

Nine billion human beings by 2050... Population growth is a major challenge for humanity, raising many questions. How will the Earth feed its population? How will humans meet their needs for energy and raw materials (mineral and biological resources)? How will the environment bear the impact of human activities?

Knowing that more than 60% of the world's population lives within 150 km of the coast, these issues contribute to making the oceans and the marine environment a 'new frontier' for humanity. Marine science and technology have a key role to play in guiding public policy and finding new ways to reconcile environmental protection and resource exploitation.



IFREMER, FRANCE'S MARINE RESEARCH INSTITUTE

Ifremer, France's national integrated marine science research institute, is a reference for knowledge on the marine environment and its resources. On the national, European and international levels, Ifremer is an instigator of coordinated research programmes and infrastructure development. For example, Ifremer now runs and operates the French Oceanographic Fleet.

Ifremer produces knowledge and know-how on the marine environment, meeting the needs for research, for technological development and innovation, for current and future societal issues and for the sustainable harvesting of marine resources and the conservation of marine ecosystems.

Ifremer is a leader in the marine science fields and can mobilise the scientific community and socio-economic partners. In these capacities, Ifremer also provides public policy support for the deployment of national maritime policies and is a key player in the development of 'blue knowledge'.

For the coming decade, in line with the sustainable development goals (SDGs) for the ocean, understanding and forecasting the state of the ocean in 2100 is at the heart of Ifremer's enterprise.

5 CENTRES
AND
19 AFFILIATED
COASTAL
STATIONS

WORKFORCE OF
1 500 PEOPLE
INCLUDING 600 ENGINEERS/
RESEARCHERS

510 PUBLISHED
SCIENTIFIC
ARTICLES
INDEXED IN THE
WEB OF SCIENCE IN 2017

€200M
ANNUAL BUDGET
(EXTERNAL OPERATIONS
ONLY)

11 VESSELS
INCLUDING 6 IFREMER SHIPS
+ 1 MANNED SUBMERSIBLE
+ 2 REMOTELY OPERATED VEHICLES
+ 2 AUTONOMOUS UNDERWATER
VEHICLES
are run and operated by the French
Oceanographic Fleet

