

The European HF Radar node: two years distributing standardized and quality-controlled data to the major European Marine Data Portals

Lorenzo Corgnati, CNR-ISMAR (Italy), lorenzo.corgnati@sp.ismar.cnr.it
Carlo Mantovani, CNR-ISMAR (Italy), carlo.mantovani@cnr.it
Anna Rubio, AZTI Marine Research (Spain), arubio@azti.es
Emma Reyes, ICTS-SOCIB (Spain), ereyes@socib.es
Paz Rotllan, ICTS SOCIB (Spain), protllan@socib.es
Antonio Novellino, ETT SpA (Italy), antonio.novellino@ettsolutions.com
Patrick Gorringer, SMHI (Sweden), patrick.gorringer@smhi.se
Jose Luis Asensio Igoa, AZTI Marine Research (Spain), jlasensio@azti.es
Annalisa Griffa, CNR-ISMAR (Italy), annalisa.griffa@sp.ismar.cnr.it
Julien Mader, AZTI Marine Research (Spain), jmader@azti.es

High Frequency Radar (HFR) proved to be a very effective land-based remote sensing technology to monitor coastal regions all over the world due to its unprecedented capacity of mapping ocean surface currents and wave fields over wide areas with high spatial and temporal resolution. HFR main application span research, marine safety and security, pollutant monitoring, tsunami detection, fishery, navigation and renewable energy. The importance of these applications for the integrated management of the coastal zones made the HFR technology rapidly expanding in Europe (at a rate of 7 new systems per year since 2016), with over 81 HFR sites currently operating and a number in the planning stage, as shown in Figure 1.

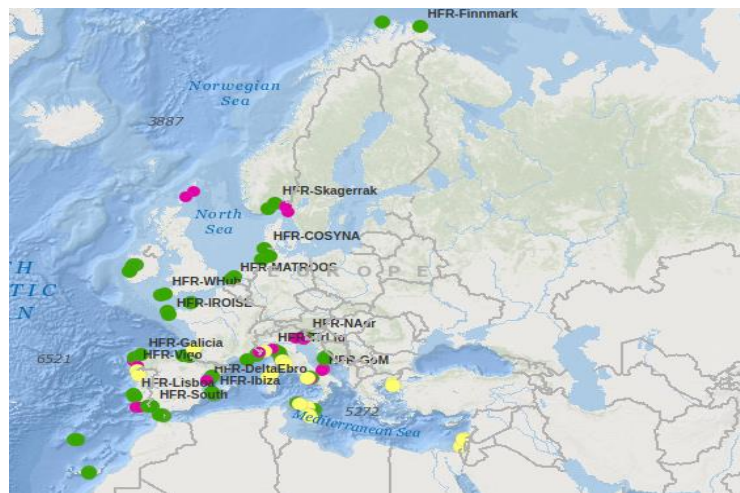


Figure 1: Distribution of HFR systems in Europe. The operational systems are plotted in green, future installations in yellow and past deployments in red. Source: <http://eurogoos.eu>

In order to improve EU coordination in the management and to enhance the accessibility to HFR data for a pan-European use, the European HFR Node was established in 2018 under the coordination of the EuroGOOS HFR Task Team, as the operational asset for pushing the creation of the pan-European HFR network to a higher level. This effort benefited from the achievements of different initiatives at national and European level active since 2014 to ensure the full exploitation of the HFR technology potential in the context of the European Ocean Observing System (EOOS).

Building on the harmonization achievements (in terms of Quality Control, data format, conventions, naming and vocabularies) of the Task Team, the EU HFR Node, coordinated by AZTI, CNR-ISMAR and

SOCIB acts as the focal point in EU for HFR data management and dissemination by implementing the HFR data stream (harvesting, harmonization, formatting and distribution) from the data providers towards the different EU marine data portals and global data infrastructures.

The EU HFR Node is fully operational since December 2018 in providing guidelines, free and open-source repository software and support for standardization to the HFR operators and in distributing standardized and quality-controlled HFR data towards the major European Marine Data Portals:

- near real time (within 6 hours in most cases) HFR total and radial current data to the Copernicus Marine Environment Monitoring Service In Situ Thematic Assembly Center (CMEMS-INSTAC) and EMODnet Physics, since April 2019 and March 2020, respectively;
- historical total current data with different delayed-mode reprocessing levels within CMEMS-INSTAC, EMODnet Physics and SeaDataNet data infrastructures since July 2020.

In the European framework, the EU HFR Node is now managing data from 12 HFR networks (built of 35 radar sites, representing more than 2/5 of the European Network), as shown in Figure 2, belonging to 8 countries included in 3 different ROOSes (i.e. MONGOOS, NOOS and IBIROOS), from two diverse HFR system types (i.e. Direction Finding and Phased Array), being most of them permanent installations. By end 2020, it is expected to manage 20 networks (50 radar sites).

Additionally, the EU HFR Node implements since June 2020 the integration and distribution of Global data on the aforementioned platforms, using the US network as a pilot case.



Figure 2: HFR systems distributed on CMEMS-INSTAC. Source: marineinsitu.eu/dashboard

The progress in the integration of historical and NRT HFR data achieved by the EU Node together with the HFR data providers will further boost the potential of multiplatform integration approaches for more accurate monitoring of the coastal currents, as well as the uptake of surface current coastal data by different intermediate and final users.