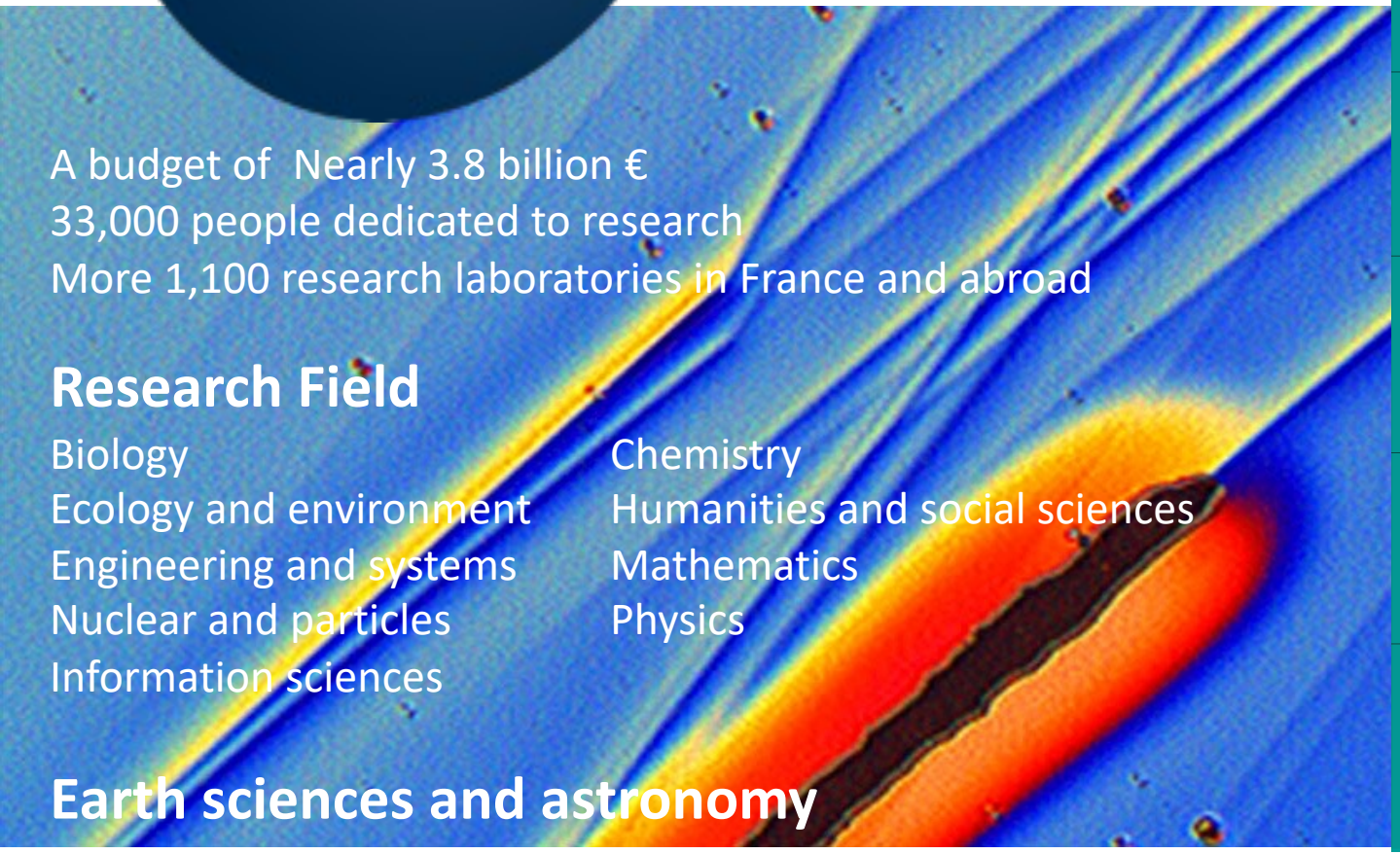
The French National Centre for Scientific Research (CNRS) is among the world's leading research institutions.

