Ocean Acidification International Coordination Centre

IAEA

OA-ICC

Ocean Acidification International Coordination Centre (OA-ICC)

Achievements to enhance global response

Peter Swarzenski

Radioecology Laboratory
International Atomic Energy Agency
Monaco

OCEANS & LAW OF THE SEA
UNITED NATIONS

Twentieth meeting: "Ocean Science and the UN Decade of Ocean Science for Sustainable Development"
10 to 14 June 2019

IAEA Environment Labs in Monaco - the only marine laboratory in the UN system

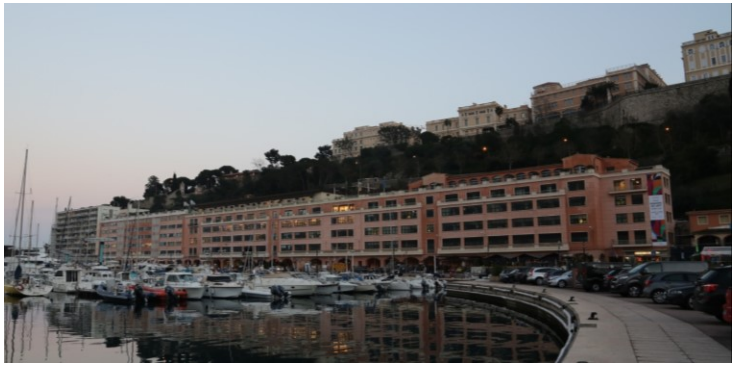
The Age of Earth?

Role of isotopes in science

"Its perhaps a little indelicate to ask Mother Nature her age, but Science acknowledges no shame and from time to time has boldly attempted to wrest from her a secret which is well guarded" Arthur Holmes, 1913

IAEA
International Atomic Energy Agency
Atoms For Peace

IAEA Environment Labs in Monaco - the only marine laboratory in the UN system



Isotopes are precision tools to:

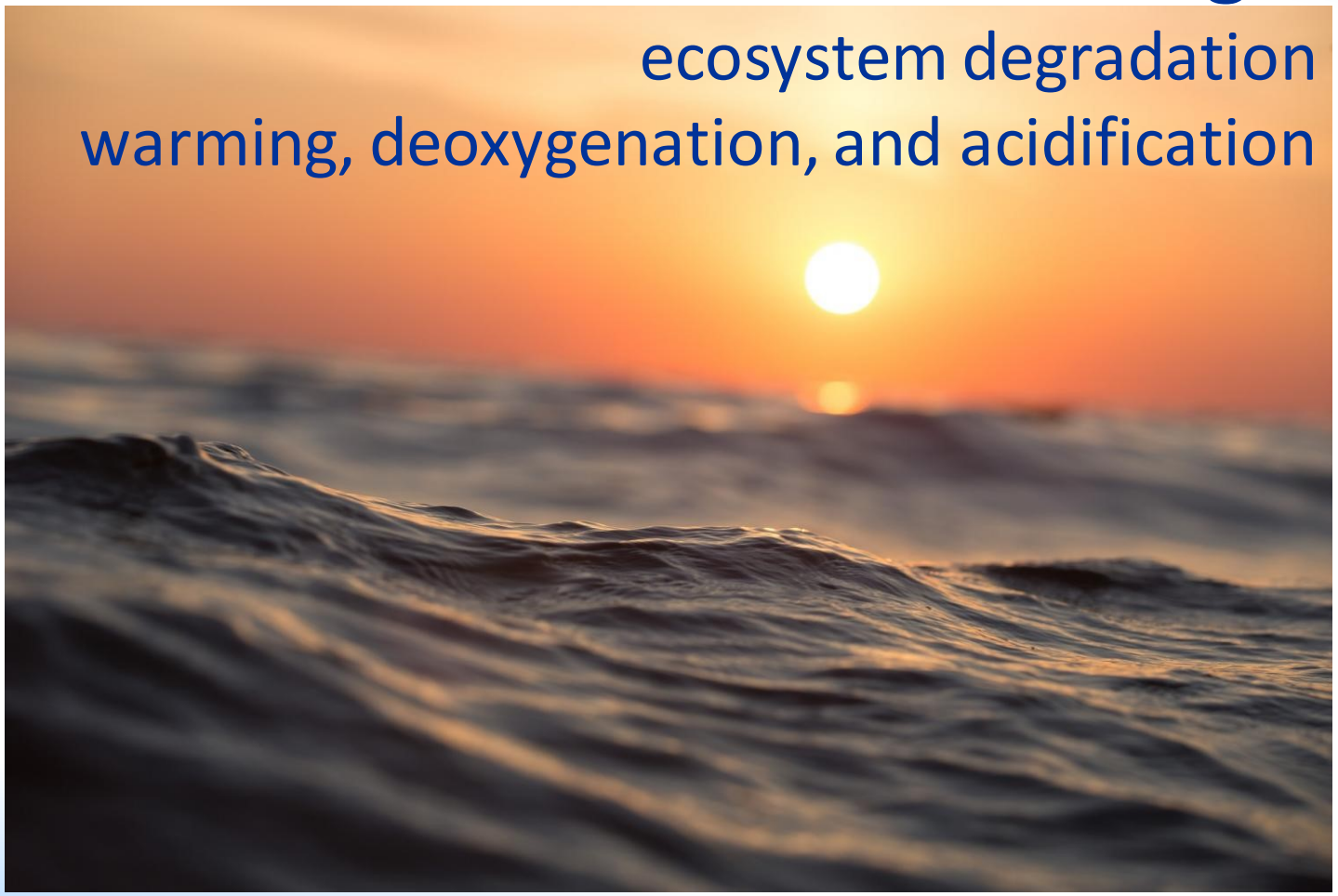
- Study environmental processes
- Contribute to Climate Change studies and the ocean
- Study pollution / Seafood Safety
- Conduct ecological assessments

