

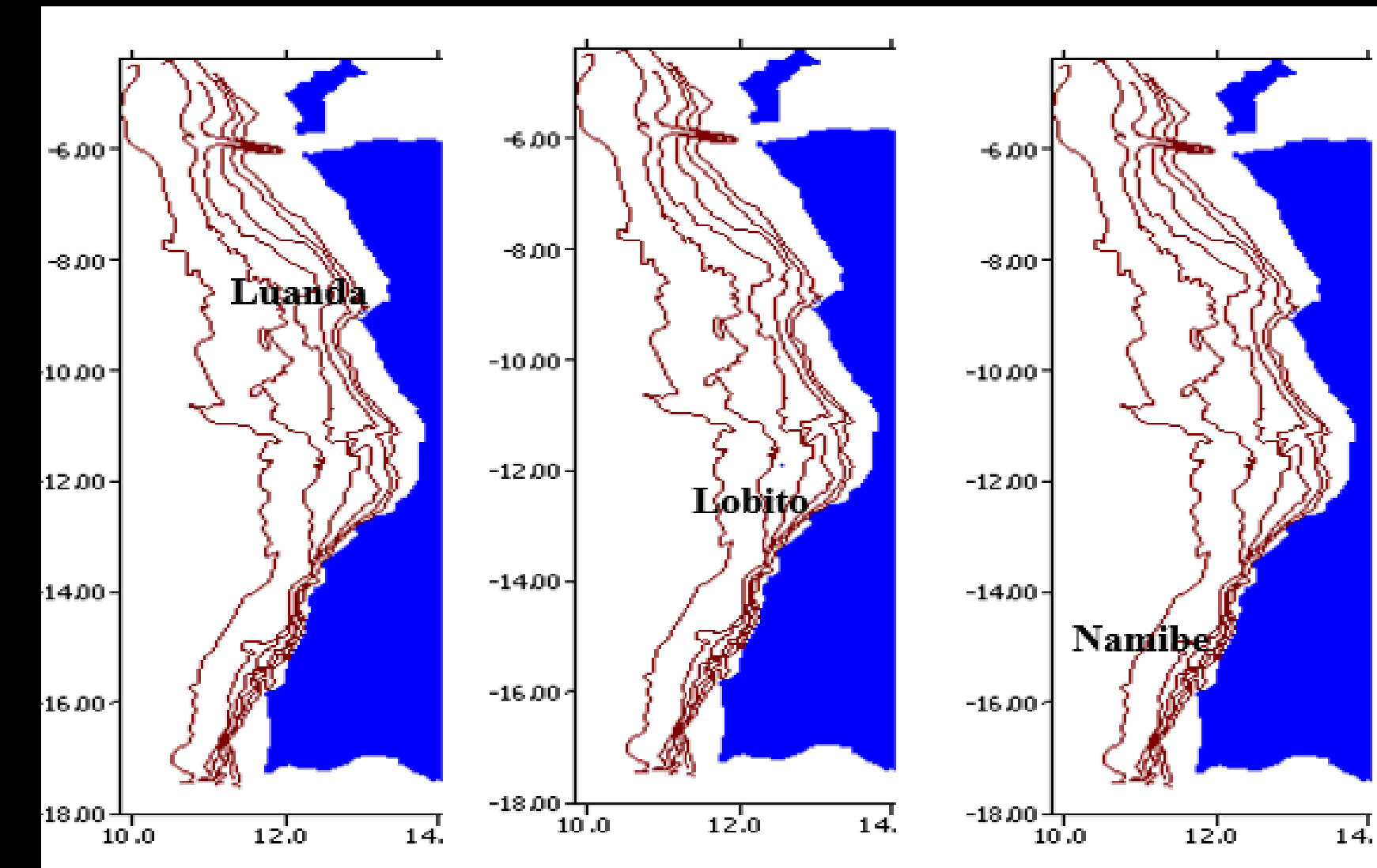


### Abstract

The media provide disturbing news about the health of the oceans. Stories about global warming, marine pollution, reef destruction, mangrove deforestation and the disappearance of marine fauna are recurrent. Water quality has declined, marine resources are in danger, recreational areas are under threat and new health risks are developing. Angola, despite the great effort, still remains a country with few marine observations, leaving many questions unanswered about climate variability and its impact on living marine resources. Observations and data collection on the marine environment have been carried out since the late 1960s, with the creation