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- **National Marine Aquarium, Plymouth, United Kingdom:**

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North Atlantic Ocean

Why is the North Atlantic Ocean important for Europe?

This ocean basin contains some of the most productive marine pelagic ecosystems in the world. Important fish stocks of the North Atlantic rim (for example, cod, herring, and mackerel) depend on these food webs.

Processes occurring in and over the North Atlantic influence ocean conditions and biological productivity in all of the European seas. The role of the North Atlantic in global change processes is not yet fully understood, but the consequences of any large scale circulation changes are likely to be dramatic. For example, temperature change and ice melt may, potentially, alter the direction and/or strength of major current systems.

We already have evidence for convincing climate change effects on North Atlantic and shelf seas plankton and fish distributions. Long term monitoring of the planktonic ecosystem has shown that warm-water species have extended their distribution northward by more than 10° of latitude. Cold-water species have decreased in number and extension.

As yet we do not understand the mechanisms by which the North Atlantic influences biological processes closer to and in continental Europe. A primary aim of EUR-OCEANS will be to examine these mechanisms of interaction.

Over the last decade, nationally-funded programs have been conducted to understand the effects of climate variability on ocean ecosystems. One outcome of these studies is the realization that the spatial scale of biological events is often larger than national or regional waters.

The North Atlantic provides the link between the marine research communities of Europe and North America, so EUR-OCEANS is building scientific co-operation in ocean basin scale studies.

The immediate challenge is to co-ordinate trans-Atlantic research, assemble appropriate data sets, and develop basin-scale physical and biological models which include the adjacent shelf seas. EUR-OCEANS is working actively with the North American research community to reach a new level of ecosystem understanding and predicative capability for the North Atlantic.