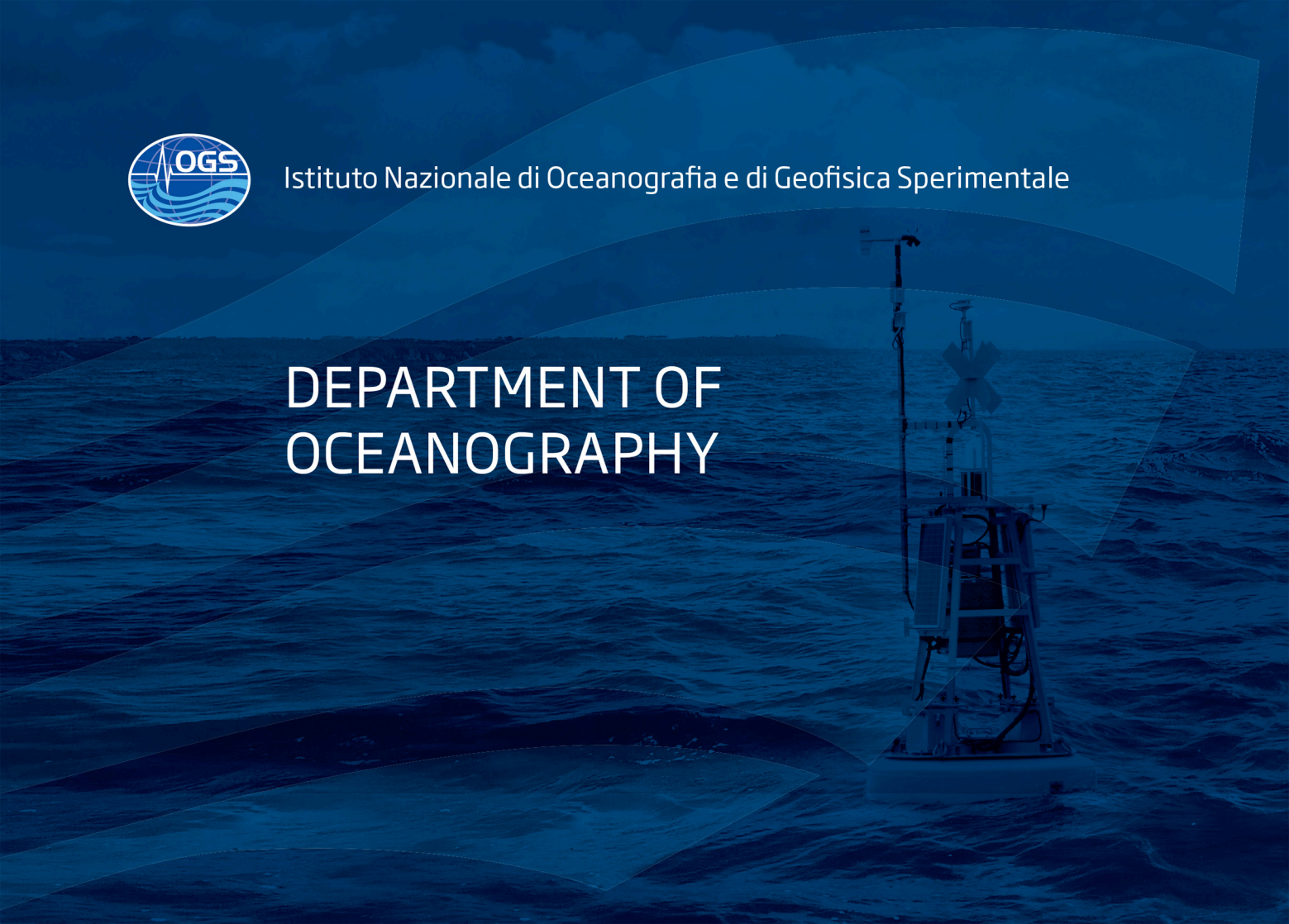
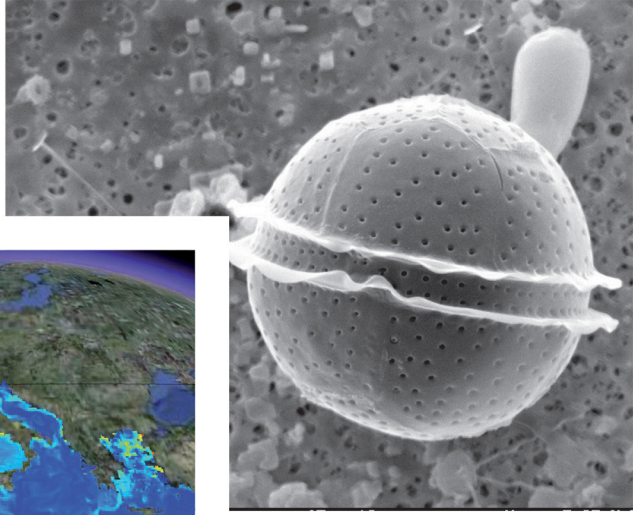
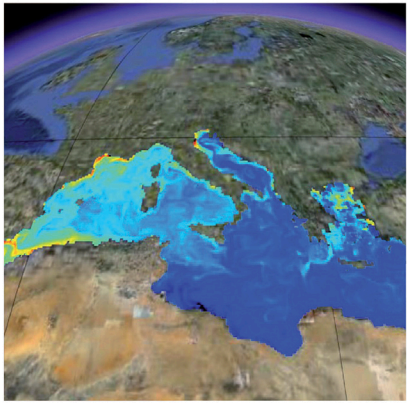
