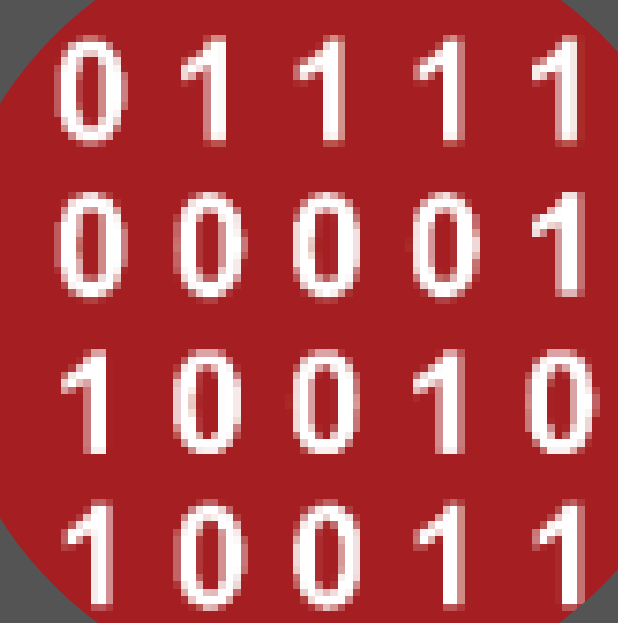


# TRACKING GLOBAL OCEAN ACIDIFICATION: SUSTAINED HIGH-QUALITY DATA



Our goal is to empower the global scientific community to track ocean acidification progress and trends by ensuring sustained, high-quality data across global platforms and integrating these into comprehensive synthesis products.

## VISION

The global science community will be equipped to provide the high-quality and high-resolution ocean acidification data needed.

## THE CHALLENGE

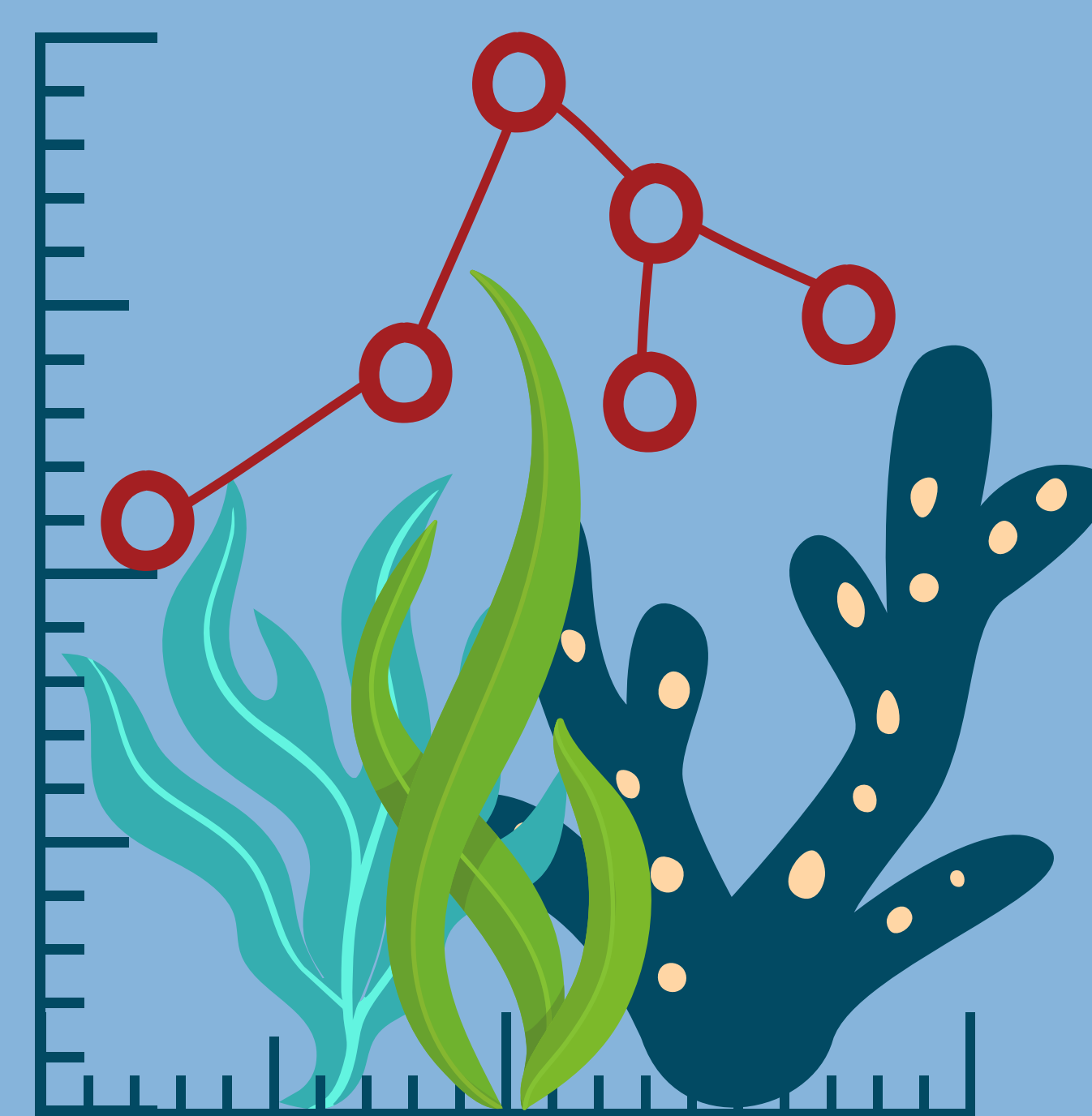
While much infrastructure is developed, some restrictions and vulnerabilities must be addressed to ensure all relevant ocean acidification observations contribute to a global data system.

