Plankton are the community of tiny drifting creatures that form the life blood of the sea. Although mostly microscopic in size, this belies their importance. Their abundance and biodiversity fuels marine foodwebs that produce fish, and is a major contributor to oxygen production, carbon sequestration and global climate regulation. Changes in plankton biodiversity reflect changes in the ocean’s health and the ecological services provided by the marine ecosystem.

How do we assess plankton biodiversity? One way is via the Continuous Plankton Recorder (CPR) Survey (http://www.sahfos.ac.uk). This is the longest (starting in 1931) most geographically extensive (North Atlantic, North Pacific) marine biological survey in the world with a unique dataset of marine biodiversity. Recorders are towed by volunteer merchant ships on regular routes at monthly frequency. Laboratory analysis involves the identification of ~500 taxa of plankton. Since its inception, it has generated >1,000 peer-reviewed papers on various aspects of biological, environmental and climatic indicators. Survey data is held in a database with an access policy that is open for bona-fide research purposes.

Copepods are one of the dominant groups in the plankton and are often the main food for fish. Recently, Beaugrand et al. (2010) used the CPR Survey of the North Atlantic (Figure a), to reveal the pattern of copepod biodiversity which was found to be greater in the warmer waters of the eastern Atlantic (Figure b). They showed that the pattern of biodiversity is not static but rather is evolving with the ocean basin becoming more biodiverse (Figure c). In general, higher biodiversity implies greater richness and this is considered to be a positive emergent property that represents stability and resilience in the ecosystem. However, when the probability of cod (Gadus morhua) occurrence is considered (Figure d), a negative correlation is found between the presence of fish and copepod biodiversity (Figure e). The authors are careful to point out that this correlation does not necessarily imply a direct negative link between fish and copepod biodiversity but rather demonstrates that cod are sensitive to the partitioning of energy and biomass among plankton components. Whatever the mechanism, the study suggests that increasing biodiversity of the plankton is reducing a key ecological service (cod production) provided by the ocean to humans.