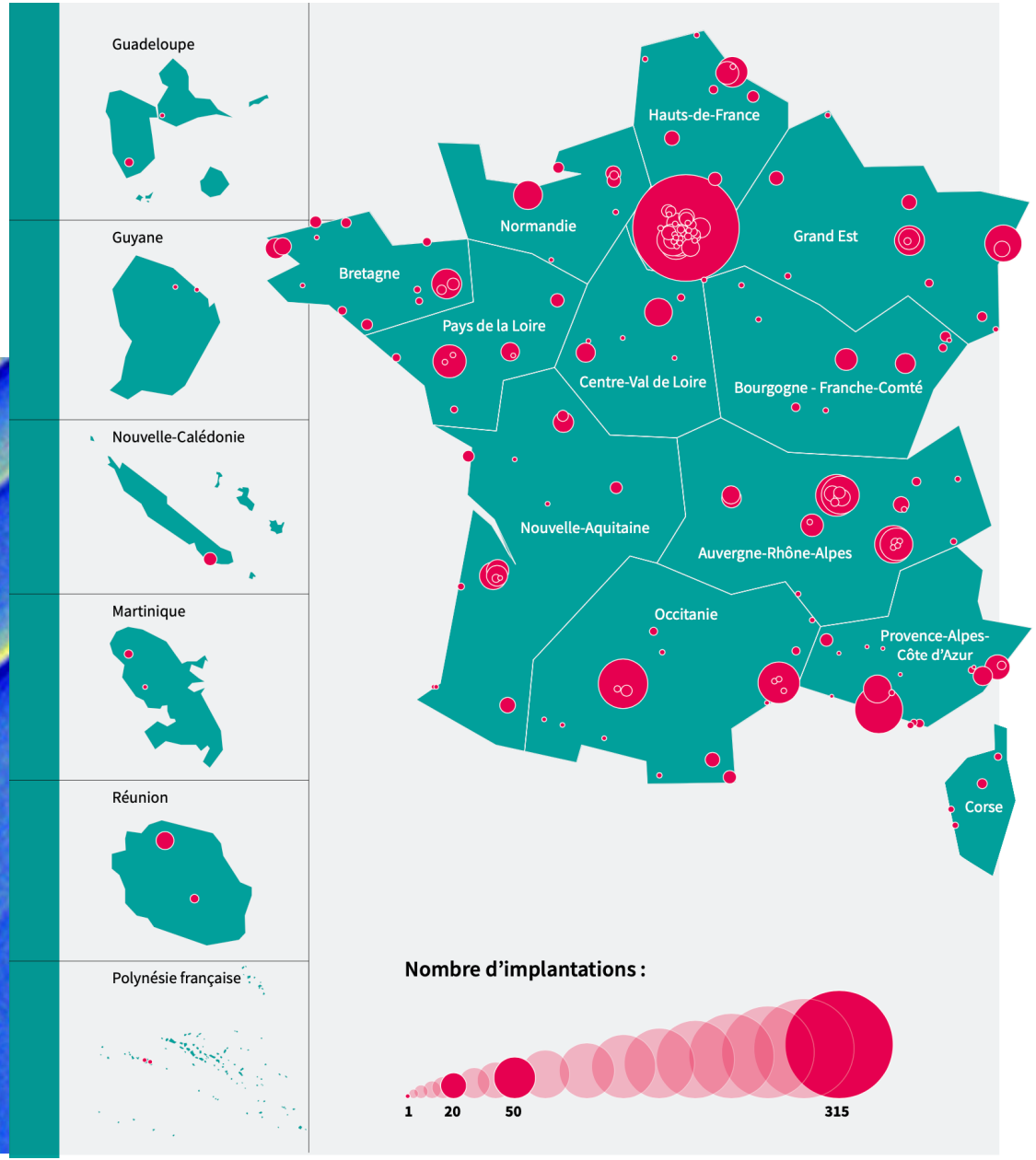


A budget of Nearly 3.8 billion €
33,000 people dedicated to research
More 1,100 research laboratories in France and abroad