Join us in advancing global ocean acidification data integration and synthesis.

Download the full report here:

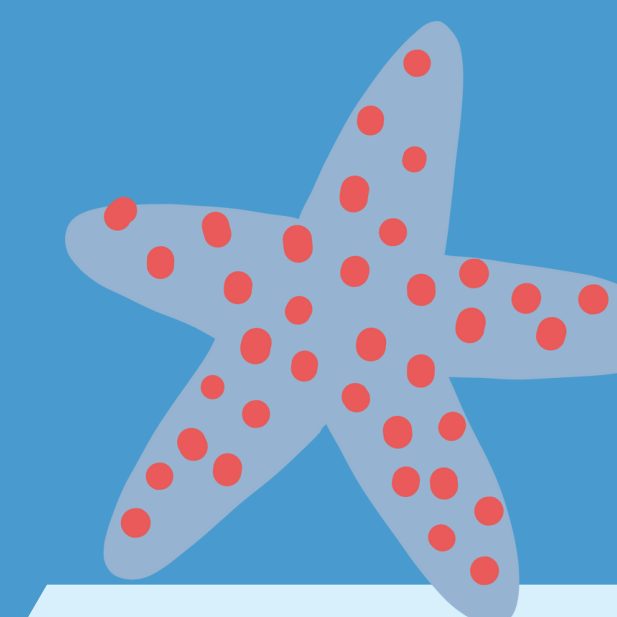


If you have any questions, please contact:  
Carla Berghoff: [cberghoff@inidep.edu.ar](mailto:cberghoff@inidep.edu.ar)  
Nico Lange: [nlan@norceresearch.no](mailto:nlan@norceresearch.no)



## WHAT IS NEEDED TO ACHIEVE OUR VISION?

Sustained and integrated physical, chemical, and biological observations



Production of data synthesis products tailored to end-users

Submission and archiving of quality-controlled data within national and regional data centers

