

*Report of the Sixth Meeting of the  
International Atlantic Salmon Research Board*

*4 June 2007, Harborside Hotel and Marina, Bar Harbor, Maine, USA*

**1. Opening of the meeting**

1.1 The Chairman, Mr Jacque Robichaud, opened the meeting and welcomed Members of the Board, their scientific advisers and representatives of the accredited NGOs to Bar Harbor. He thanked the US hosts for the excellent arrangements made for the meeting.

1.2 A list of participants is contained in Annex 1.

**2. Election of Chairman**

2.1 The Board elected Dr Ken Whelan as its Chairman.

**3. Adoption of the agenda**

3.1 The Board adopted its agenda, ICR(07)5 (Annex 2).

**4. Inventory of Research**

4.1 At its inaugural meeting the Board had developed an inventory of research relating to salmon mortality at sea, ICR(01)05, which had been updated annually (see CNL(02)21, ICR(03)3, ICR(04)3, ICR(04)6, ICR(05)3, ICR(05)10, ICR(06)2, ICR(06)11 and again in 2007, ICR(07)2). Maintenance of this inventory is required under the Board's Rules of Procedure and it is considered an essential tool in identifying research gaps and priorities and in improving coordination of existing research. It is also important in demonstrating to potential collaborators the extent of existing commitments by the Parties and the nature of the ongoing research programmes. A summary of the updated inventory had been made available to the ICES Working Group on North Atlantic Salmon for information purposes so as to assist it in identifying data deficiencies, monitoring needs and research requirements. The inventory had also been reviewed by the Board's Scientific Advisory Group (SAG) to assist it in identifying gaps in research and research priorities and to develop recommendations for enhanced coordination of existing research.

4.2 The Assistant Secretary made a brief presentation on the inventory. The updated inventory includes a total of 54 ongoing projects, an increase of 3 projects from 2006. 8 projects have been completed and 10 new projects included since last year. The total annual expenditure on the ongoing projects included in the inventory amounts to about £5million, a slight reduction compared to 2006. No costings were available for 3 of the projects. New studies of particular relevance to the SALSEA programme include a number of genetic studies which will contribute to developing a genetic baseline of stocks to facilitate genetic stock identification of salmon caught in

research cruises at sea and gear trials of a pelagic trawl off the Irish coast in May 2007. He advised the Board that the inventory had been thoroughly reviewed by the Scientific Advisory Group which had developed a number of recommendations to be presented by the Group's Chairman.

- 4.3 The Chairman welcomed the progress that had been made in compiling the inventory and after four years of development there was now a comprehensive record of ongoing research into mortality of salmon at sea. The inventory is a valuable tool in better promoting the research being undertaken, in avoiding duplication of effort and in facilitating better coordination.

## **5. Report of the Scientific Advisory Group**

- 5.1 The report of the Board's Scientific Advisory Group (SAG) was presented by its Chairman, Dr Lars Petter Hansen (Norway), SAG(07)4 (Annex 3). The Group had reviewed the updated inventory of research and progress with implementing and promoting SALSEA. A report on an ICES Workshop on the Development and Use of Historical Salmon Tagging Information from Oceanic Areas had been presented to the SAG. The Board had funded the participation by a GIS expert in this workshop. The Workshop had made good progress in identifying data sets and had proposed a standard format for recording tag recovery data for future analysis. The SAG recommends that if ICES convenes a follow-up workshop that the Board allocate £2,500-£5,000 to fund participation by a GIS expert and oceanographer. Last year the Board had asked the SAG to further develop the plans for the marine survey component of the SALSEA programme. An informal meeting had been held and the report of the meeting had been presented to the SAG. This report had been very useful to the President and Secretary in promoting SALSEA. At its last meeting the Board had decided to invite the SALMAN coordinators to report on progress with the SALMAN initiative and provide proposals for genetic stock identification work that might be supported by the Board. The SAG had noted that the application for EU FP7 funding and the TOTAL Foundation included proposals in relation to genetic stock identification and recommends to the Board that the need to seek advice from the SALMAN coordinators be reviewed at its next meeting in the light of the outcome of the applications for funding. The SAG had also considered the need to commission a report on the information relevant to marine mortality of salmon that might be derived from scale analysis. The Board had allocated the sum of £10,000 for this project but the SAG recommends that there is no longer a need to seek further advice on this topic and that if funds permit the Board considers supporting additional analysis of samples from the West Greenland fishery.
- 5.2 The Board agreed that the Parties should be given an opportunity to provide any additional information to the Secretariat by 30 June for inclusion in the inventory and that after that date the inventory should be made available on the Board's website. The Board agreed with the SAG's proposals regarding better communicating the information in the inventory
- 5.3 On the recommendation of the SAG the Board agreed:
- to encourage the Parties to compile historical tagging information using the format developed by the ICES Workshop;

- to ask that NASCO request ICES to compile, on an annual basis, tag recovery information and report on the status of analysis of historical tag recovery data;
- in the event that ICES convenes a follow-up workshop, the Board will fund the participation of a GIS expert and oceanographer and that a sum of up to £5,000 be made available to support such participation;
- to make the spreadsheet format for compiling historical tag recovery information available on the Board's website.

5.4 The Board further agreed as follows:

- to review the need to seek advice from the SALMAN coordinators on genetic stock identification at its next meeting in the light of the application for funding to the Total Foundation and the SALSEA-MERGE EU FP7;
- not to seek further advice on the information that might be derived from scale analysis in support of SALSEA since this aspect had been addressed in the SALSEA-MERGE FP7 application;
- to allocate a sum of £8,000 to an extended sampling programme at West Greenland to allow tissue samples to be collected with a view to examining trophic feeding status and condition of salmon with continent of origin and age at maturity comparisons.

## 6. The SALSEA Programme

### (a) Review of progress in implementing SALSEA

6.1 The President presented a comprehensive overview of progress in implementing and promoting the SALSEA programme. He stressed that the benefits of cooperating through SALSEA include sharing of facilities and pooling expertise, the ability to coordinate marine surveys in time and space, to make best use of existing information and the sum being greater than the component parts. With regard to progress in implementing SALSEA there had been considerable progress made on supporting technologies (Workpackage 1) for the marine surveys, including initiation of genetic baseline sampling programmes in Canada, Iceland, Ireland, Norway, Russia and the UK, and pelagic live-capture trawl gear had been trialled off the west coast of Scotland and Ireland in conjunction with the Atlantic Salmon Trust. There are a number of ongoing studies using samples from scales. With regard to early migration (Workpackage 2) there is much ongoing research largely funded by national agencies and their partners although there is a need to enhance coordination and stimulate additional financial support. For Workpackage 3 (Distribution and Migration at Sea), Norwegian surveys during 1982-2004 had resulted in the capture of approximately 7,000 post-smolts and work on migration modeling is underway. Marine surveys have also been undertaken by US, Canada and UK scientists and the Board had supported an ICES workshop on the Development and Use of Historical Tagging Information from Oceanic Areas. Russia had continued to carry out research into by-catch of salmon at sea in pelagic fisheries.

