Institut de Ciències del Mar Ocean Science for a Healthy Planet

SUPPORT PROGRAM



SEVERO OCHOA 10 Predoctoral Fellowships 2026

"Ayuda para contratos predoctorales para la formación de doctores/as", *(formerly known as FPIs).*

UPDATE: deadline for applications 5th October

oppor-tunity!

Institut de Ciències del Mar 75

EXCELENCIA SEVERO OCHOA 2020-2030

CSIC

MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

AGENCIA ESTATAL DE INVESTIGACIÓN

With support from grant CEX2024-001494-S funded by AEI 10.13039/501100011033



SEVERO OCHOA **Predoctoral Fellowships 2026**

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SEVERO OCHOA **Predoctoral Fellowships 2026**

GENERAL INFORMATION

The **Institut de Ciències del Mar (ICM-CSIC)**, Spain's leading marine research institute and the only ocean science research centre awarded the prestigious Severo Ochoa Excellence Accreditation, will launch a call for **10 predoctoral fellowships** aimed at training the next generation of marine scientists. Based in Barcelona, the programme offers an outstanding research environment, access to cutting-edge facilities, and the opportunity to contribute to research addressing some of today's most pressing challenges, including ocean health, biodiversity conservation, climate change, sustainable seafood systems, and the interactions between marine science and society.

The fellowships have a **duration of four years** and are expected to **begin in January 2027**. In addition to the employment contract, successful candidates will receive dedicated funding to support research activities, specialised training, and international mobility opportunities. **The gross annual salary is €20,364.88 during the first year and €25,456.10 per year during the second, third, and fourth years.**

Applicants must hold a Master's degree, or be enrolled in a Master's programme at the time of application, and have their **CV uploaded to Europass. Before signing the contract, selected candidates must have completed their Master's degree and secured admission to a doctoral programme**. Candidates holding degrees obtained outside the European Higher Education Area (EHEA) must also provide evidence that they have initiated the **degree equivalence recognition process.** Applications may be submitted in either **English or Spanish.**

The selection process is accepting applications until October 5th. Interested applicants must submit their applications through the Call PIX2026, available here. The call terms are available here, the FAQs here and the Guide for applicants here. Please contact the relevant supervisor before applying to any position.

01. Phd in Microbial ecology of marine wildlife

Funding programme: Severo Ochoa Predoctoral fellowships awarded as "Ayuda para contratos predoctorales para la formación de doctores/as", (formerly known as FPIs).

PhD Advisors - Joan Navarro and Josep M. Gasol

THE OFFER

We offer a four-year predoctoral contract for doctoral training funded by the Spanish Ministry of science, Innovation and Universities, associated with the topic: **"Uncovering the hidden microbial links between marine wildlife and ecosystem health"**, ascribed to the ICM-CSIC Biodiversity discovery and conservation research HUB.

THE PROJECT

Marine microbiomes influence animal ecology, immunity, and resilience, yet their potential to indicate ecosystem degradation, health, and physiological/ecological disturbance (particularly in apex predators) remains poorly understood. Because microbial communities respond rapidly to eutrophication, pollution, and warming, they are promising but underused bioindicators. Although the One Health framework links environmental, animal, and human health, it has rarely been applied to wide-ranging marine predators by integrating host and environmental microbiome description/study with movement, habitat use, and anthropogenic exposure.

This PhD project will test whether the microbiomes of wide-ranging marine predators reflect the habitats they use and can serve as early indicators of environmental change. Using opportunistic seabirds as models, it will (i) compare host and environmental microbiomes across marine and terrestrial habitats to quantify concordance between predator-associated and habitat microbial communities, and (ii) assess predators' role in microbial connectivity by tracking transfer of commensal and pathogens, antibiotic-resistance genes, and beneficial symbionts between degraded and natural areas.

Fieldwork will integrate non-invasive swab and faecal sampling with predator health and morphometric assessments, high-resolution movement tracking, and the collection of water, sediment, and prey samples across gradients of habitat quality. High-throughput 16S and 18S rRNA sequencing, advanced bioinformatics, microbial source tracking, strain-level characterization, hierarchical modelling, and machine learning approaches will be employed to identify microbial taxa, signatures, and community-level metrics that can serve as robust indicators of ecosystem condition and wildlife health.

The candidate will receive training in bioinformatics, microbial ecology, DNA sequencing, animal movement, data integration, and ecological modelling through institutional and external courses. They will attend relevant conferences and workshops and be encouraged to undertake at least two international research stays of 3–4 months from the second PhD year. These secondments will provide advanced training in microbiome analysis, machine learning, and integrative ecological modelling while expanding the candidate's professional network.
The candidate will join two dynamic groups (https://imares.science and http://emm.icm.csic.es) with more than 50 doctoral students and postdocs, and several lab technicians in an institute (http://www.icm.csic.es) which develops a large number of research projects on various topics and has received the Severo Ochoa distinction of excellence, the only marine center to receive it to date. Both groups maintain a firm commitment to training with its students to ensure maximum learning benefit, including participation in courses and conferences, stays in other laboratories, seminars and other training strategies. In addition, we are fully committed to the "10 simple rules towards healthier research labs" (https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1006914)

REQUIREMENTS

- Degree in Biology, Environmental Sciences, Microbial ecology or related quantitative disciplines.
- Master's degree required for enrollment in a PhD program.
- Strong quantitative and analytical skills, including experience/interest in scientific data analysis (R, QGIS, python, or similar).
- Excellent English communication and proven scientific writing abilities
- Curious, collaborative, and excited to work across disciplines linking seabird ecology and microbial ecology.
- Capacity to combine field ecology with handling large microbial datasets to assess ecosystem health and microbial connectivity.
- Previous experience/interest in movement ecology (including behaviour, habitat use, spatial connectivity, and biologging/tracking tools) and/or in microbial ecology (ideally microbiome sampling, microbial dispersal, or pathogen/AMR dynamics) will be favourable considered.
- Curiosity, desire to learn and capacity for teamwork.

