



Ocean Acidification
International
Coordination Centre

OA-ICC

International OA Initiatives

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www.iaea.org/services/oa-icc

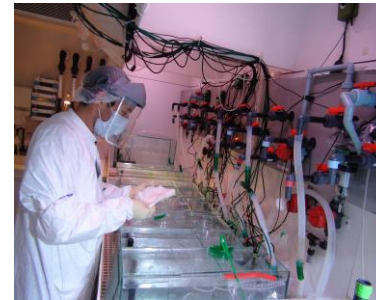
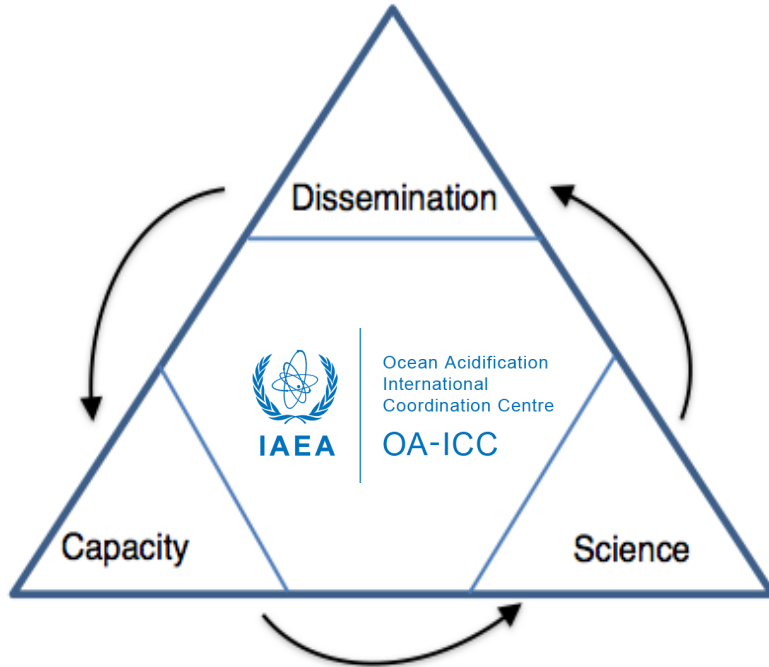
<http://news-oceanacidification-icc.org/>





increasing need for international coordination and collaboration

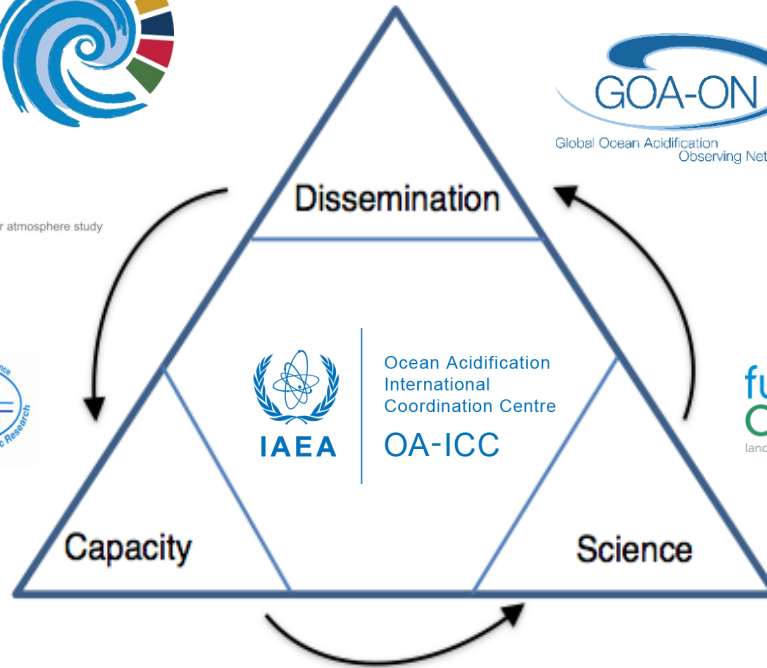
UN Rio+20, 2012: The IAEA launched the *Ocean Acidification International Coordination Centre* in response to increasing concern of Member States and upon recommendation of leading scientists in the field.





increasing need for international coordination and collaboration

UN Rio+20, 2012: The IAEA launched the *Ocean Acidification International Coordination Centre (OA-ICC)* in response to increasing concern of Member States and upon recommendation of leading scientists in the field.

