



PREVIMER - an integrated core system for coastal observation and forecast in French waters

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Website: www.previmer.org

A collaborative project:

- To provide analysis and T+48 to T+144 forecasts of coastal waters from surface to bottom along the French coasts (English channel, Atlantic and Mediterranean) for the following parameters: currents, temperature, salinity, sea level and sea state, chlorophyll and phytoplankton, suspended matters and turbidity.
- To foster applications by developing demonstrators.
- To define and install the operational service which will operate the production chain, archive and distribute the results and products.

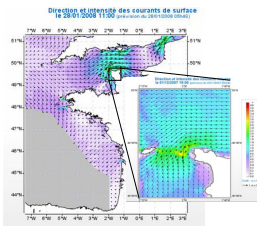
Partners



Main Contributors



Models

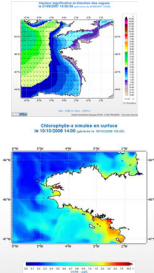


PREVIMER hydrodynamics analysis and forecasts are based on the MARS code (Model Application at Regional Scale). Nested models operate at ranges from the seafloor (4km) to the bay (typically 300 m) with capability of zooming in at higher resolution if needed.

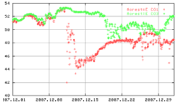
The forecasting time scale ranges from T+48 up to T+144 corresponding to the meteorological forecasts provided by Météo-France and the European Centre for Medium range Weather Forecast. Models use Mercator Ocean outputs for open sea limit conditions. They are run once or twice a day with resolution of 15 min to one hour.

PREVIMER deliver **wave forecasts** calculated by SHOM using WAVEWATCH III code forced by ECMWF meteorological data for large scale.

Primary production analysis and forecasts are performed in PREVIMER using the ECO-MARS 3D model which combines a biology model with MARS 3D physical model. It reproduces major trends and provide a dynamic explanation of phytoplankton events.



In situ observations



Wave rider buoy

In situ observations are used to validate the models outputs. Moreover, as assimilation of data in coastal models is progressing, long term availability of quality checked, synoptic and timely data is a prerequisite for any operational system.

PREVIMER operates and develops in situ observation and measurement networks:

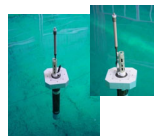
Fixed buoys: Molit buoy is capable of sampling both bottom and surface water sample to measure every 15 minutes temperature, conductivity, DO, Chlorophyll and turbidity. Small buoys, easy to deploy are also used in the island network and as requested.

Semi lagrangian coastal profilers are under development. The first trials at sea are promising. They measure TS profiles in water depth from 20 to 300 m with an autonomy of 300 cycles. They sit on the sea floor between two profiles, use Iridium as the communication link both for data transmission and mission reconfiguration.

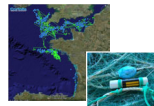
Voluntary fishing vessels are involved in the frame of the RECOPECA project which aims at monitoring the fishing effort of the coastal fleet. Very low cost autonomous sensors have been developed and are progressively installed on the fishing gears such as trawls, panel, traps or nets. This method prove to be very cost effective to obtain TS profiles on the continental shelf.

The tide gauges network operated by SHOM has been upgraded with a real time capability: The existing stations are progressively equipped with a real time modem.

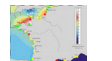
The swell buoys network operated by CETMEF is used and completed with new buoys as needed by PREVIMER activities.



Coastal profiler Arvor-C

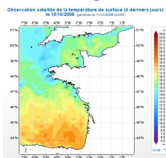


RECOPECA



Tide gauges network

Remote sensing

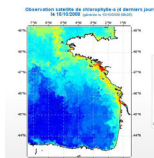


Remote sensing data are delivered to PREVIMER by CERSAT. SST and solar irradiance which give access, after processing (OCS), to total chlorophyll concentration and inorganic suspended matter.

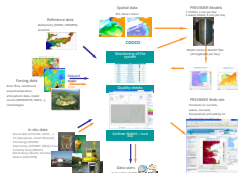
(<http://www.ifremer.fr/nausicaa/gascogne/index.htm>)

This information is integrated into the PREVIMER web site bringing a source of data complementary to in situ observation and models outputs.

Studies are underway on the assimilation of SST data in the model.



Data centre



CDOCO architecture and functionalities

The CDOCO data centre is a key component of the PREVIMER system. Its functions are to deliver:

- **reference data:** bathymetry and coastline contour,
- **forcing data:** meteorological forecasts, river discharge,
- **validation data:** in situ measurements, remote sensing.

The CDOCO provide these data to CAPARMOR computer and, in return, recover and archive the models outputs which are accessible on the web site.

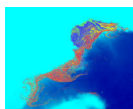
A web base **monitoring of the entire production chain** (ie. data collection, models run and diffusion) is performed at the CDOCO, giving to operators access to weekly, monthly or yearly statistics on the level of service.



CAPARMOR computer

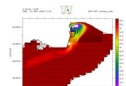
Applications

Lagrangian transport software ICHTYPOP



Two projects have been launched in the frame of the French maritime cluster as downstream services of PREVIMER:

- **GIRAC:** forecast of the impact of waste water treatment plan and rivers catchments outflow on bathing water quality, demonstration in four locations (2 in Brittany and 2 in "Côte d'Azur"),
- **PREVICOT:** development of 3 pilot downstream services for navigation aid with GSM access to information, aid to maritime civil engineering works and impact of spills at sea and macro waste.



GIRAC - Bay of Brest