6.2 He then went on to describe an application for funding under the EU Seventh Framework Research Programme (SALSEA-MERGE) for Euro3.5million. The application includes partners in UK, Ireland, Norway, Faroes, France, Iceland, Denmark, Finland and Spain and, if successful, it will fund 50% of ship-time and 75% scientific analyses. SALSEA-MERGE comprises seven workpackages, including

- development of genetic identification methodology;
- marine sample and data acquisition;
- genetic identification of samples;
- biological analysis of samples;
- merging of data sets and analysis.

- 6.3 With regard to promoting SALSEA, a Steering Committee had been established, a case for support had been prepared by this Committee in consultation with Brakeley Consultants, approaches had been made to organizations and foundations in Europe and North America, formal applications for funding had been made to the TOTAL Foundation in France (Euro350,000), the Ocean Foundation in the US (\$600,000) and the EU FP7. The Ocean Foundation had agreed to serve as a fiscal sponsor in North America and to assist in identifying eco-vessels. In conclusion, he indicated that since SALSEA was endorsed by the Board in 2005, important new research had commenced, there had been continuing commitment to inshore research projects, promotional documents had been developed, there had been commitments from some Parties of vessel time in 2008 and 2009, there had been positive signs of early buy-in from some private sector sources, and a major application for funds had been made to EU FP7. The major challenge was to ensure that a comprehensive programme of marine surveys was conducted in the north-east and north-west Atlantic in 2008 and 2009.
- 6.4 The Chairman thanked the President for his presentation, which is contained in Annex 4. He noted that there had been a giant step over the last two years in implementing and promoting SALSEA both by NASCO's Parties and its NGOs. He indicated that all the progress in improving habitat in rivers would be undermined if the factors influencing mortality at sea were not better understood. In this regard, it would be important for the Board to highlight the severity of the decline in stock abundance linked to increased mortality of salmon at sea.
- 6.5 Canada indicated that it had committed considerable resources to the SALSEA programme in the form of ongoing projects and the Minister of Fisheries and Oceans had committed to contribute CAN\$100,000 to the SALSEA programme. The EU indicated that it was looking into the possibility of contributing funds towards the 2010 Joint Symposium and asked if a draft budget could be developed for this symposium. The Chairman thanked Canada and the European Union for these offers of contributions to the Fund.
- 6.6 The Board recognizes the desirability of improving collaboration and coordination of research under the various SALSEA workpackages and asked that the SAG develop a prioritized list of workshops that might be held to stimulate cooperation and coordination of research relating to specific components of the overall SALSEA Programme being undertaken around the North Atlantic.

## **7. Finance and administrative issues**

- 7.1 At its last meeting the Board had recognized that there are significant costs in having the accounts audited annually and agreed that, in future, the Board's accounts should be audited every two years, commencing with the 2007 financial statements. For years in which an audit is not conducted, details of the Board's income and

expenditure statements will be circulated to the members of the Board and discussed at its Annual Meeting. The Secretary reported that in accordance with this decision, financial statements for the year to 31 December 2006, ICR(06)3, had been sent to all members of the Board.

- 7.2 The Secretary indicated that the balance of the fund is currently around £42,000 but it is expected that there will be miscellaneous income of around £2,000. However, the Board had previously agreed to reserve the sum of £28,000 in order to co-sponsor a joint symposium with NPAFC, PICES and ICES in 2010. Furthermore, it had decided to allocate up to £5,000 to allow a GIS specialist and oceanographer to participate in a second meeting of the ICES Workshop on the Development and Use of Historical Salmon Tagging Information from Oceanic Areas. A further £8,000 has been allocated to fund the extended analysis of samples from the West Greenland fishery. A total of £43,500 had, therefore, been allocated to project work. The Secretary indicated that Brakeley Consultants had offered to continue to work at a reduced level to maintain some momentum with promoting SALSEA after the funds allocated by the Board had all been utilized. They had indicated that they would undertake this work on the basis that they would be reimbursed when funds for promoting SALSEA become available. A sum of approximately £6,000 is due to Brakeley. The Board agreed that the account should be settled with Brakeleys but noted that this would only be possible if approximately £5,000 was withheld from the proposed expenditure on project work. Norway indicated that it would be willing to contribute £5,000 to the Board to enable the project work to be undertaken and for Brakeley to be reimbursed. The Chairman thanked Norway for this offer of a contribution to the Fund.
- 7.3 In summary, the existing available resources, together with the contribution from Norway and miscellaneous income, amount to £49,000. The anticipated expenditure, including the payment to Brakeley, is expected to be £49,000, so the Board's available funds are fully utilized.
- 7.4 The Board discussed the next steps in promoting the SALSEA programme. The Secretary indicated that the Board should be advised next week if the application to the TOTAL Foundation had been successful and in July it would know the outcome of the application for EU FP7 funding. The Board agreed that the immediate next steps should be to focus its efforts on exploring the availability of funding an eco-vessels through the Ocean Foundation with a view to conducting marine surveys in the north-west Atlantic. If further use of Brakeley Consultants' services is required, they should focus on such a project. The Secretary would advise Board members of any such intention. There may be other contacts, such as the Pew Foundation (which could only fund scientific research not vessel time), that might be approached again, together with approaches to wealthy individuals. In this regard the NGOs indicated that Fishmongers' Company had offered to provide facilities for meetings with potential funders. The Board welcomed this offer of assistance and would welcome continuing NGO cooperation in promoting SALSEA in the future.

## **8. Other business**

- 8.1 There was no other business.