IAEA
International Atomic Energy Agency
Atoms For Peace

Ocean change:

ecosystem degradation

warming, deoxygenation, and acidification

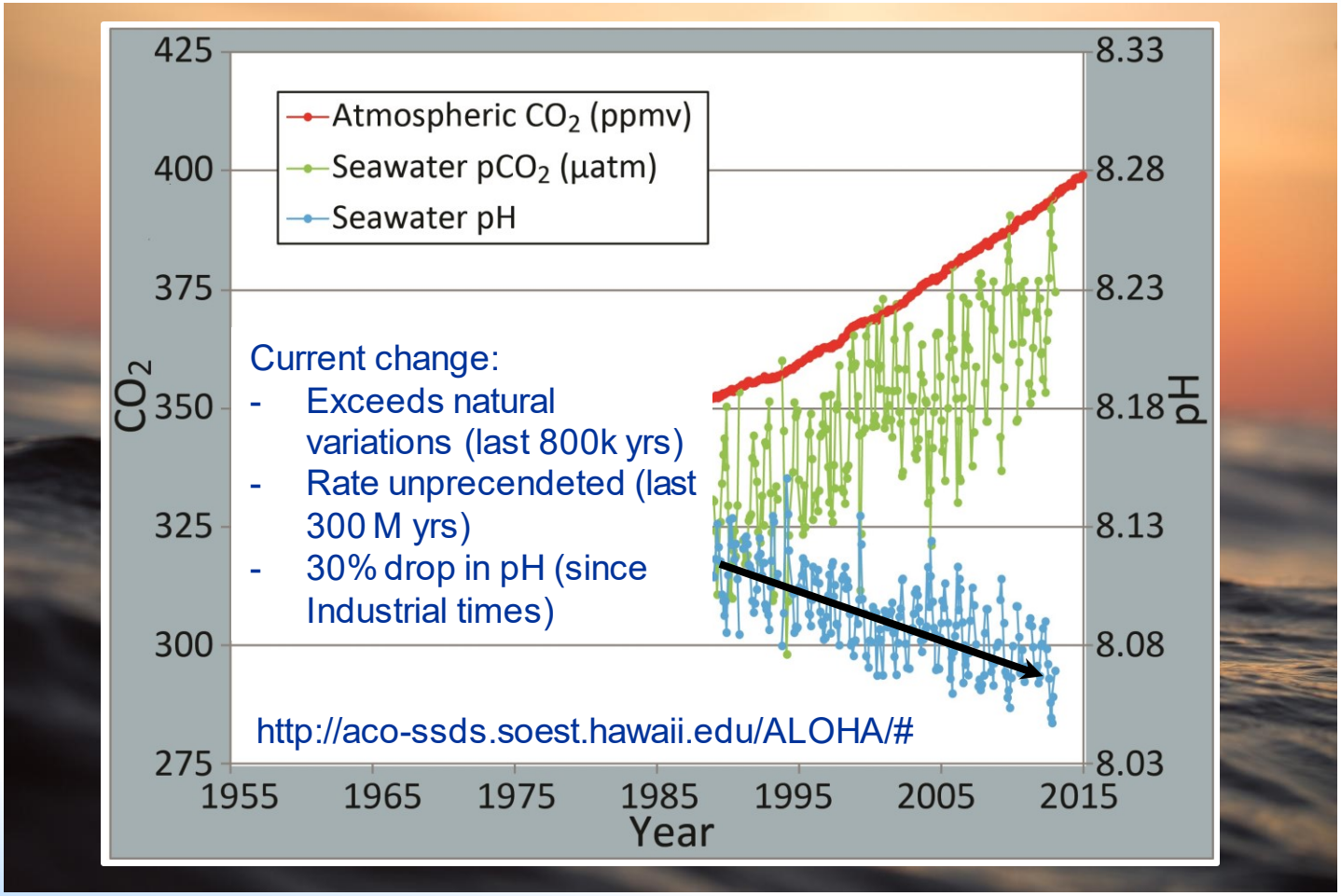


IAEA
International Atomic Energy Agency
Atoms For Peace

Ocean change:

