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Supplement of

Dataset of depth and temperature profiles obtained from 2012 to 2020 using commercial fishing vessels of the AdriFOOS fleet in the Adriatic Sea

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S1: On land datacenter detailed description

S1.1. Waves forecasting module

The wave forecasting module directly communicates with the e-logbook GUI: a routine installed on the CNR IRBIM server creates daily animated gif files derived from the forecast maps generated by the KASSANDRA storm surge operational forecast system for the Mediterranean and Black seas (http://kassandra.ve.ismar.cnr.it:8080/kassandra/model-description; last access 28 July 2023); when covered by GPRS signal, the GUI software automatically checks for new available maps and downloads from the AdriFOOS server forecasts related to Adriatic Sea waves height and direction for the next four days (3 hours level detail).

S1.2. AdriFOOS databases

Installed on the AdriFOOS server there are also 2 databases (hereafter referred to as DBs) built by means of the ORACLE MySQL Database Service, containing respectively raw and validated data (see section 4). Fig. S1 shows the tables componing the relational DB directly populated with data sent in NRT by the e-logbooks on board the vessels. In order to secure communications, REST APIs (Representational State Transfer, Application Program Interface), based on Hypertext Transfer Protocol (HTTP) and support Transport Layer Security (TLS) encryption, are used. TLS standard allows keeping a private Internet connection and checking that the data exchanges by the fishing vessel and the server ashore are encrypted and unmodified.

The table "foos.Settings" is mirrored in the DB embedded in the e- logbook and allows to store encrypted information about the vessels (e.g. landing harbour, fishing gear etc.) and settings or (changes in settings) of the systems installed on board each of them (e.g. sensors serial numbers and types etc.). All tables are linked by means of primary or secondary keys (i.e. idBoat, dateStart, port_name etc.; links not shown in the figure to simplify visualization). In some cases, links among tables are defined by specific algorithms or tools, also able to *a posteriori* fulfil some of the fields (e.g quality flags). For example, the temporal definition of fishing hauls (by means of the field "dateStart" and dateEnd") is automatically based on the crossing between GPS data (stored in the "foos.PositionSet" table) and the start/end of the oceanographic measurements made by the sensors on the fishing gear (stored in the "foos.MeasureSet" table). Information on the start/end of each fishing trip can be as well derived by data input of the fishers but also automatically corrected on the base of the GPS route and the position of the harbour associated with each vessel (see also validation procedures described in paragraph 4). A series of tables is dedicated to catch data and is again mirrored in the e-logbook DB, allowing to reconstruct catch definitions linked to each specific harbour and directly set on board (e.g. name of fish in dialect, etc.) and fishing gear type (e.g. way to refer to species sizes, etc.). All the stored information is then validated (see section 4) and transferred to a backup DB in which each table contains a validation flag column (the column may contain different codes depending on the data quality assignment; see section 4 of the paper).

S1.3. AdriFOOS data centre web interface

A visualisation service (hereafter referred to as FOOSweb; http://foosweb.irbim.cnr.it/) is directly connected to the raw data DB. It consists of a web interface, compiled to date only in Italian, from which, once logged in, it is possible to view the status of the system for each vessel. According to the different access levels (depending on user definition) various tools are available; for example fishermen are allowed to check their dataset in a summary screen or visualise single GPS positions' tracks, graphs related to the environmental parameters collected by the sensors on the fishing gear and a summary of the obtained biological data (a sample of data collected by AdriFOOS in the last period can be accessed in

this mode using username: foosample and pwd: fsA@23.mp). Researchers are also allowed to carry out some validation procedures or extract data. Through the links available under the “Menu Admin” section of FOOSweb, it is possible to remotely connect to the FOOS installed on board the fishing vessels and change some settings as: vessel-gear combination, vessel-harbour combination, species priority and species size category (Fig. S2). This feature is useful to carry out remote maintenance in case of malfunctions. Under the “Admin Menu" section, some validation procedures are also available to minimise errors and perform a quality control process (e.g. visual inspection of depth/temperature profiles with possibility to manually flag values and catch validation tool both described in paragraph 4; Fig. S2a-b). Both raw and validated data can also be accessed by researchers via Domain Name System (DNS) and for example connected to Geographic Information Systems (GIS; see for example Fig. 6 in the main text of the paper).

