

Welcome to the #4 European HF Radar Task Team Newsletter

The European HF Radar Task Team helps coordinate the activities around the development and use of this coastal technology ([more info here](#)).

We are happy to share with you the latest news and events since July 2021.

Sustainability

Training and education for the next generation of HF radar technicians and scientists as well as training opportunities for users are as crucial as funding or user engagement activities for guaranteeing long-term sustainability of the European HF radar network. Find out more about it in the Snapshot stories at the end of this newsletter.

Happy stories

- 😊 **NEW HFR SITE** installed in Celle Ligure (SV) near Genoa in North Western Italian coast by CNR within the project SICOMAR Plus, funded by the Interreg VA Italy-France (Maritime) EU Programme.
- 😊 **UPDATED MAP** from the MONGOOS HFR network showed as a regionalization of the clickable map from the European HFR network (August 2021). Thanks MONGOOS!
- 😊 **NOTICE OF CHANGE** of the names from products of currents and HFR (total and radial) datasets following the new CMEMS nomenclature rules. Stay tuned!
- 😊 **PhD THESIS DEFENCE** of Ivan Manso-Narvarte on the 15th of October 2021. Thesis entitled "Towards a 3D hydrodynamic characterization from the joint analysis and blending of multiplatform observations for potential marine applications in the southeastern Bay of Biscay"" (temporary link). Zorionak Iván!!!
- 😊 **NEWS FROM ACROSS THE POND:** CODAR and BOEM Complete Study on Wind Turbine Interference Mitigation (final report available here). More information: IOOS Bi-weekly (10 FEB 2022)
- 😊 **HFR VALIDATION EXERCISE** of the CIES radial site located in the Ría de Vigo (NW Spain) in September 2021, with the deployment of >40 IIM_CSIC GPRS drifters in the framework of RADAR ON RAIA project.



Picture showing the trajectories of GPRS IIM_CSIC drifters deployed in the Ría de Vigo –left panel-. Home-made prototypes of GPRS drifting buoys developed by IIM_CSIC for HF Radar calibration operated by GOFUVI(Uvigo) -right panel-.

- 🧐 **EEA-GRANT PROPOSAL MONICAN-BIO** submitted by the Portuguese IH for a MONICAN Observatory follow-up approved without funding. This proposal included two new HFR sites (Peniche and Nazaré). It will be submitted again!
- 🧐 **HFR-VINA radial site** from the network HFR-Ebro has been inactive since a long time, seriously reducing the coverage.
- 😊 **SICOMAR Plus project** has been one of the Winners of the WestMED Project Awards in the category 'biodiversity, marine habitat conservation and response to

marine pollution' (november 2021). Congratulations!



Open and forthcoming calls

- **CALL FOR TENDER:** Copernicus Marine - Innovation Service Evolution R&D. Full description here. Deadline: **18/03/2022**
- **HORIZON-MISS-2021-OCEAN-03-01:** Mediterranean sea basin lighthouse - actions to prevent, minimise and remediate litter and plastic pollution. Deadline: **12/04/2022**
- **HORIZON-MISS-2021-OCEAN-05-01:** Underlying models for the European Digital Twin Ocean. Deadline: **12/04/2022**
- **COST Action PROPOSAL:** Next collection date: 20/10/2022 at 12:00 noon (CET). Instructions here

Job & internship opportunities

- **OPEN POSITION: Marine Technician** at Marine Robotics Centre of the Flanders Marine Institute (VLIZ) - Belgium. Deadline: **27/02/2022**
- **PhD VACANCY in mm-wave integrated antennas** at Eindhoven University of Technology (TU/e) - The Netherlands. Deadline: **28/02/2022**
- **DOCTORAL CANDIDATE (PhD student)** in Radio Resource Allocation and Spectrum Management, at the Interdisciplinary Centre for Security, Reliability and Trust (SnT), University of Luxembourg. Application deadline: **07/03/2022**
- **OPEN POSITION: Coastal Process Scientist** at the Channel Coastal Observatory based at the National Oceanography Centre in Southampton - England. Deadline: **11/03/2022**
- **OPEN POSITION: Principal Investigator Ocean** at Marine Robotics Centre of the Flanders Marine Institute (VLIZ) - Belgium. Deadline: **13/03/2022**