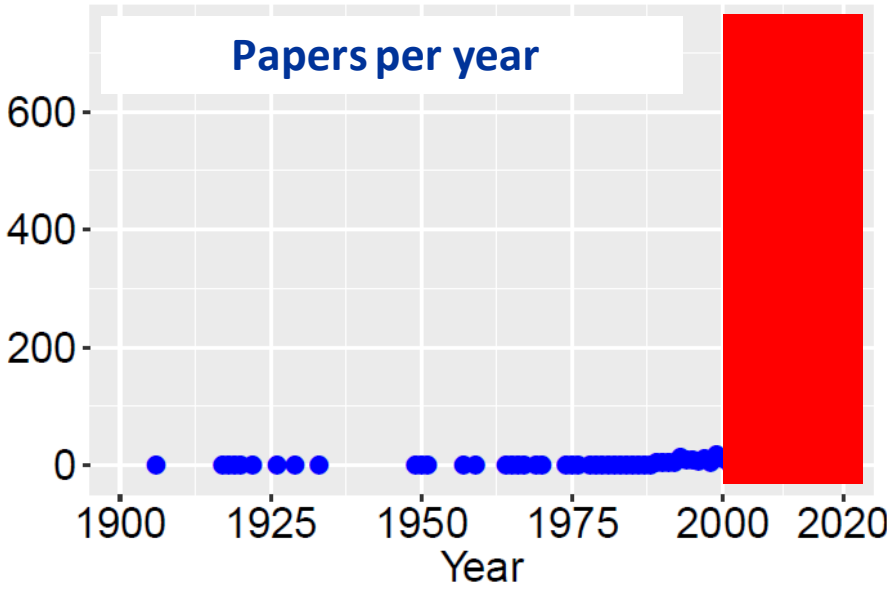
ecosystem degradation

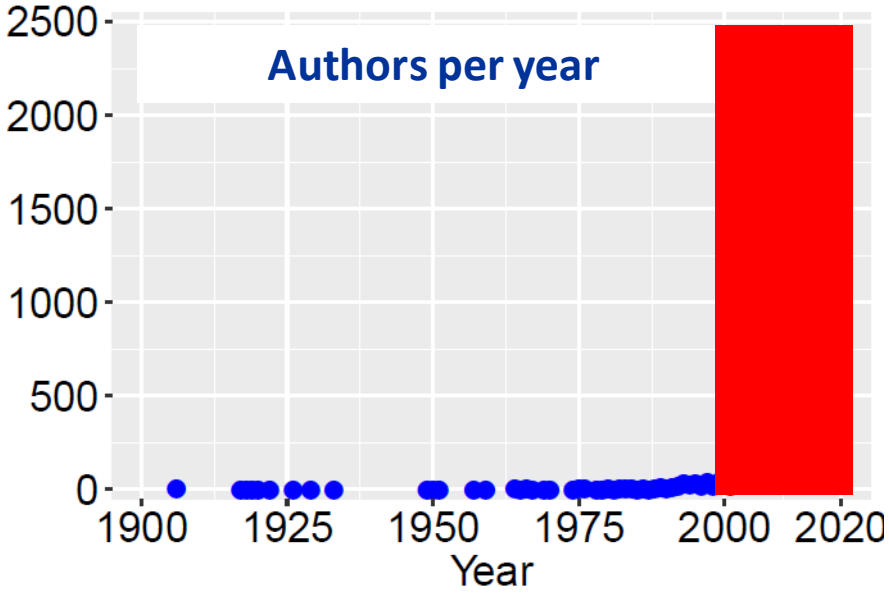
warming, deoxygenation, and acidification



Ocean acidification - a rapidly growing field

IAEA | Ocean Acidification International Coordination Centre OA-ICC





Data from the OA-ICC bibliographic database. Figure produced by Jean-Pierre Gattuso, Laboratoire d'Océanographie de Villefranche