Capacity building and mentoring

Communication and collaboration building

## OUR CURRENT FOCUS

### TOOLS



QUALITY CONTROL TOOL DATA  
EQUIPMENT AND SENSORS CATALOGUE

### OBSERVING



METS-RCN MARINE ECOLOGICAL TIMESERIES

### SYNTHESIS

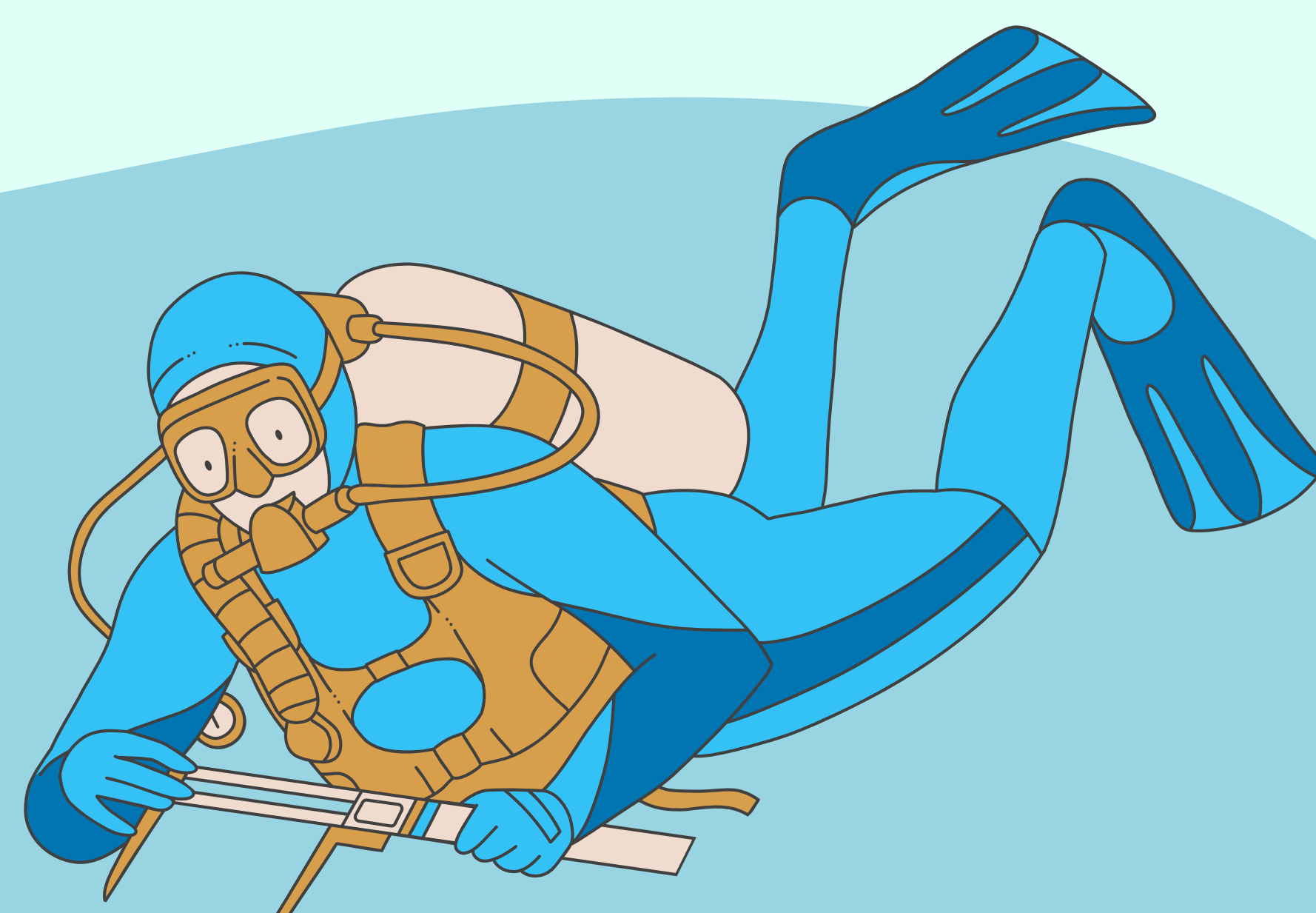


SDG 14.3.1 DATA PORTAL; GLODAP; SOCAT

science  
↓  
action

OARS OUTCOME 2

## IDENTIFYING DATA AND EVIDENCE NEEDS FOR OA MITIGATION AND ADAPTATION






### VISION

Our vision is to advance ocean acidification mitigation and adaptation by identifying critical data and evidence needs and making them available to empower decision-makers with the information necessary for effective action.

### THE CHALLENGE

Implementing actions to minimize and address the effect of OA requires considerations of:

-  Time, space, and cost constraints
-  Alignment with existing policy or management goals
-  Assessment of broader environmental and socio-economic risk and benefits

### WHAT IS NEEDED?

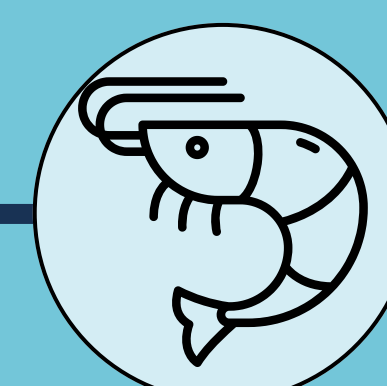
Governments and end-users need examples of targeted information that they can use to support local mitigation, adaptation, and preparedness strategies. This is especially true when setting management targets, tailoring responses, and balancing impacts on ecosystem services and marine resources that communities rely on.

### OUR CURRENT WORK

We are working with the OA community to develop case studies that demonstrate how OA data supports decision-making in:



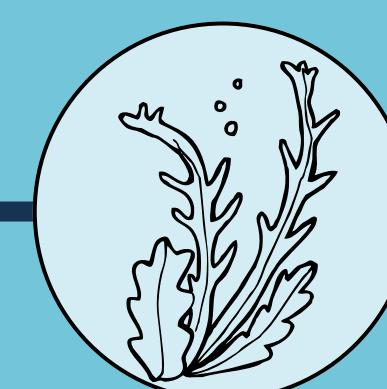
Evaluating GHG emissions' impact on human and ocean health.