IFREMER SITES

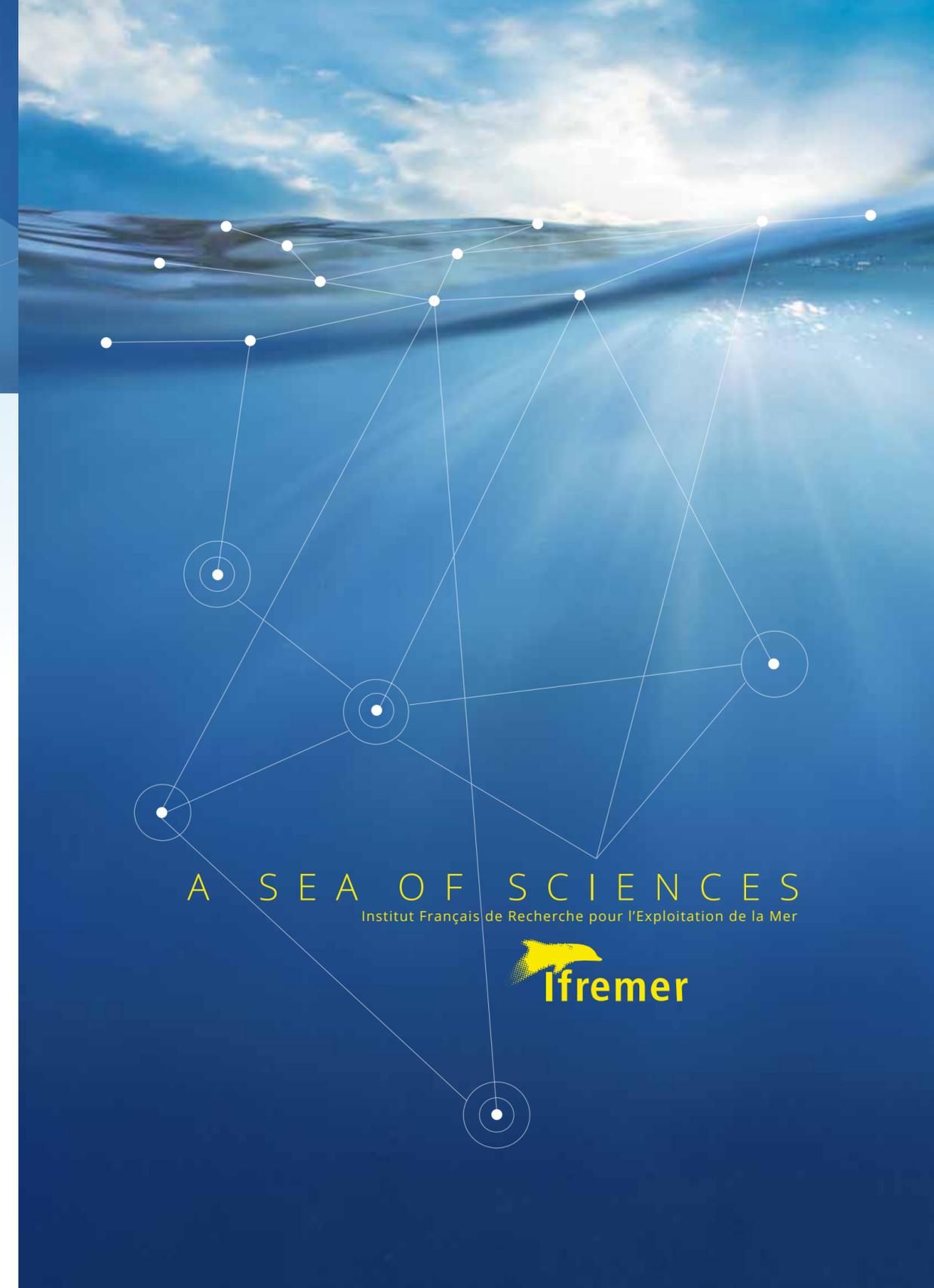


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A SEA OF SCIENCES

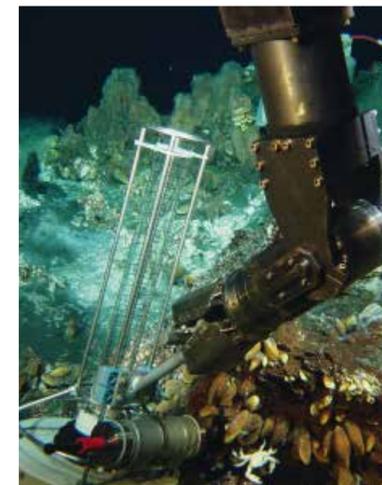
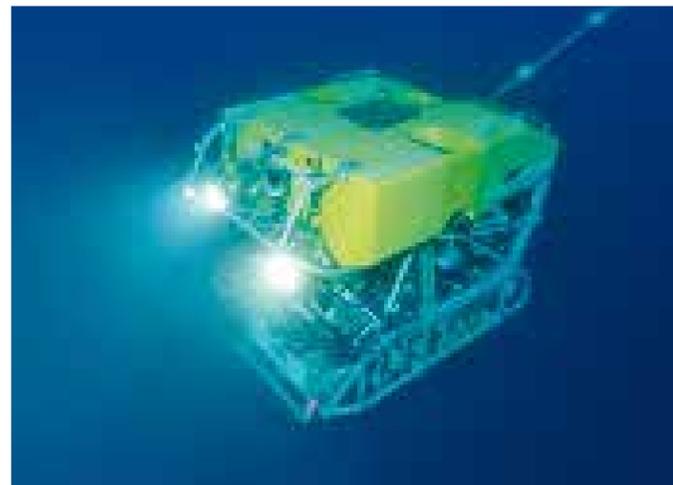
Institut Français de Recherche pour l'Exploitation de la Mer



MARINE SCIENCE RESEARCH, FROM THE COAST TO THE DEEP SEA

Ifremer is made up of 23 research units organised into 4 scientific departments:

- Department of Biological Resources and the Environment,
- Department of Physical Resources and Deep-Sea Ecosystems,
- Department of Oceanography and Ecosystem Dynamics,
- Department of Research Infrastructures and Information Systems.