OA – a rapidly growing field

Ocean Acidification International Coordination Centre
IAEA | OA-ICC

European Commission: EPOCA, 2008-2012 MedSeA, 2011-2014

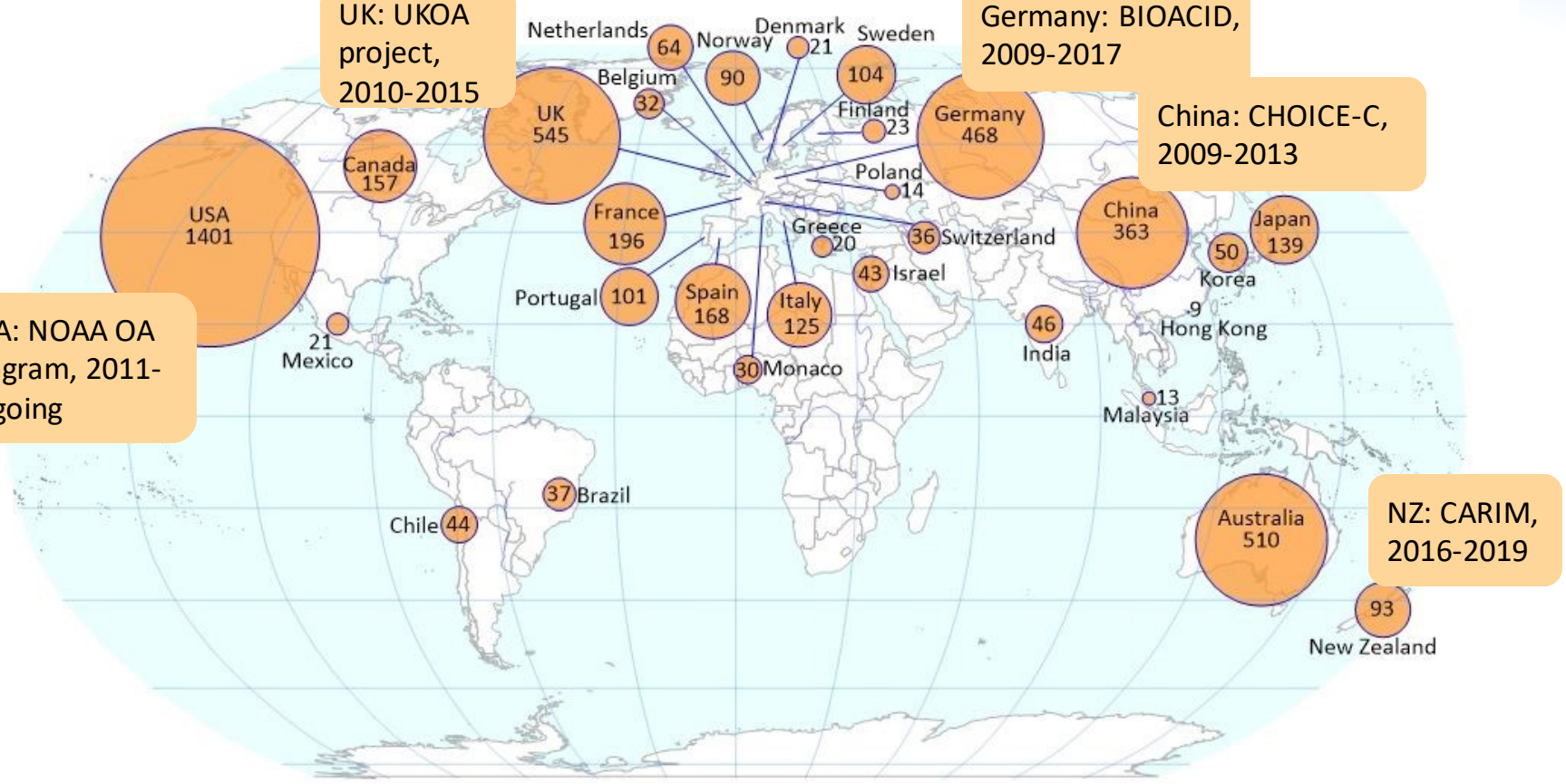
UK: UKOA project, 2010-2015

Germany: BIOACID, 2009-2017

China: CHOICE-C, 2009-2013

USA: NOAA OA Program, 2011-ongoing

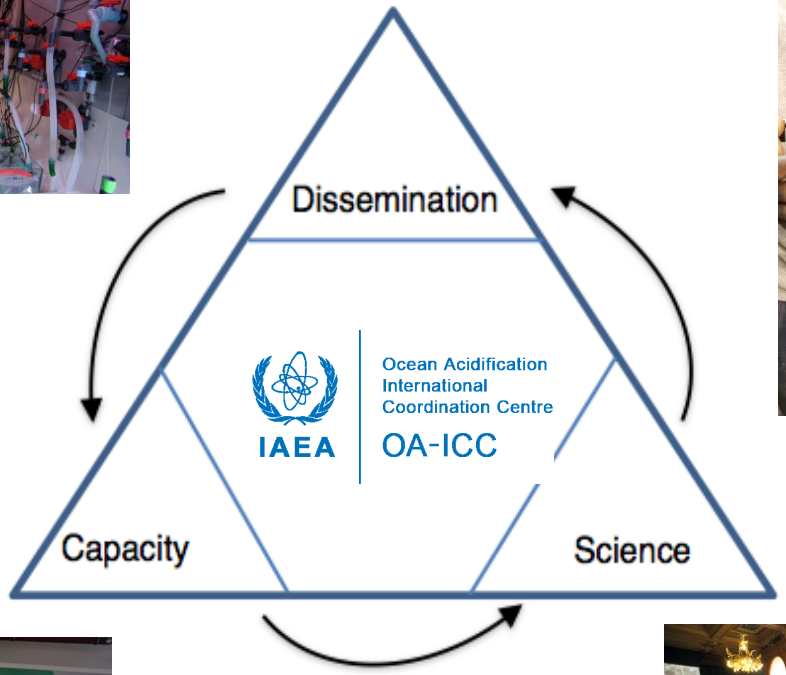
NZ: CARIM, 2016-2019



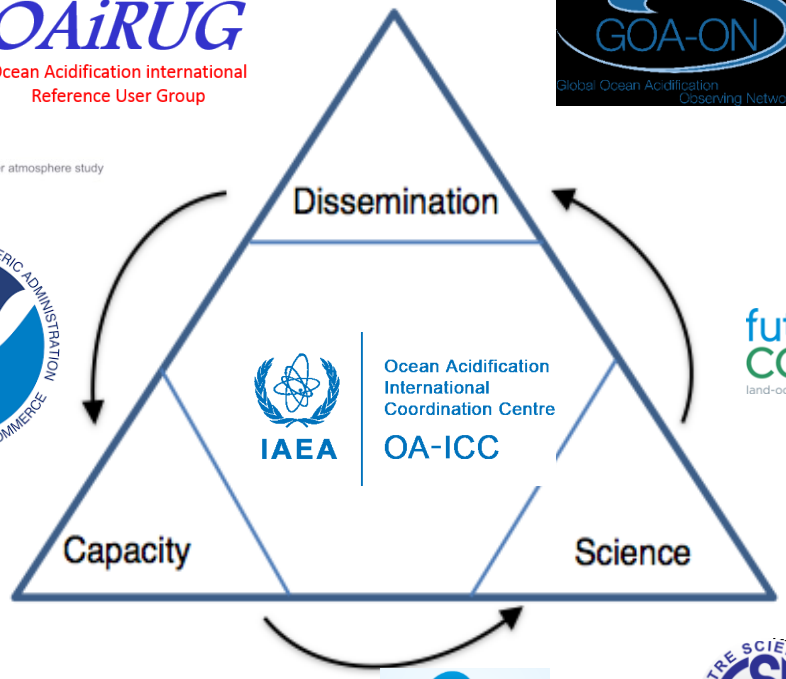
OA papers per country (2006-2018), based on first author affiliation. Data for countries with 9 papers or more are shown. Data from the OA-ICC bibliographic database. Figure produced by Dana Greeley, NOAA PMEL.

UN Rio+20, 2012:
The IAEA launched the *Ocean Acidification International Coordination Centre* in response to increasing concern of Member States

→ **increasing need for international coordination and collaboration**



OA – a globally coordinated effort



United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

IMBeR

surface ocean solas lower atmosphere study

OAiRUG

Ocean Acidification international Reference User Group

GOA-ON

Global Ocean Acidification Observing Network

OA-AFRICA

OCEAN ACIDIFICATION AFRICA NETWORK