**9. Report of the meeting**

9.1 The Board agreed the report of its meeting.

**10. Date and place of next meeting**

10.1 The Board will agree the date and place of its next meeting by correspondence.

10.2 The Chairman thanked participants for their contributions and closed the meeting.

*List of Participants*

**Chairman of the Board**

Mr Jacque Robichaud

**President of NASCO**

Dr Ken Whelan

**Canada**

Mr Guy Beaupré

Mr Bud Bird

Mr Gerald Chaput

Mr Peter Cronin

Ms Chantal Lamadeleine

**Denmark (in respect of the Faroe Islands and Greenland)**

Dr Jan Arge Jacobsen

Mr Andras Kristiansen

**European Union**

Mr Alan Gray

Dr Trevor Hastings

Mr Julian MacLean

Mr Ted Potter

**Iceland**

Mr Arni Isaksson

**Norway**

Mr Raoul Bierach

Mr Arne Eggereide

Dr Lars Petter Hansen

**Russian Federation**

Dr Boris Prischepa

Ms Elena Samoylova

Mr Gennady Ustyuzkinsky

## **USA**

Dr Alex Curtis  
Mr Pat Scida  
Mr Tim Sheehan

## **Non-Government Organizations**

Mr Niall Greene  
Mr Paul Knight  
Major General Seymour Monro

## **Secretariat**

Dr Malcolm Windsor  
Dr Peter Hutchinson

**International Atlantic Salmon Research Board**

**ICR(07)5**

**Sixth Meeting of the International Atlantic Salmon Research Board**

**Harborside Hotel & Marina, Bar Harbor, Maine, USA**

*Monday 4 June, 2007*

*Agenda*

1. Opening of the meeting
2. Election of Chairman
3. Adoption of the agenda
4. Inventory of Research
5. Report of the Scientific Advisory Group
6. The SALSEA Programme
  - (a) Review of progress in implementing SALSEA
  - (b) Review of progress in promoting SALSEA
  - (c) Future actions
7. Finance and administrative issues
8. Other business
9. Report of the meeting
10. Date and place of next meeting



**SAG(07)4**

***Report of the Fifth Meeting of the Scientific Advisory Group of the  
International Atlantic Salmon Research Board***

***Harborside Hotel and Marina, Bar Harbor, Maine, USA  
Sunday 3 June 2007***

**1. Opening of the Meeting**

- 1.1 The Chairman, Dr Lars Petter Hansen (Norway), opened the meeting, welcomed participants to Bar Harbor and thanked the US hosts for the arrangements made for the meeting.
- 1.2 A list of participants is contained in Annex 1.

**2. Adoption of the Agenda**

- 2.1 The SAG adopted its agenda, SAG(07)2 (Annex 2).

**3. Review of the updated inventory of research and recommendations for enhanced coordination of research**

- 3.1 The Assistant Secretary provided an overview of the updated inventory of research relating to salmon mortality in the sea, ICR(07)2, which is considered by the Board to be an essential tool in identifying research gaps and priorities, in improving coordination of existing research and in support of promotion of SALSEA. For 2007, 54 ongoing projects had been included in the inventory and the annual expenditure on these projects was approximately £5.0 million. No costings had been provided for 3 projects. Since the last update, 10 new projects had been included in the inventory and 8 projects had been completed, two of which were not previously included in the inventory. New projects of particular relevance to the SALSEA programme include a number of studies which will contribute to developing a genetic baseline of stocks to facilitate genetic stock identification of salmon caught in research cruises at sea and gear trials of a pelagic trawl off the Irish coast in May 2007.
- 3.2 At its last meeting the Board had noted that for some Parties and jurisdictions, long-term monitoring programmes of smolt survival in a number of rivers had been collated and presented as a single project while other Parties and jurisdictions had presented projects on individual rivers separately. The Board had asked that each Party or jurisdiction present such studies as a single project for inclusion in the inventory and this had been done in the 2007 update.
- 3.3 As requested by the Board, the Secretariat had requested details of the sampling programme at St Pierre and Miquelon from the French authorities for inclusion in the inventory but no information had been provided to date.

- 3.4 Last year the SAG had noted that the North East Atlantic Commission's pilot project involving the release of externally tagged farmed salmon, to improve understanding of their migration and fate, had not been included in the inventory. Tagged farmed salmon were released in Norway and Scotland in 2006 and a progress report will be made to the Twenty-Fourth Annual Meeting of the North-East Atlantic Commission. Details of this project had not, however, been submitted for inclusion in the inventory. The Secretariat was asked to liaise with the SAG members in Norway and Scotland with a view to including a report on the project before the inventory is made available on the website.
- 3.5 At its last meeting the SAG had agreed that efforts should be made to better communicate the valuable information in the inventory to researchers and to NASCO's accredited NGOs. The SAG recommends that to facilitate such communication, the inventory should be made more prominent and easily accessible on the Board's website. Furthermore, the Secretariat should be asked to make the summary report and tables available in a separate document from the annexes. SAG members should seek to provide links to the inventory on their institutes' websites.
- 3.6 The SAG recognized the need to continue to find means to improve communications and collaboration between institutions working on related topic areas.
- 3.7 The SAG recognized that acoustic telemetry work can contribute valuable information on the migration and distribution of salmon at sea and that acoustic arrays are being located increasingly further offshore. These studies are relevant in planning the marine surveys in the SALSEA programme and the SAG believes that, in future, such projects should be allocated to SALSEA Workpackage 3.

#### **4. The SALSEA Programme**

##### **(a) Progress with implementing SALSEA**

- 4.1 The Assistant Secretary summarized the actions agreed by the Board at its last meeting to promote and implement the SALSEA programme. A Steering Committee had been established comprising 5 representatives from the NGOs and 5 representatives from the NASCO Parties. With professional support from Brakeley consultants, the Steering Committee had developed the case for support and a marketing package for SALSEA and the NASCO President and Secretary had sought early buy-in and contributions to the fund. The SAG had been requested to deliver a comprehensive package of cruises to be undertaken in 2008 and 2009 (see 4a(ii)) and the Parties had been requested to ensure access to vessel time is given higher priority in 2008/2009 in support of the SALSEA programme. The Board had also agreed to fund three projects. First, it would support participation by GIS experts and oceanographers in the ICES workshop on development and use of historical salmon tagging information (see 4a(i)). A sum of £5,000 was allocated to this project. Second, it would seek proposals for how genetic stock identification work might be supported by the Board but did not allocate funds for this work. Third, it would, as a lower priority, seek a report on the information in relation to marine mortality of salmon that might be obtained from scales. A sum of £10,000 had been allocated to this project. The Board had also allocated a sum of £28,000 to support a joint symposium with PICES, ICES and NPAFC in 2010 on salmon mortality at sea. He indicated that, allowing for this expenditure, the Board had no surplus funds. While

the cost of funding participation in the tagging workshop was expected to be around £2,500, there may be additional costs incurred in promoting SALSEA.

