New Ocean Acidification Resources (Summer 2022)

Recent publications and resources from GOA-ON's many partners and members are collected here for the use of the GOA-ON community.

Table of commercially available seawater pH sensors for autonomous sampling

GOA-ON Executive Council member Adrienne Sutton (NOAA Pacific Marine Environmental Laboratory) and Ken Johnson (Monterey Bay Aquarium Research Institute) compiled a list of commercially available pH sensors (available as of August 2022) for the use of ocean acidification researchers in the GOA-ON community. The table provides links to peer reviewed papers that utilize these sensors and provides alternatives for Honeywell Durafet sensors which are no longer produced as of 2021.

Title: Commercially available seawater pH sensors for autonomous sampling

Contributors: Adrienne Sutton, NOAA Pacific Marine Environmental Laboratory; Ken Johnson, Monterey Bay Aquarium Research Institute

Date: August 9, 2022

Description: This table provides a list of commercially available seawater pH sensors. Honeywell Durafets (and sensors that use Durafets, for example, SeaFETs) are not included as Durafet production ceased in 2021. As of August 2022, alternative manufacturers for the Durafets are still being explored. Glass electrode sensors are not included here as they are not recommended for autonomous sampling per the best practices for seawater pH given the requirement for frequent independent validation to correct for drift. For more information about ocean carbon sensors, see www.ioccp.org/hardware-directory.

Sensor	Method	Website	Peer-reviewed methods publication
SAMI pH, iSAMI, & AFT-pH	Spectrophotometric (autonomous: SAMIs; underway: AFT)	http://sunburstsensors.com/products/prod-overview.html	www.sciencedirect.com/science/article/abs/pii/S0304420307002782
ClearWater pH	Spectrophotometric (autonomous)	www.clearwatersensors.com/ph-sensor/	https://pubs.acs.org/doi/10.1021/acs.est.1c03517
CONTROS HydroFIA pH	Spectrophotometric (underway)	www.4h-jena.de/en/maritime-technologies/sensors/hydrofiaph/	https://os.copernicus.org/articles/7/597/2011/
PryoScience AquapHOx & Pico pH	Optical (autonomous)	www.pyroscience.com/en/products/all-meters/aquaphox-tx	www.sciencedirect.com/science/article/pii/S0003267015011654 www.sciencedirect.com/science/article/pii/S0925400518320021?via%3Dihub
ANB pH	Solid-state (autonomous)	www.anbsensors.com/products	https://os.copernicus.org/preprints/os-2021-126

Link: Commercially available pH sensor Table.docx - Google Docs (upload pdf)

How to measure pH_T in biological experiments

The International Atomic Energy Agency's OA-ICC (Ocean Acidification International Coordination Centre) published a protocol by Sanja Grđan and Sam Dupont in July regarding the measurement of pH_T in biological experiments. The aim of this document and associated material (excel spreadsheets and videos) is to help experimentalists entering the field of ocean acidification to make their own TRIS buffer, calibrate their glass electrodes for pH measurement

on the total scale, take water samples and calculate pH on the total scale (pH_T). The materials are available in English, Spanish, and French.

Link: [How to measure pHT in biological experiments | IAEA]

Ocean Acidification: Solutions for Policymakers

The International Atomic Energy Agency's OA-ICC (Ocean Acidification International Coordination Centre) published a new resource in July, titled "Ocean Acidification: The Evidence is Clear. The Time for Action is Now." This policy briefing highlights the findings of the Intergovernmental Panel on Climate Change Working Group I, II, and III reports and details policy actions that can be enacted now.

Link: [final_iaea_oa_flyer_jul_16_high_res.pdf] (upload pdf)

GOA-ON in a box

The GOA-ON in a Box is a low-cost kit used for collecting weather-quality ocean acidification measurements. The GOA-ON in a Box kits have been distributed to scientists in sixteen countries in Africa, Pacific Small Island Developing States, and Latin America. This page includes information on the contents of the kit and the standard operating procedures and guidelines developed for using the kit. Instructional videos (available in English, French, Spanish, and Portuguese) detailing the use of the kit are linked on the page.

Link: http://goa-on.org/resources/kits.php