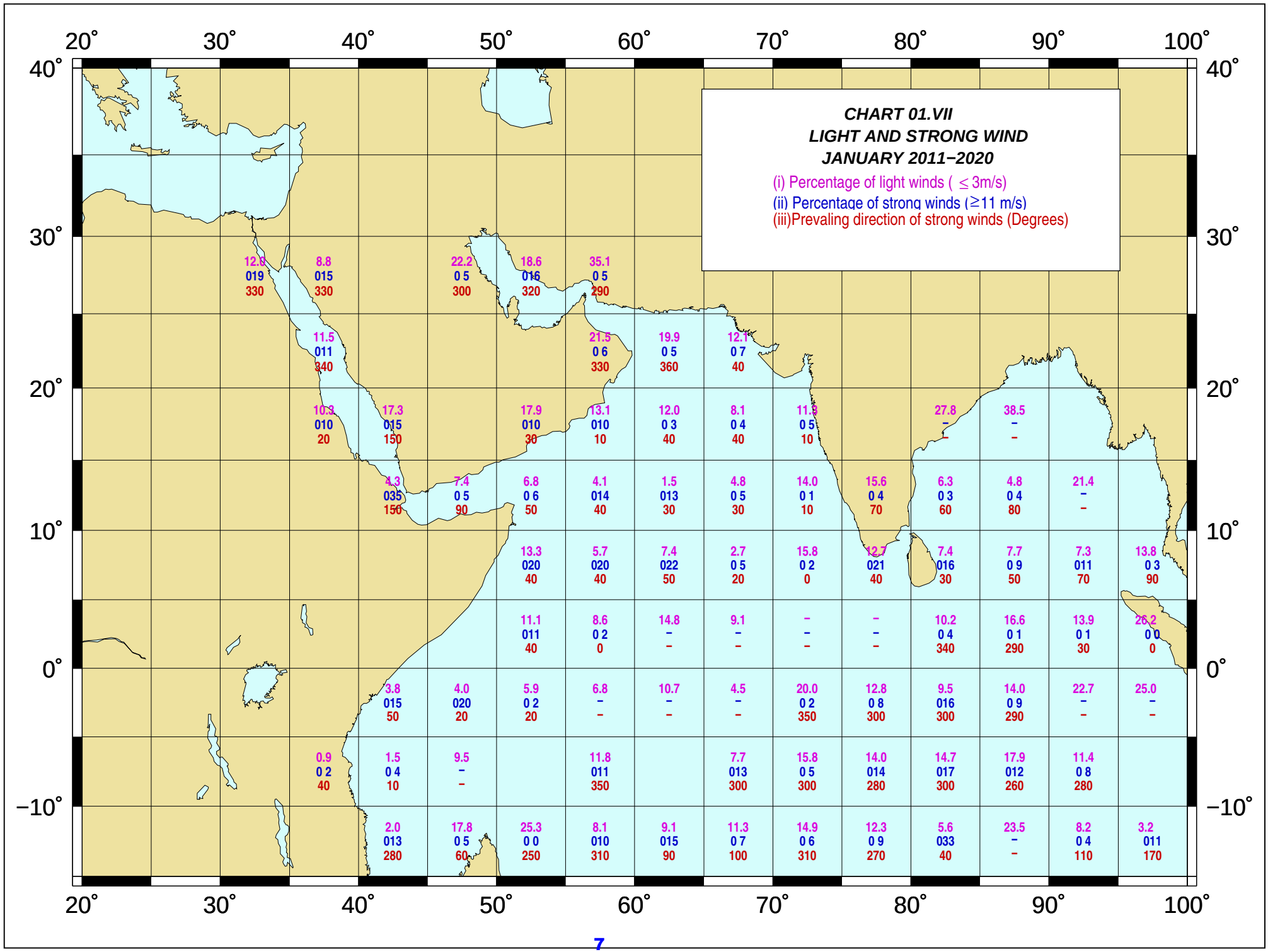


CHART 01.VII
LIGHT AND STRONG WIND
JANUARY 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
12.8 019 330
8.8 015 330
22.2 0 5 300
18.6 016 320
35.1 0 5 290
11.5 011 340
21.5 0 6 330
19.9 0 5 360
12.1 0 7 40
10.3 010 20
17.3 015 150
17.9 010 30
13.1 010 10
12.0 0 3 40
8.1 0 4 40
11.9 0 5 10
27.8 – –
38.5 – –
4.3 035 150
7.4 0 5 90
6.8 0 6 50
4.1 014 40
1.5 013 30
4.8 0 5 30
14.0 0 1 10
15.6 0 4 70
6.3 0 3 60
4.8 0 4 80
21.4 – –
13.3 020 40
5.7 020 40
7.4 022 50
2.7 0 5 20
15.8 0 2 0
12.7 021 40
7.4 016 30
7.7 0 9 50
7.3 011 70
13.8 0 3 90
11.1 011 40
8.6 0 2 0
14.8 – –
9.1 – –
– – –
– – –
10.2 0 4 340
16.6 0 1 290
13.9 0 1 30
26.2 0 0 0
3.8 015 50
4.0 020 20
5.9 0 2 20
6.8 – –
10.7 – –
4.5 – –
20.0 0 2 350
12.8 0 8 300
9.5 016 300
14.0 0 9 290
22.7 – –
25.0 – –
0.9 0 2 40
1.5 0 4 10
9.5 – –
11.8 011 350
7.7 013 300
15.8 0 5 300
14.0 014 280
14.7 017 300
17.9 012 260
11.4 0 8 280
2.0 013 280
17.8 0 5 60
25.3 0 0 250
8.1 010 310
9.1 015 90
11.3 0 7 100
14.9 0 6 310
12.3 0 9 270
5.6 033 40
23.5 – –
8.2 0 4 110
3.2 011 170

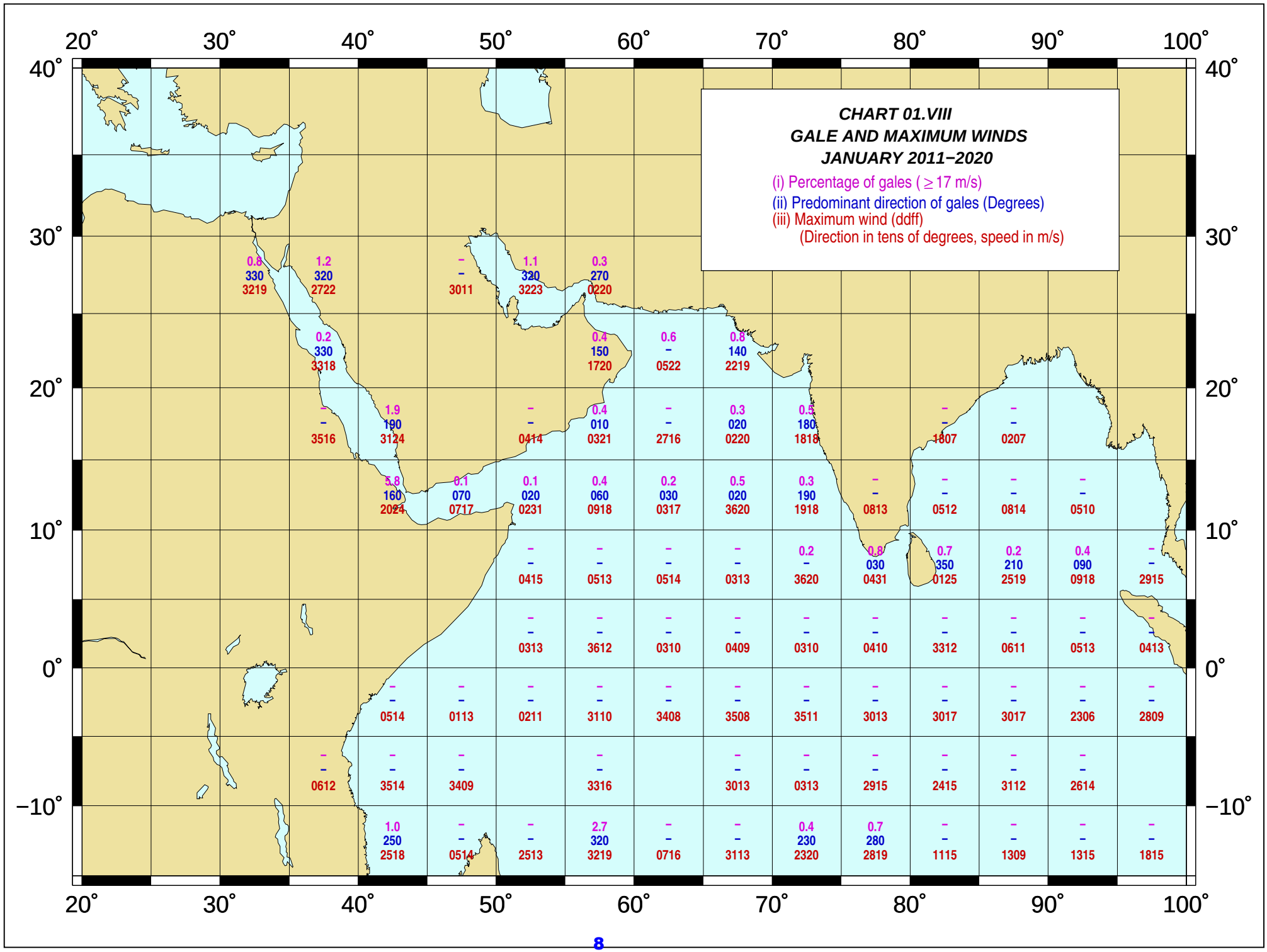


CHART 01.VIII
GALE AND MAXIMUM WINDS
JANUARY 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.8 330 3219
1.2 320 2722
– – 3011
1.1 320 3223
0.3 270 0220
0.2 330 3318
0.4 150 1720
0.6 – 0522
0.8 140 2219
– – 3516
1.9 190 3124
– – 0414
0.4 010 0321
– – 2716
0.3 020 0220
0.3 180 1818
– – 1807
– – 0207
5.8 160 2024
0.1 070 0717
0.1 020 0231
0.4 060 0918
0.2 030 0317
0.5 020 3620
0.3 190 1918
– – 0813
– – 0512
– – 0814
– – 0510
– – 0415
– – 0513
– – 0514
– – 0313
0.2 – 3620
0.8 030 0431
0.7 350 0125
0.2 210 2519
0.4 090 0918
– – 2915
– – 0313
– – 3612
– – 0310
– – 0409
– – 0310
– – 0410
– – 3312
– – 0611
– – 0513
– – 0413
– – 0514
– – 0113
– – 0211
– – 3110
– – 3408
– – 3508
– – 3511
– – 3013
– – 3017
– – 3017
– – 2306
– – 2809
– – 0612
– – 3514
– – 3409
– – 3316
– – 3013
– – 0313
– – 2915
– – 2415
– – 3112
– – 2614
1.0 250 2518
– – 0514
– – 2513
2.7 320 3219
– – 0716
– – 3113
0.4 230 2320
0.7 280 2819
– – 1115
– – 1309
– – 1315
– – 1815

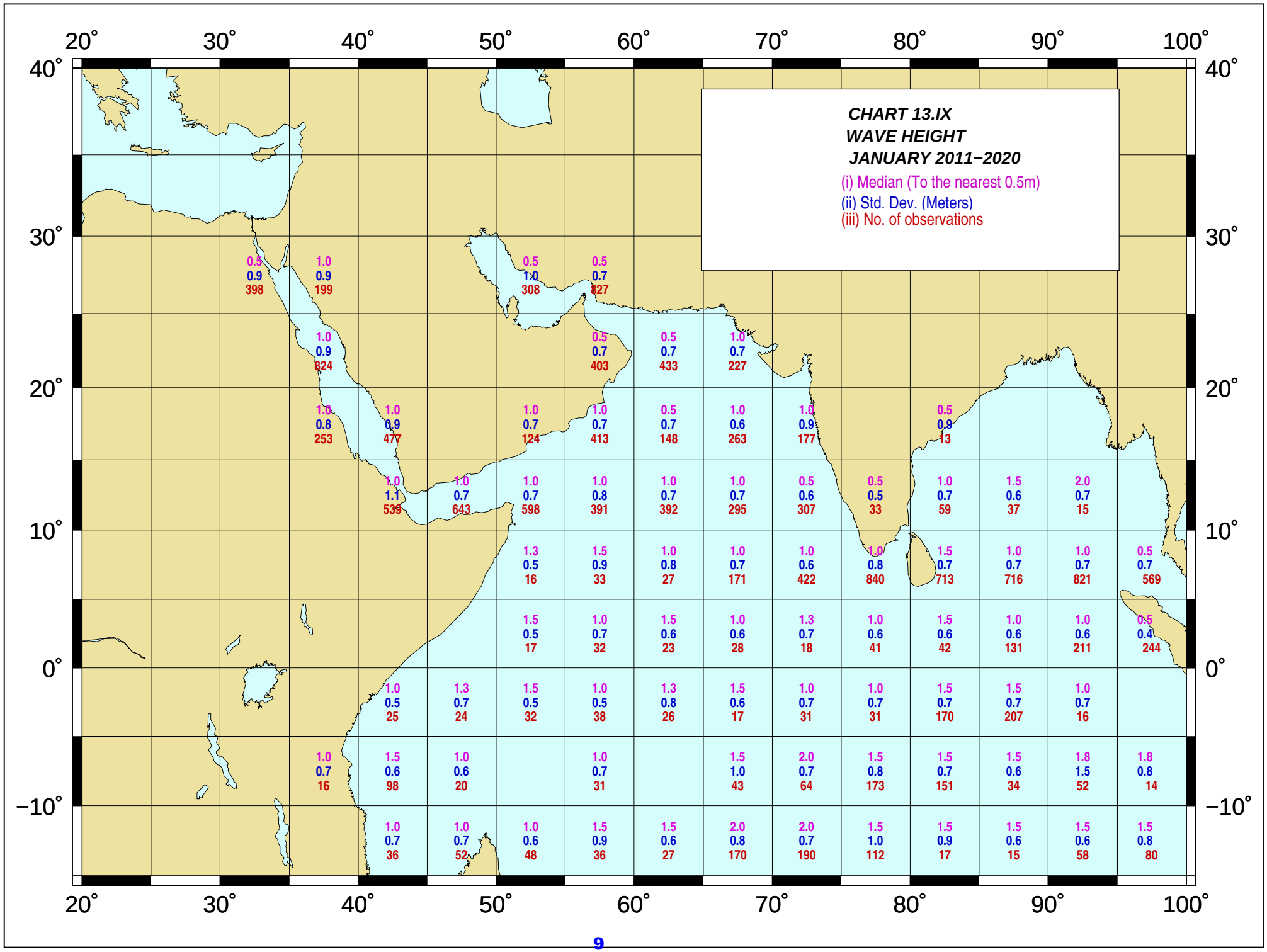


CHART 13.IX
WAVE HEIGHT
JANUARY 2011–2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.5 0.9 398
1.0 0.9 199
0.5 1.0 308
0.5 0.7 827
1.0 0.9 824
0.5 0.7 403
0.5 0.7 433
1.0 0.7 227
1.0 0.8 253
1.0 0.9 477
1.0 0.7 124
1.0 0.7 413
0.5 0.7 148
1.0 0.6 263
1.0 0.9 177
0.5 0.9 13
1.0 1.1 539
1.0 0.7 643
1.0 0.7 598
1.0 0.8 391
1.0 0.7 392
1.0 0.7 295
0.5 0.6 307
0.5 0.5 33
1.0 0.7 59
1.5 0.6 37
2.0 0.7 15
1.3 0.5 16
1.5 0.9 33
1.0 0.8 27
1.0 0.7 171
1.0 0.6 422
1.0 0.8 840
1.5 0.7 713
1.0 0.7 716
1.0 0.7 821
0.5 0.7 569
1.5 0.5 17
1.0 0.7 32
1.5 0.6 23
1.0 0.6 28
1.3 0.7 18
1.0 0.6 41
1.5 0.6 42
1.0 0.6 131
1.0 0.6 211
0.5 0.4 244
1.0 0.5 25
1.3 0.7 24
1.5 0.5 32
1.0 0.5 38
1.3 0.8 26
1.5 0.6 17
1.0 0.7 31
1.0 0.7 31
1.5 0.7 170
1.5 0.7 207
1.0 0.7 16
1.0 0.7 16
1.5 0.6 98
1.0 0.6 20
1.0 0.7 31
1.5 1.0 43
2.0 0.7 64
1.5 0.8 173
1.5 0.7 151
1.5 0.6 34
1.8 1.5 52
1.8 0.8 14
1.0 0.7 36
1.0 0.7 52
1.0 0.6 48
1.5 0.9 36
1.5 0.6 27
2.0 0.8 170
2.0 0.7 190
1.5 1.0 112
1.5 0.9 17
1.5 0.6 15
1.5 0.6 58
1.5 0.8 80

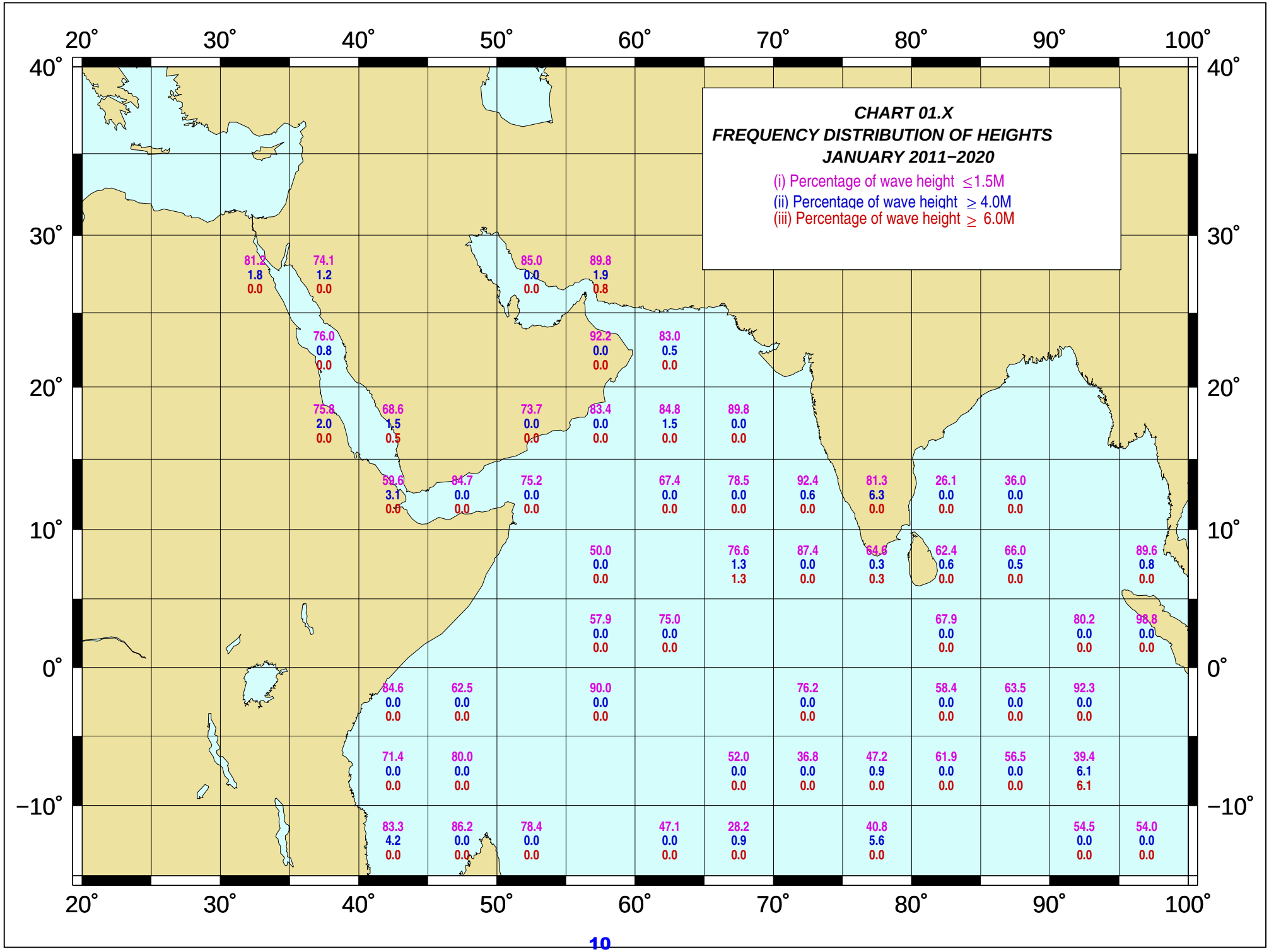


CHART 01.X
FREQUENCY DISTRIBUTION OF HEIGHTS
JANUARY 2011–2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
81.2 1.8 0.0
74.1 1.2 0.0
85.0 0.0 0.0
89.8 1.9 0.8
76.0 0.8 0.0
92.2 0.0 0.0
83.0 0.5 0.0
75.8 2.0 0.0
68.6 1.5 0.5
73.7 0.0 0.0
83.4 0.0 0.0
84.8 1.5 0.0
89.8 0.0 0.0
59.6 3.1 0.6
84.7 0.0 0.0
75.2 0.0 0.0
67.4 0.0 0.0
78.5 0.0 0.0
92.4 0.6 0.0
81.3 6.3 0.0
26.1 0.0 0.0
36.0 0.0 0.0
50.0 0.0 0.0
76.6 1.3 1.3
87.4 0.0 0.0
64.6 0.3 0.3
62.4 0.6 0.0
66.0 0.5 0.0
89.6 0.8 0.0
57.9 0.0 0.0
75.0 0.0 0.0
67.9 0.0 0.0
80.2 0.0 0.0
98.8 0.0 0.0
84.6 0.0 0.0
62.5 0.0 0.0
90.0 0.0 0.0
76.2 0.0 0.0
58.4 0.0 0.0
63.5 0.0 0.0
92.3 0.0 0.0
71.4 0.0 0.0
80.0 0.0 0.0
52.0 0.0 0.0
36.8 0.0 0.0
47.2 0.9 0.0
61.9 0.0 0.0
56.5 0.0 0.0
39.4 6.1 6.1
83.3 4.2 0.0
86.2 0.0 0.0
78.4 0.0 0.0
47.1 0.0 0.0
28.2 0.9 0.0
40.8 5.6 0.0
54.5 0.0 0.0
54.0 0.0 0.0

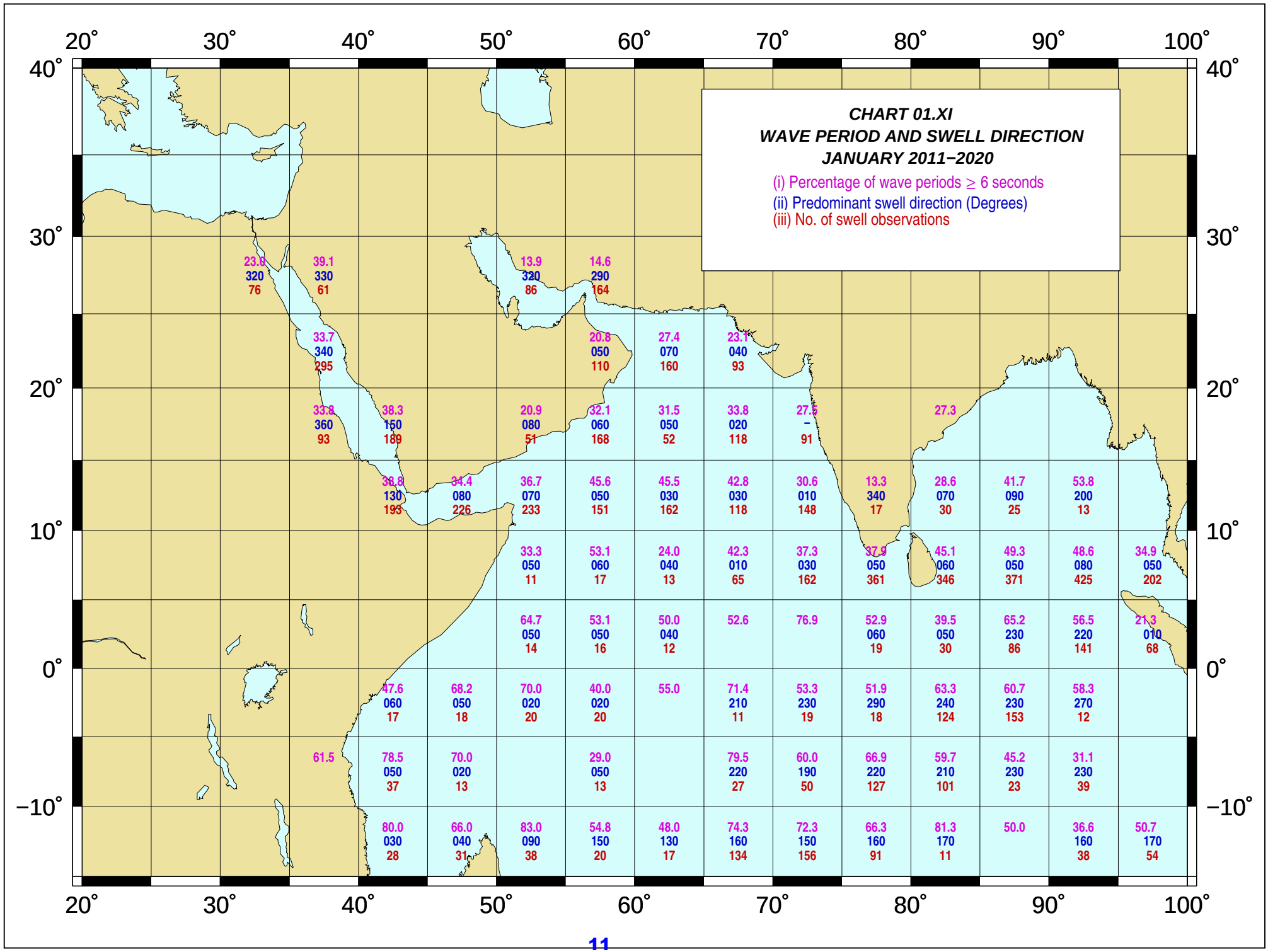


CHART 01.XI
WAVE PERIOD AND SWELL DIRECTION
JANUARY 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
23.8 320 76
39.1 330 61
13.9 320 86
14.6 290 164
33.7 340 295
20.8 050 110
27.4 070 160
23.1 040 93
33.8 360 93
38.3 150 189
20.9 080 51
32.1 060 168
31.5 050 52
33.8 020 118
27.5 – 91
27.3
38.8 130 193
34.4 080 226
36.7 070 233
45.6 050 151
45.5 030 162
42.8 030 118
30.6 010 148
13.3 340 17
28.6 070 30
41.7 090 25
53.8 200 13
33.3 050 11
53.1 060 17
24.0 040 13
42.3 010 65
37.3 030 162
37.9 050 361
45.1 060 346
49.3 050 371
48.6 080 425
34.9 050 202
64.7 050 14
53.1 050 16
50.0 040 12
52.6
76.9
52.9 060 19
39.5 050 30
65.2 230 86
56.5 220 141
21.3 010 68
47.6 060 17
68.2 050 18
70.0 020 20
40.0 020 20
55.0
71.4 210 11
53.3 230 19
51.9 290 18
63.3 240 124
60.7 230 153
58.3 270 12
61.5
78.5 050 37
70.0 020 13
29.0 050 13
79.5 220 27
60.0 190 50
66.9 220 127
59.7 210 101
45.2 230 23
31.1 230 39
80.0 030 28
66.0 040 31
83.0 090 38
54.8 150 20
48.0 130 17
74.3 160 134
72.3 150 156
66.3 160 91
81.3 170 11
50.0
36.6 160 38
50.7 170 54

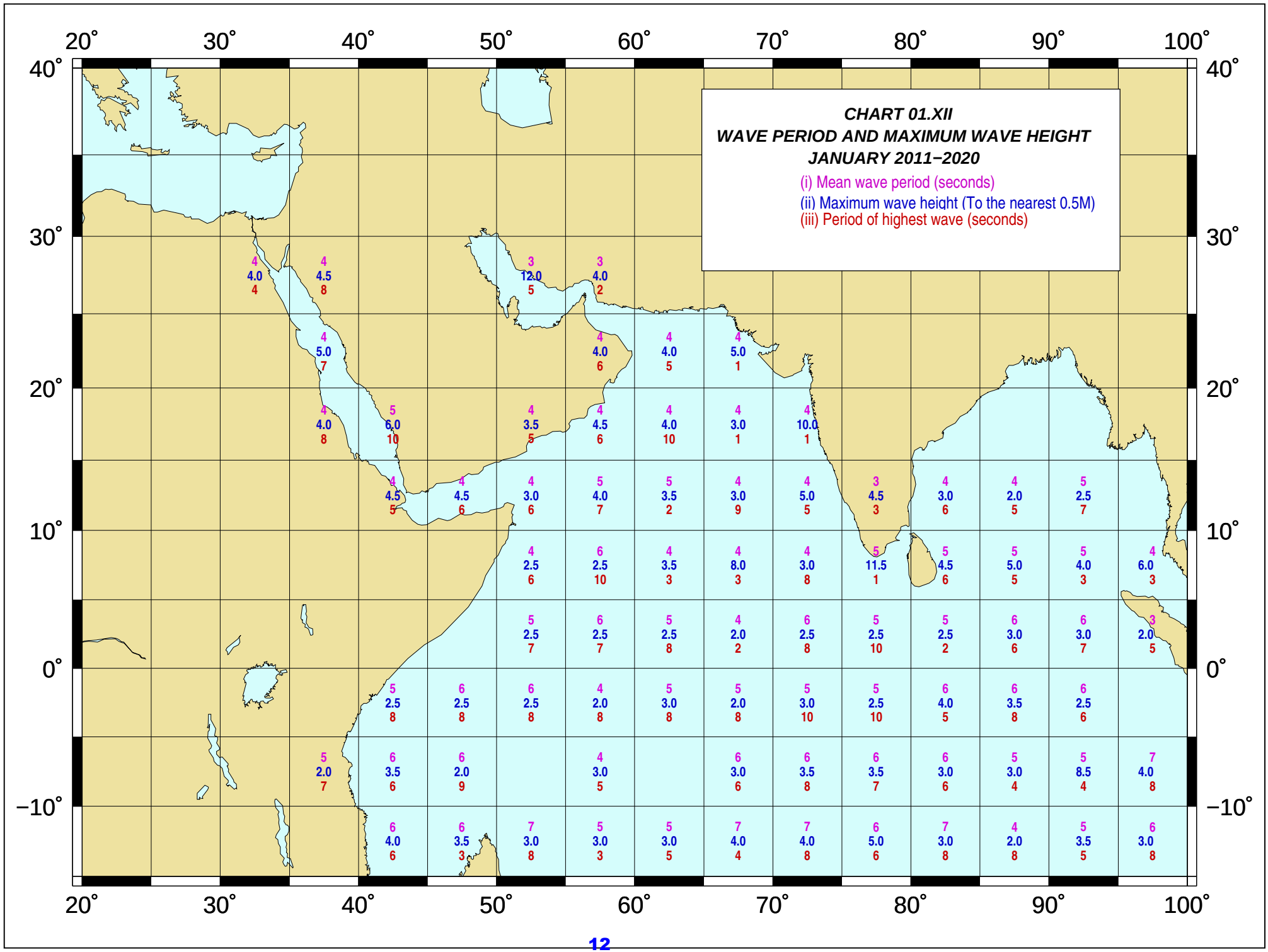


CHART 01.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
JANUARY 2011–2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°

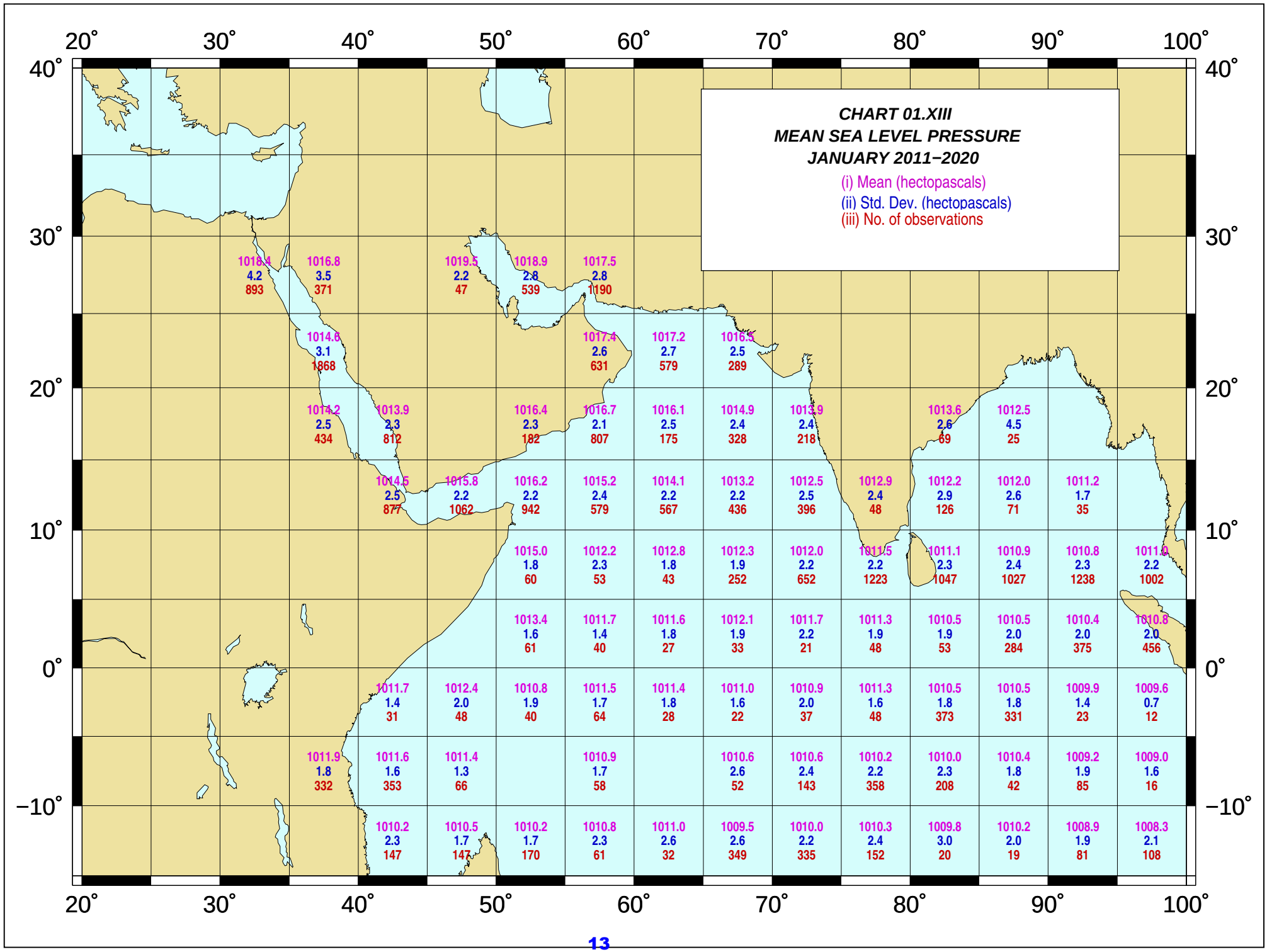


CHART 01.XIII
MEAN SEA LEVEL PRESSURE
JANUARY 2011−2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1018.4 4.2 893
1016.8 3.5 371
1019.5 2.2 47
1018.9 2.8 539
1017.5 2.8 1190
1014.6 3.1 1868
1017.4 2.6 631
1017.2 2.7 579
1016.5 2.5 289
1014.2 2.5 434
1013.9 2.3 812
1016.4 2.3 182
1016.7 2.1 807
1016.1 2.5 175
1014.9 2.4 328
1013.9 2.4 218
1013.6 2.6 69
1012.5 4.5 25
1014.5 2.5 877
1015.8 2.2 1062
1016.2 2.2 942
1015.2 2.4 579
1014.1 2.2 567
1013.2 2.2 436
1012.5 2.5 396
1012.9 2.4 48
1012.2 2.9 126
1012.0 2.6 71
1011.2 1.7 35
1015.0 1.8 60
1012.2 2.3 53
1012.8 1.8 43
1012.3 1.9 252
1012.0 2.2 652
1011.5 2.2 1223
1011.1 2.3 1047
1010.9 2.4 1027
1010.8 2.3 1238
1011.0 2.2 1002
1013.4 1.6 61
1011.7 1.4 40
1011.6 1.8 27
1012.1 1.9 33
1011.7 2.2 21
1011.3 1.9 48
1010.5 1.9 53
1010.5 2.0 284
1010.4 2.0 375
1010.6 2.0 456
1011.7 1.4 31
1012.4 2.0 48
1010.8 1.9 40
1011.5 1.7 64
1011.4 1.8 28
1011.0 1.6 22
1010.9 2.0 37
1011.3 1.6 48
1010.5 1.8 373
1010.5 1.8 331
1009.9 1.4 23
1009.6 0.7 12
1011.9 1.8 332
1011.6 1.6 353
1011.4 1.3 66
1010.9 1.7 58
1010.6 2.6 52
1010.6 2.4 143
1010.2 2.2 358
1010.0 2.3 208
1010.4 1.8 42
1009.2 1.9 85
1009.0 1.6 16
1010.2 2.3 147
1010.5 1.7 147
1010.2 1.7 170
1010.8 2.3 61
1011.0 2.6 32
1009.5 2.6 349
1010.0 2.2 335
1010.3 2.4 152
1009.8 3.0 20
1010.2 2.0 19
1008.9 1.9 81
1008.3 2.1 108

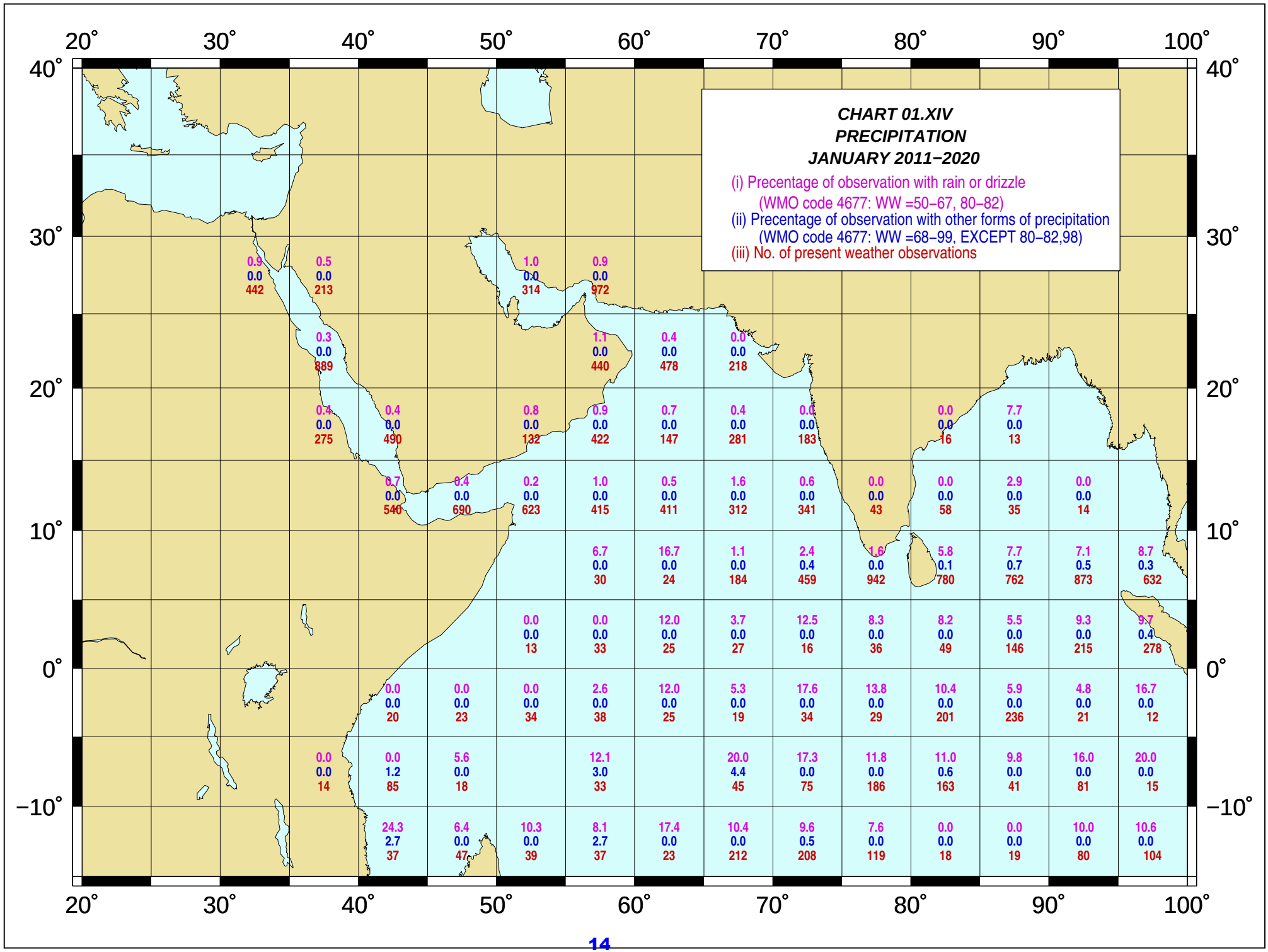


CHART 01.XIV
PRECIPITATION
JANUARY 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.9 0.0 442
0.5 0.0 213
1.0 0.0 314
0.9 0.0 972
0.3 0.0 889
1.1 0.0 440
0.4 0.0 478
0.0 0.0 218
0.4 0.0 275
0.4 0.0 490
0.8 0.0 132
0.9 0.0 422
0.7 0.0 147
0.4 0.0 281
0.0 0.0 183
0.0 0.0 16
7.7 0.0 13
0.7 0.0 540
0.4 0.0 690
0.2 0.0 623
1.0 0.0 415
0.5 0.0 411
1.6 0.0 312
0.6 0.0 341
0.0 0.0 43
0.0 0.0 58
2.9 0.0 35
0.0 0.0 14
6.7 0.0 30
16.7 0.0 24
1.1 0.0 184
2.4 0.4 459
1.6 0.0 942
5.8 0.1 780
7.7 0.7 762
7.1 0.5 873
8.7 0.3 632
0.0 0.0 13
0.0 0.0 33
12.0 0.0 25
3.7 0.0 27
12.5 0.0 16
8.3 0.0 36
8.2 0.0 49
5.5 0.0 146
9.3 0.0 215
9.7 0.4 278
0.0 0.0 20
0.0 0.0 23
0.0 0.0 34
2.6 0.0 38
12.0 0.0 25
5.3 0.0 19
17.6 0.0 34
13.8 0.0 29
10.4 0.0 201
5.9 0.0 236
4.8 0.0 21
16.7 0.0 12
0.0 0.0 14
0.0 1.2 85
5.6 0.0 18
12.1 3.0 33
20.0 4.4 45
17.3 0.0 75
11.8 0.0 186
11.0 0.6 163
9.8 0.0 41
16.0 0.0 81
20.0 0.0 15
24.3 2.7 37
6.4 0.0 47
10.3 0.0 39
8.1 2.7 37
17.4 0.0 23
10.4 0.0 212
9.6 0.5 208
7.6 0.0 119
0.0 0.0 18
0.0 0.0 19
10.0 0.0 80
10.6 0.0 104

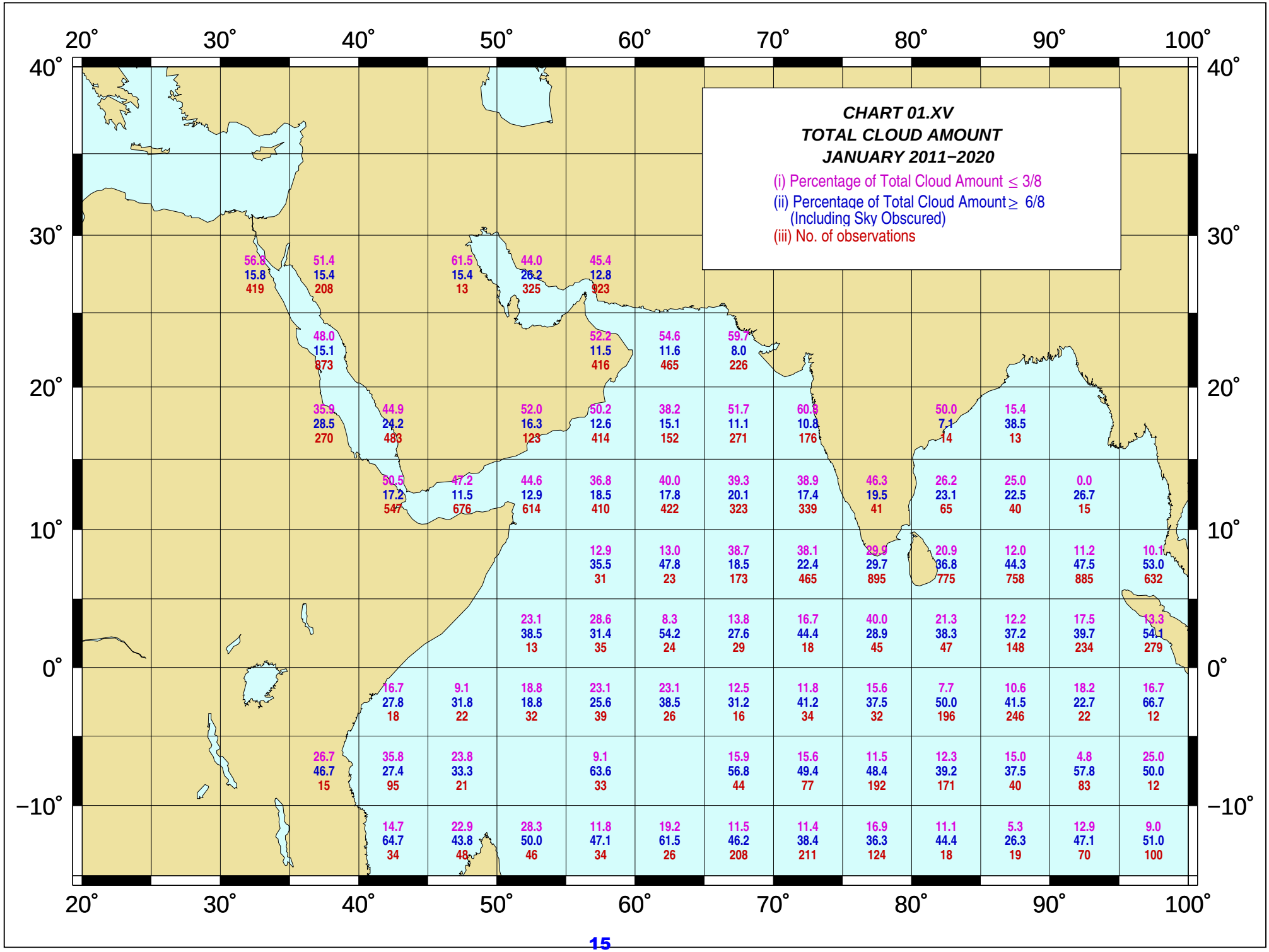


CHART 01.XV
TOTAL CLOUD AMOUNT
JANUARY 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
56.8 15.8 419
51.4 15.4 208
61.5 15.4 13
44.0 26.2 325
45.4 12.8 923
48.0 15.1 873
52.2 11.5 416
54.6 11.6 465
59.7 8.0 226
35.9 28.5 270
44.9 24.2 483
52.0 16.3 123
50.2 12.6 414
38.2 15.1 152
51.7 11.1 271
60.9 10.8 176
50.0 7.1 14
15.4 38.5 13
50.5 17.2 547
47.2 11.5 676
44.6 12.9 614
36.8 18.5 410
40.0 17.8 422
39.3 20.1 323
38.9 17.4 339
46.3 19.5 41
26.2 23.1 65
25.0 22.5 40
0.0 26.7 15
12.9 35.5 31
13.0 47.8 23
38.7 18.5 173
38.1 22.4 465
29.9 29.7 895
20.9 36.8 775
12.0 44.3 758
11.2 47.5 885
10.1 53.0 632
23.1 38.5 13
28.6 31.4 35
8.3 54.2 24
13.8 27.6 29
16.7 44.4 18
40.0 28.9 45
21.3 38.3 47
12.2 37.2 148
17.5 39.7 234
13.3 54.1 279
16.7 27.8 18
9.1 31.8 22
18.8 18.8 32
23.1 25.6 39
23.1 38.5 26
12.5 31.2 16
11.8 41.2 34
15.6 37.5 32
7.7 50.0 196
10.6 41.5 246
18.2 22.7 22
16.7 66.7 12
26.7 46.7 15
35.8 27.4 95
23.8 33.3 21
9.1 63.6 33
15.9 56.8 44
15.6 49.4 77
11.5 48.4 192
12.3 39.2 171
15.0 37.5 40
4.8 57.8 83
25.0 50.0 12
14.7 64.7 34
22.9 43.8 48
28.3 50.0 46
11.8 47.1 34
19.2 61.5 26
11.5 46.2 208
11.4 38.4 211
16.9 36.3 124
11.1 44.4 18
5.3 26.3 19
12.9 47.1 70
9.0 51.0 100

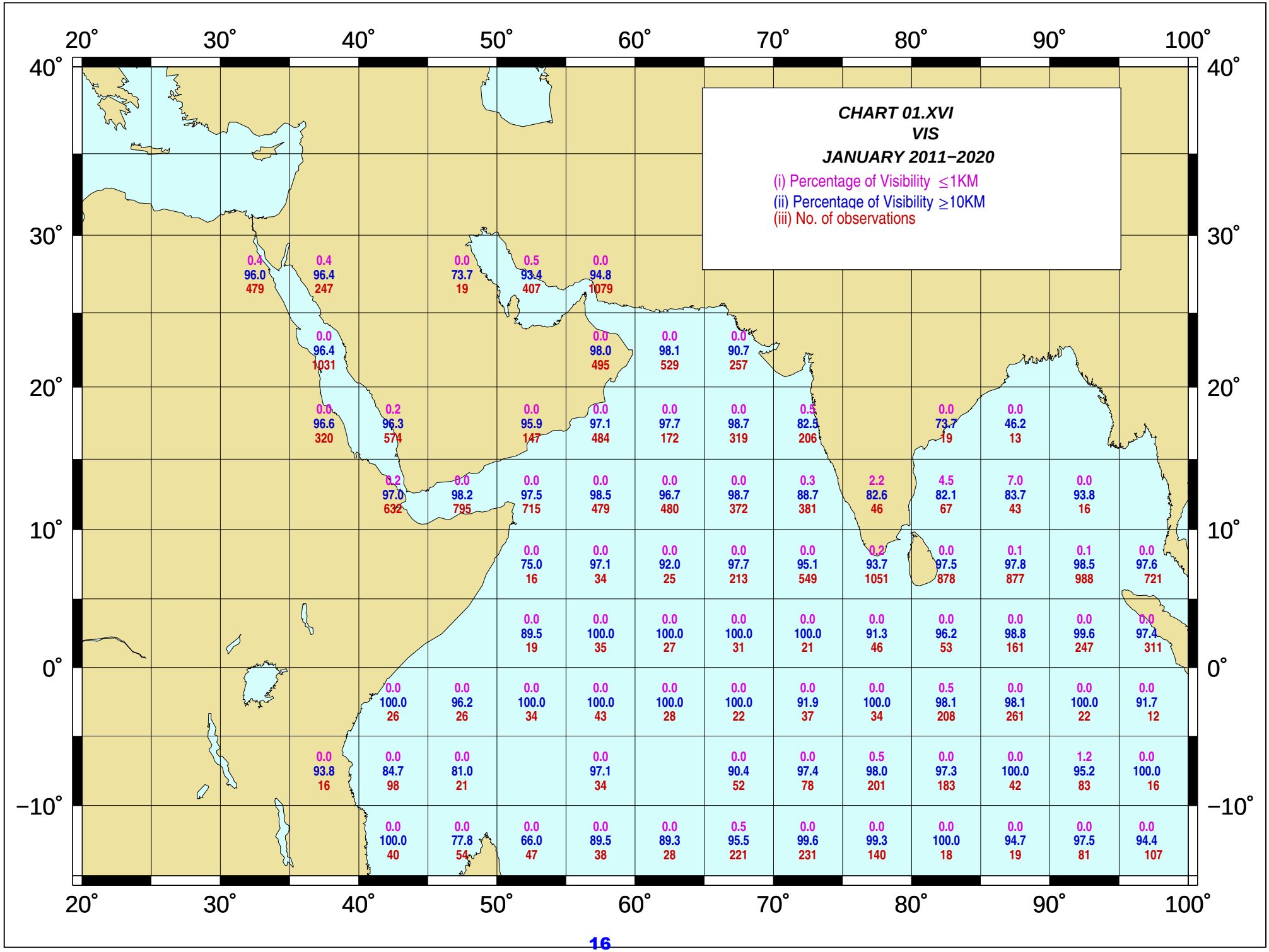


CHART 01.XVI
VIS
JANUARY 2011–2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.4 96.0 479
0.4 96.4 247
0.0 73.7 19
0.5 93.4 407
0.0 94.8 1079
0.0 96.4 1031
0.0 98.0 495
0.0 98.1 529
0.0 90.7 257
0.0 96.6 320
0.2 96.3 574
0.0 95.9 147
0.0 97.1 484
0.0 97.7 172
0.0 98.7 319
0.5 82.5 206
0.0 73.7 19
0.0 46.2 13
0.2 97.0 632
0.0 98.2 795
0.0 97.5 715
0.0 98.5 479
0.0 96.7 480
0.0 98.7 372
0.3 88.7 381
2.2 82.6 46
4.5 82.1 67
7.0 83.7 43
0.0 93.8 16
0.0 75.0 16
0.0 97.1 34
0.0 92.0 25
0.0 97.7 213
0.0 95.1 549
0.2 93.7 1051
0.0 97.5 878
0.1 97.8 877
0.1 98.5 988
0.0 97.6 721
0.0 89.5 19
0.0 100.0 35
0.0 100.0 27
0.0 100.0 31
0.0 100.0 21
0.0 91.3 46
0.0 96.2 53
0.0 98.8 161
0.0 99.6 247
0.0 97.4 311
0.0 100.0 26
0.0 96.2 26
0.0 100.0 34
0.0 100.0 43
0.0 100.0 28
0.0 100.0 22
0.0 91.9 37
0.0 100.0 34
0.5 98.1 208
0.0 98.1 261
0.0 100.0 22
0.0 91.7 12
0.0 93.8 16
0.0 84.7 98
0.0 81.0 21
0.0 97.1 34
0.0 90.4 52
0.0 97.4 78
0.5 98.0 201
0.0 97.3 183
0.0 100.0 42
1.2 95.2 83
0.0 100.0 16
0.0 100.0 40
0.0 77.8 54
0.0 66.0 47
0.0 89.5 38
0.0 89.3 28
0.5 95.5 221
0.0 99.6 231
0.0 99.3 140
0.0 100.0 18
0.0 94.7 19
0.0 97.5 81
0.0 94.4 107

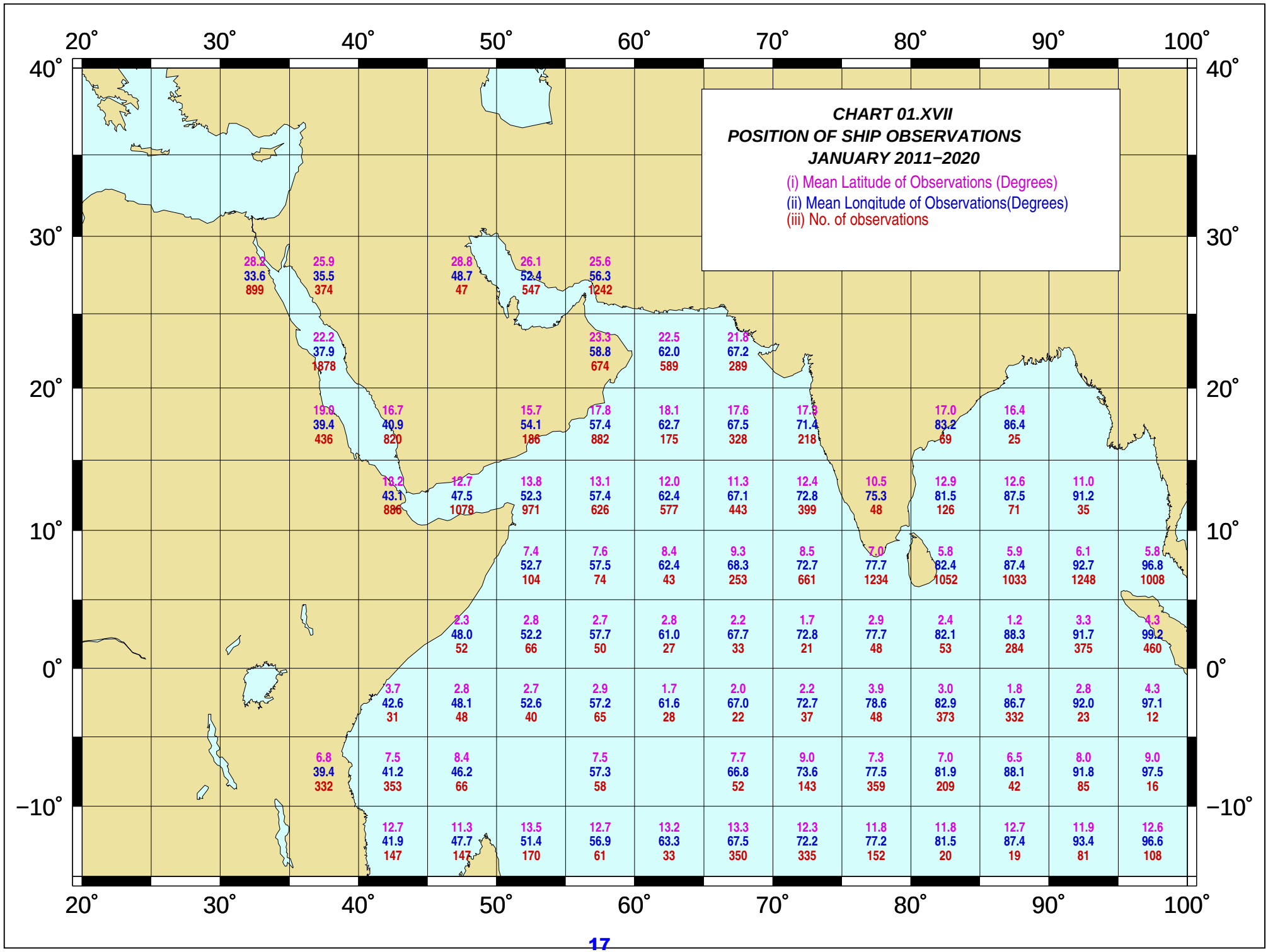


CHART 01.XVII
POSITION OF SHIP OBSERVATIONS
JANUARY 2011–2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.2 33.6 899
25.9 35.5 374
28.8 48.7 47
26.1 52.4 547
25.6 56.3 1242
22.2 37.9 1878
23.3 58.8 674
22.5 62.0 589
21.8 67.2 289
19.0 39.4 436
16.7 40.9 820
15.7 54.1 186
17.8 57.4 882
18.1 62.7 175
17.6 67.5 328
17.3 71.4 218
17.0 83.2 69
16.4 86.4 25
10.2 43.1 886
12.7 47.5 1078
13.8 52.3 971
13.1 57.4 626
12.0 62.4 577
11.3 67.1 443
12.4 72.8 399
10.5 75.3 48
12.9 81.5 126
12.6 87.5 71
11.0 91.2 35
7.4 52.7 104
7.6 57.5 74
8.4 62.4 43
9.3 68.3 253
8.5 72.7 661
7.0 77.7 1234
5.8 82.4 1052
5.9 87.4 1033
6.1 92.7 1248
5.8 96.8 1008
2.3 48.0 52
2.8 52.2 66
2.7 57.7 50
2.8 61.0 27
2.2 67.7 33
1.7 72.8 21
2.9 77.7 48
2.4 82.1 53
1.2 88.3 284
3.3 91.7 375
4.3 99.2 460
3.7 42.6 31
2.8 48.1 48
2.7 52.6 40
2.9 57.2 65
1.7 61.6 28
2.0 67.0 22
2.2 72.7 37
3.9 78.6 48
3.0 82.9 373
1.8 86.7 332
2.8 92.0 23
4.3 97.1 12
6.8 39.4 332
7.5 41.2 353
8.4 46.2 66
7.5 57.3 58
7.7 66.8 52
9.0 73.6 143
7.3 77.5 359
7.0 81.9 209
6.5 88.1 42
8.0 91.8 85
9.0 97.5 16
12.7 41.9 147
11.3 47.7 147
13.5 51.4 170
12.7 56.9 61
13.2 63.3 33
13.3 67.5 350
12.3 72.2 335
11.8 77.2 152
11.8 81.5 20
12.7 87.4 19
11.9 93.4 81
12.6 96.6 108

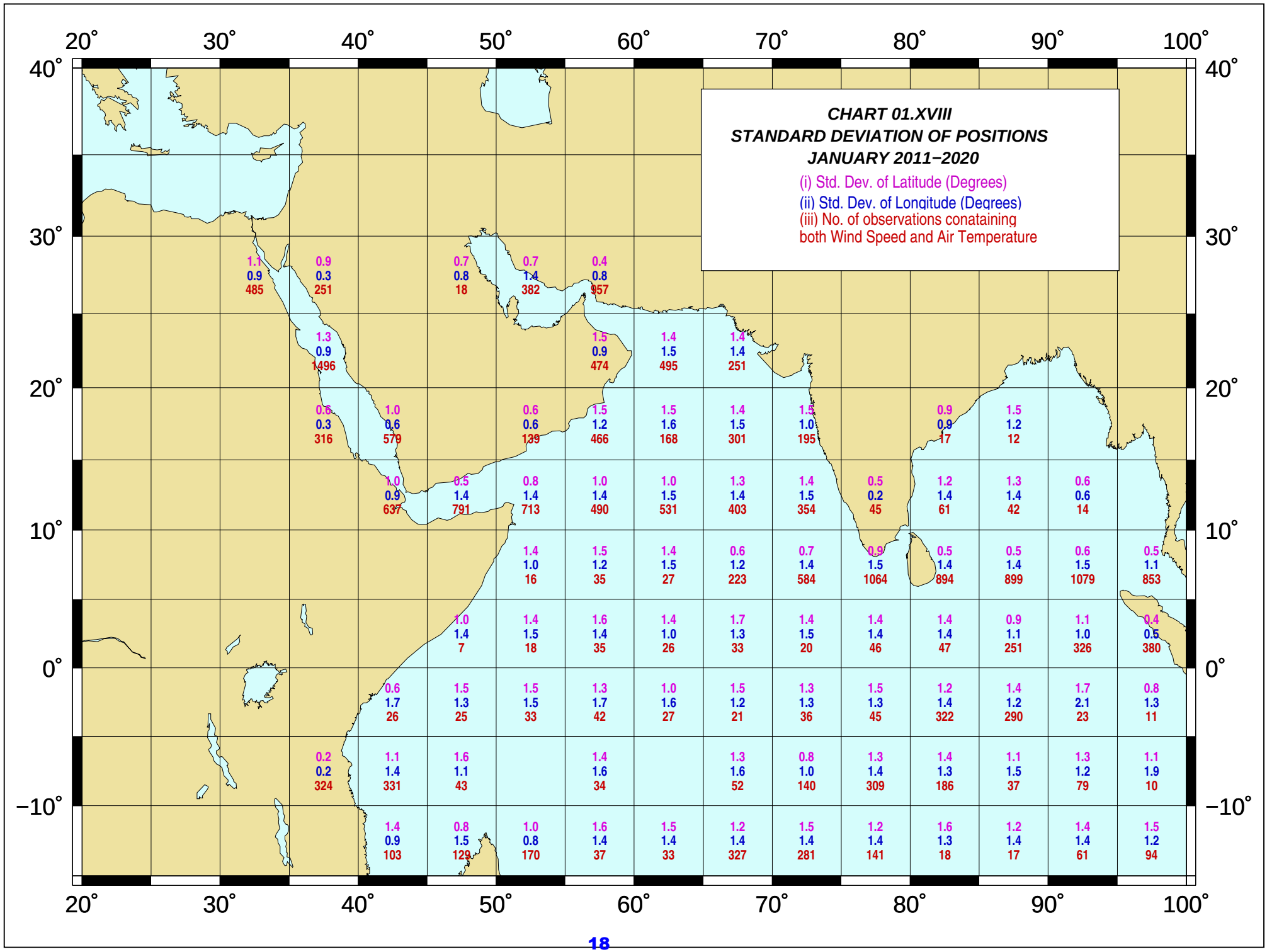
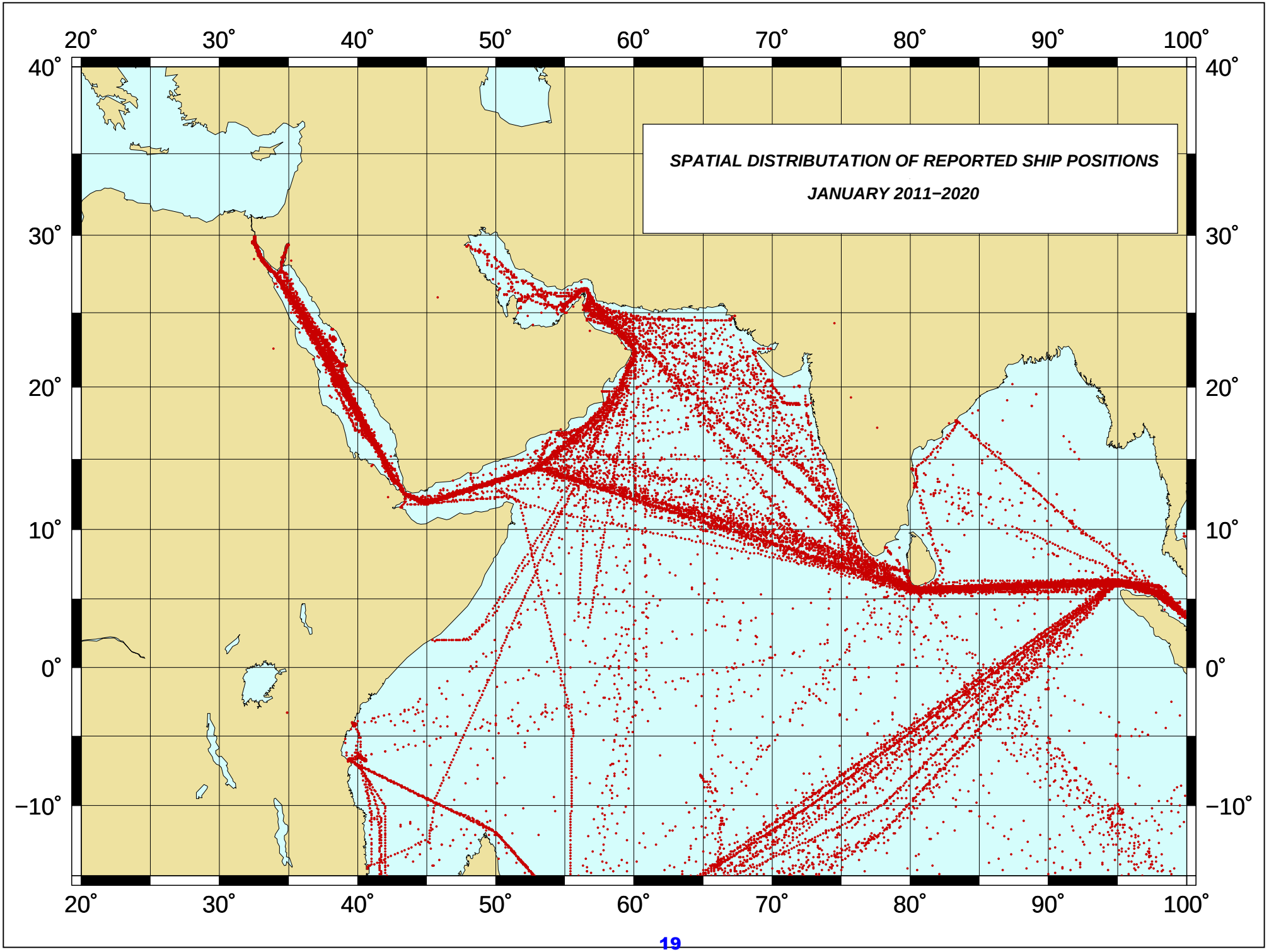


CHART 01.XVIII
STANDARD DEVIATION OF POSITIONS
JANUARY 2011−2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.1 0.9 485
0.9 0.3 251
0.7 0.8 18
0.7 1.4 382
0.4 0.8 957
1.3 0.9 1496
1.5 0.9 474
1.4 1.5 495
1.4 1.4 251
0.6 0.3 316
1.0 0.6 579
0.6 0.6 139
1.5 1.2 466
1.5 1.6 168
1.4 1.5 301
1.5 1.0 195
0.9 0.9 17
1.5 1.2 12
1.0 0.9 637
0.5 1.4 791
0.8 1.4 713
1.0 1.4 490
1.0 1.5 531
1.3 1.4 403
1.4 1.5 354
0.5 0.2 45
1.2 1.4 61
1.3 1.4 42
0.6 0.6 14
1.4 1.0 16
1.5 1.2 35
1.4 1.5 27
0.6 1.2 223
0.7 1.4 584
0.9 1.5 1064
0.5 1.4 894
0.5 1.4 899
0.6 1.5 1079
0.5 1.1 853
1.0 1.4 7
1.4 1.5 18
1.6 1.4 35
1.4 1.0 26
1.7 1.3 33
1.4 1.5 20
1.4 1.4 46
1.4 1.4 47
0.9 1.1 251
1.1 1.0 326
0.4 0.5 380
0.6 1.7 26
1.5 1.3 25
1.5 1.5 33
1.3 1.7 42
1.0 1.6 27
1.5 1.2 21
1.3 1.3 36
1.5 1.3 45
1.2 1.4 322
1.4 1.2 290
1.7 2.1 23
0.8 1.3 11
0.2 0.2 324
1.1 1.4 331
1.6 1.1 43
1.4 1.6 34
1.3 1.6 52
0.8 1.0 140
1.3 1.4 309
1.4 1.3 186
1.1 1.5 37
1.3 1.2 79
1.1 1.9 10
1.4 0.9 103
0.8 1.5 129
1.0 0.8 170
1.6 1.4 37
1.5 1.4 33
1.2 1.4 327
1.5 1.4 281
1.2 1.4 141
1.6 1.3 18
1.2 1.4 17
1.4 1.4 61
1.5 1.2 94


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
JANUARY 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF FEBRUARY 2011-2020

Marine Climatological Summary Charts 2011-2020

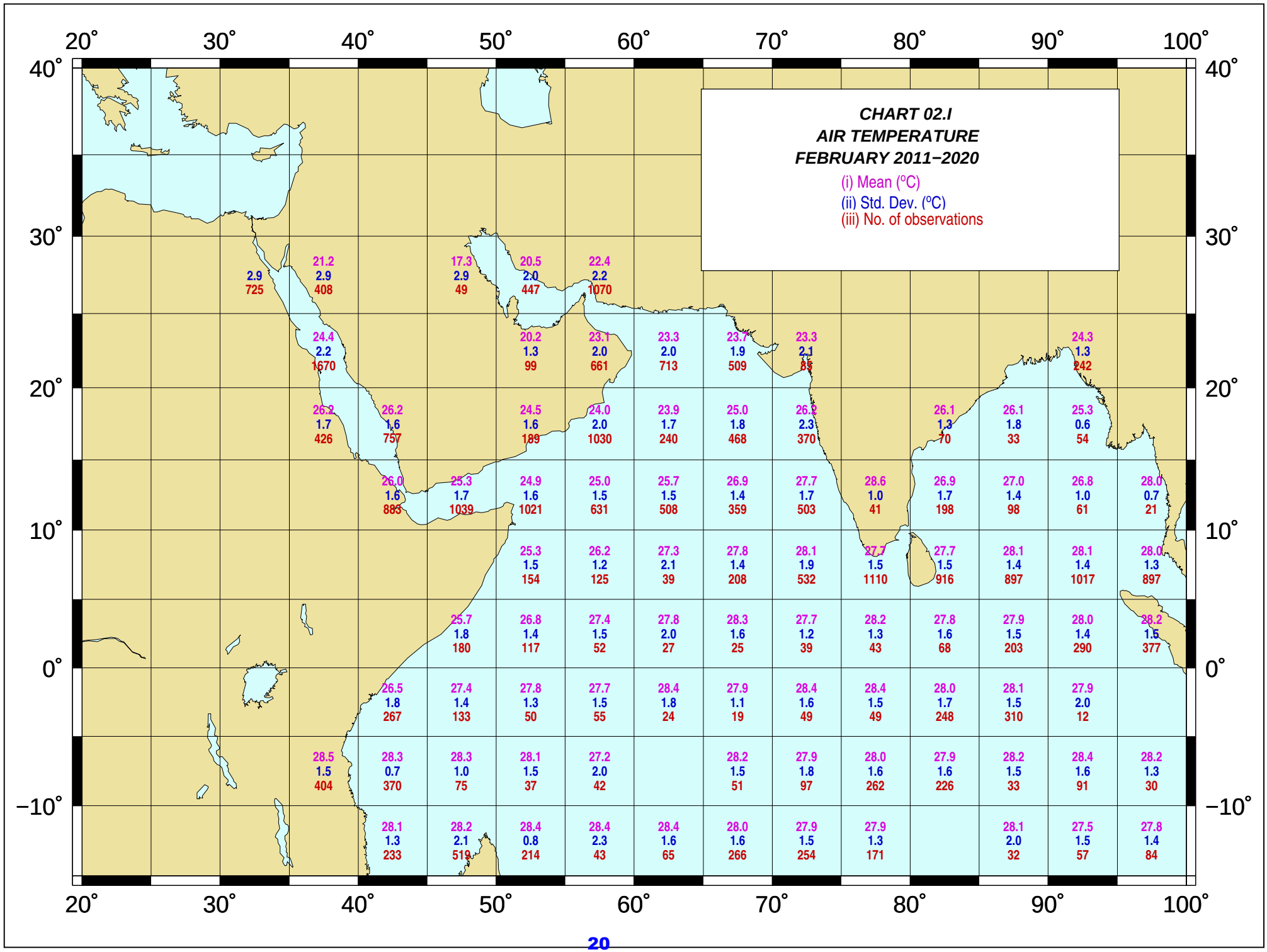


CHART 02.I
AIR TEMPERATURE
FEBRUARY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.9 725
21.2 2.9 408
17.3 2.9 49
20.5 2.0 447
22.4 2.2 1070
24.4 2.2 1670
20.2 1.3 99
23.1 2.0 661
23.3 2.0 713
23.7 1.9 509
23.3 2.1 85
24.3 1.3 242
26.2 1.7 426
26.2 1.6 757
24.5 1.6 189
24.0 2.0 1030
23.9 1.7 240
25.0 1.8 468
26.2 2.3 370
26.1 1.3 70
26.1 1.8 33
25.3 0.6 54
26.0 1.6 883
25.3 1.7 1039
24.9 1.6 1021
25.0 1.5 631
25.7 1.5 508
26.9 1.4 359
27.7 1.7 503
28.6 1.0 41
26.9 1.7 198
27.0 1.4 98
26.8 1.0 61
28.0 0.7 21
25.3 1.5 154
26.2 1.2 125
27.3 2.1 39
27.8 1.4 208
28.1 1.9 532
27.7 1.5 1110
27.7 1.5 916
28.1 1.4 897
28.1 1.4 1017
28.0 1.3 897
25.7 1.8 180
26.8 1.4 117
27.4 1.5 52
27.8 2.0 27
28.3 1.6 25
27.7 1.2 39
28.2 1.3 43
27.8 1.6 68
27.9 1.5 203
28.0 1.4 290
28.2 1.5 377
26.5 1.8 267
27.4 1.4 133
27.8 1.3 50
27.7 1.5 55
28.4 1.8 24
27.9 1.1 19
28.4 1.6 49
28.4 1.5 49
28.0 1.7 248
28.1 1.5 310
27.9 2.0 12
28.5 1.5 404
28.3 0.7 370
28.3 1.0 75
28.1 1.5 37
27.2 2.0 42
28.2 1.5 51
27.9 1.8 97
28.0 1.6 262
27.9 1.6 226
28.2 1.5 33
28.4 1.6 91
28.2 1.3 30
28.1 1.3 233
28.2 2.1 519
28.4 0.8 214
28.4 2.3 43
28.4 1.6 65
28.0 1.6 266
27.9 1.5 254
27.9 1.3 171
28.1 2.0 32
27.5 1.5 57
27.8 1.4 84

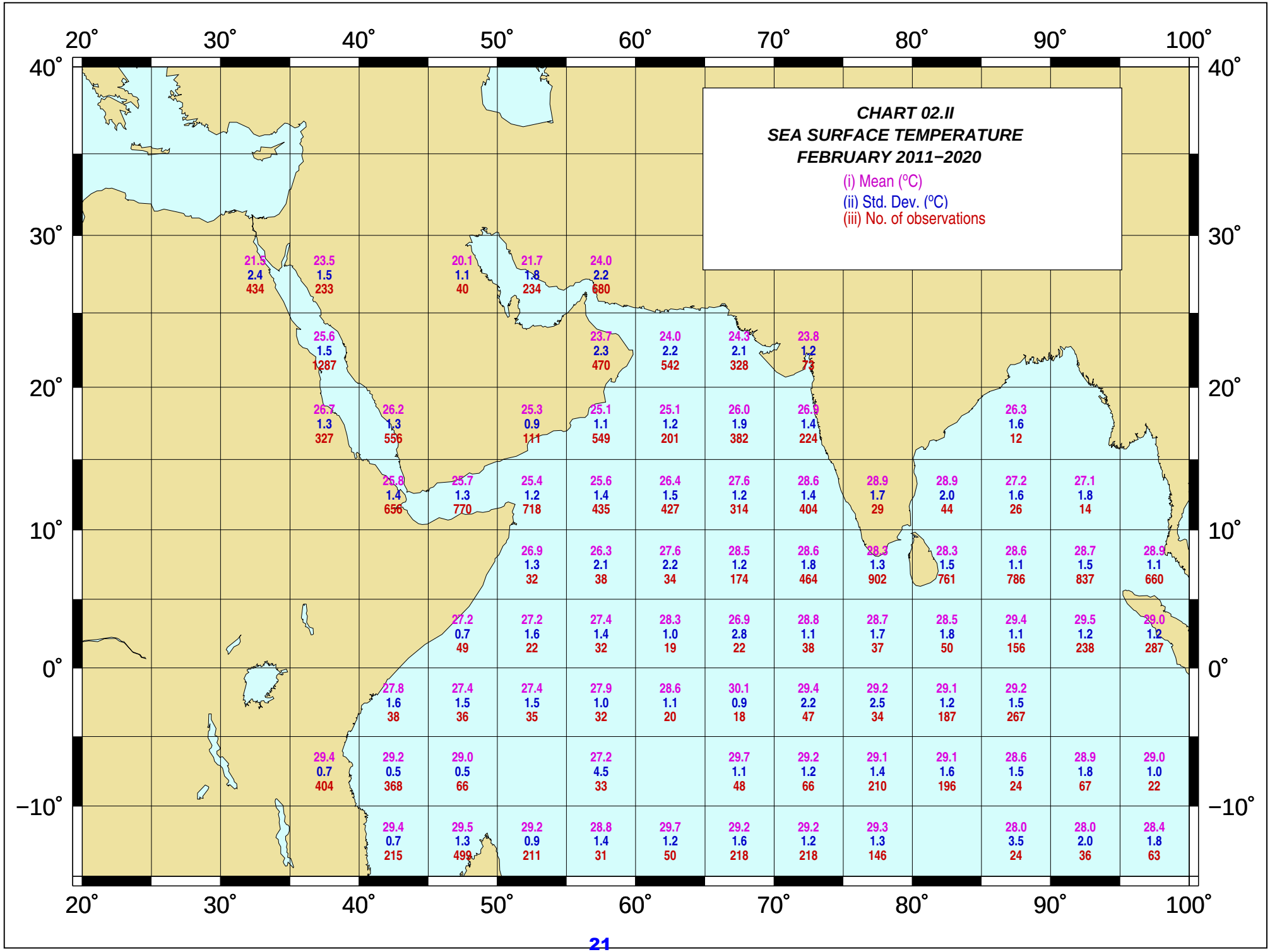


CHART 02.II
SEA SURFACE TEMPERATURE
FEBRUARY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
21.5 2.4 434
23.5 1.5 233
20.1 1.1 40
21.7 1.8 234
24.0 2.2 680
25.6 1.5 1287
23.7 2.3 470
24.0 2.2 542
24.3 2.1 328
23.8 1.2 73
26.7 1.3 327
26.2 1.3 556
25.3 0.9 111
25.1 1.1 549
25.1 1.2 201
26.0 1.9 382
26.9 1.4 224
26.3 1.6 12
25.8 1.4 656
25.7 1.3 770
25.4 1.2 718
25.6 1.4 435
26.4 1.5 427
27.6 1.2 314
28.6 1.4 404
28.9 1.7 29
28.9 2.0 44
27.2 1.6 26
27.1 1.8 14
26.9 1.3 32
26.3 2.1 38
27.6 2.2 34
28.5 1.2 174
28.6 1.8 464
28.3 1.3 902
28.3 1.5 761
28.6 1.1 786
28.7 1.5 837
28.9 1.1 660
27.2 0.7 49
27.2 1.6 22
27.4 1.4 32
28.3 1.0 19
26.9 2.8 22
28.8 1.1 38
28.7 1.7 37
28.5 1.8 50
29.4 1.1 156
29.5 1.2 238
29.0 1.2 287
27.8 1.6 38
27.4 1.5 36
27.4 1.5 35
27.9 1.0 32
28.6 1.1 20
30.1 0.9 18
29.4 2.2 47
29.2 2.5 34
29.1 1.2 187
29.2 1.5 267
29.4 0.7 404
29.2 0.5 368
29.0 0.5 66
27.2 4.5 33
29.7 1.1 48
29.2 1.2 66
29.1 1.4 210
29.1 1.6 196
28.6 1.5 24
28.9 1.8 67
29.0 1.0 22
29.4 0.7 215
29.5 1.3 499
29.2 0.9 211
28.8 1.4 31
29.7 1.2 50
29.2 1.6 218
29.2 1.2 218
29.3 1.3 146
28.0 3.5 24
28.0 2.0 36
28.4 1.8 63

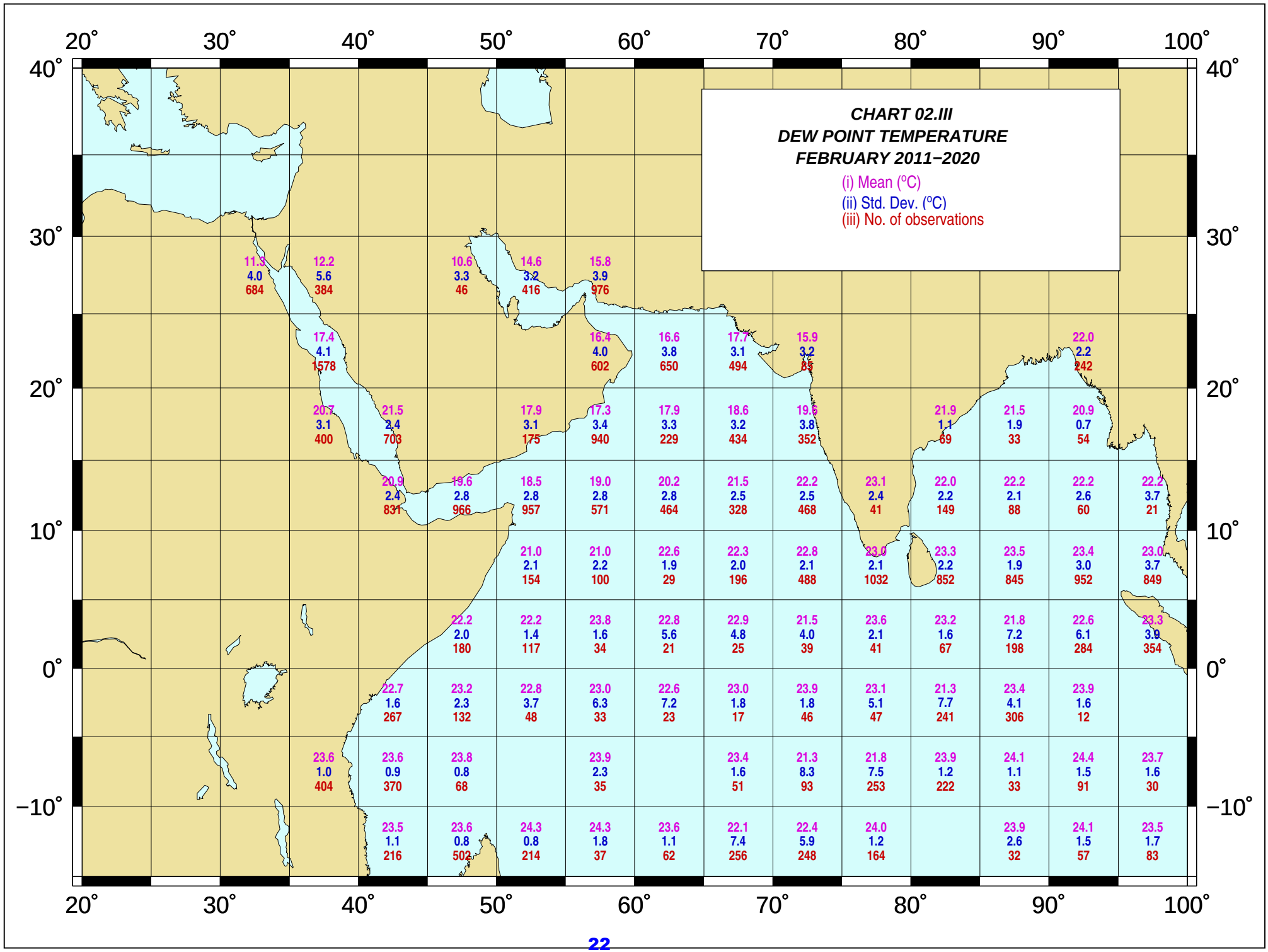


CHART 02.III
DEW POINT TEMPERATURE
FEBRUARY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
11.3 4.0 684
12.2 5.6 384
10.6 3.3 46
14.6 3.2 416
15.8 3.9 976
17.4 4.1 1578
16.4 4.0 602
16.6 3.8 650
17.7 3.1 494
15.9 3.2 85
22.0 2.2 242
20.7 3.1 400
21.5 2.4 703
17.9 3.1 175
17.3 3.4 940
17.9 3.3 229
18.6 3.2 434
19.6 3.8 352
21.9 1.1 69
21.5 1.9 33
20.9 0.7 54
20.9 2.4 831
19.6 2.8 966
18.5 2.8 957
19.0 2.8 571
20.2 2.8 464
21.5 2.5 328
22.2 2.5 468
23.1 2.4 41
22.0 2.2 149
22.2 2.1 88
22.2 2.6 60
22.2 3.7 21
21.0 2.1 154
21.0 2.2 100
22.6 1.9 29
22.3 2.0 196
22.8 2.1 488
23.0 2.1 1032
23.3 2.2 852
23.5 1.9 845
23.4 3.0 952
23.0 3.7 849
22.2 2.0 180
22.2 1.4 117
23.8 1.6 34
22.8 5.6 21
22.9 4.8 25
21.5 4.0 39
23.6 2.1 41
23.2 1.6 67
21.8 7.2 198
22.6 6.1 284
23.3 3.9 354
22.7 1.6 267
23.2 2.3 132
22.8 3.7 48
23.0 6.3 33
22.6 7.2 23
23.0 1.8 17
23.9 1.8 46
23.1 5.1 47
21.3 7.7 241
23.4 4.1 306
23.9 1.6 12
23.6 1.0 404
23.6 0.9 370
23.8 0.8 68
23.9 2.3 35
23.4 1.6 51
21.3 8.3 93
21.8 7.5 253
23.9 1.2 222
24.1 1.1 33
24.4 1.5 91
23.7 1.6 30
23.5 1.1 216
23.6 0.8 502
24.3 0.8 214
24.3 1.8 37
23.6 1.1 62
22.1 7.4 256
22.4 5.9 248
24.0 1.2 164
23.9 2.6 32
24.1 1.5 57
23.5 1.7 83

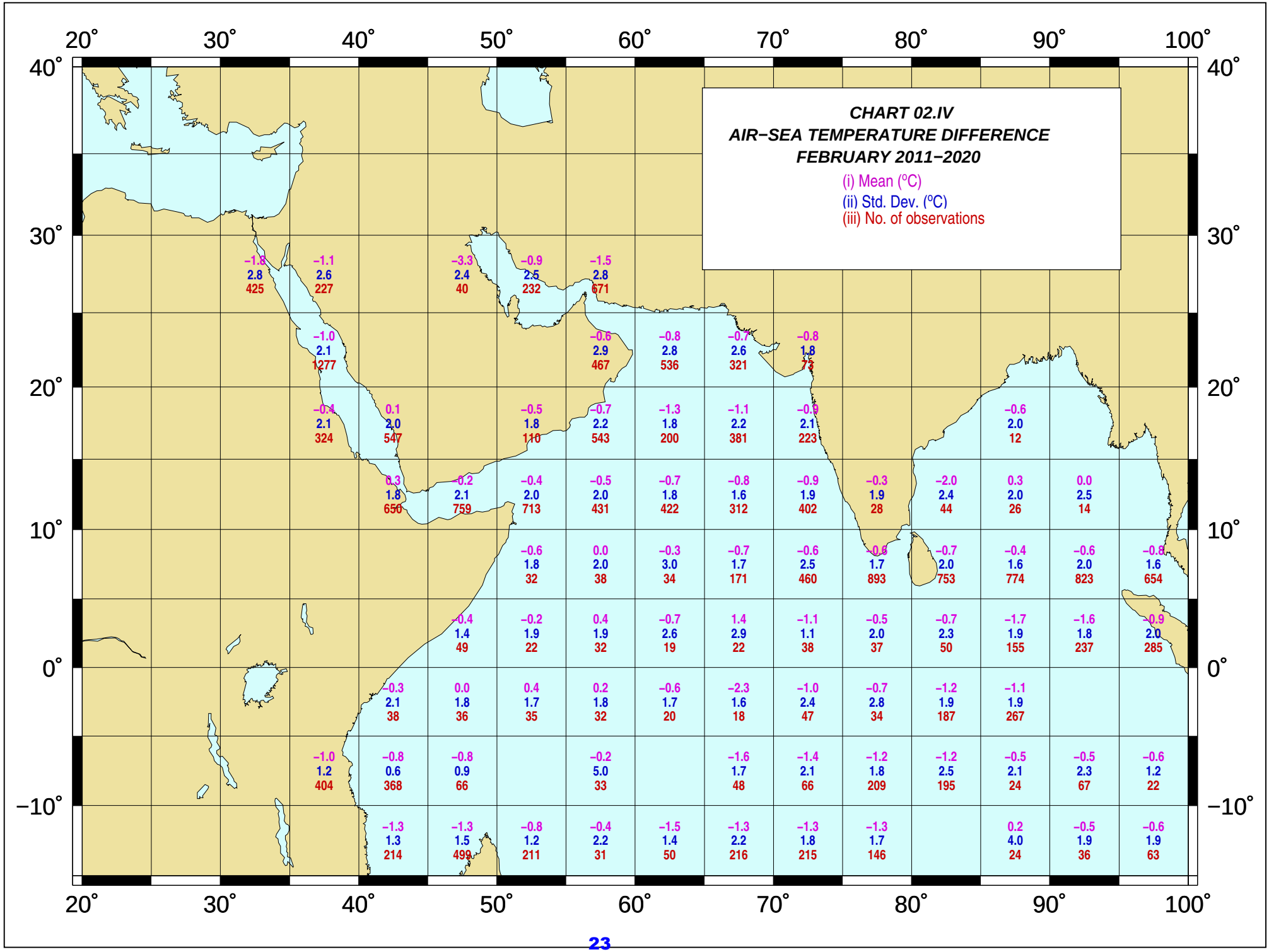


CHART 02.IV
AIR–SEA TEMPERATURE DIFFERENCE
FEBRUARY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
−1.8 2.8 425
−1.1 2.6 227
−3.3 2.4 40
−0.9 2.5 232
−1.5 2.8 671
−1.0 2.1 1277
−0.6 2.9 467
−0.8 2.8 536
−0.7 2.6 321
−0.8 1.8 73
−0.4 2.1 324
0.1 2.0 547
−0.5 1.8 110
−0.7 2.2 543
−1.3 1.8 200
−1.1 2.2 381
−0.9 2.1 223
−0.6 2.0 12
0.3 1.8 650
−0.2 2.1 759
−0.4 2.0 713
−0.5 2.0 431
−0.7 1.8 422
−0.8 1.6 312
−0.9 1.9 402
−0.3 1.9 28
−2.0 2.4 44
0.3 2.0 26
0.0 2.5 14
−0.6 1.8 32
0.0 2.0 38
−0.3 3.0 34
−0.7 1.7 171
−0.6 2.5 460
−0.6 1.7 893
−0.7 2.0 753
−0.4 1.6 774
−0.6 2.0 823
−0.8 1.6 654
−0.4 1.4 49
−0.2 1.9 22
0.4 1.9 32
−0.7 2.6 19
1.4 2.9 22
−1.1 1.1 38
−0.5 2.0 37
−0.7 2.3 50
−1.7 1.9 155
−1.6 1.8 237
−0.9 2.0 285
−0.3 2.1 38
0.0 1.8 36
0.4 1.7 35
0.2 1.8 32
−0.6 1.7 20
−2.3 1.6 18
−1.0 2.4 47
−0.7 2.8 34
−1.2 1.9 187
−1.1 1.9 267
−1.0 1.2 404
−0.8 0.6 368
−0.8 0.9 66
−0.2 5.0 33
−1.6 1.7 48
−1.4 2.1 66
−1.2 1.8 209
−1.2 2.5 195
−0.5 2.1 24
−0.5 2.3 67
−0.6 1.2 22
−1.3 1.3 214
−1.3 1.5 499
−0.8 1.2 211
−0.4 2.2 31
−1.5 1.4 50
−1.3 2.2 216
−1.3 1.8 215
−1.3 1.7 146
0.2 4.0 24
−0.5 1.9 36
−0.6 1.9 63

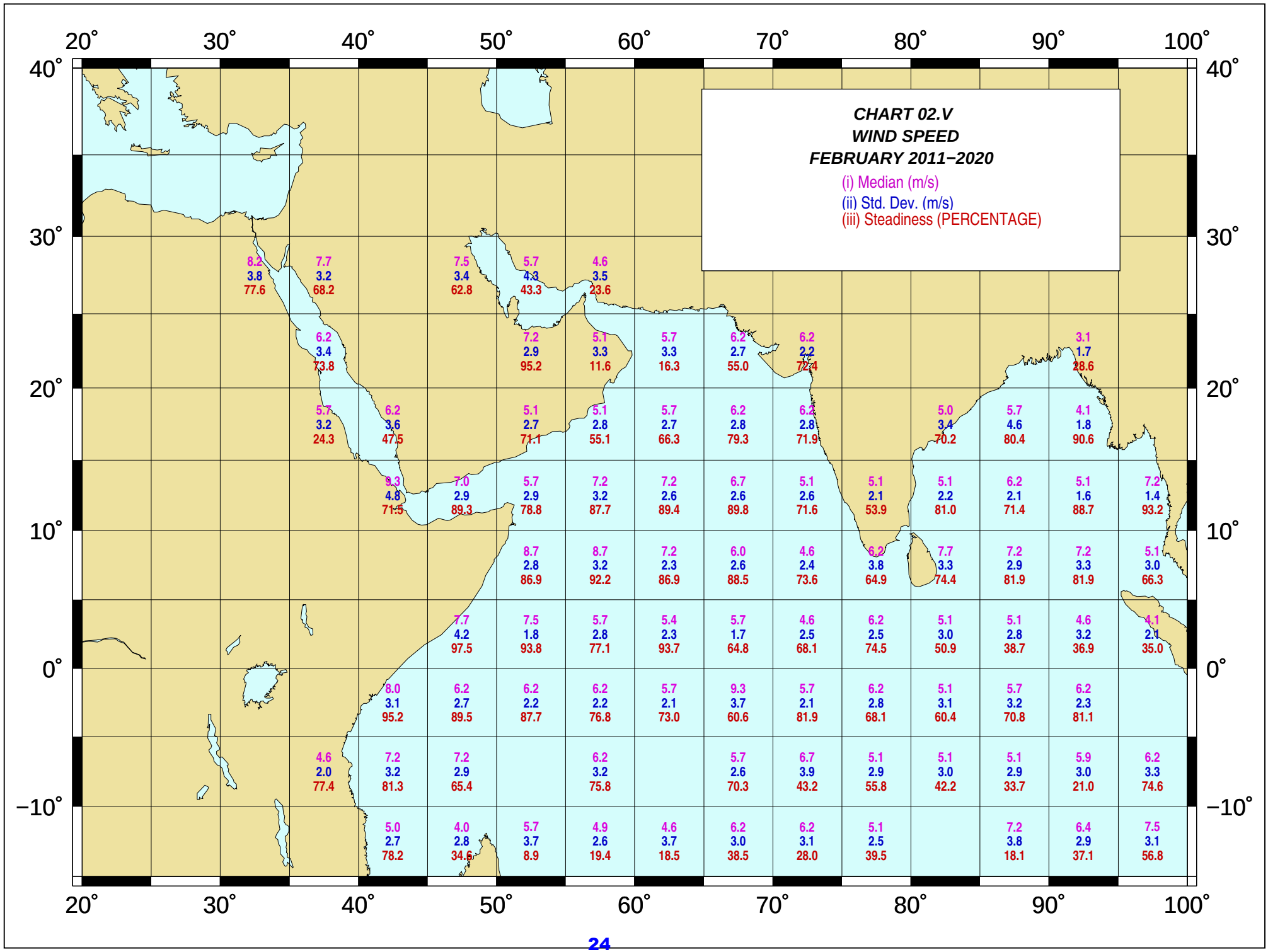


CHART 02.V
WIND SPEED
FEBRUARY 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
8.2 3.8 77.6
7.7 3.2 68.2
7.5 3.4 62.8
5.7 4.3 43.3
4.6 3.5 23.6
6.2 3.4 73.8
7.2 2.9 95.2
5.1 3.3 11.6
5.7 3.3 16.3
6.2 2.7 55.0
6.2 2.2 72.4
3.1 1.7 28.6
5.7 3.2 24.3
6.2 3.6 47.5
5.1 2.7 71.1
5.1 2.8 55.1
5.7 2.7 66.3
6.2 2.8 79.3
6.2 2.8 71.9
5.0 3.4 70.2
5.7 4.6 80.4
4.1 1.8 90.6
9.3 4.8 71.5
7.0 2.9 89.3
5.7 2.9 78.8
7.2 3.2 87.7
7.2 2.6 89.4
6.7 2.6 89.8
5.1 2.6 71.6
5.1 2.1 53.9
5.1 2.2 81.0
6.2 2.1 71.4
5.1 1.6 88.7
7.2 1.4 93.2
8.7 2.8 86.9
8.7 3.2 92.2
7.2 2.3 86.9
6.0 2.6 88.5
4.6 2.4 73.6
6.2 3.8 64.9
7.7 3.3 74.4
7.2 2.9 81.9
7.2 3.3 81.9
5.1 3.0 66.3
7.7 4.2 97.5
7.5 1.8 93.8
5.7 2.8 77.1
5.4 2.3 93.7
5.7 1.7 64.8
4.6 2.5 68.1
6.2 2.5 74.5
5.1 3.0 50.9
5.1 2.8 38.7
4.6 3.2 36.9
4.1 2.1 35.0
8.0 3.1 95.2
6.2 2.7 89.5
6.2 2.2 87.7
6.2 2.2 76.8
5.7 2.1 73.0
9.3 3.7 60.6
5.7 2.1 81.9
6.2 2.8 68.1
5.1 3.1 60.4
5.7 3.2 70.8
6.2 2.3 81.1
4.6 2.0 77.4
7.2 3.2 81.3
7.2 2.9 65.4
6.2 3.2 75.8
5.7 2.6 70.3
6.7 3.9 43.2
5.1 2.9 55.8
5.1 3.0 42.2
5.1 2.9 33.7
5.9 3.0 21.0
6.2 3.3 74.6
5.0 2.7 78.2
4.0 2.8 34.6
5.7 3.7 8.9
4.9 2.6 19.4
4.6 3.7 18.5
6.2 3.0 38.5
6.2 3.1 28.0
5.1 2.5 39.5
7.2 3.8 18.1
6.4 2.9 37.1
7.5 3.1 56.8

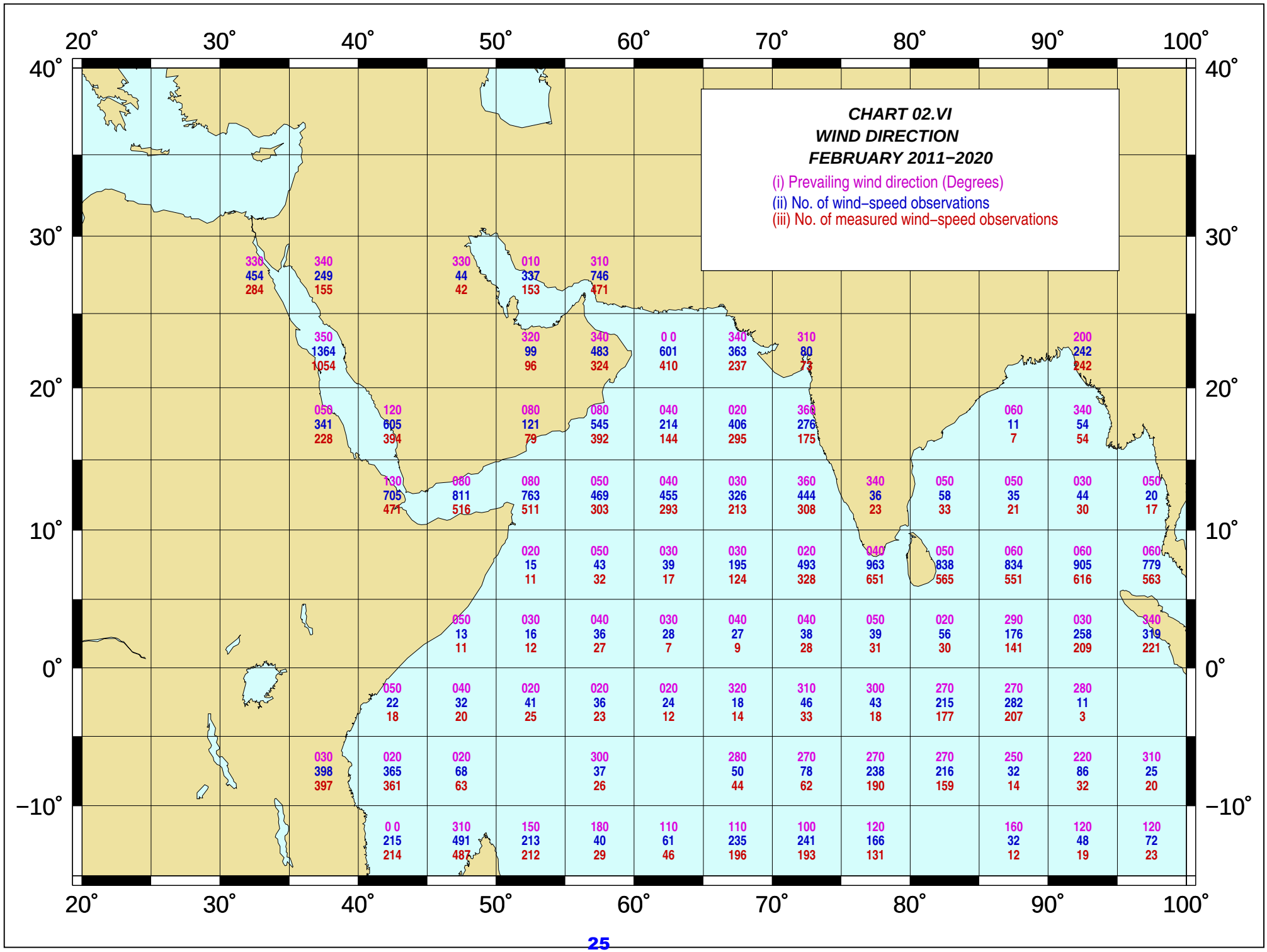


CHART 02.VI
WIND DIRECTION
FEBRUARY 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
330 454 284
340 249 155
330 44 42
010 337 153
310 746 471
350 1364 1054
320 99 96
340 483 324
0 0 601 410
340 363 237
310 80 75
200 242 242
050 341 228
120 605 394
080 121 79
080 545 392
040 214 144
020 406 295
360 276 175
060 11 7
340 54 54
130 705 471
080 811 516
080 763 511
050 469 303
040 455 293
030 326 213
360 444 308
340 36 23
050 58 33
050 35 21
030 44 30
050 20 17
020 15 11
050 43 32
030 39 17
030 195 124
020 493 328
040 963 651
050 838 565
060 834 551
060 905 616
060 779 563
050 13 11
030 16 12
040 36 27
030 28 7
040 27 9
040 38 28
050 39 31
020 56 30
290 176 141
030 258 209
340 319 221
050 22 18
040 32 20
020 41 25
020 36 23
020 24 12
320 18 14
310 46 33
300 43 18
270 215 177
270 282 207
280 11 3
030 398 397
020 365 361
020 68 63
300 37 26
280 50 44
270 78 62
270 238 190
270 216 159
250 32 14
220 86 32
310 25 20
0 0 215 214
310 491 487
150 213 212
180 40 29
110 61 46
110 235 196
100 241 193
120 166 131
160 32 12
120 48 19
120 72 23

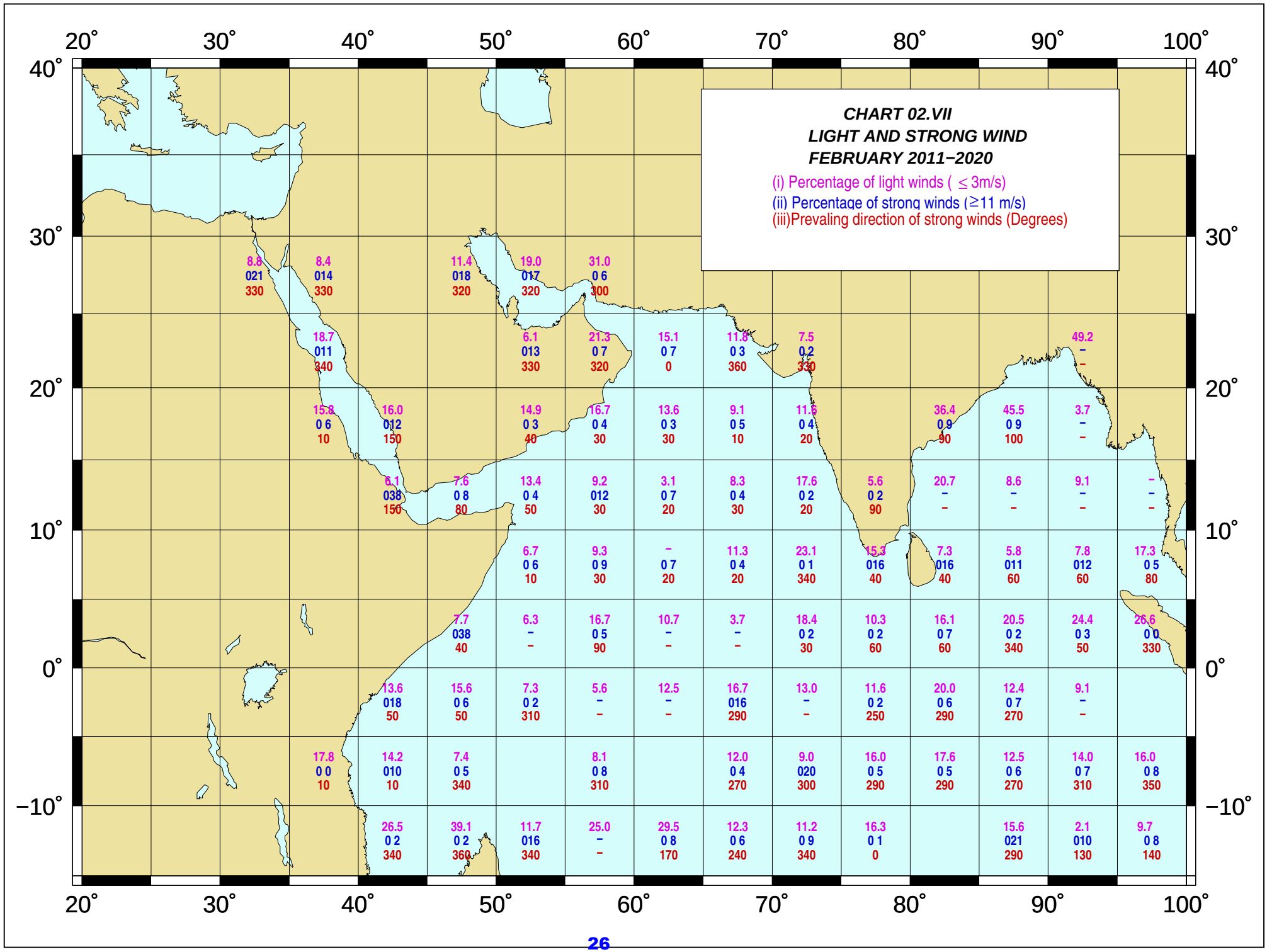


CHART 02.VII
LIGHT AND STRONG WIND
FEBRUARY 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
8.8 021 330
8.4 014 330
11.4 018 320
19.0 017 320
31.0 06 300
18.7 011 340
6.1 013 330
21.3 07 320
15.1 07 0
11.8 03 360
7.5 02 330
49.2 – –
15.8 06 10
16.0 012 150
14.9 03 40
16.7 04 30
13.6 03 30
9.1 05 10
11.5 04 20
36.4 09 90
45.5 09 100
3.7 – –
6.1 038 150
7.6 08 80
13.4 04 50
9.2 012 30
3.1 07 20
8.3 04 30
17.6 02 20
5.6 02 90
20.7 – –
8.6 – –
9.1 – –
– – –
6.7 06 10
9.3 09 30
– 07 20
11.3 04 20
23.1 01 340
15.3 016 40
7.3 016 40
5.8 011 60
7.8 012 60
17.3 05 80
7.7 038 40
6.3 – –
16.7 05 90
10.7 – –
3.7 – –
18.4 02 30
10.3 02 60
16.1 07 60
20.5 02 340
24.4 03 50
26.6 00 330
13.6 018 50
15.6 06 50
7.3 02 310
5.6 – –
12.5 – –
16.7 016 290
13.0 – –
11.6 02 250
20.0 06 290
12.4 07 270
9.1 – –
17.8 00 10
14.2 010 10
7.4 05 340
8.1 08 310
12.0 04 270
9.0 020 300
16.0 05 290
17.6 05 290
12.5 06 270
14.0 07 310
16.0 08 350
26.5 02 340
39.1 02 360
11.7 016 340
25.0 – –
29.5 08 170
12.3 06 240
11.2 09 340
16.3 01 0
15.6 021 290
2.1 010 130
9.7 08 140

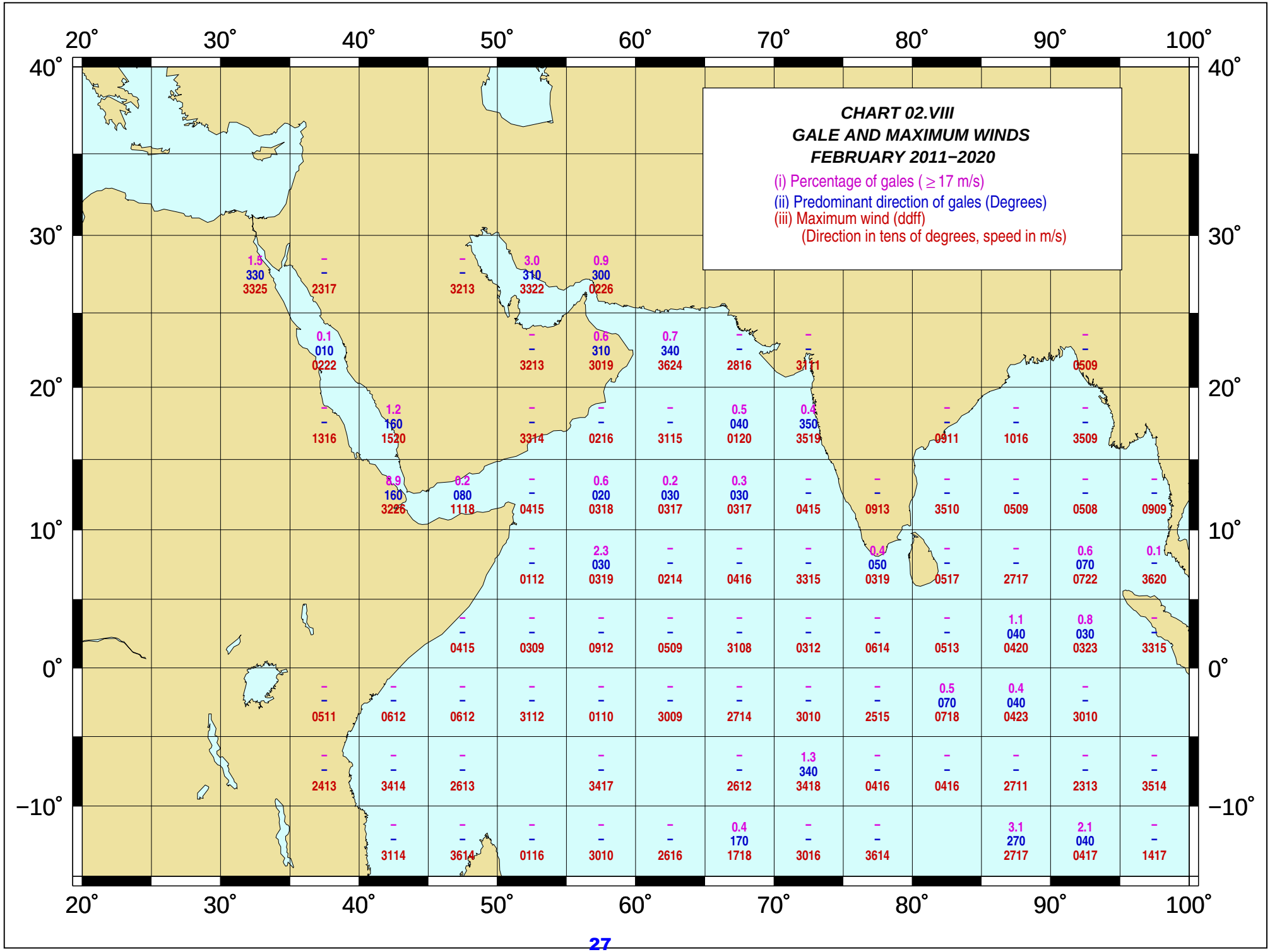


CHART 02.VIII
GALE AND MAXIMUM WINDS
FEBRUARY 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.5 330 3325
– – 2317
– – 3213
3.0 310 3322
0.9 300 0226
0.1 010 0222
– – 3213
0.6 310 3019
0.7 340 3624
– – 2816
– – 3111
– – 0509
– – 1316
1.2 160 1520
– – 3314
– – 0216
– – 3115
0.5 040 0120
0.4 350 3519
– – 0911
– – 1016
– – 3509
8.9 160 3226
0.2 080 1118
– – 0415
0.6 020 0318
0.2 030 0317
0.3 030 0317
– – 0415
– – 0913
– – 3510
– – 0509
– – 0508
– – 0909
– – 0112
2.3 030 0319
– – 0214
– – 0416
– – 3315
0.4 050 0319
– – 0517
– – 2717
0.6 070 0722
0.1 – 3620
– – 0415
– – 0309
– – 0912
– – 0509
– – 3108
– – 0312
– – 0614
– – 0513
1.1 040 0420
0.8 030 0323
– – 3315
– – 0511
– – 0612
– – 0612
– – 3112
– – 0110
– – 3009
– – 2714
– – 3010
– – 2515
0.5 070 0718
0.4 040 0423
– – 3010
– – 2413
– – 3414
– – 2613
– – 3417
– – 2612
1.3 340 3418
– – 0416
– – 0416
– – 2711
– – 2313
– – 3514
– – 3114
– – 3614
– – 0116
– – 3010
– – 2616
0.4 170 1718
– – 3016
– – 3614
3.1 270 2717
2.1 040 0417
– – 1417

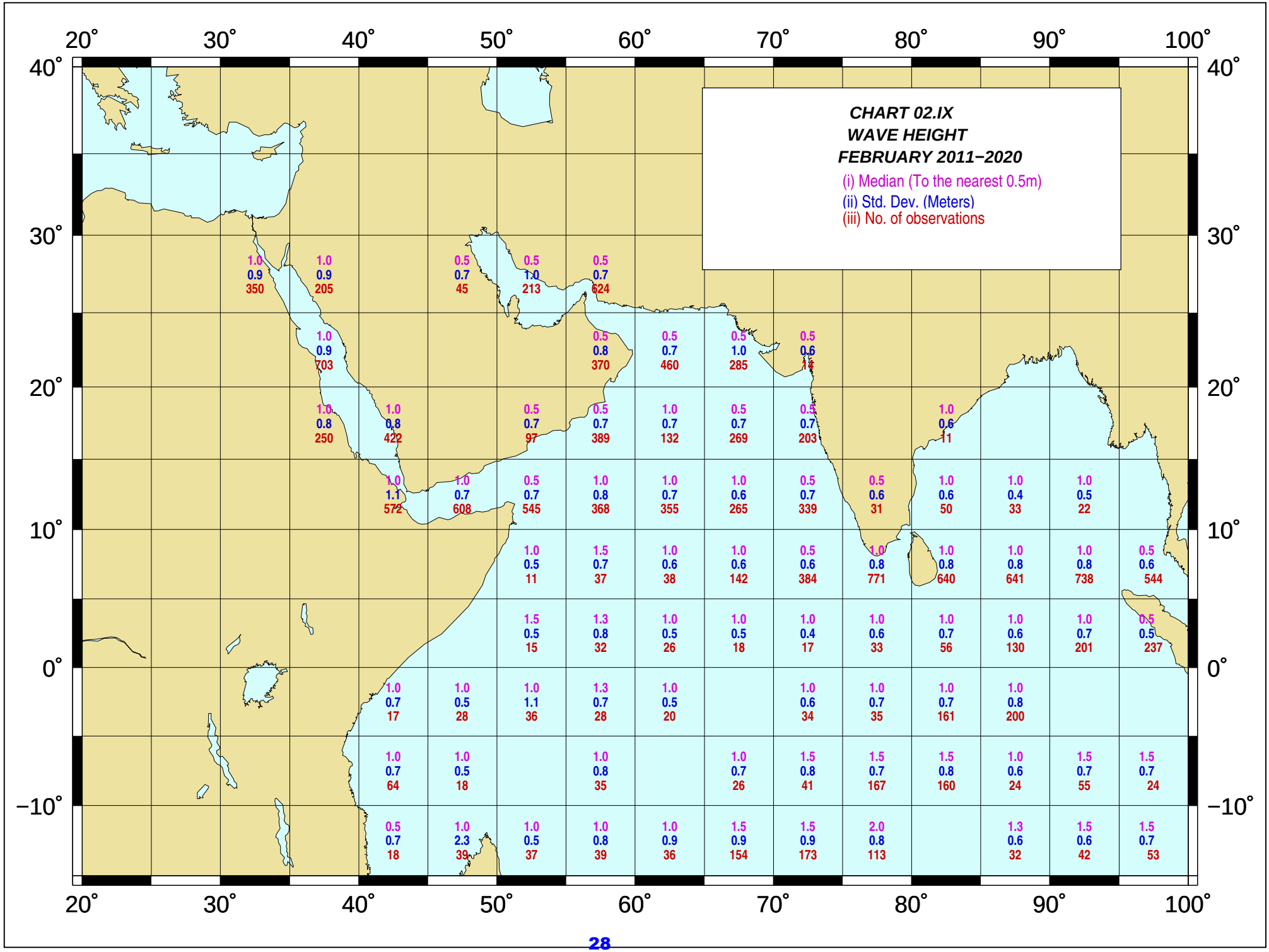


CHART 02.IX
WAVE HEIGHT
FEBRUARY 2011–2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.0 0.9 350
1.0 0.9 205
0.5 0.7 45
0.5 1.0 213
0.5 0.7 624
1.0 0.9 703
0.5 0.8 370
0.5 0.7 460
0.5 1.0 285
0.5 0.6 14
1.0 0.8 250
1.0 0.8 422
0.5 0.7 97
0.5 0.7 389
1.0 0.7 132
0.5 0.7 269
0.5 0.7 203
1.0 0.6 11
1.0 1.1 572
1.0 0.7 608
0.5 0.7 545
1.0 0.8 368
1.0 0.7 355
1.0 0.6 265
0.5 0.7 339
0.5 0.6 31
1.0 0.6 50
1.0 0.4 33
1.0 0.5 22
1.0 0.5 11
1.5 0.7 37
1.0 0.6 38
1.0 0.6 142
0.5 0.6 384
1.0 0.8 771
1.0 0.8 640
1.0 0.8 641
1.0 0.8 738
0.5 0.6 544
1.5 0.5 15
1.3 0.8 32
1.0 0.5 26
1.0 0.5 18
1.0 0.4 17
1.0 0.6 33
1.0 0.7 56
1.0 0.6 130
1.0 0.7 201
0.5 0.5 237
1.0 0.7 17
1.0 0.5 28
1.0 1.1 36
1.3 0.7 28
1.0 0.5 20
1.0 0.6 34
1.0 0.7 35
1.0 0.7 161
1.0 0.8 200
1.0 0.7 64
1.0 0.5 18
1.0 0.8 35
1.0 0.7 26
1.5 0.8 41
1.5 0.7 167
1.5 0.8 160
1.0 0.6 24
1.5 0.7 55
1.5 0.7 24
0.5 0.7 18
1.0 2.3 39
1.0 0.5 37
1.0 0.8 39
1.0 0.9 36
1.5 0.9 154
1.5 0.9 173
2.0 0.8 113
1.3 0.6 32
1.5 0.6 42
1.5 0.7 53

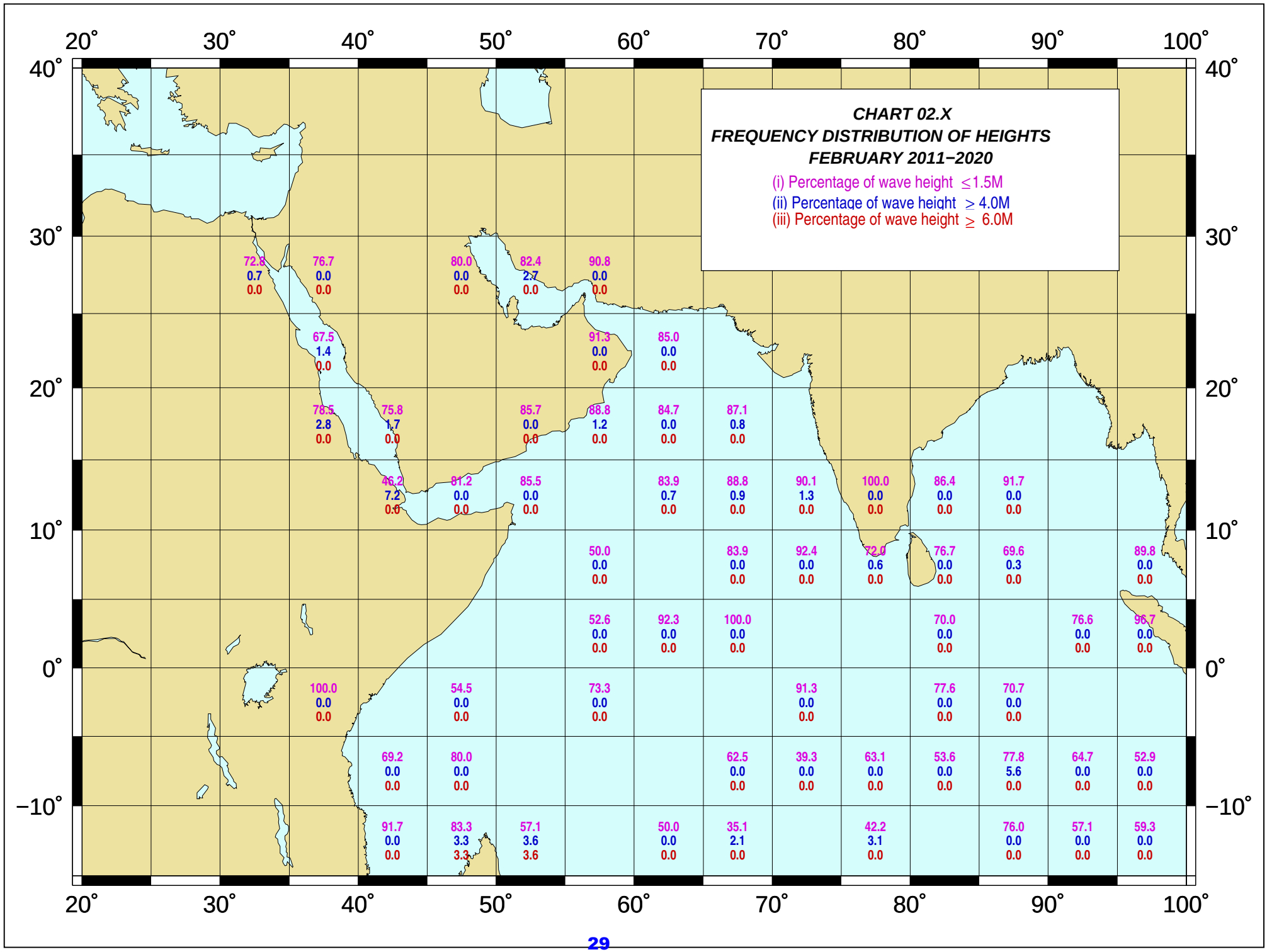


CHART 02.X
FREQUENCY DISTRIBUTION OF HEIGHTS
FEBRUARY 2011–2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
72.8 0.7 0.0
76.7 0.0 0.0
80.0 0.0 0.0
82.4 2.7 0.0
90.8 0.0 0.0
67.5 1.4 0.0
91.3 0.0 0.0
85.0 0.0 0.0
78.5 2.8 0.0
75.8 1.7 0.0
85.7 0.0 0.0
88.8 1.2 0.0
84.7 0.0 0.0
87.1 0.8 0.0
46.2 7.2 0.0
81.2 0.0 0.0
85.5 0.0 0.0
83.9 0.7 0.0
88.8 0.9 0.0
90.1 1.3 0.0
100.0 0.0 0.0
86.4 0.0 0.0
91.7 0.0 0.0
50.0 0.0 0.0
83.9 0.0 0.0
92.4 0.0 0.0
72.0 0.6 0.0
76.7 0.0 0.0
69.6 0.3 0.0
89.8 0.0 0.0
52.6 0.0 0.0
92.3 0.0 0.0
100.0 0.0 0.0
70.0 0.0 0.0
76.6 0.0 0.0
96.7 0.0 0.0
100.0 0.0 0.0
54.5 0.0 0.0
73.3 0.0 0.0
91.3 0.0 0.0
77.6 0.0 0.0
70.7 0.0 0.0
69.2 0.0 0.0
80.0 0.0 0.0
62.5 0.0 0.0
39.3 0.0 0.0
63.1 0.0 0.0
53.6 0.0 0.0
77.8 5.6 0.0
64.7 0.0 0.0
52.9 0.0 0.0
91.7 0.0 0.0
83.3 3.3 3.3
57.1 3.6 3.6
50.0 0.0 0.0
35.1 2.1 0.0
42.2 3.1 0.0
76.0 0.0 0.0
57.1 0.0 0.0
59.3 0.0 0.0

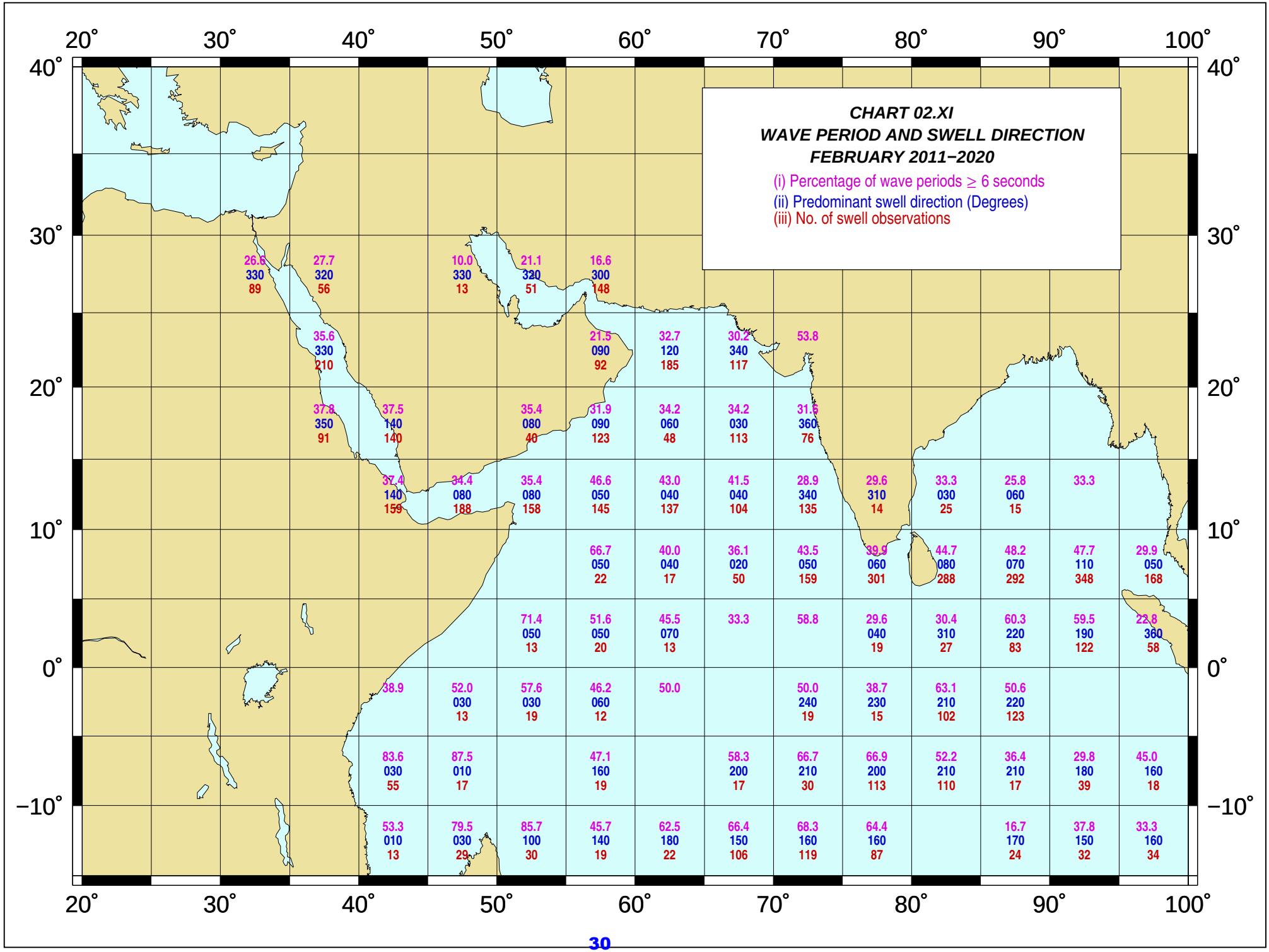


CHART 02.XI
WAVE PERIOD AND SWELL DIRECTION
FEBRUARY 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
26.6 330 89
27.7 320 56
10.0 330 13
21.1 320 51
16.6 300 148
35.6 330 210
21.5 090 92
32.7 120 185
30.2 340 117
53.8
37.8 350 91
37.5 140 140
35.4 080 40
31.9 090 123
34.2 060 48
34.2 030 113
31.6 360 76
37.4 140 159
34.4 080 188
35.4 080 158
46.6 050 145
43.0 040 137
41.5 040 104
28.9 340 135
29.6 310 14
33.3 030 25
25.8 060 15
33.3
66.7 050 22
40.0 040 17
36.1 020 50
43.5 050 159
39.9 060 301
44.7 080 288
48.2 070 292
47.7 110 348
29.9 050 168
71.4 050 13
51.6 050 20
45.5 070 13
33.3
58.8
29.6 040 19
30.4 310 27
60.3 220 83
59.5 190 122
22.8 360 58
38.9
52.0 030 13
57.6 030 19
46.2 060 12
50.0
50.0 240 19
38.7 230 15
63.1 210 102
50.6 220 123
83.6 030 55
87.5 010 17
47.1 160 19
58.3 200 17
66.7 210 30
66.9 200 113
52.2 210 110
36.4 210 17
29.8 180 39
45.0 160 18
53.3 010 13
79.5 030 29
85.7 100 30
45.7 140 19
62.5 180 22
66.4 150 106
68.3 160 119
64.4 160 87
16.7 170 24
37.8 150 32
33.3 160 34

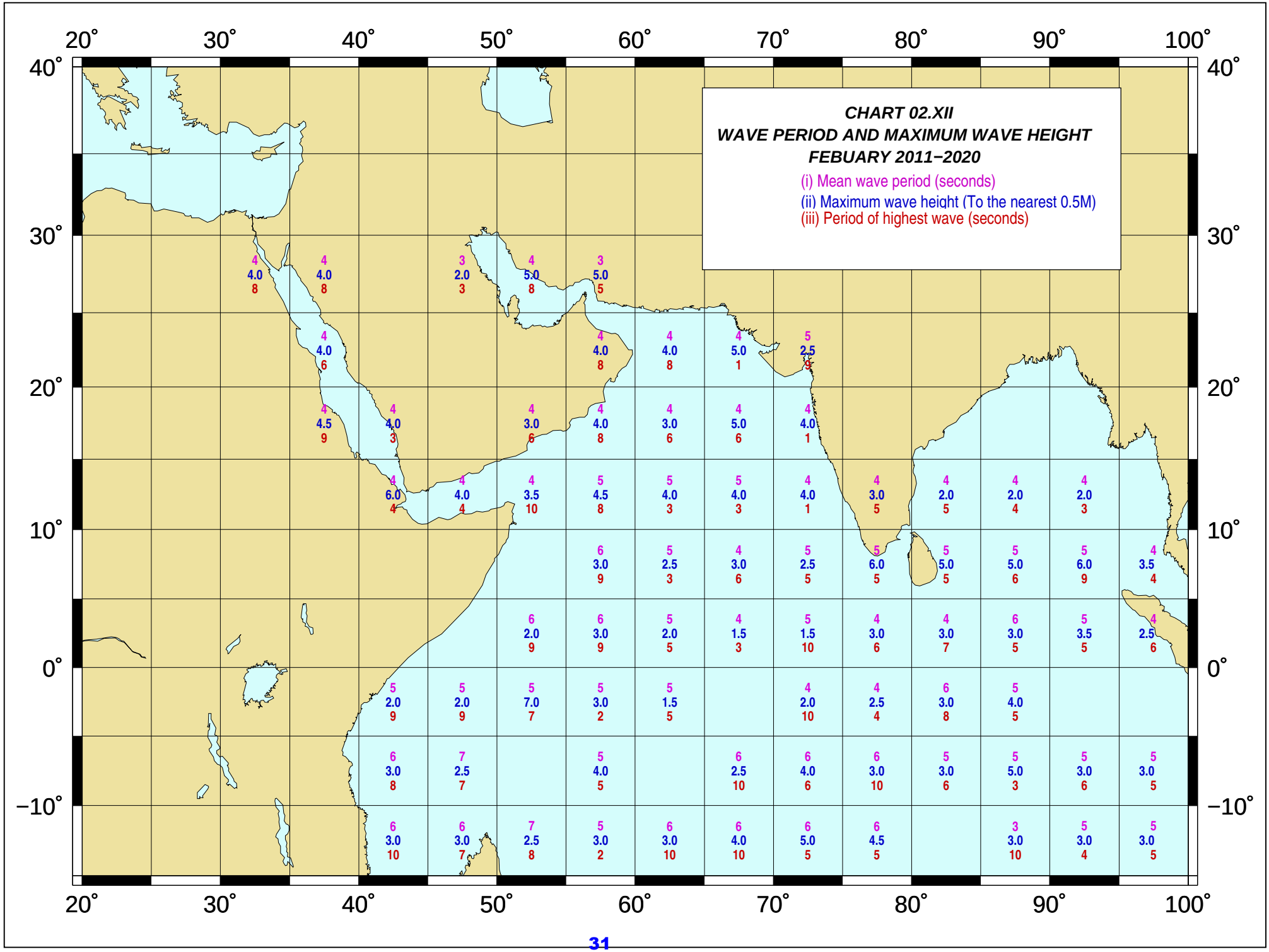


CHART 02.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
FEBUARY 2011−2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°

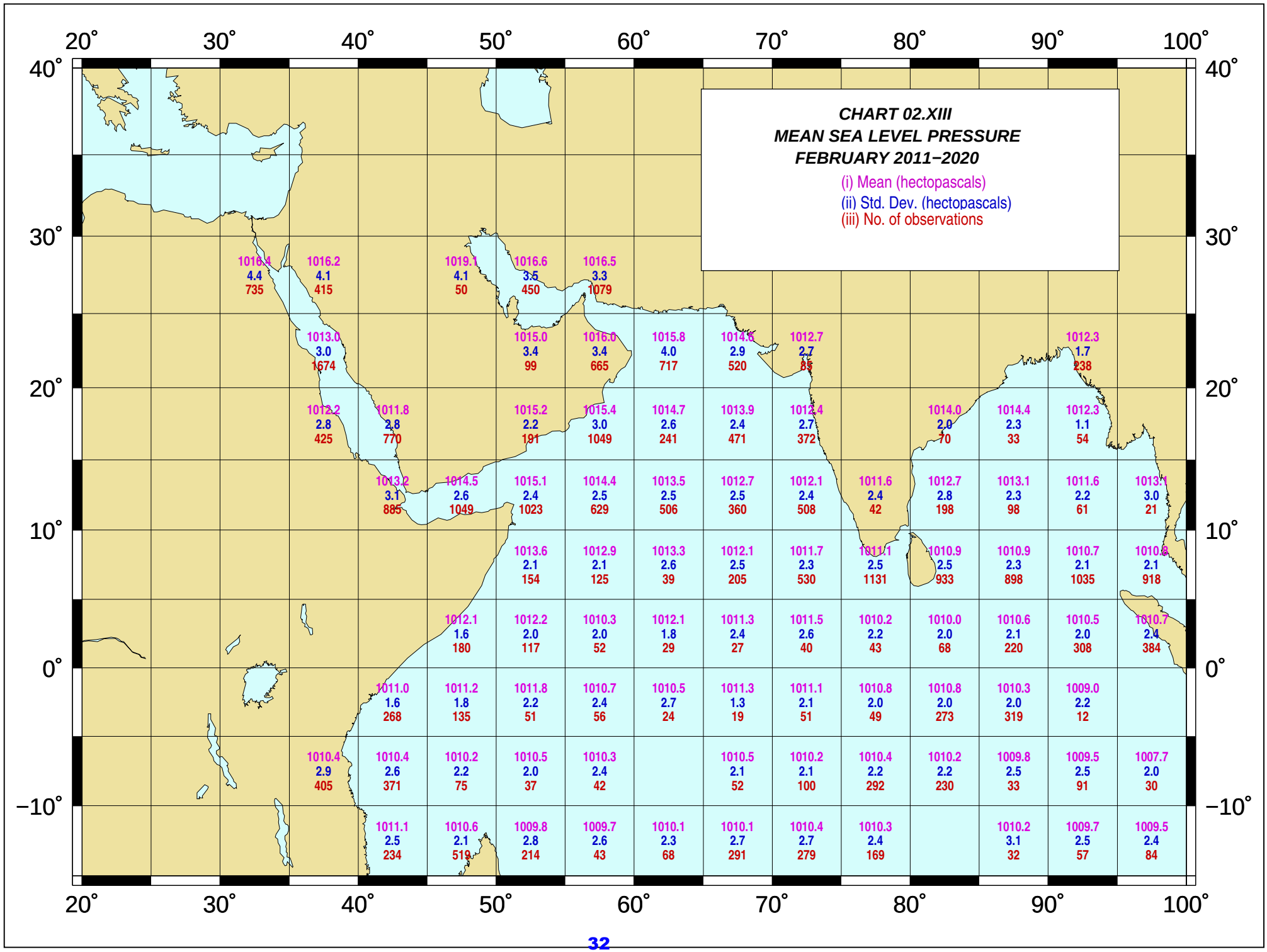


CHART 02.XIII
MEAN SEA LEVEL PRESSURE
FEBRUARY 2011–2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1016.4 4.4 735
1016.2 4.1 415
1019.1 4.1 50
1016.6 3.5 450
1016.5 3.3 1079
1013.0 3.0 1674
1015.0 3.4 99
1016.0 3.4 665
1015.8 4.0 717
1014.6 2.9 520
1012.7 2.7 85
1012.3 1.7 238
1012.2 2.8 425
1011.8 2.8 770
1015.2 2.2 191
1015.4 3.0 1049
1014.7 2.6 241
1013.9 2.4 471
1012.4 2.7 372
1014.0 2.0 70
1014.4 2.3 33
1012.3 1.1 54
1013.2 3.1 885
1014.5 2.6 1049
1015.1 2.4 1023
1014.4 2.5 629
1013.5 2.5 506
1012.7 2.5 360
1012.1 2.4 508
1011.6 2.4 42
1012.7 2.8 198
1013.1 2.3 98
1011.6 2.2 61
1013.1 3.0 21
1013.6 2.1 154
1012.9 2.1 125
1013.3 2.6 39
1012.1 2.5 205
1011.7 2.3 530
1011.1 2.5 1131
1010.9 2.5 933
1010.9 2.3 898
1010.7 2.1 1035
1010.8 2.1 918
1012.1 1.6 180
1012.2 2.0 117
1010.3 2.0 52
1012.1 1.8 29
1011.3 2.4 27
1011.5 2.6 40
1010.2 2.2 43
1010.0 2.0 68
1010.6 2.1 220
1010.5 2.0 308
1010.7 2.4 384
1011.0 1.6 268
1011.2 1.8 135
1011.8 2.2 51
1010.7 2.4 56
1010.5 2.7 24
1011.3 1.3 19
1011.1 2.1 51
1010.8 2.0 49
1010.8 2.0 273
1010.3 2.0 319
1009.0 2.2 12
1010.4 2.9 405
1010.4 2.6 371
1010.2 2.2 75
1010.5 2.0 37
1010.3 2.4 42
1010.5 2.1 52
1010.2 2.1 100
1010.4 2.2 292
1010.2 2.2 230
1009.8 2.5 33
1009.5 2.5 91
1007.7 2.0 30
1011.1 2.5 234
1010.6 2.1 519
1009.8 2.8 214
1009.7 2.6 43
1010.1 2.3 68
1010.1 2.7 291
1010.4 2.7 279
1010.3 2.4 169
1010.2 3.1 32
1009.7 2.5 57
1009.5 2.4 84

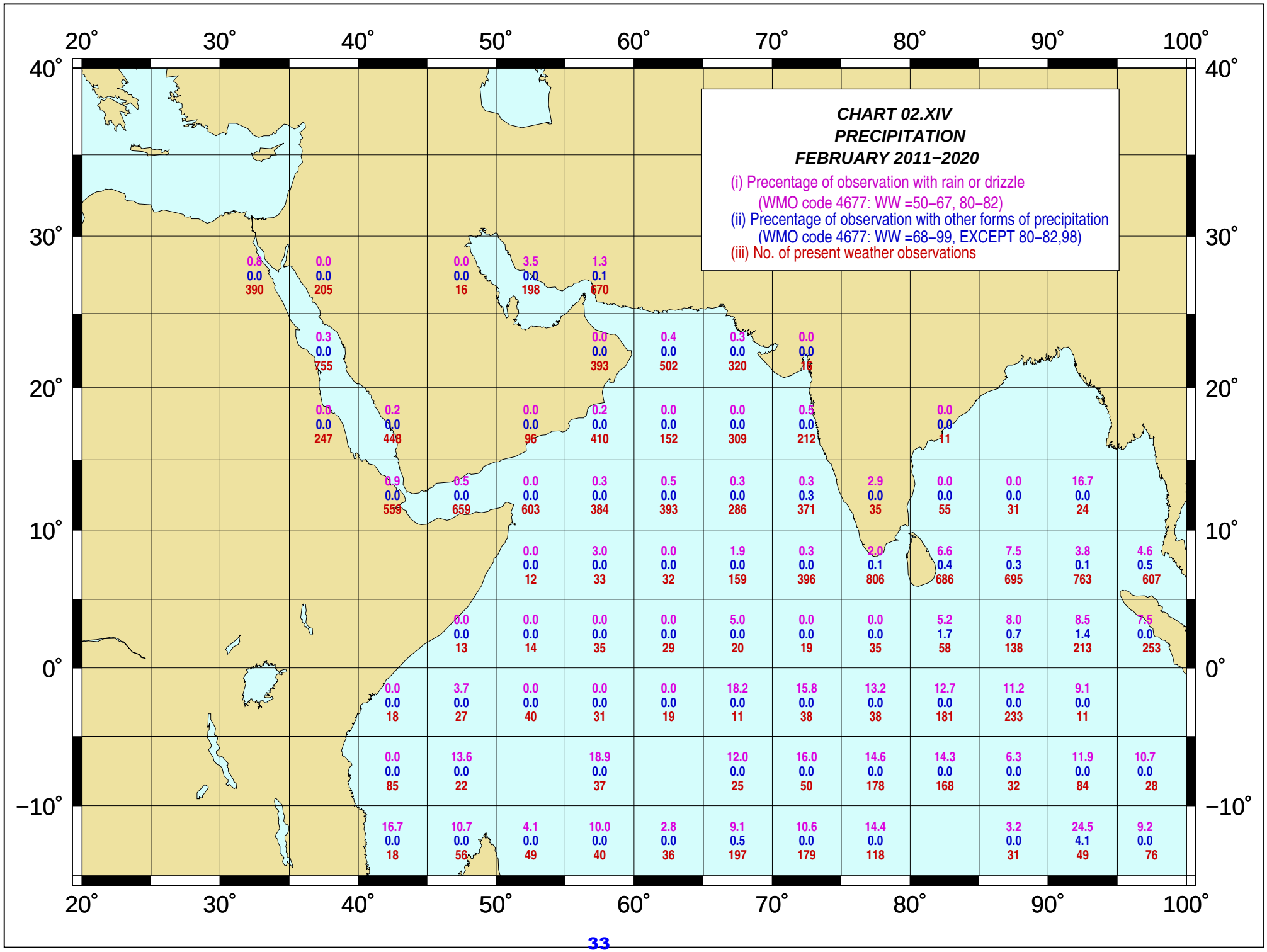


CHART 02.XIV
PRECIPITATION
FEBRUARY 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.8 0.0 390
0.0 0.0 205
0.0 0.0 16
3.5 0.0 198
1.3 0.1 670
0.3 0.0 755
0.0 0.0 393
0.4 0.0 502
0.3 0.0 320
0.0 0.0 16
0.0 0.0 247
0.2 0.0 448
0.0 0.0 96
0.2 0.0 410
0.0 0.0 152
0.0 0.0 309
0.3 0.0 212
0.0 0.0 11
0.9 0.0 559
0.5 0.0 659
0.0 0.0 603
0.3 0.0 384
0.5 0.0 393
0.3 0.0 286
0.3 0.3 371
2.9 0.0 35
0.0 0.0 55
0.0 0.0 31
16.7 0.0 24
0.0 0.0 12
3.0 0.0 33
0.0 0.0 32
1.9 0.0 159
0.3 0.0 396
2.0 0.1 806
6.6 0.4 686
7.5 0.3 695
3.8 0.1 763
4.6 0.5 607
0.0 0.0 13
0.0 0.0 14
0.0 0.0 35
0.0 0.0 29
5.0 0.0 20
0.0 0.0 19
0.0 0.0 35
5.2 1.7 58
8.0 0.7 138
8.5 1.4 213
7.5 0.0 253
0.0 0.0 18
3.7 0.0 27
0.0 0.0 40
0.0 0.0 31
0.0 0.0 19
18.2 0.0 11
15.8 0.0 38
13.2 0.0 38
12.7 0.0 181
11.2 0.0 233
9.1 0.0 11
0.0 0.0 85
13.6 0.0 22
18.9 0.0 37
12.0 0.0 25
16.0 0.0 50
14.6 0.0 178
14.3 0.0 168
6.3 0.0 32
11.9 0.0 84
10.7 0.0 28
16.7 0.0 18
10.7 0.0 56
4.1 0.0 49
10.0 0.0 40
2.8 0.0 36
9.1 0.5 197
10.6 0.0 179
14.4 0.0 118
3.2 0.0 31
24.5 4.1 49
9.2 0.0 76

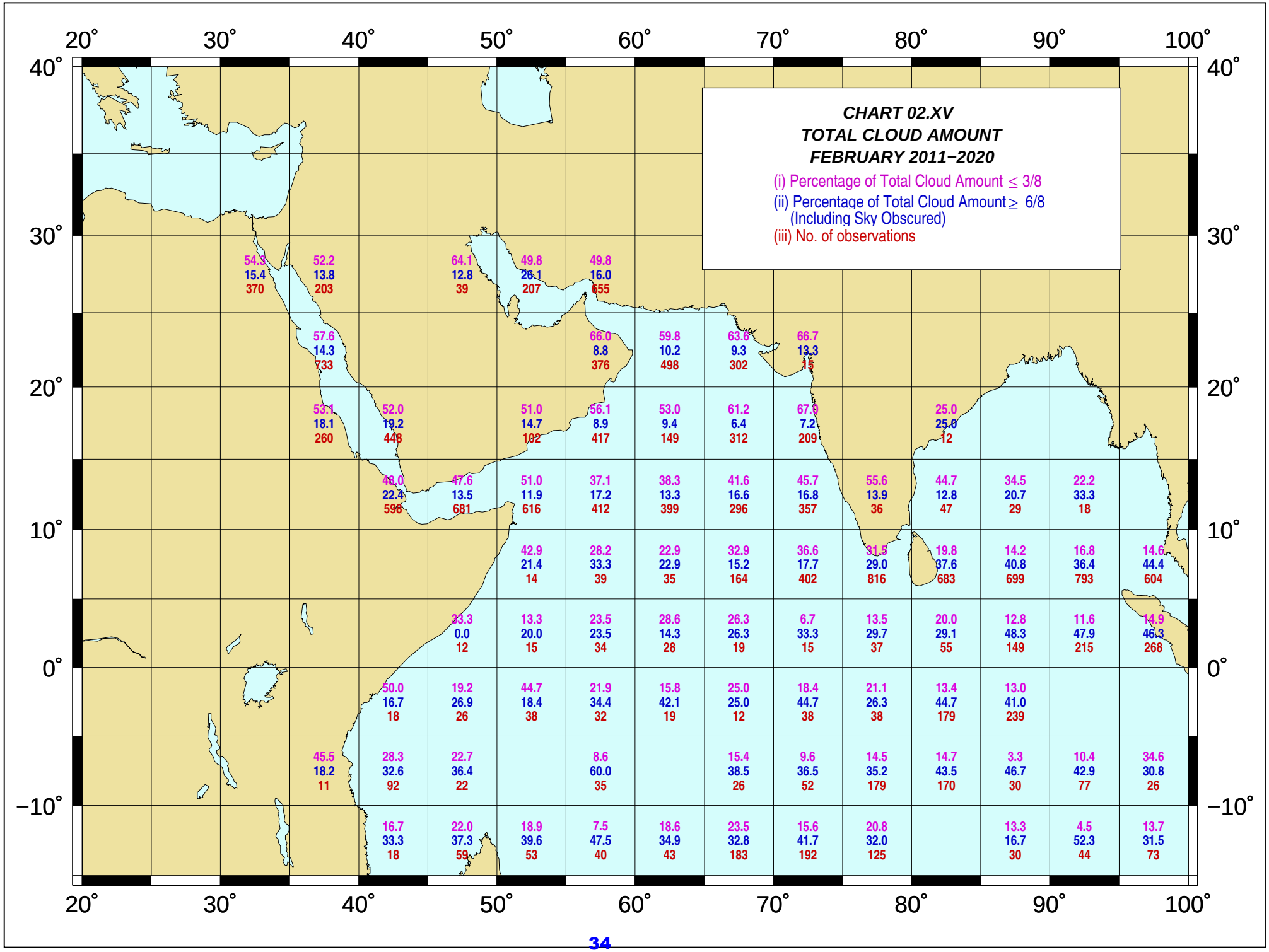


CHART 02.XV
TOTAL CLOUD AMOUNT
FEBRUARY 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
54.3 15.4 370
52.2 13.8 203
64.1 12.8 39
49.8 26.1 207
49.8 16.0 655
57.6 14.3 733
66.0 8.8 376
59.8 10.2 498
63.6 9.3 302
66.7 13.3
53.1 18.1 260
52.0 19.2 448
51.0 14.7 102
56.1 8.9 417
53.0 9.4 149
61.2 6.4 312
67.9 7.2 209
25.0 25.0 12
48.0 22.4 596
47.6 13.5 681
51.0 11.9 616
37.1 17.2 412
38.3 13.3 399
41.6 16.6 296
45.7 16.8 357
55.6 13.9 36
44.7 12.8 47
34.5 20.7 29
22.2 33.3 18
42.9 21.4 14
28.2 33.3 39
22.9 22.9 35
32.9 15.2 164
36.6 17.7 402
31.5 29.0 816
19.8 37.6 683
14.2 40.8 699
16.8 36.4 793
14.6 44.4 604
33.3 0.0 12
13.3 20.0 15
23.5 23.5 34
28.6 14.3 28
26.3 26.3 19
6.7 33.3 15
13.5 29.7 37
20.0 29.1 55
12.8 48.3 149
11.6 47.9 215
14.9 46.3 268
50.0 16.7 18
19.2 26.9 26
44.7 18.4 38
21.9 34.4 32
15.8 42.1 19
25.0 25.0 12
18.4 44.7 38
21.1 26.3 38
13.4 44.7 179
13.0 41.0 239
45.5 18.2 11
28.3 32.6 92
22.7 36.4 22
8.6 60.0 35
15.4 38.5 26
9.6 36.5 52
14.5 35.2 179
14.7 43.5 170
3.3 46.7 30
10.4 42.9 77
34.6 30.8 26
16.7 33.3 18
22.0 37.3 59
18.9 39.6 53
7.5 47.5 40
18.6 34.9 43
23.5 32.8 183
15.6 41.7 192
20.8 32.0 125
13.3 16.7 30
4.5 52.3 44
13.7 31.5 73

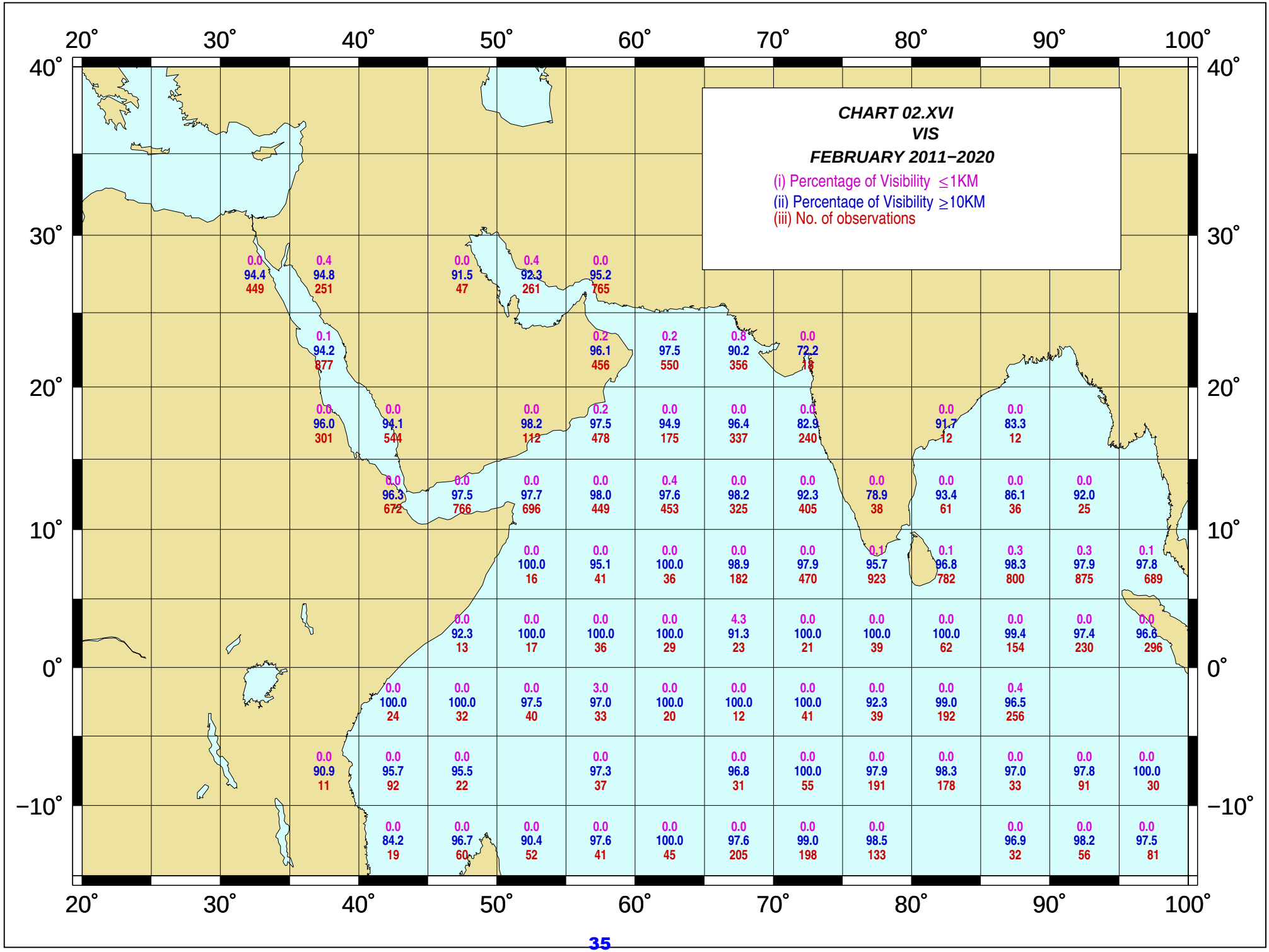


CHART 02.XVI
VIS
FEBRUARY 2011–2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 94.4 449
0.4 94.8 251
0.0 91.5 47
0.4 92.3 261
0.0 95.2 765
0.1 94.2 877
0.2 96.1 456
0.2 97.5 550
0.8 90.2 356
0.0 72.2 16
0.0 96.0 301
0.0 94.1 544
0.0 98.2 112
0.2 97.5 478
0.0 94.9 175
0.0 96.4 337
0.0 82.9 240
0.0 91.7 12
0.0 83.3 12
0.0 96.3 672
0.0 97.5 766
0.0 97.7 696
0.0 98.0 449
0.4 97.6 453
0.0 98.2 325
0.0 92.3 405
0.0 78.9 38
0.0 93.4 61
0.0 86.1 36
0.0 92.0 25
0.0 100.0 16
0.0 95.1 41
0.0 100.0 36
0.0 98.9 182
0.0 97.9 470
0.1 95.7 923
0.1 96.8 782
0.3 98.3 800
0.3 97.9 875
0.1 97.8 689
0.0 92.3 13
0.0 100.0 17
0.0 100.0 36
0.0 100.0 29
4.3 91.3 23
0.0 100.0 21
0.0 100.0 39
0.0 100.0 62
0.0 99.4 154
0.0 97.4 230
0.0 96.6 296
0.0 100.0 24
0.0 100.0 32
0.0 97.5 40
3.0 97.0 33
0.0 100.0 20
0.0 100.0 12
0.0 100.0 41
0.0 92.3 39
0.0 99.0 192
0.4 96.5 256
0.0 90.9 11
0.0 95.7 92
0.0 95.5 22
0.0 97.3 37
0.0 96.8 31
0.0 100.0 55
0.0 97.9 191
0.0 98.3 178
0.0 97.0 33
0.0 97.8 91
0.0 100.0 30
0.0 84.2 19
0.0 96.7 60
0.0 90.4 52
0.0 97.6 41
0.0 100.0 45
0.0 97.6 205
0.0 99.0 198
0.0 98.5 133
0.0 96.9 32
0.0 98.2 56
0.0 97.5 81

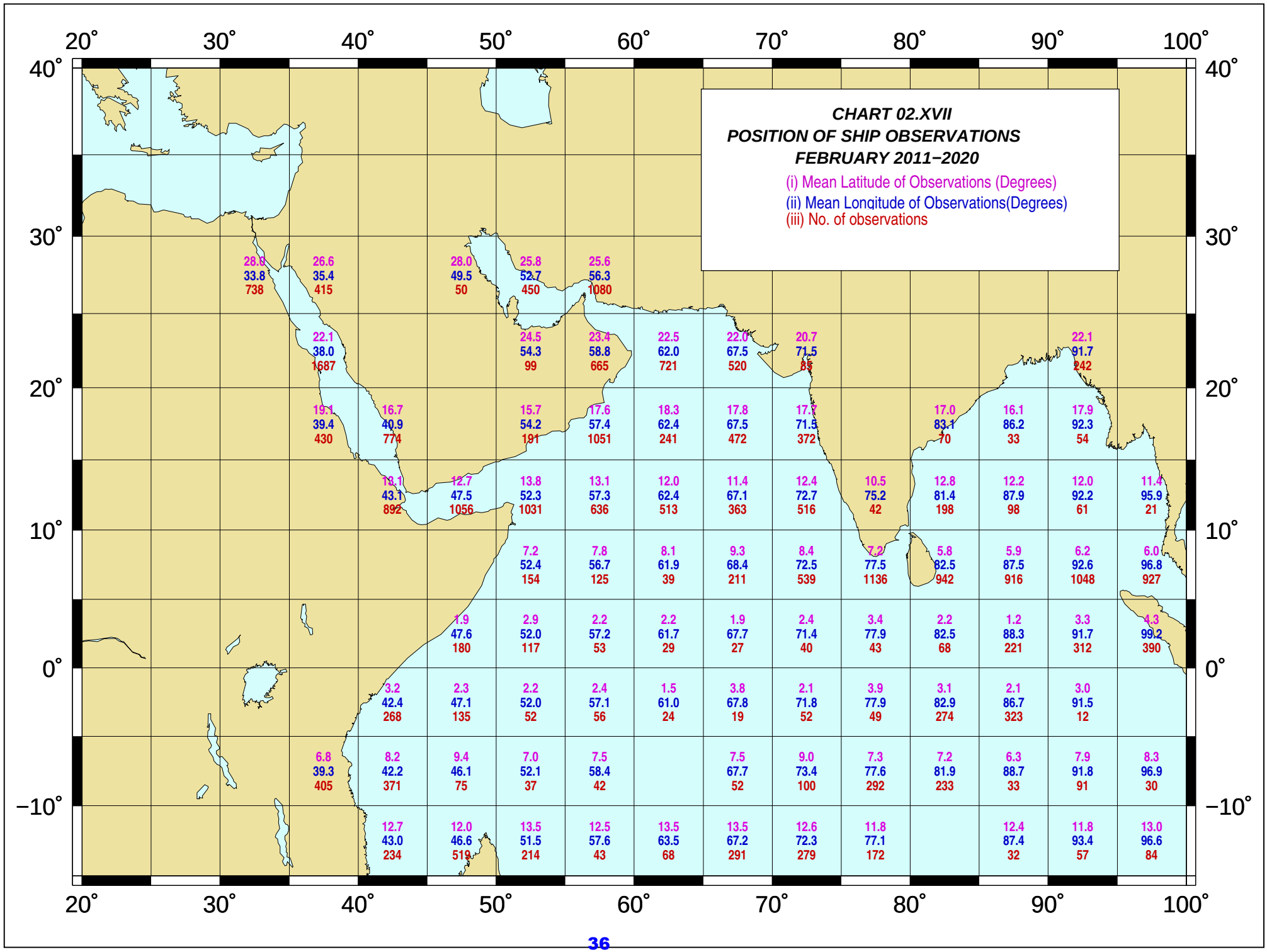


CHART 02.XVII
POSITION OF SHIP OBSERVATIONS
FEBRUARY 2011–2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.8 33.8 738
26.6 35.4 415
28.0 49.5 50
25.8 52.7 450
25.6 56.3 1080
22.1 38.0 1687
24.5 54.3 99
23.4 58.8 665
22.5 62.0 721
22.0 67.5 520
20.7 71.5 85
22.1 91.7 242
19.1 39.4 430
16.7 40.9 774
15.7 54.2 191
17.6 57.4 1051
18.3 62.4 241
17.8 67.5 472
17.7 71.5 372
17.0 83.1 70
16.1 86.2 33
17.9 92.3 54
13.1 43.1 892
12.7 47.5 1056
13.8 52.3 1031
13.1 57.3 636
12.0 62.4 513
11.4 67.1 363
12.4 72.7 516
10.5 75.2 42
12.8 81.4 198
12.2 87.9 98
12.0 92.2 61
11.4 95.9 21
7.2 52.4 154
7.8 56.7 125
8.1 61.9 39
9.3 68.4 211
8.4 72.5 539
7.2 77.5 1136
5.8 82.5 942
5.9 87.5 916
6.2 92.6 1048
6.0 96.8 927
1.9 47.6 180
2.9 52.0 117
2.2 57.2 53
2.2 61.7 29
1.9 67.7 27
2.4 71.4 40
3.4 77.9 43
2.2 82.5 68
1.2 88.3 221
3.3 91.7 312
4.3 99.2 390
3.2 42.4 268
2.3 47.1 135
2.2 52.0 52
2.4 57.1 56
1.5 61.0 24
3.8 67.8 19
2.1 71.8 52
3.9 77.9 49
3.1 82.9 274
2.1 86.7 323
3.0 91.5 12
6.8 39.3 405
8.2 42.2 371
9.4 46.1 75
7.0 52.1 37
7.5 58.4 42
7.5 67.7 52
9.0 73.4 100
7.3 77.6 292
7.2 81.9 233
6.3 88.7 33
7.9 91.8 91
8.3 96.9 30
12.7 43.0 234
12.0 46.6 519
13.5 51.5 214
12.5 57.6 43
13.5 63.5 68
13.5 67.2 291
12.6 72.3 279
11.8 77.1 172
12.4 87.4 32
11.8 93.4 57
13.0 96.6 84