Starting date: January 2027

Interested candidates may contact Joan Navarro (joan@icm.csic.es) **& Josep M. Gasol** (pepgasol@icm.csic.es) **for further details and information.**

02. PhD Tracing back Cold-Water Coral resilience and biodiversity reorganization

Funding programme: Severo Ochoa Predoctoral fellowships awarded as "Ayuda para contratos predoctorales para la formación de doctores/as", (formerly known as FPIs).

PhD Advisors - Claudio Lo Iacono and Pedro Cermeño

THE OFFER

We offer a four-year predoctoral contract for doctoral training funded by the Spanish Ministry of science, Innovation and Universities, associated with the topic: **"Tracing back Cold-Water Coral resilience and biodiversity reorganization since the Last Glacial Maximum to forecast deep-sea ecosystem response to accelerating climate change"**, ascribed to the ICM-CSIC Multiple marine stressors HUB.

THE PROJECT

Cold-water coral (CWC) reefs and mounds are crucial biodiversity hotspots in the deep sea and valuable climatic archives, yet their vulnerability to the imminent impact related to climate change remains unresolved because available datasets rarely combine high-resolution contemporary observations with long-term paleo ecological records.

Adopting the thriving CWC reefs of the Cabliers Fishery Restricted Area (FRA) in the Alboran Sea as a natural laboratory, CORECAST questions address: 1) how CWC reef biodiversity and trophic networks can be regionally upscaled, 2) how they fluctuated under natural climatic forcing during the past 20,000 years, and 3) whether process-response relationships recorded in the past can improve forecasts of CWC reorganization under future anthropogenic change. The project links habitat mapping, spatial and trophic ecology, palaeoecology, and eco-evolutionary modelling, to bridge past, present, and future coral biodiversity.

The central hypothesis to be tested is that temperature and organic-matter fluctuations over the last 20k years has controlled growth and demise of CWC ecosystems, and their associated structural complexity. Predictive spatial ensembles, stable-isotope analyses, environmental observations, faunal records from dated sediment cores, Ecopath mass-balance models, and mechanistic eco-evolutionary model simulations will be combined to reconstruct past ecosystem transitions and project future responses under climate warming scenarios.

Expected outputs include spatially explicit estimates of vulnerability, adaptive limits, trophic reorganization, and extinction risk, providing transferable guidance for basin-scale conservation, management of the Cabliers Fishery Restricted Area, and a permanent open baseline for monitoring ocean change.
Awarded student will have the opportunity to receive specific training in spatial ecology, food web analysis, sediment-core sampling and analysis, paleo-ecology and eco-evolutionary modeling. She/he will have the opportunity to be involved in oceanographic expeditions aimed to deep-sea exploration. Potential research stages are foreseen in the Netherlands (NIOZ) for food web analysis and in Switzerland (ETH) for training in eco-evolutionary modeling (Gen3sis). Laboratory work for core sampling is foreseen in ICM-CSIC and in the National Oceanography Center of Southampton, UK. The research development plan will be specifically adapted to the awarded student, under a combination of the strategic PhD research objectives and individual career aims.

REQUIREMENTS

- Applicants should ideally hold a Master's degree in Marine Sciences, Marine Geology, or Marine Ecology, though strong candidates from related scientific backgrounds are encouraged to apply. Additional background knowledge in sedimentology, statistics, code programming (e.g., Phyton, Matlab), and fluent written and spoken English will be positively evaluated.

Starting date: January 2027

Interested candidates may contact Claudio Lo Iacono (loiacono@icm.csic.es) **& Pedro Cermeño** (pedrocermeno@icm.csic.es) **for further details and information.**

03. PhD in Eco-evolutionary Marine Species Distribution Modelling

Funding programme: Severo Ochoa Predoctoral fellowships awarded as "Ayuda para contratos predoctorales para la formación de doctores/as", (formerly known as FPIs).

PhD Advisors - Maria Grazia Pennino, Noelia Díaz, and Jorge Fernandes

THE OFFER

We offer a four-year predoctoral contract for doctoral training, funded by the Spanish Ministry of Science, Innovation, and Universities, associated with the project **"Adaptive and plastic responses in marine species distribution models: integrating genomics, epigenetics, and climate projections for sustainable fisheries"** within the ICM-CSIC Seafood Sustainability Hub. The project integrates marine spatial ecology, fisheries science, population genomics, environmental epigenetics, and climate-impact assessment to develop a new generation of biologically informed marine species distribution models.

