



### Understanding Ocean Acidification

Profound **changes in seawater chemistry** are taking place around the world, as the oceans absorb a quarter of the carbon dioxide (CO<sub>2</sub>) emitted each year by human activities. After absorption into the ocean, the CO<sub>2</sub> forms carbonic acid, which increases water acidity. This phenomenon, known as **ocean acidification**, is **threatening marine ecosystems and could have devastating effects for many of the oceans' living creatures**.



### The Consequences of Changing Oceans

The most obvious victims of ocean acidification are organisms whose growth is diminished by the ocean's changing chemistry, such as molluscs or shellfish. As ocean water conditions continue to deteriorate, declines in key organisms are likely to have a **ripple effect throughout marine ecosystems and food webs**, threatening seafood yields in communities that rely on oceans for their livelihood. Meanwhile, **marine ecosystems, such as coral reefs, which provide habitat to 25% of the world's marine fish species, are already challenged by rising seawater temperature and other stressors, exacerbating the consequences arising from ocean acidification**.



### The IAEA Contribution

The IAEA uses nuclear and isotopic techniques to assess effects of ocean acidification. With marine radioisotopes, **the IAEA's Environment Laboratories in Monaco help to improve understanding of how changing ocean chemistry affects marine life**. The resulting data are being used to help develop marine models and to assess changes in the oceans and develop the tools and information needed by both scientists and policy makers to improve understanding, reduce damage and adapt to ocean acidification.

### Facts

According to ocean acidification experts:

- Changes of ocean acidity are now occurring about a hundred times faster than at any time during at least the last 20 million years.
- Ocean acidity has increased by more than 30% since the beginning of the Industrial Revolution.
- If CO<sub>2</sub> emissions continue unabated, the rise in acidity may well reach 150% of pre-Industrial Revolution levels by the end of the century.
- Within decades, acidity levels in the polar oceans could be sufficient to dissolve the shells of some living organisms.
- Coral reefs are threatened by multiple stressors, including ocean acidification, resulting in the potential demise of many reefs by the middle of this century.
- Seafood provides three billion people with 20% of their animal protein intake: ocean acidification, along with global warming and other stressors, could threaten the food security of millions of people.





photo by Nick Cobbing

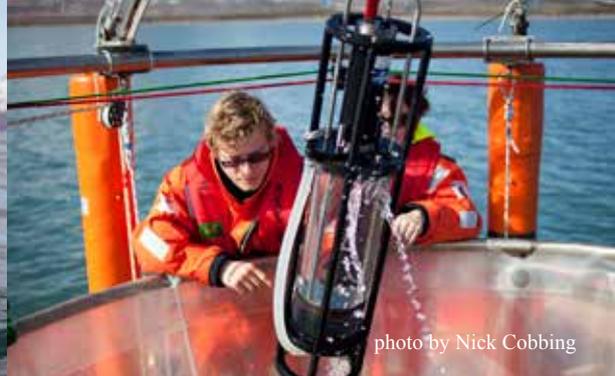


photo by Nick Cobbing

# Ocean Acidification International Coordination Centre

## Addressing the Challenge

In 2012, in response to increasing concern of IAEA Member States over the global challenges of ocean acidification, the IAEA launched a new project at its [Environmental Laboratories in Monaco](#) – the “[Ocean Acidification International Coordination Centre \(OA-ICC\)](#)”. Supported by the Peaceful Uses Initiative, a funding vehicle to advance the IAEA’s work in promoting the peaceful application of nuclear technology, the goal of this project is to coordinate international efforts to develop response strategies to the growing threat of ocean acidification.

## The Role of the OA-ICC

The OA-ICC brings together stakeholders concerned about ocean acidification, from scientists and researchers, to policymakers, the media and the general public. Its role is to [facilitate and promote activities related to ocean acidification, thereby raising awareness and understanding of the phenomenon, as well as improving communication between the stakeholders by providing an international forum for information sharing](#). With virtually all countries affected by ocean acidification, the OA-ICC’s international focus and centralization of information is critical to avoid needless duplication and to ensure that all countries advance together towards the common goal of limiting the damage arising from ocean acidification.

## Activities

The OA-ICC facilitates the following activities:

- Establishing an international observation network
- Promoting student and post-doctoral exchanges
- Promoting joint ocean acidification experiments, platforms and facilities
- Promoting capacity building
- Conducting comparison exercises
- Maintaining an online bibliographic database
- Encouraging collaboration between natural and social sciences
- Exchanging information on best practices in ocean acidification research and data reporting
- Promoting data management
- Promoting information dissemination and outreach initiatives



## Partners

The OA-ICC works closely with key research institutions and Member States. Advice is provided to the OA-ICC by [an Advisory Board](#) consisting of representatives from major international organizations and programmes as well as leading scientists in the field, including those from the SOLAS-IMBER Ocean Acidification Working Group.