

Updates from Global High Frequency Radar Network

for Observation Coordination Group (OCG)

April 13, 2021

Region 1 (Europe, Africa, Middle East)

Burt Jones

King Abdullah University of Science and Technology

Saudi Arabia

- They sustained operations of 2 radars near the university in the Central Red Sea covering 10,000 km².
- They plan to have 8 stations operational by end of 2021.
- Two of the stations will be on the Arabian Gulf which will be complemented by another 3 radars operated by King Fahd University of Petroleum and Minerals (KFUPM)

Lucy R Wyatt

Technical Director, Seaview Sensing Ltd.

- Work continues to utilize HF radar to provide wave, current and wind measurements during all phases of marine renewable energy projects. The phases include pre construction surveying, resource and impact assessment, construction, maintenance and finally performance assessment.
- Seaview Sensing is developing a promising new method for wind speed measurement.

Vassilis Zervakis

University of the Aegean

Greece

- The Laboratory of Physical and Chemical Oceanography of the University of the Aegean completed the repair, upgrade and re-installation of two antenna sites of 8 Rx antennas each at the east coast of Lemnos island, Greece, covering the area of the Black Sea outflow in the Northeastern Aegean Sea.
- The system was installed in the framework of the nationally-funded "Hellenic Integrated Marine-Inland water Observing, Forecasting and Offshore Technology System (HIMIOFoTS)" project, funded by the Hellenic Government and the European Regional Development Fund through the Operational Programme "EPANEK 2014-2021 Competitiveness, Entrepreneurship, Innovation"

Julien Mader

Chair of the EUROGOOS HFR Task Team

Spain

- Recent achievements:
 - growing from different **HFR networks** (Malta, Tuscany region, Portugal)
 - new **installations** (HFR in the NW of the Iberian Peninsula; an X-Band radar in the Bay of Biscay, a LERA HFR in the South-west of France) and re-installations (Vigo, Cíes Islands)

- new **research** outcomes (use of DIVAnd for HFR gap-filling, HFR waves and currents characterization under extreme events); emerging **products** (waves mapping, upwelling index) and promising **projects** ([i-waveNet](#))
- last [newsletter](#) of the European community, zotero [repository](#), quarterly meetings, stakeholders engagement strategy (> 140 stakeholders identified), last [FerryBox - FB- and High-Frequency Radar -HFR- online workshop](#),
- **NEW RELEASE** of the [CMEMS delayed-mode product](#)
- EMODnet Physics - Sea Surface Currents (HFR Radar) network status [link](#)
- Status: Figure 7 (see below) from an ongoing work on European HFR network Governance (D3.4 Eurosea project)
- Focus for the year ahead: EuroGOOS HF Radar Task Team Highlights and plans 2020 http://eurogoos.eu/download/TT_HFRadar_2.pdf
- Develop, update and follow Standards and Best Practices: [Mantovani et al., 2020, Guidelines](#) to sync HFR data with the EU HFR node, [SDN data management protocols](#) for HFR data, [Jerico NEXT report](#) on Best Practice

