* It is the largest public marine R+D centre in Spain

* 1951: Foundation as “Institut of Fisheries Research”

* 1987: Geology and Physics Departments incorporation. name changed to ICM

* 2001: Inauguration of a new building: Mediterranean Marine and Environmental Research Center (CMIMA) =
  - Institute of Marine Sciences (ICM) +
  - Unit of Marine Technology Marine (UTM)

* ICM staff numbers: 236
  - Scientists: 84
  - PhD students: 73
  - Scientific support personnel: 78

* 40-50 Research Projects
* 20-30 Contracts with companies and Administration
* 250-300 research papers ISI per year

www.icm.csic.es
Institut of Marine Sciences (ICM) Directorate

Technical Services

R+D

Scientia Marina

Coastal Ocean Observatory

Physical and Technological Oceanography

Marine Geosciences

Marine Biology & Biological Oceanography

Renewable Marine Resources

• Aquarium Experimental Zone (ZAE)
• Electron Microscopy
• Instrumentation
• Chemical Analysis
• Biological Reference Collection
• Marine Sediment Core Collection
• Seismic Reflection Profiles Collection
• Communication and outreach
**General Objective**: To study the physical aspects of the ocean and their impact and interactions with the climate system and global change.

The ICM hosts the “Barcelona Expert Centre on Radiometric Calibration and Ocean Salinity (SMOS-BEC)”, part of the ESA mission.
Design of new algorithms for analysis of remote sensing data (Patent obtained)

Associated Technological development

Design and construction of Lagrangian surface and subsurface drifters for TS measurements and for calibrating and validating SMOS data
Coastal line evolution

Storm impacts and coastal vulnerability

Erosion and flood risk on the Catalan coast. Cubic meters of sand needed for beach nourishment.
Sediment monitoring

Pollution Distribution

Historical Pollution

Heavy rain events and river floods
MARINE GEOSCIENCES: SEDIMENTARY PROCESSES

River discharge events

Bedforms by currents and waves

Deep sediment waves

Continent – Ocean transfer

Turbidity currents, dense shelf water cascading, nepheloid layers
MARINE GEOSCIENCES: GEOLOGICAL HAZARDS

Earthquakes
Structure and dynamics of active margins

Submarine slides
Sediment dynamics, stability of continental margins

Tsunamis
Potential studies of earthquakes and slides events
Continental margins and oceanic ridges. Structure and evolution

Minerals: deposits associated with submarine volcanic and hydrothermal activity.

Hydrocarbon and gas hydrates
Determination of regional geological and geodynamic context by acoustic methods
Formation and albedo of the clouds over the ocean

The ocean emits trace gases and aerosols forming clouds
One of the major uncertainties in predicting climate change (IPCC)
The S cycle in the pelagic ecosystem
OCEAN ACIDIFICATION

1) Calentamiento Global

2) Acidificación oceánica

Reconstructions from the past
Present variability
Future simulations
STRUCTURE AND DYNAMICS OF MARINE ECOSYSTEMS

Eutrophication

Toxic Algal Blooms

Continent–Ocean Interactions

Development and Application of Marine European Directives

Diversity and function of coastal phytoplankton
Diversity: 320000 16S rDNA sequences
Genomics: sequencing of 9 genomes
Metagenomics: 7.2 million DNA and RNA sequences
Bioeconomy and management of living marine resources. Evaluation cost - benefit looking for the sustainability of the resource.
Impact of fishing on marine ecosystems

Monitoring of commercial species

Impact of trawling on the benthos and seabed. Indicators for ecosystem conservation

Fishing lines in corals and seabed
Advice to Managers and Public Administration: Special Protected Areas

Marine Protected Areas (MPA)

Proposals for MPA in international and national waters
GENOMICS, PROTEOMICS AND BIOTECHNOLOGY the behavior and reproduction of marine species: embryonic development, differentiation and sexual maturation.

Model Species

Captive breeding
Cryopreservation
Embryonic Development

Behavior
Life Cycles
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- Communication and outreach
Two video monitoring stations, with five cameras. Record every hour.

Submarine observatories with current meters, sensors of temperature, salinity and turbidity and video cameras.

Weather Station and Satellite

Boat for littoral studies

Public access through the web: (http://elb.cmima.csic.es)
International Journal of Marine Science

Published by ICM since 1955

Included in SCI since 1998, Impact factor: 1.2

Four volumes per year

Also monographs

LIBRARY

The largest library in oceanography and marine sciences in Spain.

About 7,000 volumes and 1,400 journal titles.
SCIENTIFIC COLLECTIONS

Biological Reference Collection.
More than 1000 fish, crustacean and cephalopod species from all over the world.

Marine Sediment Core Collection.
More than 1000 sediment cores from several world oceans and seas.

Seismic Reflection Profile Collection.
Collected using a variety of systems (sediment profilers, sparkers, boomers, air cannons, and sidescan sonar) covering areas of several marine regions.
Designed to work with different types of aquatic organisms and to facilitate biological research and aquaculture.

Area: 650 m²

150 tanks and 11 experimental chambers with controlled temperature, light, dissolved oxygen, nutrients, etc.
Nutrient analysis in seawater:
* Inorganic nutrients (nitrate, nitrite, ammonium, phosphate, silicate)
* Total nitrogen and phosphorus

TOC analysis in seawater:
* Dissolved Organic Carbon (DOC)
* Total Nitrogen (TN)

Electron Microscopy
Two scanning electron microscopes (SEM) A VPSEM equipped with EDS for x-ray microanalysis

Flow cytometer
Advice, maintenance and installation of oceanographic instruments
Make logistics and technological management of scientific infrastructures for polar and oceanographic research oceanográfica y polar.

Sarmiento de Gamboa
García del Cid
Hespérides
Base G. de Castilla
Base J. Carlos I
Underwater Vehicles
PARTICIPATION IN OUTREACH PROGRAMS

ICM Web page: “ICMDivulga” www.icm.csic.es/icmdivulga
focused on spreading projects and its current up-to-date research

Two days of Open Doors, during the Week of the Science. Visits to the ICM and “García del Cid” oceanographic vessel. Shareholding: 500-600 persons every year.

Celebration of the World-Wide Day of the Oceans (8 June) with events and activities directed to general public and children. Shareholding: 700-800 persons every year.

Several activities for schools and children
Participation in other events in Spain and Catalonia
Translations to Catalan and Spanish of Science Texts