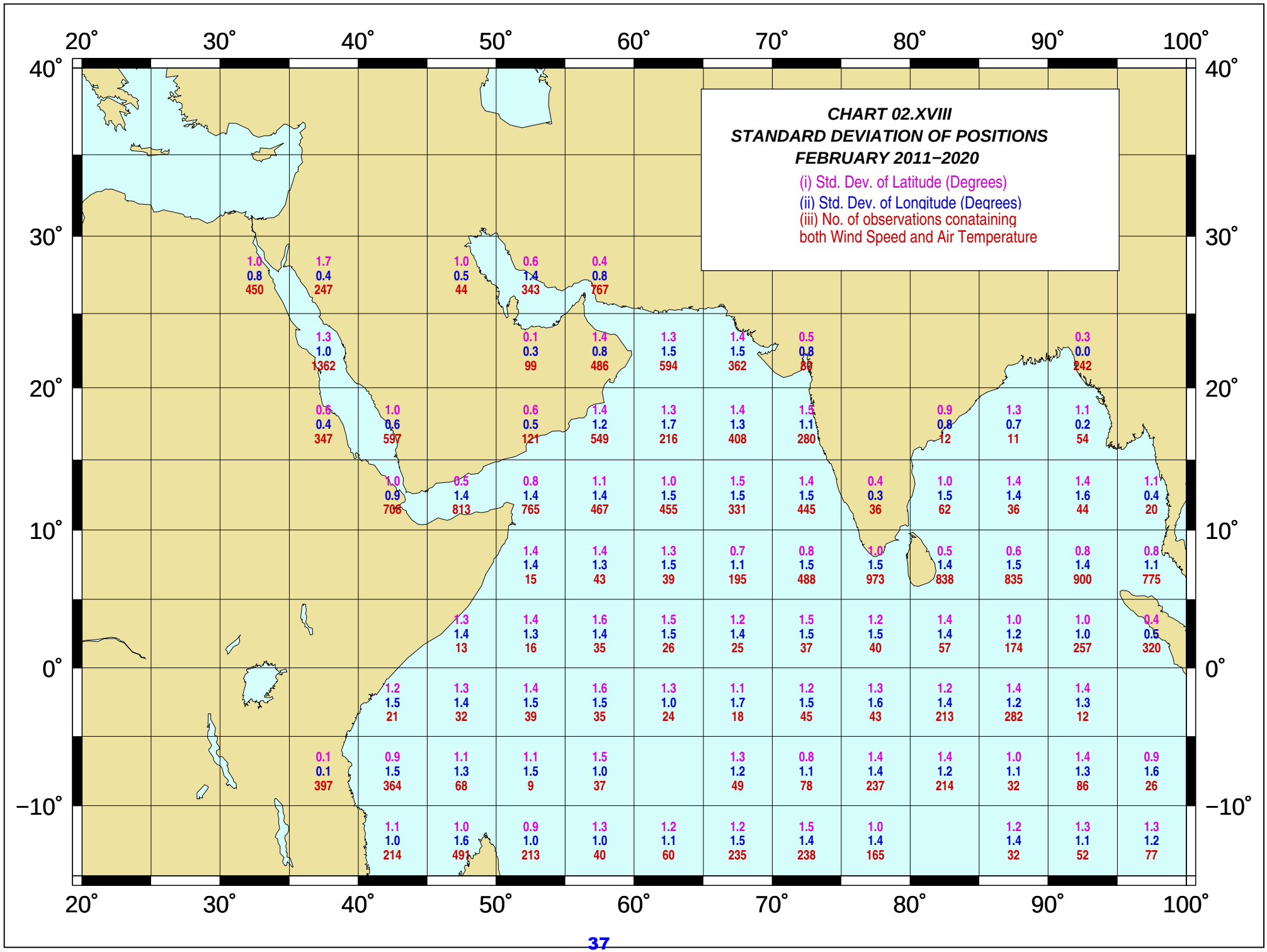
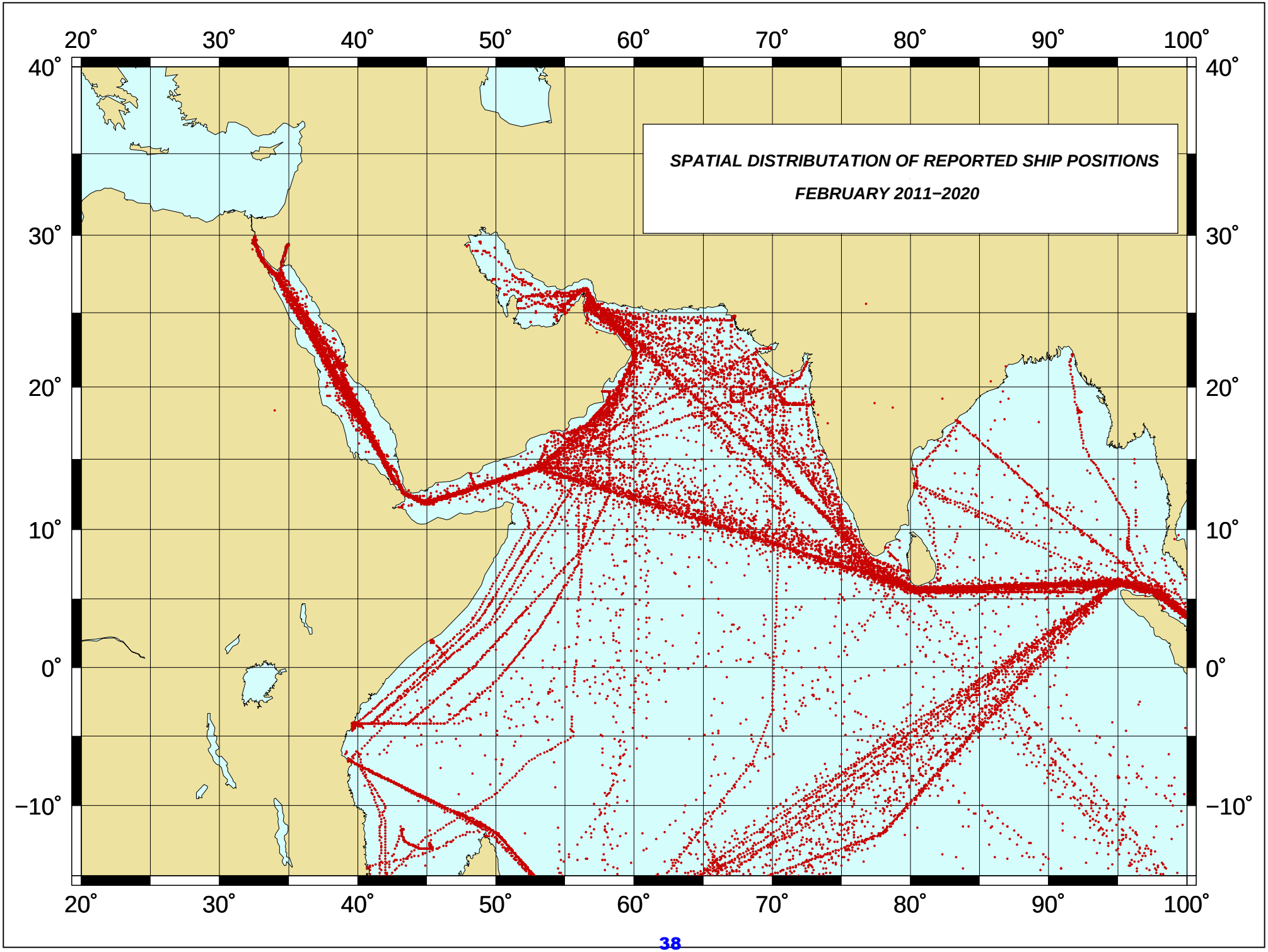


CHART 02.XVIII
STANDARD DEVIATION OF POSITIONS
FEBRUARY 2011−2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.0 0.8 450
1.7 0.4 247
1.0 0.5 44
0.6 1.4 343
0.4 0.8 767
1.3 1.0 1362
0.1 0.3 99
1.4 0.8 486
1.3 1.5 594
1.4 1.5 362
0.5 0.8
0.3 0.0 242
0.6 0.4 347
1.0 0.6 597
0.6 0.5 121
1.4 1.2 549
1.3 1.7 216
1.4 1.3 408
1.5 1.1 280
0.9 0.8 12
1.3 0.7 11
1.1 0.2 54
1.0 0.9 706
0.5 1.4 813
0.8 1.4 765
1.1 1.4 467
1.0 1.5 455
1.5 1.5 331
1.4 1.5 445
0.4 0.3 36
1.0 1.5 62
1.4 1.4 36
1.4 1.6 44
1.1 0.4 20
1.4 1.4 15
1.4 1.3 43
1.3 1.5 39
0.7 1.1 195
0.8 1.5 488
1.0 1.5 973
0.5 1.4 838
0.6 1.5 835
0.8 1.4 900
0.8 1.1 775
1.3 1.4 13
1.4 1.3 16
1.6 1.4 35
1.5 1.5 26
1.2 1.4 25
1.5 1.5 37
1.2 1.5 40
1.4 1.4 57
1.0 1.2 174
1.0 1.0 257
0.4 0.5 320
1.2 1.5 21
1.3 1.4 32
1.4 1.5 39
1.6 1.5 35
1.3 1.0 24
1.1 1.7 18
1.2 1.5 45
1.3 1.6 43
1.2 1.4 213
1.4 1.2 282
1.4 1.3 12
0.1 0.1 397
0.9 1.5 364
1.1 1.3 68
1.1 1.5 9
1.5 1.0 37
1.3 1.2 49
0.8 1.1 78
1.4 1.4 237
1.4 1.2 214
1.0 1.1 32
1.4 1.3 86
0.9 1.6 26
1.1 1.0 214
1.0 1.6 491
0.9 1.0 213
1.3 1.0 40
1.2 1.1 60
1.2 1.5 235
1.5 1.4 238
1.0 1.4 165
1.2 1.4 32
1.3 1.1 52
1.3 1.2 77


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
FEBRUARY 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF MARCH 2011-2020

Marine Climatological Summary Charts 2011-2020

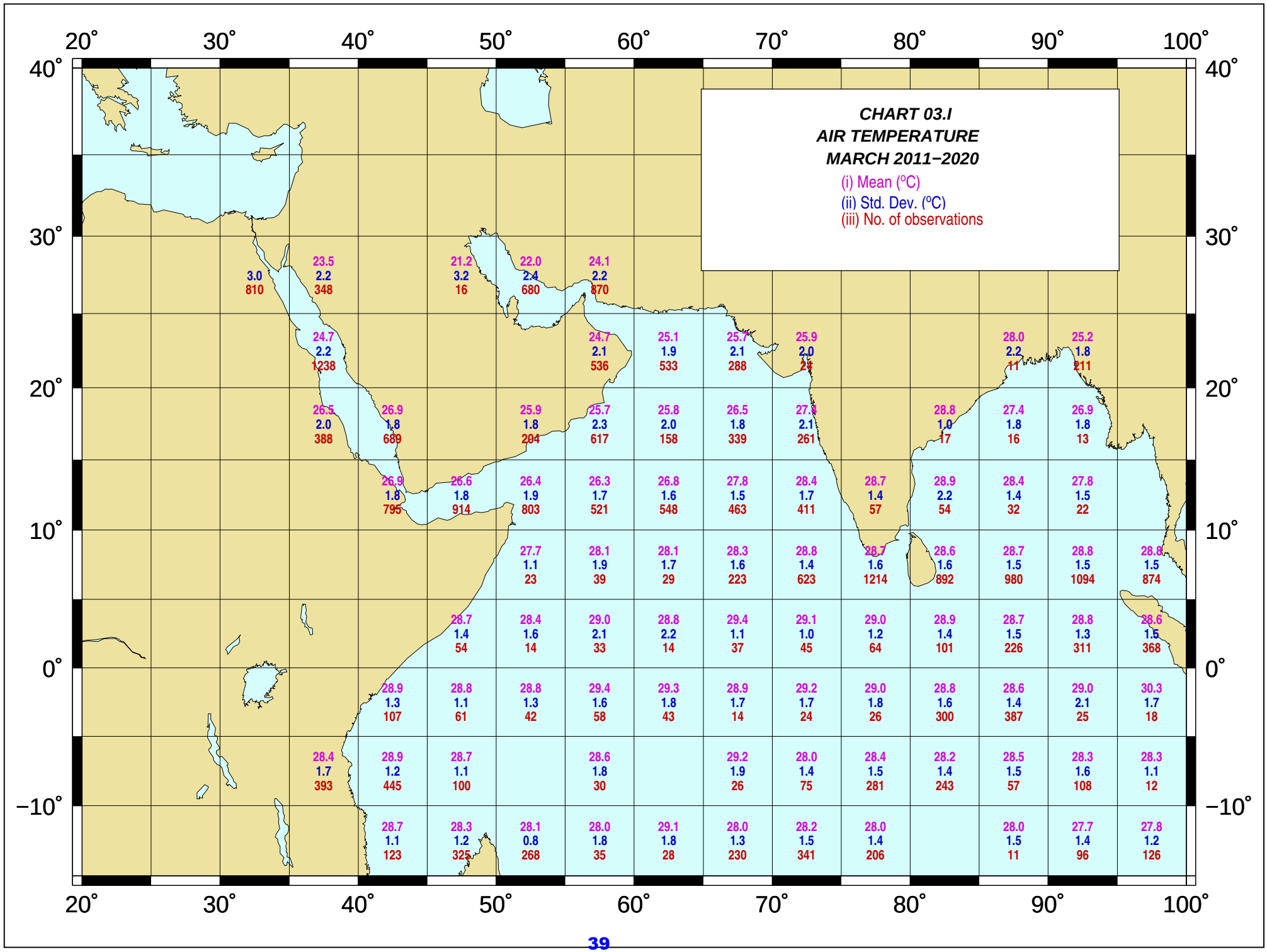


CHART 03.I
AIR TEMPERATURE
MARCH 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
3.0 810
23.5 2.2 348
21.2 3.2 16
22.0 2.4 680
24.1 2.2 870
24.7 2.2 1238
24.7 2.1 536
25.1 1.9 533
25.7 2.1 288
25.9 2.0 24
28.0 2.2 11
25.2 1.8 211
26.5 2.0 388
26.9 1.8 689
25.9 1.8 204
25.7 2.3 617
25.8 2.0 158
26.5 1.8 339
27.9 2.1 261
28.8 1.0 17
27.4 1.8 16
26.9 1.8 13
26.9 1.8 795
26.6 1.8 914
26.4 1.9 803
26.3 1.7 521
26.8 1.6 548
27.8 1.5 463
28.4 1.7 411
28.7 1.4 57
28.9 2.2 54
28.4 1.4 32
27.8 1.5 22
27.7 1.1 23
28.1 1.9 39
28.1 1.7 29
28.3 1.6 223
28.8 1.4 623
28.7 1.6 1214
28.6 1.6 892
28.7 1.5 980
28.8 1.5 1094
28.8 1.5 874
28.7 1.4 54
28.4 1.6 14
29.0 2.1 33
28.8 2.2 14
29.4 1.1 37
29.1 1.0 45
29.0 1.2 64
28.9 1.4 101
28.7 1.5 226
28.8 1.3 311
28.6 1.5 368
28.9 1.3 107
28.8 1.1 61
28.8 1.3 42
29.4 1.6 58
29.3 1.8 43
28.9 1.7 14
29.2 1.7 24
29.0 1.8 26
28.8 1.6 300
28.6 1.4 387
29.0 2.1 25
30.3 1.7 18
28.4 1.7 393
28.9 1.2 445
28.7 1.1 100
28.6 1.8 30
29.2 1.9 26
28.0 1.4 75
28.4 1.5 281
28.2 1.4 243
28.5 1.5 57
28.3 1.6 108
28.3 1.1 12
28.7 1.1 123
28.3 1.2 325
28.1 0.8 268
28.0 1.8 35
29.1 1.8 28
28.0 1.3 230
28.2 1.5 341
28.0 1.4 206
28.0 1.5 11
27.7 1.4 96
27.8 1.2 126

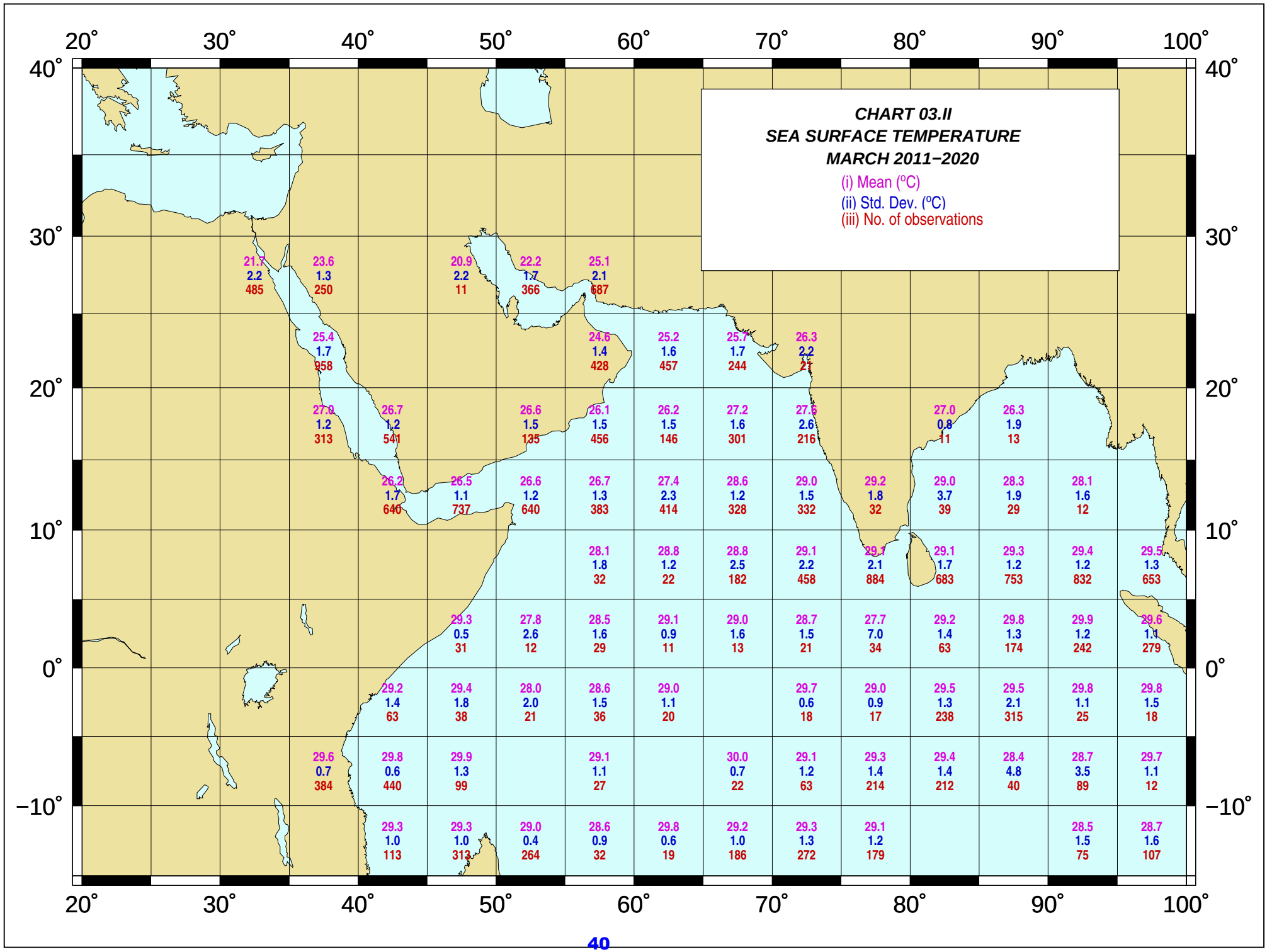


CHART 03.II
SEA SURFACE TEMPERATURE
MARCH 2011−2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
21.7 2.2 485
23.6 1.3 250
20.9 2.2 11
22.2 1.7 366
25.1 2.1 687
25.4 1.7 958
24.6 1.4 428
25.2 1.6 457
25.7 1.7 244
26.3 2.2 21
27.0 1.2 313
26.7 1.2 541
26.6 1.5 135
26.1 1.5 456
26.2 1.5 146
27.2 1.6 301
27.6 2.6 216
27.0 0.8 11
26.3 1.9 13
26.2 1.7 640
26.5 1.1 737
26.6 1.2 640
26.7 1.3 383
27.4 2.3 414
28.6 1.2 328
29.0 1.5 332
29.2 1.8 32
29.0 3.7 39
28.3 1.9 29
28.1 1.6 12
28.1 1.8 32
28.8 1.2 22
28.8 2.5 182
29.1 2.2 458
29.1 2.1 884
29.1 1.7 683
29.3 1.2 753
29.4 1.2 832
29.5 1.3 653
29.3 0.5 31
27.8 2.6 12
28.5 1.6 29
29.1 0.9 11
29.0 1.6 13
28.7 1.5 21
27.7 7.0 34
29.2 1.4 63
29.8 1.3 174
29.9 1.2 242
29.6 1.1 279
29.2 1.4 63
29.4 1.8 38
28.0 2.0 21
28.6 1.5 36
29.0 1.1 20
29.7 0.6 18
29.0 0.9 17
29.5 1.3 238
29.5 2.1 315
29.8 1.1 25
29.8 1.5 18
29.6 0.7 384
29.8 0.6 440
29.9 1.3 99
29.1 1.1 27
30.0 0.7 22
29.1 1.2 63
29.3 1.4 214
29.4 1.4 212
28.4 4.8 40
28.7 3.5 89
29.7 1.1 12
29.3 1.0 113
29.3 1.0 313
29.0 0.4 264
28.6 0.9 32
29.8 0.6 19
29.2 1.0 186
29.3 1.3 272
29.1 1.2 179
28.5 1.5 75
28.7 1.6 107

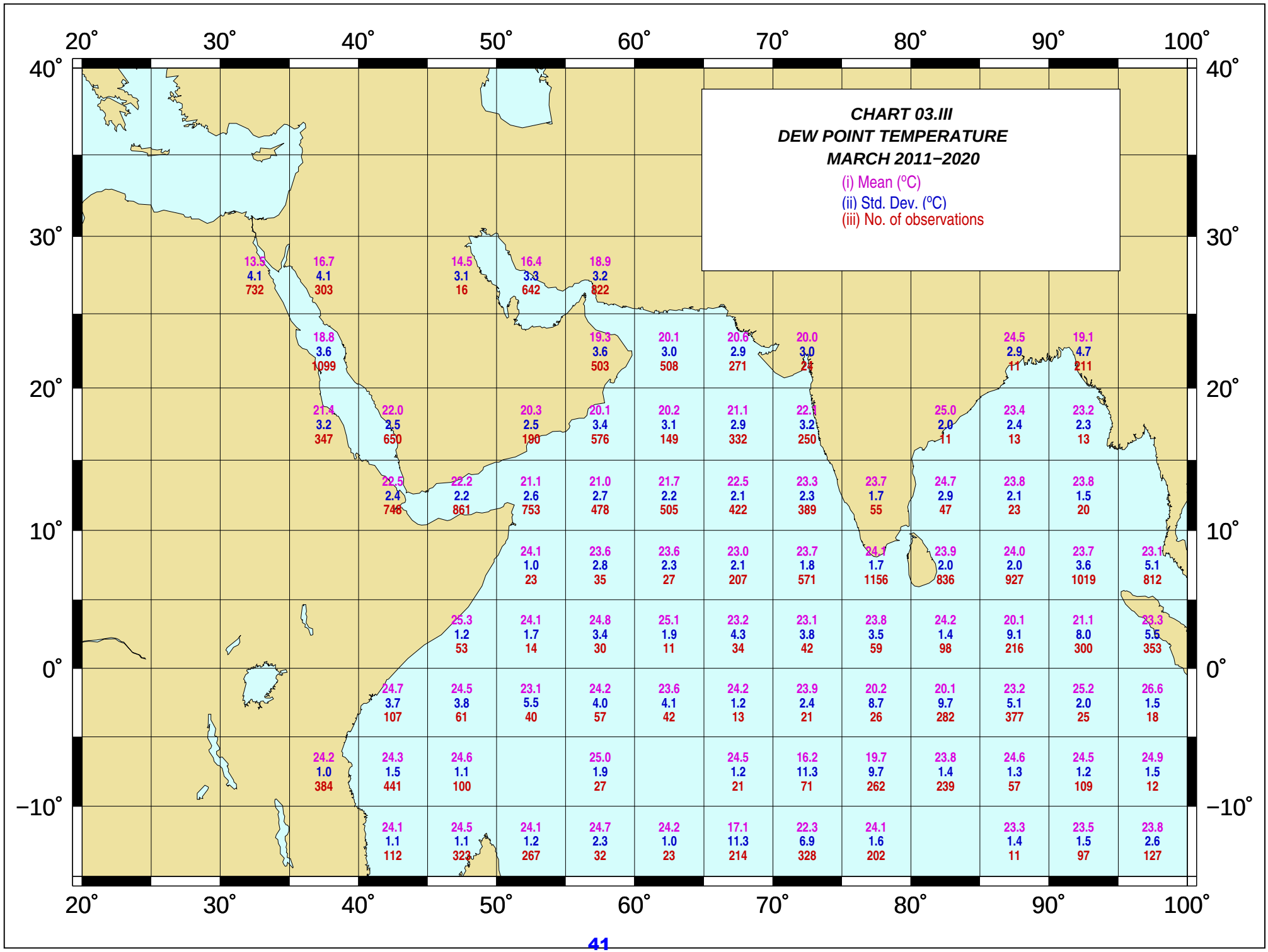


CHART 03.III
DEW POINT TEMPERATURE
MARCH 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
13.5 4.1 732
16.7 4.1 303
14.5 3.1 16
16.4 3.3 642
18.9 3.2 822
18.8 3.6 1099
19.3 3.6 503
20.1 3.0 508
20.6 2.9 271
20.0 3.0 24
24.5 2.9 11
19.1 4.7 211
21.4 3.2 347
22.0 2.5 650
20.3 2.5 190
20.1 3.4 576
20.2 3.1 149
21.1 2.9 332
22.1 3.2 250
25.0 2.0 11
23.4 2.4 13
23.2 2.3 13
22.5 2.4 746
22.2 2.2 861
21.1 2.6 753
21.0 2.7 478
21.7 2.2 505
22.5 2.1 422
23.3 2.3 389
23.7 1.7 55
24.7 2.9 47
23.8 2.1 23
23.8 1.5 20
24.1 1.0 23
23.6 2.8 35
23.6 2.3 27
23.0 2.1 207
23.7 1.8 571
24.1 1.7 1156
23.9 2.0 836
24.0 2.0 927
23.7 3.6 1019
23.1 5.1 812
25.3 1.2 53
24.1 1.7 14
24.8 3.4 30
25.1 1.9 11
23.2 4.3 34
23.1 3.8 42
23.8 3.5 59
24.2 1.4 98
20.1 9.1 216
21.1 8.0 300
23.3 5.5 353
24.7 3.7 107
24.5 3.8 61
23.1 5.5 40
24.2 4.0 57
23.6 4.1 42
24.2 1.2 13
23.9 2.4 21
20.2 8.7 26
20.1 9.7 282
23.2 5.1 377
25.2 2.0 25
26.6 1.5 18
24.2 1.0 384
24.3 1.5 441
24.6 1.1 100
25.0 1.9 27
24.5 1.2 21
16.2 11.3 71
19.7 9.7 262
23.8 1.4 239
24.6 1.3 57
24.5 1.2 109
24.9 1.5 12
24.1 1.1 112
24.5 1.1 323
24.1 1.2 267
24.7 2.3 32
24.2 1.0 23
17.1 11.3 214
22.3 6.9 328
24.1 1.6 202
23.3 1.4 11
23.5 1.5 97
23.8 2.6 127

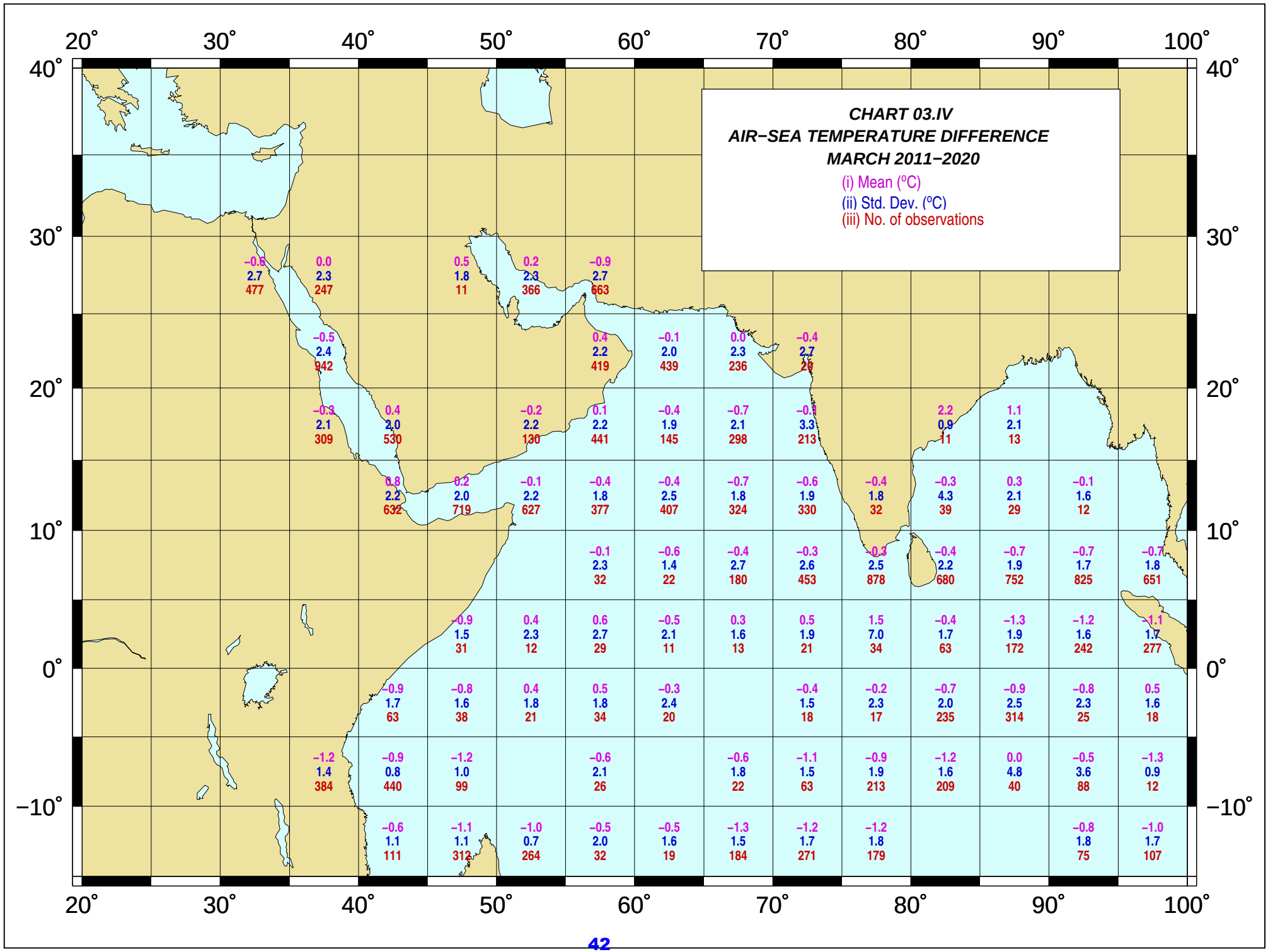


CHART 03.IV
AIR–SEA TEMPERATURE DIFFERENCE
MARCH 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
−0.6 2.7 477
0.0 2.3 247
0.5 1.8 11
0.2 2.3 366
−0.9 2.7 663
−0.5 2.4 942
0.4 2.2 419
−0.1 2.0 439
0.0 2.3 236
−0.4 2.7 26
−0.3 2.1 309
0.4 2.0 530
−0.2 2.2 130
0.1 2.2 441
−0.4 1.9 145
−0.7 2.1 298
−0.3 3.3 213
2.2 0.9 11
1.1 2.1 13
0.8 2.2 632
0.2 2.0 719
−0.1 2.2 627
−0.4 1.8 377
−0.4 2.5 407
−0.7 1.8 324
−0.6 1.9 330
−0.4 1.8 32
−0.3 4.3 39
0.3 2.1 29
−0.1 1.6 12
−0.1 2.3 32
−0.6 1.4 22
−0.4 2.7 180
−0.3 2.6 453
−0.3 2.5 878
−0.4 2.2 680
−0.7 1.9 752
−0.7 1.7 825
−0.7 1.8 651
−0.9 1.5 31
0.4 2.3 12
0.6 2.7 29
−0.5 2.1 11
0.3 1.6 13
0.5 1.9 21
1.5 7.0 34
−0.4 1.7 63
−1.3 1.9 172
−1.2 1.6 242
−1.1 1.7 277
−0.9 1.7 63
−0.8 1.6 38
0.4 1.8 21
0.5 1.8 34
−0.3 2.4 20
−0.4 1.5 18
−0.2 2.3 17
−0.7 2.0 235
−0.9 2.5 314
−0.8 2.3 25
0.5 1.6 18
−1.2 1.4 384
−0.9 0.8 440
−1.2 1.0 99
−0.6 2.1 26
−0.6 1.8 22
−1.1 1.5 63
−0.9 1.9 213
−1.2 1.6 209
0.0 4.8 40
−0.5 3.6 88
−1.3 0.9 12
−0.6 1.1 111
−1.1 1.1 312
−1.0 0.7 264
−0.5 2.0 32
−0.5 1.6 19
−1.3 1.5 184
−1.2 1.7 271
−1.2 1.8 179
−0.8 1.8 75
−1.0 1.7 107

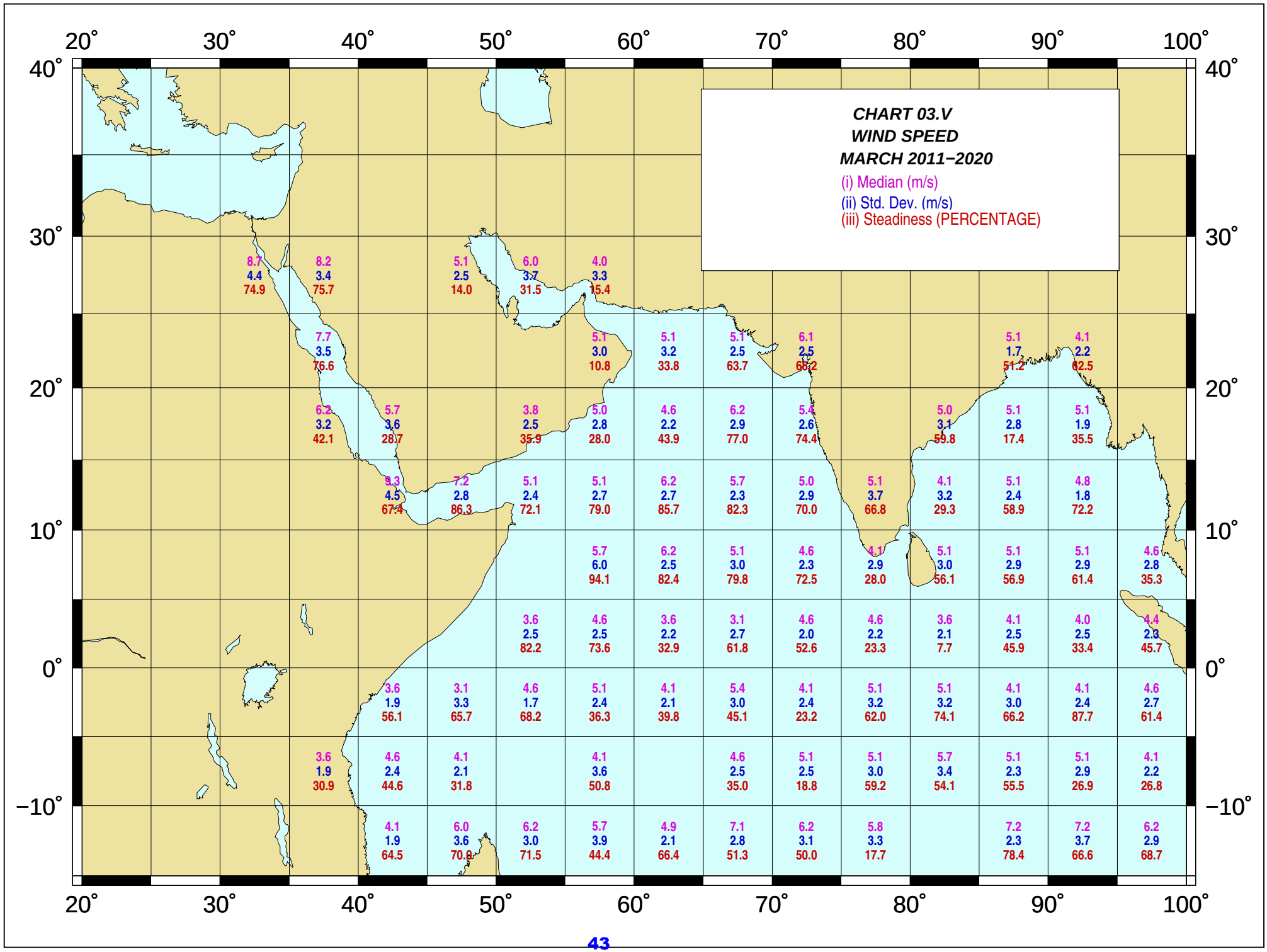


CHART 03.V
WIND SPEED
MARCH 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
8.7 4.4 74.9
8.2 3.4 75.7
5.1 2.5 14.0
6.0 3.7 31.5
4.0 3.3 15.4
7.7 3.5 76.6
5.1 3.0 10.8
5.1 3.2 33.8
5.1 2.5 63.7
6.1 2.5 68.2
5.1 1.7 51.2
4.1 2.2 62.5
6.2 3.2 42.1
5.7 3.6 28.7
3.8 2.5 35.9
5.0 2.8 28.0
4.6 2.2 43.9
6.2 2.9 77.0
5.4 2.6 74.4
5.0 3.1 59.8
5.1 2.8 17.4
5.1 1.9 35.5
9.3 4.5 67.4
7.2 2.8 86.3
5.1 2.4 72.1
5.1 2.7 79.0
6.2 2.7 85.7
5.7 2.3 82.3
5.0 2.9 70.0
5.1 3.7 66.8
4.1 3.2 29.3
5.1 2.4 58.9
4.8 1.8 72.2
5.7 6.0 94.1
6.2 2.5 82.4
5.1 3.0 79.8
4.6 2.3 72.5
4.1 2.9 28.0
5.1 3.0 56.1
5.1 2.9 56.9
5.1 2.9 61.4
4.6 2.8 35.3
3.6 2.5 82.2
4.6 2.5 73.6
3.6 2.2 32.9
3.1 2.7 61.8
4.6 2.0 52.6
4.6 2.2 23.3
3.6 2.1 7.7
4.1 2.5 45.9
4.0 2.5 33.4
4.4 2.3 45.7
3.6 1.9 56.1
3.1 3.3 65.7
4.6 1.7 68.2
5.1 2.4 36.3
4.1 2.1 39.8
5.4 3.0 45.1
4.1 2.4 23.2
5.1 3.2 62.0
5.1 3.2 74.1
4.1 3.0 66.2
4.1 2.4 87.7
4.6 2.7 61.4
3.6 1.9 30.9
4.6 2.4 44.6
4.1 2.1 31.8
4.1 3.6 50.8
4.6 2.5 35.0
5.1 2.5 18.8
5.1 3.0 59.2
5.7 3.4 54.1
5.1 2.3 55.5
5.1 2.9 26.9
4.1 2.2 26.8
4.1 1.9 64.5
6.0 3.6 70.0
6.2 3.0 71.5
5.7 3.9 44.4
4.9 2.1 66.4
7.1 2.8 51.3
6.2 3.1 50.0
5.8 3.3 17.7
7.2 2.3 78.4
7.2 3.7 66.6
6.2 2.9 68.7

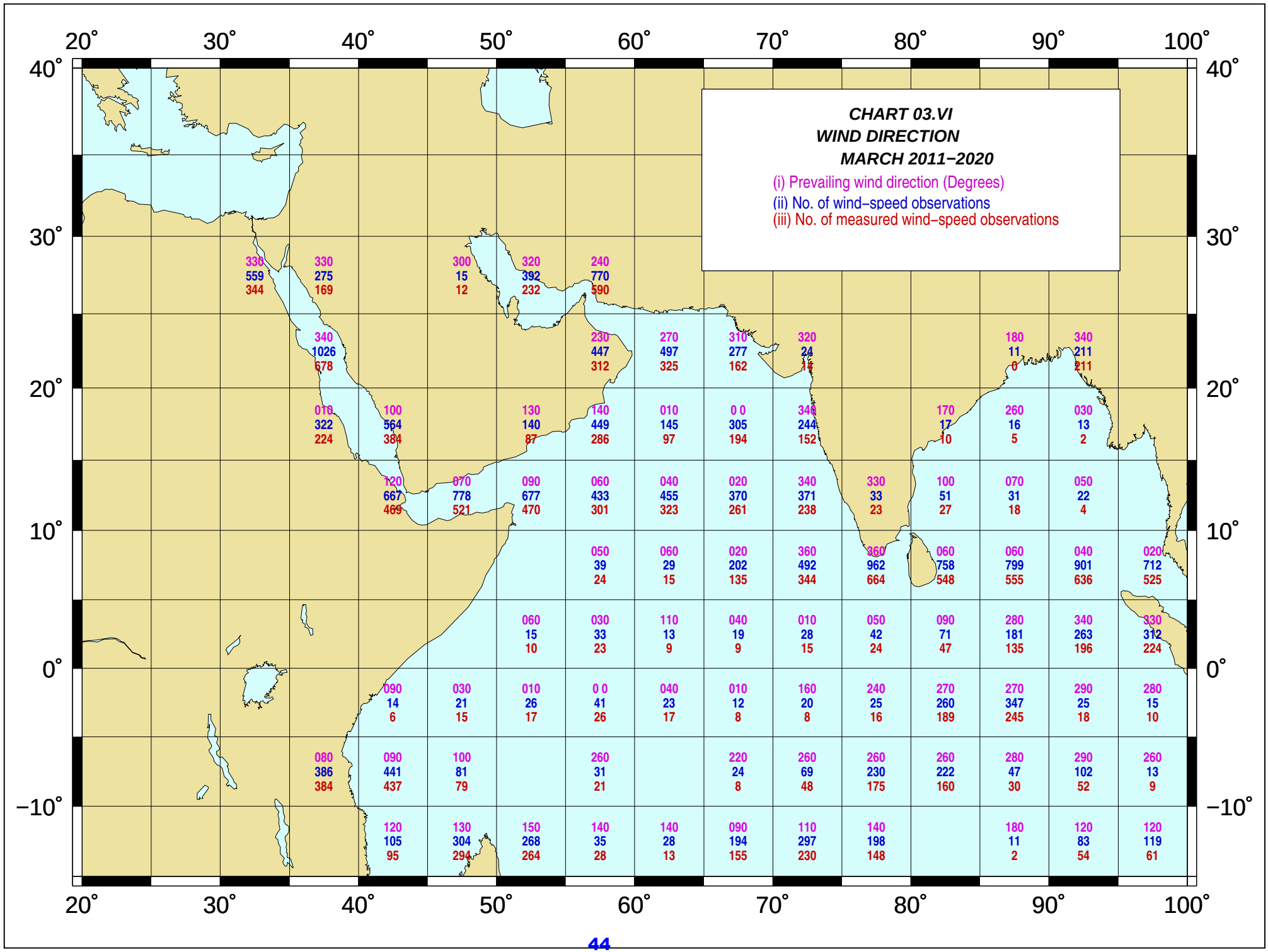


CHART 03.VI
WIND DIRECTION
MARCH 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
330 559 344
330 275 169
300 15 12
320 392 232
240 770 590
340 1026 678
230 447 312
270 497 325
310 277 162
320 24 14
180 11 0
340 211 211
010 322 224
100 564 384
130 140 87
140 449 286
010 145 97
0 0 305 194
340 244 152
170 17 10
260 16 5
030 13 2
120 667 469
070 778 521
090 677 470
060 433 301
040 455 323
020 370 261
340 371 238
330 33 23
100 51 27
070 31 18
050 22 4
050 39 24
060 29 15
020 202 135
360 492 344
360 962 664
060 758 548
060 799 555
040 901 636
020 712 525
060 15 10
030 33 23
110 13 9
040 19 9
010 28 15
050 42 24
090 71 47
280 181 135
340 263 196
330 312 224
090 14 6
030 21 15
010 26 17
0 0 41 26
040 23 17
010 12 8
160 20 8
240 25 16
270 260 189
270 347 245
290 25 18
280 15 10
080 386 384
090 441 437
100 81 79
260 31 21
220 24 8
260 69 48
260 230 175
260 222 160
280 47 30
290 102 52
260 13 9
120 105 95
130 304 294
150 268 264
140 35 28
140 28 13
090 194 155
110 297 230
140 198 148
180 11 2
120 83 54
120 119 61

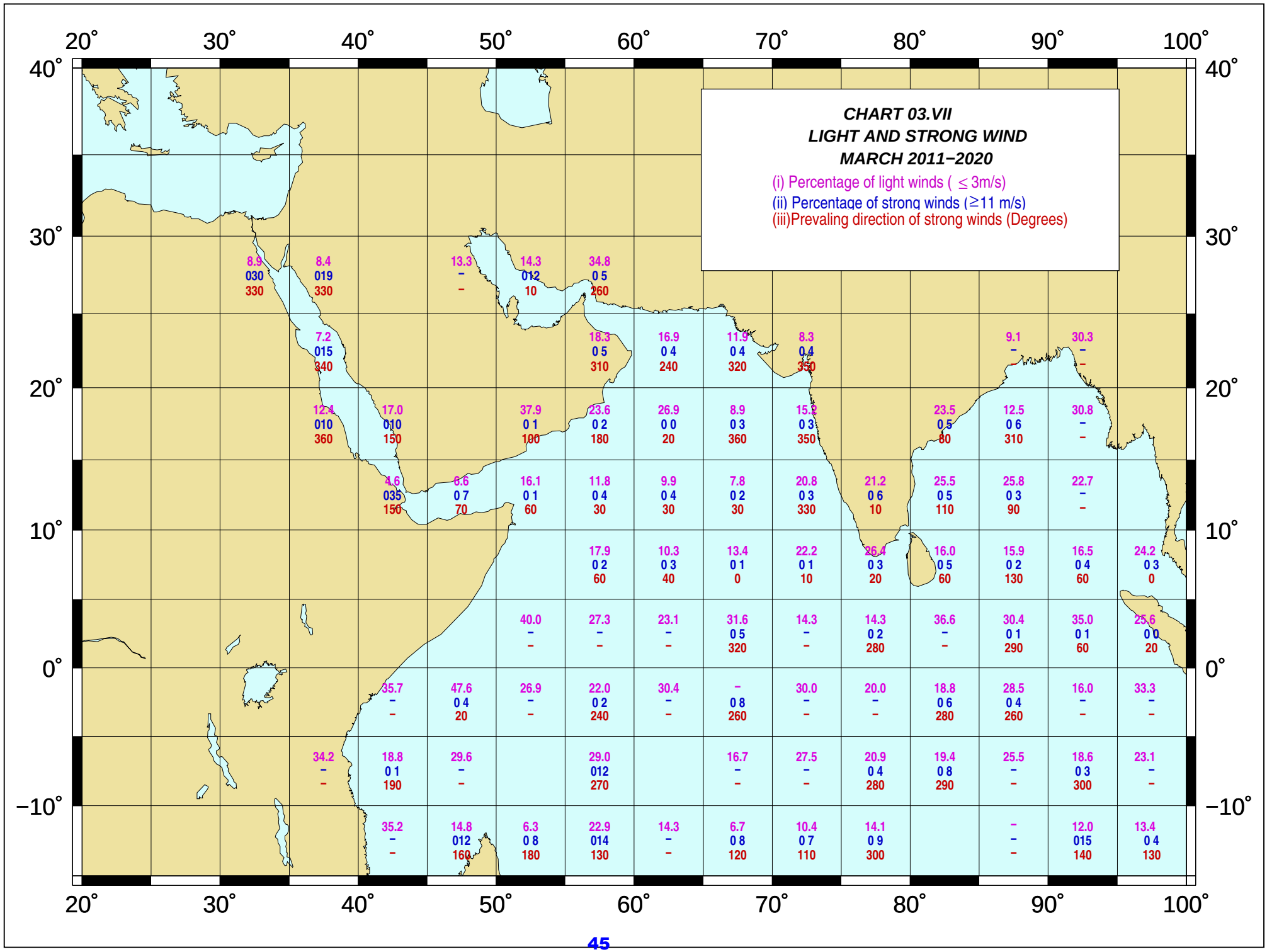


CHART 03.VII
LIGHT AND STRONG WIND
MARCH 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
8.9 030 330
8.4 019 330
13.3 – –
14.3 012 10
34.8 0 5 260
7.2 015 340
18.3 0 5 310
16.9 0 4 240
11.9 0 4 320
8.3 0 4 350
9.1 –
30.3 – –
12.4 010 360
17.0 010 150
37.9 0 1 100
23.6 0 2 180
26.9 0 0 20
8.9 0 3 360
15.2 0 3 350
23.5 0 5 30
12.5 0 6 310
30.8 – –
4.6 035 150
6.6 0 7 70
16.1 0 1 60
11.8 0 4 30
9.9 0 4 30
7.8 0 2 30
20.8 0 3 330
21.2 0 6 10
25.5 0 5 110
25.8 0 3 90
22.7 – –
17.9 0 2 60
10.3 0 3 40
13.4 0 1 0
22.2 0 1 10
26.4 0 3 20
16.0 0 5 60
15.9 0 2 130
16.5 0 4 60
24.2 0 3 0
40.0 – –
27.3 – –
23.1 – –
31.6 0 5 320
14.3 – –
14.3 0 2 280
36.6 – –
30.4 0 1 290
35.0 0 1 60
25.6 0 0 20
35.7 – –
47.6 0 4 20
26.9 – –
22.0 0 2 240
30.4 – –
– 0 8 260
30.0 – –
20.0 – –
18.8 0 6 280
28.5 0 4 260
16.0 – –
33.3 – –
34.2 – –
18.8 0 1 190
29.6 – –
29.0 012 270
16.7 – –
27.5 – –
20.9 0 4 280
19.4 0 8 290
25.5 – –
18.6 0 3 300
23.1 – –
35.2 – –
14.8 012 160
6.3 0 8 180
22.9 014 130
14.3 – –
6.7 0 8 120
10.4 0 7 110
14.1 0 9 300
– – –
12.0 015 140
13.4 0 4 130

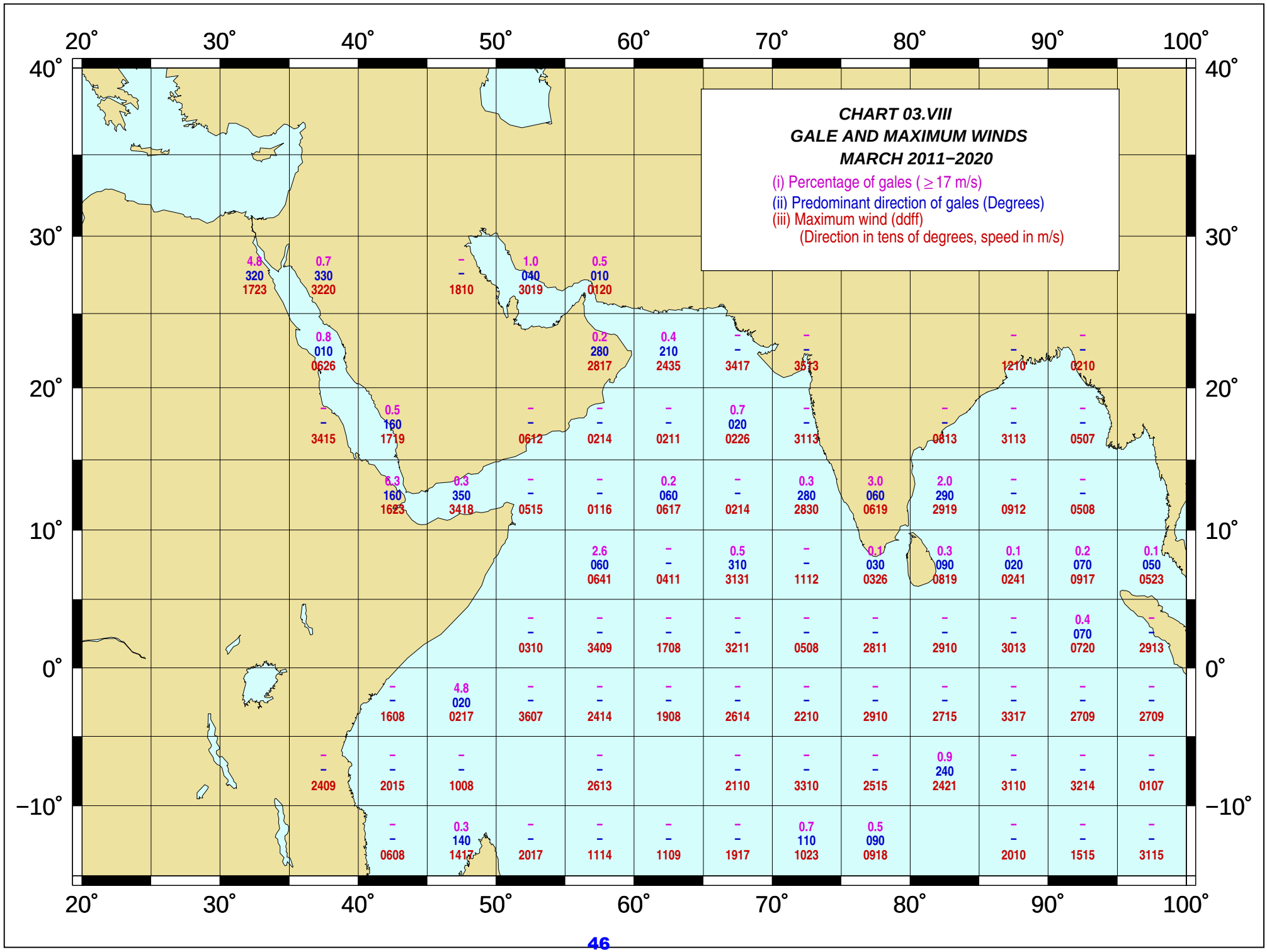


CHART 03.VIII
GALE AND MAXIMUM WINDS
MARCH 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
4.8 320 1723
0.7 330 3220
– – 1810
1.0 040 3019
0.5 010 0120
0.8 010 0626
0.2 280 2817
0.4 210 2435
– – 3417
– – 3513
– – 1210
– – 0210
– – 3415
0.5 160 1719
– – 0612
– – 0214
– – 0211
0.7 020 0226
– – 3113
– – 0813
– – 3113
– – 0507
0.3 160 1623
0.3 350 3418
– – 0515
– – 0116
0.2 060 0617
– – 0214
0.3 280 2830
3.0 060 0619
2.0 290 2919
– – 0912
– – 0508
2.6 060 0641
– – 0411
0.5 310 3131
– – 1112
0.1 030 0326
0.3 090 0819
0.1 020 0241
0.2 070 0917
0.1 050 0523
– – 0310
– – 3409
– – 1708
– – 3211
– – 0508
– – 2811
– – 2910
– – 3013
0.4 070 0720
– – 2913
– – 1608
4.8 020 0217
– – 3607
– – 2414
– – 1908
– – 2614
– – 2210
– – 2910
– – 2715
– – 3317
– – 2709
– – 2709
– – 2409
– – 2015
– – 1008
– – 2613
– – 2110
– – 3310
– – 2515
0.9 240 2421
– – 3110
– – 3214
– – 0107
– – 0608
0.3 140 1417
– – 2017
– – 1114
– – 1109
– – 1917
0.7 110 1023
0.5 090 0918
– – 2010
– – 1515
– – 3115

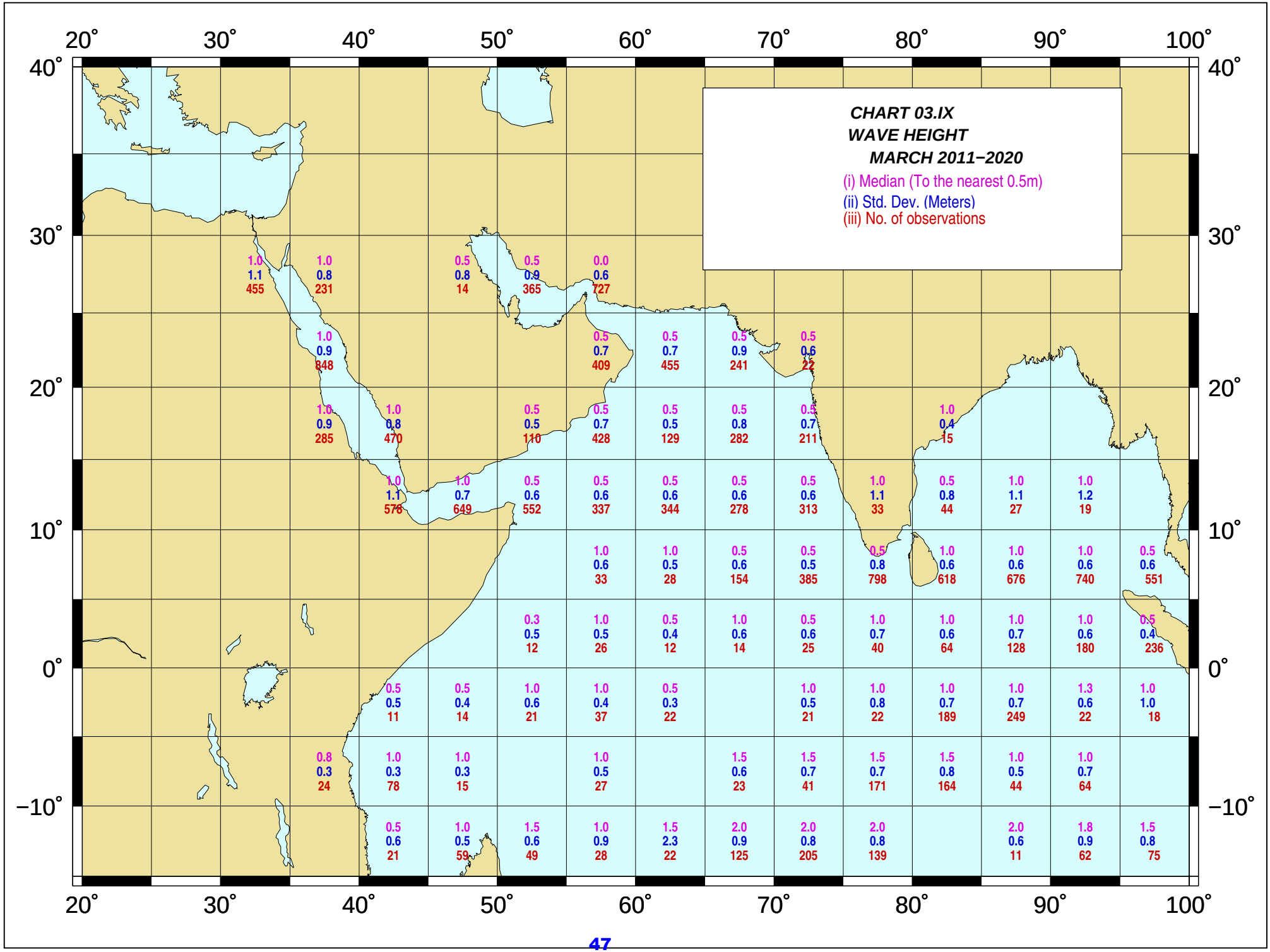


CHART 03.IX
WAVE HEIGHT
MARCH 2011–2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.0 1.1 455
1.0 0.8 231
0.5 0.8 14
0.5 0.9 365
0.0 0.6 727
1.0 0.9 848
0.5 0.7 409
0.5 0.7 455
0.5 0.9 241
0.5 0.6 22
1.0 0.9 285
1.0 0.8 470
0.5 0.5 110
0.5 0.7 428
0.5 0.5 129
0.5 0.8 282
0.5 0.7 211
1.0 0.4 15
1.0 1.1 576
1.0 0.7 649
0.5 0.6 552
0.5 0.6 337
0.5 0.6 344
0.5 0.6 278
0.5 0.6 313
1.0 1.1 33
0.5 0.8 44
1.0 1.1 27
1.0 1.2 19
1.0 0.6 33
1.0 0.5 28
0.5 0.6 154
0.5 0.5 385
0.5 0.8 798
1.0 0.6 618
1.0 0.6 676
1.0 0.6 740
0.5 0.6 551
0.3 0.5 12
1.0 0.5 26
0.5 0.4 12
1.0 0.6 14
0.5 0.6 25
1.0 0.7 40
1.0 0.6 64
1.0 0.7 128
1.0 0.6 180
0.5 0.4 236
0.5 0.5 11
0.5 0.4 14
1.0 0.6 21
1.0 0.4 37
0.5 0.3 22
1.0 0.5 21
1.0 0.8 22
1.0 0.7 189
1.0 0.7 249
1.3 0.6 22
1.0 1.0 18
0.8 0.3 24
1.0 0.3 78
1.0 0.3 15
1.0 0.5 27
1.5 0.6 23
1.5 0.7 41
1.5 0.7 171
1.5 0.8 164
1.0 0.5 44
1.0 0.7 64
0.5 0.6 21
1.0 0.5 59
1.5 0.6 49
1.0 0.9 28
1.5 2.3 22
2.0 0.9 125
2.0 0.8 205
2.0 0.8 139
2.0 0.6 11
1.8 0.9 62
1.5 0.8 75

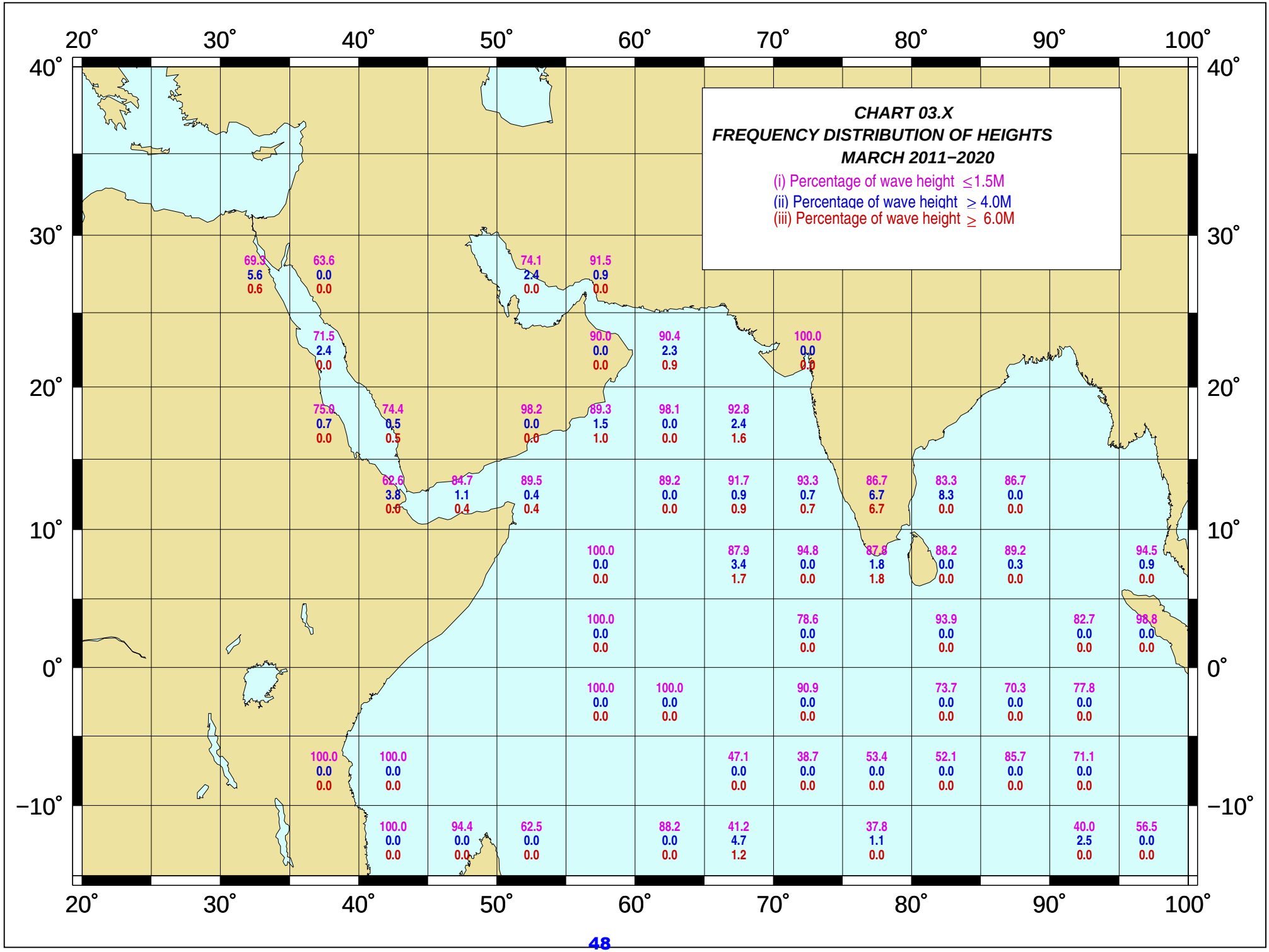


CHART 03.X
FREQUENCY DISTRIBUTION OF HEIGHTS
MARCH 2011−2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
69.3 5.6 0.6
63.6 0.0 0.0
74.1 2.4 0.0
91.5 0.9 0.0
71.5 2.4 0.0
90.0 0.0 0.0
90.4 2.3 0.9
100.0 0.0 0.0
75.9 0.7 0.0
74.4 0.5 0.5
98.2 0.0 0.0
89.3 1.5 1.0
98.1 0.0 0.0
92.8 2.4 1.6
62.6 3.8 0.6
84.7 1.1 0.4
89.5 0.4 0.4
89.2 0.0 0.0
91.7 0.9 0.9
93.3 0.7 0.7
86.7 6.7 6.7
83.3 8.3 0.0
86.7 0.0 0.0
100.0 0.0 0.0
87.9 3.4 1.7
94.8 0.0 0.0
87.8 1.8 1.8
88.2 0.0 0.0
89.2 0.3 0.0
94.5 0.9 0.0
100.0 0.0 0.0
78.6 0.0 0.0
93.9 0.0 0.0
82.7 0.0 0.0
98.8 0.0 0.0
100.0 0.0 0.0
100.0 0.0 0.0
90.9 0.0 0.0
73.7 0.0 0.0
70.3 0.0 0.0
77.8 0.0 0.0
100.0 0.0 0.0
100.0 0.0 0.0
47.1 0.0 0.0
38.7 0.0 0.0
53.4 0.0 0.0
52.1 0.0 0.0
85.7 0.0 0.0
71.1 0.0 0.0
100.0 0.0 0.0
94.4 0.0 0.0
62.5 0.0 0.0
88.2 0.0 0.0
41.2 4.7 1.2
37.8 1.1 0.0
40.0 2.5 0.0
56.5 0.0 0.0

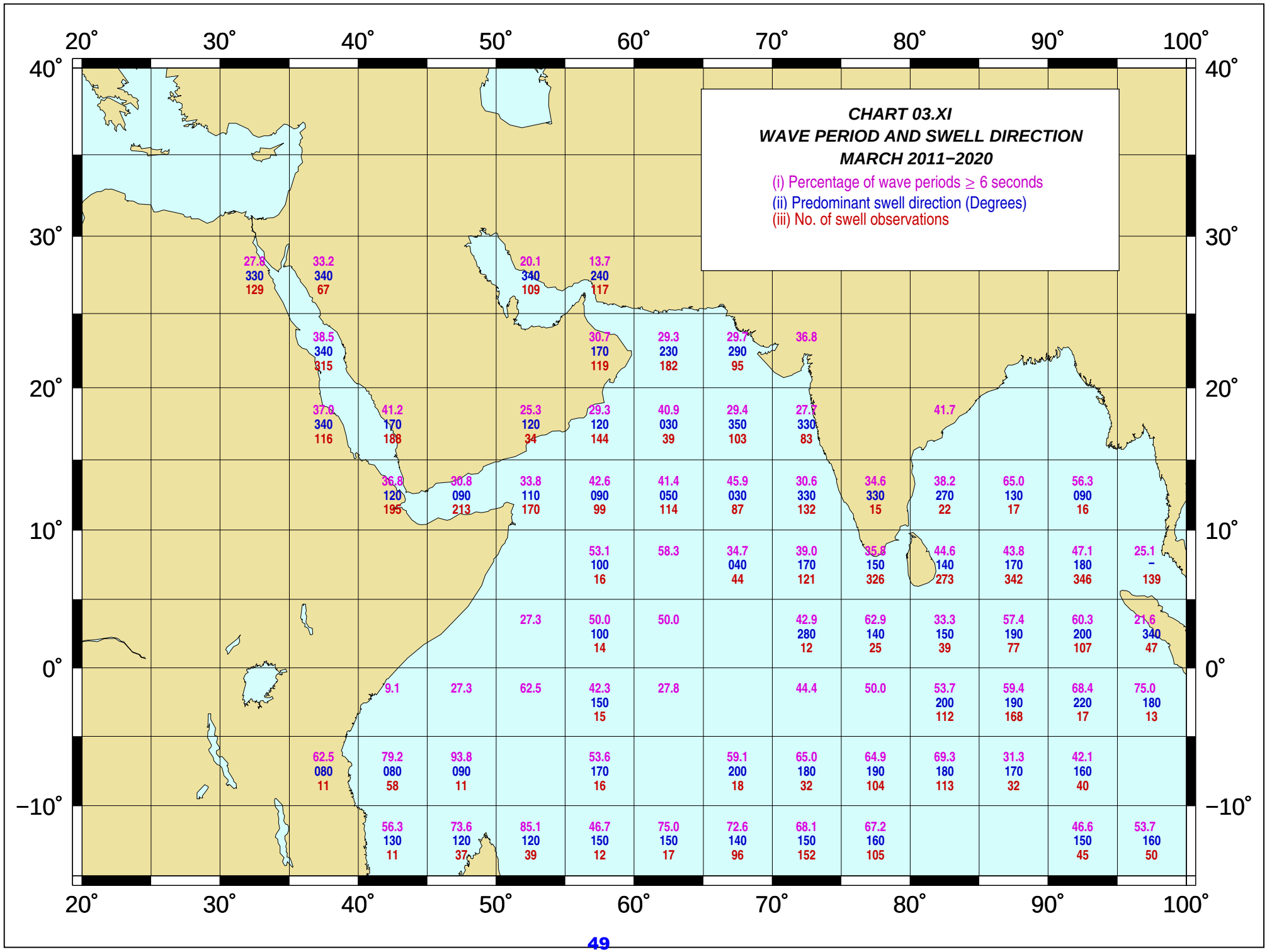


CHART 03.XI
WAVE PERIOD AND SWELL DIRECTION
MARCH 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
27.8 330 129
33.2 340 67
20.1 340 109
13.7 240 117
38.5 340 315
30.7 170 119
29.3 230 182
29.7 290 95
36.8
37.9 340 116
41.2 170 188
25.3 120 34
29.3 120 144
40.9 030 39
29.4 350 103
27.7 330 83
41.7
36.8 120 195
30.8 090 213
33.8 110 170
42.6 090 99
41.4 050 114
45.9 030 87
30.6 330 132
34.6 330 15
38.2 270 22
65.0 130 17
56.3 090 16
53.1 100 16
58.3
34.7 040 44
39.0 170 121
35.9 150 326
44.6 140 273
43.8 170 342
47.1 180 346
25.1 – 139
27.3
50.0 100 14
50.0
42.9 280 12
62.9 140 25
33.3 150 39
57.4 190 77
60.3 200 107
21.6 340 47
9.1
27.3
62.5
42.3 150 15
27.8
44.4
50.0
53.7 200 112
59.4 190 168
68.4 220 17
75.0 180 13
62.5 080 11
79.2 080 58
93.8 090 11
53.6 170 16
59.1 200 18
65.0 180 32
64.9 190 104
69.3 180 113
31.3 170 32
42.1 160 40
56.3 130 11
73.6 120 37
85.1 120 39
46.7 150 12
75.0 150 17
72.6 140 96
68.1 150 152
67.2 160 105
46.6 150 45
53.7 160 50

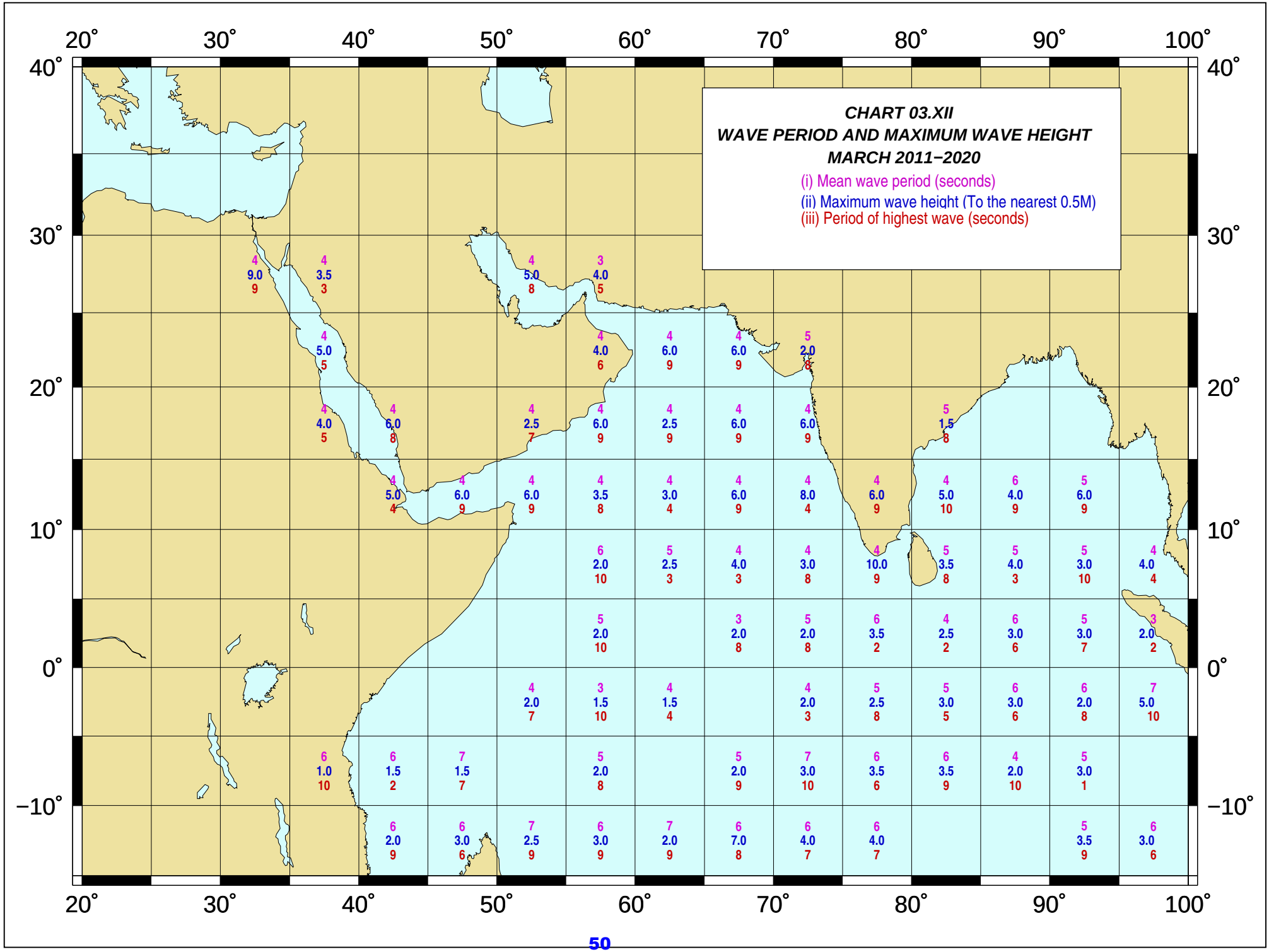


CHART 03.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
MARCH 2011−2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
4 9.0 9
4 3.5 3
4 5.0 8
3 4.0 5
4 5.0 5
4 4.0 6
4 6.0 9
4 6.0 9
5 2.0 8
4 4.0 5
4 6.0 8
4 2.5 7
4 6.0 9
4 2.5 9
4 6.0 9
4 6.0 9
5 1.5 8
4 5.0 4
4 6.0 9
4 6.0 9
4 3.5 8
4 3.0 4
4 6.0 9
4 8.0 4
4 6.0 9
4 5.0 10
6 4.0 9
5 6.0 9
6 2.0 10
5 2.5 3
4 4.0 3
4 3.0 8
4 10.0 9
5 3.5 8
5 4.0 3
5 3.0 10
4 4.0 4
5 2.0 10
3 2.0 8
5 2.0 8
6 3.5 2
4 2.5 2
6 3.0 6
5 3.0 7
3 2.0 2
4 2.0 7
3 1.5 10
4 1.5 4
4 2.0 3
5 2.5 8
5 3.0 5
6 3.0 6
6 2.0 8
7 5.0 10
6 1.0 10
6 1.5 2
7 1.5 7
5 2.0 8
5 2.0 9
7 3.0 10
6 3.5 6
6 3.5 9
4 2.0 10
5 3.0 1
6 2.0 9
6 3.0 6
7 2.5 9
6 3.0 9
7 2.0 9
6 7.0 8
6 4.0 7
6 4.0 7
5 3.5 9
6 3.0 6

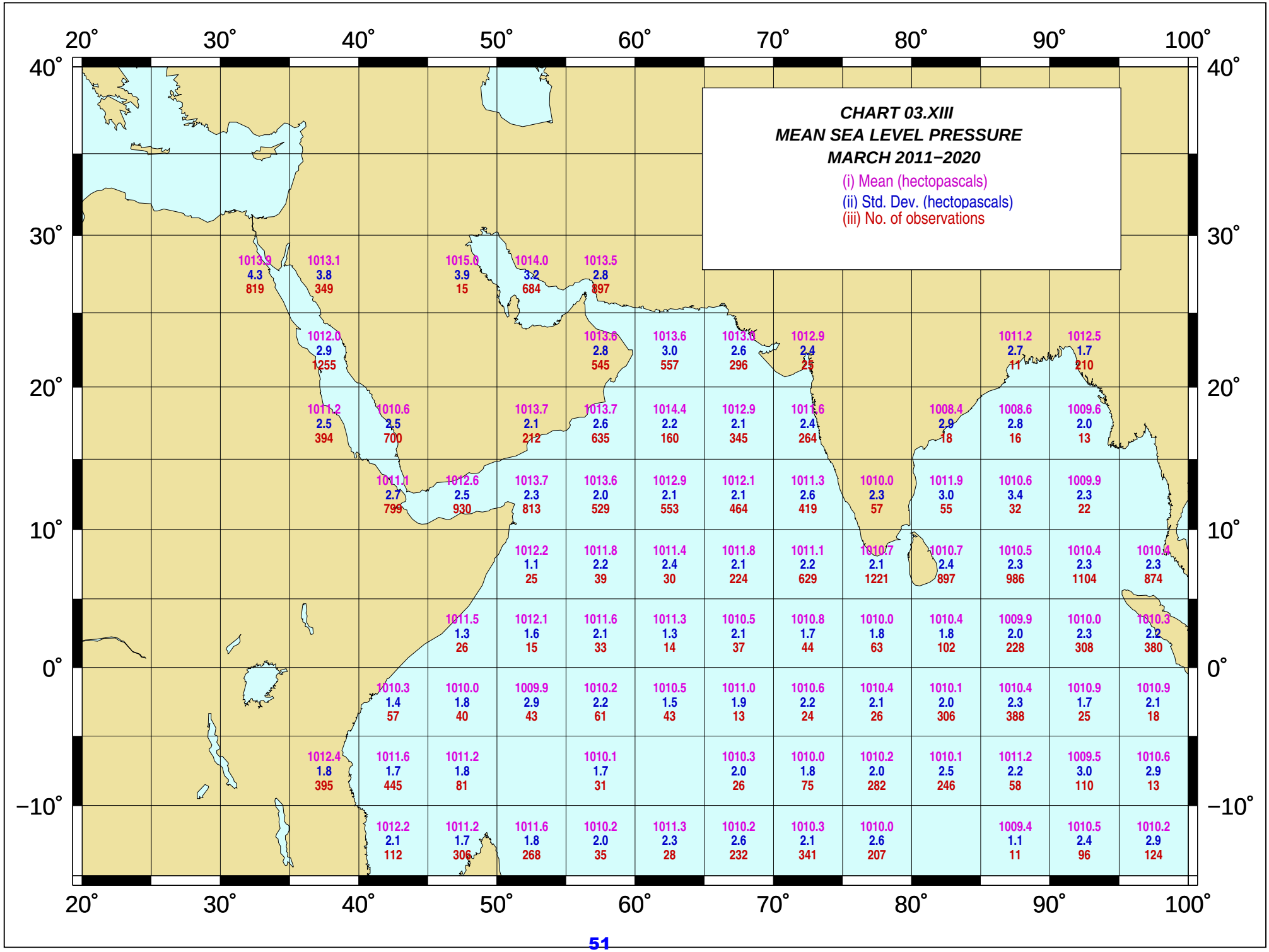


CHART 03.XIII
MEAN SEA LEVEL PRESSURE
MARCH 2011–2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1013.2 4.3 819
1013.1 3.8 349
1015.0 3.9 15
1014.0 3.2 684
1013.5 2.8 897
1012.0 2.9 1255
1013.6 2.8 545
1013.6 3.0 557
1013.6 2.6 296
1012.9 2.4 25
1011.2 2.7 11
1012.5 1.7 210
1011.2 2.5 394
1010.6 2.5 700
1013.7 2.1 212
1013.7 2.6 635
1014.4 2.2 160
1012.9 2.1 345
1011.6 2.4 264
1008.4 2.9 18
1008.6 2.8 16
1009.6 2.0 13
1011.1 2.7 799
1012.6 2.5 930
1013.7 2.3 813
1013.6 2.0 529
1012.9 2.1 553
1012.1 2.1 464
1011.3 2.6 419
1010.0 2.3 57
1011.9 3.0 55
1010.6 3.4 32
1009.9 2.3 22
1012.2 1.1 25
1011.8 2.2 39
1011.4 2.4 30
1011.8 2.1 224
1011.1 2.2 629
1010.7 2.1 1221
1010.7 2.4 897
1010.5 2.3 986
1010.4 2.3 1104
1010.4 2.3 874
1011.5 1.3 26
1012.1 1.6 15
1011.6 2.1 33
1011.3 1.3 14
1010.5 2.1 37
1010.8 1.7 44
1010.0 1.8 63
1010.4 1.8 102
1009.9 2.0 228
1010.0 2.3 308
1010.3 2.2 380
1010.3 1.4 57
1010.0 1.8 40
1009.9 2.9 43
1010.2 2.2 61
1010.5 1.5 43
1011.0 1.9 13
1010.6 2.2 24
1010.4 2.1 26
1010.1 2.0 306
1010.4 2.3 388
1010.9 1.7 25
1010.9 2.1 18
1012.4 1.8 395
1011.6 1.7 445
1011.2 1.8 81
1010.1 1.7 31
1010.3 2.0 26
1010.0 1.8 75
1010.2 2.0 282
1010.1 2.5 246
1011.2 2.2 58
1009.5 3.0 110
1010.6 2.9 13
1012.2 2.1 112
1011.2 1.7 306
1011.6 1.8 268
1010.2 2.0 35
1011.3 2.3 28
1010.2 2.6 232
1010.3 2.1 341
1010.0 2.6 207
1009.4 1.1 11
1010.5 2.4 96
1010.2 2.9 124

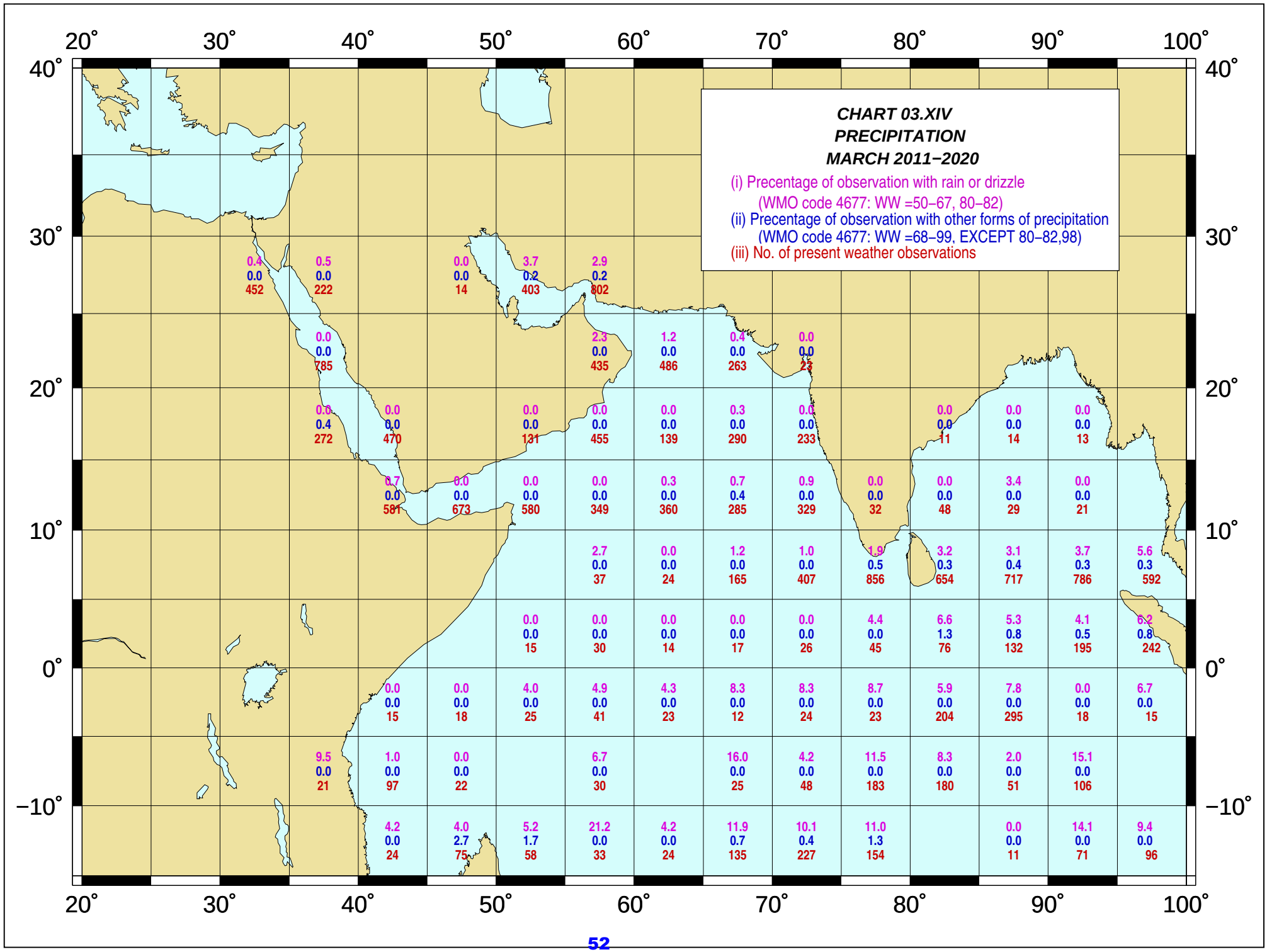


CHART 03.XIV
PRECIPITATION
MARCH 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.4 0.0 452
0.5 0.0 222
0.0 0.0 14
3.7 0.2 403
2.9 0.2 802
0.0 0.0 785
2.3 0.0 435
1.2 0.0 486
0.4 0.0 263
0.0 0.0 23
0.0 0.4 272
0.0 0.0 470
0.0 0.0 131
0.0 0.0 455
0.0 0.0 139
0.3 0.0 290
0.0 0.0 233
0.0 0.0 11
0.0 0.0 14
0.0 0.0 13
0.7 0.0 581
0.0 0.0 673
0.0 0.0 580
0.0 0.0 349
0.3 0.0 360
0.7 0.4 285
0.9 0.0 329
0.0 0.0 32
0.0 0.0 48
3.4 0.0 29
0.0 0.0 21
2.7 0.0 37
0.0 0.0 24
1.2 0.0 165
1.0 0.0 407
1.9 0.5 856
3.2 0.3 654
3.1 0.4 717
3.7 0.3 786
5.6 0.3 592
0.0 0.0 15
0.0 0.0 30
0.0 0.0 14
0.0 0.0 17
0.0 0.0 26
4.4 0.0 45
6.6 1.3 76
5.3 0.8 132
4.1 0.5 195
6.2 0.8 242
0.0 0.0 15
0.0 0.0 18
4.0 0.0 25
4.9 0.0 41
4.3 0.0 23
8.3 0.0 12
8.3 0.0 24
8.7 0.0 23
5.9 0.0 204
7.8 0.0 295
0.0 0.0 18
6.7 0.0 15
9.5 0.0 21
1.0 0.0 97
0.0 0.0 22
6.7 0.0 30
16.0 0.0 25
4.2 0.0 48
11.5 0.0 183
8.3 0.0 180
2.0 0.0 51
15.1 0.0 106
4.2 0.0 24
4.0 2.7 75
5.2 1.7 58
21.2 0.0 33
4.2 0.0 24
11.9 0.7 135
10.1 0.4 227
11.0 1.3 154
0.0 0.0 11
14.1 0.0 71
9.4 0.0 96

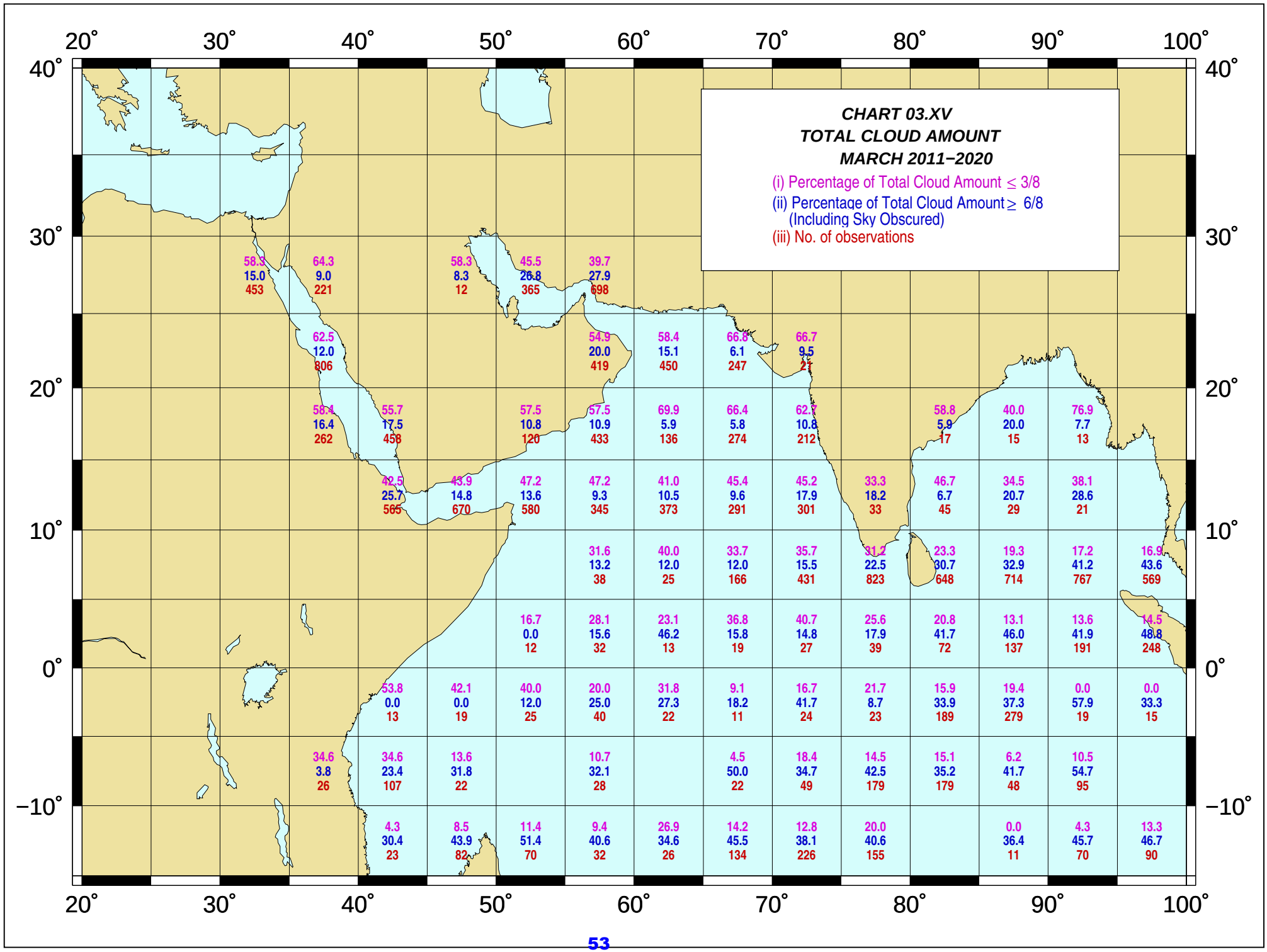


CHART 03.XV
TOTAL CLOUD AMOUNT
MARCH 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
58.3 15.0 453
64.3 9.0 221
58.3 8.3 12
45.5 26.8 365
39.7 27.9 698
62.5 12.0 806
54.9 20.0 419
58.4 15.1 450
66.8 6.1 247
66.7 9.5 21
58.4 16.4 262
55.7 17.5 458
57.5 10.8 120
57.5 10.9 433
69.9 5.9 136
66.4 5.8 274
62.7 10.8 212
58.8 5.9 17
40.0 20.0 15
76.9 7.7 13
42.5 25.7 565
43.9 14.8 670
47.2 13.6 580
47.2 9.3 345
41.0 10.5 373
45.4 9.6 291
45.2 17.9 301
33.3 18.2 33
46.7 6.7 45
34.5 20.7 29
38.1 28.6 21
31.6 13.2 38
40.0 12.0 25
33.7 12.0 166
35.7 15.5 431
31.2 22.5 823
23.3 30.7 648
19.3 32.9 714
17.2 41.2 767
16.9 43.6 569
16.7 0.0 12
28.1 15.6 32
23.1 46.2 13
36.8 15.8 19
40.7 14.8 27
25.6 17.9 39
20.8 41.7 72
13.1 46.0 137
13.6 41.9 191
14.5 48.8 248
53.8 0.0 13
42.1 0.0 19
40.0 12.0 25
20.0 25.0 40
31.8 27.3 22
9.1 18.2 11
16.7 41.7 24
21.7 8.7 23
15.9 33.9 189
19.4 37.3 279
0.0 57.9 19
0.0 33.3 15
34.6 3.8 26
34.6 23.4 107
13.6 31.8 22
10.7 32.1 28
4.5 50.0 22
18.4 34.7 49
14.5 42.5 179
15.1 35.2 179
6.2 41.7 48
10.5 54.7 95
4.3 30.4 23
8.5 43.9 82
11.4 51.4 70
9.4 40.6 32
26.9 34.6 26
14.2 45.5 134
12.8 38.1 226
20.0 40.6 155
0.0 36.4 11
4.3 45.7 70
13.3 46.7 90

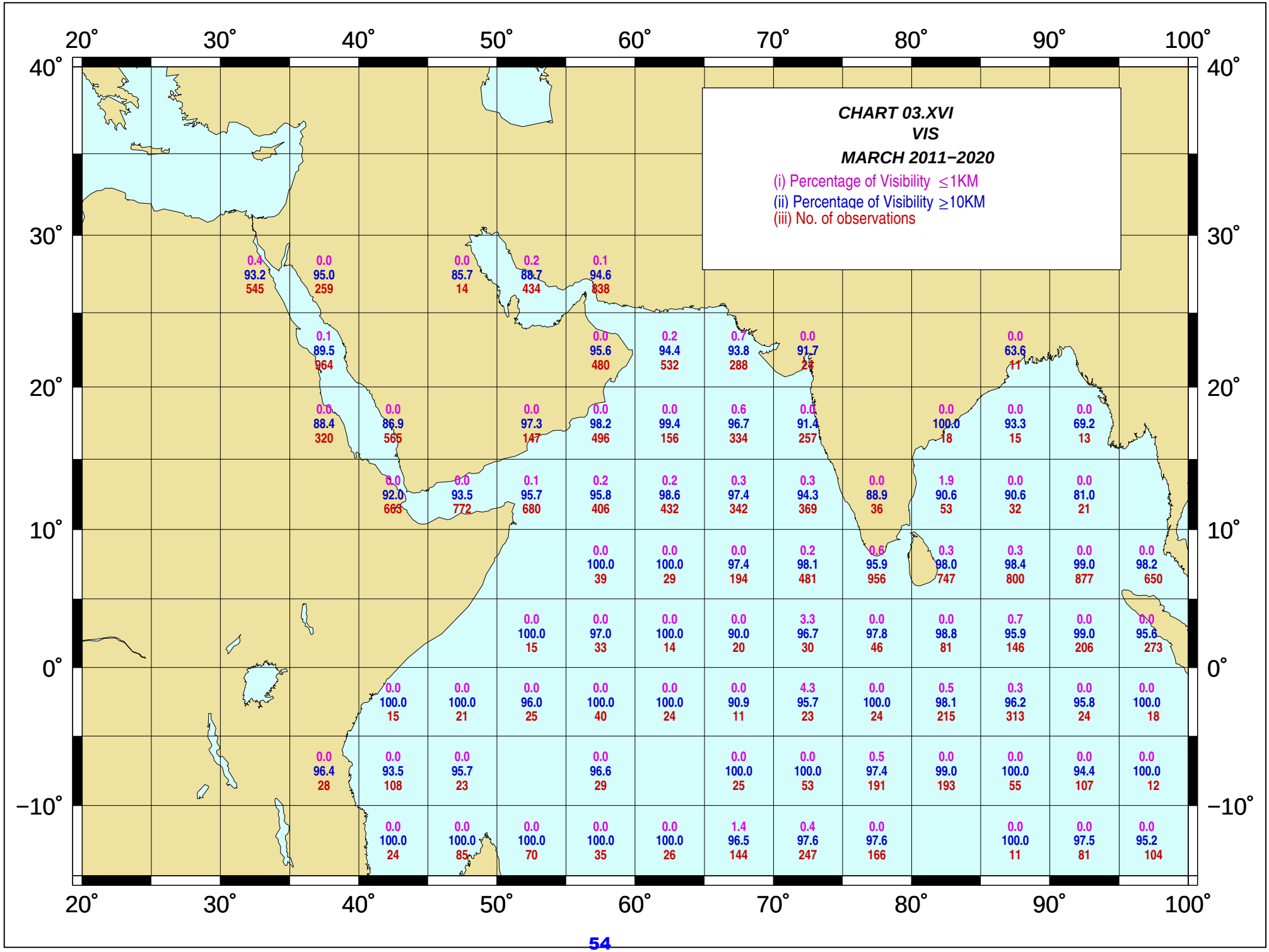


CHART 03.XVI
VIS
MARCH 2011–2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.4 93.2 545
0.0 95.0 259
0.0 85.7 14
0.2 88.7 434
0.1 94.6 838
0.1 89.5 964
0.0 95.6 480
0.2 94.4 532
0.7 93.8 288
0.0 91.7 24
0.0 63.6 11
0.0 88.4 320
0.0 86.9 565
0.0 97.3 147
0.0 98.2 496
0.0 99.4 156
0.6 96.7 334
0.0 91.4 257
0.0 100.0 18
0.0 93.3 15
0.0 69.2 13
0.0 92.0 663
0.0 93.5 772
0.1 95.7 680
0.2 95.8 406
0.2 98.6 432
0.3 97.4 342
0.3 94.3 369
0.0 88.9 36
1.9 90.6 53
0.0 90.6 32
0.0 81.0 21
0.0 100.0 39
0.0 100.0 29
0.0 97.4 194
0.2 98.1 481
0.6 95.9 956
0.3 98.0 747
0.3 98.4 800
0.0 99.0 877
0.0 98.2 650
0.0 100.0 15
0.0 97.0 33
0.0 100.0 14
0.0 90.0 20
3.3 96.7 30
0.0 97.8 46
0.0 98.8 81
0.7 95.9 146
0.0 99.0 206
0.0 95.6 273
0.0 100.0 15
0.0 100.0 21
0.0 96.0 25
0.0 100.0 40
0.0 100.0 24
0.0 90.9 11
4.3 95.7 23
0.0 100.0 24
0.5 98.1 215
0.3 96.2 313
0.0 95.8 24
0.0 100.0 18
0.0 96.4 28
0.0 93.5 108
0.0 95.7 23
0.0 96.6 29
0.0 100.0 25
0.0 100.0 53
0.5 97.4 191
0.0 99.0 193
0.0 100.0 55
0.0 94.4 107
0.0 100.0 12
0.0 100.0 24
0.0 100.0 85
0.0 100.0 70
0.0 100.0 35
0.0 100.0 26
1.4 96.5 144
0.4 97.6 247
0.0 97.6 166
0.0 100.0 11
0.0 97.5 81
0.0 95.2 104

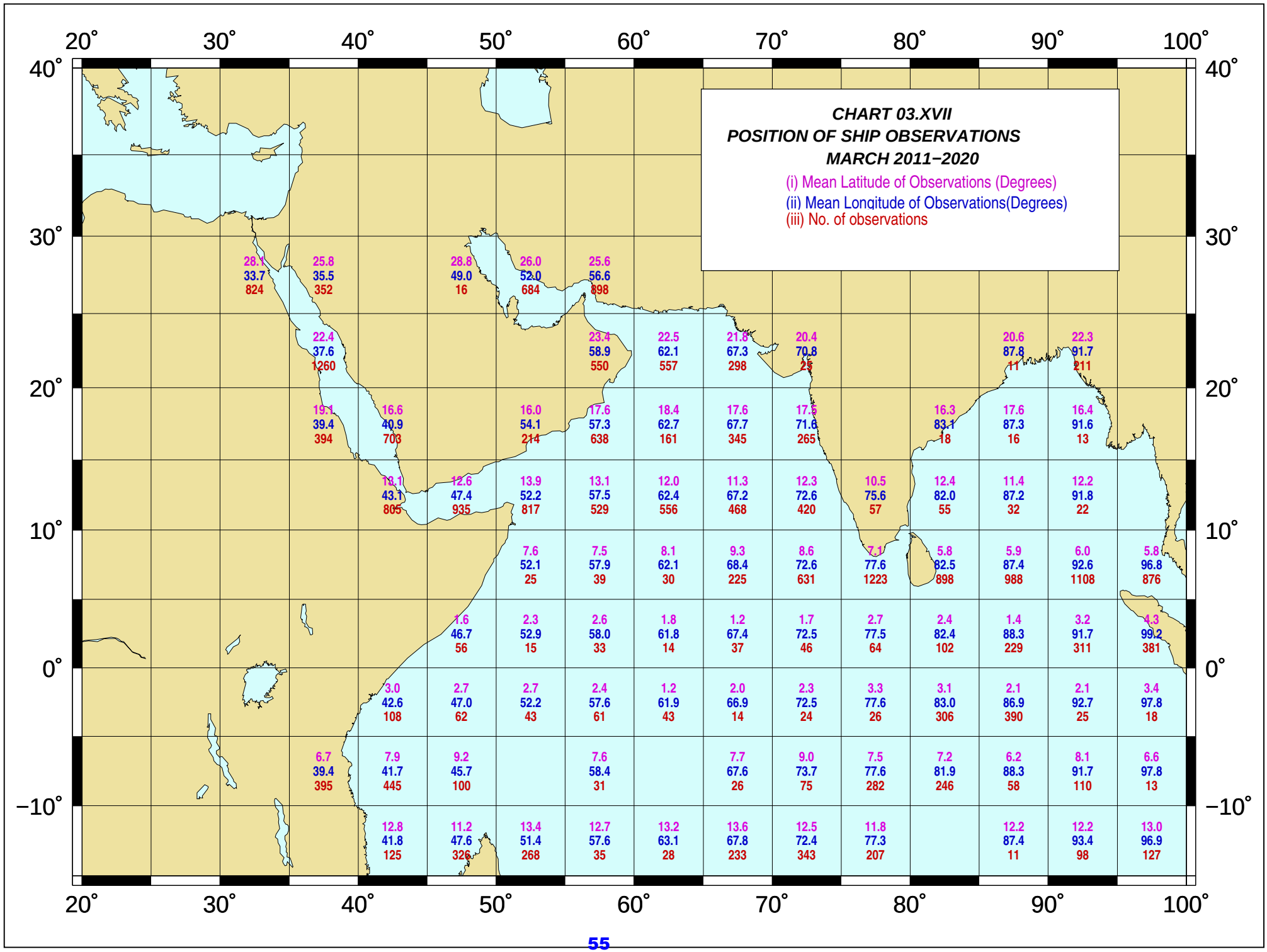


CHART 03.XVII
POSITION OF SHIP OBSERVATIONS
MARCH 2011−2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.1 33.7 824
25.8 35.5 352
28.8 49.0 16
26.0 52.0 684
25.6 56.6 898
22.4 37.6 1260
23.4 58.9 550
22.5 62.1 557
21.8 67.3 298
20.4 70.8 25
20.6 87.8 11
22.3 91.7 211
19.1 39.4 394
16.6 40.9 703
16.0 54.1 214
17.6 57.3 638
18.4 62.7 161
17.6 67.7 345
17.5 71.6 265
16.3 83.1 18
17.6 87.3 16
16.4 91.6 13
13.1 43.1 805
12.6 47.4 935
13.9 52.2 817
13.1 57.5 529
12.0 62.4 556
11.3 67.2 468
12.3 72.6 420
10.5 75.6 57
12.4 82.0 55
11.4 87.2 32
12.2 91.8 22
7.6 52.1 25
7.5 57.9 39
8.1 62.1 30
9.3 68.4 225
8.6 72.6 631
7.1 77.6 1223
5.8 82.5 898
5.9 87.4 988
6.0 92.6 1108
5.8 96.8 876
1.6 46.7 56
2.3 52.9 15
2.6 58.0 33
1.8 61.8 14
1.2 67.4 37
1.7 72.5 46
2.7 77.5 64
2.4 82.4 102
1.4 88.3 229
3.2 91.7 311
4.3 99.2 381
3.0 42.6 108
2.7 47.0 62
2.7 52.2 43
2.4 57.6 61
1.2 61.9 43
2.0 66.9 14
2.3 72.5 24
3.3 77.6 26
3.1 83.0 306
2.1 86.9 390
2.1 92.7 25
3.4 97.8 18
6.7 39.4 395
7.9 41.7 445
9.2 45.7 100
7.6 58.4 31
7.7 67.6 26
9.0 73.7 75
7.5 77.6 282
7.2 81.9 246
6.2 88.3 58
8.1 91.7 110
6.6 97.8 13
12.8 41.8 125
11.2 47.6 326
13.4 51.4 268
12.7 57.6 35
13.2 63.1 28
13.6 67.8 233
12.5 72.4 343
11.8 77.3 207
12.2 87.4 11
12.2 93.4 98
13.0 96.9 127

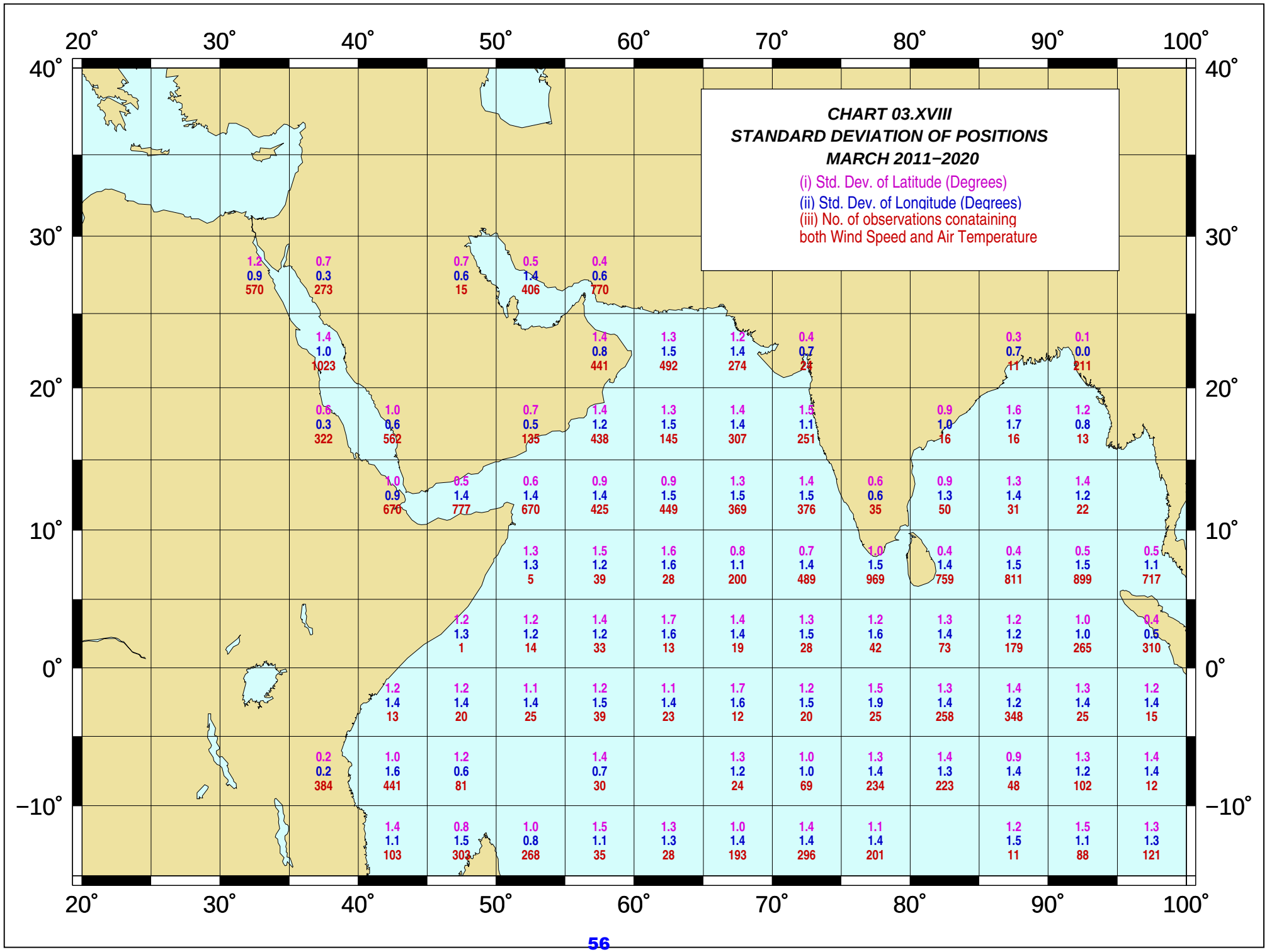
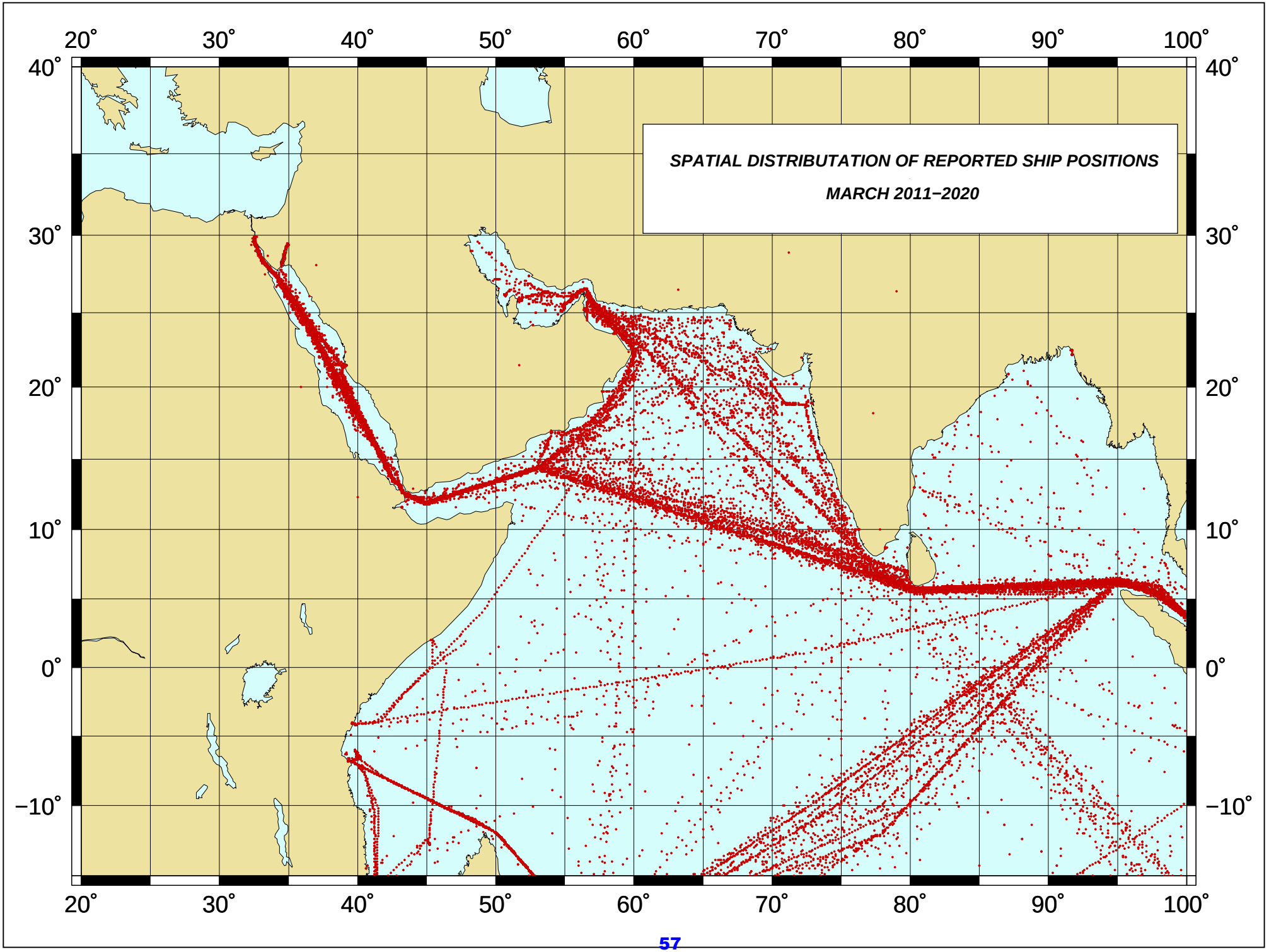


CHART 03.XVIII
STANDARD DEVIATION OF POSITIONS
MARCH 2011−2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.2 0.9 570
0.7 0.3 273
0.7 0.6 15
0.5 1.4 406
0.4 0.6 770
1.4 1.0 1023
1.4 0.8 441
1.3 1.5 492
1.2 1.4 274
0.4 0.7 24
0.3 0.7 11
0.1 0.0 211
0.6 0.3 322
1.0 0.6 562
0.7 0.5 135
1.4 1.2 438
1.3 1.5 145
1.4 1.4 307
1.5 1.1 251
0.9 1.0 16
1.6 1.7 16
1.2 0.8 13
1.0 0.9 670
0.5 1.4 777
0.6 1.4 670
0.9 1.4 425
0.9 1.5 449
1.3 1.5 369
1.4 1.5 376
0.6 0.6 35
0.9 1.3 50
1.3 1.4 31
1.4 1.2 22
1.3 1.3 5
1.5 1.2 39
1.6 1.6 28
0.8 1.1 200
0.7 1.4 489
1.0 1.5 969
0.4 1.4 759
0.4 1.5 811
0.5 1.5 899
0.5 1.1 717
1.2 1.3 1
1.2 1.2 14
1.4 1.2 33
1.7 1.6 13
1.4 1.4 19
1.3 1.5 28
1.2 1.6 42
1.3 1.4 73
1.2 1.2 179
1.0 1.0 265
0.4 0.5 310
1.2 1.4 13
1.2 1.4 20
1.1 1.4 25
1.2 1.5 39
1.1 1.4 23
1.7 1.6 12
1.2 1.5 20
1.5 1.9 25
1.3 1.4 258
1.4 1.2 348
1.3 1.4 25
1.2 1.4 15
0.2 0.2 384
1.0 1.6 441
1.2 0.6 81
1.4 0.7 30
1.3 1.2 24
1.0 1.0 69
1.3 1.4 234
1.4 1.3 223
0.9 1.4 48
1.3 1.2 102
1.4 1.4 12
1.4 1.1 103
0.8 1.5 303
1.0 0.8 268
1.5 1.1 35
1.3 1.3 28
1.0 1.4 193
1.4 1.4 296
1.1 1.4 201
1.2 1.5 11
1.5 1.1 88
1.3 1.3 121


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
MARCH 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF APRIL 2011-2020

Marine Climatological Summary Charts 2011-2020

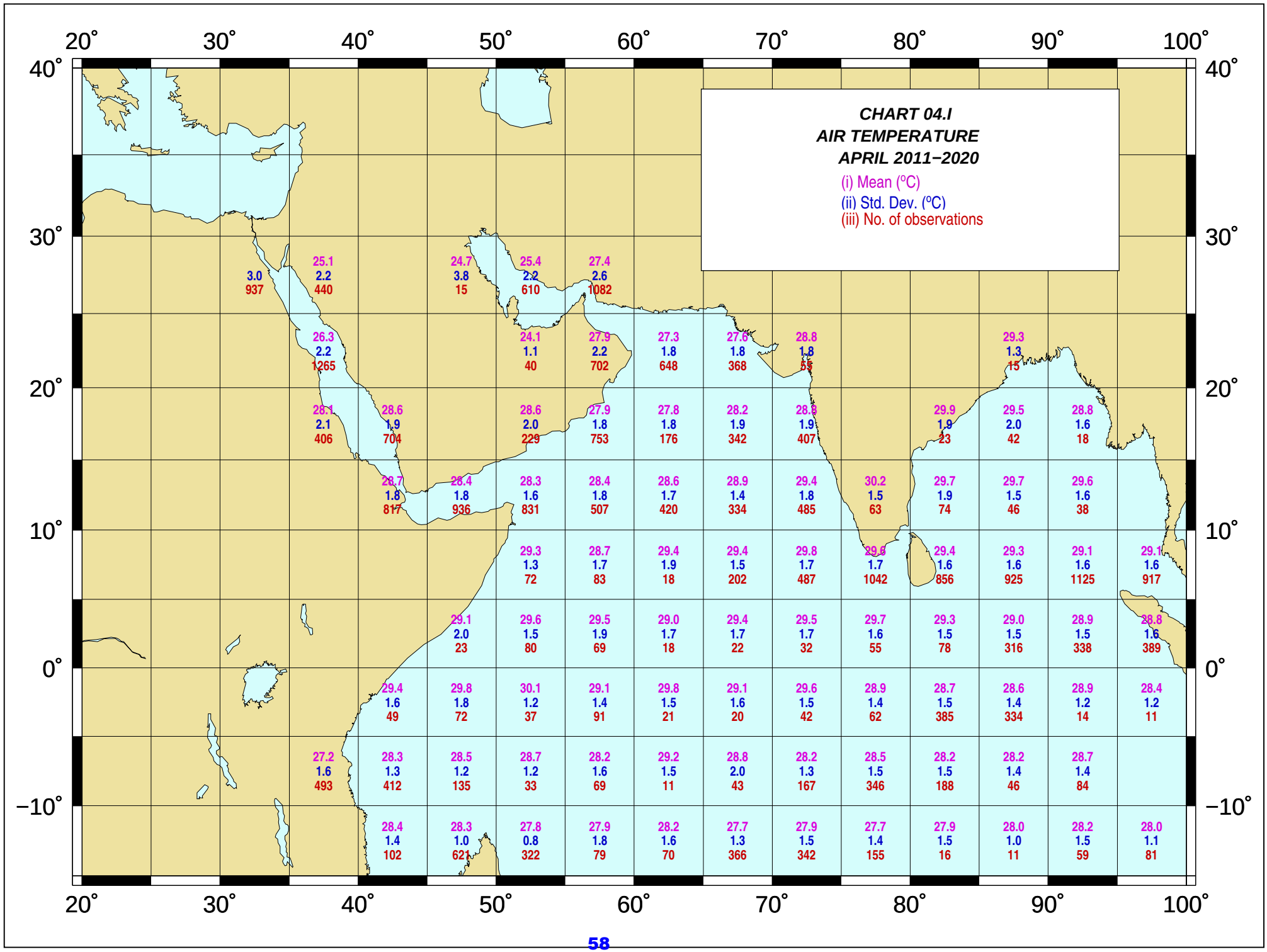


CHART 04.I
AIR TEMPERATURE
APRIL 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
3.0 937
25.1 2.2 440
24.7 3.8 15
25.4 2.2 610
27.4 2.6 1082
26.3 2.2 1265
24.1 1.1 40
27.9 2.2 702
27.3 1.8 648
27.6 1.8 368
28.8 1.8 55
29.3 1.3 15
28.1 2.1 406
28.6 1.9 704
28.6 2.0 229
27.9 1.8 753
27.8 1.8 176
28.2 1.9 342
28.9 1.9 407
29.9 1.9 23
29.5 2.0 42
28.8 1.6 18
28.7 1.8 817
28.4 1.8 936
28.3 1.6 831
28.4 1.8 507
28.6 1.7 420
28.9 1.4 334
29.4 1.8 485
30.2 1.5 63
29.7 1.9 74
29.7 1.5 46
29.6 1.6 38
29.3 1.3 72
28.7 1.7 83
29.4 1.9 18
29.4 1.5 202
29.8 1.7 487
29.6 1.7 1042
29.4 1.6 856
29.3 1.6 925
29.1 1.6 1125
29.1 1.6 917
29.1 2.0 23
29.6 1.5 80
29.5 1.9 69
29.0 1.7 18
29.4 1.7 22
29.5 1.7 32
29.7 1.6 55
29.3 1.5 78
29.0 1.5 316
28.9 1.5 338
28.8 1.6 389
29.4 1.6 49
29.8 1.8 72
30.1 1.2 37
29.1 1.4 91
29.8 1.5 21
29.1 1.6 20
29.6 1.5 42
28.9 1.4 62
28.7 1.5 385
28.6 1.4 334
28.9 1.2 14
28.4 1.2 11
27.2 1.6 493
28.3 1.3 412
28.5 1.2 135
28.7 1.2 33
28.2 1.6 69
29.2 1.5 11
28.8 2.0 43
28.2 1.3 167
28.5 1.5 346
28.2 1.5 188
28.2 1.4 46
28.7 1.4 84
28.4 1.4 102
28.3 1.0 621
27.8 0.8 322
27.9 1.8 79
28.2 1.6 70
27.7 1.3 366
27.9 1.5 342
27.7 1.4 155
27.9 1.5 16
28.0 1.0 11
28.2 1.5 59
28.0 1.1 81

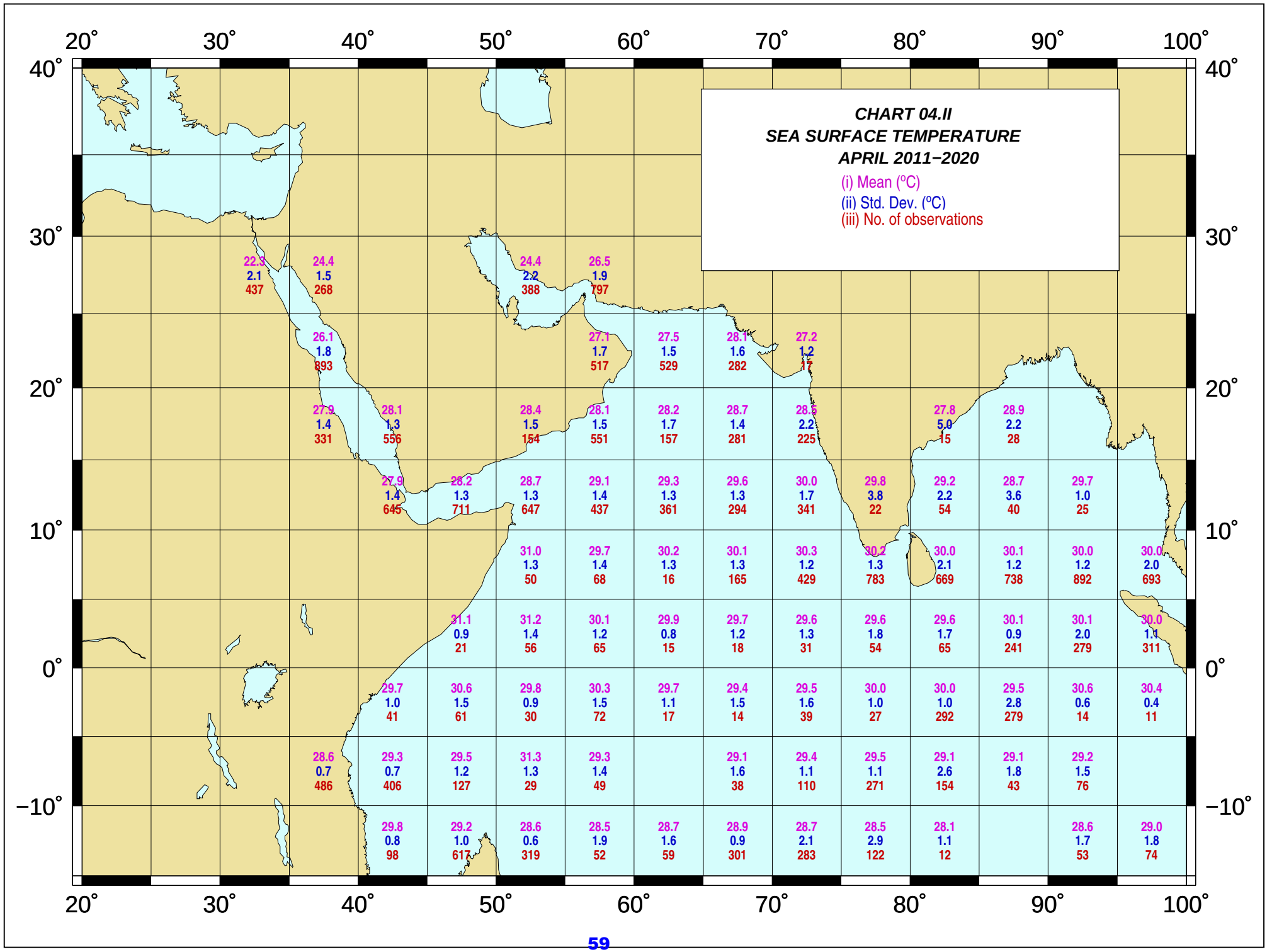


CHART 04.II
SEA SURFACE TEMPERATURE
APRIL 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
22.3 2.1 437
24.4 1.5 268
24.4 2.2 388
26.5 1.9 797
26.1 1.8 893
27.1 1.7 517
27.5 1.5 529
28.1 1.6 282
27.2 1.2 17
27.9 1.4 331
28.1 1.3 556
28.4 1.5 154
28.1 1.5 551
28.2 1.7 157
28.7 1.4 281
28.5 2.2 225
27.8 5.0 15
28.9 2.2 28
27.9 1.4 645
28.2 1.3 711
28.7 1.3 647
29.1 1.4 437
29.3 1.3 361
29.6 1.3 294
30.0 1.7 341
29.8 3.8 22
29.2 2.2 54
28.7 3.6 40
29.7 1.0 25
31.0 1.3 50
29.7 1.4 68
30.2 1.3 16
30.1 1.3 165
30.3 1.2 429
30.2 1.3 783
30.0 2.1 669
30.1 1.2 738
30.0 1.2 892
30.0 2.0 693
31.1 0.9 21
31.2 1.4 56
30.1 1.2 65
29.9 0.8 15
29.7 1.2 18
29.6 1.3 31
29.6 1.8 54
29.6 1.7 65
30.1 0.9 241
30.1 2.0 279
30.0 1.1 311
29.7 1.0 41
30.6 1.5 61
29.8 0.9 30
30.3 1.5 72
29.7 1.1 17
29.4 1.5 14
29.5 1.6 39
30.0 1.0 27
30.0 1.0 292
29.5 2.8 279
30.6 0.6 14
30.4 0.4 11
28.6 0.7 486
29.3 0.7 406
29.5 1.2 127
31.3 1.3 29
29.3 1.4 49
29.1 1.6 38
29.4 1.1 110
29.5 1.1 271
29.1 2.6 154
29.1 1.8 43
29.2 1.5 76
29.8 0.8 98
29.2 1.0 617
28.6 0.6 319
28.5 1.9 52
28.7 1.6 59
28.9 0.9 301
28.7 2.1 283
28.5 2.9 122
28.1 1.1 12
28.6 1.7 53
29.0 1.8 74

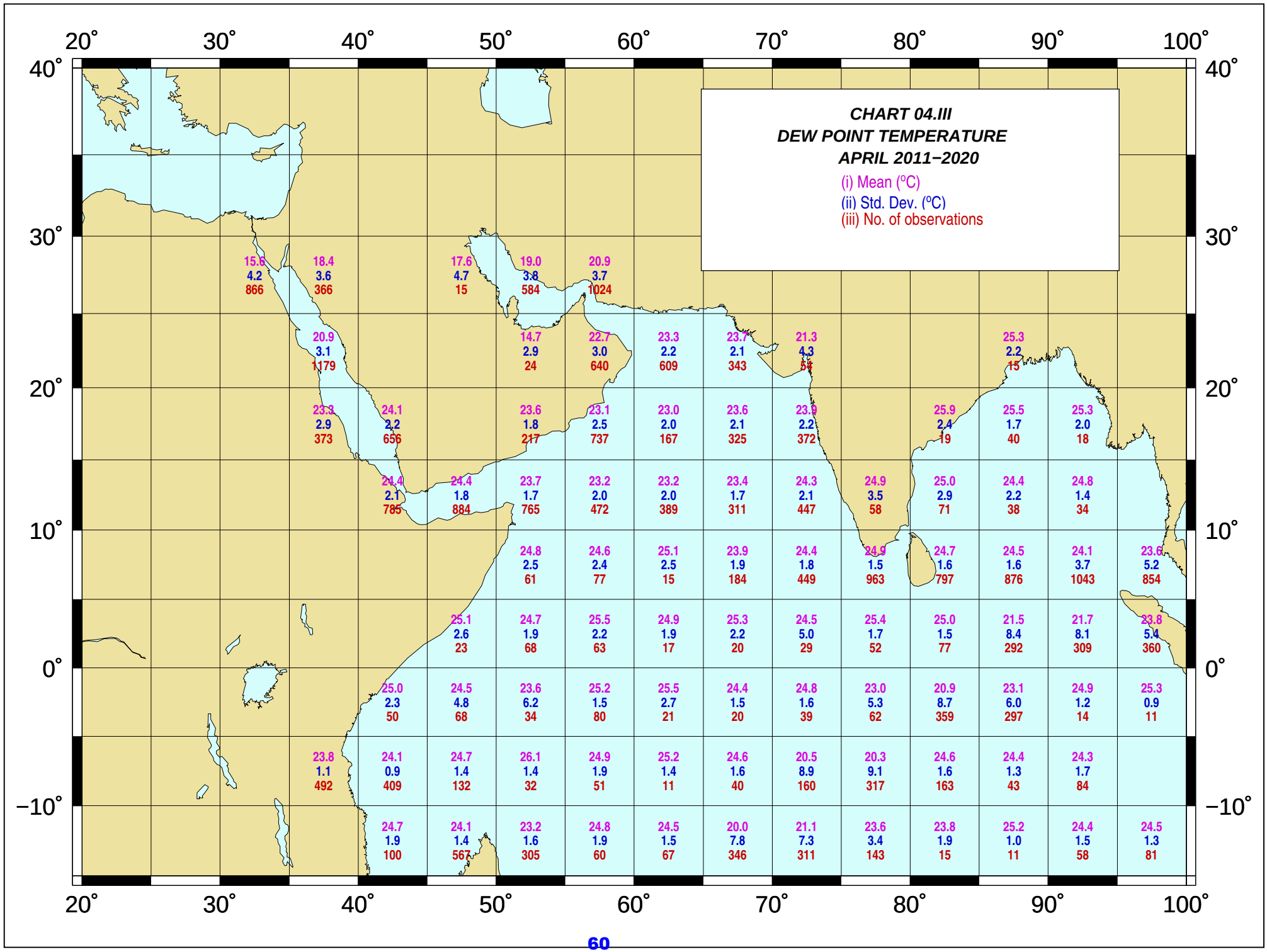


CHART 04.III
DEW POINT TEMPERATURE
APRIL 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
15.6 4.2 866
18.4 3.6 366
17.6 4.7 15
19.0 3.8 584
20.9 3.7 1024
20.9 3.1 1179
14.7 2.9 24
22.7 3.0 640
23.3 2.2 609
23.7 2.1 343
21.3 4.3 58
25.3 2.2 15
23.3 2.9 373
24.1 2.2 656
23.6 1.8 217
23.1 2.5 737
23.0 2.0 167
23.6 2.1 325
23.9 2.2 372
25.9 2.4 19
25.5 1.7 40
25.3 2.0 18
24.4 2.1 785
24.4 1.8 884
23.7 1.7 765
23.2 2.0 472
23.2 2.0 389
23.4 1.7 311
24.3 2.1 447
24.9 3.5 58
25.0 2.9 71
24.4 2.2 38
24.8 1.4 34
24.8 2.5 61
24.6 2.4 77
25.1 2.5 15
23.9 1.9 184
24.4 1.8 449
24.9 1.5 963
24.7 1.6 797
24.5 1.6 876
24.1 3.7 1043
23.6 5.2 854
25.1 2.6 23
24.7 1.9 68
25.5 2.2 63
24.9 1.9 17
25.3 2.2 20
24.5 5.0 29
25.4 1.7 52
25.0 1.5 77
21.5 8.4 292
21.7 8.1 309
23.8 5.4 360
25.0 2.3 50
24.5 4.8 68
23.6 6.2 34
25.2 1.5 80
25.5 2.7 21
24.4 1.5 20
24.8 1.6 39
23.0 5.3 62
20.9 8.7 359
23.1 6.0 297
24.9 1.2 14
25.3 0.9 11
23.8 1.1 492
24.1 0.9 409
24.7 1.4 132
26.1 1.4 32
24.9 1.9 51
25.2 1.4 11
24.6 1.6 40
20.5 8.9 160
20.3 9.1 317
24.6 1.6 163
24.4 1.3 43
24.3 1.7 84
24.7 1.9 100
24.1 1.4 567
23.2 1.6 305
24.8 1.9 60
24.5 1.5 67
20.0 7.8 346
21.1 7.3 311
23.6 3.4 143
23.8 1.9 15
25.2 1.0 11
24.4 1.5 58
24.5 1.3 81

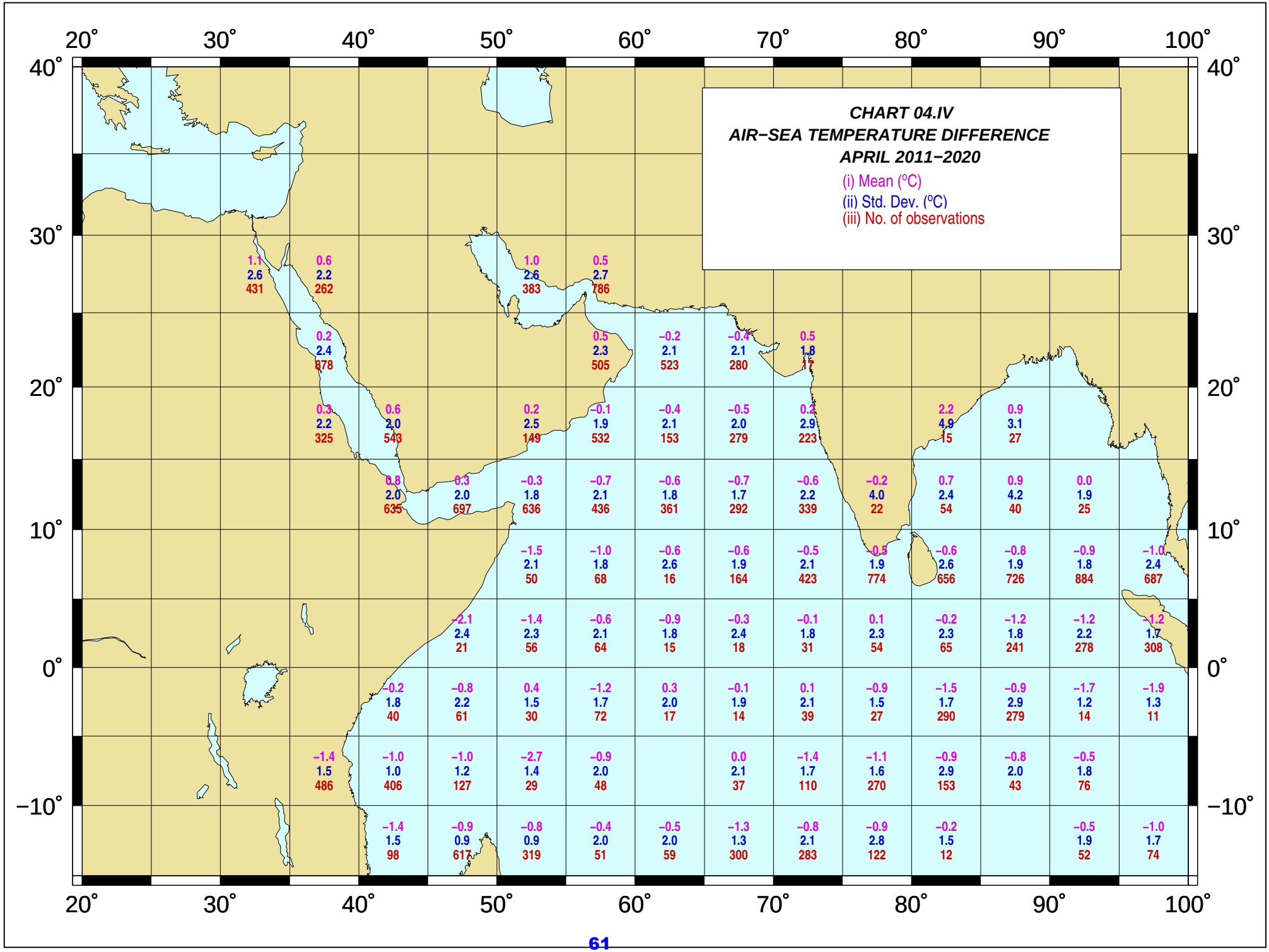


CHART 04.IV
AIR–SEA TEMPERATURE DIFFERENCE
APRIL 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.1 2.6 431
0.6 2.2 262
1.0 2.6 383
0.5 2.7 786
0.2 2.4 878
0.5 2.3 505
−0.2 2.1 523
−0.4 2.1 280
0.5 1.8 17
0.3 2.2 325
0.6 2.0 543
0.2 2.5 149
−0.1 1.9 532
−0.4 2.1 153
−0.5 2.0 279
0.2 2.9 223
2.2 4.9 15
0.9 3.1 27
0.8 2.0 635
0.3 2.0 697
−0.3 1.8 636
−0.7 2.1 436
−0.6 1.8 361
−0.7 1.7 292
−0.6 2.2 339
−0.2 4.0 22
0.7 2.4 54
0.9 4.2 40
0.0 1.9 25
−1.5 2.1 50
−1.0 1.8 68
−0.6 2.6 16
−0.6 1.9 164
−0.5 2.1 423
−0.5 1.9 774
−0.6 2.6 656
−0.8 1.9 726
−0.9 1.8 884
−1.0 2.4 687
−2.1 2.4 21
−1.4 2.3 56
−0.6 2.1 64
−0.9 1.8 15
−0.3 2.4 18
−0.1 1.8 31
0.1 2.3 54
−0.2 2.3 65
−1.2 1.8 241
−1.2 2.2 278
−1.2 1.7 308
−0.2 1.8 40
−0.8 2.2 61
0.4 1.5 30
−1.2 1.7 72
0.3 2.0 17
−0.1 1.9 14
0.1 2.1 39
−0.9 1.5 27
−1.5 1.7 290
−0.9 2.9 279
−1.7 1.2 14
−1.9 1.3 11
−1.4 1.5 486
−1.0 1.0 406
−1.0 1.2 127
−2.7 1.4 29
−0.9 2.0 48
0.0 2.1 37
−1.4 1.7 110
−1.1 1.6 270
−0.9 2.9 153
−0.8 2.0 43
−0.5 1.8 76
−1.4 1.5 98
−0.9 0.9 617
−0.8 0.9 319
−0.4 2.0 51
−0.5 2.0 59
−1.3 1.3 300
−0.8 2.1 283
−0.9 2.8 122
−0.2 1.5 12
−0.5 1.9 52
−1.0 1.7 74

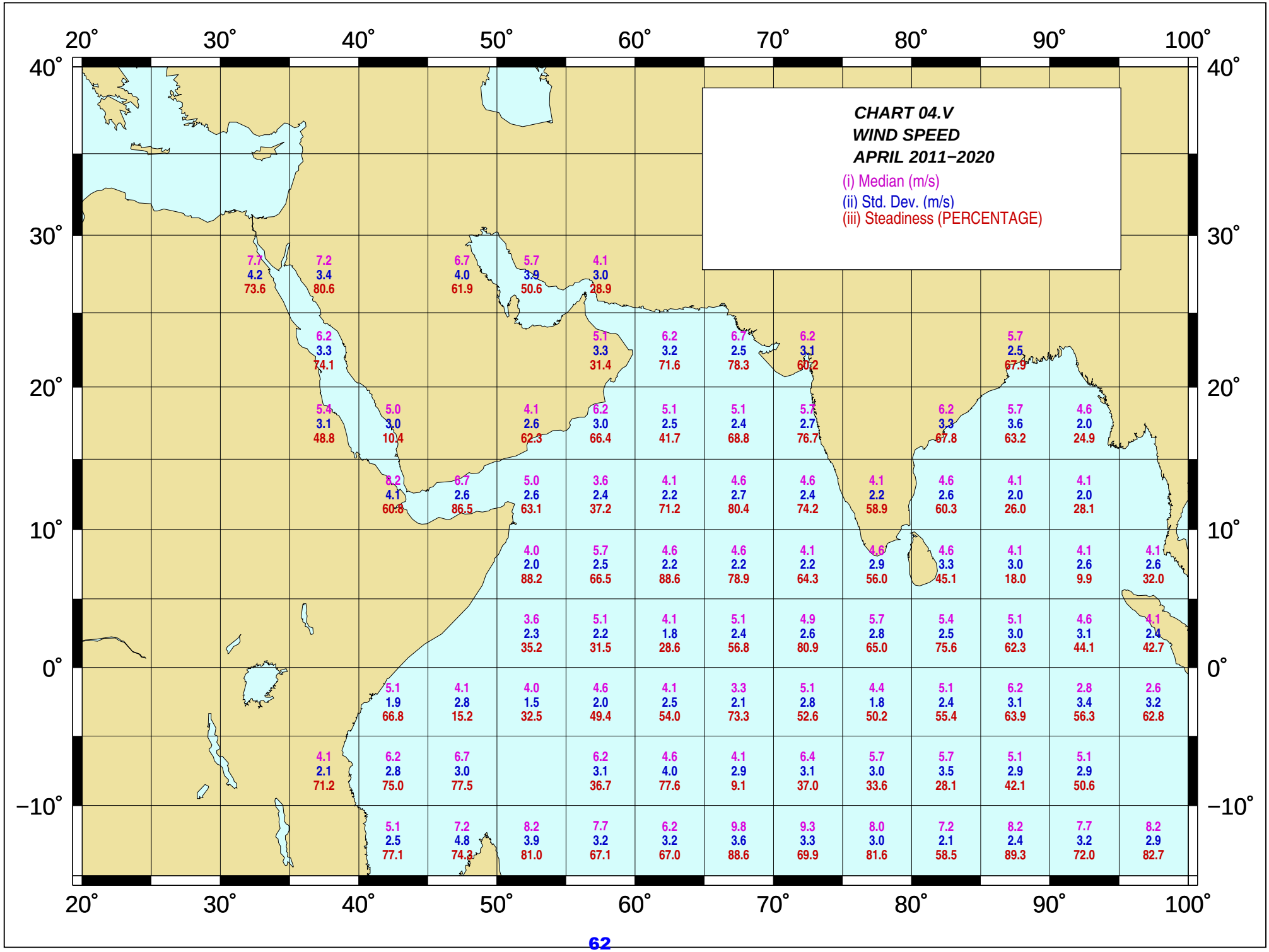


CHART 04.V
WIND SPEED
APRIL 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
7.7 4.2 73.6
7.2 3.4 80.6
6.7 4.0 61.9
5.7 3.9 50.6
4.1 3.0 28.9
6.2 3.3 74.1
5.1 3.3 31.4
6.2 3.2 71.6
6.7 2.5 78.3
6.2 3.1 60.2
5.7 2.5 67.9
5.4 3.1 48.8
5.0 3.0 10.4
4.1 2.6 62.3
6.2 3.0 66.4
5.1 2.5 41.7
5.1 2.4 68.8
5.7 2.7 76.7
6.2 3.3 67.8
5.7 3.6 63.2
4.6 2.0 24.9
8.2 4.1 60.8
6.7 2.6 86.5
5.0 2.6 63.1
3.6 2.4 37.2
4.1 2.2 71.2
4.6 2.7 80.4
4.6 2.4 74.2
4.1 2.2 58.9
4.6 2.6 60.3
4.1 2.0 26.0
4.1 2.0 28.1
4.0 2.0 88.2
5.7 2.5 66.5
4.6 2.2 88.6
4.6 2.2 78.9
4.1 2.2 64.3
4.6 2.9 56.0
4.6 3.3 45.1
4.1 3.0 18.0
4.1 2.6 9.9
4.1 2.6 32.0
3.6 2.3 35.2
5.1 2.2 31.5
4.1 1.8 28.6
5.1 2.4 56.8
4.9 2.6 80.9
5.7 2.8 65.0
5.4 2.5 75.6
5.1 3.0 62.3
4.6 3.1 44.1
4.1 2.4 42.7
5.1 1.9 66.8
4.1 2.8 15.2
4.0 1.5 32.5
4.6 2.0 49.4
4.1 2.5 54.0
3.3 2.1 73.3
5.1 2.8 52.6
4.4 1.8 50.2
5.1 2.4 55.4
6.2 3.1 63.9
2.8 3.4 56.3
2.6 3.2 62.8
4.1 2.1 71.2
6.2 2.8 75.0
6.7 3.0 77.5
6.2 3.1 36.7
4.6 4.0 77.6
4.1 2.9 9.1
6.4 3.1 37.0
5.7 3.0 33.6
5.7 3.5 28.1
5.1 2.9 42.1
5.1 2.9 50.6
5.1 2.5 77.1
7.2 4.8 74.3
8.2 3.9 81.0
7.7 3.2 67.1
6.2 3.2 67.0
9.8 3.6 88.6
9.3 3.3 69.9
8.0 3.0 81.6
7.2 2.1 58.5
8.2 2.4 89.3
7.7 3.2 72.0
8.2 2.9 82.7

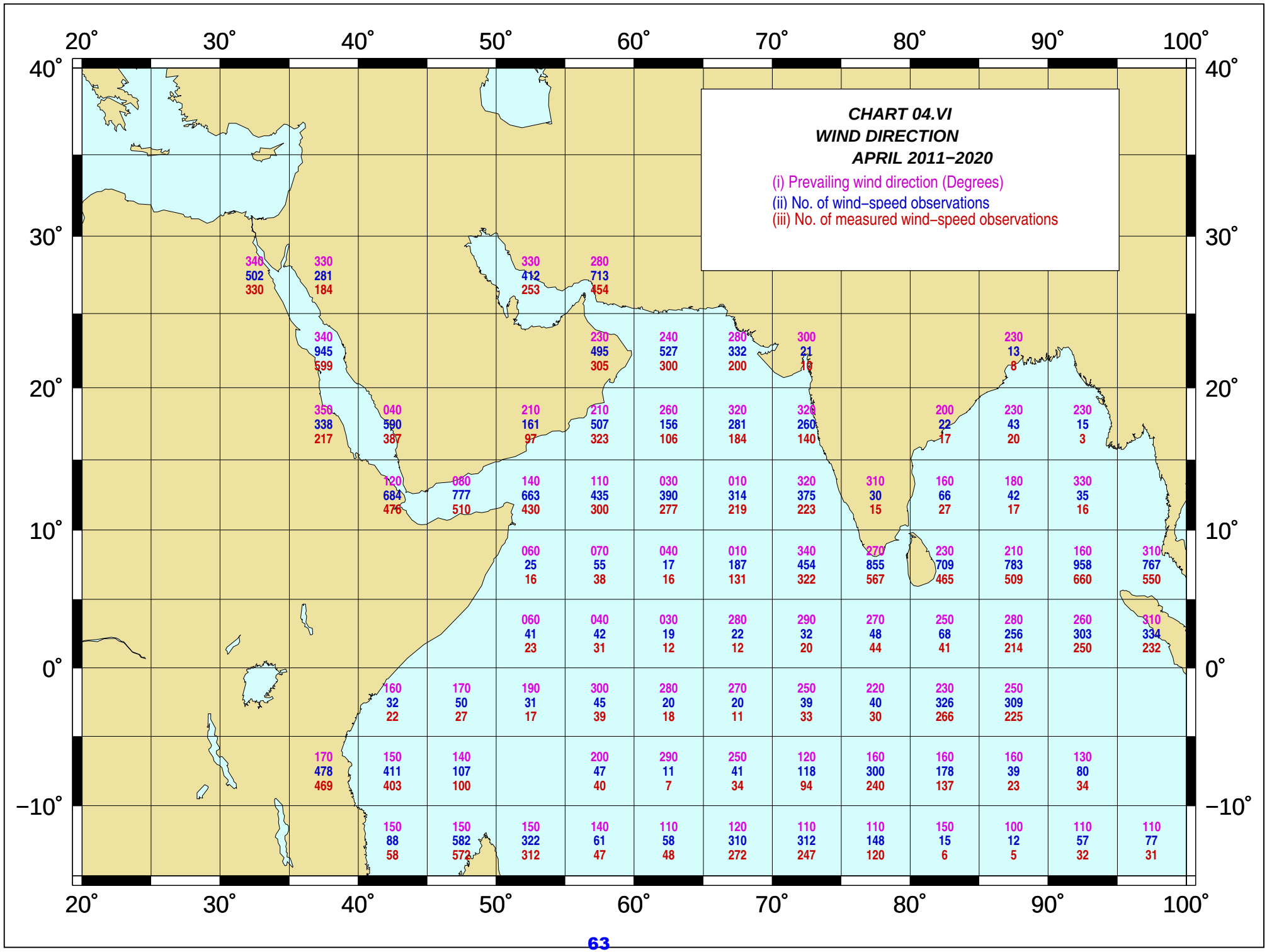


CHART 04.VI
WIND DIRECTION
APRIL 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
340 502 330
330 281 184
330 412 253
280 713 454
340 945 599
230 495 305
240 527 300
280 332 200
300 21 16
230 13 8
350 338 217
040 590 387
210 161 97
210 507 323
260 156 106
320 281 184
320 260 140
200 22 17
230 43 20
230 15 3
120 684 476
080 777 510
140 663 430
110 435 300
030 390 277
010 314 219
320 375 223
310 30 15
160 66 27
180 42 17
330 35 16
060 25 16
070 55 38
040 17 16
010 187 131
340 454 322
270 855 567
230 709 465
210 783 509
160 958 660
310 767 550
060 41 23
040 42 31
030 19 12
280 22 12
290 32 20
270 48 44
250 68 41
280 256 214
260 303 250
310 334 232
160 32 22
170 50 27
190 31 17
300 45 39
280 20 18
270 20 11
250 39 33
220 40 30
230 326 266
250 309 225
170 478 469
150 411 403
140 107 100
200 47 40
290 11 7
250 41 34
120 118 94
160 300 240
160 178 137
160 39 23
130 80 34
150 88 58
150 582 572
150 322 312
140 61 47
110 58 48
120 310 272
110 312 247
110 148 120
150 15 6
100 12 5
110 57 32
110 77 31

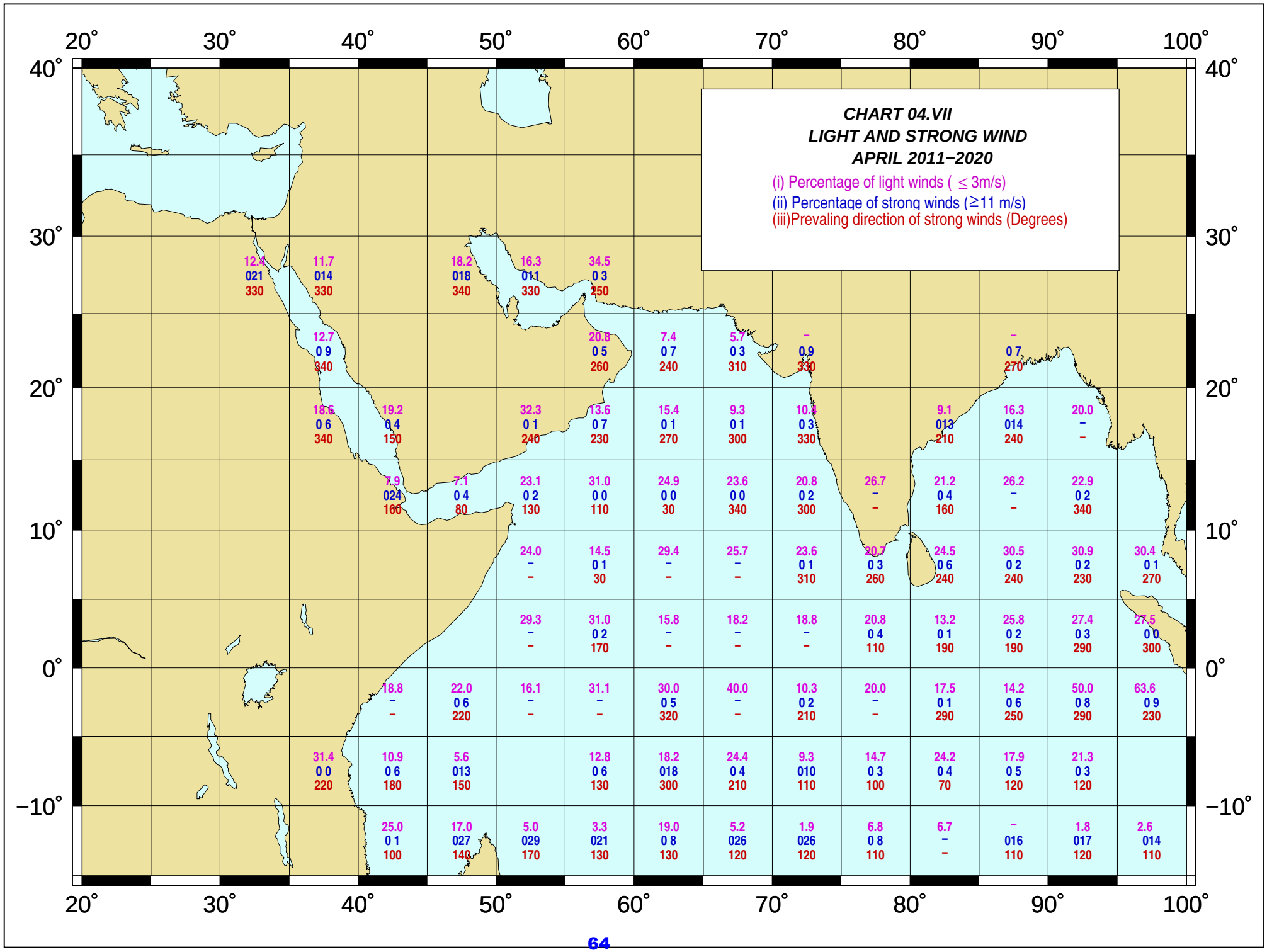


CHART 04.VII
LIGHT AND STRONG WIND
APRIL 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
12.4 021 330
11.7 014 330
18.2 018 340
16.3 011 330
34.5 0 3 250
12.7 0 9 340
20.8 0 5 260
7.4 0 7 240
5.7 0 3 310
– 0 9 330
– 0 7 270
18.6 0 6 340
19.2 0 4 150
32.3 0 1 240
13.6 0 7 230
15.4 0 1 270
9.3 0 1 300
10.9 0 3 330
9.1 013 210
16.3 014 240
20.0 – –
7.9 024 160
7.1 0 4 80
23.1 0 2 130
31.0 0 0 110
24.9 0 0 30
23.6 0 0 340
20.8 0 2 300
26.7 – –
21.2 0 4 160
26.2 – –
22.9 0 2 340
24.0 – –
14.5 0 1 30
29.4 – –
25.7 – –
23.6 0 1 310
20.7 0 3 260
24.5 0 6 240
30.5 0 2 240
30.9 0 2 230
30.4 0 1 270
29.3 – –
31.0 0 2 170
15.8 – –
18.2 – –
18.8 – –
20.8 0 4 110
13.2 0 1 190
25.8 0 2 190
27.4 0 3 290
27.5 0 0 300
18.8 – –
22.0 0 6 220
16.1 – –
31.1 – –
30.0 0 5 320
40.0 – –
10.3 0 2 210
20.0 – –
17.5 0 1 290
14.2 0 6 250
50.0 0 8 290
63.6 0 9 230
31.4 0 0 220
10.9 0 6 180
5.6 013 150
12.8 0 6 130
18.2 018 300
24.4 0 4 210
9.3 010 110
14.7 0 3 100
24.2 0 4 70
17.9 0 5 120
21.3 0 3 120
25.0 0 1 100
17.0 027 140
5.0 029 170
3.3 021 130
19.0 0 8 130
5.2 026 120
1.9 026 120
6.8 0 8 110
6.7 – –
– 016 110
1.8 017 120
2.6 014 110

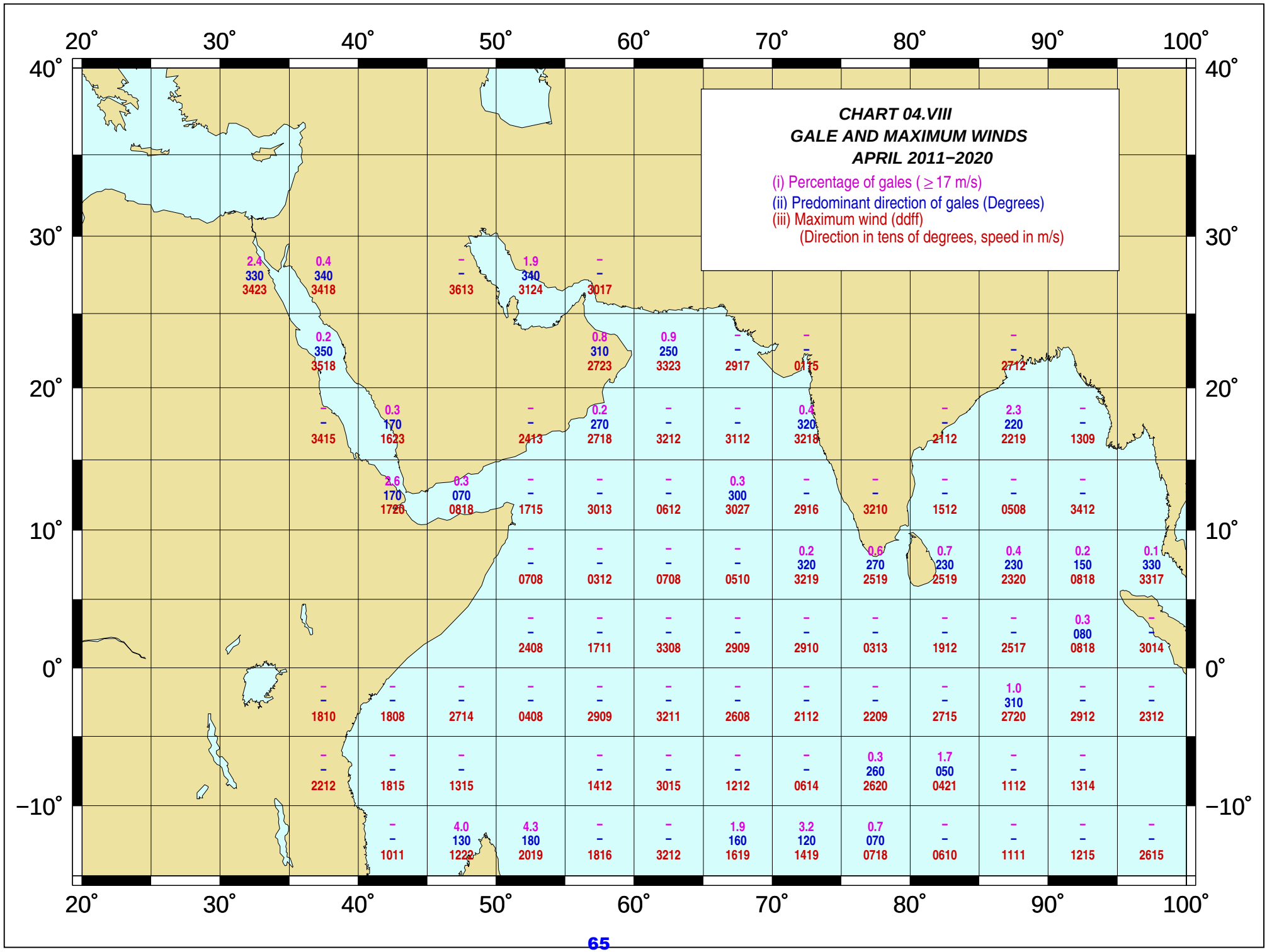


CHART 04.VIII
GALE AND MAXIMUM WINDS
APRIL 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.4 330 3423
0.4 340 3418
– – 3613
1.9 340 3124
– – 3017
0.2 350 3518
0.8 310 2723
0.9 250 3323
– – 2917
– – 0715
– – 2712
– – 3415
0.3 170 1623
– – 2413
0.2 270 2718
– – 3212
– – 3112
0.4 320 3218
– – 2112
2.3 220 2219
– – 1309
2.6 170 1720
0.3 070 0818
– – 1715
– – 3013
– – 0612
0.3 300 3027
– – 2916
– – 3210
– – 1512
– – 0508
– – 3412
– – 0708
– – 0312
– – 0708
– – 0510
0.2 320 3219
0.6 270 2519
0.7 230 2519
0.4 230 2320
0.2 150 0818
0.1 330 3317
– – 2408
– – 1711
– – 3308
– – 2909
– – 2910
– – 0313
– – 1912
– – 2517
0.3 080 0818
– – 3014
– – 1810
– – 1808
– – 2714
– – 0408
– – 2909
– – 3211
– – 2608
– – 2112
– – 2209
– – 2715
1.0 310 2720
– – 2912
– – 2312
– – 2212
– – 1815
– – 1315
– – 1412
– – 3015
– – 1212
– – 0614
0.3 260 2620
1.7 050 0421
– – 1112
– – 1314
– – 1011
4.0 130 1222
4.3 180 2019
– – 1816
– – 3212
1.9 160 1619
3.2 120 1419
0.7 070 0718
– – 0610
– – 1111
– – 1215
– – 2615

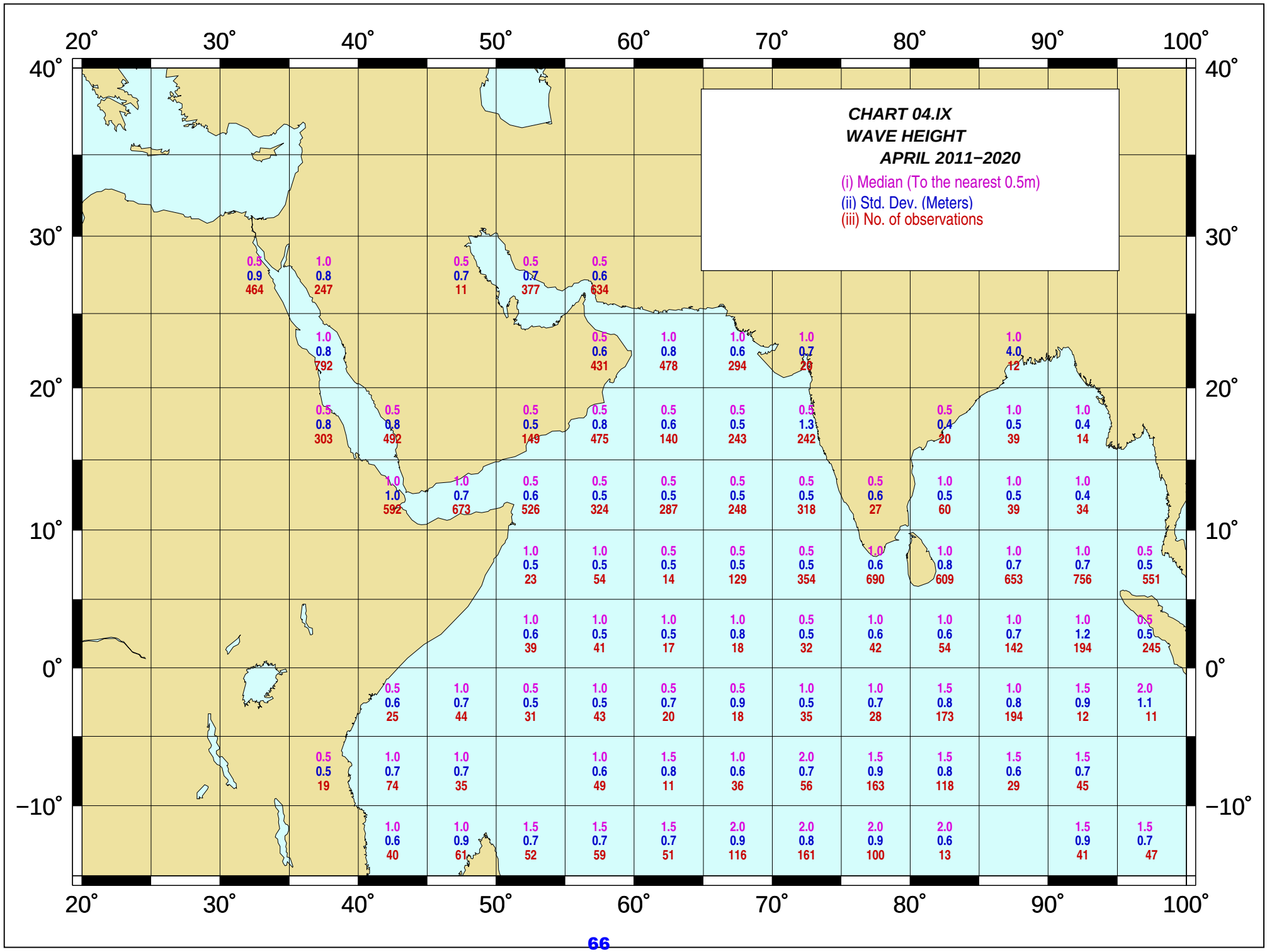


CHART 04.IX
WAVE HEIGHT
APRIL 2011−2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.5 1.0 0.5 0.5 0.5
0.9 0.8 0.7 0.7 0.6
464 247 11 377 634
1.0 0.5 1.0 1.0 1.0 1.0
0.8 0.6 0.8 0.6 0.7 4.0
792 431 478 294 29 12
0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 1.0 1.0
0.8 0.8 0.5 0.8 0.6 0.5 1.3 0.4 0.5 0.4
303 492 149 475 140 243 242 20 39 14
1.0 1.0 0.5 0.5 0.5 0.5 0.5 0.5 1.0 1.0 1.0
1.0 0.7 0.6 0.5 0.5 0.5 0.5 0.6 0.5 0.5 0.4
592 673 526 324 287 248 318 27 60 39 34
1.0 1.0 1.0 0.5 0.5 0.5 1.0 1.0 1.0 1.0 0.5
0.5 0.5 0.5 0.5 0.5 0.5 0.6 0.8 0.7 0.7 0.5
23 54 14 129 354 690 609 653 756 551
1.0 1.0 1.0 1.0 0.5 1.0 1.0 1.0 1.0 0.5
0.6 0.5 0.5 0.8 0.5 0.6 0.6 0.7 1.2 0.5
39 41 17 18 32 42 54 142 194 245
0.5 1.0 0.5 1.0 0.5 0.5 1.0 1.0 1.5 1.0 1.5 2.0
0.6 0.7 0.5 0.5 0.7 0.9 0.5 0.7 0.8 0.8 0.9 1.1
25 44 31 43 20 18 35 28 173 194 12 11
0.5 1.0 1.0 1.0 1.5 1.0 2.0 1.5 1.5 1.5 1.5
0.5 0.7 0.7 0.6 0.8 0.6 0.7 0.9 0.8 0.6 0.7
19 74 35 49 11 36 56 163 118 29 45
1.0 1.0 1.5 1.5 1.5 2.0 2.0 2.0 2.0 1.5 1.5
0.6 0.9 0.7 0.7 0.7 0.9 0.8 0.9 0.6 0.9 0.7
40 61 52 59 51 116 161 100 13 41 47

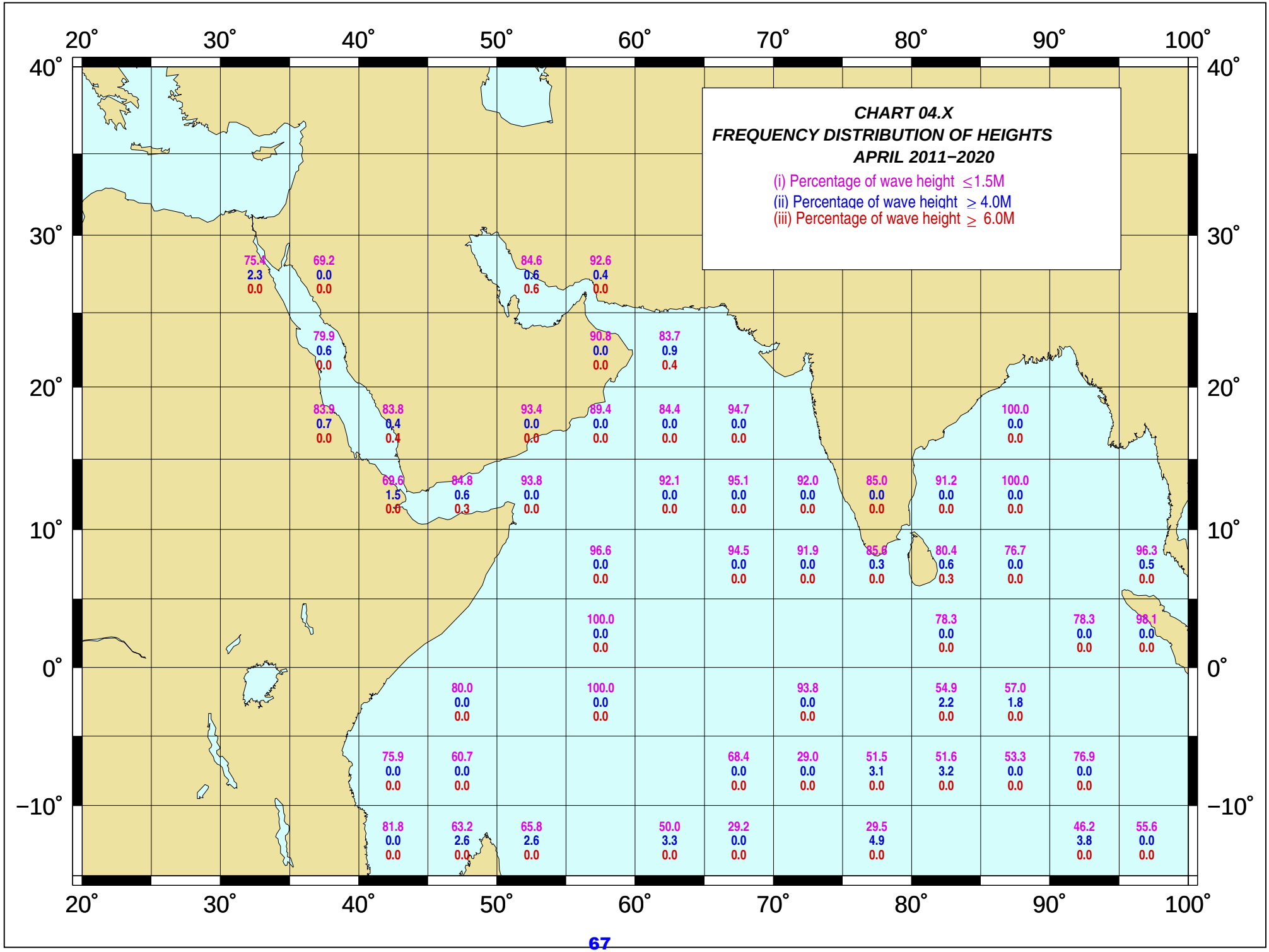


CHART 04.X
FREQUENCY DISTRIBUTION OF HEIGHTS
APRIL 2011–2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
75.4 2.3 0.0
69.2 0.0 0.0
84.6 0.6 0.6
92.6 0.4 0.0
79.9 0.6 0.0
90.8 0.0 0.0
83.7 0.9 0.4
83.9 0.7 0.0
83.8 0.4 0.4
93.4 0.0 0.0
89.4 0.0 0.0
84.4 0.0 0.0
94.7 0.0 0.0
100.0 0.0 0.0
69.6 1.5 0.6
84.8 0.6 0.3
93.8 0.0 0.0
92.1 0.0 0.0
95.1 0.0 0.0
92.0 0.0 0.0
85.0 0.0 0.0
91.2 0.0 0.0
100.0 0.0 0.0
96.6 0.0 0.0
94.5 0.0 0.0
91.9 0.0 0.0
85.6 0.3 0.0
80.4 0.6 0.3
76.7 0.0 0.0
96.3 0.5 0.0
100.0 0.0 0.0
78.3 0.0 0.0
78.3 0.0 0.0
98.1 0.0 0.0
80.0 0.0 0.0
100.0 0.0 0.0
93.8 0.0 0.0
54.9 2.2 0.0
57.0 1.8 0.0
75.9 0.0 0.0
60.7 0.0 0.0
68.4 0.0 0.0
29.0 0.0 0.0
51.5 3.1 0.0
51.6 3.2 0.0
53.3 0.0 0.0
76.9 0.0 0.0
81.8 0.0 0.0
63.2 2.6 0.0
65.8 2.6 0.0
50.0 3.3 0.0
29.2 0.0 0.0
29.5 4.9 0.0
46.2 3.8 0.0
55.6 0.0 0.0

