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Centre for Environment Fisheries & Aquaculture Science

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Run-off from agricultural land and effluent from sewage treatment enters rivers and is discharged to the sea. These nutrient loads can have a significant impact upon the marine ecosystem, and increasing levels of nutrient discharge since the 1950s led, in the late 1980s, to growing concern.

At the time, data on nutrients in the open sea were only collected infrequently from research vessels and it became clear that high temporal resolution data was urgently required to address these concerns. Thus, the "SmartBuoy" programme was born and developed; in-house designed multi-sensor devices that could be mounted on fixed buoys for long periods to measure nutrients, chlorophyll, light, oxygen, and suspended solids.

A critical feature of the SmartBuoys is their capacity transmit data back to Cefas via satellite – this ensures that data can be stored securely in case of damage to or failure of the instruments. By 2006, there were six Cefas SmartBuoys in key locations around the UK.

Today, the data collected by SmartBuoys is routinely used as part of the UK commitment to international regulatory standards and assessments of marine quality. The data have even been used in the European Courts to demonstrate that the UK meets international standards for water quality and sewage discharge, saving billions of pounds in water treatment costs.

There are currently four active SmartBuoys that are used for monitoring and the range of applications for the data has increased, including passive sampling for contaminants and validation of water quality data derived from satellites and models.

For more information please visit:
www.cefas.co.uk/cefas-data-hub/smartbuoys

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1902 — 1997–2017