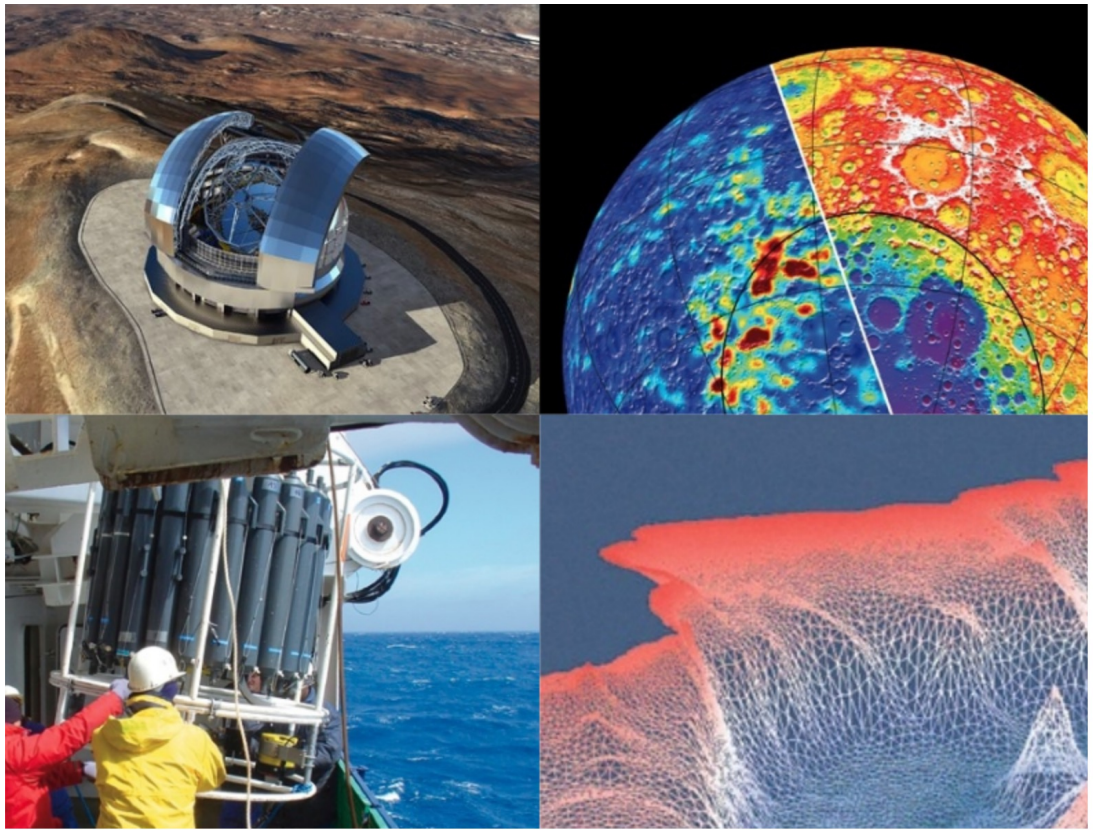
Research Field

Biology
Ecology and environment
Engineering and systems
Nuclear and particles
Information sciences
Chemistry
Humanities and social sciences
Mathematics
Physics

Earth sciences and astronomy



INSU : L'Institut national des sciences de l'Univers



Mission : leads and coordinates national and international research in Earth sciences, continental surfaces and interfaces, oceans, atmosphere, astronomy and astrophysics.

- **French Inter-organisms foresight**, which must establish the state of science and resources, and define future scientific or instrumental challenges and priorities.

- National programs, tools for the implementation of the thematic recommendations of scientific foresight and scientific innovation, and enabling the emergence of research projects, consortia, national networks, etc.