THE PROJECT

Marine Species Distribution Models (SDMs) are widely used to assess climate-change impacts on marine biodiversity and fisheries resources. However, most current SDMs are correlative and operate at the species level, implicitly assuming that all populations respond similarly to environmental change. This can overlook population structure, local adaptation, and phenotypic plasticity, potentially limiting conventional models' ability to identify climate vulnerability, distribution shifts, and refugia across heterogeneous seascapes.

This PhD project will develop and test an eco-evolutionary SDM framework that integrates population genetic structure, adaptive genomic variation and epigenetic indicators of plasticity. Using selected marine species of ecological and/or fisheries relevance, the project will assess how population-level biological variation affects climate-driven forecasts and whether genomics and epigenetics improve the identification of vulnerable and resilient populations and potential climate refugia.

The candidate will integrate occurrence, abundance, environmental, genomic, and epigenetic datasets and develop conventional and population-informed Bayesian spatial and spatio-temporal models. The work will compare baseline models with those incorporating population structure, adaptive genomic information, and epigenetic indicators, and will project future habitat suitability, vulnerability, adaptive potential, uncertainty, and climate refugia under climate-change scenarios.

Expected outputs include open, reproducible modelling workflows, quantitative comparisons of conventional and biologically informed SDMs, spatial decision-support products, and practical recommendations for integrating adaptive capacity and plasticity into fisheries and conservation assessments.

WHAT WILL YOU GAIN

The candidate will receive interdisciplinary training at the intersection of marine spatial ecology, fisheries science, population genomics, environmental epigenetics, and climate-change impact assessment. During the PhD, you will develop skills in:

- Marine species distribution modelling, including spatial and spatio-temporal approaches and Bayesian hierarchical modelling.
- Population genomics, including genotype-environment association analyses and inference of adaptive variation.
- Environmental epigenetics, with a focus on DNA methylation and plastic responses to environmental variability.
- Integration and analysis of large ecological, environmental, and molecular datasets.
- Reproducible computational workflows using R, Git and FAIR data principles.
- Climate-change projections, uncertainty analysis and production of spatial decision-support outputs.
- Scientific writing, conference presentations, visualisation and communication of results to research, management, and conservation audiences.

You will be integrated into an interdisciplinary research environment at ICM-CSIC and participate in research group meetings, ICM seminars, Seafood Sustainability Hub activities, and specialised training opportunities. The project also includes the possibility of an international research stay with a leading group specialising in eco-evolutionary modelling, marine genomics, or environmental epigenetics.

REQUIREMENTS

- Degree in Marine Sciences, Biology, Ecology, Environmental Sciences, Bioinformatics, Genetics, Biotechnology, Statistics, Mathematics, or a related discipline.
- Master's degree or equivalent qualification allowing enrolment in a PhD programme.
- Strong interest in marine ecology, climate change, and quantitative ecological research.
- Good quantitative and analytical skills and motivation to work with large and heterogeneous datasets.
- Experience with R, Python or another scientific programming language.
- Good written and oral communication skills in English.
- Ability and motivation to work in an interdisciplinary environment combining ecological modelling and molecular data.

The following will be considered an asset:

- Previous experience with species distribution models, spatial statistics or Bayesian modelling.
- Experience with genomic, epigenetic or bioinformatic data.
- Knowledge of marine ecology or fisheries science.
- Experience with reproducible workflows, Git or high-performance computing.

SUPERVISION AND RESEARCH ENVIRONMENT

The project will be co-supervised by Maria Grazia Pennino (iMARES), Noelia Díaz (MED lab) and Jorge Fernandes (HOLOEPI lab), who will provide complementary expertise in marine spatial ecology and fisheries modelling, environmental epigenetics, population genomics, and fish biology. The candidate will work across these complementary research environments, ensuring continuous integration of ecological modelling and molecular approaches throughout the PhD.

Starting date: January 2027

Interested candidates may contact Maria Grazia Pennino (grazia.pennino@icm.csic.es), **Noelia Díaz** (ndiaz@icm.csic.es), **and Jorge Fernandes** (jorge.fernandes@icm.csic.es).

04. PhD in Seafood quality and safety

Funding programme: Severo Ochoa Predoctoral fellowships awarded as "Ayuda para contratos predoctorales para la formación de doctores/as", (formerly known as FPIs).

PhD Advisors - Andrea G. Bravo, Mercedes Blázquez & Isabel Forner-Piquer

THE OFFER

We offer a four-year predoctoral contract for doctoral training funded by the Spanish Ministry of science, Innovation and Universities, associated with the topic: **"Seafood quality and safety under global Change: Contaminant trends, nutritional tradeoffs, and risk assessment in Mediterranean marine food webs"**, ascribed to the ICM-CSIC Seafood sustainability HUB.

THE PROJECT

Seafood represents a cornerstone of human nutrition providing high-quality protein and omega-3 fatty acids. However, seafood safety is increasingly challenged by contaminant exposure. Methylmercury bioaccumulates and biomagnifies through marine food webs, posing particular concern in the semi-enclosed, mercury-enriched Mediterranean Sea. Emerging contaminants associated with plastics are increasingly detected in marine biota yet remain poorly characterized in terms of their trophic dynamics and long-term ecological implications. In addition, climate-driven changes are further expected to affect both contaminant dynamics and the nutritional quality of seafood.