UNIVERSITY OF GOTHENBURG

IMBeR

surface ocean solas lower atmosphere study

latin american ocean acidification network

LAOCA

OAP

OCEAN ACIDIFICATION PROGRAM

NOAA

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

U.S. DEPARTMENT OF COMMERCE

futureearth coasts

land-ocean interactions in the coastal zone

SCOR

Scientific Committee on Oceanic Research

THE OCEAN FOUNDATION

INTERNATIONAL OCEAN CARBON COORDINATION PROJECT

IOCCP

FONDATION PRINCE ALBERT II DE MONACO

Institut océanographique

Fondation Albert Ier, Prince de Monaco

AMAO

CENTRE SCIENTIFIQUE DE MONACO

MEL

State Key Laboratory of Marine Environmental Science

IAEA Ocean Acidification International Coordination Centre OA-ICC

SCIENCE

'Promote activities to help advance ocean acidification research'

Global observing network (GOA-ON)
L. Jewett, USA / K. Currie, NZ

Joint platforms & experiments
P. Ziveri, Spain / N. Lagos, Chile

The human dimension
S. Cooley, USA / A. Magnan, France

Intercomparison exercises
F. Gazeau, France / J. Orr, France

Best practices
K. Kroeker, USA

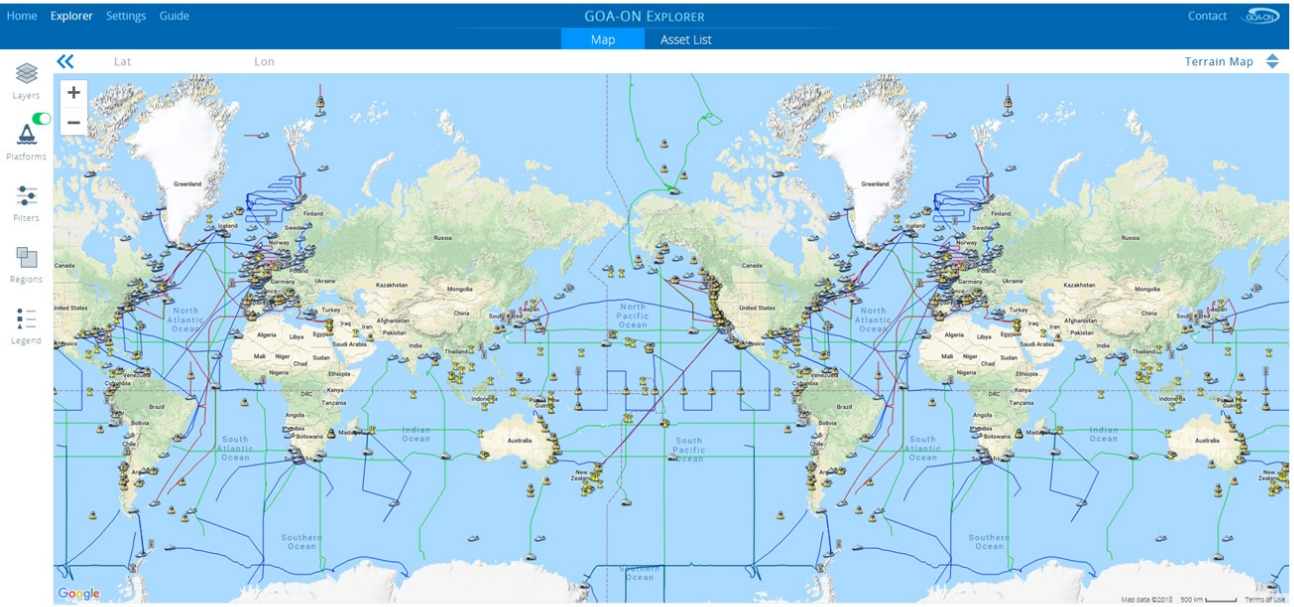
On-line bibliographic database
J.-P. Gattuso, France