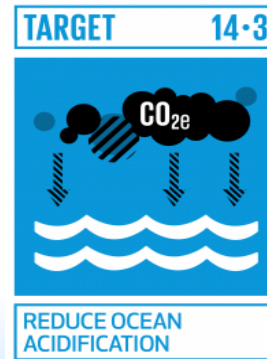
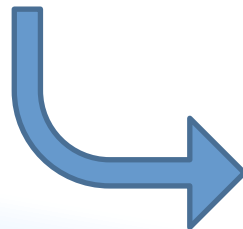


UN Sustainable Goal 14.3 on OA



Target 14.3

“Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels”



- SDG14.3.1 Reporting Process
- Community of Ocean Action on OA



COMMUNITIES OF OCEAN ACTION

IMPLEMENTATION OF SUSTAINABLE DEVELOPMENT GOAL 14

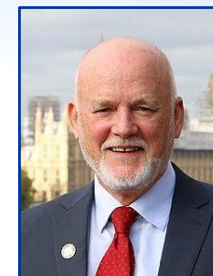
June 2017: UN Ocean Conference, New York

Submission of more than 1400 Voluntary Commitments (VCs) by various stakeholders, 240 self-identified as addressing SDG14.3 on ocean acidification



Communities of Ocean Action

launched by the United Nations Department of Economic and Social Affairs (UN DESA) and the UN Secretary-General's Special Envoy for the Ocean, Ambassador Peter Thomson



The nine multi-stakeholder Communities of Ocean Action are:

1. Mangroves
2. Coral reefs
3. Ocean acidification
4. Marine and coastal ecosystems management
5. Sustainable fisheries
6. Marine pollution
7. Sustainable blue economy
8. Scientific knowledge, research capacity development and transfer of marine technology
9. Implementation of international law as reflected in United Nations Convention on the Law of the Sea

Focal points for Community of Ocean Action on OA:

Bronte Tilbrook, *The Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia, and EC Member, Global Ocean Acidification Observing Network (GOA-ON)*

Florence Descroix-Commanducci, *International Atomic Energy Agency (IAEA), Environment Laboratories, Monaco*





**2021
2030**

**United Nations Decade of
Ocean Science for
Sustainable Development**

The Science We Need For The Ocean We Want



Further highlights the importance of Ocean health in the international community. We have a role to play here.



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SCIENCE

'Promote activities to help advance ocean acidification research'

- Global observing network (GOA-ON)
- The human dimension
- Intercomparison exercises
- Best practices guidelines
- On-line bibliographic database
- Data management and portal





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BUILDING CAPACITY

'Help train tomorrow's experts on ocean acidification'



- Capacity building
- Methodology development (research kits)
- Participation of scientists in international meetings
- Regional coordination and collaboration





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COMMUNICATION

'Serve as a hub of information for different audiences (scientists, policy makers, media...)'

- Exhibits, side events, publications
- Website & news stream
- Participation in high level forums and events



Bibliographic database, available on [Zotero](#)

The screenshot displays the Mendeley Desktop interface. On the left, the 'My Library' sidebar shows a tree view with 'Ocean Acidification (OA-ICC)' selected. The main window shows a list of references with columns for Authors, Title, Year, Published In, and Added. The selected reference is 'A new method for calibrating a boron isotope paleo-pH proxy using massive corals' by Kubota, K.; Yokoyama, Y.; Ishikawa, T.; Suzuki, A. The right-hand pane shows the details of this article, including the journal name 'Geochemistry, Geophysics, Geosystems', volume 16, issue 9, and a detailed abstract.

