

The Salmon at Sea (SALSEA) Programme ~ Overview



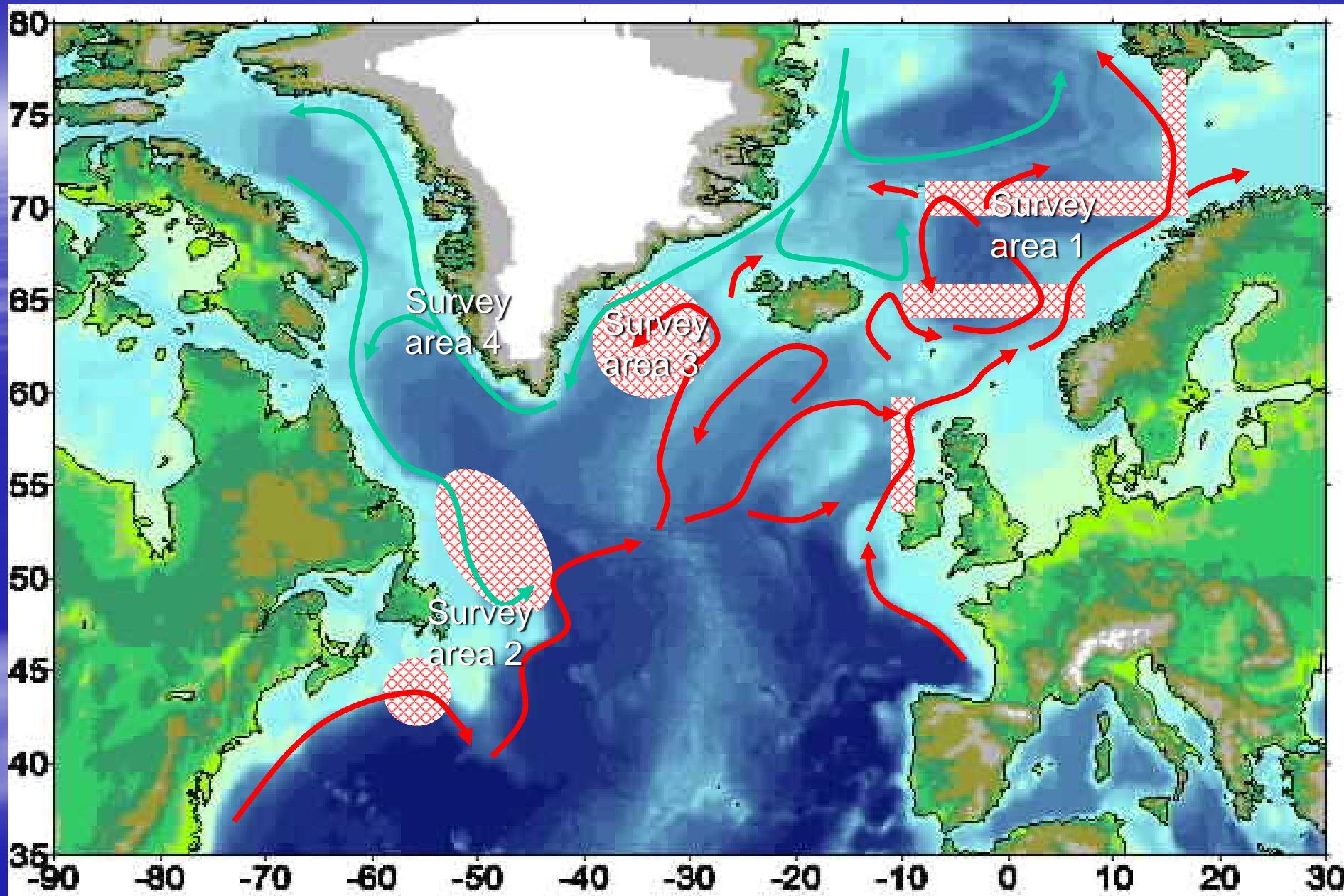
Dr Ken Whelan ~ Chairman IASRB

IASRB Meeting, Molde, Norway, June 1st 2009



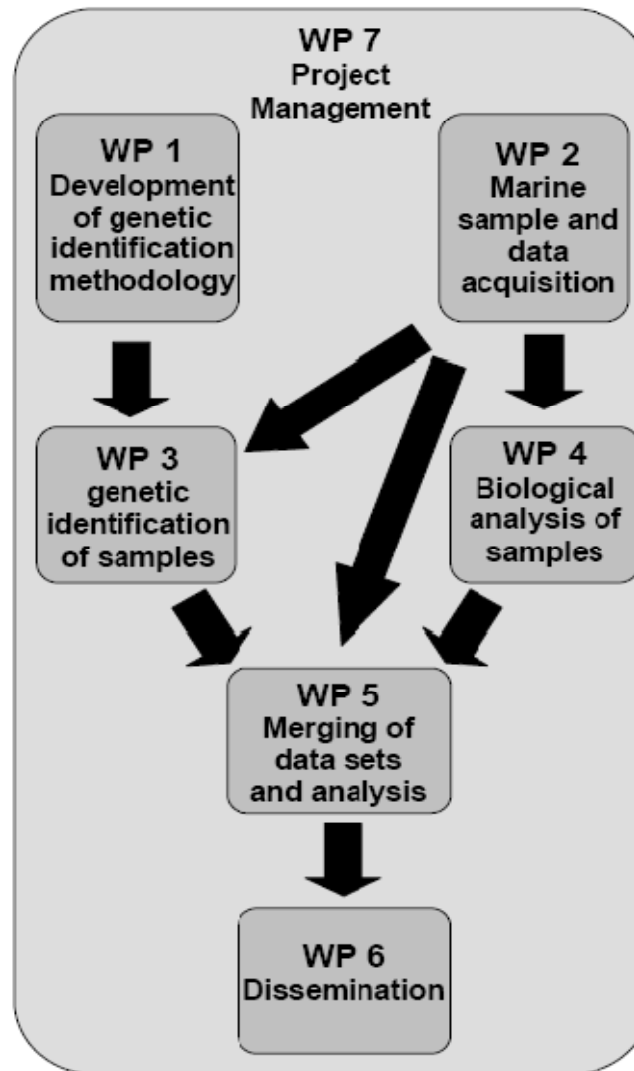
SALSEA

- SALSEA Merge
- SALSEA North America
- SALSEA Greenland