Data management and portal
F. Gazeau, France

GOA-ON
Global Ocean Acidification Observing Network

Global Ocean Acidification Observing Network

GOA-ON
Global Ocean Acidification Observing Network



Over 580 data assets measuring carbonate chemistry

GOA-ON is a **international partnership** to:

1. Document the **status and progress of ocean acidification** in open-ocean, coastal, estuarine, and coral reef environments,
2. Understand the **impacts** of ocean acidification on diverse marine ecosystems and societies, and
3. Support **forecasts** of ocean acidification conditions.

OAP NOAA OCEAN ACIDIFICATION PROGRAM
IAEA
Ocean Acidification International Coordination Centre OA-ICC
UNESCO United Nations Educational, Scientific and Cultural Organization
Intergovernmental Oceanographic Commission
International Ocean Carbon Coordination Project IOCCP
IOOS Integrated Ocean Observing System
GOOS Global Ocean Observing System

OA will change marine ecosystems

Organisms react differently

Corals and shell builders decline

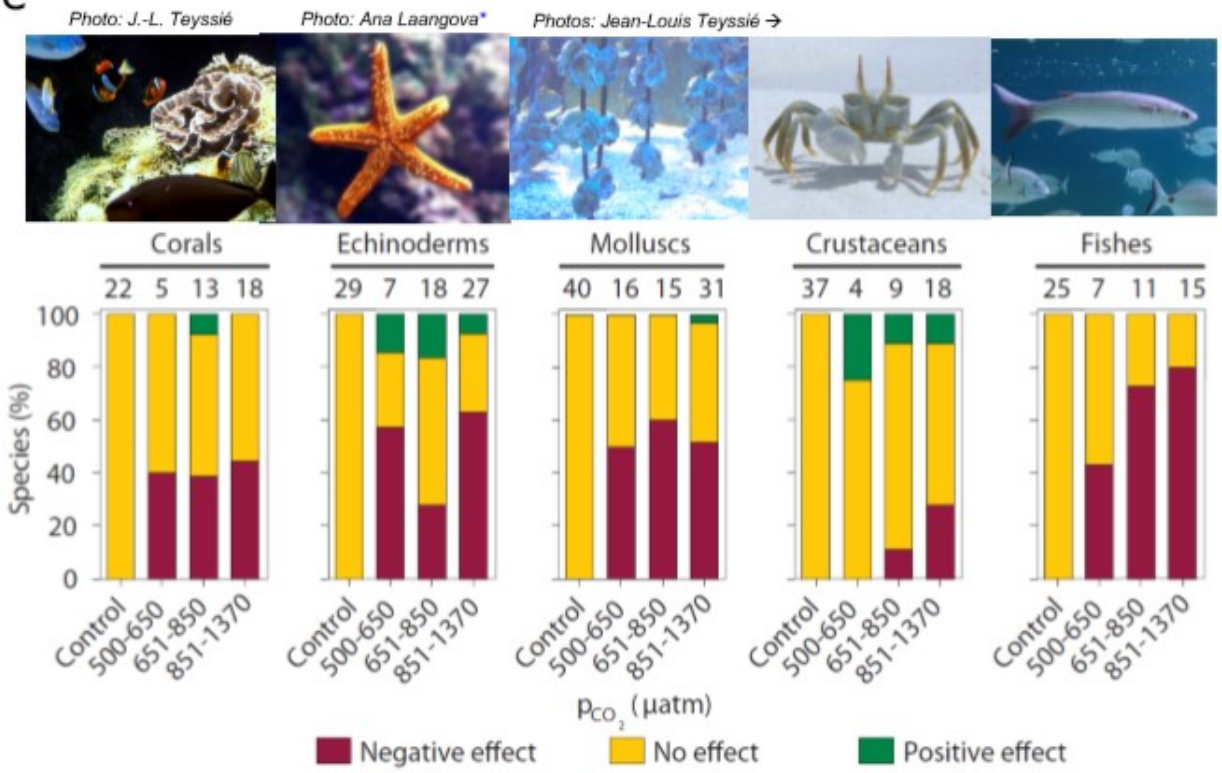
Seagrasses may increase

Fish become disoriented

Prey loss affects predators

Potential fish catch decline

Synthesis of existing experimental studies



Wittmann & Pörtner (2013)

IAEA

Ocean Acidification International Coordination Centre

OA-ICC

COMMUNICATION

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

Exhibits, side events, publications, OA-international Reference User Group
J. Baxter, UK

Web site & news stream

Data bases

IAEA

Ocean Acidification International Coordination Centre

OA-ICC

BUILDING CAPACITY

'Help train tomorrow's experts on ocean acidification'