| ★ | ● | 📄 | Authors | Title | Year | Published In | Added |
|---|---|---|--|--|------|---------------------------------|------------|
| ☆ | ● | | Kubota, K; Yokoyama, Y; Ishikawa, T; Suzuki, A | A new method for calibrating a boron isotope paleo-pH proxy using massive corals | 2015 | Geochemistry, Geophysics, Ge... | 17-07-0... |
| ☆ | ● | | Lovato, T; Vichi, M | An objective reconstruction of the Mediterranean sea carbonate system | 2015 | Deep Sea Research Part I... | 17-07-0... |
| ☆ | ● | | Schmutter, K; Nash, M; Dovey, L | Ocean acidification: assessing the vulnerability of socioeconomic systems in Small Island Developing States | | Regional Environmental ... | 17-07-0... |
| ☆ | ● | | Lauvset, S K; Gruber, N; Landschützer, P; Olsen, A; ... | Trends and drivers in global surface ocean pH over the past three decades | 2014 | Biogeosciences Discussions | 17-07-0... |
| ☆ | ● | | Hassenrück, C; Fink, A; Lichtschlag, A; Tegetmeyer, ... | Quantification of the effects of ocean acidification on sediment microbial communities in the i... | 2016 | FEMS Microbiology Ec... | 17-07-0... |
| ☆ | ● | | Matozzo, V; Chinellato, A; Munari, M; Bressan, M; Mari... | Can the combination of decreased pH and increased temperature values induce oxidative stress in the clam C... | 2013 | Marine Pollution Bulletin | 17-07-0... |
| ☆ | ● | | Ponnurangam, A; Bau, M; Brenner, M; Koschinsky, A | Mussel shells of <i>Mytilus edulis</i> bioarchives of the distribution of rare earth elements and yttrium in seawat... | 2016 | Biogeosciences | 17-07-0... |
| ☆ | ● | | Palacios, S L; Zimmerman, R C | Response of eelgrass <i>Zostera marina</i> to CO2 enrichment: possible impacts of climate change and potential for reme... | 2007 | Marine Ecology Progress Series | 17-07-0... |
| ☆ | ● | | Williams, B; Halfar, J; Steneck, R S; Wortmann, U ... | Twentieth century $\delta^{13}C$ variability in surface water dissolved inorganic carbon recorded by coralline algae in t... | 2011 | Biogeosciences | 17-07-0... |
| ☆ | ● | | Mari, X | Does ocean acidification induce an upward flux of marine aggregates? | 2008 | Biogeosciences | 17-07-0... |
| ☆ | ● | | Hare, C E; Leblanc, K; DiTullio, G R; Kudela, R M; Zhang, Y; ... | Consequences of increased temperature and CO2 for phytoplankton community structure in the Bering Sea | 2007 | Marine Ecology Progress Series | 17-07-0... |
| ☆ | ● | | Pajusalu, L; Martin, G; Põllumäe, A; Torn, K; Paalm... | Direct effects of increased CO2 concentrations in seawater on the net primary production of charophytes in a shallo... | 2015 | Boreal Environment Re... | 17-07-0... |
| ☆ | ● | | Russell, A D; Spero, H J | Field examination of the oceanic carbonate ion effect on stable isotopes in planktonic foraminifera | 2000 | Paleoceanogra... | 17-07-0... |
| ☆ | ● | | Li, S; Huang, J; Liu, C; Liu, Y; Zheng, G; Xie, L; Zhang, R | Interactive effects of seawater acidification and elevated temperature on the transcriptome and biomineralization i... | 2016 | Environmental Science & Tech... | 17-07-0... |
| ☆ | ● | | Lisle, J; Reich, C; Halley, R | Aragonite saturation states and nutrient fluxes in coral reef sediments in Biscayne National Park, FL, USA | 2014 | Marine Ecology Progress Series | 17-07-0... |

Details | Notes | Contents

Type: Journal Article

A new method for calibrating a boron isotope paleo-pH proxy using massive corals

Authors: K. Kubota, Y. Yokoyama, T. Ishikawa et al.

View research catalog entry for this paper

Journal: *Geochemistry, Geophysics, Geosys...*

Year: 2015

Volume: 16

Issue: 9

Pages: 3333-3342

Abstract:

The boron isotope ratio ($\delta^{11}B$) of marine biogenic carbonates can reconstruct pH and pCO₂ of seawater, and potentially CO₂ concentration in the atmosphere. To date, $\delta^{11}B$ -pHSW calibration has been proposed via culturing experiments, where calcifying organisms are cultured under artificially acidified seawater. However, in scleractinian corals, reconstructed pH values using culture-based calibrations do not agree well with actual observations of seawater CO₂ chemistry. Thus, another approach is needed to establish a more reliable calibration method. In this study, we established field-based calibrations for Chichijima and Tahiti, both located in subtropical gyres where surface seawater is close to CO₂ equilibrium. We suggest a new approach to calibration of $\delta^{11}B$ -pH in which the long-term $\delta^{11}B$ variation of massive Porites corals is compared with the decreasing pH tren...