The main scientific questions of the project are: 1) What are the temporal trends and drivers of mercury bioaccumulation and biomagnification across Mediterranean food webs? 2) How have emerging contaminants accumulated over time across the Mediterranean marine food webs? 3) What molecular and physiological responses are triggered in marine organisms? 4) What are the species-specific trade-offs between contaminant risk and nutritional benefit?

This PhD project will examine mercury trends and their oceanographic, biogeochemical and climatic drivers; the accumulation and trophic transfer of plastic-associated pollutants; organism-level molecular and physiological responses; and species-specific trade-offs between nutritional benefits and contaminant risks. Integrating marine ecology, environmental toxicology, molecular biology, food science and climate modelling within a One Health framework while strengthening cross-disciplinary research at ICM-CSIC.

The project offers training in modelling and analytical and experimental techniques. The PhD candidate will combine total mercury and methylmercury measurements, stable isotopes, harmonised contaminant datasets, trophic magnification factors, hotspot mapping, molecular analyses, mixed-effects modelling, benefit-risk indicators, consumption scenarios and bioaccumulation models.

The student will be integrated within the supervisor's research groups at the Institut de Ciències del Mar (ICM-CSIC), with close collaborations within the groups of ICATMAR (ICM-CSIC) and Prof. G. Gioacchini (Polytechnic University of Marche, Italy). Opportunities for research stays are available at leading institutions including the Scripps Institution of Oceanography (UC San Diego, USA). Participation in field activities may also be possible through ongoing collaborations.

REQUIREMENTS

- Degree in Biology, Environmental Science, Biochemistry, Oceanography, Marine Science or a related quantitative discipline.
- Master's degree required for enrollment in a PhD program.
- Strong quantitative and analytical skills.
- Strong written and oral communication skills in English.
- Availability to undertake research stays abroad and field activities.
- Interest in ecotoxicology, fish biology, molecular biology, food science, analytical techniques and modelling.
- Previous experience with food webs, environmental toxicology, fish biology, laboratory work or programming will be considered an asset.

Starting date: January 2027

Interested candidates may contact Andrea G. Bravo (andrea.bravo@icm.csic.es) **& Isabel Forner-Piquer** (iforner@icm.csic.es)**.**

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05. PhD From the Holocene to the Anthropocene

Funding programme: Severo Ochoa Predoctoral fellowships awarded as "Ayuda para contratos predoctorales para la formación de doctores/as", (formerly known as FPIs).

PhD Advisors - Ruth Durán and Francesc Maynou

THE OFFER

We offer a four-year predoctoral contract for doctoral training funded by the Spanish Ministry of science, Innovation and Universities, associated with the topic: **"From the Holocene to the Anthropocene: Assessing palaeoecological and sedimentological responses to multiple environmental and anthropogenic stressors along the Catalan coast"**, ascribed to the ICM-CSIC Multiple marine stressors HUB.

THE PROJECT

Coastal ecosystems along the Catalan coast have evolved under drivers including sea-level fluctuations, climate variability, storms and sediment supply, while Anthropocene pressures such as urbanisation, river regulation, bottom trawling, habitat destruction, pollution, resource overexploitation and climate change have altered their structure and functioning. The key question is how interacting natural and anthropogenic stressors have exceeded ecosystem resilience thresholds and produced regime shifts across temporal scales.

The project integrates marine geosciences and ecology, combining geomorphology, seismic stratigraphy and sedimentology with benthic ecology, faunal turnover, habitat analysis and ecosystem modelling. It supports the Multiple Stressors Hub by identifying drivers of irreversible change and enabling collaborations on biodiversity, invasive species and pollution.

The central hypothesis is that tipping points arise from cumulative, interacting stressors affecting benthic communities directly and through physical habitat modification. A multi-proxy dataset of high-resolution seismic profiles, approximately 50 vibrocores, environmental records and radiocarbon dates will reconstruct depositional environments, benthic communities and disturbance histories. GIS integration will link stressors, environmental change and ecological responses, supporting resilience-threshold modelling. Expected outcomes include preindustrial baselines, identification of causal sequences and critical thresholds, improved distinction between natural variability and human forcing, and a transferable mechanistic framework for anticipating ecosystem responses under intensifying anthropogenic pressure.

BENEFITS FOR THE AWARDED STUDENT

- Experience in marine geophysics, seismic stratigraphy and sediment core analysis and interpretation.
- Experience in coastal palaeoenvironmental evolution
- Experience in palaeoecological reconstruction
- Experience in coastal ecosystem modelling, including quantitative analysis

SUPERVISION AND RESEARCH ENVIRONMENT

- Degree in Marine Sciences, Earth Sciences, Environmental Sciences, Engineering, or a related discipline.
- Master's degree required for enrollment in a PhD program.
- Strong quantitative and analytical skills, including experience in scientific data analysis.
- Knowledge of programming languages (e.g., Python, MATLAB, R, or similar), GIS software (e.g., QGIS, ArcGIS), and/or seismic interpretation software (e.g., Kingdom, Petrel, or similar).
- Interest in marine geology, coastal dynamics, climate change, Anthropocene
- Previous experience with palaeoecology, geophysical datasets, numerical models, laboratory work, or palaeoclimate archives will be considered an asset.