*(i) Analysis of historical tagging data*

4.2 The SAG Chairman reported on an ICES Workshop on the Development and Use of Historical Salmon Tagging Information from Oceanic Areas which had been held in St Johns, Newfoundland during 19-22 February 2007. The Board had agreed to support this workshop by funding the participation of a GIS expert and this had been extremely useful in facilitating the group's work. A sum of £5,000 had been allocated last year by the Board to fund this participation but the anticipated cost is likely to be around £2,500. The Workshop had:

- collated published information on oceanic tag recoveries;
- reviewed tagging and tag recovery data that was reported to it;
- agreed a format for recording tag recovery data and considered examples of frameworks for data analysis; and
- formulated a series of hypotheses that could be tested when GIS data was complete.

4.3 The Workshop had recommended that a further meeting be held in 2007 or 2008 to complete compilation of available data and commence analysis of the distribution of recoveries of tagged salmon at sea. In this regard it was noted that the integration of data from the north-west and north-east Atlantic provides a significant opportunity to advance understanding of the marine distribution and migration of salmon. The Workshop had also recommended that consideration be given to collecting data from areas at times when research vessels cannot operate (through, for example, use of new tagging techniques). The Workshop further recommended that the format for tag recovery information be used to prepare data for analysis at the next workshop, that agencies coordinate their efforts to ensure that datasets are not duplicated and that the follow-up workshop include oceanographers and GIS experts to assist in describing salmon distributions in relation to ocean environment.

4.4 The SAG recognised the desirability of establishing a single repository of tag recovery information that would be available to a wider scientific community, e.g. scientists working on climate change. While this is a longer-term objective, in the interim it would be desirable if all data were held nationally according to the agreed format and a listing of the agencies holding the data compiled. The format is available from ICES and the Workshop participants. The SAG recognized that analysis of historical tag recovery information could improve understanding of salmon distribution and migration at sea and therefore benefit the SALSEA programme. The SAG therefore recommends that:

- the Board should encourage the Parties to compile historical tagging information using the format developed by the Workshop;
- NASCO should request ICES to compile, on an annual basis, tag recovery information and report on the status of analysis of historical tag recovery data;
- in the event that ICES convenes a follow-up workshop, the Board should consider funding the participation of a GIS expert and oceanographer and that the sum of £2,500 (or if resources permit, £5,000) be made available to support such participation.

**(ii) Development of Workpackage 3**

4.5 The Chairman reported on an informal meeting organised by the Board to further develop the plans for the marine survey component of the SALSEA programme (Workpackage 3). The meeting had been held in London during 2 and 3 November 2006 and had addressed a number of questions, including:

- why study salmon in the sea?;
- what do we know about the marine ecology of salmon?;
- what key things don't we know about salmon in the sea?;
- why is a coordinated marine research programme required?;
- what survey techniques will be used?;
- what data will be collected from captured fish and how will they be used?;
- where and when should surveys be conducted?;
- what vessels would be used?;
- what information should be collected from the fish sampled?

4.6 The report of the meeting is contained in document ICR(06) 4. This report had been very useful to the President and Secretary in promoting SALSEA.

**(iii) Development of an application for funding under the EU Seventh Framework Programme**

4.6 The President reported on the development of an application (SALSEA-MERGE) for funding marine research surveys in 2008 and 2009 that had been submitted to the EU under the Seventh Research Framework Programme (FP7). This application, if successful, would fund 50% of ship-time and 75% of the scientific analyses up to a total of Euro 3.5 million with partners in UK, Ireland, Norway, Faroes, France, Iceland, Denmark, Finland and Spain. The programme comprises a series of workpackages, including:

- development of genetic identification methodology;
- marine sample and data acquisition;
- genetic identification of samples;
- biological analysis of samples;
- merging of data sets and analysis.

4.7 While it was recognised that there would be strong competition for funding, even in the event of an unsuccessful application, it was recognised that there had been commitments from some Parties to vessel time in 2008 and 2009 that, together with possible funding from private sources, such as the Total Foundation, would enable some research surveys in the north-east Atlantic to be undertaken in 2008 and 2009, although additional funding would be needed for the genetic analysis of samples collected. Furthermore, it was hoped that funding would be raised in North America to allow complementary surveys to be undertaken in the north-west Atlantic. It was noted that access to research vessel time in the US and Canada was extremely difficult but the Ocean Foundation had indicated that eco-vessels might be available in support of SALSEA. He indicated that one advantage of the SALSEA and SALSEA-MERGE initiatives being structured into workpackages and tasks was that there was now a wide range of individual research projects that could be conducted according to

available resources. He concluded that the challenge was to ensure that funding was in place to allow a comprehensive programme of marine surveys to be undertaken in 2008 and 2009 in both the north-east and north-west Atlantic. In this regard it was noted that there is a need for scientists around the North Atlantic to promote the need for the marine survey element of the SALSEA programme as a priority for research funding.

**(iv) Other activities**

- 4.9 At its last meeting the Board had decided to invite the SALMAN coordinators to report on progress with the SALMAN initiative and provide proposals for genetic stock identification work that might be supported by the Board. The SAG noted that the applications for EU FP7 funding and the Total Foundation included proposals for further developing the genetic baseline sampling, for assessing the degree of commonality of markers in different databases and for identifying differences in sampling approaches underlying the databases. The SAG therefore recommends that the need for the Board to seek advice from the SALMAN coordinators be reviewed at its next meeting in the light of the outcome of the applications for funding.
- 4.10 At its last meeting the Board had agreed to invite Dr Kevin Friedland to report on information relevant to the marine mortality of salmon that might be derived from scale analysis. A sum of £10,000 had been allocated to this project but it was recognised that this was a lower priority than the analysis of historical tagging information, the proposals for genetic stock identification and the 2010 joint symposium. The SAG recognised that in developing the SALSEA-MERGE application for EU FP7 funding, consideration had been given to the information that that might be derived from archival and contemporary scale material and to the establishment of a digital scale library. The SAG therefore recommends that there is no longer a need to seek further advice on this topic and recommends that if funds permit, the Board considers supporting an enhanced sampling programme at West Greenland (see 4.13).
- 4.11 The SAG noted that progress in planning for the 2010 symposium would be reported during the Special Session on Salmon at Sea to be held during the Twenty-Fourth Annual Meeting of the Council.
- 4.12 The SAG noted that under the SALSEA programme it is recommended that the sampling programme at West Greenland should be extended. The SAG discussed a proposal for research on the trophic feeding state and condition of salmon – continent of origin and age at maturity comparisons. One-sea-winter salmon from both North America and the North-East Atlantic migrate to feeding grounds at West Greenland during their second year at sea. Understanding of the marine ecology of these fish could be advanced through studies of trophic state and condition (i.e. lipid content). The questions that might be addressed include:
- 1) Are trophic states of 1SW non-maturing fish similar between NAC and NEAC origin salmon?
  - 2) Are trophic states of 1SW non-maturing fish different from those of 1SW maturing fish of the same cohort? Can this tell us anything about when these different maturity groups separate in the North Atlantic?