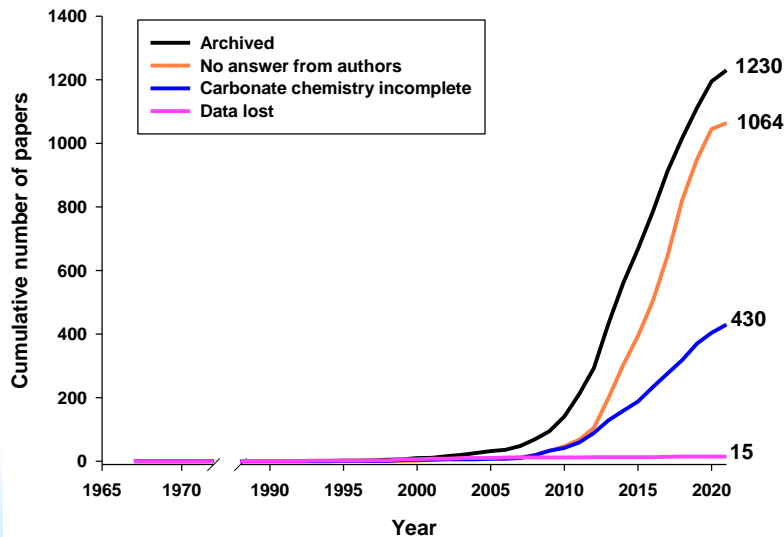
>9000 references,
abstracts, keywords



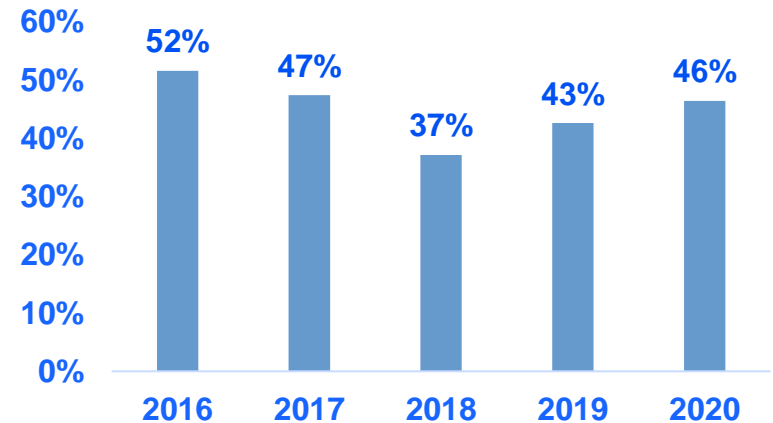
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Data compilation on the biological response to ocean acidification

- Initiated by the European projects EPOCA and EUR-OCEANS in 2008
- Resumed in the framework of OA-ICC In coop. with Xiamen Univ. and PANGAEA
- The goal is to gather published data on the biological response to OA to make them openly available in a coherent format via the data publisher PANGAEA (<http://www.pangaea.de>)
- Total **2739** papers identified, data from **1230** papers were archived, but data from **1064** papers still could not be obtained



Success rate



*Success rate=Data obtained/(Data obtained+ Data not obtained)

Data compilation and portal on biological response to OA



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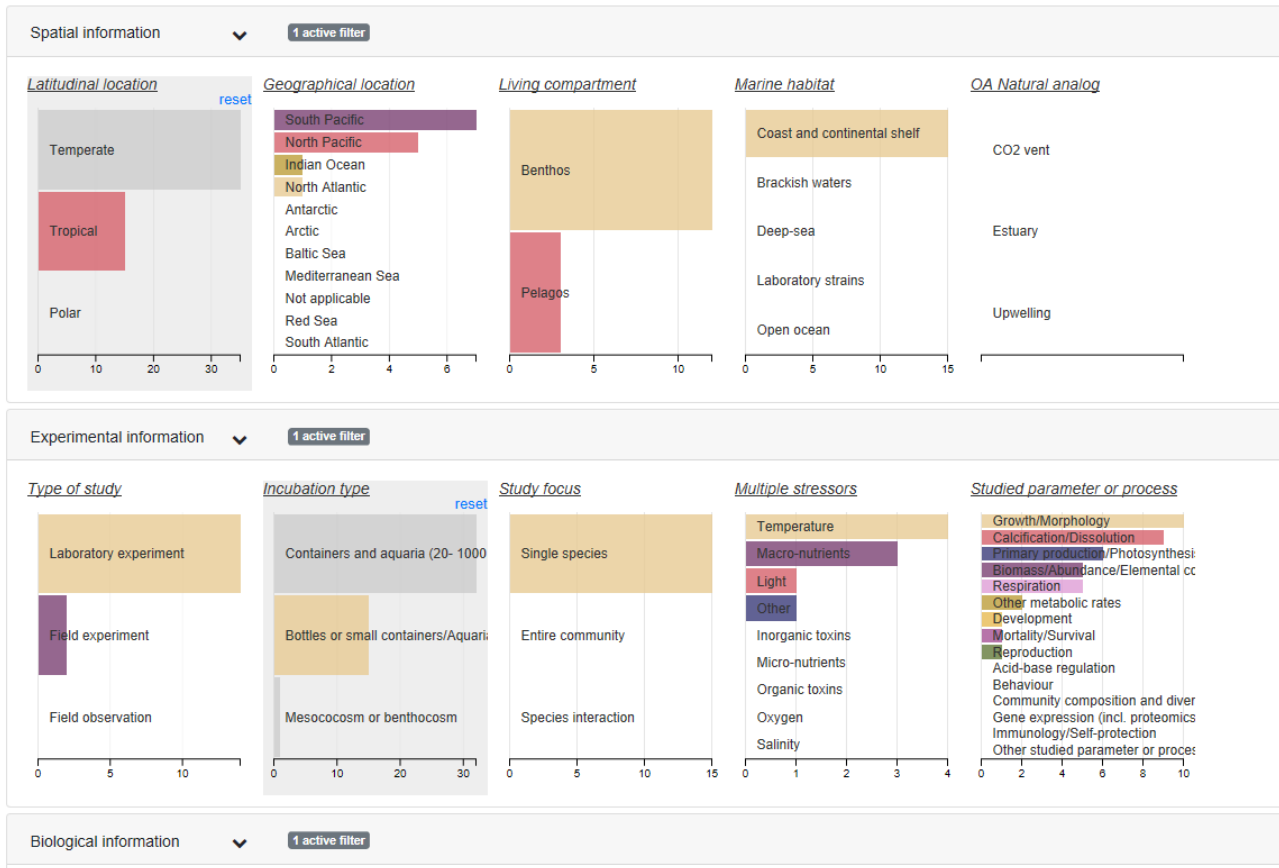
OA-ICC portal for ocean acidification biological response data