- **POSTDOCTORAL FELLOWSHIP** (3 years) at CNR-ISMAR (Italy) to Support the Secretariat of the SciNMeet Programme. Application deadline: **15/03/2022**
 - **PhD POSITION in physical oceanography** - Alfred Wegener Institute - Germany. Application deadline: **24/03/2022**
 - SCHOLARSHIPS APPLICATIONS for the new **MSc Erasmus Mundus on Coastal Hazards** - Spain, The Netherlands and Portugal. Deadline: **31/03/2022**
 - **OPEN CALL: Kostas Nittis Award** to early-career (< 30 years old) marine scientists. Nominations should be made by current EuroGOOS member organisations. Deadline: **04/04/2022**
 - **PhD SCHOLARSHIPS in Portugal**- Fundação para a Ciência e a Tecnologia (FCT) - Portugal. Deadline: **07/04/2022**
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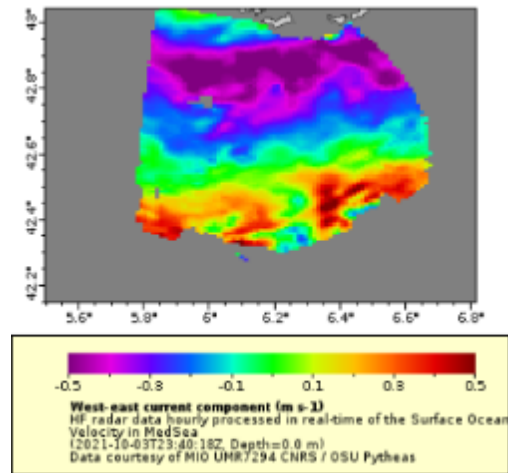
Products and Services

User's feedback always helps improve data collection and product quality by knowing about their need for an ocean-derived product, about the proper way to generate it and to distribute it to them.

(Smith et al., 2019)

Basic products

- **REAL TIME CURRENTS (totals and radials)** from HFR-EUSKOOS distributed by thredds in standard format [here](#).
- **REAL TIME CURRENTS (totals)** from HFR-MIO Toulon distributed through ERDDAP platform in standard format [here](#). Find the description [here](#). Merci beaucoup!



Screenshot of the graph showing the zonal current component of the HFR-MIO Toulon distributed throughout the ERDDAP platform.

Advanced products

- **OPERATIONAL GAP-FILLING HFR DATA** are being distributed for the Algarve area (southern part of Portugal), by using Open Modal Boundary Analysis, being available for SAR operations.

Ongoing Research and Opportunities

Building international, intergenerational networks provides the explicit collaboration opportunities necessary to ensure that the benefits outweigh the challenges of international collaborative research

(Dusdal et al., 2021)

HFR recent/new publications

- Astafyeva, E., Yasyukevich, Y. V, Maletckii, B., Oinats, A., Vesnin, A., Yasyukevich, A. S., Syrovatskii, S., & Guendouz, N. (2022). Ionospheric Disturbances and Irregularities During the 25–26 August 2018 Geomagnetic Storm.