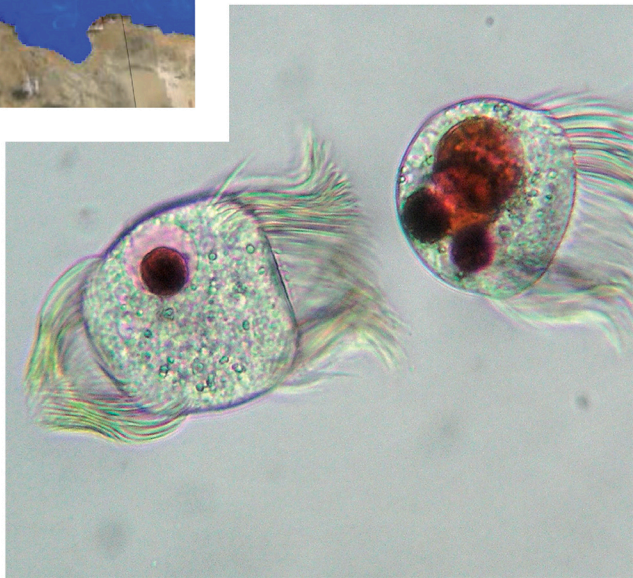
Istituto Nazionale di Oceanografia e di Geofisica Sperimentale