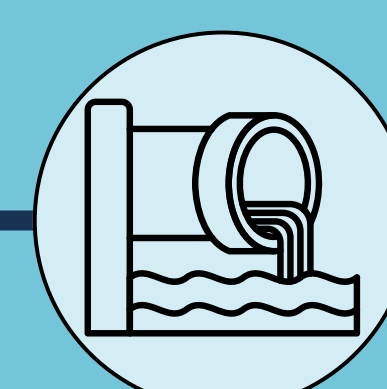
Increasing food security and resilience in seafood economies and coastal communities.



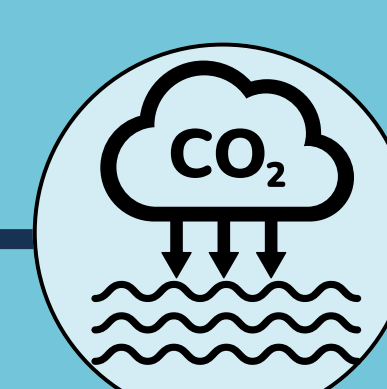
Using marine management tools to protect and restore biodiversity.



Deploying blue carbon sequestration projects or enhancing ecosystem resilience.



Reducing coastal pressures and land-based pollution.



Evaluating marine carbon dioxide removal strategies.

Download the full report here:



If you have any questions, please contact:  
Jessie Turner: [jturner@unfoundation.org](mailto:jturner@unfoundation.org)  
Richard Bellerby: [richard.bellerby@niva.no](mailto:richard.bellerby@niva.no)

# OCEAN ACIDIFICATION OBSERVING STRATEGIES

## THE CHALLENGE

While mechanisms are being established to strengthen ocean mitigation and adaptation measures across relevant UN and international conventions, capacity for generating tailored information for local management, policy response and preparedness remains a significant barrier to advancing necessary adaptation efforts.

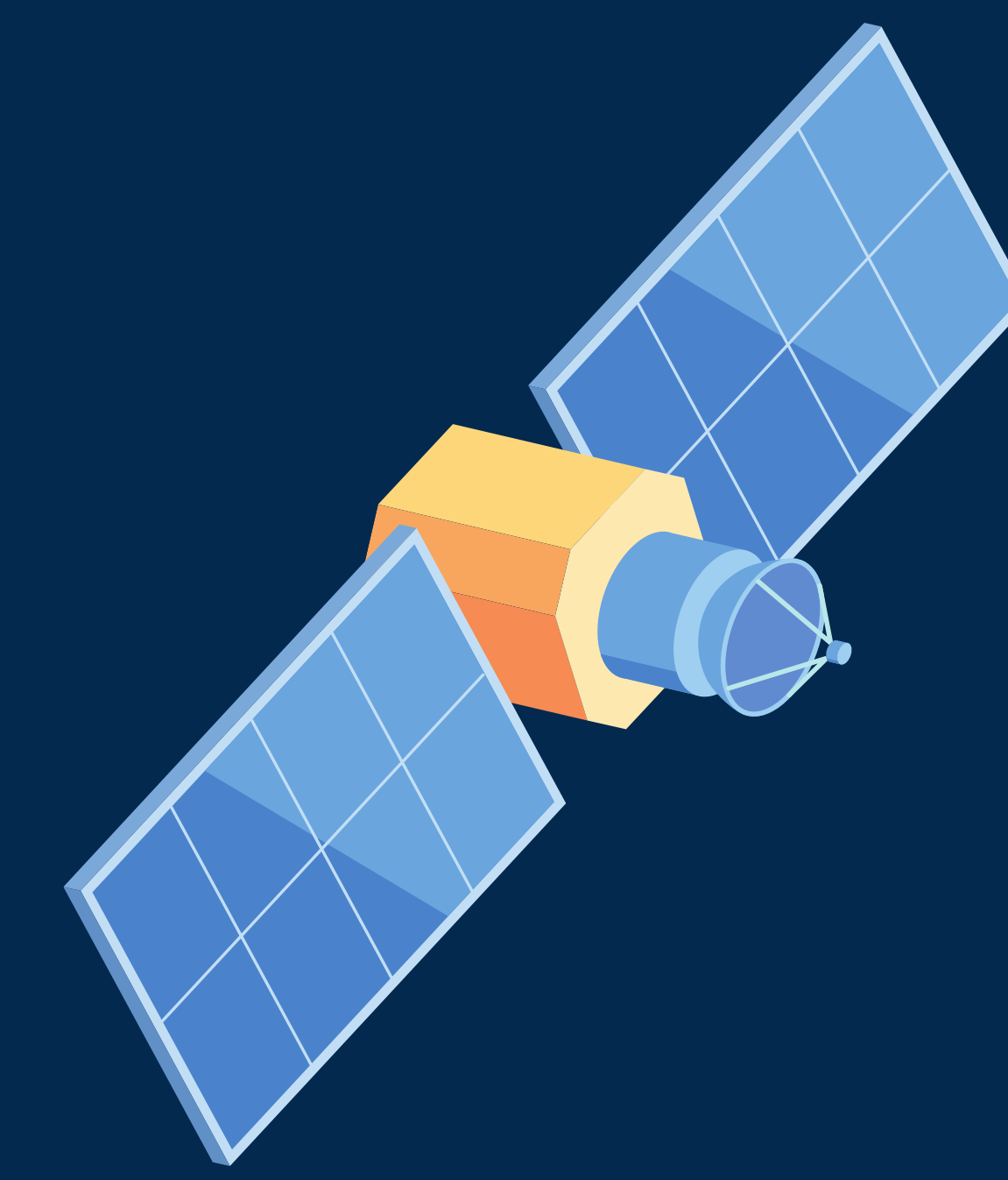
## WHAT IS NEEDED?