- **Domps, B., Marmain, J., and Guérin, C.-A (2021).** Improved Observation of Transient Phenomena with Doppler Radars: A Common Framework for Oceanic and Atmospheric Sensing, 2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS, 2021, pp. 7180-7183, doi: 10.1109/IGARSS47720.2021.9553316.
- **Barral, Q.-B., Zakardjian, B., Dumas, F., Garreau, P., Testor, P., & Beuvier, J. (2021).** Characterization of fronts in the Western Mediterranean with a special focus on the North Balearic Front. *Progress In Oceanography*, 197. <https://doi.org/10.1016/j.pocean.2021.102636>
- **Bradbury, M. C., & Conley, D. C. (2021).** Using Artificial Neural Networks for the Estimation of Subsurface Tidal Currents from High-Frequency Radar Surface Current Measurements. In *Remote Sensing* (Vol. 13, Issue 19). <https://doi.org/10.3390/rs13193896>
- **Bruciaferri, D., Tonani, M., Lewis, H. W., Siddorn, J. R., Saulter, A., Castillo Sanchez, J. M., Valiente, N. G., Conley, D., Sykes, P., Ascione, I., & McConnell, N. (2021).** The Impact of Ocean-Wave Coupling on the Upper Ocean Circulation During Storm Events. *Journal of Geophysical Research: Oceans*, 126(6), e2021JC017343. <https://doi.org/https://doi.org/10.1029/2021JC017343>
- **Ferla M., Nardone G., Orasi A., Picone M., Falco P., Zambianchi E. (2022).** Sea Monitoring Networks. In: Daponte P., Rossi G.B., Piscopo V. (eds) *Measurement for the Sea*. Springer Series in Measurement Science and Technology. Springer, Cham. https://doi.org/10.1007/978-3-030-82024-4_9
- **García-León, M., Sotillo, M. G., Mestres, M., Espino, M., & Fanjul, E. Á. (2022).** Improving Operational Ocean Models for the Spanish Port Authorities: Assessment of the SAMOA Coastal Forecasting Service Upgrades. In *Journal of Marine Science and Engineering* (Vol. 10, Issue 2). <https://doi.org/10.3390/jmse10020149>
- **Lima, V. and Fernandes, C. (2021).** Radares de Alta Frequência (HF) e sua utilização na Oceanografia e na monitorização de tsunamis. *Navy Magazine*.
- **Lorente, P., Aguiar, E., Bendoni, M., Berta, M., Brandini, C. Cáceres-Euse, A., Capodici, F., Cianelli, D., Ciraolo, G. Corgnati, L., Dadić, V., Doronzo, B., Drago, A., Dumas, D., Falco, P., Fattorini, M., Gauci, A., Gómez, R., Griffa, A., Guérin, C.-A., Hernández-Carrasco, I. Hernández-Lasheras, J., Ličer, M., Magaldi, M., Mantovani, C., Mihanović, H., Molcard, A., Murre, B., Orfila, A., Révelard, A., Reyes, E., Sánchez, J., Saviano, S., Sciascia, R., Taddei, S., Tintoré, J., Toledo, Y., Ursella, L., Uttieri, M., Vilibić, I., Zambianchi, E., Cardin, V. (preprint under review).** Coastal HF radars in the Mediterranean: Status of operations and a framework for future development, *Ocean Sci. Discuss.* [preprint], <https://doi.org/10.5194/os-2021-119>, in review, 2021.
- **Marasco, M., Reyes, E., Fernández, J. G., M., C., Notario, X., Rotllán, P., Rújula, M. A., & Tintoré, J. (2021).** SOCIB - Coastal High Frequency Radar Data Management Plan (Version 1.0). <https://doi.org/10.25704/ydas-qz53>
- **Martin, A. C. H., Gommenginger, C. P., Jacob, B., & Staneva, J. (2022).** First multi-year assessment of Sentinel-1 radial velocity products using HF radar currents

in a coastal environment. Remote Sensing of Environment, 268, 112758. <https://doi.org/10.1016/j.rse.2021.112758>

- **Reyes, E., Aguiar, E., Bondoni, M., Berta, M., Brandini, C. Cáceres-Euse, A., Capodici, F., Cardin, V. Cianelli, D., Ciraolo, G. Corgnati, L., Dadić, V., Doronzo, B., Drago, A., Dumas, D., Falco, P., Fattorini, M., Fernandes, M.J., Gauci, A., Gómez, R., Griffa, A., Guérin, C-A., Hernández-Carrasco, I. Hernández-Lasheras, J., Ličer, M., Lorente, P., Magaldi, M., Mantovani, C., Mihanović, H., Molcard, A., Mourre, B., Révelard, A., Reyes-Suárez, C., Saviano, S., Sciascia, R., Taddei, S., Tintoré, J., Toledo, Y., Uttieri, M., Vilibić, I., Zambianchi, E., Orfila, A.** (preprint under review). Coastal HF radars in the Mediterranean: Applications in support of science priorities and societal needs, Ocean Sci. Discuss [preprint], <https://doi.org/10.5194/os-2021-115>, in review, 2021
- **Rossi, G. B., Cannata, A., Iengo, A., Migliaccio, M., Nardone, G., Piscopo, V., & Zambianchi, E. (2022).** Measurement of Sea Waves. In Sensors (Vol. 22, Issue 1). <https://doi.org/10.3390/s22010078>
- **Zumwald, M., Knüsel, B., Baumberger, C., Hirsch Hadorn, G., Bresch, D. N., & Knutti, R. (2020).** Understanding and assessing uncertainty of observational climate datasets for model evaluation using ensembles. WIREs Climate Change, n/a(n/a), e654. <https://doi.org/10.1002/wcc.654>