Last update: 2019/05/23



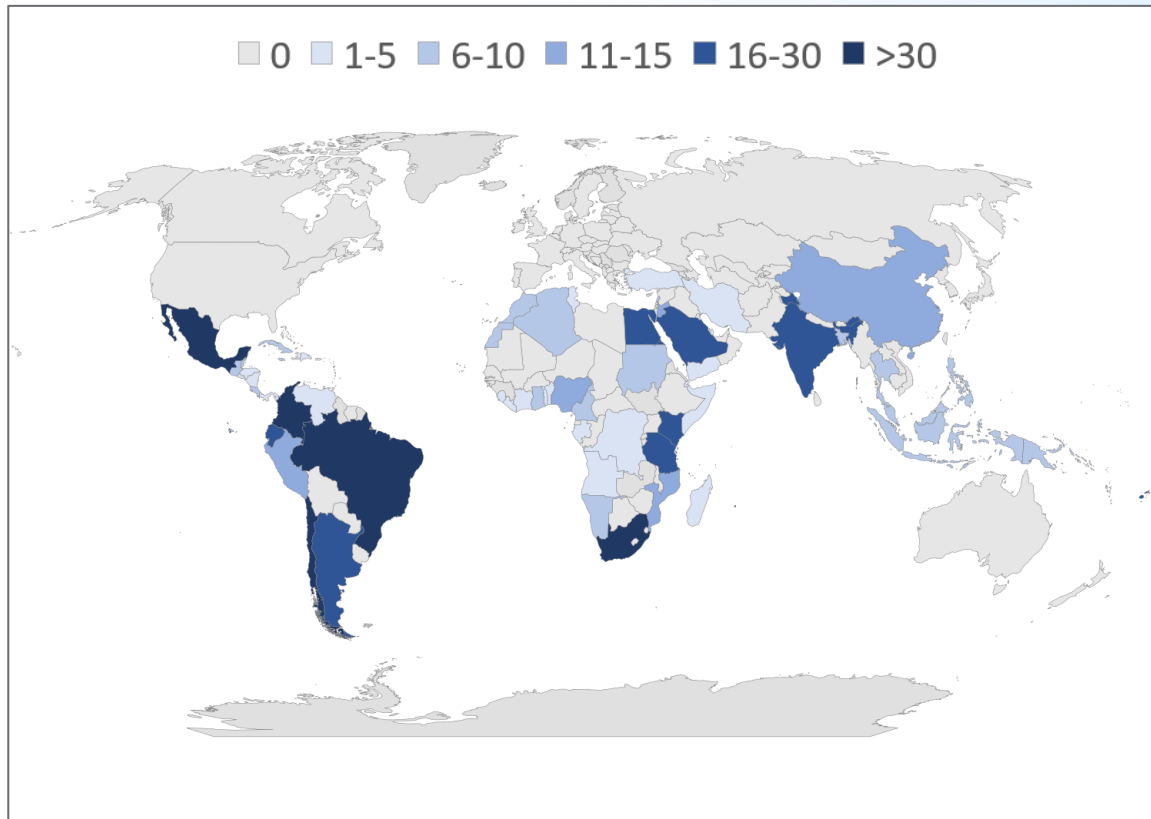
Home User instructions Filter datasets Selection **15/1024** Included/not included papers Contact

