

# *Summary of 2008 SALSEA West Greenland activities*

*submitted by  
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*Photos courtesy of the Denis Fournier, Canada, province of Quebec Ministère des Ressources Naturelles et de la Faune (top and bottom left) and Timothy Sheehan, USA, NOAA Fisheries Service (bottom right).*

## **Introduction**

The Members of the North Atlantic Salmon Conservation Organization's (NASCO) West Greenland Commission have worked cooperatively over the past three decades to collect biological data on Atlantic salmon harvested at West Greenland. In recent years, individual samplers from Canada, Ireland, UK-England & Wales, UK-Scotland, and the United States have annually spent approximately 2 weeks each in communities along the West Greenland coast to collect biological samples from the Atlantic salmon harvest. In addition, Greenland Institute of Natural Resources staff provided in-country support and additional sampling effort throughout the fishing season. This baseline sampling program provides critical input data on the harvest of Atlantic salmon in Greenland for the annual stock assessment activities conducted by the International Council for the Exploration of the Sea (ICES) Working Group on North Atlantic Salmon (WGNAS).

The marine survey aspect of the SALSEA program was developed to concentrate sampling upon areas where stocks from many rivers co-occur, since the declines in marine survival are affecting large groups of stocks. Considering that both southern European and North American stocks co-occur at West Greenland as 1SW fish, an additional land-based survey program was developed for the West Greenland area (SALSEA West Greenland). SALSEA West Greenland would enhance the current baseline sampling program at West Greenland and integrate it with the coordinated marine surveys in other oceanic areas. The data collected during SALSEA West Greenland will be combined with data collected on these same cohorts of salmon sampled during concurrent oceanic surveys and subsequent in-river sampling programs in home waters (SALSEA North America and SALSEA-Merge) to provide data for investigating hypotheses on the causal mechanisms driving stock-specific performance in the ocean (i.e. marine survival).

SALSEA West Greenland was designed to be integrated within the current sampling program's infrastructure. This 'enhanced sampling program' would conduct broader and more detailed sampling on a fixed number of fish harvested from the waters off West Greenland. Individual fishermen would be contracted to provide an agreed number of fresh whole fish on a reliable schedule in support of this program. Recently harvested whole fish are required as the protocols for many of the samples require the collection of fresh internal tissues. Sampling effort would be organized in both time and space across the fishing season and the coast of West Greenland to maximize the temporal and spatial resolution of the data collected. This sampling will be complimentary to the baseline sampling program that currently provides input data to the ICES WGNAS.

## **2008 Baseline Sampling Program**

The 2008 Atlantic salmon fishing season was set from Friday 1 August – Friday 31 October.

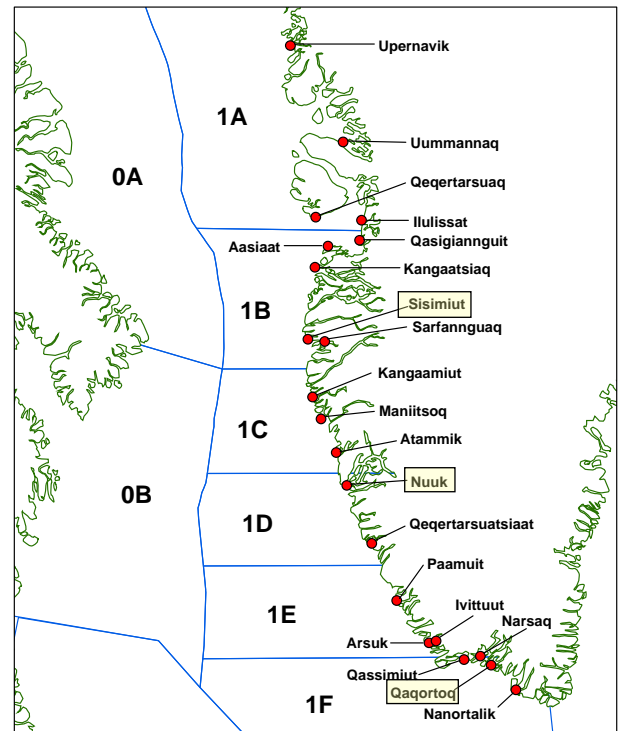
Seven samplers from five countries participated in the program. In addition, an eighth sampler from the Greenland Institute of Natural Resources in Nuuk, Greenland served as

a local coordinator and collected additional samples on an *ad hoc* basis. The participating countries and agencies were as follows:

<b>Country</b>	<b>Agency/laboratory</b>
Canada	Department of Fisheries & Oceans
Canada	Ministère des Ressources naturelles et de la Faune
Greenland	Greenland Institute of Natural Resources
Ireland	The Marine Institute
UK-England & Wales	Cefas Lowestoft Laboratory
UK-Scotland	FRS Freshwater Laboratory Field Station
United States	NOAA Fisheries Service

Samplers were deployed to 3 different communities representing 3 different Northwest Atlantic Fisheries Organization (NAFO) Divisions (geographic delineations of the area). Two samplers were stationed in Sisimiut (NAFO Division 1B), three in Nuuk (NAFO Division 1D) and two in Qaqortoq (NAFO Division 1F). A total of 115 sampling days occurred during 12 of the 13 weeks of the fishery.

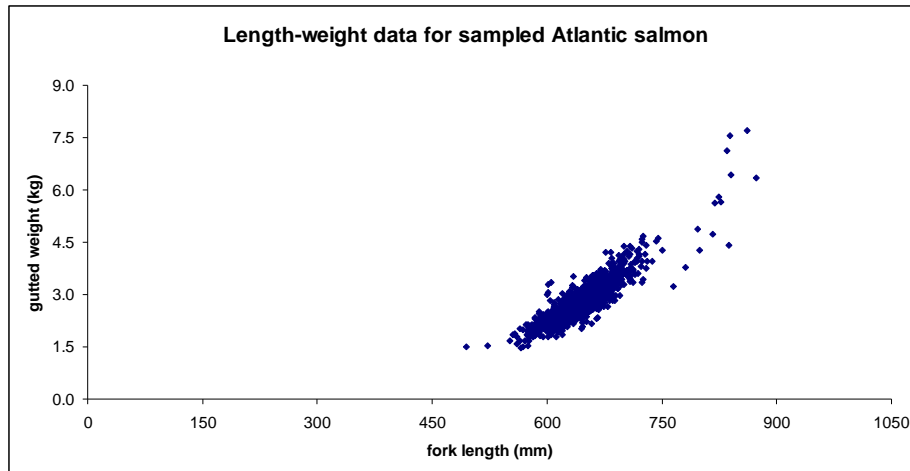
On a daily basis, the samplers would attempt to locate any recently landed Atlantic salmon. The primary site for locating fish was the local open air market where the fishermen were displaying their catch for sale. In addition, salmon were also located at the local hospital, a senior home and at the wharf where individual harvests were unloaded from the vessel. If located, the sampler would request permission to sample the fish from either the fishermen or the owner of the fish if they had been sold. Once permission was obtained, the sampler would inspect each fish for the presence of external tags and/or fin clips. The sampler would also obtain a length and weight and would collect a scale and tissue sample from as many fish as possible. The baseline sampling is non-invasive. Once the sampling is completed, the individual fish are returned to the fishermen/owner and are either displayed for sale or prepared for storage.



In total, approximately 2,000 fish were inspected for the presence of identification tags or fin clips. Of these, 1,800 fish were further sampled for length and weight data and scale

and tissue samples were collected (These numbers are currently provisional and will be confirmed). Scale samples will provide information on fish age and tissue samples will provide information on fish continent/region of origin through genetic analysis.

The mean fork length of the sampled salmon was 646 mm and the mean gutted weight was 2.75kg. The scale and tissue samples are currently being analyzed, so this information is not yet available; these data will be reported to the ICES WGNAS in April 2009.