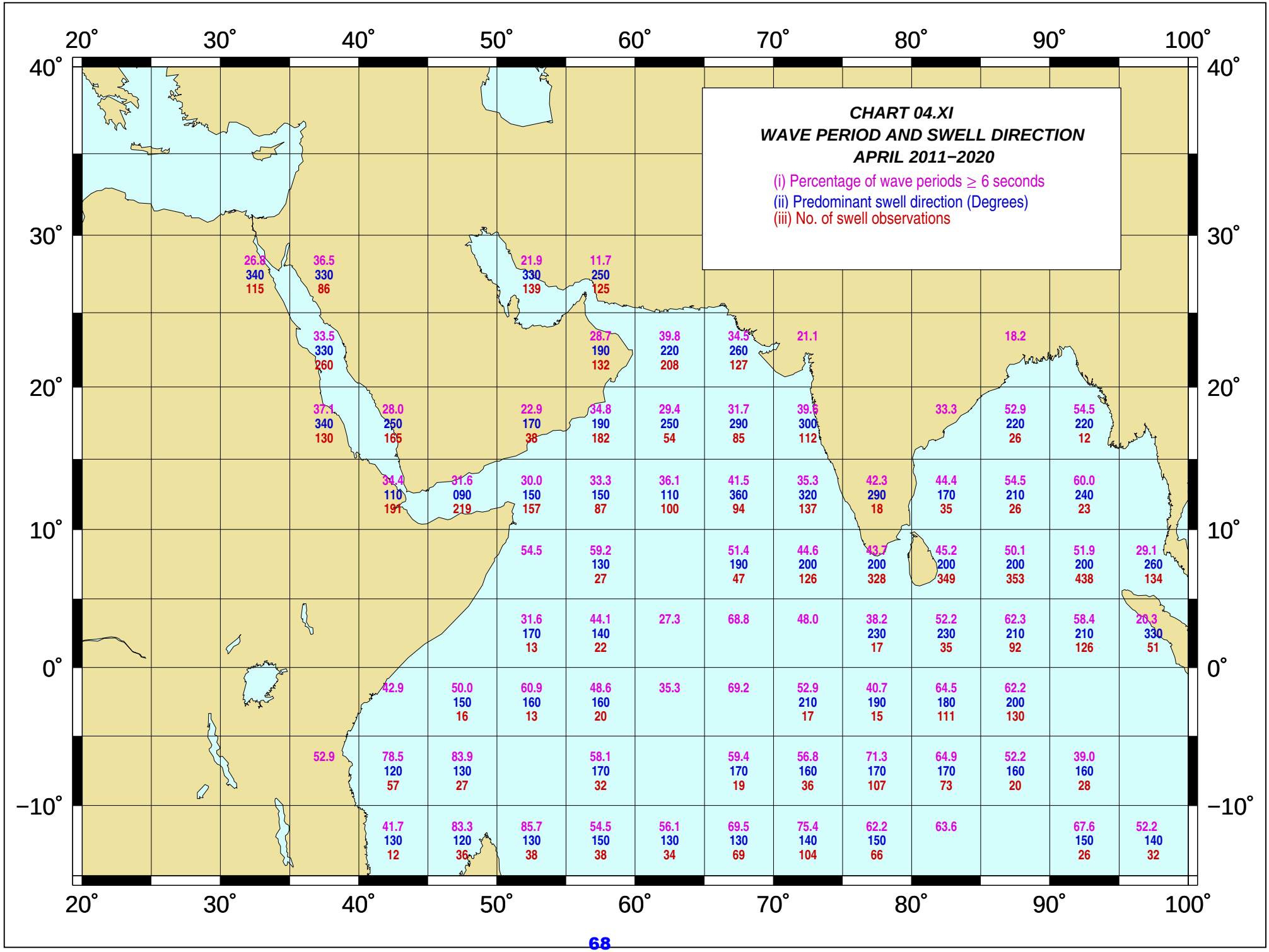


CHART 04.XI
WAVE PERIOD AND SWELL DIRECTION
APRIL 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
26.8 340 115
36.5 330 86
21.9 330 139
11.7 250 125
33.5 330 260
28.7 190 132
39.8 220 208
34.5 260 127
21.1
18.2
37.1 340 130
28.0 250 165
22.9 170 38
34.8 190 182
29.4 250 54
31.7 290 85
39.6 300 112
33.3
52.9 220 26
54.5 220 12
31.4 110 191
31.6 090 219
30.0 150 157
33.3 150 87
36.1 110 100
41.5 360 94
35.3 320 137
42.3 290 18
44.4 170 35
54.5 210 26
60.0 240 23
54.5
59.2 130 27
51.4 190 47
44.6 200 126
43.7 200 328
45.2 200 349
50.1 200 353
51.9 200 438
29.1 260 134
31.6 170 13
44.1 140 22
27.3
68.8
48.0
38.2 230 17
52.2 230 35
62.3 210 92
58.4 210 126
26.3 330 51
42.9
50.0 150 16
60.9 160 13
48.6 160 20
35.3
69.2
52.9 210 17
40.7 190 15
64.5 180 111
62.2 200 130
52.9
78.5 120 57
83.9 130 27
58.1 170 32
59.4 170 19
56.8 160 36
71.3 170 107
64.9 170 73
52.2 160 20
39.0 160 28
41.7 130 12
83.3 120 36
85.7 130 38
54.5 150 38
56.1 130 34
69.5 130 69
75.4 140 104
62.2 150 66
63.6
67.6 150 26
52.2 140 32

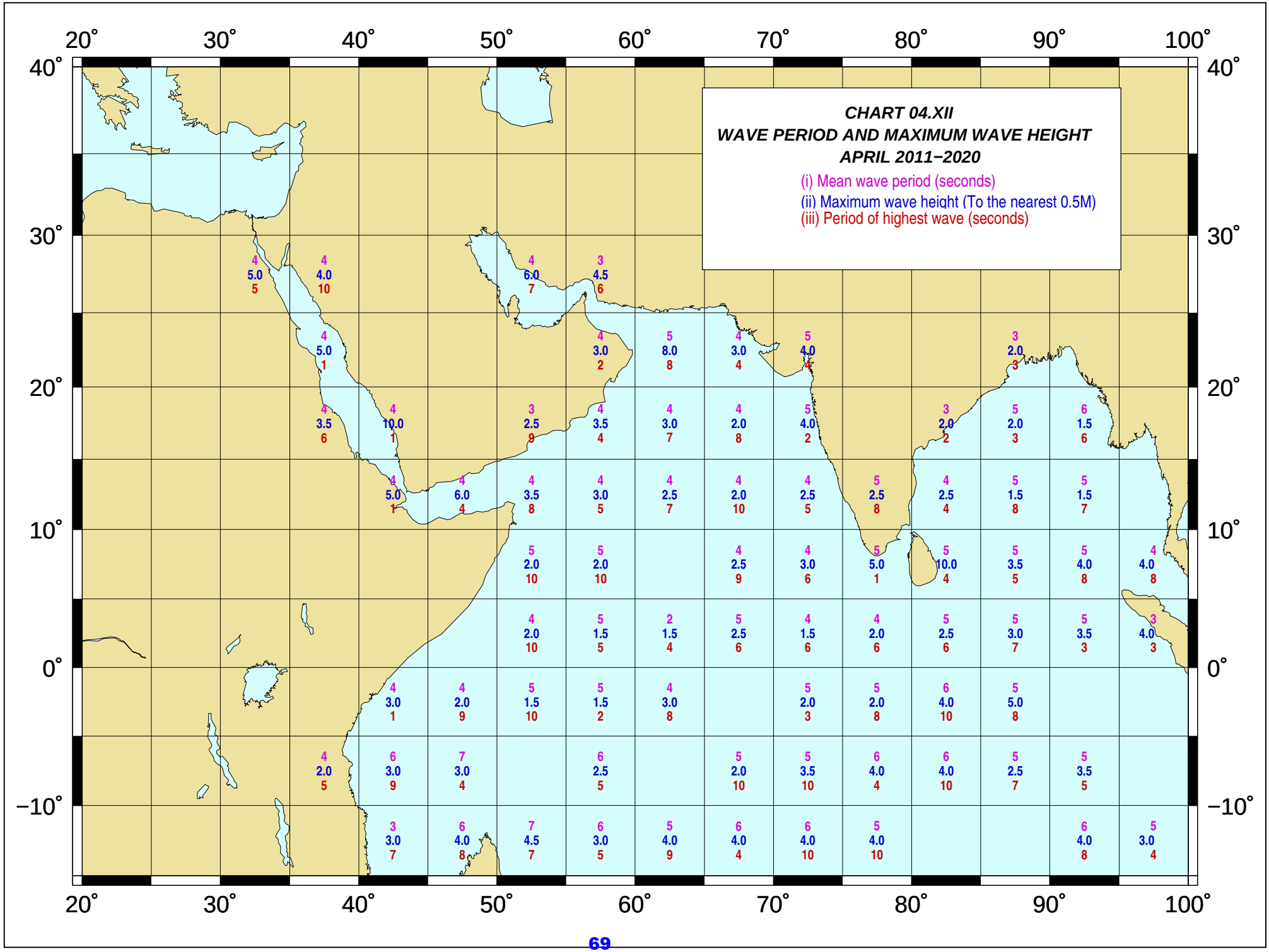


CHART 04.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
APRIL 2011–2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
4 5.0 5
4 4.0 10
4 6.0 7
3 4.5 6
4 5.0 1
4 3.0 2
5 8.0 8
4 3.0 4
5 4.0 4
3 2.0 3
4 3.5 6
4 10.0 1
3 2.5 9
4 3.5 4
4 3.0 7
4 2.0 8
5 4.0 2
3 2.0 2
5 2.0 3
6 1.5 6
4 5.0 1
4 6.0 4
4 3.5 8
4 3.0 5
4 2.5 7
4 2.0 10
4 2.5 5
5 2.5 8
4 2.5 4
5 1.5 8
5 1.5 7
5 2.0 10
5 2.0 10
4 2.5 9
4 3.0 6
5 5.0 1
5 10.0 4
5 3.5 5
5 4.0 8
4 4.0 8
4 2.0 10
5 1.5 5
2 1.5 4
5 2.5 6
4 1.5 6
4 2.0 6
5 2.5 6
5 3.0 7
5 3.5 3
3 4.0 3
4 3.0 1
4 2.0 9
5 1.5 10
5 1.5 2
4 3.0 8
5 2.0 3
5 2.0 8
6 4.0 10
5 5.0 8
4 2.0 5
6 3.0 9
7 3.0 4
6 2.5 5
5 2.0 10
5 3.5 10
6 4.0 4
6 4.0 10
5 2.5 7
5 3.5 5
3 3.0 7
6 4.0 8
7 4.5 7
6 3.0 5
5 4.0 9
6 4.0 4
6 4.0 10
5 4.0 10
6 4.0 8
5 3.0 4

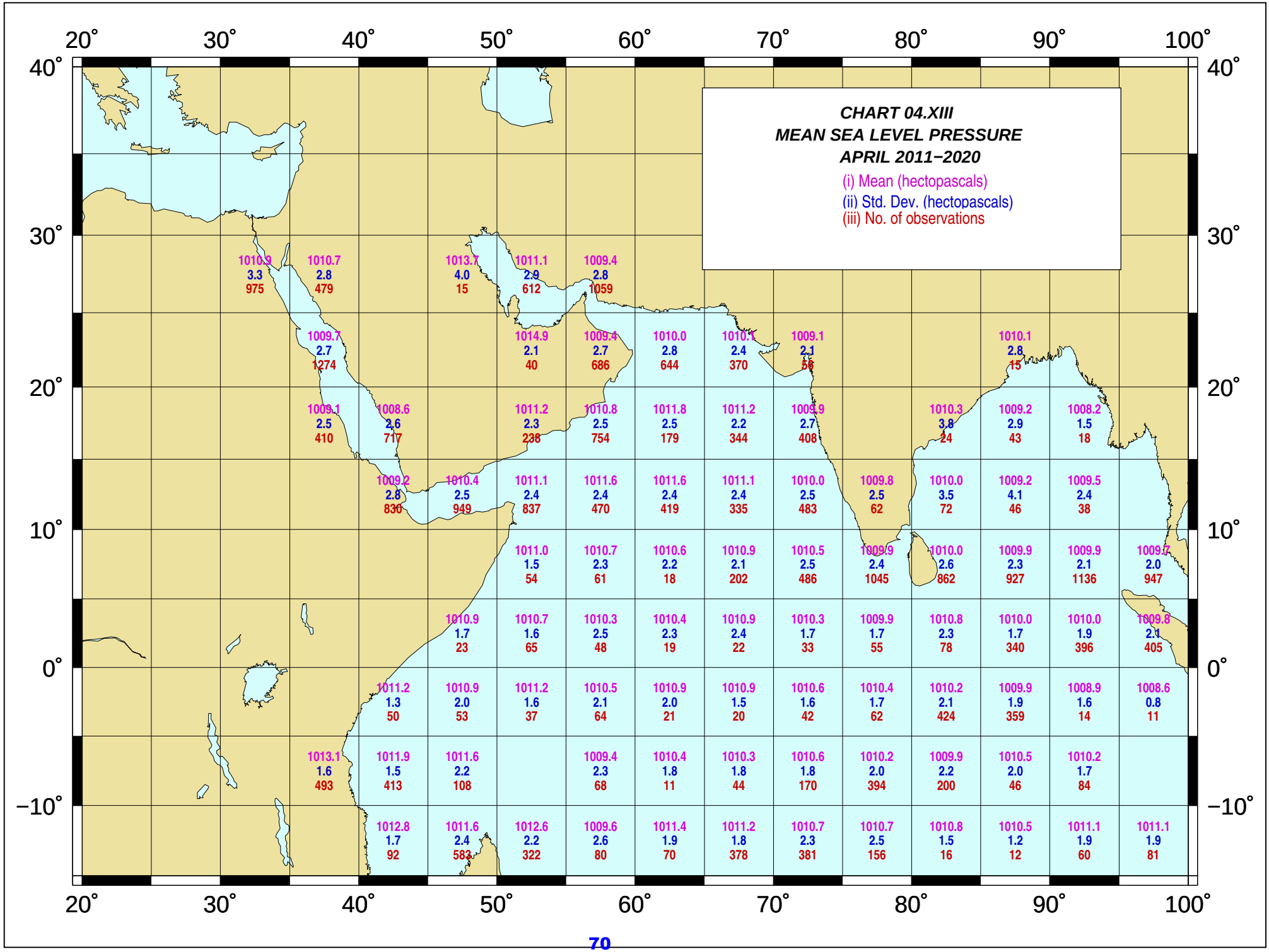


CHART 04.XIII
MEAN SEA LEVEL PRESSURE
APRIL 2011–2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1010.2 3.3 975
1010.7 2.8 479
1013.7 4.0 15
1011.1 2.9 612
1009.4 2.8 1059
1009.7 2.7 1274
1014.9 2.1 40
1009.4 2.7 686
1010.0 2.8 644
1010.1 2.4 370
1009.1 2.1 56
1010.1 2.8 15
1009.1 2.5 410
1008.6 2.6 717
1011.2 2.3 238
1010.8 2.5 754
1011.8 2.5 179
1011.2 2.2 344
1009.9 2.7 408
1010.3 3.8 24
1009.2 2.9 43
1008.2 1.5 18
1009.2 2.8 836
1010.4 2.5 949
1011.1 2.4 837
1011.6 2.4 470
1011.6 2.4 419
1011.1 2.4 335
1010.0 2.5 483
1009.8 2.5 62
1010.0 3.5 72
1009.2 4.1 46
1009.5 2.4 38
1011.0 1.5 54
1010.7 2.3 61
1010.6 2.2 18
1010.9 2.1 202
1010.5 2.5 486
1009.9 2.4 1045
1010.0 2.6 862
1009.9 2.3 927
1009.9 2.1 1136
1009.7 2.0 947
1010.9 1.7 23
1010.7 1.6 65
1010.3 2.5 48
1010.4 2.3 19
1010.9 2.4 22
1010.3 1.7 33
1009.9 1.7 55
1010.8 2.3 78
1010.0 1.7 340
1010.0 1.9 396
1009.8 2.1 405
1011.2 1.3 50
1010.9 2.0 53
1011.2 1.6 37
1010.5 2.1 64
1010.9 2.0 21
1010.9 1.5 20
1010.6 1.6 42
1010.4 1.7 62
1010.2 2.1 424
1009.9 1.9 359
1008.9 1.6 14
1008.6 0.8 11
1013.1 1.6 493
1011.9 1.5 413
1011.6 2.2 108
1009.4 2.3 68
1010.4 1.8 11
1010.3 1.8 44
1010.6 1.8 170
1010.2 2.0 394
1009.9 2.2 200
1010.5 2.0 46
1010.2 1.7 84
1012.8 1.7 92
1011.6 2.4 583
1012.6 2.2 322
1009.6 2.6 80
1011.4 1.9 70
1011.2 1.8 378
1010.7 2.3 381
1010.7 2.5 156
1010.8 1.5 16
1010.5 1.2 12
1011.1 1.9 60
1011.1 1.9 81

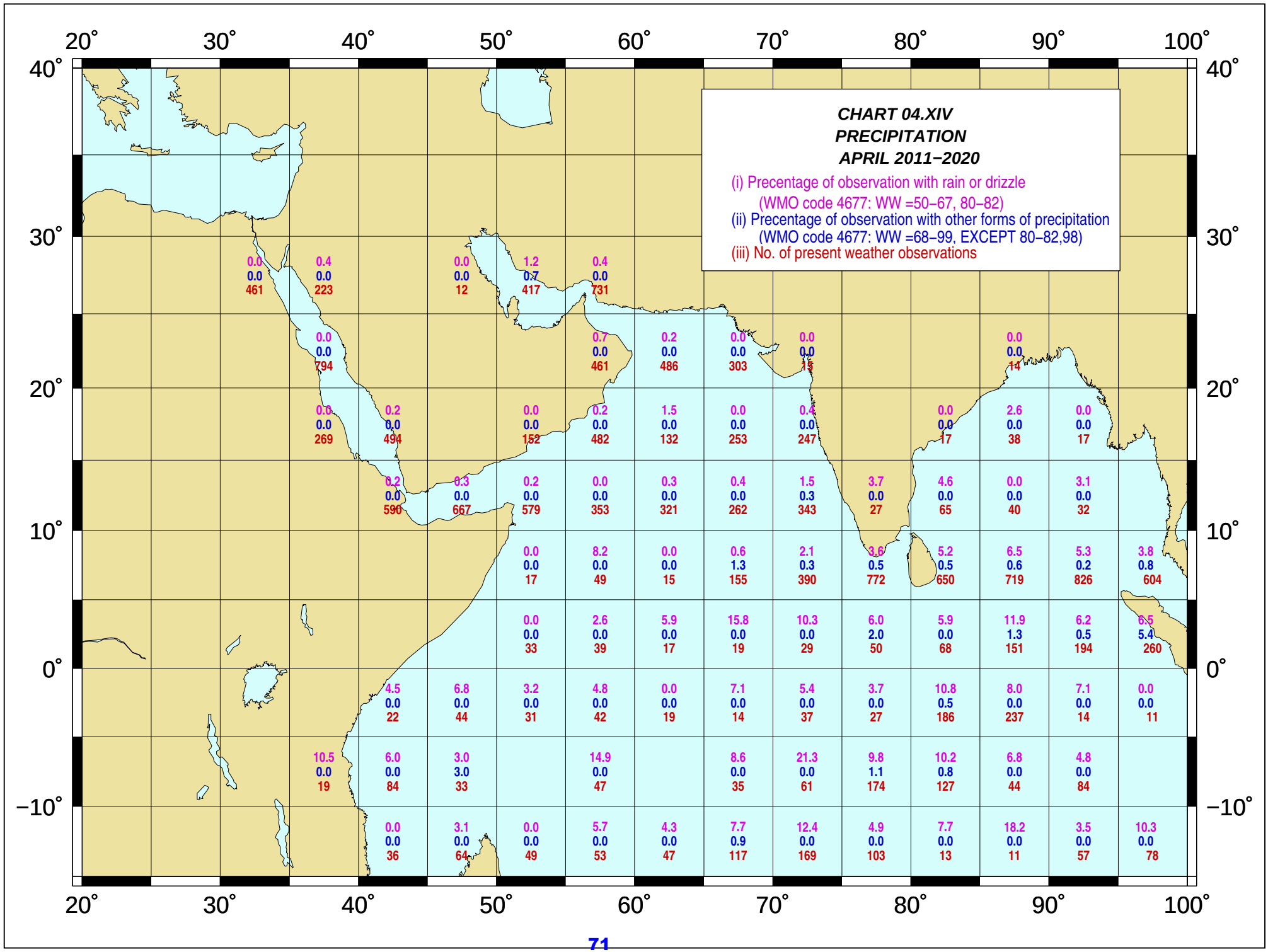


CHART 04.XIV
PRECIPITATION
APRIL 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 0.0 461
0.4 0.0 223
0.0 0.0 12
1.2 0.7 417
0.4 0.0 731
0.0 0.0 794
0.7 0.0 461
0.2 0.0 486
0.0 0.0 303
0.0 0.0 14
0.0 0.0 269
0.2 0.0 494
0.0 0.0 152
0.2 0.0 482
1.5 0.0 132
0.0 0.0 253
0.0 0.0 247
0.0 0.0 17
2.6 0.0 38
0.0 0.0 17
0.2 0.0 590
0.3 0.0 667
0.2 0.0 579
0.0 0.0 353
0.3 0.0 321
0.4 0.0 262
1.5 0.3 343
3.7 0.0 27
4.6 0.0 65
0.0 0.0 40
3.1 0.0 32
0.0 0.0 17
8.2 0.0 49
0.0 0.0 15
0.6 1.3 155
2.1 0.3 390
3.6 0.5 772
5.2 0.5 650
6.5 0.6 719
5.3 0.2 826
3.8 0.8 604
0.0 0.0 33
2.6 0.0 39
5.9 0.0 17
15.8 0.0 19
10.3 0.0 29
6.0 2.0 50
5.9 0.0 68
11.9 1.3 151
6.2 0.5 194
6.5 5.4 260
4.5 0.0 22
6.8 0.0 44
3.2 0.0 31
4.8 0.0 42
0.0 0.0 19
7.1 0.0 14
5.4 0.0 37
3.7 0.0 27
10.8 0.5 186
8.0 0.0 237
7.1 0.0 14
0.0 0.0 11
10.5 0.0 19
6.0 0.0 84
3.0 3.0 33
14.9 0.0 47
8.6 0.0 35
21.3 0.0 61
9.8 1.1 174
10.2 0.8 127
6.8 0.0 44
4.8 0.0 84
0.0 0.0 36
3.1 0.0 64
0.0 0.0 49
5.7 0.0 53
4.3 0.0 47
7.7 0.9 117
12.4 0.0 169
4.9 0.0 103
7.7 0.0 13
18.2 0.0 11
3.5 0.0 57
10.3 0.0 78

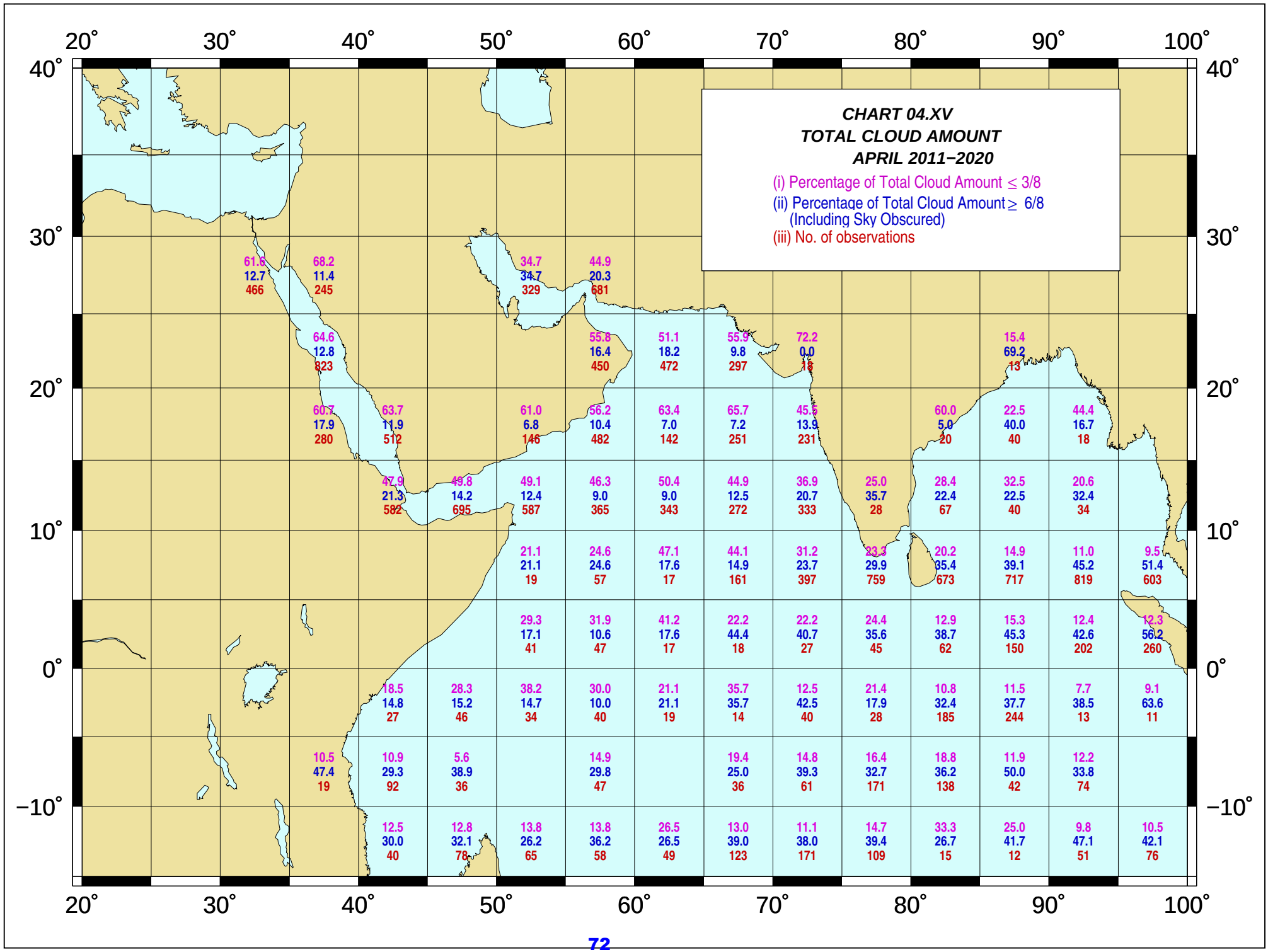


CHART 04.XV
TOTAL CLOUD AMOUNT
APRIL 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
61.6 12.7 466
68.2 11.4 245
34.7 34.7 329
44.9 20.3 681
64.6 12.8 823
55.8 16.4 450
51.1 18.2 472
55.9 9.8 297
72.2 0.0 16
15.4 69.2 13
60.7 17.9 280
63.7 11.9 512
61.0 6.8 146
56.2 10.4 482
63.4 7.0 142
65.7 7.2 251
45.5 13.9 231
60.0 5.0 20
22.5 40.0 40
44.4 16.7 18
47.9 21.3 582
49.8 14.2 695
49.1 12.4 587
46.3 9.0 365
50.4 9.0 343
44.9 12.5 272
36.9 20.7 333
25.0 35.7 28
28.4 22.4 67
32.5 22.5 40
20.6 32.4 34
21.1 21.1 19
24.6 24.6 57
47.1 17.6 17
44.1 14.9 161
31.2 23.7 397
23.9 29.9 759
20.2 35.4 673
14.9 39.1 717
11.0 45.2 819
9.5 51.4 603
29.3 17.1 41
31.9 10.6 47
41.2 17.6 17
22.2 44.4 18
22.2 40.7 27
24.4 35.6 45
12.9 38.7 62
15.3 45.3 150
12.4 42.6 202
12.3 56.2 260
18.5 14.8 27
28.3 15.2 46
38.2 14.7 34
30.0 10.0 40
21.1 21.1 19
35.7 35.7 14
12.5 42.5 40
21.4 17.9 28
10.8 32.4 185
11.5 37.7 244
7.7 38.5 13
9.1 63.6 11
10.5 47.4 19
10.9 29.3 92
5.6 38.9 36
14.9 29.8 47
19.4 25.0 36
14.8 39.3 61
16.4 32.7 171
18.8 36.2 138
11.9 50.0 42
12.2 33.8 74
12.5 30.0 40
12.8 32.1 78
13.8 26.2 65
13.8 36.2 58
26.5 26.5 49
13.0 39.0 123
11.1 38.0 171
14.7 39.4 109
33.3 26.7 15
25.0 41.7 12
9.8 47.1 51
10.5 42.1 76

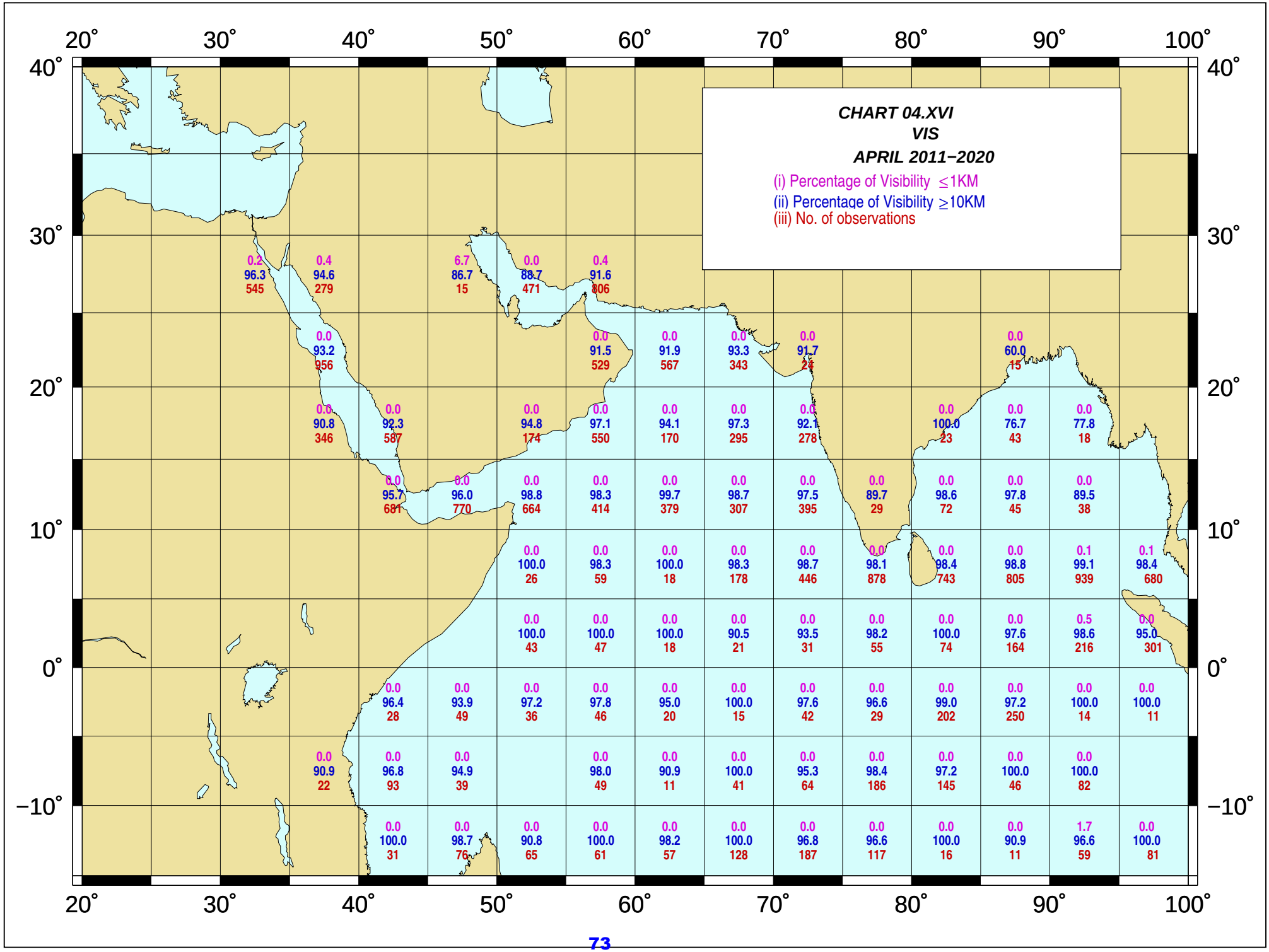


CHART 04.XVI
VIS
APRIL 2011–2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.2 96.3 545
0.4 94.6 279
6.7 86.7 15
0.0 88.7 471
0.4 91.6 806
0.0 93.2 956
0.0 91.5 529
0.0 91.9 567
0.0 93.3 343
0.0 91.7 24
0.0 60.0 15
0.0 90.8 346
0.0 92.3 587
0.0 94.8 174
0.0 97.1 550
0.0 94.1 170
0.0 97.3 295
0.0 92.1 278
0.0 100.0 23
0.0 76.7 43
0.0 77.8 18
0.0 95.7 681
0.0 96.0 770
0.0 98.8 664
0.0 98.3 414
0.0 99.7 379
0.0 98.7 307
0.0 97.5 395
0.0 89.7 29
0.0 98.6 72
0.0 97.8 45
0.0 89.5 38
0.0 100.0 26
0.0 98.3 59
0.0 100.0 18
0.0 98.3 178
0.0 98.7 446
0.0 98.1 878
0.0 98.4 743
0.0 98.8 805
0.1 99.1 939
0.1 98.4 680
0.0 100.0 43
0.0 100.0 47
0.0 100.0 18
0.0 90.5 21
0.0 93.5 31
0.0 98.2 55
0.0 100.0 74
0.0 97.6 164
0.5 98.6 216
0.0 95.0 301
0.0 96.4 28
0.0 93.9 49
0.0 97.2 36
0.0 97.8 46
0.0 95.0 20
0.0 100.0 15
0.0 97.6 42
0.0 96.6 29
0.0 99.0 202
0.0 97.2 250
0.0 100.0 14
0.0 100.0 11
0.0 90.9 22
0.0 96.8 93
0.0 94.9 39
0.0 98.0 49
0.0 90.9 11
0.0 100.0 41
0.0 95.3 64
0.0 98.4 186
0.0 97.2 145
0.0 100.0 46
0.0 100.0 82
0.0 100.0 31
0.0 98.7 76
0.0 90.8 65
0.0 100.0 61
0.0 98.2 57
0.0 100.0 128
0.0 96.8 187
0.0 96.6 117
0.0 100.0 16
0.0 90.9 11
1.7 96.6 59
0.0 100.0 81

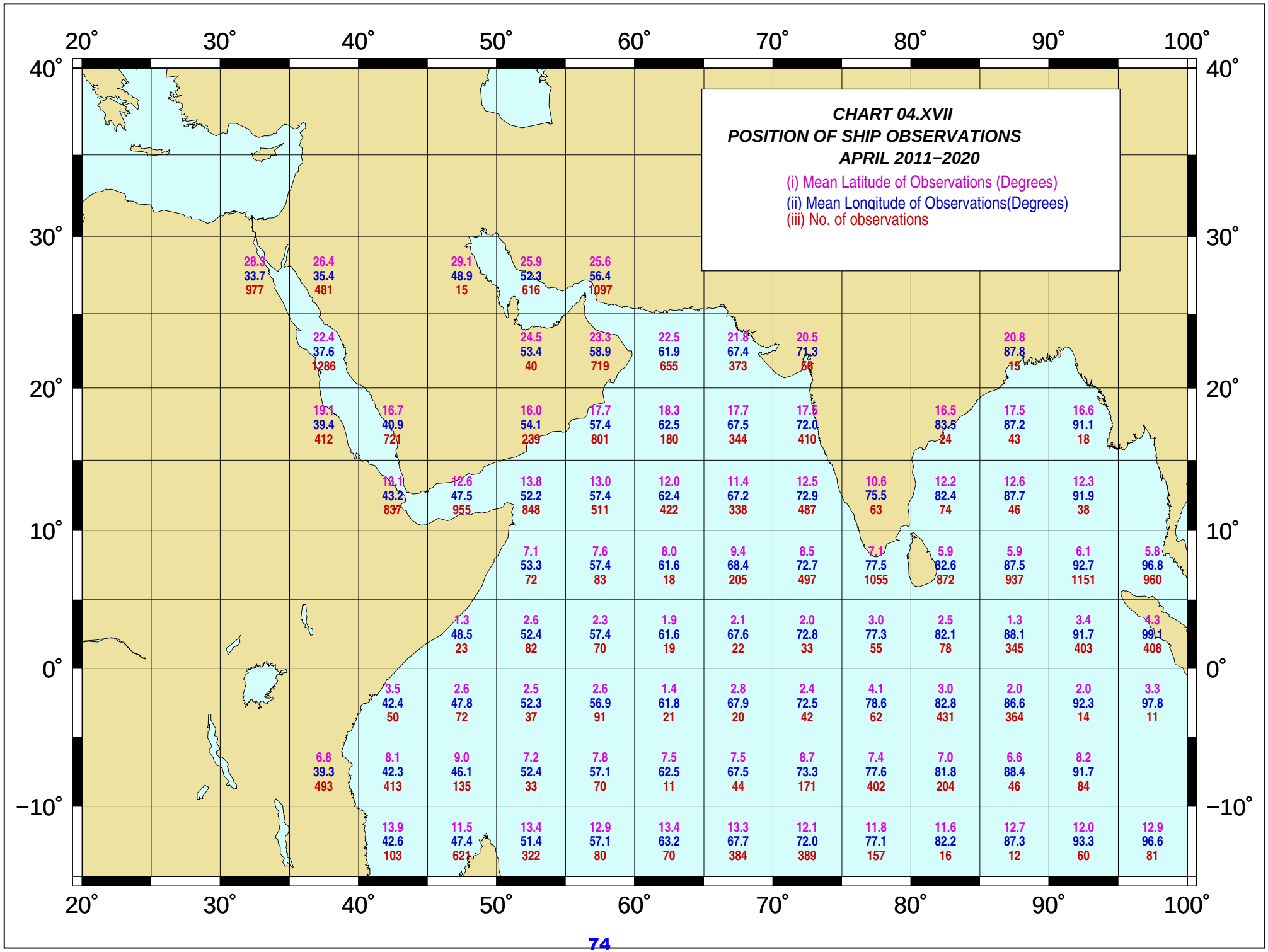


CHART 04.XVII
POSITION OF SHIP OBSERVATIONS
APRIL 2011−2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.3 33.7 977
26.4 35.4 481
29.1 48.9 15
25.9 52.3 616
25.6 56.4 1097
22.4 37.6 1286
24.5 53.4 40
23.3 58.9 719
22.5 61.9 655
21.8 67.4 373
20.5 71.3 56
20.8 87.8 15
19.1 39.4 412
16.7 40.9 721
16.0 54.1 239
17.7 57.4 801
18.3 62.5 180
17.7 67.5 344
17.5 72.0 410
16.5 83.5 24
17.5 87.2 43
16.6 91.1 18
10.1 43.2 837
12.6 47.5 955
13.8 52.2 848
13.0 57.4 511
12.0 62.4 422
11.4 67.2 338
12.5 72.9 487
10.6 75.5 63
12.2 82.4 74
12.6 87.7 46
12.3 91.9 38
7.1 53.3 72
7.6 57.4 83
8.0 61.6 18
9.4 68.4 205
8.5 72.7 497
7.1 77.5 1055
5.9 82.6 872
5.9 87.5 937
6.1 92.7 1151
5.8 96.8 960
1.3 48.5 23
2.6 52.4 82
2.3 57.4 70
1.9 61.6 19
2.1 67.6 22
2.0 72.8 33
3.0 77.3 55
2.5 82.1 78
1.3 88.1 345
3.4 91.7 403
4.3 99.1 408
3.5 42.4 50
2.6 47.8 72
2.5 52.3 37
2.6 56.9 91
1.4 61.8 21
2.8 67.9 20
2.4 72.5 42
4.1 78.6 62
3.0 82.8 431
2.0 86.6 364
2.0 92.3 14
3.3 97.8 11
6.8 39.3 493
8.1 42.3 413
9.0 46.1 135
7.2 52.4 33
7.8 57.1 70
7.5 62.5 11
7.5 67.5 44
8.7 73.3 171
7.4 77.6 402
7.0 81.8 204
6.6 88.4 46
8.2 91.7 84
13.9 42.6 103
11.5 47.4 621
13.4 51.4 322
12.9 57.1 80
13.4 63.2 70
13.3 67.7 384
12.1 72.0 389
11.8 77.1 157
11.6 82.2 16
12.7 87.3 12
12.0 93.3 60
12.9 96.6 81

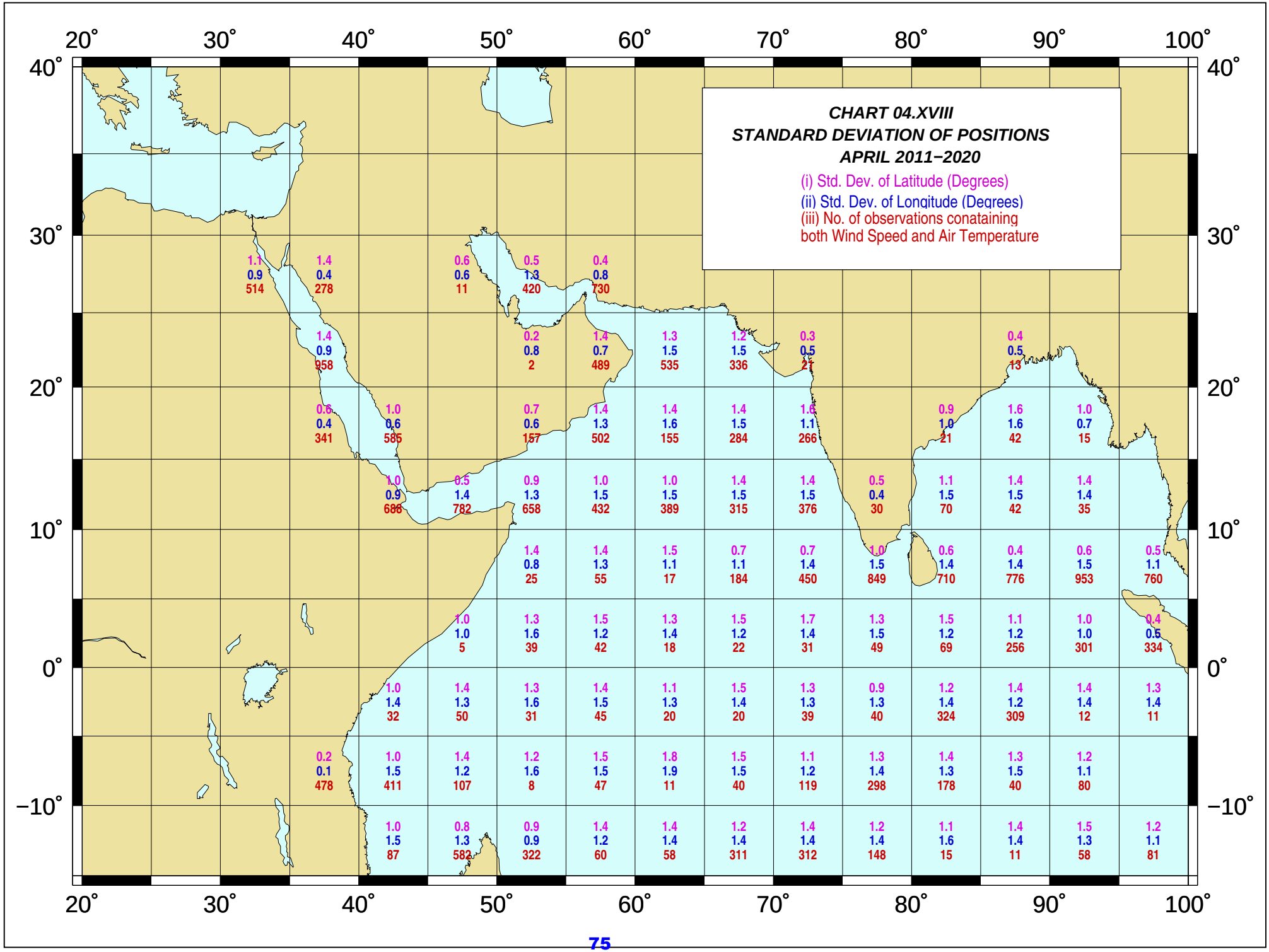
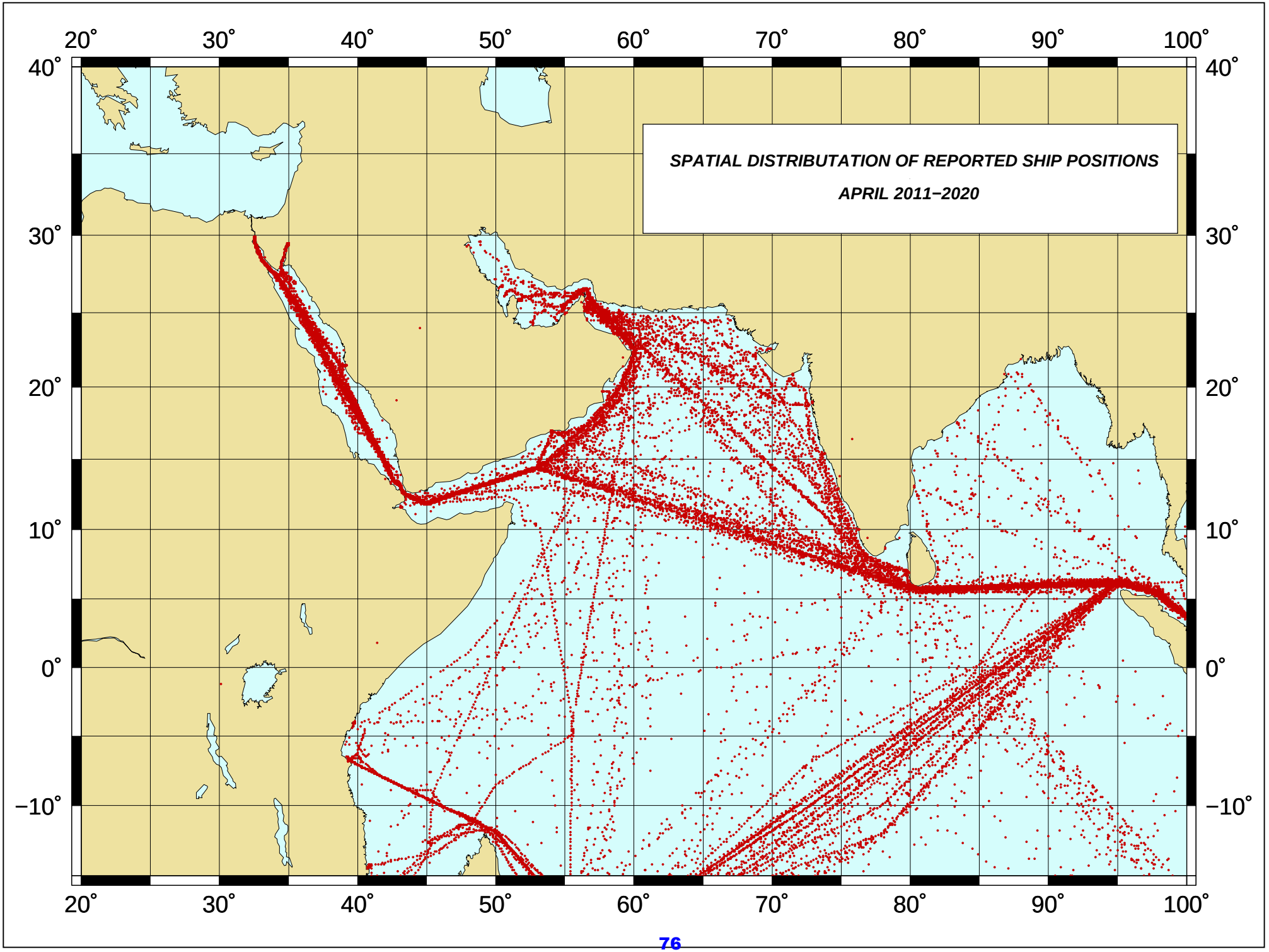


CHART 04.XVIII
STANDARD DEVIATION OF POSITIONS
APRIL 2011−2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.1 0.9 514
1.4 0.4 278
0.6 0.6 11
0.5 1.3 420
0.4 0.8 730
1.4 0.9 958
0.2 0.8 2
1.4 0.7 489
1.3 1.5 535
1.2 1.5 336
0.3 0.5 21
0.4 0.5 13
0.6 0.4 341
1.0 0.6 585
0.7 0.6 157
1.4 1.3 502
1.4 1.6 155
1.4 1.5 284
1.6 1.1 266
0.9 1.0 21
1.6 1.6 42
1.0 0.7 15
1.0 0.9 686
0.5 1.4 782
0.9 1.3 658
1.0 1.5 432
1.0 1.5 389
1.4 1.5 315
1.4 1.5 376
0.5 0.4 30
1.1 1.5 70
1.4 1.5 42
1.4 1.4 35
1.4 0.8 25
1.4 1.3 55
1.5 1.1 17
0.7 1.1 184
0.7 1.4 450
1.0 1.5 849
0.6 1.4 710
0.4 1.4 776
0.6 1.5 953
0.5 1.1 760
1.0 1.0 5
1.3 1.6 39
1.5 1.2 42
1.3 1.4 18
1.5 1.2 22
1.7 1.4 31
1.3 1.5 49
1.5 1.2 69
1.1 1.2 256
1.0 1.0 301
0.4 0.5 334
1.0 1.4 32
1.4 1.3 50
1.3 1.6 31
1.4 1.5 45
1.1 1.3 20
1.5 1.4 20
1.3 1.3 39
0.9 1.3 40
1.2 1.4 324
1.4 1.2 309
1.4 1.4 12
1.3 1.4 11
0.2 0.1 478
1.0 1.5 411
1.4 1.2 107
1.2 1.6 8
1.5 1.5 47
1.8 1.9 11
1.5 1.5 40
1.1 1.2 119
1.3 1.4 298
1.4 1.3 178
1.3 1.5 40
1.2 1.1 80
1.0 1.5 87
0.8 1.3 582
0.9 0.9 322
1.4 1.2 60
1.4 1.4 58
1.2 1.4 311
1.4 1.4 312
1.2 1.4 148
1.1 1.6 15
1.4 1.4 11
1.5 1.3 58
1.2 1.1 81


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
APRIL 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF MAY 2011-2020

Marine Climatological Summary Charts 2011-2020

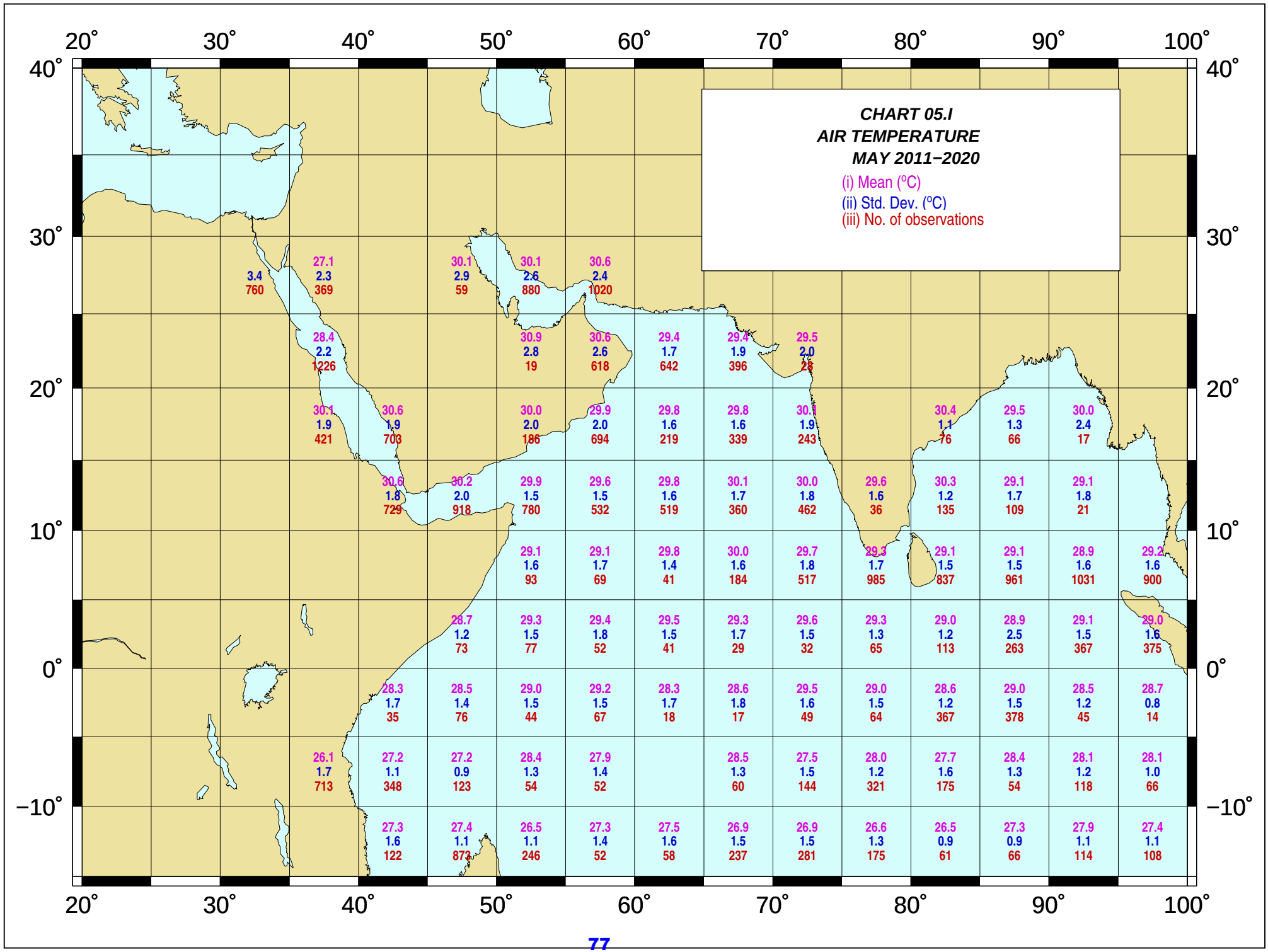


CHART 05.I
AIR TEMPERATURE
MAY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
3.4 760
27.1 2.3 369
30.1 2.9 59
30.1 2.6 880
30.6 2.4 1020
28.4 2.2 1226
30.9 2.8 19
30.6 2.6 618
29.4 1.7 642
29.4 1.9 396
29.5 2.0 26
30.1 1.9 421
30.6 1.9 703
30.0 2.0 186
29.9 2.0 694
29.8 1.6 219
29.8 1.6 339
30.1 1.9 243
30.4 1.1 76
29.5 1.3 66
30.0 2.4 17
30.6 1.8 729
30.2 2.0 918
29.9 1.5 780
29.6 1.5 532
29.8 1.6 519
30.1 1.7 360
30.0 1.8 462
29.6 1.6 36
30.3 1.2 135
29.1 1.7 109
29.1 1.8 21
29.1 1.6 93
29.1 1.7 69
29.8 1.4 41
30.0 1.6 184
29.7 1.8 517
29.3 1.7 985
29.1 1.5 837
29.1 1.5 961
28.9 1.6 1031
29.2 1.6 900
28.7 1.2 73
29.3 1.5 77
29.4 1.8 52
29.5 1.5 41
29.3 1.7 29
29.6 1.5 32
29.3 1.3 65
29.0 1.2 113
28.9 2.5 263
29.1 1.5 367
29.0 1.6 375
28.3 1.7 35
28.5 1.4 76
29.0 1.5 44
29.2 1.5 67
28.3 1.7 18
28.6 1.8 17
29.5 1.6 49
29.0 1.5 64
28.6 1.2 367
29.0 1.5 378
28.5 1.2 45
28.7 0.8 14
26.1 1.7 713
27.2 1.1 348
27.2 0.9 123
28.4 1.3 54
27.9 1.4 52
28.5 1.3 60
27.5 1.5 144
28.0 1.2 321
27.7 1.6 175
28.4 1.3 54
28.1 1.2 118
28.1 1.0 66
27.3 1.6 122
27.4 1.1 873
26.5 1.1 246
27.3 1.4 52
27.5 1.6 58
26.9 1.5 237
26.9 1.5 281
26.6 1.3 175
26.5 0.9 61
27.3 0.9 66
27.9 1.1 114
27.4 1.1 108

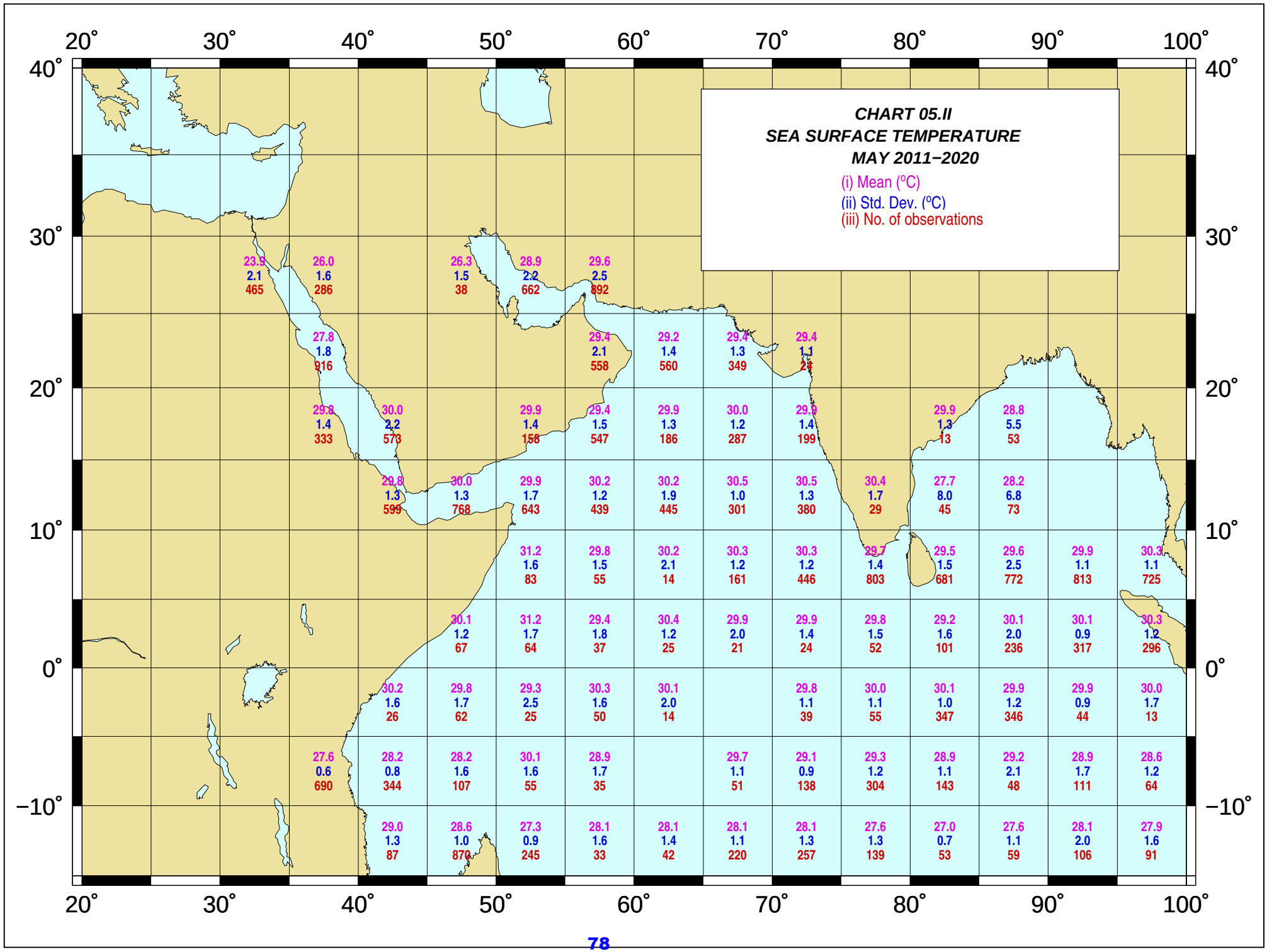


CHART 05.II
SEA SURFACE TEMPERATURE
MAY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
23.9 2.1 465
26.0 1.6 286
26.3 1.5 38
28.9 2.2 662
29.6 2.5 892
27.8 1.8 916
29.4 2.1 558
29.2 1.4 560
29.4 1.3 349
29.4 1.1 24
29.8 1.4 333
30.0 2.2 573
29.9 1.4 158
29.4 1.5 547
29.9 1.3 186
30.0 1.2 287
29.9 1.4 199
29.9 1.3 13
28.8 5.5 53
29.8 1.3 599
30.0 1.3 768
29.9 1.7 643
30.2 1.2 439
30.2 1.9 445
30.5 1.0 301
30.5 1.3 380
30.4 1.7 29
27.7 8.0 45
28.2 6.8 73
31.2 1.6 83
29.8 1.5 55
30.2 2.1 14
30.3 1.2 161
30.3 1.2 446
29.7 1.4 803
29.5 1.5 681
29.6 2.5 772
29.9 1.1 813
30.3 1.1 725
30.1 1.2 67
31.2 1.7 64
29.4 1.8 37
30.4 1.2 25
29.9 2.0 21
29.9 1.4 24
29.8 1.5 52
29.2 1.6 101
30.1 2.0 236
30.1 0.9 317
30.3 1.2 296
30.2 1.6 26
29.8 1.7 62
29.3 2.5 25
30.3 1.6 50
30.1 2.0 14
29.8 1.1 39
30.0 1.1 55
30.1 1.0 347
29.9 1.2 346
29.9 0.9 44
30.0 1.7 13
27.6 0.6 690
28.2 0.8 344
28.2 1.6 107
30.1 1.6 55
28.9 1.7 35
29.7 1.1 51
29.1 0.9 138
29.3 1.2 304
28.9 1.1 143
29.2 2.1 48
28.9 1.7 111
28.6 1.2 64
29.0 1.3 87
28.6 1.0 870
27.3 0.9 245
28.1 1.6 33
28.1 1.4 42
28.1 1.1 220
28.1 1.3 257
27.6 1.3 139
27.0 0.7 53
27.6 1.1 59
28.1 2.0 106
27.9 1.6 91

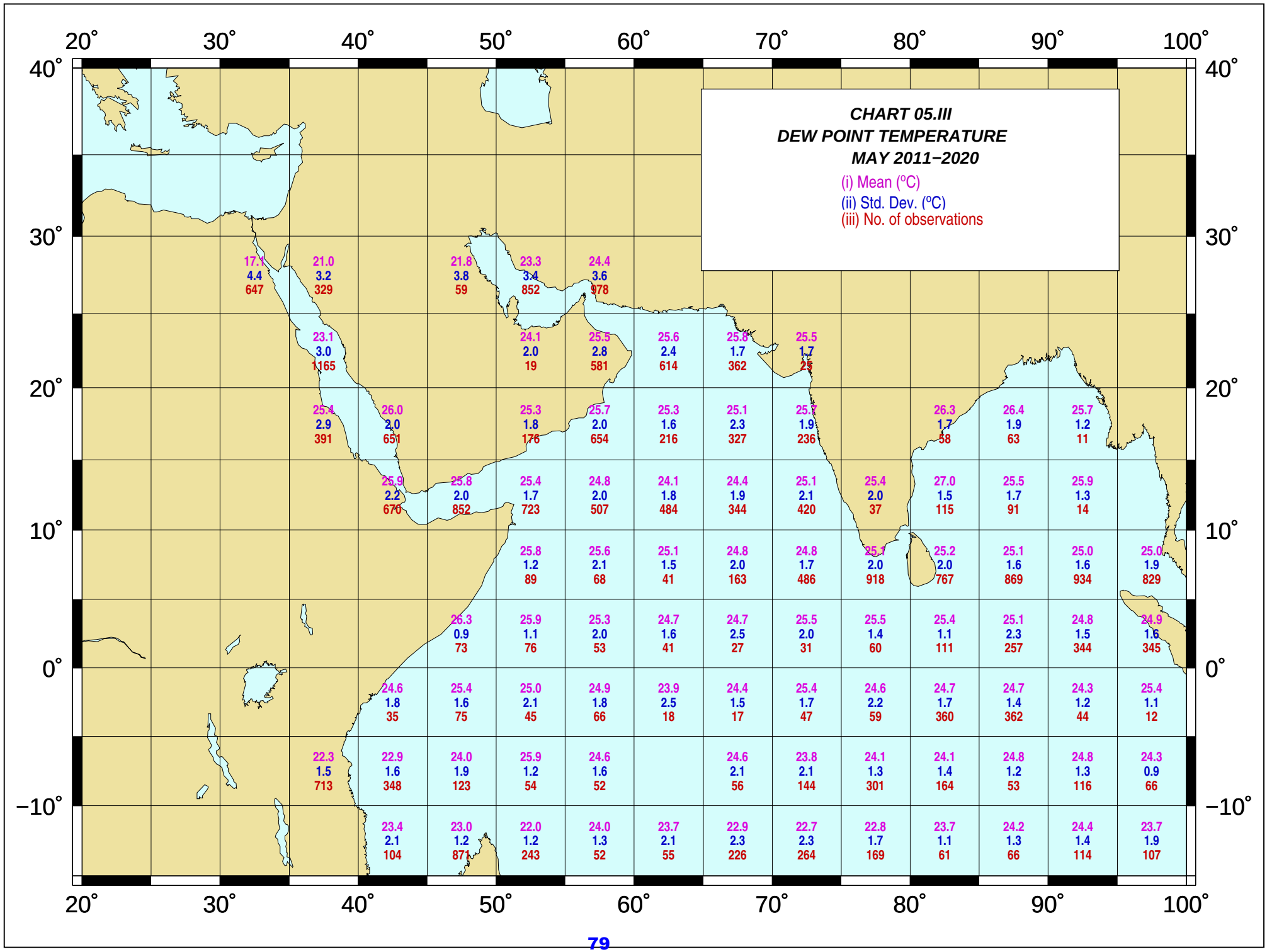


CHART 05.III
DEW POINT TEMPERATURE
MAY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
17.1 4.4 647
21.0 3.2 329
21.8 3.8 59
23.3 3.4 852
24.4 3.6 978
23.1 3.0 1165
24.1 2.0 19
25.5 2.8 581
25.6 2.4 614
25.8 1.7 362
25.5 1.7 25
25.4 2.9 391
26.0 2.0 651
25.3 1.8 176
25.7 2.0 654
25.3 1.6 216
25.1 2.3 327
25.7 1.9 236
26.3 1.7 38
26.4 1.9 63
25.7 1.2 11
25.9 2.2 670
25.8 2.0 852
25.4 1.7 723
24.8 2.0 507
24.1 1.8 484
24.4 1.9 344
25.1 2.1 420
25.4 2.0 37
27.0 1.5 115
25.5 1.7 91
25.9 1.3 14
25.8 1.2 89
25.6 2.1 68
25.1 1.5 41
24.8 2.0 163
24.8 1.7 486
25.1 2.0 918
25.2 2.0 767
25.1 1.6 869
25.0 1.6 934
25.0 1.9 829
26.3 0.9 73
25.9 1.1 76
25.3 2.0 53
24.7 1.6 41
24.7 2.5 27
25.5 2.0 31
25.5 1.4 60
25.4 1.1 111
25.1 2.3 257
24.8 1.5 344
24.9 1.6 345
24.6 1.8 35
25.4 1.6 75
25.0 2.1 45
24.9 1.8 66
23.9 2.5 18
24.4 1.5 17
25.4 1.7 47
24.6 2.2 59
24.7 1.7 360
24.7 1.4 362
24.3 1.2 44
25.4 1.1 12
22.3 1.5 713
22.9 1.6 348
24.0 1.9 123
25.9 1.2 54
24.6 1.6 52
24.6 2.1 56
23.8 2.1 144
24.1 1.3 301
24.1 1.4 164
24.8 1.2 53
24.8 1.3 116
24.3 0.9 66
23.4 2.1 104
23.0 1.2 871
22.0 1.2 243
24.0 1.3 52
23.7 2.1 55
22.9 2.3 226
22.7 2.3 264
22.8 1.7 169
23.7 1.1 61
24.2 1.3 66
24.4 1.4 114
23.7 1.9 107

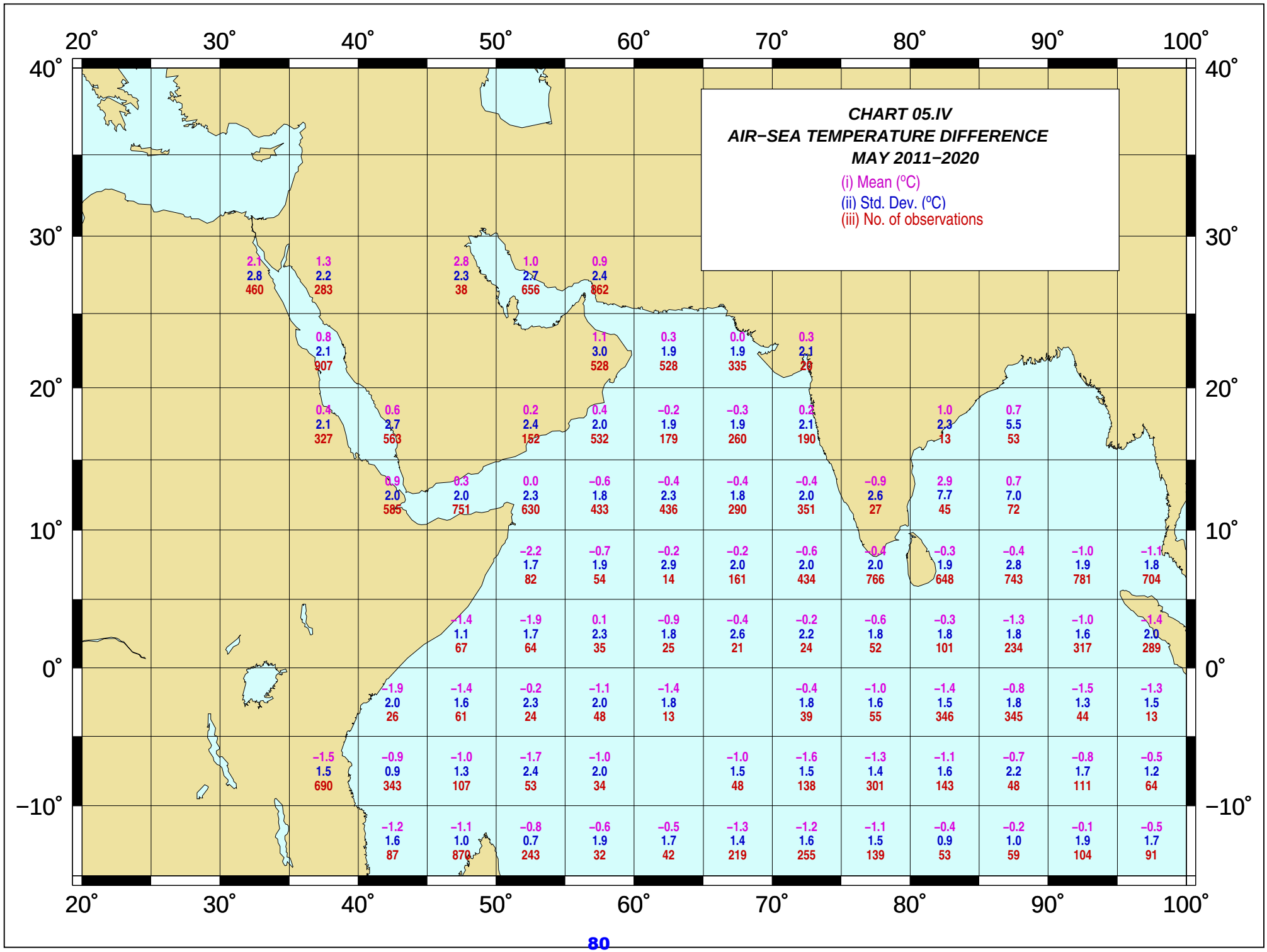


CHART 05.IV
AIR–SEA TEMPERATURE DIFFERENCE
MAY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.1 2.8 460
1.3 2.2 283
2.8 2.3 38
1.0 2.7 656
0.9 2.4 862
0.8 2.1 907
1.1 3.0 528
0.3 1.9 528
0.0 1.9 335
0.3 2.1 26
0.4 2.1 327
0.6 2.7 563
0.2 2.4 152
0.4 2.0 532
−0.2 1.9 179
−0.3 1.9 260
0.2 2.1 190
1.0 2.3 13
0.7 5.5 53
0.9 2.0 585
0.3 2.0 751
0.0 2.3 630
−0.6 1.8 433
−0.4 2.3 436
−0.4 1.8 290
−0.4 2.0 351
−0.9 2.6 27
2.9 7.7 45
0.7 7.0 72
−2.2 1.7 82
−0.7 1.9 54
−0.2 2.9 14
−0.2 2.0 161
−0.6 2.0 434
−0.4 2.0 766
−0.3 1.9 648
−0.4 2.8 743
−1.0 1.9 781
−1.1 1.8 704
−1.4 1.1 67
−1.9 1.7 64
0.1 2.3 35
−0.9 1.8 25
−0.4 2.6 21
−0.2 2.2 24
−0.6 1.8 52
−0.3 1.8 101
−1.3 1.8 234
−1.0 1.6 317
−1.4 2.0 289
−1.9 2.0 26
−1.4 1.6 61
−0.2 2.3 24
−1.1 2.0 48
−1.4 1.8 13
−0.4 1.8 39
−1.0 1.6 55
−1.4 1.5 346
−0.8 1.8 345
−1.5 1.3 44
−1.3 1.5 13
−1.5 1.5 690
−0.9 0.9 343
−1.0 1.3 107
−1.7 2.4 53
−1.0 2.0 34
−1.0 1.5 48
−1.6 1.5 138
−1.3 1.4 301
−1.1 1.6 143
−0.7 2.2 48
−0.8 1.7 111
−0.5 1.2 64
−1.2 1.6 87
−1.1 1.0 870
−0.8 0.7 243
−0.6 1.9 32
−0.5 1.7 42
−1.3 1.4 219
−1.2 1.6 255
−1.1 1.5 139
−0.4 0.9 53
−0.2 1.0 59
−0.1 1.9 104
−0.5 1.7 91

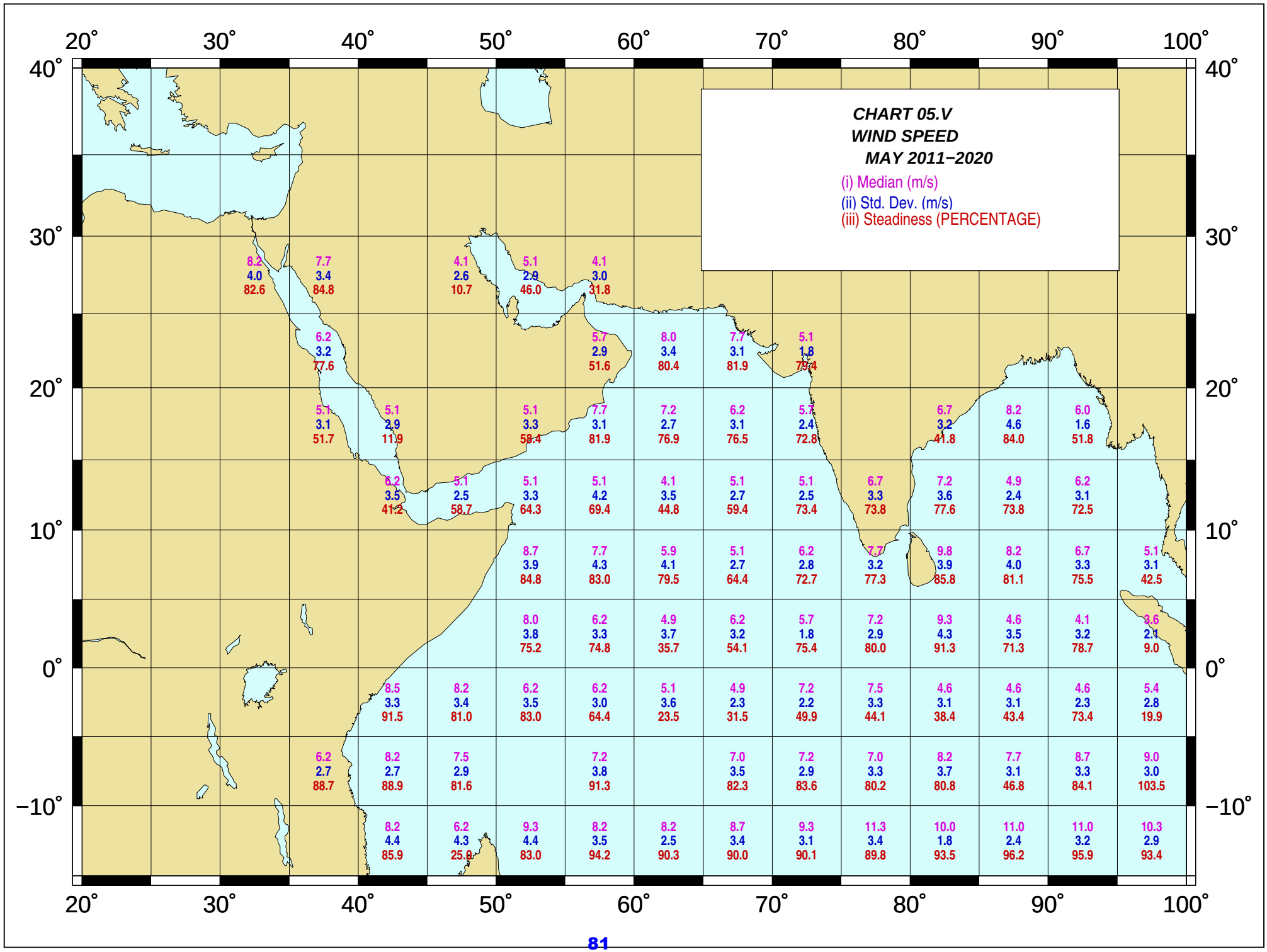


CHART 05.V
WIND SPEED
MAY 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
8.2 4.0 82.6
7.7 3.4 84.8
4.1 2.6 10.7
5.1 2.9 46.0
4.1 3.0 31.8
6.2 3.2 77.6
5.7 2.9 51.6
8.0 3.4 80.4
7.7 3.1 81.9
5.1 1.8 79.4
5.1 3.1 51.7
5.1 2.9 11.9
5.1 3.3 58.4
7.7 3.1 81.9
7.2 2.7 76.9
6.2 3.1 76.5
5.7 2.4 72.8
6.7 3.2 41.8
8.2 4.6 84.0
6.0 1.6 51.8
6.2 3.5 41.2
5.1 2.5 58.7
5.1 3.3 64.3
5.1 4.2 69.4
4.1 3.5 44.8
5.1 2.7 59.4
5.1 2.5 73.4
6.7 3.3 73.8
7.2 3.6 77.6
4.9 2.4 73.8
6.2 3.1 72.5
8.7 3.9 84.8
7.7 4.3 83.0
5.9 4.1 79.5
5.1 2.7 64.4
6.2 2.8 72.7
7.7 3.2 77.3
9.8 3.9 85.8
8.2 4.0 81.1
6.7 3.3 75.5
5.1 3.1 42.5
8.0 3.8 75.2
6.2 3.3 74.8
4.9 3.7 35.7
6.2 3.2 54.1
5.7 1.8 75.4
7.2 2.9 80.0
9.3 4.3 91.3
4.6 3.5 71.3
4.1 3.2 78.7
3.6 2.1 9.0
8.5 3.3 91.5
8.2 3.4 81.0
6.2 3.5 83.0
6.2 3.0 64.4
5.1 3.6 23.5
4.9 2.3 31.5
7.2 2.2 49.9
7.5 3.3 44.1
4.6 3.1 38.4
4.6 3.1 43.4
4.6 2.3 73.4
5.4 2.8 19.9
6.2 2.7 88.7
8.2 2.7 88.9
7.5 2.9 81.6
7.2 3.8 91.3
7.0 3.5 82.3
7.2 2.9 83.6
7.0 3.3 80.2
8.2 3.7 80.8
7.7 3.1 46.8
8.7 3.3 84.1
9.0 3.0 103.5
8.2 4.4 85.9
6.2 4.3 25.0
9.3 4.4 83.0
8.2 3.5 94.2
8.2 2.5 90.3
8.7 3.4 90.0
9.3 3.1 90.1
11.3 3.4 89.8
10.0 1.8 93.5
11.0 2.4 96.2
11.0 3.2 95.9
10.3 2.9 93.4

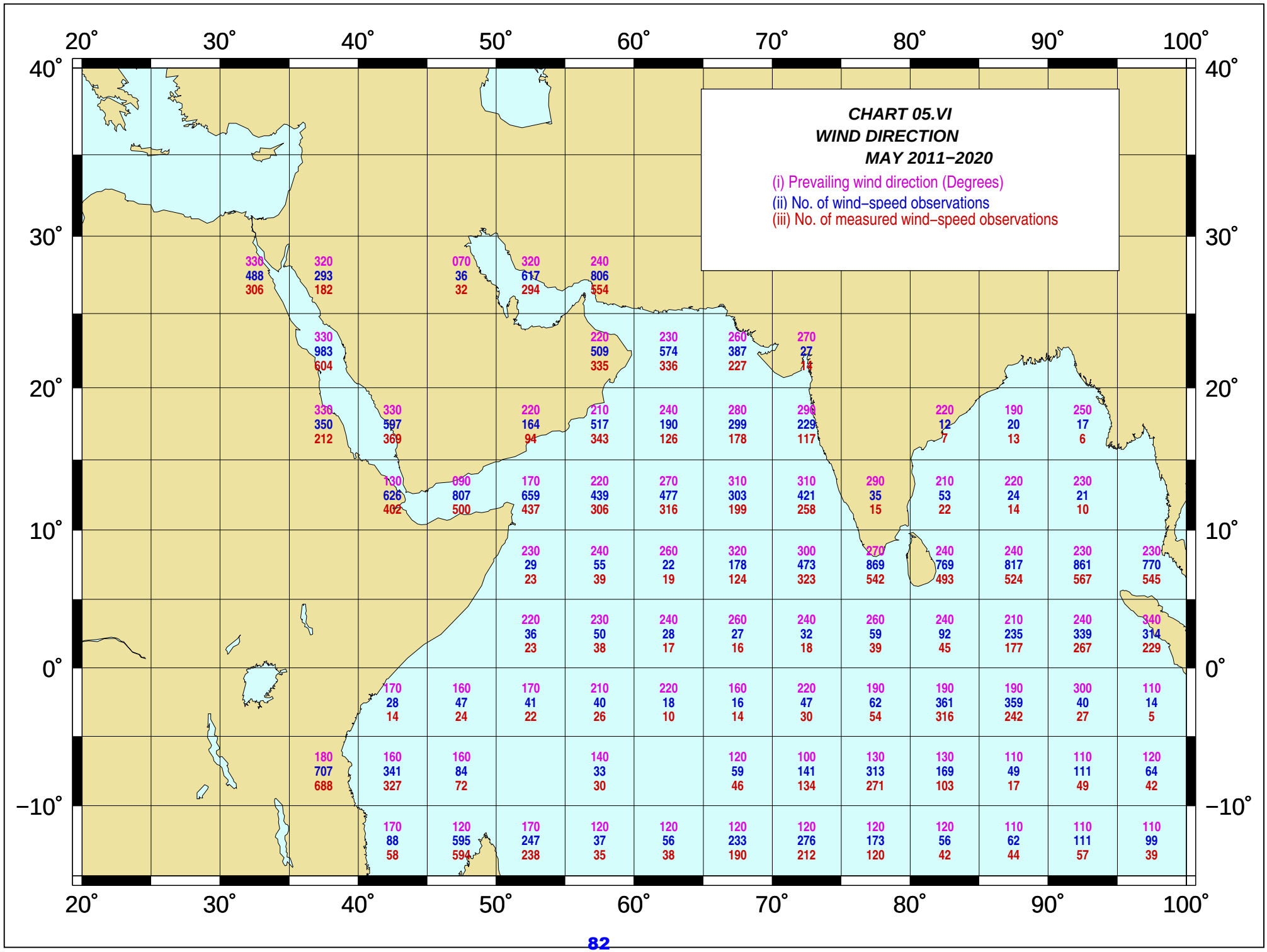


CHART 05.VI
WIND DIRECTION
MAY 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
330 488 306
320 293 182
070 36 32
320 617 294
240 806 554
330 983 604
220 509 335
230 574 336
260 387 227
270 27 14
330 350 212
330 597 369
220 164 94
210 517 343
240 190 126
280 299 178
290 229 117
220 12 7
190 20 13
250 17 6
130 626 402
090 807 500
170 659 437
220 439 306
270 477 316
310 303 199
310 421 258
290 35 15
210 53 22
220 24 14
230 21 10
230 29 23
240 55 39
260 22 19
320 178 124
300 473 323
270 869 542
240 769 493
240 817 524
230 861 567
230 770 545
220 36 23
230 50 38
240 28 17
260 27 16
240 32 18
260 59 39
240 92 45
210 235 177
240 339 267
340 314 229
170 28 14
160 47 24
170 41 22
210 40 26
220 18 10
160 16 14
220 47 30
190 62 54
190 361 316
190 359 242
300 40 27
110 14 5
180 707 688
160 341 327
160 84 72
140 33 30
120 59 46
100 141 134
130 313 271
130 169 103
110 49 17
110 111 49
120 64 42
170 88 58
120 595 594
170 247 238
120 37 35
120 56 38
120 233 190
120 276 212
120 173 120
120 56 42
110 62 44
110 111 57
110 99 39

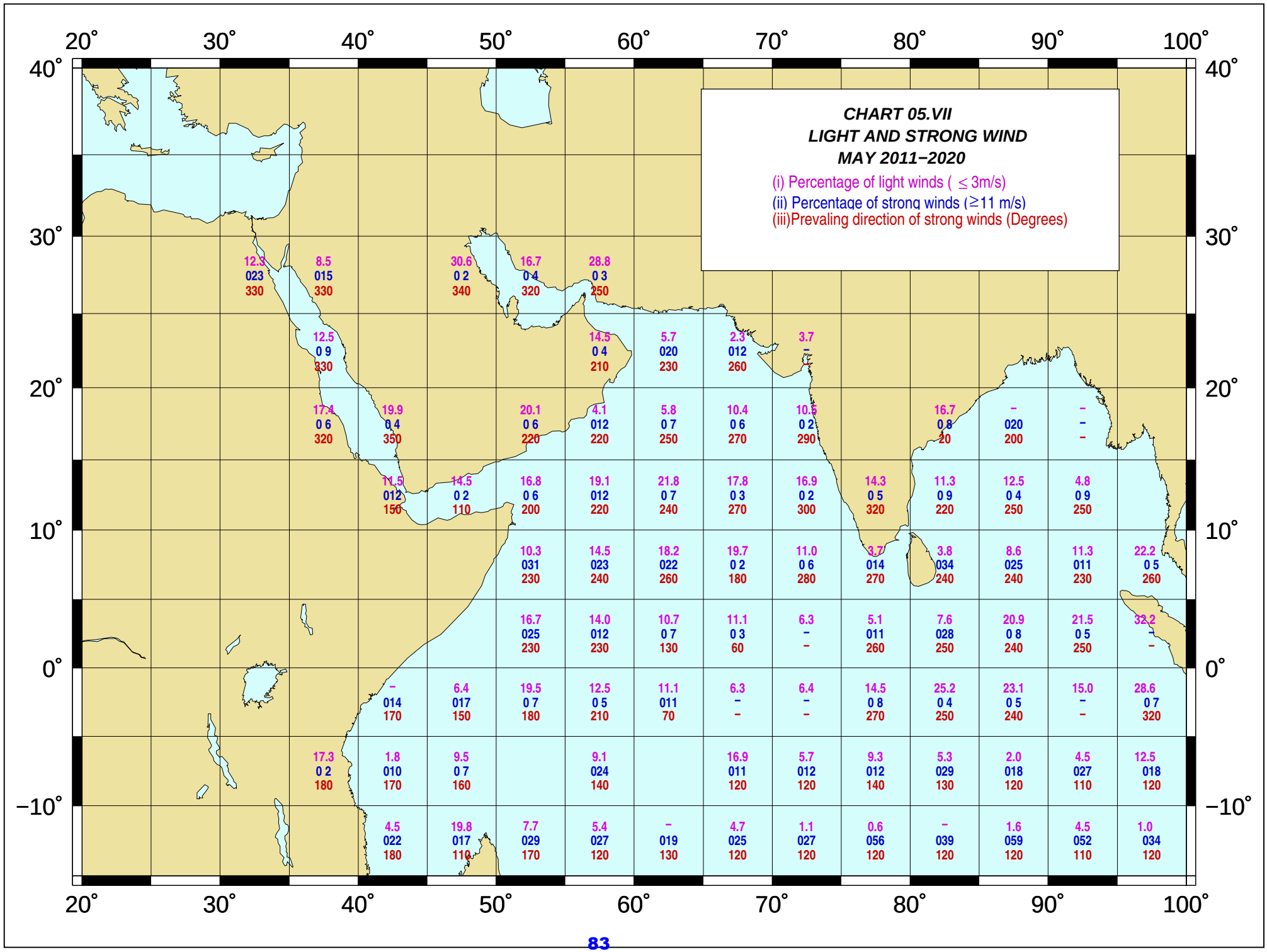


CHART 05.VII
LIGHT AND STRONG WIND
MAY 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
12.3 023 330
8.5 015 330
30.6 0 2 340
16.7 0 4 320
28.8 0 3 250
12.5 0 9 330
14.5 0 4 210
5.7 020 230
2.3 012 260
3.7 –
17.4 0 6 320
19.9 0 4 350
20.1 0 6 220
4.1 012 220
5.8 0 7 250
10.4 0 6 270
10.5 0 2 290
16.7 0 8 20
– 020 200
– – –
11.5 012 150
14.5 0 2 110
16.8 0 6 200
19.1 012 220
21.8 0 7 240
17.8 0 3 270
16.9 0 2 300
14.3 0 5 320
11.3 0 9 220
12.5 0 4 250
4.8 0 9 250
10.3 031 230
14.5 023 240
18.2 022 260
19.7 0 2 180
11.0 0 6 280
3.7 014 270
3.8 034 240
8.6 025 240
11.3 011 230
22.2 0 5 260
16.7 025 230
14.0 012 230
10.7 0 7 130
11.1 0 3 60
6.3 – –
5.1 011 260
7.6 028 250
20.9 0 8 240
21.5 0 5 250
32.2 – –
– 014 170
6.4 017 150
19.5 0 7 180
12.5 0 5 210
11.1 011 70
6.3 – –
6.4 – –
14.5 0 8 270
25.2 0 4 250
23.1 0 5 240
15.0 – –
28.6 0 7 320
17.3 0 2 180
1.8 010 170
9.5 0 7 160
9.1 024 140
16.9 011 120
5.7 012 120
9.3 012 140
5.3 029 130
2.0 018 120
4.5 027 110
12.5 018 120
4.5 022 180
19.8 017 110
7.7 029 170
5.4 027 120
– 019 130
4.7 025 120
1.1 027 120
0.6 056 120
– 039 120
1.6 059 120
4.5 052 110
1.0 034 120

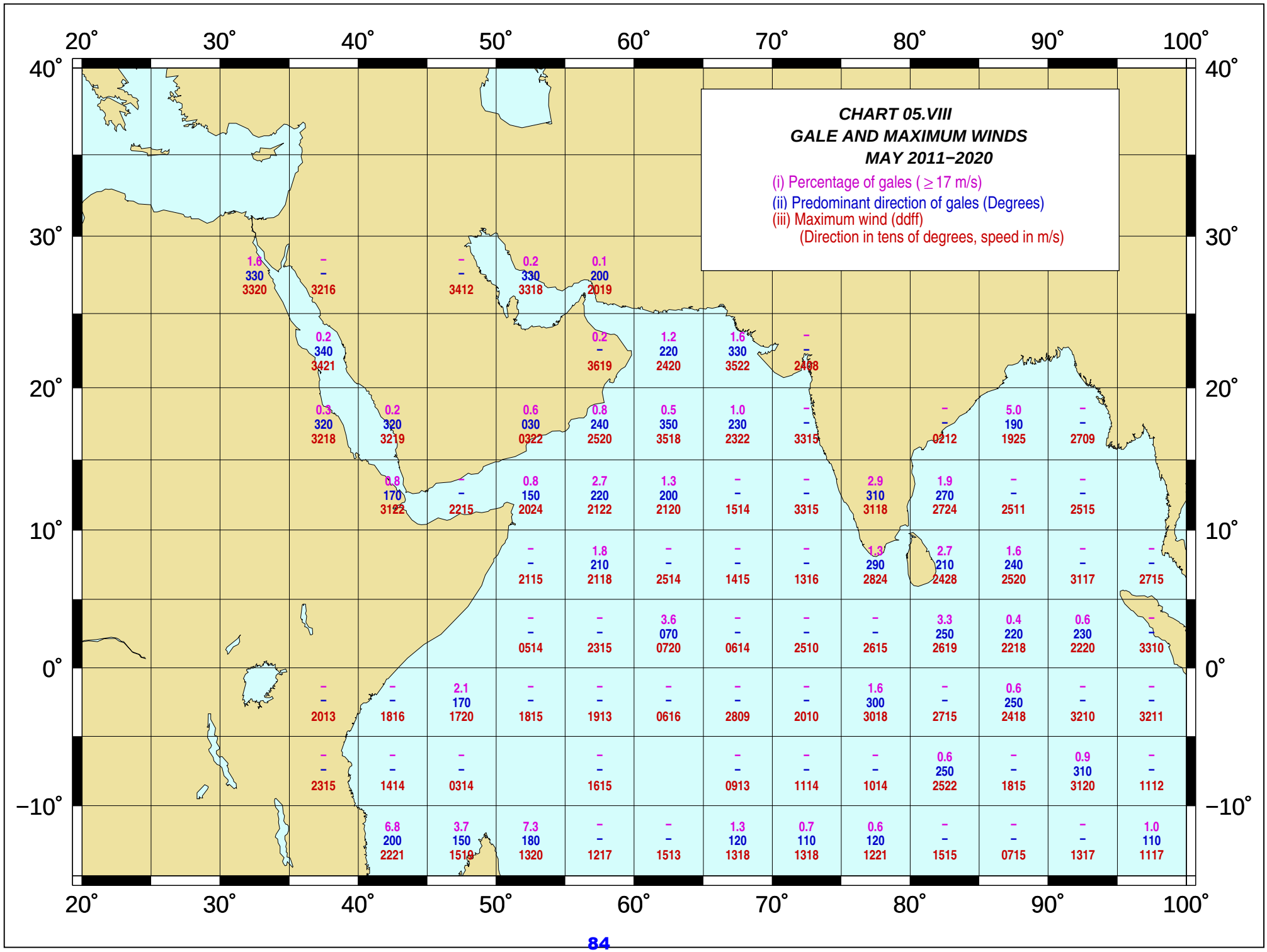


CHART 05.VIII
GALE AND MAXIMUM WINDS
MAY 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.6 330 3320
– – 3216
– – 3412
0.2 330 3318
0.1 200 2019
0.2 340 3421
0.2 – 3619
1.2 220 2420
1.6 330 3522
– – 2408
0.3 320 3218
0.2 320 3219
0.6 030 0322
0.8 240 2520
0.5 350 3518
1.0 230 2322
– – 3315
– – 0212
5.0 190 1925
– – 2709
0.8 170 3122
– – 2215
0.8 150 2024
2.7 220 2122
1.3 200 2120
– – 1514
– – 3315
2.9 310 3118
1.9 270 2724
– – 2511
– – 2515
– – 2115
1.8 210 2118
– – 2514
– – 1415
– – 1316
1.3 290 2824
2.7 210 2428
1.6 240 2520
– – 3117
– – 2715
– – 0514
– – 2315
3.6 070 0720
– – 0614
– – 2510
– – 2615
3.3 250 2619
0.4 220 2218
0.6 230 2220
– – 3310
– – 2013
– – 1816
2.1 170 1720
– – 1815
– – 1913
– – 0616
– – 2809
– – 2010
1.6 300 3018
– – 2715
0.6 250 2418
– – 3210
– – 3211
– – 2315
– – 1414
– – 0314
– – 1615
– – 0913
– – 1114
– – 1014
0.6 250 2522
– – 1815
0.9 310 3120
– – 1112
6.8 200 2221
3.7 150 1510
7.3 180 1320
– – 1217
– – 1513
1.3 120 1318
0.7 110 1318
0.6 120 1221
– – 1515
– – 0715
– – 1317
1.0 110 1117

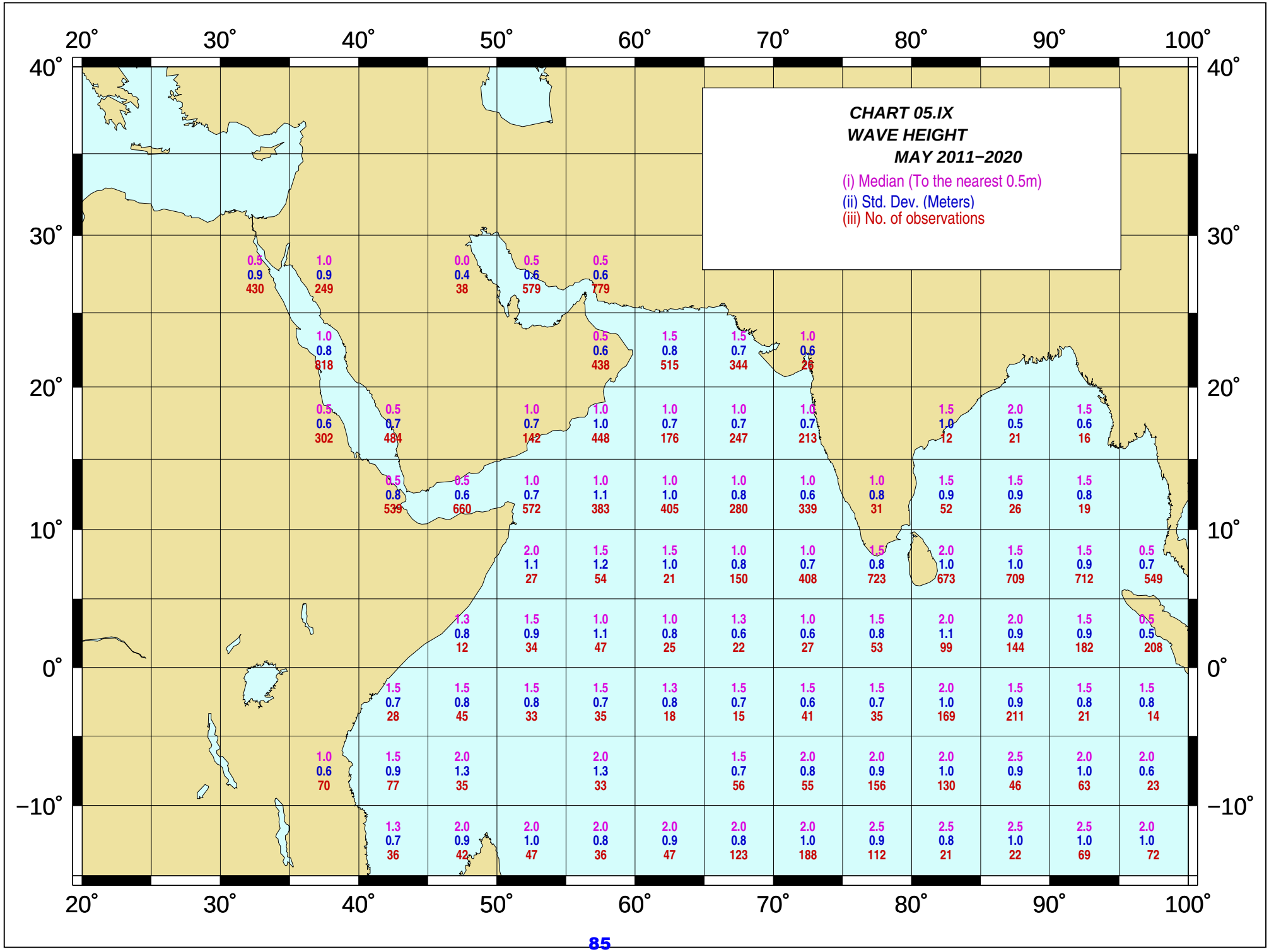


CHART 05.IX
WAVE HEIGHT
MAY 2011–2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.5 0.9 430
1.0 0.9 249
0.0 0.4 38
0.5 0.6 579
0.5 0.6 779
1.0 0.8 818
0.5 0.6 438
1.5 0.8 515
1.5 0.7 344
1.0 0.6 26
0.5 0.6 302
0.5 0.7 484
1.0 0.7 142
1.0 1.0 448
1.0 0.7 176
1.0 0.7 247
1.0 0.7 213
1.5 1.0 12
2.0 0.5 21
1.5 0.6 16
0.5 0.8 539
0.5 0.6 660
1.0 0.7 572
1.0 1.1 383
1.0 1.0 405
1.0 0.8 280
1.0 0.6 339
1.0 0.8 31
1.5 0.9 52
1.5 0.9 26
1.5 0.8 19
2.0 1.1 27
1.5 1.2 54
1.5 1.0 21
1.0 0.8 150
1.0 0.7 408
1.5 0.8 723
2.0 1.0 673
1.5 1.0 709
1.5 0.9 712
0.5 0.7 549
1.3 0.8 12
1.5 0.9 34
1.0 1.1 47
1.0 0.8 25
1.3 0.6 22
1.0 0.6 27
1.5 0.8 53
2.0 1.1 99
2.0 0.9 144
1.5 0.9 182
0.5 0.5 208
1.5 0.7 28
1.5 0.8 45
1.5 0.8 33
1.5 0.7 35
1.3 0.8 18
1.5 0.7 15
1.5 0.6 41
1.5 0.7 35
2.0 1.0 169
1.5 0.9 211
1.5 0.8 21
1.5 0.8 14
1.0 0.6 70
1.5 0.9 77
2.0 1.3 35
2.0 1.3 33
1.5 0.7 56
2.0 0.8 55
2.0 0.9 156
2.0 1.0 130
2.5 0.9 46
2.0 1.0 63
2.0 0.6 23
1.3 0.7 36
2.0 0.9 42
2.0 1.0 47
2.0 0.8 36
2.0 0.9 47
2.0 0.8 123
2.0 1.0 188
2.5 0.9 112
2.5 0.8 21
2.5 1.0 22
2.5 1.0 69
2.0 1.0 72

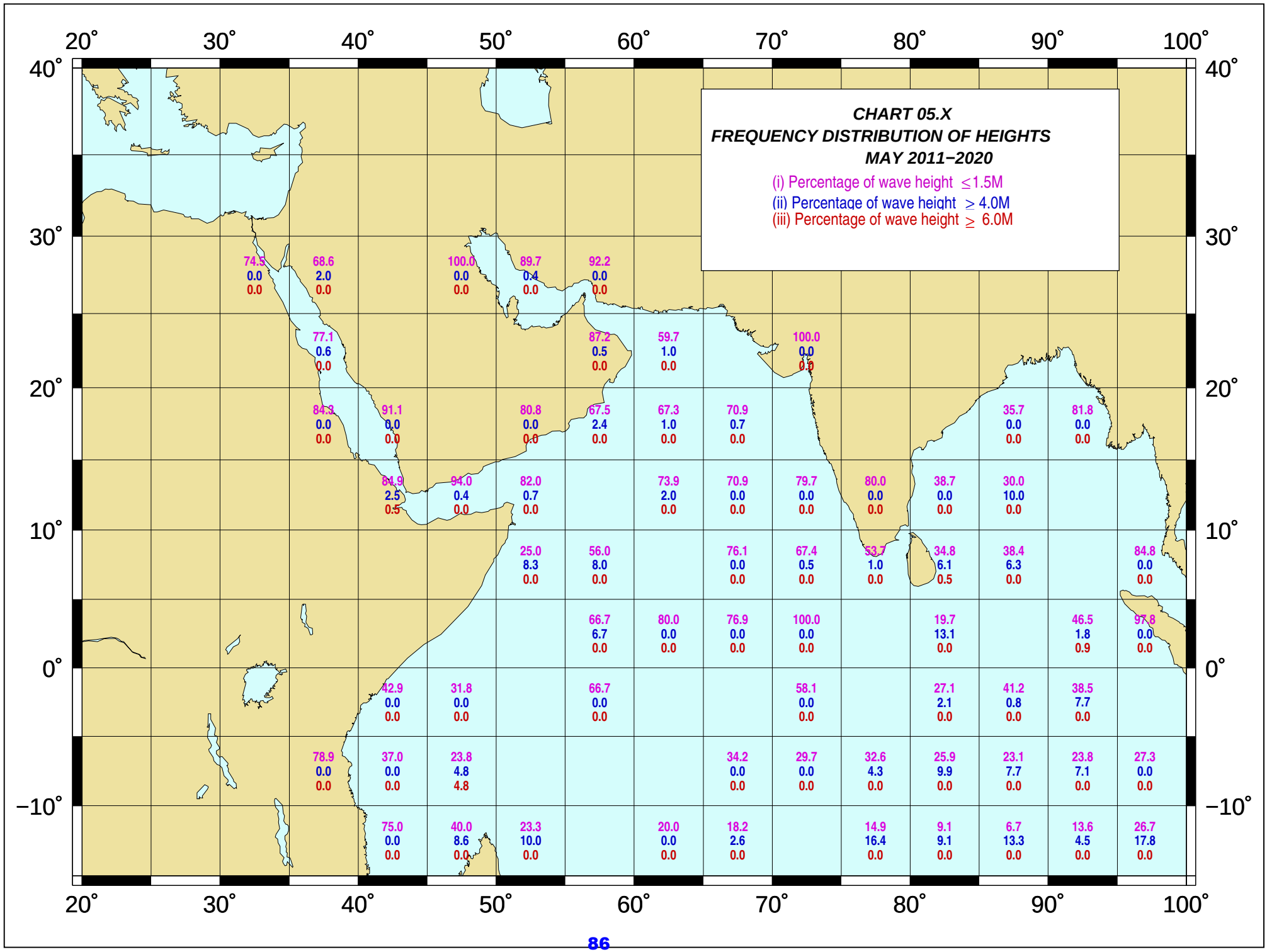


CHART 05.X
FREQUENCY DISTRIBUTION OF HEIGHTS
MAY 2011–2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
74.5 0.0 0.0
68.6 2.0 0.0
100.0 0.0 0.0
89.7 0.4 0.0
92.2 0.0 0.0
77.1 0.6 0.0
87.2 0.5 0.0
59.7 1.0 0.0
100.0 0.0 0.0
84.3 0.0 0.0
91.1 0.0 0.0
80.8 0.0 0.0
67.5 2.4 0.0
67.3 1.0 0.0
70.9 0.7 0.0
35.7 0.0 0.0
81.8 0.0 0.0
84.9 2.5 0.5
94.0 0.4 0.0
82.0 0.7 0.0
73.9 2.0 0.0
70.9 0.0 0.0
79.7 0.0 0.0
80.0 0.0 0.0
38.7 0.0 0.0
30.0 10.0 0.0
25.0 8.3 0.0
56.0 8.0 0.0
76.1 0.0 0.0
67.4 0.5 0.0
53.7 1.0 0.0
34.8 6.1 0.5
38.4 6.3 0.0
84.8 0.0 0.0
66.7 6.7 0.0
80.0 0.0 0.0
76.9 0.0 0.0
100.0 0.0 0.0
19.7 13.1 0.0
46.5 1.8 0.9
97.8 0.0 0.0
42.9 0.0 0.0
31.8 0.0 0.0
66.7 0.0 0.0
58.1 0.0 0.0
27.1 2.1 0.0
41.2 0.8 0.0
38.5 7.7 0.0
78.9 0.0 0.0
37.0 0.0 0.0
23.8 4.8 4.8
34.2 0.0 0.0
29.7 0.0 0.0
32.6 4.3 0.0
25.9 9.9 0.0
23.1 7.7 0.0
23.8 7.1 0.0
27.3 0.0 0.0
75.0 0.0 0.0
40.0 8.6 0.0
23.3 10.0 0.0
20.0 0.0 0.0
18.2 2.6 0.0
14.9 16.4 0.0
9.1 9.1 0.0
6.7 13.3 0.0
13.6 4.5 0.0
26.7 17.8 0.0

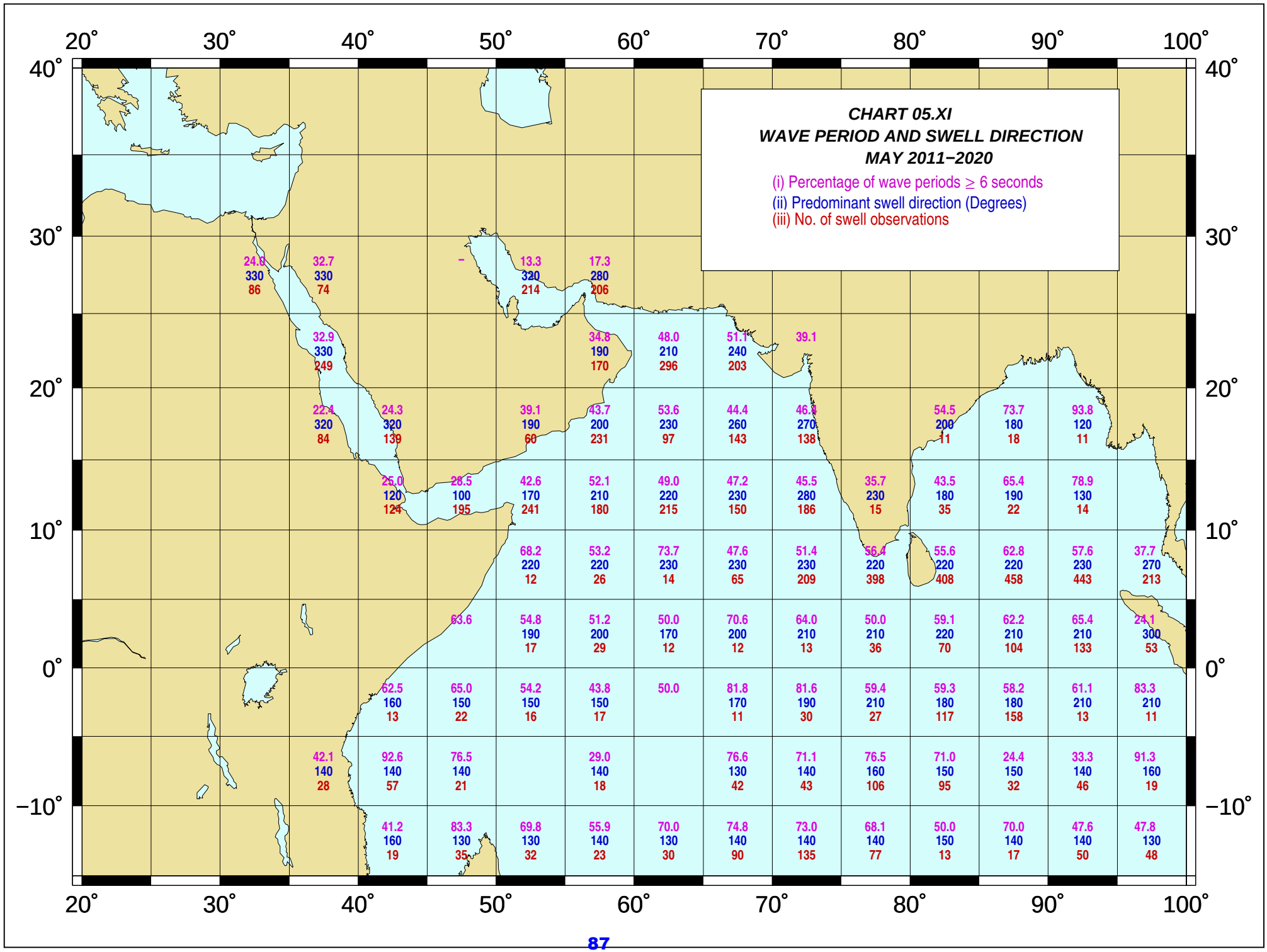


CHART 05.XI
WAVE PERIOD AND SWELL DIRECTION
MAY 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
24.8 330 86
32.7 330 74
- 13.3 320 214
17.3 280 206
32.9 330 249
34.8 190 170
48.0 210 296
51.1 240 203
39.1
22.4 320 84
24.3 320 139
39.1 190 60
43.7 200 231
53.6 230 97
44.4 260 143
46.9 270 138
54.5 200 11
73.7 180 18
93.8 120 11
25.0 120 124
28.5 100 195
42.6 170 241
52.1 210 180
49.0 220 215
47.2 230 150
45.5 280 186
35.7 230 15
43.5 180 35
65.4 190 22
78.9 130 14
68.2 220 12
53.2 220 26
73.7 230 14
47.6 230 65
51.4 230 209
56.4 220 398
55.6 220 408
62.8 220 458
57.6 230 443
37.7 270 213
63.6
54.8 190 17
51.2 200 29
50.0 170 12
70.6 200 12
64.0 210 13
50.0 210 36
59.1 220 70
62.2 210 104
65.4 210 133
24.1 300 53
62.5 160 13
65.0 150 22
54.2 150 16
43.8 150 17
50.0
81.8 170 11
81.6 190 30
59.4 210 27
59.3 180 117
58.2 180 158
61.1 210 13
83.3 210 11
42.1 140 28
92.6 140 57
76.5 140 21
29.0 140 18
76.6 130 42
71.1 140 43
76.5 160 106
71.0 150 95
24.4 150 32
33.3 140 46
91.3 160 19
41.2 160 19
83.3 130 35
69.8 130 32
55.9 140 23
70.0 130 30
74.8 140 90
73.0 140 135
68.1 140 77
50.0 150 13
70.0 140 17
47.6 140 50
47.8 130 48

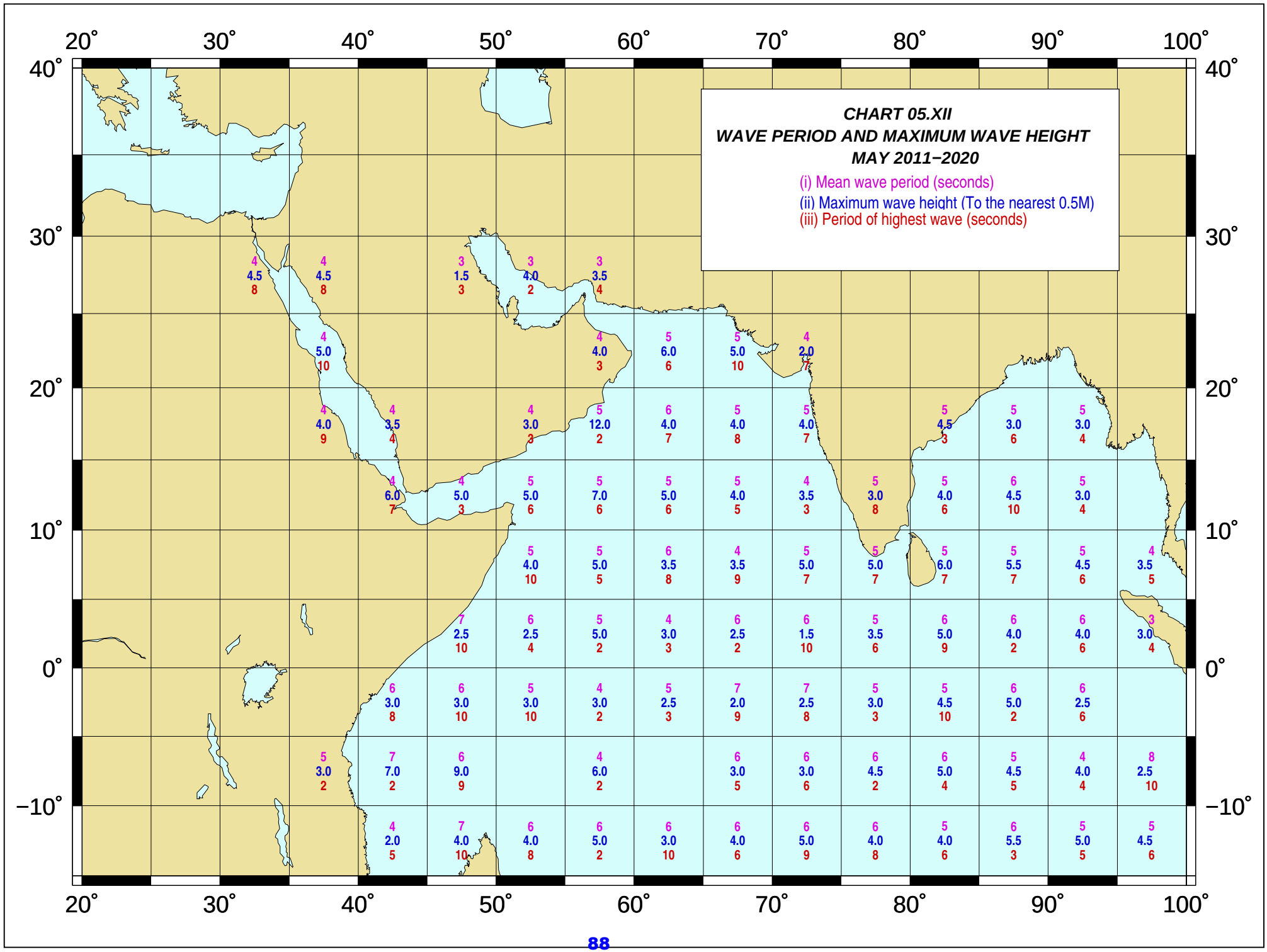


CHART 05.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
MAY 2011–2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
4 4.5 8
4 4.5 8
3 1.5 3
3 4.0 2
3 3.5 4
4 5.0 10
4 4.0 9
4 3.5 4
4 3.0 3
5 12.0 2
6 4.0 7
5 5.0 10
5 4.0 8
4 2.0 7
5 4.5 3
5 3.0 6
5 3.0 4
4 6.0 7
4 5.0 3
5 5.0 6
5 7.0 6
5 5.0 6
5 4.0 5
4 3.5 3
5 3.0 8
5 4.0 6
6 4.5 10
5 3.0 4
5 4.0 10
5 5.0 5
6 3.5 8
4 3.5 9
5 5.0 7
5 5.0 7
5 6.0 7
5 5.5 7
5 4.5 6
4 3.5 5
7 2.5 10
6 2.5 4
5 5.0 2
4 3.0 3
6 2.5 2
6 1.5 10
5 3.5 6
6 5.0 9
6 4.0 2
6 4.0 6
3 3.0 4
6 3.0 8
6 3.0 10
5 3.0 10
4 3.0 2
5 2.5 3
7 2.0 9
7 2.5 8
5 3.0 3
5 4.5 10
6 5.0 2
6 2.5 6
5 3.0 2
7 7.0 2
6 9.0 9
4 6.0 2
6 3.0 5
6 3.0 6
6 4.5 2
6 5.0 4
5 4.5 5
4 4.0 4
8 2.5 10
4 2.0 5
7 4.0 10
6 4.0 8
6 5.0 2
6 3.0 10
6 4.0 6
6 5.0 9
6 4.0 8
5 4.0 6
6 5.5 3
5 5.0 5
5 4.5 6

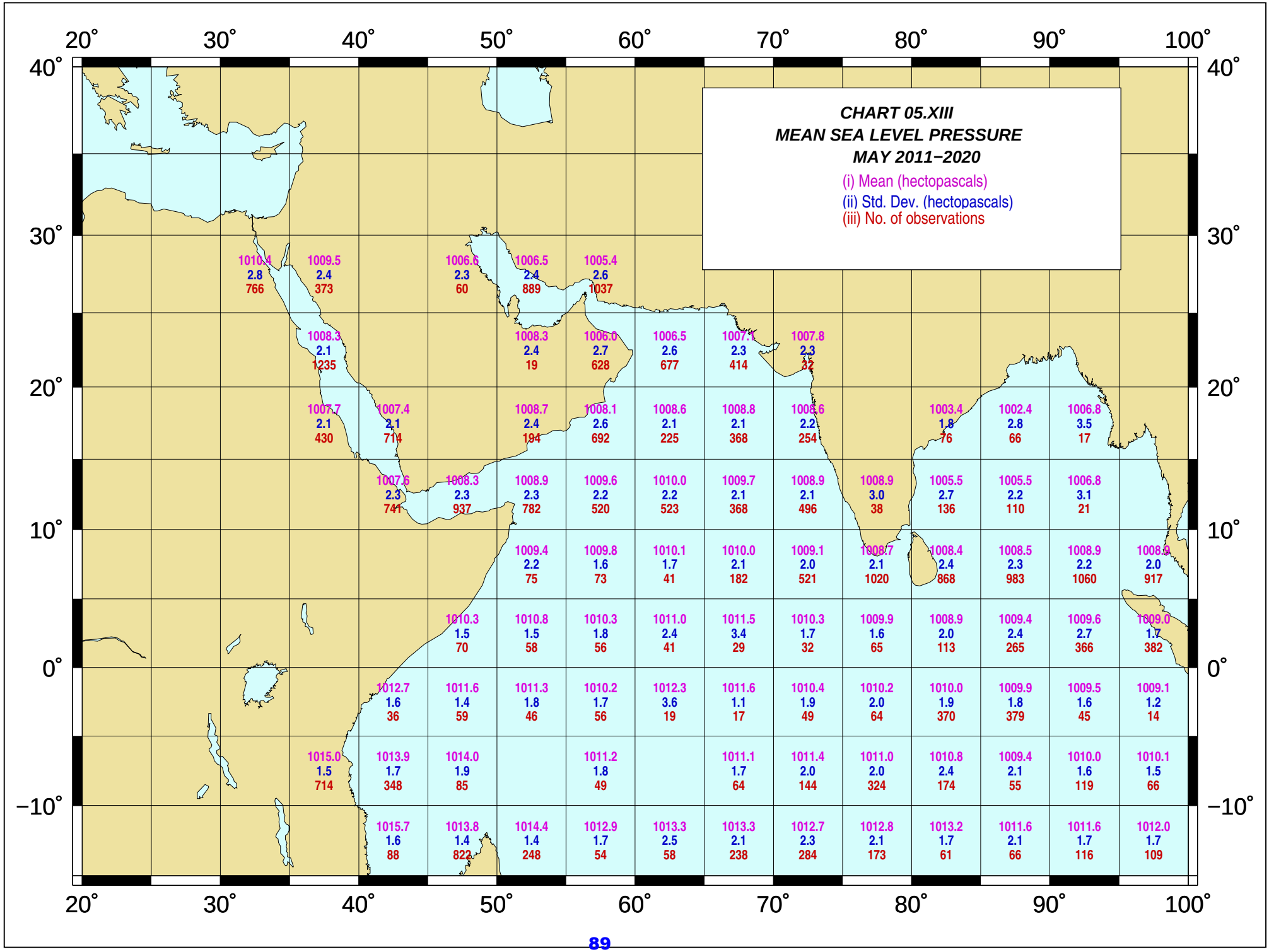


CHART 05.XIII
MEAN SEA LEVEL PRESSURE
MAY 2011–2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1010.4 2.8 766
1009.5 2.4 373
1006.6 2.3 60
1006.5 2.4 889
1005.4 2.6 1037
1008.3 2.1 1235
1008.3 2.4 19
1006.0 2.7 628
1006.5 2.6 677
1007.1 2.3 414
1007.8 2.3 32
1007.7 2.1 430
1007.4 2.1 714
1008.7 2.4 194
1008.1 2.6 692
1008.6 2.1 225
1008.8 2.1 368
1008.6 2.2 254
1003.4 1.8 76
1002.4 2.8 66
1006.8 3.5 17
1007.6 2.3 741
1008.3 2.3 937
1008.9 2.3 782
1009.6 2.2 520
1010.0 2.2 523
1009.7 2.1 368
1008.9 2.1 496
1008.9 3.0 38
1005.5 2.7 136
1005.5 2.2 110
1006.8 3.1 21
1009.4 2.2 75
1009.8 1.6 73
1010.1 1.7 41
1010.0 2.1 182
1009.1 2.0 521
1008.7 2.1 1020
1008.4 2.4 868
1008.5 2.3 983
1008.9 2.2 1060
1008.9 2.0 917
1010.3 1.5 70
1010.8 1.5 58
1010.3 1.8 56
1011.0 2.4 41
1011.5 3.4 29
1010.3 1.7 32
1009.9 1.6 65
1008.9 2.0 113
1009.4 2.4 265
1009.6 2.7 366
1009.0 1.7 382
1012.7 1.6 36
1011.6 1.4 59
1011.3 1.8 46
1010.2 1.7 56
1012.3 3.6 19
1011.6 1.1 17
1010.4 1.9 49
1010.2 2.0 64
1010.0 1.9 370
1009.9 1.8 379
1009.5 1.6 45
1009.1 1.2 14
1015.0 1.5 714
1013.9 1.7 348
1014.0 1.9 85
1011.2 1.8 49
1011.1 1.7 64
1011.4 2.0 144
1011.0 2.0 324
1010.8 2.4 174
1009.4 2.1 55
1010.0 1.6 119
1010.1 1.5 66
1015.7 1.6 88
1013.8 1.4 822
1014.4 1.4 248
1012.9 1.7 54
1013.3 2.5 58
1013.3 2.1 238
1012.7 2.3 284
1012.8 2.1 173
1013.2 1.7 61
1011.6 2.1 66
1011.6 1.7 116
1012.0 1.7 109

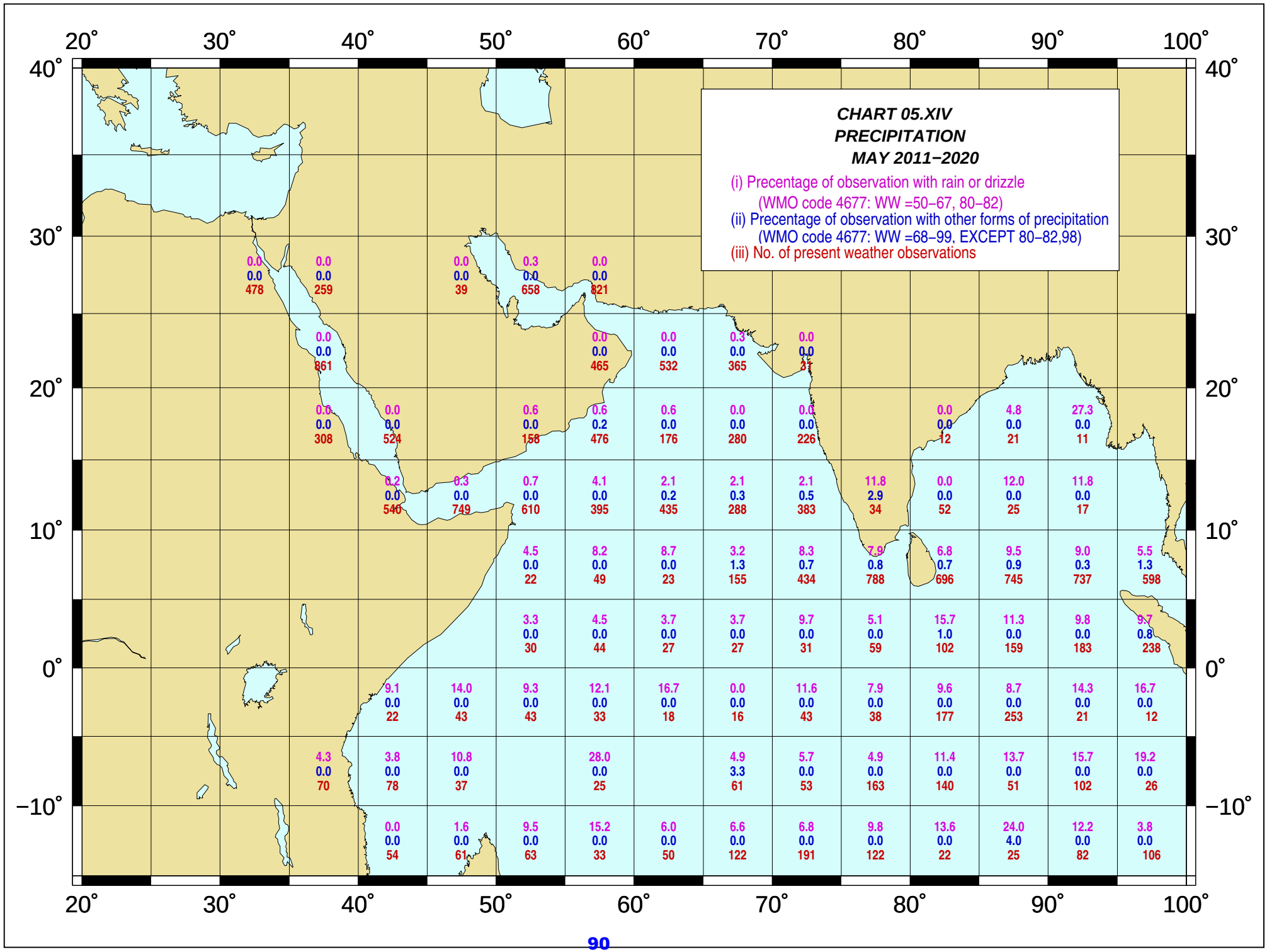


CHART 05.XIV
PRECIPITATION
MAY 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 0.0 478
0.0 0.0 259
0.0 0.0 39
0.3 0.0 658
0.0 0.0 821
0.0 0.0 861
0.0 0.0 465
0.0 0.0 532
0.3 0.0 365
0.0 0.0 31
0.0 0.0 308
0.0 0.0 524
0.6 0.0 158
0.6 0.2 476
0.6 0.0 176
0.0 0.0 280
0.0 0.0 226
0.0 0.0 12
4.8 0.0 21
27.3 0.0 11
0.2 0.0 540
0.3 0.0 749
0.7 0.0 610
4.1 0.0 395
2.1 0.2 435
2.1 0.3 288
2.1 0.5 383
11.8 2.9 34
0.0 0.0 52
12.0 0.0 25
11.8 0.0 17
4.5 0.0 22
8.2 0.0 49
8.7 0.0 23
3.2 1.3 155
8.3 0.7 434
7.9 0.8 788
6.8 0.7 696
9.5 0.9 745
9.0 0.3 737
5.5 1.3 598
3.3 0.0 30
4.5 0.0 44
3.7 0.0 27
3.7 0.0 27
9.7 0.0 31
5.1 0.0 59
15.7 1.0 102
11.3 0.0 159
9.8 0.0 183
9.7 0.8 238
9.1 0.0 22
14.0 0.0 43
9.3 0.0 43
12.1 0.0 33
16.7 0.0 18
0.0 0.0 16
11.6 0.0 43
7.9 0.0 38
9.6 0.0 177
8.7 0.0 253
14.3 0.0 21
16.7 0.0 12
4.3 0.0 70
3.8 0.0 78
10.8 0.0 37
28.0 0.0 25
4.9 3.3 61
5.7 0.0 53
4.9 0.0 163
11.4 0.0 140
13.7 0.0 51
15.7 0.0 102
19.2 0.0 26
0.0 0.0 54
1.6 0.0 61
9.5 0.0 63
15.2 0.0 33
6.0 0.0 50
6.6 0.0 122
6.8 0.0 191
9.8 0.0 122
13.6 0.0 22
24.0 4.0 25
12.2 0.0 82
3.8 0.0 106

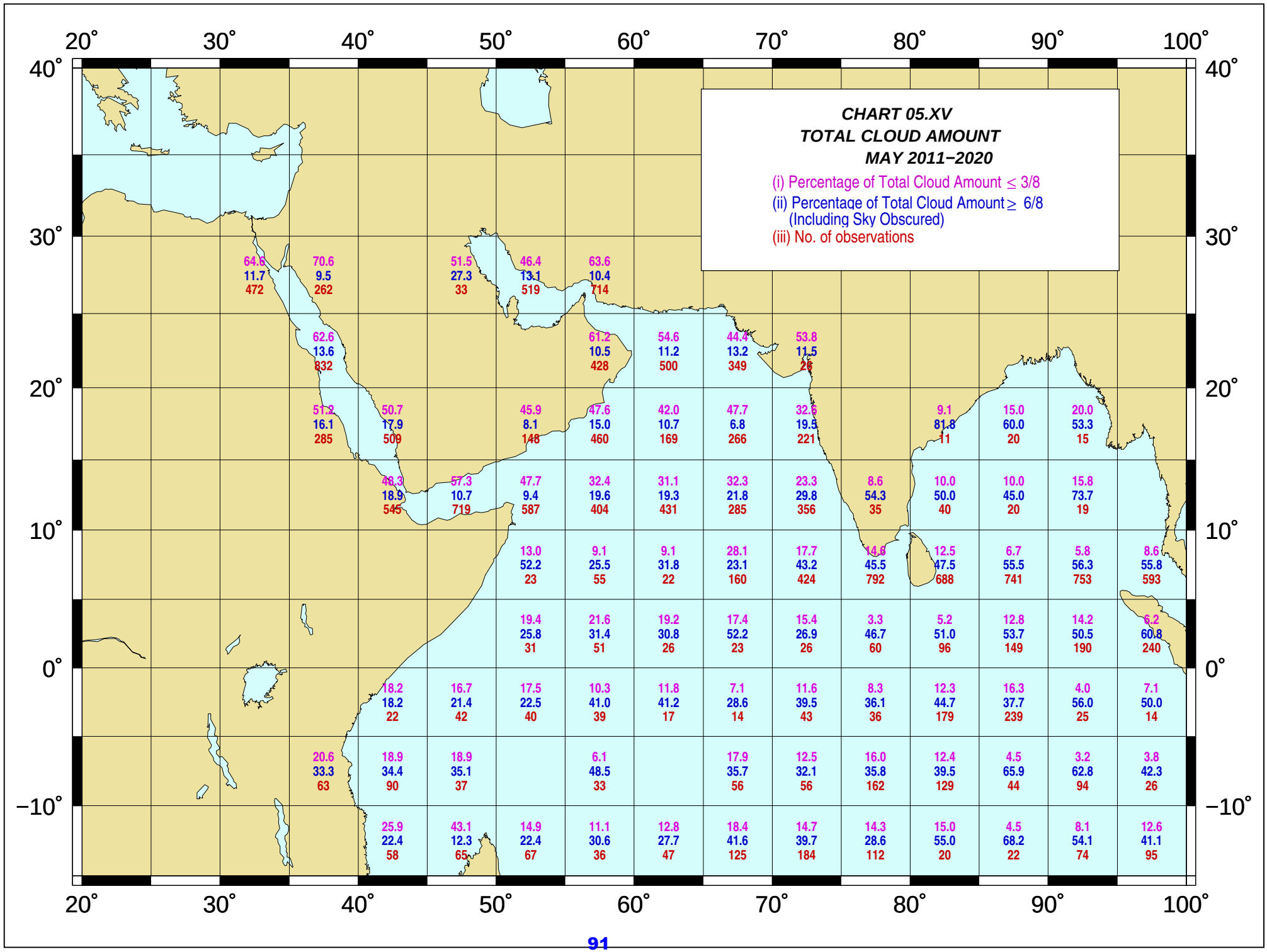


CHART 05.XV
TOTAL CLOUD AMOUNT
MAY 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
64.6 11.7 472
70.6 9.5 262
51.5 27.3 33
46.4 13.1 519
63.6 10.4 714
62.6 13.6 832
61.2 10.5 428
54.6 11.2 500
44.4 13.2 349
53.8 11.5 26
51.2 16.1 285
50.7 17.9 509
45.9 8.1 148
47.6 15.0 460
42.0 10.7 169
47.7 6.8 266
32.6 19.5 221
9.1 81.8 11
15.0 60.0 20
20.0 53.3 15
48.3 18.9 545
57.3 10.7 719
47.7 9.4 587
32.4 19.6 404
31.1 19.3 431
32.3 21.8 285
23.3 29.8 356
8.6 54.3 35
10.0 50.0 40
10.0 45.0 20
15.8 73.7 19
13.0 52.2 23
9.1 25.5 55
9.1 31.8 22
28.1 23.1 160
17.7 43.2 424
14.6 45.5 792
12.5 47.5 688
6.7 55.5 741
5.8 56.3 753
8.6 55.8 593
19.4 25.8 31
21.6 31.4 51
19.2 30.8 26
17.4 52.2 23
15.4 26.9 26
3.3 46.7 60
5.2 51.0 96
12.8 53.7 149
14.2 50.5 190
6.2 60.8 240
18.2 18.2 22
16.7 21.4 42
17.5 22.5 40
10.3 41.0 39
11.8 41.2 17
7.1 28.6 14
11.6 39.5 43
8.3 36.1 36
12.3 44.7 179
16.3 37.7 239
4.0 56.0 25
7.1 50.0 14
20.6 33.3 63
18.9 34.4 90
18.9 35.1 37
6.1 48.5 33
17.9 35.7 56
12.5 32.1 56
16.0 35.8 162
12.4 39.5 129
4.5 65.9 44
3.2 62.8 94
3.8 42.3 26
25.9 22.4 58
43.1 12.3 65
14.9 22.4 67
11.1 30.6 36
12.8 27.7 47
18.4 41.6 125
14.7 39.7 184
14.3 28.6 112
15.0 55.0 20
4.5 68.2 22
8.1 54.1 74
12.6 41.1 95

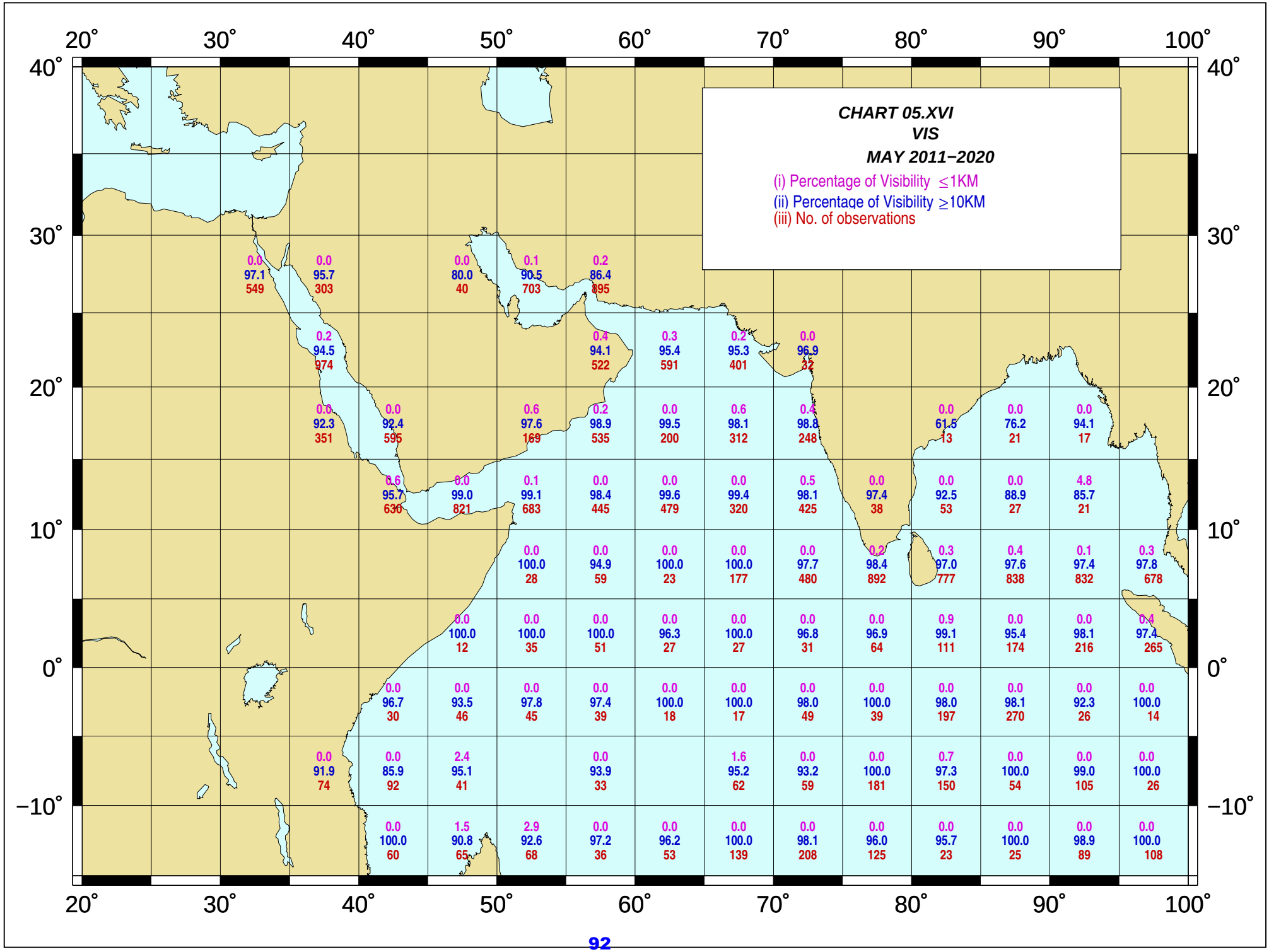


CHART 05.XVI
VIS
MAY 2011–2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 97.1 549
0.0 95.7 303
0.0 80.0 40
0.1 90.5 703
0.2 86.4 895
0.2 94.5 974
0.4 94.1 522
0.3 95.4 591
0.2 95.3 401
0.0 96.9 32
0.0 92.3 351
0.0 92.4 595
0.6 97.6 169
0.2 98.9 535
0.0 99.5 200
0.6 98.1 312
0.4 98.8 248
0.0 61.5 13
0.0 76.2 21
0.0 94.1 17
0.6 95.7 630
0.0 99.0 821
0.1 99.1 683
0.0 98.4 445
0.0 99.6 479
0.0 99.4 320
0.5 98.1 425
0.0 97.4 38
0.0 92.5 53
0.0 88.9 27
4.8 85.7 21
0.0 100.0 28
0.0 94.9 59
0.0 100.0 23
0.0 100.0 177
0.0 97.7 480
0.2 98.4 892
0.3 97.0 777
0.4 97.6 838
0.1 97.4 832
0.3 97.8 678
0.0 100.0 12
0.0 100.0 35
0.0 100.0 51
0.0 96.3 27
0.0 100.0 27
0.0 96.8 31
0.0 96.9 64
0.9 99.1 111
0.0 95.4 174
0.0 98.1 216
0.4 97.4 265
0.0 96.7 30
0.0 93.5 46
0.0 97.8 45
0.0 97.4 39
0.0 100.0 18
0.0 100.0 17
0.0 98.0 49
0.0 100.0 39
0.0 98.0 197
0.0 98.1 270
0.0 92.3 26
0.0 100.0 14
0.0 91.9 74
0.0 85.9 92
2.4 95.1 41
0.0 93.9 33
1.6 95.2 62
0.0 93.2 59
0.0 100.0 181
0.7 97.3 150
0.0 100.0 54
0.0 99.0 105
0.0 100.0 26
0.0 100.0 60
1.5 90.8 65
2.9 92.6 68
0.0 97.2 36
0.0 96.2 53
0.0 100.0 139
0.0 98.1 208
0.0 96.0 125
0.0 95.7 23
0.0 100.0 25
0.0 98.9 89
0.0 100.0 108

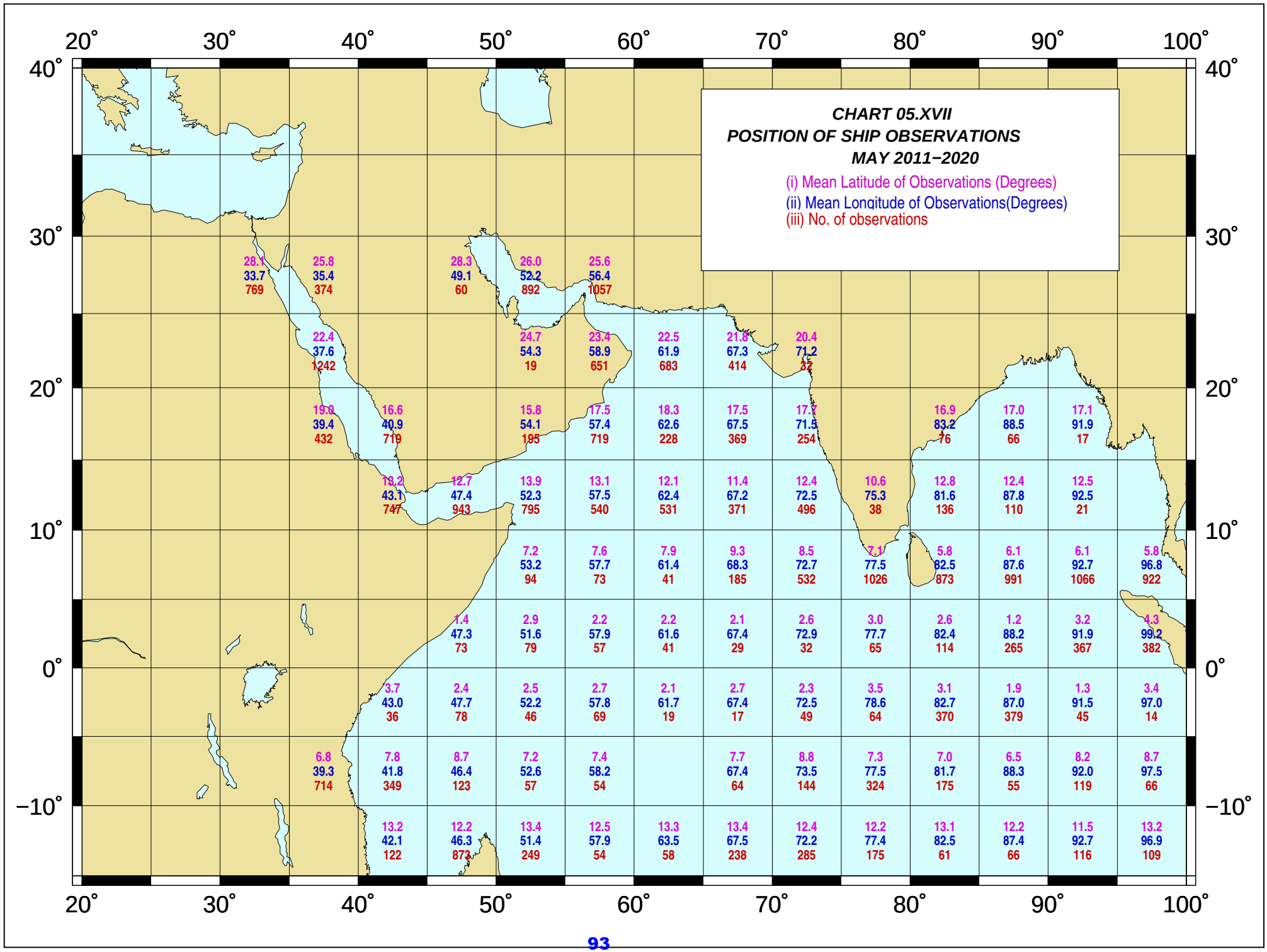


CHART 05.XVII
POSITION OF SHIP OBSERVATIONS
MAY 2011−2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.1 33.7 769
25.8 35.4 374
28.3 49.1 60
26.0 52.2 892
25.6 56.4 1057
22.4 37.6 1242
24.7 54.3 19
23.4 58.9 651
22.5 61.9 683
21.8 67.3 414
20.4 71.2 32
19.9 39.4 432
16.6 40.9 719
15.8 54.1 195
17.5 57.4 719
18.3 62.6 228
17.5 67.5 369
17.7 71.5 254
16.9 83.2 76
17.0 88.5 66
17.1 91.9 17
13.2 43.1 747
12.7 47.4 943
13.9 52.3 795
13.1 57.5 540
12.1 62.4 531
11.4 67.2 371
12.4 72.5 496
10.6 75.3 38
12.8 81.6 136
12.4 87.8 110
12.5 92.5 21
7.2 53.2 94
7.6 57.7 73
7.9 61.4 41
9.3 68.3 185
8.5 72.7 532
7.1 77.5 1026
5.8 82.5 873
6.1 87.6 991
6.1 92.7 1066
5.8 96.8 922
1.4 47.3 73
2.9 51.6 79
2.2 57.9 57
2.2 61.6 41
2.1 67.4 29
2.6 72.9 32
3.0 77.7 65
2.6 82.4 114
1.2 88.2 265
3.2 91.9 367
4.3 99.2 382
3.7 43.0 36
2.4 47.7 78
2.5 52.2 46
2.7 57.8 69
2.1 61.7 19
2.7 67.4 17
2.3 72.5 49
3.5 78.6 64
3.1 82.7 370
1.9 87.0 379
1.3 91.5 45
3.4 97.0 14
6.8 39.3 714
7.8 41.8 349
8.7 46.4 123
7.2 52.6 57
7.4 58.2 54
7.7 67.4 64
8.8 73.5 144
7.3 77.5 324
7.0 81.7 175
6.5 88.3 55
8.2 92.0 119
8.7 97.5 66
13.2 42.1 122
12.2 46.3 873
13.4 51.4 249
12.5 57.9 54
13.3 63.5 58
13.4 67.5 238
12.4 72.2 285
12.2 77.4 175
13.1 82.5 61
12.2 87.4 66
11.5 92.7 116
13.2 96.9 109

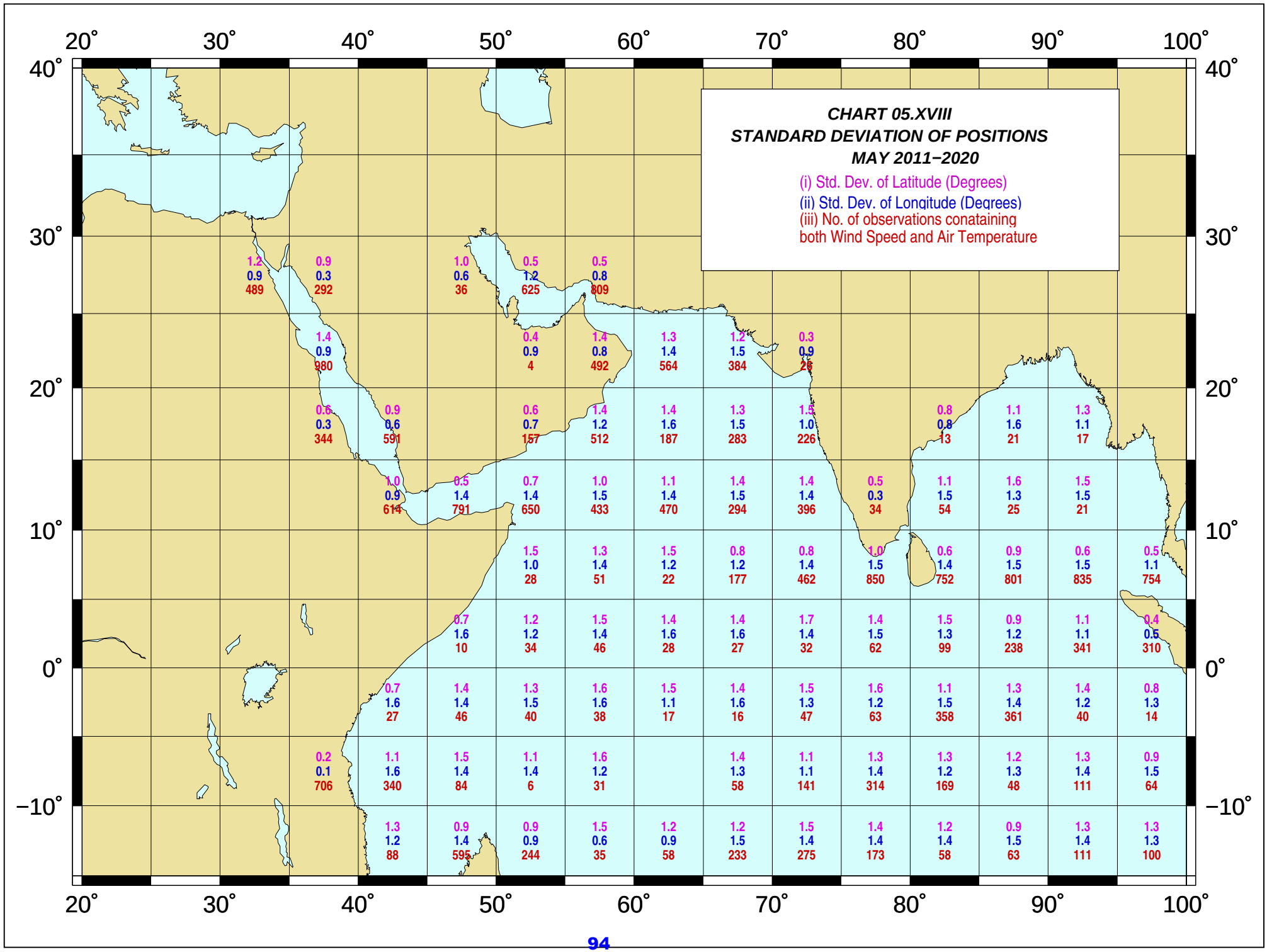
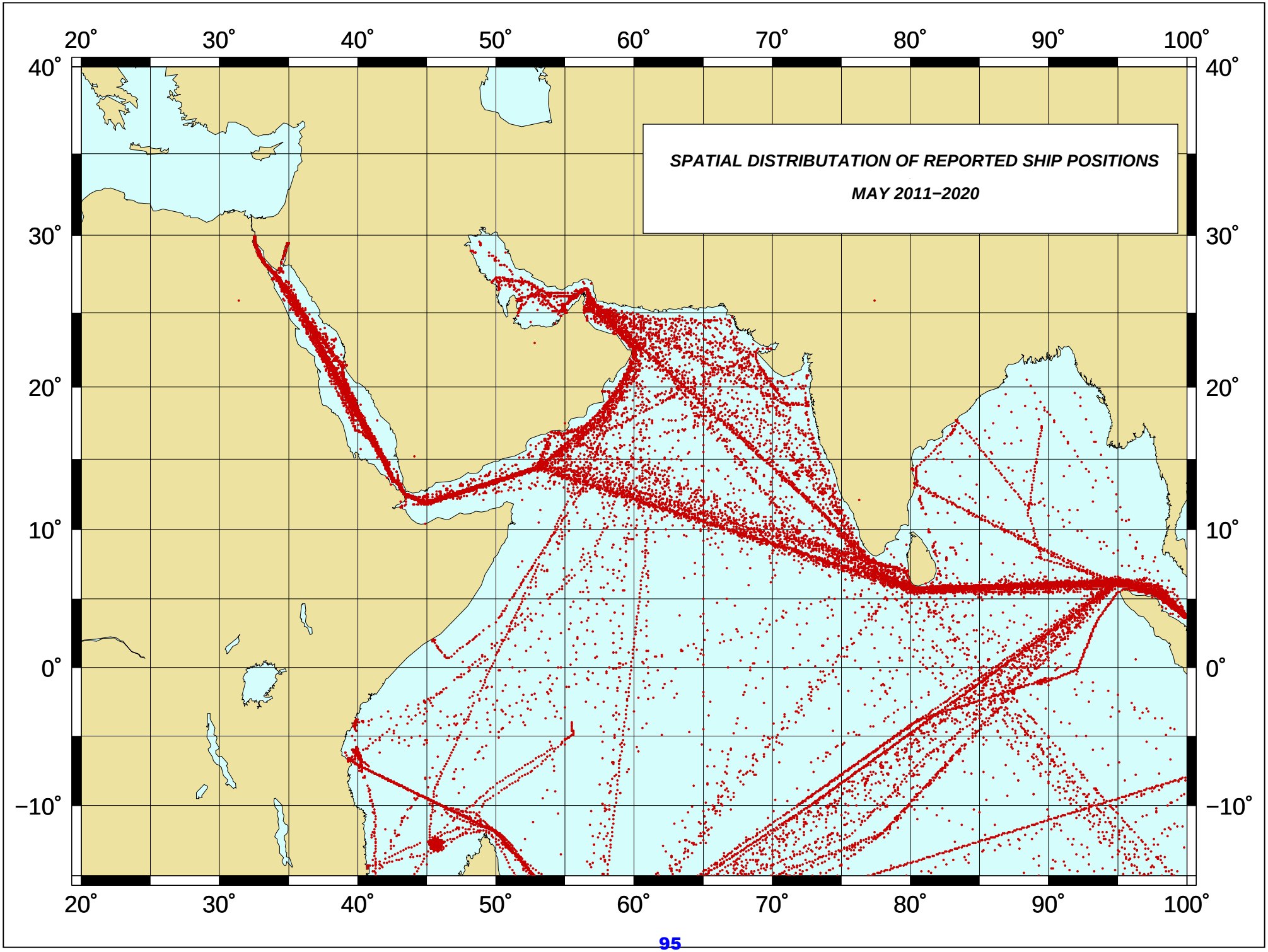


CHART 05.XVIII
STANDARD DEVIATION OF POSITIONS
MAY 2011–2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.2 0.9 489
0.9 0.3 292
1.0 0.6 36
0.5 1.2 625
0.5 0.8 809
1.4 0.9 980
0.4 0.9 4
1.4 0.8 492
1.3 1.4 564
1.2 1.5 384
0.3 0.9 26
0.6 0.3 344
0.9 0.6 591
0.6 0.7 157
1.4 1.2 512
1.4 1.6 187
1.3 1.5 283
1.5 1.0 226
0.8 0.8 13
1.1 1.6 21
1.3 1.1 17
1.0 0.9 614
0.5 1.4 791
0.7 1.4 650
1.0 1.5 433
1.1 1.4 470
1.4 1.5 294
1.4 1.4 396
0.5 0.3 34
1.1 1.5 54
1.6 1.3 25
1.5 1.5 21
1.5 1.0 28
1.3 1.4 51
1.5 1.2 22
0.8 1.2 177
0.8 1.4 462
1.0 1.5 850
0.6 1.4 752
0.9 1.5 801
0.6 1.5 835
0.5 1.1 754
0.7 1.6 10
1.2 1.2 34
1.5 1.4 46
1.4 1.6 28
1.4 1.6 27
1.7 1.4 32
1.4 1.5 62
1.5 1.3 99
0.9 1.2 238
1.1 1.1 341
0.4 0.5 310
0.7 1.6 27
1.4 1.4 46
1.3 1.5 40
1.6 1.6 38
1.5 1.1 17
1.4 1.6 16
1.5 1.3 47
1.6 1.2 63
1.1 1.5 358
1.3 1.4 361
1.4 1.2 40
0.8 1.3 14
0.2 0.1 706
1.1 1.6 340
1.5 1.4 84
1.1 1.4 6
1.6 1.2 31
1.4 1.3 58
1.1 1.1 141
1.3 1.4 314
1.3 1.2 169
1.2 1.3 48
1.3 1.4 111
0.9 1.5 64
1.3 1.2 88
0.9 1.4 595
0.9 0.9 244
1.5 0.6 35
1.2 0.9 58
1.2 1.5 233
1.5 1.4 275
1.4 1.4 173
1.2 1.4 58
0.9 1.5 63
1.3 1.4 111
1.3 1.3 100


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
MAY 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF JUNE 2011-2020

Marine Climatological Summary Charts 2011-2020

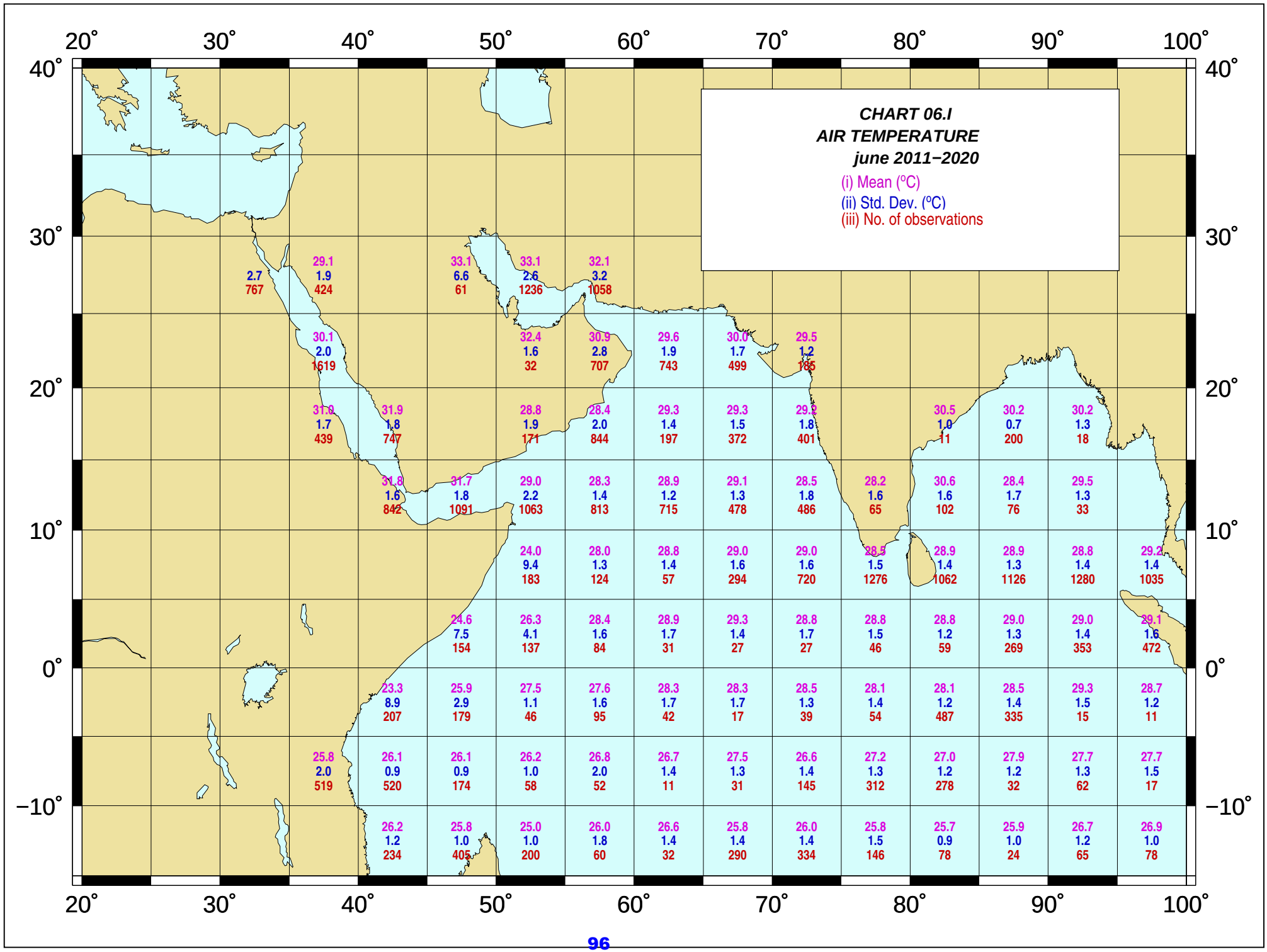


CHART 06.I
AIR TEMPERATURE
june 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.7 767
29.1 1.9 424
33.1 6.6 61
33.1 2.6 1236
32.1 3.2 1058
30.1 2.0 1619
32.4 1.6 32
30.9 2.8 707
29.6 1.9 743
30.0 1.7 499
29.5 1.2 185
31.9 1.7 439
31.9 1.8 747
28.8 1.9 171
28.4 2.0 844
29.3 1.4 197
29.3 1.5 372
30.5 1.0 11
30.2 0.7 200
30.2 1.3 18
31.8 1.6 842
31.7 1.8 1091
29.0 2.2 1063
28.3 1.4 813
28.9 1.2 715
29.1 1.3 478
28.5 1.8 486
28.2 1.6 65
30.6 1.6 102
28.4 1.7 76
29.5 1.3 33
24.0 9.4 183
28.0 1.3 124
28.8 1.4 57
29.0 1.6 294
29.0 1.6 720
28.9 1.5 1276
28.9 1.4 1062
28.9 1.3 1126
28.8 1.4 1280
29.2 1.4 1035
24.6 7.5 154
26.3 4.1 137
28.4 1.6 84
28.9 1.7 31
29.3 1.4 27
28.8 1.7 27
28.8 1.5 46
28.8 1.2 59
29.0 1.3 269
29.0 1.4 353
29.1 1.6 472
23.3 8.9 207
25.9 2.9 179
27.5 1.1 46
27.6 1.6 95
28.3 1.7 42
28.3 1.7 17
28.5 1.3 39
28.1 1.4 54
28.1 1.2 487
28.5 1.4 335
29.3 1.5 15
28.7 1.2 11
25.8 2.0 519
26.1 0.9 520
26.1 0.9 174
26.2 1.0 58
26.8 2.0 52
26.7 1.4 11
27.5 1.3 31
26.6 1.4 145
27.2 1.3 312
27.0 1.2 278
27.9 1.2 32
27.7 1.3 62
27.7 1.5 17
26.2 1.2 234
25.8 1.0 405
25.0 1.0 200
26.0 1.8 60
26.6 1.4 32
25.8 1.4 290
26.0 1.4 334
25.8 1.5 146
25.7 0.9 78
25.9 1.0 24
26.7 1.2 65
26.9 1.0 78

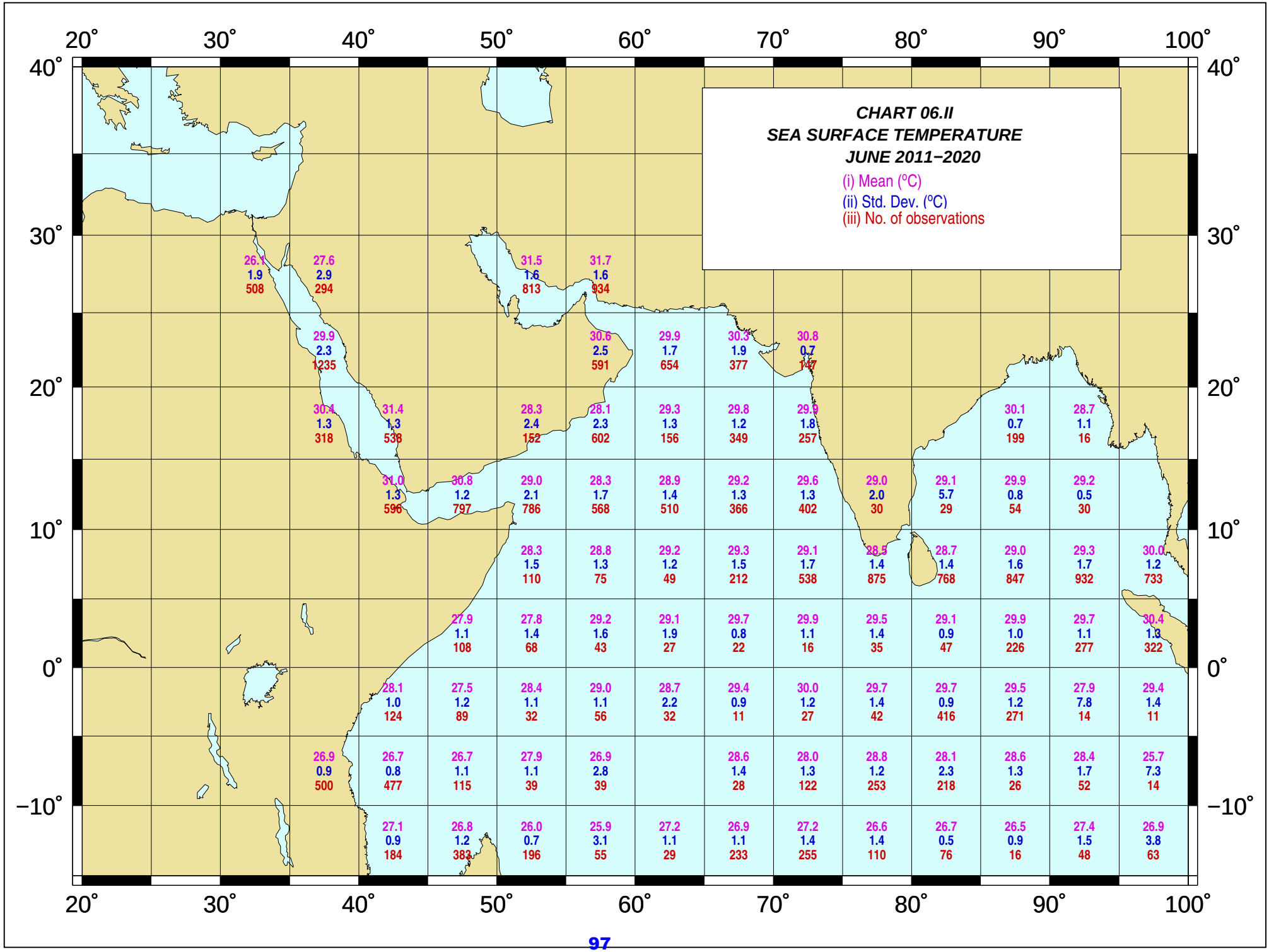


CHART 06.II
SEA SURFACE TEMPERATURE
JUNE 2011−2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
26.1 1.9 508
27.6 2.9 294
31.5 1.6 813
31.7 1.6 934
29.9 2.3 1235
30.6 2.5 591
29.9 1.7 654
30.3 1.9 377
30.8 0.7 147
30.4 1.3 318
31.4 1.3 538
28.3 2.4 152
28.1 2.3 602
29.3 1.3 156
29.8 1.2 349
29.9 1.8 257
30.1 0.7 199
28.7 1.1 16
31.0 1.3 596
30.8 1.2 797
29.0 2.1 786
28.3 1.7 568
28.9 1.4 510
29.2 1.3 366
29.6 1.3 402
29.0 2.0 30
29.1 5.7 29
29.9 0.8 54
29.2 0.5 30
28.3 1.5 110
28.8 1.3 75
29.2 1.2 49
29.3 1.5 212
29.1 1.7 538
28.5 1.4 875
28.7 1.4 768
29.0 1.6 847
29.3 1.7 932
30.0 1.2 733
27.9 1.1 108
27.8 1.4 68
29.2 1.6 43
29.1 1.9 27
29.7 0.8 22
29.9 1.1 16
29.5 1.4 35
29.1 0.9 47
29.9 1.0 226
29.7 1.1 277
30.4 1.3 322
28.1 1.0 124
27.5 1.2 89
28.4 1.1 32
29.0 1.1 56
28.7 2.2 32
29.4 0.9 11
30.0 1.2 27
29.7 1.4 42
29.7 0.9 416
29.5 1.2 271
27.9 7.8 14
29.4 1.4 11
26.9 0.9 500
26.7 0.8 477
26.7 1.1 115
27.9 1.1 39
26.9 2.8 39
28.6 1.4 28
28.0 1.3 122
28.8 1.2 253
28.1 2.3 218
28.6 1.3 26
28.4 1.7 52
25.7 7.3 14
27.1 0.9 184
26.8 1.2 383
26.0 0.7 196
25.9 3.1 55
27.2 1.1 29
26.9 1.1 233
27.2 1.4 255
26.6 1.4 110
26.7 0.5 76
26.5 0.9 16
27.4 1.5 48
26.9 3.8 63