Capacity assessment, training courses

S. Dupont, Sweden & L. Jewett, USA

Methodology development (research kits)

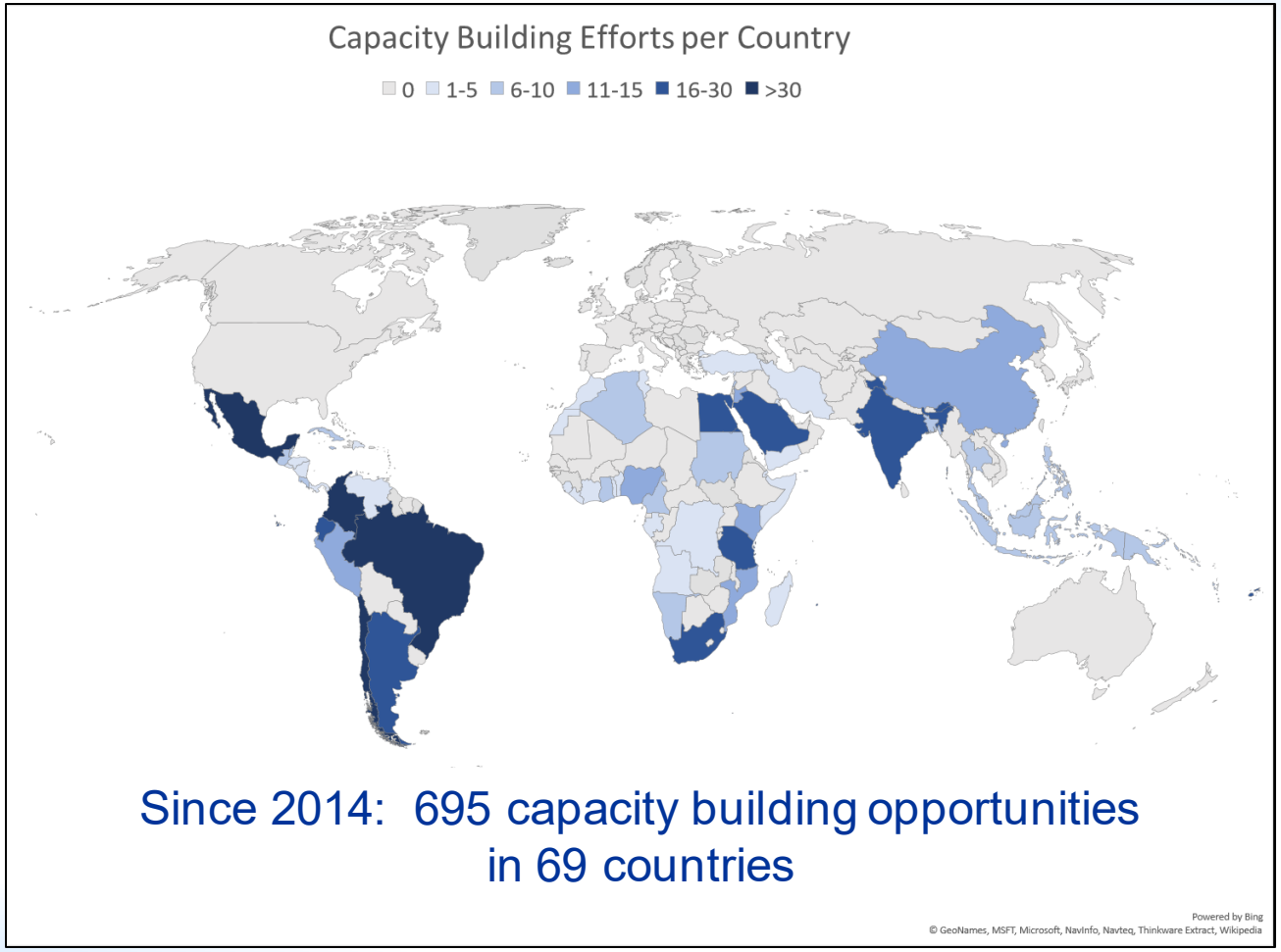
Participation of scientists in international meetings

Support of regional networks (Latin America (LAOCA), Africa)