DEPARTMENT OF OCEANOGRAPHY









DEPARTMENT OF OCEANOGRAPHY - OCE

The mission of the Department of Oceanography - OCE is to deepen and to advance the knowledge in the field of oceanography with a multidisciplinary approach in order to answer urgent societal and environmental-related challenges. The activity plan is developed around four main research themes. Within the OCE, two centers of excellence and three research infrastructure (ECCSEL, PRACE, Euro-Argo), are important elements of OGS scientific and thriving core.

Currently, OCE comprises more than 100 people including researchers, technologists, technicians, PhD students, postdoctoral fellows and administrative staff. The origin of the Department goes back to the Marine Laboratories, established in 1977. Since the early days, OGS oceanographic activity was not limited only to the basic research but several projects of applied oceanography were conducted for private companies, public administrations and local authorities to assess the environmental status for different purposes such as assessing potential natural disasters, designing new engineering works, planning novel transports, measuring anthropogenic impacts. Nowadays, the activities of the Department span from scientific research to technological development in the field of observational and theoretical oceanography, that focuses on physical and biological oceanography, biogeochemistry, marine ecology and modelling of marine systems.

The Department is articulated into seven thematic groups, reflecting the expertise of the staff, embracing physical oceanography (observational oceanography and mobile autonomous systems), technological development, marine biology, marine biogeochemistry, marine system modelling, data archiving and their integration. The seven groups operate in close collaboration thus pursuing the OCE research objectives within the four main research themes with an interdisciplinary approach.

RESEARCH THEMES

TOWARDS THE NEXT GENERATION OF MARINE OBSERVATORIES

Developing the relevant science and innovation to properly combine physical, biogeochemical, atmospheric Essential Ocean and Climate Variables with high frequency and high definition biological data.Developing innovative approaches to integrate the information derived from ocean fixed-point observatories with autonomous mobile systems (e.g. gliders) this exploiting a multiplatform approach and appropriate numerical tools.
Long-term studies of the circulation and physical and biological properties using drifter and Argo float data of the Mediterranean Sea, Black Sea, tropical Atlantic Ocean and Southern Ocean. Continuous improvement of the short-term forecasts and the multi-year reanalysis of the Mediterranean Sea biogeochemistry, already operationally delivered in the frame of the European Copernicus Marine Environment Monitoring Services.

ECOSYSTEM FUNCTIONING FROM COASTAL SEA TO OPEN OCEAN

Study of the open-sea and the coastal marine ecosystems' structure and functioning with a holistic approach.
Developing quantitative mechanistic tools to implement the ecosystem approach for managing marine living resources and protected areas. Development and application of transport, biogeochemical and ecological models in different areas to capture ecosystem dynamics.
Development of methodologies for post-processing model outputs to assess connectivity among subareas in the seas.

BIODIVERSITY AND MARINE BIOGEOCHEMISTRY

Chemical and biological studies on specific environments (lagoons, estuaries and coastal areas) in the Mediterranean Sea and in polar areas, in response to climatic variations at different time scales and to anthropogenic pressures.
Evaluation of the dynamics of natural and anthropogenic CO_2 in coastal waters and in the open sea.
Study the responses of marine ecosystems under elevated CO_2 emissions.
Study the taxonomy of plankton and benthic communities based on phenotypic and genotypic approaches in order to understand the ecosystem functioning in relation to biodiversity.

CLIMATE CHANGE IMPACTS IN THE MARGINAL SEAS

Long-term studies of biogeochemical cycles in coastal waters (MAMBO/C1-LTER site Gulf of Trieste, the northern Adriatic Sea and in open sea (Interdisciplinary Laboratory for Oceanographic Research -SAILOR, hosting the buoy E2M3A, the southern Adriatic Sea), to document and analyze environmental changes.
Projections of the socio-economical effects related to climate change using integrated regional modelling, based on the coupling between ocean-atmosphere models, biogeochemistry models that involve the whole trophic chain and socio-economical models. Study of the variability of the circulation and the oceanographic properties in the Mediterranean Sea in relation to the interactions between the climate change drivers and the thermohaline circulation, in particular in the Adriatic-Ionian System. These investigations exploit various platforms such as satellites, autonomous vehicles (gliders, floats) and research vessels, operating in crucial areas and along selected transects. Study of the variability of circulation, transport and thermohaline properties in the deep layers of the marginal polar areas, i.e. Arctic and Antarctic (Ross Sea), also in relation to the interactions between the circulation and the seafloor morphology in the present and past times.

EXCELLENCE CENTERS

NATIONAL OCEANOGRAPHIC DATA CENTER

Facilitate and promote the discovery, exchange of, and open access to, marine data and information in real-time, near real time and delayed mode, using international standards, and in compliance with the International Oceanographic Commission Data Exchange Policy. Encourage long-term archiving, standardization and free and open access to quality controlled marine data, data products and information. Coordination of data and information management at the national level. Computing user-oriented data products answering the need of large communities and, in general, to support Blue Growth and Marine Knowledge through EMODnet initiative.