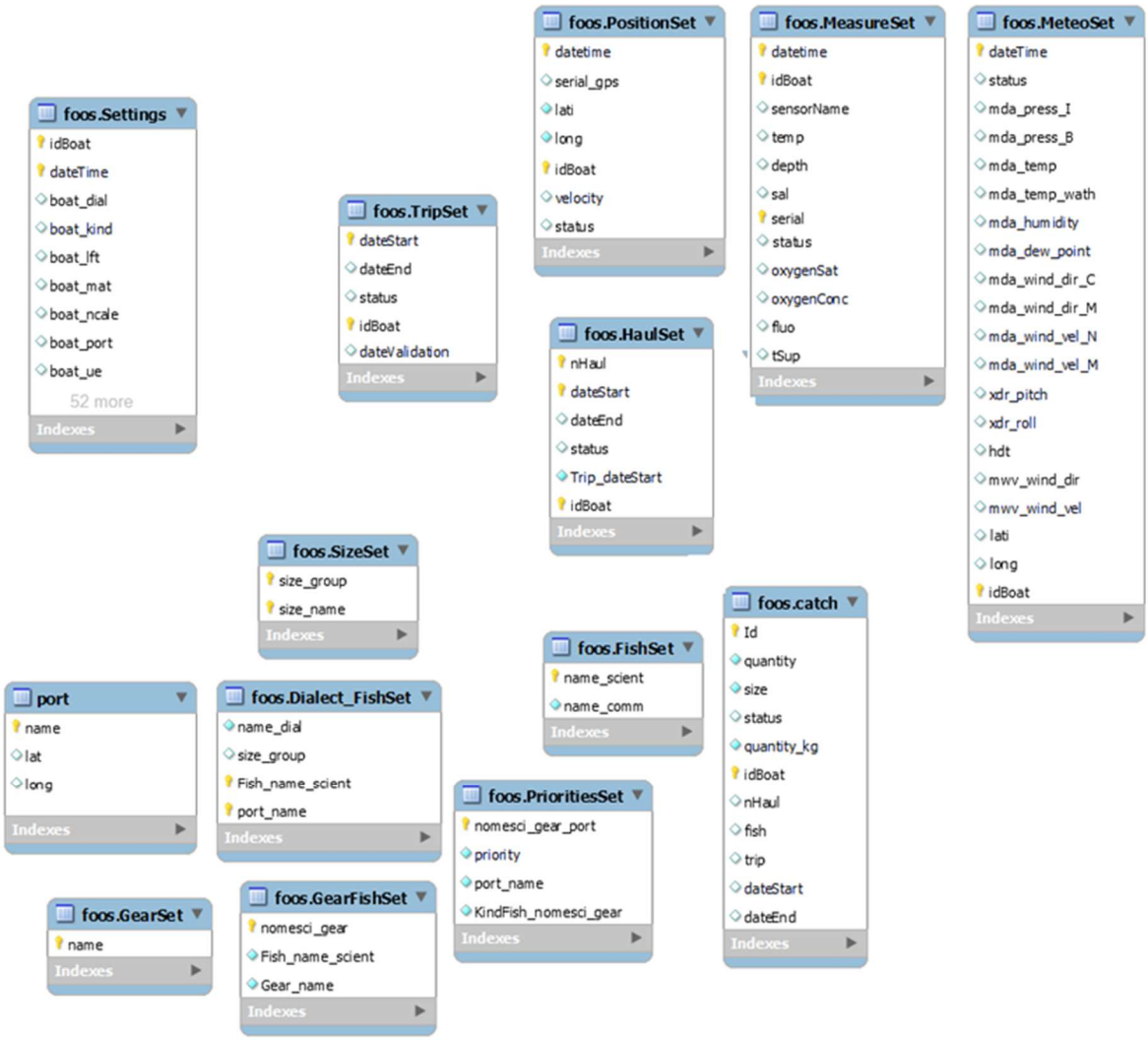