- 3) Has there been a trophic state change between West Greenland and when these fish finally return to home rivers as 2SW salmon?
  - 4) The same questions would be examined for lipid content to assess fish condition (survivals differ between fish from the two continents. Is this related to condition at that time of year as fish enter their second winter at sea?)
- 4.13 The present sampling program at West Greenland includes the purchase of whole fish specifically for disease sampling. Additional tissue sampling of these fish would be conducted including muscle, liver and caudal fin punches. All tissues would be analysed for lipid and stable isotope ratios. Caudal punches can be collected without lethal sampling and allow sampling of 1SW and 2SW salmon survivors back to home waters. Sampling costs at West Greenland are covered by existing or proposed international collaborative programmes (expenditure in 2006 was £66,200). However, funding is sought from national programs and from the Board for the analysis of the tissue samples. The additional analysis of samples collected in West Greenland will require funding of about £8,000. Details of the proposal and costings are given in Annex 3. The SAG recommends that the Board consider funding the costs of the analysis of tissue samples collected at West Greenland if its existing resources permit, or when new funds become available.

(b) Progress with promoting SALSEA

- 4.14 The President reported on fund-raising initiatives that had been conducted in conjunction with the Secretariat. A more detailed report will be presented to the Board. In addition to applications for funding to the EU FP7 programme, the Total Foundation (Euro 350,000) and the Ocean Foundation (US\$ 600,000), approaches had been made to a number of organizations and foundations and this had raised awareness not only of SALSEA but of the work of NASCO.

**5. Other business**

- 5.1 There was no other business.

**6. Report of the meeting**

- 6.1 The SAG agreed a report of its meeting.

**7. Date and place of next meeting**

- 7.1 The SAG decided to agree the date and place of its next meeting by correspondence.
- 7.2 The Chairman closed the meeting and thanked the members of the group for their contributions.

*List of Participants*

**Canada**

Mr Gerald Chaput  
Mr Bud Bird  
Ms Chantal Lamadeleine

**Denmark (in respect of the Faroe Islands and Greenland)**

Dr Jan Arge Jacobsen

**European Union**

Dr Niall O'Maoileidigh  
Mr Ted Potter  
Dr Trevor Hastings

**Norway**

Dr Lars Petter Hansen (Chairman)

**USA**

Mr Pat Scida  
Mr Tim Sheehan

**Chairman of the Board**

Mr Jacque Robichaud

**President of NASCO**

Dr Ken Whelan

**Secretariat**

Dr Peter Hutchinson

**SAG(07)2**

**Meeting of the Scientific Advisory Group of the  
International Atlantic Salmon Research Board**

*Agenda*

1. Opening of the meeting
2. Adoption of the agenda
3. Review of the updated inventory of research
4. The SALSEA Programme
  - (a) Progress with implementing SALSEA
    - (i) Analysis of historical tagging data
    - (ii) Development of Workpackage 3
    - (iii) Development of an application for funding under the EU Seventh Framework Programme
    - (iv) Other activities
  - (b) Progress with promoting SALSEA
  - (c) Recommendations to the Board
5. Other business
6. Report of the meeting
7. Date and place of next meeting

## **Marine ecology research proposal for 2007**

### **Trophic feeding state and condition of salmon – continent of origin and age at maturity comparisons**

One-sea-winter salmon from both North America and the northeast Atlantic migrate to feeding grounds at West Greenland during their second year at sea. Marine ecology of these fish could be advanced through studies of trophic state and condition (i.e. lipid content). The questions to be addressed include:

- 1) are trophic states of 1SW non-maturing fish similar between NAC- and NEAC-origin salmon?
- 2) Are trophic states of 1SW non-maturing fish different from that of 1SW maturing of the same cohort? Can this tell us anything about when these different maturity groups separate in the North Atlantic?
- 3) Has there been a trophic state change between West Greenland and when these fish finally return to home rivers as 2SW salmon?
- 4) The same questions would be examined for lipid content to assess fish condition (survivals differ between fish from the two continents. Is this related to condition at that time of year as fish enter their second winter at sea?)

The present sampling program at West Greenland includes the purchase of whole fish specifically for disease sampling. Additional tissue sampling of these fish would be conducted including muscle, liver and caudal fin punches. All tissues would be analysed for lipid and stable isotope ratios. Caudal punches can be collected without lethal sampling and would allow sampling of 1SW and 2SW salmon survivors back to home waters.

<b>Activity</b>	<b>Cost</b>	<b>Existing funding</b>	<b>New funding</b>	<b>IASRB support</b>
<b>Project costs</b>				
<b>West Greenland</b>	£74,200	£66,200	£8,000	£8,000
<b>Homewater in NAC</b>	£4,200		£4,200	£0
<b>Homewater in NEAC</b>	£4,200		£4,200	£0

Activity	Cost	Existing funding	New funding	IASRB support
<b>West Greenland Research Program</b>				
Sampling at West Greenland (international collaborative program)	£66,200 (Sampling costs, fish purchase, genetic analysis, disease analysis, stomach content analysis)	£66,200	0	0
Collection of additional tissues	£0 (muscle, liver, caudal fin)		0	0
Shipping of samples to North America	£300		£300	£300
Stable isotope analysis of tissues	£6,300 (150 fish X 3 tissues per fish X £14 per tissue)		£6,300	£6,300
Stable isotope analysis of salmon prey	£1,400 (20 species/genus X 5 replicates X £15 per tissue)		£1,400	£1,400
<b>Homewater sampling of survivors to North America (sampling planned from Miramichi River)</b>				
Collection of tissues	£0 (muscle, liver, caudal fin)			
Stable isotope analysis of tissues	£4,200 (100 fish X 3 tissues per fish X £14 per tissue)		£4,200	£0
<b>Homewater sampling of survivors to NEAC (to be developed)</b>				
Collection of tissues	£? (muscle, liver, caudal fin)			
Stable isotope analysis of tissues	£4,200 (100 fish X 3 tissues per fish X £14 per tissue)		£4,200	£0