For a complete list of publications of the **European HFR** community please visit our ZOTERO Community Library

Ongoing projects

- **i-waveNET**: the restoration and deployment of the wave buoy in Mazara del Vallo on a depth of 86 m and 8 miles from the coast, constitutes a very important element for monitoring the state of the sea and the first achievement of the project.
- **RADAR-ON-RAIA**: the project deadline is close (31 July 2022). In the next few months, several products will be released. Spread the word!
 - **RADQC web tool** for NRT quality control, management and visualisation of radial and total current with specific section of alerts implemented for Galicia-North Portugal and Vigo HFR Systems.
 - **map viewer** with several functionalities (video, HFR data temporal evolution, time series and custom downloads, *.csv and *.nc formats)
 - **web application for waves** from the HFR stations (VILA and SILL radial sites).
 - **operational maps of upwelling index** derived by the HFR along with other indices such as those provided by the Spanish Institute of Oceanography (based on Lorente et al., 2020 - more info in newsletter#2-).
 - **eulerian and lagrangian validation exercises** on the southernmost region of the Galicia-North Portugal HFR network.
- **JERICO S3**: pilot study where transboundary processes in W-SW Iberian Peninsula are analysed with HFR-derived observations.

- **EUROSEA:** validation and implementation of the newly developed coastal upwelling index based on HFR observations in different pilot areas.
- **PI-BREAK:** new project led by LIM/UPC - Maritime Engineering Laboratory and in collaboration with AZTI, BilbaoPort and IHCantabria.
 - **What?** PI-BREAK aims at extending the lifespan of port infrastructures under a range of future climatic/exploitation scenarios, introducing Predictive Intelligent maintenance to reduce risks and enlarge the safe operating space for breakwaters.
 - **How?** PI-BREAK will combine recent advances in modelling and instrumentation, including HF and X-band radar technologies.
 - The project PLEC2021-007810 is **funded** by MCIN/AEI/10.13039/501100011033 and by the European Union NextGenerationEU/PRTR.

Past events since the Newsletter#3

- **CALYPSO South:** final meeting celebrated last October, 2021, organised by the University of Catania.
 - Video available [here](#).
- **10th MONGOOS Workshop** “10 Years of Operational oceanography in the Mediterranean Sea - Towards a Full Ocean Data Integration”, 26-27 October 2021
 - Takeaways for both sessions available [here](#).
 - Presentations available in [this link](#)
- **2nd EuroGOOS Integration Workshop**, 29-30 November 2021
 - EuroGOOS HFR Task Team chair, Julien Mader (AZTI) presented the Governance (described in newsletter#3)
- **SICOMAR plus:** celebrated its final event on January 12, 2022.
 - Products of the projects are presented in [this video](#).
 - Pictures of the event are available [here](#).