IFREMER'S PARTNERS

Ifremer is a state-owned public industrial and commercial institute (EPIC), placed under the joint supervision of the Ministry of Higher Education and Research and the Ministry of the Environment. It collaborates with

- the national government, its ministries and their agencies;
- professionals, businesses and local governments, etc.;
- scientists, engineers and technicians;
- the general public.

IFREMER'S MISSIONS

- The study of marine ecosystems and the conditions for the sustainable development of marine resources.
- The observation, modelling and investigation of the functioning of coastal ecosystems and the physical ocean at various spatial scales.
- The exploration of the deep sea to determine the mechanisms behind the biodiversity found there and the study of the natural processes that lead to the formation of mineral and energy resources.
- The development of innovative infrastructures, instruments and high-tech equipment, as well as laboratory experimental techniques.

EXPERTISE AND INNOVATION

Since its creation in 1984, Ifremer has pioneered state-of-the-art skills in many areas: underwater systems, operational oceanography, biotechnology, mineral and energy resources, etc.

Given its knowledge and expertise, Ifremer provides public policy support. The French government regularly enlists Ifremer to help assess marine resources and the conditions of resource use: e.g. for the Water Framework Directive, the Marine Strategy Framework Directive, public and animal health policy issues, the Common Fisheries Policy, aquaculture, the national biodiversity strategy, etc.

Ifremer also contributes to blue growth through its proactive policy of technology and knowledge transfer, which fosters innovative developments in many economic sectors.

RESEARCH INFRASTRUCTURES AND TESTING FACILITIES

The development of research methods and the production of data rely on:

- research infrastructures and testing facilities (test tanks, metrology, assembly plants, computing platforms);
- ocean observation infrastructures to collect data (ARGO floats, French Oceanographic Fleet, satellites, etc.);
- digital infrastructures to use, compile and share databases.

THE FRENCH OCEANOGRAPHIC FLEET

Since 2018, Ifremer has been operating the French Oceanographic Fleet for the benefit of the whole scientific community. This fleet is composed of

- four sea-going vessels (*Pourquoi pas?*, *Thalassa*, *L'Atalante*, *Marion Dufresne*),
- five coastal vessels (*L'Europe*, *Thalia*, *Haliotis*, *Téthys II*, *Côtes de la Manche*),
- two vessels deployed overseas (*Alis*, *Anthea*),
- five underwater vehicles (*Victor 6000*, *HROV Ariane*, *Nautile*, *Idef*, *Aster*),
- and large instrumented platforms (e.g. marine seismic equipment).

35 YEARS OF INNOVATION

1984

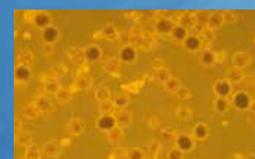


Titanic. Development of a deep-towed acoustic system that was used in 1985 to obtain a mosaic of sonar images from the sea-floor where the wreck of the *Titanic* lies at 3800 m depth.

1985

New food. Development of the process for making surimi. Optimisation of a storage technique that preserves the properties of the surimi fish proteins.

1988



Food safety. The Rephy network identifies a neurotoxin-producing species that causes paralytic shellfish poisoning (PSP), a source of food poisoning in humans.

1999

Virus. Purification of herpes, a virus that infects marine molluscs. A major step in determining the whole genome sequence of the virus.

2003



Biotechnology. Acquisition of the whole genome sequence of a deep-sea microorganism, *Pyrococcus abyssi*, that lives in 100°C hydrothermal fluids. Paves the way to many biotechnology applications.

2005

Flagship. Christening of the R/V *Pourquoi pas?*, an admiral ship of the Ifremer oceanographic fleet, shared with the French Navy.

2007



Ocean surveys. ARGO, the global ocean observation programme, reaches its goal: an array of 3000 profiling floats distributed in all the oceans across the world.

2012



Pearls. Discovery of the molecular mechanisms governing the formation of the Tahiti black pearl nacre that develops in the pearl oyster *Margarita margaritifera*.

2015

Exclusive Economic Zone. France strengthens its maritime sovereignty by extending the limits of its continental shelf by more than 500,000 km² as part of the Extraplac project led by Ifremer.

2017



Supercomputer. Inauguration of Datarmor, a new computing infrastructure for processing marine data.