**International Atlantic Salmon Research Board**

**ICR(07)6**

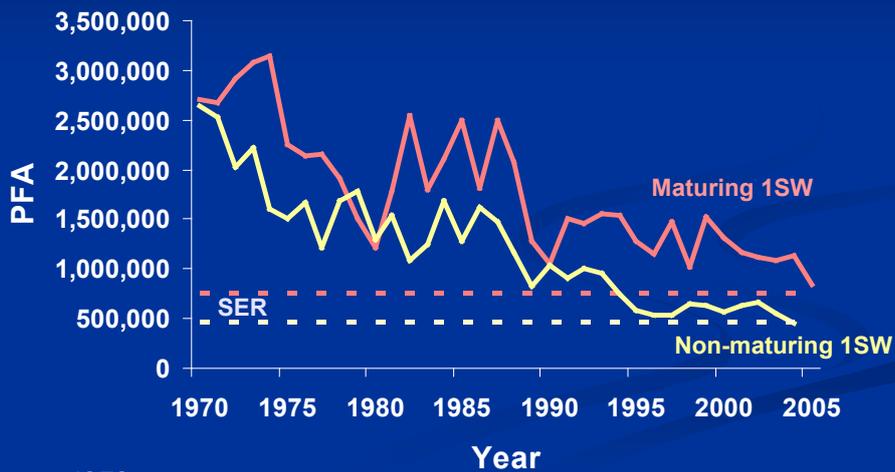
**SALSEA Programme – Progress to Date**

# (SALSEA) Programme ~ Progress to date

**Ken Whelan ~ President of NASCO**

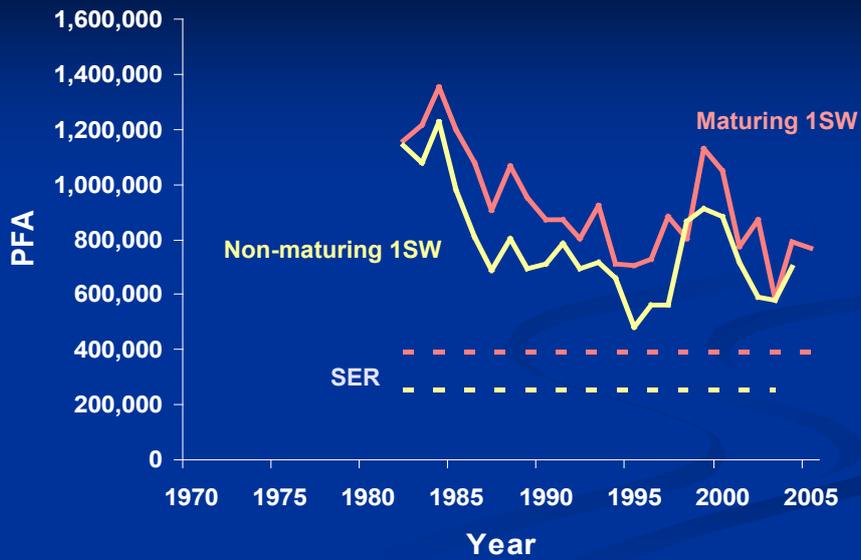
*Photograph courtesy of Gilbert van Ryckevorsel*

## PFA - Southern European stocks



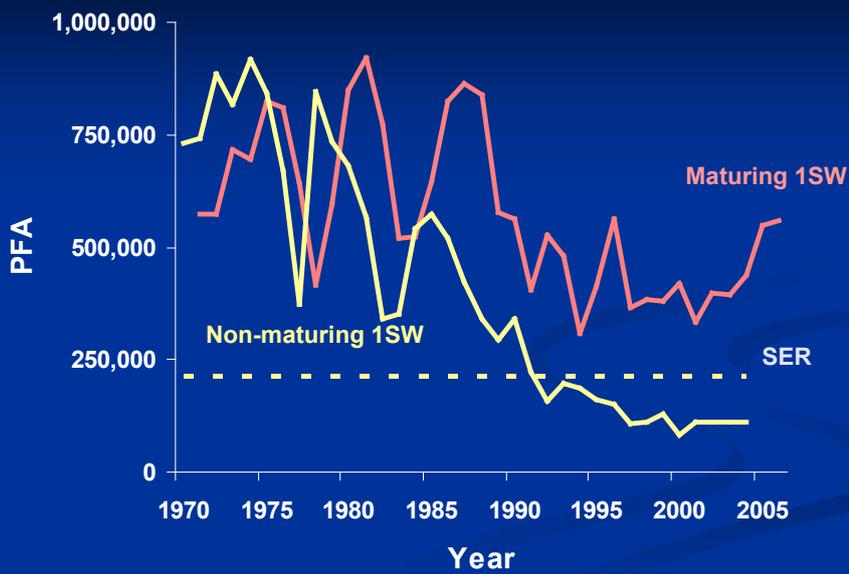
Source: ICES

## PFA - Northern European stocks



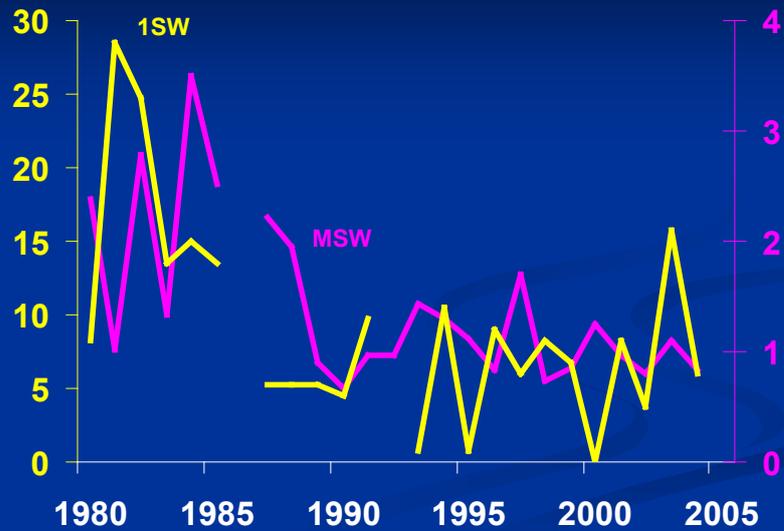
Source: ICES

## PFA - North American stocks



Source: ICES

# Marine survival – River Corrib



Source: ICES

## The SALSEA Work Packages

### WP1 - Supporting Technology

- Task 1 – Genetic stock identification
- Task 2 – Sampling equipment evolution
- Task 3 – Signals from scales

