

SWARMS)))

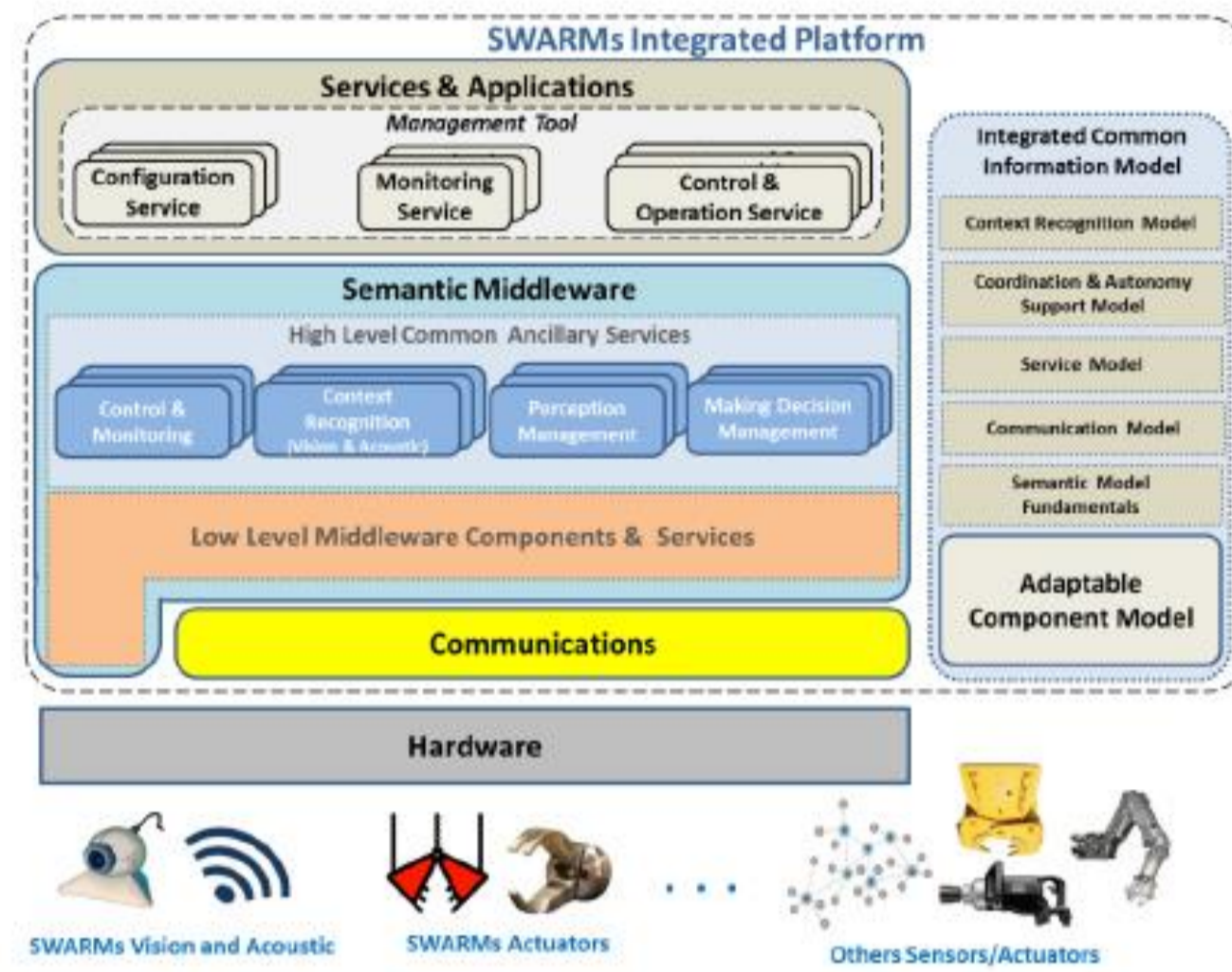
Smart and Networking Underwater Robots in Cooperation Meshes – Grant n° 662107

ECSEL Work plan

- WP1: Project management
- WP2: Autonomous operations design
- WP3: Coordination architecture and specification
- WP4: Environment recognition and sensing
- WP5: Communication and networking
- WP6: Vehicle embedded architecture and task planning
- WP7: Autonomous navigation and semi-autonomous manipulation
- WP8: Demonstrators
- WP9: Dissemination, exploitation and standardization

MAIN GOALS AND OBJECTIVES

The SWARMS project (<http://www.swarms.eu/>) aims to guarantee cooperation among autonomous maritime vehicles, for them working together in different missions. Development works that are being carried out for this purpose have already provided an underwater acoustic communication, a middleware architecture and a mission management tool. They were integrated together for the first time during the First Demonstration tests.