- **Research Infrastructures and SNO :** observation and analysis to data processing, which take on a thematic dimension by bringing communities together, and producing data and services for communities.

  SNO : national observing services (SNO), **Elementary Bricks for the observation** Implementation of observing systems over several years, or even decades in order of acquiring data describing the formation, evolution and variations of astronomical systems and terrestrial environments :

-

  - The Observatoires des Sciences de l'Univers (large labs) are responsible for the operational implementation of a site-based approach.

Main building blocks (RI) : French marine observation infrastructures : Coastal : ILICO

CNRS / IFREMER / IRD / SHOM / METEOFRANCE/ MNHN / BRGM Marine Universities Network

To observe and understand coastal environments and ecosystems in their entirety, ILICO brings together an ensemble of complementary observation networks that collect samples and deploy a wide range of measurement devices to study coastal ecosystems. The elementary networks (bricks) are:

SNO BENTHOBS,
SNO DYNALIT,
SNO ReefTemps,
SNO COASTHF,
SNO MOOSE,
SNO SOMLIT
SNO CORAIL,
SNO PHYTOBS,
SNO SONEL.

ILICO is the French node of the Joint European Research Infrastructure of Coastal Observatories (JERICO-RI).

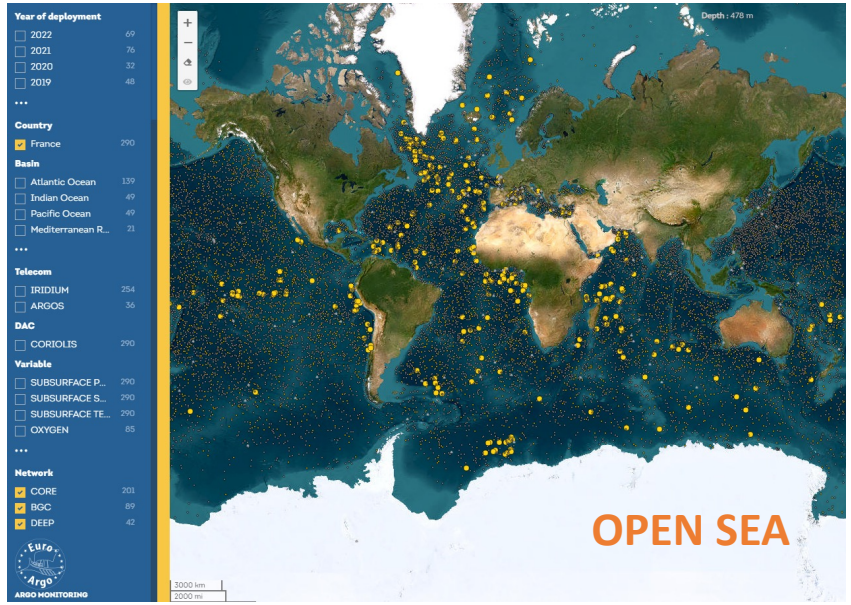
ILICO INFRASTRUCTURE DE RECHERCHE LITTORALE & CÔTIÈRE

JERICO RESEARCH INFRASTRUCTURE

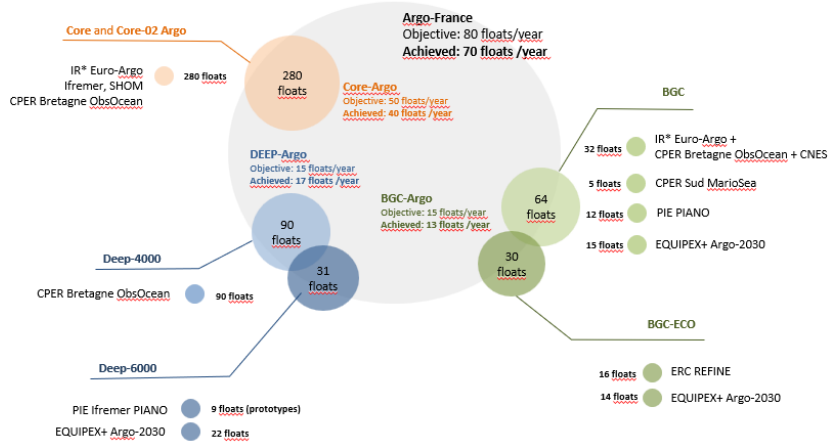
Main building blocks : French marine observation infrastructures : Argo France