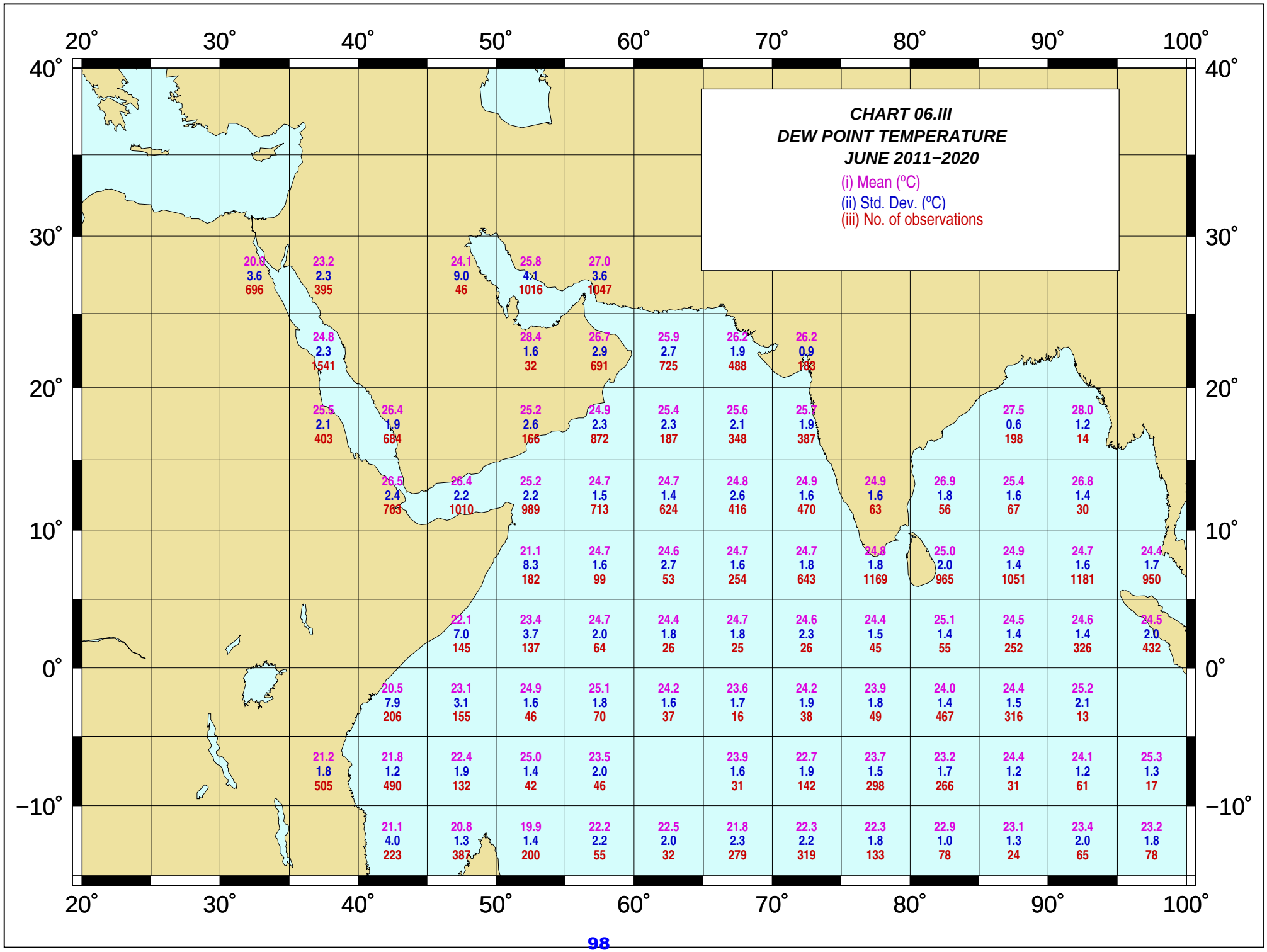


CHART 06.III
DEW POINT TEMPERATURE
JUNE 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
20.8 3.6 696
23.2 2.3 395
24.1 9.0 46
25.8 4.1 1016
27.0 3.6 1047
24.8 2.3 1541
28.4 1.6 32
26.7 2.9 691
25.9 2.7 725
26.2 1.9 488
26.2 0.9 183
25.5 2.1 403
26.4 1.9 684
25.2 2.6 166
24.9 2.3 872
25.4 2.3 187
25.6 2.1 348
25.7 1.9 387
27.5 0.6 198
28.0 1.2 14
26.5 2.4 765
26.4 2.2 1010
25.2 2.2 989
24.7 1.5 713
24.7 1.4 624
24.8 2.6 416
24.9 1.6 470
24.9 1.6 63
26.9 1.8 56
25.4 1.6 67
26.8 1.4 30
21.1 8.3 182
24.7 1.6 99
24.6 2.7 53
24.7 1.6 254
24.7 1.8 643
24.9 1.8 1169
25.0 2.0 965
24.9 1.4 1051
24.7 1.6 1181
24.4 1.7 950
22.1 7.0 145
23.4 3.7 137
24.7 2.0 64
24.4 1.8 26
24.7 1.8 25
24.6 2.3 26
24.4 1.5 45
25.1 1.4 55
24.5 1.4 252
24.6 1.4 326
24.5 2.0 432
20.5 7.9 206
23.1 3.1 155
24.9 1.6 46
25.1 1.8 70
24.2 1.6 37
23.6 1.7 16
24.2 1.9 38
23.9 1.8 49
24.0 1.4 467
24.4 1.5 316
25.2 2.1 13
21.2 1.8 505
21.8 1.2 490
22.4 1.9 132
25.0 1.4 42
23.5 2.0 46
23.9 1.6 31
22.7 1.9 142
23.7 1.5 298
23.2 1.7 266
24.4 1.2 31
24.1 1.2 61
25.3 1.3 17
21.1 4.0 223
20.8 1.3 387
19.9 1.4 200
22.2 2.2 55
22.5 2.0 32
21.8 2.3 279
22.3 2.2 319
22.3 1.8 133
22.9 1.0 78
23.1 1.3 24
23.4 2.0 65
23.2 1.8 78

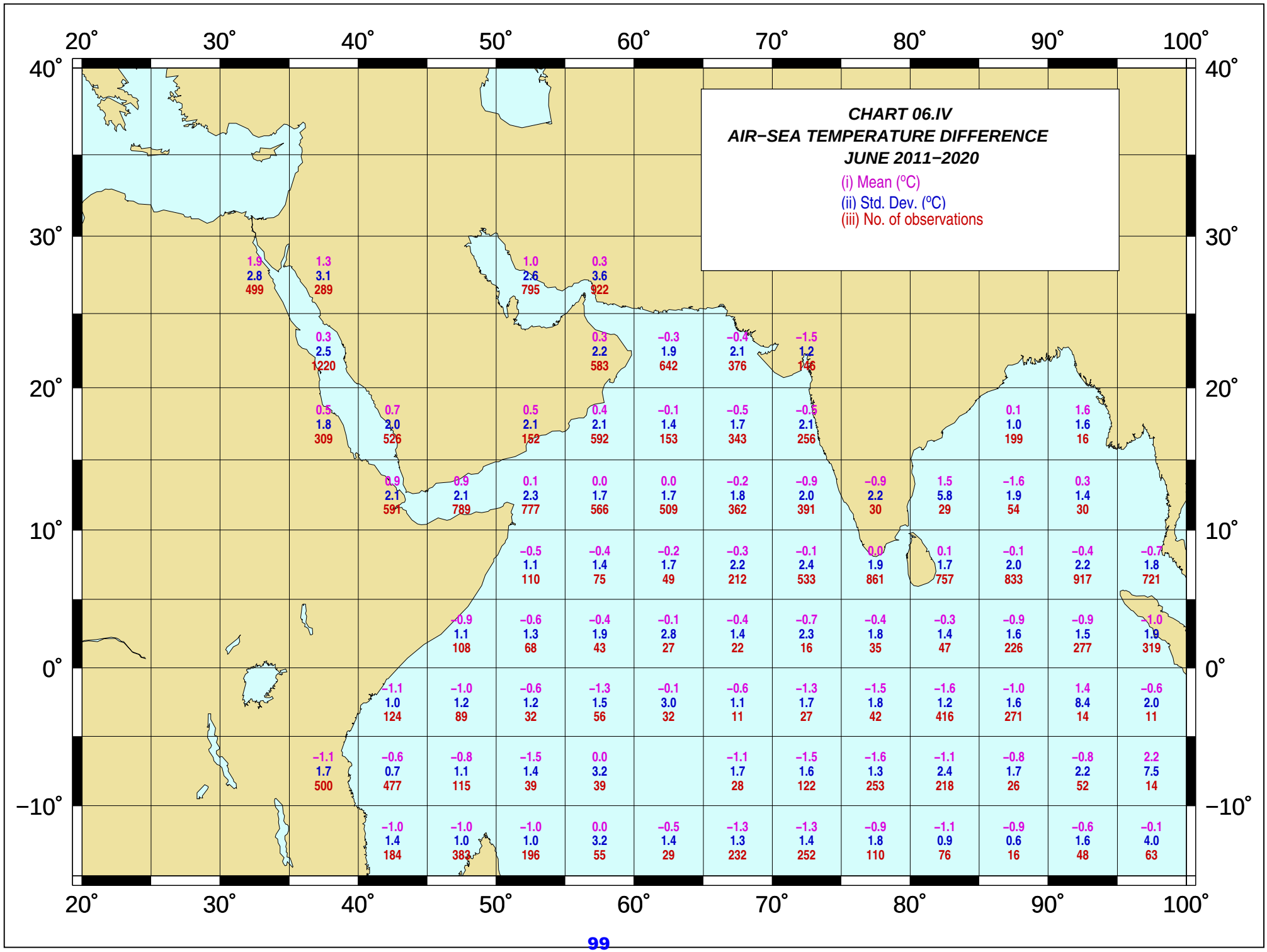


CHART 06.IV
AIR–SEA TEMPERATURE DIFFERENCE
JUNE 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.9 2.8 499
1.3 3.1 289
1.0 2.6 795
0.3 3.6 922
0.3 2.5 1220
0.3 2.2 583
−0.3 1.9 642
−0.4 2.1 376
−1.5 1.2 146
0.5 1.8 309
0.7 2.0 526
0.5 2.1 152
0.4 2.1 592
−0.1 1.4 153
−0.5 1.7 343
−0.5 2.1 256
0.1 1.0 199
1.6 1.6 16
0.9 2.1 591
0.9 2.1 789
0.1 2.3 777
0.0 1.7 566
0.0 1.7 509
−0.2 1.8 362
−0.9 2.0 391
−0.9 2.2 30
1.5 5.8 29
−1.6 1.9 54
0.3 1.4 30
−0.5 1.1 110
−0.4 1.4 75
−0.2 1.7 49
−0.3 2.2 212
−0.1 2.4 533
0.0 1.9 861
0.1 1.7 757
−0.1 2.0 833
−0.4 2.2 917
−0.7 1.8 721
−0.9 1.1 108
−0.6 1.3 68
−0.4 1.9 43
−0.1 2.8 27
−0.4 1.4 22
−0.7 2.3 16
−0.4 1.8 35
−0.3 1.4 47
−0.9 1.6 226
−0.9 1.5 277
−1.0 1.9 319
−1.1 1.0 124
−1.0 1.2 89
−0.6 1.2 32
−1.3 1.5 56
−0.1 3.0 32
−0.6 1.1 11
−1.3 1.7 27
−1.5 1.8 42
−1.6 1.2 416
−1.0 1.6 271
1.4 8.4 14
−0.6 2.0 11
−1.1 1.7 500
−0.6 0.7 477
−0.8 1.1 115
−1.5 1.4 39
0.0 3.2 39
−1.1 1.7 28
−1.5 1.6 122
−1.6 1.3 253
−1.1 2.4 218
−0.8 1.7 26
−0.8 2.2 52
2.2 7.5 14
−1.0 1.4 184
−1.0 1.0 383
−1.0 1.0 196
0.0 3.2 55
−0.5 1.4 29
−1.3 1.3 232
−1.3 1.4 252
−0.9 1.8 110
−1.1 0.9 76
−0.9 0.6 16
−0.6 1.6 48
−0.1 4.0 63

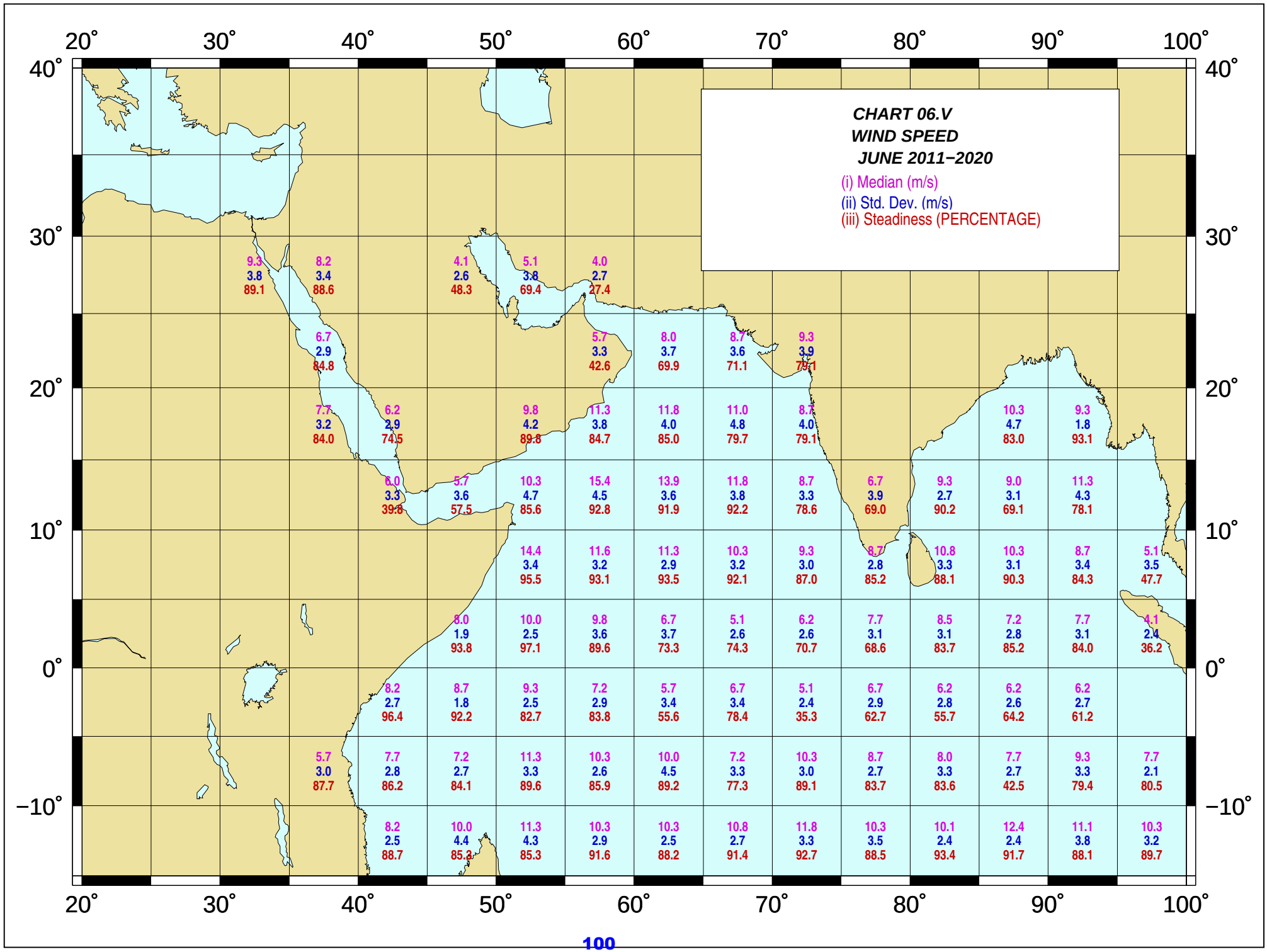


CHART 06.V
WIND SPEED
JUNE 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
9.3 3.8 89.1
8.2 3.4 88.6
4.1 2.6 48.3
5.1 3.8 69.4
4.0 2.7 27.4
6.7 2.9 84.8
5.7 3.3 42.6
8.0 3.7 69.9
8.7 3.6 71.1
9.3 3.9 79.1
7.7 3.2 84.0
6.2 2.9 74.5
9.8 4.2 89.8
11.3 3.8 84.7
11.8 4.0 85.0
11.0 4.8 79.7
8.7 4.0 79.1
10.3 4.7 83.0
9.3 1.8 93.1
6.0 3.3 39.8
5.7 3.6 57.5
10.3 4.7 85.6
15.4 4.5 92.8
13.9 3.6 91.9
11.8 3.8 92.2
8.7 3.3 78.6
6.7 3.9 69.0
9.3 2.7 90.2
9.0 3.1 69.1
11.3 4.3 78.1
14.4 3.4 95.5
11.6 3.2 93.1
11.3 2.9 93.5
10.3 3.2 92.1
9.3 3.0 87.0
8.7 2.8 85.2
10.8 3.3 88.1
10.3 3.1 90.3
8.7 3.4 84.3
5.1 3.5 47.7
8.0 1.9 93.8
10.0 2.5 97.1
9.8 3.6 89.6
6.7 3.7 73.3
5.1 2.6 74.3
6.2 2.6 70.7
7.7 3.1 68.6
8.5 3.1 83.7
7.2 2.8 85.2
7.7 3.1 84.0
4.1 2.4 36.2
8.2 2.7 96.4
8.7 1.8 92.2
9.3 2.5 82.7
7.2 2.9 83.8
5.7 3.4 55.6
6.7 3.4 78.4
5.1 2.4 35.3
6.7 2.9 62.7
6.2 2.8 55.7
6.2 2.6 64.2
6.2 2.7 61.2
5.7 3.0 87.7
7.7 2.8 86.2
7.2 2.7 84.1
11.3 3.3 89.6
10.3 2.6 85.9
10.0 4.5 89.2
7.2 3.3 77.3
10.3 3.0 89.1
8.7 2.7 83.7
8.0 3.3 83.6
7.7 2.7 42.5
9.3 3.3 79.4
7.7 2.1 80.5
8.2 2.5 88.7
10.0 4.4 85.3
11.3 4.3 85.3
10.3 2.9 91.6
10.3 2.5 88.2
10.8 2.7 91.4
11.8 3.3 92.7
10.3 3.5 88.5
10.1 2.4 93.4
12.4 2.4 91.7
11.1 3.8 88.1
10.3 3.2 89.7

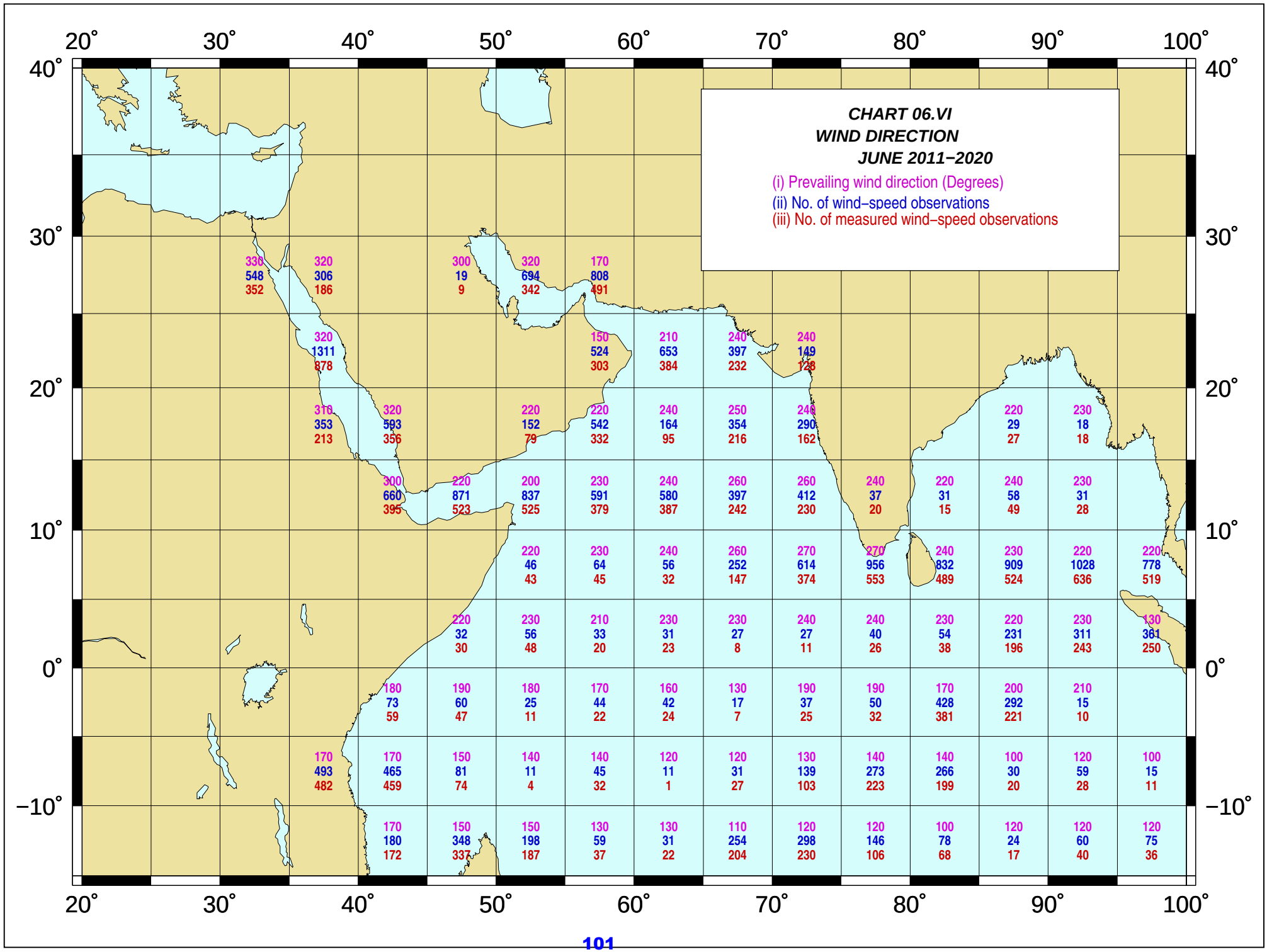


CHART 06.VI
WIND DIRECTION
JUNE 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
330 548 352
320 306 186
300 19 9
320 694 342
170 808 491
320 1311 878
150 524 303
210 653 384
240 397 232
240 149 128
310 353 213
320 593 356
220 152 79
220 542 332
240 164 95
250 354 216
240 290 162
220 29 27
230 18 18
300 660 395
220 871 523
200 837 525
230 591 379
240 580 387
260 397 242
260 412 230
240 37 20
220 31 15
240 58 49
230 31 28
220 46 43
230 64 45
240 56 32
260 252 147
270 614 374
270 956 553
240 832 489
230 909 524
220 1028 636
220 778 519
220 32 30
230 56 48
210 33 20
230 31 23
230 27 8
240 27 11
240 40 26
230 54 38
220 231 196
230 311 243
130 381 250
180 73 59
190 60 47
180 25 11
170 44 22
160 42 24
130 17 7
190 37 25
190 50 32
170 428 381
200 292 221
210 15 10
170 493 482
170 465 459
150 81 74
140 11 4
140 45 32
120 11 1
120 31 27
130 139 103
140 273 223
140 266 199
100 30 20
120 59 28
100 15 11
170 180 172
150 348 337
150 198 187
130 59 37
130 31 22
110 254 204
120 298 230
120 146 106
100 78 68
120 24 17
120 60 40
120 75 36

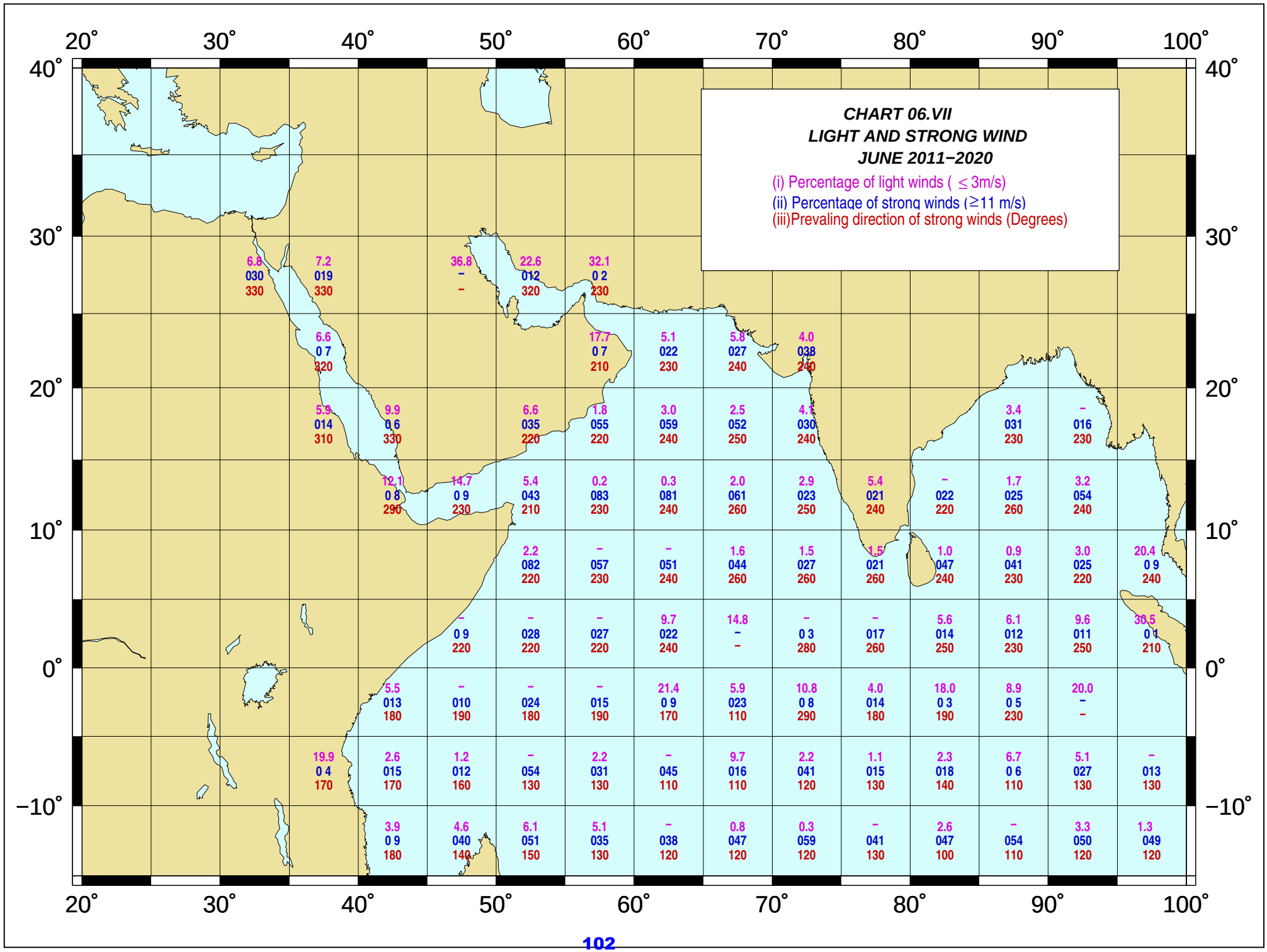


CHART 06.VII
LIGHT AND STRONG WIND
JUNE 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
6.8 030 330
7.2 019 330
36.8 – –
22.6 012 320
32.1 0 2 230
6.6 0 7 320
17.7 0 7 210
5.1 022 230
5.8 027 240
4.0 038 240
5.9 014 310
9.9 0 6 330
6.6 035 220
1.8 055 220
3.0 059 240
2.5 052 250
4.1 030 240
3.4 031 230
– 016 230
12.1 0 8 290
14.7 0 9 230
5.4 043 210
0.2 083 230
0.3 081 240
2.0 061 260
2.9 023 250
5.4 021 240
– 022 220
1.7 025 260
3.2 054 240
2.2 082 220
– 057 230
– 051 240
1.6 044 260
1.5 027 260
1.5 021 260
1.0 047 240
0.9 041 230
3.0 025 220
20.4 0 9 240
– 0 9 220
– 028 220
– 027 220
9.7 022 240
14.8 – –
– 0 3 280
– 017 260
5.6 014 250
6.1 012 230
9.6 011 250
30.5 0 1 210
5.5 013 180
– 010 190
– 024 180
– 015 190
21.4 0 9 170
5.9 023 110
10.8 0 8 290
4.0 014 180
18.0 0 3 190
8.9 0 5 230
20.0 – –
19.9 0 4 170
2.6 015 170
1.2 012 160
– 054 130
2.2 031 130
– 045 110
9.7 016 110
2.2 041 120
1.1 015 130
2.3 018 140
6.7 0 6 110
5.1 027 130
– 013 130
3.9 0 9 180
4.6 040 140
6.1 051 150
5.1 035 130
– 038 120
0.8 047 120
0.3 059 120
– 041 130
2.6 047 100
– 054 110
3.3 050 120
1.3 049 120

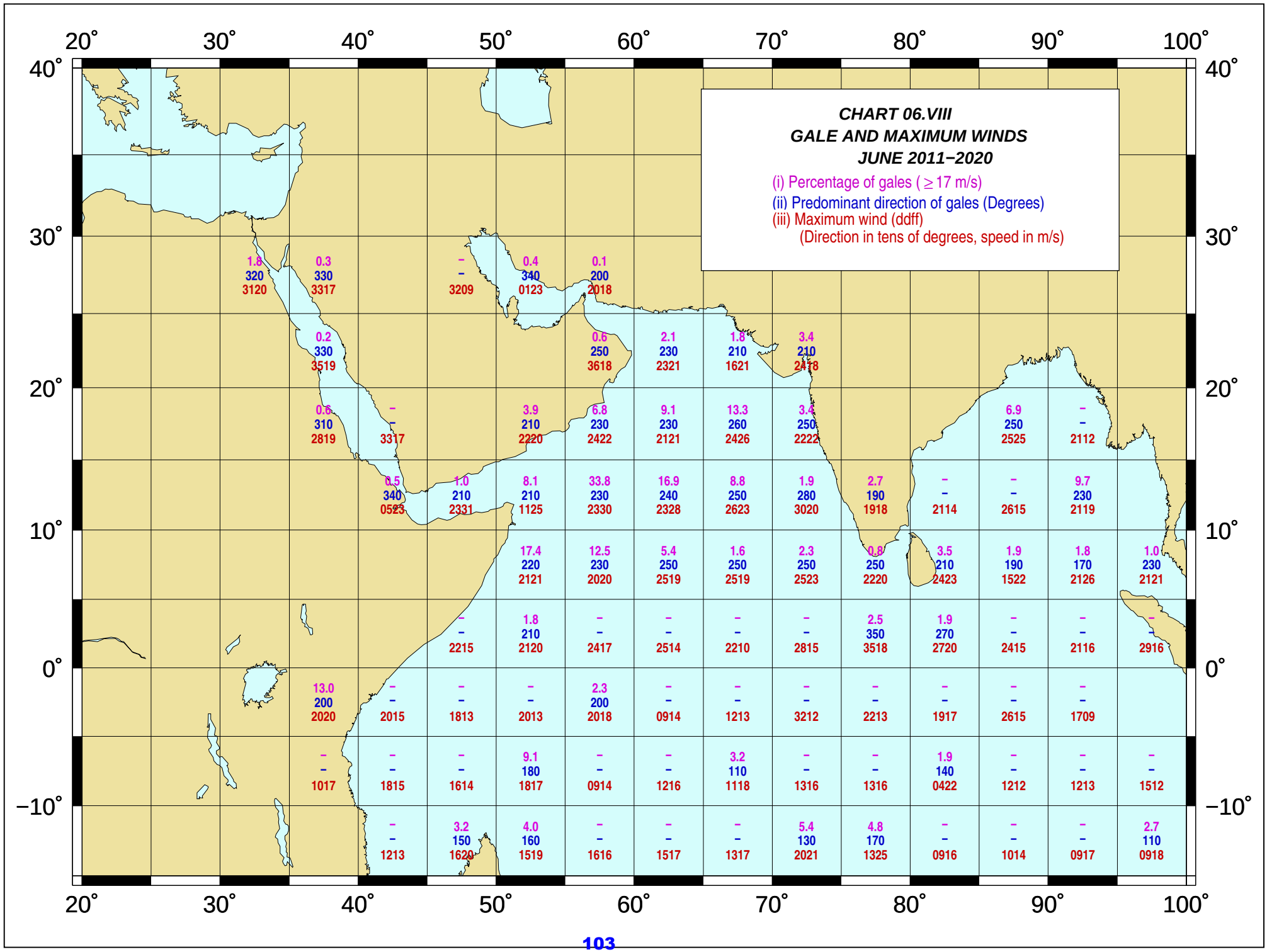


CHART 06.VIII
GALE AND MAXIMUM WINDS
JUNE 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.8 320 3120
0.3 330 3317
– – 3209
0.4 340 0123
0.1 200 2018
0.2 330 3519
0.6 250 3618
2.1 230 2321
1.8 210 1621
3.4 210 2418
0.6 310 2819
– – 3317
3.9 210 2220
6.8 230 2422
9.1 230 2121
13.3 260 2426
3.4 250 2222
6.9 250 2525
– – 2112
0.5 340 0523
1.0 210 2331
8.1 210 1125
33.8 230 2330
16.9 240 2328
8.8 250 2623
1.9 280 3020
2.7 190 1918
– – 2114
– – 2615
9.7 230 2119
17.4 220 2121
12.5 230 2020
5.4 250 2519
1.6 250 2519
2.3 250 2523
0.8 250 2220
3.5 210 2423
1.9 190 1522
1.8 170 2126
1.0 230 2121
– – 2215
1.8 210 2120
– – 2417
– – 2514
– – 2210
– – 2815
2.5 350 3518
1.9 270 2720
– – 2415
– – 2116
– – 2916
13.0 200 2020
– – 2015
– – 1813
– – 2013
2.3 200 2018
– – 0914
– – 1213
– – 3212
– – 2213
– – 1917
– – 2615
– – 1709
– – 1017
– – 1815
– – 1614
9.1 180 1817
– – 0914
– – 1216
3.2 110 1118
– – 1316
– – 1316
1.9 140 0422
– – 1212
– – 1213
– – 1512
– – 1213
3.2 150 1620
4.0 160 1519
– – 1616
– – 1517
– – 1317
5.4 130 2021
4.8 170 1325
– – 0916
– – 1014
– – 0917
2.7 110 0918

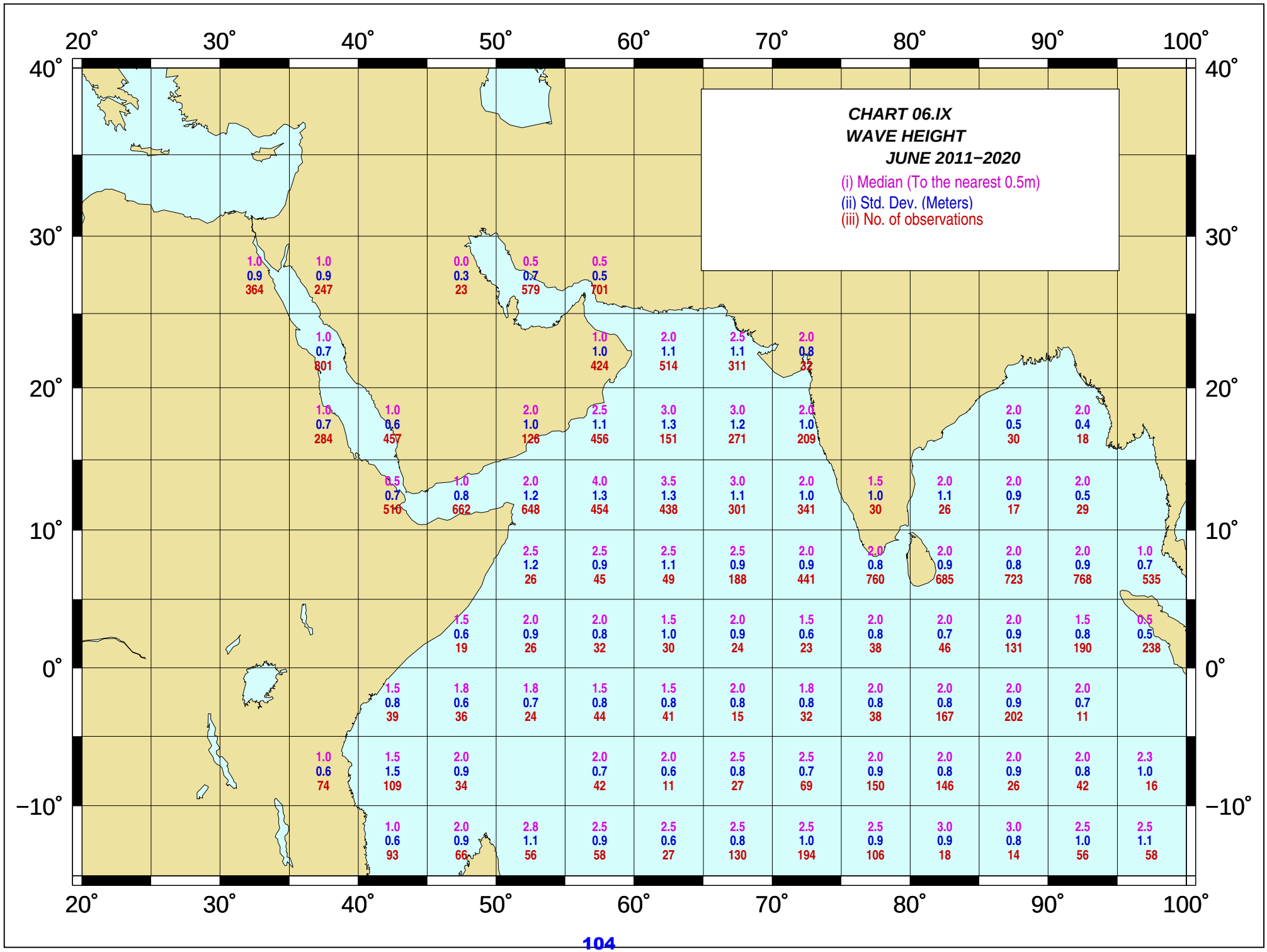


CHART 06.IX
WAVE HEIGHT
JUNE 2011−2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.0 0.9 364
1.0 0.9 247
0.0 0.3 23
0.5 0.7 579
0.5 0.5 701
1.0 0.7 801
1.0 1.0 424
2.0 1.1 514
2.5 1.1 311
2.0 0.8 32
1.0 0.7 284
1.0 0.6 457
2.0 1.0 126
2.5 1.1 456
3.0 1.3 151
3.0 1.2 271
2.0 1.0 209
2.0 0.5 30
2.0 0.4 18
0.5 0.7 510
1.0 0.8 662
2.0 1.2 648
4.0 1.3 454
3.5 1.3 438
3.0 1.1 301
2.0 1.0 341
1.5 1.0 30
2.0 1.1 26
2.0 0.9 17
2.0 0.5 29
2.5 1.2 26
2.5 0.9 45
2.5 1.1 49
2.5 0.9 188
2.0 0.9 441
2.0 0.8 760
2.0 0.9 685
2.0 0.8 723
2.0 0.9 768
1.0 0.7 535
1.5 0.6 19
2.0 0.9 26
2.0 0.8 32
1.5 1.0 30
2.0 0.9 24
1.5 0.6 23
2.0 0.8 38
2.0 0.7 46
2.0 0.9 131
1.5 0.8 190
0.5 0.5 238
1.5 0.8 39
1.8 0.6 36
1.8 0.7 24
1.5 0.8 44
1.5 0.8 41
2.0 0.8 15
1.8 0.8 32
2.0 0.8 38
2.0 0.8 167
2.0 0.9 202
2.0 0.7 11
1.0 0.6 74
1.5 1.5 109
2.0 0.9 34
2.0 0.7 42
2.0 0.6 11
2.5 0.8 27
2.5 0.7 69
2.0 0.9 150
2.0 0.8 146
2.0 0.9 26
2.0 0.8 42
2.3 1.0 16
1.0 0.6 93
2.0 0.9 66
2.8 1.1 56
2.5 0.9 58
2.5 0.6 27
2.5 0.8 130
2.5 1.0 194
2.5 0.9 106
3.0 0.9 18
3.0 0.8 14
2.5 1.0 56
2.5 1.1 58

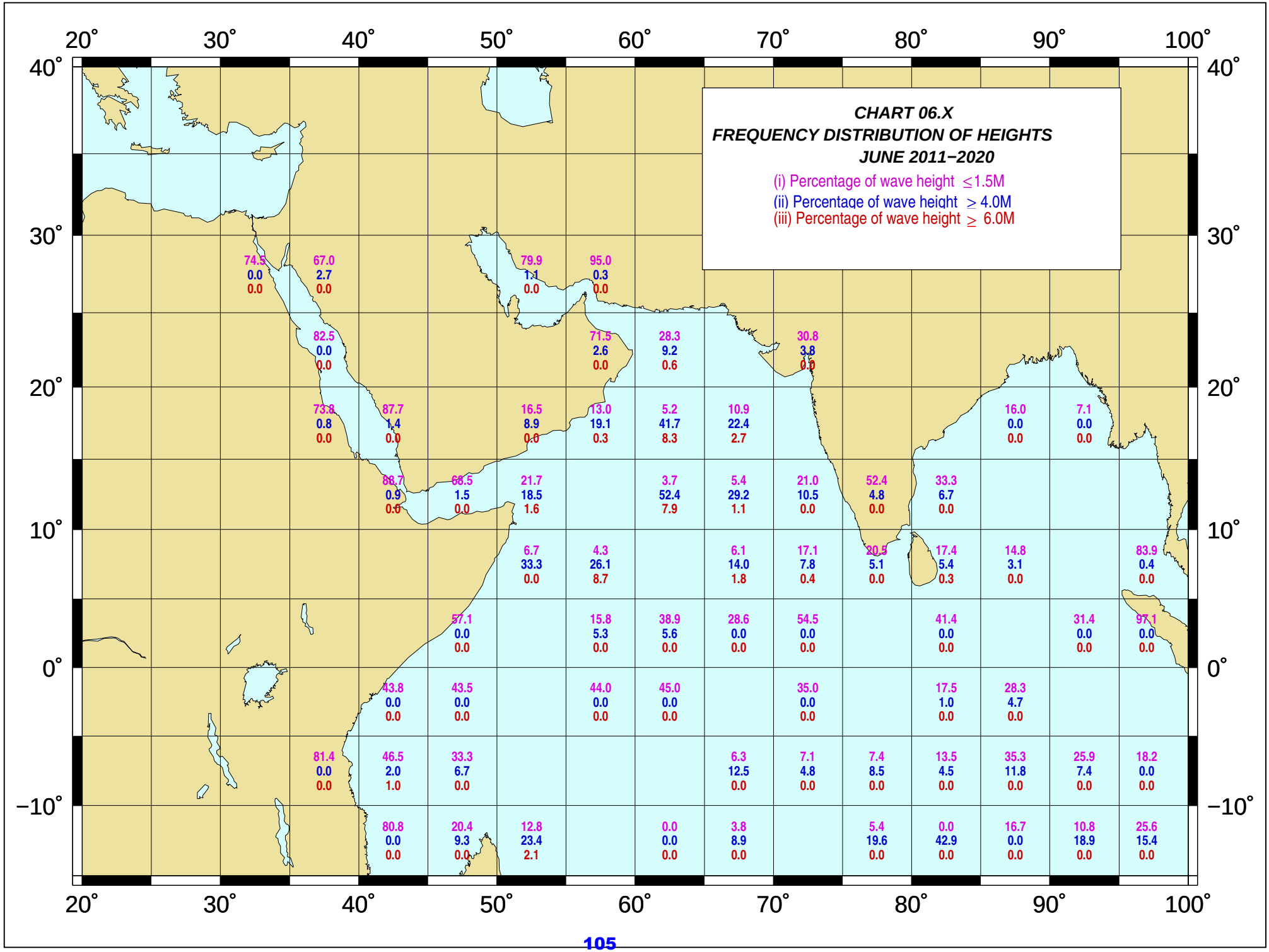


CHART 06.X
FREQUENCY DISTRIBUTION OF HEIGHTS
JUNE 2011–2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
74.5 0.0 0.0
67.0 2.7 0.0
79.9 1.1 0.0
95.0 0.3 0.0
82.5 0.0 0.0
71.5 2.6 0.0
28.3 9.2 0.6
30.8 3.8 0.0
73.8 0.8 0.0
87.7 1.4 0.0
16.5 8.9 0.0
13.0 19.1 0.3
5.2 41.7 8.3
10.9 22.4 2.7
16.0 0.0 0.0
7.1 0.0 0.0
88.7 0.9 0.0
68.5 1.5 0.0
21.7 18.5 1.6
3.7 52.4 7.9
5.4 29.2 1.1
21.0 10.5 0.0
52.4 4.8 0.0
33.3 6.7 0.0
6.7 33.3 0.0
4.3 26.1 8.7
6.1 14.0 1.8
17.1 7.8 0.4
20.5 5.1 0.0
17.4 5.4 0.3
14.8 3.1 0.0
83.9 0.4 0.0
57.1 0.0 0.0
15.8 5.3 0.0
38.9 5.6 0.0
28.6 0.0 0.0
54.5 0.0 0.0
41.4 0.0 0.0
31.4 0.0 0.0
97.1 0.0 0.0
43.8 0.0 0.0
43.5 0.0 0.0
44.0 0.0 0.0
45.0 0.0 0.0
35.0 0.0 0.0
17.5 1.0 0.0
28.3 4.7 0.0
81.4 0.0 0.0
46.5 2.0 1.0
33.3 6.7 0.0
6.3 12.5 0.0
7.1 4.8 0.0
7.4 8.5 0.0
13.5 4.5 0.0
35.3 11.8 0.0
25.9 7.4 0.0
18.2 0.0 0.0
80.8 0.0 0.0
20.4 9.3 0.0
12.8 23.4 2.1
0.0 0.0 0.0
3.8 8.9 0.0
5.4 19.6 0.0
0.0 42.9 0.0
16.7 0.0 0.0
10.8 18.9 0.0
25.6 15.4 0.0

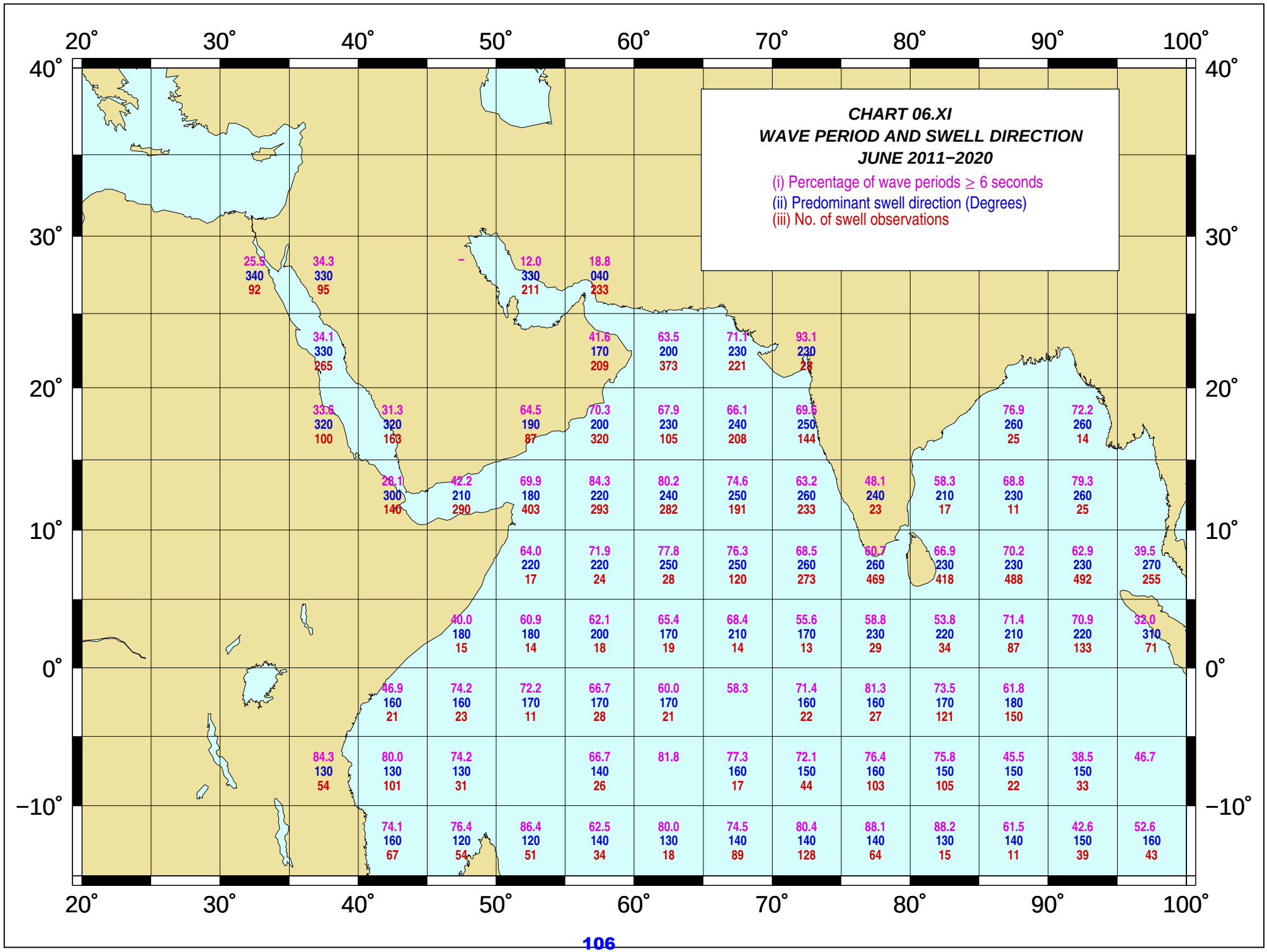


CHART 06.XI
WAVE PERIOD AND SWELL DIRECTION
JUNE 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
25.5 340 92
34.3 330 95
– 12.0 330 211
18.8 040 233
34.1 330 265
41.6 170 209
63.5 200 373
71.1 230 221
93.1 230 26
33.6 320 100
31.3 320 163
64.5 190 87
70.3 200 320
67.9 230 105
66.1 240 208
69.6 250 144
76.9 260 25
72.2 260 14
28.1 300 140
42.2 210 290
69.9 180 403
84.3 220 293
80.2 240 282
74.6 250 191
63.2 260 233
48.1 240 23
58.3 210 17
68.8 230 11
79.3 260 25
64.0 220 17
71.9 220 24
77.8 250 28
76.3 250 120
68.5 260 273
60.7 260 469
66.9 230 418
70.2 230 488
62.9 230 492
39.5 270 255
40.0 180 15
60.9 180 14
62.1 200 18
65.4 170 19
68.4 210 14
55.6 170 13
58.8 230 29
53.8 220 34
71.4 210 87
70.9 220 133
32.0 310 71
46.9 160 21
74.2 160 23
72.2 170 11
66.7 170 28
60.0 170 21
58.3
71.4 160 22
81.3 160 27
73.5 170 121
61.8 180 150
84.3 130 54
80.0 130 101
74.2 130 31
66.7 140 26
81.8
77.3 160 17
72.1 150 44
76.4 160 103
75.8 150 105
45.5 150 22
38.5 150 33
46.7
74.1 160 67
76.4 120 54
86.4 120 51
62.5 140 34
80.0 130 18
74.5 140 89
80.4 140 128
88.1 140 64
88.2 130 15
61.5 140 11
42.6 150 39
52.6 160 43

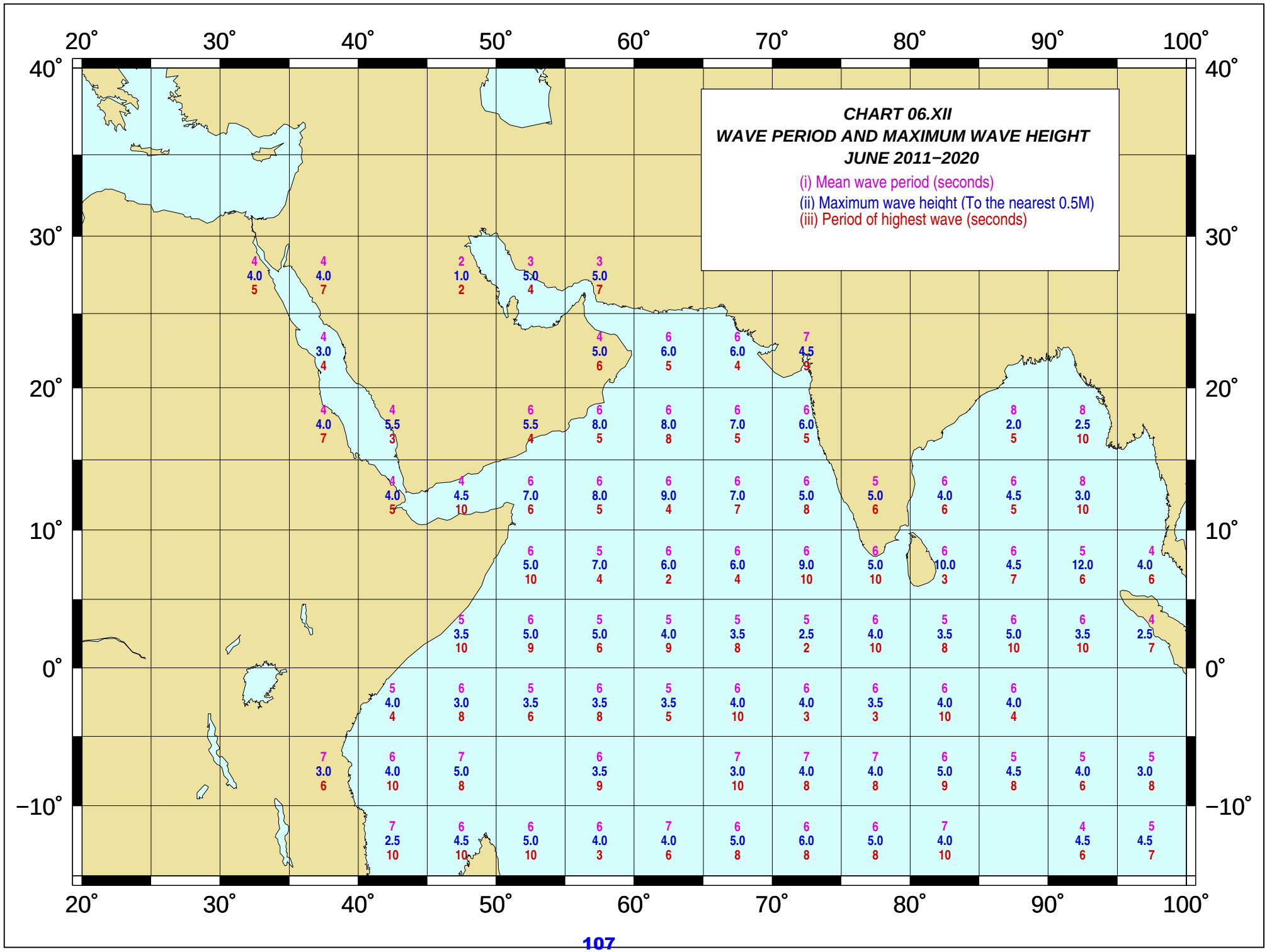


CHART 06.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
JUNE 2011–2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
4 4.0 5
4 4.0 7
2 1.0 2
3 5.0 4
3 5.0 7
4 3.0 4
4 5.0 6
6 6.0 5
6 6.0 4
7 4.5 5
4 4.0 7
4 5.5 3
6 5.5 4
6 8.0 5
6 8.0 8
6 7.0 5
6 6.0 5
8 2.0 5
8 2.5 10
4 4.0 5
4 4.5 10
6 7.0 6
6 8.0 5
6 9.0 4
6 7.0 7
6 5.0 8
5 5.0 6
6 4.0 6
6 4.5 5
8 3.0 10
6 5.0 10
5 7.0 4
6 6.0 2
6 6.0 4
6 9.0 10
6 5.0 10
6 10.0 3
6 4.5 7
5 12.0 6
4 4.0 6
5 3.5 10
6 5.0 9
5 5.0 6
5 4.0 9
5 3.5 8
5 2.5 2
6 4.0 10
5 3.5 8
6 5.0 10
6 3.5 10
4 2.5 7
5 4.0 4
6 3.0 8
5 3.5 6
6 3.5 8
5 3.5 5
6 4.0 10
6 4.0 3
6 3.5 3
6 4.0 10
6 4.0 4
7 3.0 6
6 4.0 10
7 5.0 8
6 3.5 9
7 3.0 10
7 4.0 8
7 4.0 8
6 5.0 9
5 4.5 8
5 4.0 6
5 3.0 8
7 2.5 10
6 4.5 10
6 5.0 10
6 4.0 3
7 4.0 6
6 5.0 8
6 6.0 8
6 5.0 8
7 4.0 10
4 4.5 6
5 4.5 7

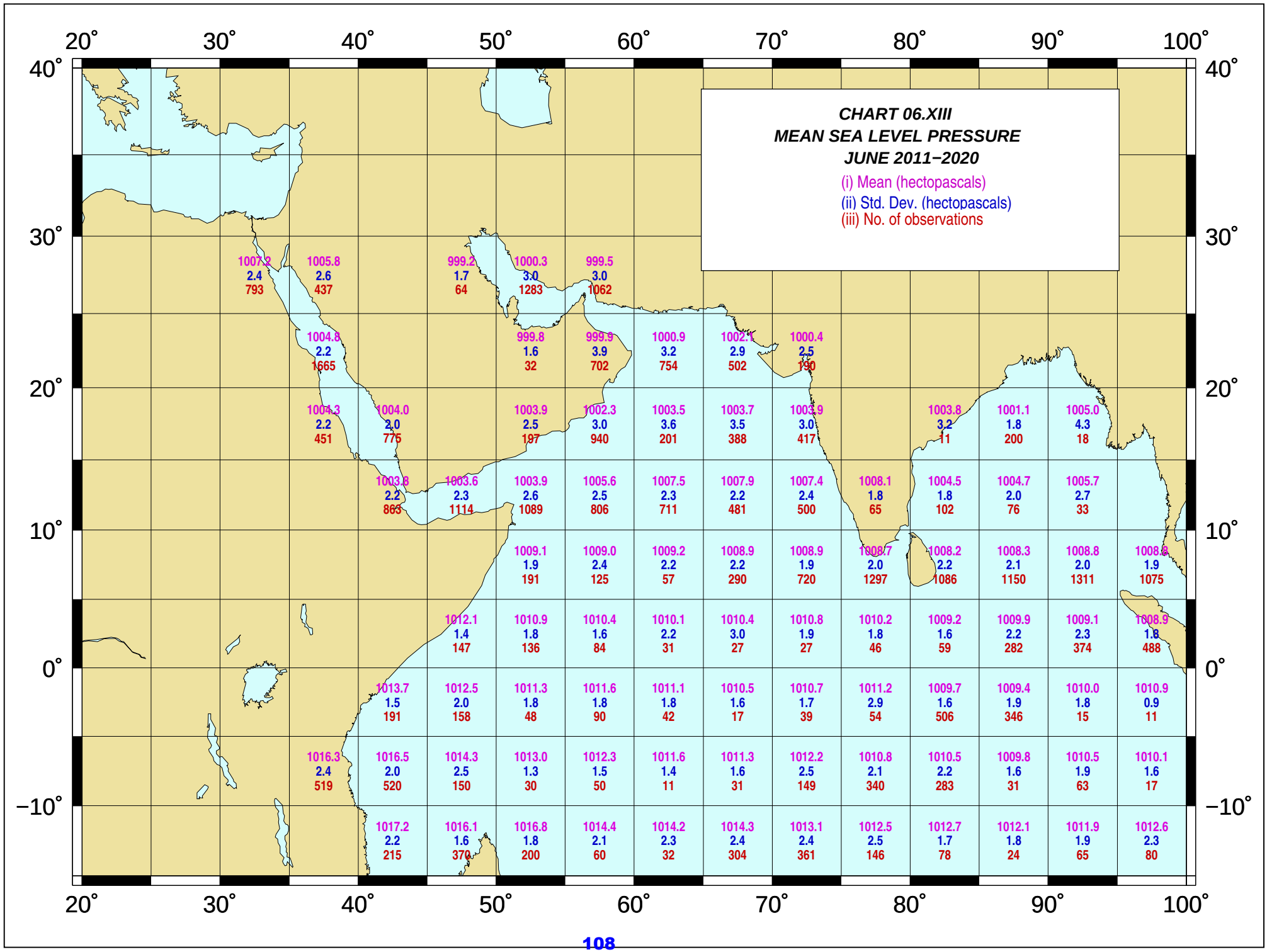


CHART 06.XIII
MEAN SEA LEVEL PRESSURE
JUNE 2011–2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1007.2 2.4 793
1005.8 2.6 437
999.2 1.7 64
1000.3 3.0 1283
999.5 3.0 1062
1004.8 2.2 1665
999.8 1.6 32
999.9 3.9 702
1000.9 3.2 754
1002.1 2.9 502
1000.4 2.5 190
1004.3 2.2 451
1004.0 2.0 775
1003.9 2.5 197
1002.3 3.0 940
1003.5 3.6 201
1003.7 3.5 388
1003.9 3.0 417
1003.8 3.2 11
1001.1 1.8 200
1005.0 4.3 18
1003.8 2.2 863
1003.6 2.3 1114
1003.9 2.6 1089
1005.6 2.5 806
1007.5 2.3 711
1007.9 2.2 481
1007.4 2.4 500
1008.1 1.8 65
1004.5 1.8 102
1004.7 2.0 76
1005.7 2.7 33
1009.1 1.9 191
1009.0 2.4 125
1009.2 2.2 57
1008.9 2.2 290
1008.9 1.9 720
1008.7 2.0 1297
1008.2 2.2 1086
1008.3 2.1 1150
1008.8 2.0 1311
1008.8 1.9 1075
1012.1 1.4 147
1010.9 1.8 136
1010.4 1.6 84
1010.1 2.2 31
1010.4 3.0 27
1010.8 1.9 27
1010.2 1.8 46
1009.2 1.6 59
1009.9 2.2 282
1009.1 2.3 374
1008.9 1.8 488
1013.7 1.5 191
1012.5 2.0 158
1011.3 1.8 48
1011.6 1.8 90
1011.1 1.8 42
1010.5 1.6 17
1010.7 1.7 39
1011.2 2.9 54
1009.7 1.6 506
1009.4 1.9 346
1010.0 1.8 15
1010.9 0.9 11
1016.3 2.4 519
1016.5 2.0 520
1014.3 2.5 150
1013.0 1.3 30
1012.3 1.5 50
1011.6 1.4 11
1011.3 1.6 31
1012.2 2.5 149
1010.8 2.1 340
1010.5 2.2 283
1009.8 1.6 31
1010.5 1.9 63
1010.1 1.6 17
1017.2 2.2 215
1016.1 1.6 370
1016.8 1.8 200
1014.4 2.1 60
1014.2 2.3 32
1014.3 2.4 304
1013.1 2.4 361
1012.5 2.5 146
1012.7 1.7 78
1012.1 1.8 24
1011.9 1.9 65
1012.6 2.3 80

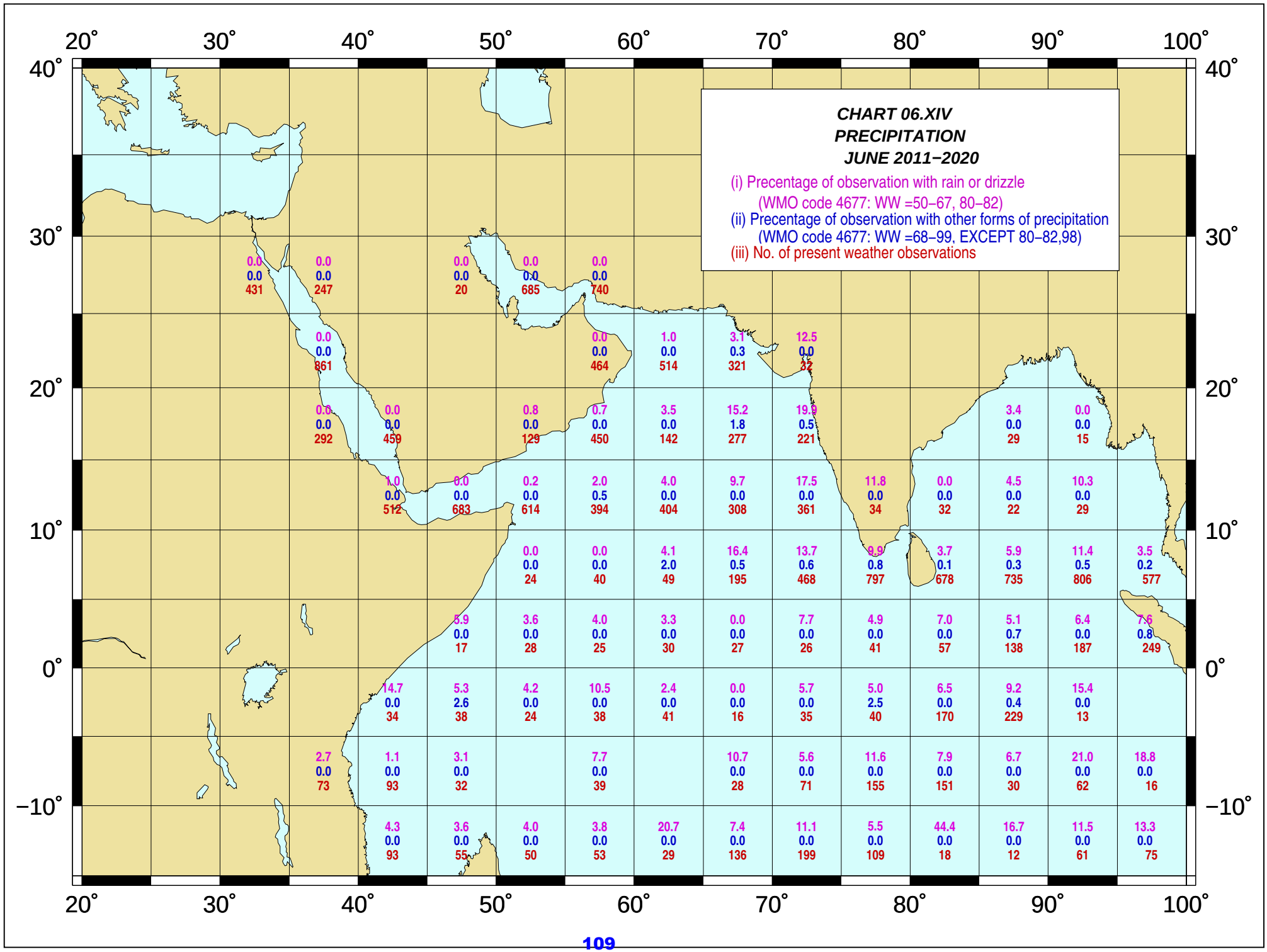


CHART 06.XIV
PRECIPITATION
JUNE 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 0.0 431
0.0 0.0 247
0.0 0.0 20
0.0 0.0 685
0.0 0.0 740
0.0 0.0 861
0.0 0.0 464
1.0 0.0 514
3.1 0.3 321
12.5 0.0 32
0.0 0.0 292
0.0 0.0 459
0.8 0.0 129
0.7 0.0 450
3.5 0.0 142
15.2 1.8 277
19.9 0.5 221
3.4 0.0 29
0.0 0.0 15
1.0 0.0 512
0.0 0.0 683
0.2 0.0 614
2.0 0.5 394
4.0 0.0 404
9.7 0.0 308
17.5 0.0 361
11.8 0.0 34
0.0 0.0 32
4.5 0.0 22
10.3 0.0 29
0.0 0.0 24
0.0 0.0 40
4.1 2.0 49
16.4 0.5 195
13.7 0.6 468
9.9 0.8 797
3.7 0.1 678
5.9 0.3 735
11.4 0.5 806
3.5 0.2 577
5.9 0.0 17
3.6 0.0 28
4.0 0.0 25
3.3 0.0 30
0.0 0.0 27
7.7 0.0 26
4.9 0.0 41
7.0 0.0 57
5.1 0.7 138
6.4 0.0 187
7.6 0.8 249
14.7 0.0 34
5.3 2.6 38
4.2 0.0 24
10.5 0.0 38
2.4 0.0 41
0.0 0.0 16
5.7 0.0 35
5.0 2.5 40
6.5 0.0 170
9.2 0.4 229
15.4 0.0 13
2.7 0.0 73
1.1 0.0 93
3.1 0.0 32
7.7 0.0 39
10.7 0.0 28
5.6 0.0 71
11.6 0.0 155
7.9 0.0 151
6.7 0.0 30
21.0 0.0 62
18.8 0.0 16
4.3 0.0 93
3.6 0.0 55
4.0 0.0 50
3.8 0.0 53
20.7 0.0 29
7.4 0.0 136
11.1 0.0 199
5.5 0.0 109
44.4 0.0 18
16.7 0.0 12
11.5 0.0 61
13.3 0.0 75

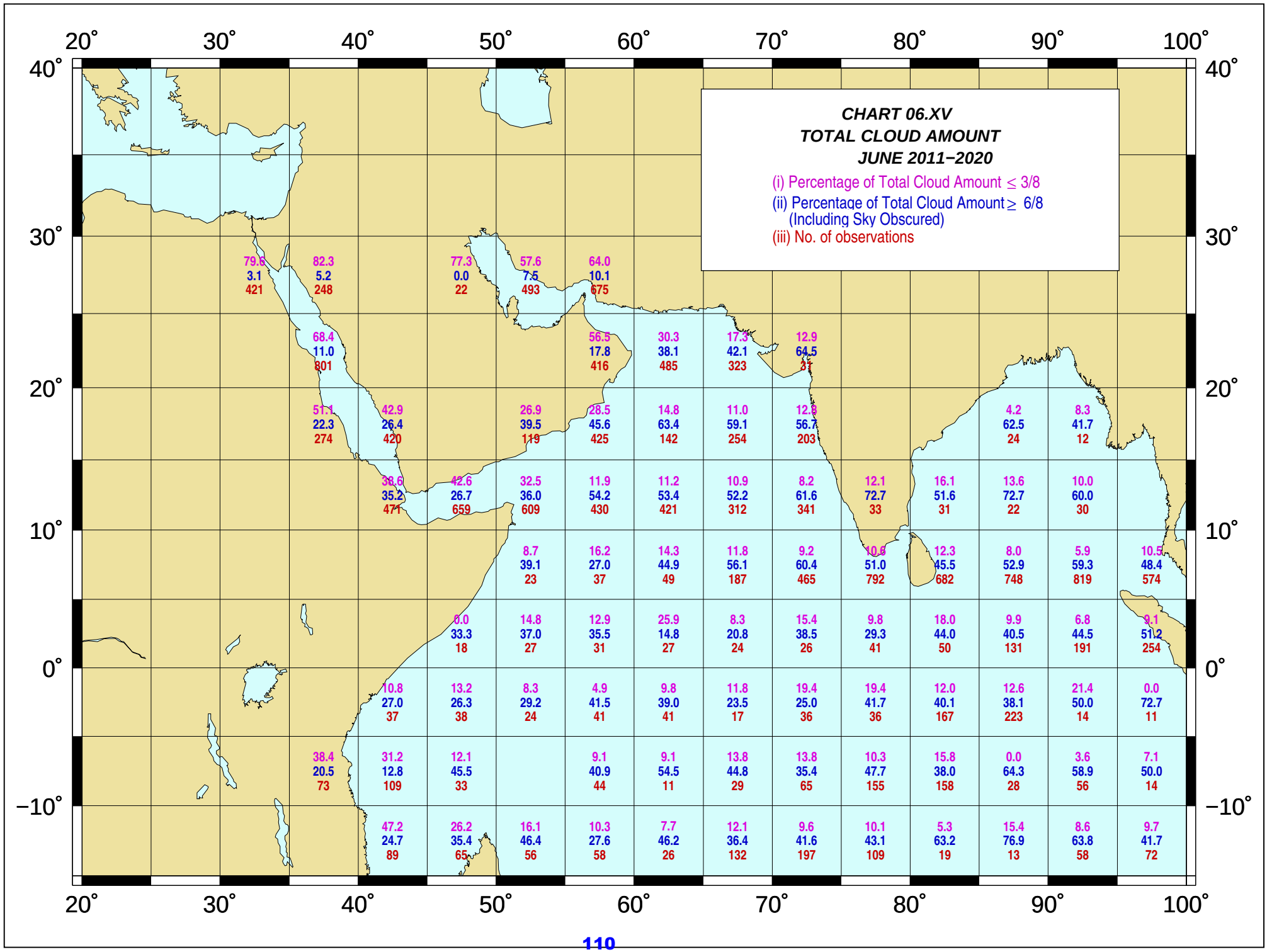


CHART 06.XV
TOTAL CLOUD AMOUNT
JUNE 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
79.6 3.1 421
82.3 5.2 248
77.3 0.0 22
57.6 7.5 493
64.0 10.1 675
68.4 11.0 801
56.5 17.8 416
30.3 38.1 485
17.3 42.1 323
12.9 64.5 31
51.1 22.3 274
42.9 26.4 420
26.9 39.5 119
28.5 45.6 425
14.8 63.4 142
11.0 59.1 254
12.9 56.7 203
4.2 62.5 24
8.3 41.7 12
38.6 35.2 471
42.6 26.7 659
32.5 36.0 609
11.9 54.2 430
11.2 53.4 421
10.9 52.2 312
8.2 61.6 341
12.1 72.7 33
16.1 51.6 31
13.6 72.7 22
10.0 60.0 30
8.7 39.1 23
16.2 27.0 37
14.3 44.9 49
11.8 56.1 187
9.2 60.4 465
10.6 51.0 792
12.3 45.5 682
8.0 52.9 748
5.9 59.3 819
10.5 48.4 574
0.0 33.3 18
14.8 37.0 27
12.9 35.5 31
25.9 14.8 27
8.3 20.8 24
15.4 38.5 26
9.8 29.3 41
18.0 44.0 50
9.9 40.5 131
6.8 44.5 191
9.1 51.2 254
10.8 27.0 37
13.2 26.3 38
8.3 29.2 24
4.9 41.5 41
9.8 39.0 41
11.8 23.5 17
19.4 25.0 36
19.4 41.7 36
12.0 40.1 167
12.6 38.1 223
21.4 50.0 14
0.0 72.7 11
38.4 20.5 73
31.2 12.8 109
12.1 45.5 33
9.1 40.9 44
9.1 54.5 11
13.8 44.8 29
13.8 35.4 65
10.3 47.7 155
15.8 38.0 158
0.0 64.3 28
3.6 58.9 56
7.1 50.0 14
47.2 24.7 89
26.2 35.4 65
16.1 46.4 56
10.3 27.6 58
7.7 46.2 26
12.1 36.4 132
9.6 41.6 197
10.1 43.1 109
5.3 63.2 19
15.4 76.9 13
8.6 63.8 58
9.7 41.7 72

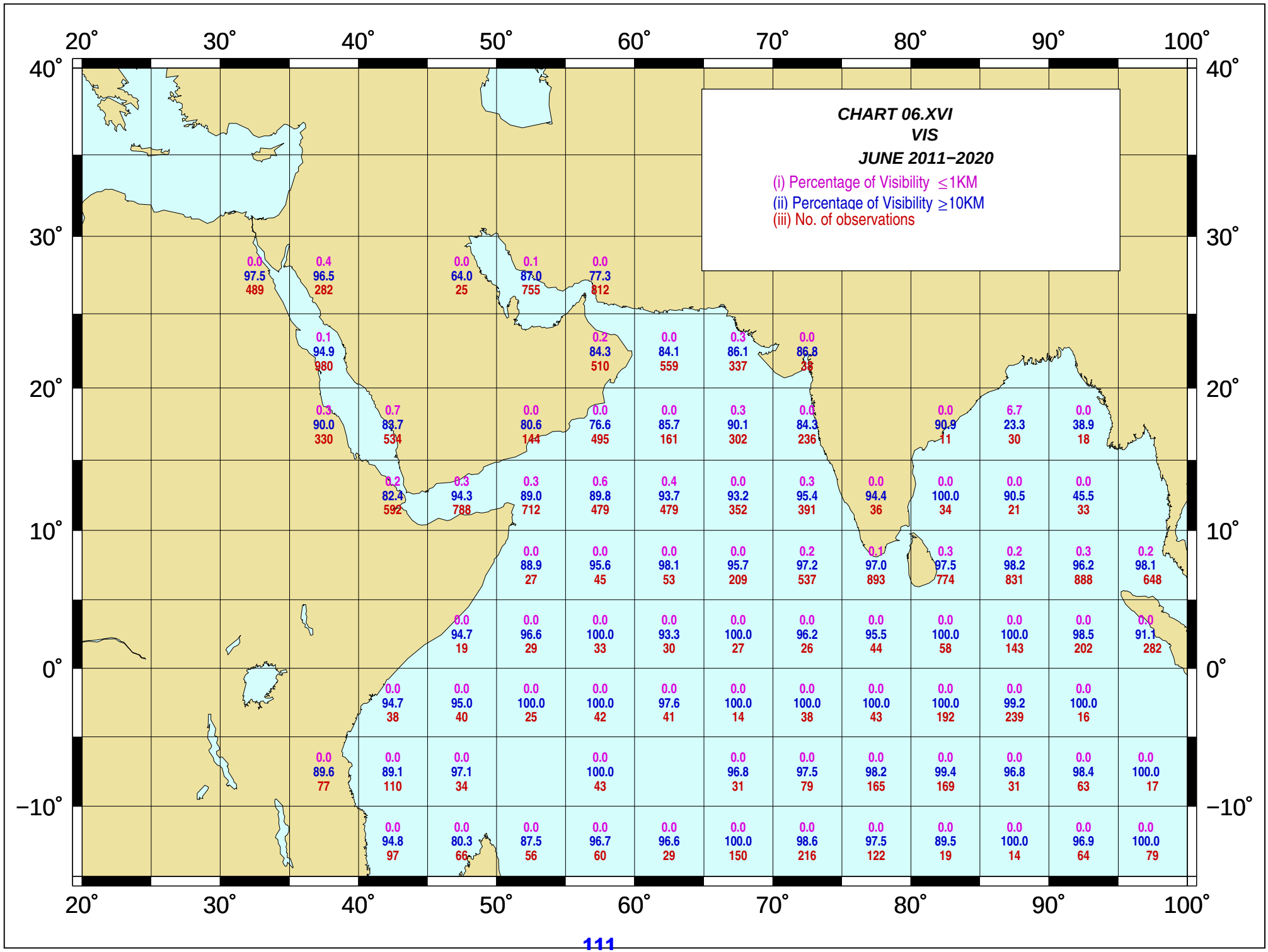


CHART 06.XVI
VIS
JUNE 2011–2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 97.5 489
0.4 96.5 282
0.0 64.0 25
0.1 87.0 755
0.0 77.3 812
0.1 94.9 980
0.2 84.3 510
0.0 84.1 559
0.3 86.1 337
0.0 86.8 36
0.3 90.0 330
0.7 83.7 534
0.0 80.6 144
0.0 76.6 495
0.0 85.7 161
0.3 90.1 302
0.0 84.3 236
0.0 90.9 11
6.7 23.3 30
0.0 38.9 18
0.2 82.4 592
0.3 94.3 788
0.3 89.0 712
0.6 89.8 479
0.4 93.7 479
0.0 93.2 352
0.3 95.4 391
0.0 94.4 36
0.0 100.0 34
0.0 90.5 21
0.0 45.5 33
0.0 88.9 27
0.0 95.6 45
0.0 98.1 53
0.0 95.7 209
0.2 97.2 537
0.1 97.0 893
0.3 97.5 774
0.2 98.2 831
0.3 96.2 888
0.2 98.1 648
0.0 94.7 19
0.0 96.6 29
0.0 100.0 33
0.0 93.3 30
0.0 100.0 27
0.0 96.2 26
0.0 95.5 44
0.0 100.0 58
0.0 100.0 143
0.0 98.5 202
0.0 91.1 282
0.0 94.7 38
0.0 95.0 40
0.0 100.0 25
0.0 100.0 42
0.0 97.6 41
0.0 100.0 14
0.0 100.0 38
0.0 100.0 43
0.0 100.0 192
0.0 99.2 239
0.0 100.0 16
0.0 89.6 77
0.0 89.1 110
0.0 97.1 34
0.0 100.0 43
0.0 96.8 31
0.0 97.5 79
0.0 98.2 165
0.0 99.4 169
0.0 96.8 31
0.0 98.4 63
0.0 100.0 17
0.0 94.8 97
0.0 80.3 66
0.0 87.5 56
0.0 96.7 60
0.0 96.6 29
0.0 100.0 150
0.0 98.6 216
0.0 97.5 122
0.0 89.5 19
0.0 100.0 14
0.0 96.9 64
0.0 100.0 79

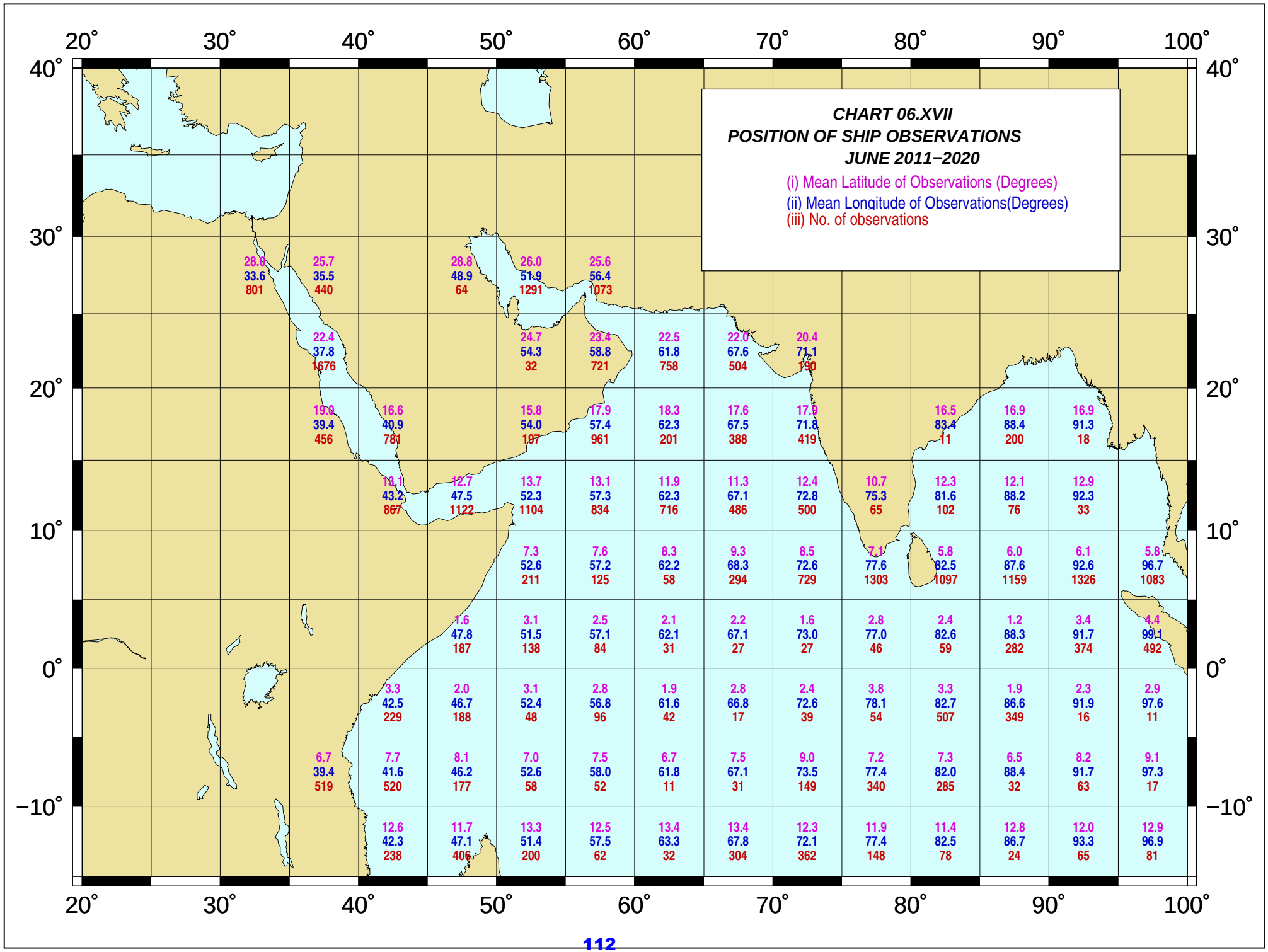


CHART 06.XVII
POSITION OF SHIP OBSERVATIONS
JUNE 2011−2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.8 33.6 801
25.7 35.5 440
28.8 48.9 64
26.0 51.9 1291
25.6 56.4 1073
22.4 37.8 1676
24.7 54.3 32
23.4 58.8 721
22.5 61.8 758
22.0 67.6 504
20.4 71.1 190
19.9 39.4 456
16.6 40.9 781
15.8 54.0 197
17.9 57.4 961
18.3 62.3 201
17.6 67.5 388
17.9 71.8 419
16.5 83.4 11
16.9 88.4 200
16.9 91.3 18
13.1 43.2 867
12.7 47.5 1122
13.7 52.3 1104
13.1 57.3 834
11.9 62.3 716
11.3 67.1 486
12.4 72.8 500
10.7 75.3 65
12.3 81.6 102
12.1 88.2 76
12.9 92.3 33
7.3 52.6 211
7.6 57.2 125
8.3 62.2 58
9.3 68.3 294
8.5 72.6 729
7.1 77.6 1303
5.8 82.5 1097
6.0 87.6 1159
6.1 92.6 1326
5.8 96.7 1083
1.6 47.8 187
3.1 51.5 138
2.5 57.1 84
2.1 62.1 31
2.2 67.1 27
1.6 73.0 27
2.8 77.0 46
2.4 82.6 59
1.2 88.3 282
3.4 91.7 374
4.4 99.1 492
3.3 42.5 229
2.0 46.7 188
3.1 52.4 48
2.8 56.8 96
1.9 61.6 42
2.8 66.8 17
2.4 72.6 39
3.8 78.1 54
3.3 82.7 507
1.9 86.6 349
2.3 91.9 16
2.9 97.6 11
6.7 39.4 519
7.7 41.6 520
8.1 46.2 177
7.0 52.6 58
7.5 58.0 52
6.7 61.8 11
7.5 67.1 31
9.0 73.5 149
7.2 77.4 340
7.3 82.0 285
6.5 88.4 32
8.2 91.7 63
9.1 97.3 17
12.6 42.3 238
11.7 47.1 406
13.3 51.4 200
12.5 57.5 62
13.4 63.3 32
13.4 67.8 304
12.3 72.1 362
11.9 77.4 148
11.4 82.5 78
12.8 86.7 24
12.0 93.3 65
12.9 96.9 81

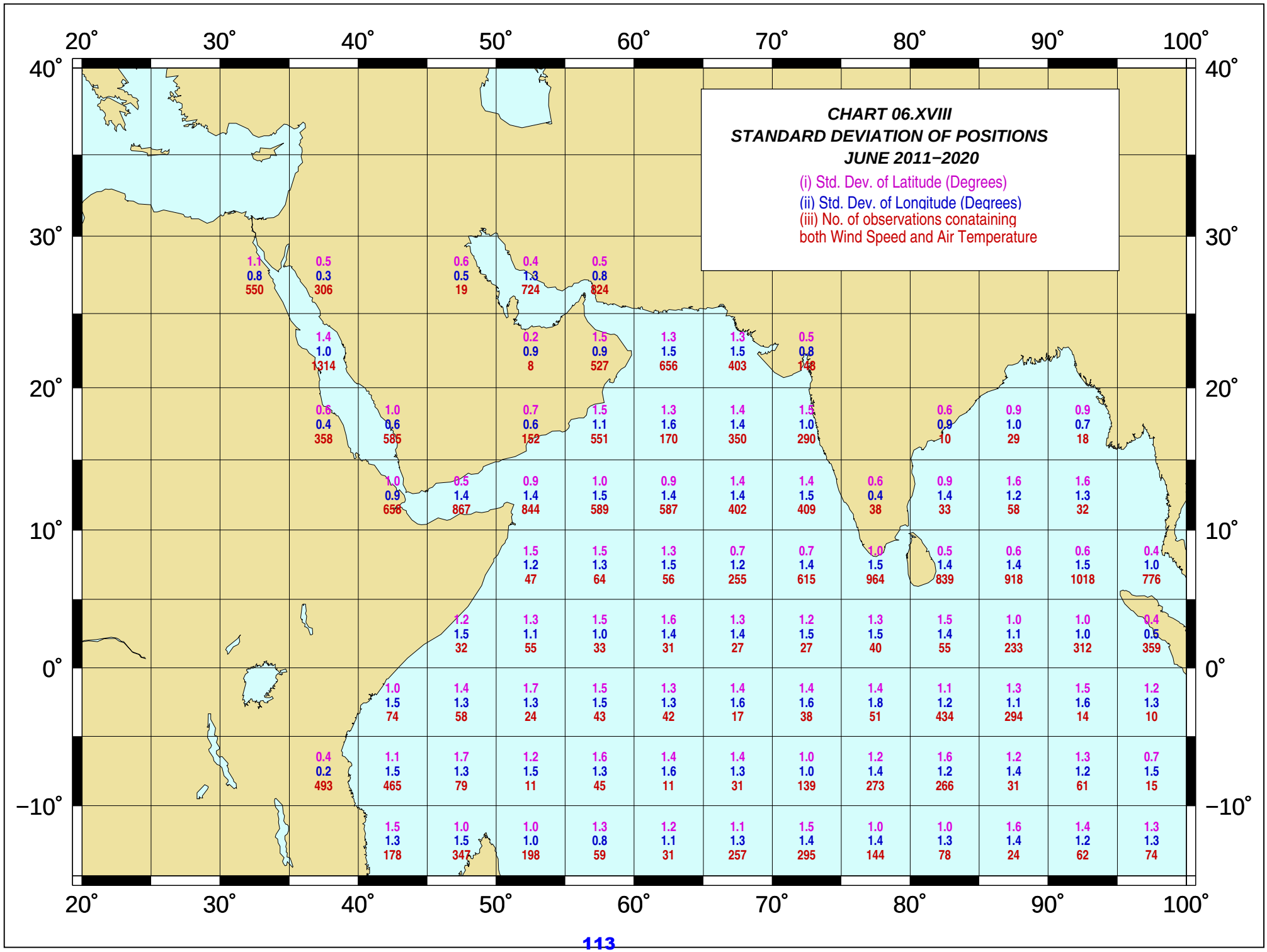
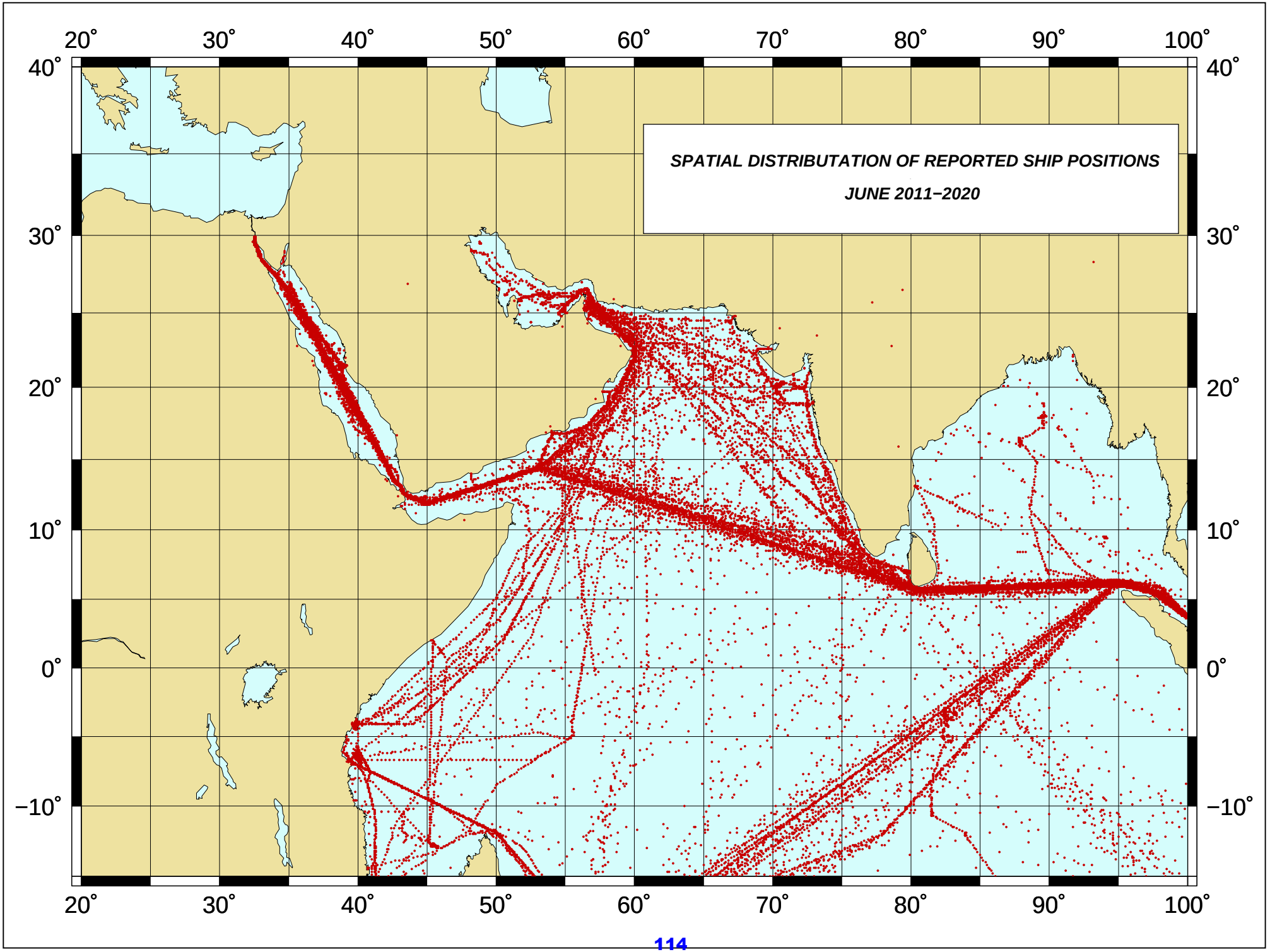


CHART 06.XVIII
STANDARD DEVIATION OF POSITIONS
JUNE 2011−2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.1 0.8 550
0.5 0.3 306
0.6 0.5 19
0.4 1.3 724
0.5 0.8 824
1.4 1.0 1314
0.2 0.9 8
1.5 0.9 527
1.3 1.5 656
1.3 1.5 403
0.5 0.8 148
0.6 0.4 358
1.0 0.6 585
0.7 0.6 152
1.5 1.1 551
1.3 1.6 170
1.4 1.4 350
1.5 1.0 290
0.6 0.9 10
0.9 1.0 29
0.9 0.7 18
1.0 0.9 656
0.5 1.4 867
0.9 1.4 844
1.0 1.5 589
0.9 1.4 587
1.4 1.4 402
1.4 1.5 409
0.6 0.4 38
0.9 1.4 33
1.6 1.2 58
1.6 1.3 32
1.5 1.2 47
1.5 1.3 64
1.3 1.5 56
0.7 1.2 255
0.7 1.4 615
1.0 1.5 964
0.5 1.4 839
0.6 1.4 918
0.6 1.5 1018
0.4 1.0 776
1.2 1.5 32
1.3 1.1 55
1.5 1.0 33
1.6 1.4 31
1.3 1.4 27
1.2 1.5 27
1.3 1.5 40
1.5 1.4 55
1.0 1.1 233
1.0 1.0 312
0.4 0.5 359
1.0 1.5 74
1.4 1.3 58
1.7 1.3 24
1.5 1.5 43
1.3 1.3 42
1.4 1.6 17
1.4 1.6 38
1.4 1.8 51
1.1 1.2 434
1.3 1.1 294
1.5 1.6 14
1.2 1.3 10
0.4 0.2 493
1.1 1.5 465
1.7 1.3 79
1.2 1.5 11
1.6 1.3 45
1.4 1.6 11
1.4 1.3 31
1.0 1.0 139
1.2 1.4 273
1.6 1.2 266
1.2 1.4 31
1.3 1.2 61
0.7 1.5 15
1.5 1.3 178
1.0 1.5 347
1.0 1.0 198
1.3 0.8 59
1.2 1.1 31
1.1 1.3 257
1.5 1.4 295
1.0 1.4 144
1.0 1.3 78
1.6 1.4 24
1.4 1.2 62
1.3 1.3 74


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
JUNE 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF JULY 2011-2020

Marine Climatological Summary Charts 2011-2020

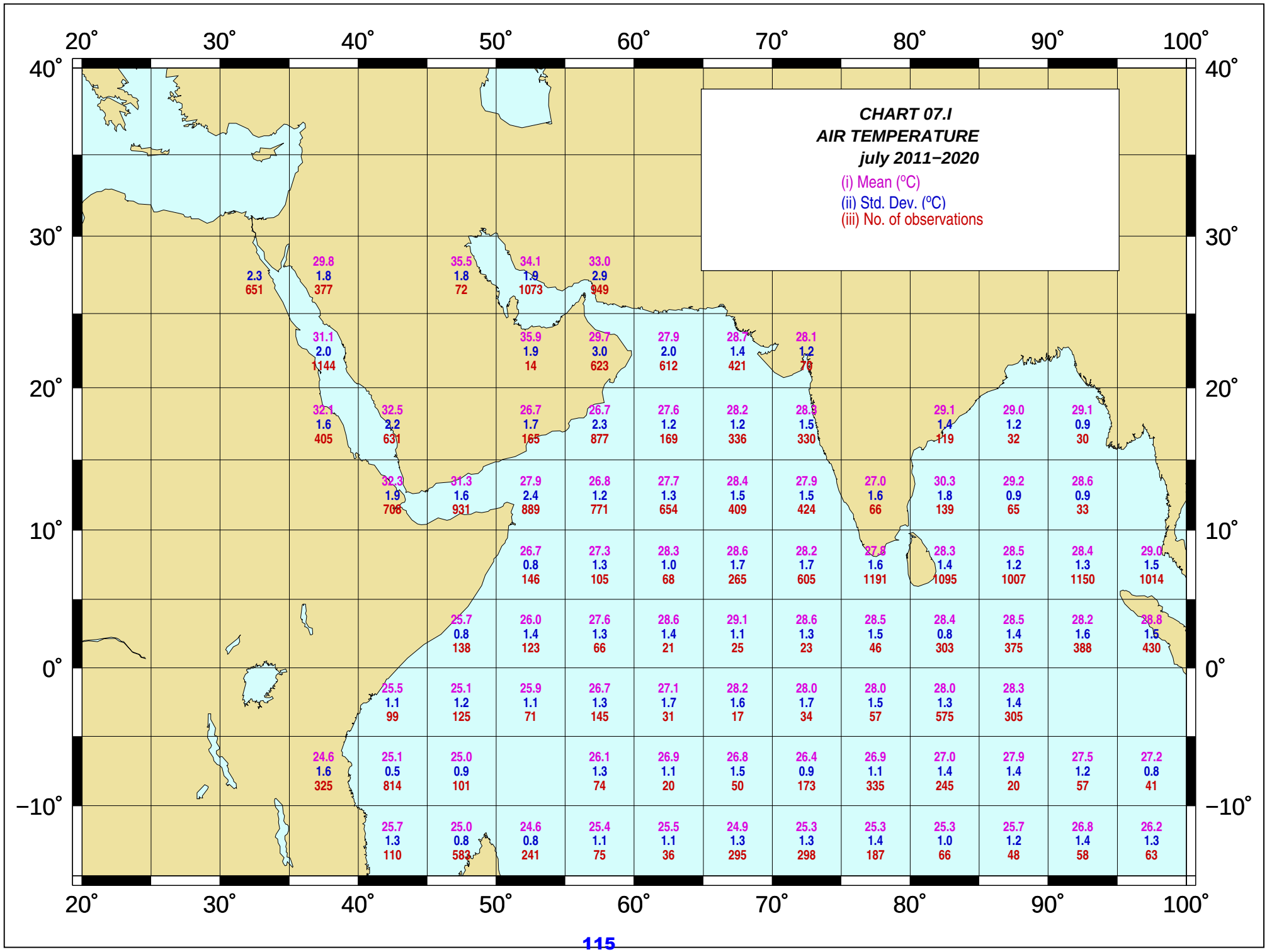


CHART 07.I
AIR TEMPERATURE
july 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.3 651
29.8 1.8 377
35.5 1.8 72
34.1 1.9 1073
33.0 2.9 949
31.1 2.0 1144
35.9 1.9 14
29.7 3.0 623
27.9 2.0 612
28.7 1.4 421
28.1 1.2 76
32.1 1.6 405
32.5 2.2 631
26.7 1.7 165
26.7 2.3 877
27.6 1.2 169
28.2 1.2 336
28.3 1.5 330
29.1 1.4 119
29.0 1.2 32
29.1 0.9 30
32.3 1.9 706
31.3 1.6 931
27.9 2.4 889
26.8 1.2 771
27.7 1.3 654
28.4 1.5 409
27.9 1.5 424
27.0 1.6 66
30.3 1.8 139
29.2 0.9 65
28.6 0.9 33
26.7 0.8 146
27.3 1.3 105
28.3 1.0 68
28.6 1.7 265
28.2 1.7 605
27.9 1.6 1191
28.3 1.4 1095
28.5 1.2 1007
28.4 1.3 1150
29.0 1.5 1014
25.7 0.8 138
26.0 1.4 123
27.6 1.3 66
28.6 1.4 21
29.1 1.1 25
28.6 1.3 23
28.5 1.5 46
28.4 0.8 303
28.5 1.4 375
28.2 1.6 388
28.8 1.5 430
25.5 1.1 99
25.1 1.2 125
25.9 1.1 71
26.7 1.3 145
27.1 1.7 31
28.2 1.6 17
28.0 1.7 34
28.0 1.5 57
28.0 1.3 575
28.3 1.4 305
24.6 1.6 325
25.1 0.5 814
25.0 0.9 101
26.1 1.3 74
26.9 1.1 20
26.8 1.5 50
26.4 0.9 173
26.9 1.1 335
27.0 1.4 245
27.9 1.4 20
27.5 1.2 57
27.2 0.8 41
25.7 1.3 110
25.0 0.8 583
24.6 0.8 241
25.4 1.1 75
25.5 1.1 36
24.9 1.3 295
25.3 1.3 298
25.3 1.4 187
25.3 1.0 66
25.7 1.2 48
26.8 1.4 58
26.2 1.3 63

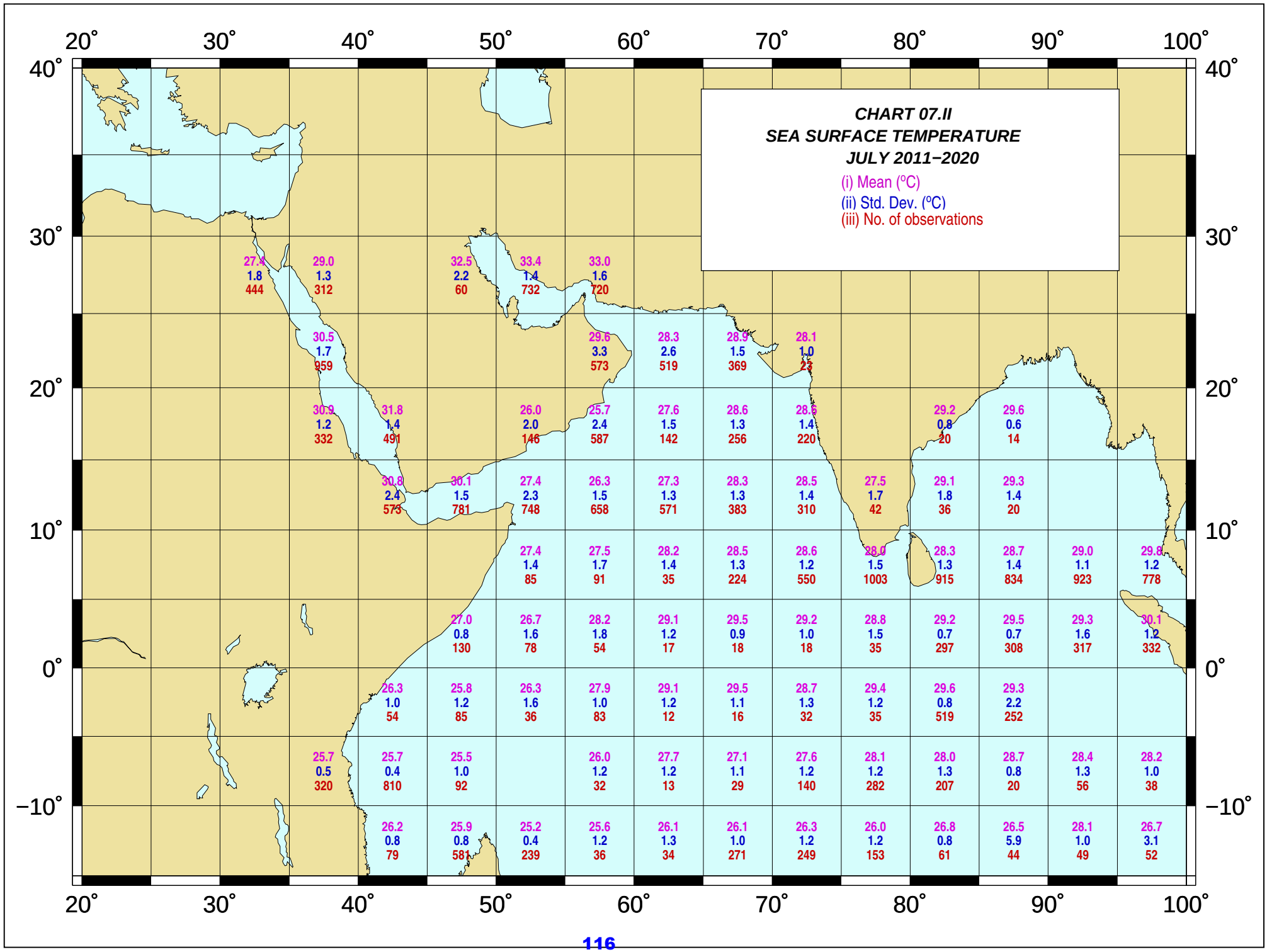


CHART 07.II
SEA SURFACE TEMPERATURE
JULY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
27.4 1.8 444
29.0 1.3 312
32.5 2.2 60
33.4 1.4 732
33.0 1.6 720
30.5 1.7 959
29.6 3.3 573
28.3 2.6 519
28.9 1.5 369
28.1 1.0 23
30.9 1.2 332
31.8 1.4 491
26.0 2.0 146
25.7 2.4 587
27.6 1.5 142
28.6 1.3 256
28.6 1.4 220
29.2 0.8 20
29.6 0.6 14
30.8 2.4 573
30.1 1.5 781
27.4 2.3 748
26.3 1.5 658
27.3 1.3 571
28.3 1.3 383
28.5 1.4 310
27.5 1.7 42
29.1 1.8 36
29.3 1.4 20
27.4 1.4 85
27.5 1.7 91
28.2 1.4 35
28.5 1.3 224
28.6 1.2 550
28.0 1.5 1003
28.3 1.3 915
28.7 1.4 834
29.0 1.1 923
29.8 1.2 778
27.0 0.8 130
26.7 1.6 78
28.2 1.8 54
29.1 1.2 17
29.5 0.9 18
29.2 1.0 18
28.8 1.5 35
29.2 0.7 297
29.5 0.7 308
29.3 1.6 317
30.1 1.2 332
26.3 1.0 54
25.8 1.2 85
26.3 1.6 36
27.9 1.0 83
29.1 1.2 12
29.5 1.1 16
28.7 1.3 32
29.4 1.2 35
29.6 0.8 519
29.3 2.2 252
25.7 0.5 320
25.7 0.4 810
25.5 1.0 92
26.0 1.2 32
27.7 1.2 13
27.1 1.1 29
27.6 1.2 140
28.1 1.2 282
28.0 1.3 207
28.7 0.8 20
28.4 1.3 56
28.2 1.0 38
26.2 0.8 79
25.9 0.8 581
25.2 0.4 239
25.6 1.2 36
26.1 1.3 34
26.1 1.0 271
26.3 1.2 249
26.0 1.2 153
26.8 0.8 61
26.5 5.9 44
28.1 1.0 49
26.7 3.1 52

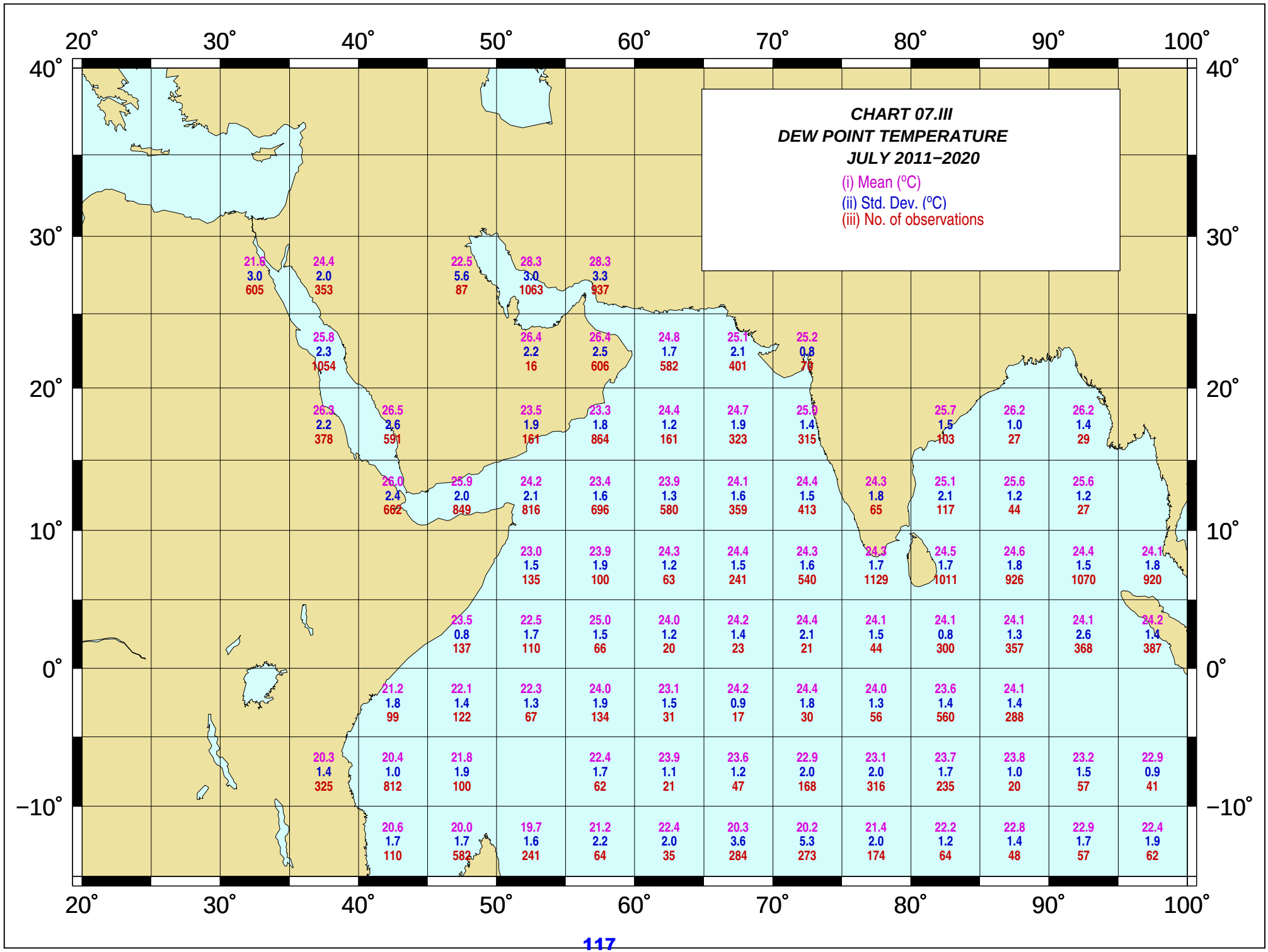


CHART 07.III
DEW POINT TEMPERATURE
JULY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
21.6 3.0 605
24.4 2.0 353
22.5 5.6 87
28.3 3.0 1063
28.3 3.3 937
25.8 2.3 1054
26.4 2.2 16
26.4 2.5 606
24.8 1.7 582
25.1 2.1 401
25.2 0.8 76
26.3 2.2 378
26.5 2.6 591
23.5 1.9 161
23.3 1.8 864
24.4 1.2 161
24.7 1.9 323
25.9 1.4 315
25.7 1.5 103
26.2 1.0 27
26.2 1.4 29
26.0 2.4 662
25.9 2.0 849
24.2 2.1 816
23.4 1.6 696
23.9 1.3 580
24.1 1.6 359
24.4 1.5 413
24.3 1.8 65
25.1 2.1 117
25.6 1.2 44
25.6 1.2 27
23.0 1.5 135
23.9 1.9 100
24.3 1.2 63
24.4 1.5 241
24.3 1.6 540
24.3 1.7 1129
24.5 1.7 1011
24.6 1.8 926
24.4 1.5 1070
24.1 1.8 920
23.5 0.8 137
22.5 1.7 110
25.0 1.5 66
24.0 1.2 20
24.2 1.4 23
24.4 2.1 21
24.1 1.5 44
24.1 0.8 300
24.1 1.3 357
24.1 2.6 368
24.2 1.4 387
21.2 1.8 99
22.1 1.4 122
22.3 1.3 67
24.0 1.9 134
23.1 1.5 31
24.2 0.9 17
24.4 1.8 30
24.0 1.3 56
23.6 1.4 560
24.1 1.4 288
20.3 1.4 325
20.4 1.0 812
21.8 1.9 100
22.4 1.7 62
23.9 1.1 21
23.6 1.2 47
22.9 2.0 168
23.1 2.0 316
23.7 1.7 235
23.8 1.0 20
23.2 1.5 57
22.9 0.9 41
20.6 1.7 110
20.0 1.7 582
19.7 1.6 241
21.2 2.2 64
22.4 2.0 35
20.3 3.6 284
20.2 5.3 273
21.4 2.0 174
22.2 1.2 64
22.8 1.4 48
22.9 1.7 57
22.4 1.9 62

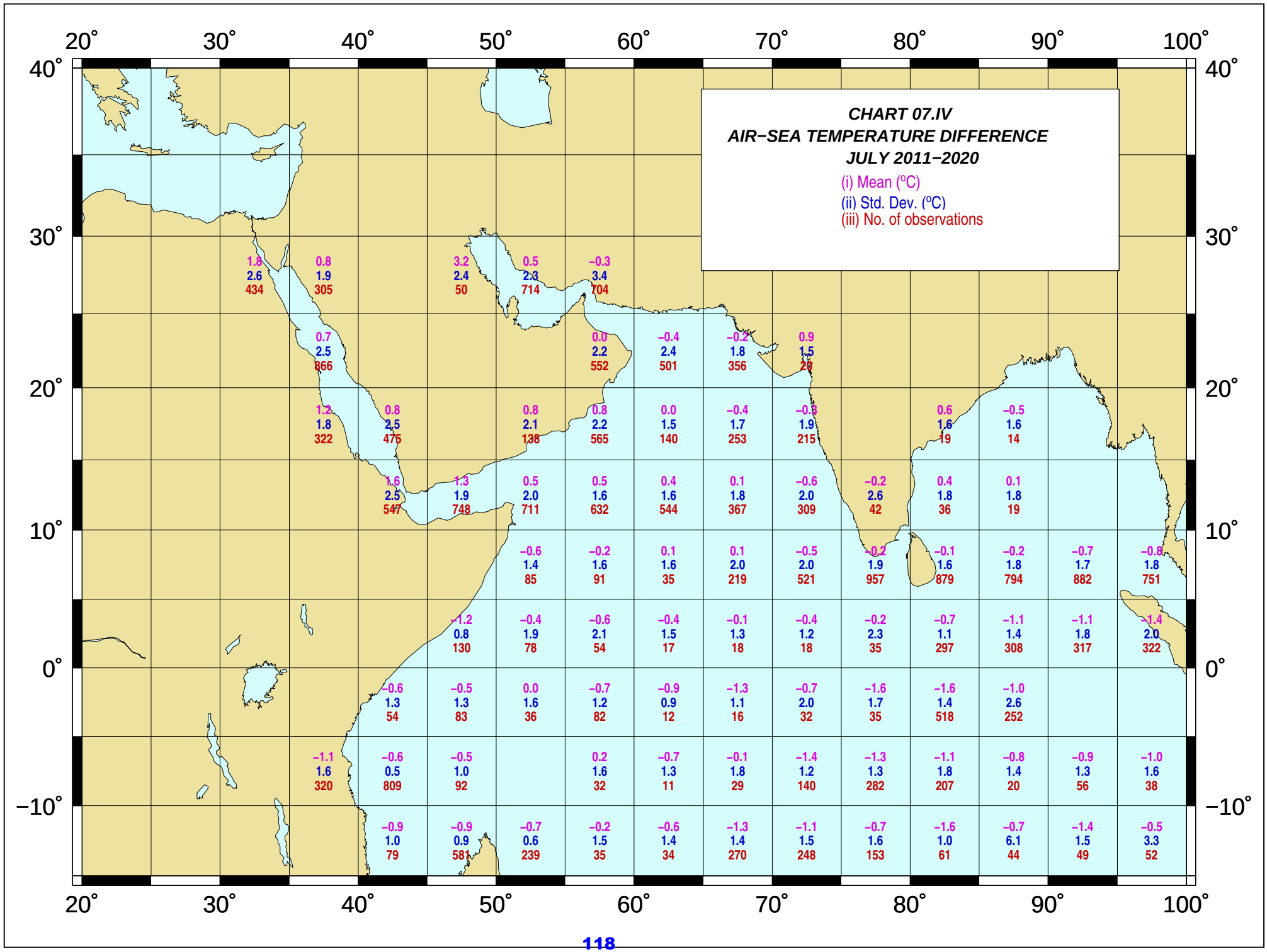


CHART 07.IV
AIR–SEA TEMPERATURE DIFFERENCE
JULY 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.8 2.6 434
0.8 1.9 305
3.2 2.4 50
0.5 2.3 714
−0.3 3.4 704
0.7 2.5 866
0.0 2.2 552
−0.4 2.4 501
−0.2 1.8 356
0.9 1.5 26
1.2 1.8 322
0.8 2.5 475
0.8 2.1 138
0.8 2.2 565
0.0 1.5 140
−0.4 1.7 253
−0.3 1.9 215
0.6 1.6 19
−0.5 1.6 14
1.6 2.5 547
1.3 1.9 748
0.5 2.0 711
0.5 1.6 632
0.4 1.6 544
0.1 1.8 367
−0.6 2.0 309
−0.2 2.6 42
0.4 1.8 36
0.1 1.8 19
−0.6 1.4 85
−0.2 1.6 91
0.1 1.6 35
0.1 2.0 219
−0.5 2.0 521
−0.2 1.9 957
−0.1 1.6 879
−0.2 1.8 794
−0.7 1.7 882
−0.8 1.8 751
−1.2 0.8 130
−0.4 1.9 78
−0.6 2.1 54
−0.4 1.5 17
−0.1 1.3 18
−0.4 1.2 18
−0.2 2.3 35
−0.7 1.1 297
−1.1 1.4 308
−1.1 1.8 317
−1.4 2.0 322
−0.6 1.3 54
−0.5 1.3 83
0.0 1.6 36
−0.7 1.2 82
−0.9 0.9 12
−1.3 1.1 16
−0.7 2.0 32
−1.6 1.7 35
−1.6 1.4 518
−1.0 2.6 252
−1.1 1.6 320
−0.6 0.5 809
−0.5 1.0 92
0.2 1.6 32
−0.7 1.3 11
−0.1 1.8 29
−1.4 1.2 140
−1.3 1.3 282
−1.1 1.8 207
−0.8 1.4 20
−0.9 1.3 56
−1.0 1.6 38
−0.9 1.0 79
−0.9 0.9 581
−0.7 0.6 239
−0.2 1.5 35
−0.6 1.4 34
−1.3 1.4 270
−1.1 1.5 248
−0.7 1.6 153
−1.6 1.0 61
−0.7 6.1 44
−1.4 1.5 49
−0.5 3.3 52

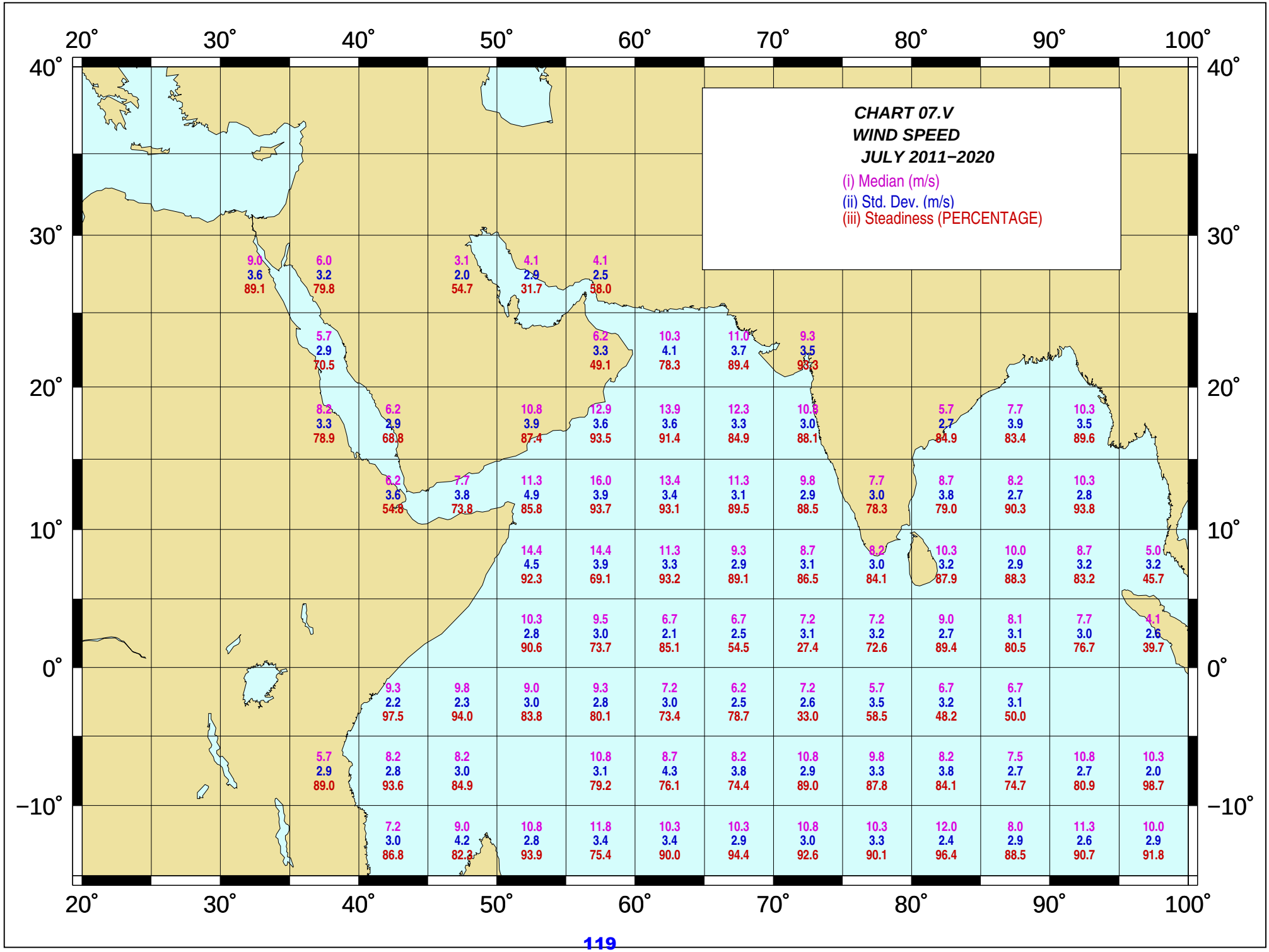


CHART 07.V
WIND SPEED
JULY 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
9.0 3.6 89.1
6.0 3.2 79.8
3.1 2.0 54.7
4.1 2.9 31.7
4.1 2.5 58.0
5.7 2.9 70.5
6.2 3.3 49.1
10.3 4.1 78.3
11.0 3.7 89.4
9.3 3.5 93.3
8.2 3.3 78.9
6.2 2.9 68.8
10.8 3.9 87.4
12.9 3.6 93.5
13.9 3.6 91.4
12.3 3.3 84.9
10.9 3.0 88.1
5.7 2.7 84.9
7.7 3.9 83.4
10.3 3.5 89.6
6.2 3.6 54.8
7.7 3.8 73.8
11.3 4.9 85.8
16.0 3.9 93.7
13.4 3.4 93.1
11.3 3.1 89.5
9.8 2.9 88.5
7.7 3.0 78.3
8.7 3.8 79.0
8.2 2.7 90.3
10.3 2.8 93.8
14.4 4.5 92.3
14.4 3.9 69.1
11.3 3.3 93.2
9.3 2.9 89.1
8.7 3.1 86.5
8.2 3.0 84.1
10.3 3.2 87.9
10.0 2.9 88.3
8.7 3.2 83.2
5.0 3.2 45.7
10.3 2.8 90.6
9.5 3.0 73.7
6.7 2.1 85.1
6.7 2.5 54.5
7.2 3.1 27.4
7.2 3.2 72.6
9.0 2.7 89.4
8.1 3.1 80.5
7.7 3.0 76.7
4.1 2.6 39.7
9.3 2.2 97.5
9.8 2.3 94.0
9.0 3.0 83.8
9.3 2.8 80.1
7.2 3.0 73.4
6.2 2.5 78.7
7.2 2.6 33.0
5.7 3.5 58.5
6.7 3.2 48.2
6.7 3.1 50.0
5.7 2.9 89.0
8.2 2.8 93.6
8.2 3.0 84.9
10.8 3.1 79.2
8.7 4.3 76.1
8.2 3.8 74.4
10.8 2.9 89.0
9.8 3.3 87.8
8.2 3.8 84.1
7.5 2.7 74.7
10.8 2.7 80.9
10.3 2.0 98.7
7.2 3.0 86.8
9.0 4.2 82.3
10.8 2.8 93.9
11.8 3.4 75.4
10.3 3.4 90.0
10.3 2.9 94.4
10.8 3.0 92.6
10.3 3.3 90.1
12.0 2.4 96.4
8.0 2.9 88.5
11.3 2.6 90.7
10.0 2.9 91.8

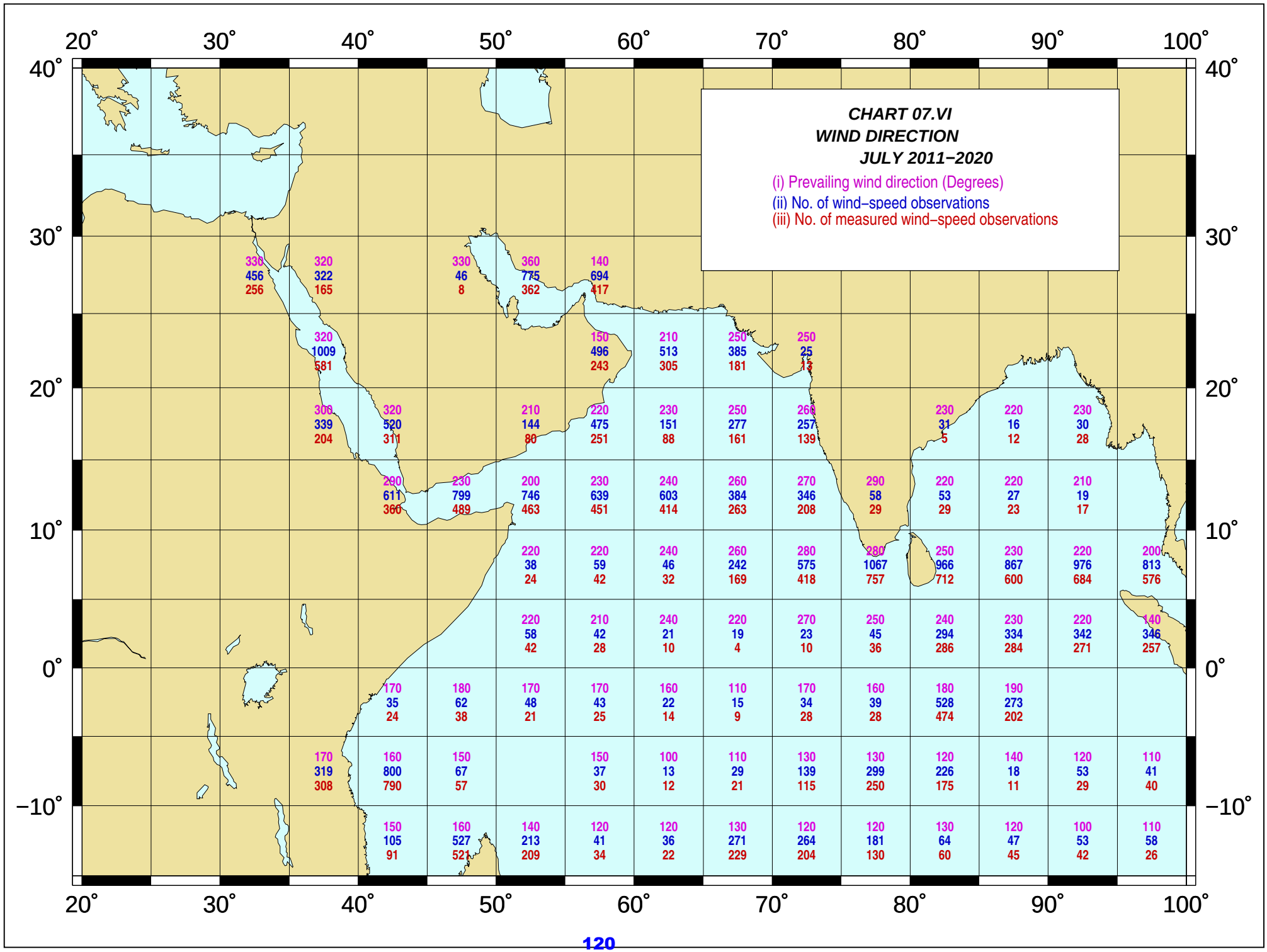


CHART 07.VI
WIND DIRECTION
JULY 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
330 456 256
320 322 165
330 46 8
360 775 362
140 694 417
320 1009 581
150 496 243
210 513 305
250 385 181
250 25 13
300 339 204
320 520 311
210 144 80
220 475 251
230 151 88
250 277 161
260 257 139
230 31 5
220 16 12
230 30 28
290 611 360
230 799 489
200 746 463
230 639 451
240 603 414
260 384 263
270 346 208
290 58 29
220 53 29
220 27 23
210 19 17
220 38 24
220 59 42
240 46 32
260 242 169
280 575 418
280 1067 757
250 966 712
230 867 600
220 976 684
200 813 576
220 58 42
210 42 28
240 21 10
220 19 4
270 23 10
250 45 36
240 294 286
230 334 284
220 342 271
140 346 257
170 35 24
180 62 38
170 48 21
170 43 25
160 22 14
110 15 9
170 34 28
160 39 28
180 528 474
190 273 202
170 319 308
160 800 790
150 67 57
150 37 30
100 13 12
110 29 21
130 139 115
130 299 250
120 226 175
140 18 11
120 53 29
110 41 40
150 105 91
160 527 521
140 213 209
120 41 34
120 36 22
130 271 229
120 264 204
120 181 130
130 64 60
120 47 45
100 53 42
110 58 26

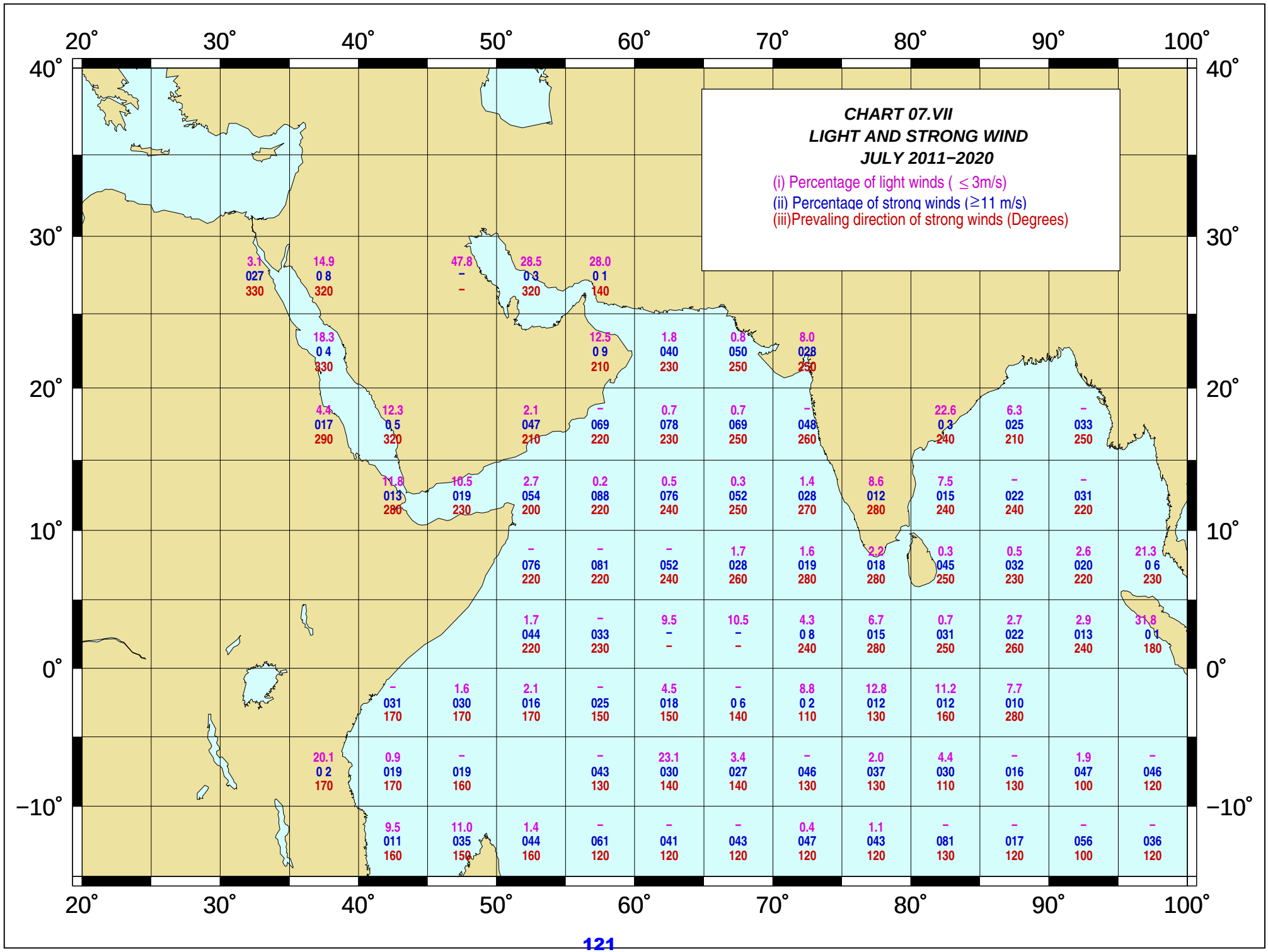


CHART 07.VII
LIGHT AND STRONG WIND
JULY 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
3.1 027 330
14.9 0 8 320
47.8 – –
28.5 0 3 320
28.0 0 1 140
18.3 0 4 330
12.5 0 9 210
1.8 040 230
0.8 050 250
8.0 028 250
4.4 017 290
12.3 0 5 320
2.1 047 210
– 069 220
0.7 078 230
0.7 069 250
– 048 260
22.6 0 3 240
6.3 025 210
– 033 250
11.8 013 280
10.5 019 230
2.7 054 200
0.2 088 220
0.5 076 240
0.3 052 250
1.4 028 270
8.6 012 280
7.5 015 240
– 022 240
– 031 220
– 076 220
– 081 220
– 052 240
1.7 028 260
1.6 019 280
2.2 018 280
0.3 045 250
0.5 032 230
2.6 020 220
21.3 0 6 230
1.7 044 220
– 033 230
9.5 – –
10.5 – –
4.3 0 8 240
6.7 015 280
0.7 031 250
2.7 022 260
2.9 013 240
31.8 0 1 180
– 031 170
1.6 030 170
2.1 016 170
– 025 150
4.5 018 150
– 0 6 140
8.8 0 2 110
12.8 012 130
11.2 012 160
7.7 010 280
20.1 0 2 170
0.9 019 170
– 019 160
– 043 130
23.1 030 140
3.4 027 140
– 046 130
2.0 037 130
4.4 030 110
– 016 130
1.9 047 100
– 046 120
9.5 011 160
11.0 035 150
1.4 044 160
– 061 120
– 041 120
– 043 120
0.4 047 120
1.1 043 120
– 081 130
– 017 120
– 056 100
– 036 120

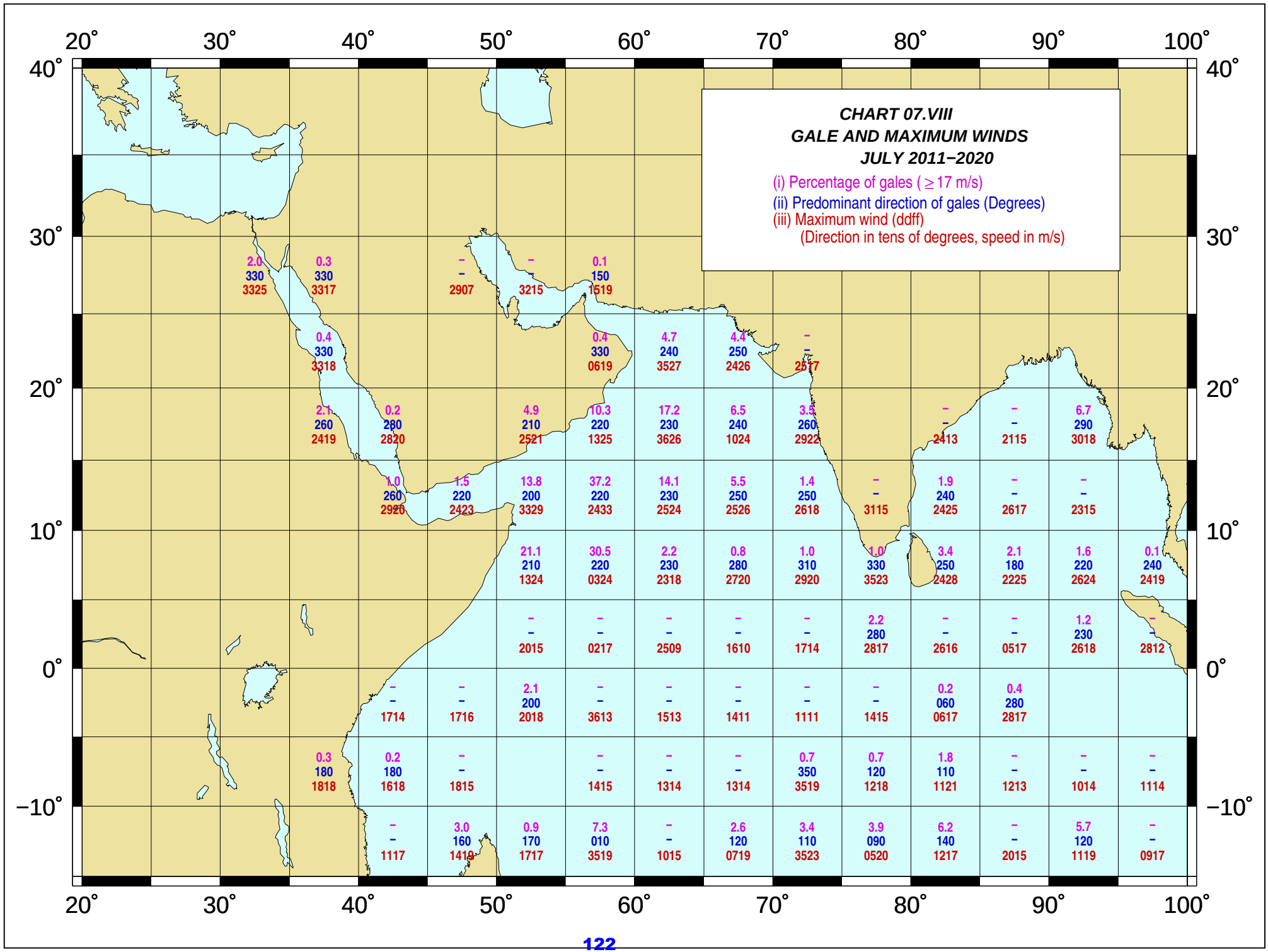


CHART 07.VIII
GALE AND MAXIMUM WINDS
JULY 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.0 330 3325
0.3 330 3317
– – 2907
– – 3215
0.1 150 1519
0.4 330 3318
0.4 330 0619
4.7 240 3527
4.4 250 2426
– – 2517
2.1 260 2419
0.2 280 2820
4.9 210 2521
10.3 220 1325
17.2 230 3626
6.5 240 1024
3.5 260 2922
– – 2413
– – 2115
6.7 290 3018
1.0 260 2926
1.5 220 2423
13.8 200 3329
37.2 220 2433
14.1 230 2524
5.5 250 2526
1.4 250 2618
– – 3115
1.9 240 2425
– – 2617
– – 2315
21.1 210 1324
30.5 220 0324
2.2 230 2318
0.8 280 2720
1.0 310 2920
1.0 330 3523
3.4 250 2428
2.1 180 2225
1.6 220 2624
0.1 240 2419
– – 2015
– – 0217
– – 2509
– – 1610
– – 1714
2.2 280 2817
– – 2616
– – 0517
1.2 230 2618
– – 2812
– – 1714
– – 1716
2.1 200 2018
– – 3613
– – 1513
– – 1411
– – 1111
– – 1415
0.2 060 0617
0.4 280 2817
0.3 180 1818
0.2 180 1618
– – 1815
– – 1415
– – 1314
– – 1314
0.7 350 3519
0.7 120 1218
1.8 110 1121
– – 1213
– – 1014
– – 1114
– – 1117
3.0 160 1410
0.9 170 1717
7.3 010 3519
– – 1015
2.6 120 0719
3.4 110 3523
3.9 090 0520
6.2 140 1217
– – 2015
5.7 120 1119
– – 0917

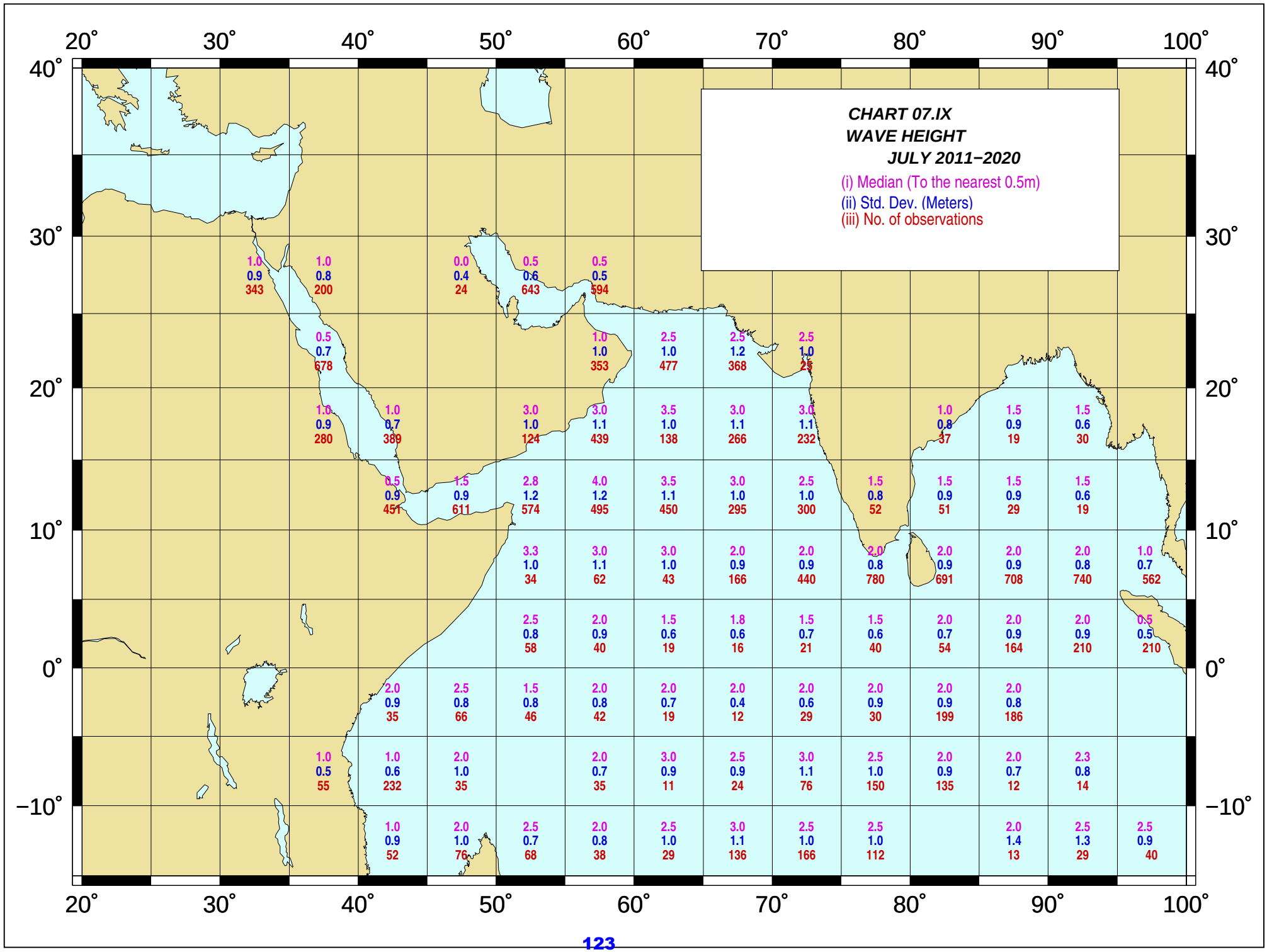


CHART 07.IX
WAVE HEIGHT
JULY 2011–2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.0 0.9 343
1.0 0.8 200
0.0 0.4 24
0.5 0.6 643
0.5 0.5 594
0.5 0.7 678
1.0 1.0 353
2.5 1.0 477
2.5 1.2 368
2.5 1.0 25
1.0 0.9 280
1.0 0.7 389
3.0 1.0 124
3.0 1.1 439
3.5 1.0 138
3.0 1.1 266
3.0 1.1 232
1.0 0.8 37
1.5 0.9 19
1.5 0.6 30
0.5 0.9 451
1.5 0.9 611
2.8 1.2 574
4.0 1.2 495
3.5 1.1 450
3.0 1.0 295
2.5 1.0 300
1.5 0.8 52
1.5 0.9 51
1.5 0.9 29
1.5 0.6 19
3.3 1.0 34
3.0 1.1 62
3.0 1.0 43
2.0 0.9 166
2.0 0.9 440
2.0 0.8 780
2.0 0.9 691
2.0 0.9 708
2.0 0.8 740
1.0 0.7 562
2.5 0.8 58
2.0 0.9 40
1.5 0.6 19
1.8 0.6 16
1.5 0.7 21
1.5 0.6 40
2.0 0.7 54
2.0 0.9 164
2.0 0.9 210
0.5 0.5 210
2.0 0.9 35
2.5 0.8 66
1.5 0.8 46
2.0 0.8 42
2.0 0.7 19
2.0 0.4 12
2.0 0.6 29
2.0 0.9 30
2.0 0.9 199
2.0 0.8 186
1.0 0.5 55
1.0 0.6 232
2.0 1.0 35
2.0 0.7 35
3.0 0.9 11
2.5 0.9 24
3.0 1.1 76
2.5 1.0 150
2.0 0.9 135
2.0 0.7 12
2.3 0.8 14
1.0 0.9 52
2.0 1.0 76
2.5 0.7 68
2.0 0.8 38
2.5 1.0 29
3.0 1.1 136
2.5 1.0 166
2.5 1.0 112
2.0 1.4 13
2.5 1.3 29
2.5 0.9 40

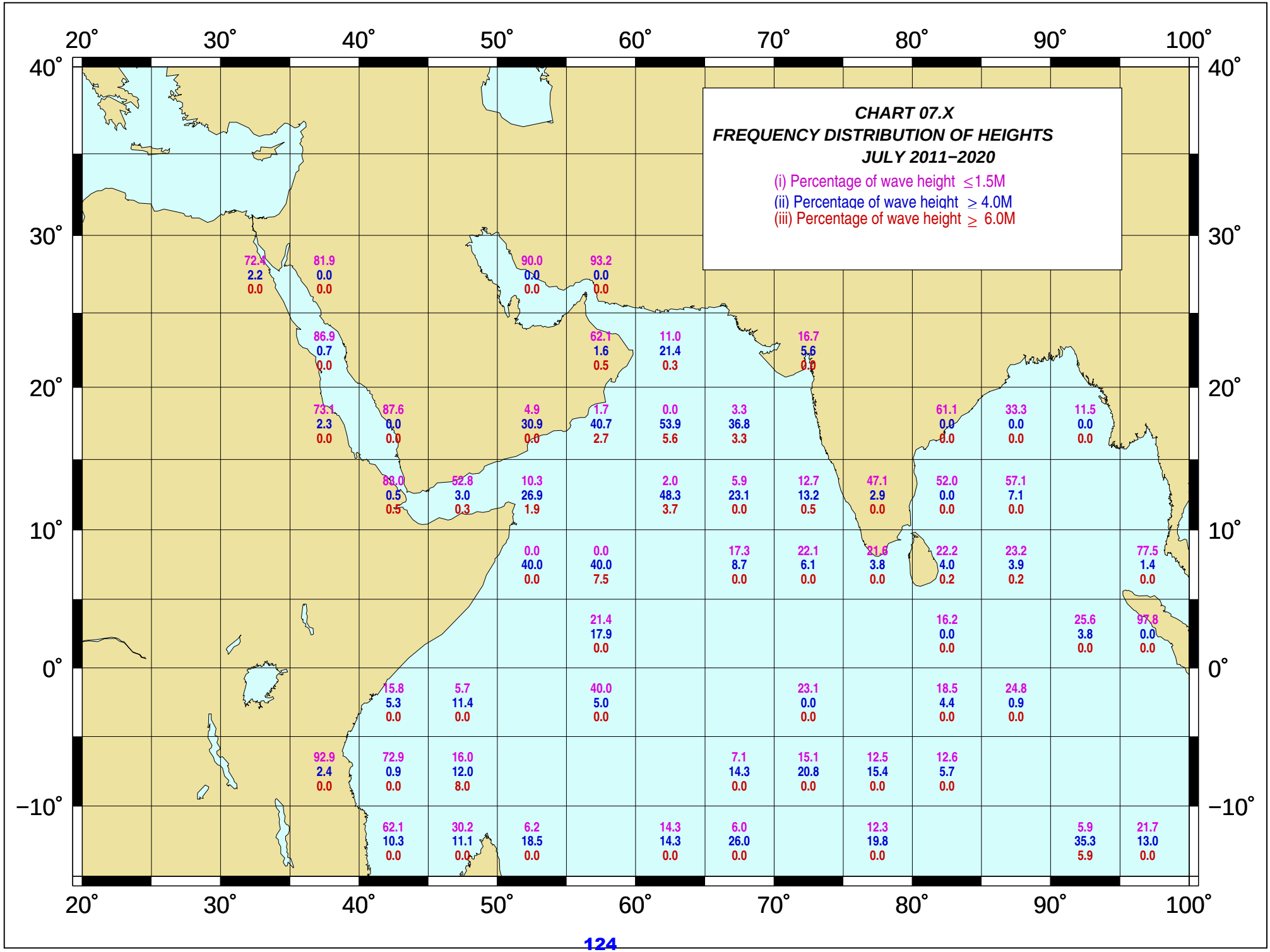


CHART 07.X
FREQUENCY DISTRIBUTION OF HEIGHTS
JULY 2011–2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
72.4 2.2 0.0
81.9 0.0 0.0
90.0 0.0 0.0
93.2 0.0 0.0
86.9 0.7 0.0
62.1 1.6 0.5
11.0 21.4 0.3
16.7 5.6 0.0
73.1 2.3 0.0
87.6 0.0 0.0
4.9 30.9 0.0
1.7 40.7 2.7
0.0 53.9 5.6
3.3 36.8 3.3
61.1 0.0 0.0
33.3 0.0 0.0
11.5 0.0 0.0
52.8 3.0 0.3
10.3 26.9 1.9
2.0 48.3 3.7
5.9 23.1 0.0
12.7 13.2 0.5
47.1 2.9 0.0
52.0 0.0 0.0
57.1 7.1 0.0
0.0 40.0 0.0
0.0 40.0 7.5
17.3 8.7 0.0
22.1 6.1 0.0
22.2 4.0 0.2
23.2 3.9 0.2
77.5 1.4 0.0
21.4 17.9 0.0
16.2 0.0 0.0
25.6 3.8 0.0
97.8 0.0 0.0
15.8 5.3 0.0
5.7 11.4 0.0
40.0 5.0 0.0
23.1 0.0 0.0
18.5 4.4 0.0
24.8 0.9 0.0
92.9 2.4 0.0
72.9 0.9 0.0
16.0 12.0 8.0
7.1 14.3 0.0
15.1 20.8 0.0
12.5 15.4 0.0
12.6 5.7 0.0
62.1 10.3 0.0
30.2 11.1 0.0
6.2 18.5 0.0
14.3 14.3 0.0
6.0 26.0 0.0
12.3 19.8 0.0
5.9 35.3 5.9
21.7 13.0 0.0

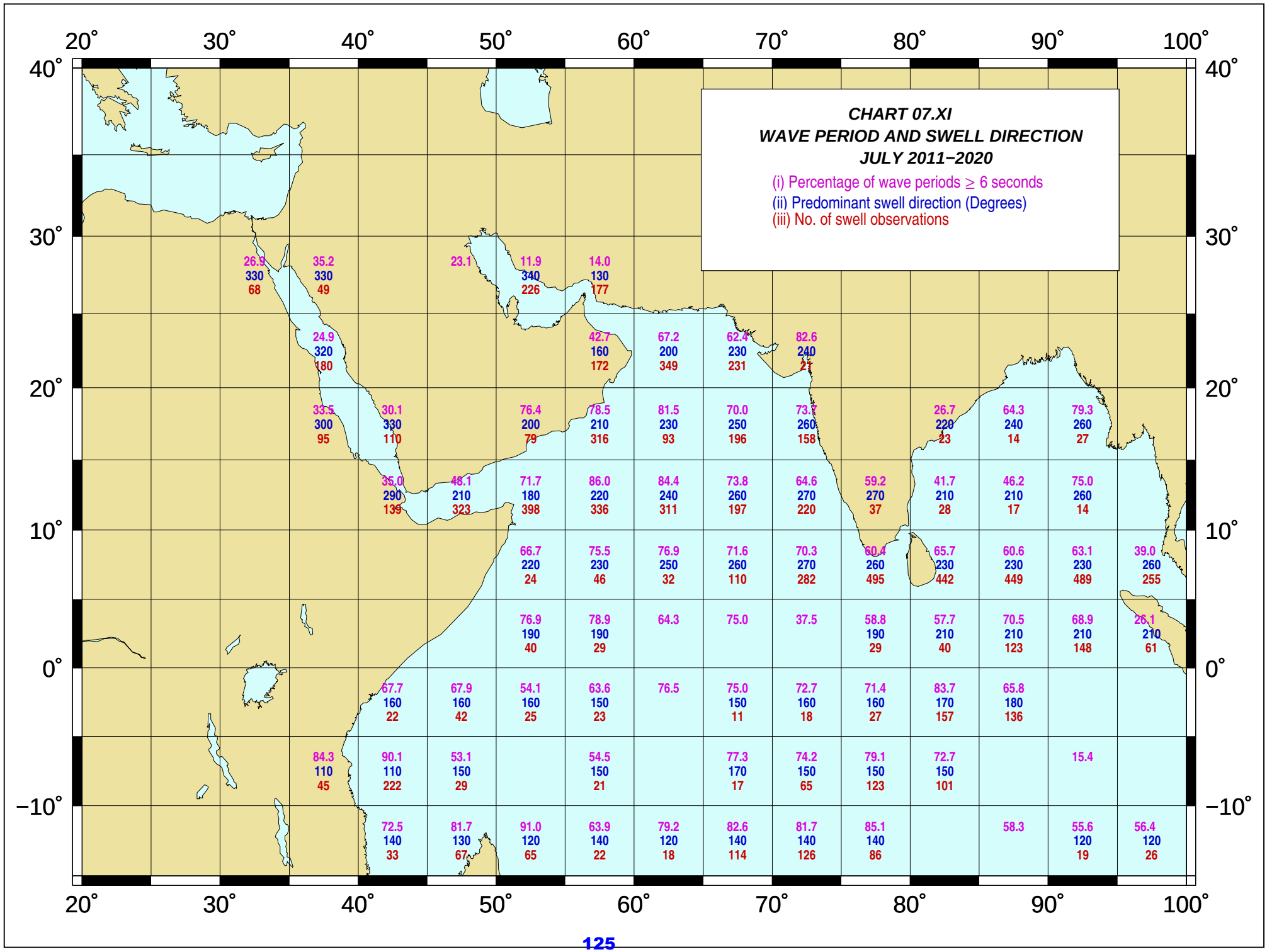


CHART 07.XI
WAVE PERIOD AND SWELL DIRECTION
JULY 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
26.9 330 68
35.2 330 49
23.1
11.9 340 226
14.0 130 177
24.9 320 180
42.7 160 172
67.2 200 349
62.4 230 231
82.6 240 21
33.5 300 95
30.1 330 110
76.4 200 79
78.5 210 316
81.5 230 93
70.0 250 196
73.7 260 158
26.7 220 23
64.3 240 14
79.3 260 27
35.0 290 139
48.1 210 323
71.7 180 398
86.0 220 336
84.4 240 311
73.8 260 197
64.6 270 220
59.2 270 37
41.7 210 28
46.2 210 17
75.0 260 14
66.7 220 24
75.5 230 46
76.9 250 32
71.6 260 110
70.3 270 282
60.4 260 495
65.7 230 442
60.6 230 449
63.1 230 489
39.0 260 255
76.9 190 40
78.9 190 29
64.3
75.0
37.5
58.8 190 29
57.7 210 40
70.5 210 123
68.9 210 148
26.1 210 61
67.7 160 22
67.9 160 42
54.1 160 25
63.6 150 23
76.5
75.0 150 11
72.7 160 18
71.4 160 27
83.7 170 157
65.8 180 136
84.3 110 45
90.1 110 222
53.1 150 29
54.5 150 21
77.3 170 17
74.2 150 65
79.1 150 123
72.7 150 101
15.4
72.5 140 33
81.7 130 67
91.0 120 65
63.9 140 22
79.2 120 18
82.6 140 114
81.7 140 126
85.1 140 86
58.3
55.6 120 19
56.4 120 26

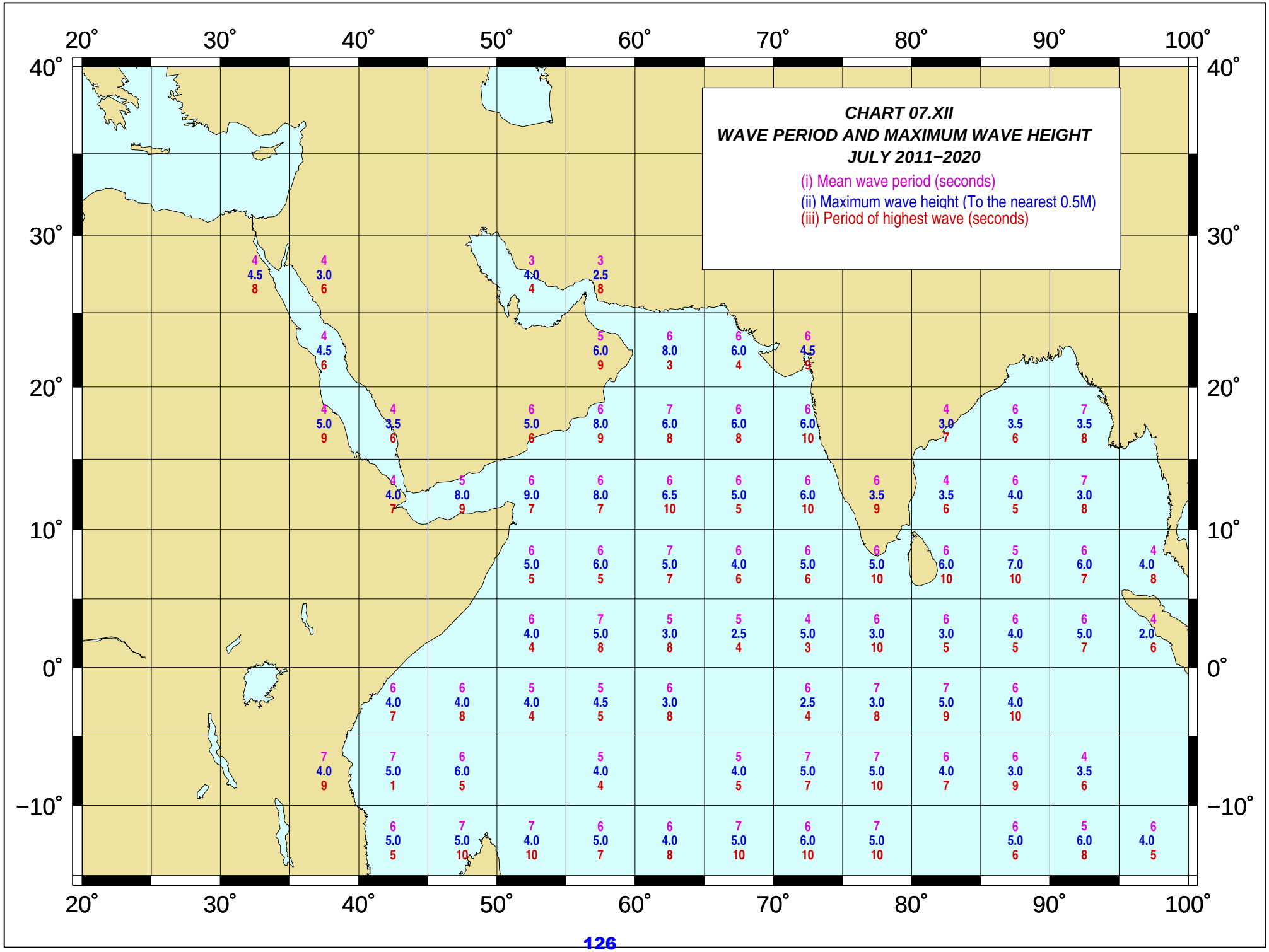


CHART 07.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
JULY 2011–2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°

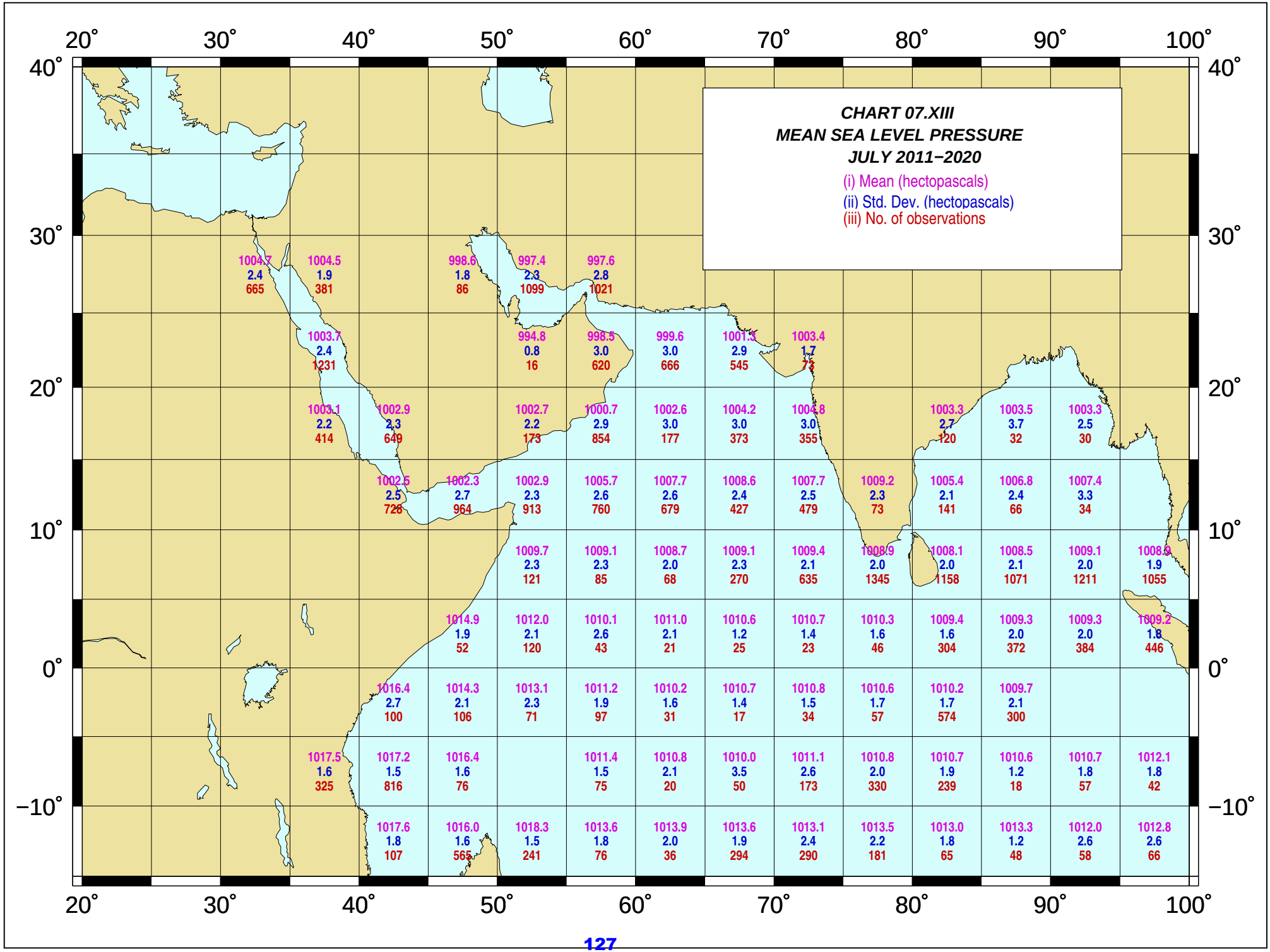


CHART 07.XIII
MEAN SEA LEVEL PRESSURE
JULY 2011–2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1004.7 2.4 665
1004.5 1.9 381
998.6 1.8 86
997.4 2.3 1099
997.6 2.8 1021
1003.7 2.4 1231
994.8 0.8 16
998.5 3.0 620
999.6 3.0 666
1001.3 2.9 545
1003.4 1.7 75
1003.1 2.2 414
1002.9 2.3 649
1002.7 2.2 173
1000.7 2.9 854
1002.6 3.0 177
1004.2 3.0 373
1004.8 3.0 355
1003.3 2.7 120
1003.5 3.7 32
1003.3 2.5 30
1002.5 2.5 726
1002.3 2.7 964
1002.9 2.3 913
1005.7 2.6 760
1007.7 2.6 679
1008.6 2.4 427
1007.7 2.5 479
1009.2 2.3 73
1005.4 2.1 141
1006.8 2.4 66
1007.4 3.3 34
1009.7 2.3 121
1009.1 2.3 85
1008.7 2.0 68
1009.1 2.3 270
1009.4 2.1 635
1008.9 2.0 1345
1008.1 2.0 1158
1008.5 2.1 1071
1009.1 2.0 1211
1008.9 1.9 1055
1014.9 1.9 52
1012.0 2.1 120
1010.1 2.6 43
1011.0 2.1 21
1010.6 1.2 25
1010.7 1.4 23
1010.3 1.6 46
1009.4 1.6 304
1009.3 2.0 372
1009.3 2.0 384
1009.2 1.8 446
1016.4 2.7 100
1014.3 2.1 106
1013.1 2.3 71
1011.2 1.9 97
1010.2 1.6 31
1010.7 1.4 17
1010.8 1.5 34
1010.6 1.7 57
1010.2 1.7 574
1009.7 2.1 300
1017.5 1.6 325
1017.2 1.5 816
1016.4 1.6 76
1011.4 1.5 75
1010.8 2.1 20
1010.0 3.5 50
1011.1 2.6 173
1010.8 2.0 330
1010.7 1.9 239
1010.6 1.2 18
1010.7 1.8 57
1012.1 1.8 42
1017.6 1.8 107
1016.0 1.6 565
1018.3 1.5 241
1013.6 1.8 76
1013.9 2.0 36
1013.6 1.9 294
1013.1 2.4 290
1013.5 2.2 181
1013.0 1.8 65
1013.3 1.2 48
1012.0 2.6 58
1012.8 2.6 66