### WP2 - Early Migration

- Task 1 – Biological characteristics of smolts
- Task 2 – Physical factors in fresh water
- Task 3 – Preparing to migrate
- Task 4 – Key predators
- Task 5 – Impacts of aquaculture

### WP3 – Oceanic Distribution

- Task 1 – Theoretical models
- Task 2 – Plan marine survey
- Task 3 – Conduct survey
- Task 4 – Collate and analyse data

### WP4 – Communications

- Task 1 – Promoting SALSEA
- Task 2 – SALSEA on-line
- Task 3 – IASRB/NPAFC symposium
- Task 4 – SALSEA report
- Task 5 – SALSEA administration

## Why cooperate through SALSEA?

- **more efficient sharing of facilities and pooling of expertise**
- **ability to co-ordinate surveys in time and space**
- **make best use of existing information**
- **sum is greater than parts**
- **the survey programme will concentrate upon areas where stocks from many rivers are thought to be present at the same time, but local studies will also be needed**

## Progress in promoting SALSEA

- **SALSEA Steering Committee established with equal representation from NASCO Parties and NGOs**
- **case for support prepared in consultation with Brakeley consultants**
- **approaches made to Organizations and foundations in Europe and North America**
- **formal applications for funds made to TOTAL Foundation in France , the Ocean Foundation in US, EU FP7 (SALSEA MERGE)**
- **TOF serving as fiscal sponsor in North America and assisting in identifying eco-vessels**

# Progress in implementing SALSEA

## WP1 : Supporting technology

- Genetic baseline sampling programmes initiated in Canada, Iceland, Ireland, Norway, Russia and UK

Pelagic live and sacrificed capture trawl gear developed by IMR Bergen trialled off the west coasts of Scotland (FRS in 2005) and Ireland (Marine Institute in 2007) in conjunction with Atlantic Salmon Trust

- Ongoing studies using signals from scales in Canada, UK and Iceland

# Progress in implementing SALSEA

## WP2 : Early migration

- **much ongoing research, largely funded by national agencies and their partners; a need to enhance coordination and stimulate additional financial support**
- **studies of biological characteristics of smolts in monitored rivers**
- **studies on the influence of freshwater contaminants on marine survival in Canada and UK**
- **research on the role of predation by cormorants (US) and seals (UK) and approaches to mitigation**

## Progress in implementing SALSEA

### WP2 : Early migration

- studies on impacts of sea lice from salmon farms in Ireland and Norway
- numerous studies involving acoustic tagging and detection arrays in Canada, Ireland, Denmark, UK and USA

## Progress in implementing SALSEA

### WP3 : Distribution and migration at sea

- Norwegian surveys (1982 – 2004) caught ~ 7,000 post-smolts, work on migration modelling underway – Ireland (2007)
- marine surveys for salmon undertaken by US (Gulf of Maine), Canada (Labrador Sea) and UK
- studies with data storage tags in Iceland
- IASRB supported ICES Workshop on the Development and Use of Historical Tagging Information from Oceanic Areas
- Russian studies of by-catch in fisheries for pelagic fish species

## By-catch

- near surface mackerel trawl fishery in Norwegian Sea greatest potential for by-catch of salmon
- no new assessment in 2006, further development and data needed
- two sources of data: Russian research trawl catches and Russian observer programmes
- research vessel trawls slower so may be less effective at catching mackerel i.e. over-estimate by-catch
- observers may under-estimate by-catch because of difficulties in observing smolts in large catch of mackerel
- even highest estimate ~5% of combined European PFA
- by-catch in other fisheries (Icelandic survey ~ 5,000 salmon, <0.001% of catch)

*Photograph courtesy of Gilbert van Ryckevorsel*

## Progress in implementing SALSEA

IASRB Workshop held to refine plans for the marine surveys. Specific questions :

- **does early marine growth differ between southern and northern stocks?**
- **does early marine growth differ between post-smolts and those surviving to home rivers?**
- **does condition of fish (lipid levels) differ among stocks?**
- **are fish from different stocks and different areas feeding on different prey?**
- **do disease and parasite characteristics differ between stocks?**
- **do salmon from southern areas differ in heavy metal and organic compound loads from fish originating in other areas?**

# Progress in implementing SALSEA

## *Norwegian Sea and Northwest Atlantic Post-smolt surveys*

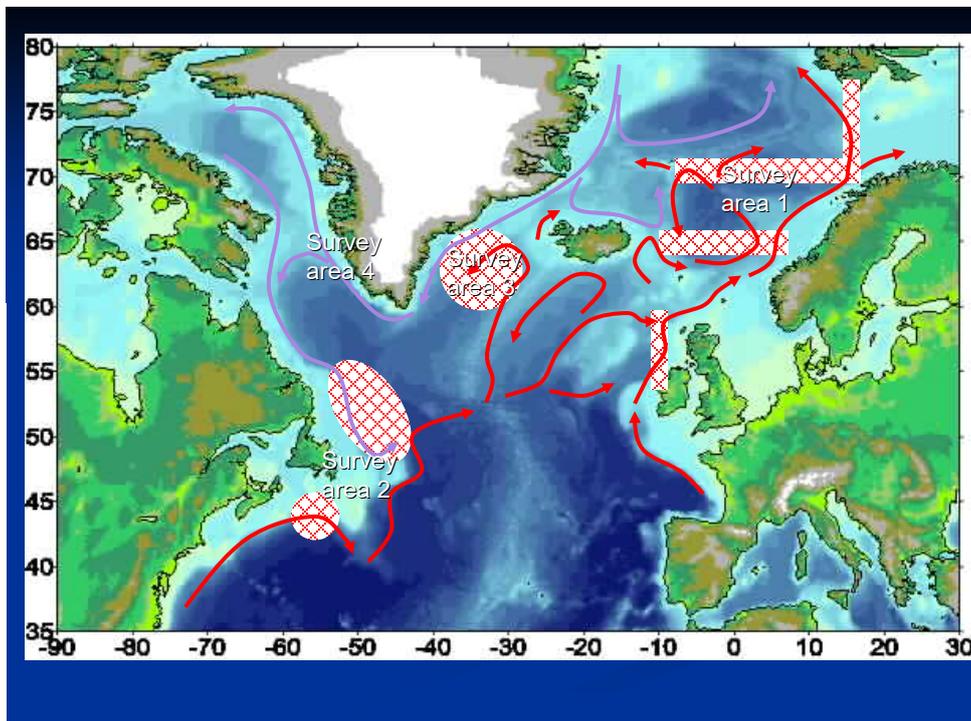
- test whether distribution of post-smolts matches migration model predictions
- repeat transects to provide description of movement of genetically identified stocks throughout the survey area