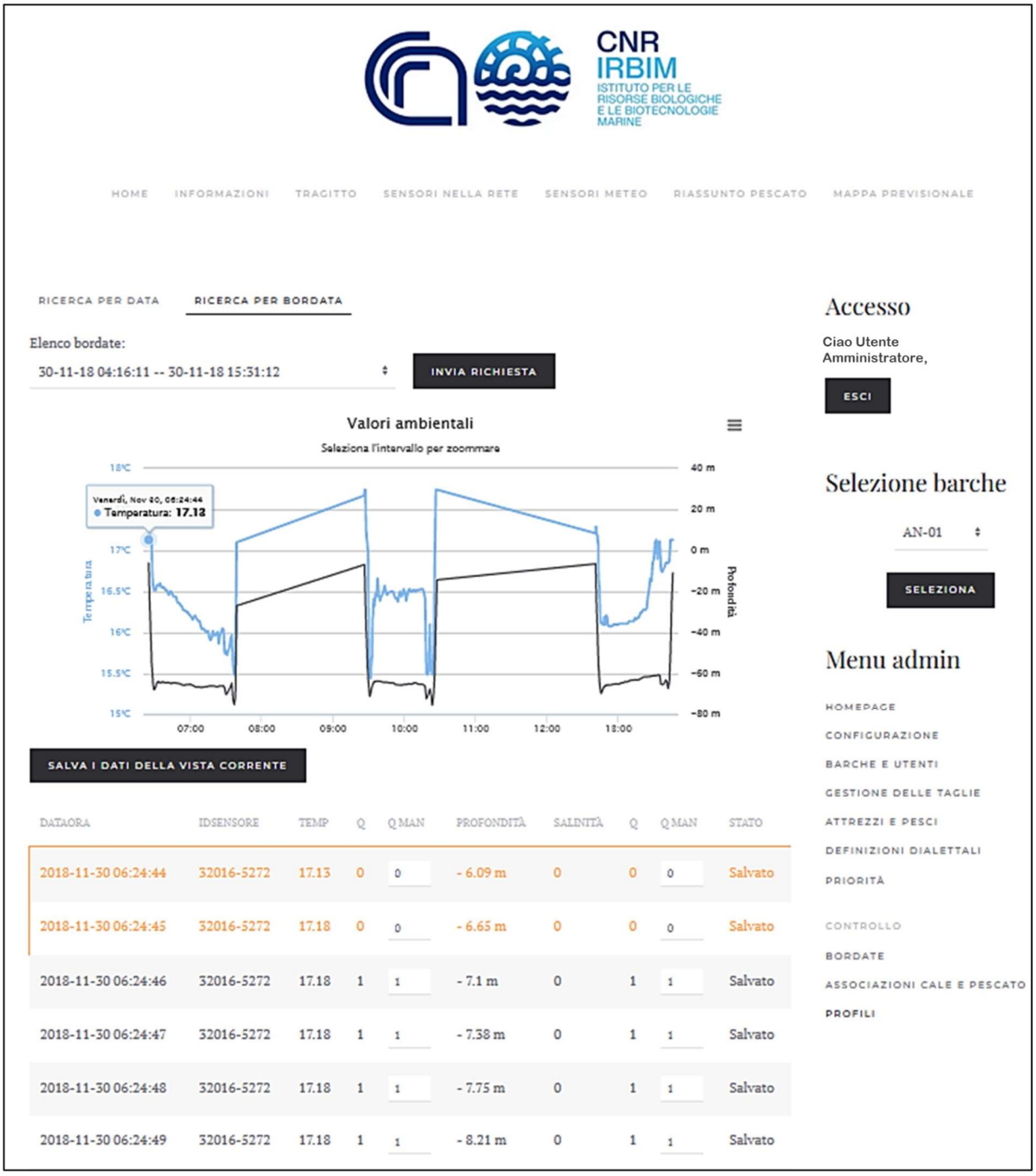