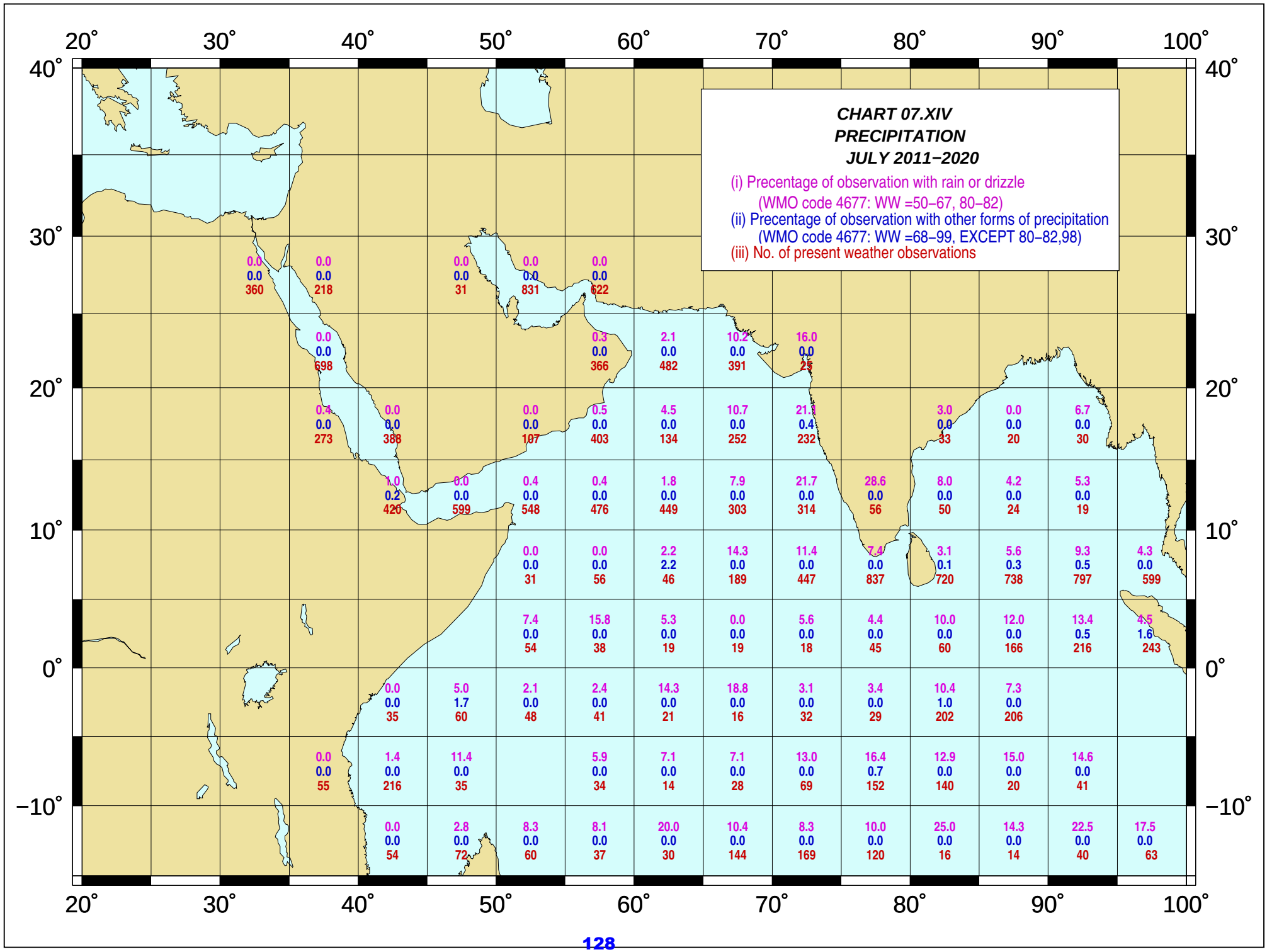


CHART 07.XIV
PRECIPITATION
JULY 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 0.0 360
0.0 0.0 218
0.0 0.0 31
0.0 0.0 831
0.0 0.0 622
0.0 0.0 698
0.3 0.0 366
2.1 0.0 482
10.2 0.0 391
16.0 0.0 25
0.4 0.0 273
0.0 0.0 388
0.0 0.0 107
0.5 0.0 403
4.5 0.0 134
10.7 0.0 252
21.1 0.4 232
3.0 0.0 33
0.0 0.0 20
6.7 0.0 30
1.0 0.2 420
0.0 0.0 599
0.4 0.0 548
0.4 0.0 476
1.8 0.0 449
7.9 0.0 303
21.7 0.0 314
28.6 0.0 56
8.0 0.0 50
4.2 0.0 24
5.3 0.0 19
0.0 0.0 31
0.0 0.0 56
2.2 2.2 46
14.3 0.0 189
11.4 0.0 447
7.4 0.0 837
3.1 0.1 720
5.6 0.3 738
9.3 0.5 797
4.3 0.0 599
7.4 0.0 54
15.8 0.0 38
5.3 0.0 19
0.0 0.0 19
5.6 0.0 18
4.4 0.0 45
10.0 0.0 60
12.0 0.0 166
13.4 0.5 216
4.5 1.6 243
0.0 0.0 35
5.0 1.7 60
2.1 0.0 48
2.4 0.0 41
14.3 0.0 21
18.8 0.0 16
3.1 0.0 32
3.4 0.0 29
10.4 1.0 202
7.3 0.0 206
0.0 0.0 55
1.4 0.0 216
11.4 0.0 35
5.9 0.0 34
7.1 0.0 14
7.1 0.0 28
13.0 0.0 69
16.4 0.7 152
12.9 0.0 140
15.0 0.0 20
14.6 0.0 41
0.0 0.0 54
2.8 0.0 72
8.3 0.0 60
8.1 0.0 37
20.0 0.0 30
10.4 0.0 144
8.3 0.0 169
10.0 0.0 120
25.0 0.0 16
14.3 0.0 14
22.5 0.0 40
17.5 0.0 63

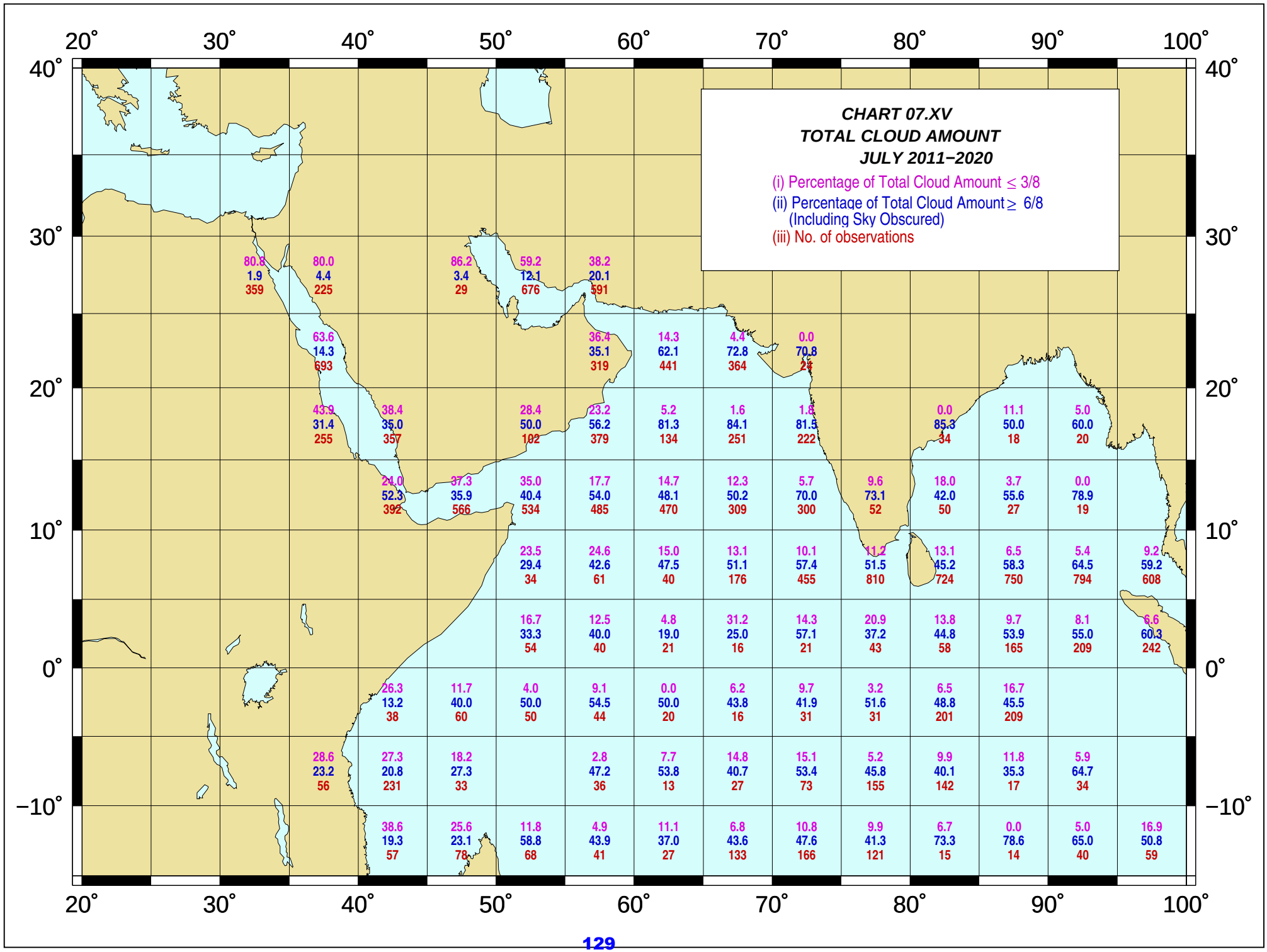


CHART 07.XV
TOTAL CLOUD AMOUNT
JULY 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
80.8 1.9 359
80.0 4.4 225
86.2 3.4 29
59.2 12.1 676
38.2 20.1 591
63.6 14.3 693
36.4 35.1 319
14.3 62.1 441
4.4 72.8 364
0.0 70.8
43.9 31.4 255
38.4 35.0 357
28.4 50.0 102
23.2 56.2 379
5.2 81.3 134
1.6 84.1 251
1.8 81.5 222
0.0 85.3 34
11.1 50.0 18
5.0 60.0 20
21.0 52.3 392
37.3 35.9 566
35.0 40.4 534
17.7 54.0 485
14.7 48.1 470
12.3 50.2 309
5.7 70.0 300
9.6 73.1 52
18.0 42.0 50
3.7 55.6 27
0.0 78.9 19
23.5 29.4 34
24.6 42.6 61
15.0 47.5 40
13.1 51.1 176
10.1 57.4 455
11.2 51.5 810
13.1 45.2 724
6.5 58.3 750
5.4 64.5 794
9.2 59.2 608
16.7 33.3 54
12.5 40.0 40
4.8 19.0 21
31.2 25.0 16
14.3 57.1 21
20.9 37.2 43
13.8 44.8 58
9.7 53.9 165
8.1 55.0 209
6.6 60.3 242
26.3 13.2 38
11.7 40.0 60
4.0 50.0 50
9.1 54.5 44
0.0 50.0 20
6.2 43.8 16
9.7 41.9 31
3.2 51.6 31
6.5 48.8 201
16.7 45.5 209
28.6 23.2 56
27.3 20.8 231
18.2 27.3 33
2.8 47.2 36
7.7 53.8 13
14.8 40.7 27
15.1 53.4 73
5.2 45.8 155
9.9 40.1 142
11.8 35.3 17
5.9 64.7 34
38.6 19.3 57
25.6 23.1 78
11.8 58.8 68
4.9 43.9 41
11.1 37.0 27
6.8 43.6 133
10.8 47.6 166
9.9 41.3 121
6.7 73.3 15
0.0 78.6 14
5.0 65.0 40
16.9 50.8 59

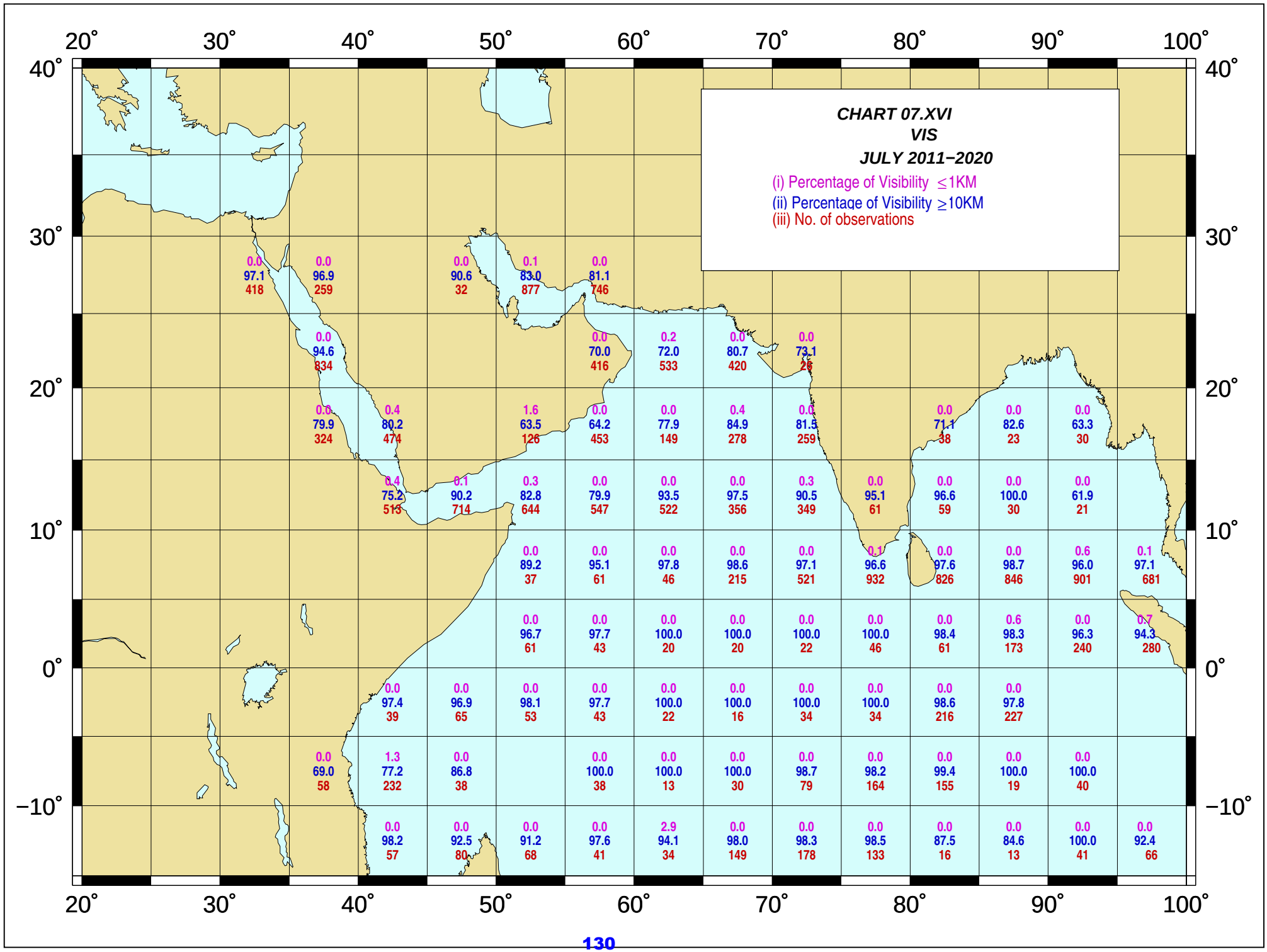


CHART 07.XVI
VIS
JULY 2011–2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 97.1 418
0.0 96.9 259
0.0 90.6 32
0.1 83.0 877
0.0 81.1 746
0.0 94.6 834
0.0 70.0 416
0.2 72.0 533
0.0 80.7 420
0.0 73.1 26
0.0 79.9 324
0.4 80.2 474
1.6 63.5 126
0.0 64.2 453
0.0 77.9 149
0.4 84.9 278
0.0 81.5 259
0.0 71.1 38
0.0 82.6 23
0.0 63.3 30
0.4 75.2 513
0.1 90.2 714
0.3 82.8 644
0.0 79.9 547
0.0 93.5 522
0.0 97.5 356
0.3 90.5 349
0.0 95.1 61
0.0 96.6 59
0.0 100.0 30
0.0 61.9 21
0.0 89.2 37
0.0 95.1 61
0.0 97.8 46
0.0 98.6 215
0.0 97.1 521
0.1 96.6 932
0.0 97.6 826
0.0 98.7 846
0.6 96.0 901
0.1 97.1 681
0.0 96.7 61
0.0 97.7 43
0.0 100.0 20
0.0 100.0 20
0.0 100.0 22
0.0 100.0 46
0.0 98.4 61
0.6 98.3 173
0.0 96.3 240
0.7 94.3 280
0.0 97.4 39
0.0 96.9 65
0.0 98.1 53
0.0 97.7 43
0.0 100.0 22
0.0 100.0 16
0.0 100.0 34
0.0 100.0 34
0.0 98.6 216
0.0 97.8 227
0.0 69.0 58
1.3 77.2 232
0.0 86.8 38
0.0 100.0 38
0.0 100.0 13
0.0 100.0 30
0.0 98.7 79
0.0 98.2 164
0.0 99.4 155
0.0 100.0 19
0.0 100.0 40
0.0 98.2 57
0.0 92.5 80
0.0 91.2 68
0.0 97.6 41
2.9 94.1 34
0.0 98.0 149
0.0 98.3 178
0.0 98.5 133
0.0 87.5 16
0.0 84.6 13
0.0 100.0 41
0.0 92.4 66

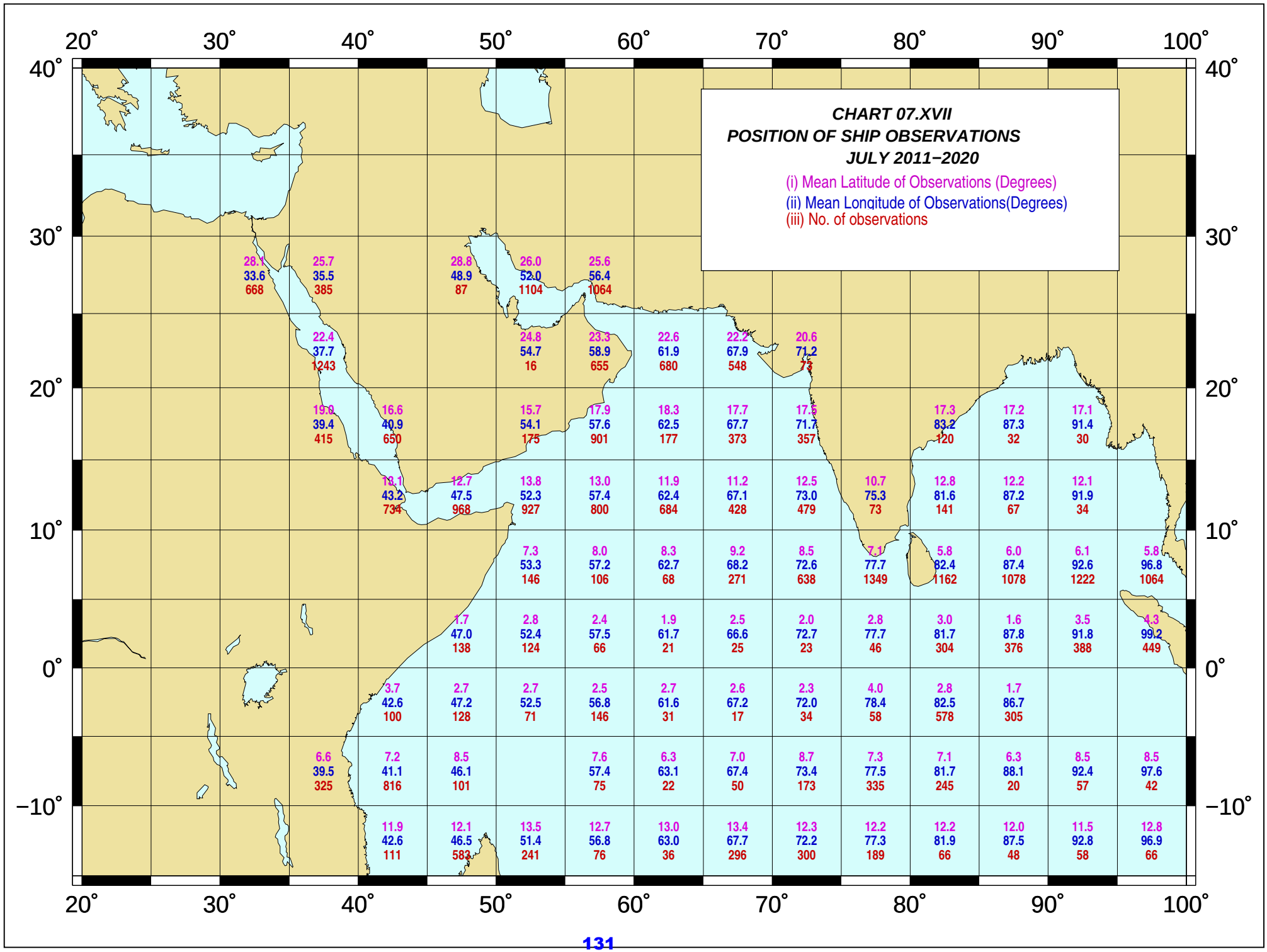


CHART 07.XVII
POSITION OF SHIP OBSERVATIONS
JULY 2011–2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.1 33.6 668
25.7 35.5 385
28.8 48.9 87
26.0 52.0 1104
25.6 56.4 1064
22.4 37.7 1243
24.8 54.7 16
23.3 58.9 655
22.6 61.9 680
22.2 67.9 548
20.6 71.2 73
19.0 39.4 415
16.6 40.9 650
15.7 54.1 175
17.9 57.6 901
18.3 62.5 177
17.7 67.7 373
17.5 71.7 357
17.3 83.2 120
17.2 87.3 32
17.1 91.4 30
10.1 43.2 734
12.7 47.5 968
13.8 52.3 927
13.0 57.4 800
11.9 62.4 684
11.2 67.1 428
12.5 73.0 479
10.7 75.3 73
12.8 81.6 141
12.2 87.2 67
12.1 91.9 34
7.3 53.3 146
8.0 57.2 106
8.3 62.7 68
9.2 68.2 271
8.5 72.6 638
7.1 77.7 1349
5.8 82.4 1162
6.0 87.4 1078
6.1 92.6 1222
5.8 96.8 1064
1.7 47.0 138
2.8 52.4 124
2.4 57.5 66
1.9 61.7 21
2.5 66.6 25
2.0 72.7 23
2.8 77.7 46
3.0 81.7 304
1.6 87.8 376
3.5 91.8 388
4.3 99.2 449
3.7 42.6 100
2.7 47.2 128
2.7 52.5 71
2.5 56.8 146
2.7 61.6 31
2.6 67.2 17
2.3 72.0 34
4.0 78.4 58
2.8 82.5 578
1.7 86.7 305
6.6 39.5 325
7.2 41.1 816
8.5 46.1 101
7.6 57.4 75
6.3 63.1 22
7.0 67.4 50
8.7 73.4 173
7.3 77.5 335
7.1 81.7 245
6.3 88.1 20
8.5 92.4 57
8.5 97.6 42
11.9 42.6 111
12.1 46.5 583
13.5 51.4 241
12.7 56.8 76
13.0 63.0 36
13.4 67.7 296
12.3 72.2 300
12.2 77.3 189
12.2 81.9 66
12.0 87.5 48
11.5 92.8 58
12.8 96.9 66

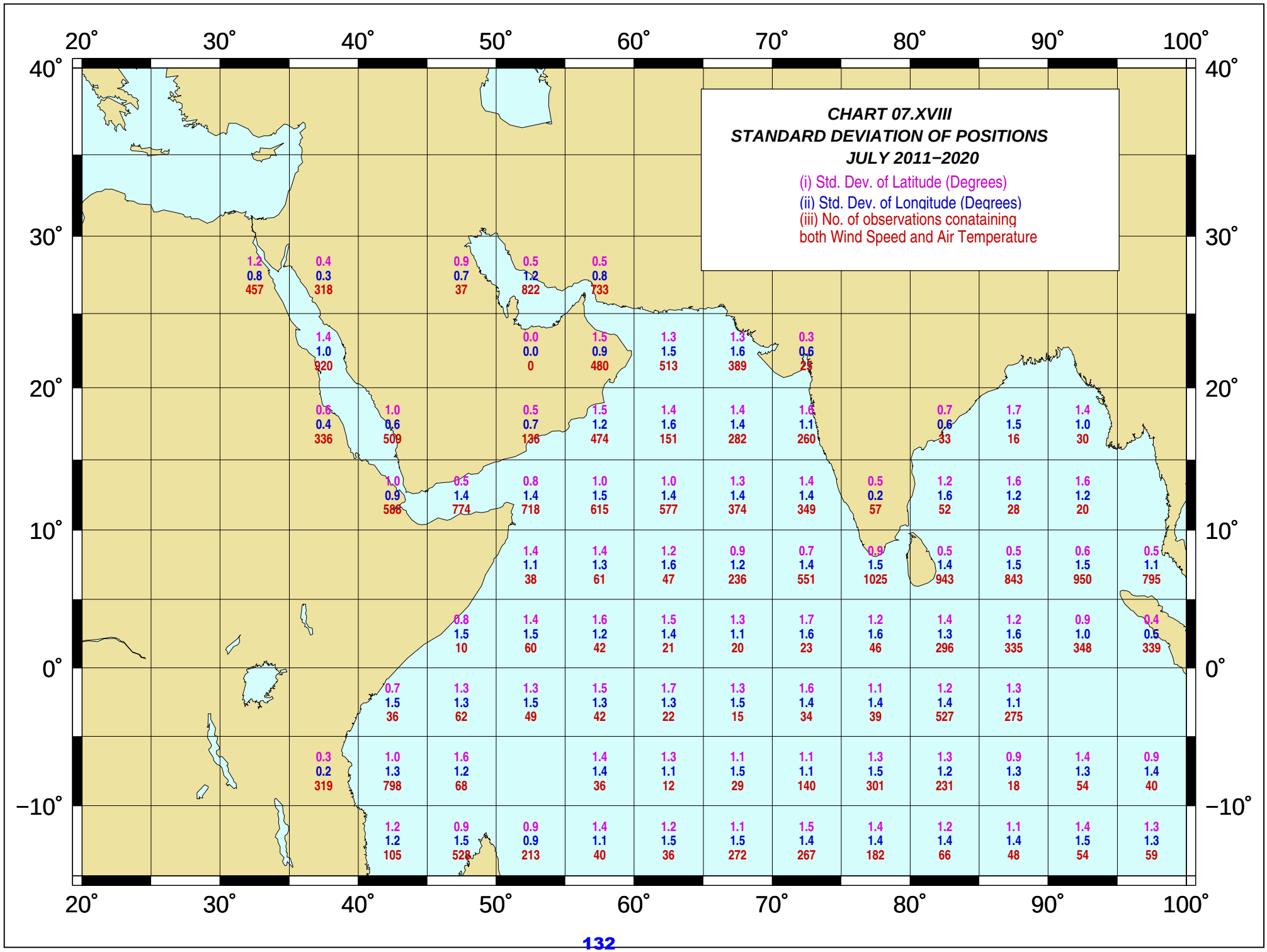
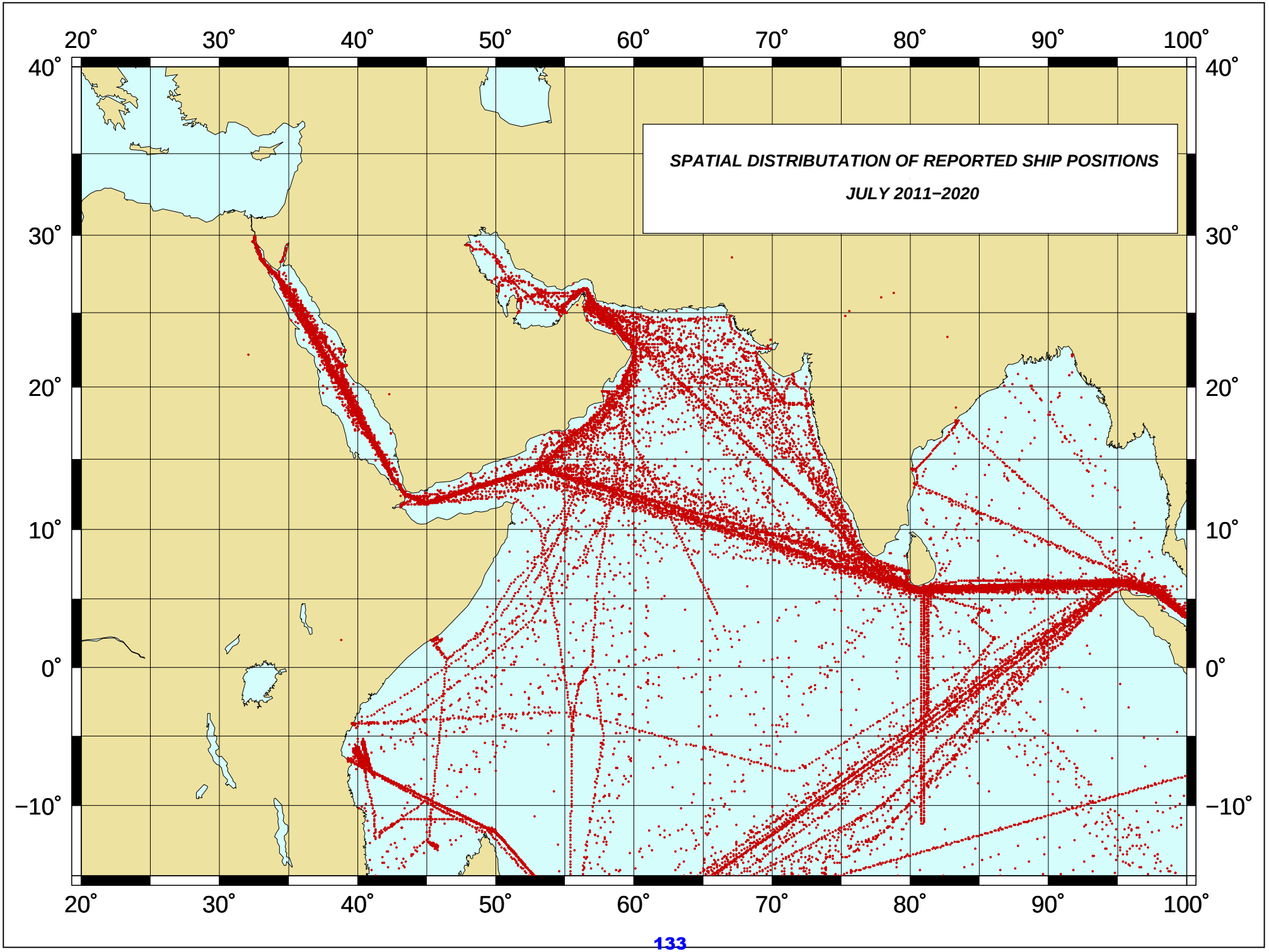


CHART 07.XVIII
STANDARD DEVIATION OF POSITIONS
JULY 2011–2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.2 0.8 457
0.4 0.3 318
0.9 0.7 37
0.5 1.2 822
0.5 0.8 733
1.4 1.0 920
0.0 0.0 0
1.5 0.9 480
1.3 1.5 513
1.3 1.6 389
0.3 0.6 25
0.6 0.4 336
1.0 0.6 509
0.5 0.7 136
1.5 1.2 474
1.4 1.6 151
1.4 1.4 282
1.6 1.1 260
0.7 0.6 33
1.7 1.5 16
1.4 1.0 30
1.0 0.9 586
0.5 1.4 774
0.8 1.4 718
1.0 1.5 615
1.0 1.4 577
1.3 1.4 374
1.4 1.4 349
0.5 0.2 57
1.2 1.6 52
1.6 1.2 28
1.6 1.2 20
1.4 1.1 38
1.4 1.3 61
1.2 1.6 47
0.9 1.2 236
0.7 1.4 551
0.9 1.5 1025
0.5 1.4 943
0.5 1.5 843
0.6 1.5 950
0.5 1.1 795
0.8 1.5 10
1.4 1.5 60
1.6 1.2 42
1.5 1.4 21
1.3 1.1 20
1.7 1.6 23
1.2 1.6 46
1.4 1.3 296
1.2 1.6 335
0.9 1.0 348
0.4 0.5 339
0.7 1.5 36
1.3 1.3 62
1.3 1.5 49
1.5 1.3 42
1.7 1.3 22
1.3 1.5 15
1.6 1.4 34
1.1 1.4 39
1.2 1.4 527
1.3 1.1 275
0.3 0.2 319
1.0 1.3 798
1.6 1.2 68
1.4 1.4 36
1.3 1.1 12
1.1 1.5 29
1.1 1.1 140
1.3 1.5 301
1.3 1.2 231
0.9 1.3 18
1.4 1.3 54
0.9 1.4 40
1.2 1.2 105
0.9 1.5 528
0.9 0.9 213
1.4 1.1 40
1.2 1.5 36
1.1 1.5 272
1.5 1.4 267
1.4 1.4 182
1.2 1.4 66
1.1 1.4 48
1.4 1.5 54
1.3 1.3 59


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
JULY 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF AUGUST 2011-2020

Marine Climatological Summary Charts 2011-2020

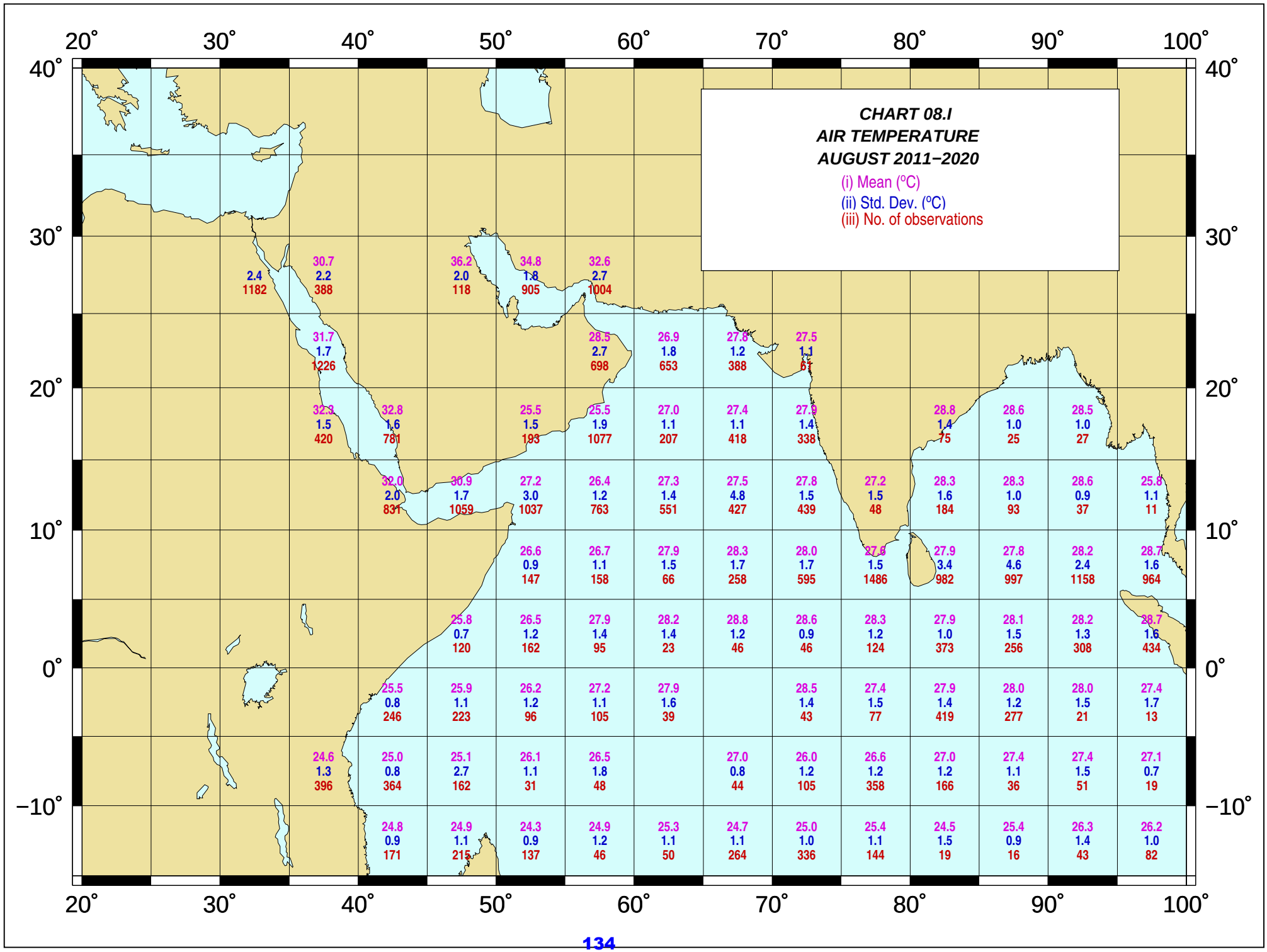


CHART 08.I
AIR TEMPERATURE
AUGUST 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.4 1182
30.7 2.2 388
36.2 2.0 118
34.8 1.8 905
32.6 2.7 1004
31.7 1.7 1226
28.5 2.7 698
26.9 1.8 653
27.8 1.2 388
27.5 1.1 61
32.3 1.5 420
32.8 1.6 781
25.5 1.5 193
25.5 1.9 1077
27.0 1.1 207
27.4 1.1 418
27.9 1.4 338
28.8 1.4 75
28.6 1.0 25
28.5 1.0 27
32.0 2.0 831
30.9 1.7 1059
27.2 3.0 1037
26.4 1.2 763
27.3 1.4 551
27.5 4.8 427
27.8 1.5 439
27.2 1.5 48
28.3 1.6 184
28.3 1.0 93
28.6 0.9 37
25.8 1.1 11
26.6 0.9 147
26.7 1.1 158
27.9 1.5 66
28.3 1.7 258
28.0 1.7 595
27.6 1.5 1486
27.9 3.4 982
27.8 4.6 997
28.2 2.4 1158
28.7 1.6 964
25.8 0.7 120
26.5 1.2 162
27.9 1.4 95
28.2 1.4 23
28.8 1.2 46
28.6 0.9 46
28.3 1.2 124
27.9 1.0 373
28.1 1.5 256
28.2 1.3 308
28.7 1.6 434
25.5 0.8 246
25.9 1.1 223
26.2 1.2 96
27.2 1.1 105
27.9 1.6 39
28.5 1.4 43
27.4 1.5 77
27.9 1.4 419
28.0 1.2 277
28.0 1.5 21
27.4 1.7 13
24.6 1.3 396
25.0 0.8 364
25.1 2.7 162
26.1 1.1 31
26.5 1.8 48
27.0 0.8 44
26.0 1.2 105
26.6 1.2 358
27.0 1.2 166
27.4 1.1 36
27.4 1.5 51
27.1 0.7 19
24.8 0.9 171
24.9 1.1 215
24.3 0.9 137
24.9 1.2 46
25.3 1.1 50
24.7 1.1 264
25.0 1.0 336
25.4 1.1 144
24.5 1.5 19
25.4 0.9 16
26.3 1.4 43
26.2 1.0 82

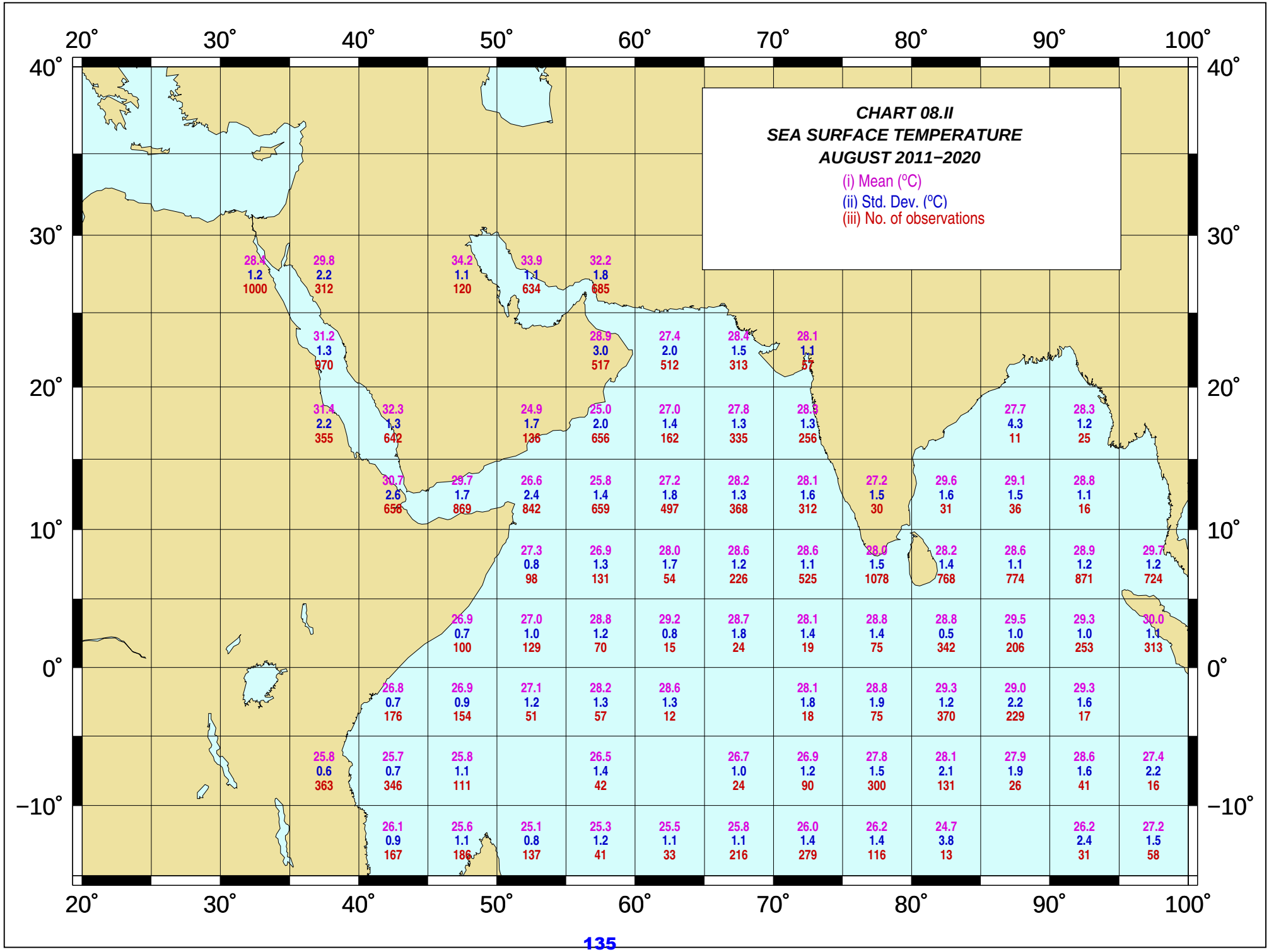


CHART 08.II
SEA SURFACE TEMPERATURE
AUGUST 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.4 1.2 1000
29.8 2.2 312
34.2 1.1 120
33.9 1.1 634
32.2 1.8 685
31.2 1.3 970
28.9 3.0 517
27.4 2.0 512
28.4 1.5 313
28.1 1.1
31.4 2.2 355
32.3 1.3 642
24.9 1.7 136
25.0 2.0 656
27.0 1.4 162
27.8 1.3 335
28.3 1.3 256
27.7 4.3 11
28.3 1.2 25
30.7 2.6 656
29.7 1.7 869
26.6 2.4 842
25.8 1.4 659
27.2 1.8 497
28.2 1.3 368
28.1 1.6 312
27.2 1.5 30
29.6 1.6 31
29.1 1.5 36
28.8 1.1 16
27.3 0.8 98
26.9 1.3 131
28.0 1.7 54
28.6 1.2 226
28.6 1.1 525
28.0 1.5 1078
28.2 1.4 768
28.6 1.1 774
28.9 1.2 871
29.7 1.2 724
26.9 0.7 100
27.0 1.0 129
28.8 1.2 70
29.2 0.8 15
28.7 1.8 24
28.1 1.4 19
28.8 1.4 75
28.8 0.5 342
29.5 1.0 206
29.3 1.0 253
30.0 1.1 313
26.8 0.7 176
26.9 0.9 154
27.1 1.2 51
28.2 1.3 57
28.6 1.3 12
28.1 1.8 18
28.8 1.9 75
29.3 1.2 370
29.0 2.2 229
29.3 1.6 17
25.8 0.6 363
25.7 0.7 346
25.8 1.1 111
26.5 1.4 42
26.7 1.0 24
26.9 1.2 90
27.8 1.5 300
28.1 2.1 131
27.9 1.9 26
28.6 1.6 41
27.4 2.2 16
26.1 0.9 167
25.6 1.1 186
25.1 0.8 137
25.3 1.2 41
25.5 1.1 33
25.8 1.1 216
26.0 1.4 279
26.2 1.4 116
24.7 3.8 13
26.2 2.4 31
27.2 1.5 58

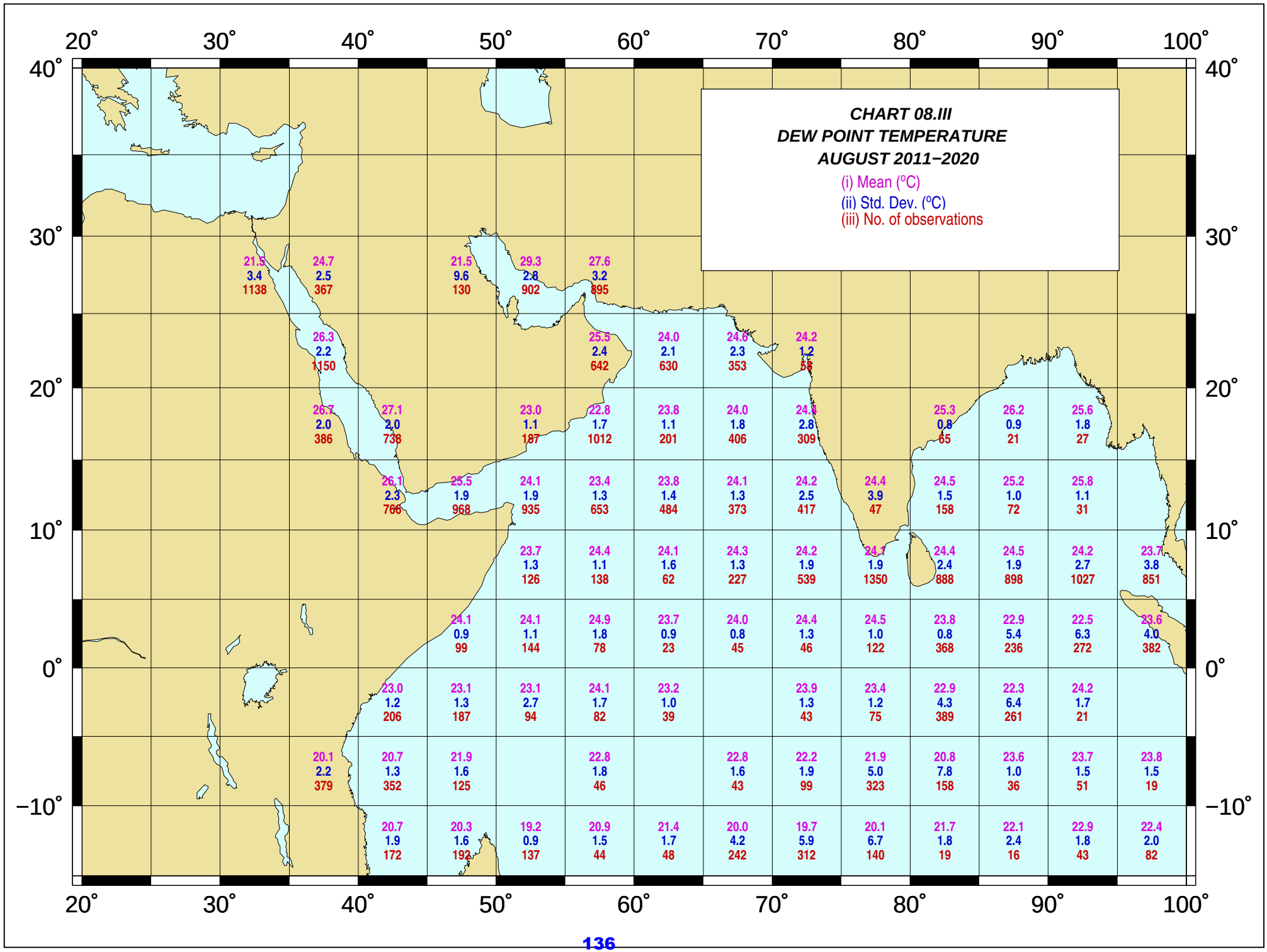


CHART 08.III
DEW POINT TEMPERATURE
AUGUST 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
21.5 3.4 1138
24.7 2.5 367
21.5 9.6 130
29.3 2.8 902
27.6 3.2 895
26.3 2.2 1150
25.5 2.4 642
24.0 2.1 630
24.6 2.3 353
24.2 1.2 56
26.7 2.0 386
27.1 2.0 738
23.0 1.1 187
22.8 1.7 1012
23.8 1.1 201
24.0 1.8 406
24.3 2.8 309
25.3 0.8 65
26.2 0.9 21
25.6 1.8 27
26.1 2.3 766
25.5 1.9 968
24.1 1.9 935
23.4 1.3 653
23.8 1.4 484
24.1 1.3 373
24.2 2.5 417
24.4 3.9 47
24.5 1.5 158
25.2 1.0 72
25.8 1.1 31
23.7 1.3 126
24.4 1.1 138
24.1 1.6 62
24.3 1.3 227
24.2 1.9 539
24.1 1.9 1350
24.4 2.4 888
24.5 1.9 898
24.2 2.7 1027
23.7 3.8 851
24.1 0.9 99
24.1 1.1 144
24.9 1.8 78
23.7 0.9 23
24.0 0.8 45
24.4 1.3 46
24.5 1.0 122
23.8 0.8 368
22.9 5.4 236
22.5 6.3 272
23.6 4.0 382
23.0 1.2 206
23.1 1.3 187
23.1 2.7 94
24.1 1.7 82
23.2 1.0 39
23.9 1.3 43
23.4 1.2 75
22.9 4.3 389
22.3 6.4 261
24.2 1.7 21
20.1 2.2 379
20.7 1.3 352
21.9 1.6 125
22.8 1.8 46
22.8 1.6 43
22.2 1.9 99
21.9 5.0 323
20.8 7.8 158
23.6 1.0 36
23.7 1.5 51
23.8 1.5 19
20.7 1.9 172
20.3 1.6 192
19.2 0.9 137
20.9 1.5 44
21.4 1.7 48
20.0 4.2 242
19.7 5.9 312
20.1 6.7 140
21.7 1.8 19
22.1 2.4 16
22.9 1.8 43
22.4 2.0 82

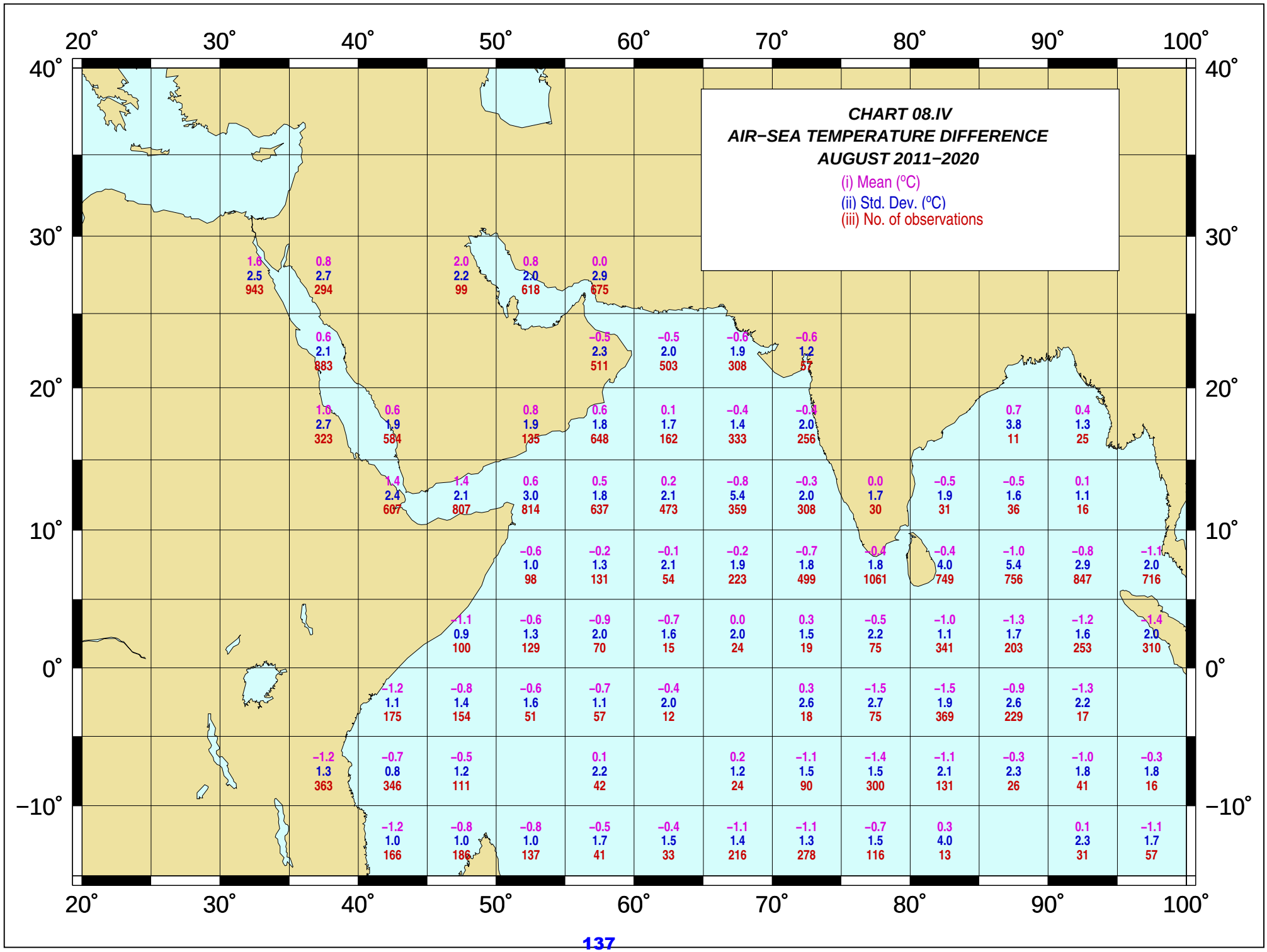


CHART 08.IV
AIR–SEA TEMPERATURE DIFFERENCE
AUGUST 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.6 2.5 943
0.8 2.7 294
2.0 2.2 99
0.8 2.0 618
0.0 2.9 675
0.6 2.1 883
−0.5 2.3 511
−0.5 2.0 503
−0.6 1.9 308
−0.6 1.2 57
1.0 2.7 323
0.6 1.9 584
0.8 1.9 135
0.6 1.8 648
0.1 1.7 162
−0.4 1.4 333
−0.3 2.0 256
0.7 3.8 11
0.4 1.3 25
1.4 2.4 607
1.4 2.1 807
0.6 3.0 814
0.5 1.8 637
0.2 2.1 473
−0.8 5.4 359
−0.3 2.0 308
0.0 1.7 30
−0.5 1.9 31
−0.5 1.6 36
0.1 1.1 16
−0.6 1.0 98
−0.2 1.3 131
−0.1 2.1 54
−0.2 1.9 223
−0.7 1.8 499
−0.4 1.8 1061
−0.4 4.0 749
−1.0 5.4 756
−0.8 2.9 847
−1.1 2.0 716
−1.1 0.9 100
−0.6 1.3 129
−0.9 2.0 70
−0.7 1.6 15
0.0 2.0 24
0.3 1.5 19
−0.5 2.2 75
−1.0 1.1 341
−1.3 1.7 203
−1.2 1.6 253
−1.4 2.0 310
−1.2 1.1 175
−0.8 1.4 154
−0.6 1.6 51
−0.7 1.1 57
−0.4 2.0 12
0.3 2.6 18
−1.5 2.7 75
−1.5 1.9 369
−0.9 2.6 229
−1.3 2.2 17
−1.2 1.3 363
−0.7 0.8 346
−0.5 1.2 111
0.1 2.2 42
0.2 1.2 24
−1.1 1.5 90
−1.4 1.5 300
−1.1 2.1 131
−0.3 2.3 26
−1.0 1.8 41
−0.3 1.8 16
−1.2 1.0 166
−0.8 1.0 186
−0.8 1.0 137
−0.5 1.7 41
−0.4 1.5 33
−1.1 1.4 216
−1.1 1.3 278
−0.7 1.5 116
0.3 4.0 13
0.1 2.3 31
−1.1 1.7 57

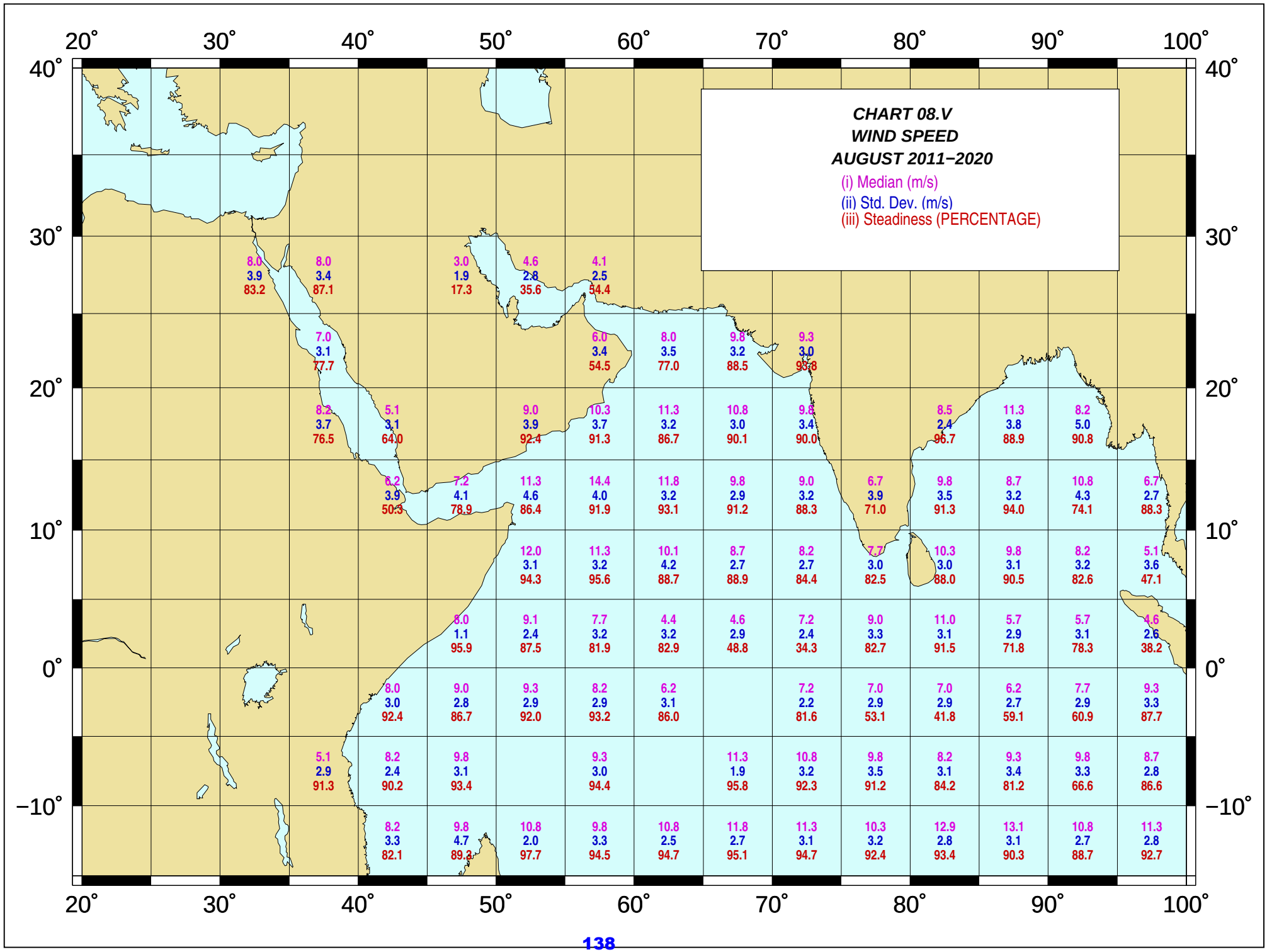


CHART 08.V
WIND SPEED
AUGUST 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
8.0 3.9 83.2
8.0 3.4 87.1
3.0 1.9 17.3
4.6 2.8 35.6
4.1 2.5 54.4
7.0 3.1 77.7
6.0 3.4 54.5
8.0 3.5 77.0
9.8 3.2 88.5
9.3 3.0 93.8
8.2 3.7 76.5
5.1 3.1 64.0
9.0 3.9 92.4
10.3 3.7 91.3
11.3 3.2 86.7
10.8 3.0 90.1
9.8 3.4 90.0
8.5 2.4 96.7
11.3 3.8 88.9
8.2 5.0 90.8
6.2 3.9 50.3
7.2 4.1 78.9
11.3 4.6 86.4
14.4 4.0 91.9
11.8 3.2 93.1
9.8 2.9 91.2
9.0 3.2 88.3
6.7 3.9 71.0
9.8 3.5 91.3
8.7 3.2 94.0
10.8 4.3 74.1
6.7 2.7 88.3
12.0 3.1 94.3
11.3 3.2 95.6
10.1 4.2 88.7
8.7 2.7 88.9
8.2 2.7 84.4
7.7 3.0 82.5
10.3 3.0 88.0
9.8 3.1 90.5
8.2 3.2 82.6
5.1 3.6 47.1
8.0 1.1 95.9
9.1 2.4 87.5
7.7 3.2 81.9
4.4 3.2 82.9
4.6 2.9 48.8
7.2 2.4 34.3
9.0 3.3 82.7
11.0 3.1 91.5
5.7 2.9 71.8
5.7 3.1 78.3
4.6 2.6 38.2
8.0 3.0 92.4
9.0 2.8 86.7
9.3 2.9 92.0
8.2 2.9 93.2
6.2 3.1 86.0
7.2 2.2 81.6
7.0 2.9 53.1
7.0 2.9 41.8
6.2 2.7 59.1
7.7 2.9 60.9
9.3 3.3 87.7
5.1 2.9 91.3
8.2 2.4 90.2
9.8 3.1 93.4
9.3 3.0 94.4
11.3 1.9 95.8
10.8 3.2 92.3
9.8 3.5 91.2
8.2 3.1 84.2
9.3 3.4 81.2
9.8 3.3 66.6
8.7 2.8 86.6
8.2 3.3 82.1
9.8 4.7 89.3
10.8 2.0 97.7
9.8 3.3 94.5
10.8 2.5 94.7
11.8 2.7 95.1
11.3 3.1 94.7
10.3 3.2 92.4
12.9 2.8 93.4
13.1 3.1 90.3
10.8 2.7 88.7
11.3 2.8 92.7

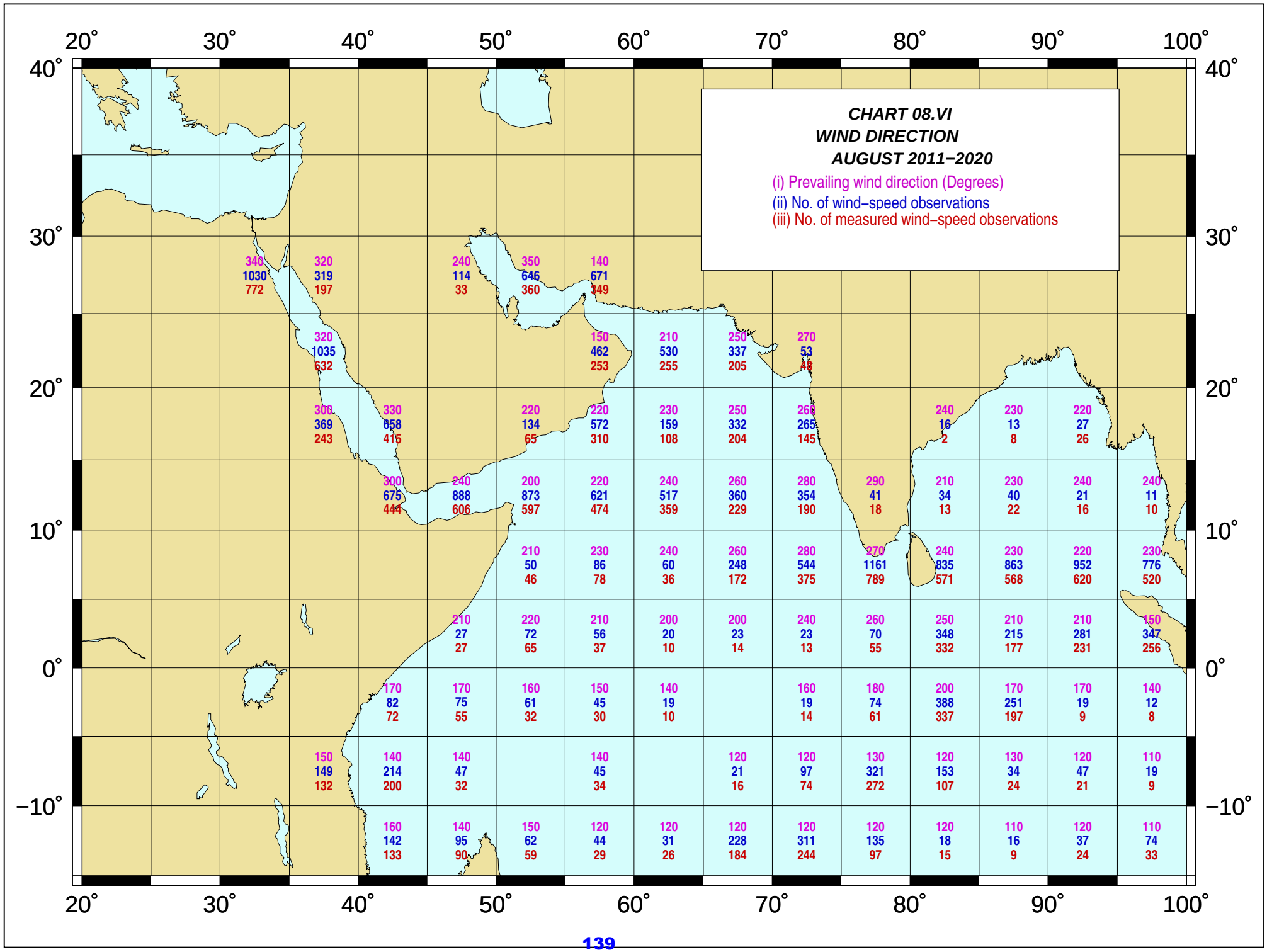


CHART 08.VI
WIND DIRECTION
AUGUST 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
340 1030 772
320 319 197
240 114 33
350 646 360
140 671 349
320 1035 632
150 462 253
210 530 255
250 337 205
270 53 46
300 369 243
330 658 415
220 134 65
220 572 310
230 159 108
250 332 204
260 265 145
240 16 2
230 13 8
220 27 26
300 675 444
240 888 606
200 873 597
220 621 474
240 517 359
260 360 229
280 354 190
290 41 18
210 34 13
230 40 22
240 21 16
240 11 10
210 50 46
230 86 78
240 60 36
260 248 172
280 544 375
270 1161 789
240 835 571
230 863 568
220 952 620
230 776 520
210 27 27
220 72 65
210 56 37
200 20 10
200 23 14
240 23 13
260 70 55
250 348 332
210 215 177
210 281 231
150 347 256
170 82 72
170 75 55
160 61 32
150 45 30
140 19 10
160 19 14
180 74 61
200 388 337
170 251 197
170 19 9
140 12 8
150 149 132
140 214 200
140 47 32
140 45 34
120 21 16
120 97 74
130 321 272
120 153 107
130 34 24
120 47 21
110 19 9
160 142 133
140 95 90
150 62 59
120 44 29
120 31 26
120 228 184
120 311 244
120 135 97
120 18 15
110 16 9
120 37 24
110 74 33

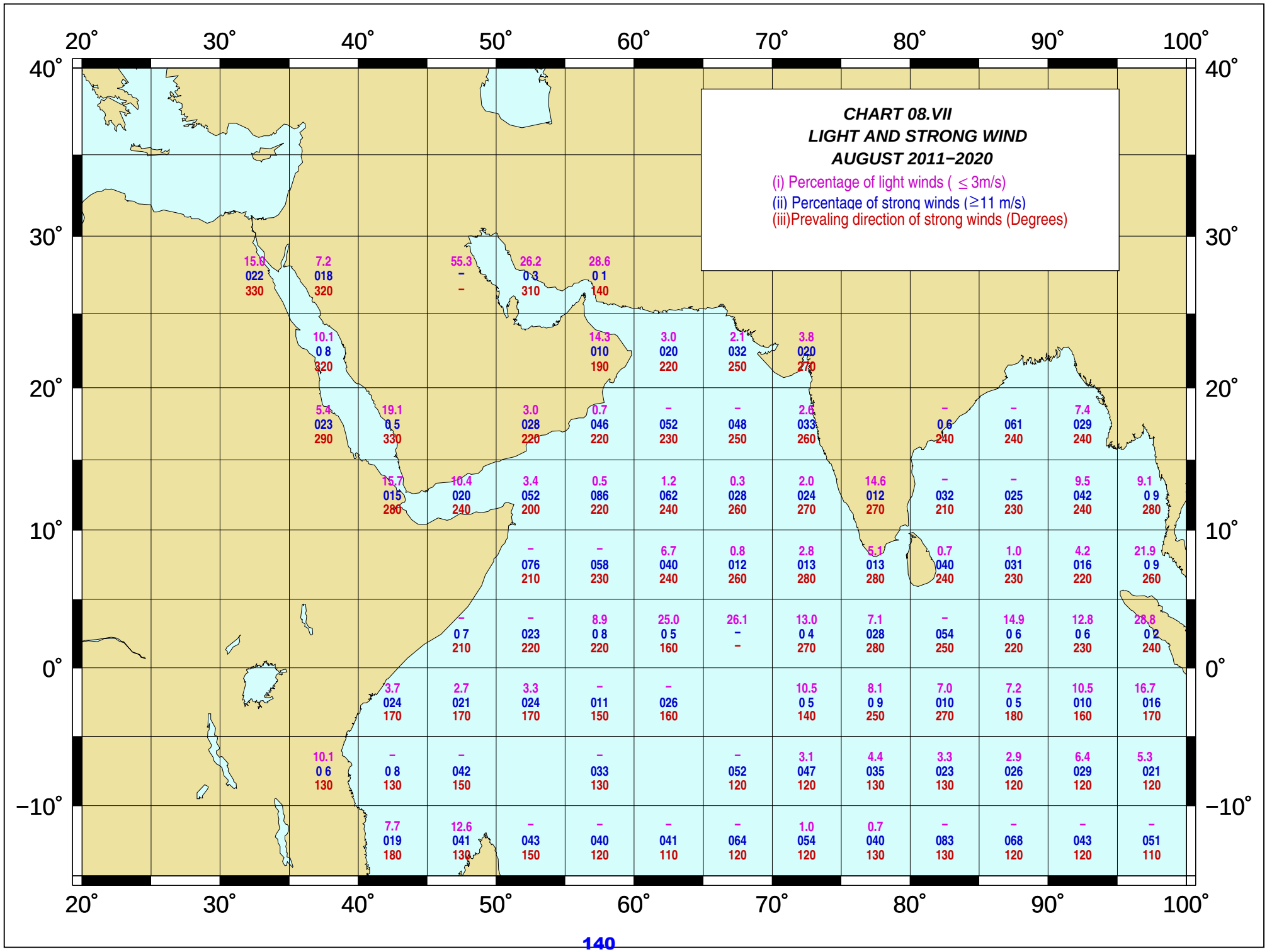


CHART 08.VII
LIGHT AND STRONG WIND
AUGUST 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
15.6 022 330
7.2 018 320
55.3 – –
26.2 03 310
28.6 01 140
10.1 08 320
14.3 010 190
3.0 020 220
2.1 032 250
3.8 020 270
5.4 023 290
19.1 05 330
3.0 028 220
0.7 046 220
– 052 230
– 048 250
2.6 033 260
– 06 240
– 061 240
7.4 029 240
15.7 015 280
10.4 020 240
3.4 052 200
0.5 086 220
1.2 062 240
0.3 028 260
2.0 024 270
14.6 012 270
– 032 210
– 025 230
9.5 042 240
9.1 09 280
– 076 210
– 058 230
6.7 040 240
0.8 012 260
2.8 013 280
5.1 013 280
0.7 040 240
1.0 031 230
4.2 016 220
21.9 09 260
– 07 210
– 023 220
8.9 08 220
25.0 05 160
26.1 – –
13.0 04 270
7.1 028 280
– 054 250
14.9 06 220
12.8 06 230
28.8 02 240
3.7 024 170
2.7 021 170
3.3 024 170
– 011 150
– 026 160
10.5 05 140
8.1 09 250
7.0 010 270
7.2 05 180
10.5 010 160
16.7 016 170
10.1 06 130
– 08 130
– 042 150
– 033 130
– 052 120
3.1 047 120
4.4 035 130
3.3 023 130
2.9 026 120
6.4 029 120
5.3 021 120
7.7 019 180
12.6 041 130
– 043 150
– 040 120
– 041 110
– 064 120
1.0 054 120
0.7 040 130
– 083 130
– 068 120
– 043 120
– 051 110

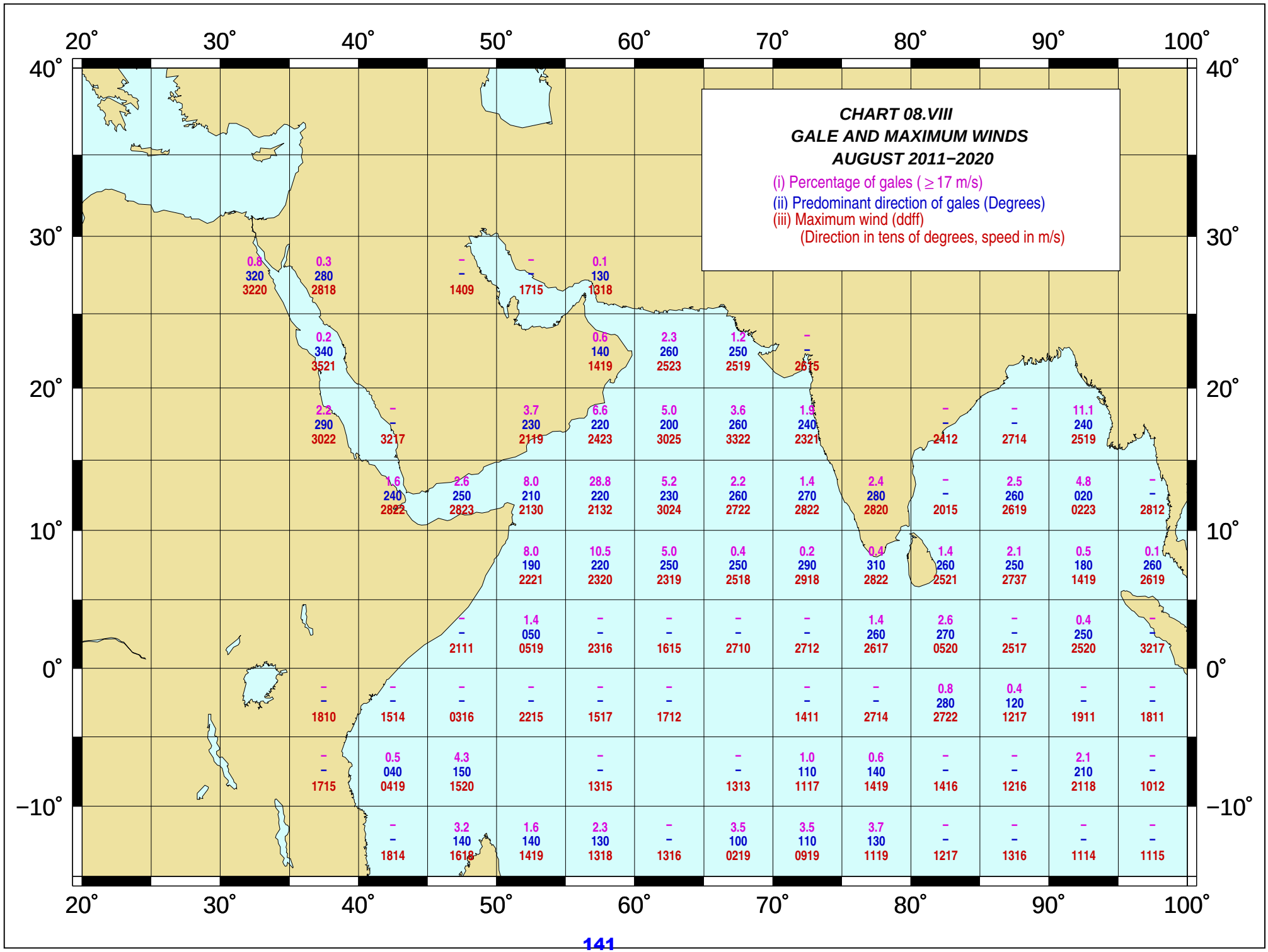


CHART 08.VIII
GALE AND MAXIMUM WINDS
AUGUST 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.8 320 3220
0.3 280 2818
– – 1409
– – 1715
0.1 130 1318
0.2 340 3521
0.6 140 1419
2.3 260 2523
1.2 250 2519
– – 2615
2.2 290 3022
– – 3217
3.7 230 2119
6.6 220 2423
5.0 200 3025
3.6 260 3322
1.9 240 2321
– – 2412
– – 2714
11.1 240 2519
1.6 240 2822
2.6 250 2823
8.0 210 2130
28.8 220 2132
5.2 230 3024
2.2 260 2722
1.4 270 2822
2.4 280 2820
– – 2015
2.5 260 2619
4.8 020 0223
– – 2812
8.0 190 2221
10.5 220 2320
5.0 250 2319
0.4 250 2518
0.2 290 2918
0.4 310 2822
1.4 260 2521
2.1 250 2737
0.5 180 1419
0.1 260 2619
– – 2111
1.4 050 0519
– – 2316
– – 1615
– – 2710
– – 2712
1.4 260 2617
2.6 270 0520
– – 2517
0.4 250 2520
– – 3217
– – 1810
– – 1514
– – 0316
– – 2215
– – 1517
– – 1712
– – 1411
– – 2714
0.8 280 2722
0.4 120 1217
– – 1911
– – 1811
– – 1715
0.5 040 0419
4.3 150 1520
– – 1315
– – 1313
1.0 110 1117
0.6 140 1419
– – 1416
– – 1216
2.1 210 2118
– – 1012
– – 1814
3.2 140 1618
1.6 140 1419
2.3 130 1318
– – 1316
3.5 100 0219
3.5 110 0919
3.7 130 1119
– – 1217
– – 1316
– – 1114
– – 1115

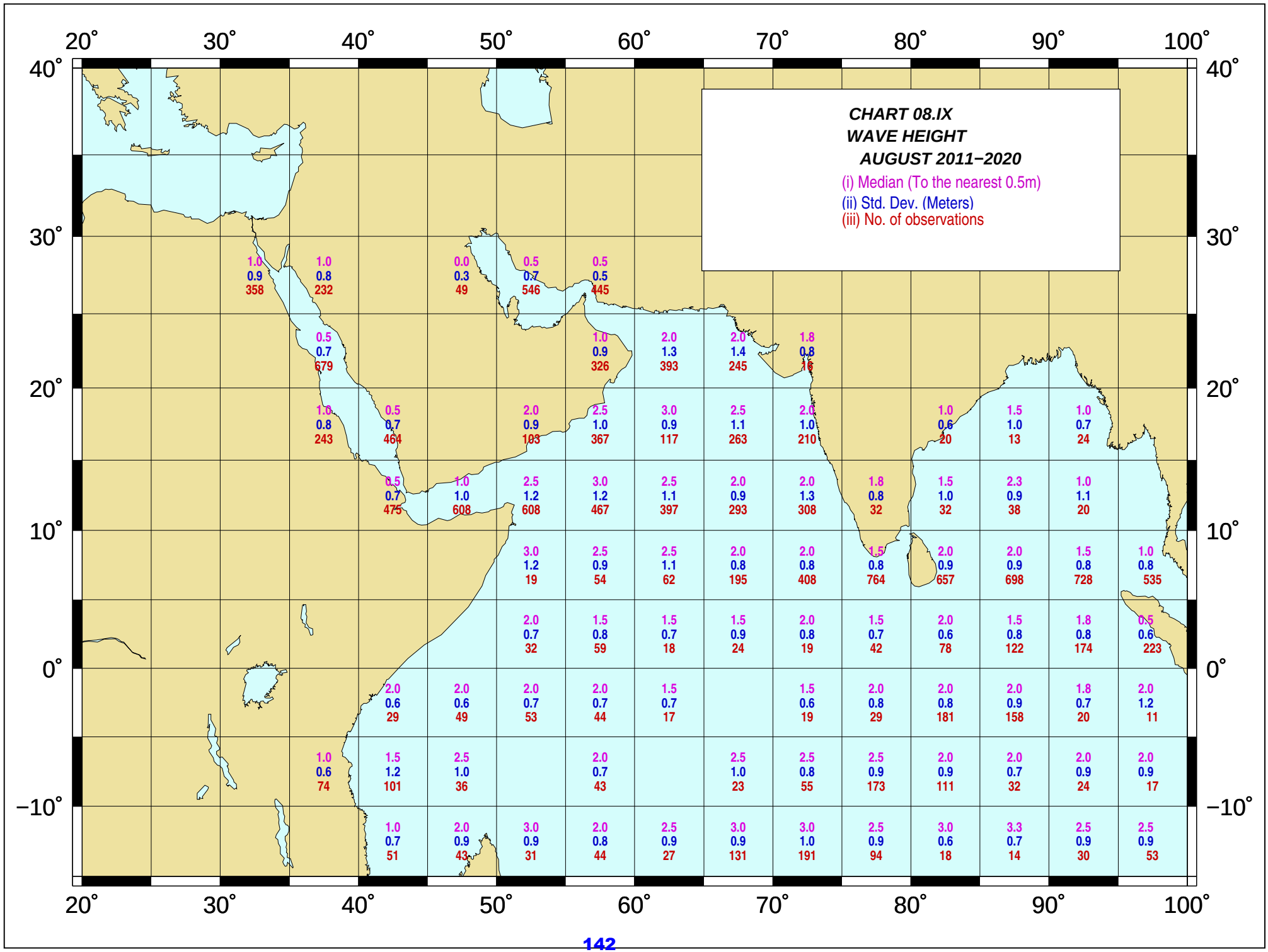


CHART 08.IX
WAVE HEIGHT
AUGUST 2011–2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.0 0.9 358
1.0 0.8 232
0.0 0.3 49
0.5 0.7 546
0.5 0.5 445
0.5 0.7 679
1.0 0.9 326
2.0 1.3 393
2.0 1.4 245
1.8 0.8 16
1.0 0.8 243
0.5 0.7 464
2.0 0.9 103
2.5 1.0 367
3.0 0.9 117
2.5 1.1 263
2.0 1.0 210
1.0 0.6 20
1.5 1.0 13
1.0 0.7 24
0.5 0.7 475
1.0 1.0 608
2.5 1.2 608
3.0 1.2 467
2.5 1.1 397
2.0 0.9 293
2.0 1.3 308
1.8 0.8 32
1.5 1.0 32
2.3 0.9 38
1.0 1.1 20
3.0 1.2 19
2.5 0.9 54
2.5 1.1 62
2.0 0.8 195
2.0 0.8 408
1.5 0.8 764
2.0 0.9 657
2.0 0.9 698
1.5 0.8 728
1.0 0.8 535
2.0 0.7 32
1.5 0.8 59
1.5 0.7 18
1.5 0.9 24
2.0 0.8 19
1.5 0.7 42
2.0 0.6 78
1.5 0.8 122
1.8 0.8 174
0.5 0.6 223
2.0 0.6 29
2.0 0.6 49
2.0 0.7 53
2.0 0.7 44
1.5 0.7 17
1.5 0.6 19
2.0 0.8 29
2.0 0.8 181
2.0 0.9 158
1.8 0.7 20
2.0 1.2 11
1.0 0.6 74
1.5 1.2 101
2.5 1.0 36
2.0 0.7 43
2.5 1.0 23
2.5 0.8 55
2.5 0.9 173
2.0 0.9 111
2.0 0.7 32
2.0 0.9 24
2.0 0.9 17
1.0 0.7 51
2.0 0.9 43
3.0 0.9 31
2.0 0.8 44
2.5 0.9 27
3.0 0.9 131
3.0 1.0 191
2.5 0.9 94
3.0 0.6 18
3.3 0.7 14
2.5 0.9 30
2.5 0.9 53

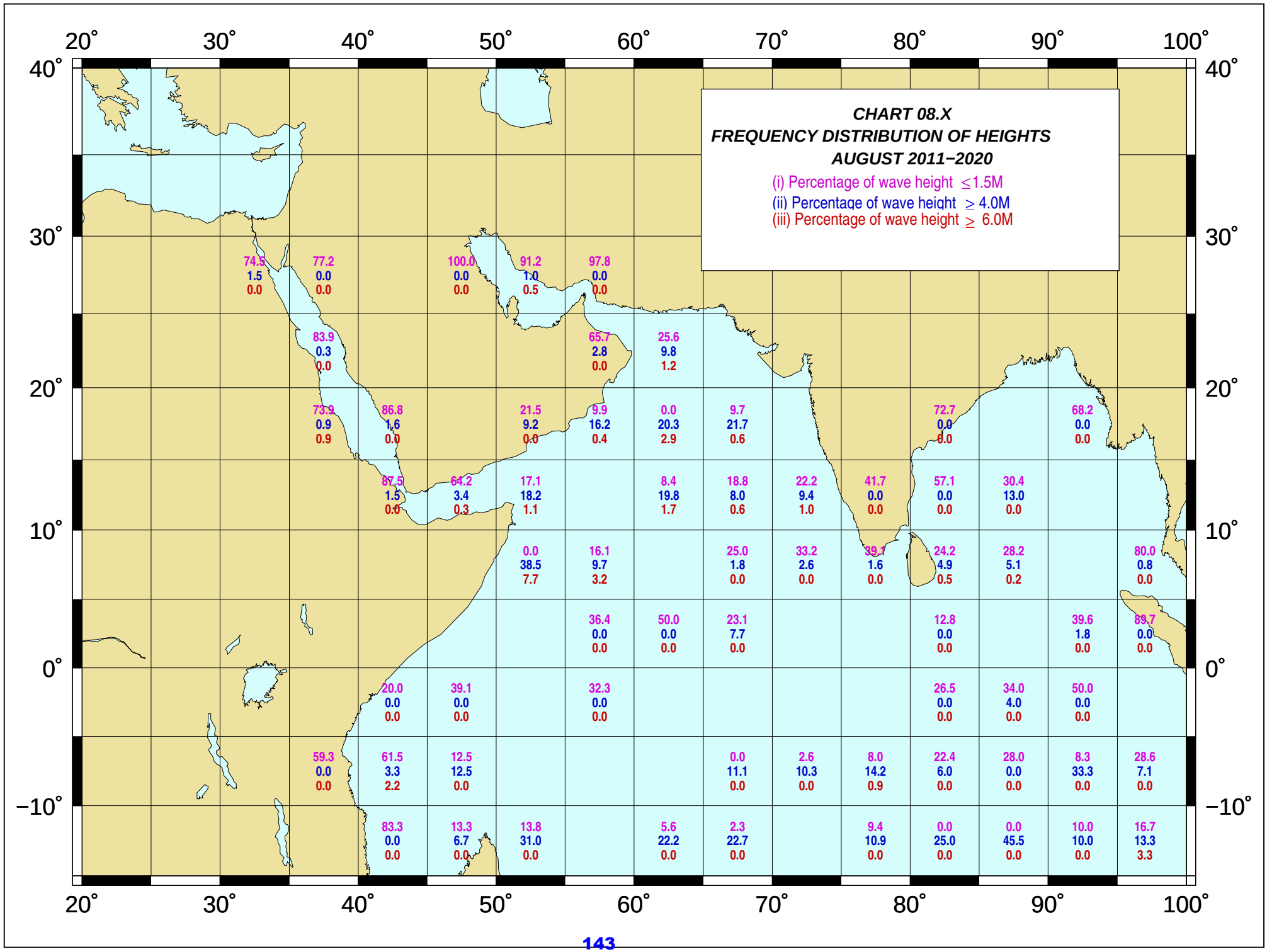


CHART 08.X
FREQUENCY DISTRIBUTION OF HEIGHTS
AUGUST 2011–2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
74.5 1.5 0.0
77.2 0.0 0.0
100.0 0.0 0.0
91.2 1.0 0.5
97.8 0.0 0.0
83.9 0.3 0.0
65.7 2.8 0.0
25.6 9.8 1.2
73.9 0.9 0.9
86.8 1.6 0.0
21.5 9.2 0.0
9.9 16.2 0.4
0.0 20.3 2.9
9.7 21.7 0.6
72.7 0.0 0.0
68.2 0.0 0.0
87.5 1.5 0.6
64.2 3.4 0.3
17.1 18.2 1.1
8.4 19.8 1.7
18.8 8.0 0.6
22.2 9.4 1.0
41.7 0.0 0.0
57.1 0.0 0.0
30.4 13.0 0.0
0.0 38.5 7.7
16.1 9.7 3.2
25.0 1.8 0.0
33.2 2.6 0.0
39.1 1.6 0.0
24.2 4.9 0.5
28.2 5.1 0.2
80.0 0.8 0.0
36.4 0.0 0.0
50.0 0.0 0.0
23.1 7.7 0.0
12.8 0.0 0.0
39.6 1.8 0.0
89.7 0.0 0.0
20.0 0.0 0.0
39.1 0.0 0.0
32.3 0.0 0.0
26.5 0.0 0.0
34.0 4.0 0.0
50.0 0.0 0.0
59.3 0.0 0.0
61.5 3.3 2.2
12.5 12.5 0.0
0.0 11.1 0.0
2.6 10.3 0.0
8.0 14.2 0.9
22.4 6.0 0.0
28.0 0.0 0.0
8.3 33.3 0.0
28.6 7.1 0.0
83.3 0.0 0.0
13.3 6.7 0.0
13.8 31.0 0.0
5.6 22.2 0.0
2.3 22.7 0.0
9.4 10.9 0.0
0.0 25.0 0.0
0.0 45.5 0.0
10.0 10.0 0.0
16.7 13.3 3.3

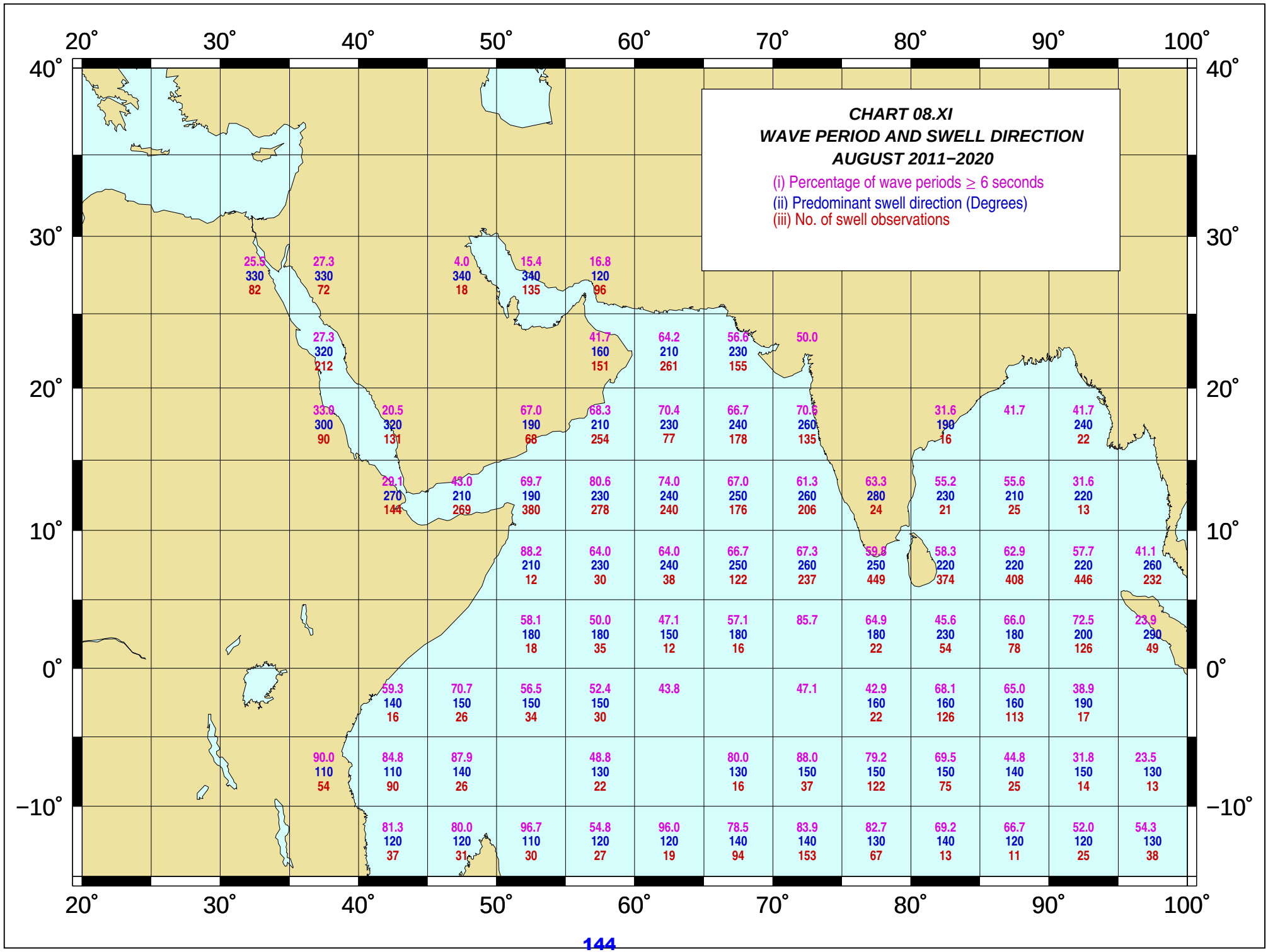


CHART 08.XI
WAVE PERIOD AND SWELL DIRECTION
AUGUST 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
25.5 330 82
27.3 330 72
4.0 340 18
15.4 340 135
16.8 120 96
27.3 320 212
41.7 160 151
64.2 210 261
56.6 230 155
50.0
33.9 300 90
20.5 320 131
67.0 190 68
68.3 210 254
70.4 230 77
66.7 240 178
70.6 260 135
31.6 190 16
41.7
41.7 240 22
29.1 270 144
43.0 210 269
69.7 190 380
80.6 230 278
74.0 240 240
67.0 250 176
61.3 260 206
63.3 280 24
55.2 230 21
55.6 210 25
31.6 220 13
88.2 210 12
64.0 230 30
64.0 240 38
66.7 250 122
67.3 260 237
59.9 250 449
58.3 220 374
62.9 220 408
57.7 220 446
41.1 260 232
58.1 180 18
50.0 180 35
47.1 150 12
57.1 180 16
85.7
64.9 180 22
45.6 230 54
66.0 180 78
72.5 200 126
23.9 290 49
59.3 140 16
70.7 150 26
56.5 150 34
52.4 150 30
43.8
47.1
42.9 160 22
68.1 160 126
65.0 160 113
38.9 190 17
90.0 110 54
84.8 110 90
87.9 140 26
48.8 130 22
80.0 130 16
88.0 150 37
79.2 150 122
69.5 150 75
44.8 140 25
31.8 150 14
23.5 130 13
81.3 120 37
80.0 120 31
96.7 110 30
54.8 120 27
96.0 120 19
78.5 140 94
83.9 140 153
82.7 130 67
69.2 140 13
66.7 120 11
52.0 120 25
54.3 130 38

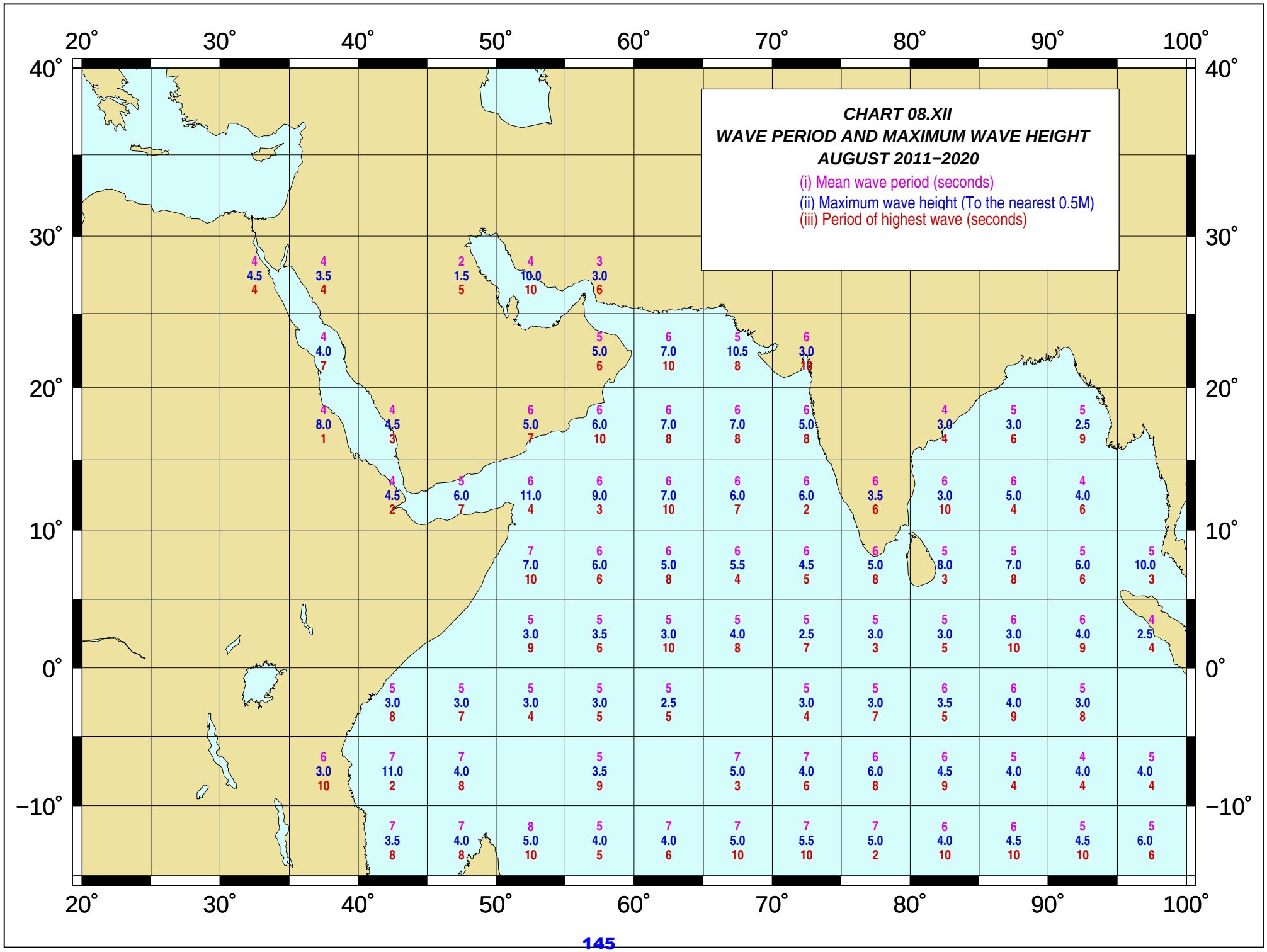


CHART 08.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
AUGUST 2011–2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
4 4.5 4
4 3.5 4
2 1.5 5
4 10.0 10
3 3.0 6
4 4.0 7
5 5.0 6
6 7.0 10
5 10.5 8
6 3.0 10
4 8.0 1
4 4.5 3
6 5.0 7
6 6.0 10
6 7.0 8
6 7.0 8
6 5.0 8
4 3.0 4
5 3.0 6
5 2.5 9
4 4.5 2
5 6.0 7
6 11.0 4
6 9.0 3
6 7.0 10
6 6.0 7
6 6.0 2
6 3.5 6
6 3.0 10
6 5.0 4
4 4.0 6
7 7.0 10
6 6.0 6
6 5.0 8
6 5.5 4
6 4.5 5
6 5.0 8
5 8.0 3
5 7.0 8
5 6.0 6
5 10.0 3
5 3.0 9
5 3.5 6
5 3.0 10
5 4.0 8
5 2.5 7
5 3.0 3
5 3.0 5
6 3.0 10
6 4.0 9
4 2.5 4
5 3.0 8
5 3.0 7
5 3.0 4
5 3.0 5
5 2.5 5
5 3.0 4
5 3.0 7
6 3.5 5
6 4.0 9
5 3.0 8
6 3.0 10
7 11.0 2
7 4.0 8
5 3.5 9
7 5.0 3
7 4.0 6
6 6.0 8
6 4.5 9
5 4.0 4
4 4.0 4
5 4.0 4
7 3.5 8
7 4.0 8
8 5.0 10
5 4.0 5
7 4.0 6
7 5.0 10
7 5.5 10
7 5.0 2
6 4.0 10
6 4.5 10
5 4.5 10
5 6.0 6

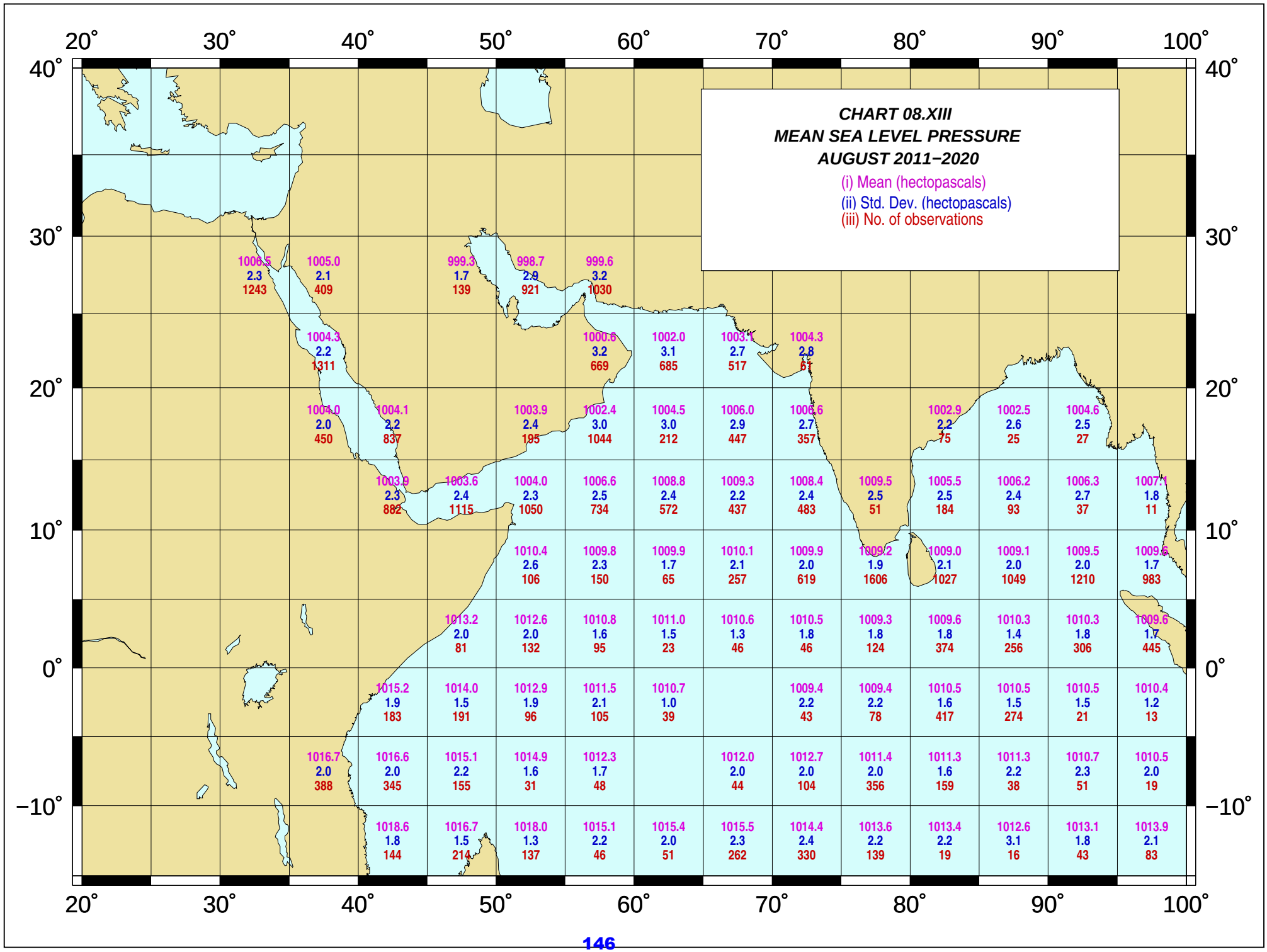


CHART 08.XIII
MEAN SEA LEVEL PRESSURE
AUGUST 2011–2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1006.5 2.3 1243
1005.0 2.1 409
999.3 1.7 139
998.7 2.9 921
999.6 3.2 1030
1004.3 2.2 1311
1000.6 3.2 669
1002.0 3.1 685
1003.1 2.7 517
1004.3 2.8 61
1004.0 2.0 450
1004.1 2.2 837
1003.9 2.4 195
1002.4 3.0 1044
1004.5 3.0 212
1006.0 2.9 447
1006.6 2.7 357
1002.9 2.2 75
1002.5 2.6 25
1004.6 2.5 27
1003.9 2.3 882
1003.6 2.4 1115
1004.0 2.3 1050
1006.6 2.5 734
1008.8 2.4 572
1009.3 2.2 437
1008.4 2.4 483
1009.5 2.5 51
1005.5 2.5 184
1006.2 2.4 93
1006.3 2.7 37
1007.1 1.8 11
1010.4 2.6 106
1009.8 2.3 150
1009.9 1.7 65
1010.1 2.1 257
1009.9 2.0 619
1009.2 1.9 1606
1009.0 2.1 1027
1009.1 2.0 1049
1009.5 2.0 1210
1009.6 1.7 983
1013.2 2.0 81
1012.6 2.0 132
1010.8 1.6 95
1011.0 1.5 23
1010.6 1.3 46
1010.5 1.8 46
1009.3 1.8 124
1009.6 1.8 374
1010.3 1.4 256
1010.3 1.8 306
1009.6 1.7 445
1015.2 1.9 183
1014.0 1.5 191
1012.9 1.9 96
1011.5 2.1 105
1010.7 1.0 39
1009.4 2.2 43
1009.4 2.2 78
1010.5 1.6 417
1010.5 1.5 274
1010.5 1.5 21
1010.4 1.2 13
1016.7 2.0 388
1016.6 2.0 345
1015.1 2.2 155
1014.9 1.6 31
1012.3 1.7 48
1012.0 2.0 44
1012.7 2.0 104
1011.4 2.0 356
1011.3 1.6 159
1011.3 2.2 38
1010.7 2.3 51
1010.5 2.0 19
1018.6 1.8 144
1016.7 1.5 214
1018.0 1.3 137
1015.1 2.2 46
1015.4 2.0 51
1015.5 2.3 262
1014.4 2.4 330
1013.6 2.2 139
1013.4 2.2 19
1012.6 3.1 16
1013.1 1.8 43
1013.9 2.1 83

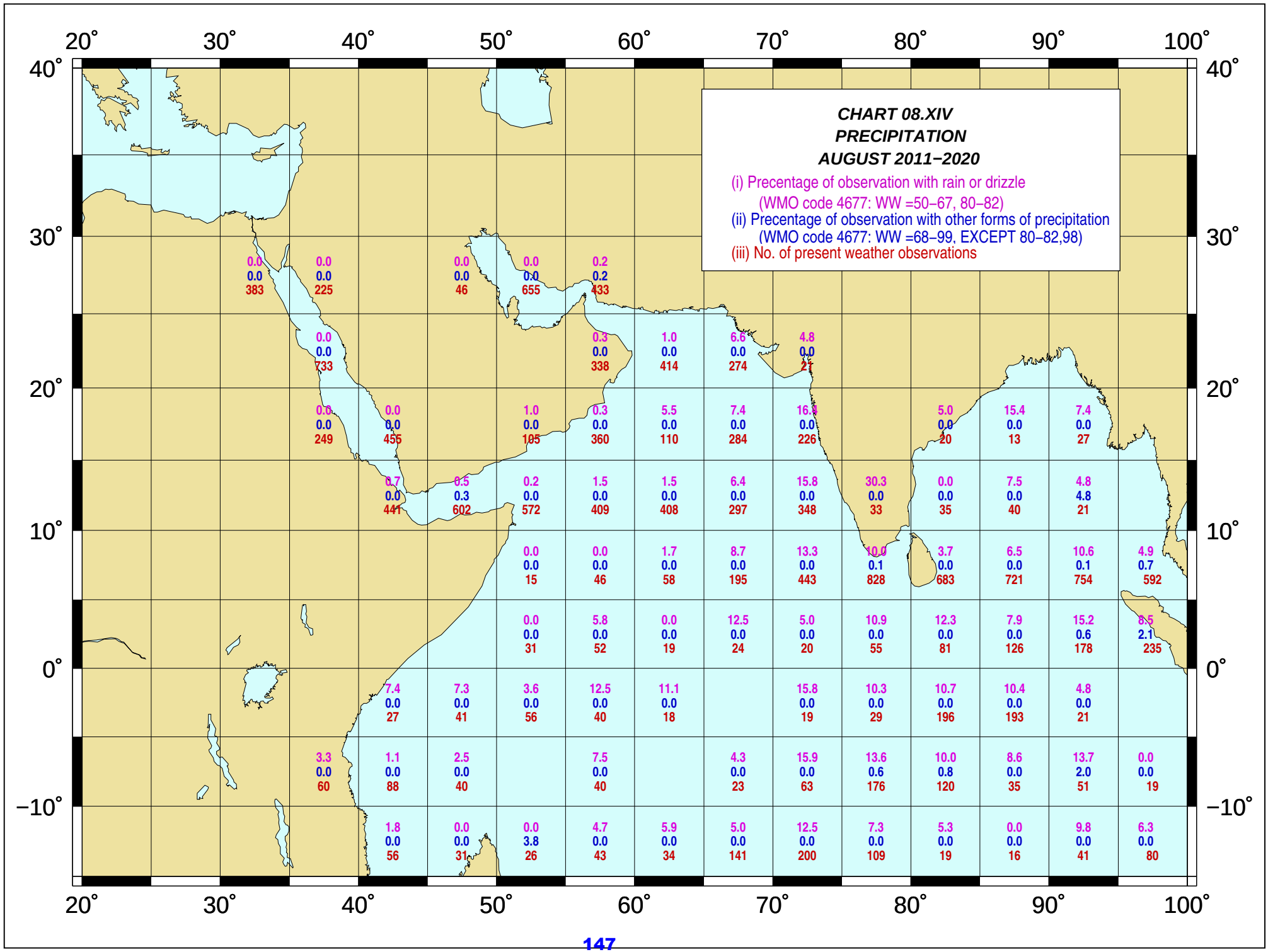


CHART 08.XIV
PRECIPITATION
AUGUST 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 0.0 383
0.0 0.0 225
0.0 0.0 46
0.0 0.0 655
0.2 0.2 433
0.0 0.0 733
0.3 0.0 338
1.0 0.0 414
6.6 0.0 274
4.8 0.0 21
0.0 0.0 249
0.0 0.0 456
1.0 0.0 105
0.3 0.0 360
5.5 0.0 110
7.4 0.0 284
16.8 0.0 226
5.0 0.0 20
15.4 0.0 13
7.4 0.0 27
0.7 0.0 441
0.5 0.3 602
0.2 0.0 572
1.5 0.0 409
1.5 0.0 408
6.4 0.0 297
15.8 0.0 348
30.3 0.0 33
0.0 0.0 35
7.5 0.0 40
4.8 4.8 21
0.0 0.0 15
0.0 0.0 46
1.7 0.0 58
8.7 0.0 195
13.3 0.0 443
10.0 0.1 828
3.7 0.0 683
6.5 0.0 721
10.6 0.1 754
4.9 0.7 592
0.0 0.0 31
5.8 0.0 52
0.0 0.0 19
12.5 0.0 24
5.0 0.0 20
10.9 0.0 55
12.3 0.0 81
7.9 0.0 126
15.2 0.6 178
6.5 2.1 235
7.4 0.0 27
7.3 0.0 41
3.6 0.0 56
12.5 0.0 40
11.1 0.0 18
15.8 0.0 19
10.3 0.0 29
10.7 0.0 196
10.4 0.0 193
4.8 0.0 21
3.3 0.0 60
1.1 0.0 88
2.5 0.0 40
7.5 0.0 40
4.3 0.0 23
15.9 0.0 63
13.6 0.6 176
10.0 0.8 120
8.6 0.0 35
13.7 2.0 51
0.0 0.0 19
1.8 0.0 56
0.0 0.0 31
0.0 3.8 26
4.7 0.0 43
5.9 0.0 34
5.0 0.0 141
12.5 0.0 200
7.3 0.0 109
5.3 0.0 19
0.0 0.0 16
9.8 0.0 41
6.3 0.0 80

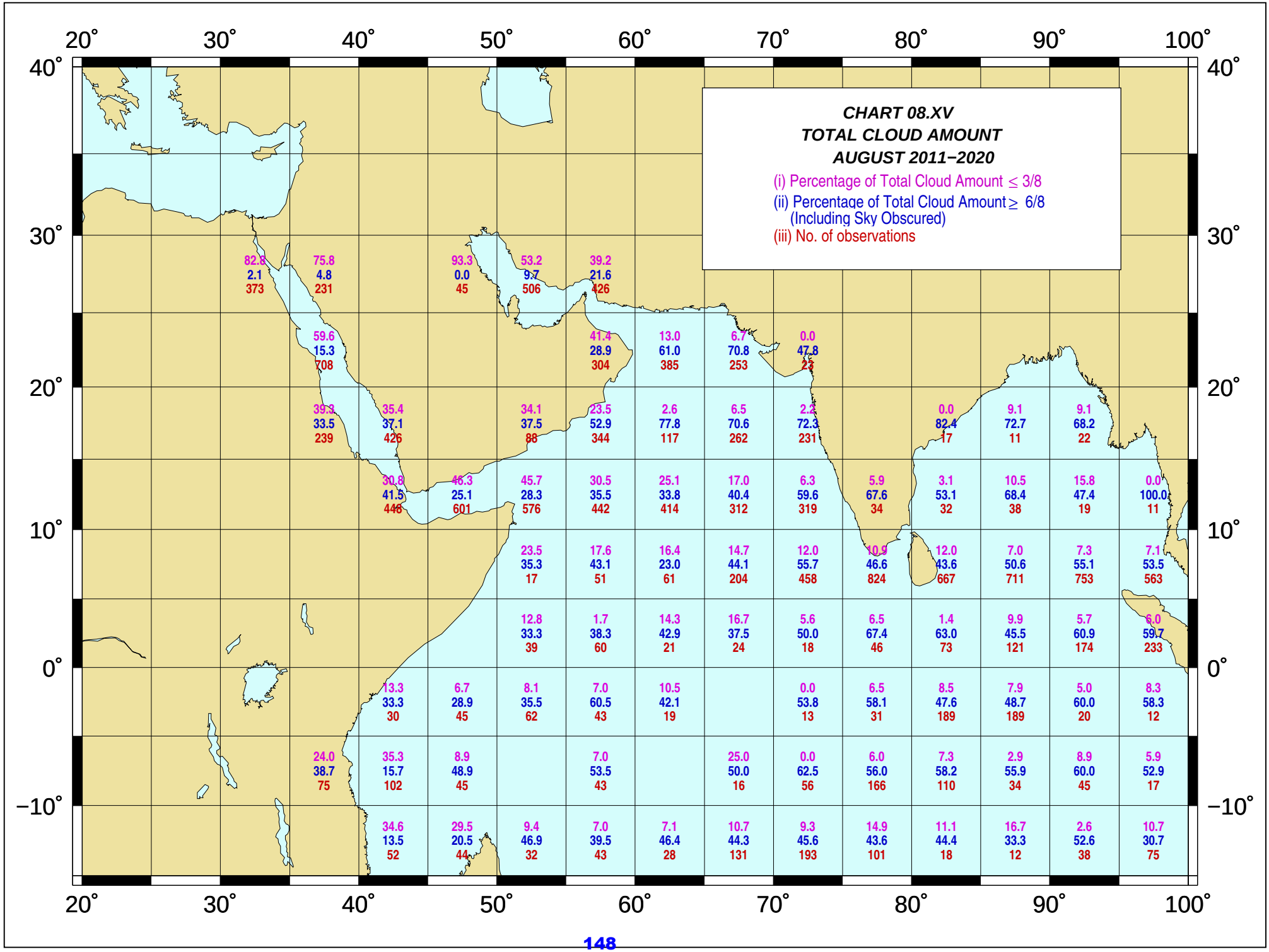


CHART 08.XV
TOTAL CLOUD AMOUNT
AUGUST 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
82.8 2.1 373
75.8 4.8 231
93.3 0.0 45
53.2 9.7 506
39.2 21.6 426
59.6 15.3 708
41.4 28.9 304
13.0 61.0 385
6.7 70.8 253
0.0 47.8 23
39.3 33.5 239
35.4 37.1 426
34.1 37.5 88
23.5 52.9 344
2.6 77.8 117
6.5 70.6 262
2.2 72.3 231
0.0 82.4 17
9.1 72.7 11
9.1 68.2 22
30.8 41.5 446
46.3 25.1 601
45.7 28.3 576
30.5 35.5 442
25.1 33.8 414
17.0 40.4 312
6.3 59.6 319
5.9 67.6 34
3.1 53.1 32
10.5 68.4 38
15.8 47.4 19
0.0 100.0 11
23.5 35.3 17
17.6 43.1 51
16.4 23.0 61
14.7 44.1 204
12.0 55.7 458
10.9 46.6 824
12.0 43.6 667
7.0 50.6 711
7.3 55.1 753
7.1 53.5 563
12.8 33.3 39
1.7 38.3 60
14.3 42.9 21
16.7 37.5 24
5.6 50.0 18
6.5 67.4 46
1.4 63.0 73
9.9 45.5 121
5.7 60.9 174
6.0 59.7 233
13.3 33.3 30
6.7 28.9 45
8.1 35.5 62
7.0 60.5 43
10.5 42.1 19
0.0 53.8 13
6.5 58.1 31
8.5 47.6 189
7.9 48.7 189
5.0 60.0 20
8.3 58.3 12
24.0 38.7 75
35.3 15.7 102
8.9 48.9 45
7.0 53.5 43
25.0 50.0 16
0.0 62.5 56
6.0 56.0 166
7.3 58.2 110
2.9 55.9 34
8.9 60.0 45
5.9 52.9 17
34.6 13.5 52
29.5 20.5 44
9.4 46.9 32
7.0 39.5 43
7.1 46.4 28
10.7 44.3 131
9.3 45.6 193
14.9 43.6 101
11.1 44.4 18
16.7 33.3 12
2.6 52.6 38
10.7 30.7 75

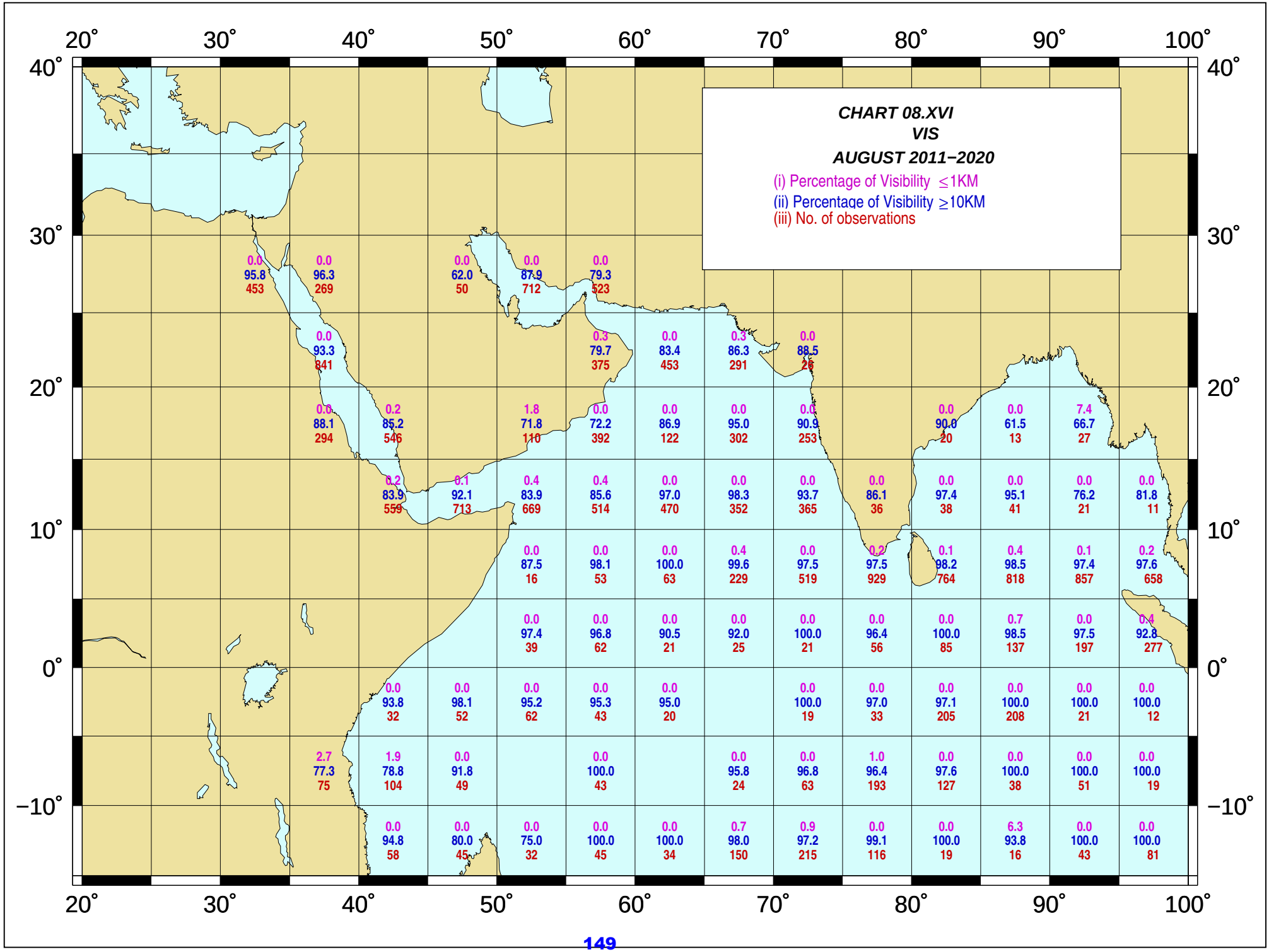


CHART 08.XVI
VIS
AUGUST 2011–2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 95.8 453
0.0 96.3 269
0.0 62.0 50
0.0 87.9 712
0.0 79.3 523
0.0 93.3 841
0.3 79.7 375
0.0 83.4 453
0.3 86.3 291
0.0 88.5 26
0.0 88.1 294
0.2 85.2 546
1.8 71.8 110
0.0 72.2 392
0.0 86.9 122
0.0 95.0 302
0.0 90.9 253
0.0 90.0 20
0.0 61.5 13
7.4 66.7 27
0.2 83.9 559
0.1 92.1 713
0.4 83.9 669
0.4 85.6 514
0.0 97.0 470
0.0 98.3 352
0.0 93.7 365
0.0 86.1 36
0.0 97.4 38
0.0 95.1 41
0.0 76.2 21
0.0 81.8 11
0.0 87.5 16
0.0 98.1 53
0.0 100.0 63
0.4 99.6 229
0.0 97.5 519
0.2 97.5 929
0.1 98.2 764
0.4 98.5 818
0.1 97.4 857
0.2 97.6 658
0.0 97.4 39
0.0 96.8 62
0.0 90.5 21
0.0 92.0 25
0.0 100.0 21
0.0 96.4 56
0.0 100.0 85
0.7 98.5 137
0.0 97.5 197
0.4 92.8 277
0.0 93.8 32
0.0 98.1 52
0.0 95.2 62
0.0 95.3 43
0.0 95.0 20
0.0 100.0 19
0.0 97.0 33
0.0 97.1 205
0.0 100.0 208
0.0 100.0 21
0.0 100.0 12
2.7 77.3 75
1.9 78.8 104
0.0 91.8 49
0.0 100.0 43
0.0 95.8 24
0.0 96.8 63
1.0 96.4 193
0.0 97.6 127
0.0 100.0 38
0.0 100.0 51
0.0 100.0 19
0.0 94.8 58
0.0 80.0 45
0.0 75.0 32
0.0 100.0 45
0.0 100.0 34
0.7 98.0 150
0.9 97.2 215
0.0 99.1 116
0.0 100.0 19
6.3 93.8 16
0.0 100.0 43
0.0 100.0 81

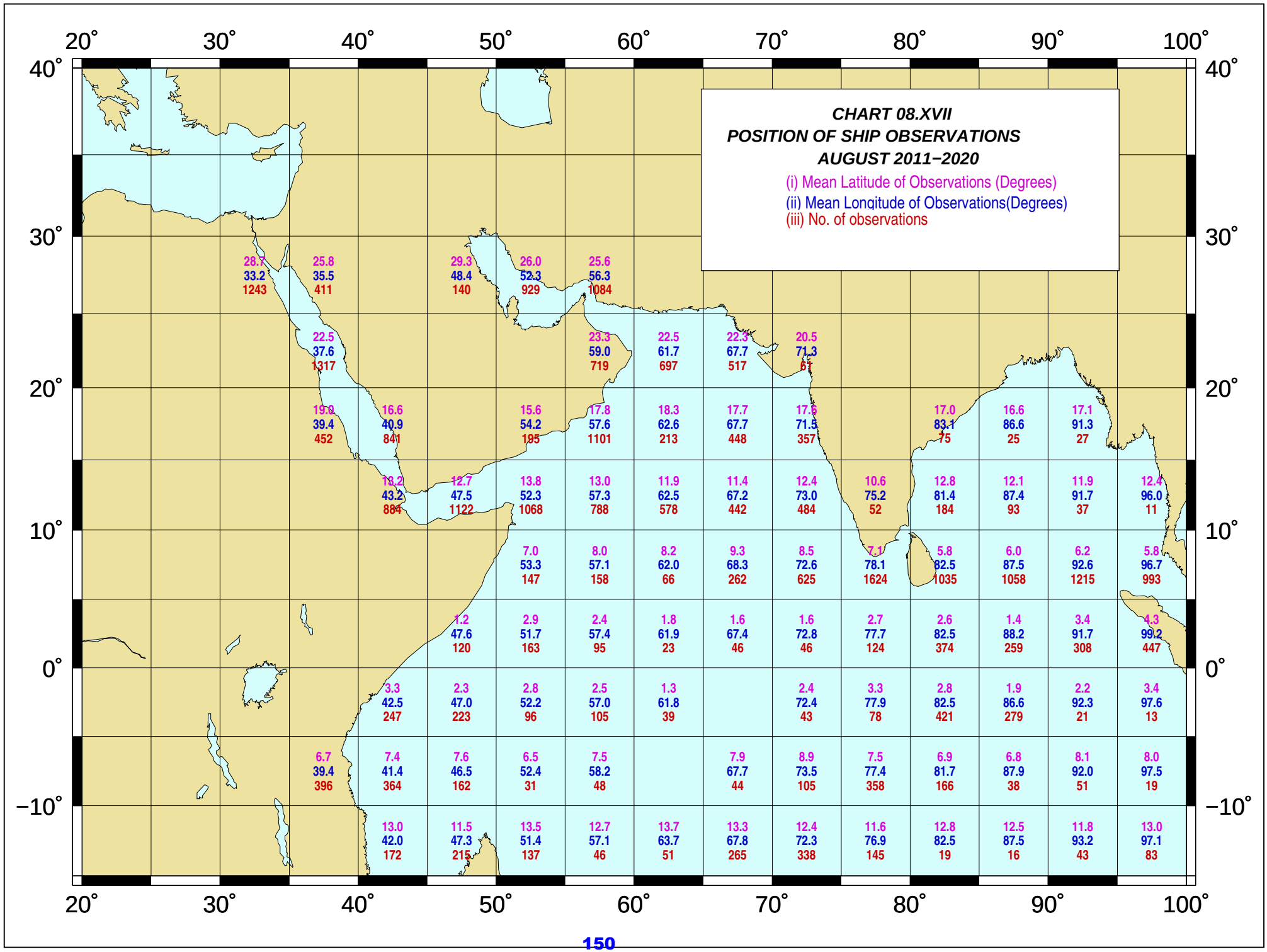


CHART 08.XVII
POSITION OF SHIP OBSERVATIONS
AUGUST 2011–2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.7 33.2 1243
25.8 35.5 411
29.3 48.4 140
26.0 52.3 929
25.6 56.3 1084
22.5 37.6 1317
23.3 59.0 719
22.5 61.7 697
22.3 67.7 517
20.5 71.3 61
19.9 39.4 452
16.6 40.9 841
15.6 54.2 195
17.8 57.6 1101
18.3 62.6 213
17.7 67.7 448
17.5 71.5 357
17.0 83.1 75
16.6 86.6 25
17.1 91.3 27
13.2 43.2 884
12.7 47.5 1122
13.8 52.3 1068
13.0 57.3 788
11.9 62.5 578
11.4 67.2 442
12.4 73.0 484
10.6 75.2 52
12.8 81.4 184
12.1 87.4 93
11.9 91.7 37
12.4 96.0 11
7.0 53.3 147
8.0 57.1 158
8.2 62.0 66
9.3 68.3 262
8.5 72.6 625
7.1 78.1 1624
5.8 82.5 1035
6.0 87.5 1058
6.2 92.6 1215
5.8 96.7 993
1.2 47.6 120
2.9 51.7 163
2.4 57.4 95
1.8 61.9 23
1.6 67.4 46
1.6 72.8 46
2.7 77.7 124
2.6 82.5 374
1.4 88.2 259
3.4 91.7 308
4.3 99.2 447
3.3 42.5 247
2.3 47.0 223
2.8 52.2 96
2.5 57.0 105
1.3 61.8 39
2.4 72.4 43
3.3 77.9 78
2.8 82.5 421
1.9 86.6 279
2.2 92.3 21
3.4 97.6 13
6.7 39.4 396
7.4 41.4 364
7.6 46.5 162
6.5 52.4 31
7.5 58.2 48
7.9 67.7 44
8.9 73.5 105
7.5 77.4 358
6.9 81.7 166
6.8 87.9 38
8.1 92.0 51
8.0 97.5 19
13.0 42.0 172
11.5 47.3 215
13.5 51.4 137
12.7 57.1 46
13.7 63.7 51
13.3 67.8 265
12.4 72.3 338
11.6 76.9 145
12.8 82.5 19
12.5 87.5 16
11.8 93.2 43
13.0 97.1 83

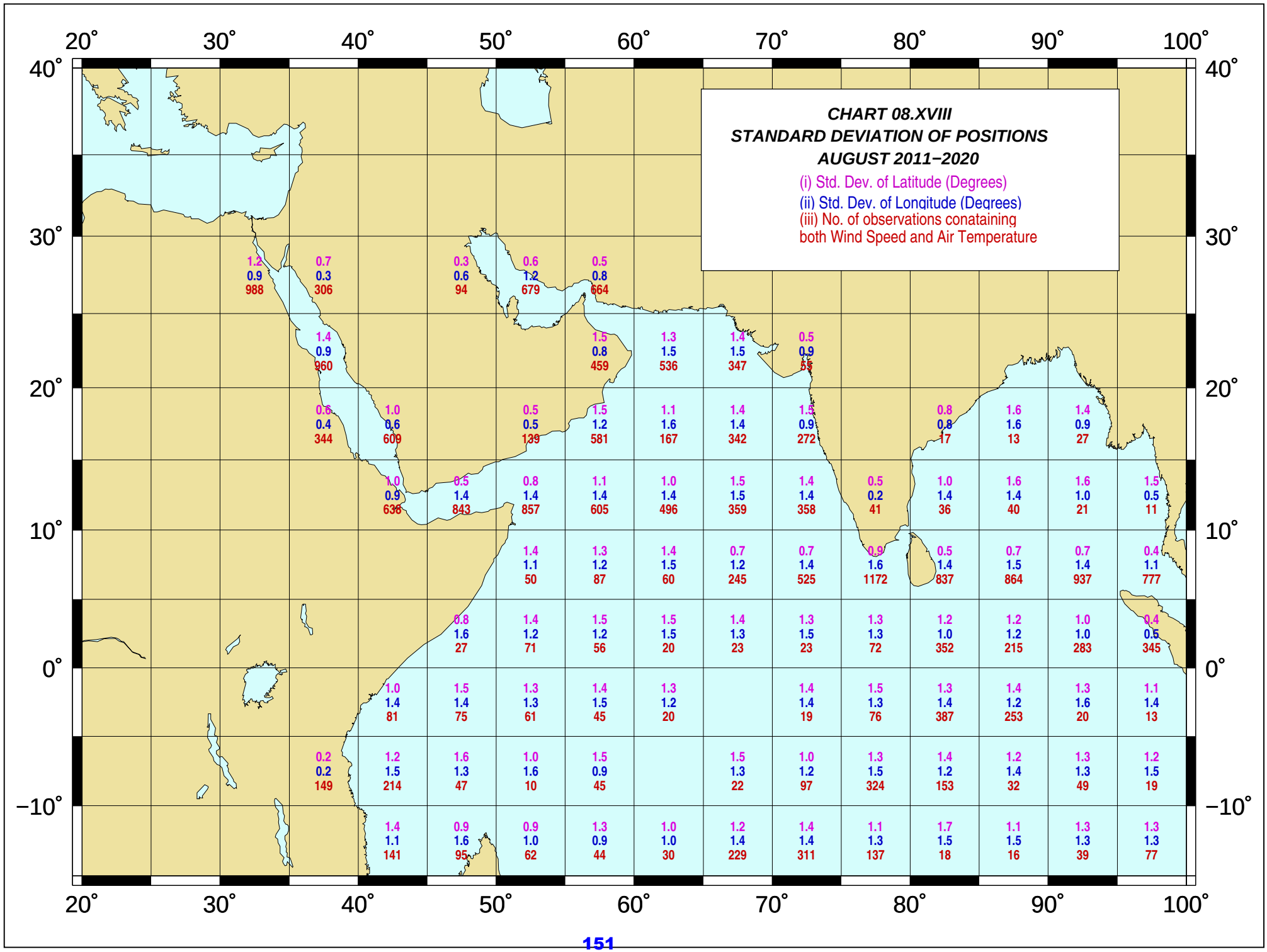
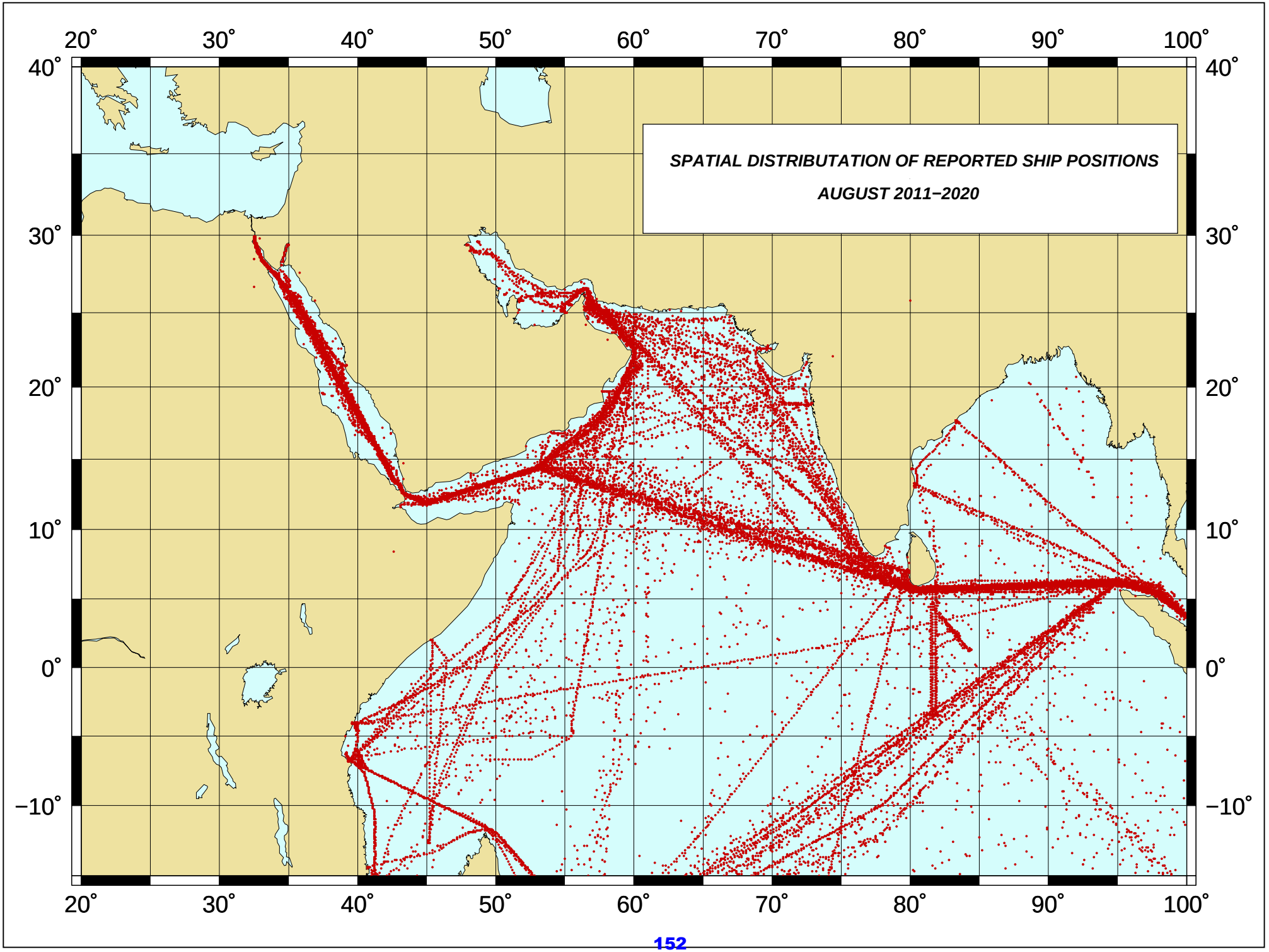


CHART 08.XVIII
STANDARD DEVIATION OF POSITIONS
AUGUST 2011–2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.2 0.9 988
0.7 0.3 306
0.3 0.6 94
0.6 1.2 679
0.5 0.8 664
1.4 0.9 960
1.5 0.8 459
1.3 1.5 536
1.4 1.5 347
0.5 0.9
0.6 0.4 344
1.0 0.6 609
0.5 0.5 139
1.5 1.2 581
1.1 1.6 167
1.4 1.4 342
0.8 0.8 17
1.6 1.6 13
1.4 0.9 27
1.0 0.9 636
0.5 1.4 843
0.8 1.4 857
1.1 1.4 605
1.0 1.4 496
1.5 1.5 359
1.4 1.4 358
0.5 0.2 41
1.0 1.4 36
1.6 1.4 40
1.6 1.0 21
1.5 0.5 11
1.4 1.1 50
1.3 1.2 87
1.4 1.5 60
0.7 1.2 245
0.7 1.4 525
1.6 1172
0.5 1.4 837
0.7 1.5 864
0.7 1.4 937
0.4 1.1 777
0.8 1.6 27
1.4 1.2 71
1.5 1.2 56
1.5 1.5 20
1.4 1.3 23
1.3 1.5 23
1.3 1.3 72
1.2 1.0 352
1.2 1.2 215
1.0 1.0 283
0.4 0.5 345
1.0 1.4 81
1.5 1.4 75
1.3 1.3 61
1.4 1.5 45
1.3 1.2 20
1.4 1.4 19
1.5 1.3 76
1.3 1.4 387
1.4 1.2 253
1.3 1.6 20
1.1 1.4 13
0.2 0.2 149
1.2 1.5 214
1.6 1.3 47
1.0 1.6 10
1.5 0.9 45
1.5 1.3 22
1.0 1.2 97
1.3 1.5 324
1.4 1.2 153
1.2 1.4 32
1.3 1.3 49
1.2 1.5 19
1.4 1.1 141
0.9 1.6 95
0.9 1.0 62
1.3 0.9 44
1.0 1.0 30
1.2 1.4 229
1.4 1.4 311
1.1 1.3 137
1.7 1.5 18
1.1 1.5 16
1.3 1.3 39
1.3 1.3 77


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
AUGUST 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF SEPTEMBER 2011-2020

Marine Climatological Summary Charts 2011-2020

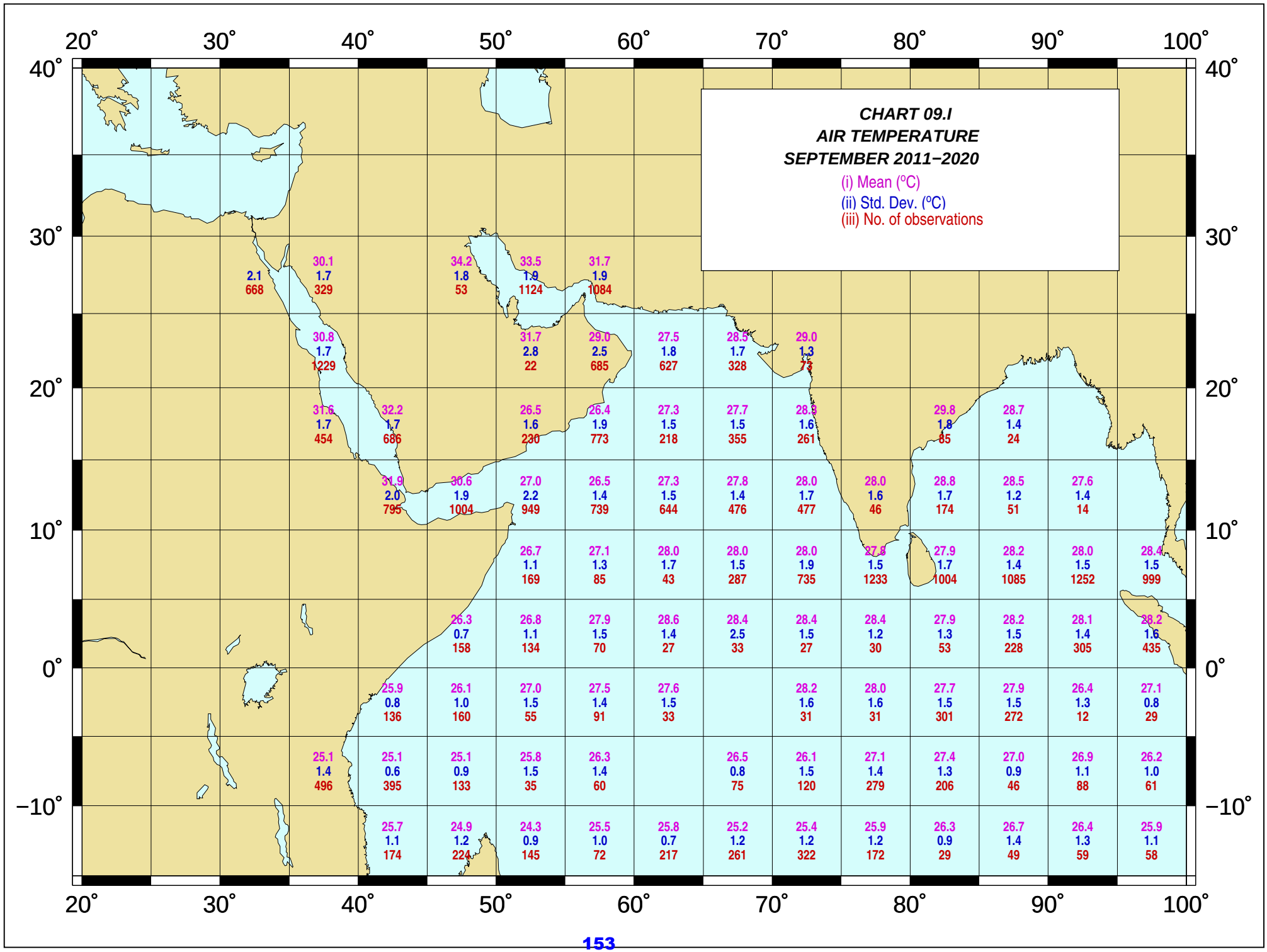


CHART 09.I
AIR TEMPERATURE
SEPTEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.1 668
30.1 1.7 329
34.2 1.8 53
33.5 1.9 1124
31.7 1.9 1084
30.8 1.7 1229
31.7 2.8 22
29.0 2.5 685
27.5 1.8 627
28.5 1.7 328
29.0 1.3 73
31.6 1.7 454
32.2 1.7 686
26.5 1.6 230
26.4 1.9 773
27.3 1.5 218
27.7 1.5 355
28.3 1.6 261
29.8 1.8 85
28.7 1.4 24
31.9 2.0 795
30.6 1.9 1004
27.0 2.2 949
26.5 1.4 739
27.3 1.5 644
27.8 1.4 476
28.0 1.7 477
28.0 1.6 46
28.8 1.7 174
28.5 1.2 51
27.6 1.4 14
26.7 1.1 169
27.1 1.3 85
28.0 1.7 43
28.0 1.5 287
28.0 1.9 735
27.9 1.5 1233
27.9 1.7 1004
28.2 1.4 1085
28.0 1.5 1252
28.4 1.5 999
26.3 0.7 158
26.8 1.1 134
27.9 1.5 70
28.6 1.4 27
28.4 2.5 33
28.4 1.5 27
28.4 1.2 30
27.9 1.3 53
28.2 1.5 228
28.1 1.4 305
28.2 1.6 435
25.9 0.8 136
26.1 1.0 160
27.0 1.5 55
27.5 1.4 91
27.6 1.5 33
28.2 1.6 31
28.0 1.6 31
27.7 1.5 301
27.9 1.5 272
26.4 1.3 12
27.1 0.8 29
25.1 1.4 496
25.1 0.6 395
25.1 0.9 133
25.8 1.5 35
26.3 1.4 60
26.5 0.8 75
26.1 1.5 120
27.1 1.4 279
27.4 1.3 206
27.0 0.9 46
26.9 1.1 88
26.2 1.0 61
25.7 1.1 174
24.9 1.2 224
24.3 0.9 145
25.5 1.0 72
25.8 0.7 217
25.2 1.2 261
25.4 1.2 322
25.9 1.2 172
26.3 0.9 29
26.7 1.4 49
26.4 1.3 59
25.9 1.1 58

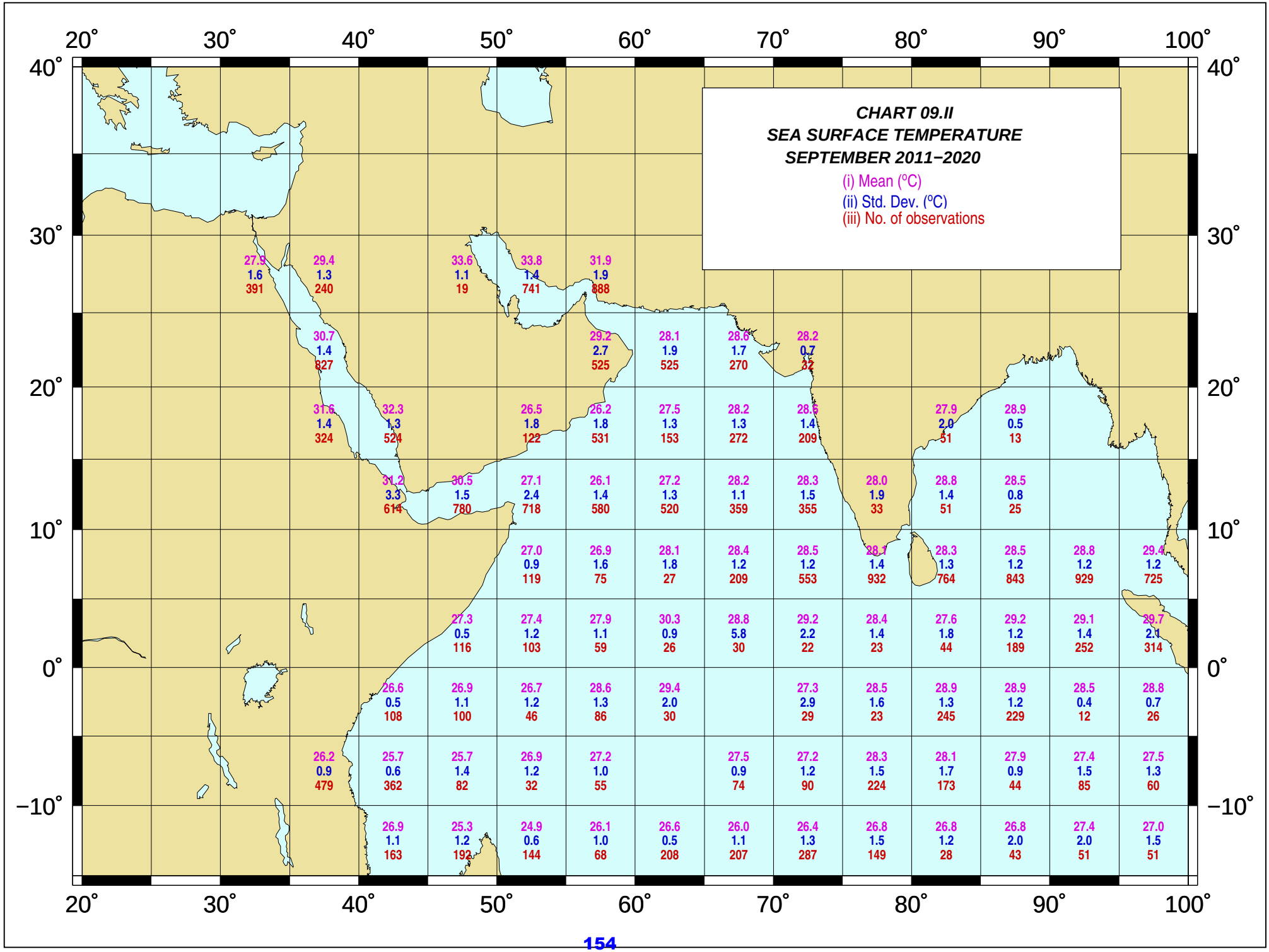


CHART 09.II
SEA SURFACE TEMPERATURE
SEPTEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
27.9 1.6 391
29.4 1.3 240
33.6 1.1 19
33.8 1.4 741
31.9 1.9 888
30.7 1.4 827
29.2 2.7 525
28.1 1.9 525
28.6 1.7 270
28.2 0.7 32
31.6 1.4 324
32.3 1.3 524
26.5 1.8 122
26.2 1.8 531
27.5 1.3 153
28.2 1.3 272
28.6 1.4 209
27.9 2.0 31
28.9 0.5 13
31.2 3.3 614
30.5 1.5 780
27.1 2.4 718
26.1 1.4 580
27.2 1.3 520
28.2 1.1 359
28.3 1.5 355
28.0 1.9 33
28.8 1.4 51
28.5 0.8 25
27.0 0.9 119
26.9 1.6 75
28.1 1.8 27
28.4 1.2 209
28.5 1.2 553
28.1 1.4 932
28.3 1.3 764
28.5 1.2 843
28.8 1.2 929
29.4 1.2 725
27.3 0.5 116
27.4 1.2 103
27.9 1.1 59
30.3 0.9 26
28.8 5.8 30
29.2 2.2 22
28.4 1.4 23
27.6 1.8 44
29.2 1.2 189
29.1 1.4 252
29.7 2.1 314
26.6 0.5 108
26.9 1.1 100
26.7 1.2 46
28.6 1.3 86
29.4 2.0 30
27.3 2.9 29
28.5 1.6 23
28.9 1.3 245
28.9 1.2 229
28.5 0.4 12
28.8 0.7 26
26.2 0.9 479
25.7 0.6 362
25.7 1.4 82
26.9 1.2 32
27.2 1.0 55
27.5 0.9 74
27.2 1.2 90
28.3 1.5 224
28.1 1.7 173
27.9 0.9 44
27.4 1.5 85
27.5 1.3 60
26.9 1.1 163
25.3 1.2 192
24.9 0.6 144
26.1 1.0 68
26.6 0.5 208
26.0 1.1 207
26.4 1.3 287
26.8 1.5 149
26.8 1.2 28
26.8 2.0 43
27.4 2.0 51
27.0 1.5 51

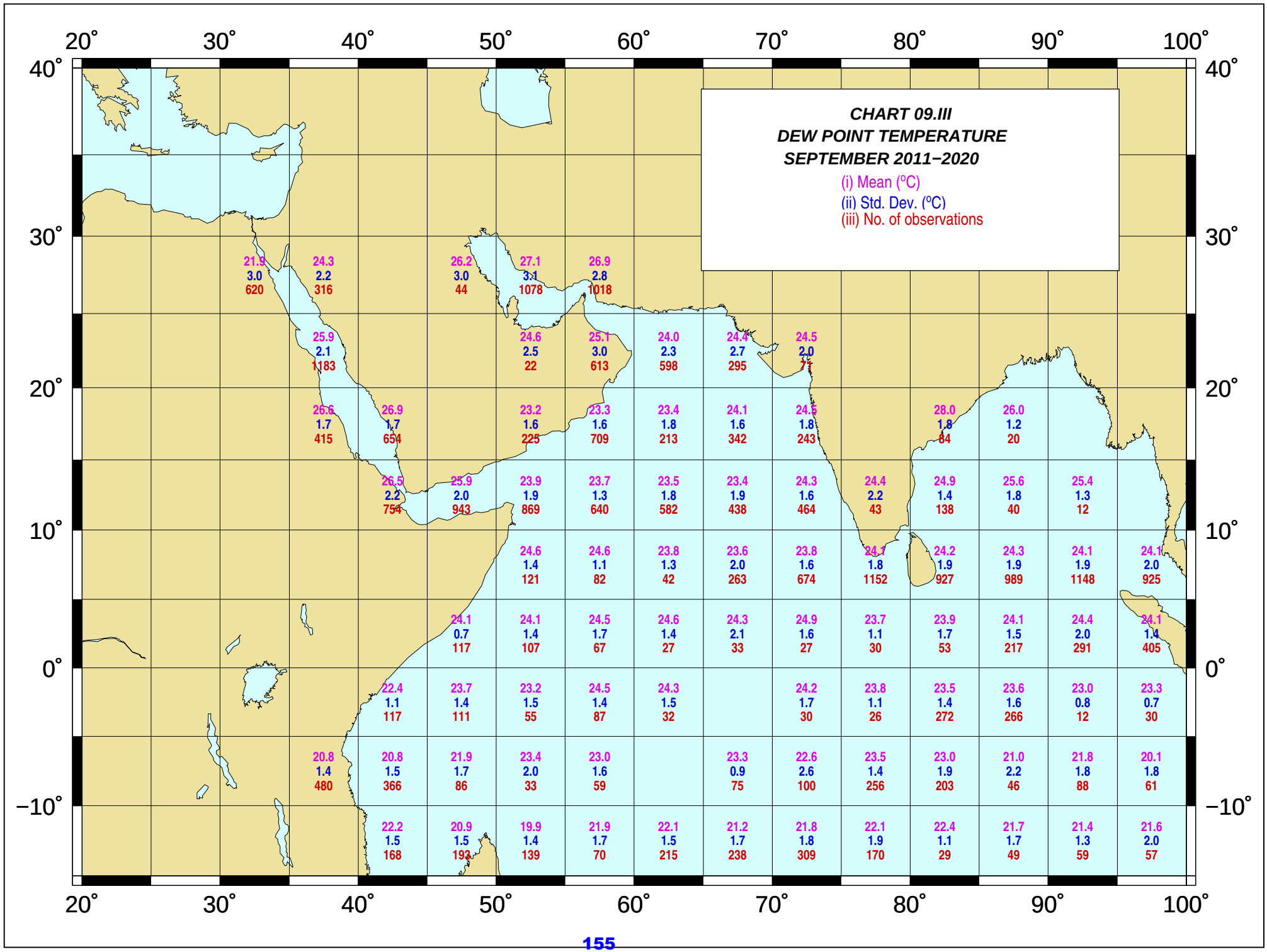


CHART 09.III
DEW POINT TEMPERATURE
SEPTEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
21.9 3.0 620
24.3 2.2 316
26.2 3.0 44
27.1 3.1 1078
26.9 2.8 1018
25.9 2.1 1183
24.6 2.5 22
25.1 3.0 613
24.0 2.3 598
24.4 2.7 295
24.5 2.0 71
26.6 1.7 415
26.9 1.7 654
23.2 1.6 225
23.3 1.6 709
23.4 1.8 213
24.1 1.6 342
24.5 1.8 243
28.0 1.8 84
26.0 1.2 20
26.5 2.2 754
25.9 2.0 943
23.9 1.9 869
23.7 1.3 640
23.5 1.8 582
23.4 1.9 438
24.3 1.6 464
24.4 2.2 43
24.9 1.4 138
25.6 1.8 40
25.4 1.3 12
24.6 1.4 121
24.6 1.1 82
23.8 1.3 42
23.6 2.0 263
23.8 1.6 674
24.1 1.8 1152
24.2 1.9 927
24.3 1.9 989
24.1 1.9 1148
24.1 2.0 925
24.1 0.7 117
24.1 1.4 107
24.5 1.7 67
24.6 1.4 27
24.3 2.1 33
24.9 1.6 27
23.7 1.1 30
23.9 1.7 53
24.1 1.5 217
24.4 2.0 291
24.1 1.4 405
22.4 1.1 117
23.7 1.4 111
23.2 1.5 55
24.5 1.4 87
24.3 1.5 32
24.2 1.7 30
23.8 1.1 26
23.5 1.4 272
23.6 1.6 266
23.0 0.8 12
23.3 0.7 30
20.8 1.4 480
20.8 1.5 366
21.9 1.7 86
23.4 2.0 33
23.0 1.6 59
23.3 0.9 75
22.6 2.6 100
23.5 1.4 256
23.0 1.9 203
21.0 2.2 46
21.8 1.8 88
20.1 1.8 61
22.2 1.5 168
20.9 1.5 193
19.9 1.4 139
21.9 1.7 70
22.1 1.5 215
21.2 1.7 238
21.8 1.8 309
22.1 1.9 170
22.4 1.1 29
21.7 1.7 49
21.4 1.3 59
21.6 2.0 57

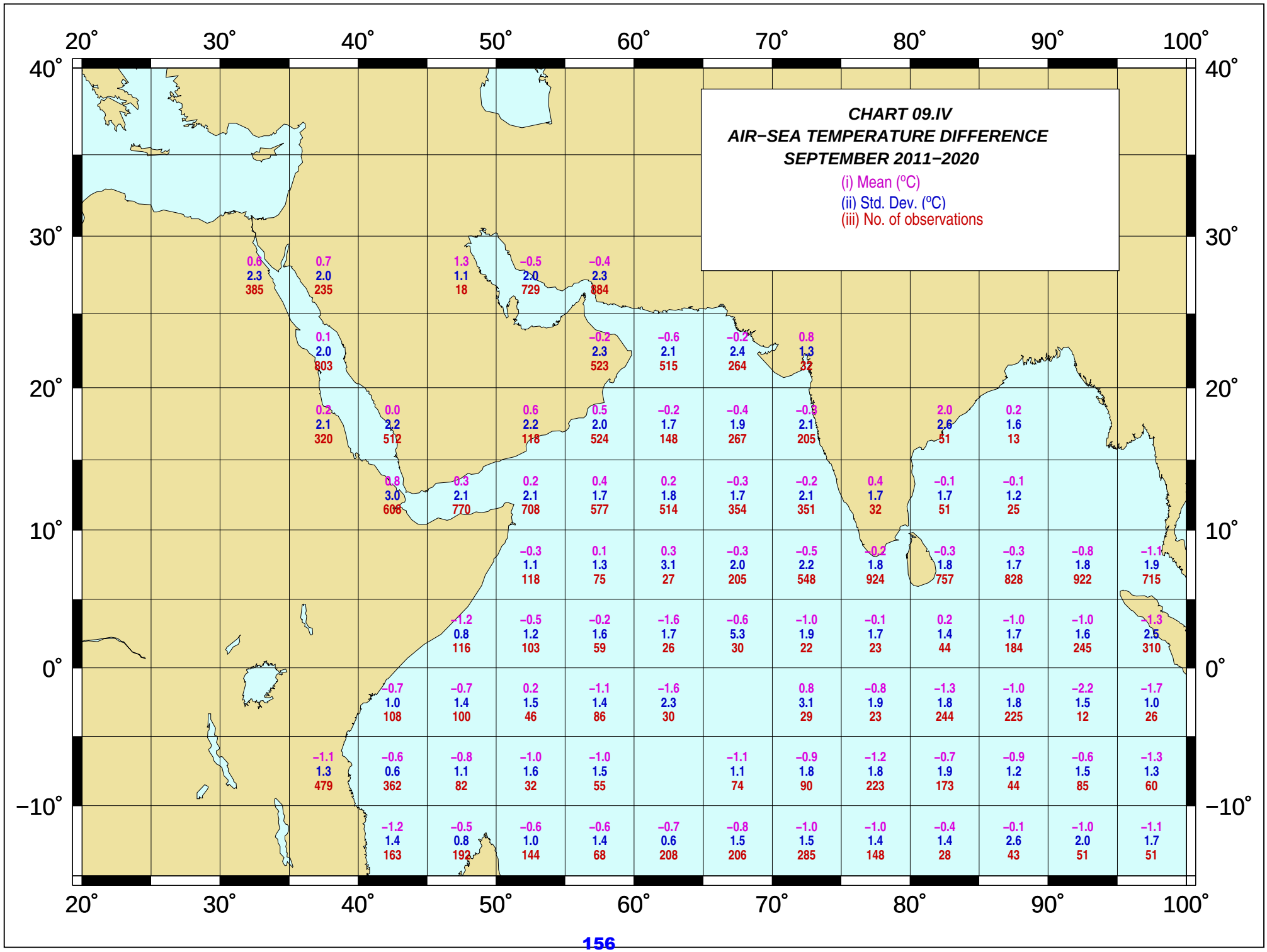


CHART 09.IV
AIR–SEA TEMPERATURE DIFFERENCE
SEPTEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.6 2.3 385
0.7 2.0 235
1.3 1.1 18
−0.5 2.0 729
−0.4 2.3 884
0.1 2.0 803
−0.2 2.3 523
−0.6 2.1 515
−0.2 2.4 264
0.8 1.3 32
0.2 2.1 320
0.0 2.2 512
0.6 2.2 118
0.5 2.0 524
−0.2 1.7 148
−0.4 1.9 267
−0.3 2.1 205
2.0 2.6 31
0.2 1.6 13
0.8 3.0 606
0.3 2.1 770
0.2 2.1 708
0.4 1.7 577
0.2 1.8 514
−0.3 1.7 354
−0.2 2.1 351
0.4 1.7 32
−0.1 1.7 51
−0.1 1.2 25
−0.3 0.1 1.1 1.3 118 75
0.3 3.1 27
−0.3 2.0 205
−0.5 2.2 548
−0.2 1.8 924
−0.3 1.8 757
−0.3 1.7 828
−0.8 1.8 922
−1.1 1.9 715
−1.2 0.8 116
−0.5 1.2 103
−0.2 1.6 59
−1.6 1.7 26
−0.6 5.3 30
−1.0 1.9 22
−0.1 1.7 23
0.2 1.4 44
−1.0 1.7 184
−1.0 1.6 245
−1.3 2.5 310
−0.7 1.0 108
−0.7 1.4 100
0.2 1.5 46
−1.1 1.4 86
−1.6 2.3 30
0.8 3.1 29
−0.8 1.9 23
−1.3 1.8 244
−1.0 1.8 225
−2.2 1.5 12
−1.7 1.0 26
−1.1 1.3 479
−0.6 0.6 362
−0.8 1.1 82
−1.0 1.6 32
−1.0 1.5 55
−1.1 1.1 74
−0.9 1.8 90
−1.2 1.8 223
−0.7 1.9 173
−0.9 1.2 44
−0.6 1.5 85
−1.3 1.3 60
−1.2 1.4 163
−0.5 0.8 192
−0.6 1.0 144
−0.6 1.4 68
−0.7 0.6 208
−0.8 1.5 206
−1.0 1.5 285
−1.0 1.4 148
−0.4 1.4 28
−0.1 2.6 43
−1.0 2.0 51
−1.1 1.7 51

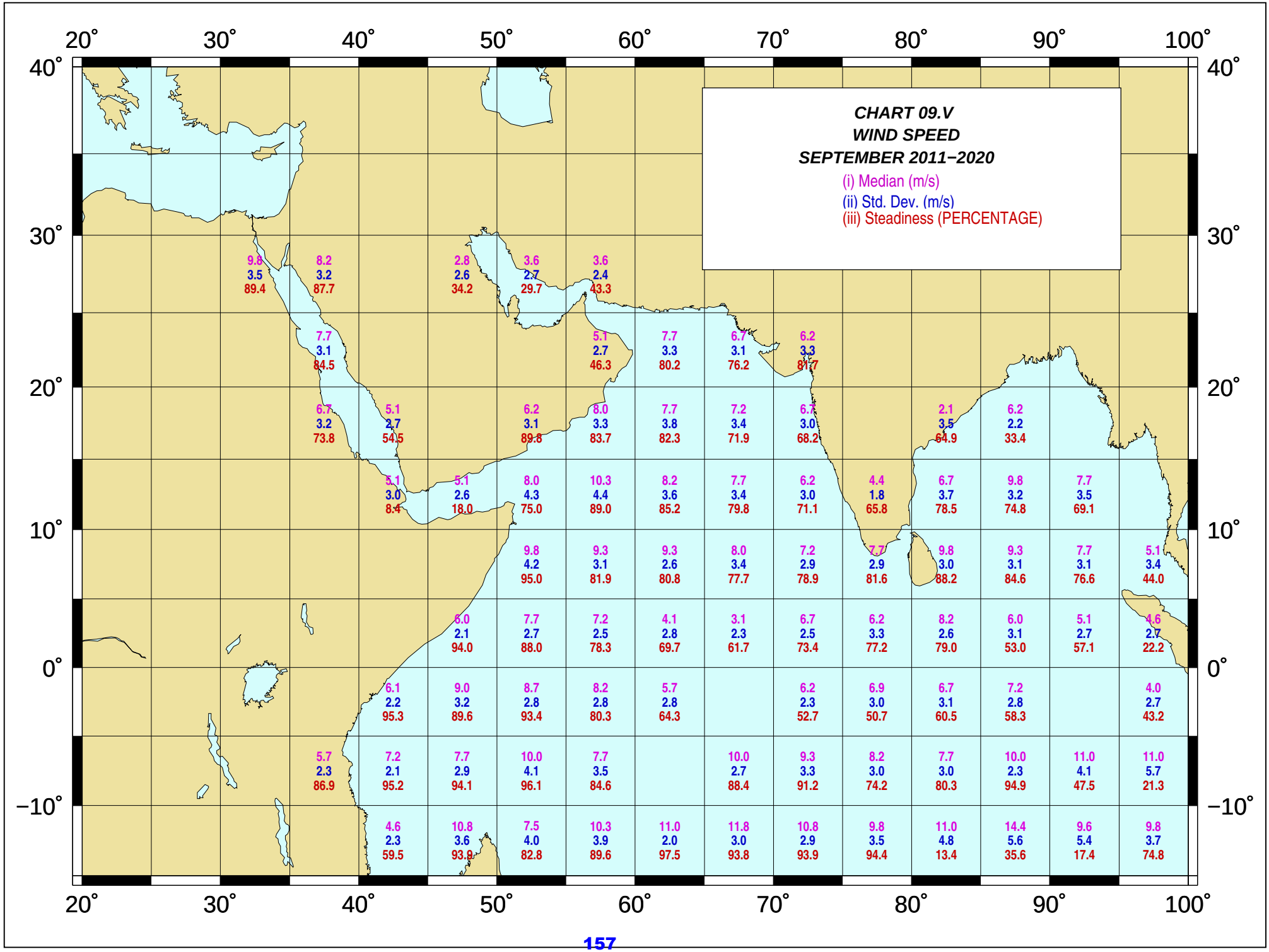


CHART 09.V
WIND SPEED
SEPTEMBER 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
9.8 3.5 89.4
8.2 3.2 87.7
2.8 2.6 34.2
3.6 2.7 29.7
3.6 2.4 43.3
7.7 3.1 84.5
5.1 2.7 46.3
7.7 3.3 80.2
6.7 3.1 76.2
6.2 3.3 81.7
6.7 3.2 73.8
5.1 2.7 54.5
6.2 3.1 89.8
8.0 3.3 83.7
7.7 3.8 82.3
7.2 3.4 71.9
6.7 3.0 68.2
2.1 3.5 64.9
6.2 2.2 33.4
5.1 3.0 8.4
5.1 2.6 18.0
8.0 4.3 75.0
10.3 4.4 89.0
8.2 3.6 85.2
7.7 3.4 79.8
6.2 3.0 71.1
4.4 1.8 65.8
6.7 3.7 78.5
9.8 3.2 74.8
7.7 3.5 69.1
9.8 4.2 95.0
9.3 3.1 81.9
9.3 2.6 80.8
8.0 3.4 77.7
7.2 2.9 78.9
7.7 2.9 81.6
9.8 3.0 88.2
9.3 3.1 84.6
7.7 3.1 76.6
5.1 3.4 44.0
6.0 2.1 94.0
7.7 2.7 88.0
7.2 2.5 78.3
4.1 2.8 69.7
3.1 2.3 61.7
6.7 2.5 73.4
6.2 3.3 77.2
8.2 2.6 79.0
6.0 3.1 53.0
5.1 2.7 57.1
4.6 2.7 22.2
6.1 2.2 95.3
9.0 3.2 89.6
8.7 2.8 93.4
8.2 2.8 80.3
5.7 2.8 64.3
6.2 2.3 52.7
6.9 3.0 50.7
6.7 3.1 60.5
7.2 2.8 58.3
4.0 2.7 43.2
5.7 2.3 86.9
7.2 2.1 95.2
7.7 2.9 94.1
10.0 4.1 96.1
7.7 3.5 84.6
10.0 2.7 88.4
9.3 3.3 91.2
8.2 3.0 74.2
7.7 3.0 80.3
10.0 2.3 94.9
11.0 4.1 47.5
11.0 5.7 21.3
4.6 2.3 59.5
10.8 3.6 93.8
7.5 4.0 82.8
10.3 3.9 89.6
11.0 2.0 97.5
11.8 3.0 93.8
10.8 2.9 93.9
9.8 3.5 94.4
11.0 4.8 13.4
14.4 5.6 35.6
9.6 5.4 17.4
9.8 3.7 74.8

