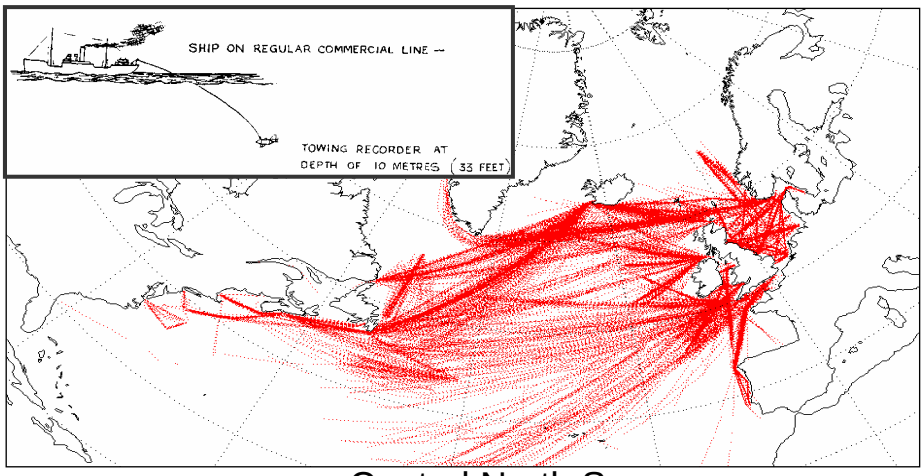
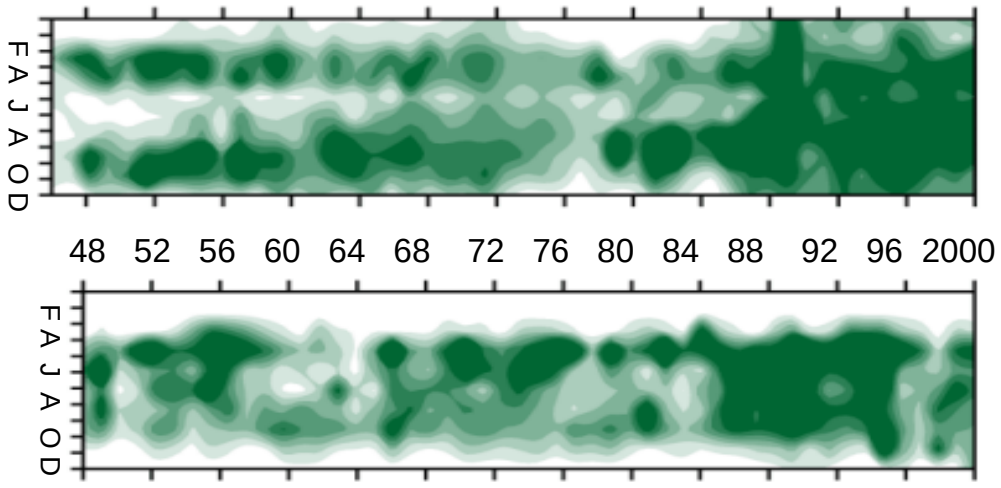
Climate change, biodiversity, productivity and Volunteer Observing Ships

Volunteer observing ships (VOS) are an important part of the existing network for monitoring the physical ocean, operating around the world. The biological equivalent is the Hardy continuous plankton sampler that has been recording changes in the small life forms in the surface waters of the North Atlantic for over 50 years (upper frame) The increase in the quantity of single-celled photosynthetic organisms and length of growing season associated with global warming show up clearly in these records (lower frame). Dramatic shifts in the associated species feeding on them are also recorded. This powerful biological tool reveals changes in biodiversity and related effects on carbon fixation and oxygen production, but it is so labor intensive that it its application has been limited in other oceans and the results come too slowly to provide early warnings. A variety of alternate technologies for sampling are being tested ranging from computer analysis of video images to identifying DNA barcodes for species collected by pumps, homogenized and analyzed by DNA 'chip' technology. Some form of global plankton sampling is critical to understand how climate change is affecting the 'lungs of the planet' that produce at least half of the oxygen we breathe. The optimum methods must be simple enough to be acceptable to VOS. The continued use and expansion of existing practice and networks for monitoring must be maintained until suitable alternatives are available to understand the impact of climate change.



Central North Sea



Northeast Atlantic