Upcoming events & opportunities

- **NEW VERSION OF RadarOnRAIA CLASSROOM COURSE:** on discovering, accessing and processing tools of oceanographic data in the RAIA area (Galicia - North Portugal) focused on non-specific users. Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial - INEGI (Porto, 26-27/04/2022).
- **EOOS Technology Forum** 22-24 March, 2022. Registration open.
- **EGU2022:** planned for 23-27 May, 2022 Registration now open
 - **OS2.4** Session “Advances in understanding of the multi-scale and multi-disciplinary dynamics of the Southern European Seas (Mediterranean and Black Sea)”
 - **OS4.2** Session “Surface Waves and Wave-Coupled Effects in Lower Atmosphere and Upper Ocean”
 - **OS4.4** Session “Marine Pollution Monitoring, Modeling and Risk Mapping”
- **VII EOF (Expanding Ocean Frontiers) CONFERENCE**, 4-8 July, 2022 (hybrid event), organised by the Marine Sciences Faculty from the University of Las Palmas de Gran Canaria (FCM-ULPGC) with the support of the EOF scientific committee.

- **ECSA 59 SYMPOSIUM**, 5-8 September, 2022 (San Sebastian, Spain): Using the best scientific knowledge for the sustainable management of estuaries and coastal seas. Abstract submission deadline: 01/04/2022
- **SCIENCE SEMINARS**: NOAA Coastal Ocean Modeling. If you have a story to share, or would like to be added on the email list for the future seminars, please visit [this link](#)
- **SPECIAL ISSUE** in Remote Sensing: "Sustained Ocean Surface Observation Using HF Radar: from Data to Societal Applications". Deadline: 31/03/2022
- **SPECIAL ISSUE** in the Journal of Marine Science and Engineering: "Dynamics in Coastal Areas". Deadline: 20/06/2022

Memory Corner

This new section of our newsletter will help us remember 10 important "HOW-TO"

Do you want to...?

- **ACCESS the CMEMS product** containing **Near real time in-situ** observations of surface ocean currents (drifters and HFR) for the Global Ocean? [Click here](#)
- **ACCESS the CMEMS product** containing **Delayed Mode in-situ** Observations of surface (drifters and HFR) and sub-surface (vessel-mounted ADCPs) ocean currents for the Global Ocean? [Click here](#)
- **ACCESS the EMODnet Physics** ERDDAP HFR catalog? [Click here](#)
- **SYNCHRONIZE your HFR** data with the EU HFR Node? [Learn here how to do it!](#)
- **SHARE your historical** HFR data? Contact Us: euhrnode@azti.es
- **USE standard templates** for maintenance and for monitoring your HFR site? [Access to the document available in the Ocean Best Practices repository.](#)
- **CONTRIBUTE** to the forthcoming **newsletters**? Contact Us: euhrnode@azti.es and help us to populate them.
- **BE PART** of effective **consortium**? [Fulfill the European HFR Competence Matrix.](#)
- **CONTRIBUTE** to the HFR **stakeholder engagement** strategy? Please, take a look at the list of existing and potential users of HFR data and help us to identify the main stakeholders in your region.
- **INCLUDE** your **publications and projects** in the European HFR Task Team ZOTERO Community Library? Contact Us: euhrnode@azti.es

Snapshot Stories

Hello HFR community!

Let's start summarising the accomplishments we made in the previous six months and look forward to achieving more along this year.

Since the publication of the last newsletter#3, two important projects (i.e. SICOMAR Plus and CALYPSO South) have celebrated their final meetings, while RadarOnRaia project will finish by the end of July this year. At the same time, new projects involving HFR technology (i.e. PI-BREAK) as well as new calls have appeared on the HORIZON 😊

Since last July, the HFR community has been represented in several past events and has contributed to different joint publications. You can have more information in the specific sections of this newsletter.

Moreover, a new HFR site has been installed in Italy in the context of

SICOMAR plus project, a wave buoy has been deployed in Mazara del Vallo (Italy) in the framework of i-waveNET and the number of institutions providing HFR surface currents in standardised format are continuously increasing.