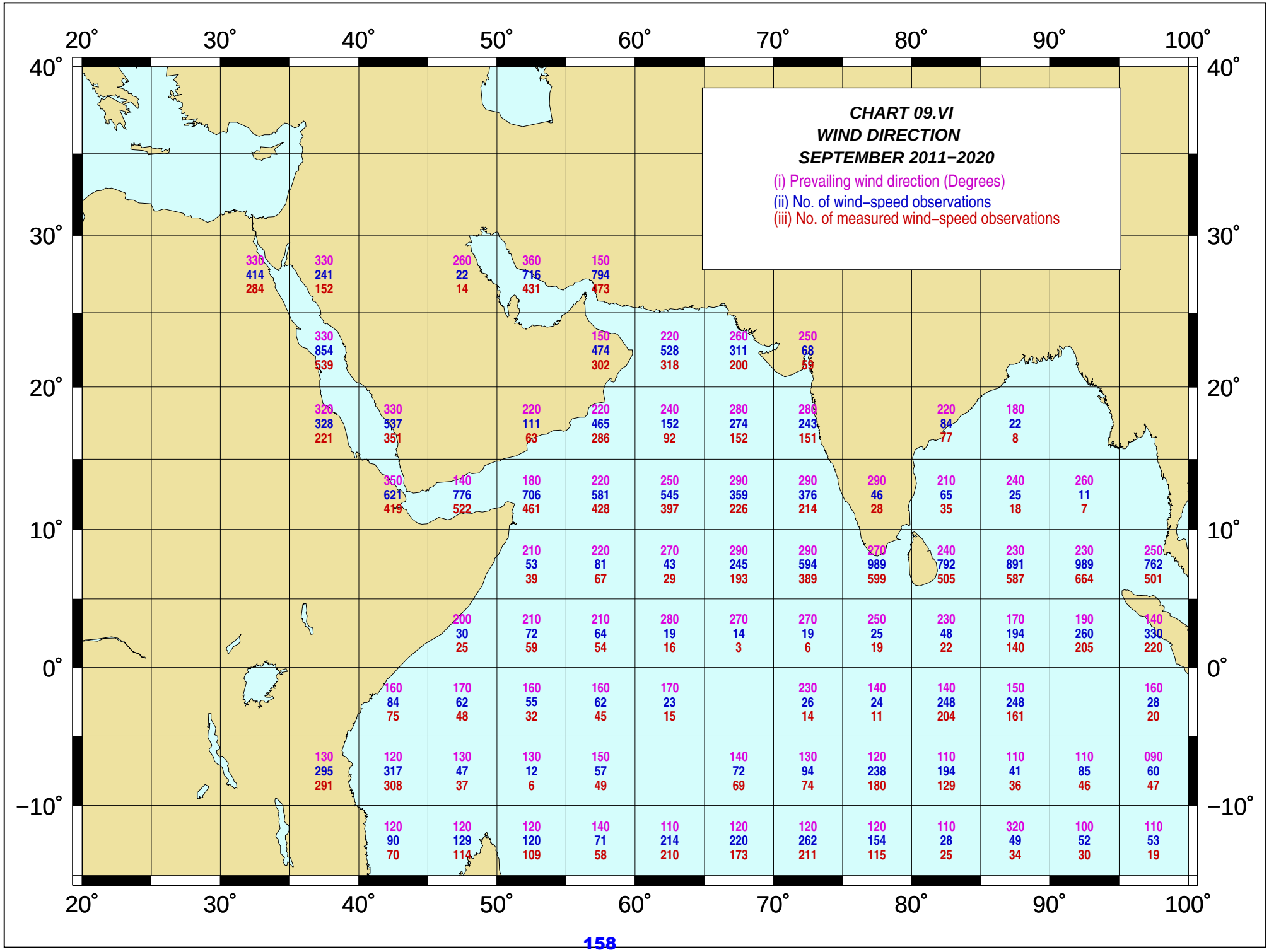


CHART 09.VI
WIND DIRECTION
SEPTEMBER 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
330 414 284
330 241 152
260 22 14
360 716 431
150 794 473
330 854 539
150 474 302
220 528 318
260 311 200
250 68 55
328 328 221
330 537 351
220 111 63
220 465 286
240 152 92
280 274 152
280 243 151
220 84 77
180 22 8
350 621 419
140 776 522
180 706 461
220 581 428
250 545 397
290 359 226
290 376 214
290 46 28
210 65 35
240 25 18
260 11 7
210 53 39
220 81 67
270 43 29
290 245 193
290 594 389
270 989 599
240 792 505
230 891 587
230 989 664
250 762 501
200 30 25
210 72 59
210 64 54
280 19 16
270 14 3
270 19 6
250 25 19
230 48 22
170 194 140
190 260 205
140 330 220
160 84 75
170 62 48
160 55 32
160 62 45
170 23 15
230 26 14
140 24 11
140 248 204
150 248 161
160 28 20
130 295 291
120 317 308
130 47 37
130 12 6
150 57 49
140 72 69
130 94 74
120 238 180
110 194 129
110 41 36
110 85 46
090 60 47
120 90 70
120 129 114
120 120 109
140 71 58
110 214 210
120 220 173
120 262 211
120 154 115
110 28 25
320 49 34
100 52 30
110 53 19

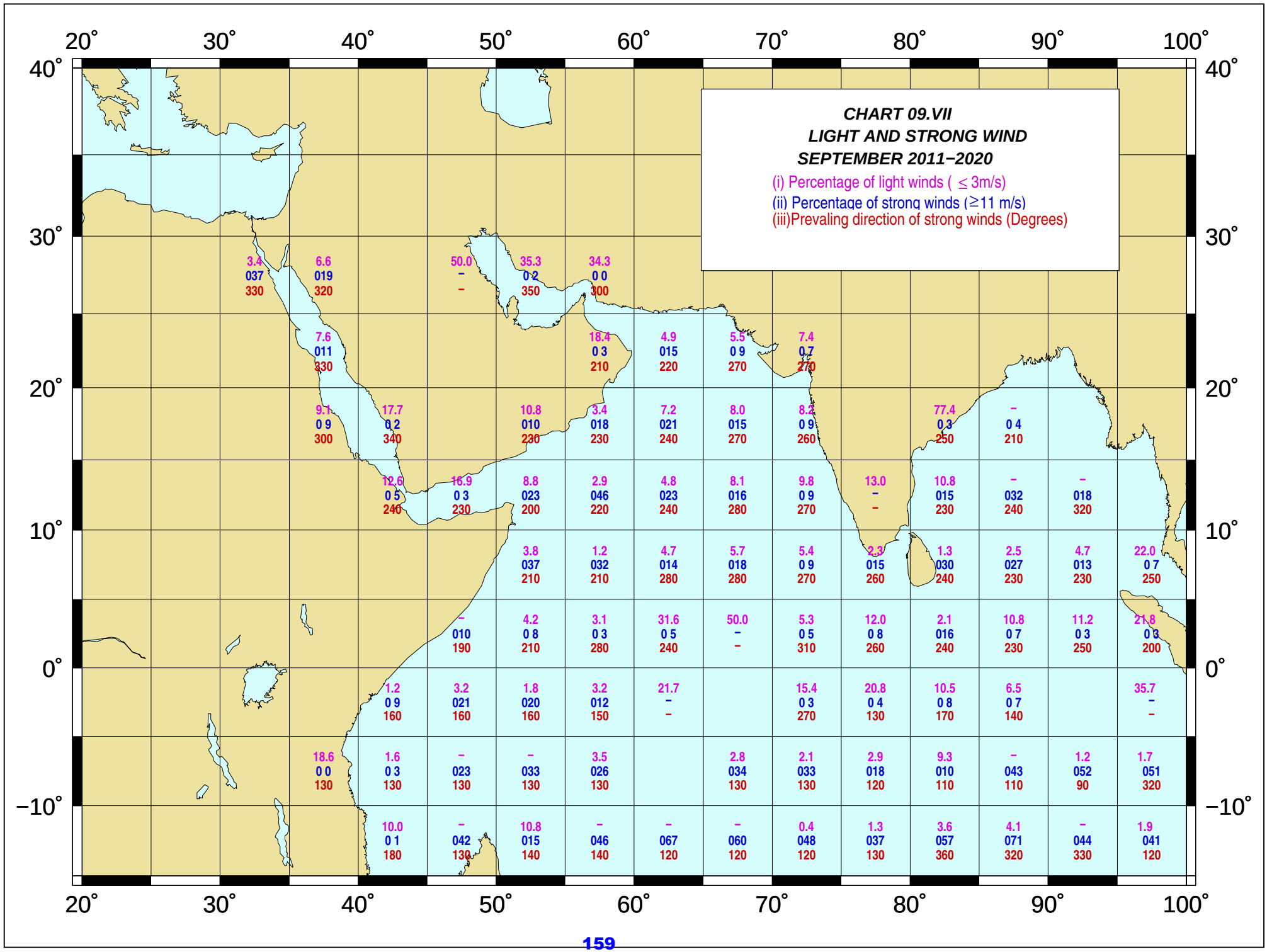


CHART 09.VII
LIGHT AND STRONG WIND
SEPTEMBER 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
3.4 037 330
6.6 019 320
50.0 – –
35.3 02 350
34.3 00 300
7.6 011 330
18.4 03 210
4.9 015 220
5.5 09 270
7.4 07 270
9.1 09 300
17.7 02 340
10.8 010 230
3.4 018 230
7.2 021 240
8.0 015 270
8.2 09 260
77.4 03 250
– 04 210
12.6 05 240
16.9 03 230
8.8 023 200
2.9 046 220
4.8 023 240
8.1 016 280
9.8 09 270
13.0 – –
10.8 015 230
– 032 240
– 018 320
3.8 037 210
1.2 032 210
4.7 014 280
5.7 018 280
5.4 09 270
2.3 015 260
1.3 030 240
2.5 027 230
4.7 013 230
22.0 07 250
– 010 190
4.2 08 210
3.1 03 280
31.6 05 240
50.0 – –
5.3 05 310
12.0 08 260
2.1 016 240
10.8 07 230
11.2 03 250
21.8 03 200
1.2 09 160
3.2 021 160
1.8 020 160
3.2 012 150
21.7 – –
15.4 03 270
20.8 04 130
10.5 08 170
6.5 07 140
35.7 – –
18.6 00 130
1.6 03 130
– 023 130
– 033 130
3.5 026 130
2.8 034 130
2.1 033 130
2.9 018 120
9.3 010 110
– 043 110
1.2 052 90
1.7 051 320
10.0 01 180
– 042 130
10.8 015 140
– 046 140
– 067 120
– 060 120
0.4 048 120
1.3 037 130
3.6 057 360
4.1 071 320
– 044 330
1.9 041 120

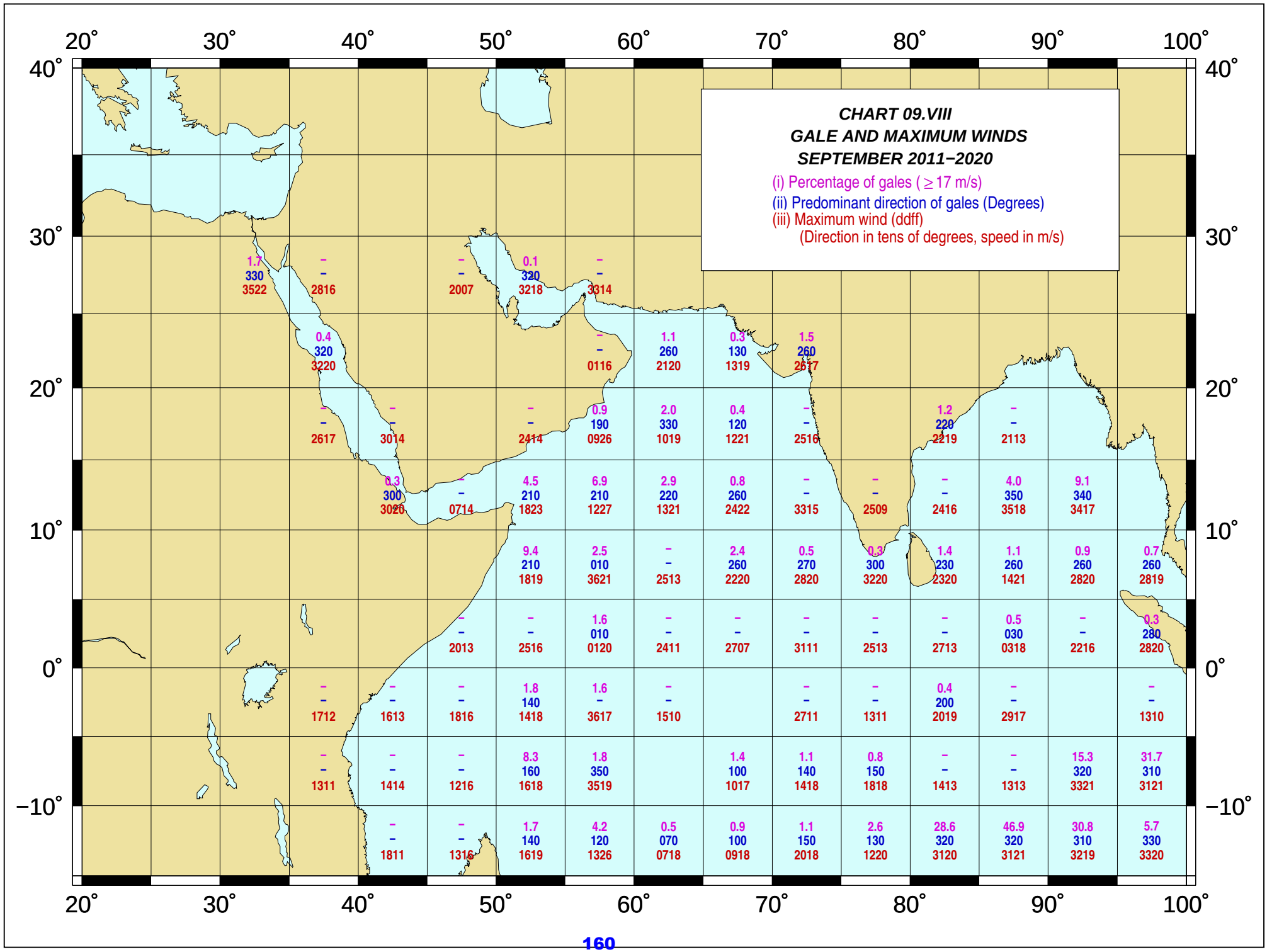


CHART 09.VIII
GALE AND MAXIMUM WINDS
SEPTEMBER 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.7 330 3522
– – 2816
– – 2007
0.1 320 3218
– – 3314
0.4 320 3220
– – 0116
1.1 260 2120
0.3 130 1319
1.5 260 2617
– – 2617
– – 3014
– – 2414
0.9 190 0926
2.0 330 1019
0.4 120 1221
– – 2516
1.2 220 2219
– – 2113
0.3 300 3026
– – 0714
4.5 210 1823
6.9 210 1227
2.9 220 1321
0.8 260 2422
– – 3315
– – 2509
– – 2416
4.0 350 3518
9.1 340 3417
9.4 210 1819
2.5 010 3621
– – 2513
2.4 260 2220
0.5 270 2820
0.3 300 3220
1.4 230 2320
1.1 260 1421
0.9 260 2820
0.7 260 2819
– – 2013
– – 2516
1.6 010 0120
– – 2411
– – 2707
– – 3111
– – 2513
– – 2713
0.5 030 0318
– – 2216
0.3 280 2820
– – 1712
– – 1613
– – 1816
1.8 140 1418
1.6 – 3617
– – 1510
– – 2711
– – 1311
0.4 200 2019
– – 2917
– – 1310
– – 1311
– – 1414
– – 1216
8.3 160 1618
1.8 350 3519
1.4 100 1017
1.1 140 1418
0.8 150 1818
– – 1413
– – 1313
15.3 320 3321
31.7 310 3121
– – 1811
– – 1316
1.7 140 1619
4.2 120 1326
0.5 070 0718
0.9 100 0918
1.1 150 2018
2.6 130 1220
28.6 320 3120
46.9 320 3121
30.8 310 3219
5.7 330 3320

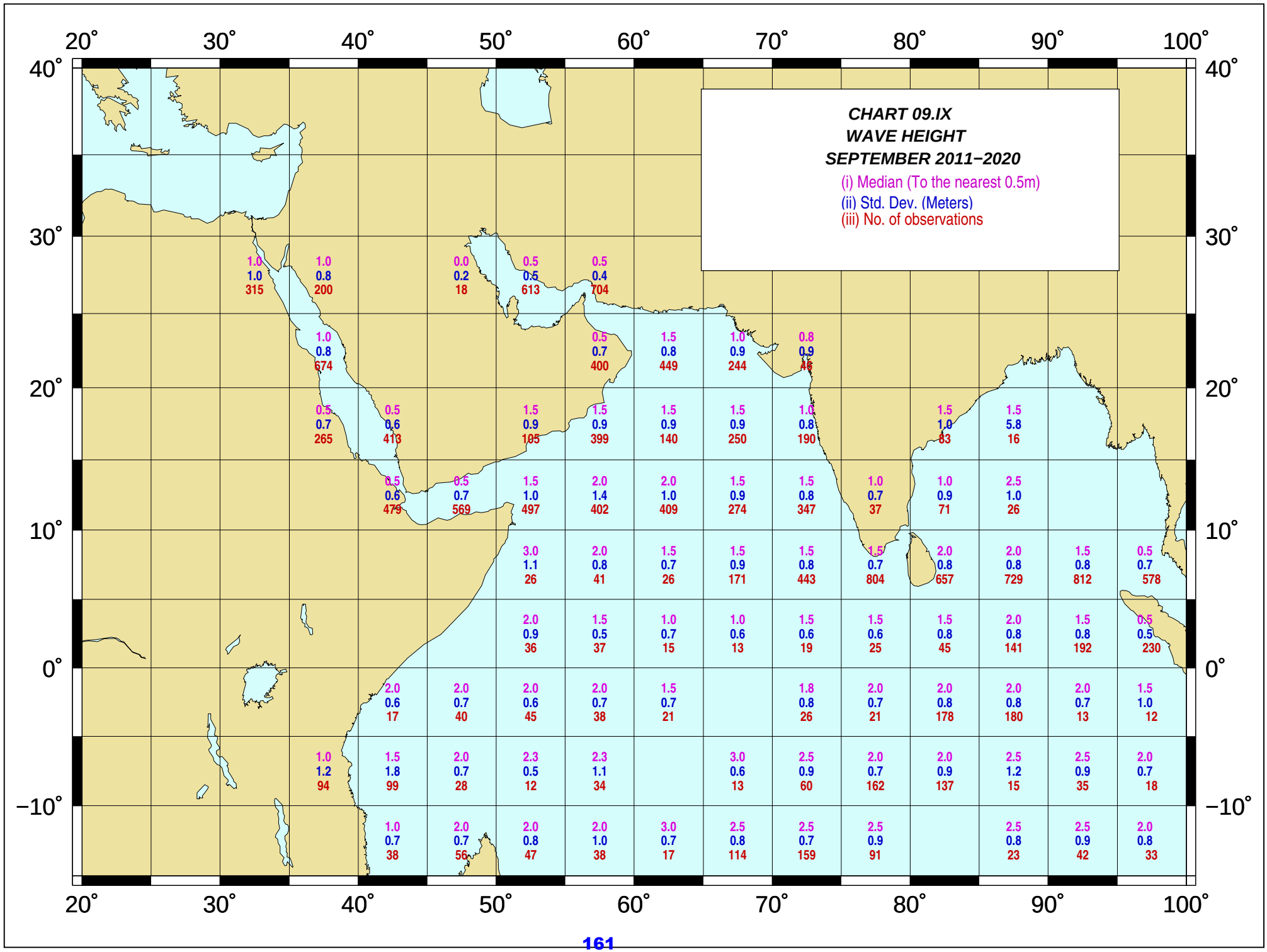


CHART 09.IX
WAVE HEIGHT
SEPTEMBER 2011−2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.0 1.0 315
1.0 0.8 200
0.0 0.2 18
0.5 0.5 613
0.5 0.4 704
1.0 0.8 674
0.5 0.7 400
1.5 0.8 449
1.0 0.9 244
0.8 0.9 46
0.5 0.7 265
0.5 0.6 413
1.5 0.9 105
1.5 0.9 399
1.5 0.9 140
1.5 0.9 250
1.0 0.8 190
1.5 1.0 83
1.5 5.8 16
0.5 0.6 479
0.5 0.7 569
1.5 1.0 497
2.0 1.4 402
2.0 1.0 409
1.5 0.9 274
1.5 0.8 347
1.0 0.7 37
1.0 0.9 71
2.5 1.0 26
3.0 1.1 26
2.0 0.8 41
1.5 0.7 26
1.5 0.9 171
1.5 0.8 443
1.5 0.7 804
2.0 0.8 657
2.0 0.8 729
1.5 0.8 812
0.5 0.7 578
2.0 0.9 36
1.5 0.5 37
1.0 0.7 15
1.0 0.6 13
1.5 0.6 19
1.5 0.6 25
1.5 0.8 45
2.0 0.8 141
1.5 0.8 192
0.5 0.5 230
2.0 0.6 17
2.0 0.7 40
2.0 0.6 45
2.0 0.7 38
1.5 0.7 21
1.8 0.8 26
2.0 0.7 21
2.0 0.8 178
2.0 0.8 180
2.0 0.7 13
1.5 1.0 12
1.0 1.2 94
1.5 1.8 99
2.0 0.7 28
2.3 0.5 12
2.3 1.1 34
3.0 0.6 13
2.5 0.9 60
2.0 0.7 162
2.0 0.9 137
2.5 1.2 15
2.5 0.9 35
2.0 0.7 18
1.0 0.7 38
2.0 0.7 56
2.0 0.8 47
2.0 1.0 38
3.0 0.7 17
2.5 0.8 114
2.5 0.7 159
2.5 0.9 91
2.5 0.8 23
2.5 0.9 42
2.0 0.8 33

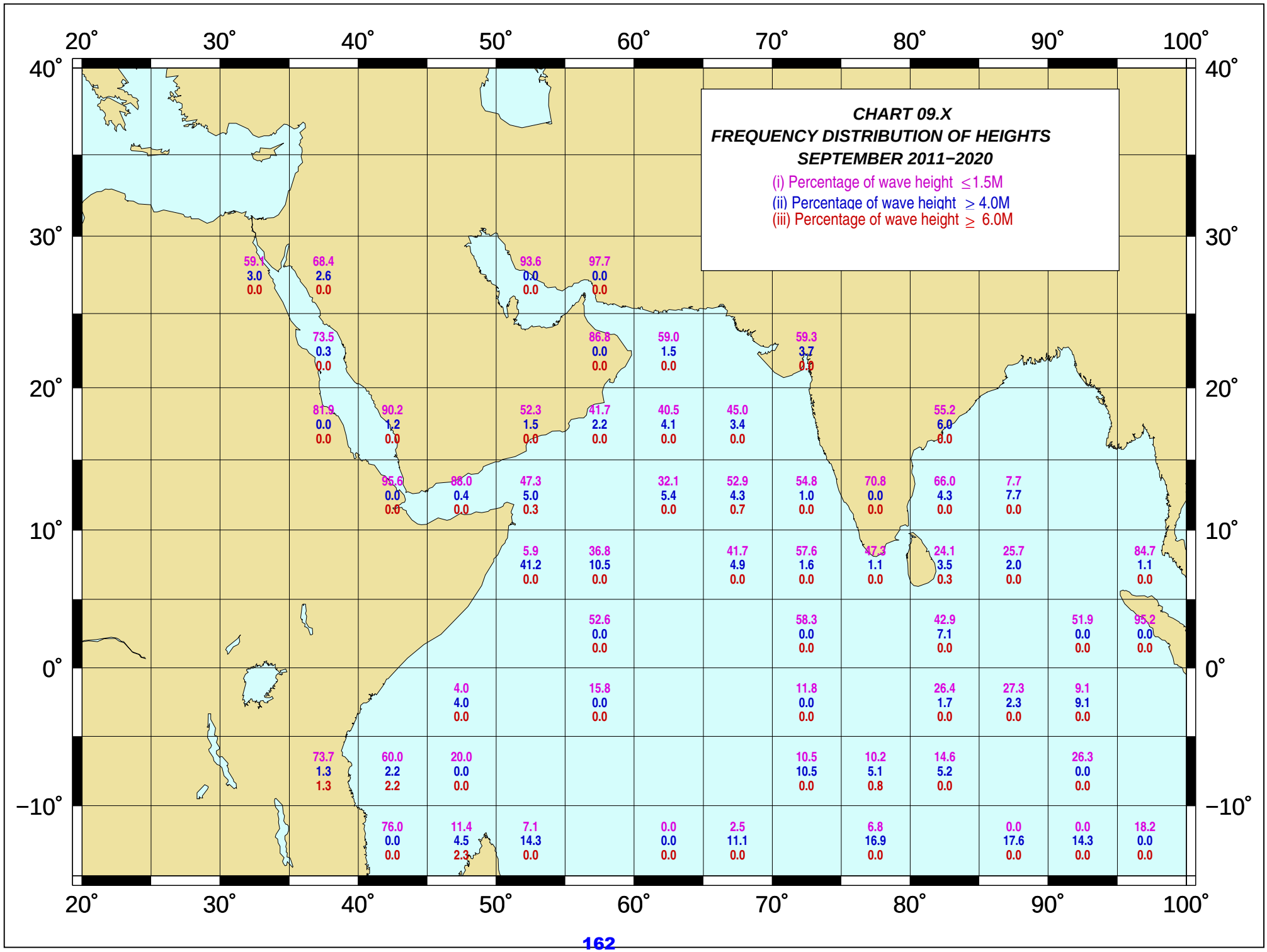


CHART 09.X
FREQUENCY DISTRIBUTION OF HEIGHTS
SEPTEMBER 2011–2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
59.1 3.0 0.0
68.4 2.6 0.0
93.6 0.0 0.0
97.7 0.0 0.0
73.5 0.3 0.0
86.8 0.0 0.0
59.0 1.5 0.0
59.3 3.7 0.0
81.9 0.0 0.0
90.2 1.2 0.0
52.3 1.5 0.0
41.7 2.2 0.0
40.5 4.1 0.0
45.0 3.4 0.0
55.2 6.0 0.0
95.6 0.0 0.0
88.0 0.4 0.0
47.3 5.0 0.3
32.1 5.4 0.0
52.9 4.3 0.7
54.8 1.0 0.0
70.8 0.0 0.0
66.0 4.3 0.0
7.7 7.7 0.0
5.9 41.2 0.0
36.8 10.5 0.0
41.7 4.9 0.0
57.6 1.6 0.0
47.3 1.1 0.0
24.1 3.5 0.3
25.7 2.0 0.0
84.7 1.1 0.0
52.6 0.0 0.0
58.3 0.0 0.0
42.9 7.1 0.0
51.9 0.0 0.0
95.2 0.0 0.0
4.0 4.0 0.0
15.8 0.0 0.0
11.8 0.0 0.0
26.4 1.7 0.0
27.3 2.3 0.0
9.1 9.1 0.0
73.7 1.3 1.3
60.0 2.2 2.2
20.0 0.0 0.0
10.5 10.5 0.0
10.2 5.1 0.8
14.6 5.2 0.0
26.3 0.0 0.0
76.0 0.0 0.0
11.4 4.5 2.3
7.1 14.3 0.0
0.0 0.0 0.0
2.5 11.1 0.0
6.8 16.9 0.0
0.0 17.6 0.0
0.0 14.3 0.0
18.2 0.0 0.0

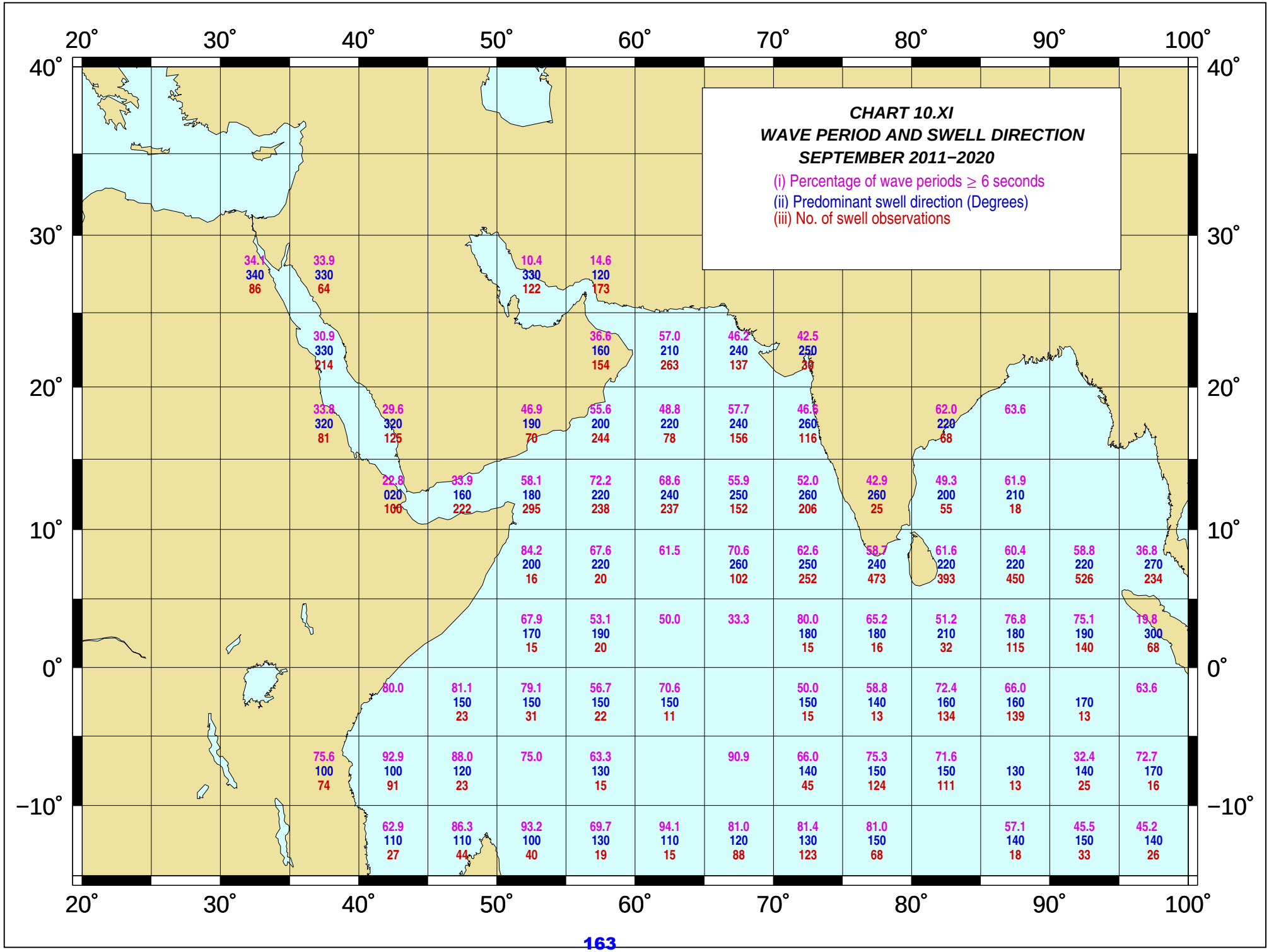


CHART 10.XI
WAVE PERIOD AND SWELL DIRECTION
SEPTEMBER 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
34.1 340 86
33.9 330 64
10.4 330 122
14.6 120 173
30.9 330 214
36.6 160 154
57.0 210 263
46.2 240 137
42.5 250
33.8 320 81
29.6 320 125
46.9 190 70
55.6 200 244
48.8 220 78
57.7 240 156
46.6 260 116
62.0 220 68
63.6
22.8 020 100
33.9 160 222
58.1 180 295
72.2 220 238
68.6 240 237
55.9 250 152
52.0 260 206
42.9 260 25
49.3 200 55
61.9 210 18
84.2 200 16
67.6 220 20
61.5
70.6 260 102
62.6 250 252
58.7 240 473
61.6 220 393
60.4 220 450
58.8 220 526
36.8 270 234
67.9 170 15
53.1 190 20
50.0
33.3
80.0 180 15
65.2 180 16
51.2 210 32
76.8 180 115
75.1 190 140
19.8 300 68
80.0
81.1 150 23
79.1 150 31
56.7 150 22
70.6 150 11
50.0 150 15
58.8 140 13
72.4 160 134
66.0 160 139
170 13
63.6
75.6 100 74
92.9 100 91
88.0 120 23
75.0
63.3 130 15
90.9
66.0 140 45
75.3 150 124
71.6 150 111
130 13
32.4 140 25
72.7 170 16
62.9 110 27
86.3 110 44
93.2 100 40
69.7 130 19
94.1 110 15
81.0 120 88
81.4 130 123
81.0 150 68
57.1 140 18
45.5 150 33
45.2 140 26

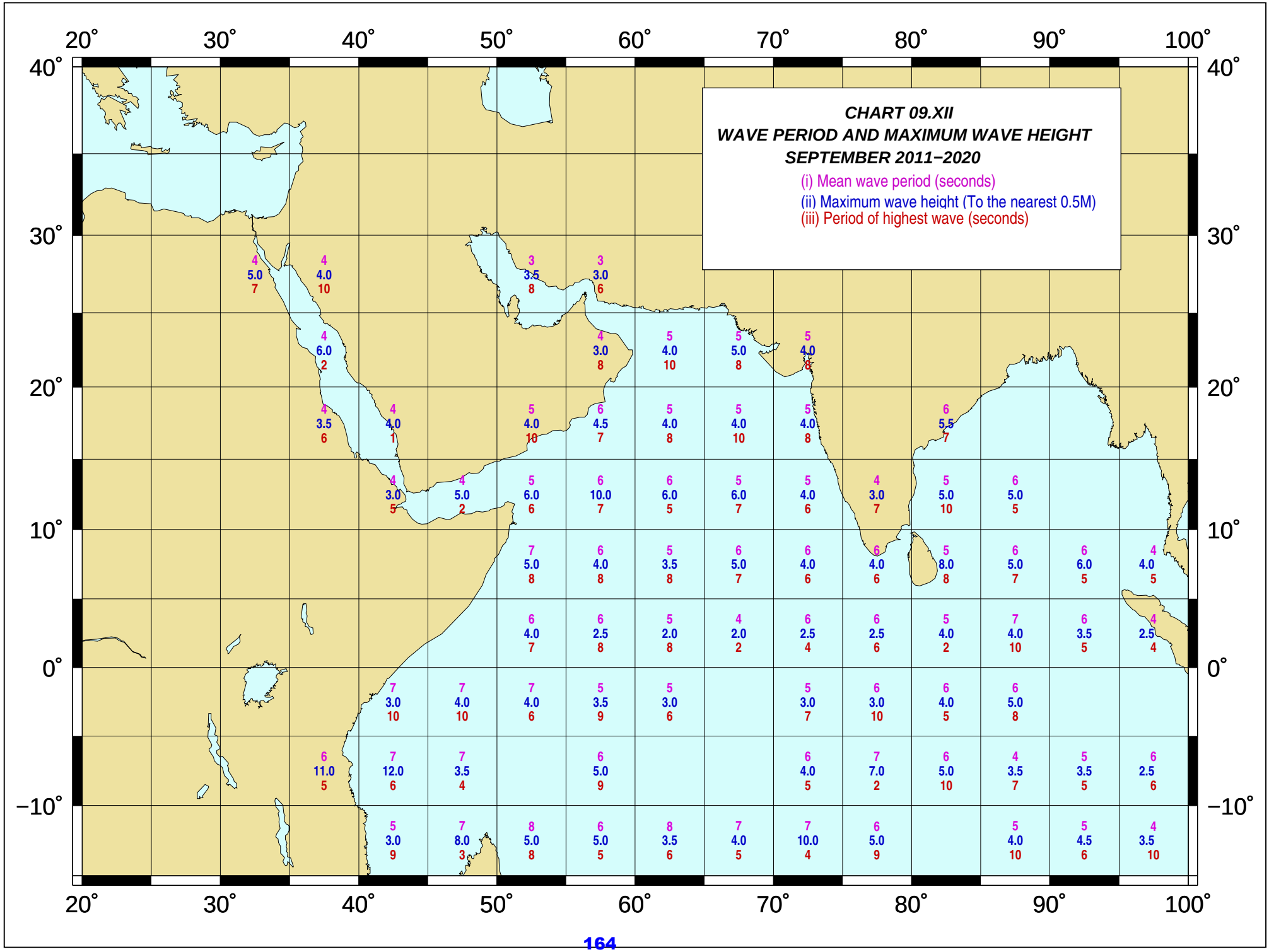


CHART 09.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
SEPTEMBER 2011–2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°

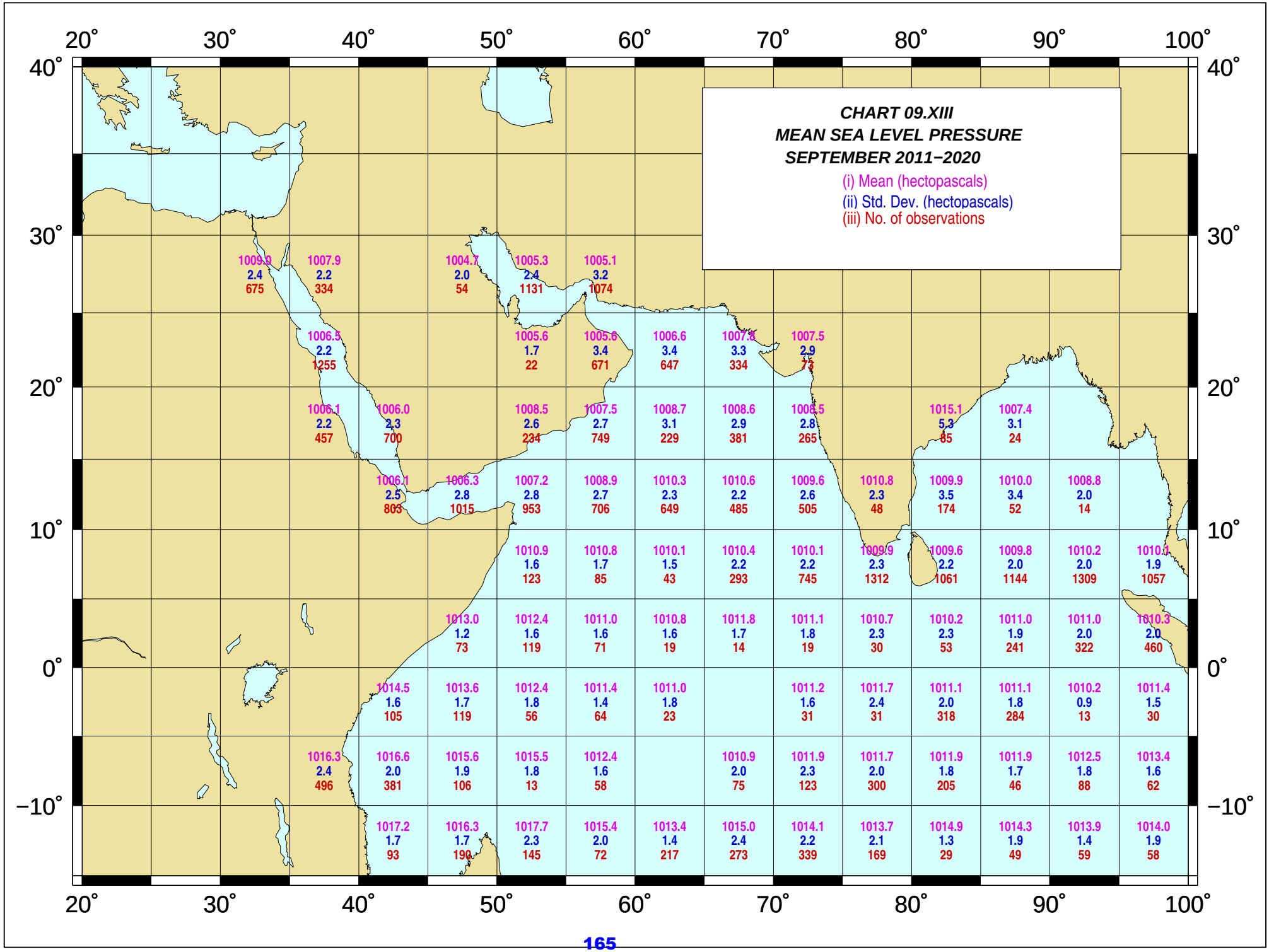


CHART 09.XIII
MEAN SEA LEVEL PRESSURE
SEPTEMBER 2011–2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1009.0 2.4 675
1007.9 2.2 334
1004.7 2.0 54
1005.3 2.4 1131
1005.1 3.2 1074
1006.5 2.2 1255
1005.6 1.7 22
1005.6 3.4 671
1006.6 3.4 647
1007.8 3.3 334
1007.5 2.9 75
1006.1 2.2 457
1006.0 2.3 700
1008.5 2.6 234
1007.5 2.7 749
1008.7 3.1 229
1008.6 2.9 381
1008.5 2.8 265
1015.1 5.3 85
1007.4 3.1 24
1006.1 2.5 803
1006.3 2.8 1015
1007.2 2.8 953
1008.9 2.7 706
1010.3 2.3 649
1010.6 2.2 485
1009.6 2.6 505
1010.8 2.3 48
1009.9 3.5 174
1010.0 3.4 52
1008.8 2.0 14
1010.9 1.6 123
1010.8 1.7 85
1010.1 1.5 43
1010.4 2.2 293
1010.1 2.2 745
1009.9 2.3 1312
1009.6 2.2 1061
1009.8 2.0 1144
1010.2 2.0 1309
1010.1 1.9 1057
1013.0 1.2 73
1012.4 1.6 119
1011.0 1.6 71
1010.8 1.6 19
1011.8 1.7 14
1011.1 1.8 19
1010.7 2.3 30
1010.2 2.3 53
1011.0 1.9 241
1011.0 2.0 322
1010.3 2.0 460
1014.5 1.6 105
1013.6 1.7 119
1012.4 1.8 56
1011.4 1.4 64
1011.0 1.8 23
1011.2 1.6 31
1011.7 2.4 31
1011.1 2.0 318
1011.1 1.8 284
1010.2 0.9 13
1011.4 1.5 30
1016.3 2.4 496
1016.6 2.0 381
1015.6 1.9 106
1015.5 1.8 13
1012.4 1.6 58
1010.9 2.0 75
1011.9 2.3 123
1011.7 2.0 300
1011.9 1.8 205
1011.9 1.7 46
1012.5 1.8 88
1013.4 1.6 62
1017.2 1.7 93
1016.3 1.7 190
1017.7 2.3 145
1015.4 2.0 72
1013.4 1.4 217
1015.0 2.4 273
1014.1 2.2 339
1013.7 2.1 169
1014.9 1.3 29
1014.3 1.9 49
1013.9 1.4 59
1014.0 1.9 58

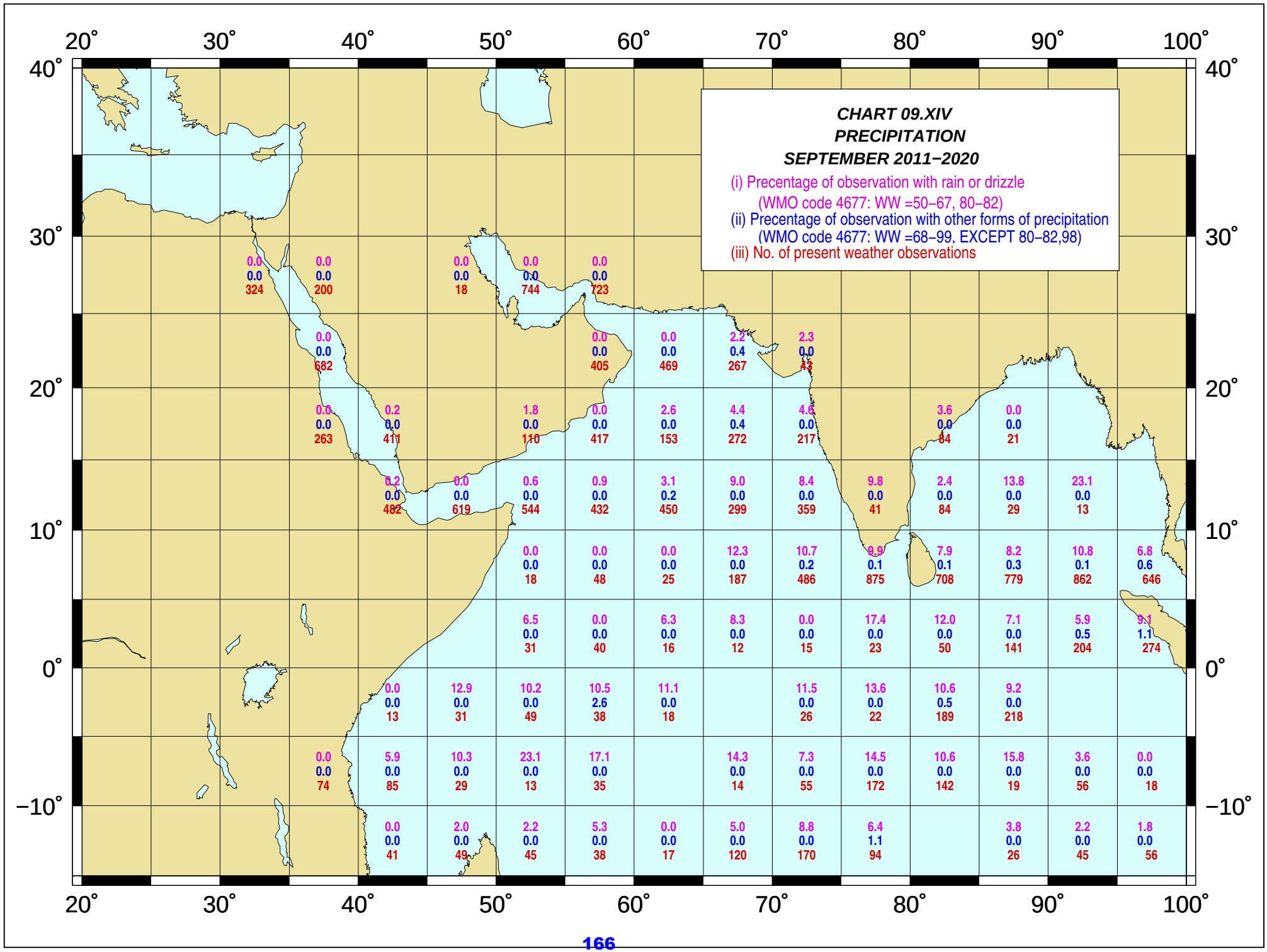


CHART 09.XIV
PRECIPITATION
SEPTEMBER 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 0.0 324
0.0 0.0 200
0.0 0.0 18
0.0 0.0 744
0.0 0.0 723
0.0 0.0 682
0.0 0.0 405
0.0 0.0 469
2.2 0.4 267
2.3 0.0 43
0.0 0.0 263
0.2 0.0 411
1.8 0.0 110
0.0 0.0 417
2.6 0.0 153
4.4 0.4 272
4.6 0.0 217
3.6 0.0 84
0.0 0.0 21
0.2 0.0 482
0.0 0.0 619
0.6 0.0 544
0.9 0.0 432
3.1 0.2 450
9.0 0.0 299
8.4 0.0 359
9.8 0.0 41
2.4 0.0 84
13.8 0.0 29
23.1 0.0 13
0.0 0.0 18
0.0 0.0 48
0.0 0.0 25
12.3 0.0 187
10.7 0.2 486
9.9 0.1 875
7.9 0.1 708
8.2 0.3 779
10.8 0.1 862
6.8 0.6 646
6.5 0.0 31
0.0 0.0 40
6.3 0.0 16
8.3 0.0 12
0.0 0.0 15
17.4 0.0 23
12.0 0.0 50
7.1 0.0 141
5.9 0.5 204
9.1 1.1 274
0.0 0.0 13
12.9 0.0 31
10.2 0.0 49
10.5 2.6 38
11.1 0.0 18
11.5 0.0 26
13.6 0.0 22
10.6 0.5 189
9.2 0.0 218
0.0 0.0 74
5.9 0.0 85
10.3 0.0 29
23.1 0.0 13
17.1 0.0 35
14.3 0.0 14
7.3 0.0 55
14.5 0.0 172
10.6 0.0 142
15.8 0.0 19
3.6 0.0 56
0.0 0.0 18
0.0 0.0 41
2.0 0.0 49
2.2 0.0 45
5.3 0.0 38
0.0 0.0 17
5.0 0.0 120
8.8 0.0 170
6.4 1.1 94
3.8 0.0 26
2.2 0.0 45
1.8 0.0 56

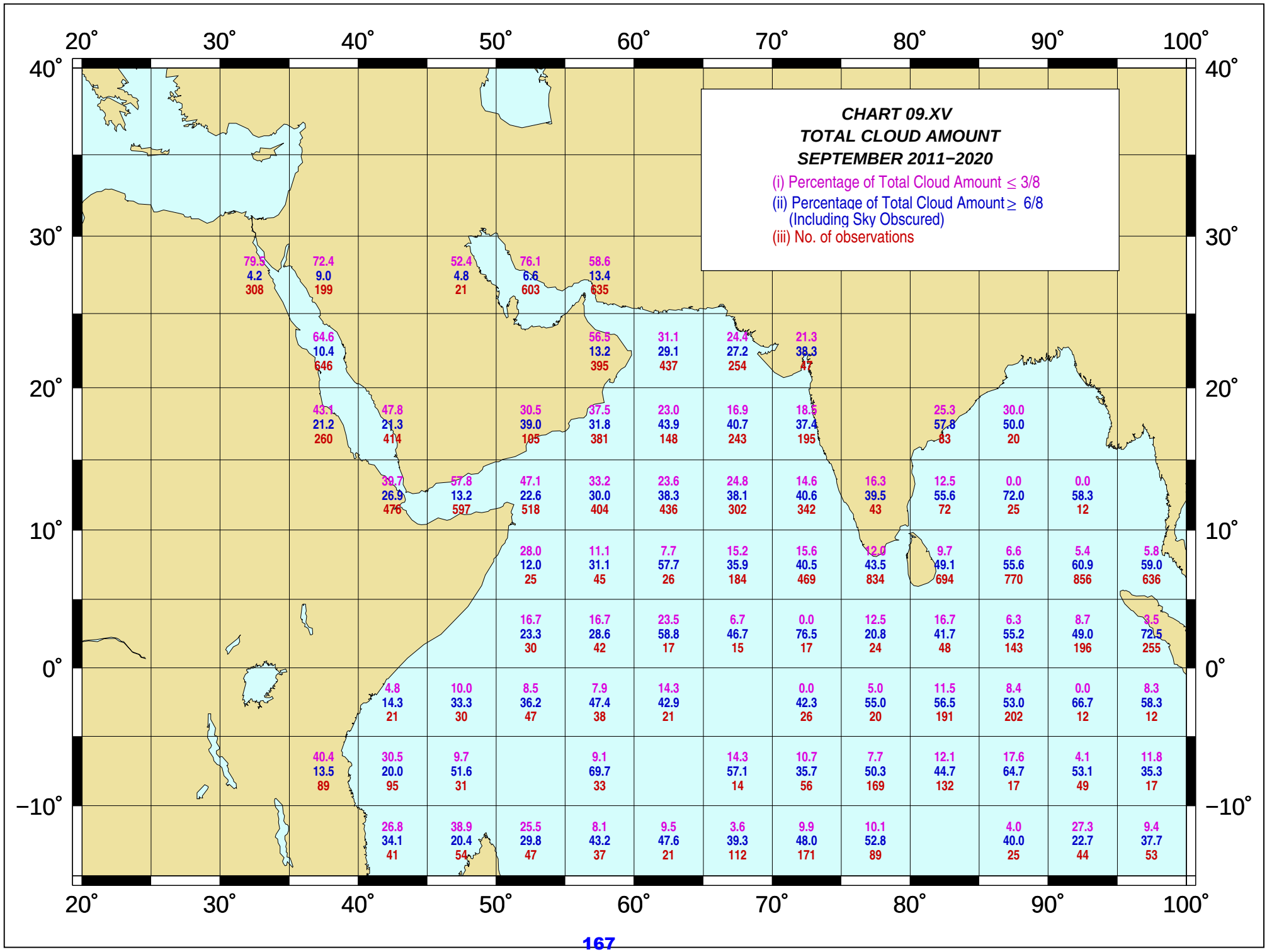


CHART 09.XV
TOTAL CLOUD AMOUNT
SEPTEMBER 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
79.5 4.2 308
72.4 9.0 199
52.4 4.8 21
76.1 6.6 603
58.6 13.4 635
64.6 10.4 646
56.5 13.2 395
31.1 29.1 437
24.4 27.2 254
21.3 38.3 47
43.1 21.2 260
47.8 21.3 414
30.5 39.0 105
37.5 31.8 381
23.0 43.9 148
16.9 40.7 243
18.5 37.4 195
25.3 57.8 83
30.0 50.0 20
39.7 26.9 476
57.8 13.2 597
47.1 22.6 518
33.2 30.0 404
23.6 38.3 436
24.8 38.1 302
14.6 40.6 342
16.3 39.5 43
12.5 55.6 72
0.0 72.0 25
0.0 58.3 12
28.0 12.0 25
11.1 31.1 45
7.7 57.7 26
15.2 35.9 184
15.6 40.5 469
12.0 43.5 834
9.7 49.1 694
6.6 55.6 770
5.4 60.9 856
5.8 59.0 636
16.7 23.3 30
16.7 28.6 42
23.5 58.8 17
6.7 46.7 15
0.0 76.5 17
12.5 20.8 24
16.7 41.7 48
6.3 55.2 143
8.7 49.0 196
3.5 72.5 255
4.8 14.3 21
10.0 33.3 30
8.5 36.2 47
7.9 47.4 38
14.3 42.9 21
0.0 42.3 26
5.0 55.0 20
11.5 56.5 191
8.4 53.0 202
0.0 66.7 12
8.3 58.3 12
40.4 13.5 89
30.5 20.0 95
9.7 51.6 31
9.1 69.7 33
14.3 57.1 14
10.7 35.7 56
7.7 50.3 169
12.1 44.7 132
17.6 64.7 17
4.1 53.1 49
11.8 35.3 17
26.8 34.1 41
38.9 20.4 54
25.5 29.8 47
8.1 43.2 37
9.5 47.6 21
3.6 39.3 112
9.9 48.0 171
10.1 52.8 89
4.0 40.0 25
27.3 22.7 44
9.4 37.7 53

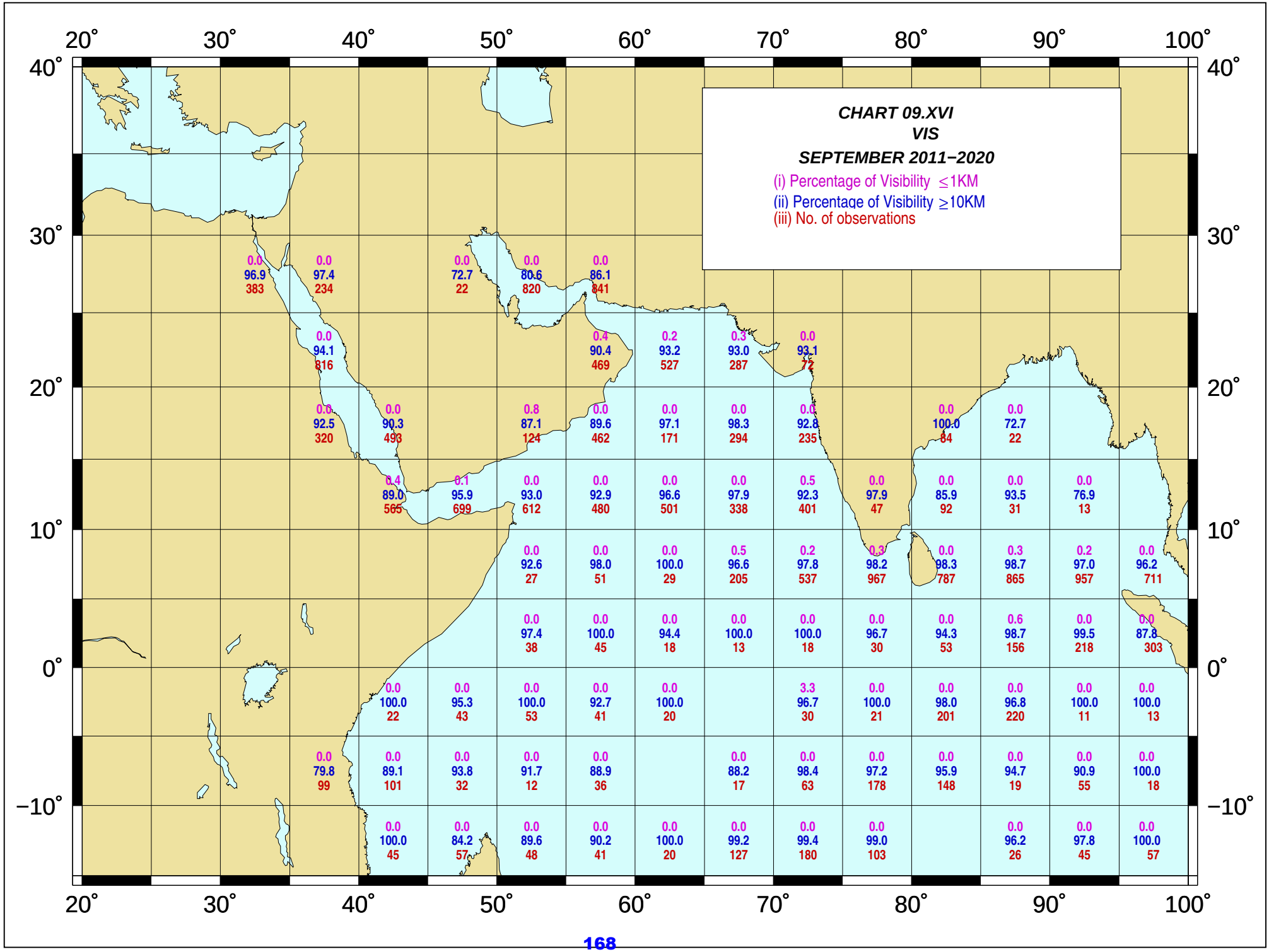


CHART 09.XVI
VIS
SEPTEMBER 2011–2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 96.9 383
0.0 97.4 234
0.0 72.7 22
0.0 80.6 820
0.0 86.1 841
0.0 94.1 816
0.4 90.4 469
0.2 93.2 527
0.3 93.0 287
0.0 93.1 72
0.0 92.5 320
0.0 90.3 493
0.8 87.1 124
0.0 89.6 462
0.0 97.1 171
0.0 98.3 294
0.0 92.8 235
0.0 100.0 84
0.0 72.7 22
0.4 89.0 565
0.1 95.9 699
0.0 93.0 612
0.0 92.9 480
0.0 96.6 501
0.0 97.9 338
0.5 92.3 401
0.0 97.9 47
0.0 85.9 92
0.0 93.5 31
0.0 76.9 13
0.0 92.6 27
0.0 98.0 51
0.0 100.0 29
0.5 96.6 205
0.2 97.8 537
0.3 98.2 967
0.0 98.3 787
0.3 98.7 865
0.2 97.0 957
0.0 96.2 711
0.0 97.4 38
0.0 100.0 45
0.0 94.4 18
0.0 100.0 13
0.0 100.0 18
0.0 96.7 30
0.0 94.3 53
0.6 98.7 156
0.0 99.5 218
0.0 87.8 303
0.0 100.0 22
0.0 95.3 43
0.0 100.0 53
0.0 92.7 41
0.0 100.0 20
3.3 96.7 30
0.0 100.0 21
0.0 98.0 201
0.0 96.8 220
0.0 100.0 11
0.0 100.0 13
0.0 79.8 99
0.0 89.1 101
0.0 93.8 32
0.0 91.7 12
0.0 88.9 36
0.0 88.2 17
0.0 98.4 63
0.0 97.2 178
0.0 95.9 148
0.0 94.7 19
0.0 90.9 55
0.0 100.0 18
0.0 100.0 45
0.0 84.2 57
0.0 89.6 48
0.0 90.2 41
0.0 100.0 20
0.0 99.2 127
0.0 99.4 180
0.0 99.0 103
0.0 96.2 26
0.0 97.8 45
0.0 100.0 57

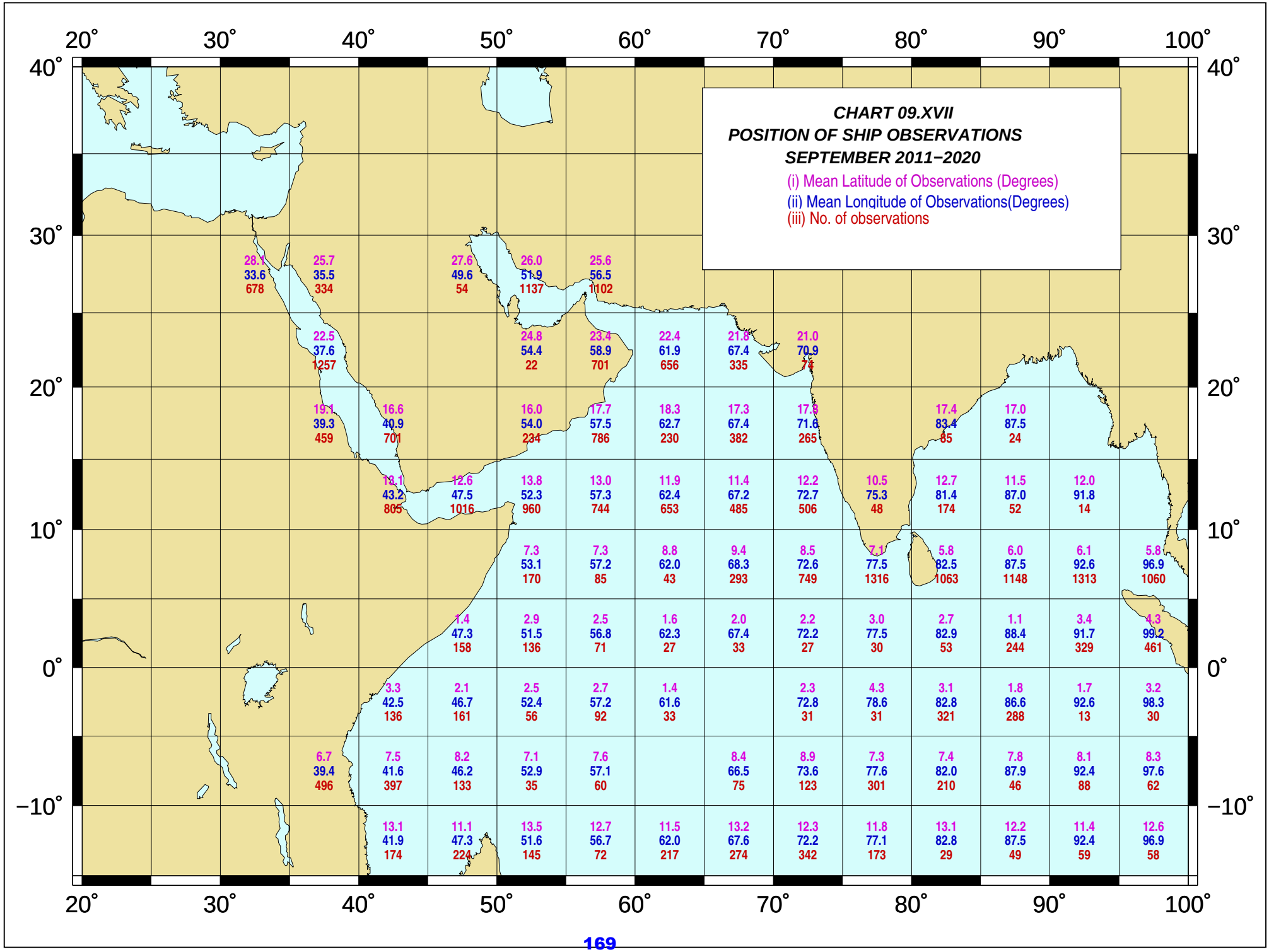


CHART 09.XVII
POSITION OF SHIP OBSERVATIONS
SEPTEMBER 2011−2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.1 33.6 678
25.7 35.5 334
27.6 49.6 54
26.0 51.9 1137
25.6 56.5 1102
22.5 37.6 1257
24.8 54.4 22
23.4 58.9 701
22.4 61.9 656
21.8 67.4 335
21.0 70.9
19.1 39.3 459
16.6 40.9 701
16.0 54.0 234
17.7 57.5 786
18.3 62.7 230
17.3 67.4 382
17.4 83.4
17.0 87.5 24
12.6 47.5 1016
13.8 52.3 960
13.0 57.3 744
11.9 62.4 653
11.4 67.2 485
12.2 72.7 506
10.5 75.3 48
12.7 81.4 174
11.5 87.0 52
12.0 91.8 14
7.3 53.1 170
7.3 57.2 85
8.8 62.0 43
9.4 68.3 293
8.5 72.6 749
7.1 77.5 1316
5.8 82.5 1063
6.0 87.5 1148
6.1 92.6 1313
5.8 96.9 1060
1.4 47.3 158
2.9 51.5 136
2.5 56.8 71
1.6 62.3 27
2.0 67.4 33
2.2 72.2 27
3.0 77.5 30
2.7 82.9 53
1.1 88.4 244
3.4 91.7 329
4.3 99.2 461
3.3 42.5 136
2.1 46.7 161
2.5 52.4 56
2.7 57.2 92
1.4 61.6 33
2.3 72.8 31
4.3 78.6 31
3.1 82.8 321
1.8 86.6 288
1.7 92.6 13
3.2 98.3 30
6.7 39.4 496
7.5 41.6 397
8.2 46.2 133
7.1 52.9 35
7.6 57.1 60
8.4 66.5 75
8.9 73.6 123
7.3 77.6 301
7.4 82.0 210
7.8 87.9 46
8.1 92.4 88
8.3 97.6 62
13.1 41.9 174
11.1 47.3 224
13.5 51.6 145
12.7 56.7 72
11.5 62.0 217
13.2 67.6 274
12.3 72.2 342
11.8 77.1 173
13.1 82.8 29
12.2 87.5 49
11.4 92.4 59
12.6 96.9 58

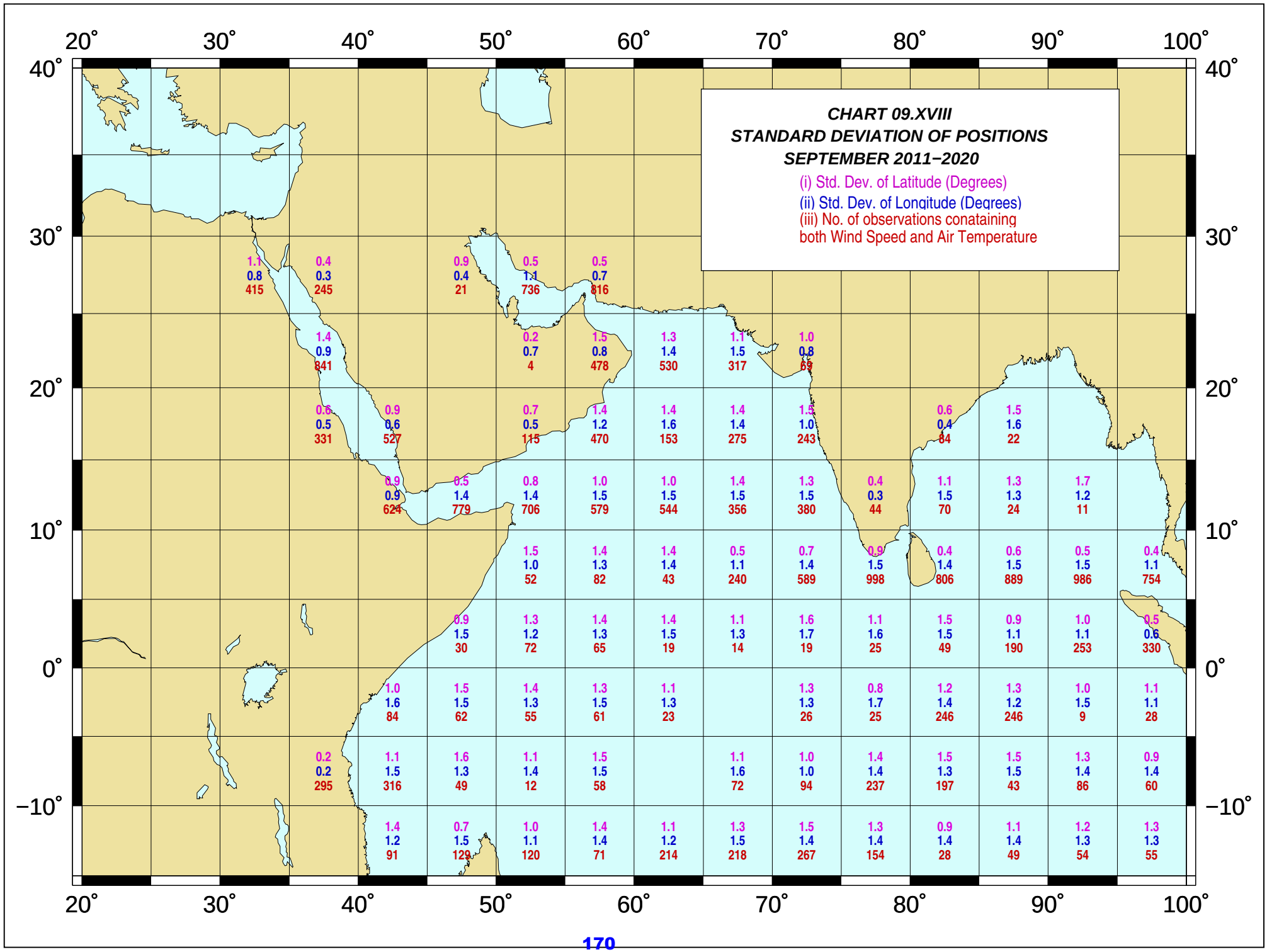
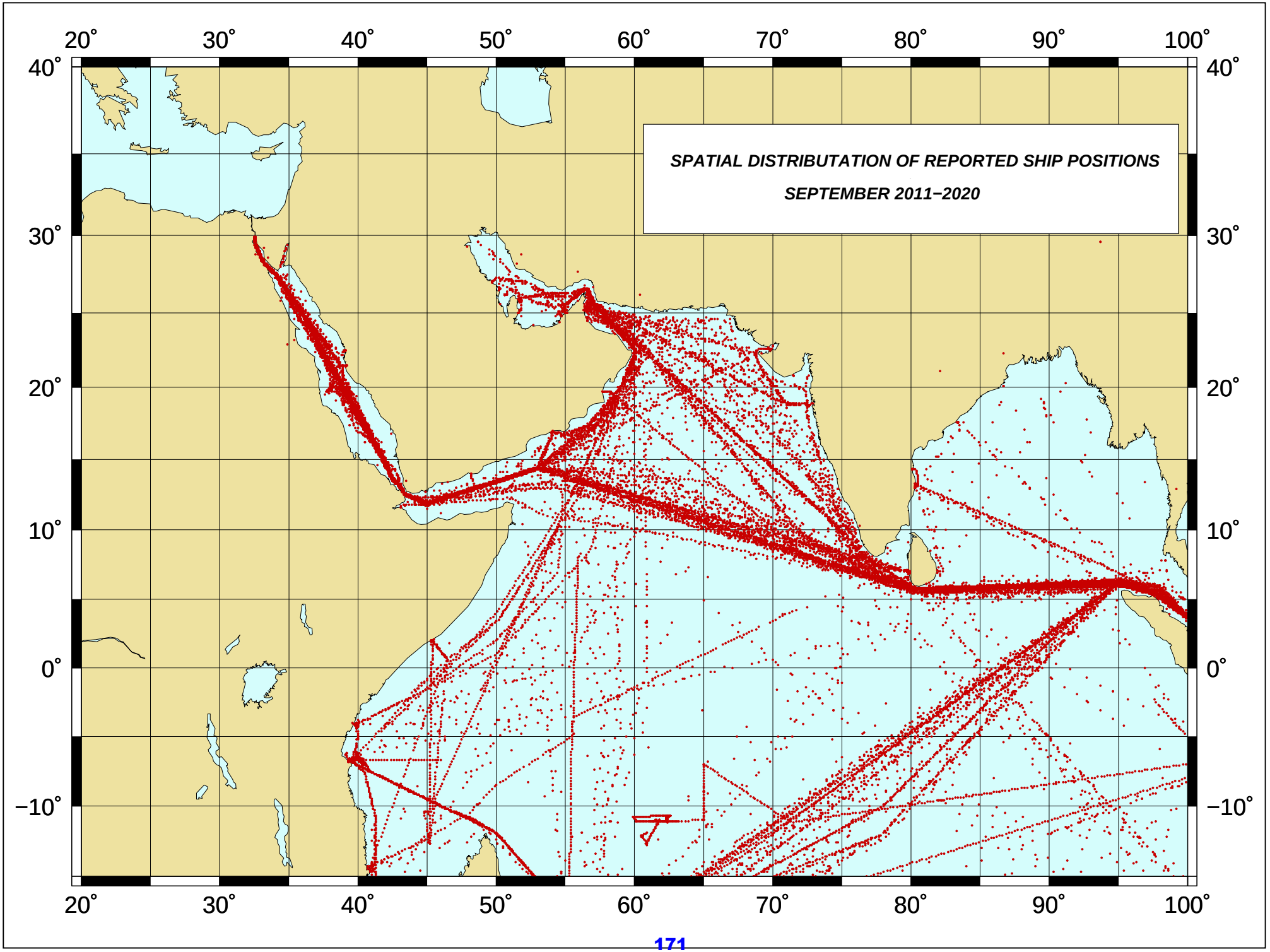


CHART 09.XVIII
STANDARD DEVIATION OF POSITIONS
SEPTEMBER 2011−2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.1 0.8 415
0.4 0.3 245
0.9 0.4 21
0.5 1.1 736
0.5 0.7 816
1.4 0.9 841
0.2 0.7 4
1.5 0.8 478
1.3 1.4 530
1.1 1.5 317
1.0 0.8
0.6 0.5 331
0.9 0.6 527
0.7 0.5 115
1.4 1.2 470
1.4 1.6 153
1.4 1.4 275
0.6 0.4 84
1.5 1.6 22
0.9 0.9 624
0.5 1.4 779
0.8 1.4 706
1.0 1.5 579
1.0 1.5 544
1.4 1.5 356
1.3 1.5 380
0.4 0.3 44
1.1 1.5 70
1.3 1.3 24
1.7 1.2 11
1.5 1.0 52
1.4 1.3 82
1.4 1.4 43
0.5 1.1 240
0.7 1.4 589
0.9 1.5 998
0.4 1.4 806
0.6 1.5 889
0.5 1.5 986
0.4 1.1 754
0.9 1.5 30
1.3 1.2 72
1.4 1.3 65
1.4 1.5 19
1.1 1.3 14
1.6 1.7 19
1.1 1.6 25
1.5 1.5 49
0.9 1.1 190
1.0 1.1 253
0.5 0.6 330
1.0 1.6 84
1.5 1.5 62
1.4 1.3 55
1.3 1.5 61
1.1 1.3 23
1.3 1.3 26
0.8 1.7 25
1.2 1.4 246
1.3 1.2 246
1.0 1.5 9
1.1 1.1 28
0.2 0.2 295
1.1 1.5 316
1.6 1.3 49
1.1 1.4 12
1.5 1.5 58
1.1 1.6 72
1.0 1.0 94
1.4 1.4 237
1.5 1.3 197
1.5 1.5 43
1.3 1.4 86
0.9 1.4 60
1.4 1.2 91
0.7 1.5 129
1.0 1.1 120
1.4 1.4 71
1.1 1.2 214
1.3 1.5 218
1.5 1.4 267
1.3 1.4 154
0.9 1.4 28
1.1 1.4 49
1.2 1.3 54
1.3 1.3 55


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
SEPTEMBER 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF OCTOBER 2011-2020

Marine Climatological Summary Charts 2011-2020

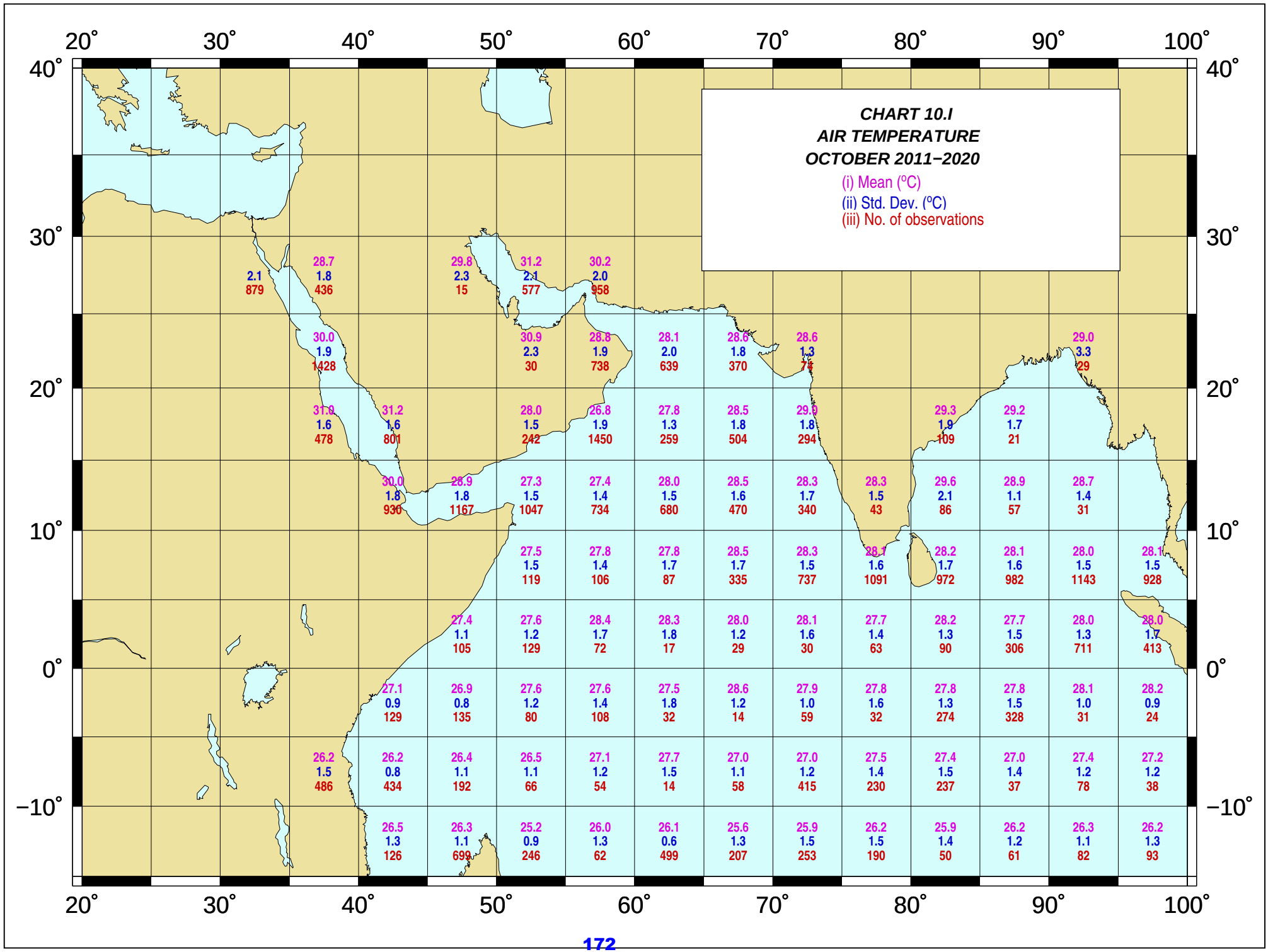


CHART 10.I
AIR TEMPERATURE
OCTOBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.1 879
28.7 1.8 436
29.8 2.3 15
31.2 2.1 577
30.2 2.0 958
30.0 1.9 1428
30.9 2.3 30
28.8 1.9 738
28.1 2.0 639
28.6 1.8 370
28.6 1.3 74
29.0 3.3 29
31.9 1.6 478
31.2 1.6 801
28.0 1.5 242
26.8 1.9 1450
27.8 1.3 259
28.5 1.8 504
29.9 1.8 294
29.3 1.9 109
29.2 1.7 21
30.0 1.8 930
28.9 1.8 1167
27.3 1.5 1047
27.4 1.4 734
28.0 1.5 680
28.5 1.6 470
28.3 1.7 340
28.3 1.5 43
29.6 2.1 86
28.9 1.1 57
28.7 1.4 31
27.5 1.5 119
27.8 1.4 106
27.8 1.7 87
28.5 1.7 335
28.3 1.5 737
28.1 1.6 1091
28.2 1.7 972
28.1 1.6 982
28.0 1.5 1143
28.1 1.5 928
27.4 1.1 105
27.6 1.2 129
28.4 1.7 72
28.3 1.8 17
28.0 1.2 29
28.1 1.6 30
27.7 1.4 63
28.2 1.3 90
27.7 1.5 306
28.0 1.3 711
28.0 1.7 413
27.1 0.9 129
26.9 0.8 135
27.6 1.2 80
27.6 1.4 108
27.5 1.8 32
28.6 1.2 14
27.9 1.0 59
27.8 1.6 32
27.8 1.3 274
27.8 1.5 328
28.1 1.0 31
28.2 0.9 24
26.2 1.5 486
26.2 0.8 434
26.4 1.1 192
26.5 1.1 66
27.1 1.2 54
27.7 1.5 14
27.0 1.1 58
27.0 1.2 415
27.5 1.4 230
27.4 1.5 237
27.0 1.4 37
27.4 1.2 78
27.2 1.2 38
26.5 1.3 126
26.3 1.1 699
25.2 0.9 246
26.0 1.3 62
26.1 0.6 499
25.6 1.3 207
25.9 1.5 253
26.2 1.5 190
25.9 1.4 50
26.2 1.2 61
26.3 1.1 82
26.2 1.3 93

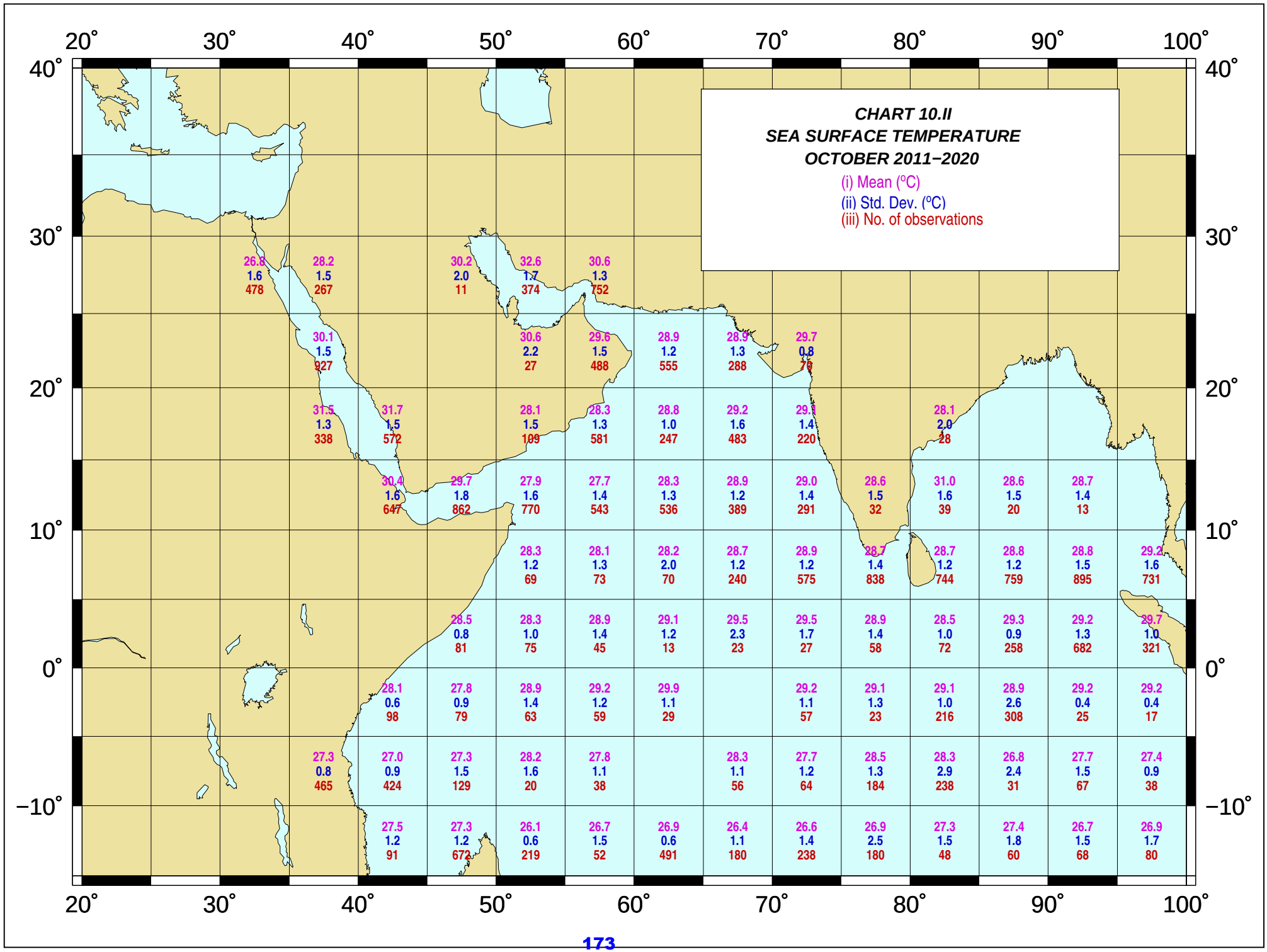


CHART 10.II
SEA SURFACE TEMPERATURE
OCTOBER 2011−2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
26.8 1.6 478
28.2 1.5 267
30.2 2.0 11
32.6 1.7 374
30.6 1.3 752
30.1 1.5 927
30.6 2.2 27
29.6 1.5 488
28.9 1.2 555
28.9 1.3 288
29.7 0.8 76
31.5 1.3 338
31.7 1.5 572
28.1 1.5 109
28.3 1.3 581
28.8 1.0 247
29.2 1.6 483
29.1 1.4 220
28.1 2.0 28
30.4 1.6 647
29.7 1.8 862
27.9 1.6 770
27.7 1.4 543
28.3 1.3 536
28.9 1.2 389
29.0 1.4 291
28.6 1.5 32
31.0 1.6 39
28.6 1.5 20
28.7 1.4 13
28.3 1.2 69
28.1 1.3 73
28.2 2.0 70
28.7 1.2 240
28.9 1.2 575
28.7 1.4 838
28.7 1.2 744
28.8 1.2 759
28.8 1.5 895
29.2 1.6 731
28.5 0.8 81
28.3 1.0 75
28.9 1.4 45
29.1 1.2 13
29.5 2.3 23
29.5 1.7 27
28.9 1.4 58
28.5 1.0 72
29.3 0.9 258
29.2 1.3 682
29.7 1.0 321
28.1 0.6 98
27.8 0.9 79
28.9 1.4 63
29.2 1.2 59
29.9 1.1 29
29.2 1.1 57
29.1 1.3 23
29.1 1.0 216
28.9 2.6 308
29.2 0.4 25
29.2 0.4 17
27.3 0.8 465
27.0 0.9 424
27.3 1.5 129
28.2 1.6 20
27.8 1.1 38
28.3 1.1 56
27.7 1.2 64
28.5 1.3 184
28.3 2.9 238
26.8 2.4 31
27.7 1.5 67
27.4 0.9 38
27.5 1.2 91
27.3 1.2 672
26.1 0.6 219
26.7 1.5 52
26.9 0.6 491
26.4 1.1 180
26.6 1.4 238
26.9 2.5 180
27.3 1.5 48
27.4 1.8 60
26.7 1.5 68
26.9 1.7 80

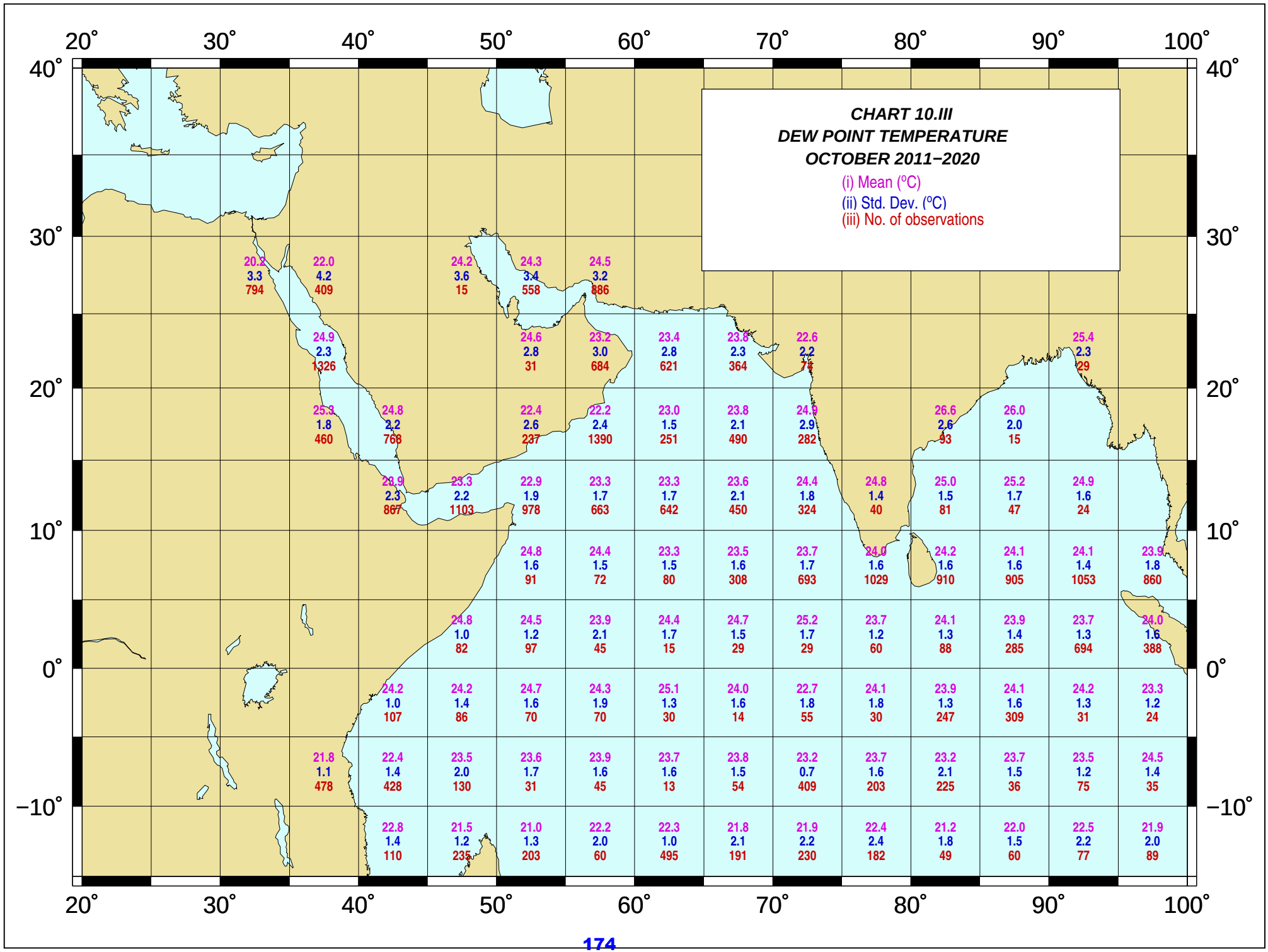


CHART 10.III
DEW POINT TEMPERATURE
OCTOBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
20.2 3.3 794
22.0 4.2 409
24.2 3.6 15
24.3 3.4 558
24.5 3.2 886
24.9 2.3 1326
24.6 2.8 31
23.2 3.0 684
23.4 2.8 621
23.8 2.3 364
22.6 2.2
25.4 2.3 29
25.3 1.8 460
24.8 2.2 768
22.4 2.6 237
22.2 2.4 1390
23.0 1.5 251
23.8 2.1 490
24.9 2.9 282
26.6 2.6 93
26.0 2.0 15
23.9 2.3 867
23.3 2.2 1103
22.9 1.9 978
23.3 1.7 663
23.3 1.7 642
23.6 2.1 450
24.4 1.8 324
24.8 1.4 40
25.0 1.5 81
25.2 1.7 47
24.9 1.6 24
24.8 1.6 91
24.4 1.5 72
23.3 1.5 80
23.5 1.6 308
23.7 1.7 693
24.0 1.6 1029
24.2 1.6 910
24.1 1.6 905
24.1 1.4 1053
23.9 1.8 860
24.8 1.0 82
24.5 1.2 97
23.9 2.1 45
24.4 1.7 15
24.7 1.5 29
25.2 1.7 29
23.7 1.2 60
24.1 1.3 88
23.9 1.4 285
23.7 1.3 694
24.0 1.6 388
24.2 1.0 107
24.2 1.4 86
24.7 1.6 70
24.3 1.9 70
25.1 1.3 30
24.0 1.6 14
22.7 1.8 55
24.1 1.8 30
23.9 1.3 247
24.1 1.6 309
24.2 1.3 31
23.3 1.2 24
21.8 1.1 478
22.4 1.4 428
23.5 2.0 130
23.6 1.7 31
23.9 1.6 45
23.7 1.6 13
23.8 1.5 54
23.2 0.7 409
23.7 1.6 203
23.2 2.1 225
23.7 1.5 36
23.5 1.2 75
24.5 1.4 35
22.8 1.4 110
21.5 1.2 235
21.0 1.3 203
22.2 2.0 60
22.3 1.0 495
21.8 2.1 191
21.9 2.2 230
22.4 2.4 182
21.2 1.8 49
22.0 1.5 60
22.5 2.2 77
21.9 2.0 89

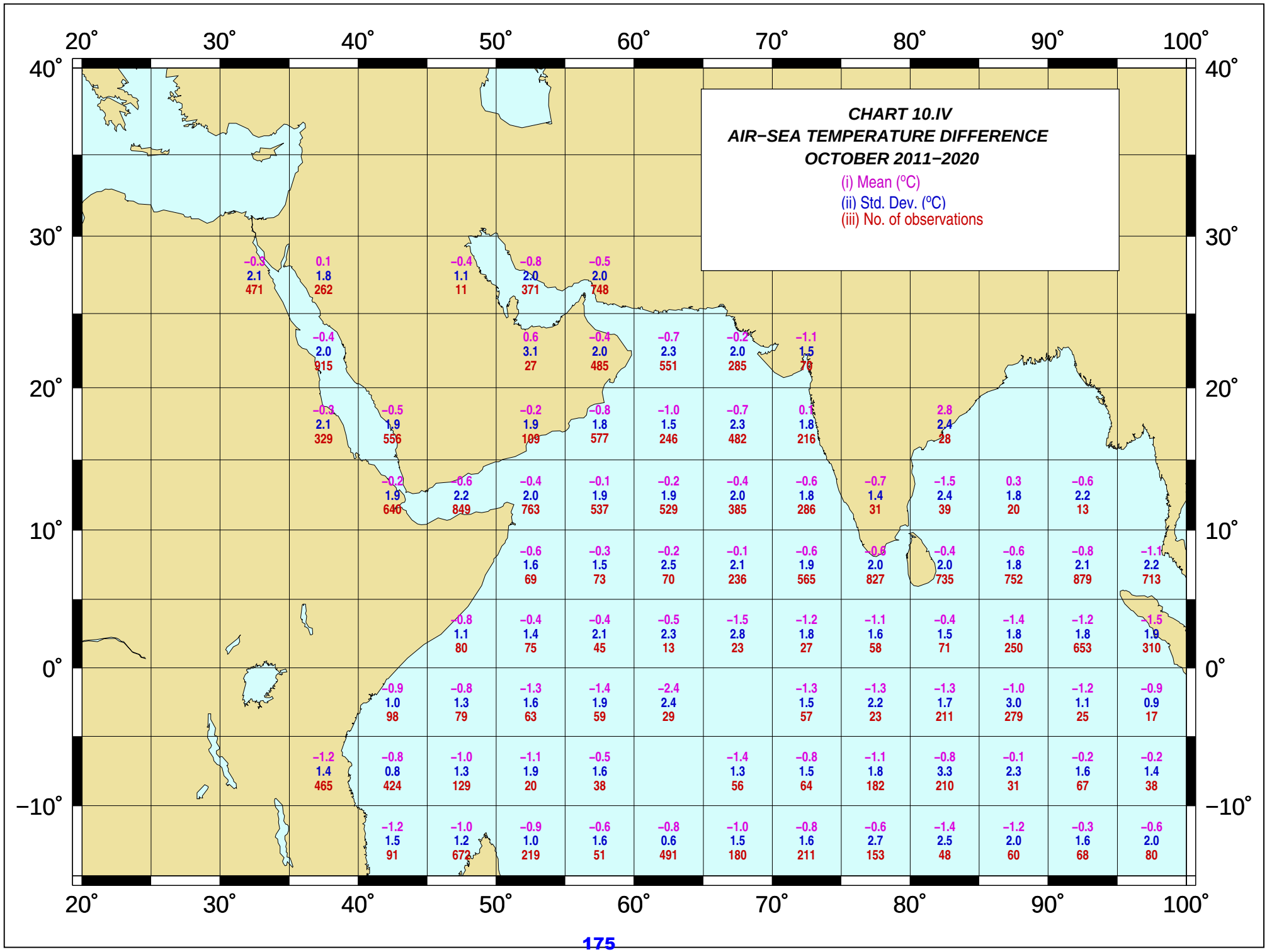


CHART 10.IV
AIR–SEA TEMPERATURE DIFFERENCE
OCTOBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
−0.3 2.1 471
0.1 1.8 262
−0.4 1.1 11
−0.8 2.0 371
−0.5 2.0 748
−0.4 2.0 915
0.6 3.1 27
−0.4 2.0 485
−0.7 2.3 551
−0.2 2.0 285
−1.1 1.5 76
−0.3 2.1 329
−0.5 1.9 556
−0.2 1.9 109
−0.8 1.8 577
−1.0 1.5 246
−0.7 2.3 482
0.1 1.8 216
2.8 2.4 28
−0.2 1.9 640
−0.6 2.2 849
−0.4 2.0 763
−0.1 1.9 537
−0.2 1.9 529
−0.4 2.0 385
−0.6 1.8 286
−0.7 1.4 31
−1.5 2.4 39
0.3 1.8 20
−0.6 2.2 13
−0.6 1.6 69
−0.3 1.5 73
−0.2 2.5 70
−0.1 2.1 236
−0.6 1.9 565
−0.6 2.0 827
−0.4 2.0 735
−0.6 1.8 752
−0.8 2.1 879
−1.1 2.2 713
−0.8 1.1 80
−0.4 1.4 75
−0.4 2.1 45
−0.5 2.3 13
−1.5 2.8 23
−1.2 1.8 27
−1.1 1.6 58
−0.4 1.5 71
−1.4 1.8 250
−1.2 1.8 653
−1.5 1.9 310
−0.9 1.0 98
−0.8 1.3 79
−1.3 1.6 63
−1.4 1.9 59
−2.4 2.4 29
−1.3 1.5 57
−1.3 2.2 23
−1.3 1.7 211
−1.0 3.0 279
−1.2 1.1 25
−0.9 0.9 17
−1.2 1.4 465
−0.8 0.8 424
−1.0 1.3 129
−1.1 1.9 20
−0.5 1.6 38
−1.4 1.3 56
−0.8 1.5 64
−1.1 1.8 182
−0.8 3.3 210
−0.1 2.3 31
−0.2 1.6 67
−0.2 1.4 38
−1.2 1.5 91
−1.0 1.2 672
−0.9 1.0 219
−0.6 1.6 51
−0.8 0.6 491
−1.0 1.5 180
−0.8 1.6 211
−0.6 2.7 153
−1.4 2.5 48
−1.2 2.0 60
−0.3 1.6 68
−0.6 2.0 80

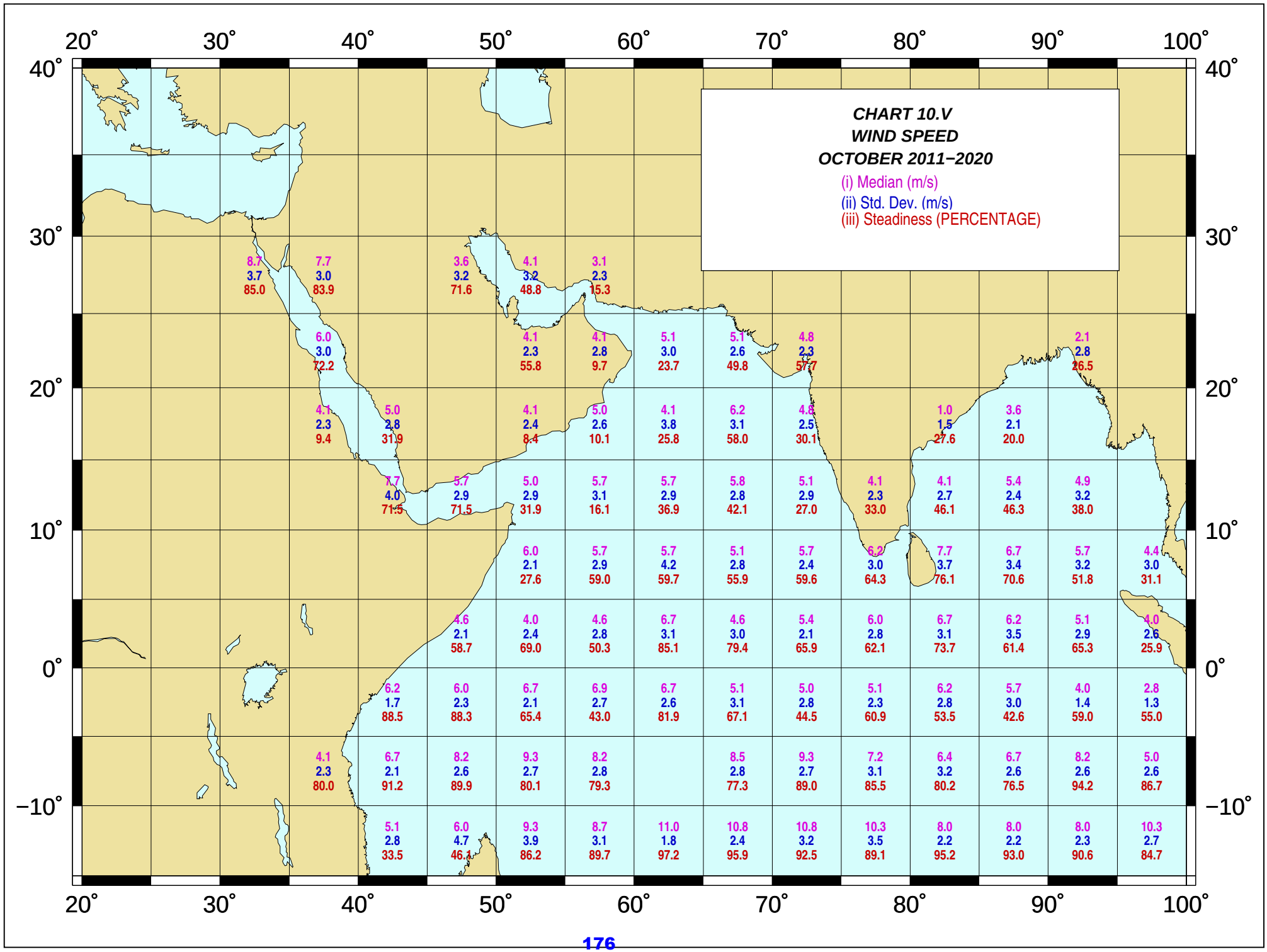


CHART 10.V
WIND SPEED
OCTOBER 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
8.7 3.7 85.0
7.7 3.0 83.9
3.6 3.2 71.6
4.1 3.2 48.8
3.1 2.3 15.3
6.0 3.0 72.2
4.1 2.3 55.8
4.1 2.8 9.7
5.1 3.0 23.7
5.1 2.6 49.8
4.8 2.3 57.7
2.1 2.8 26.5
4.1 2.3 9.4
5.0 2.8 31.9
4.1 2.4 8.4
5.0 2.6 10.1
4.1 3.8 25.8
6.2 3.1 58.0
4.8 2.5 30.1
1.0 1.5 27.6
3.6 2.1 20.0
7.7 4.0 71.5
5.7 2.9 71.5
5.0 2.9 31.9
5.7 3.1 16.1
5.7 2.9 36.9
5.8 2.8 42.1
5.1 2.9 27.0
4.1 2.3 33.0
4.1 2.7 46.1
5.4 2.4 46.3
4.9 3.2 38.0
6.0 2.1 27.6
5.7 2.9 59.0
5.7 4.2 59.7
5.1 2.8 55.9
5.7 2.4 59.6
6.2 3.0 64.3
7.7 3.7 76.1
6.7 3.4 70.6
5.7 3.2 51.8
4.4 3.0 31.1
4.6 2.1 58.7
4.0 2.4 69.0
4.6 2.8 50.3
6.7 3.1 85.1
4.6 3.0 79.4
5.4 2.1 65.9
6.0 2.8 62.1
6.7 3.1 73.7
6.2 3.5 61.4
5.1 2.9 65.3
4.0 2.6 25.9
6.2 1.7 88.5
6.0 2.3 88.3
6.7 2.1 65.4
6.9 2.7 43.0
6.7 2.6 81.9
5.1 3.1 67.1
5.0 2.8 44.5
5.1 2.3 60.9
6.2 2.8 53.5
5.7 3.0 42.6
4.0 1.4 59.0
2.8 1.3 55.0
4.1 2.3 80.0
6.7 2.1 91.2
8.2 2.6 89.9
9.3 2.7 80.1
8.2 2.8 79.3
8.5 2.8 77.3
9.3 2.7 89.0
7.2 3.1 85.5
6.4 3.2 80.2
6.7 2.6 76.5
8.2 2.6 94.2
5.0 2.6 86.7
5.1 2.8 33.5
6.0 4.7 46.1
9.3 3.9 86.2
8.7 3.1 89.7
11.0 1.8 97.2
10.8 2.4 95.9
10.8 3.2 92.5
10.3 3.5 89.1
8.0 2.2 95.2
8.0 2.2 93.0
8.0 2.3 90.6
10.3 2.7 84.7

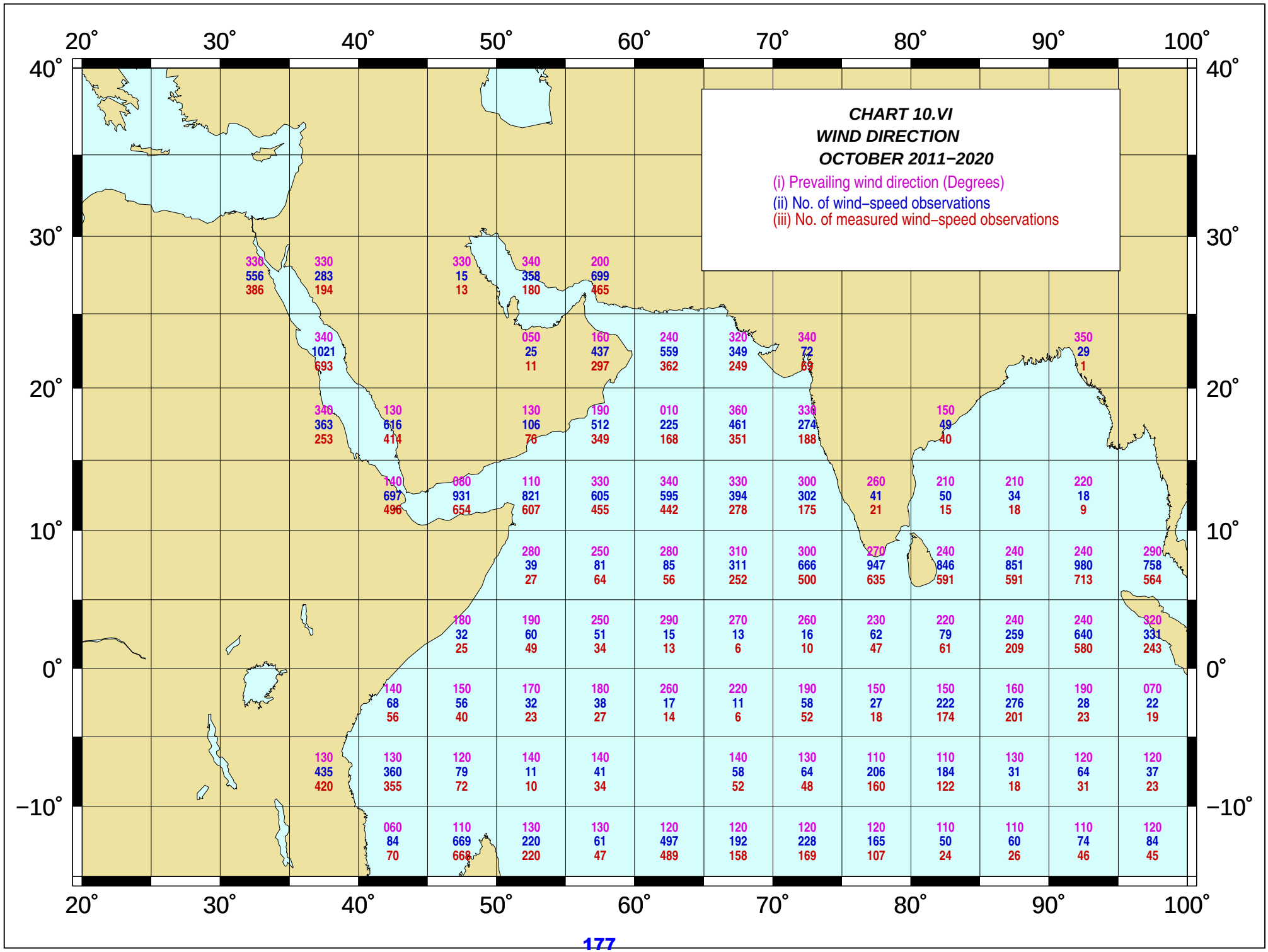


CHART 10.VI
WIND DIRECTION
OCTOBER 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
330 556 386
330 283 194
330 15 13
340 358 180
200 699 465
340 1021 693
050 25 11
160 437 297
240 559 362
320 349 249
340 72 69
350 29 1
340 363 253
130 616 414
130 106 76
190 512 349
010 225 168
360 461 351
330 274 188
150 49 40
140 697 496
080 931 654
110 821 607
330 605 455
340 595 442
330 394 278
300 302 175
260 41 21
210 50 15
210 34 18
220 18 9
280 39 27
250 81 64
280 85 56
310 311 252
300 666 500
270 947 635
240 846 591
240 851 591
240 980 713
290 758 564
180 32 25
190 60 49
250 51 34
290 15 13
270 13 6
260 16 10
230 62 47
220 79 61
240 259 209
240 640 580
320 331 243
140 68 56
150 56 40
170 32 23
180 38 27
260 17 14
220 11 6
190 58 52
150 27 18
150 222 174
160 276 201
190 28 23
070 22 19
130 435 420
130 360 355
120 79 72
140 11 10
140 41 34
140 58 52
130 64 48
110 206 160
110 184 122
130 31 18
120 64 31
120 37 23
060 84 70
110 669 668
130 220 220
130 61 47
120 497 489
120 192 158
120 228 169
120 165 107
110 50 24
110 60 26
110 74 46
120 84 45

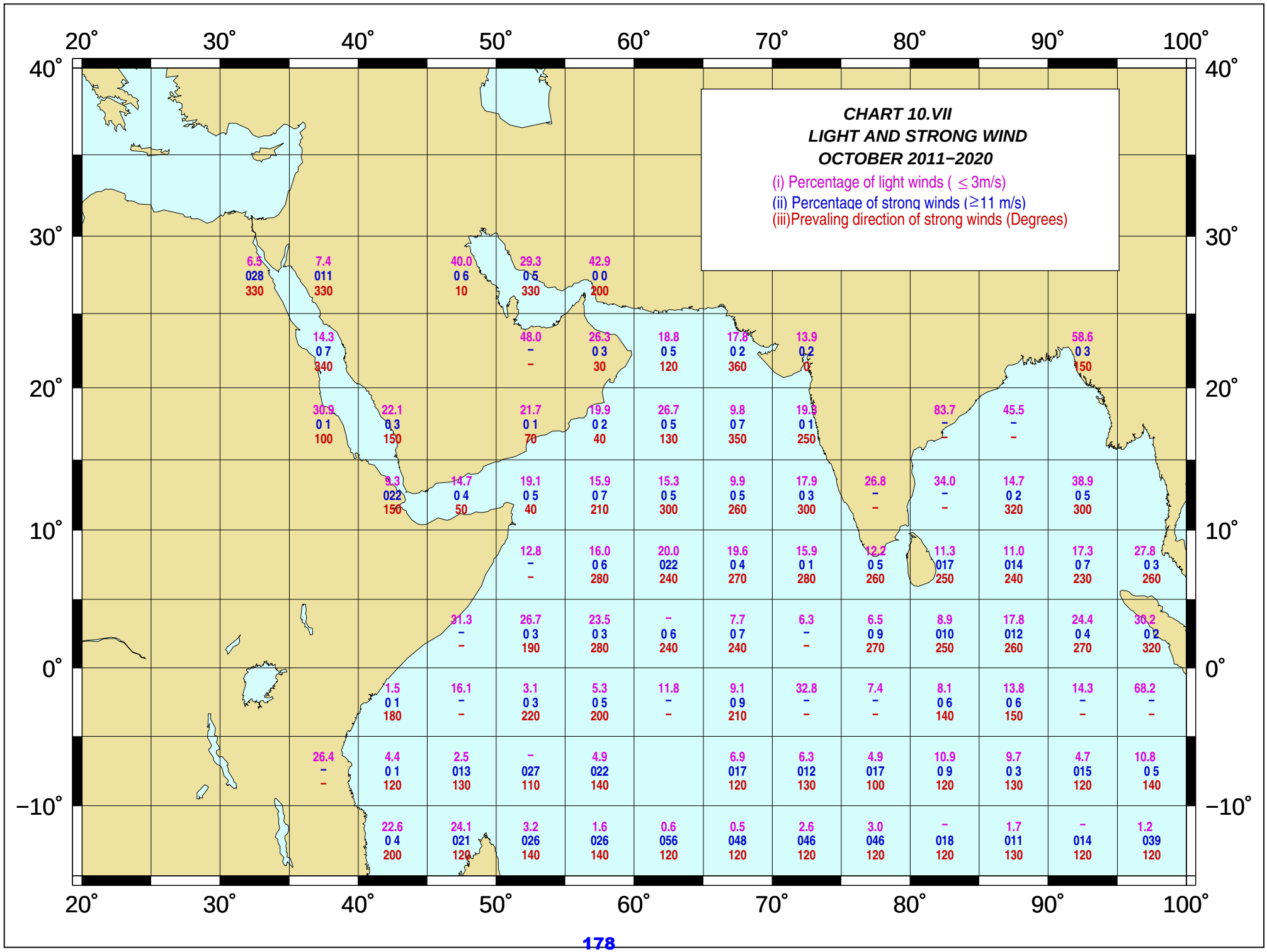


CHART 10.VII
LIGHT AND STRONG WIND
OCTOBER 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
6.5 028 330
7.4 011 330
40.0 06 10
29.3 05 330
42.9 00 200
14.3 07 340
48.0 – –
26.3 03 30
18.8 05 120
17.8 02 360
13.9 02 0
58.6 03 150
30.9 01 100
22.1 03 150
21.7 01 70
19.9 02 40
26.7 05 130
9.8 07 350
19.3 01 250
83.7 – –
45.5 – –
9.3 022 150
14.7 04 50
19.1 05 40
15.9 07 210
15.3 05 300
9.9 05 260
17.9 03 300
26.8 – –
34.0 – –
14.7 02 320
38.9 05 300
12.8 – –
16.0 06 280
20.0 022 240
19.6 04 270
15.9 01 280
12.2 05 260
11.3 017 250
11.0 014 240
17.3 07 230
27.8 03 260
31.3 – –
26.7 03 190
23.5 03 280
– 06 240
7.7 07 240
6.3 – –
6.5 09 270
8.9 010 250
17.8 012 260
24.4 04 270
30.2 02 320
1.5 01 180
16.1 – –
3.1 03 220
5.3 05 200
11.8 – –
9.1 09 210
32.8 – –
7.4 – –
8.1 06 140
13.8 06 150
14.3 – –
68.2 – –
26.4 – –
4.4 01 120
2.5 013 130
– 027 110
4.9 022 140
6.9 017 120
6.3 012 130
4.9 017 100
10.9 09 120
9.7 03 130
4.7 015 120
10.8 05 140
22.6 04 200
24.1 021 120
3.2 026 140
1.6 026 140
0.6 056 120
0.5 048 120
2.6 046 120
3.0 046 120
– 018 120
1.7 011 130
– 014 120
1.2 039 120

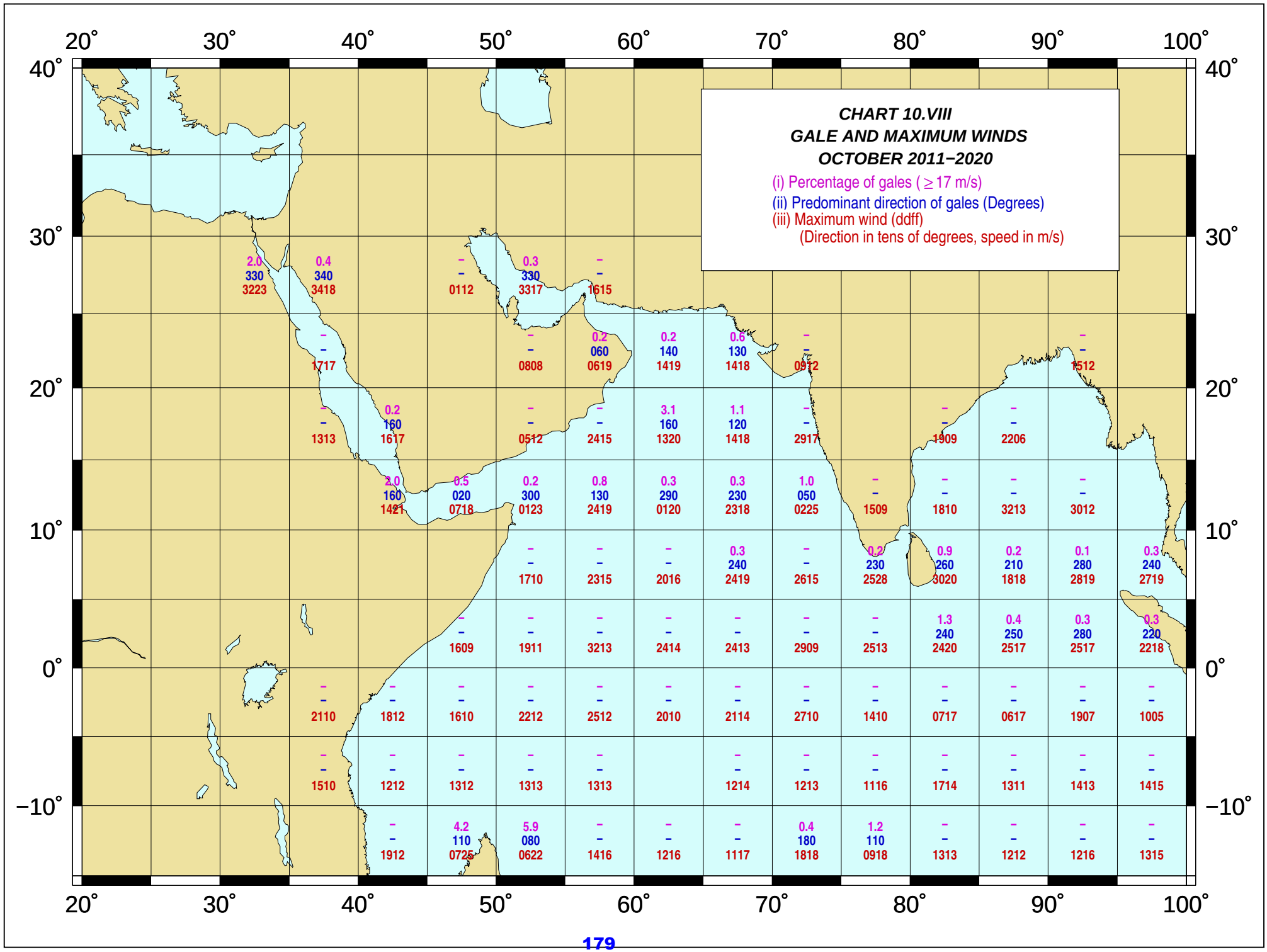


CHART 10.VIII
GALE AND MAXIMUM WINDS
OCTOBER 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.0 330 3223
0.4 340 3418
– – 0112
0.3 330 3317
– – 1615
– – 1717
– – 0808
0.2 060 0619
0.2 140 1419
0.6 130 1418
– – 0912
– – 1512
– – 1313
0.2 160 1617
– – 0512
– – 2415
3.1 160 1320
1.1 120 1418
– – 2917
– – 1909
– – 2206
2.0 160 1421
0.5 020 0718
0.2 300 0123
0.8 130 2419
0.3 290 0120
0.3 230 2318
1.0 050 0225
– – 1509
– – 1810
– – 3213
– – 3012
– – 1710
– – 2315
– – 2016
0.3 240 2419
– – 2615
0.2 230 2528
0.9 260 3020
0.2 210 1818
0.1 280 2819
0.3 240 2719
– – 1609
– – 1911
– – 3213
– – 2414
– – 2413
– – 2909
– – 2513
1.3 240 2420
0.4 250 2517
0.3 280 2517
0.3 220 2218
– – 2110
– – 1812
– – 1610
– – 2212
– – 2512
– – 2010
– – 2114
– – 2710
– – 1410
– – 0717
– – 0617
– – 1907
– – 1005
– – 1510
– – 1212
– – 1312
– – 1313
– – 1313
– – 1214
– – 1213
– – 1116
– – 1714
– – 1311
– – 1413
– – 1415
– – 1912
4.2 110 0725
5.9 080 0622
– – 1416
– – 1216
– – 1117
0.4 180 1818
1.2 110 0918
– – 1313
– – 1212
– – 1216
– – 1315

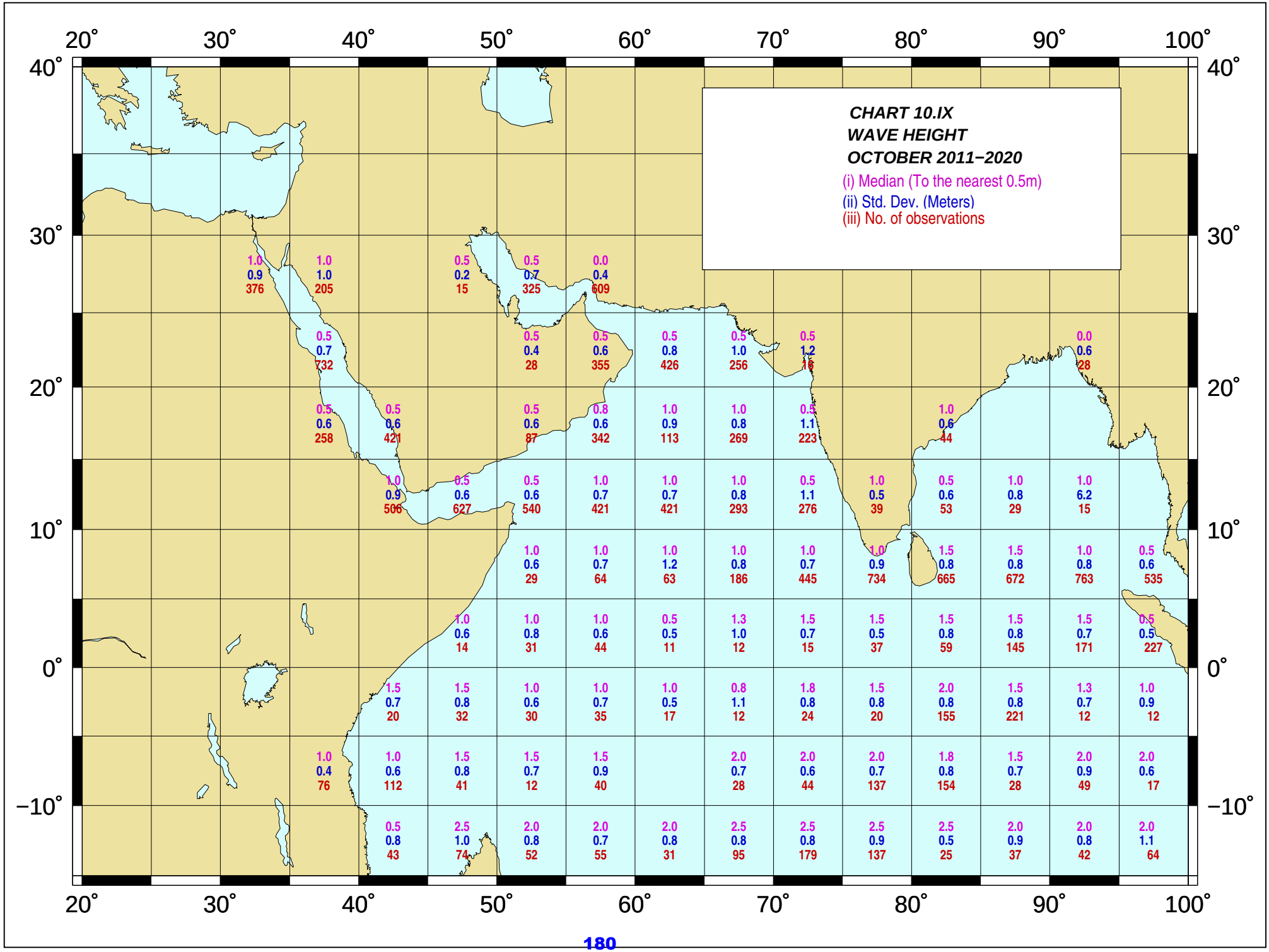


CHART 10.IX
WAVE HEIGHT
OCTOBER 2011–2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.0 0.9 376
1.0 1.0 205
0.5 0.2 15
0.5 0.7 325
0.0 0.4 609
0.5 0.7 732
0.5 0.4 28
0.5 0.6 355
0.5 0.8 426
0.5 1.0 256
0.5 1.2 16
0.0 0.6 28
0.5 0.6 258
0.5 0.6 421
0.5 0.6 87
0.8 0.6 342
1.0 0.9 113
1.0 0.8 269
0.5 1.1 223
1.0 0.6 44
1.0 0.9 506
0.5 0.6 627
0.5 0.6 540
1.0 0.7 421
1.0 0.7 421
1.0 0.8 293
0.5 1.1 276
1.0 0.5 39
0.5 0.6 53
1.0 0.8 29
1.0 6.2 15
1.0 0.6 29
1.0 0.7 64
1.0 1.2 63
1.0 0.8 186
1.0 0.7 445
1.0 0.9 734
1.5 0.8 665
1.5 0.8 672
1.0 0.8 763
0.5 0.6 535
1.0 0.6 14
1.0 0.8 31
1.0 0.6 44
0.5 0.5 11
1.3 1.0 12
1.5 0.7 15
1.5 0.5 37
1.5 0.8 59
1.5 0.8 145
1.5 0.7 171
0.5 0.5 227
1.5 0.7 20
1.5 0.8 32
1.0 0.6 30
1.0 0.7 35
1.0 0.5 17
0.8 1.1 12
1.8 0.8 24
1.5 0.8 20
2.0 0.8 155
1.5 0.8 221
1.3 0.7 12
1.0 0.9 12
1.0 0.4 76
1.0 0.6 112
1.5 0.8 41
1.5 0.7 12
1.5 0.9 40
2.0 0.7 28
2.0 0.6 44
2.0 0.7 137
1.8 0.8 154
1.5 0.7 28
2.0 0.9 49
2.0 0.6 17
0.5 0.8 43
2.5 1.0 74
2.0 0.8 52
2.0 0.7 55
2.0 0.8 31
2.5 0.8 95
2.5 0.8 179
2.5 0.9 137
2.5 0.5 25
2.0 0.9 37
2.0 0.8 42
2.0 1.1 64

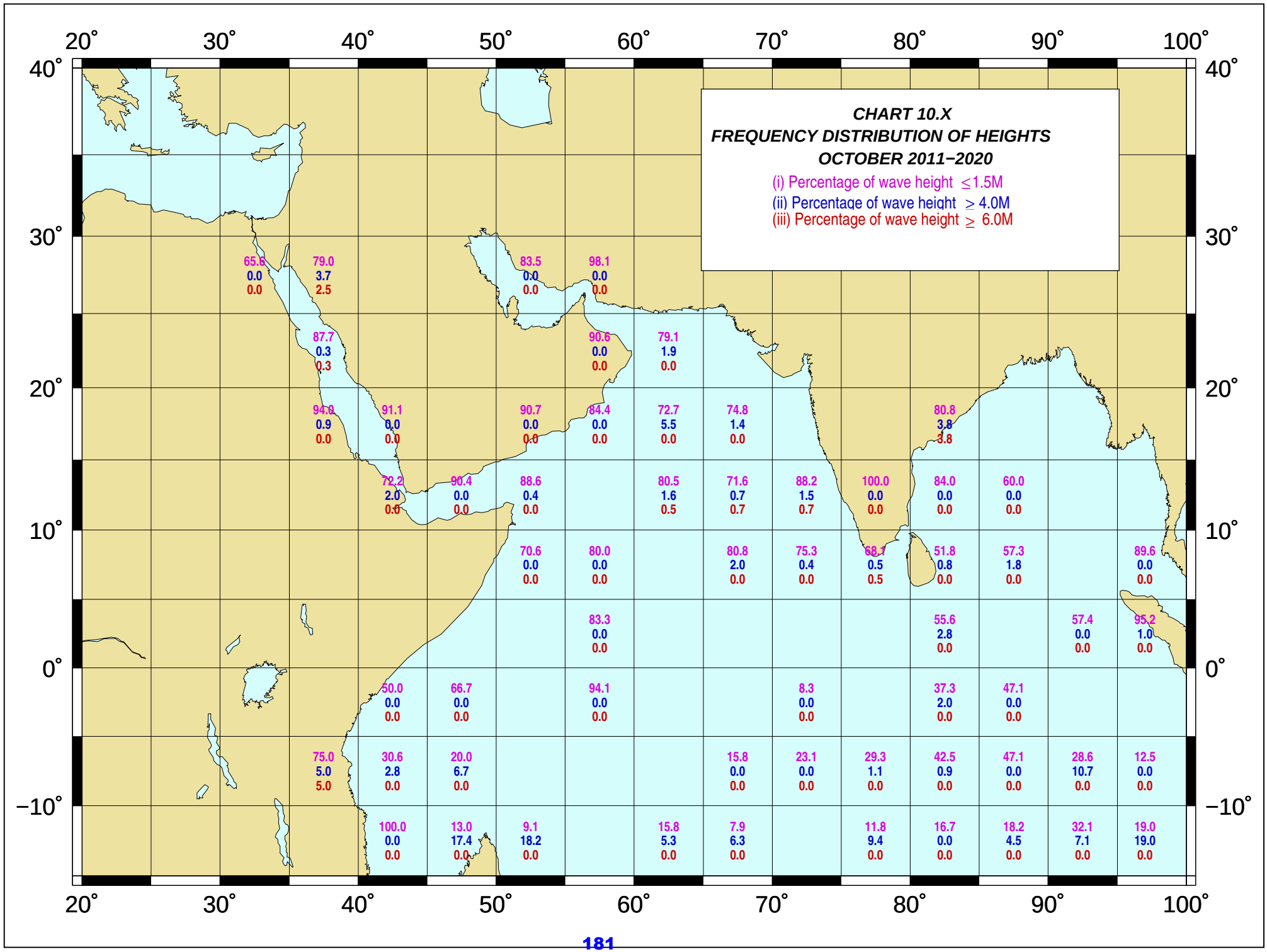


CHART 10.X
FREQUENCY DISTRIBUTION OF HEIGHTS
OCTOBER 2011–2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
65.6 0.0 0.0
79.0 3.7 2.5
83.5 0.0 0.0
98.1 0.0 0.0
87.7 0.3 0.3
90.6 0.0 0.0
79.1 1.9 0.0
94.9 0.9 0.0
91.1 0.0 0.0
90.7 0.0 0.0
84.4 0.0 0.0
72.7 5.5 0.0
74.8 1.4 0.0
80.8 3.8 3.8
72.2 2.0 0.0
90.4 0.0 0.0
88.6 0.4 0.0
80.5 1.6 0.5
71.6 0.7 0.7
88.2 1.5 0.7
100.0 0.0 0.0
84.0 0.0 0.0
60.0 0.0 0.0
70.6 0.0 0.0
80.0 0.0 0.0
80.8 2.0 0.0
75.3 0.4 0.0
68.1 0.5 0.5
51.8 0.8 0.0
57.3 1.8 0.0
89.6 0.0 0.0
83.3 0.0 0.0
55.6 2.8 0.0
57.4 0.0 0.0
95.2 1.0 0.0
50.0 0.0 0.0
66.7 0.0 0.0
94.1 0.0 0.0
8.3 0.0 0.0
37.3 2.0 0.0
47.1 0.0 0.0
75.0 5.0 5.0
30.6 2.8 0.0
20.0 6.7 0.0
15.8 0.0 0.0
23.1 0.0 0.0
29.3 1.1 0.0
42.5 0.9 0.0
47.1 0.0 0.0
28.6 10.7 0.0
12.5 0.0 0.0
100.0 0.0 0.0
13.0 17.4 0.0
9.1 18.2 0.0
15.8 5.3 0.0
7.9 6.3 0.0
11.8 9.4 0.0
16.7 0.0 0.0
18.2 4.5 0.0
32.1 7.1 0.0
19.0 19.0 0.0

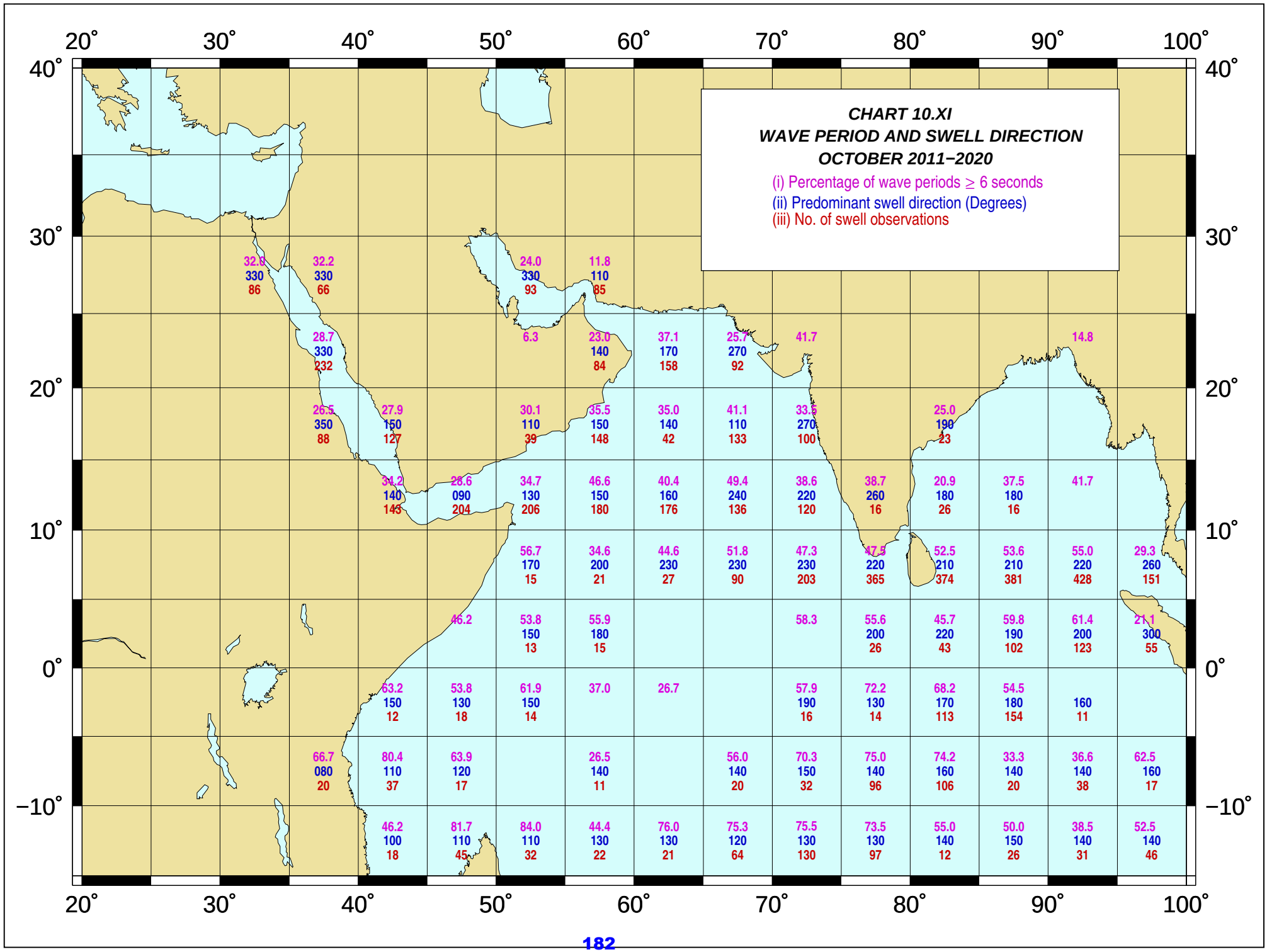


CHART 10.XI
WAVE PERIOD AND SWELL DIRECTION
OCTOBER 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
32.8 330 86
32.2 330 66
24.0 330 93
11.8 110 85
28.7 330 232
6.3
23.0 140 84
37.1 170 158
25.7 270 92
41.7
14.8
26.5 350 88
27.9 150 127
30.1 110 39
35.5 150 148
35.0 140 42
41.1 110 133
33.5 270 100
25.0 190 23
31.2 140 143
28.6 090 204
34.7 130 206
46.6 150 180
40.4 160 176
49.4 240 136
38.6 220 120
38.7 260 16
20.9 180 26
37.5 180 16
41.7
56.7 170 15
34.6 200 21
44.6 230 27
51.8 230 90
47.3 230 203
47.5 220 365
52.5 210 374
53.6 210 381
55.0 220 428
29.3 260 151
46.2
53.8 150 13
55.9 180 15
58.3
55.6 200 26
45.7 220 43
59.8 190 102
61.4 200 123
21.1 300 55
63.2 150 12
53.8 130 18
61.9 150 14
37.0
26.7
57.9 190 16
72.2 130 14
68.2 170 113
54.5 180 154
160 11
66.7 080 20
80.4 110 37
63.9 120 17
26.5 140 11
56.0 140 20
70.3 150 32
75.0 140 96
74.2 160 106
33.3 140 20
36.6 140 38
62.5 160 17
46.2 100 18
81.7 110 45
84.0 110 32
44.4 130 22
76.0 130 21
75.3 120 64
75.5 130 130
73.5 130 97
55.0 140 12
50.0 150 26
38.5 140 31
52.5 140 46

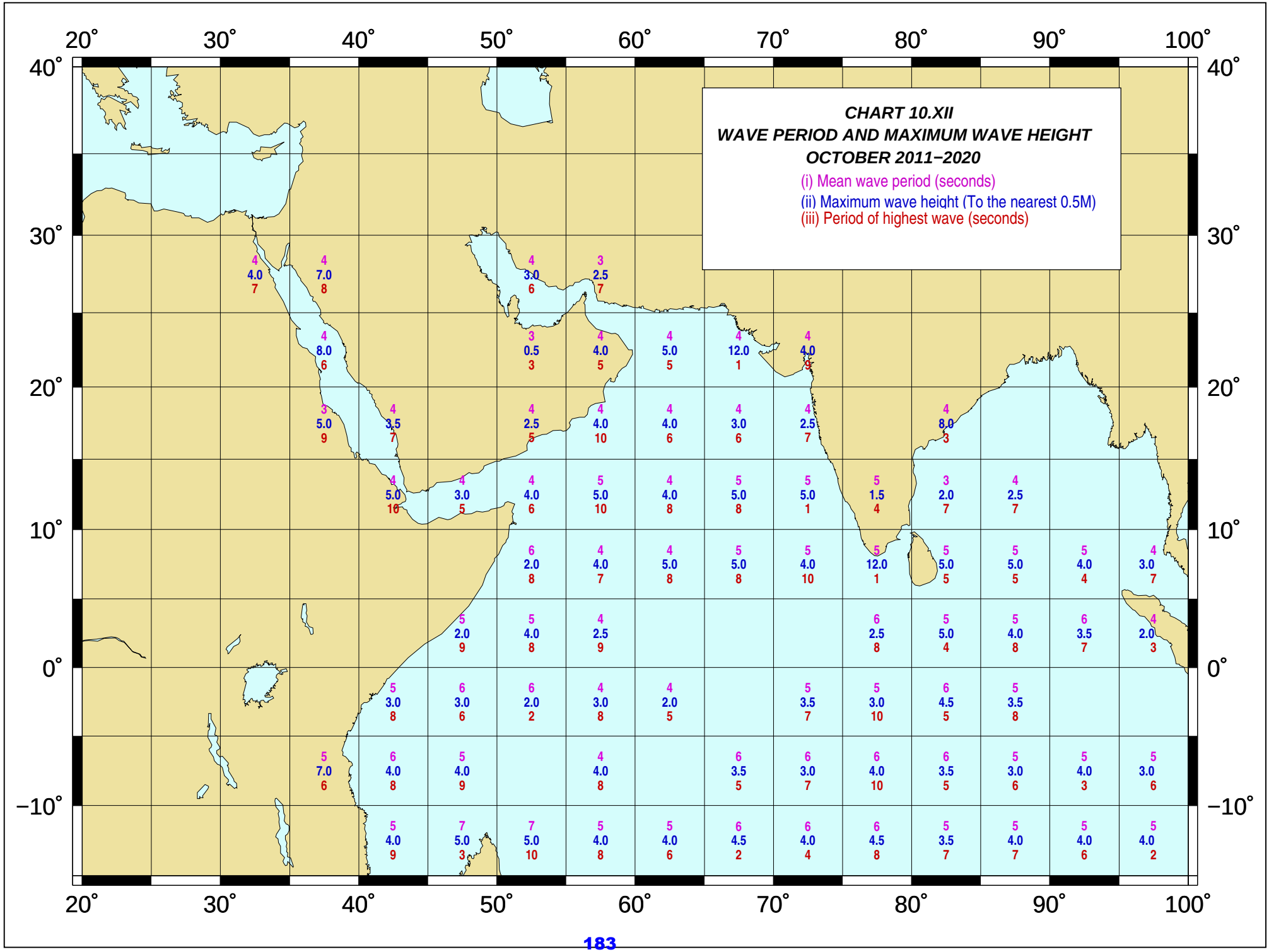


CHART 10.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
OCTOBER 2011–2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°

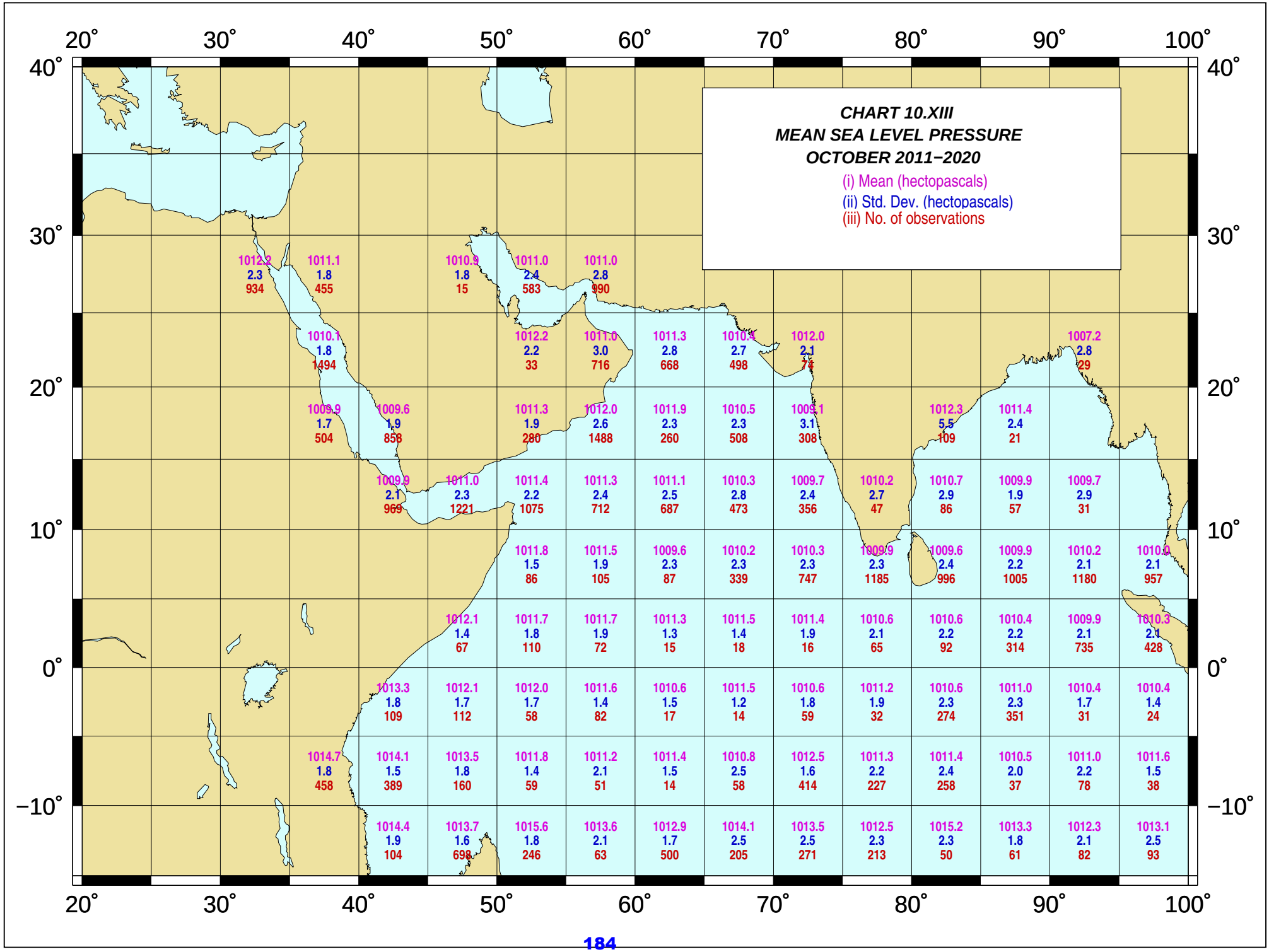


CHART 10.XIII
MEAN SEA LEVEL PRESSURE
OCTOBER 2011–2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1012.2 2.3 934
1011.1 1.8 455
1010.9 1.8 15
1011.0 2.4 583
1011.0 2.8 990
1010.1 1.8 1494
1012.2 2.2 33
1011.0 3.0 716
1011.3 2.8 668
1010.4 2.7 498
1012.0 2.1 74
1007.2 2.8 29
1009.9 1.7 504
1009.6 1.9 858
1011.3 1.9 280
1012.0 2.6 1488
1011.9 2.3 260
1010.5 2.3 508
1009.1 3.1 308
1012.3 5.5 109
1011.4 2.4 21
1009.9 2.1 969
1011.0 2.3 1221
1011.4 2.2 1075
1011.3 2.4 712
1011.1 2.5 687
1010.3 2.8 473
1009.7 2.4 356
1010.2 2.7 47
1010.7 2.9 86
1009.9 1.9 57
1009.7 2.9 31
1011.8 1.5 86
1011.5 1.9 105
1009.6 2.3 87
1010.2 2.3 339
1010.3 2.3 747
1009.9 2.3 1185
1009.6 2.4 996
1009.9 2.2 1005
1010.2 2.1 1180
1010.0 2.1 957
1012.1 1.4 67
1011.7 1.8 110
1011.7 1.9 72
1011.3 1.3 15
1011.5 1.4 18
1011.4 1.9 16
1010.6 2.1 65
1010.6 2.2 92
1010.4 2.2 314
1009.9 2.1 735
1010.3 2.1 428
1013.3 1.8 109
1012.1 1.7 112
1012.0 1.7 58
1011.6 1.4 82
1010.6 1.5 17
1011.5 1.2 14
1010.6 1.8 59
1011.2 1.9 32
1010.6 2.3 274
1011.0 2.3 351
1010.4 1.7 31
1010.4 1.4 24
1014.7 1.8 458
1014.1 1.5 389
1013.5 1.8 160
1011.8 1.4 59
1011.2 2.1 51
1011.4 1.5 14
1010.8 2.5 58
1012.5 1.6 414
1011.3 2.2 227
1011.4 2.4 258
1010.5 2.0 37
1011.0 2.2 78
1011.6 1.5 38
1014.4 1.9 104
1013.7 1.6 698
1015.6 1.8 246
1013.6 2.1 63
1012.9 1.7 500
1014.1 2.5 205
1013.5 2.5 271
1012.5 2.3 213
1015.2 2.3 50
1013.3 1.8 61
1012.3 2.1 82
1013.1 2.5 93

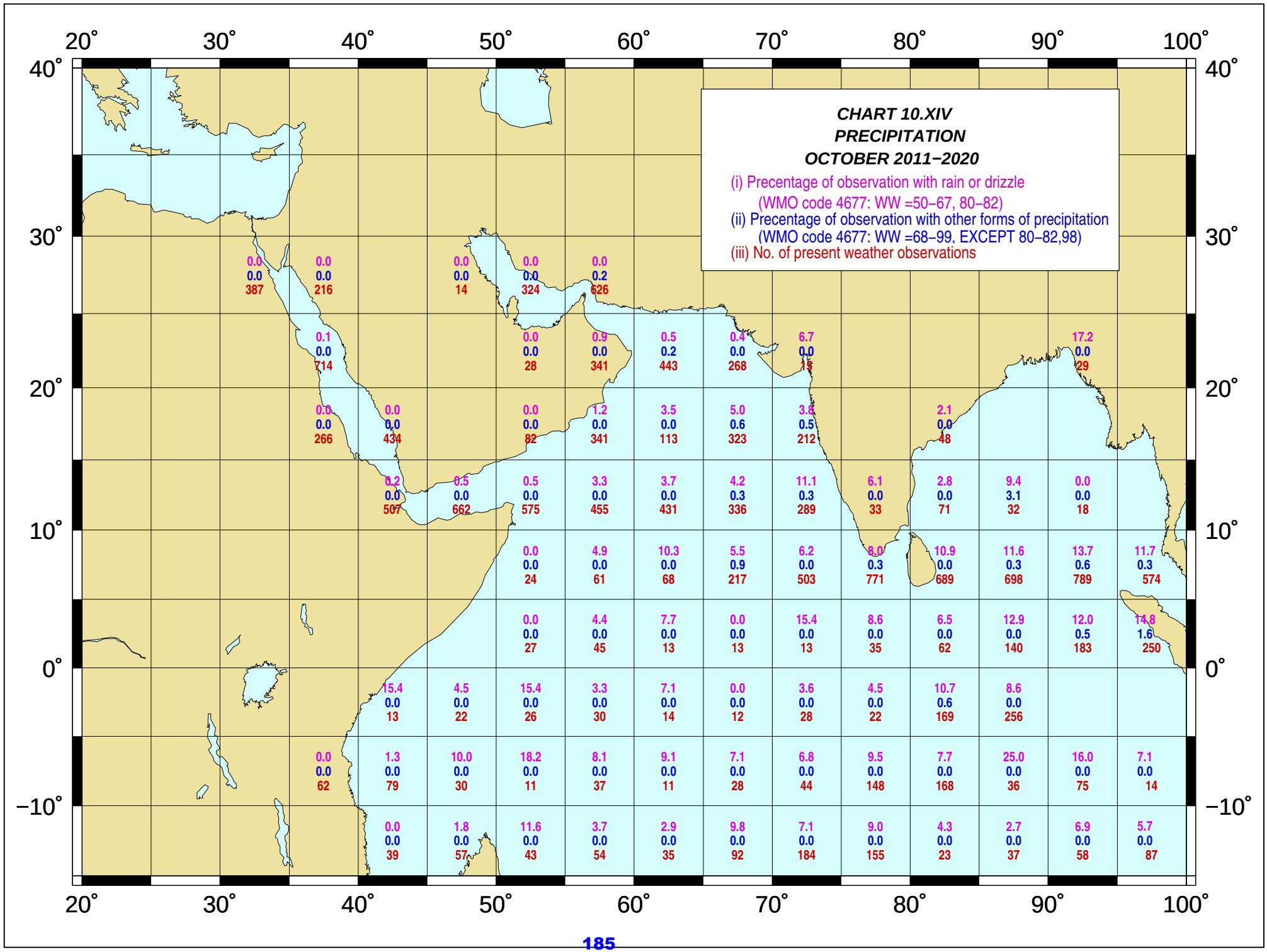


CHART 10.XIV
PRECIPITATION
OCTOBER 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°

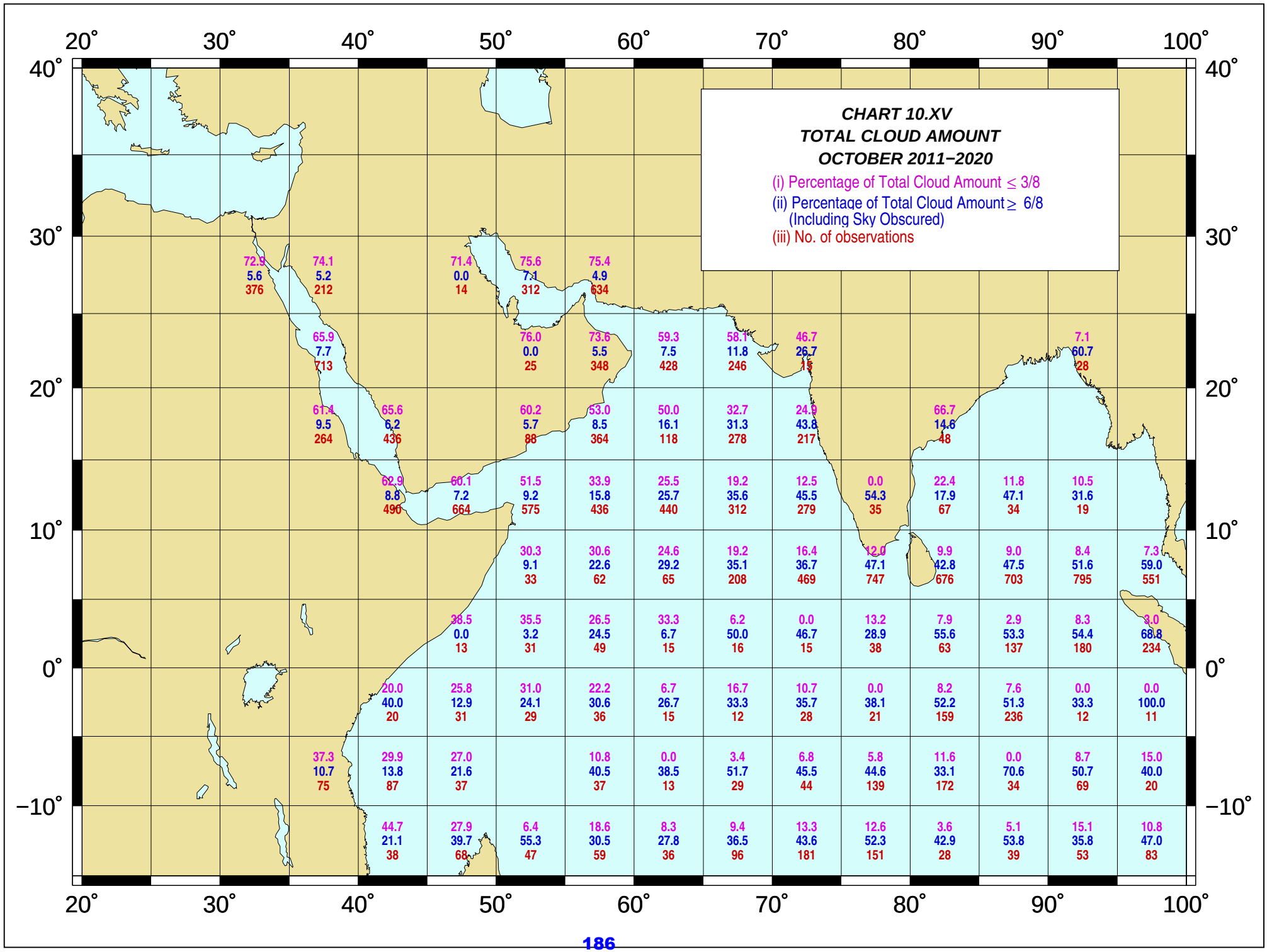


CHART 10.XV
TOTAL CLOUD AMOUNT
OCTOBER 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
72.9 5.6 376
74.1 5.2 212
71.4 0.0 14
75.6 7.1 312
75.4 4.9 634
65.9 7.7 713
76.0 0.0 25
73.6 5.5 348
59.3 7.5 428
58.1 11.8 246
46.7 26.7 15
7.1 60.7 28
61.4 9.5 264
65.6 6.2 436
60.2 5.7 88
53.0 8.5 364
50.0 16.1 118
32.7 31.3 278
24.9 43.8 217
66.7 14.6 48
62.9 8.8 496
60.1 7.2 664
51.5 9.2 575
33.9 15.8 436
25.5 25.7 440
19.2 35.6 312
12.5 45.5 279
0.0 54.3 35
22.4 17.9 67
11.8 47.1 34
10.5 31.6 19
30.3 9.1 33
30.6 22.6 62
24.6 29.2 65
19.2 35.1 208
16.4 36.7 469
12.0 47.1 747
9.9 42.8 676
9.0 47.5 703
8.4 51.6 795
7.3 59.0 551
38.5 0.0 13
35.5 3.2 31
26.5 24.5 49
33.3 6.7 15
6.2 50.0 16
0.0 46.7 15
13.2 28.9 38
7.9 55.6 63
2.9 53.3 137
8.3 54.4 180
3.0 68.8 234
20.0 40.0 20
25.8 12.9 31
31.0 24.1 29
22.2 30.6 36
6.7 26.7 15
16.7 33.3 12
10.7 35.7 28
0.0 38.1 21
8.2 52.2 159
7.6 51.3 236
0.0 33.3 12
0.0 100.0 11
37.3 10.7 75
29.9 13.8 87
27.0 21.6 37
10.8 40.5 37
0.0 38.5 13
3.4 51.7 29
6.8 45.5 44
5.8 44.6 139
11.6 33.1 172
0.0 70.6 34
8.7 50.7 69
15.0 40.0 20
44.7 21.1 38
27.9 39.7 68
6.4 55.3 47
18.6 30.5 59
8.3 27.8 36
9.4 36.5 96
13.3 43.6 181
12.6 52.3 151
3.6 42.9 28
5.1 53.8 39
15.1 35.8 53
10.8 47.0 83

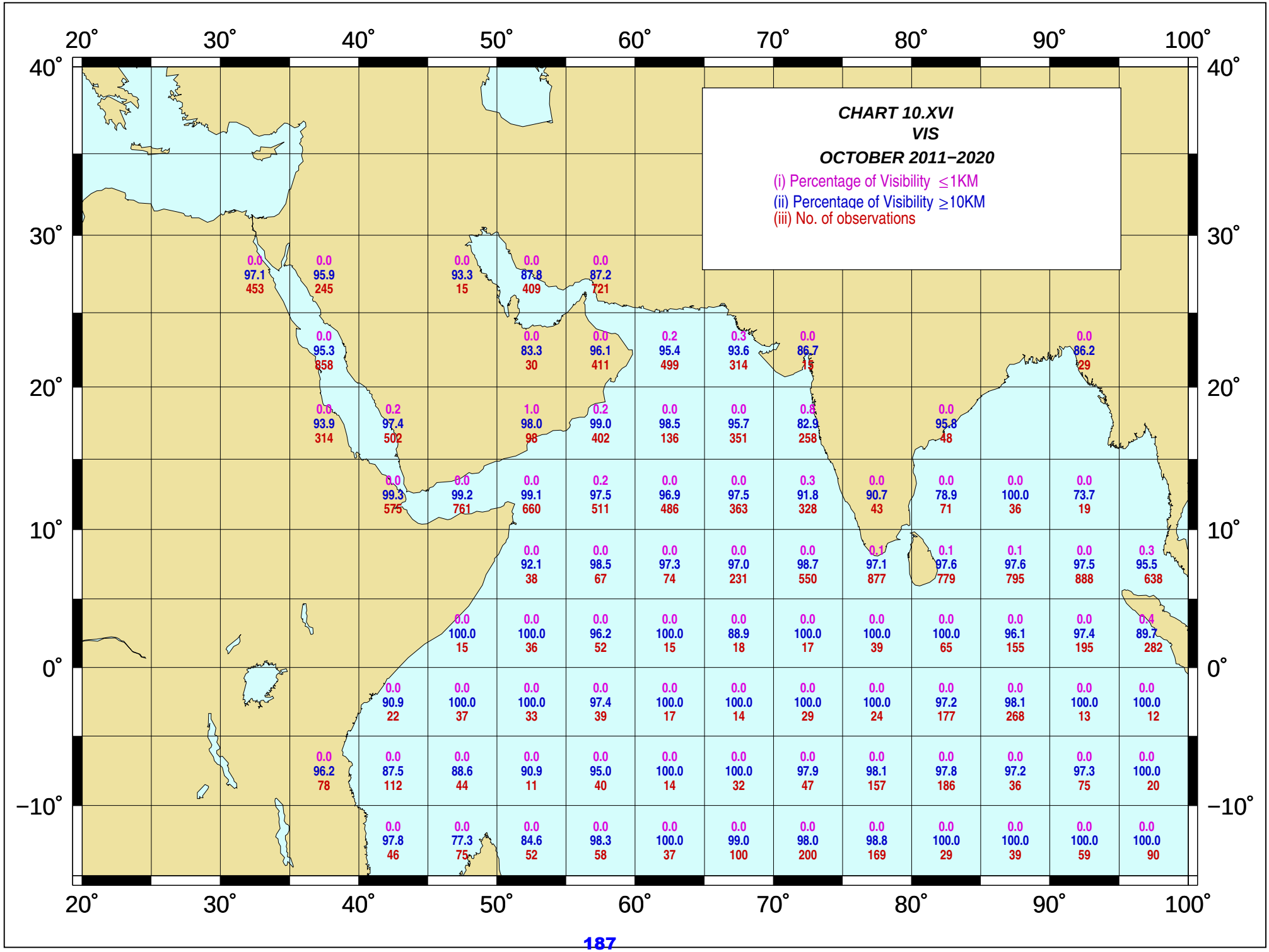


CHART 10.XVI
VIS
OCTOBER 2011–2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 97.1 453
0.0 95.9 245
0.0 93.3 15
0.0 87.8 409
0.0 87.2 721
0.0 95.3 858
0.0 83.3 30
0.0 96.1 411
0.2 95.4 499
0.3 93.6 314
0.0 86.7 15
0.0 86.2 29
0.0 93.9 314
0.2 97.4 502
1.0 98.0 98
0.2 99.0 402
0.0 98.5 136
0.0 95.7 351
0.0 82.9 258
0.0 95.8 48
0.0 99.3 575
0.0 99.2 761
0.0 99.1 660
0.2 97.5 511
0.0 96.9 486
0.0 97.5 363
0.3 91.8 328
0.0 90.7 43
0.0 78.9 71
0.0 100.0 36
0.0 73.7 19
0.0 92.1 38
0.0 98.5 67
0.0 97.3 74
0.0 97.0 231
0.0 98.7 550
0.1 97.1 877
0.1 97.6 779
0.1 97.6 795
0.0 97.5 888
0.3 95.5 638
0.0 100.0 15
0.0 100.0 36
0.0 96.2 52
0.0 100.0 15
0.0 88.9 18
0.0 100.0 17
0.0 100.0 39
0.0 100.0 65
0.0 96.1 155
0.0 97.4 195
0.4 89.7 282
0.0 90.9 22
0.0 100.0 37
0.0 100.0 33
0.0 97.4 39
0.0 100.0 17
0.0 100.0 14
0.0 100.0 29
0.0 100.0 24
0.0 97.2 177
0.0 98.1 268
0.0 100.0 13
0.0 100.0 12
0.0 96.2 78
0.0 87.5 112
0.0 88.6 44
0.0 90.9 11
0.0 95.0 40
0.0 100.0 14
0.0 100.0 32
0.0 97.9 47
0.0 98.1 157
0.0 97.8 186
0.0 97.2 36
0.0 97.3 75
0.0 100.0 20
0.0 97.8 46
0.0 77.3 75
0.0 84.6 52
0.0 98.3 58
0.0 100.0 37
0.0 99.0 100
0.0 98.0 200
0.0 98.8 169
0.0 100.0 29
0.0 100.0 39
0.0 100.0 59
0.0 100.0 90

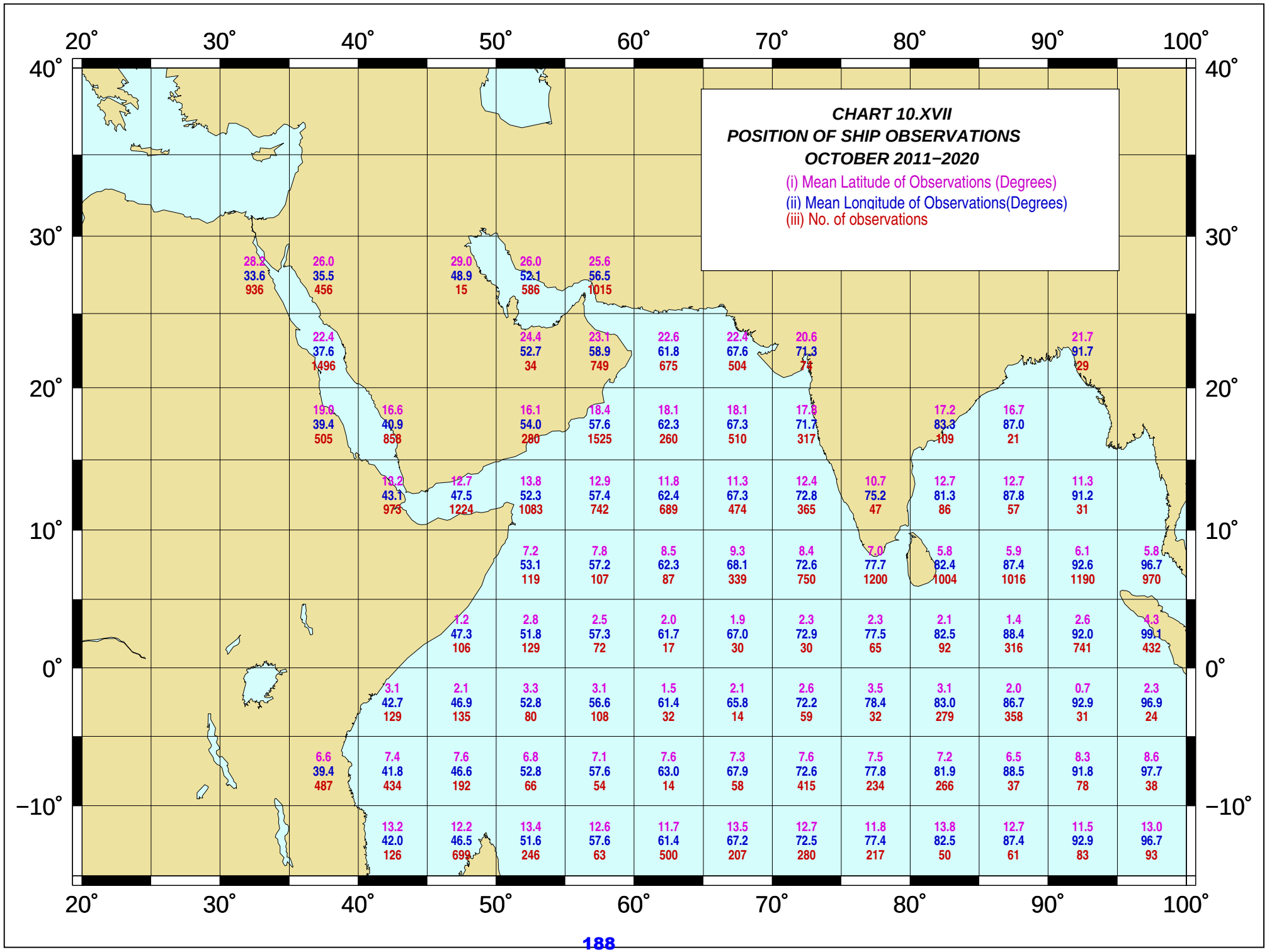


CHART 10.XVII
POSITION OF SHIP OBSERVATIONS
OCTOBER 2011−2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.2 33.6 936
26.0 35.5 456
29.0 48.9 15
26.0 52.1 586
25.6 56.5 1015
22.4 37.6 1496
24.4 52.7 34
23.1 58.9 749
22.6 61.8 675
22.4 67.6 504
20.6 71.3 74
21.7 91.7 29
19.9 39.4 505
16.6 40.9 858
16.1 54.0 280
18.4 57.6 1525
18.1 62.3 260
18.1 67.3 510
17.9 71.7 317
17.2 83.3 109
16.7 87.0 21
13.2 43.1 975
12.7 47.5 1224
13.8 52.3 1083
12.9 57.4 742
11.8 62.4 689
11.3 67.3 474
12.4 72.8 365
10.7 75.2 47
12.7 81.3 86
12.7 87.8 57
11.3 91.2 31
7.2 53.1 119
7.8 57.2 107
8.5 62.3 87
9.3 68.1 339
8.4 72.6 750
7.0 77.7 1200
5.8 82.4 1004
5.9 87.4 1016
6.1 92.6 1190
5.8 96.7 970
1.2 47.3 106
2.8 51.8 129
2.5 57.3 72
2.0 61.7 17
1.9 67.0 30
2.3 72.9 30
2.3 77.5 65
2.1 82.5 92
1.4 88.4 316
2.6 92.0 741
4.3 99.1 432
3.1 42.7 129
2.1 46.9 135
3.3 52.8 80
3.1 56.6 108
1.5 61.4 32
2.1 65.8 14
2.6 72.2 59
3.5 78.4 32
3.1 83.0 279
2.0 86.7 358
0.7 92.9 31
2.3 96.9 24
6.6 39.4 487
7.4 41.8 434
7.6 46.6 192
6.8 52.8 66
7.1 57.6 54
7.6 63.0 14
7.3 67.9 58
7.6 72.6 415
7.5 77.8 234
7.2 81.9 266
6.5 88.5 37
8.3 91.8 78
8.6 97.7 38
13.2 42.0 126
12.2 46.5 699
13.4 51.6 246
12.6 57.6 63
11.7 61.4 500
13.5 67.2 207
12.7 72.5 280
11.8 77.4 217
13.8 82.5 50
12.7 87.4 61
11.5 92.9 83
13.0 96.7 93