of the Lobito Fixed Station (12° 18' 36" S and 13° 34' 38" E), and the periodic realization of scheduled research cruises along the entire coastal zone with research vessels (NI) Goa and Sardinella. Constantly, updates are made in order to improve the methodology of observation and acquisition of oceanographic parameters, involving interested entities both national and foreign, through local, regional and international projects and programs. Thus, through the cooperation program with Norway/FAO Fridtjof Nansen for more than three decades (1985-2021), data (oceanographic and biological) of several cruises carried out along the entire length of the coastal zone were accumulated. Additionally fixed stations in the north, center and south of the country provide daily local and in situ data on sea surface temperature. A new step is currently required in order to improve the quality of data and its publication for a constant update of the environmental status, contributing to a better understanding and prediction of the occurrence of extreme events (warm and cold), which may have a significant impact on the dynamics and abundance of fisheries resources, and in addition to supporting related services, ocean cartography, marine pollution control, ocean level observation, oceanographic data exchange and marine information management.

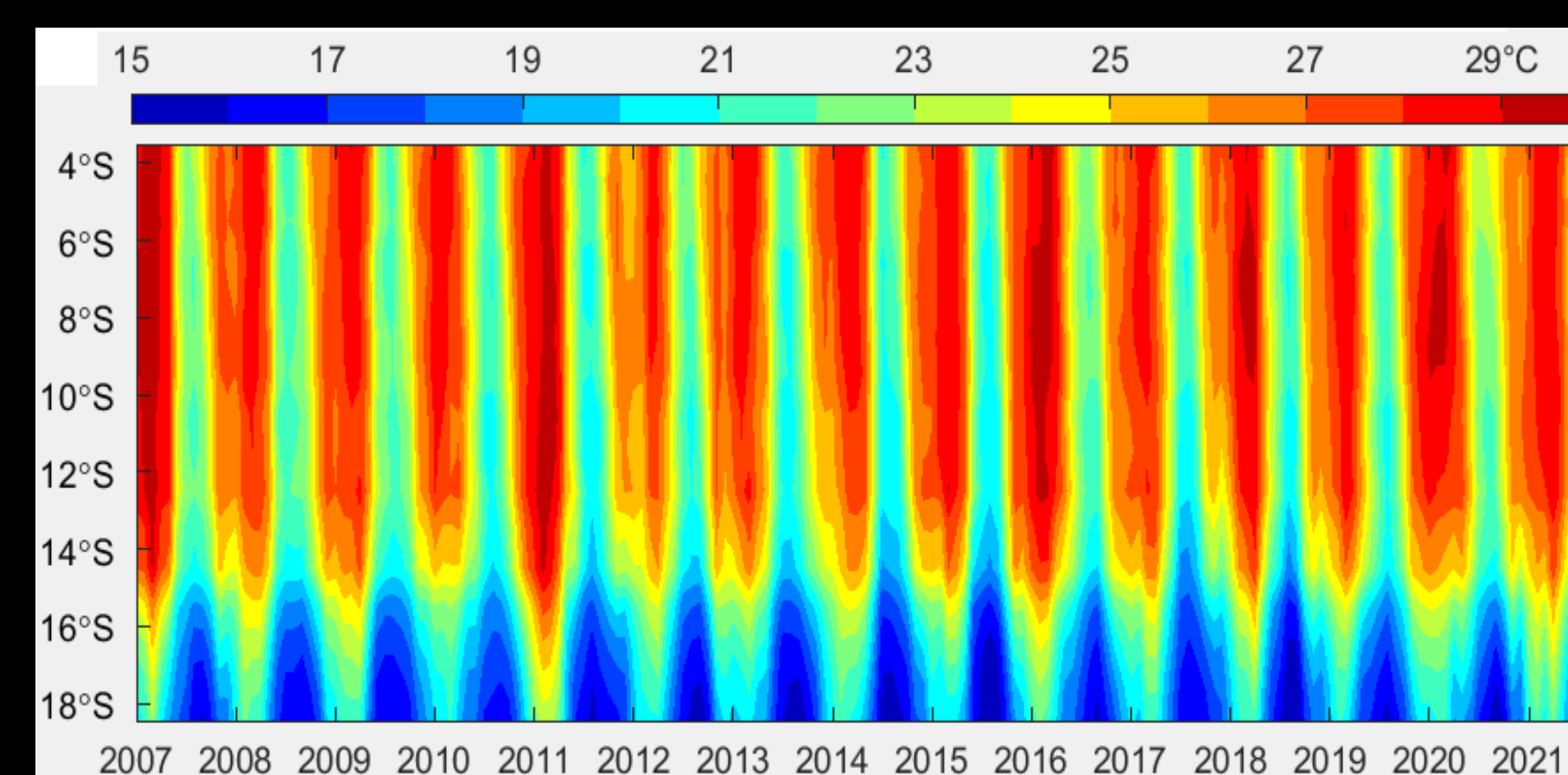
### Data collection (2)