Figure S1. Schema of the relational database embedded in the AdriFOOS on land datacenter (diagram made by means of MySQL Workbench 8.0).



DATAORA	IDSENSORE	TEMP	Q	Q MAN	PROFONDITÀ	SALINITÀ	Q	Q MAN	STATO
2018-11-30 06:24:44	32016-5272	17.13	0	0	- 6.09 m	0	0	0	Salvato
2018-11-30 06:24:45	32016-5272	17.18	0	0	- 6.65 m	0	0	0	Salvato
2018-11-30 06:24:46	32016-5272	17.18	1	1	- 7.1 m	0	1	1	Salvato
2018-11-30 06:24:47	32016-5272	17.18	1	1	- 7.38 m	0	1	1	Salvato
2018-11-30 06:24:48	32016-5272	17.18	1	1	- 7.75 m	0	1	1	Salvato
2018-11-30 06:24:49	32016-5272	17.18	1	1	- 8.21 m	0	1	1	Salvato

Figure S2a. FOOSweb interface: on top depth profile (in Italian Profondità) in black and temperature profile (in Italian Temperatura) in light blue relating to the entire fishing trip, on the bottom a list of depth/temperature pairs with indication of quality flag derived from automated procedures (Q) and possibility to modify it manually in the column Qman (this feature is available also for salinity profiles, in Italian Salinità).