latin american ocean acidification network LAOCA

OA-AFRICA OCEAN ACIDIFICATION AFRICA NETWORK

Ocean acidification training and networking >>> 2030 Agenda; Decade



Ocean Acidification International Coordination Centre OA-ICC

GOA-ON Global Ocean Acidification Observing Network

The Ocean Foundation

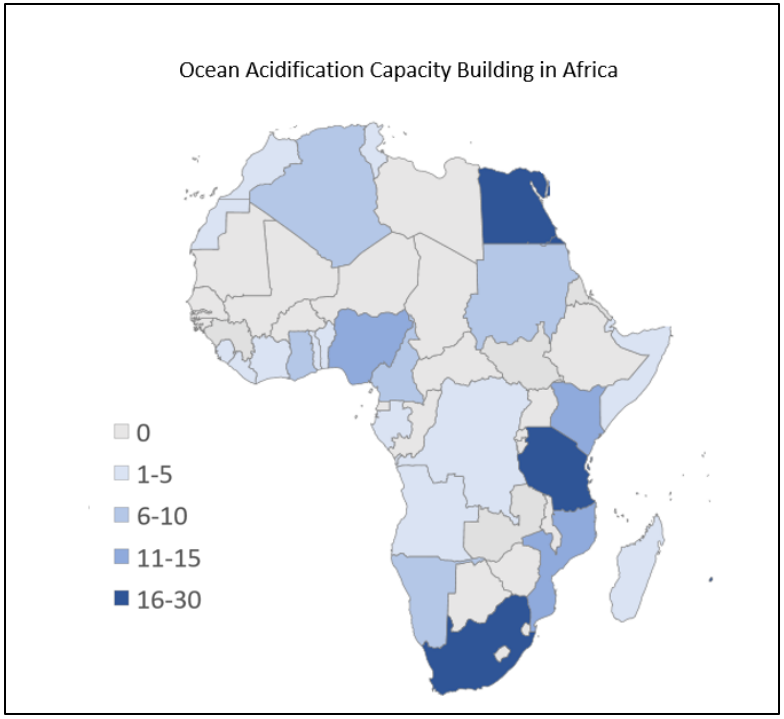
LAOCA latin american ocean acidification network

United Nations Educational, Scientific and Cultural Organization | Intergovernmental Oceanographic Commission

NOAA Ocean Acidification Program

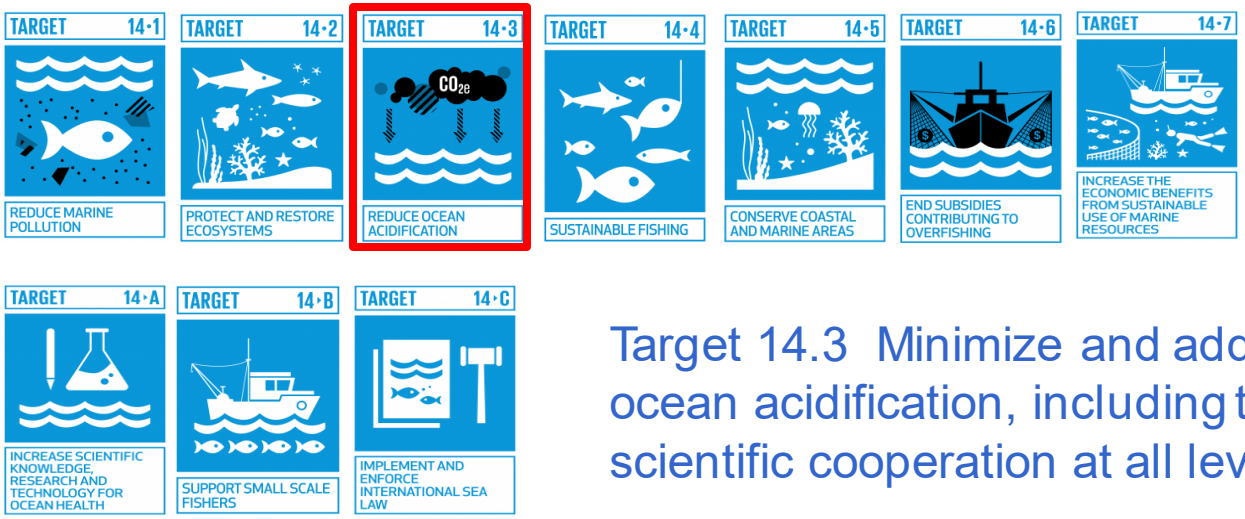
Sida Swedish International Development Cooperation Agency

Ocean acidification training and networking >>> 2030 Agenda; Decade



Africa: 247 capacity building opportunities in 26 African countries

Ocean acidification – one of 10 targets to achieve Sustainable Development Goal 14



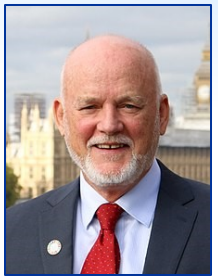
Target 14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels

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

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**



UNDESA

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

2nd UN Ocean Conference: June 2020, Lisbon, Portugal

Focal points for Community of Ocean Action on OA:

Bronte Tilbrook
The Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia
Co-chair, Global Ocean Acidification Observing Network (GOA-ON)
David Osborn
International Atomic Energy Agency (IAEA), Environment Laboratories, Monaco

IAEA Ocean Acidification International Coordination Centre OA-ICC

CSIRO

GOA-ON Global Ocean Acidification Observing Network

UNESCO United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

Take home messages

Ocean Acidification International Coordination Centre
IAEA | OA-ICC

OA community well-organized to advance:

- SCIENCE (chemistry, biologic response; **role of nuclear techniques**)
- COMMUNICATION (data bases, biblio, news stream)
- CAPACITY BUILDING (trainings, tech transfer)
- Member State engagement in the 2030 Agenda…

…Decade of Ocean Science for Sustainable Development

GOA-ON Global Ocean Acidification Observing Network

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

14 LIFE BELOW WATER

Ocean Acidification International Coordination Centre

IAEA | OA-ICC

Thank you!

Peter Swarzenski
IAEA Radioecology

Contact: p.swarzenski@iaea.org
www.iaea.org/ocean-acidification
http://news-oceanacidification-icc.org/