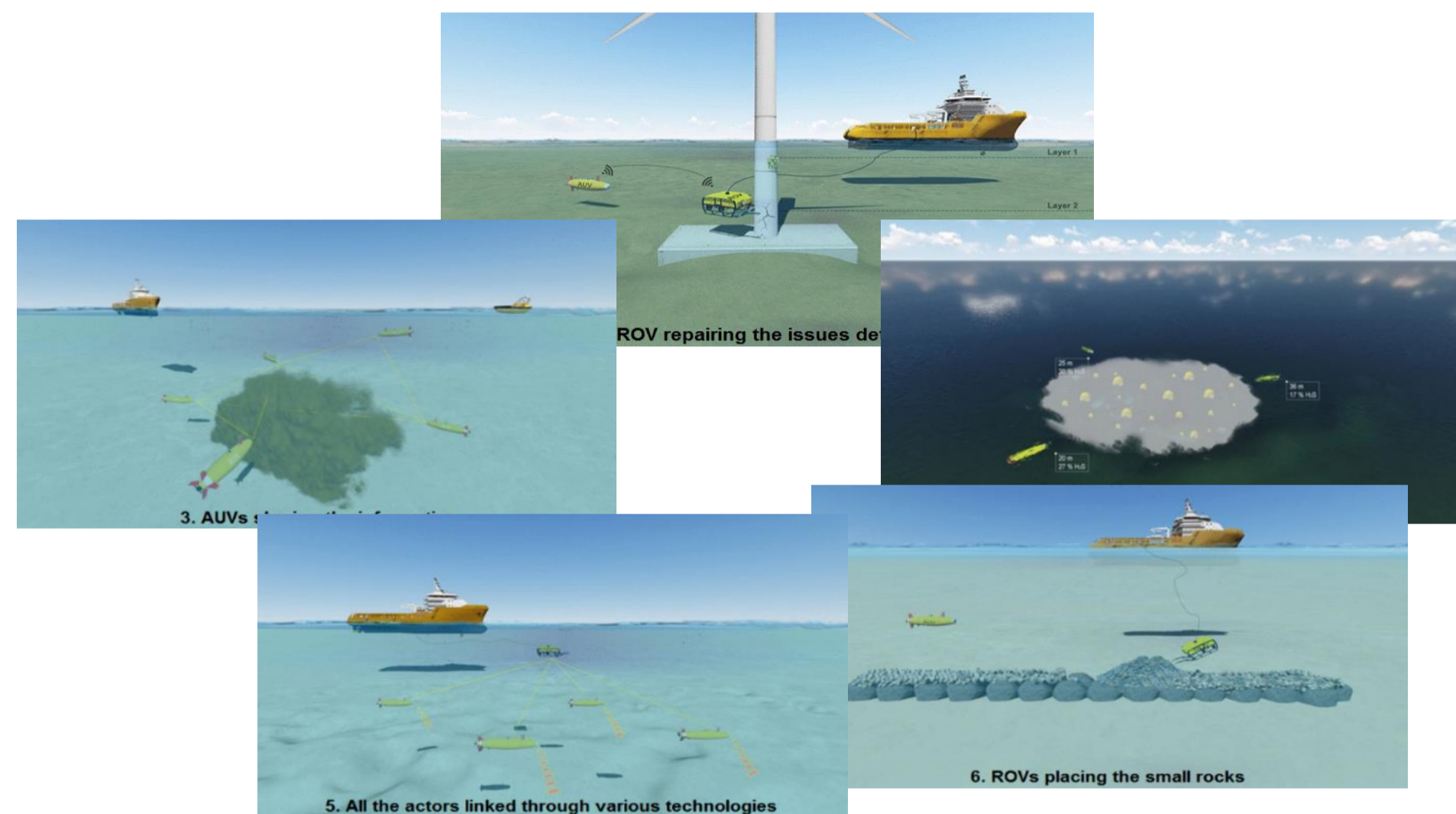
UNIQUE FEATURES

- Integration of hardware and software.
- Technologies: ROS, DDS.
- Services for the enhancement of data transmission.
- Mission Management Tool.
- Acoustic underwater and wireless Over-the-Air communications.
- On-board autonomous and semi-autonomous capabilities



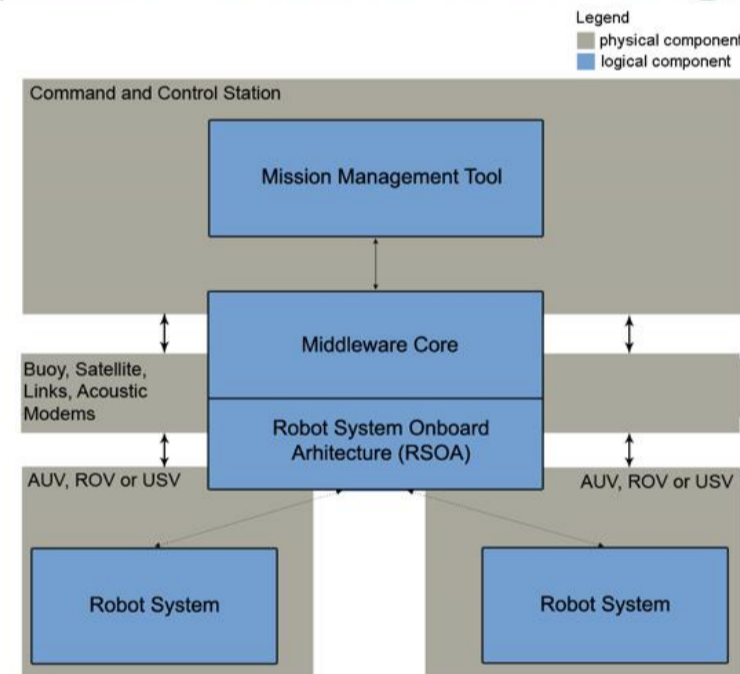
Five Use Cases:

- Corrosion prevention in offshore installation
- Monitoring of chemical pollution
- Detection, inspection and tracking of plumes
- Berm building
- Seabed mapping

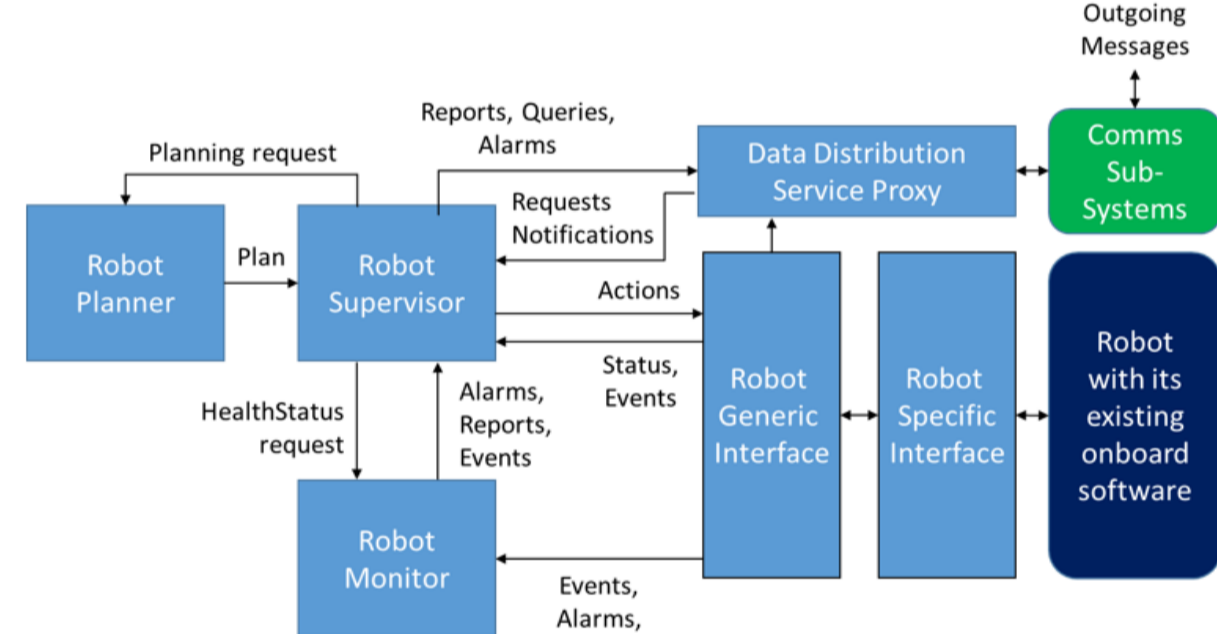


SWARMS integrated systems:

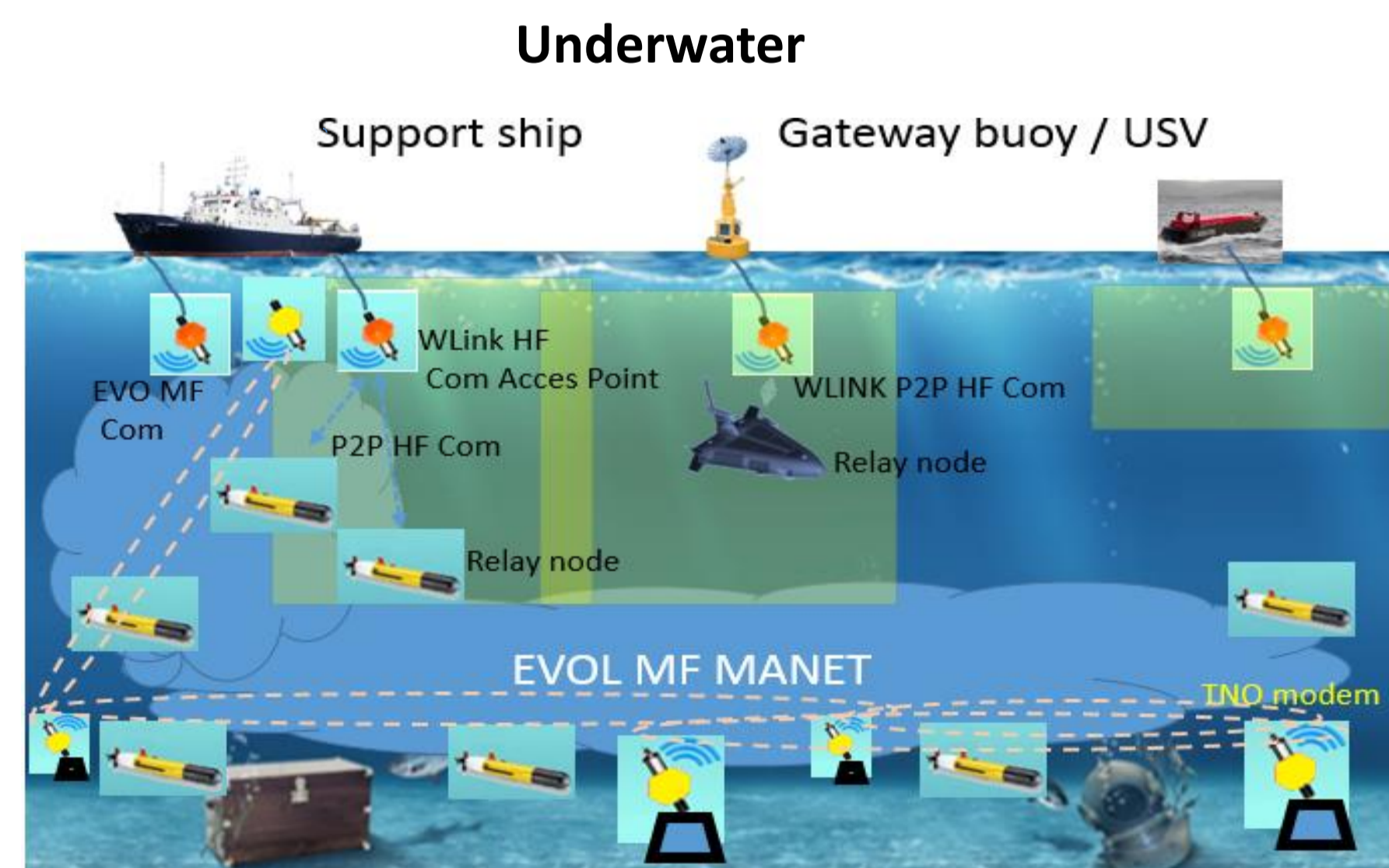
Simplified architecture diagram