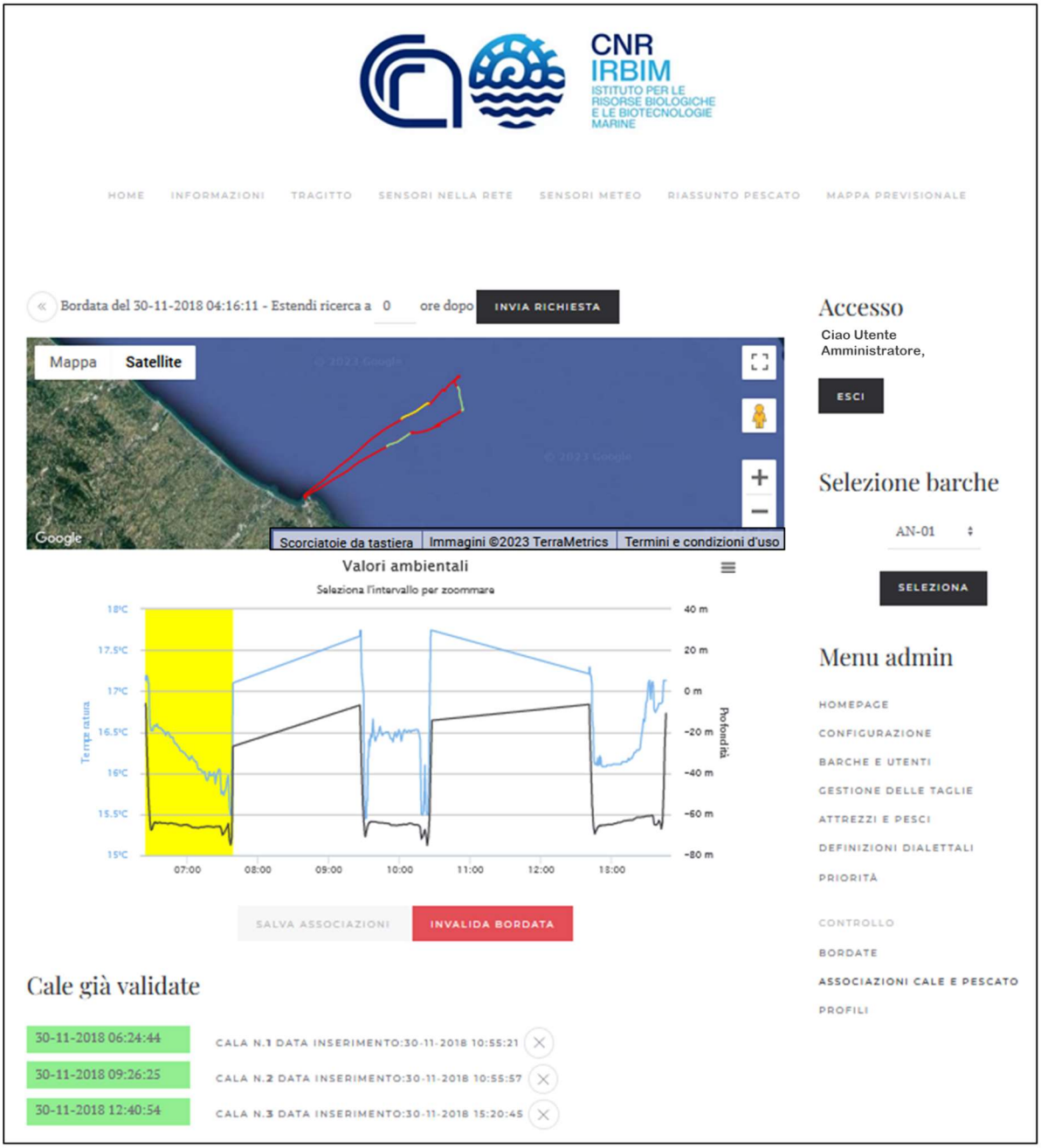


Figure S2b. FOOSweb interface: on top in red, GPS route tracks generated by means of Google Maps APIs (Application Programming Interface; base layer source: Copyright TerraMetrics, LLC – www.terrametrics.com) with fishing hauls highlighted in green and a single haul GPS track highlighted in yellow and corresponding to oceanographic and catch data below.