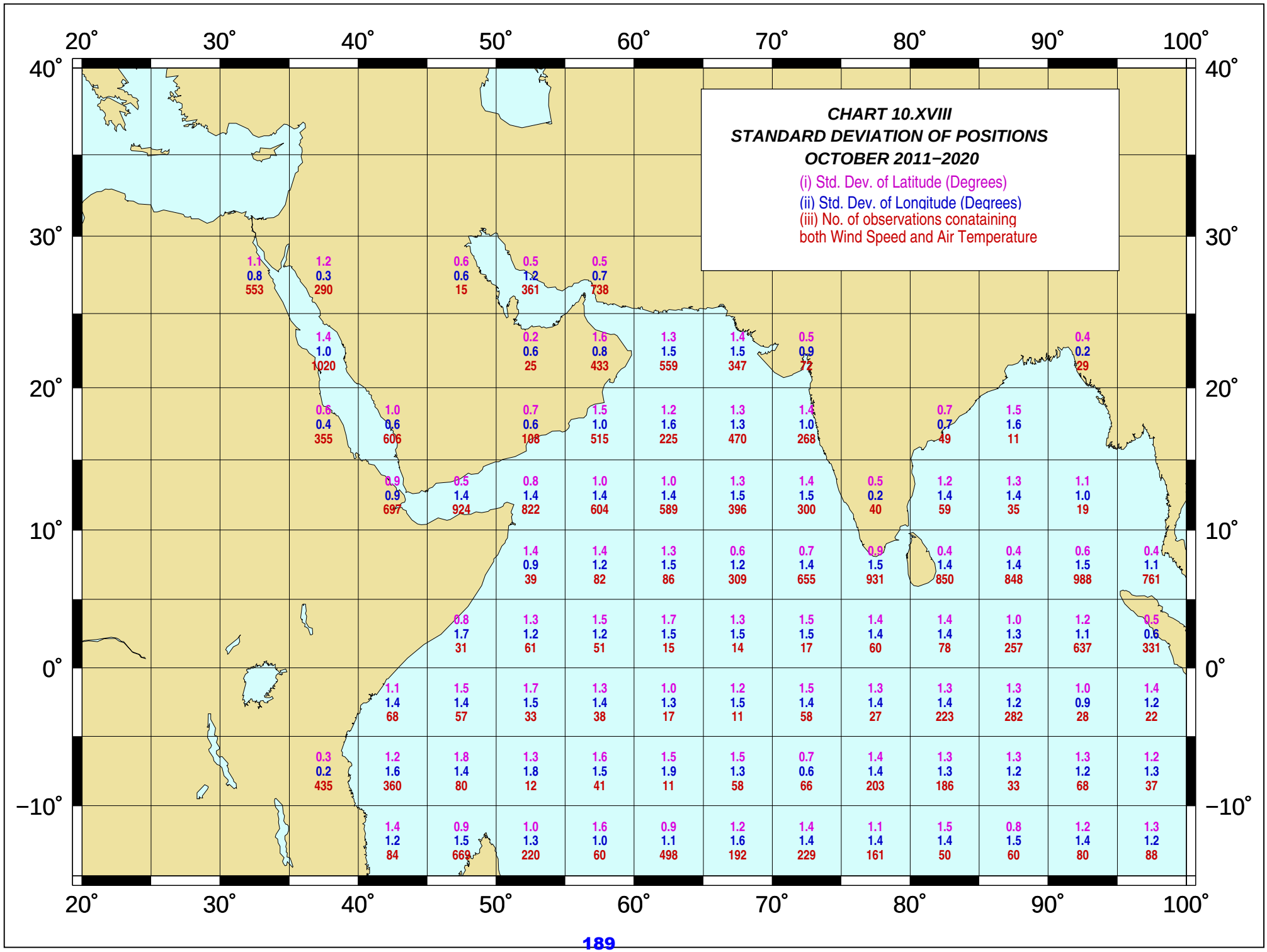
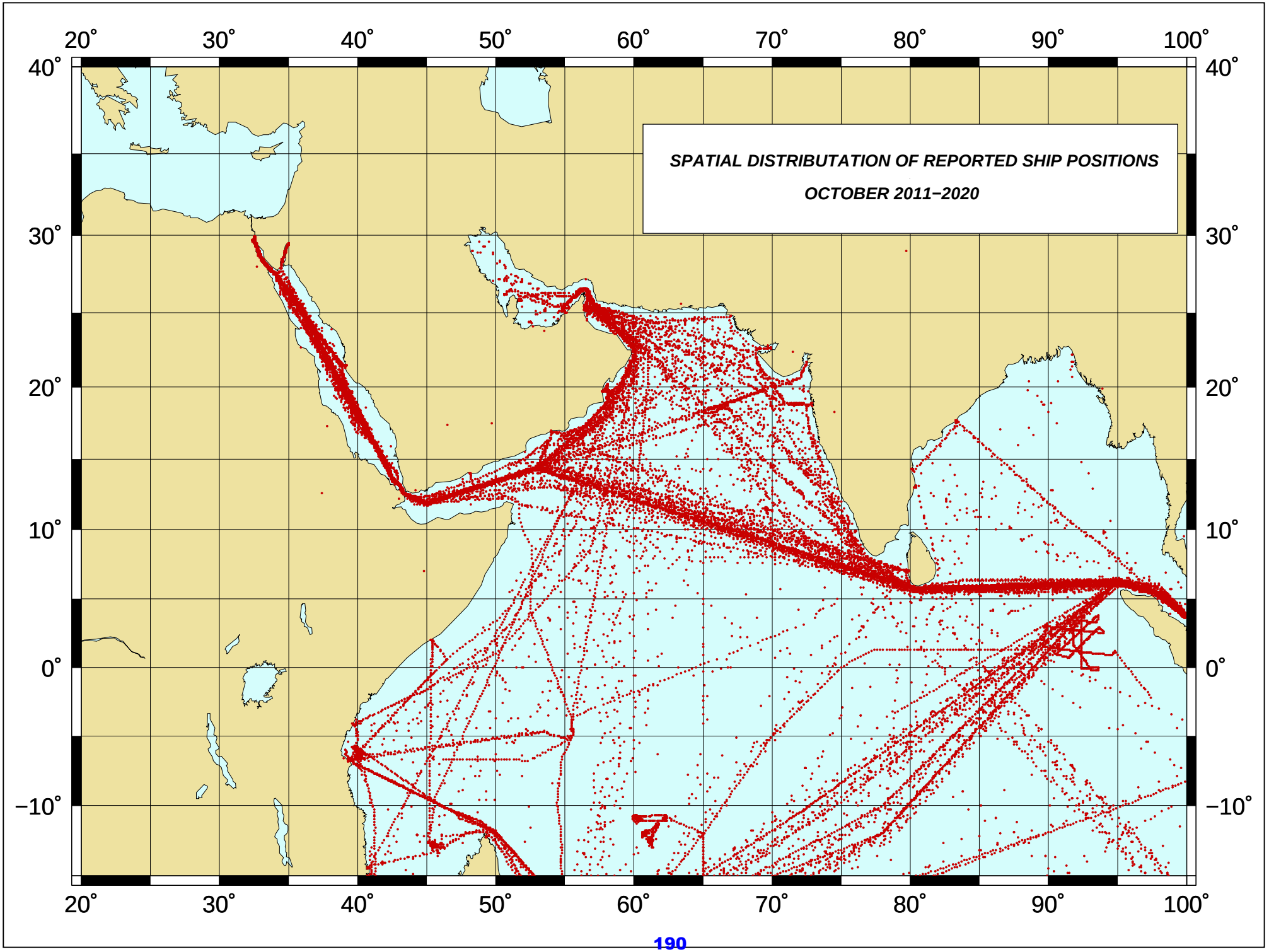


CHART 10.XVIII
STANDARD DEVIATION OF POSITIONS
OCTOBER 2011−2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.1 0.8 553
1.2 0.3 290
0.6 0.6 15
0.5 1.2 361
0.5 0.7 738
1.4 1.0 1020
0.2 0.6 25
1.6 0.8 433
1.3 1.5 559
1.4 1.5 347
0.5 0.9 72
0.4 0.2 29
0.6 0.4 355
1.0 0.6 606
0.7 0.6 108
1.5 1.0 515
1.2 1.6 225
1.3 1.3 470
1.4 1.0 268
0.7 0.7 49
1.5 1.6 11
0.9 0.9 697
0.5 1.4 924
0.8 1.4 822
1.0 1.4 604
1.0 1.4 589
1.3 1.5 396
1.4 1.5 300
0.5 0.2 40
1.2 1.4 59
1.3 1.4 35
1.1 1.0 19
1.4 0.9 39
1.4 1.2 82
1.3 1.5 86
0.6 1.2 309
0.7 1.4 655
0.9 1.5 931
0.4 1.4 850
0.4 1.4 848
0.6 1.5 988
0.4 1.1 761
0.8 1.7 31
1.3 1.2 61
1.5 1.2 51
1.7 1.5 15
1.3 1.5 14
1.5 1.5 17
1.4 1.4 60
1.4 1.4 78
1.0 1.3 257
1.2 1.1 637
0.5 0.6 331
1.1 1.4 68
1.5 1.4 57
1.7 1.5 33
1.3 1.4 38
1.0 1.3 17
1.2 1.5 11
1.5 1.4 58
1.3 1.4 27
1.3 1.4 223
1.3 1.2 282
1.0 0.9 28
1.4 1.2 22
0.3 0.2 435
1.2 1.6 360
1.8 1.4 80
1.3 1.8 12
1.6 1.5 41
1.5 1.9 11
1.5 1.3 58
0.7 0.6 66
1.4 1.4 203
1.3 1.3 186
1.3 1.2 33
1.3 1.2 68
1.2 1.3 37
1.4 1.2 84
0.9 1.5 669
1.0 1.3 220
1.6 1.0 60
0.9 1.1 498
1.2 1.6 192
1.4 1.4 229
1.1 1.4 161
1.5 1.4 50
0.8 1.5 60
1.2 1.4 80
1.3 1.2 88


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
OCTOBER 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF NOVEMBER 2011-2020

Marine Climatological Summary Charts 2011-2020

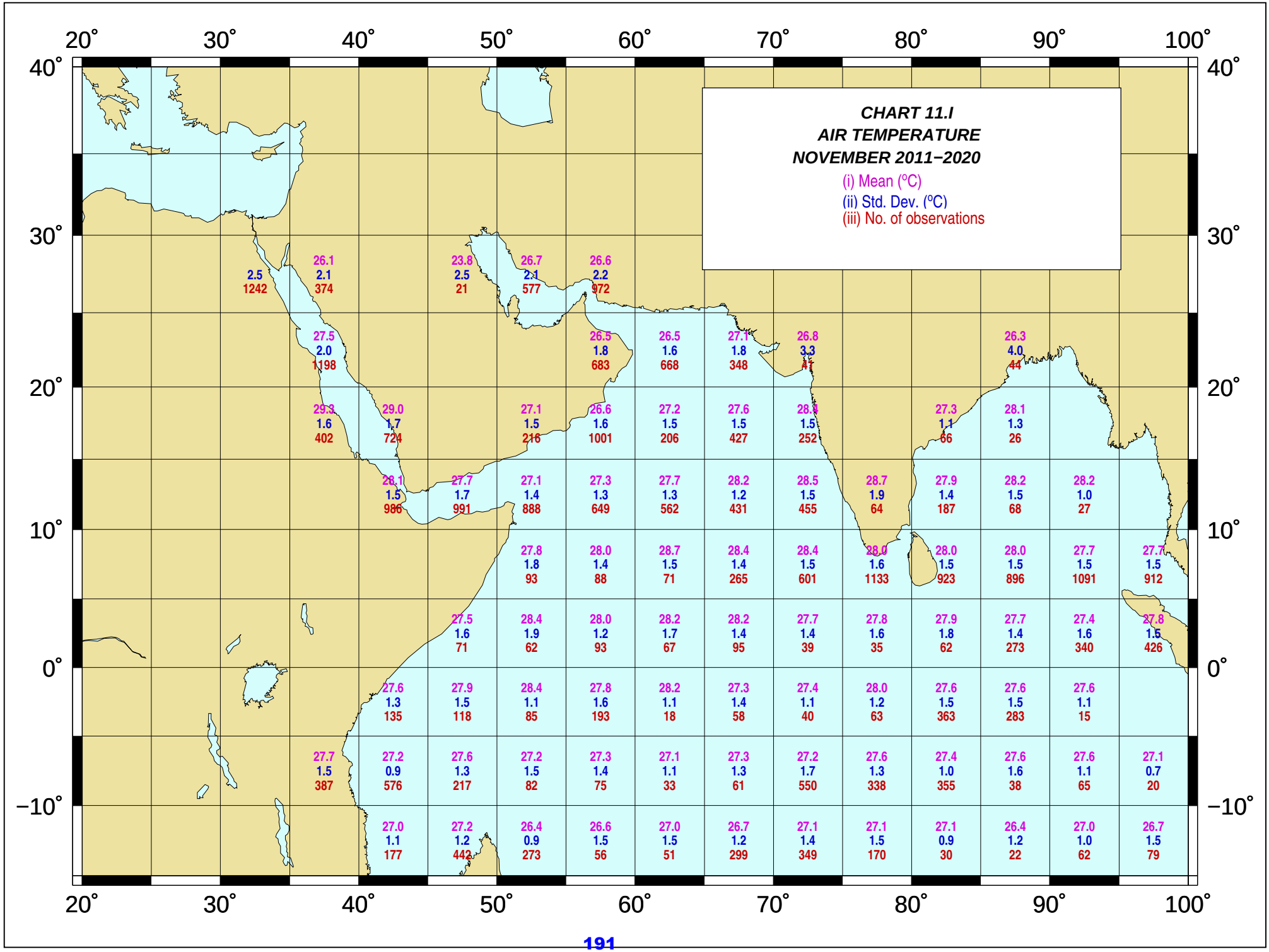


CHART 11.I
AIR TEMPERATURE
NOVEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.5 1242
26.1 2.1 374
23.8 2.5 21
26.7 2.1 577
26.6 2.2 972
27.5 2.0 1198
26.5 1.8 683
26.5 1.6 668
27.1 1.8 348
26.8 3.3 41
26.3 4.0 44
29.3 1.6 402
29.0 1.7 724
27.1 1.5 216
26.6 1.6 1001
27.2 1.5 206
27.6 1.5 427
28.3 1.5 252
27.3 1.1 66
28.1 1.3 26
28.1 1.5 986
27.7 1.7 991
27.1 1.4 888
27.3 1.3 649
27.7 1.3 562
28.2 1.2 431
28.5 1.5 455
28.7 1.9 64
27.9 1.4 187
28.2 1.5 68
28.2 1.0 27
27.8 1.8 93
28.0 1.4 88
28.7 1.5 71
28.4 1.4 265
28.4 1.5 601
28.0 1.6 1133
28.0 1.5 923
28.0 1.5 896
27.7 1.5 1091
27.7 1.5 912
27.5 1.6 71
28.4 1.9 62
28.0 1.2 93
28.2 1.7 67
28.2 1.4 95
27.7 1.4 39
27.8 1.6 35
27.9 1.8 62
27.7 1.4 273
27.4 1.6 340
27.8 1.5 426
27.6 1.3 135
27.9 1.5 118
28.4 1.1 85
27.8 1.6 193
28.2 1.1 18
27.3 1.4 58
27.4 1.1 40
28.0 1.2 63
27.6 1.5 363
27.6 1.5 283
27.6 1.1 15
27.7 1.5 387
27.2 0.9 576
27.6 1.3 217
27.2 1.5 82
27.3 1.4 75
27.1 1.1 33
27.3 1.3 61
27.2 1.7 550
27.6 1.3 338
27.4 1.0 355
27.6 1.6 38
27.6 1.1 65
27.1 0.7 20
27.0 1.1 177
27.2 1.2 442
26.4 0.9 273
26.6 1.5 56
27.0 1.5 51
26.7 1.2 299
27.1 1.4 349
27.1 1.5 170
27.1 0.9 30
26.4 1.2 22
27.0 1.0 62
26.7 1.5 79

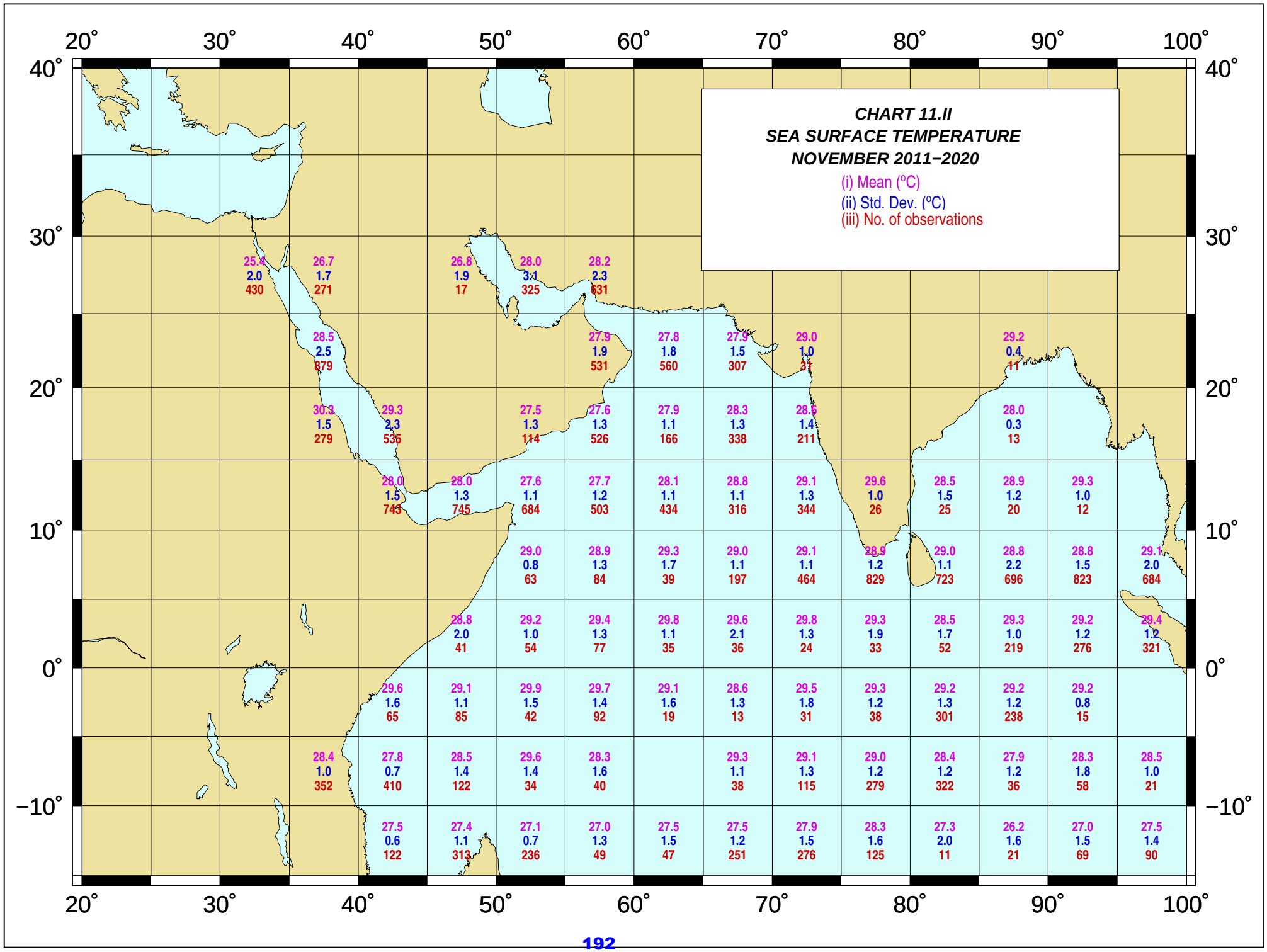


CHART 11.II
SEA SURFACE TEMPERATURE
NOVEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
25.4 2.0 430
26.7 1.7 271
26.8 1.9 17
28.0 3.1 325
28.2 2.3 631
28.5 2.5 879
27.9 1.9 531
27.8 1.8 560
27.9 1.5 307
29.0 1.0 31
29.2 0.4 11
30.3 1.5 279
29.3 2.3 535
27.5 1.3 114
27.6 1.3 526
27.9 1.1 166
28.3 1.3 338
28.6 1.4 211
28.0 0.3 13
28.0 1.5 745
28.0 1.3 745
27.6 1.1 684
27.7 1.2 503
28.1 1.1 434
28.8 1.1 316
29.1 1.3 344
29.6 1.0 26
28.5 1.5 25
28.9 1.2 20
29.3 1.0 12
29.0 0.8 63
28.9 1.3 84
29.3 1.7 39
29.0 1.1 197
29.1 1.1 464
28.9 1.2 829
29.0 1.1 723
28.8 2.2 696
28.8 1.5 823
29.1 2.0 684
28.8 2.0 41
29.2 1.0 54
29.4 1.3 77
29.8 1.1 35
29.6 2.1 36
29.8 1.3 24
29.3 1.9 33
28.5 1.7 52
29.3 1.0 219
29.2 1.2 276
29.4 1.2 321
29.6 1.6 65
29.1 1.1 85
29.9 1.5 42
29.7 1.4 92
29.1 1.6 19
28.6 1.3 13
29.5 1.8 31
29.3 1.2 38
29.2 1.3 301
29.2 1.2 238
29.2 0.8 15
28.4 1.0 352
27.8 0.7 410
28.5 1.4 122
29.6 1.4 34
28.3 1.6 40
29.3 1.1 38
29.1 1.3 115
29.0 1.2 279
28.4 1.2 322
27.9 1.2 36
28.3 1.8 58
28.5 1.0 21
27.5 0.6 122
27.4 1.1 313
27.1 0.7 236
27.0 1.3 49
27.5 1.5 47
27.5 1.2 251
27.9 1.5 276
28.3 1.6 125
27.3 2.0 11
26.2 1.6 21
27.0 1.5 69
27.5 1.4 90

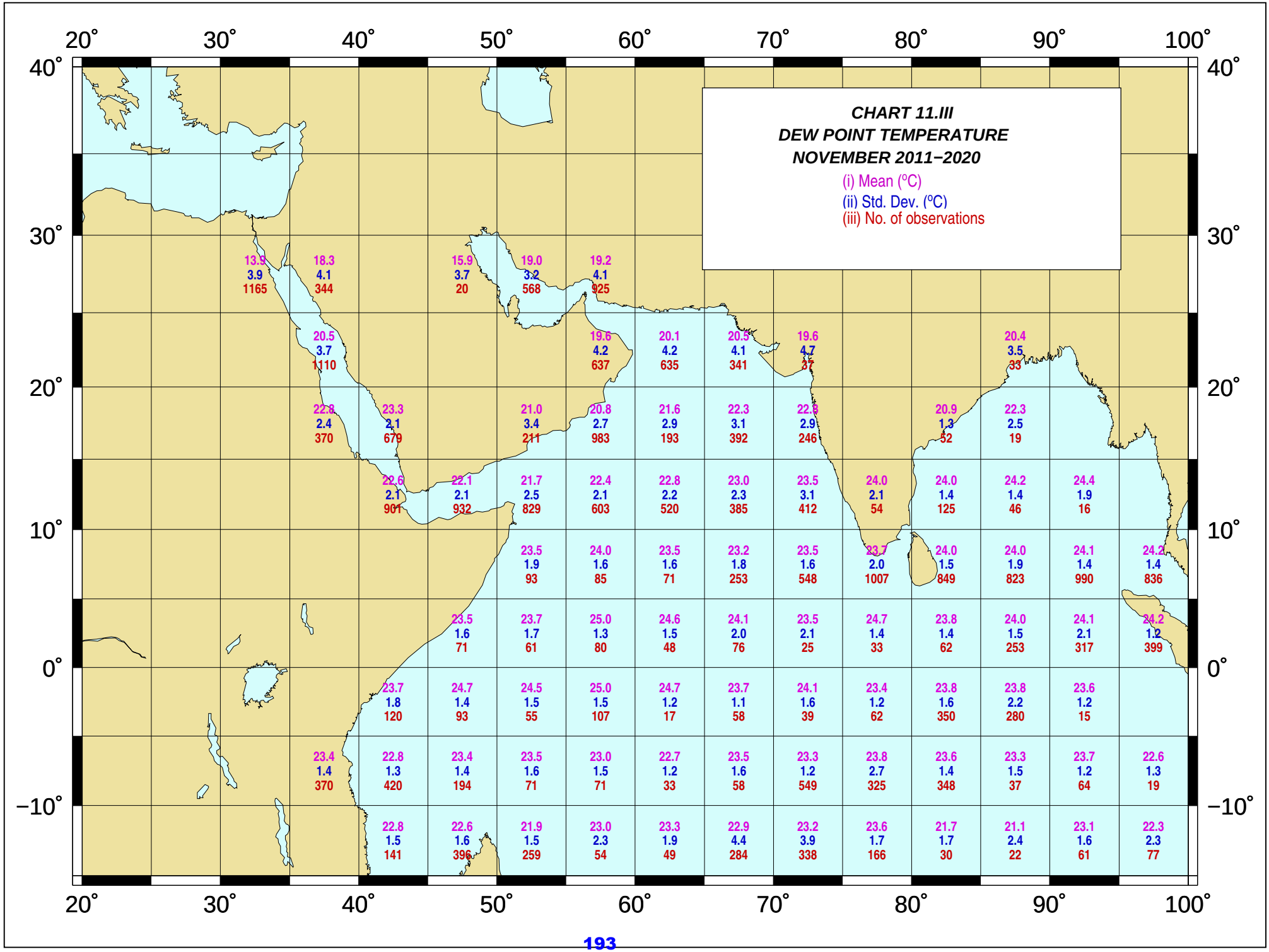


CHART 11.III
DEW POINT TEMPERATURE
NOVEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
13.9 3.9 1165
18.3 4.1 344
15.9 3.7 20
19.0 3.2 568
19.2 4.1 925
20.5 3.7 1110
19.6 4.2 637
20.1 4.2 635
20.5 4.1 341
19.6 4.7 37
20.4 3.5 33
22.8 2.4 370
23.3 2.1 679
21.0 3.4 211
20.8 2.7 983
21.6 2.9 193
22.3 3.1 392
22.9 2.9 246
20.9 1.3 52
22.3 2.5 19
22.6 2.1 901
22.1 2.1 932
21.7 2.5 829
22.4 2.1 603
22.8 2.2 520
23.0 2.3 385
23.5 3.1 412
24.0 2.1 54
24.0 1.4 125
24.2 1.4 46
24.4 1.9 16
23.5 1.9 93
24.0 1.6 85
23.5 1.6 71
23.2 1.8 253
23.5 1.6 548
23.7 2.0 1007
24.0 1.5 849
24.0 1.9 823
24.1 1.4 990
24.2 1.4 836
23.5 1.6 71
23.7 1.7 61
25.0 1.3 80
24.6 1.5 48
24.1 2.0 76
23.5 2.1 25
24.7 1.4 33
23.8 1.4 62
24.0 1.5 253
24.1 2.1 317
24.2 1.2 399
23.7 1.8 120
24.7 1.4 93
24.5 1.5 55
25.0 1.5 107
24.7 1.2 17
23.7 1.1 58
24.1 1.6 39
23.4 1.2 62
23.8 1.6 350
23.8 2.2 280
23.6 1.2 15
23.4 1.4 370
22.8 1.3 420
23.4 1.4 194
23.5 1.6 71
23.0 1.5 71
22.7 1.2 33
23.5 1.6 58
23.3 1.2 549
23.8 2.7 325
23.6 1.4 348
23.3 1.5 37
23.7 1.2 64
22.6 1.3 19
22.8 1.5 141
22.6 1.6 396
21.9 1.5 259
23.0 2.3 54
23.3 1.9 49
22.9 4.4 284
23.2 3.9 338
23.6 1.7 166
21.7 1.7 30
21.1 2.4 22
23.1 1.6 61
22.3 2.3 77

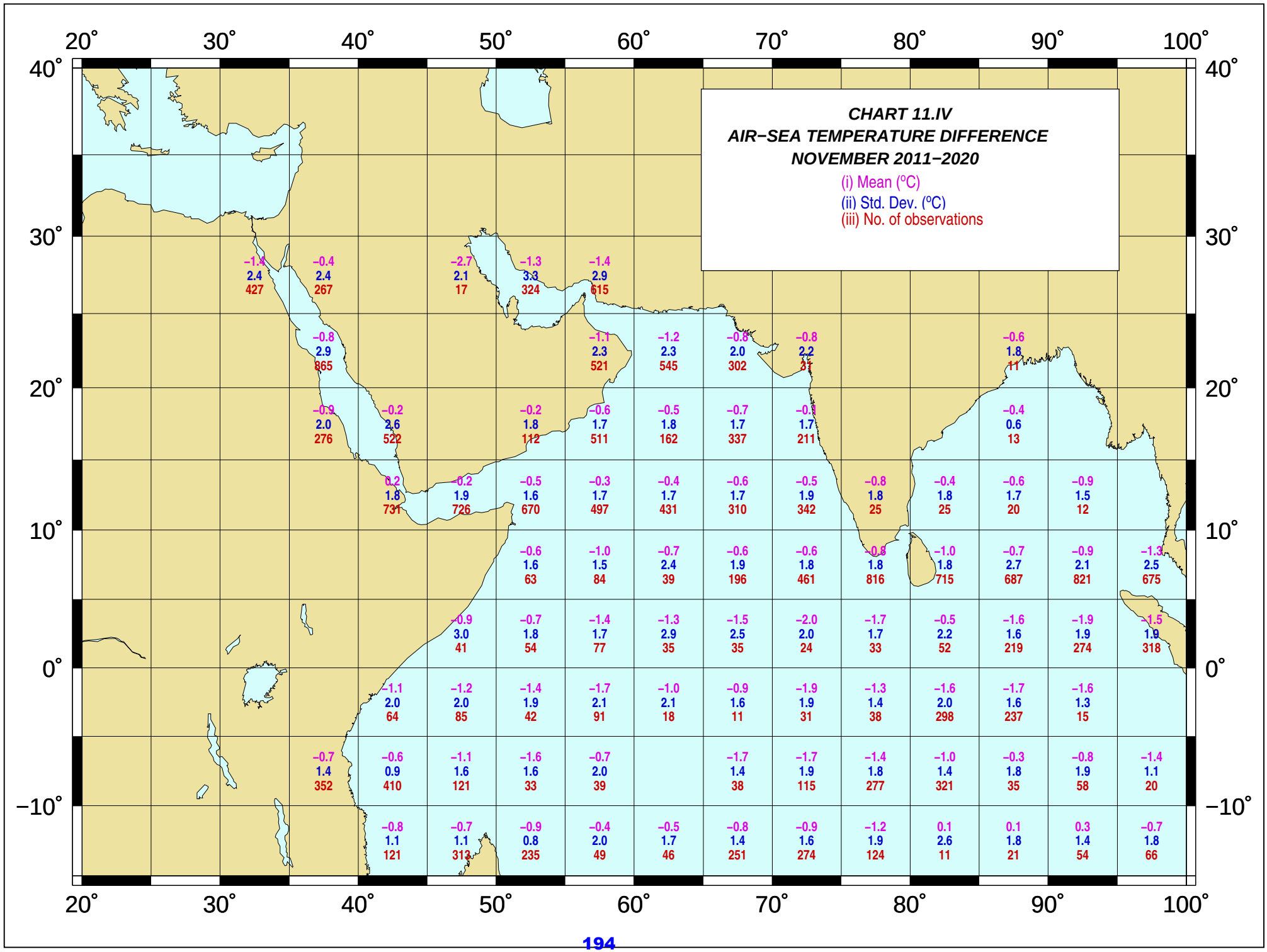


CHART 11.IV
AIR–SEA TEMPERATURE DIFFERENCE
NOVEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
−1.4 2.4 427
−0.4 2.4 267
−2.7 2.1 17
−1.3 3.3 324
−1.4 2.9 615
−0.8 2.9 865
−1.1 2.3 521
−1.2 2.3 545
−0.8 2.0 302
−0.8 2.2 31
−0.6 1.8 11
−0.9 2.0 276
−0.2 2.6 522
−0.2 1.8 112
−0.6 1.7 511
−0.5 1.8 162
−0.7 1.7 337
−0.8 1.7 211
−0.4 0.6 13
0.2 1.8 731
−0.2 1.9 726
−0.5 1.6 670
−0.3 1.7 497
−0.4 1.7 431
−0.6 1.7 310
−0.5 1.9 342
−0.8 1.8 25
−0.4 1.8 25
−0.6 1.7 20
−0.9 1.5 12
−0.6 1.6 63
−1.0 1.5 84
−0.7 2.4 39
−0.6 1.9 196
−0.6 1.8 461
−0.8 1.8 816
−1.0 1.8 715
−0.7 2.7 687
−0.9 2.1 821
−1.3 2.5 675
−0.9 3.0 41
−0.7 1.8 54
−1.4 1.7 77
−1.3 2.9 35
−1.5 2.5 35
−2.0 2.0 24
−1.7 1.7 33
−0.5 2.2 52
−1.6 1.6 219
−1.9 1.9 274
−1.5 1.9 318
−1.1 2.0 64
−1.2 2.0 85
−1.4 1.9 42
−1.7 2.1 91
−1.0 2.1 18
−0.9 1.6 11
−1.9 1.9 31
−1.3 1.4 38
−1.6 2.0 298
−1.7 1.6 237
−1.6 1.3 15
−0.7 1.4 352
−0.6 0.9 410
−1.1 1.6 121
−1.6 1.6 33
−0.7 2.0 39
−1.7 1.4 38
−1.7 1.9 115
−1.4 1.8 277
−1.0 1.4 321
−0.3 1.8 35
−0.8 1.9 58
−1.4 1.1 20
−0.8 1.1 121
−0.7 1.1 313
−0.9 0.8 235
−0.4 2.0 49
−0.5 1.7 46
−0.8 1.4 251
−0.9 1.6 274
−1.2 1.9 124
0.1 2.6 11
0.1 1.8 21
0.3 1.4 54
−0.7 1.8 66

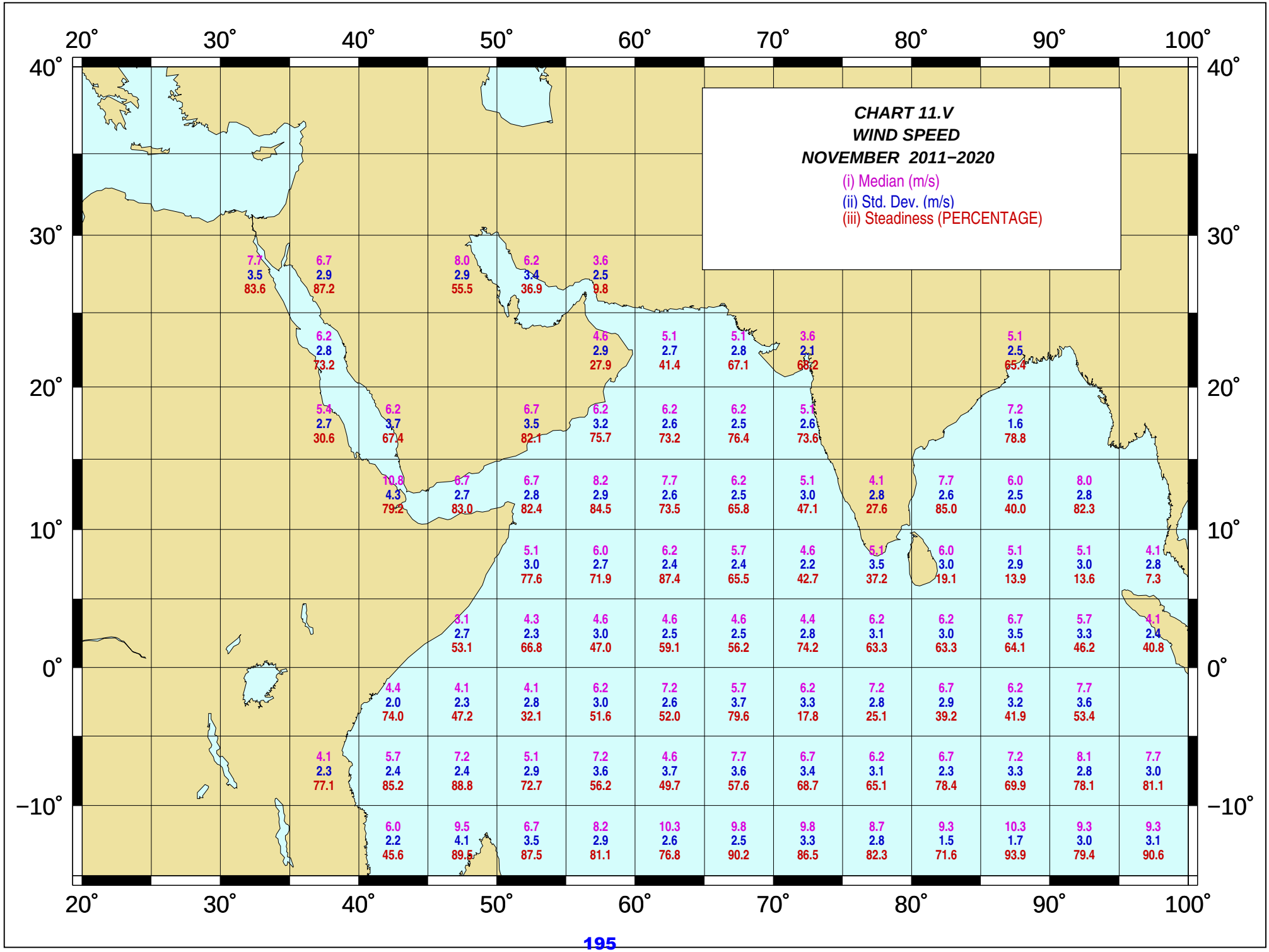


CHART 11.V
WIND SPEED
NOVEMBER 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
7.7 3.5 83.6
6.7 2.9 87.2
8.0 2.9 55.5
6.2 3.4 36.9
3.6 2.5 9.8
6.2 2.8 73.2
4.6 2.9 27.9
5.1 2.7 41.4
5.1 2.8 67.1
3.6 2.1 68.2
5.1 2.5 65.4
5.4 2.7 30.6
6.2 3.7 67.4
6.7 3.5 82.1
6.2 3.2 75.7
6.2 2.6 73.2
6.2 2.5 76.4
5.1 2.6 73.6
7.2 1.6 78.8
10.8 4.3 79.2
6.7 2.7 83.0
6.7 2.8 82.4
8.2 2.9 84.5
7.7 2.6 73.5
6.2 2.5 65.8
5.1 3.0 47.1
4.1 2.8 27.6
7.7 2.6 85.0
6.0 2.5 40.0
8.0 2.8 82.3
5.1 3.0 77.6
6.0 2.7 71.9
6.2 2.4 87.4
5.7 2.4 65.5
4.6 2.2 42.7
5.1 3.5 37.2
6.0 3.0 19.1
5.1 2.9 13.9
5.1 3.0 13.6
4.1 2.8 7.3
3.1 2.7 53.1
4.3 2.3 66.8
4.6 3.0 47.0
4.6 2.5 59.1
4.6 2.5 56.2
4.4 2.8 74.2
6.2 3.1 63.3
6.2 3.0 63.3
6.7 3.5 64.1
5.7 3.3 46.2
4.1 2.4 40.8
4.4 2.0 74.0
4.1 2.3 47.2
4.1 2.8 32.1
6.2 3.0 51.6
7.2 2.6 52.0
5.7 3.7 79.6
6.2 3.3 17.8
7.2 2.8 25.1
6.7 2.9 39.2
6.2 3.2 41.9
7.7 3.6 53.4
4.1 2.3 77.1
5.7 2.4 85.2
7.2 2.4 88.8
5.1 2.9 72.7
7.2 3.6 56.2
4.6 3.7 49.7
7.7 3.6 57.6
6.7 3.4 68.7
6.2 3.1 65.1
6.7 2.3 78.4
7.2 3.3 69.9
8.1 2.8 78.1
7.7 3.0 81.1
6.0 2.2 45.6
9.5 4.1 89.5
6.7 3.5 87.5
8.2 2.9 81.1
10.3 2.6 76.8
9.8 2.5 90.2
9.8 3.3 86.5
8.7 2.8 82.3
9.3 1.5 71.6
10.3 1.7 93.9
9.3 3.0 79.4
9.3 3.1 90.6

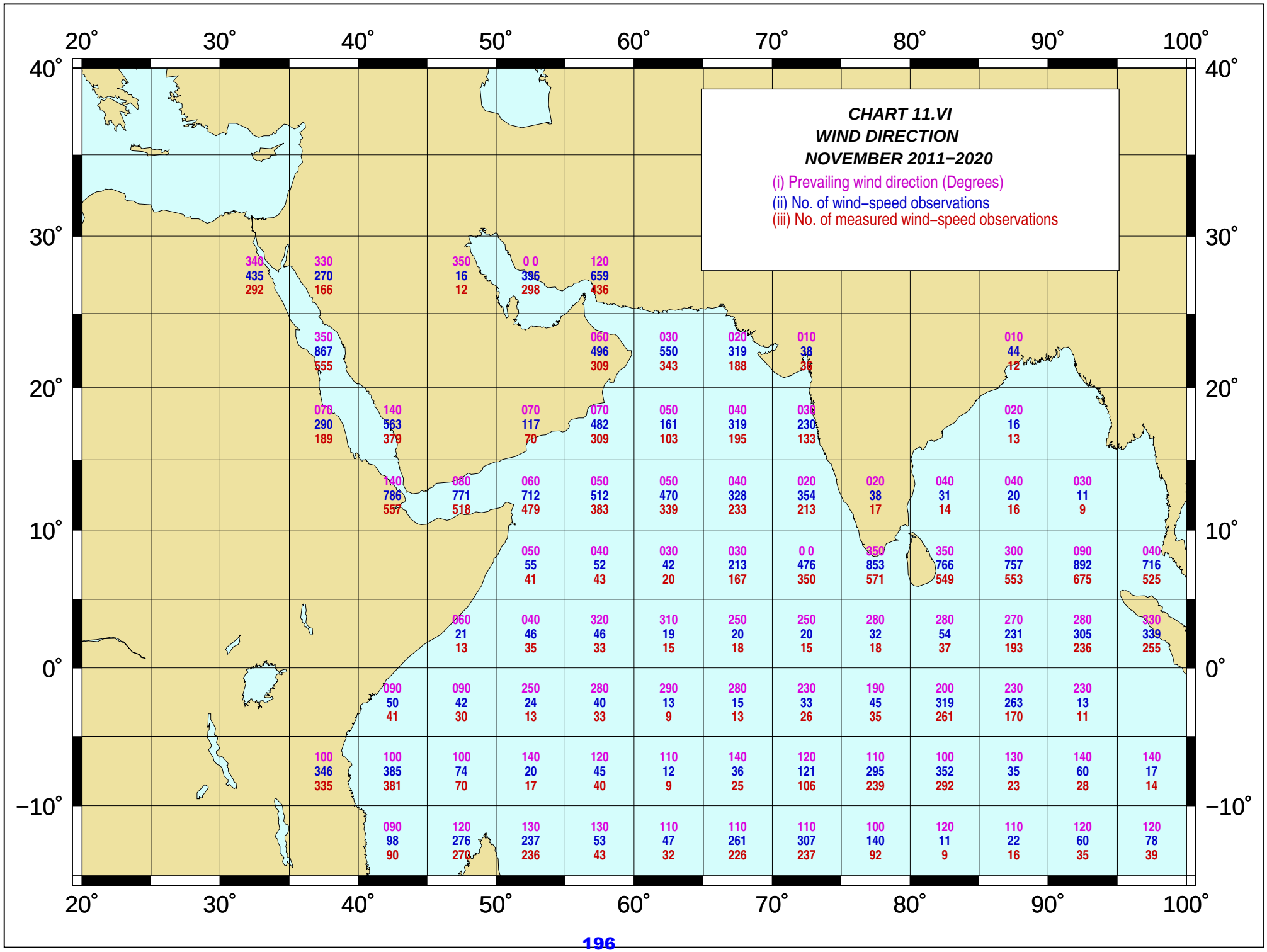


CHART 11.VI
WIND DIRECTION
NOVEMBER 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
340 435 292
330 270 166
350 16 12
0 0 396 298
120 659 436
350 867 555
060 496 309
030 550 343
020 319 188
010 38 36
010 44 12
070 290 189
140 563 379
070 117 70
070 482 309
050 161 103
040 319 195
030 230 133
020 16 13
140 786 557
080 771 518
060 712 479
050 512 383
050 470 339
040 328 233
020 354 213
020 38 17
040 31 14
040 20 16
030 11 9
050 55 41
040 52 43
030 42 20
030 213 167
0 0 476 350
350 853 571
350 766 549
300 757 553
090 892 675
040 716 525
060 21 13
040 46 35
320 46 33
310 19 15
250 20 18
250 20 15
280 32 18
280 54 37
270 231 193
280 305 236
330 339 255
090 50 41
090 42 30
250 24 13
280 40 33
290 13 9
280 15 13
230 33 26
190 45 35
200 319 261
230 263 170
230 13 11
100 346 335
100 385 381
100 74 70
140 20 17
120 45 40
110 12 9
140 36 25
120 121 106
110 295 239
100 352 292
130 35 23
140 60 28
140 17 14
090 98 90
120 276 270
130 237 236
130 53 43
110 47 32
110 261 226
110 307 237
100 140 92
120 11 9
110 22 16
120 60 35
120 78 39

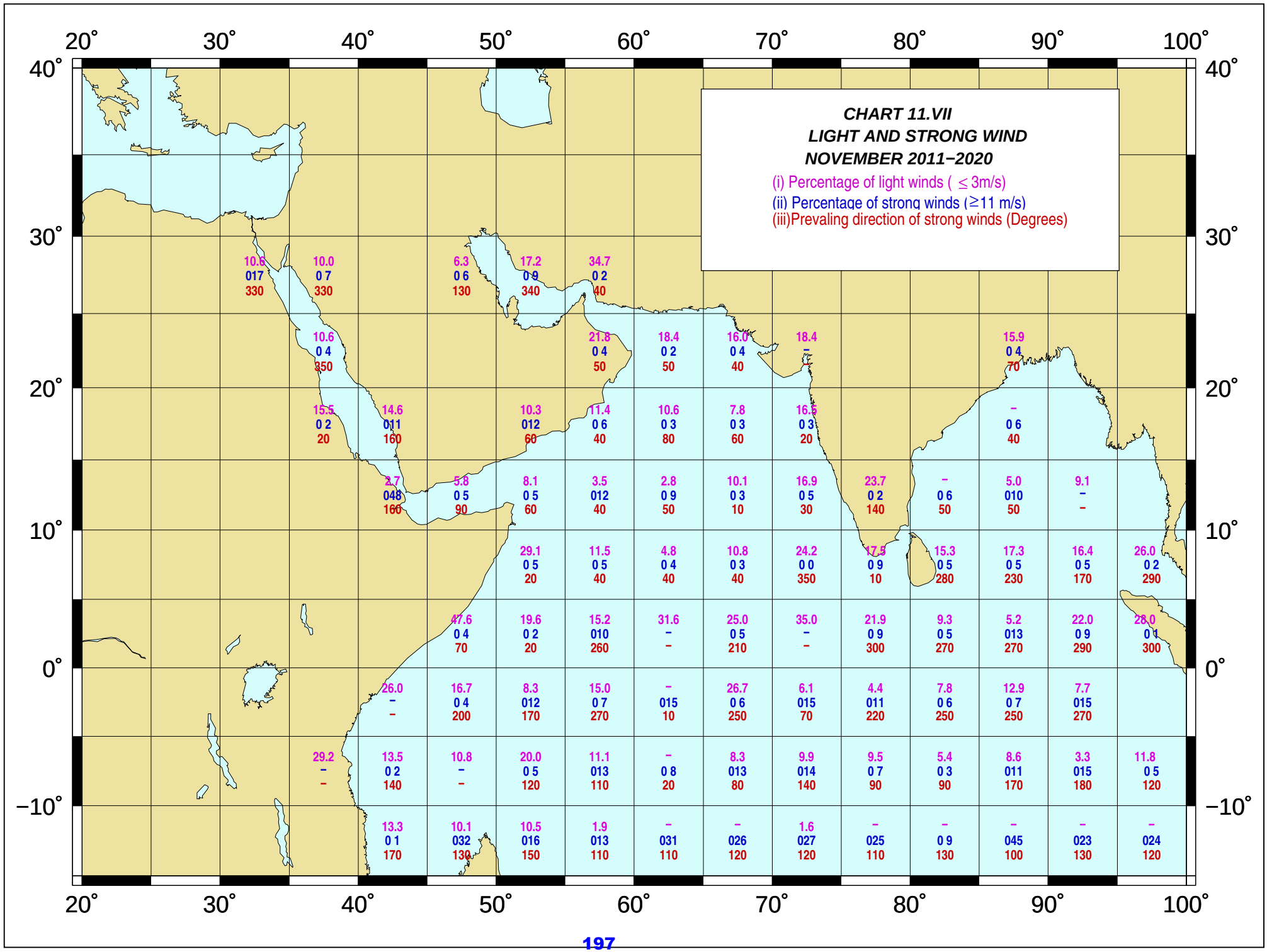


CHART 11.VII
LIGHT AND STRONG WIND
NOVEMBER 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
10.6 017 330
10.0 07 330
6.3 06 130
17.2 09 340
34.7 02 40
10.6 04 350
21.8 04 50
18.4 02 50
16.0 04 40
18.4 –
15.9 04 70
15.5 02 20
14.6 011 160
10.3 012 60
11.4 06 40
10.6 03 80
7.8 03 60
16.5 03 20
– 06 40
2.7 048 160
5.8 05 90
8.1 05 60
3.5 012 40
2.8 09 50
10.1 03 10
16.9 05 30
23.7 02 140
– 06 50
5.0 010 50
9.1 – –
29.1 05 20
11.5 05 40
4.8 04 40
10.8 03 40
24.2 00 350
17.5 09 10
15.3 05 280
17.3 05 230
16.4 05 170
26.0 02 290
47.6 04 70
19.6 02 20
15.2 010 260
31.6 – –
25.0 05 210
35.0 – –
21.9 09 300
9.3 05 270
5.2 013 270
22.0 09 290
28.0 01 300
26.0 – –
16.7 04 200
8.3 012 170
15.0 07 270
– 015 10
26.7 06 250
6.1 015 70
4.4 011 220
7.8 06 250
12.9 07 250
7.7 015 270
29.2 – –
13.5 02 140
10.8 – –
20.0 05 120
11.1 013 110
– 08 20
8.3 013 80
9.9 014 140
9.5 07 90
5.4 03 90
8.6 011 170
3.3 015 180
11.8 05 120
13.3 01 170
10.1 032 130
10.5 016 150
1.9 013 110
– 031 110
– 026 120
1.6 027 120
– 025 110
– 09 130
– 045 100
– 023 130
– 024 120

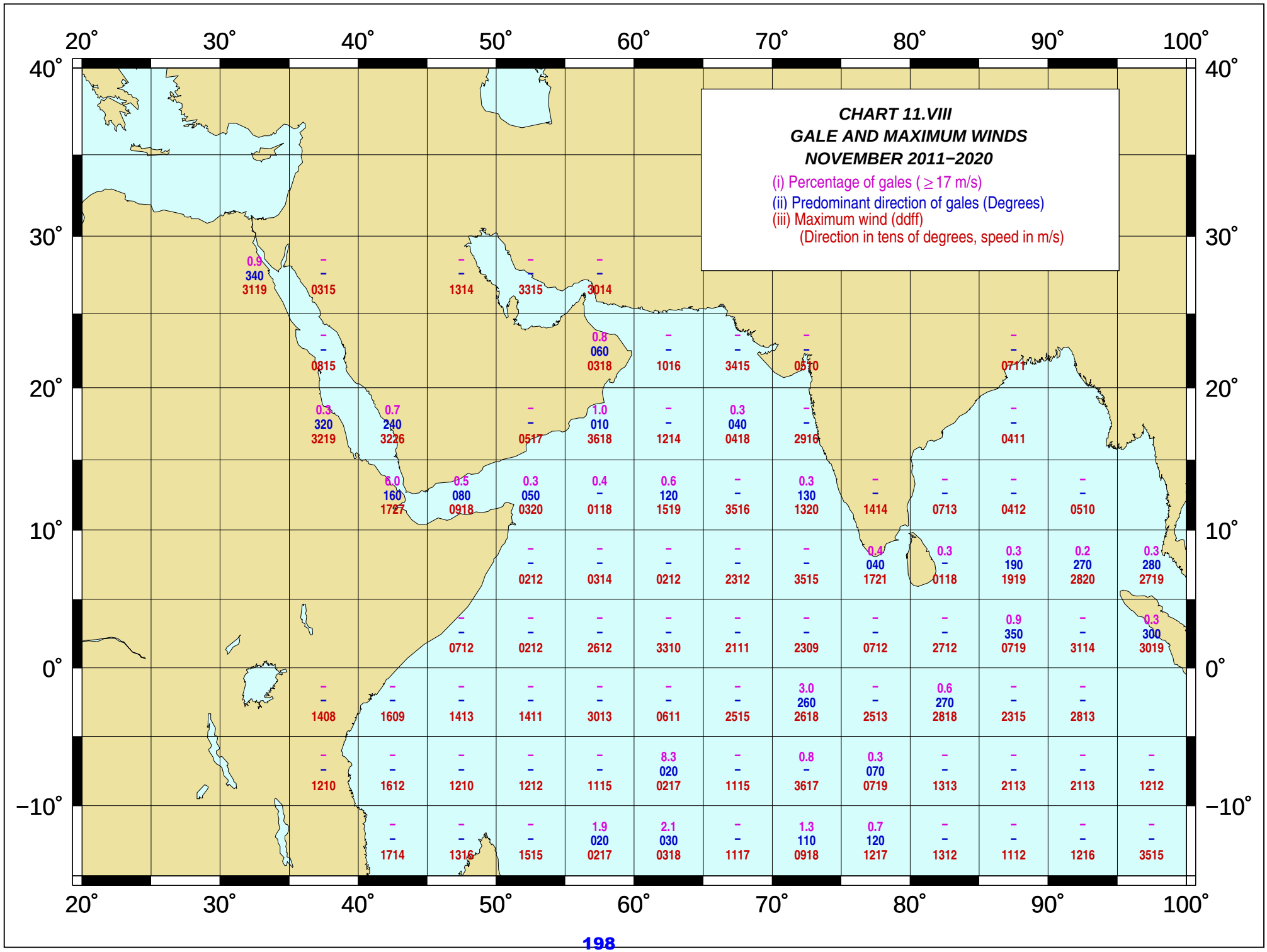


CHART 11.VIII
GALE AND MAXIMUM WINDS
NOVEMBER 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.9 340 3119
– – 0315
– – 1314
– – 3315
– – 3014
– – 0315
0.8 060 0318
– – 1016
– – 3415
– – 0510
– – 0711
0.3 320 3219
0.7 240 3226
– – 0517
1.0 010 3618
– – 1214
0.3 040 0418
– – 2916
– – 0411
0.0 160 1727
0.5 080 0918
0.3 050 0320
0.4 – 0118
0.6 120 1519
– – 3516
0.3 130 1320
– – 1414
– – 0713
– – 0412
– – 0510
– – 0212
– – 0314
– – 0212
– – 2312
– – 3515
0.4 040 1721
0.3 – 0118
0.3 190 1919
0.2 270 2820
0.3 280 2719
– – 0712
– – 0212
– – 2612
– – 3310
– – 2111
– – 2309
– – 0712
– – 2712
0.9 350 0719
– – 3114
0.3 300 3019
– – 1408
– – 1609
– – 1413
– – 1411
– – 3013
– – 0611
– – 2515
3.0 260 2618
– – 2513
0.6 270 2818
– – 2315
– – 2813
– – 1210
– – 1612
– – 1210
– – 1212
– – 1115
8.3 020 0217
– – 1115
0.8 – 3617
0.3 070 0719
– – 1313
– – 2113
– – 2113
– – 1212
– – 1714
– – 1316
– – 1515
1.9 020 0217
2.1 030 0318
– – 1117
1.3 110 0918
0.7 120 1217
– – 1312
– – 1112
– – 1216
– – 3515

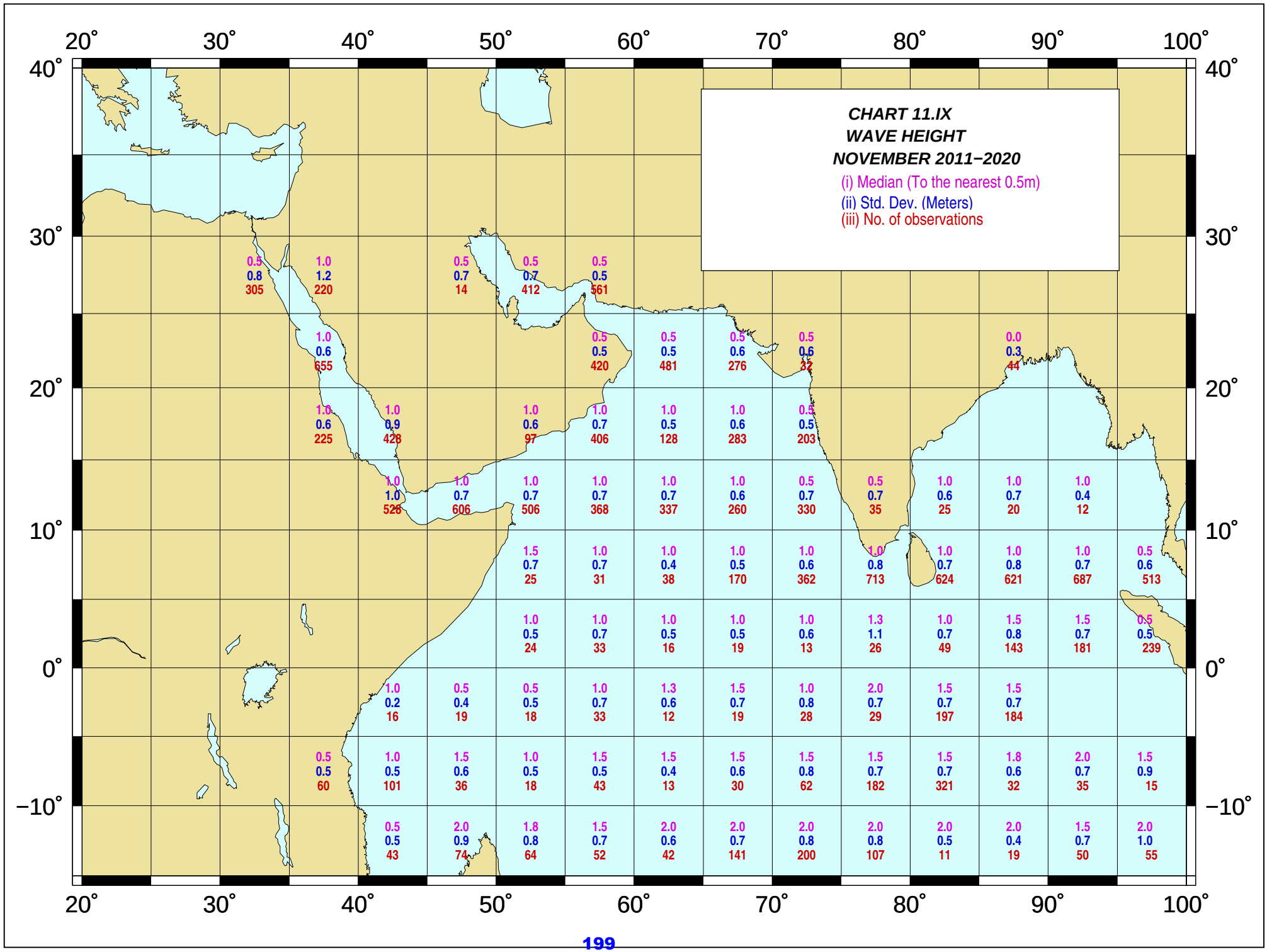


CHART 11.IX
WAVE HEIGHT
NOVEMBER 2011−2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.5 0.8 305
1.0 1.2 220
0.5 0.7 14
0.5 0.7 412
0.5 0.5 561
1.0 0.6 655
0.5 0.5 420
0.5 0.5 481
0.5 0.6 276
0.5 0.6 32
0.0 0.3 44
1.0 0.6 225
1.0 0.9 428
1.0 0.6 97
1.0 0.7 406
1.0 0.5 128
1.0 0.6 283
0.5 0.5 203
1.0 1.0 526
1.0 0.7 606
1.0 0.7 506
1.0 0.7 368
1.0 0.7 337
1.0 0.6 260
0.5 0.7 330
0.5 0.7 35
1.0 0.6 25
1.0 0.7 20
1.0 0.4 12
1.5 0.7 25
1.0 0.7 31
1.0 0.4 38
1.0 0.5 170
1.0 0.6 362
1.0 0.8 713
1.0 0.7 624
1.0 0.8 621
1.0 0.7 687
0.5 0.6 513
1.0 0.5 24
1.0 0.7 33
1.0 0.5 16
1.0 0.5 19
1.0 0.6 13
1.3 1.1 26
1.0 0.7 49
1.5 0.8 143
1.5 0.7 181
0.5 0.5 239
1.0 0.2 16
0.5 0.4 19
0.5 0.5 18
1.0 0.7 33
1.3 0.6 12
1.5 0.7 19
1.0 0.8 28
2.0 0.7 29
1.5 0.7 197
1.5 0.7 184
0.5 0.5 60
1.0 0.5 101
1.5 0.6 36
1.0 0.5 18
1.5 0.5 43
1.5 0.4 13
1.5 0.6 30
1.5 0.8 62
1.5 0.7 182
1.5 0.7 321
1.8 0.6 32
2.0 0.7 35
1.5 0.9 15
0.5 0.5 43
2.0 0.9 74
1.8 0.8 64
1.5 0.7 52
2.0 0.6 42
2.0 0.7 141
2.0 0.8 200
2.0 0.8 107
2.0 0.5 11
2.0 0.4 19
1.5 0.7 50
2.0 1.0 55

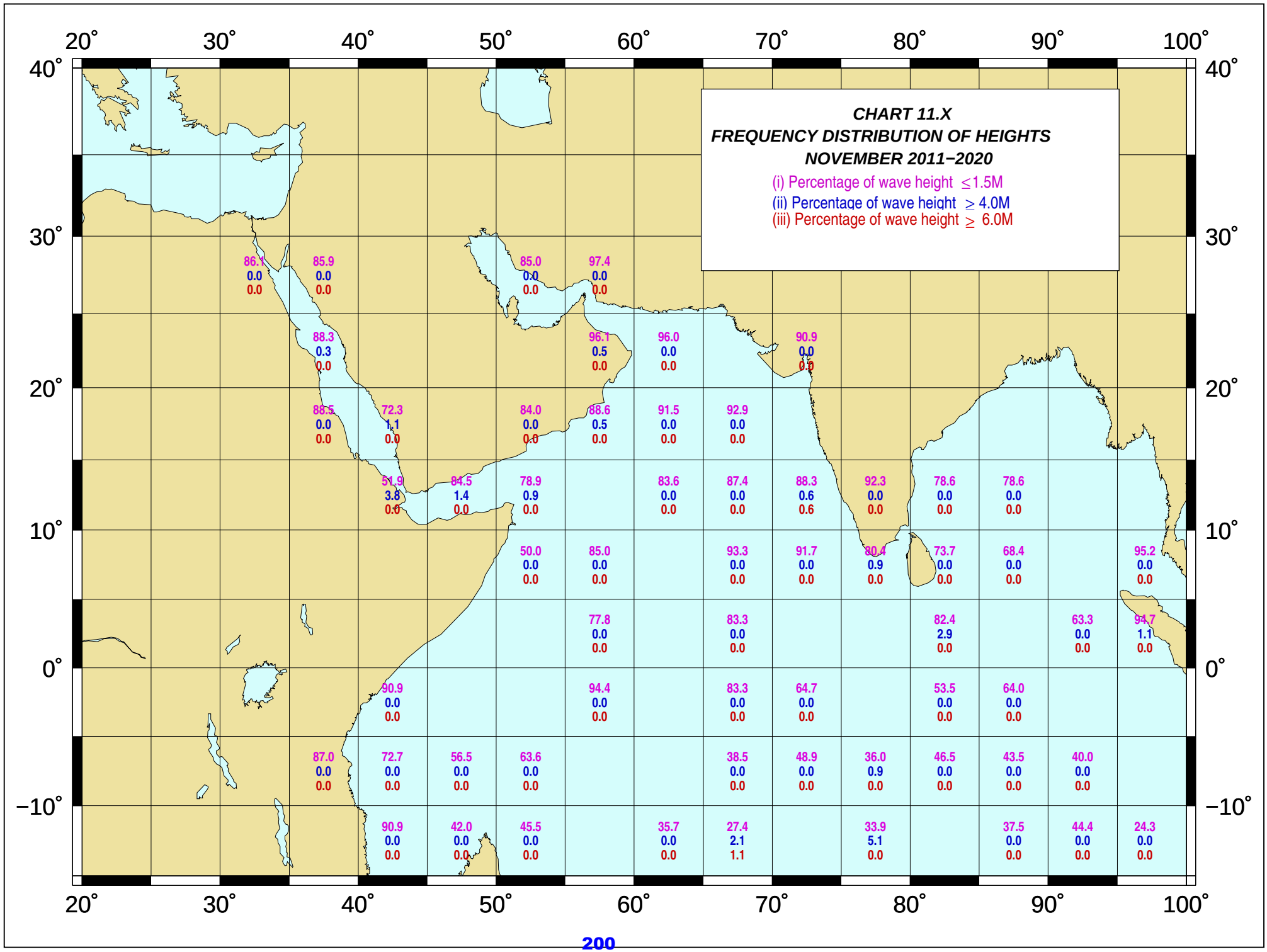


CHART 11.X
FREQUENCY DISTRIBUTION OF HEIGHTS
NOVEMBER 2011–2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
86.1 0.0 0.0
85.9 0.0 0.0
85.0 0.0 0.0
97.4 0.0 0.0
88.3 0.3 0.0
96.1 0.5 0.0
96.0 0.0 0.0
90.9 0.0 0.0
88.5 0.0 0.0
72.3 1.1 0.0
84.0 0.0 0.0
88.6 0.5 0.0
91.5 0.0 0.0
92.9 0.0 0.0
51.9 3.8 0.0
84.5 1.4 0.0
78.9 0.9 0.0
83.6 0.0 0.0
87.4 0.0 0.0
88.3 0.6 0.6
92.3 0.0 0.0
78.6 0.0 0.0
78.6 0.0 0.0
50.0 0.0 0.0
85.0 0.0 0.0
93.3 0.0 0.0
91.7 0.0 0.0
80.4 0.9 0.0
73.7 0.0 0.0
68.4 0.0 0.0
95.2 0.0 0.0
77.8 0.0 0.0
83.3 0.0 0.0
82.4 2.9 0.0
63.3 0.0 0.0
94.7 1.1 0.0
90.9 0.0 0.0
94.4 0.0 0.0
83.3 0.0 0.0
64.7 0.0 0.0
53.5 0.0 0.0
64.0 0.0 0.0
87.0 0.0 0.0
72.7 0.0 0.0
56.5 0.0 0.0
63.6 0.0 0.0
38.5 0.0 0.0
48.9 0.0 0.0
36.0 0.9 0.0
46.5 0.0 0.0
43.5 0.0 0.0
40.0 0.0 0.0
90.9 0.0 0.0
42.0 0.0 0.0
45.5 0.0 0.0
35.7 0.0 0.0
27.4 2.1 1.1
33.9 5.1 0.0
37.5 0.0 0.0
44.4 0.0 0.0
24.3 0.0 0.0

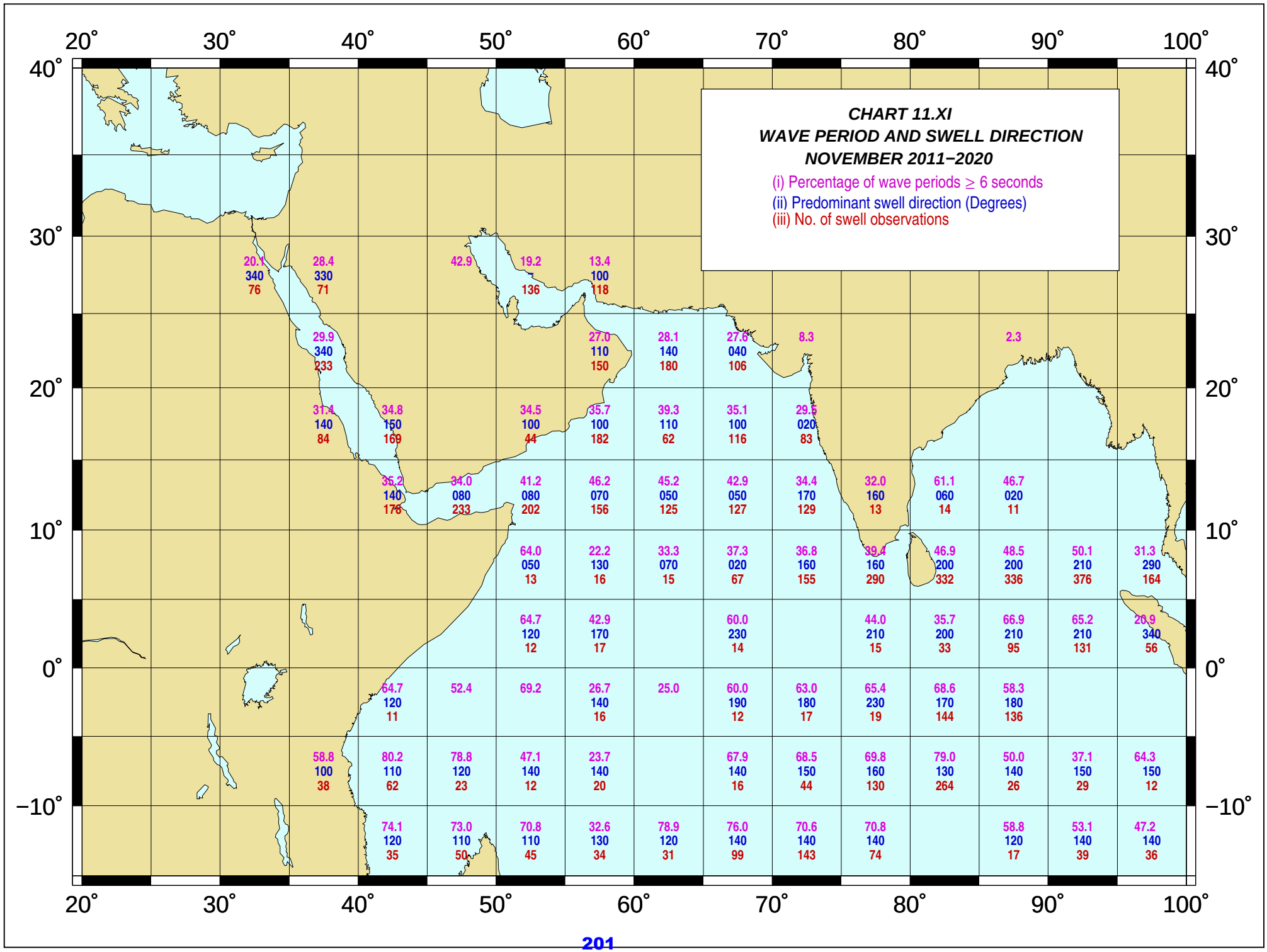


CHART 11.XI
WAVE PERIOD AND SWELL DIRECTION
NOVEMBER 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
20.1 340 76
28.4 330 71
42.9
19.2 136
13.4 100 118
29.9 340 233
27.0 110 150
28.1 140 180
27.6 040 106
8.3
2.3
31.4 140 84
34.8 150 169
34.5 100 44
35.7 100 182
39.3 110 62
35.1 100 116
29.5 020 83
35.2 140 176
34.0 080 233
41.2 080 202
46.2 070 156
45.2 050 125
42.9 050 127
34.4 170 129
32.0 160 13
61.1 060 14
46.7 020 11
64.0 050 13
22.2 130 16
33.3 070 15
37.3 020 67
36.8 160 155
39.4 160 290
46.9 200 332
48.5 200 336
50.1 210 376
31.3 290 164
64.7 120 12
42.9 170 17
60.0 230 14
44.0 210 15
35.7 200 33
66.9 210 95
65.2 210 131
20.9 340 56
64.7 120 11
52.4
69.2
26.7 140 16
25.0
60.0 190 12
63.0 180 17
65.4 230 19
68.6 170 144
58.3 180 136
58.8 100 38
80.2 110 62
78.8 120 23
47.1 140 12
23.7 140 20
67.9 140 16
68.5 150 44
69.8 160 130
79.0 130 264
50.0 140 26
37.1 150 29
64.3 150 12
74.1 120 35
73.0 110 50
70.8 110 45
32.6 130 34
78.9 120 31
76.0 140 99
70.6 140 143
70.8 140 74
58.8 120 17
53.1 140 39
47.2 140 36

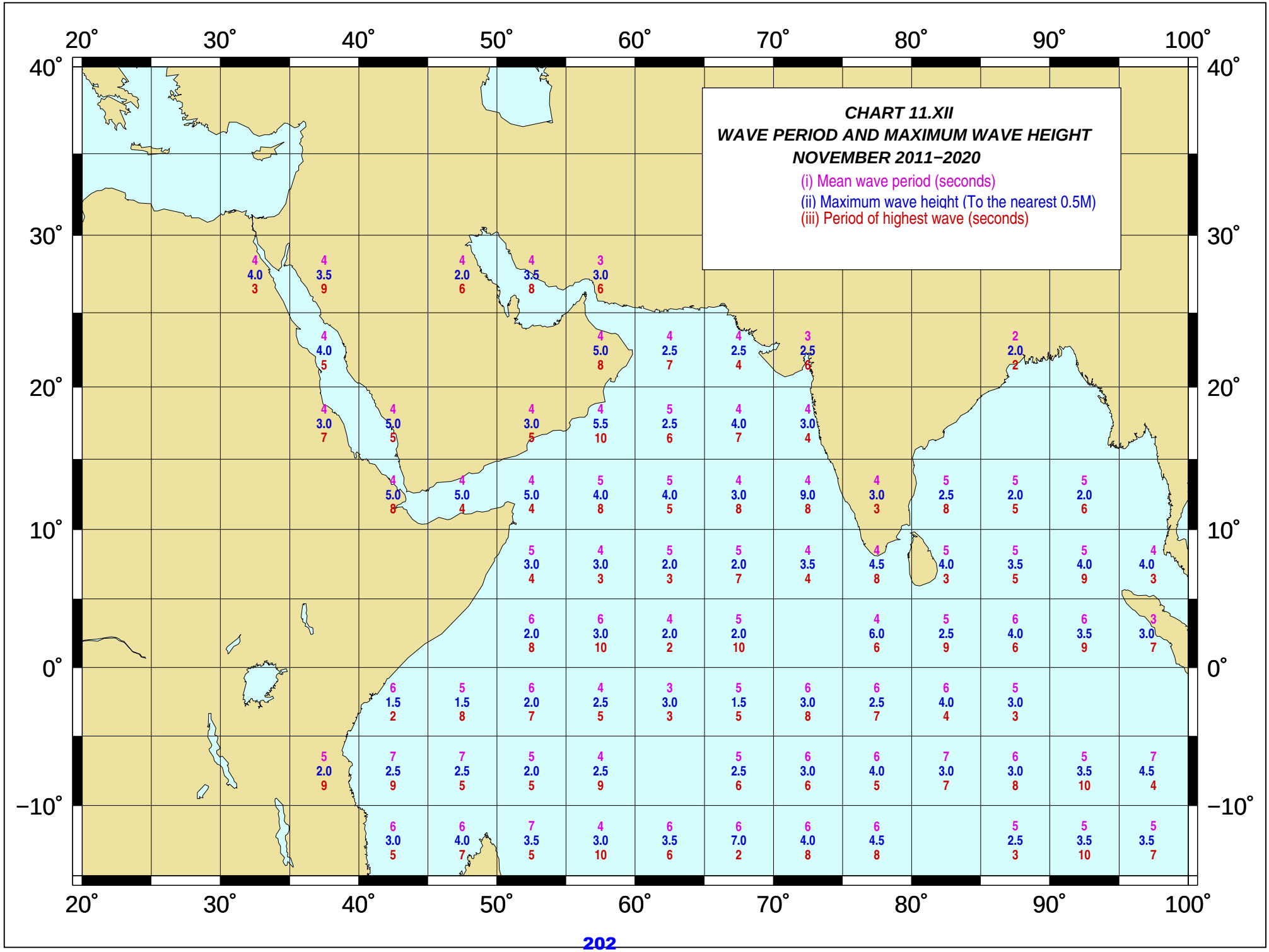


CHART 11.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
NOVEMBER 2011–2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°

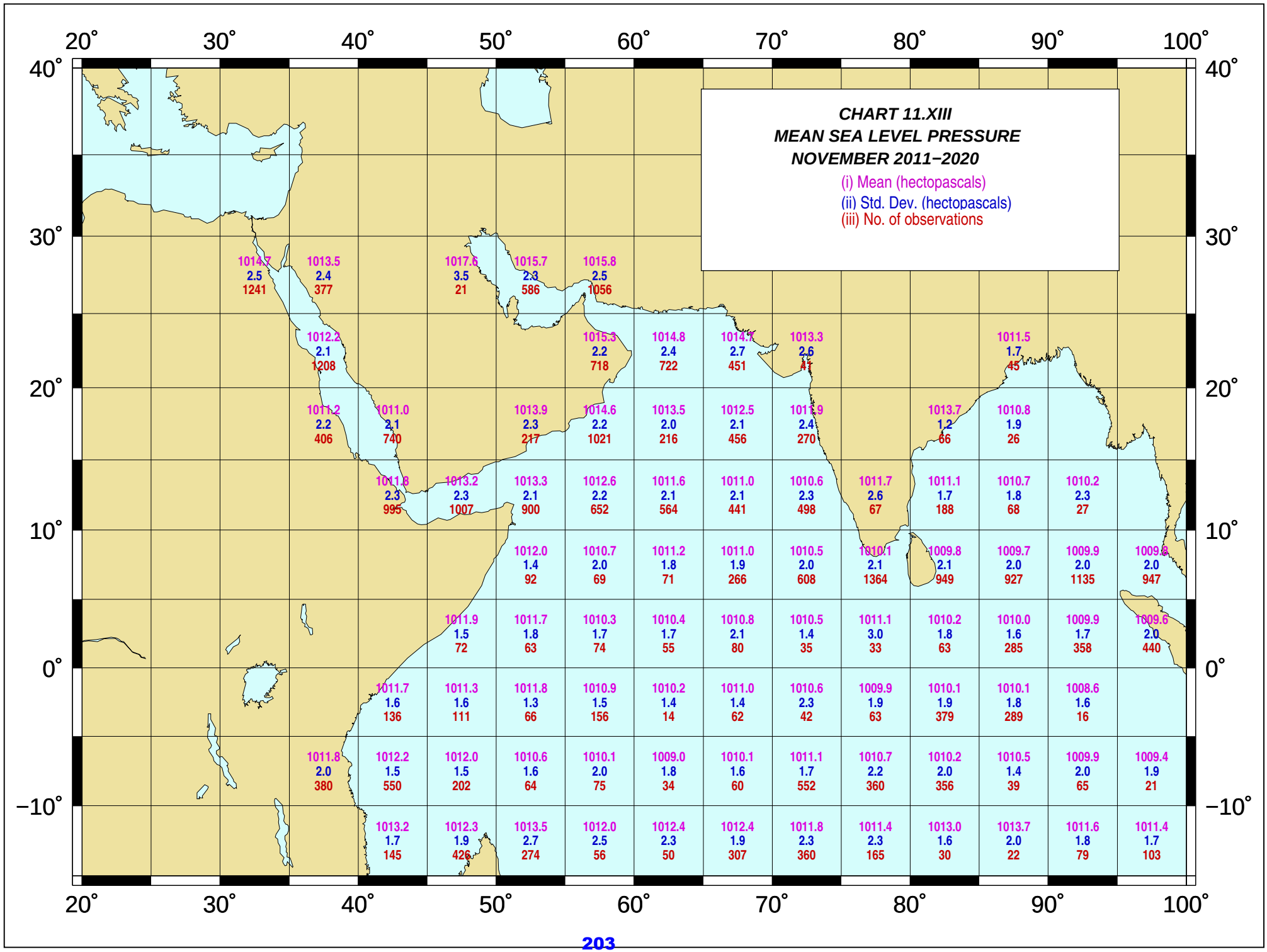


CHART 11.XIII
MEAN SEA LEVEL PRESSURE
NOVEMBER 2011–2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1014.7 2.5 1241
1013.5 2.4 377
1017.6 3.5 21
1015.7 2.3 586
1015.8 2.5 1056
1012.2 2.1 1208
1015.3 2.2 718
1014.8 2.4 722
1014.7 2.7 451
1013.3 2.6 41
1011.5 1.7 45
1011.2 2.2 406
1011.0 2.1 740
1013.9 2.3 217
1014.6 2.2 1021
1013.5 2.0 216
1012.5 2.1 456
1013.7 1.2 66
1010.8 1.9 26
1011.8 2.3 995
1013.2 2.3 1007
1013.3 2.1 900
1012.6 2.2 652
1011.6 2.1 564
1011.0 2.1 441
1010.6 2.3 498
1011.7 2.6 67
1011.1 1.7 188
1010.7 1.8 68
1010.2 2.3 27
1012.0 1.4 92
1010.7 2.0 69
1011.2 1.8 71
1011.0 1.9 266
1010.5 2.0 608
1010.1 2.1 1364
1009.8 2.1 949
1009.7 2.0 927
1009.9 2.0 1135
1009.8 2.0 947
1011.9 1.5 72
1011.7 1.8 63
1010.3 1.7 74
1010.4 1.7 55
1010.8 2.1 80
1010.5 1.4 35
1011.1 3.0 33
1010.2 1.8 63
1010.0 1.6 285
1009.9 1.7 358
1009.6 2.0 440
1011.7 1.6 136
1011.3 1.6 111
1011.8 1.3 66
1010.9 1.5 156
1010.2 1.4 14
1011.0 1.4 62
1010.6 2.3 42
1009.9 1.9 63
1010.1 1.9 379
1010.1 1.8 289
1008.6 1.6 16
1011.8 2.0 380
1012.2 1.5 550
1012.0 1.5 202
1010.6 1.6 64
1010.1 2.0 75
1009.0 1.8 34
1010.1 1.6 60
1011.1 1.7 552
1010.7 2.2 360
1010.2 2.0 356
1010.5 1.4 39
1009.9 2.0 65
1009.4 1.9 21
1013.2 1.7 145
1012.3 1.9 426
1013.5 2.7 274
1012.0 2.5 56
1012.4 2.3 50
1012.4 1.9 307
1011.8 2.3 360
1011.4 2.3 165
1013.0 1.6 30
1013.7 2.0 22
1011.6 1.8 79
1011.4 1.7 103

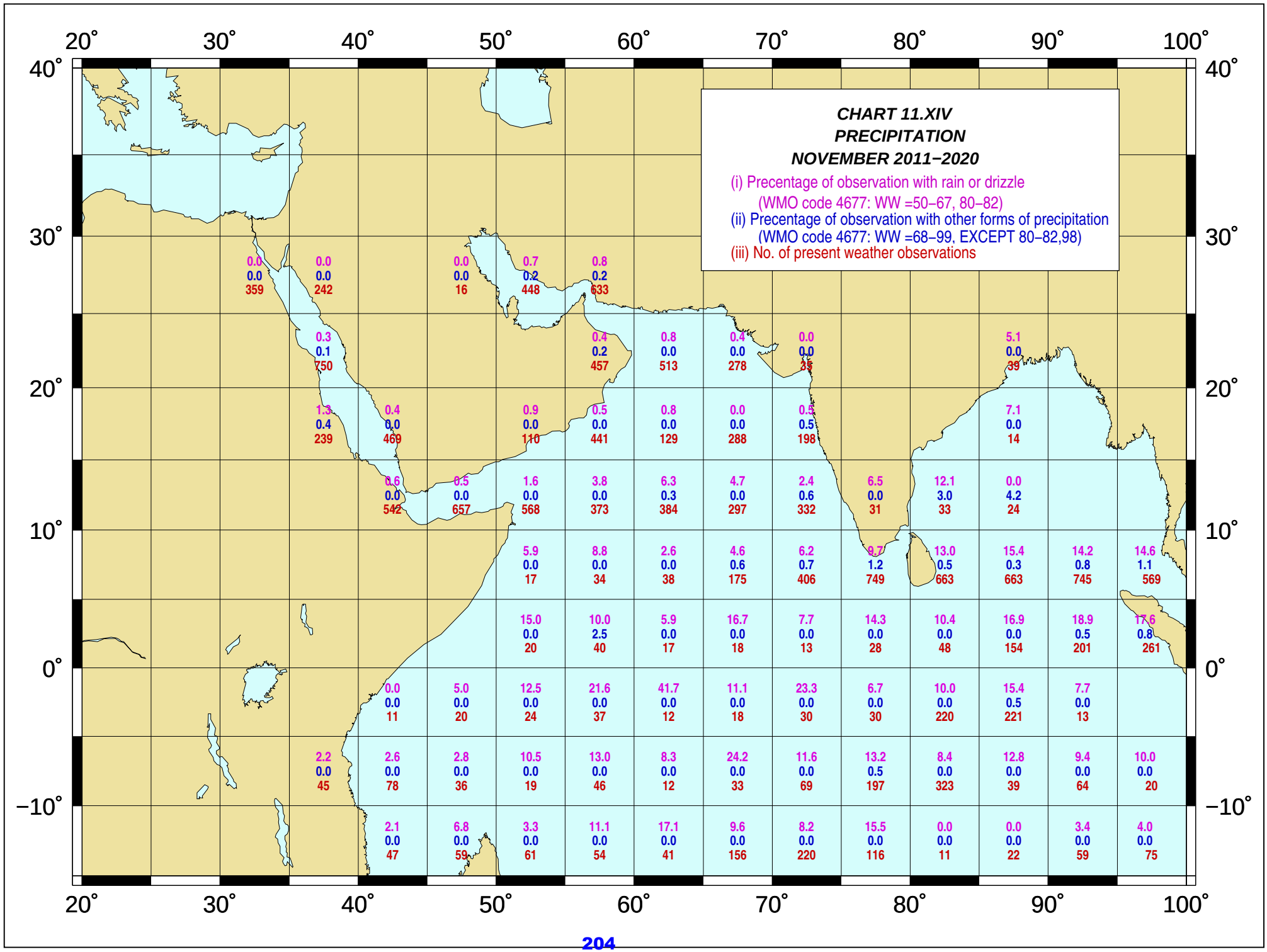


CHART 11.XIV
PRECIPITATION
NOVEMBER 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 0.0 359
0.0 0.0 242
0.0 0.0 16
0.7 0.2 448
0.8 0.2 633
0.3 0.1 750
0.4 0.2 457
0.8 0.0 513
0.4 0.0 278
0.0 0.0 39
5.1 0.0 39
1.3 0.4 239
0.4 0.0 469
0.9 0.0 110
0.5 0.0 441
0.8 0.0 129
0.0 0.0 288
0.5 0.5 198
7.1 0.0 14
0.6 0.0 542
0.5 0.0 657
1.6 0.0 568
3.8 0.0 373
6.3 0.3 384
4.7 0.0 297
2.4 0.6 332
6.5 0.0 31
12.1 3.0 33
0.0 4.2 24
5.9 0.0 17
8.8 0.0 34
2.6 0.0 38
4.6 0.6 175
6.2 0.7 406
9.7 1.2 749
13.0 0.5 663
15.4 0.3 663
14.2 0.8 745
14.6 1.1 569
15.0 0.0 20
10.0 2.5 40
5.9 0.0 17
16.7 0.0 18
7.7 0.0 13
14.3 0.0 28
10.4 0.0 48
16.9 0.0 154
18.9 0.5 201
17.6 0.8 261
0.0 0.0 11
5.0 0.0 20
12.5 0.0 24
21.6 0.0 37
41.7 0.0 12
11.1 0.0 18
23.3 0.0 30
6.7 0.0 30
10.0 0.0 220
15.4 0.5 221
7.7 0.0 13
2.2 0.0 45
2.6 0.0 78
2.8 0.0 36
10.5 0.0 19
13.0 0.0 46
8.3 0.0 12
24.2 0.0 33
11.6 0.0 69
13.2 0.5 197
8.4 0.0 323
12.8 0.0 39
9.4 0.0 64
10.0 0.0 20
2.1 0.0 47
6.8 0.0 59
3.3 0.0 61
11.1 0.0 54
17.1 0.0 41
9.6 0.0 156
8.2 0.0 220
15.5 0.0 116
0.0 0.0 11
0.0 0.0 22
3.4 0.0 59
4.0 0.0 75

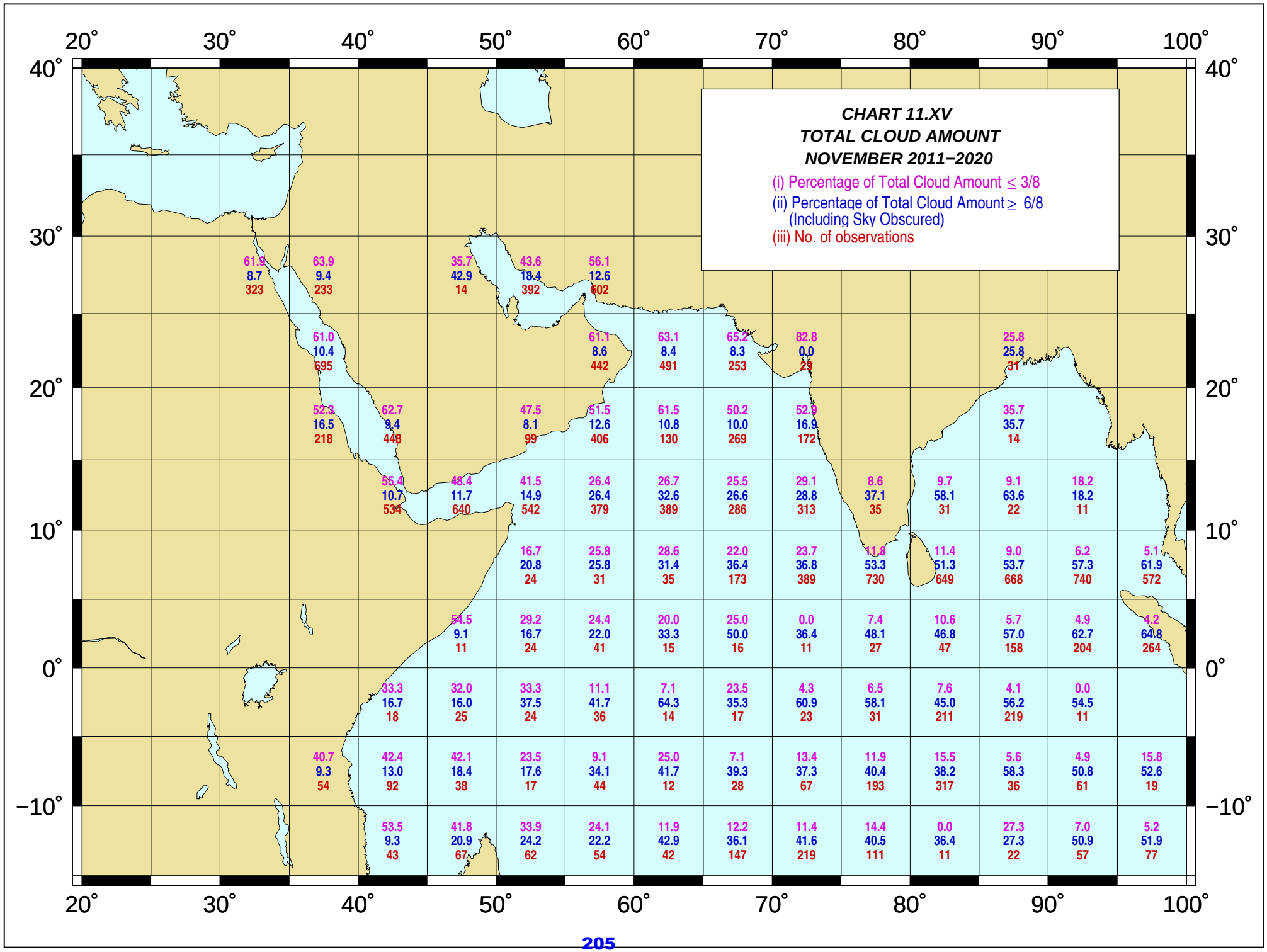


CHART 11.XV
TOTAL CLOUD AMOUNT
NOVEMBER 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
61.9 8.7 323
63.9 9.4 233
35.7 42.9 14
43.6 18.4 392
56.1 12.6 602
61.0 10.4 695
61.1 8.6 442
63.1 8.4 491
65.2 8.3 253
82.8 0.0 29
25.8 25.8 31
52.3 16.5 218
62.7 9.4 448
47.5 8.1 99
51.5 12.6 406
61.5 10.8 130
50.2 10.0 269
52.9 16.9 172
35.7 35.7 14
55.4 10.7 534
48.4 11.7 640
41.5 14.9 542
26.4 26.4 379
26.7 32.6 389
25.5 26.6 286
29.1 28.8 313
8.6 37.1 35
9.7 58.1 31
9.1 63.6 22
18.2 18.2 11
16.7 20.8 24
25.8 25.8 31
28.6 31.4 35
22.0 36.4 173
23.7 36.8 389
11.9 53.3 730
11.4 51.3 649
9.0 53.7 668
6.2 57.3 740
5.1 61.9 572
54.5 9.1 11
29.2 16.7 24
24.4 22.0 41
20.0 33.3 15
25.0 50.0 16
0.0 36.4 11
7.4 48.1 27
10.6 46.8 47
5.7 57.0 158
4.9 62.7 204
4.2 64.8 264
33.3 16.7 18
32.0 16.0 25
33.3 37.5 24
11.1 41.7 36
7.1 64.3 14
23.5 35.3 17
4.3 60.9 23
6.5 58.1 31
7.6 45.0 211
4.1 56.2 219
0.0 54.5 11
40.7 9.3 54
42.4 13.0 92
42.1 18.4 38
23.5 17.6 17
9.1 34.1 44
25.0 41.7 12
7.1 39.3 28
13.4 37.3 67
11.9 40.4 193
15.5 38.2 317
5.6 58.3 36
4.9 50.8 61
15.8 52.6 19
53.5 9.3 43
41.8 20.9 67
33.9 24.2 62
24.1 22.2 54
11.9 42.9 42
12.2 36.1 147
11.4 41.6 219
14.4 40.5 111
0.0 36.4 11
27.3 27.3 22
7.0 50.9 57
5.2 51.9 77

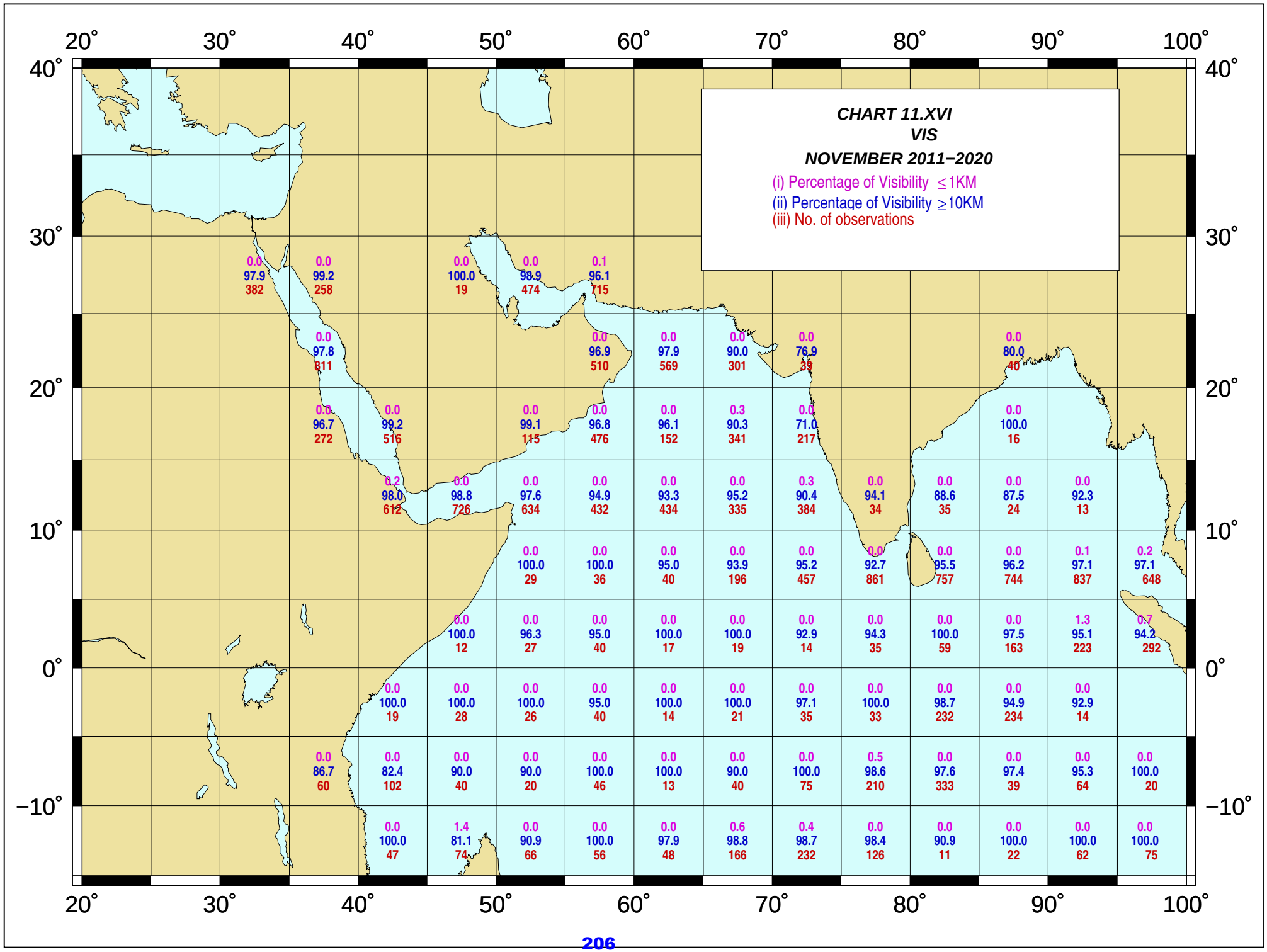


CHART 11.XVI
VIS
NOVEMBER 2011−2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 97.9 382
0.0 99.2 258
0.0 100.0 19
0.0 98.9 474
0.1 96.1 715
0.0 97.8 811
0.0 96.9 510
0.0 97.9 569
0.0 90.0 301
0.0 76.9 39
0.0 80.0 40
0.0 96.7 272
0.0 99.2 516
0.0 99.1 115
0.0 96.8 476
0.0 96.1 152
0.3 90.3 341
0.0 71.0 217
0.0 100.0 16
0.2 98.0 612
0.0 98.8 726
0.0 97.6 634
0.0 94.9 432
0.0 93.3 434
0.0 95.2 335
0.3 90.4 384
0.0 94.1 34
0.0 88.6 35
0.0 87.5 24
0.0 92.3 13
0.0 100.0 29
0.0 100.0 36
0.0 95.0 40
0.0 93.9 196
0.0 95.2 457
0.0 92.7 861
0.0 95.5 757
0.0 96.2 744
0.1 97.1 837
0.2 97.1 648
0.0 100.0 12
0.0 96.3 27
0.0 95.0 40
0.0 100.0 17
0.0 100.0 19
0.0 92.9 14
0.0 94.3 35
0.0 100.0 59
0.0 97.5 163
1.3 95.1 223
0.7 94.2 292
0.0 100.0 19
0.0 100.0 28
0.0 100.0 26
0.0 95.0 40
0.0 100.0 14
0.0 100.0 21
0.0 97.1 35
0.0 100.0 33
0.0 98.7 232
0.0 94.9 234
0.0 92.9 14
0.0 86.7 60
0.0 82.4 102
0.0 90.0 40
0.0 90.0 20
0.0 100.0 46
0.0 100.0 13
0.0 90.0 40
0.0 100.0 75
0.5 98.6 210
0.0 97.6 333
0.0 97.4 39
0.0 95.3 64
0.0 100.0 20
0.0 100.0 47
1.4 81.1 74
0.0 90.9 66
0.0 100.0 56
0.0 97.9 48
0.6 98.8 166
0.4 98.7 232
0.0 98.4 126
0.0 90.9 11
0.0 100.0 22
0.0 100.0 62
0.0 100.0 75

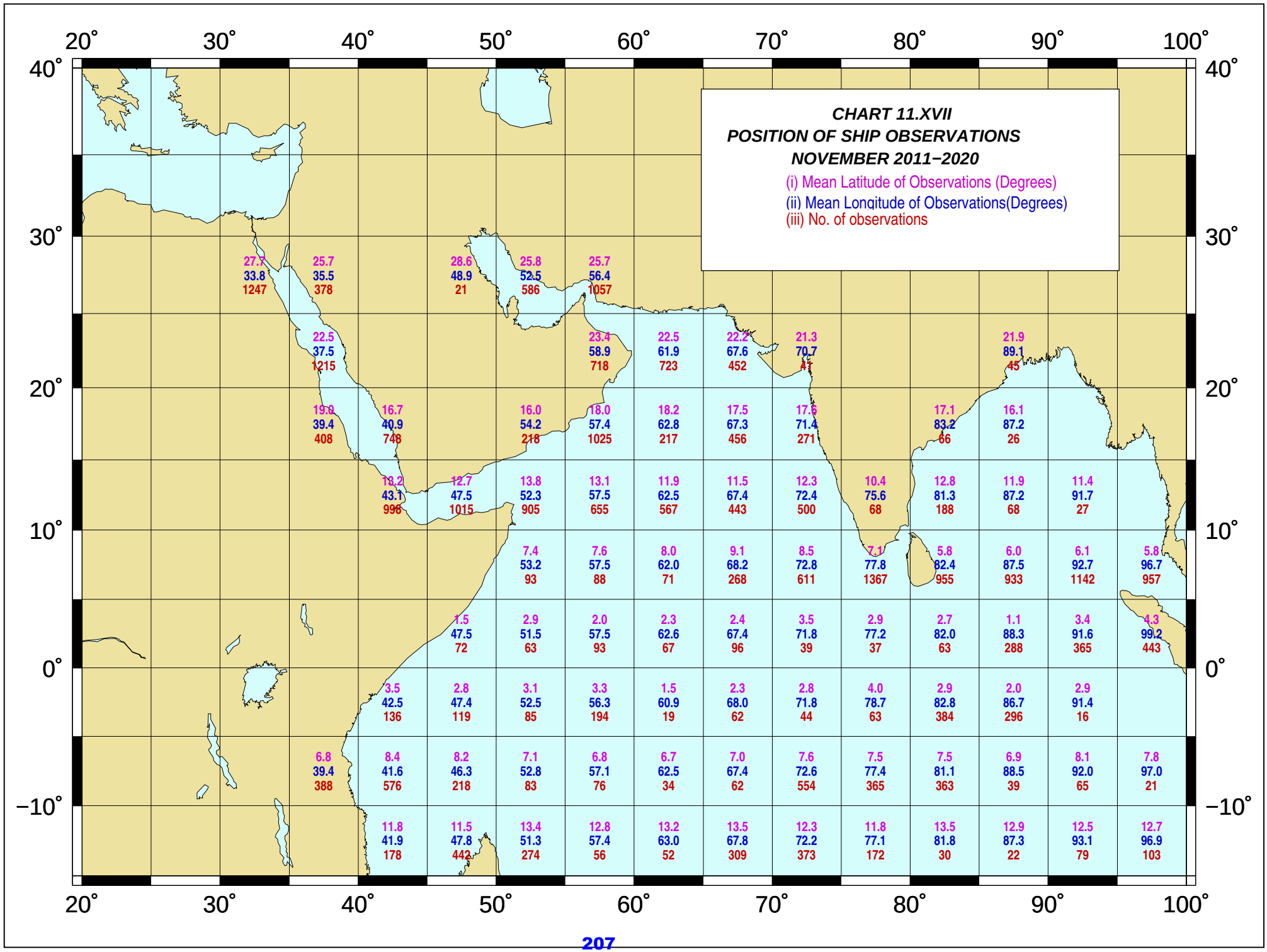


CHART 11.XVII
POSITION OF SHIP OBSERVATIONS
NOVEMBER 2011−2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
27.7 33.8 1247
25.7 35.5 378
28.6 48.9 21
25.8 52.5 586
25.7 56.4 1057
22.5 37.5 1215
23.4 58.9 718
22.5 61.9 723
22.2 67.6 452
21.3 70.7 41
21.9 89.1 45
19.9 39.4 408
16.7 40.9 748
16.0 54.2 218
18.0 57.4 1025
18.2 62.8 217
17.5 67.3 456
17.5 71.4 271
17.1 83.2 66
16.1 87.2 26
10.2 43.1 996
12.7 47.5 1015
13.8 52.3 905
13.1 57.5 655
11.9 62.5 567
11.5 67.4 443
12.3 72.4 500
10.4 75.6 68
12.8 81.3 188
11.9 87.2 68
11.4 91.7 27
7.4 53.2 93
7.6 57.5 88
8.0 62.0 71
9.1 68.2 268
8.5 72.8 611
7.1 77.8 1367
5.8 82.4 955
6.0 87.5 933
6.1 92.7 1142
5.8 96.7 957
1.5 47.5 72
2.9 51.5 63
2.0 57.5 93
2.3 62.6 67
2.4 67.4 96
3.5 71.8 39
2.9 77.2 37
2.7 82.0 63
1.1 88.3 288
3.4 91.6 365
4.3 99.2 443
3.5 42.5 136
2.8 47.4 119
3.1 52.5 85
3.3 56.3 194
1.5 60.9 19
2.3 68.0 62
2.8 71.8 44
4.0 78.7 63
2.9 82.8 384
2.0 86.7 296
2.9 91.4 16
6.8 39.4 388
8.4 41.6 576
8.2 46.3 218
7.1 52.8 83
6.8 57.1 76
6.7 62.5 34
7.0 67.4 62
7.6 72.6 554
7.5 77.4 365
7.5 81.1 363
6.9 88.5 39
8.1 92.0 65
7.8 97.0 21
11.8 41.9 178
11.5 47.8 442
13.4 51.3 274
12.8 57.4 56
13.2 63.0 52
13.5 67.8 309
12.3 72.2 373
11.8 77.1 172
13.5 81.8 30
12.9 87.3 22
12.5 93.1 79
12.7 96.9 103

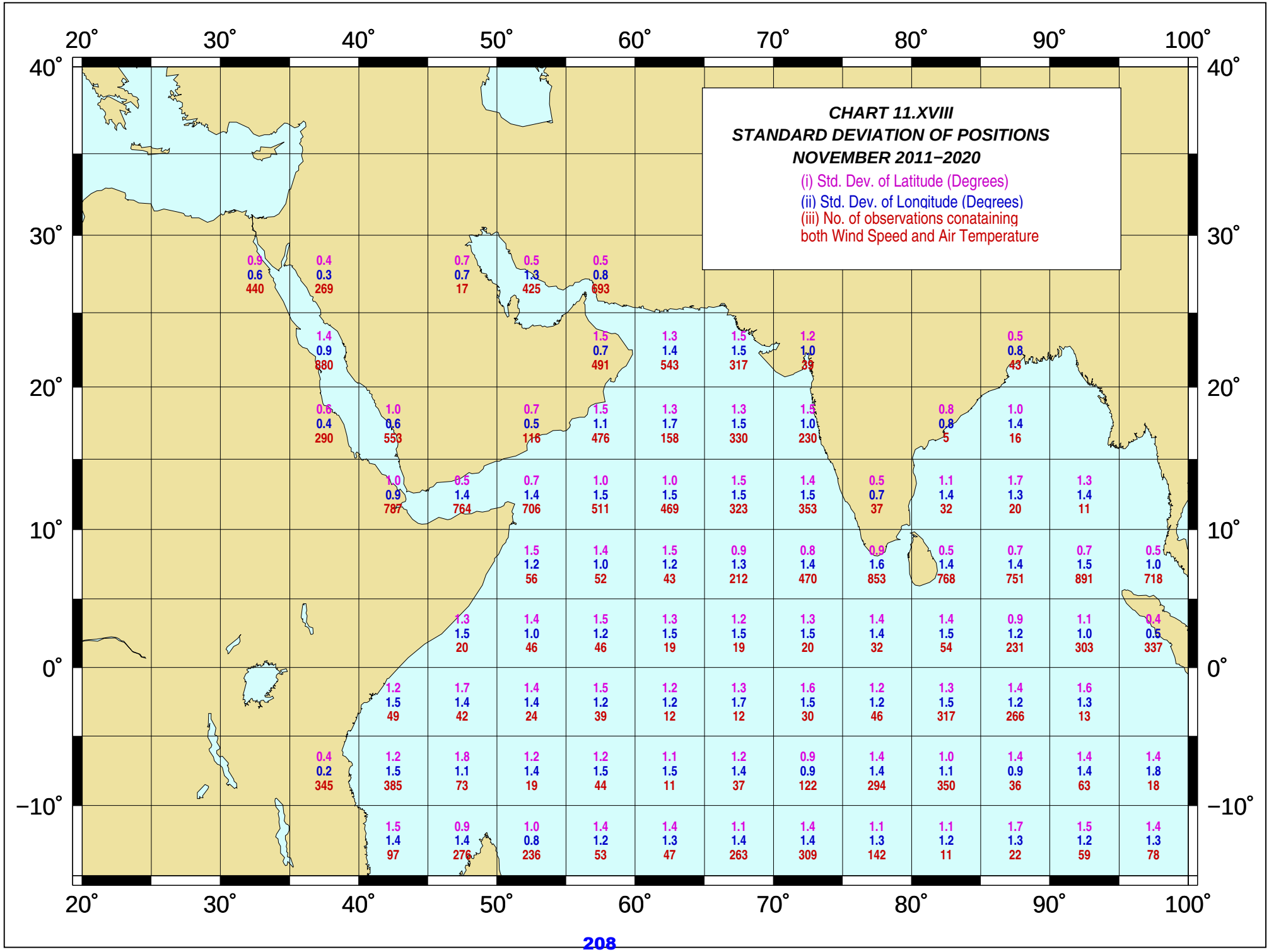
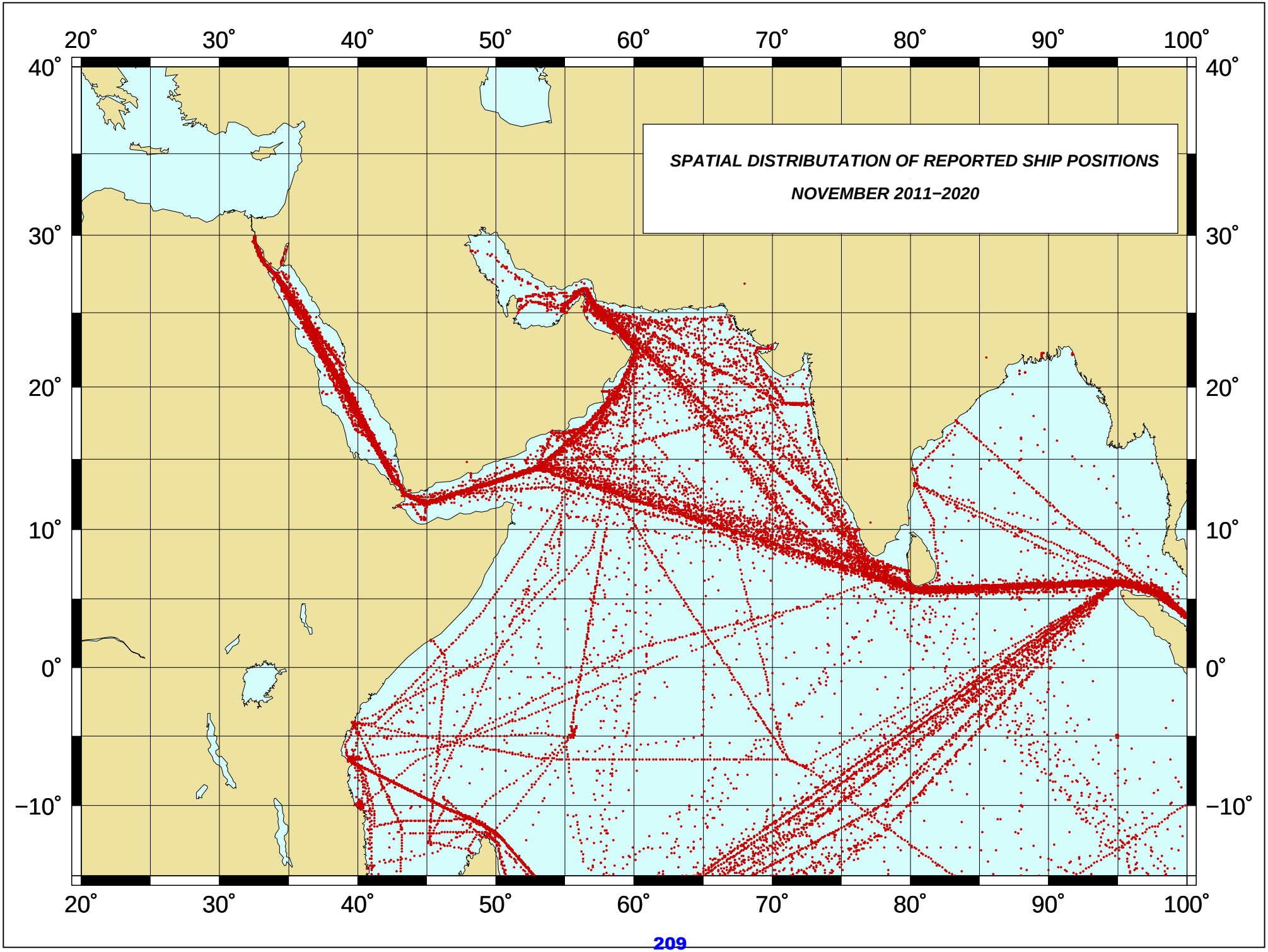


CHART 11.XVIII
STANDARD DEVIATION OF POSITIONS
NOVEMBER 2011−2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.9 0.6 440
0.4 0.3 269
0.7 0.7 17
0.5 1.3 425
0.5 0.8 693
1.4 0.9 880
1.5 0.7 491
1.3 1.4 543
1.5 1.5 317
1.2 1.0 39
0.5 0.8 43
0.6 0.4 290
1.0 0.6 553
0.7 0.5 116
1.5 1.1 476
1.3 1.7 158
1.3 1.5 330
1.5 1.0 230
0.8 0.8 5
1.0 1.4 16
1.0 0.9 787
0.5 1.4 764
0.7 1.4 706
1.0 1.5 511
1.0 1.5 469
1.5 1.5 323
1.4 1.5 353
0.5 0.7 37
1.1 1.4 32
1.7 1.3 20
1.3 1.4 11
1.5 1.2 56
1.4 1.0 52
1.5 1.2 43
0.9 1.3 212
0.8 1.4 470
0.9 1.6 853
0.5 1.4 768
0.7 1.4 751
0.7 1.5 891
0.5 1.0 718
1.3 1.5 20
1.4 1.0 46
1.5 1.2 46
1.3 1.5 19
1.2 1.5 19
1.3 1.5 20
1.4 1.4 32
1.4 1.5 54
0.9 1.2 231
1.1 1.0 303
0.4 0.5 337
1.2 1.5 49
1.7 1.4 42
1.4 1.4 24
1.5 1.2 39
1.2 1.2 12
1.3 1.7 12
1.6 1.5 30
1.2 1.2 46
1.3 1.5 317
1.4 1.2 266
1.6 1.3 13
0.4 0.2 345
1.2 1.5 385
1.8 1.1 73
1.2 1.4 19
1.2 1.5 44
1.1 1.5 11
1.2 1.4 37
0.9 0.9 122
1.4 1.4 294
1.0 1.1 350
1.4 0.9 36
1.4 1.4 63
1.4 1.8 18
1.5 1.4 97
0.9 1.4 276
1.0 0.8 236
1.4 1.2 53
1.4 1.3 47
1.1 1.4 263
1.4 1.4 309
1.1 1.3 142
1.1 1.2 11
1.7 1.3 22
1.5 1.2 59
1.4 1.3 78


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
NOVEMBER 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF DECEMBER 2011-2020

Marine Climatological Summary Charts 2011-2020

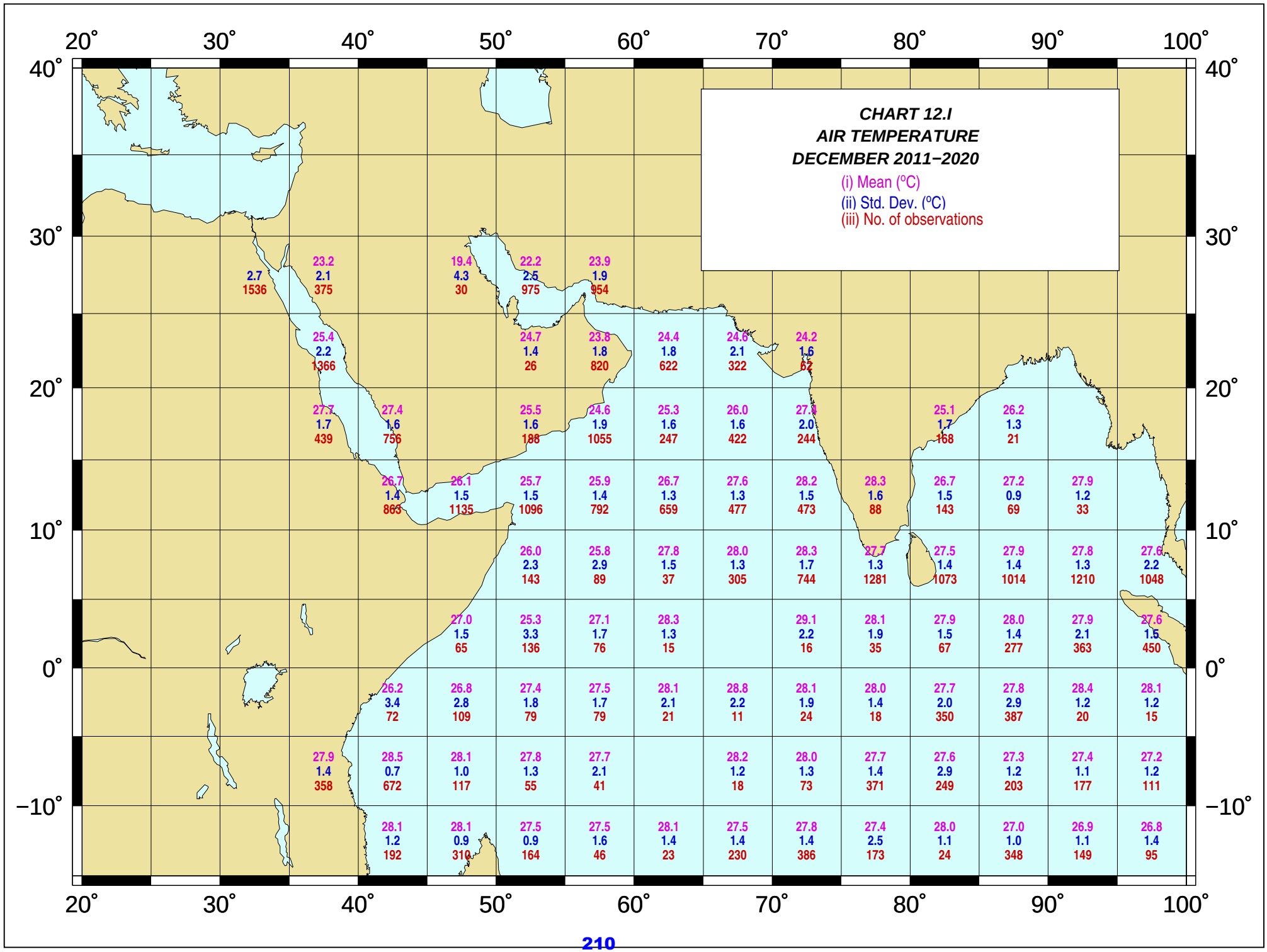


CHART 12.I
AIR TEMPERATURE
DECEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
2.7 1536
23.2 2.1 375
19.4 4.3 30
22.2 2.5 975
23.9 1.9 954
25.4 2.2 1366
24.7 1.4 26
23.8 1.8 820
24.4 1.8 622
24.6 2.1 322
24.2 1.6 62
27.7 1.7 439
27.4 1.6 756
25.5 1.6 188
24.6 1.9 1055
25.3 1.6 247
26.0 1.6 422
27.3 2.0 244
25.1 1.7 168
26.2 1.3 21
26.7 1.4 863
26.1 1.5 1135
25.7 1.5 1096
25.9 1.4 792
26.7 1.3 659
27.6 1.3 477
28.2 1.5 473
28.3 1.6 88
26.7 1.5 143
27.2 0.9 69
27.9 1.2 33
26.0 2.3 143
25.8 2.9 89
27.8 1.5 37
28.0 1.3 305
28.3 1.7 744
27.7 1.3 1281
27.5 1.4 1073
27.9 1.4 1014
27.8 1.3 1210
27.6 2.2 1048
27.0 1.5 65
25.3 3.3 136
27.1 1.7 76
28.3 1.3 15
29.1 2.2 16
28.1 1.9 35
27.9 1.5 67
28.0 1.4 277
27.9 2.1 363
27.6 1.5 450
26.2 3.4 72
26.8 2.8 109
27.4 1.8 79
27.5 1.7 79
28.1 2.1 21
28.8 2.2 11
28.1 1.9 24
28.0 1.4 18
27.7 2.0 350
27.8 2.9 387
28.4 1.2 20
28.1 1.2 15
27.9 1.4 358
28.5 0.7 672
28.1 1.0 117
27.8 1.3 55
27.7 2.1 41
28.2 1.2 18
28.0 1.3 73
27.7 1.4 371
27.6 2.9 249
27.3 1.2 203
27.4 1.1 177
27.2 1.2 111
28.1 1.2 192
28.1 0.9 310
27.5 0.9 164
27.5 1.6 46
28.1 1.4 23
27.5 1.4 230
27.8 1.4 386
27.4 2.5 173
28.0 1.1 24
27.0 1.0 348
26.9 1.1 149
26.8 1.4 95

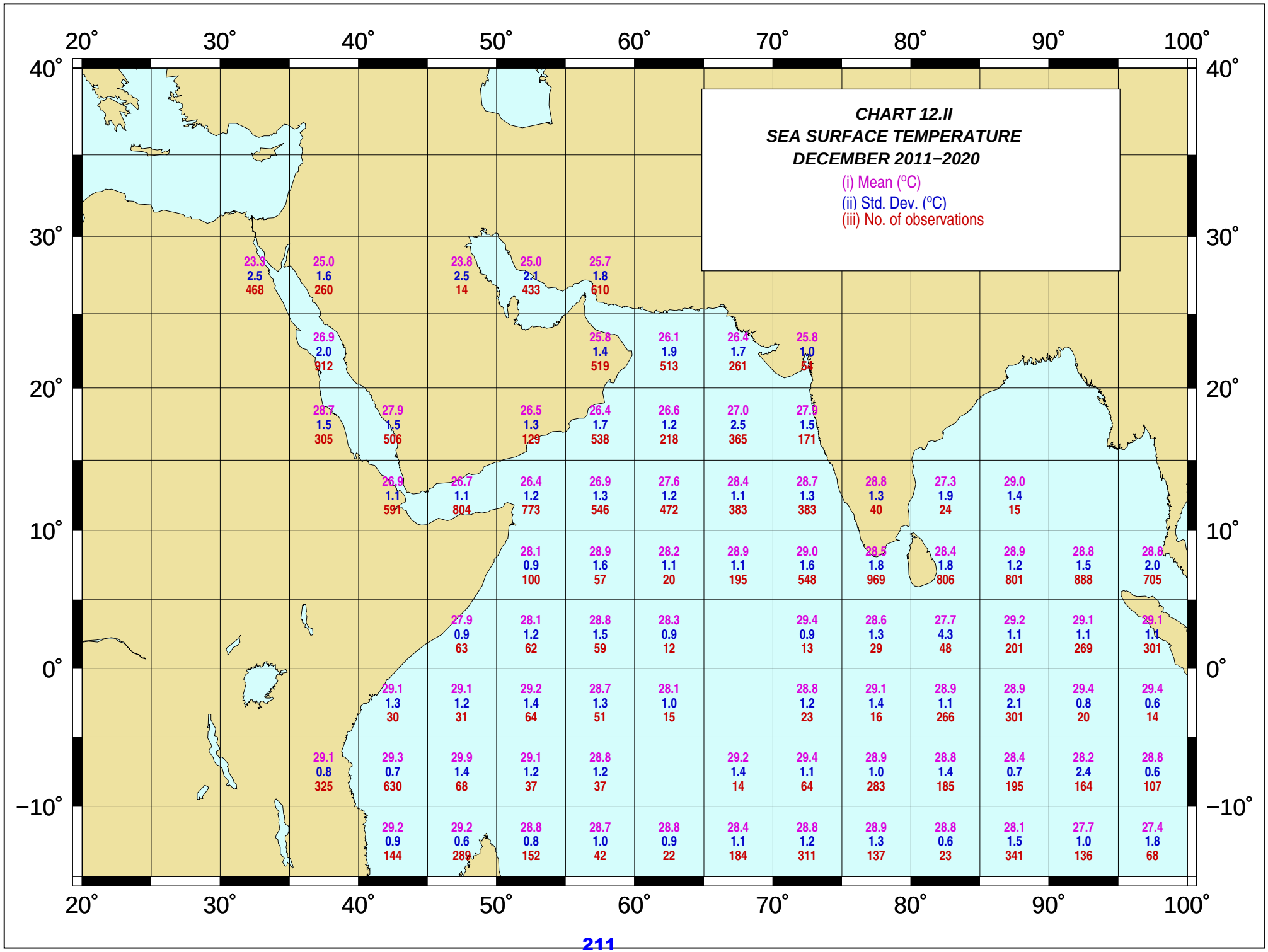


CHART 12.II
SEA SURFACE TEMPERATURE
DECEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
23.3 2.5 468
25.0 1.6 260
23.8 2.5 14
25.0 2.1 433
25.7 1.8 610
26.9 2.0 912
25.8 1.4 519
26.1 1.9 513
26.4 1.7 261
25.8 1.0 56
28.7 1.5 305
27.9 1.5 506
26.5 1.3 129
26.4 1.7 538
26.6 1.2 218
27.0 2.5 365
27.9 1.5 171
26.9 1.1 591
26.7 1.1 804
26.4 1.2 773
26.9 1.3 546
27.6 1.2 472
28.4 1.1 383
28.7 1.3 383
28.8 1.3 40
27.3 1.9 24
29.0 1.4 15
28.1 0.9 100
28.9 1.6 57
28.2 1.1 20
28.9 1.1 195
29.0 1.6 548
28.5 1.8 969
28.4 1.8 806
28.9 1.2 801
28.8 1.5 888
28.8 2.0 705
27.9 0.9 63
28.1 1.2 62
28.8 1.5 59
28.3 0.9 12
29.4 0.9 13
28.6 1.3 29
27.7 4.3 48
29.2 1.1 201
29.1 1.1 269
29.1 1.1 301
29.1 1.3 30
29.1 1.2 31
29.2 1.4 64
28.7 1.3 51
28.1 1.0 15
28.8 1.2 23
29.1 1.4 16
28.9 1.1 266
28.9 2.1 301
29.4 0.8 20
29.4 0.6 14
29.1 0.8 325
29.3 0.7 630
29.9 1.4 68
29.1 1.2 37
28.8 1.2 37
29.2 1.4 14
29.4 1.1 64
28.9 1.0 283
28.8 1.4 185
28.4 0.7 195
28.2 2.4 164
28.8 0.6 107
29.2 0.9 144
29.2 0.6 289
28.8 0.8 152
28.7 1.0 42
28.8 0.9 22
28.4 1.1 184
28.8 1.2 311
28.9 1.3 137
28.8 0.6 23
28.1 1.5 341
27.7 1.0 136
27.4 1.8 68

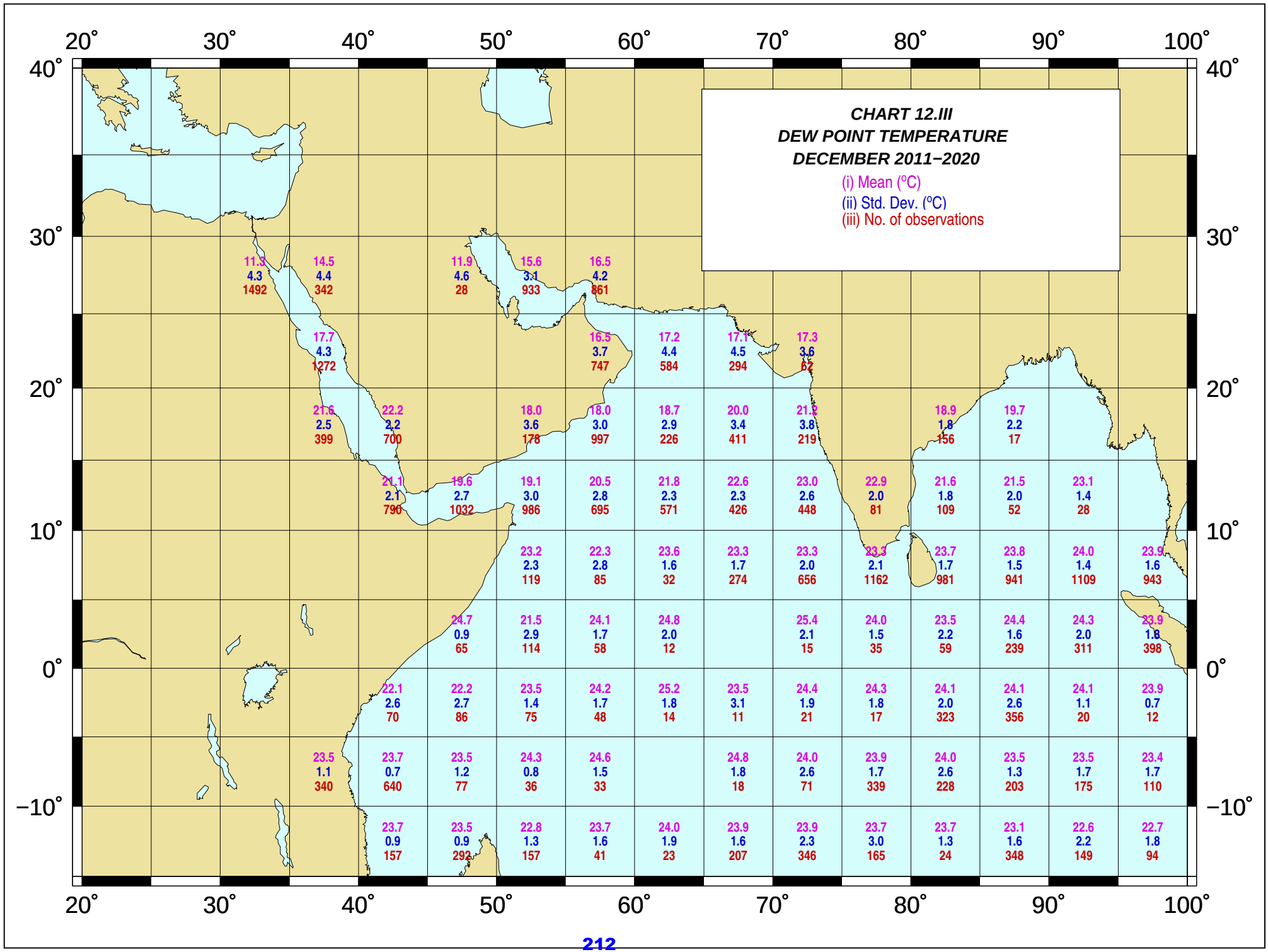


CHART 12.III
DEW POINT TEMPERATURE
DECEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
11.3 4.3 1492
14.5 4.4 342
11.9 4.6 28
15.6 3.1 933
16.5 4.2 861
17.7 4.3 1272
16.5 3.7 747
17.2 4.4 584
17.1 4.5 294
17.3 3.6 62
21.6 2.5 399
22.2 2.2 700
18.0 3.6 178
18.0 3.0 997
18.7 2.9 226
20.0 3.4 411
21.2 3.8 219
18.9 1.8 156
19.7 2.2 17
21.1 2.1 790
19.6 2.7 1032
19.1 3.0 986
20.5 2.8 695
21.8 2.3 571
22.6 2.3 426
23.0 2.6 448
22.9 2.0 81
21.6 1.8 109
21.5 2.0 52
23.1 1.4 28
23.2 2.3 119
22.3 2.8 85
23.6 1.6 32
23.3 1.7 274
23.3 2.0 656
23.9 2.1 1162
23.7 1.7 981
23.8 1.5 941
24.0 1.4 1109
23.9 1.6 943
24.7 0.9 65
21.5 2.9 114
24.1 1.7 58
24.8 2.0 12
25.4 2.1 15
24.0 1.5 35
23.5 2.2 59
24.4 1.6 239
24.3 2.0 311
23.9 1.8 398
22.1 2.6 70
22.2 2.7 86
23.5 1.4 75
24.2 1.7 48
25.2 1.8 14
23.5 3.1 11
24.4 1.9 21
24.3 1.8 17
24.1 2.0 323
24.1 2.6 356
24.1 1.1 20
23.9 0.7 12
23.5 1.1 340
23.7 0.7 640
23.5 1.2 77
24.3 0.8 36
24.6 1.5 33
24.8 1.8 18
24.0 2.6 71
23.9 1.7 339
24.0 2.6 228
23.5 1.3 203
23.5 1.7 175
23.4 1.7 110
23.7 0.9 157
23.5 0.9 292
22.8 1.3 157
23.7 1.6 41
24.0 1.9 23
23.9 1.6 207
23.9 2.3 346
23.7 3.0 165
23.7 1.3 24
23.1 1.6 348
22.6 2.2 149
22.7 1.8 94

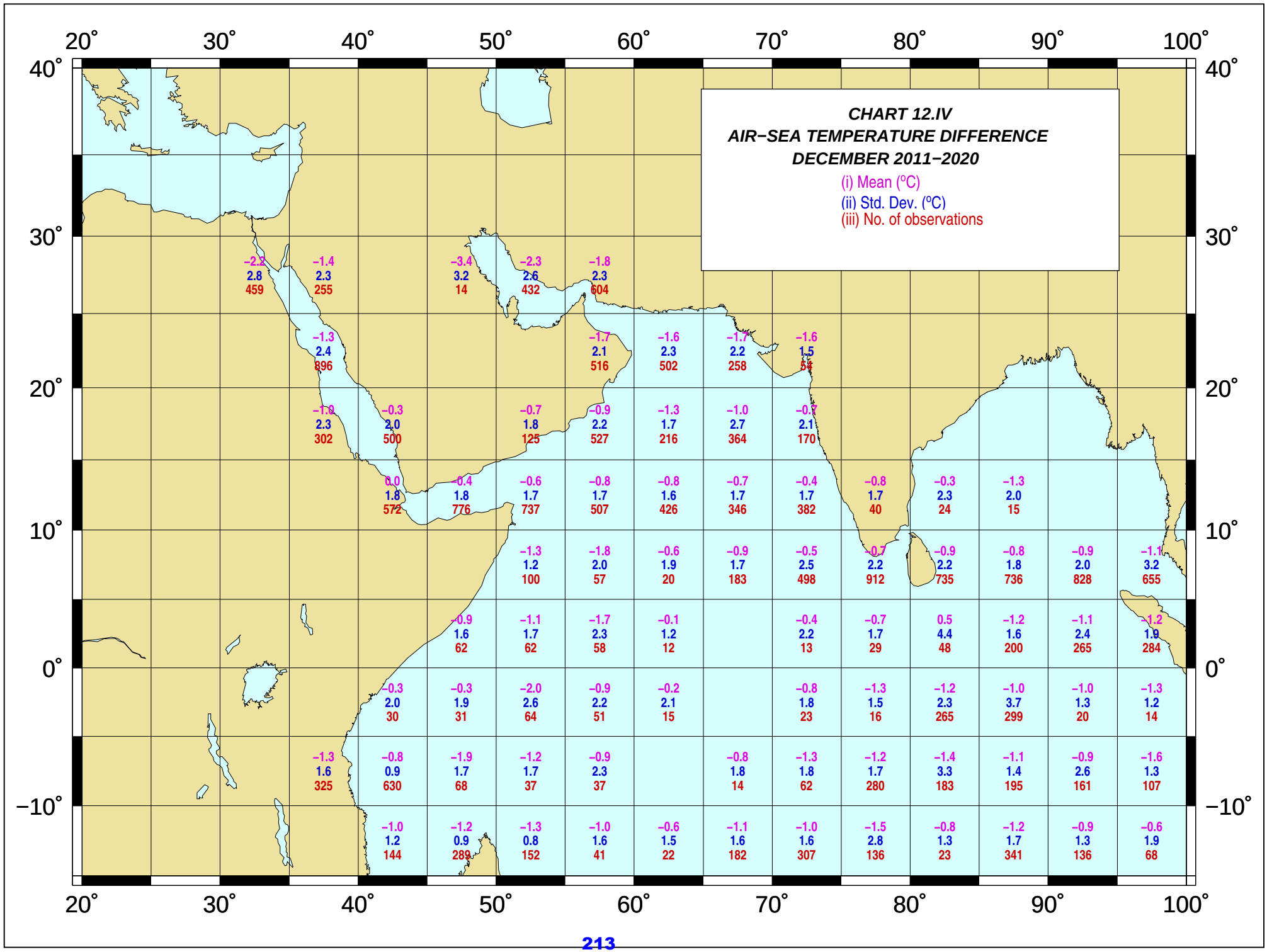


CHART 12.IV
AIR–SEA TEMPERATURE DIFFERENCE
DECEMBER 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
−2.2 2.8 459
−1.4 2.3 255
−3.4 3.2 14
−2.3 2.6 432
−1.8 2.3 604
−1.3 2.4 896
−1.7 2.1 516
−1.6 2.3 502
−1.7 2.2 258
−1.6 1.5 58
−1.9 2.3 302
−0.3 2.0 500
−0.7 1.8 125
−0.9 2.2 527
−1.3 1.7 216
−1.0 2.7 364
−0.7 2.1 170
0.0 1.8 572
−0.4 1.8 776
−0.6 1.7 737
−0.8 1.7 507
−0.8 1.6 426
−0.7 1.7 346
−0.4 1.7 382
−0.8 1.7 40
−0.3 2.3 24
−1.3 2.0 15
−1.3 1.2 100
−1.8 2.0 57
−0.6 1.9 20
−0.9 1.7 183
−0.5 2.5 498
−0.7 2.2 912
−0.9 2.2 735
−0.8 1.8 736
−0.9 2.0 828
−1.1 3.2 655
−0.9 1.6 62
−1.1 1.7 62
−1.7 2.3 58
−0.1 1.2 12
−0.4 2.2 13
−0.7 1.7 29
0.5 4.4 48
−1.2 1.6 200
−1.1 2.4 265
−1.2 1.9 284
−0.3 2.0 30
−0.3 1.9 31
−2.0 2.6 64
−0.9 2.2 51
−0.2 2.1 15
−0.8 1.8 23
−1.3 1.5 16
−1.2 2.3 265
−1.0 3.7 299
−1.0 1.3 20
−1.3 1.2 14
−1.3 1.6 325
−0.8 0.9 630
−1.9 1.7 68
−1.2 1.7 37
−0.9 2.3 37
−0.8 1.8 14
−1.3 1.8 62
−1.2 1.7 280
−1.4 3.3 183
−1.1 1.4 195
−0.9 2.6 161
−1.6 1.3 107
−1.0 1.2 144
−1.2 0.9 289
−1.3 0.8 152
−1.0 1.6 41
−0.6 1.5 22
−1.1 1.6 182
−1.0 1.6 307
−1.5 2.8 136
−0.8 1.3 23
−1.2 1.7 341
−0.9 1.3 136
−0.6 1.9 68

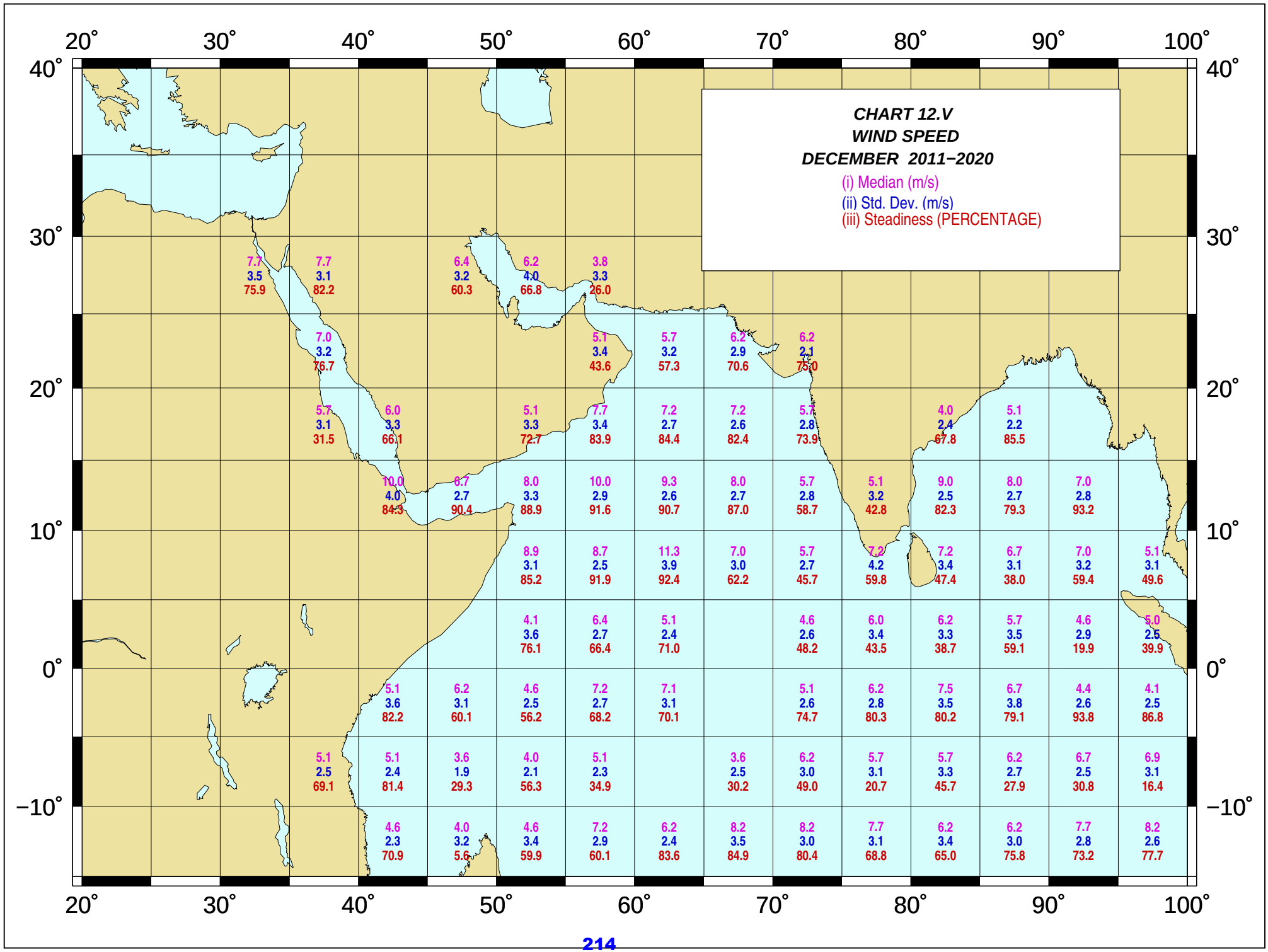


CHART 12.V
WIND SPEED
DECEMBER 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
7.7 3.5 75.9
7.7 3.1 82.2
6.4 3.2 60.3
6.2 4.0 66.8
3.8 3.3 26.0
7.0 3.2 76.7
5.1 3.4 43.6
5.7 3.2 57.3
6.2 2.9 70.6
6.2 2.1 75.0
5.7 3.1 31.5
6.0 3.3 66.1
5.1 3.3 72.7
7.7 3.4 83.9
7.2 2.7 84.4
7.2 2.6 82.4
5.7 2.8 73.9
4.0 2.4 67.8
5.1 2.2 85.5
10.0 4.0 84.3
6.7 2.7 90.4
8.0 3.3 88.9
10.0 2.9 91.6
9.3 2.6 90.7
8.0 2.7 87.0
5.7 2.8 58.7
5.1 3.2 42.8
9.0 2.5 82.3
8.0 2.7 79.3
7.0 2.8 93.2
8.9 3.1 85.2
8.7 2.5 91.9
11.3 3.9 92.4
7.0 3.0 62.2
5.7 2.7 45.7
7.2 4.2 59.8
7.2 3.4 47.4
6.7 3.1 38.0
7.0 3.2 59.4
5.1 3.1 49.6
4.1 3.6 76.1
6.4 2.7 66.4
5.1 2.4 71.0
4.6 2.6 48.2
6.0 3.4 43.5
6.2 3.3 38.7
5.7 3.5 59.1
4.6 2.9 19.9
5.0 2.5 39.9
5.1 3.6 82.2
6.2 3.1 60.1
4.6 2.5 56.2
7.2 2.7 68.2
7.1 3.1 70.1
5.1 2.6 74.7
6.2 2.8 80.3
7.5 3.5 80.2
6.7 3.8 79.1
4.4 2.6 93.8
4.1 2.5 86.8
5.1 2.5 69.1
5.1 2.4 81.4
3.6 1.9 29.3
4.0 2.1 56.3
5.1 2.3 34.9
3.6 2.5 30.2
6.2 3.0 49.0
5.7 3.1 20.7
5.7 3.3 45.7
6.2 2.7 27.9
6.7 2.5 30.8
6.9 3.1 16.4
4.6 2.3 70.9
4.0 3.2 5.6
4.6 3.4 59.9
7.2 2.9 60.1
6.2 2.4 83.6
8.2 3.5 84.9
8.2 3.0 80.4
7.7 3.1 68.8
6.2 3.4 65.0
6.2 3.0 75.8
7.7 2.8 73.2
8.2 2.6 77.7

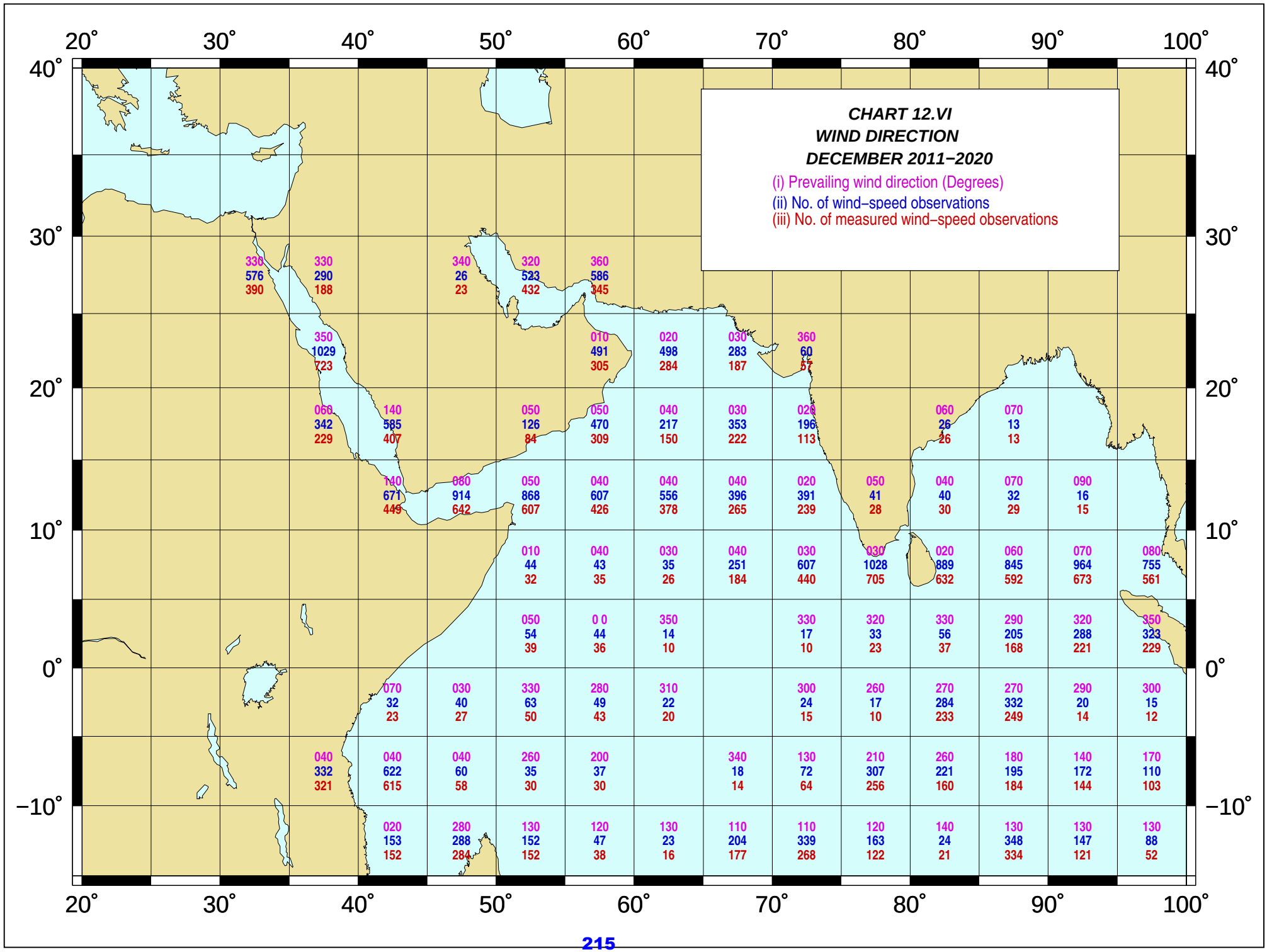


CHART 12.VI
WIND DIRECTION
DECEMBER 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
330 576 390
330 290 188
340 26 23
320 523 432
360 586 345
350 1029 723
010 491 305
020 498 284
030 283 187
360 60 57
060 342 229
140 585 407
050 126 84
050 470 309
040 217 150
030 353 222
020 196 113
060 26 26
070 13 13
140 671 449
080 914 642
050 868 607
040 607 426
040 556 378
040 396 265
020 391 239
050 41 28
040 40 30
070 32 29
090 16 15
010 44 32
040 43 35
030 35 26
040 251 184
030 607 440
030 1028 705
020 889 632
060 845 592
070 964 673
080 755 561
050 54 39
0 0 44 36
350 14 10
330 17 10
320 33 23
330 56 37
290 205 168
320 288 221
350 323 229
070 32 23
030 40 27
330 63 50
280 49 43
310 22 20
300 24 15
260 17 10
270 284 233
270 332 249
290 20 14
300 15 12
040 332 321
040 622 615
040 60 58
260 35 30
200 37 30
340 18 14
130 72 64
210 307 256
260 221 160
180 195 184
140 172 144
170 110 103
020 153 152
280 288 284
130 152 152
120 47 38
130 23 16
110 204 177
110 339 268
120 163 122
140 24 21
130 348 334
130 147 121
130 88 52

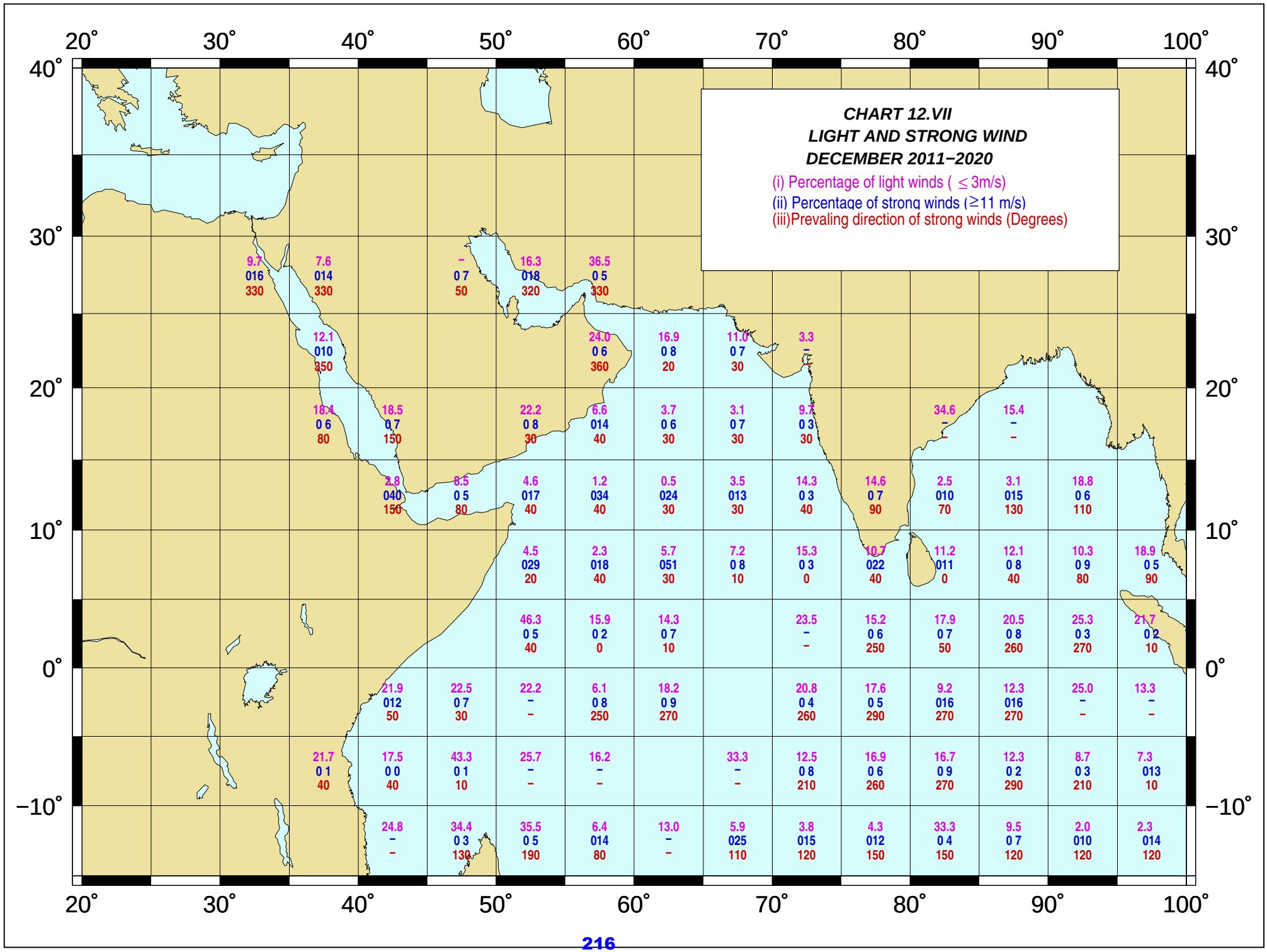


CHART 12.VII
LIGHT AND STRONG WIND
DECEMBER 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
9.7 016 330
7.6 014 330
– 07 50
16.3 018 320
36.5 05 330
12.1 010 350
24.0 06 360
16.9 08 20
11.0 07 30
3.3 –
18.4 06 80
18.5 07 150
22.2 08 30
6.6 014 40
3.7 06 30
3.1 07 30
9.7 03 30
34.6 – –
15.4 – –
2.8 040 150
8.5 05 80
4.6 017 40
1.2 034 40
0.5 024 30
3.5 013 30
14.3 03 40
14.6 07 90
2.5 010 70
3.1 015 130
18.8 06 110
4.5 029 20
2.3 018 40
5.7 051 30
7.2 08 10
15.3 03 0
10.7 022 40
11.2 011 0
12.1 08 40
10.3 09 80
18.9 05 90
46.3 05 40
15.9 02 0
14.3 07 10
23.5 – –
15.2 06 250
17.9 07 50
20.5 08 260
25.3 03 270
21.7 02 10
21.9 012 50
22.5 07 30
22.2 – –
6.1 08 250
18.2 09 270
20.8 04 260
17.6 05 290
9.2 016 270
12.3 016 270
25.0 – –
13.3 – –
21.7 01 40
17.5 00 40
43.3 01 10
25.7 – –
16.2 – –
33.3 – –
12.5 08 210
16.9 06 260
16.7 09 270
12.3 02 290
8.7 03 210
7.3 013 10
24.8 – –
34.4 03 130
35.5 05 190
6.4 014 80
13.0 – –
5.9 025 110
3.8 015 120
4.3 012 150
33.3 04 150
9.5 07 120
2.0 010 120
2.3 014 120

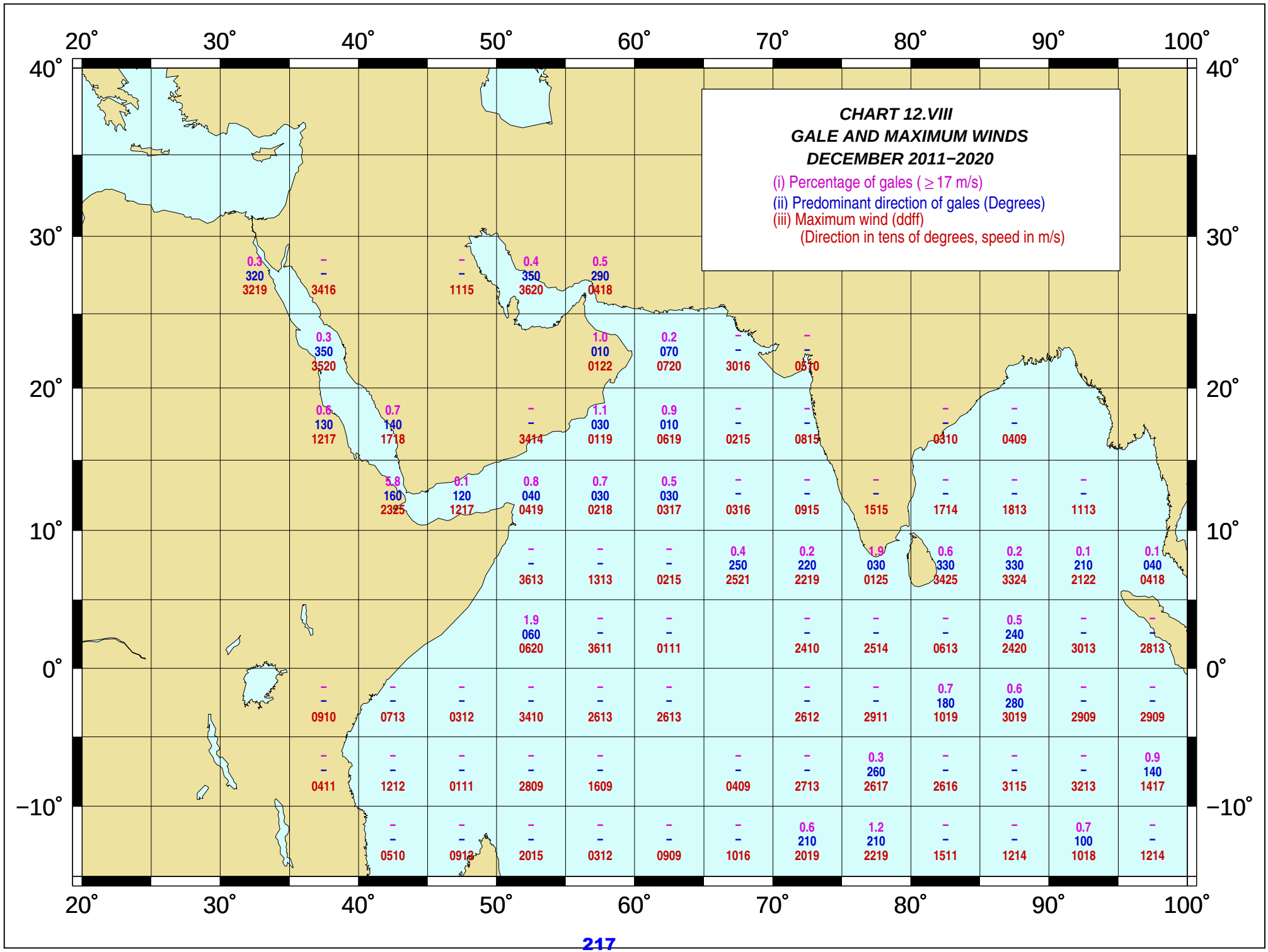


CHART 12.VIII
GALE AND MAXIMUM WINDS
DECEMBER 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.3 320 3219
– – 3416
– – 1115
0.4 350 3620
0.5 290 0418
0.3 350 3520
1.0 010 0122
0.2 070 0720
– – 3016
– – 0510
0.6 130 1217
0.7 140 1718
– – 3414
1.1 030 0119
0.9 010 0619
– – 0215
– – 0815
– – 0310
– – 0409
5.8 160 2325
0.1 120 1217
0.8 040 0419
0.7 030 0218
0.5 030 0317
– – 0316
– – 0915
– – 1515
– – 1714
– – 1813
– – 1113
– – 3613
– – 1313
– – 0215
0.4 250 2521
0.2 220 2219
1.9 030 0125
0.6 330 3425
0.2 330 3324
0.1 210 2122
0.1 040 0418
1.9 060 0620
– – 3611
– – 0111
– – 2410
– – 2514
– – 0613
0.5 240 2420
– – 3013
– – 2813
– – 0910
– – 0713
– – 0312
– – 3410
– – 2613
– – 2613
– – 2612
– – 2911
0.7 180 1019
0.6 280 3019
– – 2909
– – 2909
– – 0411
– – 1212
– – 0111
– – 2809
– – 1609
– – 0409
– – 2713
0.3 260 2617
– – 2616
– – 3115
– – 3213
0.9 140 1417
– – 0510
– – 0913
– – 2015
– – 0312
– – 0909
– – 1016
0.6 210 2019
1.2 210 2219
– – 1511
– – 1214
0.7 100 1018
– – 1214

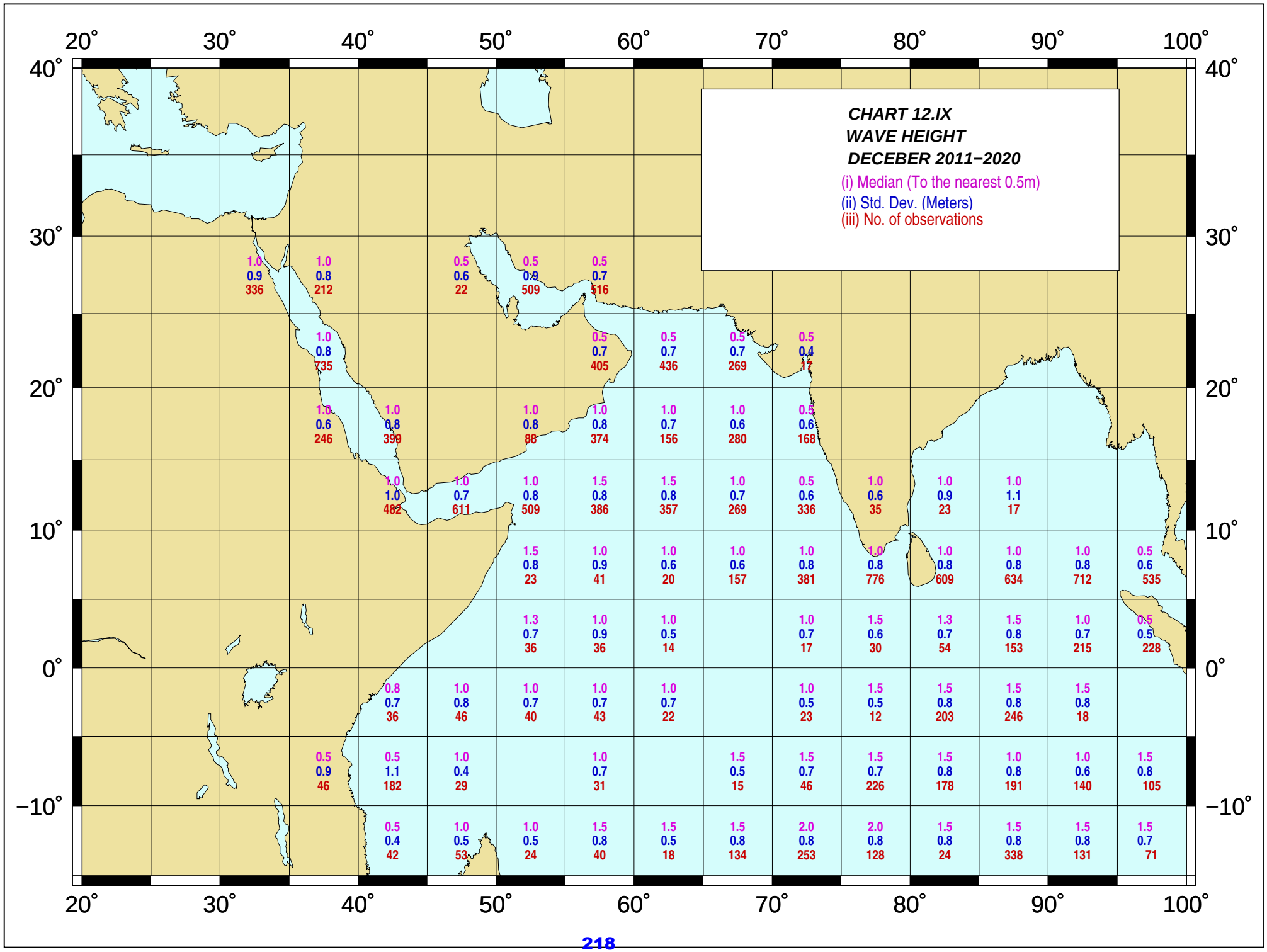


CHART 12.IX
WAVE HEIGHT
DECEBER 2011–2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.0 0.9 336
1.0 0.8 212
0.5 0.6 22
0.5 0.9 509
0.5 0.7 516
1.0 0.8 735
0.5 0.7 405
0.5 0.7 436
0.5 0.7 269
0.5 0.4
1.0 0.6 246
1.0 0.8 399
1.0 0.8 88
1.0 0.8 374
1.0 0.7 156
1.0 0.6 280
0.5 0.6 168
1.0 1.0 482
1.0 0.7 611
1.0 0.8 509
1.5 0.8 386
1.5 0.8 357
1.0 0.7 269
0.5 0.6 336
1.0 0.6 35
1.0 0.9 23
1.0 1.1 17
1.5 0.8 23
1.0 0.9 41
1.0 0.6 20
1.0 0.6 157
1.0 0.8 381
1.0 0.8 776
1.0 0.8 609
1.0 0.8 634
1.0 0.8 712
0.5 0.6 535
1.3 0.7 36
1.0 0.9 36
1.0 0.5 14
1.0 0.7 17
1.5 0.6 30
1.3 0.7 54
1.5 0.8 153
1.0 0.7 215
0.5 0.5 228
0.8 0.7 36
1.0 0.8 46
1.0 0.7 40
1.0 0.7 43
1.0 0.7 22
1.0 0.5 23
1.5 0.5 12
1.5 0.8 203
1.5 0.8 246
1.5 0.8 18
0.5 0.9 46
0.5 1.1 182
1.0 0.4 29
1.0 0.7 31
1.5 0.5 15
1.5 0.7 46
1.5 0.7 226
1.5 0.8 178
1.0 0.8 191
1.0 0.6 140
1.5 0.8 105
0.5 0.4 42
1.0 0.5 53
1.0 0.5 24
1.5 0.8 40
1.5 0.5 18
1.5 0.8 134
2.0 0.8 253
2.0 0.8 128
1.5 0.8 24
1.5 0.8 338
1.5 0.8 131
1.5 0.7 71