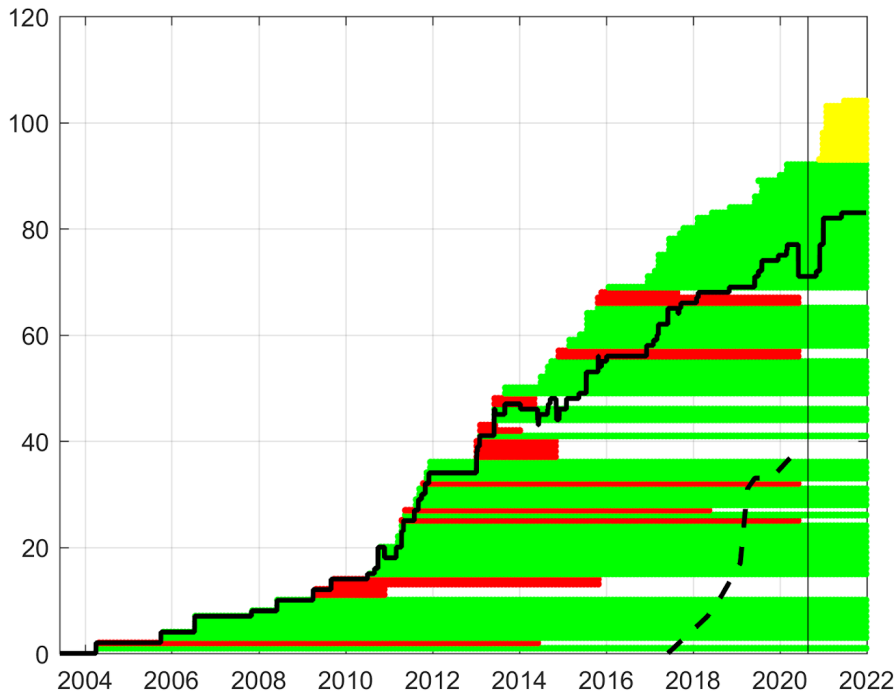


Figure 1: Evolution in time of (bold line) number of HFR sites in EUROPE and (dashed line) the number of European HFR sites connected into the operational European HFR NODE data flow. Vertical line: day of the inventory update. Green lines: operational HFRs. Yellow lines: future installations. Red lines: past installations or installations no-longer operational.

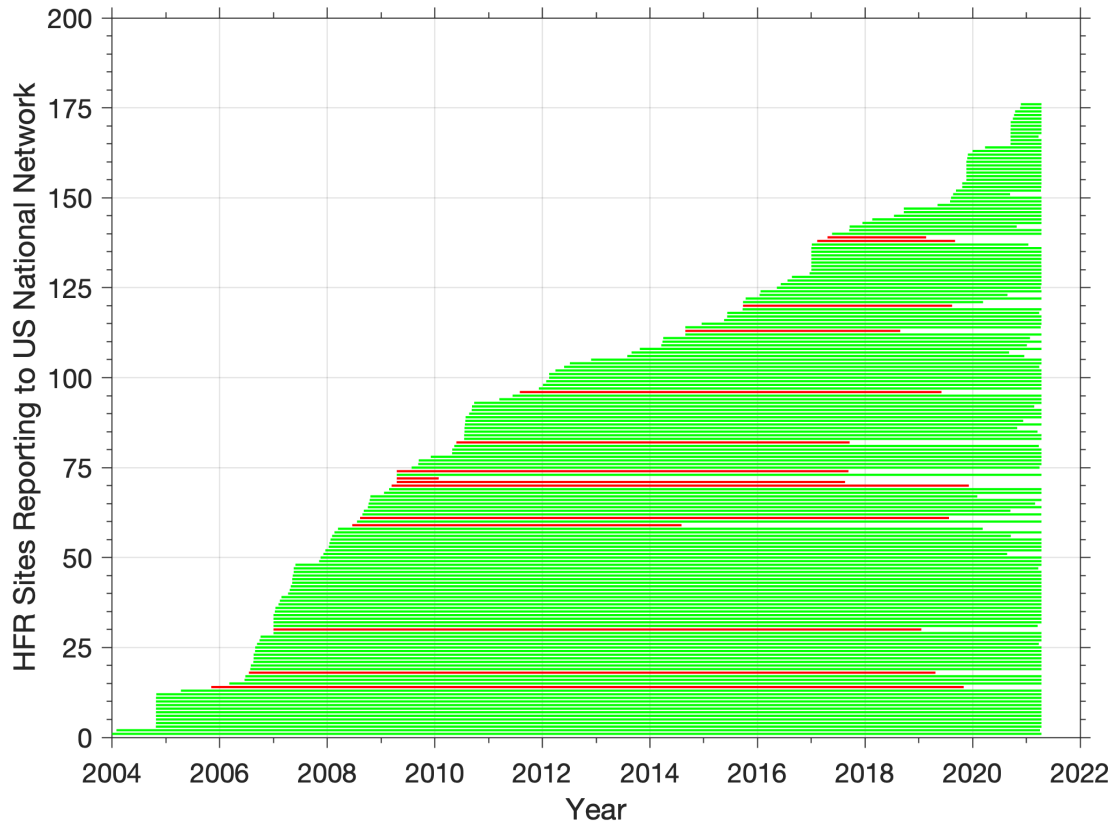
Region 2 (Americas)