- SALSEA Irminger



Additional Support

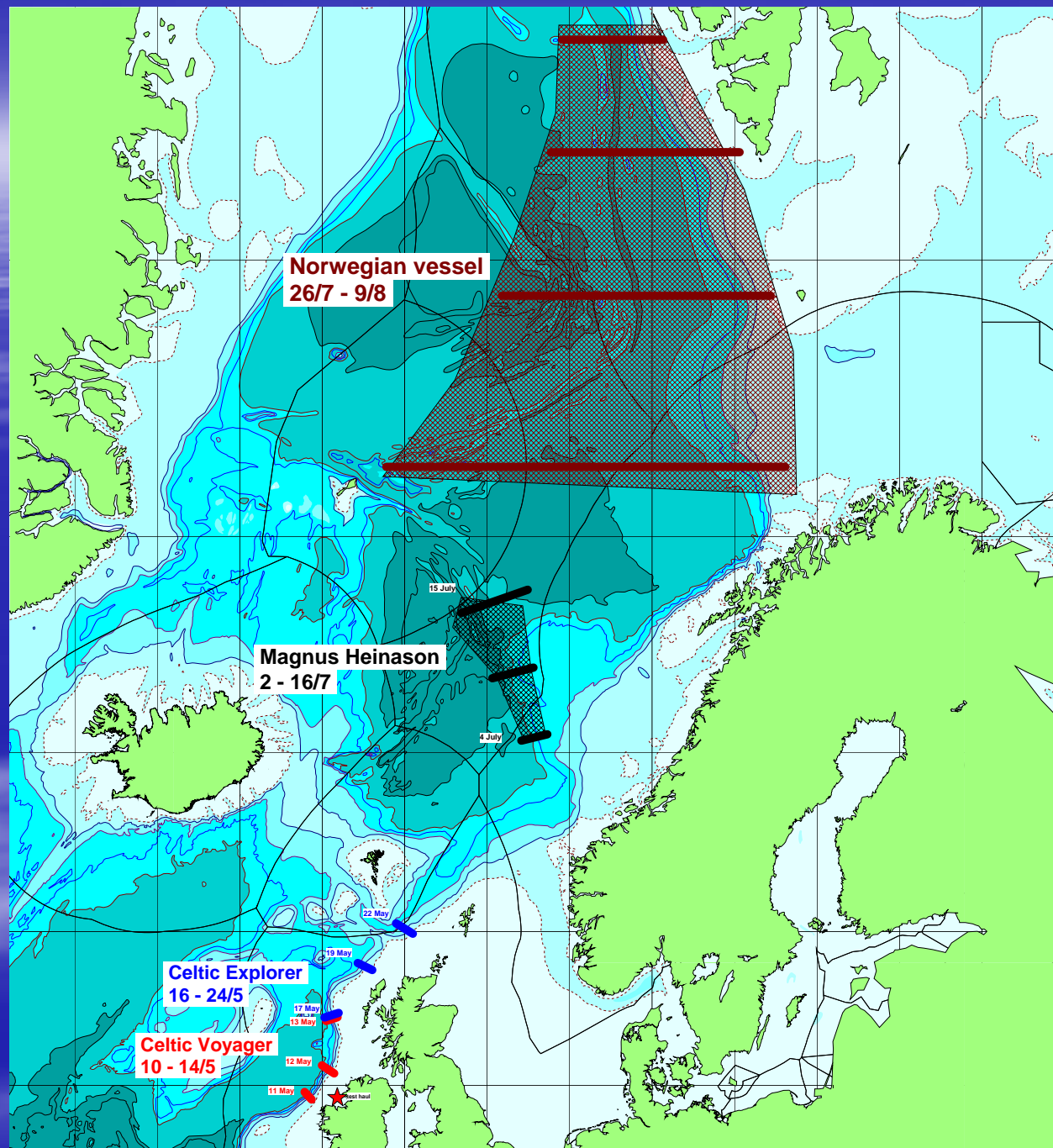
- NOAA
- DFO
- North American regional agencies (Atlantic and Pacific)
- Universities N.A. and Europe
- Newfoundland Labrador
- Russia - Pinro
- Northern Ireland – DARD, DCAL, Bush



