



Oceanographic monitoring behind sustainability



Institut National de Recherche Halieutique (INRH)

The oceanographic monitoring program is made up of several actions carried out to respond to sectoral issues such as:

- What is the impact of marine pollution on the development of the fisheries and aquaculture sector,
- How can the development of the sector be achieved while guaranteeing the sustainability of the ocean and the preservation of marine ecosystems,
- What is the evolution of fish stocks under the impact of anthropic pressures, especially in the context of climate change

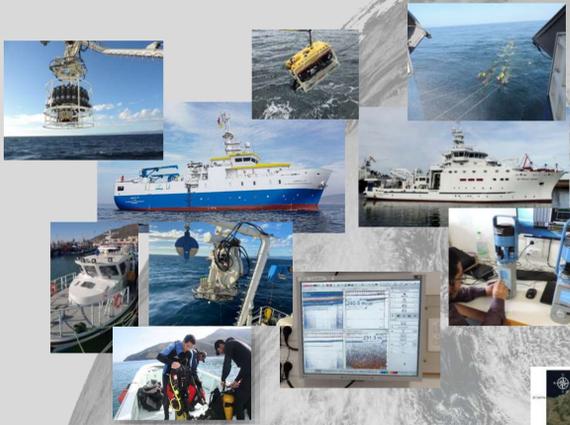
Ocean observation

The program try to answer scientific questions as:

- What is the state of health of marine ecosystems,
- What are the key factors conditioning biological and fisheries productivity,
- Towards which ecological equilibrium are marine ecosystems evolving in the context of the cumulative effects of climate change and other anthropogenic disturbances

Oceanographic/coastal cruises

IN SITU MONITORING FACILITIES



INRH currently has a fleet of three deep-sea vessels, one speedboat and a dozen light boats. In 2023, this capacity for intervention at sea will be reinforced by the acquisition of a coastal vessel.

COASTAL OCEANOGRAPHY AND RISK ASSESSMENT

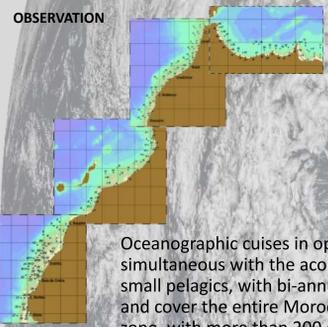
Observation efforts

- 112 environmental monitoring stations
- Concentrated in areas exposed to high anthropogenic pressure

Observed parameters

- Mineral contaminants (heavy metals)
- Organic contaminants (PCB, PAH)
- Bacterial contamination
- Microplastic and macro-waste Contamination
- Ecotoxicology (Water, sediment, biota)
- Phytoplankton populations
- Oceanographic parameters

OPEN SEA IN-SITU OBSERVATION

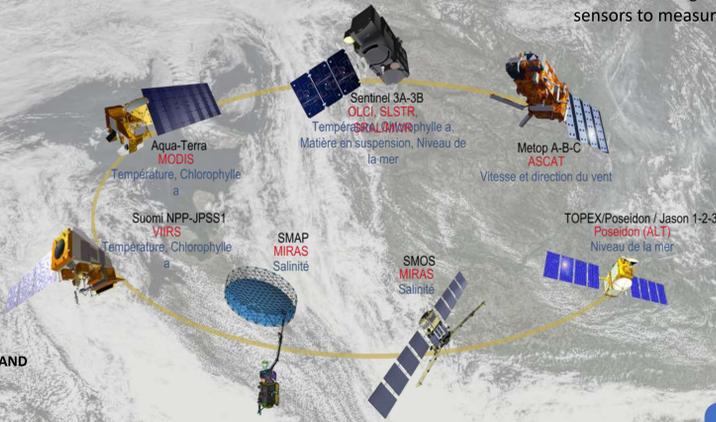


Oceanographic cruises in open sea are simultaneous with the acoustic survey of small pelagics, with bi-annual periodicity and cover the entire Moroccan coastal zone, with more than 200 observation stations.

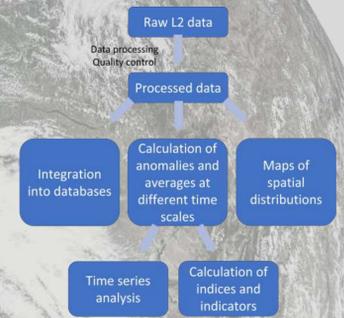
Coastal surveillance aims to provide knowledge of the risks, which should automatically lead to immediate action to minimise or stop the risks, to protect the environment and to raise the alarm

Remote sensing

Remote sensing offers the possibility to use several specialised sensors to measure several parameters of the water surface.