Lisa Hazard
 Director HFRadar Network (HFRNet)

United States

- The United States added 3 HF radar sites and Canada added 1 station in 2020. This brings the number of stations operating in the US and Canada up to 176.
- The Southern California Coastal Ocean Observing System (SCOOS) is looking to develop products that combine HF radar currents, satellite ocean color imagery, and in situ observations to quantify development of Harmful Algal Blooms

Sites Reporting Up To Apr 13, 2021 <http://hfrnet.ucsd.edu/sitediag/stationList.php>



04/13/21 IOOS_HFR_age_graph_v12.png / plot_IOOS_HFR_age.m

Figure 2: Number of radar stations reporting to the United States National Network (bold black line) from 2004 to 2021. Past systems or those no longer providing operational data are plotted in red and operational systems in green.

George Voulgaris

SECOORA

United States

- Modified two radars to operate in the new FCC approved frequency of 5.256 MHz
- Obtained environmental approval and in process of deploying a 3rd radar in Long Bay, SC to resolve baseline between existing 2 stations.
- Made progress on inverting HF radar beam forming signals to estimate full directional wave spectra.

Nick Shay

SECOORA

United States

- Reestablished an HF radar site in North Key Largo in both Direction Finding and Beam Forming Modes.
- Upgraded Both Crandon Park and Virginia Key sites with a frequency of 13.5 MHz to comply with new ITU bands

Guy Meadows

GLOS

United States

- In May 2019, conducted full scale trials of two 41 MHz radars in the Straits of Mackinac
- Installation and testing of systems will take place in June/July 2021
- Planning to be first US operational freshwater HF radar system in September 2021

Pierre Flament

PacIOOS

- HFRs operating in Hawaii and Marianas

Carlos Leandro

Coordinator of the CRONOS Project

Brazil

- Three HF radar stations were installed on the coast of Rio de Janeiro - Brazil. The system was installed by the private company OceanPact Serviços Marítimos SA and all are a Long-Range Dual Transmitter configuration at a frequency of 4.65 Mhz.

Region 3 (Asia and Oceania)

Simone Cosoli

Director IMOS Ocean Radar Facility

Australia

- IMOS has made major efforts to install new HFR systems along the northwest shelf, Ningaloo, and the fact that IMOS have been forward thinking by investing significant budget to the complete refurbishment of the assets, along with planning operations for the next 10 years, not for radars only but for the entire observing infrastructure.
- Certain frequency bands allocated within ITU are completely useless, both in Europe and in Australia, for the lack of coordination globally. Specifically, the 9MHz band which is allocated in Region 1 and 3 was tested in Malta and turned out to be jammed which limited operations in Western Australia and South Africa. This interference was due to unregulated pirate radio stations broadcasting from the United States.

Siriluk Prukpitikul

Director of Geo-Informatics Applications and Services Office, GISTDA

Thailand

- Thailand is concluding Phase 2 (2016-2021) of their HF radar buildout plan which brings the number of operating stations to 24.

Jian-Wu Lai

National Academy of Marine Research (NAMR)

Taiwan

- NAMR is preparing for deployment of 12 phased array systems and 15 X-band ocean radars this year. Those phased array radars will operate with main frequencies 25~32MHz. The project is focusing on monitoring ocean waves and currents for recreation safety in the coastal ocean in four demonstration areas.

Naoto Ebuchi

Institute of Low Temperature Science, Hokkaido University

Japan

- The annual meeting of HFR user communities was held in December 2020 in Fukuoka. In Japan, HFR activities are shifting from technical developments and scientific researches to operational applications. Most of new HFR stations have been installed and operated by the Japan Coast Guard, fishery division of local governments, electric power companies. The data have been used for navigation, fishery and tsunami warning.