- Co-design and implement observation strategies in collaboration with data and information producers and end-users, including ships of opportunity and the aquaculture industry.
- Identify factors limiting collection of data and implementation of solutions and collaborate with OARS Outcome 1 activities to amend the identified issues.
- Proactively design and implement observation strategies to ensure vulnerable areas are adequately monitored.

Download  
the full report  
here:



If you have any questions, please contact:  
Jose Martin Hernandez Ayon: [jmartin@uabc.edu.mx](mailto:jmartin@uabc.edu.mx)  
Véronique Garçon: [veronique.garcon.legos@gmail.com](mailto:veronique.garcon.legos@gmail.com)

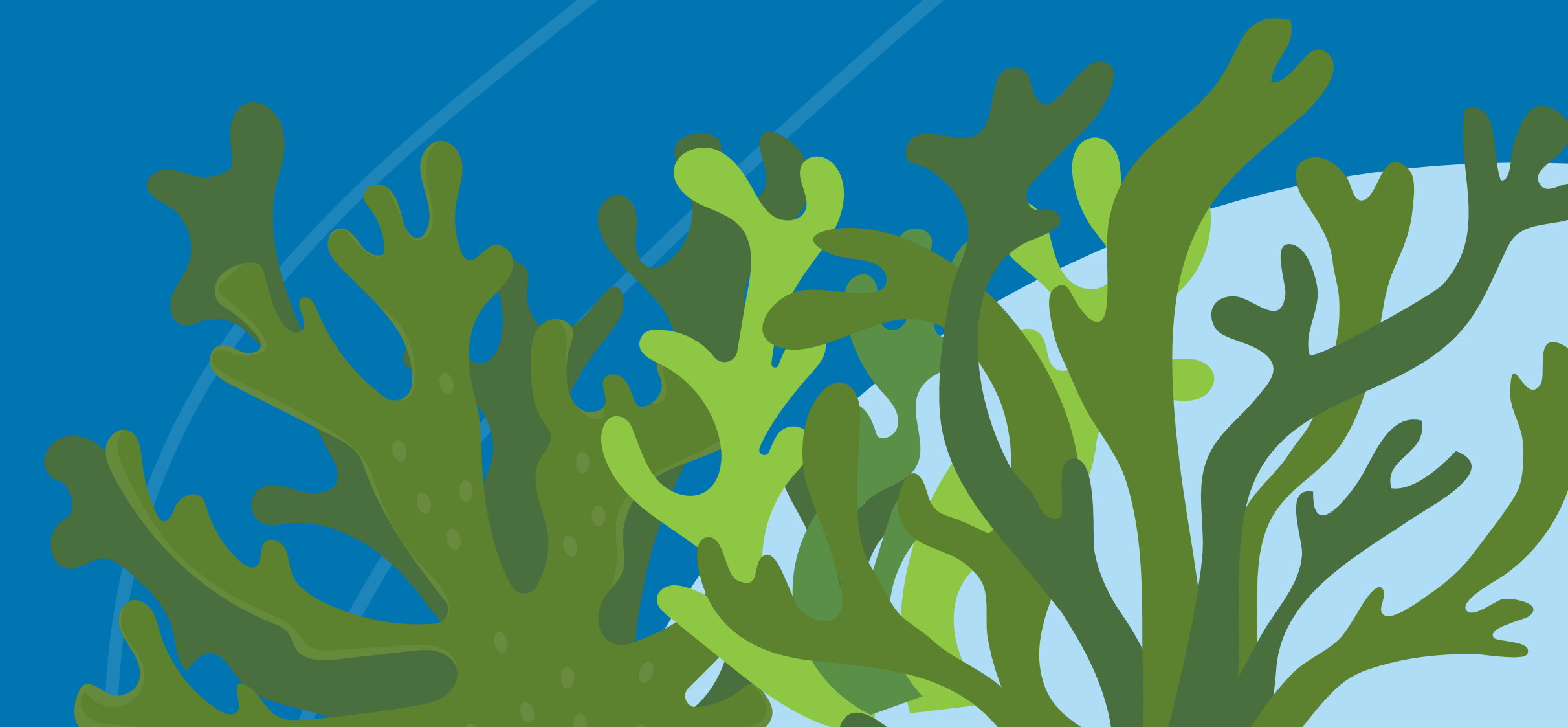


## VISION

Long-term ocean observing systems will be co-designed and implemented by scientists, funders, and end-user partnerships.