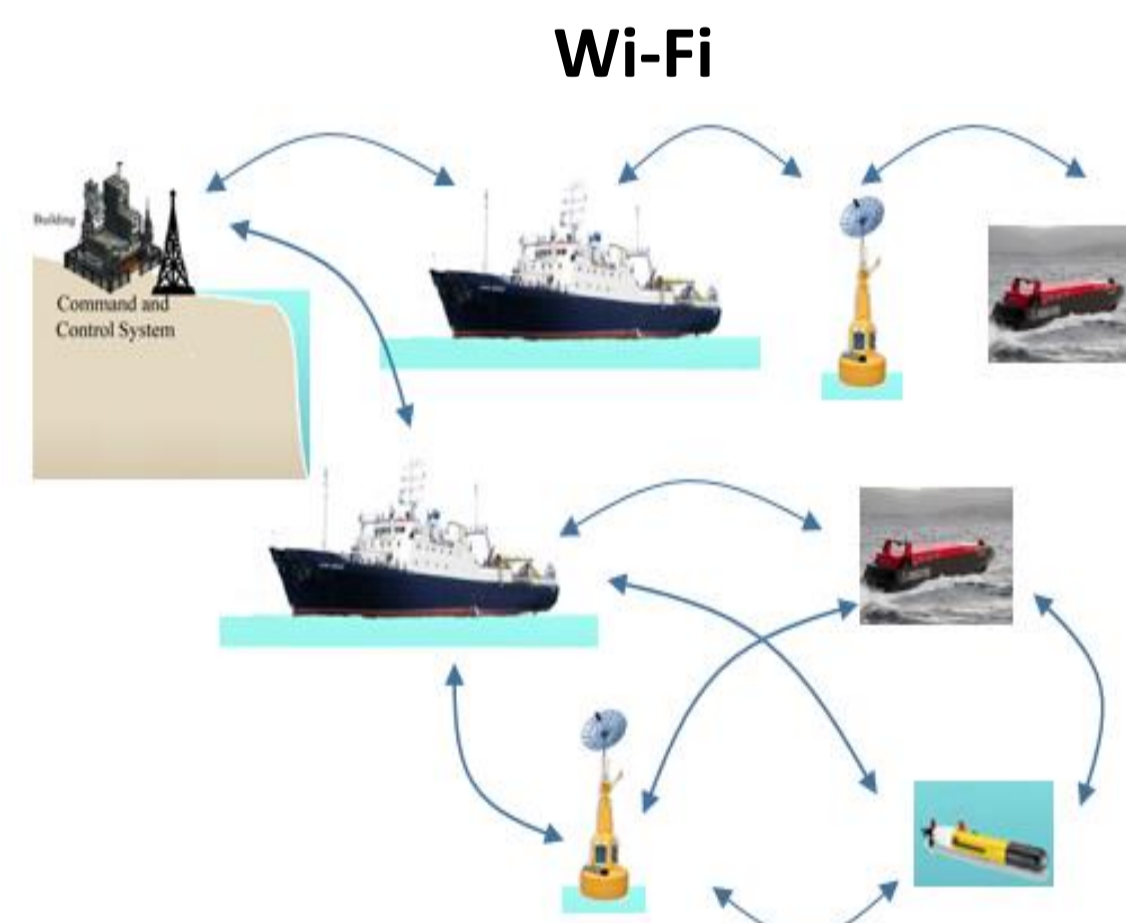
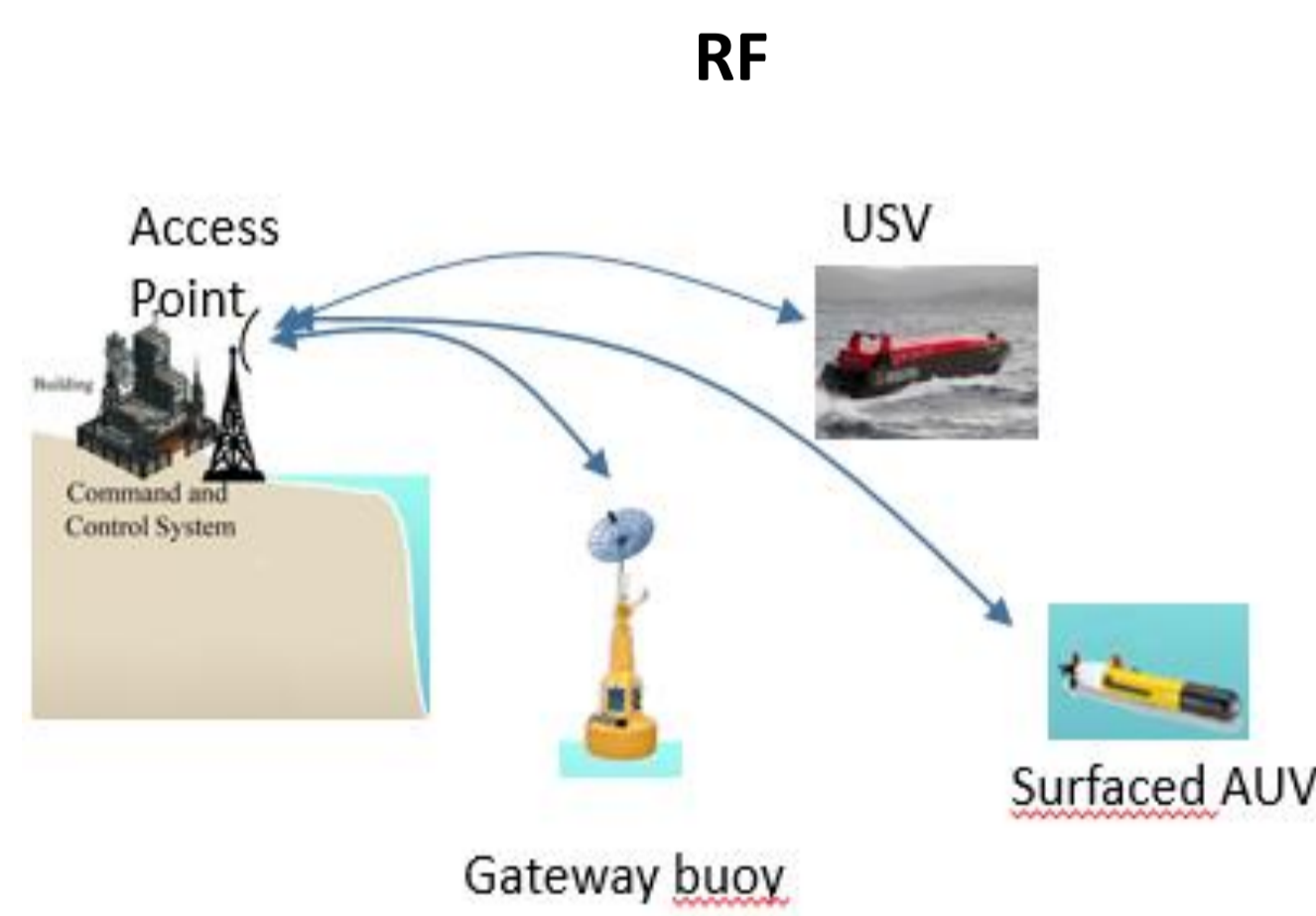
