

THE CALYPSO HF RADAR DATA INTERFACE

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Abstract

Within the ambit of the CALYPSO project, a network of HF-radars with installations on the northern coast of the Maltese Islands, and on the southern Sicilian coast is intended to provide real-time sea surface currents in the Malta Channel. This paper describes the web interface developed to provide users with viewing, selection and downloading of the measured data. Value-added services targeting the general public as well as specialised professional users provide a means to maximise benefits through the use of the data for different applications.

Keywords: Remote sensing, Currents, Malta Channel

The HF radar network set up within the CALYPSO project [1] provides synoptic maps of currents in real-time every hour and with a high resolution and coverage in space. It consists of multiple radars at different locations and with an overlapping beam pattern; the same patch of water can be viewed from different angles, and the surface current radial velocity components can be summed to determine the total surface current velocity vector. Data measured simultaneously at the different points can be combined to produce hourly maps of current vectors within a regular grid.

The real-time data produced by the HF-radar network is of interest not only to researchers but is also useful to national authorities during the undertaking of crucial activities such as Search-and-Rescue and Oil Spill Response. However, such users would require the data to be in an enhanced format that is readable and understandable to them and their systems. For this reason the CALYPSO web data interface was developed to provide such users with the required value-added services derived from the original data gathered by the radars.

The data interface is composed of two main sections, namely: the Public Interface – targeting the public users by showing plots and statistics over nine different sub-regions in the Malta Channel; and the Professional Interface – targeting the professional users by the presentation of quick-view plots, and allowing the download of data, and the handling of special data requests.

The products available on the CALYPSO Data Interface are derived from nowcast sea surface currents data generated by the HF-radar system, and forecast currents data generated by the ROSARIO-6420 [2] Malta shelf forecast. The domain of data coverage has a spatial resolution of 0.03° (approx. 3Km) in the case of the observation nowcasts, and 0.0163° (approx. 1.6 Km) for the forecast fields. Data is provided with a temporal resolution of 1 hour.

The Public Data Interface synthesises the hourly data fields by spatial averaging over 9 sub-regions and presenting the information on sea surface currents averaged for each sub-region for a time span of 13 hours, namely: the present hour conditions; the previous 6 hours generated from HF radar observations; and the next 6 hours generated by ROSARIO 6420 forecast. The information displayed for each selected sub-region includes: the average current magnitude and direction in that sub region; the maximum and minimum current magnitude; the maximum current magnitude over the last 6 hours; and the maximum current magnitude expected in the coming 6 hours.

The Calypso Professional Data Interface consists of four main components. It allows the viewing and downloading of data for the entire domain. The user selects the date and time of interest, and is presented with an image of the currents for the selected date-time, along with the necessary links to download the data in ASCII or in NetCDF formats. The user can also submit a request to aggregate the data over a period of interest. The system performs the required aggregation and 'pushes' the user-selected aggregated dataset in the pre-selected format. The user can alternatively select a point and period of interest, and the system prepares a time series of the sea surface currents hourly data at the selected geographical location and time span; apart from the data time series, the system also presents the user with an interactive plot of the time series using Google Charts [3]. The user has also the option to select an area of interest, and the system outputs to the user time series of the mean, minimum and maximum currents within the selected area. The online interface further allows the user to submit a special data request; the user requests an area and period of interest, and the system returns a pdf report describing the evolving sea surface circulation conditions. This reporting function is especially relevant for oil spill emergencies where such a report can then be uploaded to the European CECIS Emergency Response system [4] in case of an oil spill emergency.

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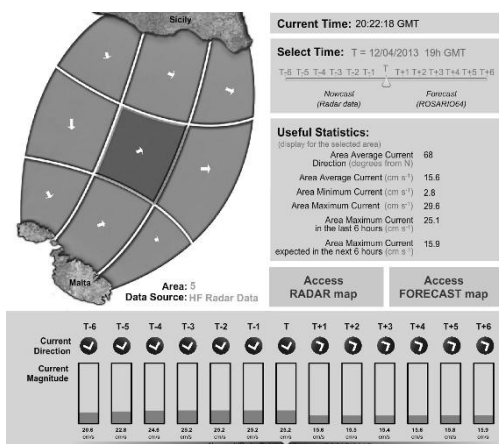


Fig. 1. A screen-shot of the Calypso Public Data Interface