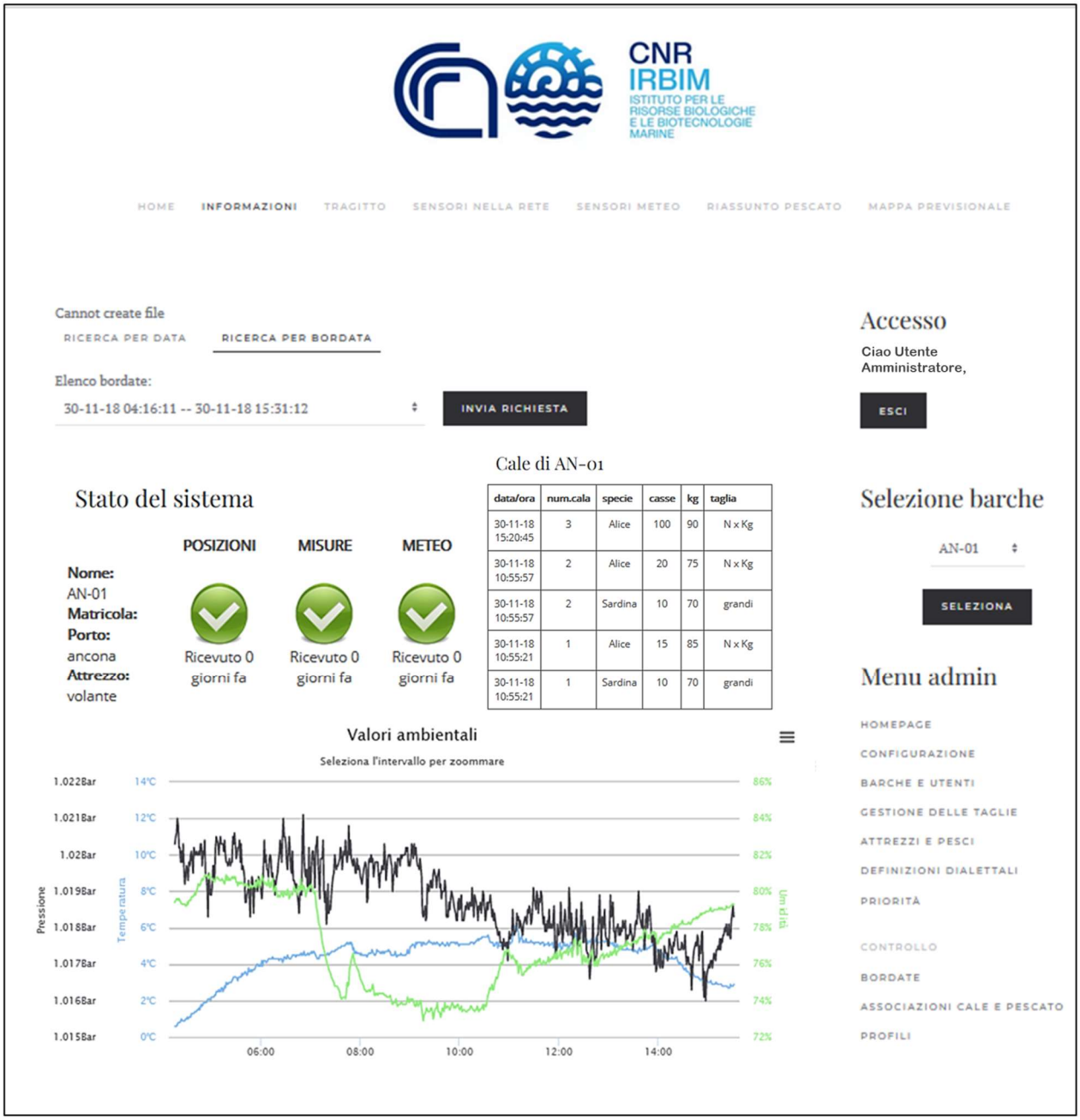


Figure S2c. FOOSweb interface: control dashboard with summary of weather and fishing data.

S2: Assumptions and procedures used to create a new ODV merged data collection

To create a new ODV merged data collection, the following steps were followed:

1) by using the CMEMS Ocean data visualisation tools (MYOCEANPRO, 2022), the Adriatic Sea data in the CMEMS GLORYS12V1 products were selected and and downloaded in NETCDF format;

2) the dataset was imported and opened by using ODV open file function;

3) the dataset was exported in text format (export/data/ODV spreadsheet file function);

4) the file created in step 3 was imported into the AdriFOOS ODV collection (import/ODV spreadsheet file function).

During the input phase, date, location and depth of the CMEMS GLORYS12V1 data were associated with date, location and pressure of the AdriFOOS dataset and the corresponding potential temperature in the CMEMS GLORYS12V1 dataset was associated with the AdriFOOS measured temperature data. This comparison could be improved in future and be made more stringent by converting pressure to depth and using salinity profiles to calculate potential temperature in the AdriFOOS dataset. However considering that at the latitudes of the Adriatic Sea, the difference between pressure and depth is empirically in the order of 0.1% and that the potential temperature, at a salinity of 35 PSU (Practical Salinity Unit), has a minimum difference (in order of cents), this methodology can be considered suitable for the purpose of visually comparing the AdriFOOS dataset and the CMEMS data product GLORYS12V1.

S3: Example of ODV standard tab-delimited ASCII text format (Lowry, 2019) for 2 of the depth and temperature profiles included in the dataset Penna et al. 2020.

***The header reports metadata.**

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//<Software>Ocean Data View 5.2.1 - 64 bit (Windows)</Software>
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//<abstract>The dataset contains 14810 depth (pressure)/temperature profiles obtained from 2012 to 2020 using 10 commercial fishing vessels of the AdriFOOS fleet (plus 1 research vessel) in the Adriatic Sea (Mediterranean Sea)</abstract>
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ImpossibleLocationSetQC(longitudeMin=12.4°E, longitudeMax=18.6°E) did not fail on any LONGITUDE sample.
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//<author>Penna, Pierluigi</author>
//<principal_investigator>Martinelli, Michela</principal_investigator>
//<principal_investigator_email>michela.martinelli@cnr.it</principal_investigator_email>

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//<acknowledgement>Any users of data are required to clearly acknowledge the source of the material derived. This work was supported by: -CNR's Decision Support System for Sustainable Fisheries Management in the Regions of Southern Italy (SSD-Pesca) project; -Towards a Joint European Research Infrastructure Network for Coastal Observatories (EU FP7 JERICO) project [grant number 262584]; -Next generation, cost-effective, compact, multifunctional web enabled Ocean Sensor Systems Empowering Marine, Maritime and Fisheries Management (EU FP7 NEXOS) project [grant number 614102]; -Joint European Research Infrastructure network for Coastal Observatory – Novel European eXpertise for coastal observaTories (H2020 JERICO-NEXT) project [grant number 654410]. The authors would also like to thank the crews of the fishing vessels of the AdriFOOS fleet for their contribution</acknowledgement>
//<distribution_statement>These data are public and free of charge. User assumes all risk for use of data. User must display citation in any publication or product using data. User must contact PI prior to any commercial use of data.</distribution_statement>
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//<license>http://creativecommons.org/licenses/by/4.0/</license>
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					5.97	1	18.200001	1	1	
					6.16	1	18.200001	1	1	
					6.62	1	18.200001	1	1	
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					8.39	1	18.200001	1	1	
					8.58	1	18.200001	1	1	
					8.76	1	18.200001	1	1	
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