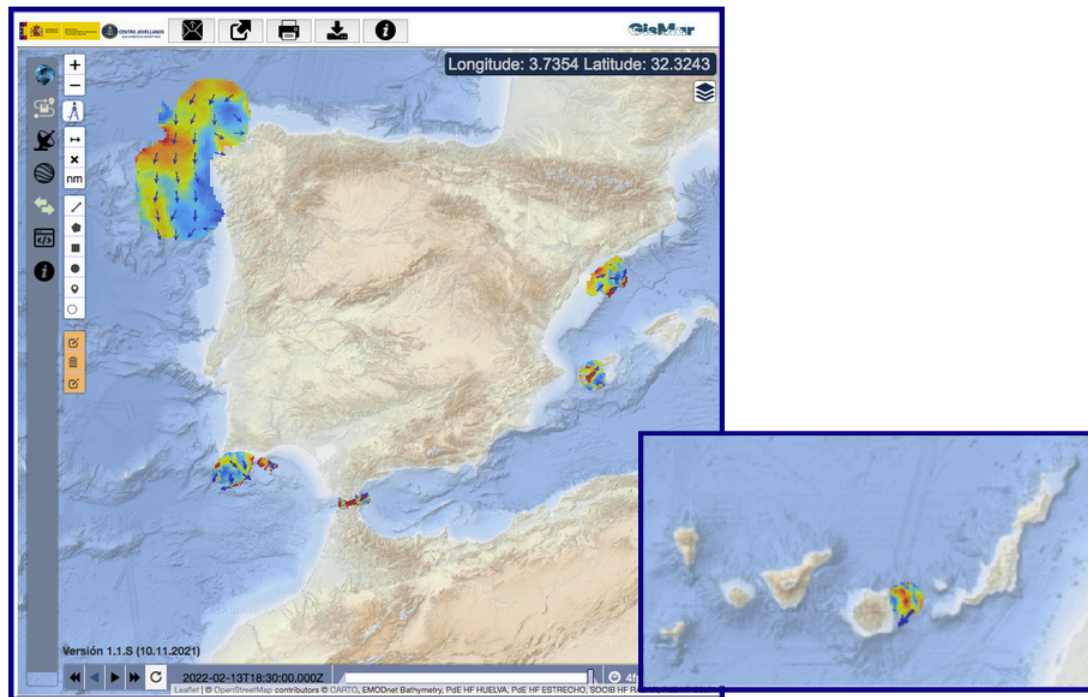
I now invite you to learn more about HFR data users from different sectors (e.g. Maritime Safety, Weather services and ocean forecasting, Fisheries, Academia), since the snapshot stories of this next newsletter are bringing us their very valuable testimonials.

In addition, I would like to share with you a proposal, aiming to enhance the HFR discovery and visibility by citizens. Keep reading until the end!

Thank you very much for your testimonies, for providing your contributions, for your involvement, and, ultimately, for your huge efforts helping to build, to strengthen and to sustain the European HFR network for common benefit.

May the 4th Be With You!

Julien Mader (chair of the EuroGOOS HFR Task Team)



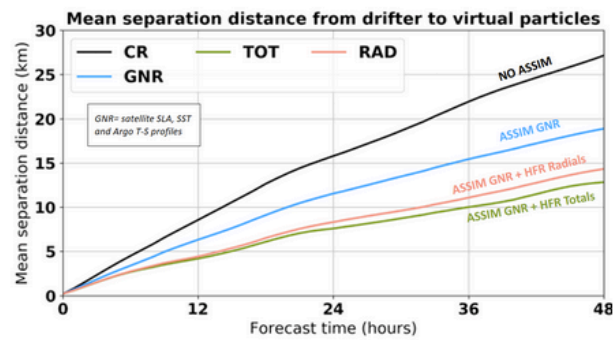
HF radar use by the Spanish Maritime Safety and Rescue Society

As the Head of the e-Learning and R&D projects Area from the Jovellanos Centre, which is the training centre of the Spanish Maritime Search and Rescue Agency (SASEMAR), I am aware of the HFR technology, the data provided and its potentiality. SASEMAR has integrated HFR data from several Spanish systems in its Environmental Data Server, which are available in the IBISAR skill assessment tool, being also displayed in our viewer GisMAR (see figure above).

The Jovellanos Centre hosted a webinar on applications of the HFR technology, which is now included in its online catalogue. The surface currents provided by the HFR at high spatio-temporal resolution are considered, jointly with other in-situ and satellite data, as ground truth information for model assessment purposes in coastal areas, where most of the SAR incidents occur and where there is often a great lack of observations.

