



Marine sensors for the 21st century



CONSERVE AND SUSTAINABLY USE THE OCEANS, SEA AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

In 2015 countries adopted a set of goals to end poverty, protect the planet, and ensure prosperity for all as part of a new sustainable development agenda.

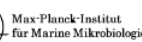
sustainabledevelopment.un.org/sdgsproposal



SenseOCEAN provides the instrumental tools to monitor progress towards achievement of United Nations Sustainable Development Goal 14

To effectively assess progress towards Goal 14, we must be able to measure the health of the oceans on an ongoing basis. The vastness of the oceans means this is a huge challenge. SenseOCEAN is enabling measurement of the oceans through the development of in situ sensors for a range of parameters that can be deployed over long time periods on a variety of platforms.

For more information about the SenseOCEAN project, please go to: www.senseocean.eu



How can we monitor progress towards the achievement of SDG 14?

The challenges

Greenhouse gases



Greenhouse gas emissions are driving climate change. The oceans absorb CO₂ but not without some impact. N₂O can be released from the oceans.

Ocean acidification



As the oceans absorb more CO₂, the water becomes more acidic, lowering the pH and changing ocean chemistry. Marine life which has evolved over millions of years may not be able to adapt at the speed of the change.

Ocean deoxygenation



Lack of O₂ in the oceans could impact ocean productivity, nutrient cycling and marine life. Marine plants, fish and organisms struggle to survive in 'oxygen minimum zones', areas which are increasing in size and number.

Eutrophication



An excess of nutrients due to e.g. industrial and farm run-off can lead to excessive growth of plants and algae. Decomposition of the algae consumes oxygen in the water. Oxygen is vital for fish and shellfish to survive.

Marine biodiversity

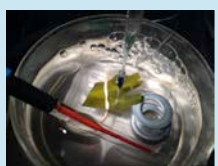


Marine systems are complex, all species are an integral part of the ecosystem performing specific functions. Biodiversity is crucial for human well-being and economic development.

SenseOCEAN tools

N₂O & pCO₂ sensors

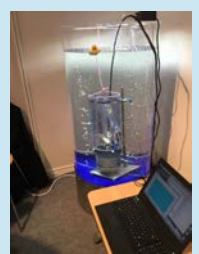
Optode sensors for CO₂ and electrochemical sensors for CO₂ and N₂O.



Electrochemical CO₂ sensor

pH sensor

Lab on chip and optode sensors



pH lab on chip sensor in demonstration tank

Oxygen sensor



Optode sensors

Nutrients sensors, FRRf

Electrochemical and lab on chip sensors for phosphate, nitrate and silicate. Fast Repetition Rate fluorimetry measures primary productivity.

Fluorescence sensor



Measures a range of parameters key in assessing ecosystem health.

These sensors will be integrated into a multiparameter sensor system that can be deployed on many platforms (e.g. observatories, AUVs). Common communications systems, electronics, data systems are being used to enable cost effective mass production.