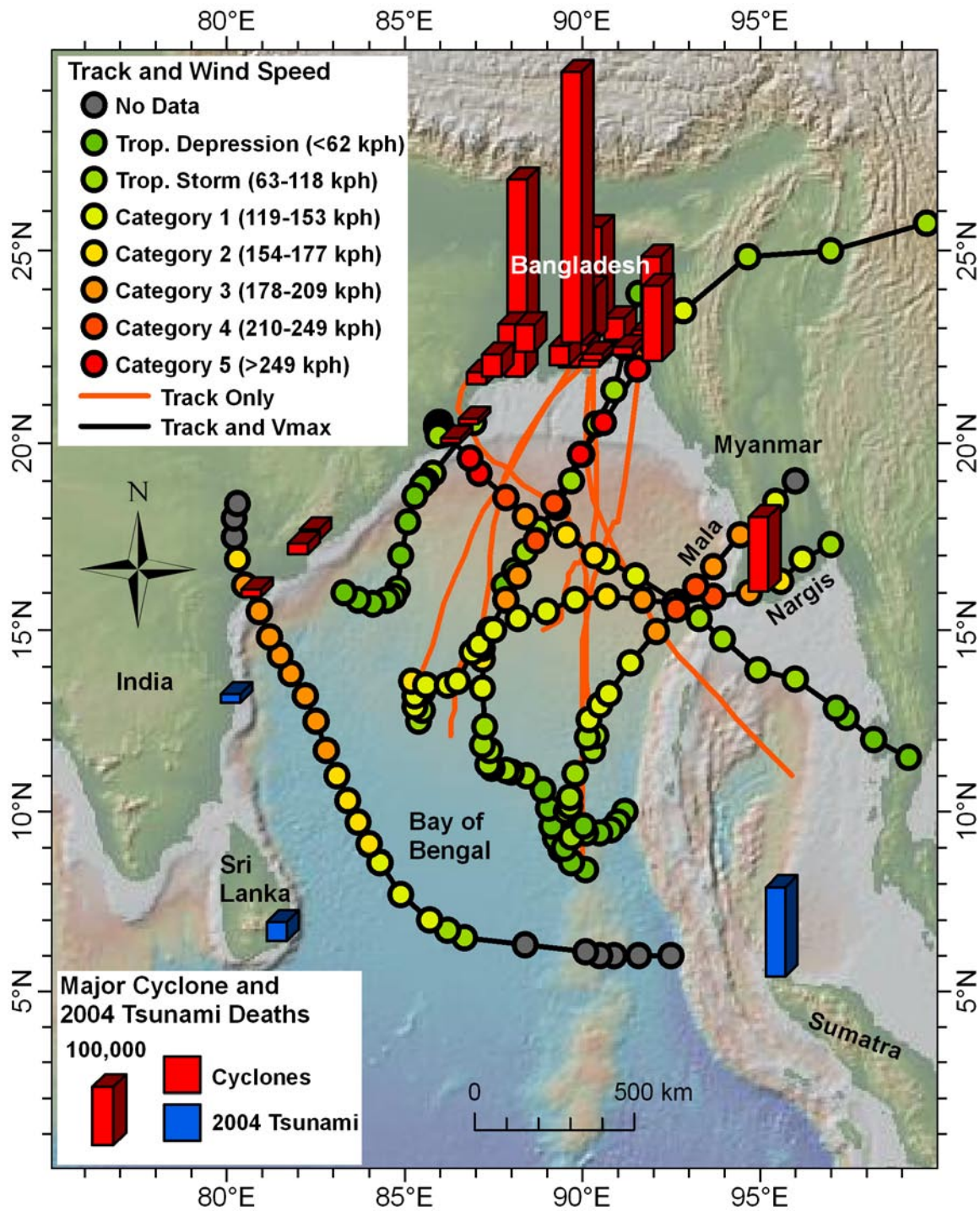


Supplementary Information to accompany

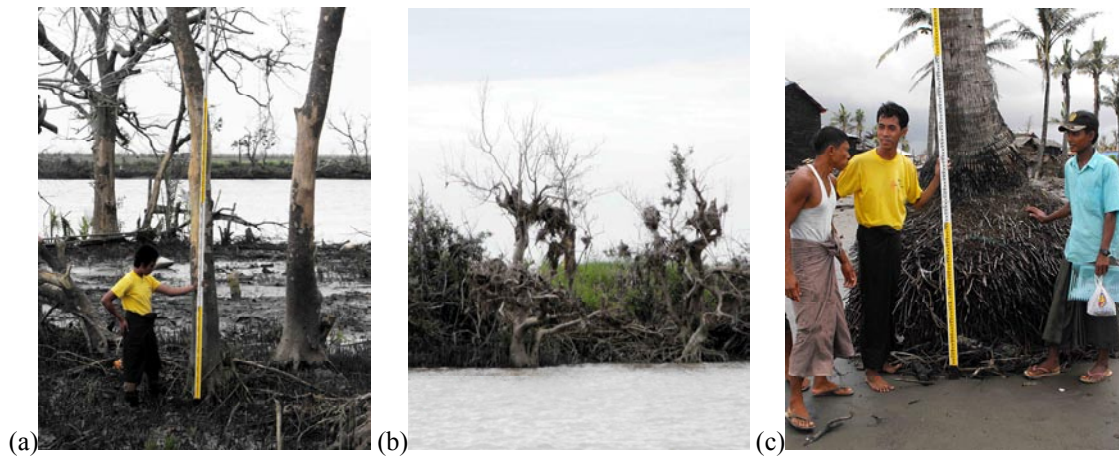
**Cyclone Nargis storm surge in Myanmar**