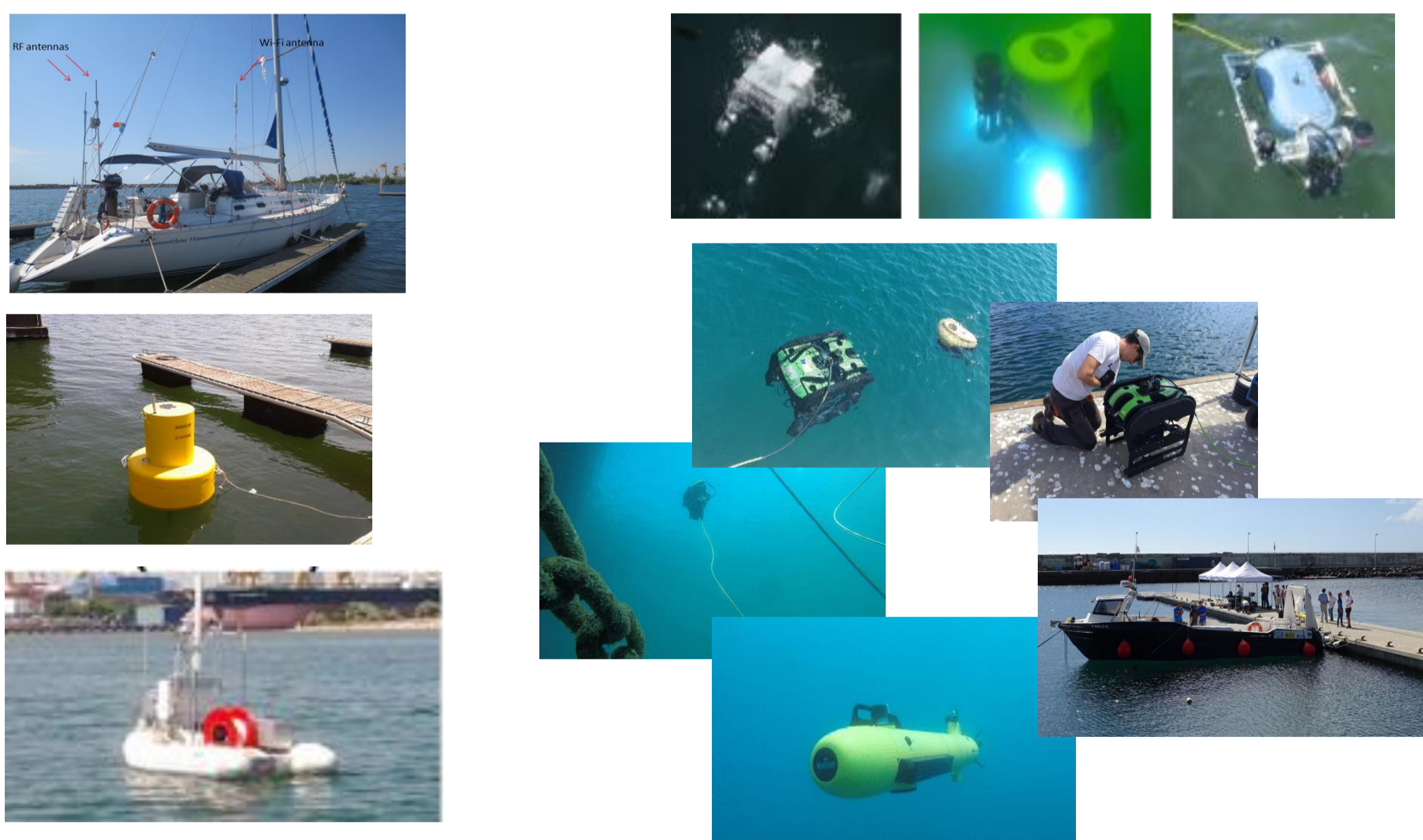
Generic and modular Robot System On-board Architecture (RSOA)