Starting date: January 2027

Interested candidates may contact Ruth Durán (rduran@icm.csic.es) **& Francesc Maynou** (maynouf@icm.csic.es)**.**

06. PhD in AI-assisted Technologies for Underwater Noise Monitoring

Funding programme: Severo Ochoa Predoctoral fellowships awarded as "Ayuda para contratos predoctorales para la formación de doctores/as", (formerly known as FPIs).

PhD Advisors - Ivan Masmitja and Arantza Ugalde

THE OFFER

We offer a four-year predoctoral contract for doctoral training funded by the Spanish Ministry of science, Innovation and Universities, associated with the topic: **"AI-assisted fibre-optic and robotic observatories for whale-ship interactions and underwater noise monitoring"**, ascribed to the ICM-CSIC Multiple Marine Stressors HUB.

THE PROJECT

Marine ecosystems in the Mediterranean face overlapping pressures from shipping, offshore activities and underwater noise, yet existing acoustic, robotic, AIS and geophysical observing systems remain fragmented and discontinuous. Distributed acoustic sensing transforms submarine fibre-optic cables into dense sensor arrays, while autonomous surface vehicles provide adaptive, mobile observations. Their closed-loop integration could enable detection, classification, localisation and tracking of fin whales, vessels and acoustic sources, while supporting in situ calibration of cable-based measurements. Key questions concern the accuracy of these technologies, the effectiveness of deep-learning and multi-agent reinforcement-learning methods, and their capacity to generate indicators of ship-strike risk, acoustic exposure and noise patterns. Combining marine geophysics, fibre sensing, underwater robotics, signal processing, artificial intelligence and marine ecology, the work supports the Multiple Marine Stressors Hub through conservation-oriented evidence for spatial planning and offshore risk management. DAS data will be pre-processed and classified using supervised and semi-supervised models; tracking algorithms will integrate spatial coherence, robotic observations, AIS trajectories and environmental metadata. Expected outputs include validated algorithms, a curated labelled dataset, maps of whale presence, vessel noise and overlap, and prototype hotspot indicators. The resulting hybrid framework could underpin scalable, non-invasive ocean observatories and improve long-term mitigation of human pressures on Mediterranean biodiversity.

06. PhD in AI-assisted Technologies for Underwater Noise Monitoring

The PhD candidate will be integrated in the Physical and Technological Oceanography and in the Barcelona Center for Subsurface Imaging research groups at ICM-CSIC. Additionally, it will benefit from existing collaborations with the iMARES research group, which connects technological developments with marine ecology, bioacoustics and conservation applications.
Opportunities for research stays are available at leading institutions including the Monterey Bay Aquarium Research Institute (California) and ISEN-Brest (France).

REQUIREMENTS

- Degree in Computer Science, Engineering, or a related quantitative discipline.
- Master's degree required for enrollment in a PhD program.
- Strong quantitative and analytical skills, including experience in underwater technology, robotics, and data analysis.
- Strong written and oral communication skills in English.
- Availability to undertake research stays abroad.
- Interest in underwater monitoring, robotics, marine ecology, physical oceanography, or Earth observation.
- Previous experience with artificial intelligence and machine learning, underwater monitoring, laboratory work, or marine robotics will be considered an asset.

Starting date: January 2027

Interested candidates may contact Ivan Masmitja (masmitja@icm.csic.es) **& Arantza Ugalde** (a.ugalde@icm.csic.es).

07. PhD in Decadal variability and trends in NW Mediterranean coastal ecosystems driven by climate processes

Funding programme: Severo Ochoa Predoctoral fellowships awarded as "Ayuda para contratos predoctorales para la formación de doctores/as", (formerly known as FPIs).

PhD Advisors - Joaquim Ballabrera, Magda Vila and Savitri Galiana

THE OFFER

We offer a four-year predoctoral contract for doctoral training funded by the Spanish Ministry of science, Innovation and Universities, associated with the topic: **"Linking marine ecosystem variability to climate-driven physical and biogeochemical processes in the coastal NW Mediterranean Sea: Decadal variability and trends"**, ascribed to the ICM-CSIC Climate Change HUB.

THE PROJECT

The North Western Mediterranean Sea (NWMS) is a hotspot of climate change, where significant shifts in species distributions have been observed over recent decades. These shifts are driven by a complex interplay of factors, including warming, acidification, nutrient depletion, overfishing, and habitat modification. However, disentangling the individual contributions of these drivers remains a major scientific challenge due to the limitations of observational data. This project tackles this critical knowledge gap by leveraging high-resolution numerical modeling to explore the links between climate-driven physical and biogeochemical processes and the variability of surface (<60m) pelagic and benthic ecosystems.

The main research question focuses on how environmental factors drive the variability of key biogeochemical indicators (chlorophyll, nutrients, and pH) in the NWMS across seasonal, inter-annual, and decadal time scales. Specifically, because chlorophyll variability directly controls solar radiation absorption in the upper ocean, we investigate how it modulates the upper-layer heat budget, density stratification, and vertical mixing. Understanding these dynamics is critical for evaluating ocean responses under climate change scenarios.

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07. PhD in Decadal variability and trends in NW Mediterranean coastal ecosystems driven by climate processes

METHODOLOGY AND CANDIDATE'S ROLE

The PhD candidate will develop a high-resolution configuration of a coupled physical-biogeochemical model. Using this tool, they will execute a suite of numerical experiments designed to quantify the relative contributions of key forcing mechanisms, including: wind forcing and atmospheric heat/mass fluxes; riverine inputs and remote drivers.
Model results will be rigorously validated against different available observational data, including unique, long-term time series of biogeochemical variables maintained by the ICM-CSIC. Furthermore, the candidate will develop and apply Artificial Intelligence tools to reconstruct gaps in these historical datasets, enhancing their utility for model evaluation and long-term trend analysis.

TRAINING AND RESEARCH ENVIRONMENT

This project offers comprehensive training in:
•Advanced numerical modeling and high-performance scientific computing,
•Analysis of large physical and biogeochemical datasets,
•Understanding physical and biological oceanography and their response to climate variability,
•Development and application of Artificial Intelligence.

The successful candidate will be integrated into a vibrant and collaborative research ecosystem. They will be based within the Physical and Technological Oceanography department and the Plankton Ecology and Ocean Health research groups at the Institut de Ciències del Mar (ICM-CSIC). They will also actively participate in the activities of the ICM-CSIC Climate Change HUB and the Institut Català de la Recerca per a la Governança del Mar (ICATMAR)
The candidate will have opportunities for research stays with international and national partners, including the National Institute of Oceanography and Applied Geophysics (OGS, Italy) and the University of Málaga. Participation in NWMS-related field campaigns may also be possible through ongoing collaborations, providing a valuable complement to the modeling work.

07. PhD in Decadal variability and trends in NW Mediterranean coastal ecosystems driven by climate processes

REQUIREMENTS

Essential:

- Degree in Physics, Oceanography, Marine Sciences, Geophysics, Mathematics, Engineering, or related quantitative field.
- Master's degree (required for PhD enrollment).
- Strong quantitative and analytical skills, with experience in scientific data analysis.
- Programming skills (Python, MATLAB, R, or equivalent).
- Excellent English communication skills (written and oral).
- Availability for research stays abroad.
- Demonstrated interest in physical oceanography, climate dynamics, or biogeochemistry.

Desirable:

- Experience with numerical hydrodynamical/biogeochemical modeling.
- Proficiency in processing geophysical datasets (e.g., satellite, in situ, reanalysis).
- Knowledge of AI/machine learning techniques.
- Familiarity with high-performance computing.
- Background in statistical time-series analysis.

Starting date: January 2027

Interested candidates may contact Joaquim Ballabrera (joaquim@icm.csic.es, DOFT, ICATMAR), **Magda Vila** (magda@icm.csic.es, HOPE, ICM) **and Savitri Galiana** (galiana@icm.csic.es, DOFT, ICATMAR)

08. PhD in Southern Ocean Convection

Funding programme: Severo Ochoa Predoctoral fellowships awarded as "Ayuda para contratos predoctorales para la formación de doctores/as", (formerly known as FPIs).

PhD Advisors - Estrella Olmedo and Carles Pelejero

THE OFFER

We offer a four-year predoctoral contract for doctoral training funded by the Spanish Ministry of science, Innovation and Universities, associated with the topic: **"Southern Ocean Convection: Current State, Historical Context, and Global CO_2 Implications"**, ascribed to the ICM-CSIC Climate Change HUB.

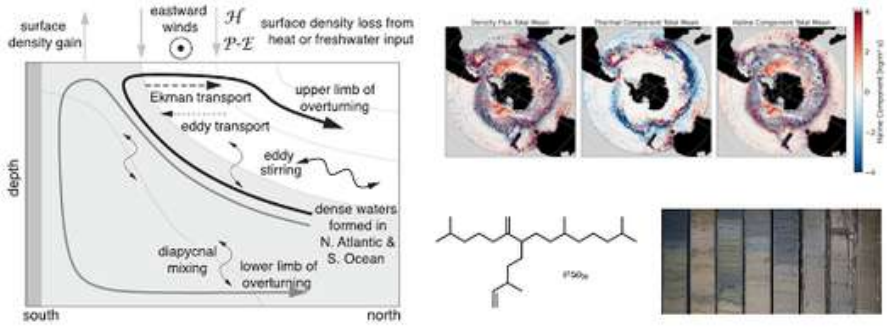
THE PROJECT

The Southern Ocean is a key component of the Earth's climate system, connecting the major ocean basins and acting as a major sink of anthropogenic heat and atmospheric CO_2. Deep convection and ocean ventilation processes play a central role in regulating carbon storage and exchanges between the ocean and the atmosphere, yet substantial uncertainties remain regarding their evolution and stability under ongoing climate change.

The main scientific question of the project is: How has Southern Ocean deep convection evolved from the historical record to the present day, and which key drivers and indicators determine its variability and stability under climate change? A second, closely related objective is to understand how changes in convection and its coupling with sea-ice processes influence the Southern Ocean's role as a sink or source of atmospheric CO_2.

The PhD candidate will combine multiple types of observations spanning different timescales. The project includes the analysis of satellite observations and ocean reanalysis products to characterize present-day convection and ventilation processes, as well as the study of high-resolution marine sediment records and sea-ice proxies to reconstruct past variability in the Southern Ocean. By integrating modern observations with paleoclimate reconstructions, the student will investigate the links between ocean circulation, sea-ice dynamics, and the global carbon cycle.

The project offers training in the analysis of large geophysical datasets, satellite oceanography, climate variability, physical oceanography, and paleoceanography. The student will be integrated within the Barcelona Expert Center (BEC) and the Marine Biogeochemistry, Atmosphere and Climate (MBAC) research groups at the Institut de Ciències del Mar (ICM-CSIC), with close collaborations within the Antarctic InSync Initiative and international partners.
Opportunities for research stays are available at leading institutions including the University of Southampton (UK), the Alfred Wegener Institute (Germany), and the University of Plymouth (UK). Participation in Antarctic-related field activities may also be possible through ongoing collaborations.



REQUIREMENTS

- Degree in Physics, Applied Physics, Oceanography, Marine Sciences, Geophysics, Environmental Sciences, Mathematics, Engineering, or a related quantitative discipline.
- Master's degree required for enrollment in a PhD program.
- Strong quantitative and analytical skills, including experience in scientific data analysis.
- Programming experience (e.g., Python, MATLAB, R, or similar).
- Strong written and oral communication skills in English.
- Availability to undertake research stays abroad.
- Interest in physical oceanography, climate dynamics, sea-ice processes, Earth observation, or ocean biogeochemistry.
- Previous experience with satellite observations, geophysical datasets, numerical models, laboratory work, or paleoclimate archives will be considered an asset.

Starting date: January 2027

Interested candidates may contact Estrella Olmedo (olmedo@icm.csic.es) **& Carles Pelejero** (carles.pelejero@icrea.cat).

09. PhD in Open Schooling and Participatory Environmental Monitoring

Funding programme: Severo Ochoa Predoctoral fellowships awarded as "Ayuda para contratos predoctorales para la formación de doctores/as", (formerly known as FPIs).

PhD Advisors - Carlos Rodero, EMBIMOS, ICM-CSIC; Marta Carretón, EMERGE, ICM-CSIC; and Digna Couso, ACELEC, UAB.

THE OFFER

We offer a four-year predoctoral contract for doctoral training associated with the project **"Analysing the educational and scientific impact of Open Schooling environmental initiatives: co-creation approaches to monitoring marine biodiversity"**, ascribed to the Severo Ochoa Applicable and Inspiring Science scheme at the Institut de Ciències del Mar (ICM-CSIC), in collaboration with the Universitat Autònoma de Barcelona (UAB).

THE PROJECT

Open Schooling connects science education with real societal challenges through collaboration among schools, communities, researchers, public bodies, civil society and productive-sector actors. In marine and coastal contexts, Blue School and citizen-science initiatives have shown strong potential to enhance ocean literacy, inquiry-based learning and public engagement. However, few initiatives combine robust educational and scientific objectives or involve schools in the co-design, deployment and interpretation of environmental-monitoring technologies.

This PhD will investigate how participatory technologies can be integrated into Open Schooling to connect science education with real marine and coastal monitoring needs. The research will examine how these approaches affect students' scientific literacy, STEM identity, technological agency and environmental stewardship, and what educational, scientific and societal outputs can be generated through school-based environmental monitoring.

The project is aligned with the Severo Ochoa Societal Impact Pillar and adopts an impact-by-design approach through the early involvement of educational, research, administrative, civil-society and productive-sector stakeholders. It is based on the hypothesis that inquiry-based, cooperative and situated participation as makers, observers and analysers can strengthen students' and teachers' understanding of how scientific knowledge is produced, validated and applied in real environmental contexts.

09. PhD in Open Schooling and Participatory Environmental Monitoring

The PhD will be developed at the interface between science education research, participatory technologies and marine ecology. At ICM-CSIC, the candidate will work with Carlos Rodero within EMBIMOS, contributing expertise in citizen science, MINKA workflows, participatory technologies, DIY/low-cost sensing and community-based marine observation. The candidate will also work with Marta Carretón within EMERGE, connecting the project with marine ecological knowledge, biodiversity monitoring and potential links with coastal stakeholders such as aquaculture, fisheries or other marine-sector actors. The educational research dimension will be developed in close collaboration with Digna Couso and the UAB-recognised research group ACELEC.

The methodology will support the co-design of school-based monitoring activities, the development or adaptation of low-cost tools and shared protocols, the collection, validation and interpretation of environmental and biodiversity data, and the mixed-method assessment of educational, scientific and societal outcomes. During the first stage of the PhD, the candidate will help identify the most suitable empirical contexts from existing ICM-CSIC lines of work, according to scientific relevance, educational value, stakeholder availability and feasibility.

Expected outputs include a transferable framework for Open Schooling environmental monitoring initiatives, three peer-reviewed publications, open protocols, datasets, educational resources and practical recommendations for schools, public administrations, citizen-science practitioners and coastal stakeholders. In the long term, the project aims to support scalable monitoring initiatives that simultaneously advance marine knowledge, inclusive science education, community stewardship and evidence-informed public action.

The candidate will receive interdisciplinary doctoral training at the intersection of science education, citizen science, participatory technologies and marine ecology. At ICM-CSIC, the candidate will be integrated into EMBIMOS, gaining experience in MINKA, citizen-science project design, participatory data workflows, DIY/low-cost environmental sensing, community-based marine observation and science communication. Through EMERGE, the candidate will be exposed to marine ecological research, biodiversity monitoring and interactions with coastal and productive-sector stakeholders. In collaboration with Digna Couso and ACELEC at UAB, the candidate will receive specialised training in Open Schooling, science education research, design-based research, mixed-methods analysis, learning assessment, STEM identity, technological agency, research ethics with minors and teacher/student engagement. The project offers the opportunity to develop a distinctive profile bridging educational research, marine sustainability, participatory monitoring and societal impact. Training opportunities may include ICM-CSIC doctoral and transversal training, UAB PhD seminars, APICE and ESERA doctoral activities, Blue School-related activities, citizen-science workshops, national and international conferences, and potential short research stays with institutions experienced in Open Schooling, Blue Schools, citizen-science impact assessment or marine education.

REQUIREMENTS

- Degree in Biology, Environmental Sciences, Marine Sciences, Education, Science Education, Pedagogy, or related disciplines.
- Master's degree required for enrolment in a PhD programme.
- Interest in science education, Open Schooling, citizen science, marine/coastal environmental monitoring and societal impact.
- Experience or strong motivation to work with schools, teachers, students and/or community stakeholders.
- Capacity to work in interdisciplinary environments combining educational, scientific and technological perspectives.
- Basic skills in data analysis. Experience with R, Jamovi, ATLAS.ti, Python or similar tools will be considered an asset.
- Strong written and oral communication skills in English. Catalan and/or Spanish will be important for interaction with schools and local stakeholders.
- Previous experience in educational research, science communication, citizen science, environmental monitoring, marine ecology, low-cost sensors or participatory projects will be considered an asset.

Starting date: January 2027

Interested candidates may contact Carlos Rodero (rodero@icm.csic.es)**, Marta Carretón** (mcarreton@icm.csic.es) **and Digna Couso** (digna.couso@uab.cat)**.**

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10. PhD in Ocean Cities as Diplomatic Actors

Funding programme: Severo Ochoa Predoctoral fellowships awarded as "Ayuda para contratos predoctorales para la formación de doctores/as", (formerly known as FPIs).

PhD Advisors - Marco Talone (ICM) and Oriol Costa (UAB & IBEI)

THE OFFER

We offer a four-year predoctoral contract for doctoral training funded by the Spanish Ministry of science, Innovation and Universities, associated with the topic: **"Ocean Cities as Diplomatic Actors: How Coastal Cities Use Marine Science to Shape Global Ocean Governance"**, ascribed to the ICM-CSIC Internationalization & Science Diplomacy Associate Deputy Directorate, and UAB.

THE PROJECT

Ocean governance has traditionally been dominated by nation-states through frameworks such as UNCLOS, the BBNJ Agreement, and IOC-UNESCO. However, coastal cities are increasingly emerging as diplomatic actors, using transnational municipal networks and science-based initiatives to influence global governance agendas. While city diplomacy is well established in climate governance, its role in ocean governance remains largely unexplored. The proposed research examines how and under what conditions coastal cities employ marine science as a diplomatic instrument to influence international ocean governance, and what factors determine the effectiveness of their science-based diplomatic strategies. The central hypothesis is that cities combining strong links to credible marine scientific institutions with active participation in transnational networks exert greater influence than cities relying on only one of these assets. Marine science is expected to provide legitimacy, facilitate coalition building, and strengthen policy positions in international arenas.

The project integrates International Relations, science diplomacy, multilevel governance, and marine science governance, contributing to the Societal Impact Pillar through policy-relevant knowledge and stakeholder co-production. Using comparative case studies of Barcelona, Faro, Ensenada, Concepción, and Qingdao, the research combines elite interviews, documentary analysis, and process tracing. Expected outcomes include a novel theoretical framework, the first comparative analysis of coastal cities as ocean science diplomacy actors, practical policy guidance for city networks, and significant contributions to emerging debates on post-2030 ocean governance.

The project offers a unique opportunity to work at the frontier of ocean science diplomacy, embedded within one of Europe's leading marine science institutions. The student will be co-supervised by two complementary experts: a leading ocean science diplomacy practitioner and a senior International Relations scholar and will have access to international research stays at leading institutions such as the Research Institute for Sustainability (RIFS), Potsdam (Germany), or World Maritime University – Sasakawa Global Ocean Institute, Malmö (Sweden). Throughout the PhD, the student will develop transferable skills in science diplomacy, qualitative research methods, policy brief writing, and stakeholder engagement – highly valued in both academic and policy careers – while producing research with direct policy impact at a critical moment for the governance of the global ocean commons.

REQUIREMENTS

- Degree in Political Sciences, International Relations, or a related social science discipline.
- Master's degree required for enrollment in a PhD program.
- Strong analytical and writing skills, with experience in qualitative research methods.
- Strong written and oral communication skills in English. Knowledge of Catalan, Spanish and/or additional languages relevant to the case study cities will be considered an asset.
- Interest in ocean governance, science diplomacy, international environmental politics, or municipal foreign policy.
- Availability to undertake a research stay abroad and fieldwork in OC-NET member cities.
- Previous experience in qualitative research (interviews, case studies, document analysis), policy analysis or engagement with international organizations will be considered an asset.

Starting date: January 2027

Interested candidates may contact Marco Talone (international@icm.csic.es) **& Oriol Costa** (oriol.costa@uab.cat)**.**