## 2008 Enhanced Sampling Program

Preparations were made in advance of the 2008 fishing season to implement the Enhanced Sampling Program. An in-country coordinator was hired at the Greenland Institute of Natural Resources in Nuuk, Greenland to assist with implementation. A contract was also set up with the Greenland Institute of Natural Resources to provide reimbursement to the individual fishermen who provided fish for the sampling program. Individual contracts were set up with various entities to fund the processing of specific samples, arrangements were made with numerous scientists for sample processing and all the sampling supplies required for the program were shipped to Greenland. All preparations were completed prior to the start of the 2008 fishing season.

The maximum number of fish to be purchased for the Enhanced Sampling Program was set at 900 (300 per community). Logistically, a maximum number was necessary to provide an upper limit for the purchase of supplies and allocation of funding for the program. A target number of 500 fish (300 fish from Nuuk and 100 fish each from Qaqortoq and Sisimiut) was set as a reasonable goal for the 2008 sampling season. These fish were to come from the existing harvest allowed under the internal consumption fishery. Close and constant communication and coordination between the sampling program and the Organization of Fishermen and Hunters in Greenland (KNAPK) was

essential to ensure that this sampling program did not result in an increase in the annual harvest of salmon for internal consumption.

In addition to the data collected under the baseline sampling, additional samples were to be collected under the Enhanced Sampling Program. The samples to be collect are listed below:

<b>Enhanced Program samples</b>	<b>Sample Type</b>
Sea lice	Count and preserve individual specimens
Disease	Preserve gill, pyloric caeca, spleen, kidney tissue samples
Lipid content	Preserve muscle tissue
Stable isotope	Preserve liver, dorsal muscle, caudal fin and scales samples
Sea age at maturity	Preserve ovaries
Feeding ecology	Preserve stomachs
Parasites	Preserve intestines, pyloric caeca, gill arch, liver, spleen, kidney
Elemental analysis	Preserve otoliths

When combined with the data collected under the Baseline Sampling Program, these data would provide insights into the health and status of all sampled individuals. Identifying the origin of each individual with a high level of precision to large stock complex groupings through genetic analysis will then allow scientists to make comparisons between different stock complexes. These comparisons may lead scientists to make inferences regarding stock complex-specific performance (i.e. marine survival).

The North Atlantic Salmon Fund (NASF), the Atlantic Salmon Federation (ASF) and KNAPK had decided to extend their 2002 North Atlantic Salmon Conservation Agreement to cover the fishing seasons of 2007-2013. This conservation agreement provides financial compensation to KNAPK while prohibiting fishing for Atlantic salmon within Greenland territorial waters, except for a minimal subsistence and recreational catch. The agreement also provides an infrastructure to develop alternative fishing activities designed to promote sustainable use of marine resources, benefit marine conservation and compliment the Greenland Government's various development programs. The Agreement also makes provisions for the continued reduction of the annual subsistence/recreational catch of Atlantic salmon for local consumption to a minimal level.

Concerns were raised by the NASF, ASF and KNAPK that the Enhanced Sampling Program could result in an increased harvest for the subsistence/internal consumption fishery. They were concerned that these activities would counteract their efforts to reduce the annual harvest of salmon in Greenland under the North Atlantic Salmon Conservation Agreement. A solution to this disagreement was not reached prior to the 2008 sampling program and unfortunately no samples were collected under the Enhanced Sampling Program. Efforts are underway to develop a workable solution to ensure that the Enhanced Sampling Program can be implemented in 2009 with the full cooperation of all participating parties.

## Acknowledgements

Samplers in 2008 were:

- Denise Deschamps (Canada),
- Mike Erwin (USA),
- Michael Godard (UK-England & Wales),
- Chad Keith (USA),
- Paul Leblanc (Canada),
- Tom McDermott (Ireland) and
- James Raffell (UK-Scotland).

I thank them for their efforts. Rasmus Nygaard (Greenland) served as the in-country coordinator and was a tremendous asset to the program. I would also like to acknowledge the support provided by the Greenland Institute for Natural Resources. I would also like to acknowledge the fishers and residents in Greenland who provided access to their fish for samples.

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