- Argo France. Part of the French Ministry of Research roadmap for large Research Infrastructures (IR*). French node of the Euro-Argo ERIC
- Implemented by Ifremer, CNRS/INSU and Shom.
- Instrumentation (Provor/Arvor floats, BGC and Deep)
- Float deployment (OneArgo : Core, Deep and BGC): <10% international, 30% Europe
- Data Centers (GDAC, DAC) (Coriolis CDS in ODATIS/IR DataTerra): Major role
- Research: Ocean, Climate, Biogeochemistry
- Operational oceanography (Mercator, Copernicus Marine)
- European coordination: Euro-Argo ERIC
- International coordination : OceanOps and AIC

Argo France floats / Status



Argo France : contribution to OneArgo



Main building blocks : French marine observation infrastructures :
EMSO France : European Multidisciplinary Seafloor and Water Column Observatory

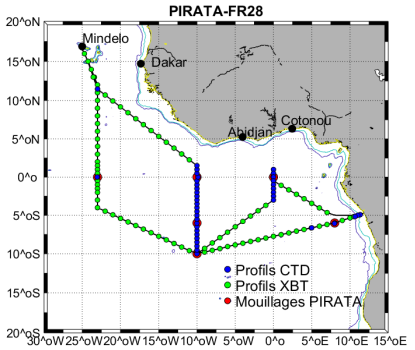
- EMSO-France: national research infrastructure supported by French Ministry of Research. French contribution to the EMSO ERIC.
- Facilities: high technology automated fixed platforms, powered by submarine cables or stand-alone devices equipped with standardized suite of sensors assembled module and ‘site-specific’ sensors (traps, cameras, CTD, O2…)
- Research: geosciences, biogeochemistry, marine ecology, physics
- Sites: Azores, Ligurian Sea, Marmara
- Data acquisition (real-time & delayed mode) : T, S, O2, organic carbon, currents, turbidity, zooplankton, marine particles, seismology, rock samples
- Data centers: CORIOLIS, RESIF, SISMER/SEANOE (ODATIS/IR DataTerra)
- International cooperation: OceanSites, ONC, OOI, DONET, IMOS

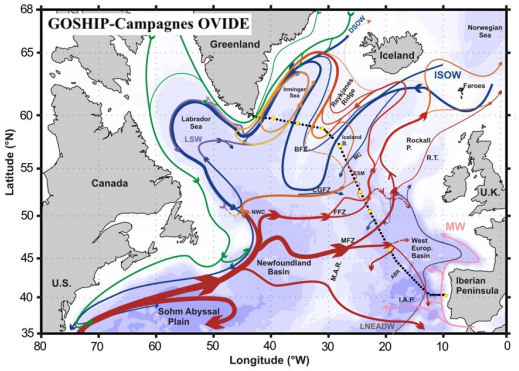
Main building blocks : French marine observation infrastructures : OHIS

Added value of OHIS :

- ✓ Structuring the different permanent observation systems (SNOs) of the open ocean not part the French Ministry RI roadmap
- ✓ Harmonization of their strategies and priorities
- ✓ Incubation of observation systems to be consolidated
- ✓ Coherence of data and techniques with marine RIs
- ✓ International visibility