## OUR CURRENT AND FUTURE WORK

-  **STAKEHOLDER-ORIENTED CO-DESIGN WITH AQUACULTURE INDUSTRIES:**  
Test sites: Tongoy Bay, Chile (sea scallops), San Quintin Bay, Ensenada, Mexico (oysters)
-  **PROMOTING DEVELOPMENT AND USE OF LOW-COST SENSORS FOR REGIONAL INITIATIVES**
-  **PARTNERSHIP WITH THE PONANT COMPANY:**  
Collection of carbonate chemistry data off Costa Rica and Panama

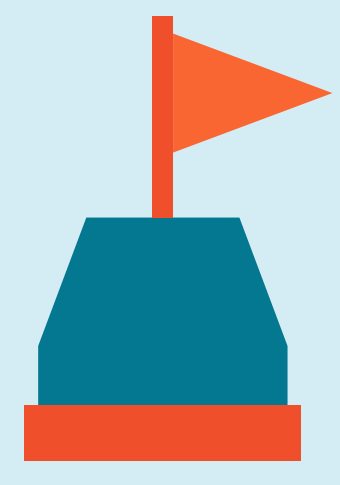


## OARS OUTCOME 4

# BIOLOGICAL IMPACTS OF OCEAN ACIDIFICATION (OA)

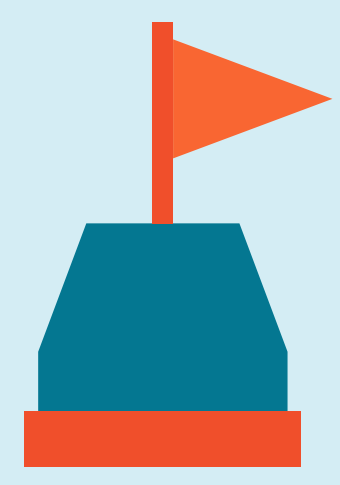
## THE ROADMAP

This strategic guideline outlines the steps, priorities, and required actions needed to achieve the goals of the OARS initiative:



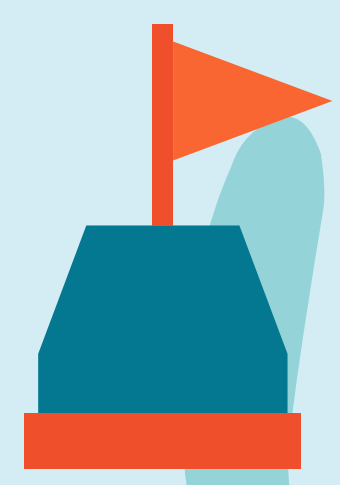
### ENGAGEMENT WITH STAKEHOLDERS

Coordinating with resource managers, observing system planners, coordinators, and scientists to collaboratively design the roadmap.



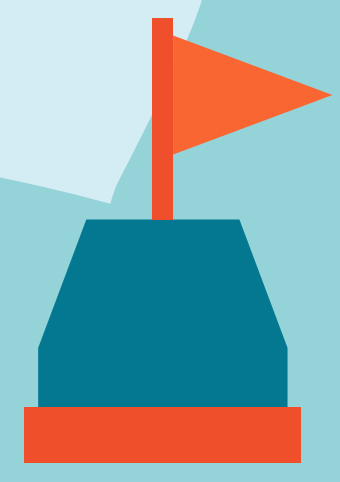
### IDENTIFYING KNOWLEDGE NEEDS

Pinpointing the necessary OA knowledge for effective decision-making, including data quality and resolution requirements.



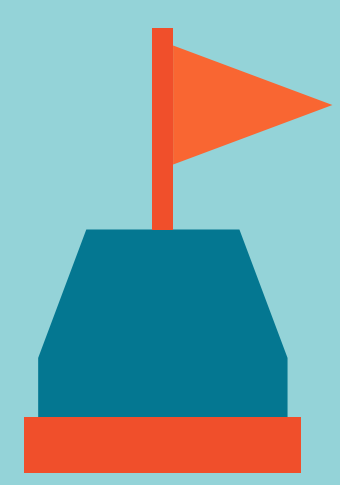
### EVALUATION & GAP ANALYSIS

Assessing current data, identifying gaps, and understanding the reasons for these gaps (e.g., data sharing issues, communication barriers, funding shortages).