The nowadays HFR limited coverage reduces its potential in SAR and oil spill applications against the robustness of the regional ocean models' predictions over wider domains. Operational provision of short-term predictions, based on HFR, are desirable to support the early stage (first 6 hours) of the SAR incident response, whereas longer-term forecasts (> 72 hours) are required for oil spill tracking. The applicability of HFR-derived products should be evaluated for both cases independently. A significant expansion to cover coastal areas that are still under-sampled might also be advantageous in the future.

Christian de Lera Fernández (SASEMAR- Centro Jovellanos, Spain)



HF radar data assimilation helps to improve the prediction of Lagrangian trajectories

As members of the SOCIB Modeling and Forecasting Facility -MFF- from the Balearic Islands Coastal Ocean Observing and Forecasting System (SOCIB) we are users of the HFR technology and the derived measurements.

More concretely, the HFR surface currents from the Ibiza Channel are assimilated in the regional model WMOP (Western Mediterranean OPERational forecasting system), together with satellite data (i.e. sea level anomaly and sea surface temperature) and Argo T-S profiles. WMOP is also being validated on an operational basis against several in-situ and satellite measurements, including also the HFR data from the Ebro Delta, Strait of Gibraltar, and Ibiza Channel. Findings from Hernández-Lasheras et al., 2021 show that the assimilation of the HFR-Ibiza data contributes, jointly with all other multi-platform data observations, to constrain the model solution and to improve the forecast, reducing the error in simulating real drifter trajectories by up to 50% after 48 hours (right panel of the figure). This confirms the usefulness of HFR systems to improve regional operational ocean forecasting models, even when providing limited coverage with respect to the model domain extension. This is crucial to enhance our knowledge about the dynamics in the area, provide better support to maritime emergencies and analyze the larval and marine litter dispersion.

There is still room for improvement given that the HFR high temporal resolution potential has not yet been fully exploited due to new challenges associated with the use of HFR hourly data in the sequential data assimilation scheme. A better knowledge of the observation error covariances, which are unfortunately often unavailable, would also be beneficial to improve the assimilation of HFR surface currents.

Baptiste Mourre (left panel) and Jaime Hernández-Lasheras (SOCIB, Spain)



Fishermen's Guild of Vigo (NW of Spain)

As providers of technical assistance to the fishermen's Guild of Vigo, we are aware about the provision of surface currents by HFRs. However, in the area of our interest, located in the inner bay of Ría de Vigo (NW of Spain), there is still not any HFR system installed, so thus, we instead use the model forecasts from Meteogalicia and Windguru to gather information on oceanographic and meteorological conditions (e.g. winds, waves, etc). In addition, information retrieved from buoys and webcams are also used to know about the state of the sea in real time in the near shore areas in order to carry out and plan professional (i.e. fishing) and recreational activities (e.g. surfing, recreational fishing, etc).

We would like to know if there is any easy-to-use product from the HFR system from Galicia-North Portugal or from the HFR system of Ría de Vigo that could be of our interest and useful for fisheries and aquaculture activity in the inner bay of Ría de Vigo.



Baptiste Doms (DEGREANE-HORIZON, France)

I recently defended my Ph.D. in remote sensing within the University of Toulon and the Mediterranean Institute of Oceanography (France), during which I assessed new processing methods for the inversion of fast-varying surface currents (e.g. storm surges or tsunamis). Since then, I have been working as a radar engineer in the

company Degreane Horizon on the development of new instruments and methodologies for the remote sensing of the sea surface and the lower atmosphere. I also take part in the deployment and maintenance of new radar setups.