Participant No.	Participant organisation Name (*non contracting partners)	Country
1 (Coordinator)	Institute of Marine Research (IMR)	Norway
2	Marine Institute (MI)	Ireland
3	Fisheries Research Services (FRS)	UK
4	Norwegian Institute for Nature Research (NINA)	Norway
5	University of Exeter (UE)	UK
6	National University of Ireland, Cork (NUIC)	Ireland
7	Queen's University Belfast (QUB)	UK
8	University of Wales, Swansea (UWS)	UK
9	Danish Institute for Fisheries Research (DIFRES)	Denmark
10	Institute of Freshwater Fisheries (IFL)	Iceland
11	University of Turku (UT)	Finland
12	University of Oviedo (UO)	Spain
13	Geneindex (GENI)	France
14	Finnish Game and Fisheries Research Institute (FGFRI)	Finland
15	*Faroese Fisheries Laboratory (FFL)	Faroes
16	*Atlantic Salmon Trust (AST)	UK
17	*North Atlantic Salmon Conservation Organisation (NASCO)	UK
18	*Total Foundation (TOTAL)	France
19	*Conservatoire du Saumon Sauvage (CSS)	France
20	*Loughs Agency	UK







Irish Survey May 2008

- The *Celtic Explorer* - 358 salmon post-smolts,
- A further 76 post-smolts were taken during the 9-day cruise of the *Celtic Voyager*, resulting in a total catch of 434 salmon.
- Most of the post-smolts were between 15 - 18cm in length.



Faroese Survey July 2008

- RV *Magnus Heinason* - 363 post-smolts were caught, with three hauls accounting for 184 fish
- The salmon had a mean length 21cm and mean weight of 100g, but 11 larger salmon were also caught. Eleven post-smolts had been finclipped when caught.