- ❖ Fixed stations implemented in Luanda, Lobito (Benguela) and Namibe.
- ❖ Temperature, salinity and dissolved oxygen recorded on the surface.
- ❖ Fluorescence, collected in Luanda, Lobito and Namibe.
- ❖ Plankton (Luanda and Lobito) dynamics as well as to predict the occurrence of massive microalgae events.



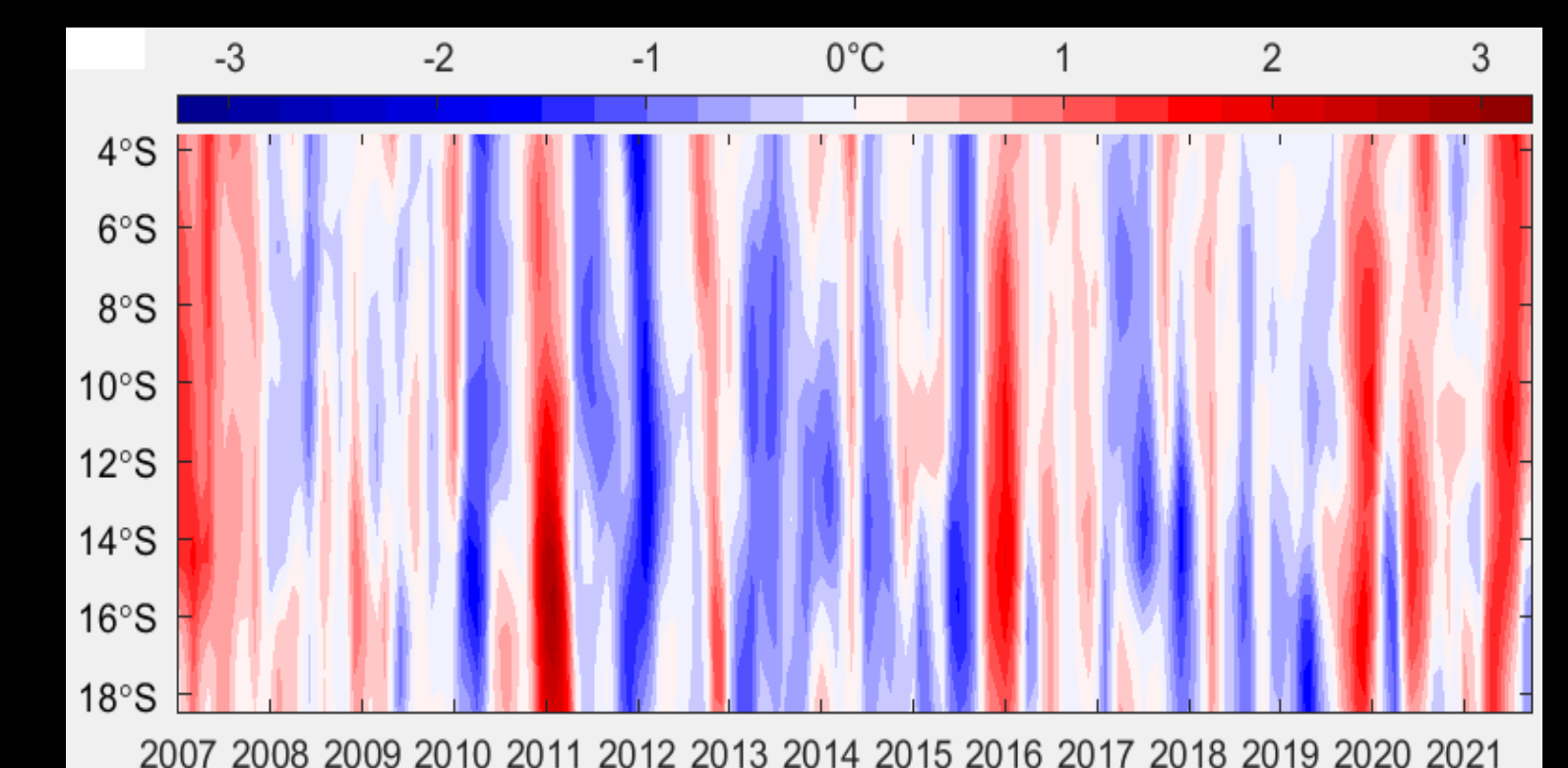
### Application of data?

