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The European Multidisciplinary Seafloor and Water-column Observatory Consortium (EMSO-ERIC): Impact, Progress, and Plans.

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EMSO is forging ahead through the next challenge in Earth-Ocean Science: How to co-ordinate ocean data acquisition, analysis and response across provincial, national, regional, and global scales. EMSO provides power, communications, sensors, and data infrastructure for continuous, high resolution, (near)-real-time, interactive ocean observations across a truly multi- and interdisciplinary range of research areas including biology, geology, chemistry, physics, engineering, and computer science; from polar to tropical environments, through the water column down to the abyss. 11 deep sea and 4 shallow nodes span from Arctic through the Atlantic and Mediterranean, to the Black Sea. The EMSO Preparatory Phase (FP7) project led to the Interim phase (involving 13 countries) of forming the legal entity: the EMSO European Research Infrastructure Consortium (EMSO-ERIC). The open user community is through ESONET-Vi (European Seafloor Observatory NETwork - The Vision), following on the extensive scientific community planning contributions of the ESONET-NoE (FP6) project. The further progress made through the FixO_3 project (FP7) will also benefit the development of this shared infrastructure. Coordination among nodes is being strengthened through the EMSOdev project (H2020) which will produce the EMSO Generic Instrument Module (EGIM) - standardised observations of temperature, pressure, salinity, dissolved oxygen, turbidity, chlorophyll fluorescence, currents, passive acoustics, pH, pCO_2, and nutrients.
Early installations are now being upgraded; for example in October 2015 EMSO-France deployed a second cable and junction box serving the Ligurian Sea Node in order to monitor slope stability offshore Nice; in 2016 the EMSO Azores Node will receive a major upgrade that will double its observing capacity; for the Ionian Sea Node the Capo Passero site will be installed and the Catania site will be upgraded.
Significant findings are already coming in; for example high frequency surface and subsurface water column measurements the Porcupine Abyssal Plain sustained Observatory (PAP-SO) Node in the northeast Atlantic (49N, 16:5W) show an increase in seawater p(CO_2) (from 339 μatm in 2003 to 353 μatm in 2011) with little variability in the mean air–sea CO_2 flux.
In the Central Eastern Atlantic, the PLOCAN open-ocean Node (a.k.a ESTOC station) has long-standing time-series on surface and water column variables, most notably on water column physical, biogeochemical and acidification processes. Acquired data have contributed to the assessment efforts of the Intergovernmental Panel on Climate Change (IPCC) and the characterization of oceanic processes in the North Atlantic subtropical gyre.
EMSO not only brings together countries and disciplines, but allows the pooling of resources and coordination to assemble harmonised data into a comprehensive regional ocean picture which it will then make available to researchers and stakeholders worldwide on an open and interoperable access basis.