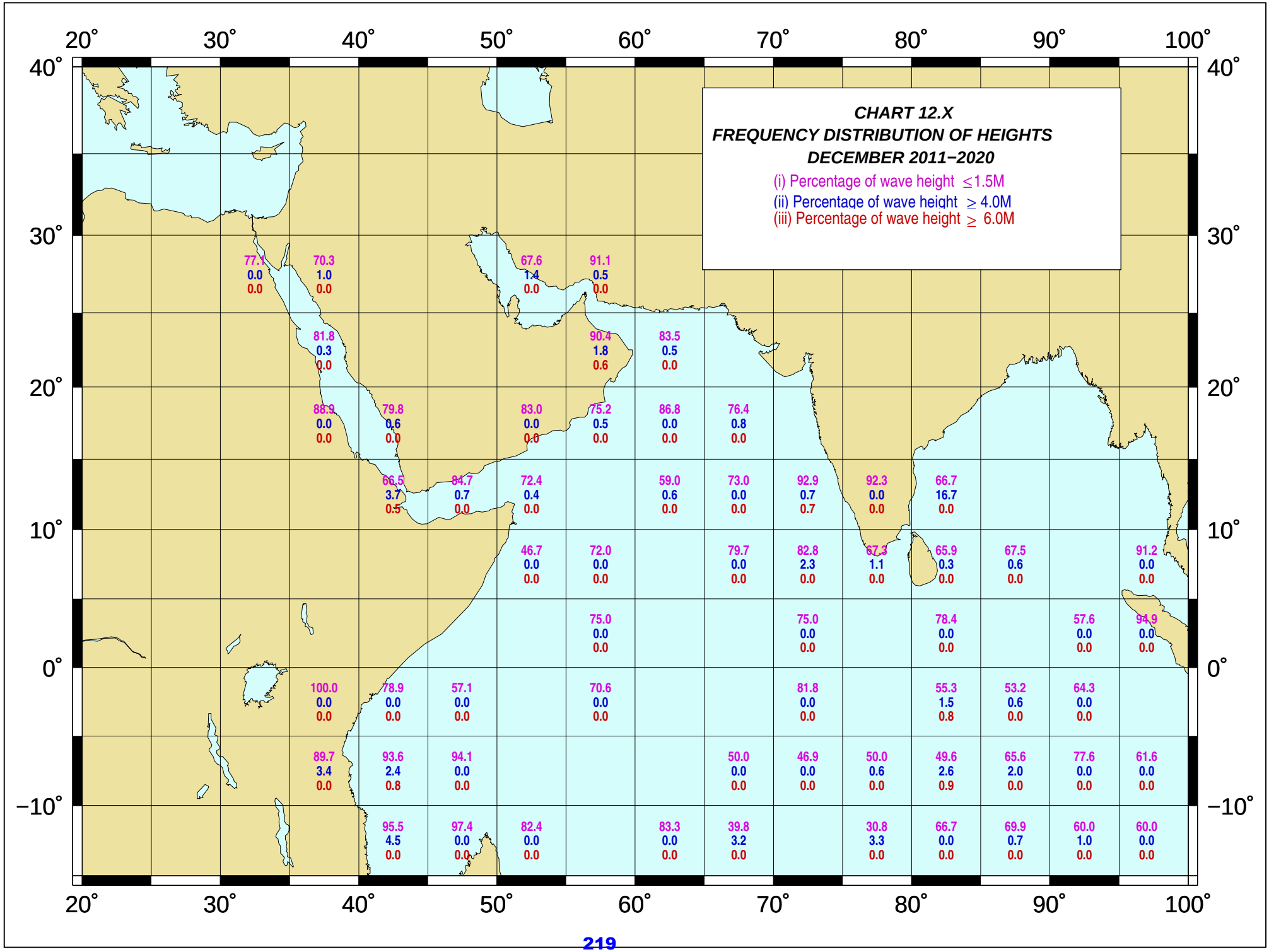


CHART 12.X
FREQUENCY DISTRIBUTION OF HEIGHTS
DECEMBER 2011−2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
77.1 0.0 0.0
70.3 1.0 0.0
67.6 1.4 0.0
91.1 0.5 0.0
81.8 0.3 0.0
90.4 1.8 0.6
83.5 0.5 0.0
88.9 0.0 0.0
79.8 0.6 0.0
83.0 0.0 0.0
75.2 0.5 0.0
86.8 0.0 0.0
76.4 0.8 0.0
66.5 3.7 0.5
84.7 0.7 0.0
72.4 0.4 0.0
59.0 0.6 0.0
73.0 0.0 0.0
92.9 0.7 0.7
92.3 0.0 0.0
66.7 16.7 0.0
46.7 0.0 0.0
72.0 0.0 0.0
79.7 0.0 0.0
82.8 2.3 0.0
67.3 1.1 0.0
65.9 0.3 0.0
67.5 0.6 0.0
91.2 0.0 0.0
75.0 0.0 0.0
75.0 0.0 0.0
78.4 0.0 0.0
57.6 0.0 0.0
94.9 0.0 0.0
100.0 0.0 0.0
78.9 0.0 0.0
57.1 0.0 0.0
70.6 0.0 0.0
81.8 0.0 0.0
55.3 1.5 0.8
53.2 0.6 0.0
64.3 0.0 0.0
89.7 3.4 0.0
93.6 2.4 0.8
94.1 0.0 0.0
50.0 0.0 0.0
46.9 0.0 0.0
50.0 0.6 0.0
49.6 2.6 0.9
65.6 2.0 0.0
77.6 0.0 0.0
61.6 0.0 0.0
95.5 4.5 0.0
97.4 0.0 0.0
82.4 0.0 0.0
83.3 0.0 0.0
39.8 3.2 0.0
30.8 3.3 0.0
66.7 0.0 0.0
69.9 0.7 0.0
60.0 1.0 0.0
60.0 0.0 0.0

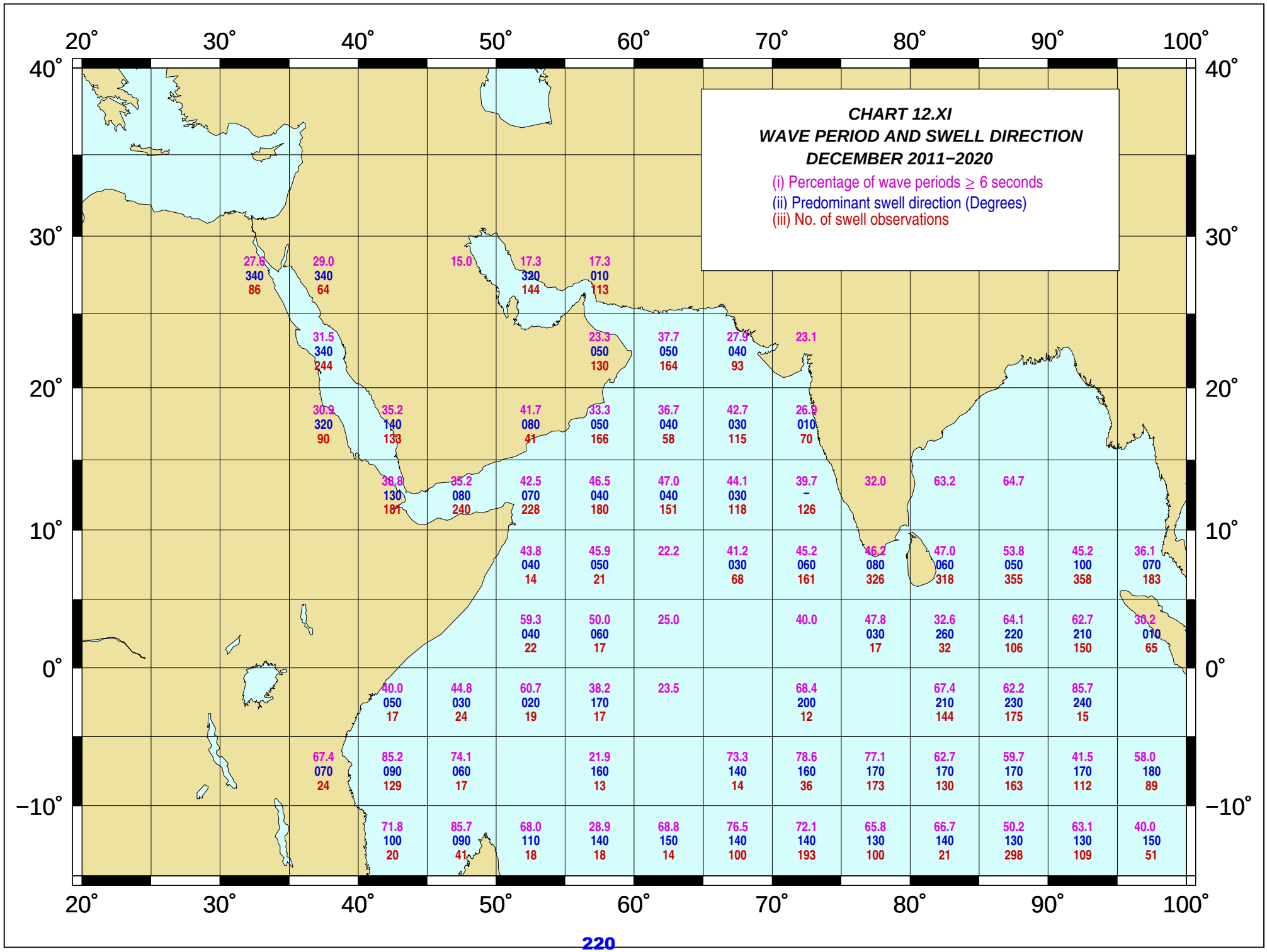


CHART 12.XI
WAVE PERIOD AND SWELL DIRECTION
DECEMBER 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
27.6 340 86
29.0 340 64
15.0
17.3 320 144
17.3 010 113
31.5 340 244
23.3 050 130
37.7 050 164
27.9 040 93
23.1
30.9 320 90
35.2 140 133
41.7 080 41
33.3 050 166
36.7 040 58
42.7 030 115
26.9 010 70
38.8 130 181
35.2 080 240
42.5 070 228
46.5 040 180
47.0 040 151
44.1 030 118
39.7 – 126
32.0
63.2
64.7
43.8 040 14
45.9 050 21
22.2
41.2 030 68
45.2 060 161
46.2 080 326
47.0 060 318
53.8 050 355
45.2 100 358
36.1 070 183
59.3 040 22
50.0 060 17
25.0
40.0
47.8 030 17
32.6 260 32
64.1 220 106
62.7 210 150
30.2 010 65
40.0 050 17
44.8 030 24
60.7 020 19
38.2 170 17
23.5
68.4 200 12
67.4 210 144
62.2 230 175
85.7 240 15
67.4 070 24
85.2 090 129
74.1 060 17
21.9 160 13
73.3 140 14
78.6 160 36
77.1 170 173
62.7 170 130
59.7 170 163
41.5 170 112
58.0 180 89
71.8 100 20
85.7 090 41
68.0 110 18
28.9 140 18
68.8 150 14
76.5 140 100
72.1 140 193
65.8 130 100
66.7 140 21
50.2 130 298
63.1 130 109
40.0 150 51

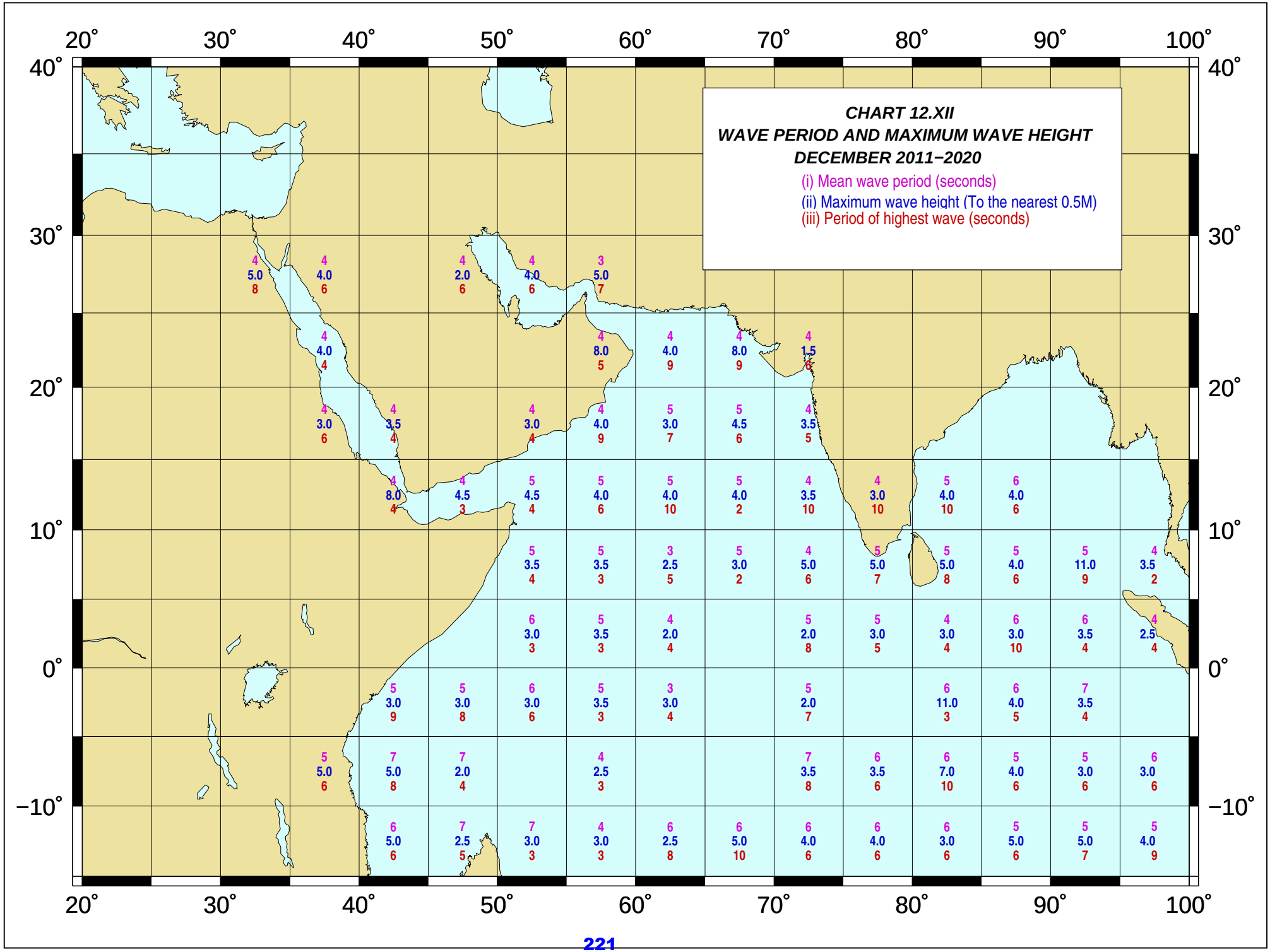


CHART 12.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
DECEMBER 2011–2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°

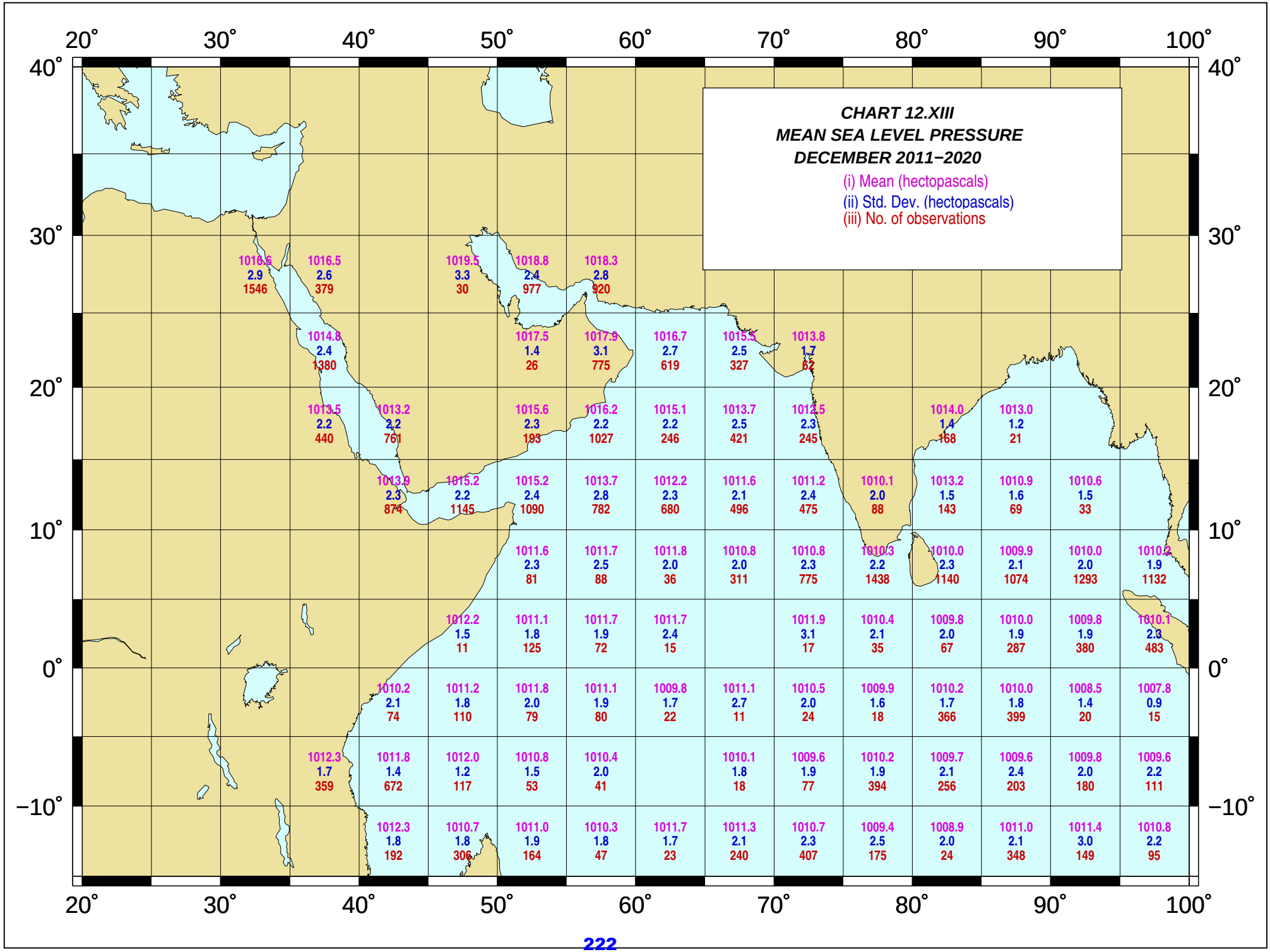


CHART 12.XIII
MEAN SEA LEVEL PRESSURE
DECEMBER 2011−2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1016.5 2.6 379
1019.5 3.3 30
1018.8 2.4 977
1018.3 2.8 920
1014.8 2.4 1380
1017.5 1.4 26
1017.9 3.1 775
1016.7 2.7 619
1015.5 2.5 327
1013.8 1.7 62
1013.5 2.2 440
1013.2 2.2 761
1015.6 2.3 193
1016.2 2.2 1027
1015.1 2.2 246
1013.7 2.5 421
1012.5 2.3 245
1014.0 1.4 168
1013.0 1.2 21
1013.9 2.3 874
1015.2 2.2 1145
1015.2 2.4 1090
1013.7 2.8 782
1012.2 2.3 680
1011.6 2.1 496
1011.2 2.4 475
1010.1 2.0 88
1013.2 1.5 143
1010.9 1.6 69
1010.6 1.5 33
1011.6 2.3 81
1011.7 2.5 88
1011.8 2.0 36
1010.8 2.0 311
1010.8 2.3 775
1010.3 2.2 1438
1010.0 2.3 1140
1009.9 2.1 1074
1010.0 2.0 1293
1010.2 1.9 1132
1012.2 1.5 11
1011.1 1.8 125
1011.7 1.9 72
1011.7 2.4 15
1011.9 3.1 17
1010.4 2.1 35
1009.8 2.0 67
1010.0 1.9 287
1009.8 1.9 380
1010.1 2.3 483
1010.2 2.1 74
1011.2 1.8 110
1011.8 2.0 79
1011.1 1.9 80
1009.8 1.7 22
1011.1 2.7 11
1010.5 2.0 24
1009.9 1.6 18
1010.2 1.7 366
1010.0 1.8 399
1008.5 1.4 20
1007.8 0.9 15
1012.3 1.7 359
1011.8 1.4 672
1012.0 1.2 117
1010.8 1.5 53
1010.4 2.0 41
1010.1 1.8 18
1009.6 1.9 77
1010.2 1.9 394
1009.7 2.1 256
1009.6 2.4 203
1009.8 2.0 180
1009.6 2.2 111
1012.3 1.8 192
1010.7 1.8 306
1011.0 1.9 164
1010.3 1.8 47
1011.7 1.7 23
1011.3 2.1 240
1010.7 2.3 407
1009.4 2.5 175
1008.9 2.0 24
1011.0 2.1 348
1011.4 3.0 149
1010.8 2.2 95

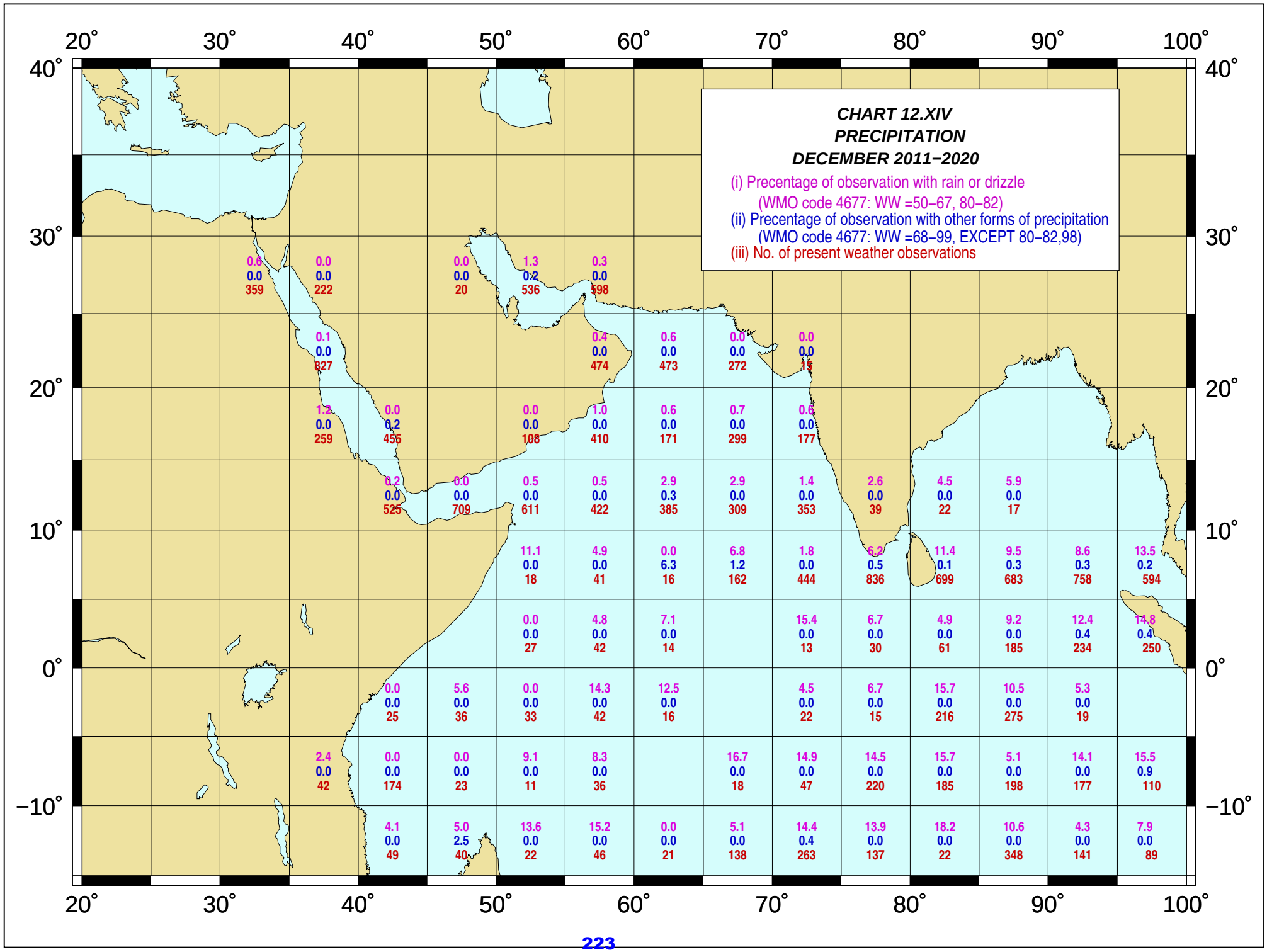


CHART 12.XIV
PRECIPITATION
DECEMBER 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.6 0.0 359
0.0 0.0 222
0.0 0.0 20
1.3 0.2 536
0.3 0.0 598
0.1 0.0 827
0.4 0.0 474
0.6 0.0 473
0.0 0.0 272
0.0 0.0 15
1.2 0.0 259
0.0 0.2 455
0.0 0.0 108
1.0 0.0 410
0.6 0.0 171
0.7 0.0 299
0.0 0.0 177
0.2 0.0 525
0.0 0.0 709
0.5 0.0 611
0.5 0.0 422
2.9 0.3 385
2.9 0.0 309
1.4 0.0 353
2.6 0.0 39
4.5 0.0 22
5.9 0.0 17
11.1 0.0 18
4.9 0.0 41
0.0 6.3 16
6.8 1.2 162
1.8 0.0 444
6.2 0.5 836
11.4 0.1 699
9.5 0.3 683
8.6 0.3 758
13.5 0.2 594
0.0 0.0 27
4.8 0.0 42
7.1 0.0 14
15.4 0.0 13
6.7 0.0 30
4.9 0.0 61
9.2 0.0 185
12.4 0.4 234
14.8 0.4 250
0.0 0.0 25
5.6 0.0 36
0.0 0.0 33
14.3 0.0 42
12.5 0.0 16
4.5 0.0 22
6.7 0.0 15
15.7 0.0 216
10.5 0.0 275
5.3 0.0 19
2.4 0.0 42
0.0 0.0 174
0.0 0.0 23
9.1 0.0 11
8.3 0.0 36
16.7 0.0 18
14.9 0.0 47
14.5 0.0 220
15.7 0.0 185
5.1 0.0 198
14.1 0.0 177
15.5 0.9 110
4.1 0.0 49
5.0 2.5 40
13.6 0.0 22
15.2 0.0 46
0.0 0.0 21
5.1 0.0 138
14.4 0.4 263
13.9 0.0 137
18.2 0.0 22
10.6 0.0 348
4.3 0.0 141
7.9 0.0 89

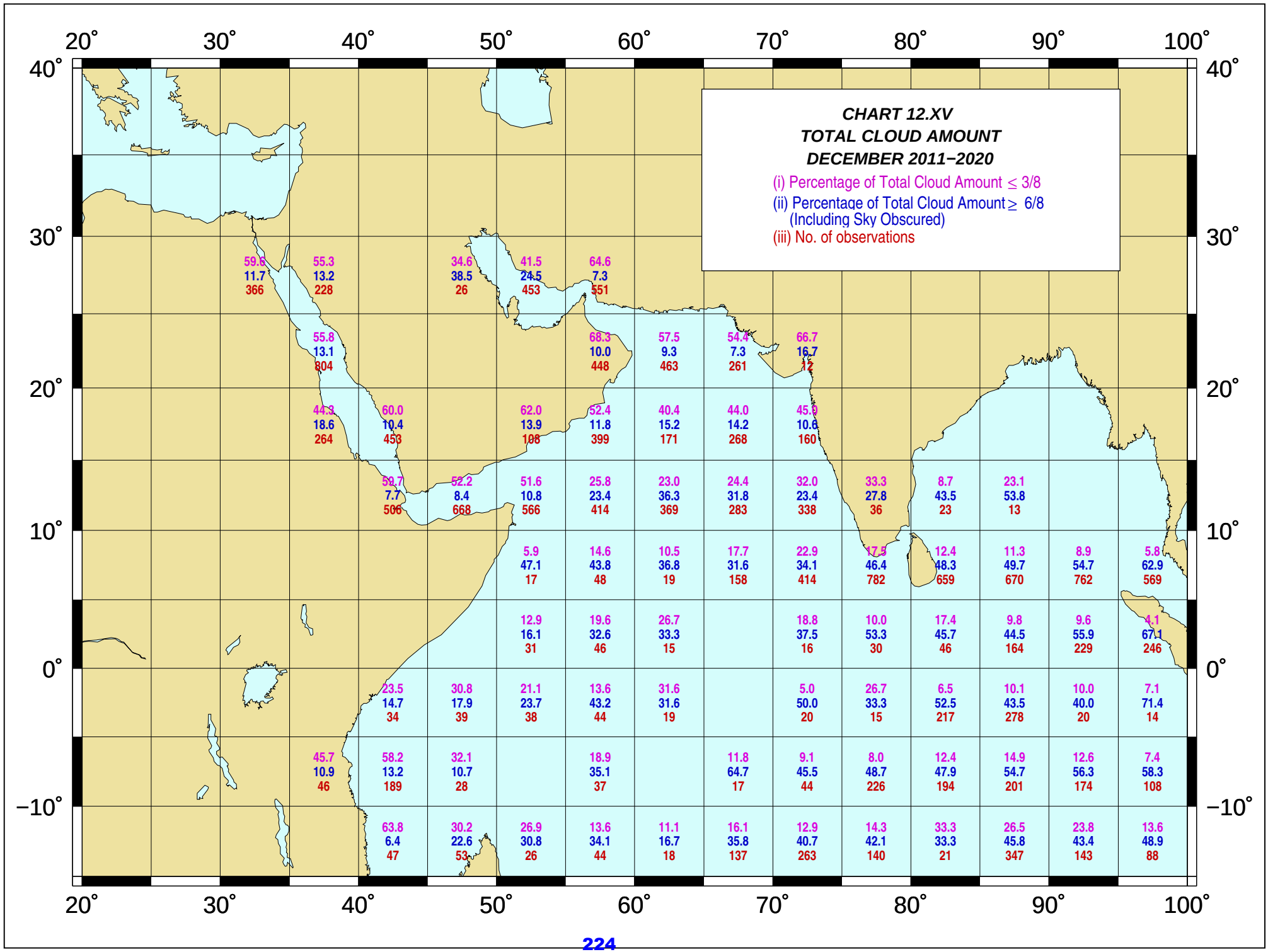


CHART 12.XV
TOTAL CLOUD AMOUNT
DECEMBER 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
59.6 11.7 366
55.3 13.2 228
34.6 38.5 26
41.5 24.5 453
64.6 7.3 551
55.8 13.1 804
68.3 10.0 448
57.5 9.3 463
54.4 7.3 261
66.7 16.7 12
44.3 18.6 264
60.0 10.4 453
62.0 13.9 108
52.4 11.8 399
40.4 15.2 171
44.0 14.2 268
45.9 10.6 160
59.7 7.7 506
52.2 8.4 668
51.6 10.8 566
25.8 23.4 414
23.0 36.3 369
24.4 31.8 283
32.0 23.4 338
33.3 27.8 36
8.7 43.5 23
23.1 53.8 13
5.9 47.1 17
14.6 43.8 48
10.5 36.8 19
17.7 31.6 158
22.9 34.1 414
17.5 46.4 782
12.4 48.3 659
11.3 49.7 670
8.9 54.7 762
5.8 62.9 569
12.9 16.1 31
19.6 32.6 46
26.7 33.3 15
18.8 37.5 16
10.0 53.3 30
17.4 45.7 46
9.8 44.5 164
9.6 55.9 229
4.1 67.1 246
23.5 14.7 34
30.8 17.9 39
21.1 23.7 38
13.6 43.2 44
31.6 31.6 19
5.0 50.0 20
26.7 33.3 15
6.5 52.5 217
10.1 43.5 278
10.0 40.0 20
7.1 71.4 14
45.7 10.9 46
58.2 13.2 189
32.1 10.7 28
18.9 35.1 37
11.8 64.7 17
9.1 45.5 44
8.0 48.7 226
12.4 47.9 194
14.9 54.7 201
12.6 56.3 174
7.4 58.3 108
63.8 6.4 47
30.2 22.6 53
26.9 30.8 26
13.6 34.1 44
11.1 16.7 18
16.1 35.8 137
12.9 40.7 263
14.3 42.1 140
33.3 33.3 21
26.5 45.8 347
23.8 43.4 143
13.6 48.9 88

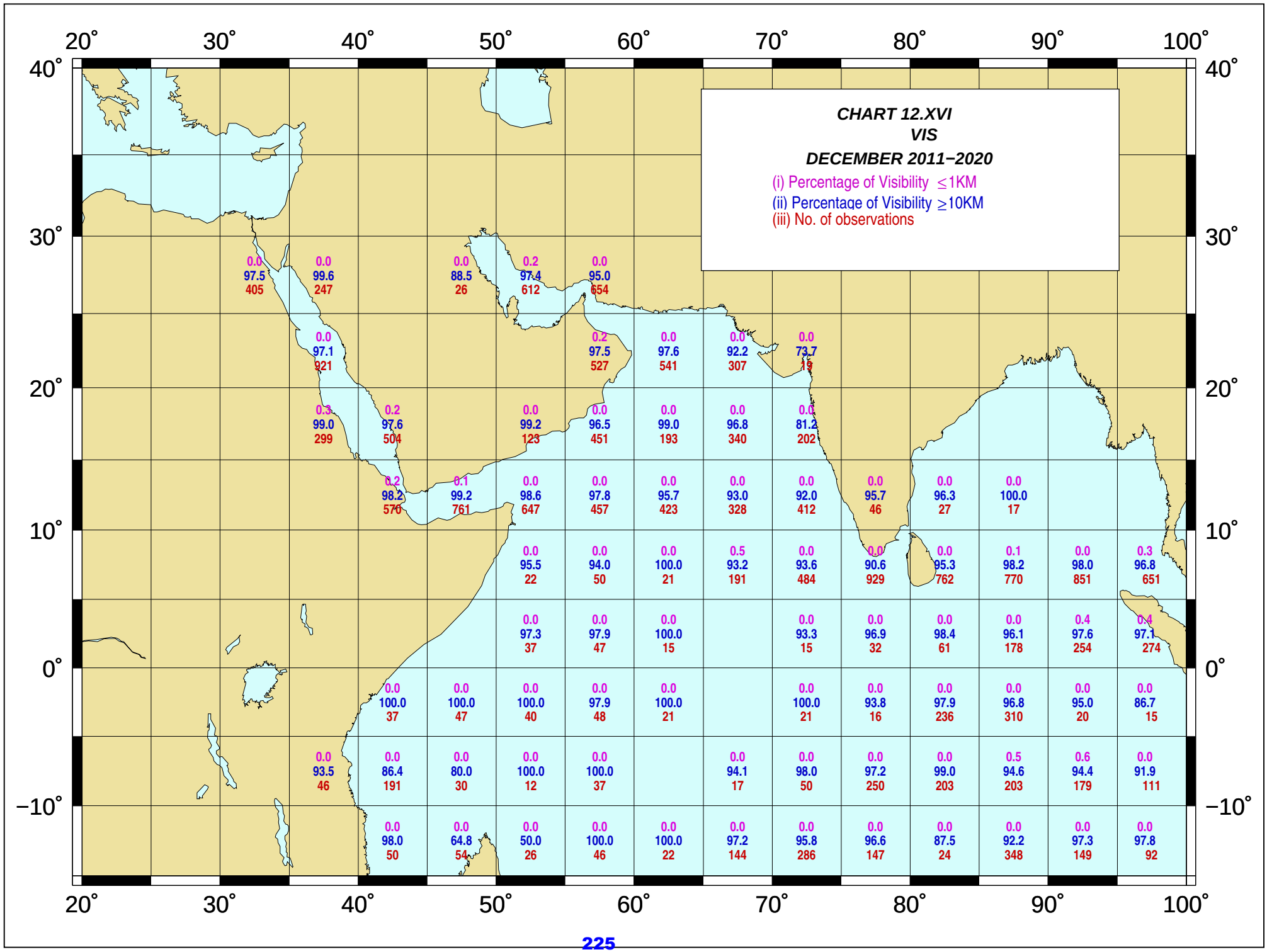


CHART 12.XVI
VIS
DECEMBER 2011−2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.0 97.5 405
0.0 99.6 247
0.0 88.5 26
0.2 97.4 612
0.0 95.0 654
0.0 97.1 921
0.2 97.5 527
0.0 97.6 541
0.0 92.2 307
0.0 73.7 19
0.3 99.0 299
0.2 97.6 504
0.0 99.2 123
0.0 96.5 451
0.0 99.0 193
0.0 96.8 340
0.0 81.2 202
0.2 98.2 570
0.1 99.2 761
0.0 98.6 647
0.0 97.8 457
0.0 95.7 423
0.0 93.0 328
0.0 92.0 412
0.0 95.7 46
0.0 96.3 27
0.0 100.0 17
0.0 95.5 22
0.0 94.0 50
0.0 100.0 21
0.5 93.2 191
0.0 93.6 484
0.0 90.6 929
0.0 95.3 762
0.1 98.2 770
0.0 98.0 851
0.3 96.8 651
0.0 97.3 37
0.0 97.9 47
0.0 100.0 15
0.0 93.3 15
0.0 96.9 32
0.0 98.4 61
0.0 96.1 178
0.4 97.6 254
0.4 97.1 274
0.0 100.0 37
0.0 100.0 47
0.0 100.0 40
0.0 97.9 48
0.0 100.0 21
0.0 100.0 21
0.0 93.8 16
0.0 97.9 236
0.0 96.8 310
0.0 95.0 20
0.0 86.7 15
0.0 93.5 46
0.0 86.4 191
0.0 80.0 30
0.0 100.0 12
0.0 100.0 37
0.0 94.1 17
0.0 98.0 50
0.0 97.2 250
0.0 99.0 203
0.5 94.6 203
0.6 94.4 179
0.0 91.9 111
0.0 98.0 50
0.0 64.8 54
0.0 50.0 26
0.0 100.0 46
0.0 100.0 22
0.0 97.2 144
0.0 95.8 286
0.0 96.6 147
0.0 87.5 24
0.0 92.2 348
0.0 97.3 149
0.0 97.8 92

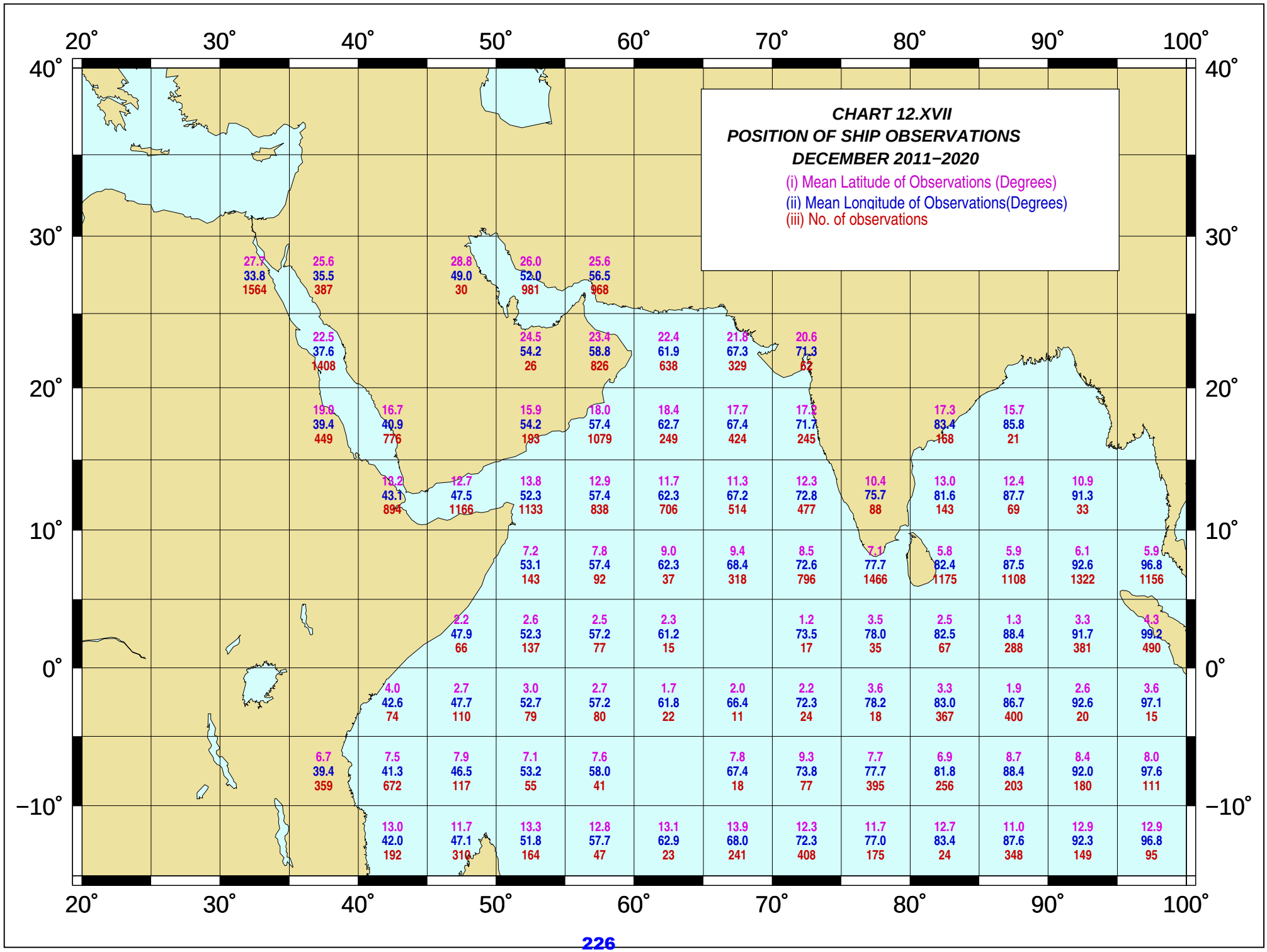


CHART 12.XVII
POSITION OF SHIP OBSERVATIONS
DECEMBER 2011−2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
27.7 33.8 1564
25.6 35.5 387
28.8 49.0 30
26.0 52.0 981
25.6 56.5 968
22.5 37.6 1408
24.5 54.2 26
23.4 58.8 826
22.4 61.9 638
21.8 67.3 329
20.6 71.3 62
19.9 39.4 449
16.7 40.9 776
15.9 54.2 193
18.0 57.4 1079
18.4 62.7 249
17.7 67.4 424
17.2 71.7 245
17.3 83.4 168
15.7 85.8 21
10.2 43.1 894
12.7 47.5 1166
13.8 52.3 1133
12.9 57.4 838
11.7 62.3 706
11.3 67.2 514
12.3 72.8 477
10.4 75.7 88
13.0 81.6 143
12.4 87.7 69
10.9 91.3 33
7.2 53.1 143
7.8 57.4 92
9.0 62.3 37
9.4 68.4 318
8.5 72.6 796
7.1 77.7 1466
5.8 82.4 1175
5.9 87.5 1108
6.1 92.6 1322
5.9 96.8 1156
2.2 47.9 66
2.6 52.3 137
2.5 57.2 77
2.3 61.2 15
1.2 73.5 17
3.5 78.0 35
2.5 82.5 67
1.3 88.4 288
3.3 91.7 381
4.3 99.2 490
4.0 42.6 74
2.7 47.7 110
3.0 52.7 79
2.7 57.2 80
1.7 61.8 22
2.0 66.4 11
2.2 72.3 24
3.6 78.2 18
3.3 83.0 367
1.9 86.7 400
2.6 92.6 20
3.6 97.1 15
6.7 39.4 359
7.5 41.3 672
7.9 46.5 117
7.1 53.2 55
7.6 58.0 41
7.8 67.4 18
9.3 73.8 77
7.7 77.7 395
6.9 81.8 256
8.7 88.4 203
8.4 92.0 180
8.0 97.6 111
13.0 42.0 192
11.7 47.1 310
13.3 51.8 164
12.8 57.7 47
13.1 62.9 23
13.9 68.0 241
12.3 72.3 408
11.7 77.0 175
12.7 83.4 24
11.0 87.6 348
12.9 92.3 149
12.9 96.8 95

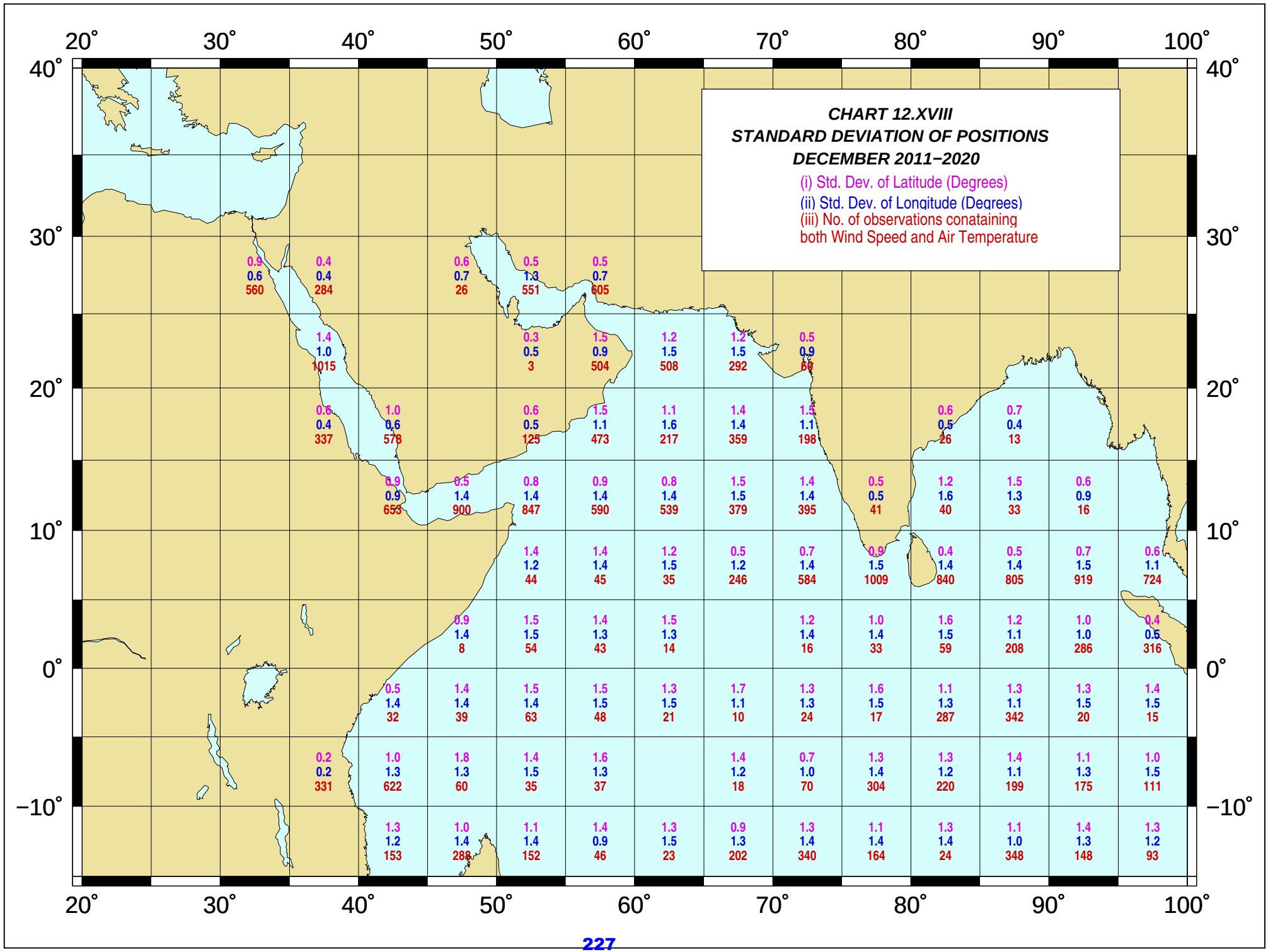
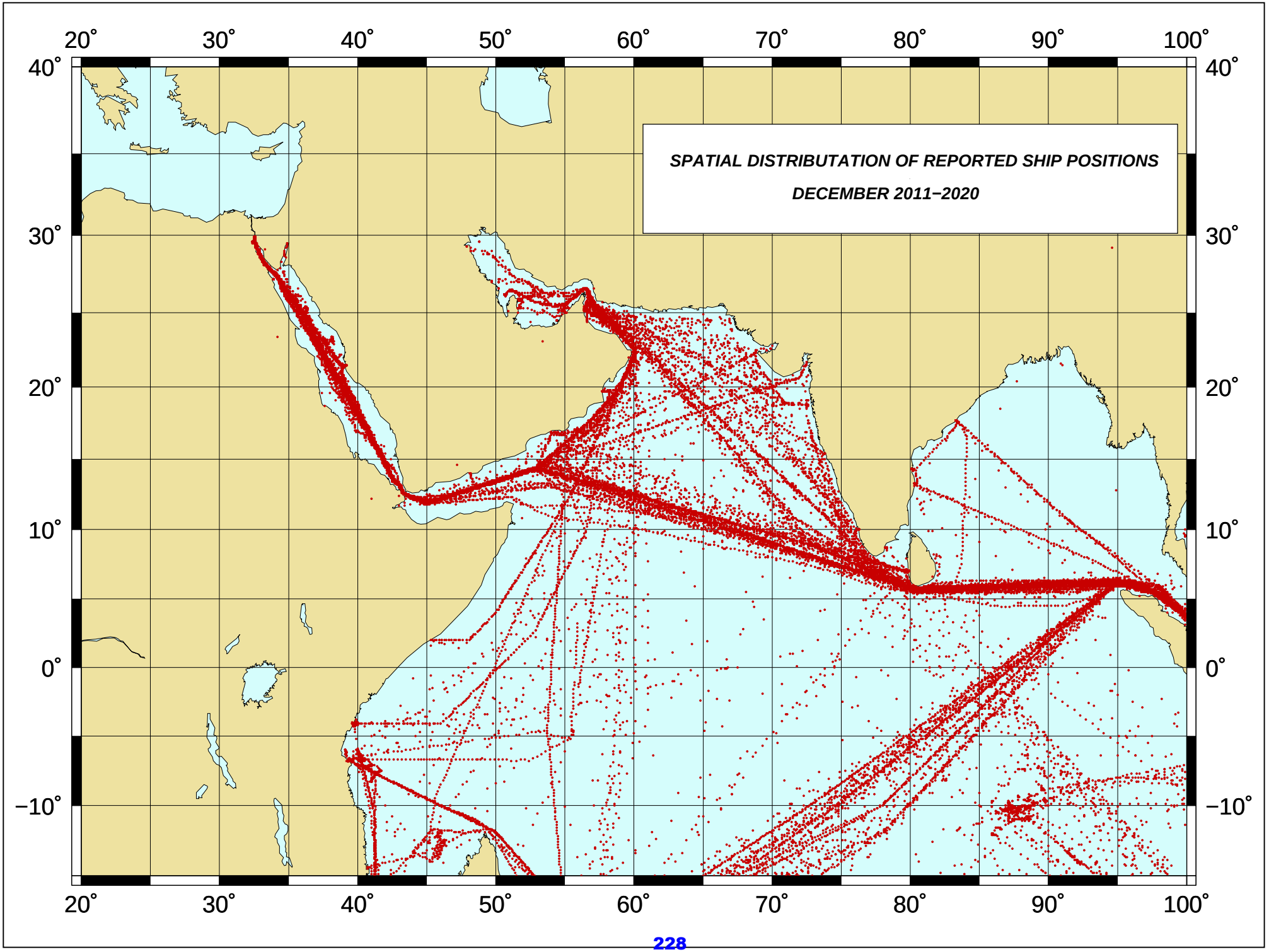


CHART 12.XVIII
STANDARD DEVIATION OF POSITIONS
DECEMBER 2011−2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.9 0.6 560
0.4 0.4 284
0.6 0.7 26
0.5 1.3 551
0.5 0.7 605
1.4 1.0 1015
0.3 0.5 3
1.5 0.9 504
1.2 1.5 508
1.2 1.5 292
0.5 0.9 66
0.6 0.4 337
1.0 0.6 578
0.6 0.5 125
1.5 1.1 473
1.1 1.6 217
1.4 1.4 359
1.5 1.1 198
0.6 0.5 26
0.7 0.4 13
0.9 0.9 653
0.5 1.4 900
0.8 1.4 847
0.9 1.4 590
0.8 1.4 539
1.5 1.5 379
1.4 1.4 395
0.5 0.5 41
1.2 1.6 40
1.5 1.3 33
0.6 0.9 16
1.4 1.2 44
1.4 1.4 45
1.2 1.5 35
0.5 1.2 246
0.7 1.4 584
0.9 1.5 1009
0.4 1.4 840
0.5 1.4 805
0.7 1.5 919
0.6 1.1 724
0.9 1.4 8
1.5 1.5 54
1.4 1.3 43
1.5 1.3 14
1.2 1.4 16
1.0 1.4 33
1.6 1.5 59
1.2 1.1 208
1.0 1.0 286
0.4 0.5 316
0.5 1.4 32
1.4 1.4 39
1.5 1.4 63
1.5 1.5 48
1.3 1.5 21
1.7 1.1 10
1.3 1.3 24
1.6 1.5 17
1.1 1.3 287
1.3 1.1 342
1.3 1.5 20
1.4 1.5 15
0.2 0.2 331
1.0 1.3 622
1.8 1.3 60
1.4 1.5 35
1.6 1.3 37
1.4 1.2 18
0.7 1.0 70
1.3 1.4 304
1.3 1.2 220
1.4 1.1 199
1.1 1.3 175
1.0 1.5 111
1.3 1.2 153
1.0 1.4 288
1.1 1.4 152
1.4 0.9 46
1.3 1.5 23
0.9 1.3 202
1.3 1.4 340
1.1 1.4 164
1.3 1.4 24
1.1 1.0 348
1.4 1.3 148
1.3 1.2 93


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
DECEMBER 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

CHARTS OF ANNUAL 2011-2020

Marine Climatological Summary Charts 2011-2020

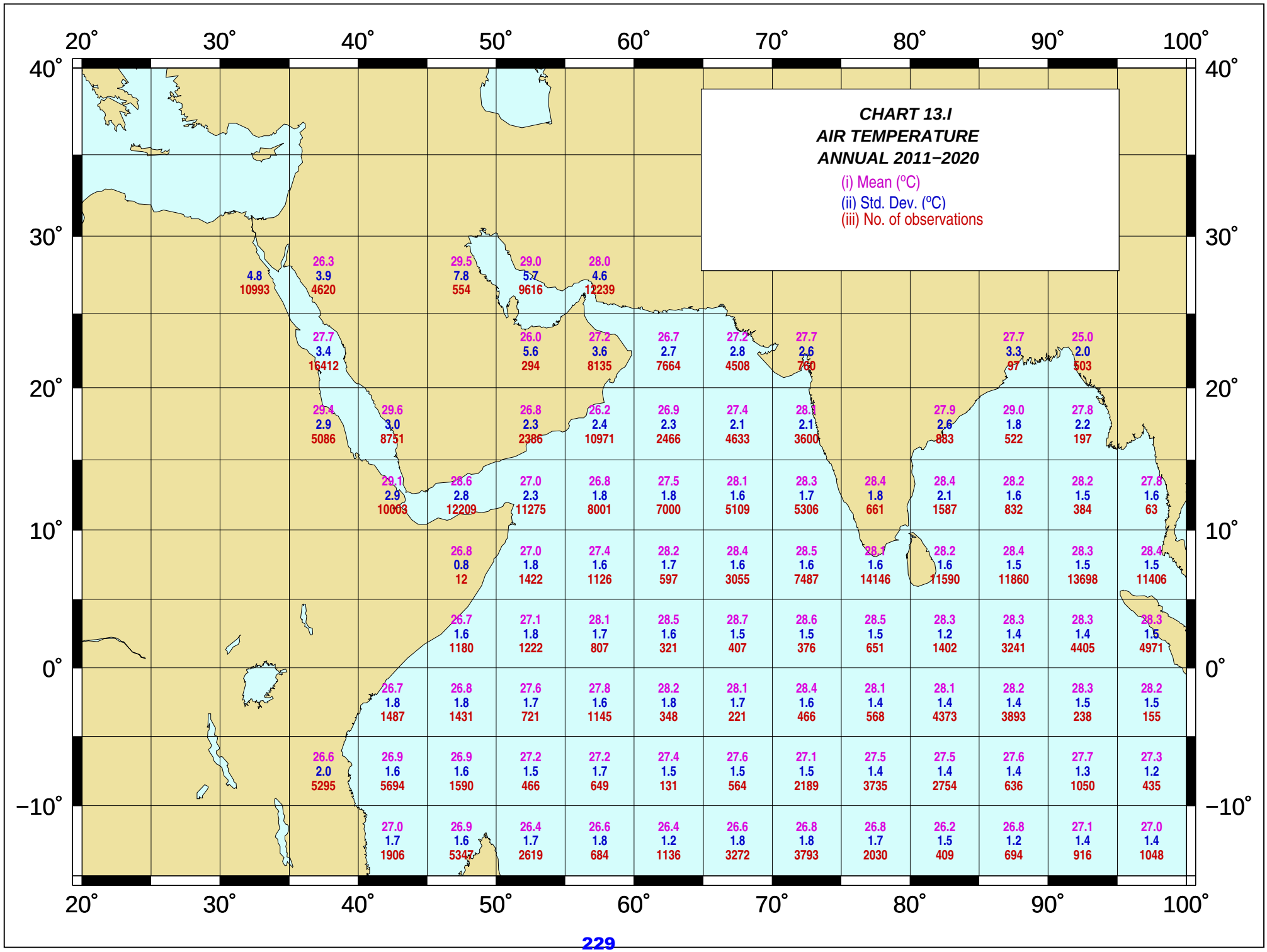


CHART 13.I
AIR TEMPERATURE
ANNUAL 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
4.8 10993
26.3 3.9 4620
29.5 7.8 554
29.0 5.7 9616
28.0 4.6 12239
27.7 3.4 16412
26.0 5.6 294
27.2 3.6 8135
26.7 2.7 7664
27.2 2.8 4508
27.7 2.6 760
27.7 3.3 97
25.0 2.0 503
29.4 2.9 5086
29.6 3.0 8751
26.8 2.3 2386
26.2 2.4 10971
26.9 2.3 2466
27.4 2.1 4633
28.1 2.1 3600
27.9 2.6 883
29.0 1.8 522
27.8 2.2 197
29.1 2.9 10003
28.6 2.8 12209
27.0 2.3 11275
26.8 1.8 8001
27.5 1.8 7000
28.1 1.6 5109
28.3 1.7 5306
28.4 1.8 661
28.4 2.1 1587
28.2 1.6 832
28.2 1.5 384
27.8 1.6 63
26.8 0.8 12
27.0 1.8 1422
27.4 1.6 1126
28.2 1.7 597
28.4 1.6 3055
28.5 1.6 7487
28.1 1.6 14146
28.2 1.6 11590
28.4 1.5 11860
28.3 1.5 13698
28.4 1.5 11406
26.7 1.6 1180
27.1 1.8 1222
28.1 1.7 807
28.5 1.6 321
28.7 1.5 407
28.6 1.5 376
28.5 1.5 651
28.3 1.2 1402
28.3 1.4 3241
28.3 1.4 4405
28.3 1.5 4971
26.7 1.8 1487
26.8 1.8 1431
27.6 1.7 721
27.8 1.6 1145
28.2 1.8 348
28.1 1.7 221
28.4 1.6 466
28.1 1.4 568
28.1 1.4 4373
28.2 1.4 3893
28.3 1.5 238
28.2 1.5 155
26.6 2.0 5295
26.9 1.6 5694
26.9 1.6 1590
27.2 1.5 466
27.2 1.7 649
27.4 1.5 131
27.6 1.5 564
27.1 1.5 2189
27.5 1.4 3735
27.5 1.4 2754
27.6 1.4 636
27.7 1.3 1050
27.3 1.2 435
27.0 1.7 1906
26.9 1.6 5347
26.4 1.7 2619
26.6 1.8 684
26.4 1.2 1136
26.6 1.8 3272
26.8 1.8 3793
26.8 1.7 2030
26.2 1.5 409
26.8 1.2 694
27.1 1.4 916
27.0 1.4 1048

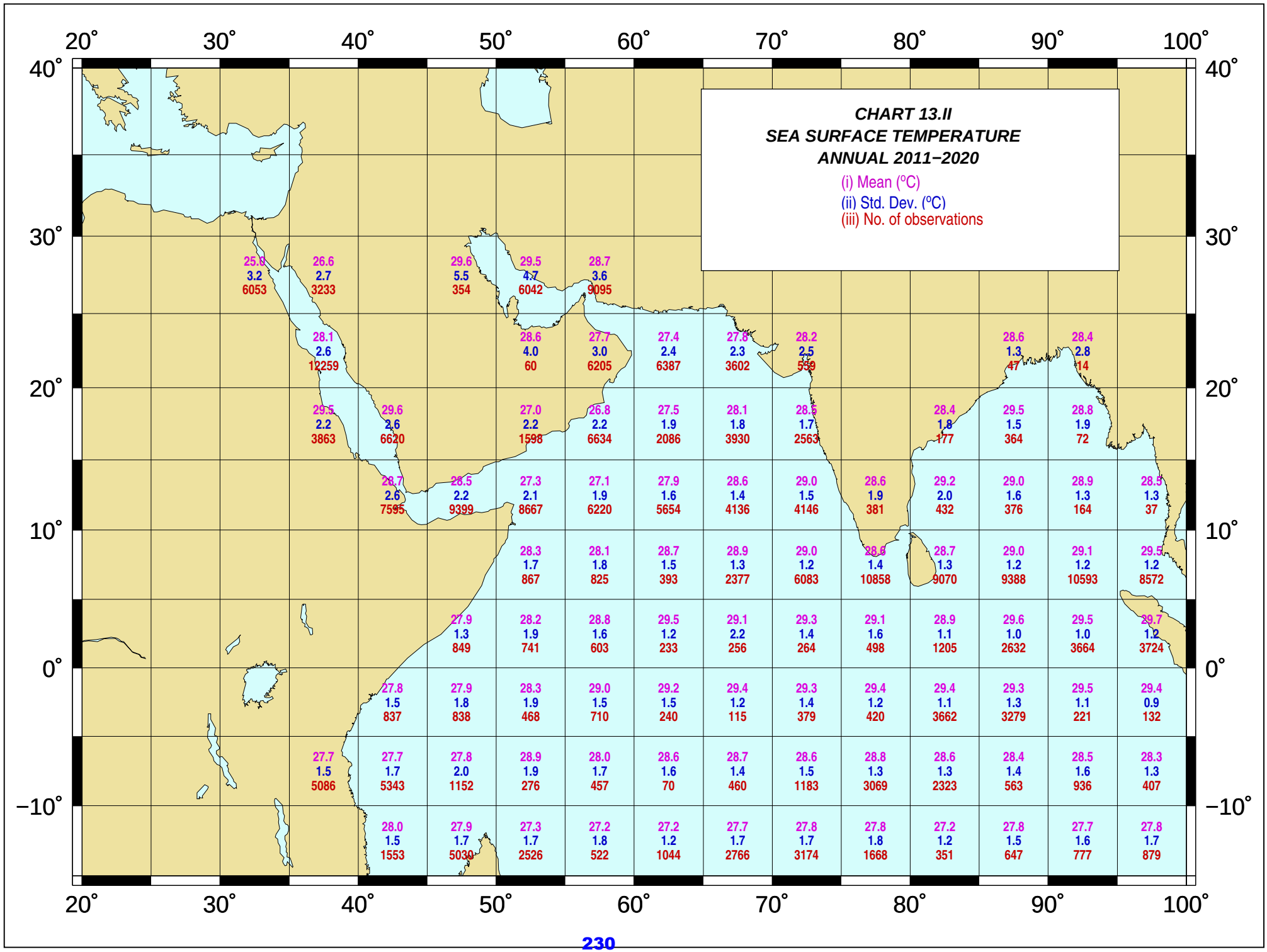


CHART 13.II
SEA SURFACE TEMPERATURE
ANNUAL 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
25.8 3.2 6053
26.6 2.7 3233
29.6 5.5 354
29.5 4.7 6042
28.7 3.6 9095
28.1 2.6 12259
28.6 4.0 60
27.7 3.0 6205
27.4 2.4 6387
27.8 2.3 3602
28.2 2.5 559
28.6 1.3 47
28.4 2.8 14
29.5 2.2 3863
29.6 2.6 6620
27.0 2.2 1598
26.8 2.2 6634
27.5 1.9 2086
28.1 1.8 3930
28.5 1.7 2563
28.4 1.8 177
29.5 1.5 364
28.8 1.9 72
28.7 2.6 7595
28.5 2.2 9399
27.3 2.1 8667
27.1 1.9 6220
27.9 1.6 5654
28.6 1.4 4136
29.0 1.5 4146
28.6 1.9 381
29.2 2.0 432
29.0 1.6 376
28.9 1.3 164
28.5 1.3 37
28.3 1.7 867
28.1 1.8 825
28.7 1.5 393
28.9 1.3 2377
29.0 1.2 6083
28.6 1.4 10858
28.7 1.3 9070
29.0 1.2 9388
29.1 1.2 10593
29.5 1.2 8572
27.9 1.3 849
28.2 1.9 741
28.8 1.6 603
29.5 1.2 233
29.1 2.2 256
29.3 1.4 264
29.1 1.6 498
28.9 1.1 1205
29.6 1.0 2632
29.5 1.0 3664
29.7 1.2 3724
27.8 1.5 837
27.9 1.8 838
28.3 1.9 468
29.0 1.5 710
29.2 1.5 240
29.4 1.2 115
29.3 1.4 379
29.4 1.2 420
29.4 1.1 3662
29.3 1.3 3279
29.5 1.1 221
29.4 0.9 132
27.7 1.5 5086
27.7 1.7 5343
27.8 2.0 1152
28.9 1.9 276
28.0 1.7 457
28.6 1.6 70
28.7 1.4 460
28.6 1.5 1183
28.8 1.3 3069
28.6 1.3 2323
28.4 1.4 563
28.5 1.6 936
28.3 1.3 407
28.0 1.5 1553
27.9 1.7 5030
27.3 1.7 2526
27.2 1.8 522
27.2 1.2 1044
27.7 1.7 2766
27.8 1.7 3174
27.8 1.8 1668
27.2 1.2 351
27.8 1.5 647
27.7 1.6 777
27.8 1.7 879

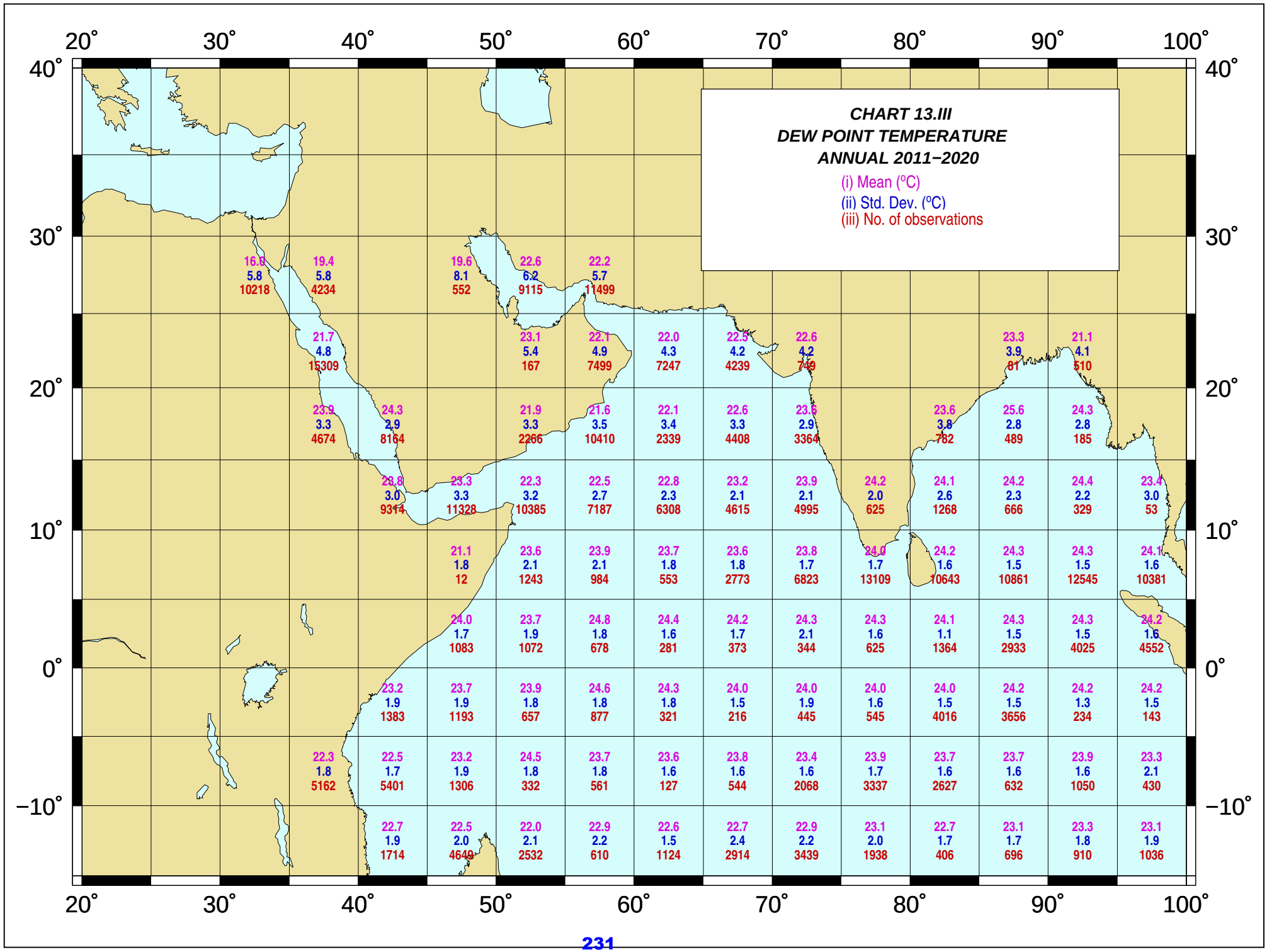


CHART 13.III
DEW POINT TEMPERATURE
ANNUAL 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
16.6 5.8 10218
19.4 5.8 4234
19.6 8.1 552
22.6 6.2 9115
22.2 5.7 11499
21.7 4.8 15309
23.1 5.4 167
22.1 4.9 7499
22.0 4.3 7247
22.5 4.2 4239
22.6 4.2 749
23.3 3.9 81
21.1 4.1 510
23.9 3.3 4674
24.3 2.9 8164
21.9 3.3 2266
21.6 3.5 10410
22.1 3.4 2339
22.6 3.3 4408
23.6 2.9 3364
23.6 3.8 782
25.6 2.8 489
24.3 2.8 185
23.8 3.0 9314
23.3 3.3 11328
22.3 3.2 10385
22.5 2.7 7187
22.8 2.3 6308
23.2 2.1 4615
23.9 2.1 4995
24.2 2.0 625
24.1 2.6 1268
24.2 2.3 666
24.4 2.2 329
23.4 3.0 53
21.1 1.8 12
23.6 2.1 1243
23.9 2.1 984
23.7 1.8 553
23.6 1.8 2773
23.8 1.7 6823
24.0 1.7 13109
24.2 1.6 10643
24.3 1.5 10861
24.3 1.5 12545
24.1 1.6 10381
24.0 1.7 1083
23.7 1.9 1072
24.8 1.8 678
24.4 1.6 281
24.2 1.7 373
24.3 2.1 344
24.3 1.6 625
24.1 1.1 1364
24.3 1.5 2933
24.3 1.5 4025
24.2 1.6 4552
23.2 1.9 1383
23.7 1.9 1193
23.9 1.8 657
24.6 1.8 877
24.3 1.8 321
24.0 1.5 216
24.0 1.9 445
24.0 1.6 545
24.0 1.5 4016
24.2 1.5 3656
24.2 1.3 234
24.2 1.5 143
22.3 1.8 5162
22.5 1.7 5401
23.2 1.9 1306
24.5 1.8 332
23.7 1.8 561
23.6 1.6 127
23.8 1.6 544
23.4 1.6 2068
23.9 1.7 3337
23.7 1.6 2627
23.7 1.6 632
23.9 1.6 1050
23.3 2.1 430
22.7 1.9 1714
22.5 2.0 4649
22.0 2.1 2532
22.9 2.2 610
22.6 1.5 1124
22.7 2.4 2914
22.9 2.2 3439
23.1 2.0 1938
22.7 1.7 406
23.1 1.7 696
23.3 1.8 910
23.1 1.9 1036

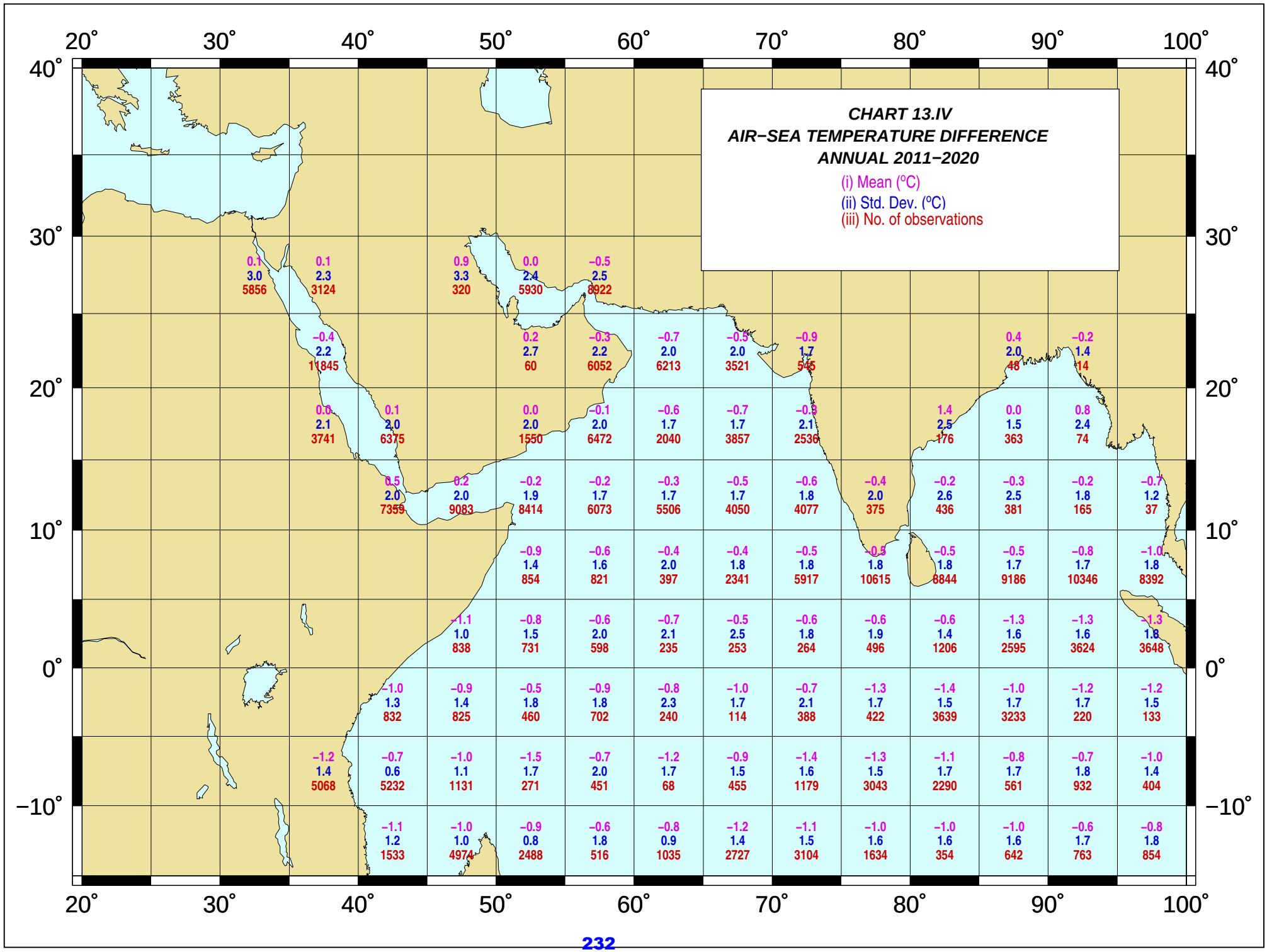


CHART 13.IV
AIR–SEA TEMPERATURE DIFFERENCE
ANNUAL 2011–2020
(i) Mean (°C)
(ii) Std. Dev. (°C)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.1 3.0 5856
0.1 2.3 3124
0.9 3.3 320
0.0 2.4 5930
−0.5 2.5 8922
−0.4 2.2 11845
0.2 2.7 60
−0.3 2.2 6052
−0.7 2.0 6213
−0.5 2.0 3521
−0.9 1.7 545
0.4 2.0 48
−0.2 1.4 14
0.0 2.1 3741
0.1 2.0 6375
0.0 2.0 1550
−0.1 2.0 6472
−0.6 1.7 2040
−0.7 1.7 3857
−0.9 2.1 2536
1.4 2.5 176
0.0 1.5 363
0.8 2.4 74
0.5 2.0 7359
0.2 2.0 9083
−0.2 1.9 8414
−0.2 1.7 6073
−0.3 1.7 5506
−0.5 1.7 4050
−0.6 1.8 4077
−0.4 2.0 375
−0.2 2.6 436
−0.3 2.5 381
−0.2 1.8 165
−0.7 1.2 37
−0.9 1.4 854
−0.6 1.6 821
−0.4 2.0 397
−0.4 1.8 2341
−0.5 1.8 5917
−0.5 1.8 10615
−0.5 1.8 8844
−0.5 1.7 9186
−0.8 1.7 10346
−1.0 1.8 8392
−1.1 1.0 838
−0.8 1.5 731
−0.6 2.0 598
−0.7 2.1 235
−0.5 2.5 253
−0.6 1.8 264
−0.6 1.9 496
−0.6 1.4 1206
−1.3 1.6 2595
−1.3 1.6 3624
−1.3 1.8 3648
−1.0 1.3 832
−0.9 1.4 825
−0.5 1.8 460
−0.9 1.8 702
−0.8 2.3 240
−1.0 1.7 114
−0.7 2.1 388
−1.3 1.7 422
−1.4 1.5 3639
−1.0 1.7 3233
−1.2 1.7 220
−1.2 1.5 133
−1.2 1.4 5068
−0.7 0.6 5232
−1.0 1.1 1131
−1.5 1.7 271
−0.7 2.0 451
−1.2 1.7 68
−0.9 1.5 455
−1.4 1.6 1179
−1.3 1.5 3043
−1.1 1.7 2290
−0.8 1.7 561
−0.7 1.8 932
−1.0 1.4 404
−1.1 1.2 1533
−1.0 1.0 4974
−0.9 0.8 2488
−0.6 1.8 516
−0.8 0.9 1035
−1.2 1.4 2727
−1.1 1.5 3104
−1.0 1.6 1634
−1.0 1.6 354
−1.0 1.6 642
−0.6 1.7 763
−0.8 1.8 854

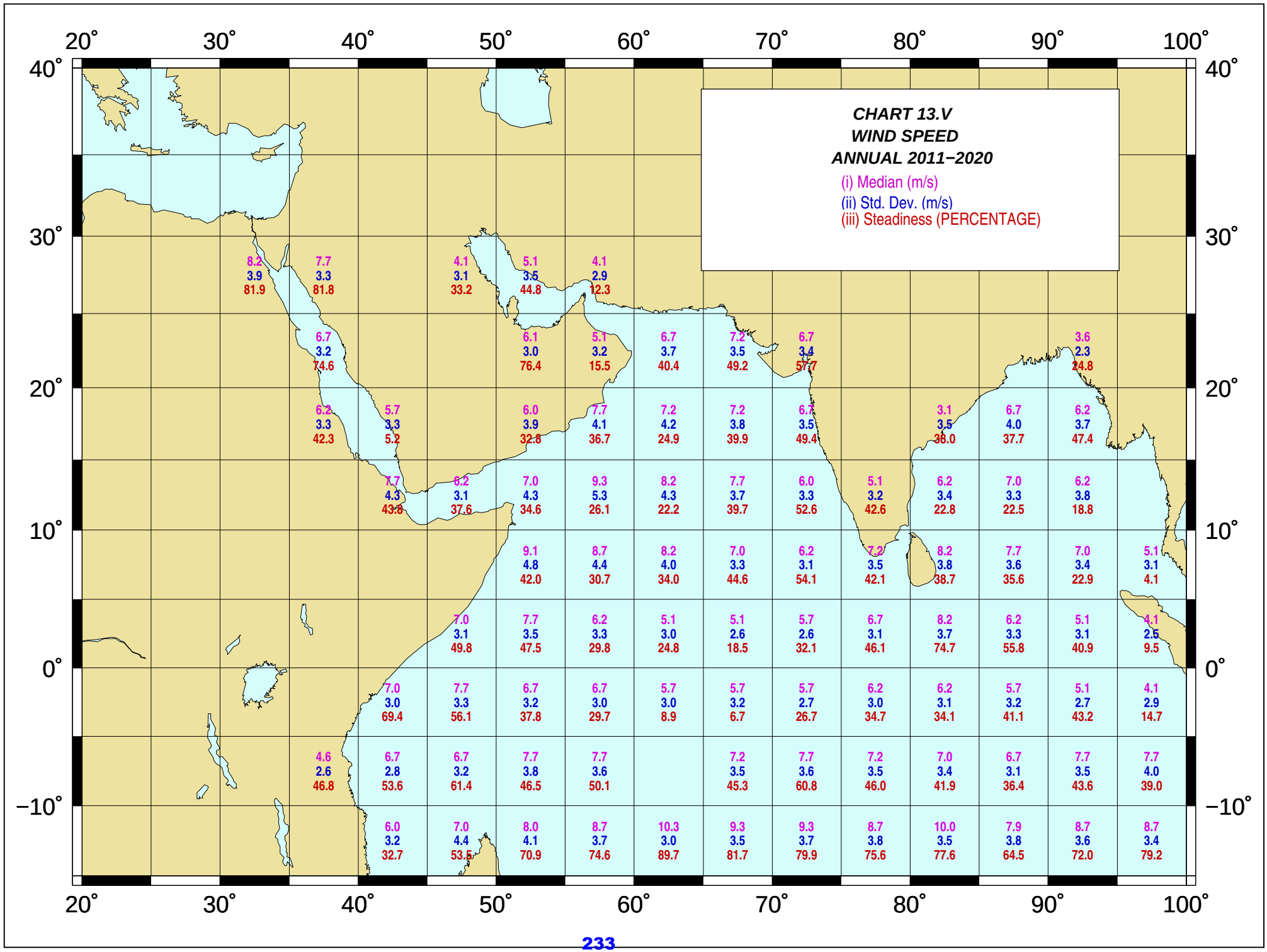


CHART 13.V
WIND SPEED
ANNUAL 2011–2020
(i) Median (m/s)
(ii) Std. Dev. (m/s)
(iii) Steadiness (PERCENTAGE)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
8.2 3.9 81.9
7.7 3.3 81.8
4.1 3.1 33.2
5.1 3.5 44.8
4.1 2.9 12.3
6.7 3.2 74.6
6.1 3.0 76.4
5.1 3.2 15.5
6.7 3.7 40.4
7.2 3.5 49.2
6.7 3.4 57.7
3.6 2.3 24.8
6.2 3.3 42.3
5.7 3.3 5.2
6.0 3.9 32.8
7.7 4.1 36.7
7.2 4.2 24.9
7.2 3.8 39.9
6.7 3.5 49.4
3.1 3.5 38.0
6.7 4.0 37.7
6.2 3.7 47.4
7.7 4.3 43.8
6.2 3.1 37.6
7.0 4.3 34.6
9.3 5.3 26.1
8.2 4.3 22.2
7.7 3.7 39.7
6.0 3.3 52.6
5.1 3.2 42.6
6.2 3.4 22.8
7.0 3.3 22.5
6.2 3.8 18.8
9.1 4.8 42.0
8.7 4.4 30.7
8.2 4.0 34.0
7.0 3.3 44.6
6.2 3.1 54.1
7.2 3.5 42.1
8.2 3.8 38.7
7.7 3.6 35.6
7.0 3.4 22.9
5.1 3.1 4.1
7.0 3.1 49.8
7.7 3.5 47.5
6.2 3.3 29.8
5.1 3.0 24.8
5.1 2.6 18.5
5.7 2.6 32.1
6.7 3.1 46.1
8.2 3.7 74.7
6.2 3.3 55.8
5.1 3.1 40.9
4.1 2.5 9.5
7.0 3.0 69.4
7.7 3.3 56.1
6.7 3.2 37.8
6.7 3.0 29.7
5.7 3.0 8.9
5.7 3.2 6.7
5.7 2.7 26.7
6.2 3.0 34.7
6.2 3.1 34.1
5.7 3.2 41.1
5.1 2.7 43.2
4.1 2.9 14.7
4.6 2.6 46.8
6.7 2.8 53.6
6.7 3.2 61.4
7.7 3.8 46.5
7.7 3.6 50.1
7.2 3.5 45.3
7.7 3.6 60.8
7.2 3.5 46.0
7.0 3.4 41.9
6.7 3.1 36.4
7.7 3.5 43.6
7.7 4.0 39.0
6.0 3.2 32.7
7.0 4.4 53.5
8.0 4.1 70.9
8.7 3.7 74.6
10.3 3.0 89.7
9.3 3.5 81.7
9.3 3.7 79.9
8.7 3.8 75.6
10.0 3.5 77.6
7.9 3.8 64.5
8.7 3.6 72.0
8.7 3.4 79.2

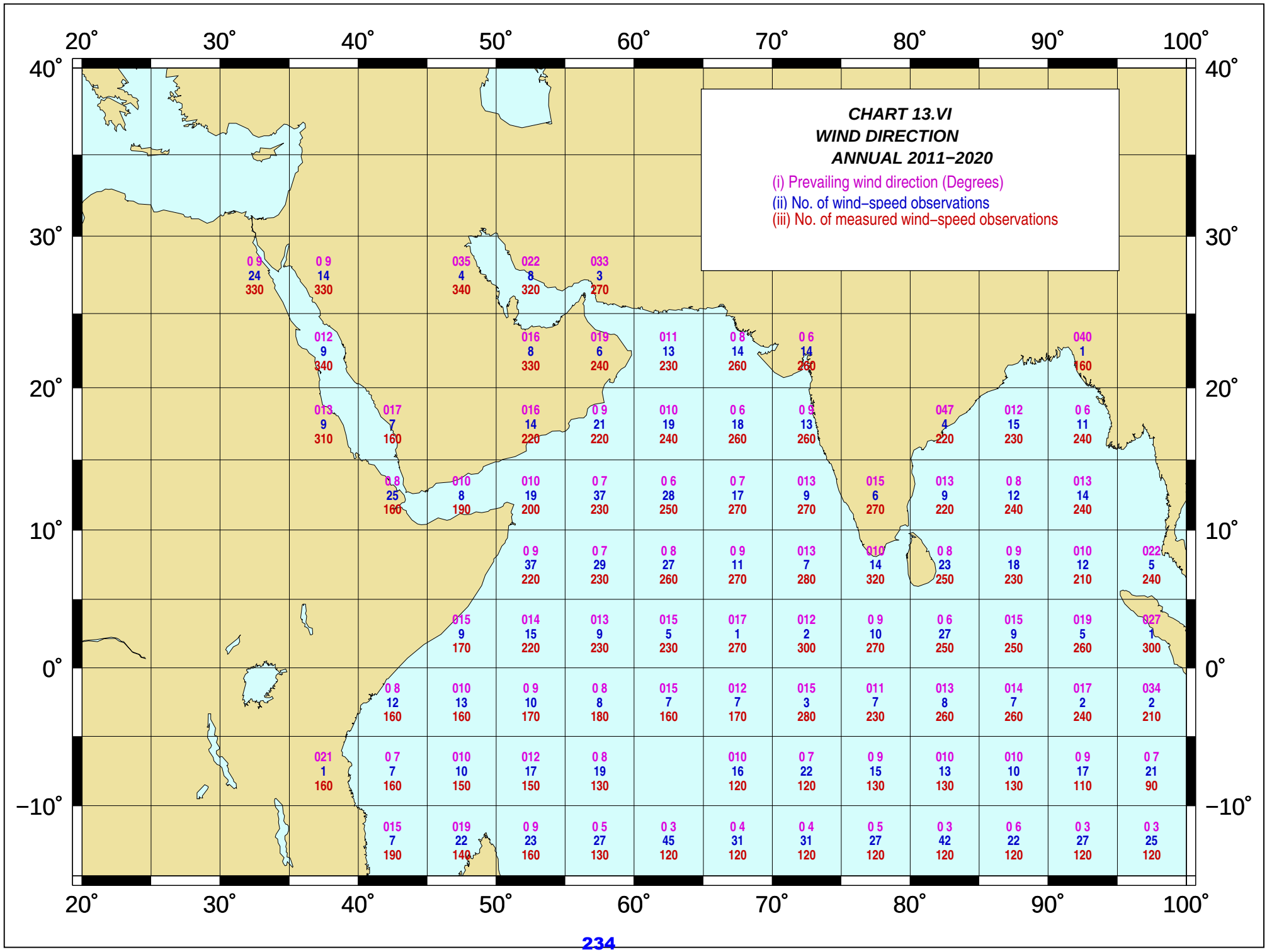


CHART 13.VI
WIND DIRECTION
ANNUAL 2011–2020
(i) Prevailing wind direction (Degrees)
(ii) No. of wind–speed observations
(iii) No. of measured wind–speed observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
09 24 330
09 14 330
035 4 340
022 8 320
033 3 270
012 9 340
016 8 330
019 6 240
011 13 230
08 14 260
06 14 260
040 1 160
013 9 310
017 7 160
016 14 220
09 21 220
010 19 240
06 18 260
09 13 260
047 4 220
012 15 230
06 11 240
08 25 160
010 8 190
010 19 200
07 37 230
06 28 250
07 17 270
013 9 270
015 6 270
013 9 220
08 12 240
013 14 240
09 37 220
07 29 230
08 27 260
09 11 270
013 7 280
010 14 320
08 23 250
09 18 230
010 12 210
022 5 240
015 9 170
014 15 220
013 9 230
015 5 230
017 1 270
012 2 300
09 10 270
06 27 250
015 9 250
019 5 260
027 1 300
08 12 160
010 13 160
09 10 170
08 8 180
015 7 160
012 7 170
015 3 280
011 7 230
013 8 260
014 7 260
017 2 240
034 2 210
021 1 160
07 7 160
010 10 150
012 17 150
08 19 130
010 16 120
07 22 120
09 15 130
010 13 130
010 10 130
09 17 110
07 21 90
015 7 190
019 22 140
09 23 160
05 27 130
03 45 120
04 31 120
04 31 120
05 27 120
03 42 120
06 22 120
03 27 120
03 25 120

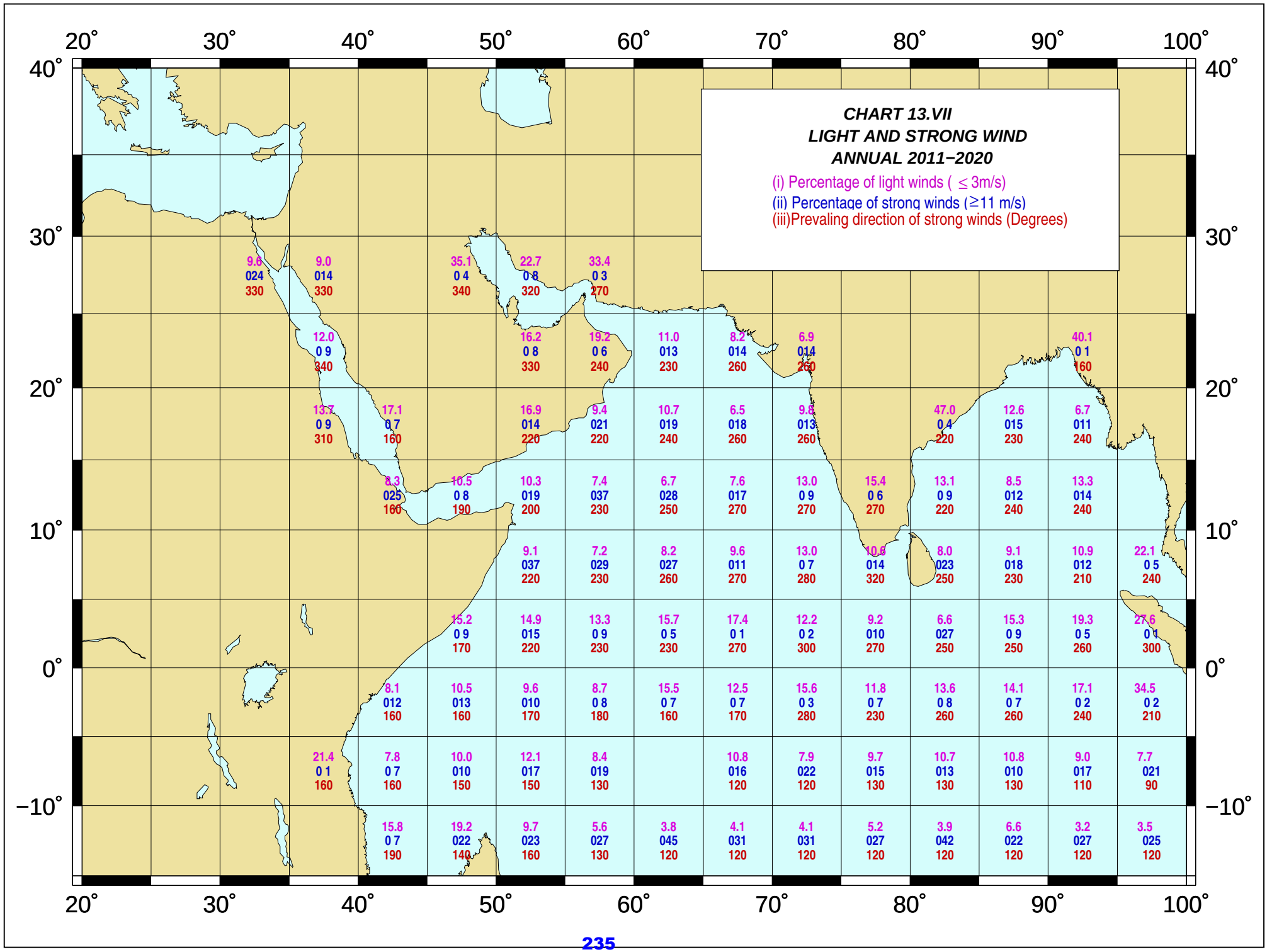


CHART 13.VII
LIGHT AND STRONG WIND
ANNUAL 2011–2020
(i) Percentage of light winds (≤ 3m/s)
(ii) Percentage of strong winds (≥11 m/s)
(iii)Prevaling direction of strong winds (Degrees)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
9.6 024 330
9.0 014 330
35.1 0 4 340
22.7 0 8 320
33.4 0 3 270
12.0 0 9 340
16.2 0 8 330
19.2 0 6 240
11.0 013 230
8.2 014 260
6.9 014 260
40.1 0 1 160
13.7 0 9 310
17.1 0 7 160
16.9 014 220
9.4 021 220
10.7 019 240
6.5 018 260
9.8 013 260
47.0 0 4 220
12.6 015 230
6.7 011 240
8.3 025 160
10.5 0 8 190
10.3 019 200
7.4 037 230
6.7 028 250
7.6 017 270
13.0 0 9 270
15.4 0 6 270
13.1 0 9 220
8.5 012 240
13.3 014 240
9.1 037 220
7.2 029 230
8.2 027 260
9.6 011 270
13.0 0 7 280
10.6 014 320
8.0 023 250
9.1 018 230
10.9 012 210
22.1 0 5 240
15.2 0 9 170
14.9 015 220
13.3 0 9 230
15.7 0 5 230
17.4 0 1 270
12.2 0 2 300
9.2 010 270
6.6 027 250
15.3 0 9 250
19.3 0 5 260
27.6 0 1 300
8.1 012 160
10.5 013 160
9.6 010 170
8.7 0 8 180
15.5 0 7 160
12.5 0 7 170
15.6 0 3 280
11.8 0 7 230
13.6 0 8 260
14.1 0 7 260
17.1 0 2 240
34.5 0 2 210
21.4 0 1 160
7.8 0 7 160
10.0 010 150
12.1 017 150
8.4 019 130
10.8 016 120
7.9 022 120
9.7 015 130
10.7 013 130
10.8 010 130
9.0 017 110
7.7 021 90
15.8 0 7 190
19.2 022 140
9.7 023 160
5.6 027 130
3.8 045 120
4.1 031 120
4.1 031 120
5.2 027 120
3.9 042 120
6.6 022 120
3.2 027 120
3.5 025 120

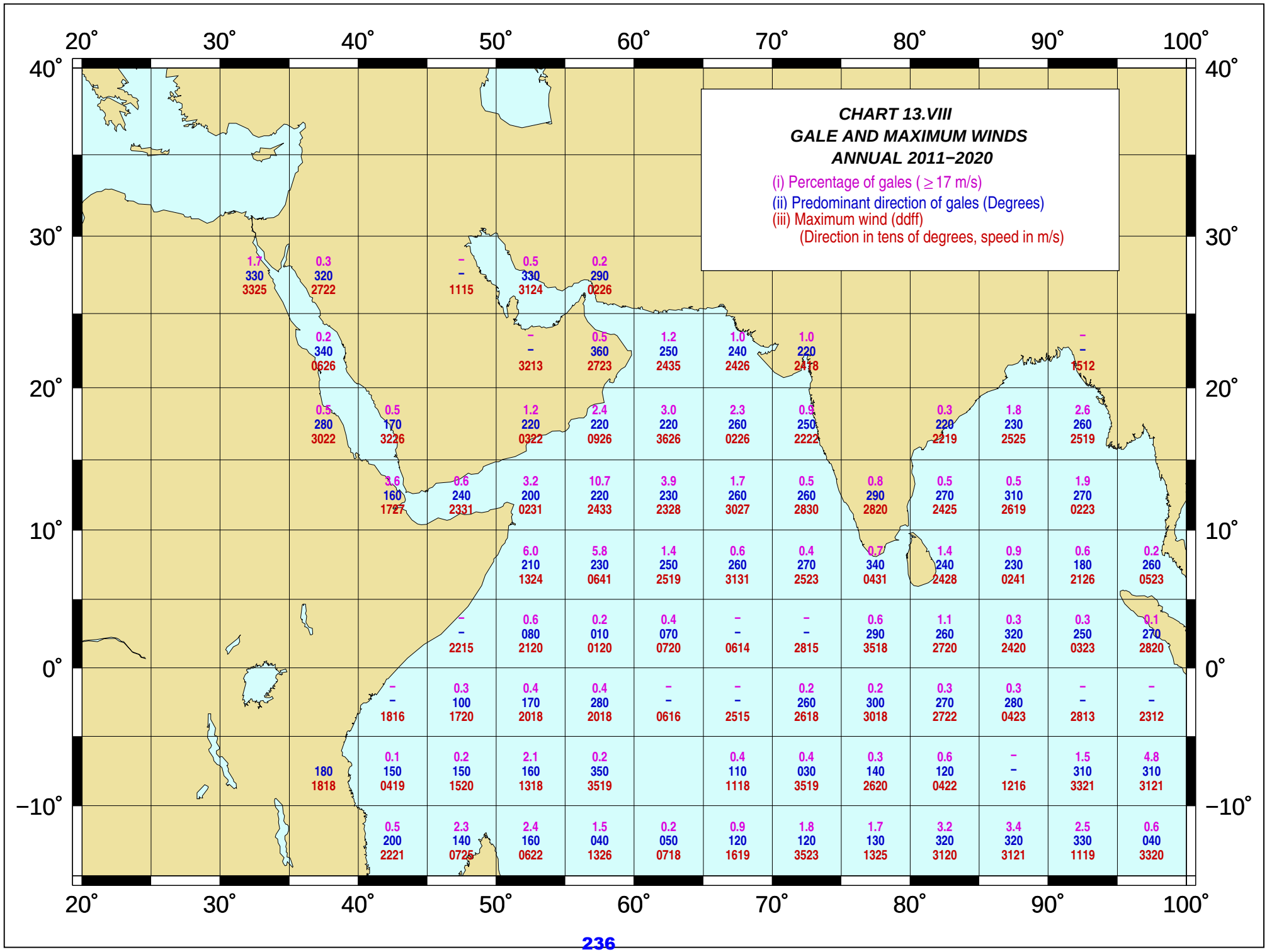


CHART 13.VIII
GALE AND MAXIMUM WINDS
ANNUAL 2011–2020
(i) Percentage of gales (≥ 17 m/s)
(ii) Predominant direction of gales (Degrees)
(iii) Maximum wind (ddff)
(Direction in tens of degrees, speed in m/s)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.7 330 3325
0.3 320 2722
– – 1115
0.5 330 3124
0.2 290 0226
0.2 340 0626
– – 3213
0.5 360 2723
1.2 250 2435
1.0 240 2426
1.0 220 2418
– – 1512
0.5 280 3022
0.5 170 3226
1.2 220 0322
2.4 220 0926
3.0 220 3626
2.3 260 0226
0.3 220 2219
1.8 230 2525
2.6 260 2519
3.6 160 1727
0.6 240 2331
3.2 200 0231
10.7 220 2433
3.9 230 2328
1.7 260 3027
0.5 260 2830
0.8 290 2820
0.5 270 2425
0.5 310 2619
1.9 270 0223
6.0 210 1324
5.8 230 0641
1.4 250 2519
0.6 260 3131
0.4 270 2523
0.7 340 0431
1.4 240 2428
0.9 230 0241
0.6 180 2126
0.2 260 0523
– – 2215
0.6 080 2120
0.2 010 0120
0.4 070 0720
– – 0614
– – 2815
0.6 290 3518
1.1 260 2720
0.3 320 2420
0.3 250 0323
0.1 270 2820
– – 1816
0.3 100 1720
0.4 170 2018
0.4 280 2018
– – 0616
– – 2515
0.2 260 2618
0.2 300 3018
0.3 270 2722
0.3 280 0423
– – 2813
– – 2312
180 1818
0.1 150 0419
0.2 150 1520
2.1 160 1318
0.2 350 3519
0.4 110 1118
0.4 030 3519
0.3 140 2620
0.6 120 0422
– – 1216
1.5 310 3321
4.8 310 3121
0.5 200 2221
2.3 140 0725
2.4 160 0622
1.5 040 1326
0.2 050 0718
0.9 120 1619
1.8 120 3523
1.7 130 1325
3.2 320 3120
3.4 320 3121
2.5 330 1119
0.6 040 3320

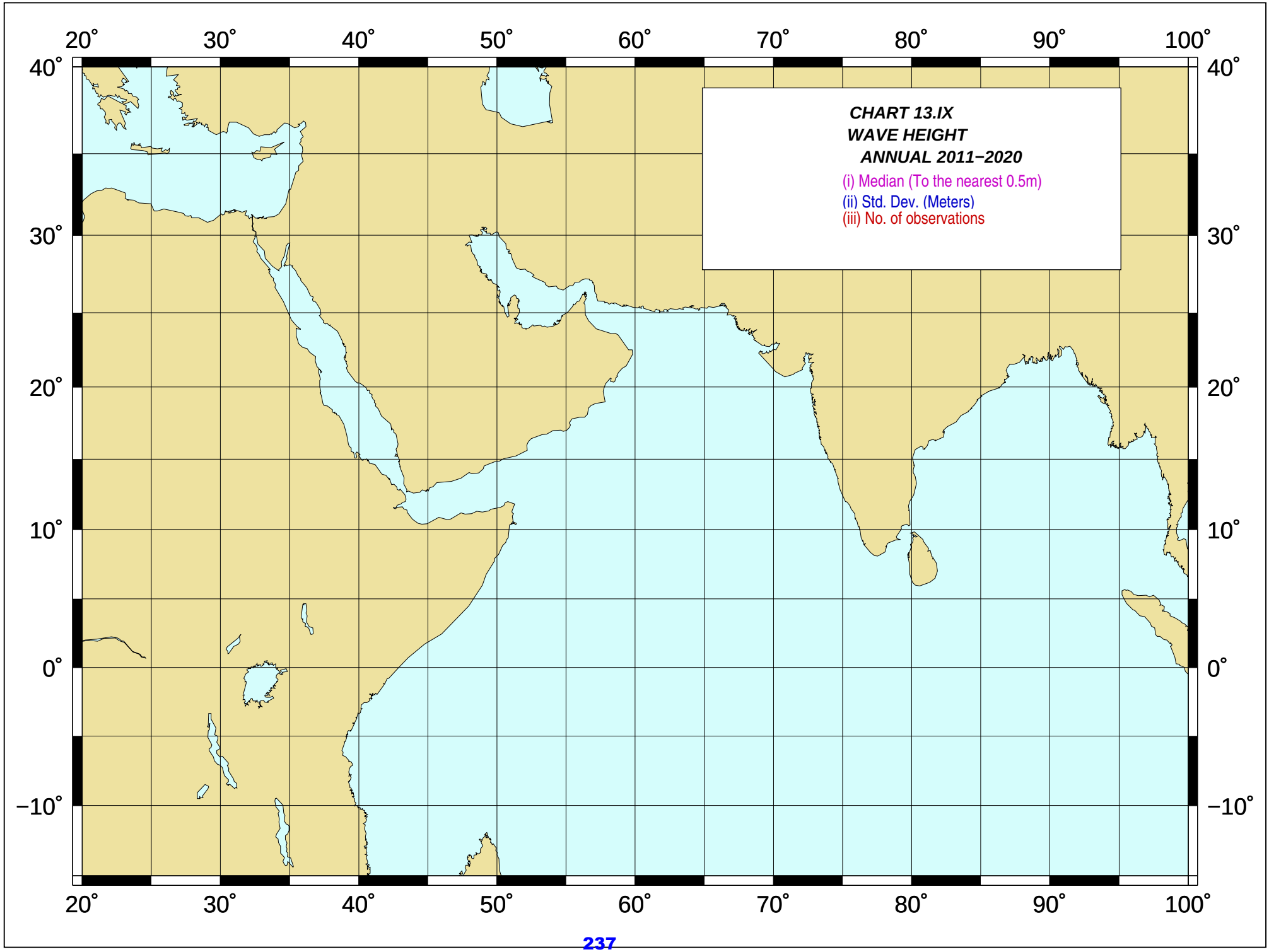


CHART 13.IX
WAVE HEIGHT
ANNUAL 2011–2020
(i) Median (To the nearest 0.5m)
(ii) Std. Dev. (Meters)
(iii) No. of observations
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°

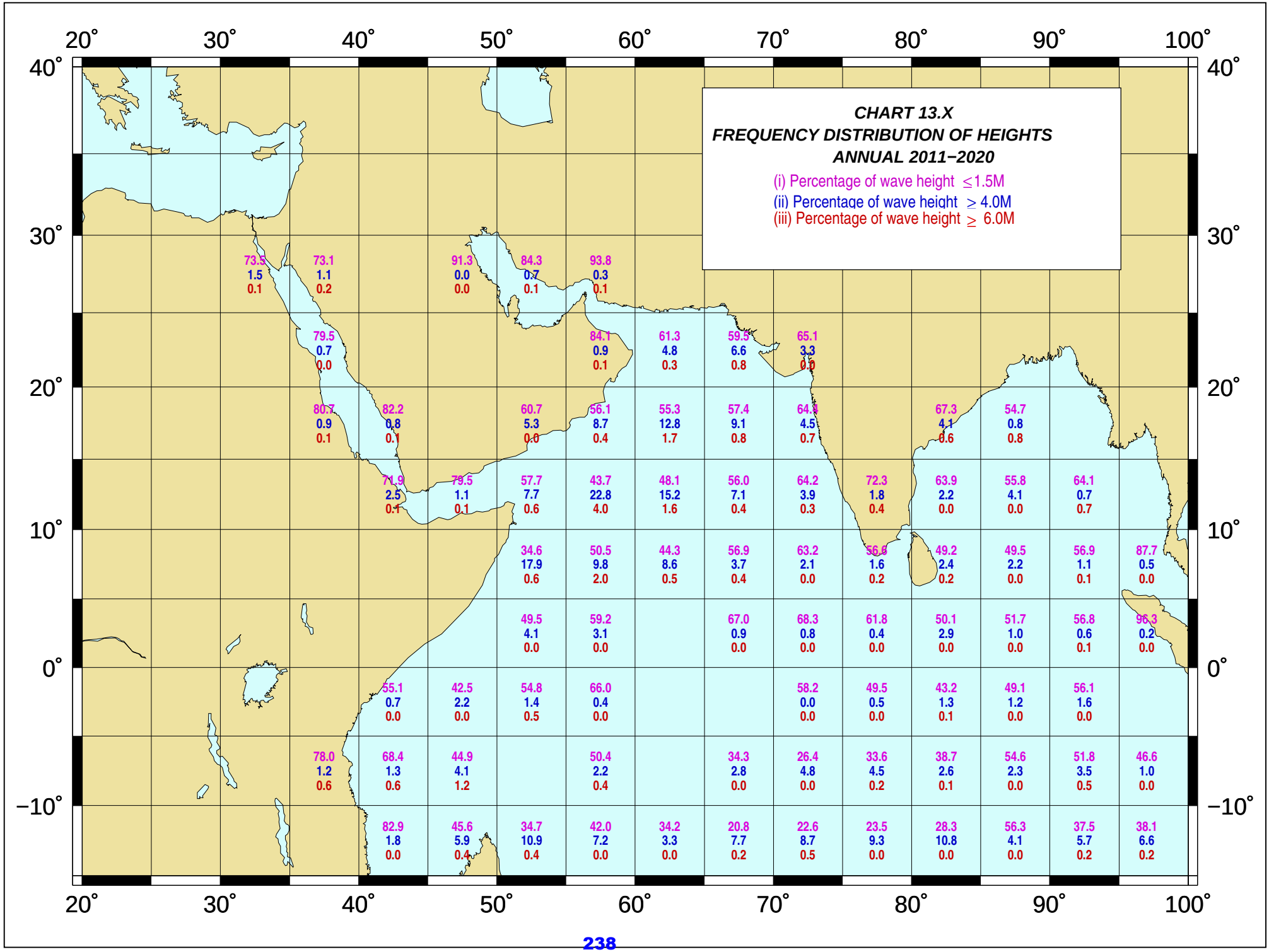


CHART 13.X
FREQUENCY DISTRIBUTION OF HEIGHTS
ANNUAL 2011–2020
(i) Percentage of wave height ≤1.5M
(ii) Percentage of wave height ≥ 4.0M
(iii) Percentage of wave height ≥ 6.0M
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
73.5 1.5 0.1
73.1 1.1 0.2
91.3 0.0 0.0
84.3 0.7 0.1
93.8 0.3 0.1
79.5 0.7 0.0
84.1 0.9 0.1
61.3 4.8 0.3
59.5 6.6 0.8
65.1 3.3 0.9
80.7 0.9 0.1
82.2 0.8 0.1
60.7 5.3 0.0
56.1 8.7 0.4
55.3 12.8 1.7
57.4 9.1 0.8
64.3 4.5 0.7
67.3 4.1 0.6
54.7 0.8 0.8
71.9 2.5 0.1
79.5 1.1 0.1
57.7 7.7 0.6
43.7 22.8 4.0
48.1 15.2 1.6
56.0 7.1 0.4
64.2 3.9 0.3
72.3 1.8 0.4
63.9 2.2 0.0
55.8 4.1 0.0
64.1 0.7 0.7
34.6 17.9 0.6
50.5 9.8 2.0
44.3 8.6 0.5
56.9 3.7 0.4
63.2 2.1 0.0
56.9 1.6 0.2
49.2 2.4 0.2
49.5 2.2 0.0
56.9 1.1 0.1
87.7 0.5 0.0
49.5 4.1 0.0
59.2 3.1 0.0
67.0 0.9 0.0
68.3 0.8 0.0
61.8 0.4 0.0
50.1 2.9 0.0
51.7 1.0 0.0
56.8 0.6 0.1
96.3 0.2 0.0
55.1 0.7 0.0
42.5 2.2 0.0
54.8 1.4 0.5
66.0 0.4 0.0
58.2 0.0 0.0
49.5 0.5 0.0
43.2 1.3 0.1
49.1 1.2 0.0
56.1 1.6 0.0
78.0 1.2 0.6
68.4 1.3 0.6
44.9 4.1 1.2
50.4 2.2 0.4
34.3 2.8 0.0
26.4 4.8 0.0
33.6 4.5 0.2
38.7 2.6 0.1
54.6 2.3 0.0
51.8 3.5 0.5
46.6 1.0 0.0
82.9 1.8 0.0
45.6 5.9 0.4
34.7 10.9 0.4
42.0 7.2 0.0
34.2 3.3 0.0
20.8 7.7 0.2
22.6 8.7 0.5
23.5 9.3 0.0
28.3 10.8 0.0
56.3 4.1 0.0
37.5 5.7 0.2
38.1 6.6 0.2

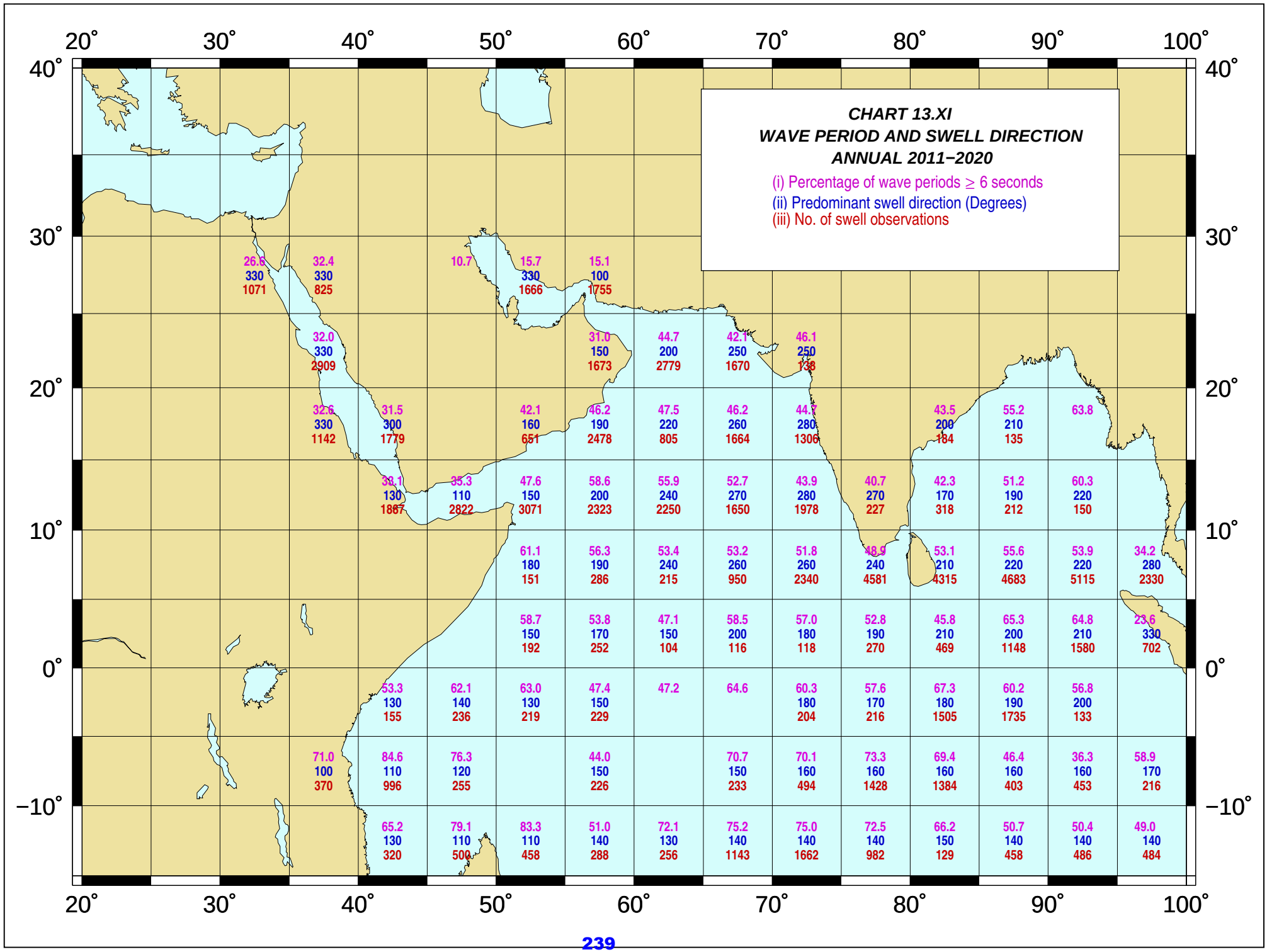


CHART 13.XI
WAVE PERIOD AND SWELL DIRECTION
ANNUAL 2011–2020
(i) Percentage of wave periods ≥ 6 seconds
(ii) Predominant swell direction (Degrees)
(iii) No. of swell observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
26.6 330 1071
32.4 330 825
10.7
15.7 330 1666
15.1 100 1755
32.0 330 2909
31.0 150 1673
44.7 200 2779
42.1 250 1670
46.1 250 138
32.6 330 1142
31.5 300 1779
42.1 160 651
46.2 190 2478
47.5 220 805
46.2 260 1664
44.7 280 1306
43.5 200 184
55.2 210 135
63.8
30.1 130 1867
35.3 110 2822
47.6 150 3071
58.6 200 2323
55.9 240 2250
52.7 270 1650
43.9 280 1978
40.7 270 227
42.3 170 318
51.2 190 212
60.3 220 150
61.1 180 151
56.3 190 286
53.4 240 215
53.2 260 950
51.8 260 2340
48.9 240 4581
53.1 210 4315
55.6 220 4683
53.9 220 5115
34.2 280 2330
58.7 150 192
53.8 170 252
47.1 150 104
58.5 200 116
57.0 180 118
52.8 190 270
45.8 210 469
65.3 200 1148
64.8 210 1580
23.6 330 702
53.3 130 155
62.1 140 236
63.0 130 219
47.4 150 229
47.2
64.6
60.3 180 204
57.6 170 216
67.3 180 1505
60.2 190 1735
56.8 200 133
71.0 100 370
84.6 110 996
76.3 120 255
44.0 150 226
70.7 150 233
70.1 160 494
73.3 160 1428
69.4 160 1384
46.4 160 403
36.3 160 453
58.9 170 216
65.2 130 320
79.1 110 500
83.3 110 458
51.0 140 288
72.1 130 256
75.2 140 1143
75.0 140 1662
72.5 140 982
66.2 150 129
50.7 140 458
50.4 140 486
49.0 140 484

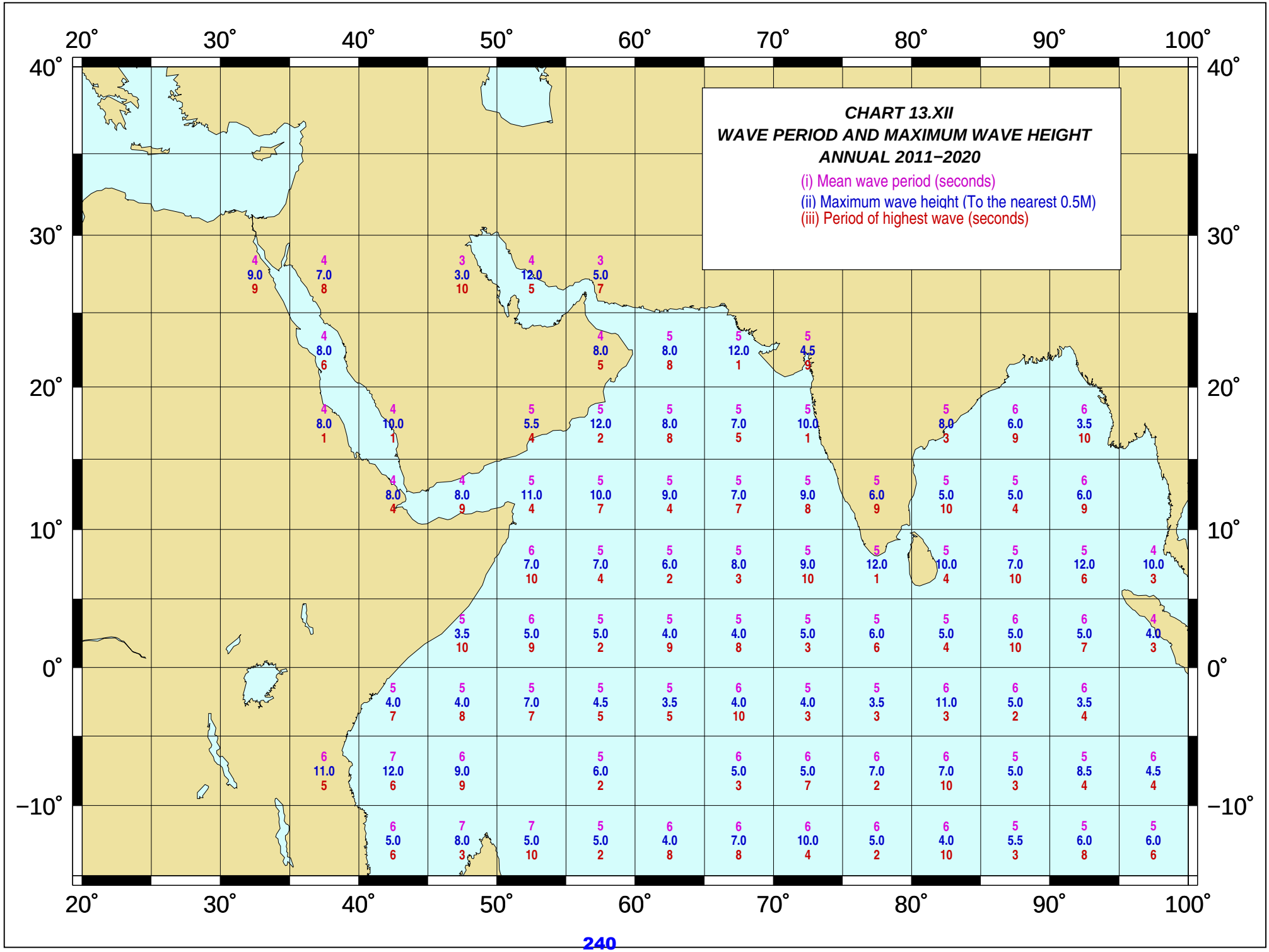


CHART 13.XII
WAVE PERIOD AND MAXIMUM WAVE HEIGHT
ANNUAL 2011–2020
(i) Mean wave period (seconds)
(ii) Maximum wave height (To the nearest 0.5M)
(iii) Period of highest wave (seconds)
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°

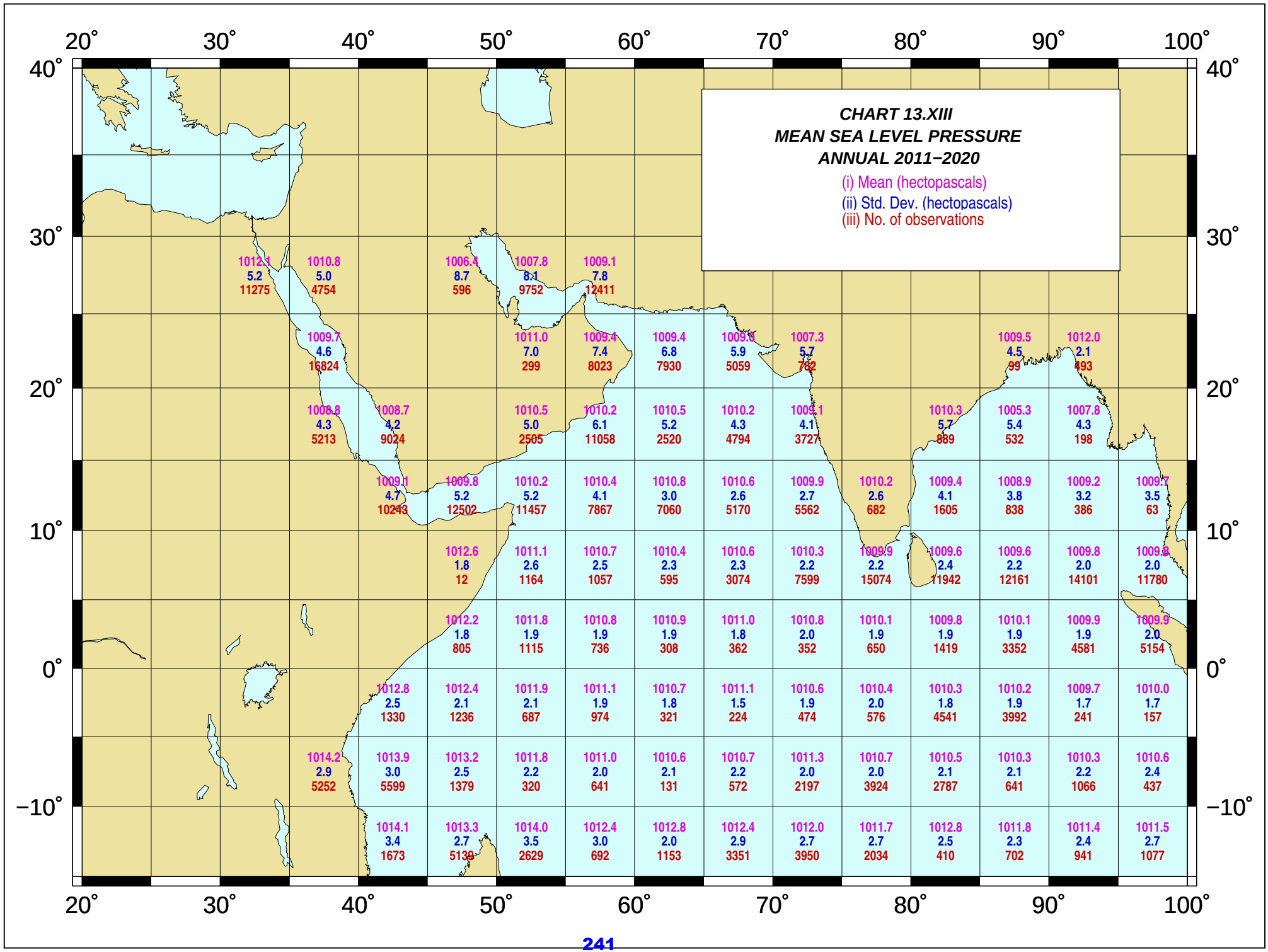


CHART 13.XIII
MEAN SEA LEVEL PRESSURE
ANNUAL 2011–2020
(i) Mean (hectopascals)
(ii) Std. Dev. (hectopascals)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1012.1 5.2 11275
1010.8 5.0 4754
1006.4 8.7 596
1007.8 8.1 9752
1009.1 7.8 12411
1009.7 4.6 16824
1011.0 7.0 299
1009.4 7.4 8023
1009.4 6.8 7930
1009.6 5.9 5059
1007.3 5.7 782
1009.5 4.5 99
1012.0 2.1 493
1008.8 4.3 5213
1008.7 4.2 9024
1010.5 5.0 2505
1010.2 6.1 11058
1010.5 5.2 2520
1010.2 4.3 4794
1009.1 4.1 3727
1010.3 5.7 889
1005.3 5.4 532
1007.8 4.3 198
1009.1 4.7 10243
1009.8 5.2 12502
1010.2 5.2 11457
1010.4 4.1 7867
1010.8 3.0 7060
1010.6 2.6 5170
1009.9 2.7 5562
1010.2 2.6 682
1009.4 4.1 1605
1008.9 3.8 838
1009.2 3.2 386
1009.7 3.5 63
1012.6 1.8 12
1011.1 2.6 1164
1010.7 2.5 1057
1010.4 2.3 595
1010.6 2.3 3074
1010.3 2.2 7599
1009.9 2.2 15074
1009.6 2.4 11942
1009.6 2.2 12161
1009.8 2.0 14101
1009.8 2.0 11780
1012.2 1.8 805
1011.8 1.9 1115
1010.8 1.9 736
1010.9 1.9 308
1011.0 1.8 362
1010.8 2.0 352
1010.1 1.9 650
1009.8 1.9 1419
1010.1 1.9 3352
1009.9 1.9 4581
1009.9 2.0 5154
1012.8 2.5 1330
1012.4 2.1 1236
1011.9 2.1 687
1011.1 1.9 974
1010.7 1.8 321
1011.1 1.5 224
1010.6 1.9 474
1010.4 2.0 576
1010.3 1.8 4541
1010.2 1.9 3992
1009.7 1.7 241
1010.0 1.7 157
1014.2 2.9 5252
1013.9 3.0 5599
1013.2 2.5 1379
1011.8 2.2 320
1011.0 2.0 641
1010.6 2.1 131
1010.7 2.2 572
1011.3 2.0 2197
1010.7 2.0 3924
1010.5 2.1 2787
1010.3 2.1 641
1010.3 2.2 1066
1010.6 2.4 437
1014.1 3.4 1673
1013.3 2.7 5139
1014.0 3.5 2629
1012.4 3.0 692
1012.8 2.0 1153
1012.4 2.9 3351
1012.0 2.7 3950
1011.7 2.7 2034
1012.8 2.5 410
1011.8 2.3 702
1011.4 2.4 941
1011.5 2.7 1077

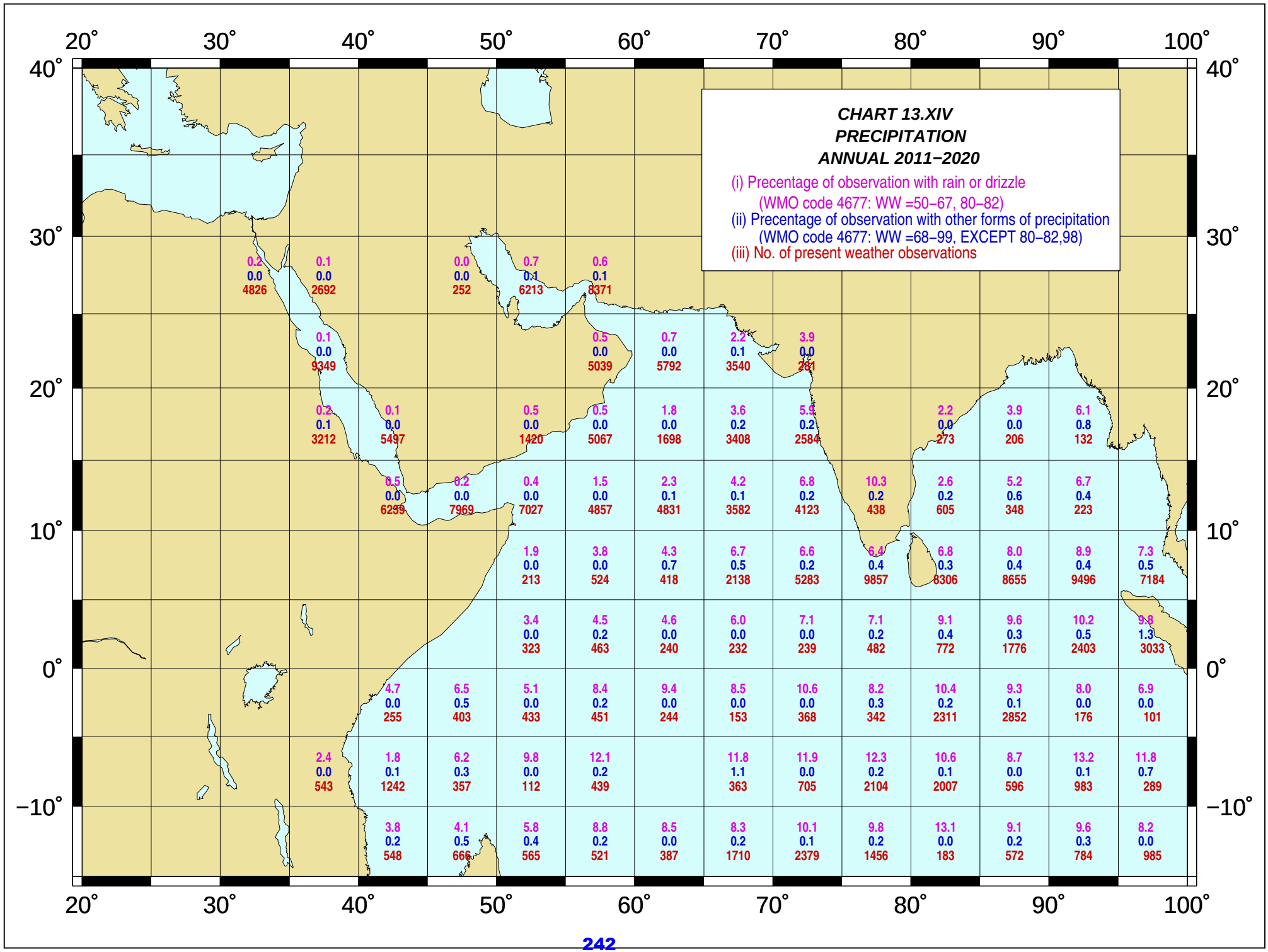


CHART 13.XIV
PRECIPITATION
ANNUAL 2011–2020
(i) Precentage of observation with rain or drizzle
(WMO code 4677: WW =50–67, 80–82)
(ii) Precentage of observation with other forms of precipitation
(WMO code 4677: WW =68–99, EXCEPT 80–82,98)
(iii) No. of present weather observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.2 0.0 4826
0.1 0.0 2692
0.0 0.0 252
0.7 0.1 6213
0.6 0.1 8371
0.1 0.0 9349
0.5 0.0 5039
0.7 0.0 5792
2.2 0.1 3540
3.9 0.0 281
0.2 0.1 3212
0.1 0.0 5497
0.5 0.0 1420
0.5 0.0 5067
1.8 0.0 1698
3.6 0.2 3408
5.9 0.2 2584
2.2 0.0 273
3.9 0.0 206
6.1 0.8 132
0.5 0.0 6239
0.2 0.0 7969
0.4 0.0 7027
1.5 0.0 4857
2.3 0.1 4831
4.2 0.1 3582
6.8 0.2 4123
10.3 0.2 438
2.6 0.2 605
5.2 0.6 348
6.7 0.4 223
1.9 0.0 213
3.8 0.0 524
4.3 0.7 418
6.7 0.5 2138
6.6 0.2 5283
6.4 0.4 9857
6.8 0.3 8306
8.0 0.4 8655
8.9 0.4 9496
7.3 0.5 7184
3.4 0.0 323
4.5 0.2 463
4.6 0.0 240
6.0 0.0 232
7.1 0.0 239
7.1 0.2 482
9.1 0.4 772
9.6 0.3 1776
10.2 0.5 2403
9.8 1.3 3033
4.7 0.0 255
6.5 0.5 403
5.1 0.0 433
8.4 0.2 451
9.4 0.0 244
8.5 0.0 153
10.6 0.0 368
8.2 0.3 342
10.4 0.2 2311
9.3 0.1 2852
8.0 0.0 176
6.9 0.0 101
2.4 0.0 543
1.8 0.1 1242
6.2 0.3 357
9.8 0.0 112
12.1 0.2 439
11.8 1.1 363
11.9 0.0 705
12.3 0.2 2104
10.6 0.1 2007
8.7 0.0 596
13.2 0.1 983
11.8 0.7 289
3.8 0.2 548
4.1 0.5 666
5.8 0.4 565
8.8 0.2 521
8.5 0.0 387
8.3 0.2 1710
10.1 0.1 2379
9.8 0.2 1456
13.1 0.0 183
9.1 0.2 572
9.6 0.3 784
8.2 0.0 985

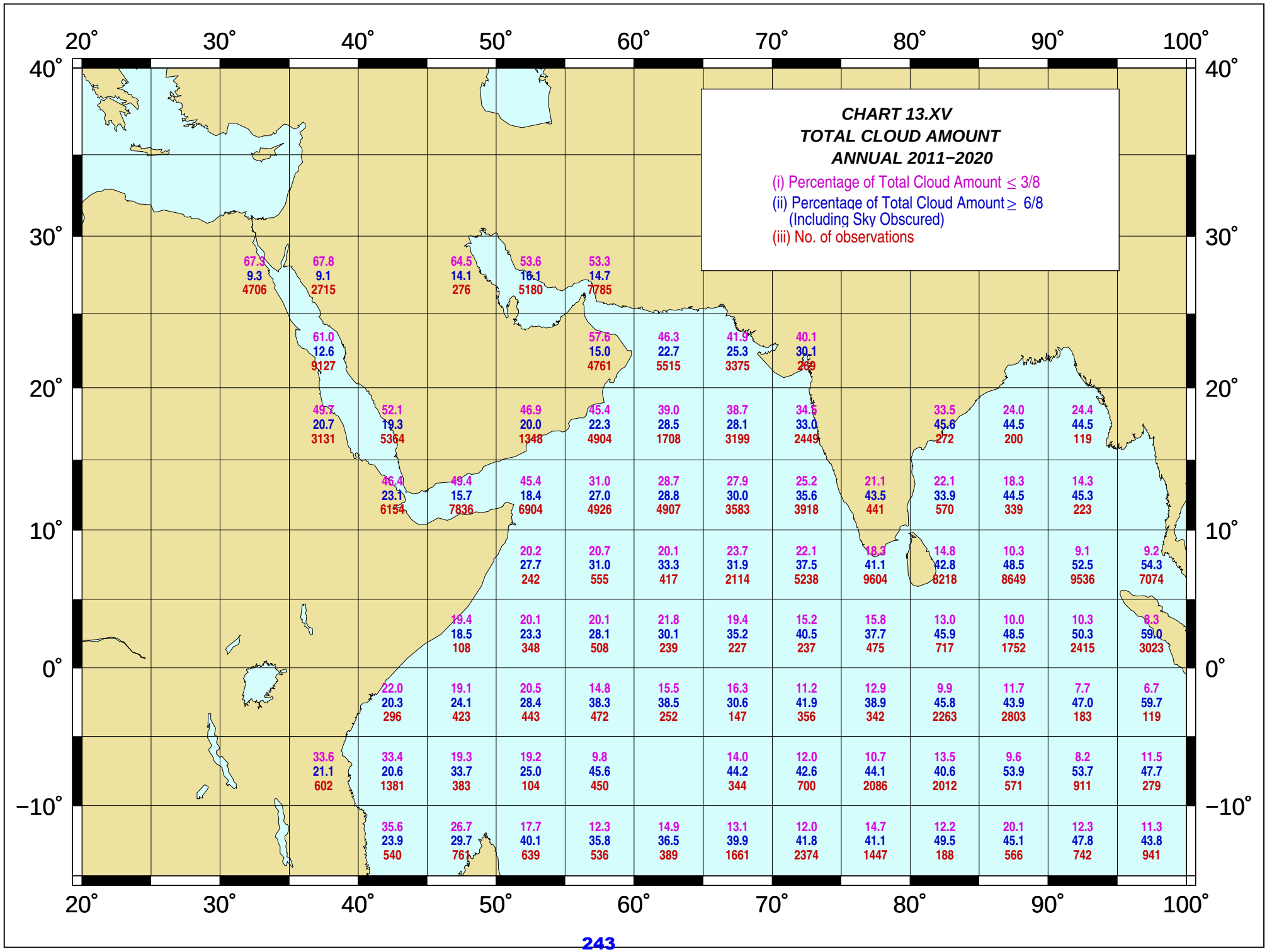


CHART 13.XV
TOTAL CLOUD AMOUNT
ANNUAL 2011–2020
(i) Percentage of Total Cloud Amount ≤ 3/8
(ii) Percentage of Total Cloud Amount ≥ 6/8 (Including Sky Obscured)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
67.3 9.3 4706
67.8 9.1 2715
64.5 14.1 276
53.6 16.1 5180
53.3 14.7 7785
61.0 12.6 9127
57.6 15.0 4761
46.3 22.7 5515
41.9 25.3 3375
40.1 30.1 269
49.7 20.7 3131
52.1 19.3 5364
46.9 20.0 1348
45.4 22.3 4904
39.0 28.5 1708
38.7 28.1 3199
34.5 33.0 2449
33.5 45.6 272
24.0 44.5 200
24.4 44.5 119
46.4 23.1 6154
49.4 15.7 7836
45.4 18.4 6904
31.0 27.0 4926
28.7 28.8 4907
27.9 30.0 3583
25.2 35.6 3918
21.1 43.5 441
22.1 33.9 570
18.3 44.5 339
14.3 45.3 223
20.2 27.7 242
20.7 31.0 555
20.1 33.3 417
23.7 31.9 2114
22.1 37.5 5238
18.3 41.1 9604
14.8 42.8 8218
10.3 48.5 8649
9.1 52.5 9536
9.2 54.3 7074
19.4 18.5 108
20.1 23.3 348
20.1 28.1 508
21.8 30.1 239
19.4 35.2 227
15.2 40.5 237
15.8 37.7 475
13.0 45.9 717
10.0 48.5 1752
10.3 50.3 2415
8.3 59.0 3023
22.0 20.3 296
19.1 24.1 423
20.5 28.4 443
14.8 38.3 472
15.5 38.5 252
16.3 30.6 147
11.2 41.9 356
12.9 38.9 342
9.9 45.8 2263
11.7 43.9 2803
7.7 47.0 183
6.7 59.7 119
33.6 21.1 602
33.4 20.6 1381
19.3 33.7 383
19.2 25.0 104
9.8 45.6 450
14.0 44.2 344
12.0 42.6 700
10.7 44.1 2086
13.5 40.6 2012
9.6 53.9 571
8.2 53.7 911
11.5 47.7 279
35.6 23.9 540
26.7 29.7 761
17.7 40.1 639
12.3 35.8 536
14.9 36.5 389
13.1 39.9 1661
12.0 41.8 2374
14.7 41.1 1447
12.2 49.5 188
20.1 45.1 566
12.3 47.8 742
11.3 43.8 941

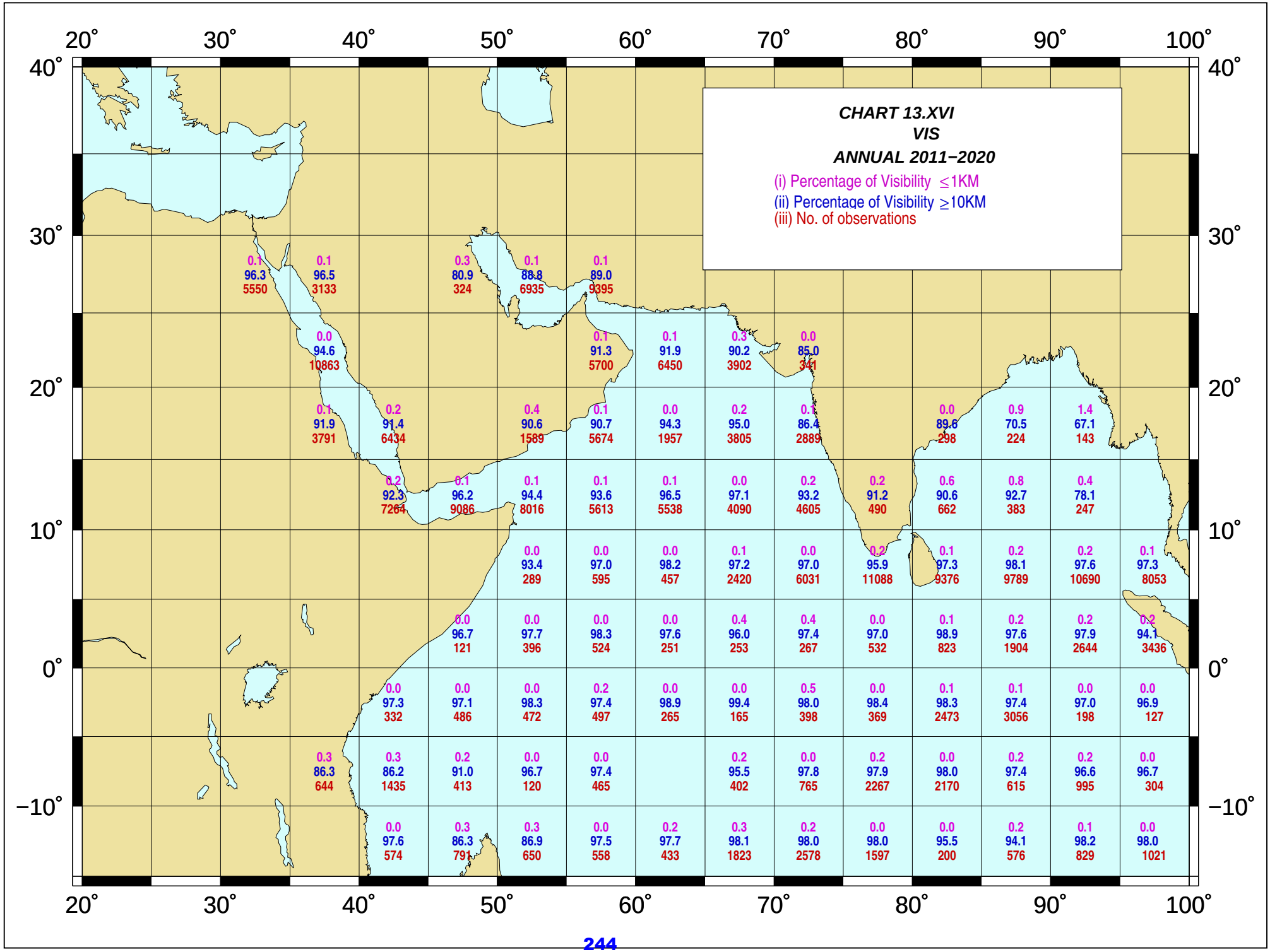


CHART 13.XVI
VIS
ANNUAL 2011–2020
(i) Percentage of Visibility ≤1KM
(ii) Percentage of Visibility ≥10KM
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
0.1 96.3 5550
0.1 96.5 3133
0.3 80.9 324
0.1 88.8 6935
0.1 89.0 9395
0.0 94.6 10863
0.1 91.3 5700
0.1 91.9 6450
0.3 90.2 3902
0.0 85.0 341
0.1 91.9 3791
0.2 91.4 6434
0.4 90.6 1589
0.1 90.7 5674
0.0 94.3 1957
0.2 95.0 3805
0.1 86.4 2889
0.0 89.6 298
0.9 70.5 224
1.4 67.1 143
0.2 92.3 7264
0.1 96.2 9086
0.1 94.4 8016
0.1 93.6 5613
0.1 96.5 5538
0.0 97.1 4090
0.2 93.2 4605
0.2 91.2 490
0.6 90.6 662
0.8 92.7 383
0.4 78.1 247
0.0 93.4 289
0.0 97.0 595
0.0 98.2 457
0.1 97.2 2420
0.0 97.0 6031
0.2 95.9 11088
0.1 97.3 9376
0.2 98.1 9789
0.2 97.6 10690
0.1 97.3 8053
0.0 96.7 121
0.0 97.7 396
0.0 98.3 524
0.0 97.6 251
0.4 96.0 253
0.4 97.4 267
0.0 97.0 532
0.1 98.9 823
0.2 97.6 1904
0.2 97.9 2644
0.2 94.1 3436
0.0 97.3 332
0.0 97.1 486
0.0 98.3 472
0.2 97.4 497
0.0 98.9 265
0.0 99.4 165
0.5 98.0 398
0.0 98.4 369
0.1 98.3 2473
0.1 97.4 3056
0.0 97.0 198
0.0 96.9 127
0.3 86.3 644
0.3 86.2 1435
0.2 91.0 413
0.0 96.7 120
0.0 97.4 465
0.2 95.5 402
0.0 97.8 765
0.2 97.9 2267
0.0 98.0 2170
0.2 97.4 615
0.2 96.6 995
0.0 96.7 304
0.0 97.6 574
0.3 86.3 791
0.3 86.9 650
0.0 97.5 558
0.2 97.7 433
0.3 98.1 1823
0.2 98.0 2578
0.0 98.0 1597
0.0 95.5 200
0.2 94.1 576
0.1 98.2 829
0.0 98.0 1021

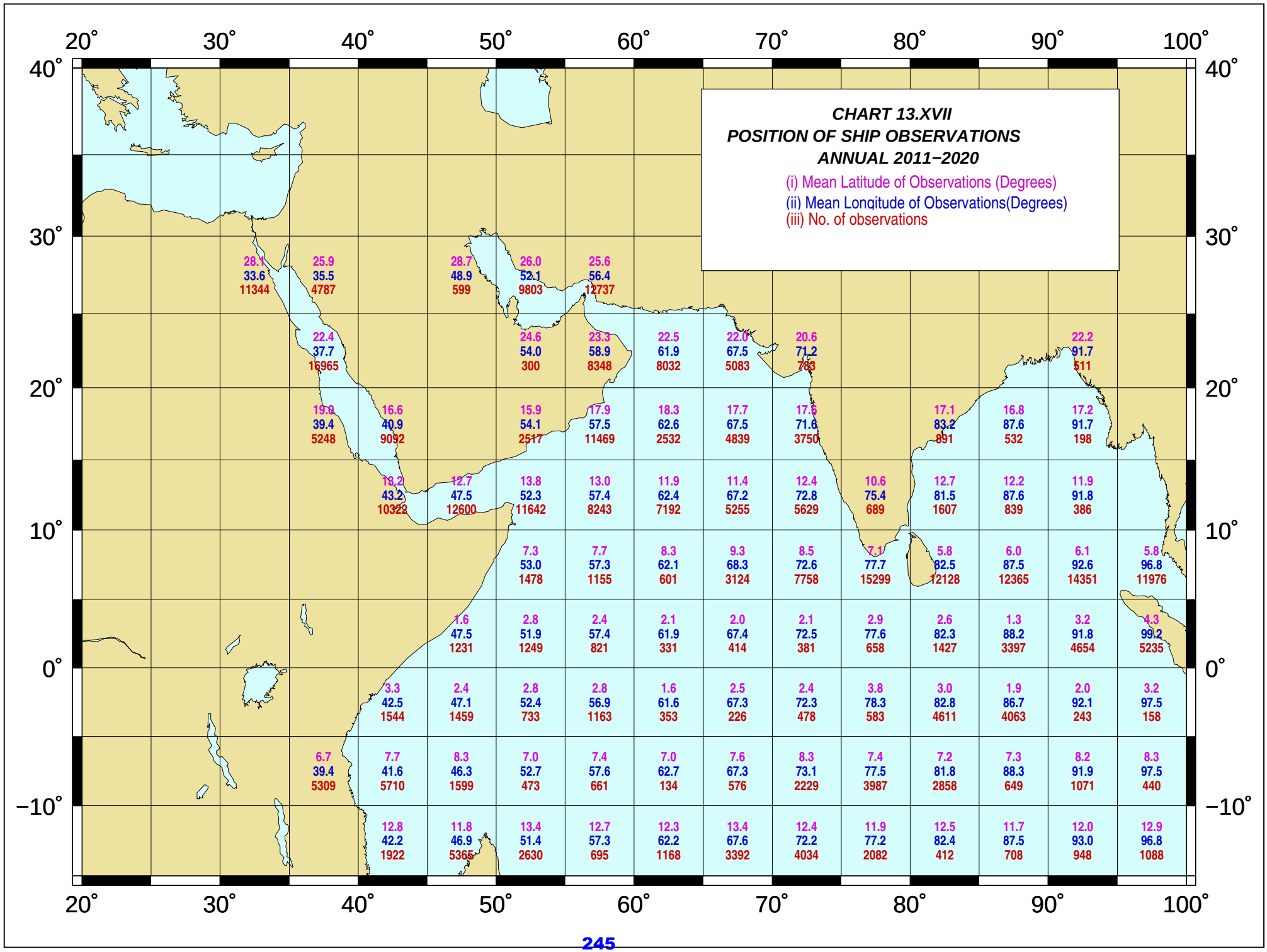


CHART 13.XVII
POSITION OF SHIP OBSERVATIONS
ANNUAL 2011–2020
(i) Mean Latitude of Observations (Degrees)
(ii) Mean Longitude of Observations(Degrees)
(iii) No. of observations
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
28.1 33.6 11344
25.9 35.5 4787
28.7 48.9 599
26.0 52.1 9803
25.6 56.4 12737
22.4 37.7 16965
24.6 54.0 300
23.3 58.9 8348
22.5 61.9 8032
22.0 67.5 5083
20.6 71.2 783
22.2 91.7 511
19.9 39.4 5248
16.6 40.9 9092
15.9 54.1 2517
17.9 57.5 11469
18.3 62.6 2532
17.7 67.5 4839
17.5 71.6 3750
17.1 83.2 891
16.8 87.6 532
17.2 91.7 198
13.2 43.2 10322
12.7 47.5 12600
13.8 52.3 11642
13.0 57.4 8243
11.9 62.4 7192
11.4 67.2 5255
12.4 72.8 5629
10.6 75.4 689
12.7 81.5 1607
12.2 87.6 839
11.9 91.8 386
7.3 53.0 1478
7.7 57.3 1155
8.3 62.1 601
9.3 68.3 3124
8.5 72.6 7758
7.1 77.7 15299
5.8 82.5 12128
6.0 87.5 12365
6.1 92.6 14351
5.8 96.8 11976
1.6 47.5 1231
2.8 51.9 1249
2.4 57.4 821
2.1 61.9 331
2.0 67.4 414
2.1 72.5 381
2.9 77.6 658
2.6 82.3 1427
1.3 88.2 3397
3.2 91.8 4654
4.3 99.2 5235
3.3 42.5 1544
2.4 47.1 1459
2.8 52.4 733
2.8 56.9 1163
1.6 61.6 353
2.5 67.3 226
2.4 72.3 478
3.8 78.3 583
3.0 82.8 4611
1.9 86.7 4063
2.0 92.1 243
3.2 97.5 158
6.7 39.4 5309
7.7 41.6 5710
8.3 46.3 1599
7.0 52.7 473
7.4 57.6 661
7.0 62.7 134
7.6 67.3 576
8.3 73.1 2229
7.4 77.5 3987
7.2 81.8 2858
7.3 88.3 649
8.2 91.9 1071
8.3 97.5 440
12.8 42.2 1922
11.8 46.9 5365
13.4 51.4 2630
12.7 57.3 695
12.3 62.2 1168
13.4 67.6 3392
12.4 72.2 4034
11.9 77.2 2082
12.5 82.4 412
11.7 87.5 708
12.0 93.0 948
12.9 96.8 1088

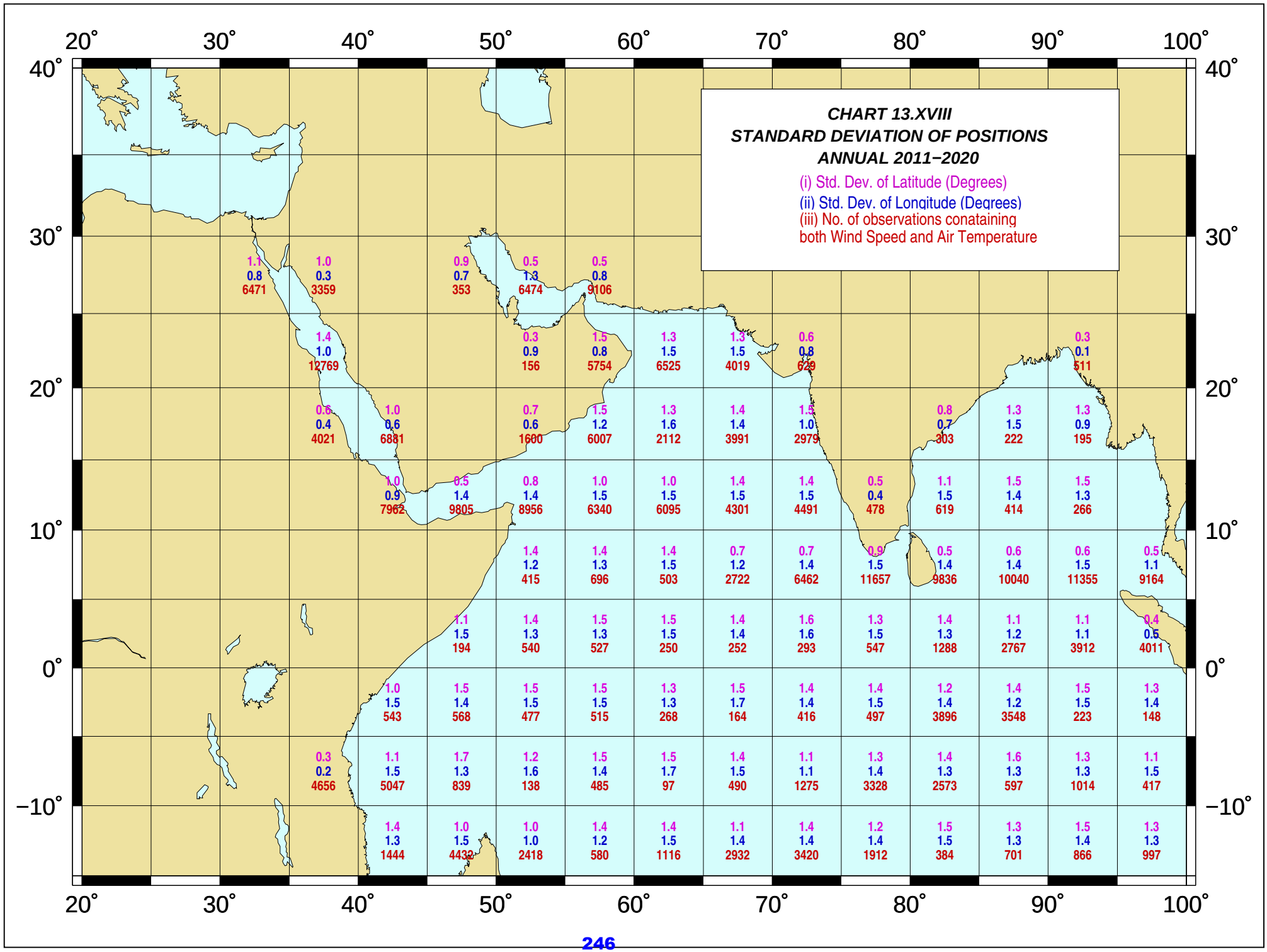
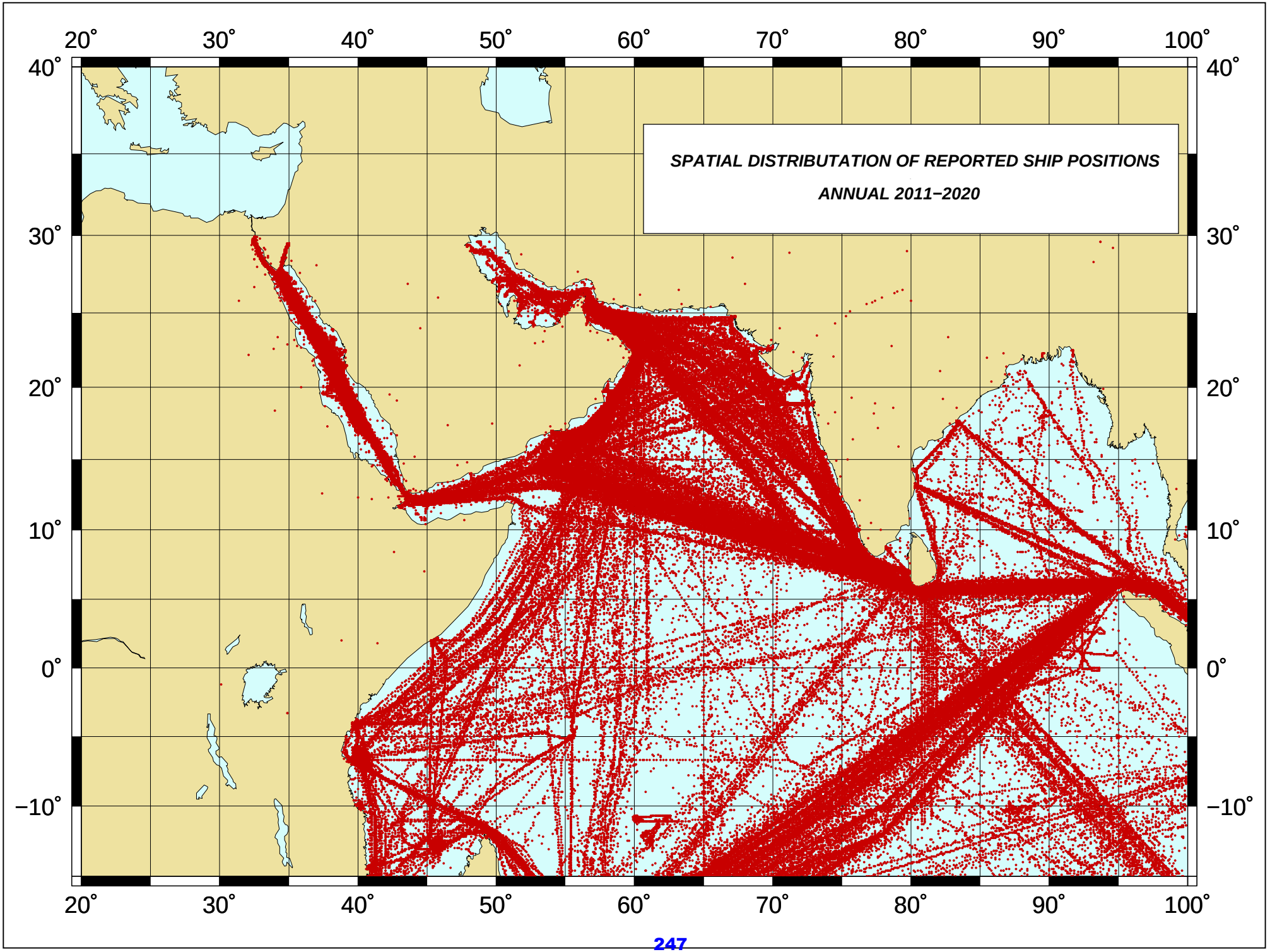
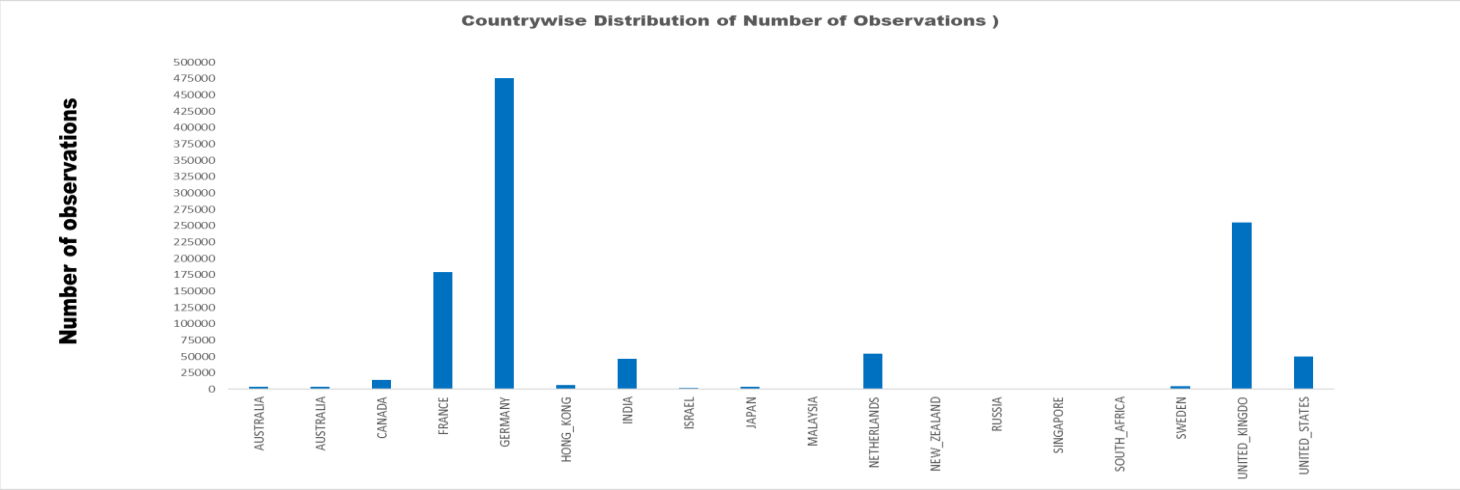
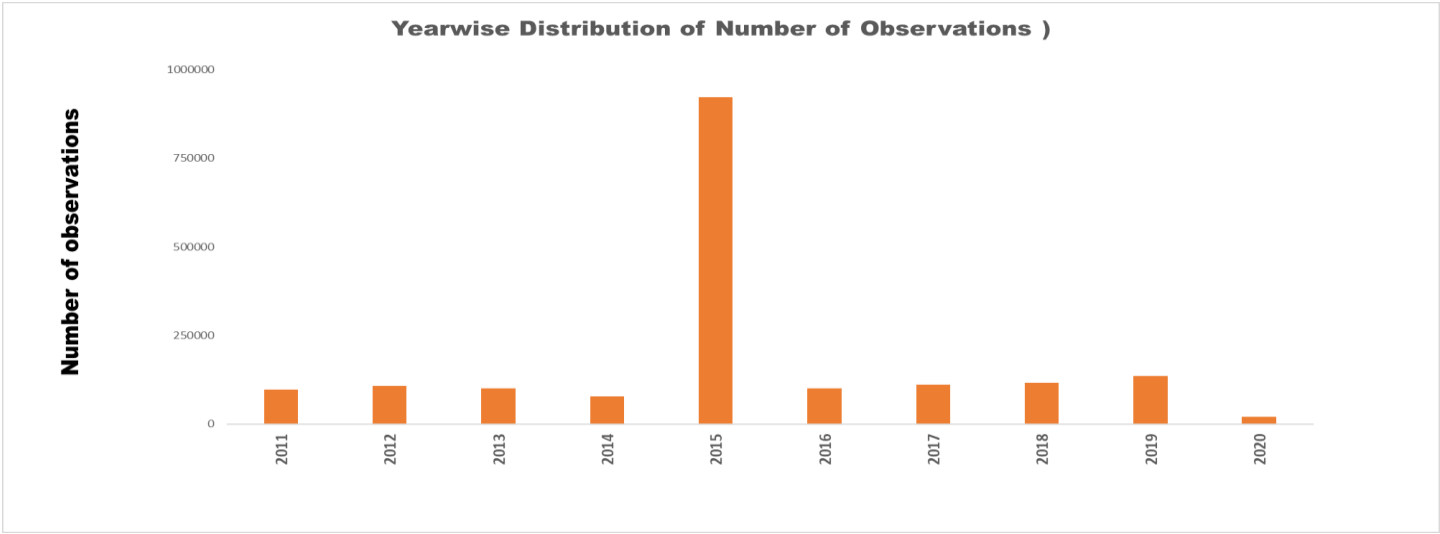


CHART 13.XVIII
STANDARD DEVIATION OF POSITIONS
ANNUAL 2011–2020
(i) Std. Dev. of Latitude (Degrees)
(ii) Std. Dev. of Longitude (Degrees)
(iii) No. of observations conataining
both Wind Speed and Air Temperature
20° 30° 40° 50° 60° 70° 80° 90° 100°
40° 30° 20° 10° 0° −10°
1.1 0.8 6471
1.0 0.3 3359
0.9 0.7 353
0.5 1.3 6474
0.5 0.8 9106
1.4 1.0 12769
0.3 0.9 156
1.5 0.8 5754
1.3 1.5 6525
1.3 1.5 4019
0.6 0.8 629
0.3 0.1 511
0.6 0.4 4021
1.0 0.6 6881
0.7 0.6 1600
1.5 1.2 6007
1.3 1.6 2112
1.4 1.4 3991
1.5 1.0 2979
0.8 0.7 303
1.3 1.5 222
1.3 0.9 195
1.0 0.9 7962
0.5 1.4 9805
0.8 1.4 8956
1.0 1.5 6340
1.0 1.5 6095
1.4 1.5 4301
1.4 1.5 4491
0.5 0.4 478
1.1 1.5 619
1.5 1.4 414
1.5 1.3 266
1.4 1.2 415
1.4 1.3 696
1.4 1.5 503
0.7 1.2 2722
0.7 1.4 6462
0.9 1.5 11657
0.5 1.4 9836
0.6 1.4 10040
0.6 1.5 11355
0.5 1.1 9164
1.1 1.5 194
1.4 1.3 540
1.5 1.3 527
1.5 1.5 250
1.4 1.4 252
1.6 1.6 293
1.3 1.5 547
1.4 1.3 1288
1.1 1.2 2767
1.1 1.1 3912
0.4 0.5 4011
1.0 1.5 543
1.5 1.4 568
1.5 1.5 477
1.5 1.5 515
1.3 1.3 268
1.5 1.7 164
1.4 1.4 416
1.4 1.5 497
1.2 1.4 3896
1.4 1.2 3548
1.5 1.5 223
1.3 1.4 148
0.3 0.2 4656
1.1 1.5 5047
1.7 1.3 839
1.2 1.6 138
1.5 1.4 485
1.5 1.7 97
1.4 1.5 490
1.1 1.1 1275
1.3 1.4 3328
1.4 1.3 2573
1.6 1.3 597
1.3 1.3 1014
1.1 1.5 417
1.4 1.3 1444
1.0 1.5 4432
1.0 1.0 2418
1.4 1.2 580
1.4 1.5 1116
1.1 1.4 2932
1.4 1.4 3420
1.2 1.4 1912
1.5 1.5 384
1.3 1.3 701
1.5 1.4 866
1.3 1.3 997


SPATIAL DISTRIBUTATION OF REPORTED SHIP POSITIONS
ANNUAL 2011–2020
20°
30°
40°
50°
60°
70°
80°
90°
100°
40°
30°
20°
10°
0°
−10°


Countrywise Distribution of Number of Observations)
Number of observations
500000
475000
450000
425000
400000
375000
350000
325000
300000
275000
250000
225000
200000
175000
150000
125000
100000
75000
50000
25000
0
AUSTRALIA
AUSTRALIA
CANADA
FRANCE
GERMANY
HONG_KONG
INDIA
ISRAEL
JAPAN
MALAYSIA
NETHERLANDS
NEW_ZEALAND
RUSSIA
SINGAPORE
SOUTH_AFRICA
SWEDEN
UNITED_KINGDO
UNITED_STATES


Yearwise Distribution of Number of Observations)
Number of observations
1000000
750000
500000
250000
0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

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