Reset all filters



<http://oa-icc.ipsl.fr/>

BUILDING CAPACITY



850 capacity building opportunities
750 scientists from 100 countries





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COMMUNICATION

'Serve as a hub of information for different audiences'

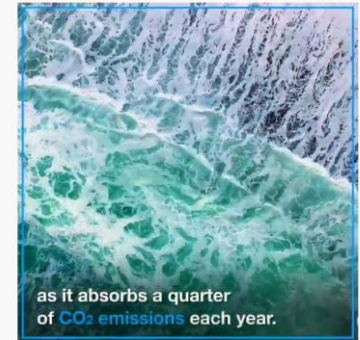


COP26 Side Events,
Glasgow, Scotland,
November 2021

OA-Africa White Papers and
Policy Brief

Ocean Acidification in Africa

A major food fish in African coastal communities, parrotfish such as these rely on healthy coral reefs that could disappear in an acidic ocean.



New Video released

[The Ocean
Acidification Day of
Action 2021 -
YouTube](#)



HIGH-LEVEL POLITICAL FORUM
ON SUSTAINABLE DEVELOPMENT

Side event at UN High-Level
Political Forum 2020



Ocean Acidification International Coordination Centre (OA-ICC)

Web site

iaea.org/ocean-acidification

Ocean Acidification International Coordination Centre (OA-ICC)

- Home
- Science and collaboration
- Capacity building
- Outreach and communication
- Highlights
- News

The IAEA *Ocean Acidification International Coordination Centre (OA-ICC)* promotes international collaboration on [ocean acidification](#). The OA-ICC organizes training courses in Member States and provides access to data and resources to advance ocean acidification research. The Centre promotes the development of data portals, standardized methodology and best practices. The OA-ICC works to raise awareness of the issue among various stakeholders and inform about the role that nuclear and isotopic techniques can play in assessing its impacts. To achieve these objectives, the OA-ICC works with many international partners and supports global and regional ocean acidification networks, including the [Global Ocean Acidification Observing Network](#).

Ocean Acidification - Helping to Tackle this Global Threat

Related Stories



High-level Workshop Discusses Ocean Acidification and Coral Reefs



Using Nuclear Techniques to Monitor the Health of Coral Reefs



US Announces \$433,000 Support toward Scientific Research and Coordination on Ocean Acidification

Related resources

Ocean Acidification

a news stream provided by the Ocean Acidification International Coordination Center (OA-ICC)



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IAEA Environment Laboratories in Monaco turn 60 (text & video)

Published 1 October 2021 Presentations Leave a Comment

Tags: presentation, resource, video/audio



The IAEA's Environment Laboratories have been at the forefront of ocean research since 1961, and this year are celebrating 60 years of addressing global ocean issues. From marine radioactivity to plastic pollution to climate change and more, the laboratories use nuclear science and technology to understand our biggest emerging challenges.

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OA-ICC Highlights



OA-ICC
ONLINE
RESOURCES

News stream

- news-oceanacidification-icc.org
- *The latest news on all things OA!*
- 2020: >42,000 visitors from 191 countries
- 2021: >45,000 visitors
- Average of 5 posts a day

Portfolio of IAEA projects on OA

2019-2022:
Coordinated Research Project – ‘Evaluating the impact of OA on seafood – a global approach’



Technical Cooperation Programme

2012:



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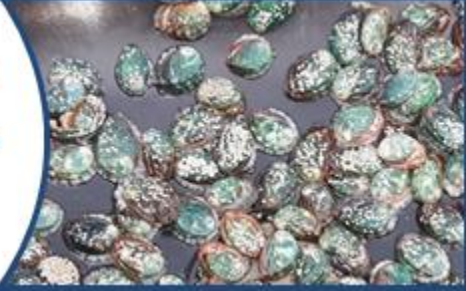


2016-2019: Inter-regional project (INT7019) – ‘Supporting a Global OA Observing Network towards increased involvement of developing states’

+ regional Technical Cooperation projects in Africa and Latin America



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Technical Cooperation inter-regional project INT7019:

*“Supporting a Global Ocean Acidification Observing Network
- towards Increased Involvement of Developing States”*

Participating regions: Africa, Asia & the Pacific, Latin America, Europe. 40 Member States, spanning all regions.

