

## **Detectives at work in the high seas: Tracking the Atlantic Salmon (SALSEA-Merge)**

### **Why does this matter?**

Young wild salmon (referred to as "smolt") leave the rivers after they hatch to find food in the open oceans. Only about 5 to 10 percent of them survive the journey. It is unclear why so many salmon are dying, but it is assumed that environmental and climatic changes are threatening their chances of survival. Until very recently, it was unclear which routes European salmon took to travel through the high seas and whether European salmon from different rivers took the same path. Understanding this is essential if we want to protect salmon and marine biodiversity. Salmon is an important food for people all over the world and a source of income for European fishermen. The ground-breaking research results of SALSEA-Merge are the basis for protection measures which might enable this valuable fish stock to grow to numbers which existed 30-40 years ago. This would reintroduce salmon fishing at sea without harming the species' future.

### **What has the project achieved?**

The European research project SALSEA-Merge tracked the migration of salmon through the ocean and discovered the travel destination of young European salmon. The smolt travel from European rivers towards a region northeast of Iceland, between northern Norway and Greenland. For salmon from Southern European countries (e.g. Portugal), it takes up to about 4 years to travel to Arctic feeding grounds. During this period, they grow from about 13 to 14 cm to about 25 to 26 cm in length. Before the start of SALSEA-Merge, it was generally believed that salmon swim in surface waters. However, now we know that salmon also migrate in much deeper waters. Occasionally, salmon were traced back to depths of 400 m, where they benefit from deep ocean currents and lower temperatures which reduce the energy needed during migration. For the first time in fishery research, these results unravel the behaviour of salmon in the high seas.

### **How?**

The 20 partner institutions from 9 European countries which have come together under SALSEA-Merge applied the recently developed molecular markers in order to distinguish the geographic origin of the salmon (the genetic stock) when they were caught at sea. In addition, highly accurate and cost effective sensors (so-called electronic tags) built into the fish allowed to trace both their horizontal and vertical movements in the ocean as well as their travel time. In parallel, the project collected data on the environmental and oceanographic conditions which salmon faced. Novel high seas trawling technology was used to locate small and young salmon, which are often smaller than 20 cm, in the huge northern North Atlantic sea area. It is this merger of hydrographical, oceanographic, genetic, ecological and modelling approaches that ensured the success of SALSEA-Merge's detective work.

### **Who was involved?**

A total of 20 partners from Norway, Ireland, Great Britain, Denmark, Iceland, Finland, the Faroer Islands, France, and Spain, including NASCO's International Atlantic Salmon Research Board, the Atlantic Salmon Trust and TOTAL Foundation for the biodiversity of the ocean made up the SALSEA-Merge consortium, which was coordinated by the Institute of Marine Research in Norway (Dr. Jens Christian Holst).

**What is the EU added value?**

SALSEA-Merge is part of an international effort to re-establish salmon stocks. SALSEA-Merge is the European contribution to the international project SALSEA, led by the International Atlantic Salmon Research Board. The added value of SALSEA-Merge thus goes beyond the European Union as it provides suggestions for the world-wide protection of salmon.

**How much money has the EU invested in this endeavour?**

The SALSEA-Merge project ran for 3 years and had a total cost of € 5.6 million, out of which € 3.5 million were contributed by the European Union.

For more information, please visit <http://www.nasco.int/sas/salseamerge.htm>