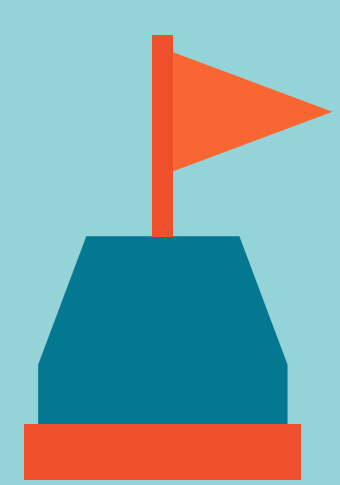
### POLICY INTEGRATION

Ensuring OA considerations are included in international and national policy frameworks (e.g. the Convention on Biological Diversity, IPBES, the UNFCCC).



### OPTIMAL USE OF INFORMATION

Utilising existing information efficiently to avoid delays in implementing actions to mitigate OA impacts.



### KNOWLEDGE SYNTHESIS & RECOMMENDATIONS

Summarising existing information, generating new knowledge from current data, and providing clear recommendations for future research and capacity-building efforts.

Download the full report here:



If you have any questions, please contact:  
Sam Dupont: [sam.dupont@bioenv.gu.se](mailto:sam.dupont@bioenv.gu.se)  
Carla Edworthy: [carlaedworthy@gmail.com](mailto:carlaedworthy@gmail.com)



## VISION

A healthy ocean, through the production of timely, accurate, and solution-oriented information on the impact of OA on marine life to inform policy and management.

We must integrate all of the aspects of OA with other drivers to understand their impact on marine life. OARS Outcome 4 bridges aspects of monitoring, biological impacts, and societal consequences, and works closely with the other OARS Outcome groups to achieve its goal.

## WHO DO WE NEED TO ACHIEVE THIS?

### ACADEMIC COMMUNITY

Researchers across various disciplines to support and conduct essential research.

### LOCAL COMMUNITIES

Contribute local knowledge, reduce impacts on marine systems, and advocate for better marine management.

### INDUSTRY

Developers of new technologies and marine sector industries to offer facilities, knowledge, and resources.



### FUNDERS

Funding agencies and philanthropy to provide necessary resources.

### EDUCATORS AND COMMUNICATORS

Educators, media, and artists to inform the public and inspire action.

### POLICYMAKERS

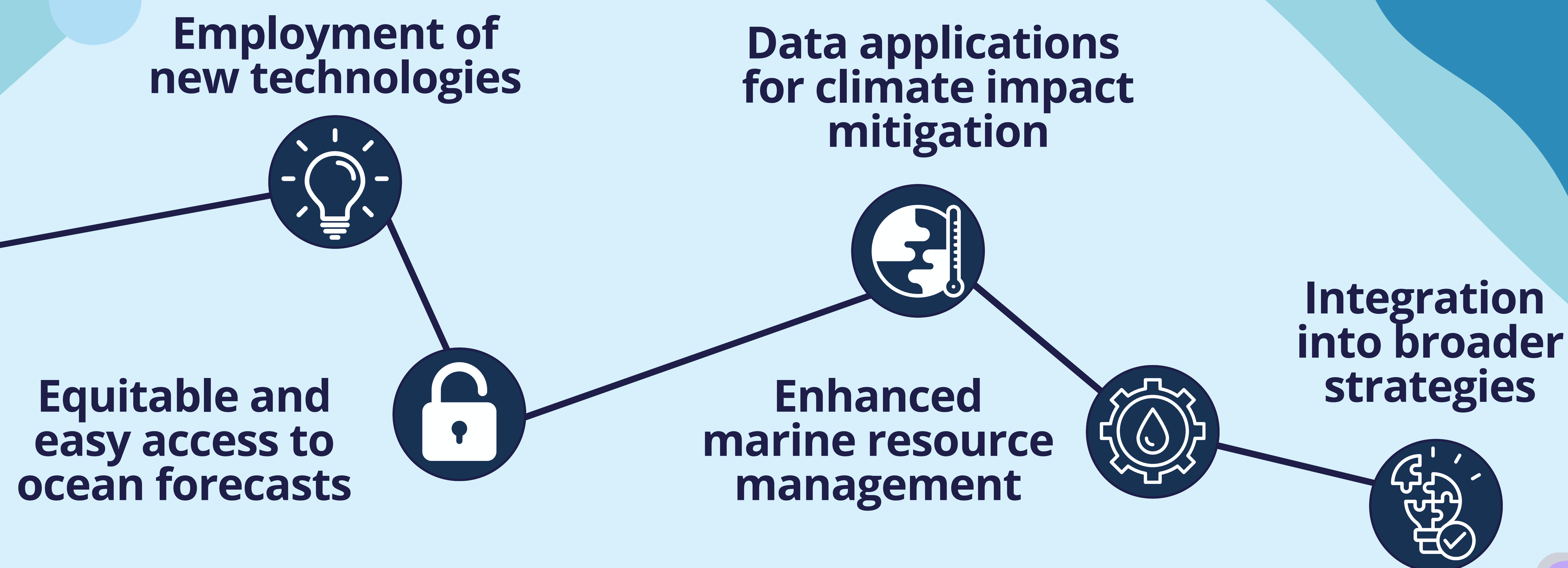
Utilise research data to support and implement environmental legislation.