Duration: 4 years (2016-2019)

Goal: help build capacity to measure and study ocean acidification, and connect countries and regions with an interest in OA

NEW CRP: Evaluating the Impacts of Ocean Acidification on Seafood - A Global Approach (K41018)

Tanmay Misra, IAEA Department of Nuclear Sciences and Applications

JUN
13
2018



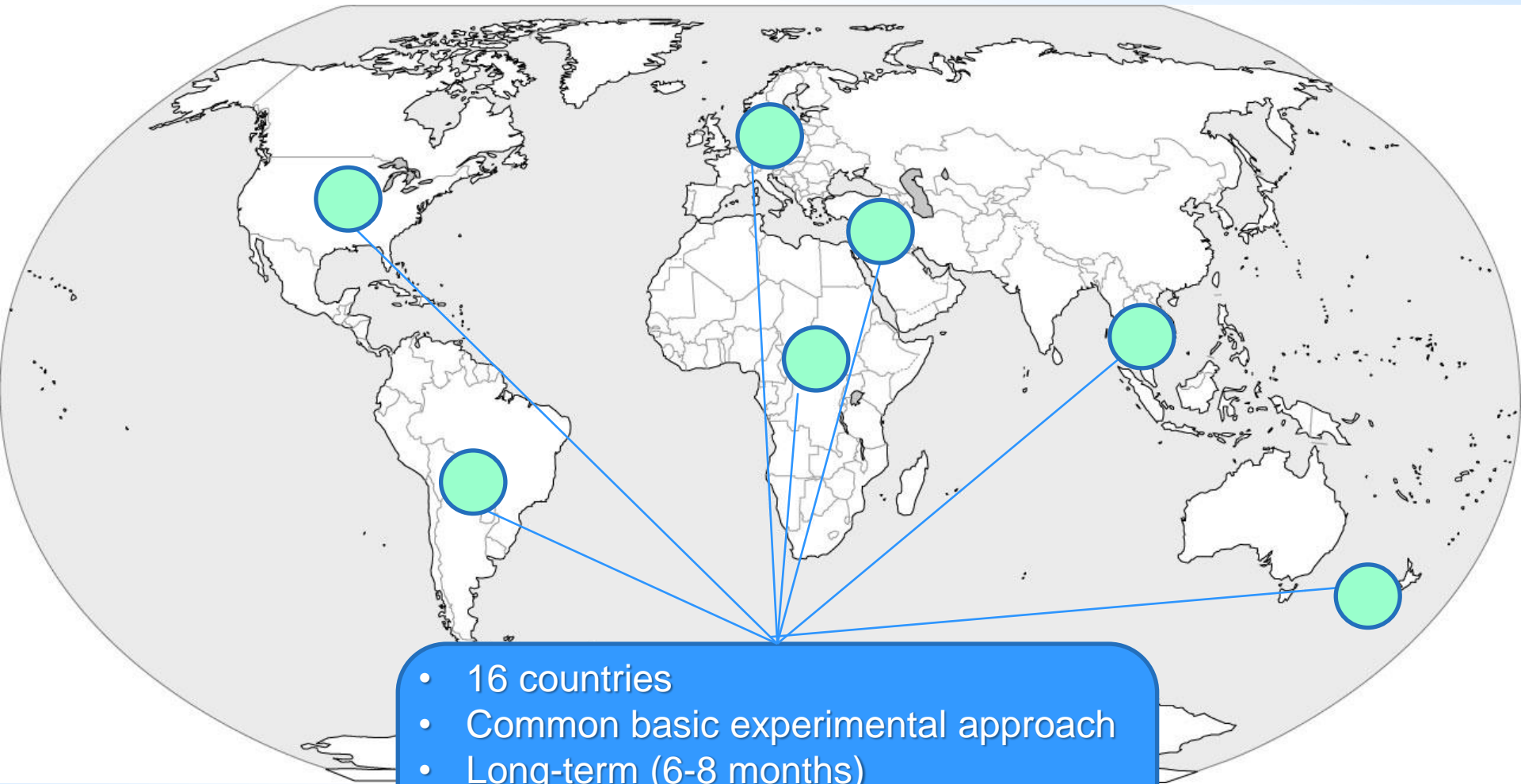
Little is known about the long-term impact of ocean acidification (OA) on socioeconomically important seafood despite the potentially severe risk OA presents to marine organisms. (Photo: Marc Metian)

The IAEA is launching a new 4-year Coordinated Research Project (CRP) starting in 2019 to advance understanding on the effects of ocean acidification on seafood around the world and to explore adaptation strategies for aquaculture and seafood industries.