## *Distribution of salmon in the Irminger Sea*

- describe composition of salmon stocks in the region
- provide data to support development of migration models
- identify stock-specific maturity status

## *Expanded West Greenland sampling programme*

- more comprehensive sampling
- collect data on same cohorts of salmon as sampled in earlier programmes on post-smolts and subsequently on return to home waters
- sampling to be undertaken on smolts leaving and adults returning to fresh water



## SALSEA Merge

- application under European Union's Seventh Framework Programme, 20 partners located in Norway Ireland, UK, Faroes, France, Iceland, Denmark, Finland and Spain
- if successful will fund 50% of ship-time and 75% of scientific analyses
- seven workpackages:
  - WP 1 Develop genetic identification methodology
  - WP 2 Marine sample and data acquisition
  - WP 3 Genetic identification of samples
  - WP 4 Biological analysis of samples
  - WP 5 Merge data sets and analysis
  - WP 6 Dissemination
  - WP 7 Project management

## SALSEA Merge

### WP 1 Develop genetic identification methodology

- integrate existing and new genetic data from across the European range into database of microsatellite and mitochondrial DNA
- investigate the use of new markers - SNPs
- agree on suite of markers to identify origin of salmon
- optimise and validate database and assignment methodology

### WP 2 Marine sampling and data acquisition

- 3 cruises X2 years collect biological and oceanographic data
- catalogue and assemble archival tissue for genetic typing
- catalogue and assemble archival scale material for age and growth determinations
- collect biological information including stomach contents from post-smolts sampled
- conduct synchronous plankton surveys

## SALSEA Merge

### WP 3 Genetic identification of stock origin of samples

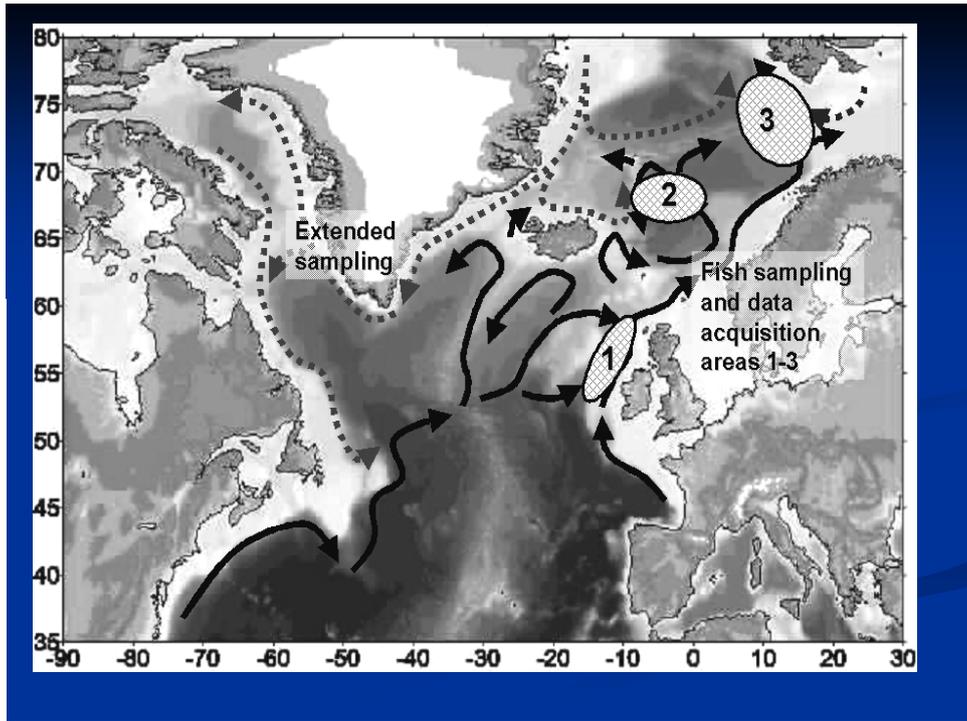
- determine region or river of origin of sampled post-smolts

### WP4 Biological analysis of samples

- analyse and rank available food items
- analyse archival scale material
- analyse scale samples collected in WP2
- establish digital scale library
- determine fine-scale growth rates
- undertake dietary analysis and assessment of condition

## SALSEA Merge

- WP5 Merge and analyse, genetic, biological and oceanographic data
  - develop models to integrate stock specific distribution and migration patterns
- WP6 Dissemination and Communications
  - SALSEA website [www.salmonatsea.com](http://www.salmonatsea.com)
  - IASRB / NPAFC/ICES/PICES Salmon Summit 2010
- WP7 Project Management



## Funding in play

### SALSEA estimated cost

- €20.6m
- €7.2m - Parties
- €13.4m – to raise

### ■ SALSEA – Merge

- EU €3.5m
- Partners €1.6m
- TOTAL €200,000
- AST €210,000
- Full cost: €5.51m
- ASAP €1.6m
- Genetic baseline €1.5m
- MI /AST Cruise 07 €100,000
- IMR / FRS /AST Cruise 05 €150,000

# Conclusions

- stimulated a keen interest in marine survival issues
- important new research projects initiated e.g. gear trials and genetic baseline studies
- continuing commitment to inshore work
- promotional documents developed to assist in search for new funds
- commitments from some Parties of vessel time in 2007, 2008 and 2009
- positive signs of early-buy-in from some private sector sources
- major application for funds submitted to EU FP7
- major challenge is to ensure comprehensive programme of marine surveys in north-east and north-west Atlantic in 2008 and 2009, the preparatory work has been done but funds needed to realise the programme

*Photo courtesy of Dr R Brown*