- Provide information to the management of fisheries resources.
- Preparation of annual Environmental Status Report and registered abnormalities.
- Correlate the distribution of physic-chemical, biological and fishing resources.



Intrusion of warm waters in the south of Angola

Benguela Niños events are intermittent, usually peak at the end of the Great warm Season (January-April) and can persist for periods of months.



Sea Surface Temperature Anomalies

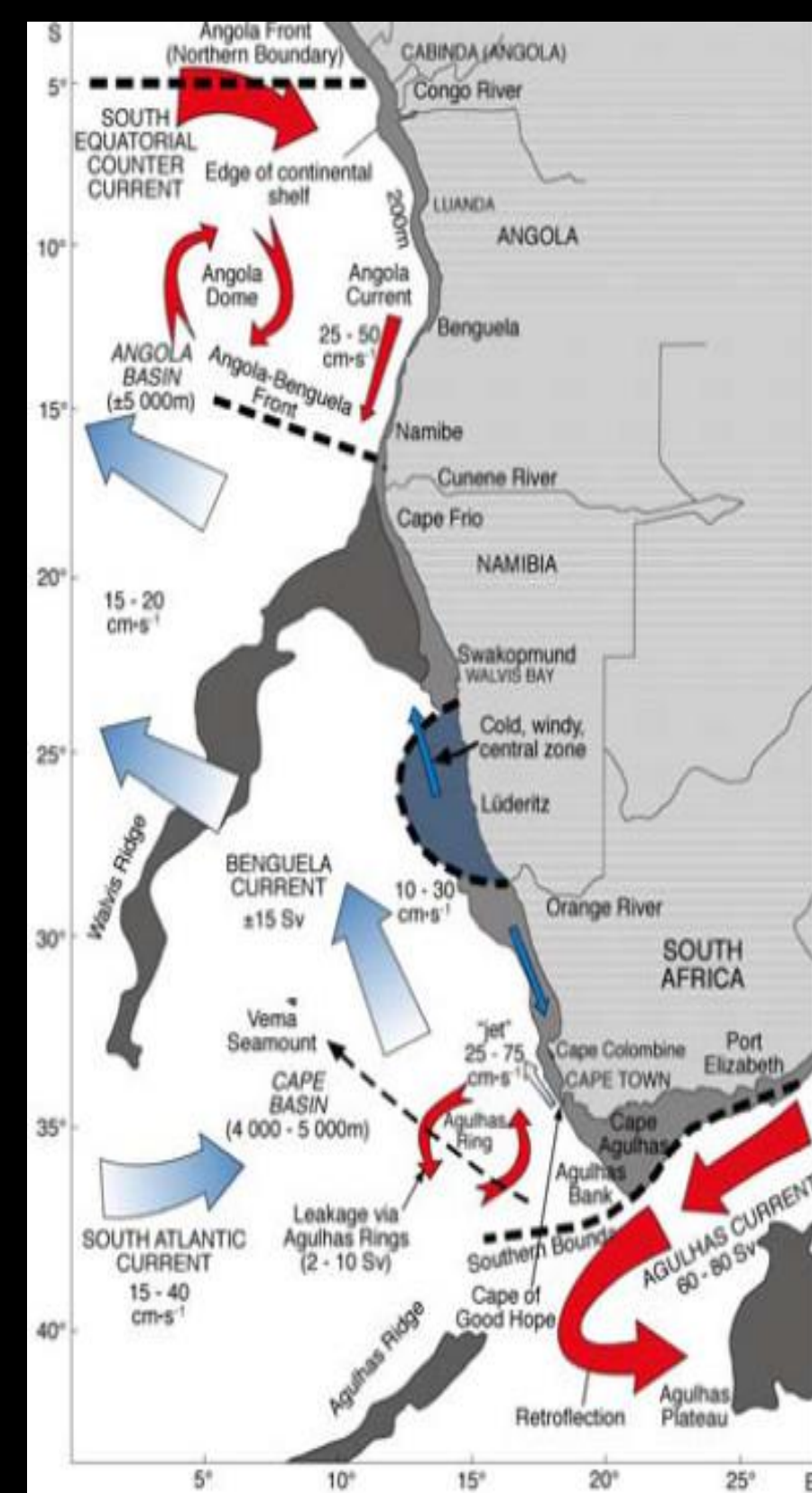
### Motivation of Angola

Angola, with a coastline of 1650 km, is located between two current systems, the hot current of Angola and cold current of Benguela.

It is characterized by a specific oceanographic dynamics that induces variability, such as anomalous warm and cold events, which has a significant impact on the dynamics of living resources, especially pelagic species.