# PREDICTIONS AND PROJECTIONS OF OCEAN ACIDIFICATION

## VISION

Freely available predictions of the impacts of ocean acidification will support society's mitigation and adaptation efforts. To achieve this, we need timely, reliable, and accessible ocean data, information, and new technologies for the benefit of all ocean users.

## WHAT IS NEEDED?



## THE CHALLENGE

Coastal processes can amplify or alter ocean acidification, but these changes happen on small scales that Earth System Models don't capture well. As a result, coastal communities lack reliable predictions to help them respond to ocean acidification. Some regions do have forecasts, but these are often too complex for non-experts due to large data sizes, uncertainty in predictions, and difficult-to-use interfaces.

Download the full report here:



If you have any questions, please contact:  
Richard Bellerby: [richard.bellerby@niva.no](mailto:richard.bellerby@niva.no)  
Samantha Siedlecki: [samantha.siedlecki@uconn.edu](mailto:samantha.siedlecki@uconn.edu)

## OARS OUTCOME 6

# PUBLIC AWARENESS OF OCEAN ACIDIFICATION (OA)

## VISION

Increased public awareness and action on ocean acidification, its sources, and impacts, achieved via ocean literacy and public outreach.

## WHAT IS OCEAN LITERACY?



Ocean Literacy is more than just knowledge about ocean functioning. It includes awareness, attitude, behaviour, activism, communication, access and experience, emotional connections, trust and transparency, and adaptive capacity. An ocean-literate person understands the influence the ocean has on them and their connection to and influence on the ocean. They can make informed, responsible actions regarding the ocean.

## WE NEED YOU!

### TRADITIONAL ECOLOGICAL KNOWLEDGE HOLDERS AND SCIENTISTS

Develop the science base for OA literacy.

### EXPERTS FROM FIELDS SUCH AS STORYTELLING, ART, MARKETING, JOURNALISM, SOCIAL MEDIA, COMMUNICATION, AND EDUCATION

Essential to make sure that the focus is not only on the scientific accuracy but also the way of delivering the message.

## WHY IS IT IMPORTANT?



- Helps demonstrate the value of ocean science for sustainable economy and policy.
- A lack of OA literacy can lead to a lack of consistent policies and regional governance.
- OA literacy is key to informing the public and authorities about the complex consequences of OA and solutions to mitigate and adapt to future global changes.

## EFFECTIVE APPROACHES

Focus on personal connection, relevance, learner agency, and direct experience rather than mere facts.



OARS education website

Professional development for Civil Society Organizations

Innovative communication strategies

High-tech tools, e.g. VR/AR

Co-created take-home messages

Comprehensive OA training programmes

Citizen science campaigns

Download the full report here:



If you have any questions, please contact:  
Amy Kenworthy: [ake@pml.ac.uk](mailto:ake@pml.ac.uk)  
Secretariat: [secretariat@goa-on.org](mailto:secretariat@goa-on.org)



OARS OUTCOME 7

# POLICY ENGAGEMENT FOR OCEAN ACIDIFICATION (OA)

## VISION

Develop strategies and solutions to enable countries and regions to include measures to reduce ocean acidification in their respective policy and legislation.

## THE CHALLENGE

Ocean Acidification is a direct result of human-caused carbon dioxide emission and is altering the chemical balance of seawater that marine life depends upon for survival. OA is a global condition with local effects.

Governments are encouraged to reach out to the OARS Programme for expert guidance on implementing Target 8 of the Global Biodiversity Framework - *Minimize the Impacts of Climate Change on Biodiversity and Build Resilience.*

Download the full report here:



If you have any questions, please contact:  
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Punyasloke Bhadury: [pbhadury@iiserkol.ac.in](mailto:pbhadury@iiserkol.ac.in)



OA policies should effectively integrate with and enhance climate-ocean mitigation and adaptation strategies.

OA policy must be suited to the unique political and legal landscapes of each region and country.

OA policies should reflect local science, include coastal community needs or priorities, and be supported with robust regional finance.

