The UK Pelagic Habitats Expert Group:

- A network of universities, agencies, governments and research institutes with expertise in plankton data, ecology, and dynamics
- University of Plymouth (UoP) and the Environment Agency co-chair the UK group; UoP also chairs the OSPAR Pelagic Habitats Expert Group
- Provides technical capacity to deliver information on the state of the pelagic habitat, and inform on pressures including climate change and eutrophication. This evidence fulfils the UK Marine Strategy as well as international obligations to OSPAR, UN-SDGs, and COP26
- Has primarily progressed their work through projects funded by mechanisms such as NERC (e.g. Knowledge Exchange Fellowships), EMFF (e.g. the EcApRHA and ICEGRAPH projects), and HBDSEG rather than through sustained or strategic government funding.
- Delivered the first assessments of UK pelagic habitats as part of the UK Marine Strategy and OSPAR Intermediate Assessment 2017

Key expert group achievements:

- Development of Plankton Lifeform Indicator, which can be used across the UK’s and OSPAR’s diffuse plankton monitoring programmes, regardless of sampling technique, fulfilling marine policy obligations of an integrated monitoring and assessment programme
- Construction of trait-linked plankton database containing 44.7 million plankton records for NW European waters. This database is essential for ensuring consistency of indicator application between datasets.
- Development of web-based tool for lifeform extraction, to facilitate indicator application
- Protocol for pelagic habitat assessment which can be used at UK and OSPAR levels

Data collection and management

A database of 44.7 million plankton records compiled and quality controlled, with functional traits assigned.

Flagging change in lifeforms

Plankton Index developed for open source use. Options for comparison periods explored and quantitatively tested.

Further interpretation

Multi-decadal trends mapped and compared across disparate surveys

Linking to drivers of change

Indicator change linked to SST and coastal nutrients through statistical models.

Reporting GES

Assessment and reporting protocol developed and agreed.

Indicator assessment protocol derived from Pelagic Habitats Expert Group research and development.
Profound changes revealed through the plankton lifeform indicator approach

- The Plankton Lifeform Indicator has revealed that plankton are experiencing profound region-wide changes in abundance and distribution.
- Both phytoplankton and zooplankton have undergone reorganisation, suggesting alterations to the marine food web.
- Many of these changes have been linked to increasing sea surface temperature, a key manifestation of climate change.
- Inshore lifeform trends may be influenced by anthropogenic nutrient loading.
- Such alterations to plankton communities suggest consequences for marine biodiversity, carbon cycling, and foodweb interactions.
- Plankton monitoring is necessary for collecting data allowing detection of change.
- Collective expertise of expert group critical for producing and interpreting results.

Symbols courtesy of the Integration and Application Network, University of Maryland Center for Environmental Science (ian.umces.edu/symbols/)

Outlook for upcoming pelagic habitats assessments

- Sustained funding is necessary for the plankton monitoring needed to recognise change in pelagic habitats. This monitoring covers multiple trophic levels at the base of the food web, yet is at risk, with financial cuts reducing our ability to detect change.
- Maintenance of the Pelagic Habitats Expert Group is critical for recognising and interpreting change in pelagic habitats. Diminished capacity in this group puts policy assessments, such as the OSPAR QSR2023 and the 2024 UK Marine Strategy, at risk.
- Future indicator development work needed includes further interpreting the implications of indicator changes to higher trophic levels, including fisheries and sea birds.
- Only with consistent resourcing can these important changes to the base of the marine foodweb continue to be evaluated in a fully integrated way, and the results assessed and interpreted to inform effective adaptive ecosystem-based management.