

As documented by the IPCC in their report on the oceans and cryosphere, since 1970, the oceans have absorbed more than 90% of the extra heat that's come about through global warming. This has resulted in warmer, less salty and more acidic waters. The growing acidification of the seas poses threats to coral and fisheries and the possibility that warming might melt permafrost, releasing huge amounts of CO₂ gas. It is evident there is a need for in situ pH measurements to provide a high spatial and temporal resolution of the world's oceans. Whilst the introduction of intelligent, low-cost AUVs provide the platform, the development of low power and reliable pH sensors is lagging behind.

ANB Sensors electrochemical pH sensing technology provides a voltammetric signal to measure the pH of the ocean, whilst incorporating an additional redox species to monitor the reference potential. This patented sensor is ideally suited for today's AUVs as, coupled with the fact that the technology provides accurate measurements (± 0.05 pH units) without the need to recalibrate, it can be packaged into a small form.

With the help of Innovate UK and Horizon 2020 funding, ANB Sensors have translated their ground-breaking sensing technology into a cutting-edge system suitable for oceanographic monitoring. They will introduce this technology, highlighting the fundamental chemical principle behind the solid-state transducer, illustrating how they achieve calibration free sensing. This will be demonstrated through the plethora of results obtained across many sensor interfaces in a variety of waters.