Multi domain communication system:



Vehicles and support platforms



Trials and Demonstrations:

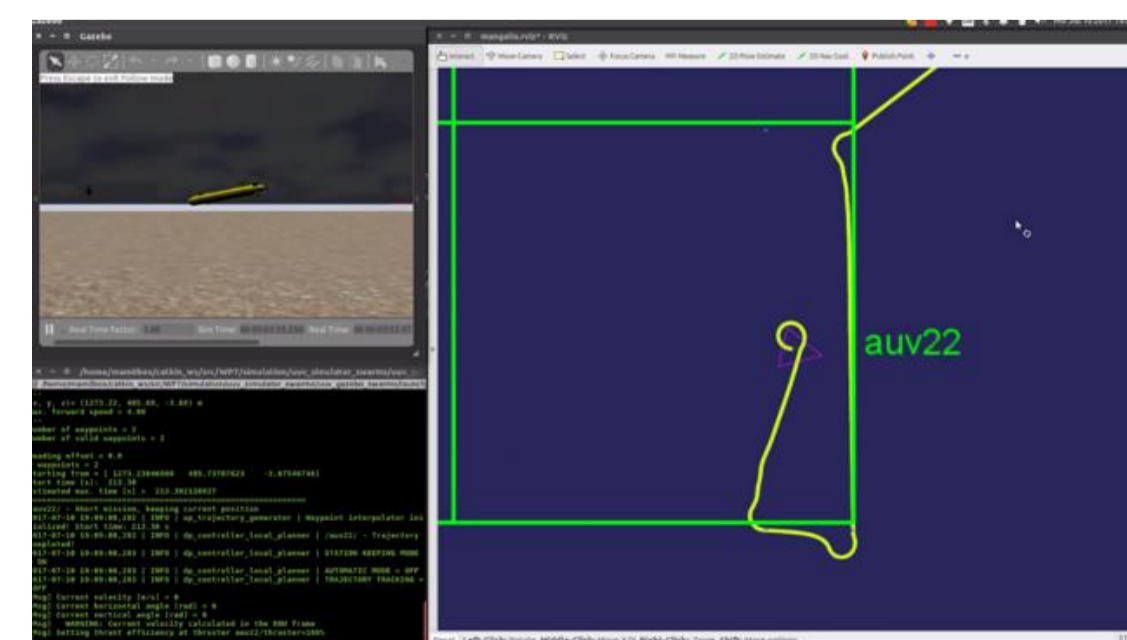
Early Trials: 7 Missions
22nd – 30th September 2016
PLOCAN, Gran Canaria

- Mission 1: Environmental recognition with vehicles
- Mission 2: HF acoustic underwater data transfer
- Mission 3: RF Air Data Transfer
- Mission 4: LF Acoustic Underwater Data Transfer
- Mission 5: Middleware Data Transfer
- Mission 6: Intuitive input device simulation
- Mission 7: Mission planning simulation

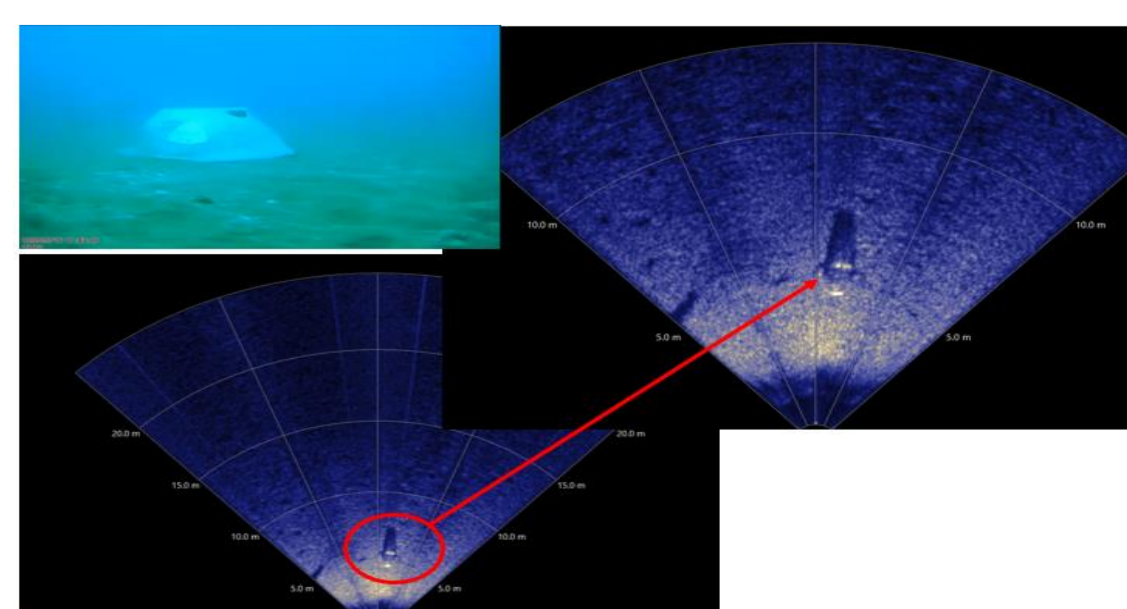
First Demonstration 7 Missions
3rd – 14th July 2017
Mangalia harbour, Romania

- Mission 1: Environmental recognition with vehicles
- Mission 2: HF acoustic underwater data transfer
- Mission 3: Integrated communication systems verification
- Mission 4: Mission Management Tool, Middleware, Communication network, USV, AUVs and ROVs integration
- Mission 5: Command and Control station mission management
- Mission 6: Intuitive input device remote control
- Mission 7: Mission planning and RSOA integration @ simulation level