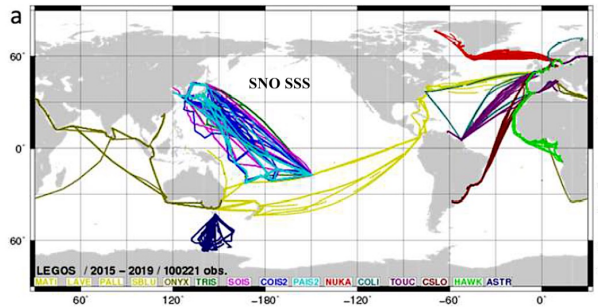
OPEN SEA





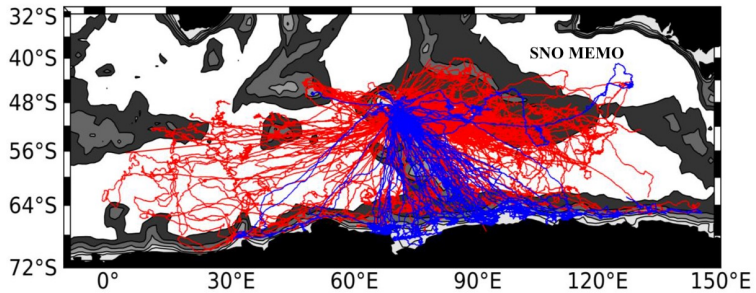
Four existing multi-platforms observing systems:

- ✓ **SNO-PIRATA :** Tropical moorings and R/V cruises – ocean/atmosphere interactions
- ✓ **GO-SHIP/OVIDE :** Interannual to decadal variability of the North Atlantic
- ✓ **SNO-SSS :** Sea Surface Salinity from ships of opportunity
- ✓ **SNO-MEMO :** Marine mammals equipped with marine environment sensors



Incubator for development of observing systems:

- ✓ Ocean carbon (linked with **ICOS RI**): new SNO COOL-ML
- ✓ Sub-surface ocean currents: started in EuroGO-SHIP



Specific interactions on methods, data and observation strategy with

RI* : Euro-Argo, FOF, RI: ILICO, EMSO, ICOS

RI / data center : ODATIS / IR DATA-TERRA (CDS Coriolis)

Main building blocks :
French research E-Infrastructure in the Earth system and environment domain DATA TERRA

Objectif : develop a global access and processing facility for Earth observation data, products and services.
4 Data Hubs representing a compartment of the Earth system.

Partners

- Marine data management, processing and analysis
- Improving links between satellite data (Altimetry, Diffusiometry, Optical imaging …) and in situ observations (IR, French Oceanographic Fleet….)

French Ocean Observing System (Fr-OOS) :
A high-level coordination of long-term observation of the ocean in France

A **high-level coordination** of long-term observation of the ocean in France, structured by integrating the **main National research Infrastructures (IR)** AND **additional networks** not yet organized in infrastructure

Main Objectives

- **Strengthen** long-term ocean and coastal observations at global, regional and local scales for research, climate & weather, sustainable ocean management and operational oceanography.

- **Harmonize** activities related to long-term ocean observation, promote resource pooling and align/simplify associated governance bodies.

- **Organize the interfaces** between the national ocean observation research infrastructures Argo-France (IR* EURO-ARGO), EMSO-France, ILICO, a future open sea infrastructure (OHIS), networks not organized as research infrastructures. Transverse activities : interfaces with the Research Vessel fleet infrastructure, interfaces with data center infrastructure (IR DATA TERRA, ODATIS and its Coriolis data center), satellite observations and ocean, weather and climate modeling centers.

- **Insert** the French community into the international and European landscapes.

Euro-GOOS & CNRS

- **CNRS is a main actor of the ocean observing activities in French:**
    - CNRS is the major sustains (Manpower & Financial support) of the elementary "bricks" of observing networks (SNO) , generally (although not always) organized in Research Infrastructures
    - CNRS promotes interfaces between long term observing systems and a wide community of research users
- **As member of Euro-GOOS, CNRS is interested in:**
    - Align SNO and IR missions to European priorities
    - Promote CNRS activity at European Level (trough contribution to Fr-OOS)
    - Participate in the identification of European strategies in the ocean observing