Hermann M. Fritz, Christopher D. Blount, Swe Thwin, Moe Kyaw Thu, and Nyein Chan

This section contains Supplementary Figures 1-3 and Supplementary Tables 1 and 2.



Supplementary Fig 1. Fatalities from major cyclone events (> 10,000 deaths) from 1584 up to Nargis compiled from the Emergency Events Database (EM-DAT) and other sources (see refs. S1-S3) with storm track and wind speed (from the Joint Typhoon Warning Center and IBTrACS) compared against 2004 Indian Ocean tsunami deaths (ref. S1). Additional cyclone track: 2006 Cyclone Mala with 22 deaths in Myanmar.



Supplementary Fig. 2. Field survey: (a) bark damage and (b) rafted debris in trees as high water marks at Pyinsalu; (c) vertical erosion on palm tree roots at Aung Hlaing.



Supplementary Fig. 3. Coastal erosion: (a) Drinking water wells scoured in surf zone at Aya; (b) Golden Buddhist Stupa built on land piercing the water surface offshore highlighting 150m land loss. Land use: (c) Deforestation of mangroves for use as charcoal and rice paddies; (d) Secondary growth mangroves with cyclone damage in a forestry reserve.

Supplementary Table 1. Summary of physical survey after Cyclone Nargis. Vertical survey natures are classified as: TB = tree bark, MI = mudline inside, MO = mudline outside, RD = rafted debris, DT = damage trimline, WL = wrackline, EW = eye witness.

| #  | Location            | Latitude [°N] | Longitude [°E] | Date        | Local Time [UTC+6:30] | Nargis Vertical Survey Data |          |        | 2004 Tsunami |            |
|----|---------------------|---------------|----------------|-------------|-----------------------|-----------------------------|----------|--------|--------------|------------|
|    |                     |               |                |             |                       | Surge [m]                   | Wave [m] | Nature | Erosion [m]  | Height [m] |
| 1  | Thaukkya            | 16.19516      | 95.76763       | 12-Aug-2008 | 13:27                 | 1.90                        |          | TB, EW |              |            |
| 2  | Thaukkya            | 16.19517      | 95.76821       | 12-Aug-2008 | 13:34                 | 1.60                        |          | MI, EW |              |            |
| 3  | Gway Gone           | 16.16275      | 95.78517       | 12-Aug-2008 | 14:21                 | 1.90                        | 1.3      | MI, EW |              |            |
| 4  | Lae Ein Dan         | 16.25017      | 95.78088       | 12-Aug-2008 | 16:13                 | 2.60                        | 1.8      | TB, EW |              |            |
| 5  | Nauk Pyan Toe       | 16.27390      | 95.73006       | 12-Aug-2008 | 17:08                 | 2.95                        | 1.2      | MO, EW |              |            |
| 6  | Nauk Pyan Toe       | 16.27131      | 95.73076       | 12-Aug-2008 | 17:23                 | 3.30                        | 1.2      | TB, EW |              |            |
| 7  | Bogale              | 16.28894      | 95.39317       | 14-Aug-2008 | 8:57                  | 1.10                        |          | WL, EW |              |            |
| 8  | Kyar Chaung         | 16.19118      | 95.33466       | 14-Aug-2008 | 10:52                 | 3.00                        | 1.9      | MO, EW |              |            |
| 9  | Tae Tae Ku          | 16.17357      | 95.30560       | 14-Aug-2008 | 11:52                 | 2.60                        | 1.8      | TB, EW |              |            |
| 10 | Along Kyondon River | 16.13791      | 95.31047       | 14-Aug-2008 | 12:50                 | 3.40                        |          | RD     |              |            |
| 11 | Hteik Chaung        | 16.12244      | 95.32365       | 14-Aug-2008 | 13:36                 | 3.20                        | 1.8      | TB, EW |              |            |
| 12 | Kadon Kani          | 15.82248      | 95.21595       | 15-Aug-2008 | 7:13                  | 2.10                        |          | MO, EW |              |            |
| 13 | Ohn Pin Su          | 15.80148      | 95.13107       | 15-Aug-2008 | 8:32                  | 2.10                        |          | TB, EW | -1.0         |            |
| 14 | Aya                 | 15.80085      | 95.11753       | 15-Aug-2008 | 9:53                  |                             |          |        |              |            |
| 15 | Aya                 | 15.80113      | 95.11799       | 15-Aug-2008 | 10:00                 | 3.60                        |          | TB, EW |              |            |
| 16 | Aya                 | 15.80548      | 95.11373       | 15-Aug-2008 | 10:20                 | 4.50                        |          | DT, EW |              |            |
| 17 | Aya                 | 15.80885      | 95.11195       | 15-Aug-2008 | 10:35                 | 3.50                        |          | EW     |              |            |
| 18 | Aya                 | 15.80899      | 95.11187       | 15-Aug-2008 | 10:46                 |                             |          |        | -1.0         |            |
| 19 | Aung Hlaing         | 15.77123      | 94.98468       | 15-Aug-2008 | 13:30                 | 3.30                        |          | TB, EW |              |            |
| 20 | Aung Hlaing         | 15.77098      | 94.98461       | 15-Aug-2008 | 13:53                 | 3.40                        |          | MO, EW |              |            |
| 21 | Pyinsalu            | 15.82900      | 94.80557       | 16-Aug-2008 | 6:39                  | 4.70                        |          | TB, EW |              |            |
| 22 | Pyinsalu            | 15.82900      | 94.80557       | 16-Aug-2008 | 6:39                  | 5.60                        |          | TB, EW |              |            |
| 23 | Ye Gyaw Wa          | 15.93291      | 94.80584       | 16-Aug-2008 | 9:12                  | 3.30                        | 1.7      | TB, EW |              |            |
| 24 | Mi Chaung Ai        | 15.88404      | 94.66521       | 16-Aug-2008 | 12:16                 | 2.70                        | 0.6      | TB, EW |              |            |
| 25 | Dae Yae Phyu        | 15.95060      | 94.67308       | 16-Aug-2008 | 13:38                 | 4.20                        | 1.2      | TB, EW |              |            |
| 26 | Ze Thuang           | 15.88307      | 94.40648       | 17-Aug-2008 | 12:29                 | 4.30                        | 2.0      | EW     | 2.4          | EW         |
| 27 | Kyauk Ka Latt       | 15.88185      | 94.43219       | 17-Aug-2008 | 13:57                 | 4.50                        | 1.3      | DT, EW | -1.1         | 3.9        |

