

NEMO-SN1 seafloor observatory at EMSO Western Ionian Sea site: a multidisciplinary approach for geophysical, oceanographic and environmental studies.

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The Western Ionian Sea is one of the sites of the European Multidisciplinary Seafloor and water-column Observatory Research Infrastructure (EMSO). A prototype of a cabled deep-sea observatory (NEMO-SN1) was set up and has been operational in real-time since 2005 at 2100 m depth, 25 km off the harbour of Catania. In 2012 the observatory was upgraded to a fully integrated system for multidisciplinary deep-sea science, capable to transmit and distribute data in real time to the scientific community and to the general public. NEMO-SN1 hosts a large number of sensors to monitor and study oceanographic, environmental parameters (CTD, ADCP, current meter), and geophysical phenomena (hydrophones, accelerometer, gravity meter, magnetometers, seismometer, pressure gauges). Ocean noise monitoring and identification of biological acoustic sources in deep sea have also been possible with hydrophones working at low and high frequencies. The whole system was connected and powered from shore, by means of the electro-optical cable net installed at the East Sicily Site Infrastructure, and synchronised with GPS time. Sensors data sampling is performed underwater and transmitted via optical fibre link. A dedicated computing and networking infrastructure for data acquisition, storage and distribution through the internet has been also operative. Some examples of seafloor data analyses will be described to show the importance of such an integrated multidisciplinary infrastructure to geophysical, oceanographic and environmental studies.