METROLOGY AND CALIBRATION CENTER

Calibration & Control: Calibration, performance-testing and inter-comparisons of oceanographic sensors; provision of information useful for data quality assurance; formulation of Best Practice.
Testing & Assessment: Evaluation of techniques and instrumentation; establishment of testing methods and protocols; harmonization of procedures. Metrological R&D: Investigation and testing of reference material; traceability determinations; uncertainty estimations.

INFRASTRUCTURES FOR OCEANOGRAPHY

ECCSEL NAT LAB-ITALY LABORATORY ON PANAREA

A natural laboratory where CO_2 gas is leaking out at substantial rates in the sea. Panarea island's waters are unique for studying the climate changes effects (i. e.: ocean acidification) and for implementing innovative techniques to monitor the impacts on the ecosystem.
The on-land installation, financed by MIUR, and managed by OGS offers logistical and scientific support to scientists thus allowing national and international collaborations and promoting multidisciplinary approach in ocean acidification and CCS (Carbon Capture and Storage) leakage studies

EURO-ARGO AND ARGO-ITALY

The OCE is coordinating the Euro-Argo ERIC activities in the Mediterranean and Black seas, and is particularly responsible for the delayed mode quality control of the Argo data in these marginal seas.
Under the sponsorship of MIUR, the OCE provides a substantial Italian contribution to Argo (Argo-Italy), with main focus on Italian seas, the Mediterranean and Black seas, and the Southern Ocean.
The OCE is an active partner in international initiatives to test and operate floats with biogeochemical sensors and floats capable to sample as deep as 4000 dbar.

PRACE

PRACE provides high-performance computing resources for excellence European research. The national references of PRACE are CINECA (MIUR delegate at the PRACE Board of Directors and Council) and OGS (MIUR representative).
Under the sponsorship of MIUR, OGS aims to promote and support the training of researchers and the growth of expertise in the field of high-performance computing applied to Earth Sciences, with a special focus on the oceanographic-biogeochemical modelling and the Blue Growth strategy.

NATIONAL INSTITUTE OF OCEANOGRAPHY AND APPLIED GEOPHYSICS

The National Institute of Oceanography and Applied Geophysics - OGS - is a public research Institute which acts internationally in the fields of Earth and Marine Sciences, Oceanography, Geophysics and Seismology.
The Institute aims at safeguarding and enhancing the environmental and natural resources and focuses its efforts on evaluating and preventing geological, environmental and climatic risks, and spreading the scientific culture and knowledge.

OGS has four locations in the Friuli Venezia Giulia Region (North-Eastern Italy) and it is structured under four main Departments:

- Oceanography - OCE;
- Geophysics - GEO;
- Seismological Research - CRS;
- Research Infrastructures - IRI.

With its strategic infrastructures of excellence (such as the oceanographic research vessel OGS Explora), OGS makes its own expertise available for research related to environment and climate, biodiversity and ecosystem functionality and to the study of seismicity, hydrodynamic and geodynamic phenomena having an impact on both environment and population.

HEADQUARTER

The headquarter hosts the offices of the Presidency, the Administrative and Technical Departments and the four Scientific Departments. It is located in the municipality of Sgonico, 12 km from the center of Trieste.

Borgo Grotta Gigante 42/C - 34010 Sgonico (TS) - Italy
Tel.+39 040 21401 - Fax.+39 040 327307

SANTA CROCE

The biochemistry and biology labs of the Oceanography Department are adjacent to the sea.

Via Auguste Piccard, 54 - 34151 Trieste (TS) - Italy
Tel.+39 040 21401 - Fax.+39 040 327307

MIRAMARE

Here are hosted the modelling and High Performance Computing labs of the Oceanography Department.

Via Beirut 2/4 - 34014 Trieste (TS) - Italy
Tel.+39 040 21401 - Fax.+39 040 327307

UDINE

Here is located the Department of Seismological Research.

33100 Udine (UD) - Italy
Tel.+39 0432 522433 - Fax.+39 0432 522474

www.inogs.it - urp@inogs.it