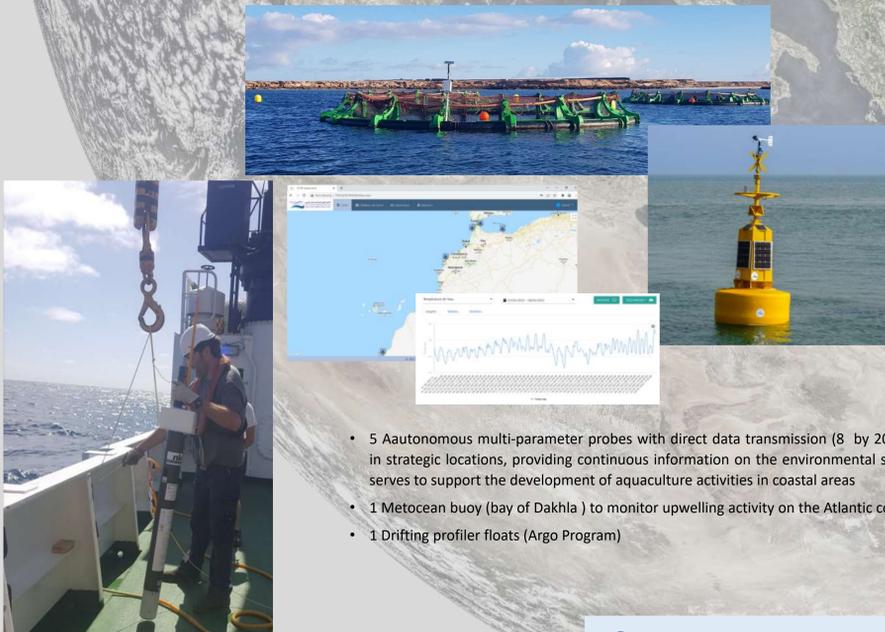


The data used are from sensors onboard the missions of the American space agencies (NASA/NOAA), the European Space Agency (ESA), or the Japanese space agency (JAXA). These data are available through several platforms, such as OceanColor, CMEMS, PO.DAAC, REMSS, NCEI, NODC, ...



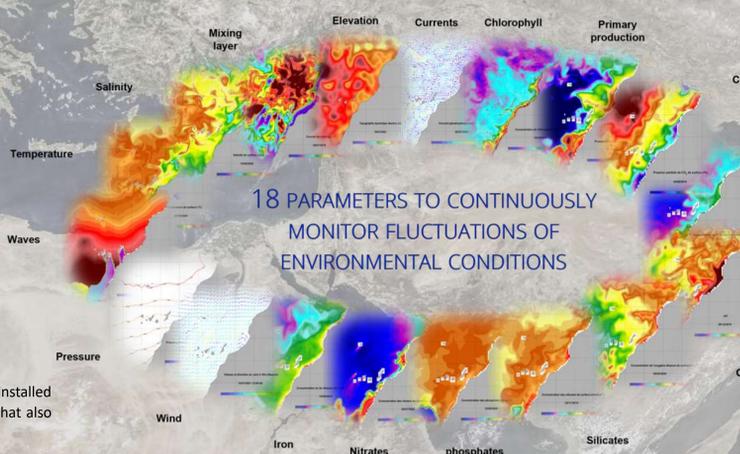
The database is constantly fed with raw L2 data from different sensors. Once these data are processed to remove cloudy and poor quality data, they are used to compute time averages of different periodicity and its corresponding anomalies, to produce spatial distribution maps, to create long time series and to compute the different upwelling indices and other indicators of the ocean state.

Real-time monitoring



- 5 Autonomous multi-parameter probes with direct data transmission (8 by 2023), installed in strategic locations, providing continuous information on the environmental state that also serves to support the development of aquaculture activities in coastal areas
- 1 Metocean buoy (bay of Dakhla) to monitor upwelling activity on the Atlantic coast
- 1 Drifting profiler floats (Argo Program)

Numerical modeling



The operational products of numerical modelling are a continuous source of information and give us an idea of the likely future evolution of different oceanographic processes

In total, we monitor a total of 18 meteorological, physical, and biogeochemical parameters daily, that complement the information obtained from the oceanographic cruises, remote sensing and real-time monitoring to help us better understand the functioning of the different ecosystems

Ecosystem modelling is one of the priority objectives of oceanographic research at INRH, and for this reason, the creation of a specialist team in this discipline is one of the priorities to be developed in the coming years

The Moroccan Fisheries Observatory (OHM)

Goals

OHM is a tool for economic and ecological intelligence.

OHM provides public administrations, maritime fishing and aquaculture professionals, universities and citizens with scientific data and indicators aimed at contributing to sustainable exploitation and optimising fishing conditions while respecting the marine environment.

OHM's mission is essentially based on the collection of data on fishing activities, on all professional fishing fleets, on biological data relating to catches, on information on the state of fish stocks, and on the characteristics of the marine environment.

Sections

Monitoring by fishery

Regular monitoring of catch, effort and CPU for the main fisheries by segment and by port and for the main species fished.

Catch by species

It includes the weekly volumes landed by barges, the inshore fleet and pelagic trawlers for about 258 species.

Annual review by fishery

For each fishery, it presents the fleets concerned, the fishing gear used, the areas of activity frequented, the production and the current exploitation situation.

Scientific Surveys

Monitoring of the abundance and biomass indices of the main target species resulting from scientific prospecting cruises on board INRH research vessels.

Stock status

Regular assessment of the major stocks that structure the exploitation of Morocco's marine ecosystems.

Oceanography

Daily observations of the main physical, biological and meteorological parameters along the Moroccan coastal fringe as well as the expected distributions for the next few days.

Sanitary status

Sanitary surveillance and alert in Morocco allowing the collection, processing and rapid dissemination of scientific information related to consumer health.

Environmental alerts

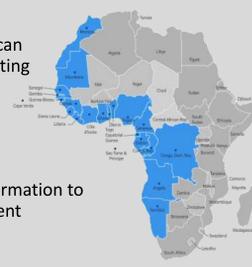
Monitoring of strandings of protected marine species, mass strandings of marine species and risks of marine pollution.

Ambition

Setting up a collaborative scientific information platform in the COMHAFAT region (RAFISMER network) to act together

Improving and integrating African ocean observation and forecasting systems for sustainable development.

Provide scientific data and information to support all levels of management



<https://observatoire-halieutique.ma/>