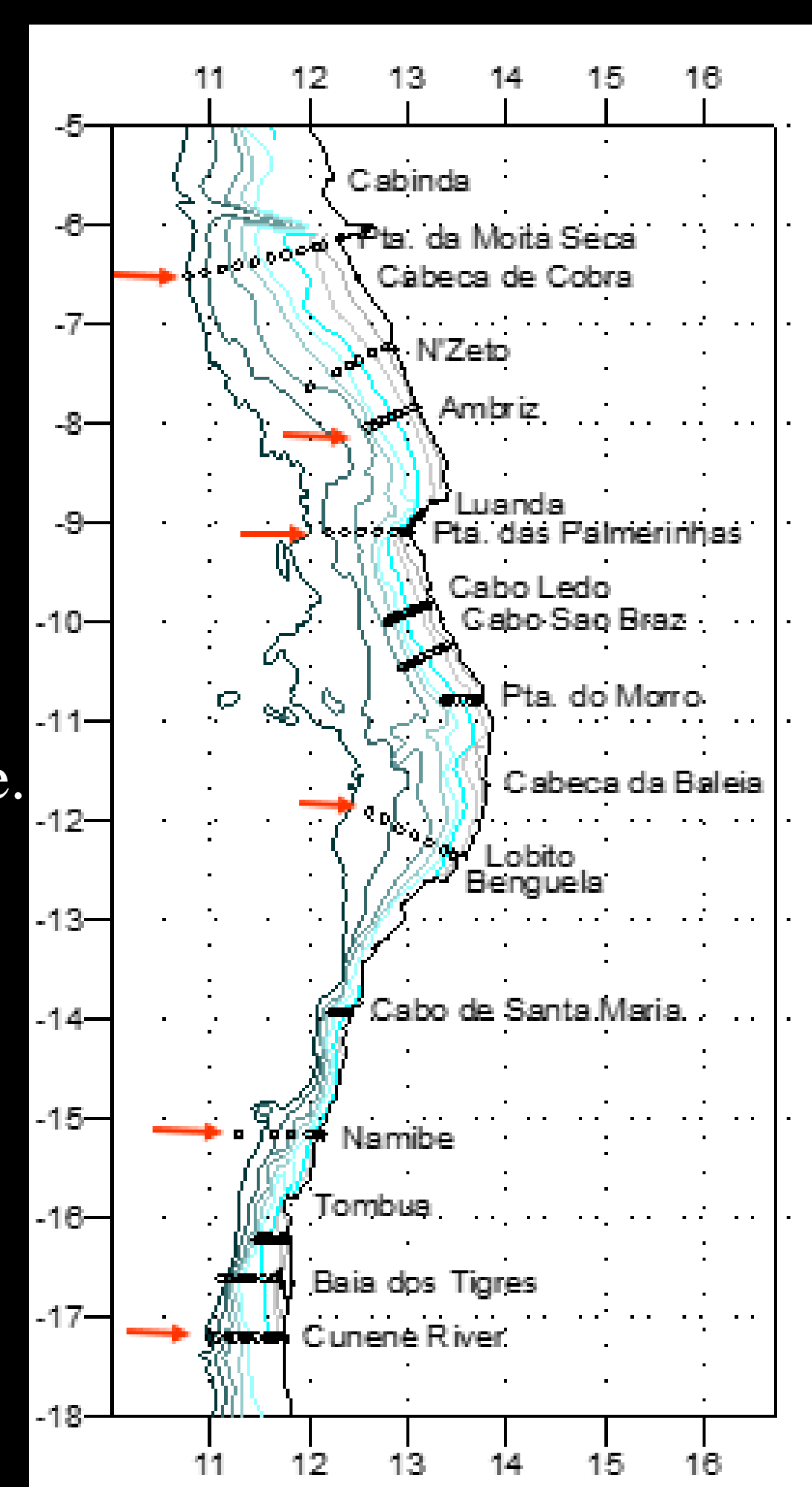
Since 1983, mostly bi-annual cruises to Angolan and Namibia upwelling region as part of the FAO EAF-Nansen program

- Feb. – Apr. (Austral summer)
- Jul. – Aug. (Austral winter)



### Data collection (1)

- ❖ is recorded annually in the warm and cold season 6 monitoring lines, namely Congo River, Ambriz (since 2017) Luanda, Lobito, Namibe and Cunene River.
- ❖ The information is recorded using the NI "Dr Fridtjof Nansen" feature in which the following information
- ❖ Temperature, salinity, dissolved oxygen and fluorescence.
- ❖ Current speed and direction data (ADCP).
- ❖ Data that allow to calculate abundance and specific composition of the plankton (phytoplankton and zooplankton).



### Challenges

- ❖ What additional oceanographic data cruises, projects and programs, can we provide to improve knowledge about state of the state marine environment along the Angolan coast?
- ❖ Creating a Link between biological oceanographic data and fishing resources.
- ❖ What other analysis for biological data (phytoplankton and zooplankton) can be performed?
- ❖ Creation of a global oceanic observation system along the coast, with the installation of oceanographic buoys in northern and southern Angola.

### Perspectives

Implementation of methods for validation and evaluation of time series of data.

Formation in the modeling area, with developments of oceanographic and ecological models..

Short- and long-term course in post-cruise data analysis..