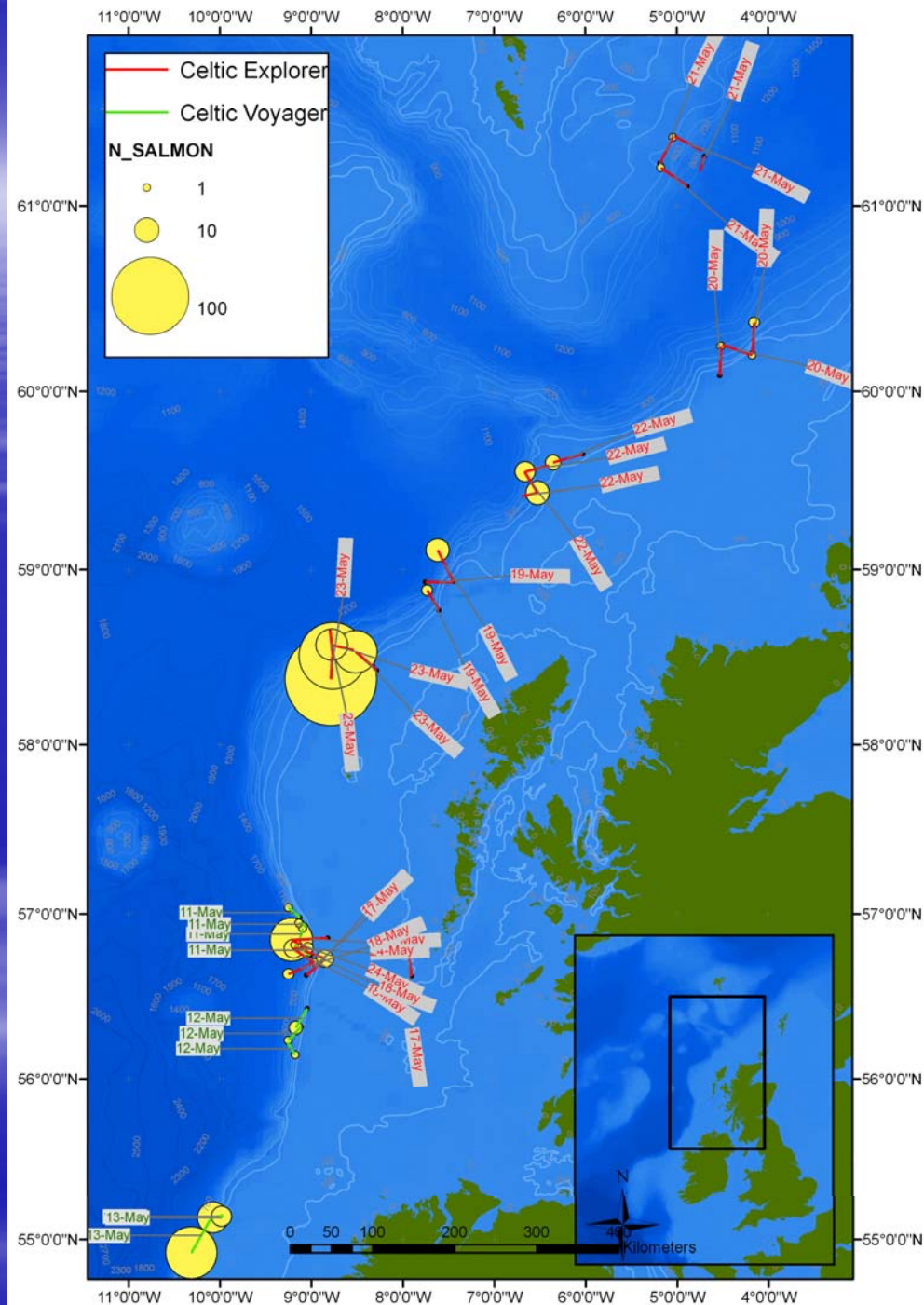


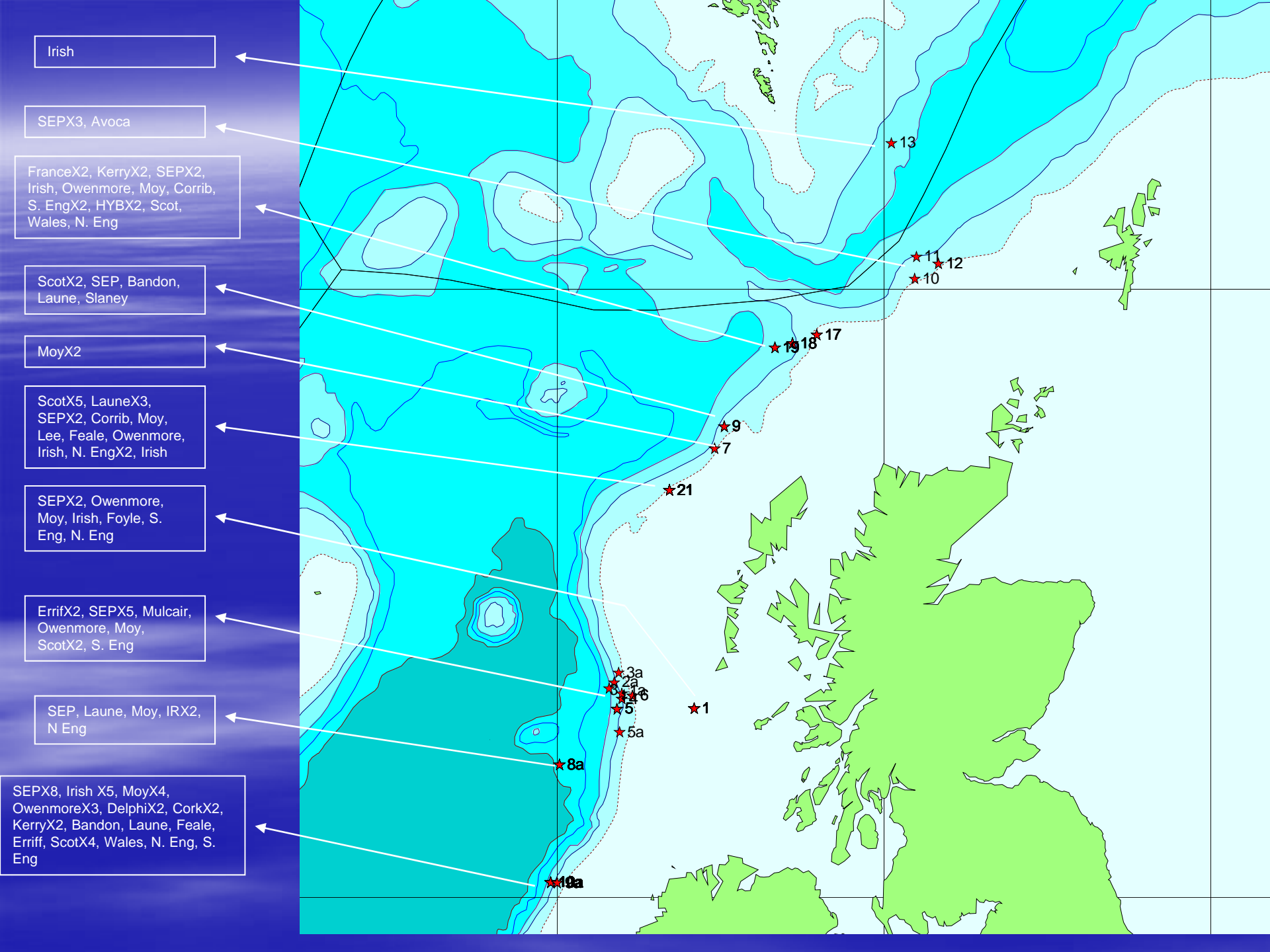
Norwegian Survey July / August 2008

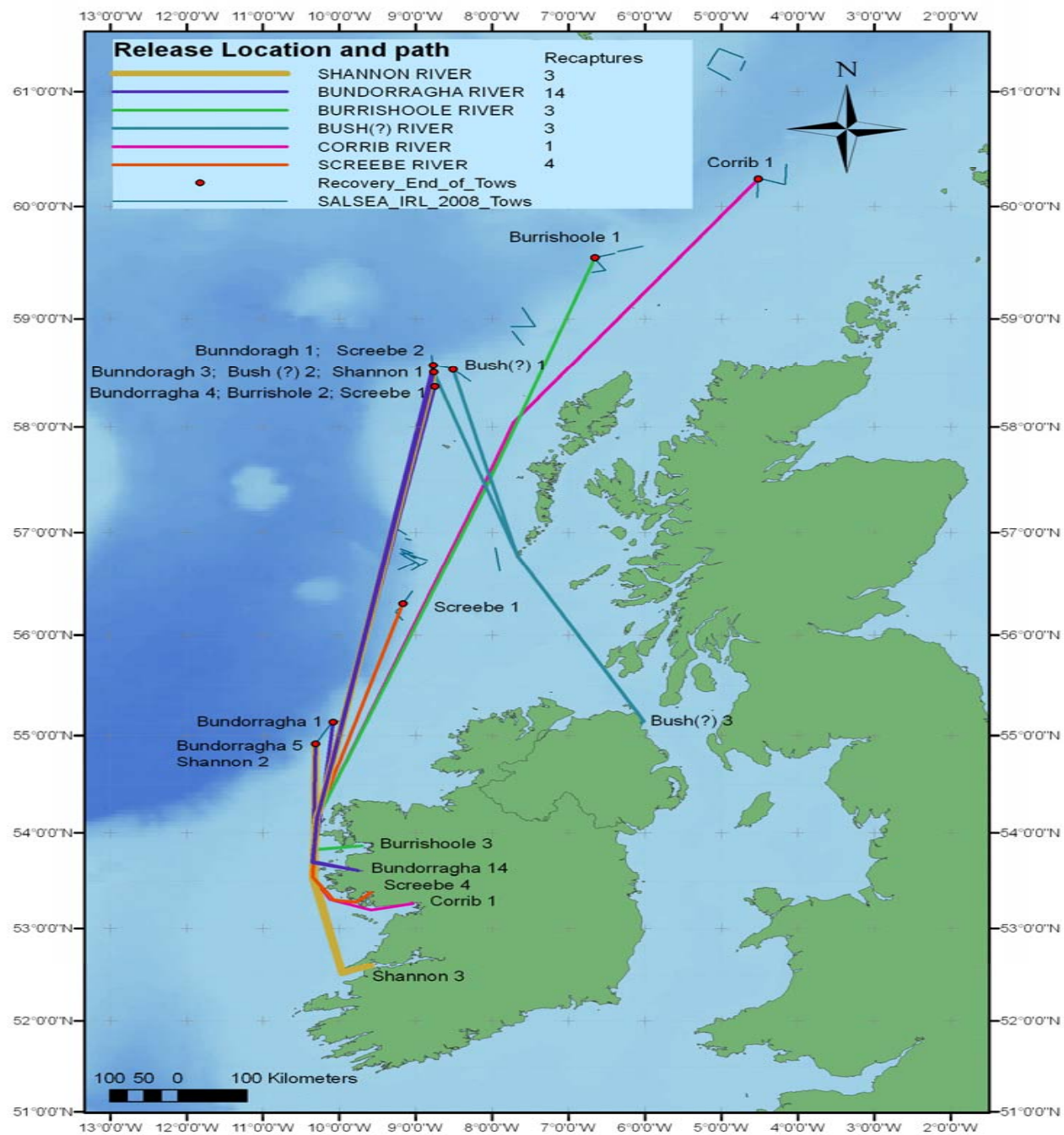
- RV *Eros* - covered the northern-most sector of the sampling area bounded by the north coast of Norway, Jan Mayen Island, Spitzbergen and Bear Island.
- A total of 88 salmon, mostly post-smolts (mean length 24.8 cm and mean weight 143 g), were taken
- The areas fished had not previously been surveyed systematically for post-smolts. Six adult salmon were also caught.
- Post-smolts > dispersed

