1. Objectives

GRC-GM is a transdisciplinary excellence research group whose main aim is to understand the functioning of the ocean and its shorelines from a geological and environmental viewpoint. The group works on six main inter-related and mutually reinforcing objectives: (1) increasing current knowledge on physical processes and their sedimentary products and morphological effects in ocean basins and margins, with an special focus on seascape evolution of submarine canyons and continental slopes; (2) investigating biogeochemical cycles and fluxes from the shallow ocean to the deep-sea and their impacts on the ecosystem from a “source to sink” approach, with particular attention to C and N export to the deep; (3) disentangling the paleoceanographic and paleoclimatic records contained in marine sediments and analyzing the ocean response under present global change scenarios; (4) recognizing the variety of anthropogenic impacts in the modern ocean, from fisheries to pollution by chemicals; (5) identifying marine geohazards, such as submarine landslides and tsunamis, and their consequences; and (6) developing studies on coastal stability and evolution in particularly sensitive areas.

2. Research areas and Scientist in charge

- Physical processes and their sedimentary products (Dr Miquel Canals, miquelcanals@ub.edu).
- Biogeochemical cycles and fluxes (“source to sink”) (Dr Antonio M. Calafat, antonalcalafat@ub.edu).
- Paleoceanography and global change (Dr Isabel Cacho, icacho@ub.edu).
- Anthropogenic impacts in the modern ocean (Dr Miquel Canals, miquelcanals@ub.edu).
- Marine geohazards and their consequences (Dr Galderic Lastras, glastras@ub.edu).
- Coastal stability and evolution (Dr Jordi Serra, jordi.serra@ub.edu).

GRC-GM has also carried out numerous applied research and consultancy projects to solve practical problems posed by administrations and private companies and consortia, such as studies for submarine cable lying, offshore windmills, seafloor sand and gravel resources, monitoring of dredging areas and seafloor obstacles, port bathymetry and geophysical surveys for safety and operational purposes, quality control of seabed works, seafloor and habitat mapping for management purposes, and seafloor object search including archaeology and shipwreck targets, amongst other.

3. Capacities

- **Research vessels and underwater vehicles.** Access to a large span of research vessels, from oceanic to coastal (R/V Miguel Oliver, R/V Hesperides, R/V Sarmiento de Gamboa, R/V García del Cid and
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coastal vessels from Spain, and foreign vessels), with their on board scientific equipment (multibeam echosounders, side scan sonars, sub-bottom profilers, seismic reflection profiling systems, sediment coring and sampling devices, water column instrumentation). Access to ROVs rated at various water depths, down to 2.000 m.

- **Mobile instrumentation.** *Water column and seafloor.* Automatic sediment traps, current meters, acoustic releases, thermistor chains deck units, buoys and complements for the long-term (months to years) mooring of instrumented arrays to ocean depths. Water and sediment sampling and processing systems. *Geophysics.* Shallow water multibeam system, side scan sonar, sub-bottom profiler and high-resolution seismic reflection equipment.

- **Laboratory equipment.** CORELAB, a facility for the non-destructive analysis of sediment and rock samples, including an XRF core scanner and soon a CATSCAN. Sedimentology and micropal paleoceanography laboratories with clean room, laser-infrared particle size analyzer, microscopes and other equipment. Access to full analytical facilities of Scientific and Technological Centres of the University of Barcelona, including mass spectrometers and other relevant equipment.

- **Hardware and software.** Linux and Unix Workstations. Group server integrated in a local network. Licensed software to process, analyse, integrate and visualize Marine Geosciences datasets (ArcGis, CARIS HIPS and SIPS, Kingdom Suite, GeoGraphix and EarthVision, amongst other) and open access software. DIN A-3 colour printers and scanner.

4. Teaching

- Degree in Geology
- Degree in Geological Engineering
- Degree in Environmental Sciences
- Degree in Biology
- Master in Marine Sciences
- Master in Water: Interdisciplinary Analysis and Sustainable Management
- Doctorate Program on Marine Geosciences (coordinator)

5. Selected papers


6. Selected competitive projects


DOS MARES - CTM2010-21810-C03, MICINN, PN I+D+i: Deep canyon and slopes in the Mediterranean and Cantabrian seas: from the synchrony amongst external forcings to living resources. Funding: 164.000 € + 36 days shiptime with large vessel, 36 days shiptime with medium vessel and 12 days shiptime with coastal vessel. Scientist in charge: M. Canals. Period: 2010-2013.


ASTARTE - 603839-ASTARTE, Funding agency: EC, VII FP: Assessment, STrategy And Risk Reduction for Tsunamis in Europe. Funding: 213.000€ + 15 days shiptime with medium vessel. Scientist in charge: M. Canals. Period: 2013-2016. The PI is a member of the Steering Comittee and leader of one of the project Test Sites.


7. Selected private contracts


Barcelona Port Authority: Search for sand deposits on the floor of the continental shelf of Barcelona and nearby areas. Scientist in charge: M. Canals. Period: 2006 - 2009 (several phases).