Related Resources

- 🔗 [Coordinated Research Activities](#)
- 🔗 [Division of IAEA Environment Laboratories](#)
- 🔗 [Department of Nuclear Sciences and Applications](#)

CRP: Evaluating the impacts of OA on seafood – a global approach



- 16 countries
- Common basic experimental approach
- Long-term (6-8 months)
- Key local seafood species
- Mortality, growth.. + additional endpoints
- Communication/awareness raising



Global Ocean Acidification
Observing Network

The Global Problem needs a Global Effort

Formed in 2012, the **Global Ocean Acidification - Observing Network (GOA-ON)** is an international community partnership



GOA-ON in 2021



930 Scientists
from 105
countries

<http://goa-on.org>



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GOA-ON's High-Level Goals

Goal 1: Improve our understanding of global OA conditions

- Where is it happening?
- How fast is it happening?
- Why is it happening?

Goal 2: Improve our understanding of ecosystem response to OA

- What are the observed biological responses specifically to OA?
- How fast are they happening
- What places / ecosystems are most vulnerable or most resilient?

Goal 3: Create reliable future projections of OA and its impacts

- Optimise data / knowledge exchange and knowledge?
- Ensure models are robust and reliable
- Provide the spatial and temporal resolution needed to produce societally-relevant forecasts and projections.

Next steps.....

Science needs to Drive Change



Global Ocean Acidification Observing Network (GOA-ON)

Activities

- OA Week, Sept 2021: plenaries, presentations, discussion groups
 - 23 sessions. 31.5 hours. combined attendance more than 1340 including 93 presenters, panelists, plenary speakers, and discussion leaders. 20 new GOA-ON members join since the start of OA Week.
 - CRM session (article in SCIENCE)
- Webinar Series
- GOA-ON YouTube channel, facebook, twitter, newsletters
- Data Portal : 800 assets, new maps
- SDG14.3
- COP26

Capacity Building

- Pier2Peer: GOA-ON-in-a-Box (see map)
- Training workshops: on-line (OTGA)
- Pacific Island Regional Training Hub (NOAA/ TOF)



GOA-ON in a Box Instructional Videos

16 videos • 829 views • Last updated on Nov 13, 2020





2021 United Nations Decade
2030 of Ocean Science
for Sustainable Development

A 10 year Programme for Action

KEY OUTCOMES



Outcome Champions

Kim Currie & Richard Feely

Jessie Turner & Richard Bellerby

Veronique Garcon
& Martin Hernandez Ayon

Sam Dupont
& Frank Muller-Karger

Samantha Siedlecki
& Richard Bellerby

Abed El Rahman Hassoun &
Geraldine Fauville

Alexis Valauri-Orton
& Nick Hardman-Mountford

- The global science community will be equipped to provide the **high quality, high quantity and high-resolution ocean acidification data** needed.
- Specific data and evidence needs for **mitigation and adaptation strategies**, from local to global, will be clearly identified and provided.
- **Long-term ocean observing systems** will be **co-designed** and implemented by scientists, funders and end-user partnerships.
- The risks and severity of ocean acidification **impacts on marine organisms and ecosystems** will be better understood and used to support the protection of marine life (linked to other UN programmes).
- **Societally relevant predictions** of the impacts of ocean acidification will be freely available.
- The public will be more **ocean acidification literate**, its causes and impacts.
- Countries and regions will routinely include measures to reduce ocean acidification in their respective **national legislation**.



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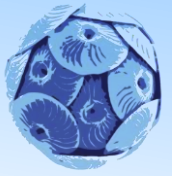
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Upcoming Plans

- Further Progress on CRP - Second Meeting
- IAEA TC Interregional project proposal
- Consultancies
- High CO₂ Symposium and side events
- Joint Training Course on multiple stressors in Monaco in October – OACIS
- Technical Meeting in Monaco to discuss and produce OA meta-analyses using the OA-ICC bibliographic database and other data resources
- Communication technical meeting in Costa Rica
- IPCC Report – OA Summary Document



5TH INTERNATIONAL SYMPOSIUM ON THE OCEAN IN A HIGH CO₂ WORLD



<http://www.highco2-lima.org/>

Key Dates (2022)

- 24 April Abstract submission deadline
- 24 April Application for Travel Support
- 7 May Abstract and travel support applicants notified
- 21 June Early registration closes
- 21 August Registration closes
- 7 September On-site registration



5th International Symposium on the
ocean in a High CO₂ world - Lima
2022



@High-CO₂-
Lima



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Thank you