SALSEA Merge - genetics

- Assigning salmon caught at sea to river of origin but at least to region of origin, is possible, provided that adequate genetic baseline data has been collected
- Further progress has already been made in establishing the international database, standardising labs and work on determining the origin of samples caught in the 2008 marine surveys is underway
- Wealth of archival material to be analysed







Biological Workpackages

- post-smolts were: photographed, measured, weighed, sexed, scale loss was estimated, number of lice counted and stored, a visual inspection for the presence of cataracts, external tags, finclips and fin damage
- Biological samples: scale samples, pectoral fin samples (DNA analysis), samples for disease analysis , isotope samples, lipid samples, stomach samples for diet analysis, and otolith samples for age and growth studies

Biological Workpackages (cont.)

- New digital technology - four labs. established inter-calibration protocols to standardize and improve the accuracy of scale reading and imaging techniques.
- Workshop - Trondheim in September 2008 to train researchers in the new scale reading technique and in use of the new imaging equipment.
- Wealth of archival material to be analysed
- The contents of all the stomachs of salmon caught during the 2008 surveys are currently in the process of being analysed.

Scale analysis – Inter lab “Blind test”

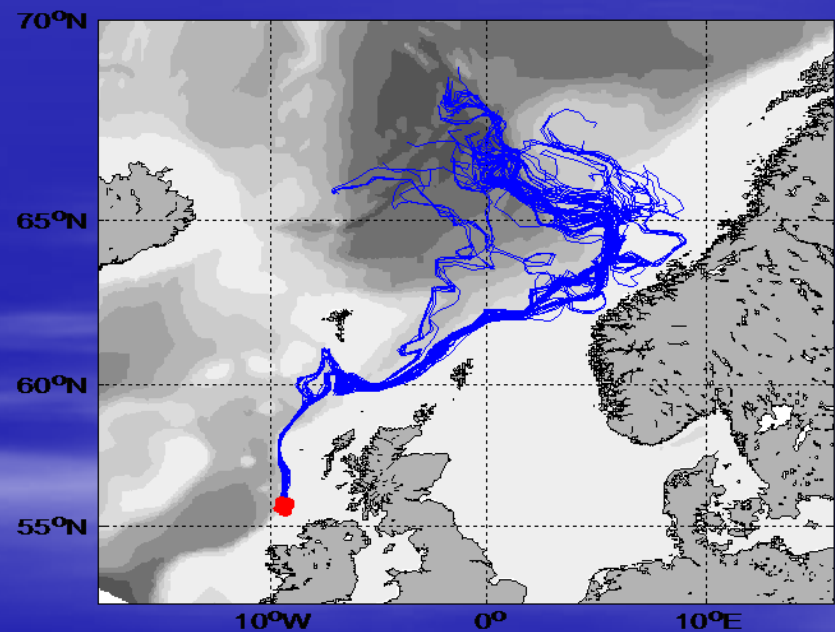
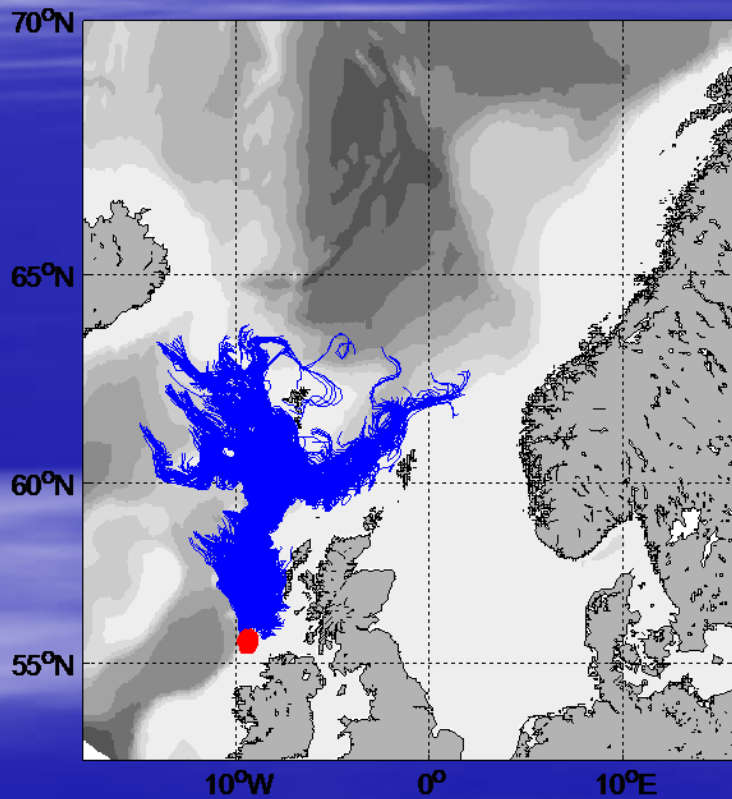
Average data													
	Total scale	No sclerites	Freshwater	C1	C2	C3	C4	C5	C6	C7	C8	C9	
Ireland	3.43	46.4	0.836	0.035	0.045	0.050	0.051	0.060	0.063	0.064	0.064	0.071	
Norway	3.44	45.5	0.875	0.037	0.048	0.055	0.064	0.063	0.067	0.066	0.070	0.070	
Iceland	3.45	41.4	0.917	0.059	0.060	0.063	0.072	0.068	0.071	0.072	0.075	0.071	
Finland	3.50	44.4	0.995	0.045	0.055	0.062	0.066	0.066	0.069	0.070	0.074	0.072	