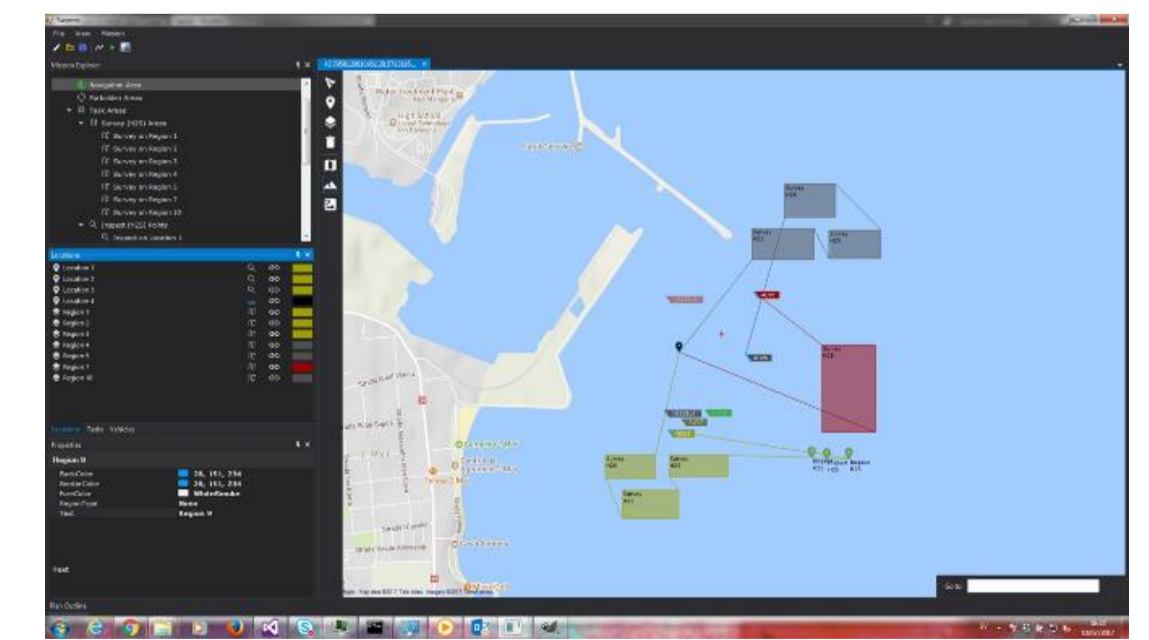
• Simulated mission



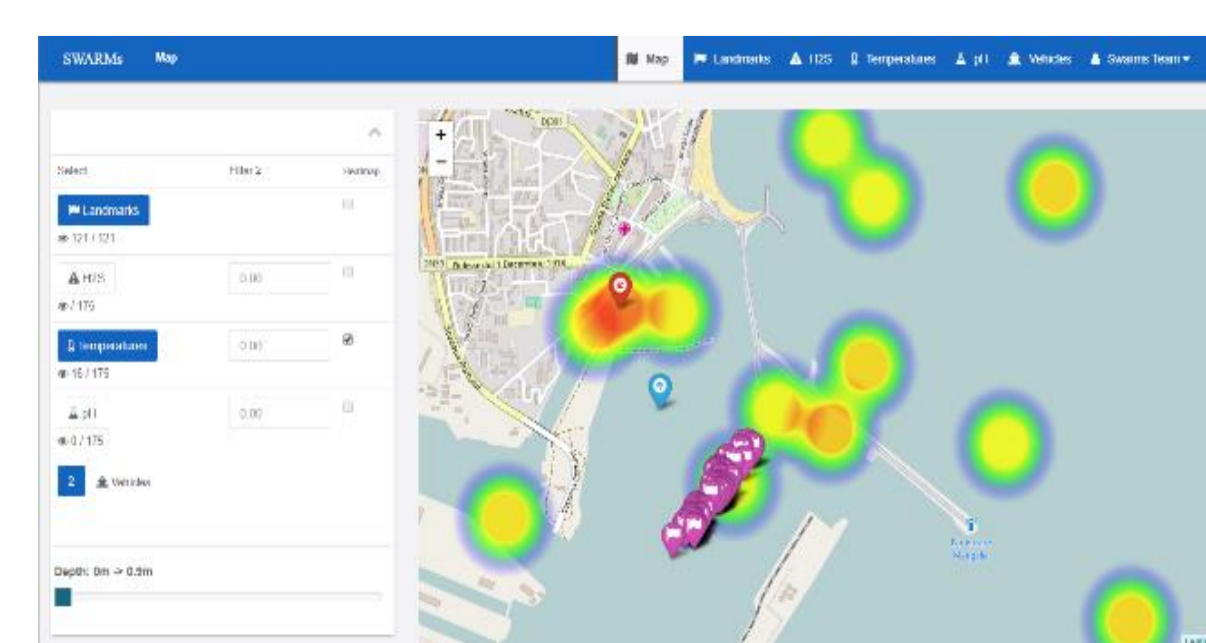
- Sonar and underwater pictures on local ROV CCS



• Mission planner



- Results plotted on the main CCS screen



Project co-funded by National authorities and:



29 Partners from 10 countries:

