

Regional School

LAOCA 2025

Unraveling the Impact of Deoxygenation and Coastal Acidification in the Latin American Region:

From Physical and Chemical Perspectives
to Evolutionary Implications

10-14
NOVEMBER 2025

Application deadline: August 25, 2025

Language: Spanish

Location: Universidad del Mar, Puerto Ángel, Oaxaca,
Mexico



This school will train young scientists from the region in key tools to understand and address these challenges, integrating **science, sustainability, and equity.**

Organization

Organized by:

Latin American Ocean Acidification Network (LAOCA)

Dr. Cecilia Chapa-Balcorta – Department of Oceanology, Universidad del Mar, Oaxaca, Mexico, &
LAOCA Co-Chair

Dr. Cristian A. Vargas – Department of Aquatic Systems, Faculty of Environmental Sciences, Universidad de Concepción, & Coastal Social-Ecological Millennium Institute, SECOS, Chile

Dr. Rodrigo Kerr – Universidade Federal do Rio Grande (FURG), Brazil LAOCA Co-Chair

Sponsored by:

- Scientific Community on Ocean Research (SCOR)
- The Ocean Foundation (TOF)
- Coastal Social-Ecological Millennium Institute (SECOS)
- Millennium Institute of Oceanography (IMO)
- Universidad Autónoma de Baja California (UABC) – México
- Universidad del Mar (UMAR) – México
- Universidad de Concepción (UdeC) – Chile
- Research Program for Climate Action Planning (CLAP Project – ANID)



Rationale

The Latin American region has emerged as a global hotspot for studying the effects of expanding Oxygen Minimum Zones (OMZs) and coastal acidification. These phenomena, driven by climate change and anthropogenic impacts, pose significant threats to marine ecosystems and the communities that depend on them. The combined effects of deoxygenation and acidification are particularly pronounced in this region due to the prevalence of upwelling zones, nutrient-rich coastal waters, and ecosystems that are highly sensitive to environmental change. Addressing these challenges requires a comprehensive understanding of their physical, chemical, biological, and socio-economic implications, along with the development of regional scientific capacity.

OMZs are expanding globally due to climate-driven changes in ocean circulation and stratification, leading to lower dissolved oxygen concentrations across vast areas of the ocean. Latin America is particularly affected by these processes, with extensive OMZs along the eastern Pacific coast, stretching from Chile and Peru to Mexico. These zones are characterized by low oxygen, low pH, and high $p\text{CO}_2$ conditions that exert severe physiological stress on marine organisms, especially those critical to artisanal fisheries and aquaculture, such as scallops, oysters, and other shellfish. Coastal acidification, exacerbated by the upwelling of acidic waters and land-based pollution, further compounds the vulnerabilities of these ecosystems and the communities that rely on them.

Marine resources hold immense economic and cultural value for Latin America, supporting livelihoods through artisanal fisheries, shellfish aquaculture, and tourism. In Mexico, coral reefs contribute significantly to tourism and coastal protection, while in Peru and Chile, shellfish aquaculture is a cornerstone of local economies. The cascading impacts of deoxygenation and acidification threaten the productivity and resilience of these resources. Declines in fish stocks, shellfish die-offs, and coral reef degradation jeopardize economic stability and exacerbate food insecurity and social inequality in coastal communities.

Despite growing awareness of these challenges, Latin America faces critical gaps in scientific expertise, infrastructure, and coordination to address the combined effects of deoxygenation and coastal acidification. Many early-career researchers and institutions lack access to state-of-the-art techniques for measuring and monitoring carbonate chemistry, assessing the impacts of OMZs, or modeling future scenarios. This knowledge gap hampers the region's ability to develop and implement effective mitigation and adaptation strategies tailored to local and regional needs.

Scope

The Regional School “**Unravelling the Impact of Deoxygenation and Coastal Acidification in the Latin American Region: From Physical and Chemical Perspectives to Evolutionary Implications**” is designed to address existing knowledge and capacity gaps by fostering scientific collaboration and strengthening research capabilities across the region. Organized by the **Latin American Ocean Acidification Network (LAOCA)**, in collaboration with the **Coastal Social-Ecological Millennium Institute (SECOS)** and the **Millennium Institute of Oceanography (IMO)**, and sponsored by international partners including **The Ocean Foundation (TOF)** and the **Scientific Committee on Oceanic Research (SCOR)**, and **Chilean (UdeC)** and **Mexican universities (UABC, UMAR)**, this school offers an interdisciplinary platform to train approximately 18 Latin American scientists in cutting-edge methodologies and concepts related to ocean deoxygenation and acidification.

This initiative will also emphasize the socio-economic dimensions of these environmental challenges, with a focus on empowering coastal communities to build resilience through sustainable practices and informed policy interventions. Including researchers from underrepresented regions will ensure a diversity of perspectives and promote equity in scientific capacity building. By creating a network of trained scientists equipped to study and address these critical issues, the Regional School will contribute to the long-term goal of mitigating the impacts of deoxygenation and coastal acidification in Latin America. Additionally, it will strengthen collaboration among local, regional, and global initiatives, including the Global Ocean Acidification Observing Network (GOA-ON) and Global Ocean Oxygen Network (GO2NE).

With representation from at least 4 to 5 Latin American countries involved in LAOCA, as well as other developing nations, the workshop will convene nine renowned Latin American scientists from Mexico and Chile, along with 16 to 18 selected participants.



Course objectives and content

Upon completion of the training course, participants will have gained increased knowledge in the following aspects:

- Building foundational knowledge of the scientific processes driving deoxygenation and coastal/ocean acidification.
- Exploring the physical, chemical, and biological dynamics of Oxygen Minimum Zones (OMZs) in the Eastern Tropical Pacific (ETP) off Central America and its extension to the Southern Pacific Ocean in and their variation mechanisms.
- Assessing the impacts of hypoxia and low pH/high pCO₂ levels on marine organisms populations (i.e., plankton, bivalves, crustaceans, and fishes).
- Discussing the evolutionary implications for species under prolonged exposure to hypoxia and acidification, including both local and global drivers.
- Equipping participants with skills to conduct experiments, analyze data, and develop adaptive strategies for artisanal fisheries, aquaculture, and tourism.

Expected outcomes:

We expect participants to further propose and develop the research agenda related to the impacts of coupled ocean acidification and deoxygenation in order to increase knowledge and produce high-quality data that will contribute to global databases.

All participants who complete the workshop will be given participation certificates.



Who should attend?

We invite **early-career researchers, including more specifically to postdoctoral researchers and PhD students** from Latin American countries, especially LAOCA members, who are directly engaged in studying deoxygenation and coastal acidification. This course prioritizes participants **working in physical, chemical, and experimental disciplines**, with a focus on physical or chemical oceanography coupled with **deoxygenation/acidification** processes, as well as the biological and evolutionary responses to these pressing environmental issues. If you are actively contributing to this field, we encourage you to join us in exploring these critical challenges at this regional workshop.

How to apply?

Interested participants must complete the **online application** form available at the following link:

<https://docs.google.com/forms/d/e/1FAIpQLSeUaBYFXM7TYBh-PIGHKubpt2CrI2rYJFcSXLd1QeITLYrGmQ/viewform?usp=header>

- Applicants must fill out all required fields, including **personal and academic information**, and upload a .pdf file with a **summarized CV** (maximum 4 to 5 pages), as well as a separate file with a **letter of intent** describing their experience in the topic, current interests, and the expected benefits of participating in this course.
- Maximum number of participants: 18

Travel funding will be provided for up to 8 participants, including round-trip airfare from the capital city of their country (e.g., Santiago de Chile, Lima, Quito, San José, Panama City, etc.) and hotel expenses. Meals are not included in the scholarship, nor the transportation from other regions to the capital city of their country. Therefore, selected participants are expected to seek additional support from their institutions to cover these costs.

Instructors



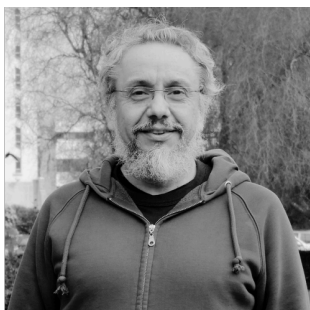
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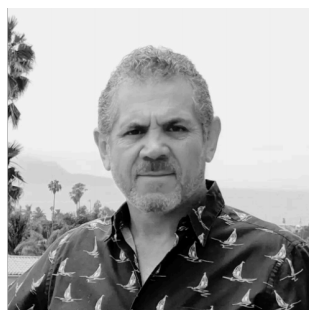
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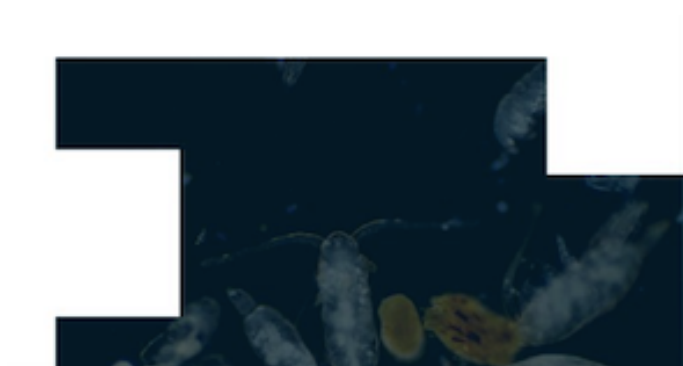
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