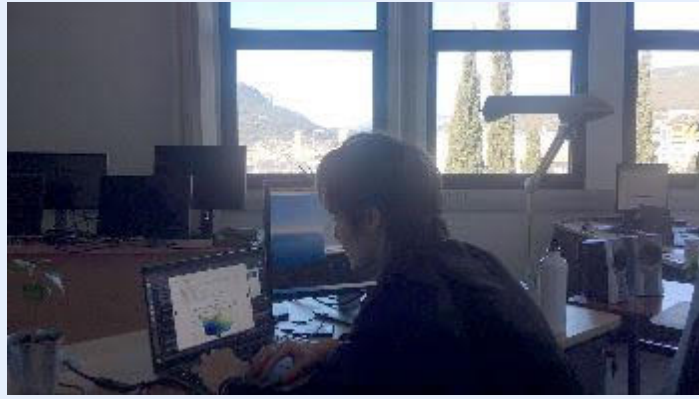
Our research activities are focused on the use of HFR data for the cal/val of spaceborne instruments and the development of tsunami early warning algorithms. I expect that the ever-growing dissemination of data from various instruments makes it possible to observe more geophysical phenomena around the Mediterranean Sea, using the HFR networks as backbone for the data-fusion process.



Alejandro Cáceres (University of Toulon, France)

I am a Postdoctoral fellow at the University of Toulon, France. I know about HFR systems and how this technology has been implemented nowadays for applied and basic science in the oceanographic and atmospheric field. I use HFR data to study the different components that contribute to the total surface sea current, such as wind/wave-induced currents and the geostrophic component.

The HFR system provides valuable spatial and temporal information from in-situ surface sea currents at the coastal region. Nonetheless, even when HFR data is a great tool to explore complex physical processes at sea, still there are several limitations when trying to cover long-term time series. In addition, a larger spatial coverage would be valuable for the understanding of regional circulation features. I would like to merge the available HFR data at the Mediterranean Sea, in order to better observe larger-scale circulation systems.



Natacha Bourg (Mediterranean Institute of Oceanography-University of Toulon, France)

I am a PhD student at the Mediterranean Institute of Oceanography and the University of Toulon (France). The subject of my thesis is to study the role of two boundary currents and their features on transport of heat and passive tracers. For this purpose, I particularly use HFR-derived surface velocity data from sites located on the French coast of the Mediterranean Sea (Northern Current) and on the East coast of Australia (East Australian Current).

This data is precious in this context as its resolution and closeness to the coast enables the observation of the high frequency variability of boundary currents, meso- to sub-mesoscale structures, and exchanges between the littoral and the ocean. However, long and continuous time series are rare with this observational system. Efforts to sustain the HFR observations and create new HFR sites would be great to study ocean currents from both a high resolution and larger spatio-temporal scale. Besides, grouping the experience from different labs could be useful to propose a common procedure to process and check the quality of the data amongst the different sites.



HFR sites: casual encounters

Last summer I was enjoying the holidays cycling along the Portugal coast, from Lisbon to Faro. One of my mid-way stops was in Sagres (close to the southwesternmost tip of Europe, south of Portugal) where I visited the Fortress of the

city. This fortress was severely damaged during the great earthquake in 1755 and then restored in the mid 20th century. In addition to the beauty of its landscape, I was also surprised to see one of the radial sites from the National HF Network-South operated by our colleagues from the Portuguese IH inside the fortress. Interestingly, our colleague Pedro Montero (INTECMAR) faced a similar experience years ago in Sagres (see them on the left and middle panels in the figure).

On another trip to Italy, I took the advantage to visit the Cinque Terre National Park, in La Spezia, Liguria. This amazing place is Italy's first national park, being also the smallest and the densest one and it was included as a UNESCO World Heritage Site in 1999. In one of the five coastal villages (i.e. cinque terre) I found the HFR site from Monterosso al Mare, which belongs to the HFR-TirLig. I must admit that it was hard to find it due to its camouflage 😊 (see it on the right panel).

I think that it would be nice to include some outreach materials about the HFR technology and its applications in those places to inform the visitors and to invite them to share pictures from these casual encounters to enhance discovery and to provide more visibility to the HFR platforms, by describing where they are, how they are integrated in the landscape or in historical buildings and places, how they look... so then, let's give it a try!

Emma Reyes (SOCIB, Spain) and Pedro Montero (INTECMAR, Spain)



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Would you like to contribute to the next newsletter?

Please, contribute to our biannual survey, which is launched one or two months in advance. For providing further details, please, include links (to videos, images, pictures, papers, documents) to third-party websites. Thanks a lot for your contributions!

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10 attachments



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