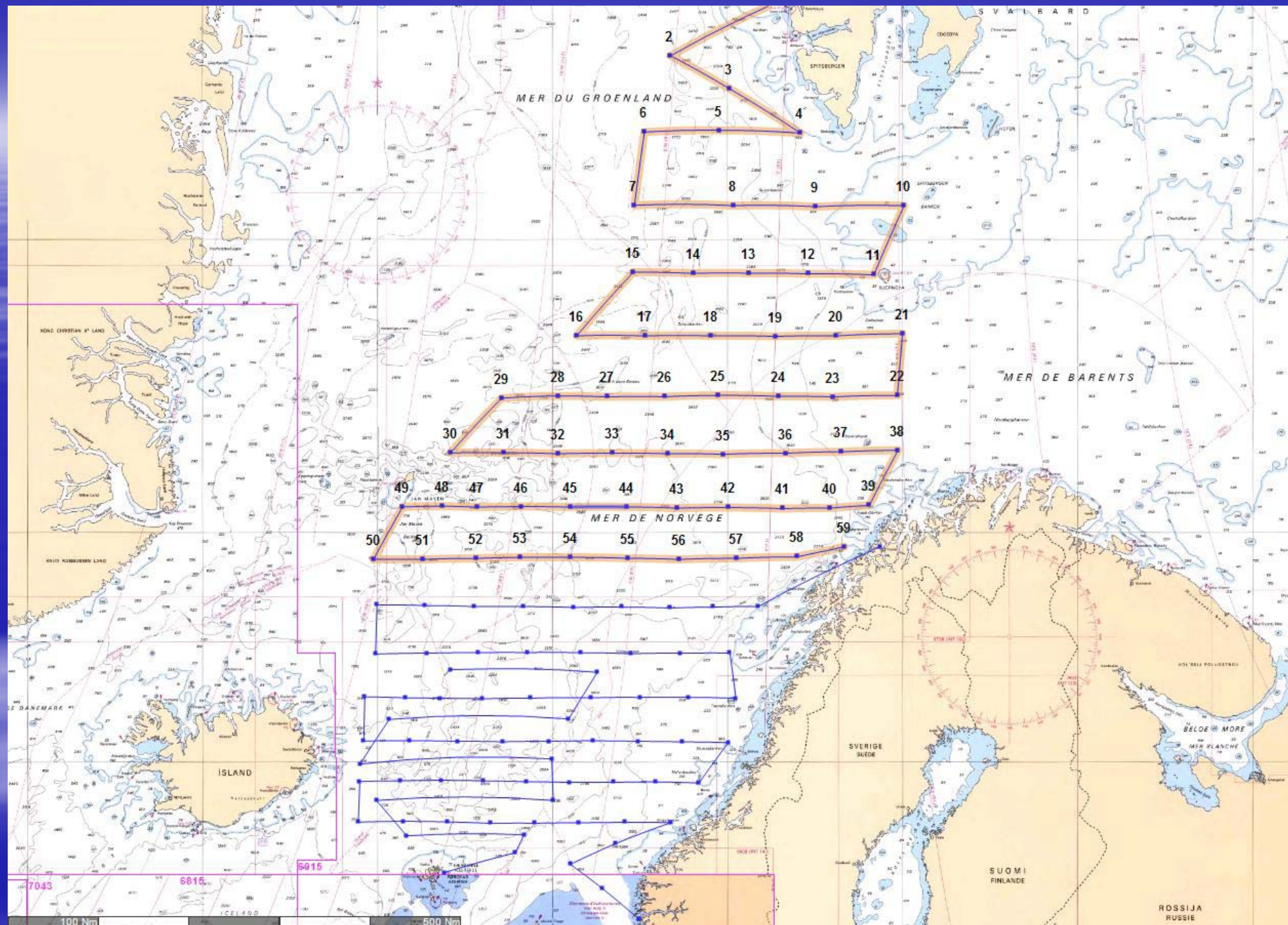


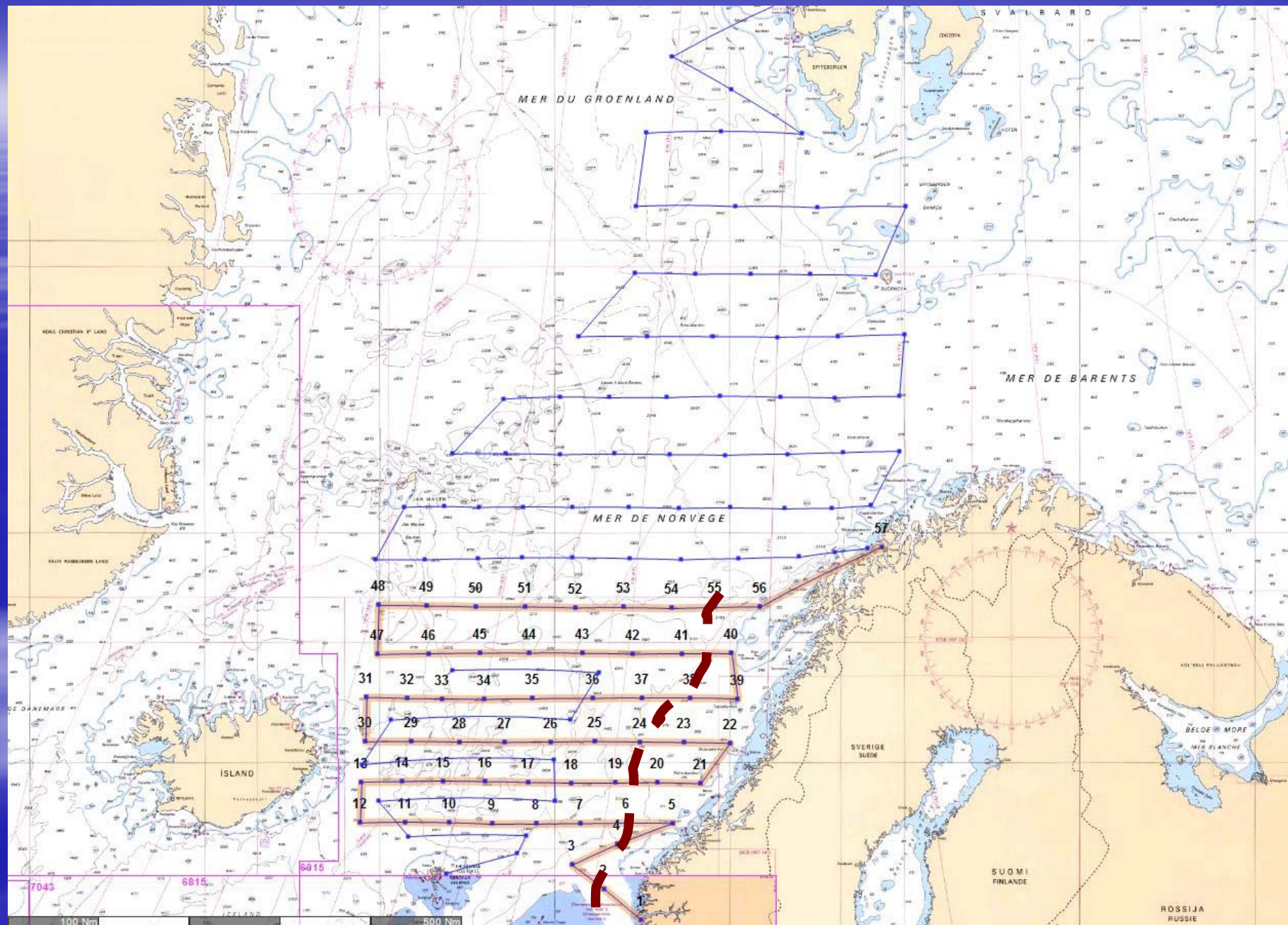
Merge workpackage

The work to date has focused on developing and testing the hydrographic particle tracking model which will be used for simulating and studying the dynamics of post-smolt migrations in the North-East Atlantic.

. Modeled trajectories after 2 months drift of 10000 released post smolts (red dot) the 1st May 2008. Left figure: only passive drift with the surface currents is included. Right figure: active swimming behavior (directed with the current) is also included.







Funding in play

SALSEA estimated cost

- €20.6m
- SALSEA N.A.
- SALSEA Greenland
- SALSEA Irminger
- ASF Marine Salmon Pgm

- SALSEA – Merge

- EU €3.5m
- Partners €1.6m
- TOTAL Fnd €200,000
- AST €210,000
- Full cost: €5.96m

- Funded outside of SALSEA

- ASAP €1.6m
- Genetic baseline €1.5m
- MI /AST Cruise 07
€100,000
- IMR / FRS /AST Cruise 05
€150,000
- TOTAL (genetics meeting)
€50,000



Conclusions

- SALSEA has helped stimulate a keen interest in marine survival issues
- has helped to foster public awareness of the delicate nature of marine ecosystems
- seen by the EU as a major project in the areas of marine biodiversity and impacts of rapid climate change
- now must deliver on very ambitious objectives