Supplementary Table 2. Summary of societal survey after Cyclone Nargis.

| #  | Location            | Nargis Fatality Survey |            |          | Residential<br>Destruction Rate (%) |
|----|---------------------|------------------------|------------|----------|-------------------------------------|
|    |                     | Fatalities             | Population | Rate (%) |                                     |
| 1  | Thaukkya            |                        |            |          |                                     |
| 2  | Thaukkya            |                        |            |          |                                     |
| 3  | Gway Gone           |                        |            |          |                                     |
| 4  | Lae Ein Dan         | 12                     | 1320       | 0.9      |                                     |
| 5  | Nauk Pyan Toe       | 116                    | 2178       | 5.3      | 98                                  |
| 6  | Nauk Pyan Toe       |                        |            |          |                                     |
| 7  | Bogale              |                        |            |          |                                     |
| 8  | Kyar Chaung         | 41                     | 542        | 7.6      |                                     |
| 9  | Tae Tae Ku          | 21                     | 236        | 8.9      | 100                                 |
| 10 | Along Kyondon River |                        |            |          |                                     |
| 11 | Hteik Chaung        | 173                    | 500        | 34.6     | 100                                 |
| 12 | Kadon Kani          | 5                      | 20000      | 0.0      |                                     |
| 13 | Ohn Pin Su          | 26                     | 634        | 4.1      |                                     |
| 14 | Aya                 |                        |            |          |                                     |
| 15 | Aya                 | 500                    | 10000      | 5.0      | 13                                  |
| 16 | Aya                 |                        |            |          |                                     |
| 17 | Aya                 |                        |            |          |                                     |
| 18 | Aya                 |                        |            |          |                                     |
| 19 | Aung Hlaing         | 28                     | 1999       | 1.4      | 78                                  |
| 20 | Aung Hlaing         |                        |            |          |                                     |
| 21 | Pyinsalu            | 700                    | 1510       | 46.4     | 90                                  |
| 22 | Pyinsalu            |                        |            |          |                                     |
| 23 | Ye Gyaw Wa          | 500                    | 1000       | 50.0     | 100                                 |
| 24 | Mi Chaung Ai        | 400                    | 1520       | 26.3     | 100                                 |
| 25 | Dae Yae Phyu        | 1700                   | 2000       | 85.0     | 100                                 |
| 26 | Ze Thauung          | 2                      | 117        | 1.7      | 100                                 |
| 27 | Kyauk Ka Latt       | 5                      | 2000       | 0.3      | 93                                  |

### Supplementary References

- S1. EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium < <http://www.emdat.be>>.
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