REPORT OF ICES ADVISORY COMMITTEE

ON

NORTH ATLANTIC SALMON STOCKS

TO

NORTH ATLANTIC SALMON CONSERVATION ORGANIZATION

WGC Area

CNL(13)8

Advice generated by ICES in response to terms of reference from NASCO

10.4 With respect to Atlantic salmon in the West Greenland Commission area:

1. **describe the key events of the 2012 fisheries**
2. **describe the status of the stocks**

N.B. No catch advice provided – West Greenland Framework of Indicators (applied January 2013) did not signal a significant change in stock status. Previous multi-year agreement continues and no reassessment required.

Atlantic salmon in the West Greenland Commission area

- Salmon from NAC and NEAC in their 2nd summer and autumn at sea go to West Greenland to feed
- Most of the salmon are 1SW non-maturing fish, destined to become 2SW (or older) fish if not caught

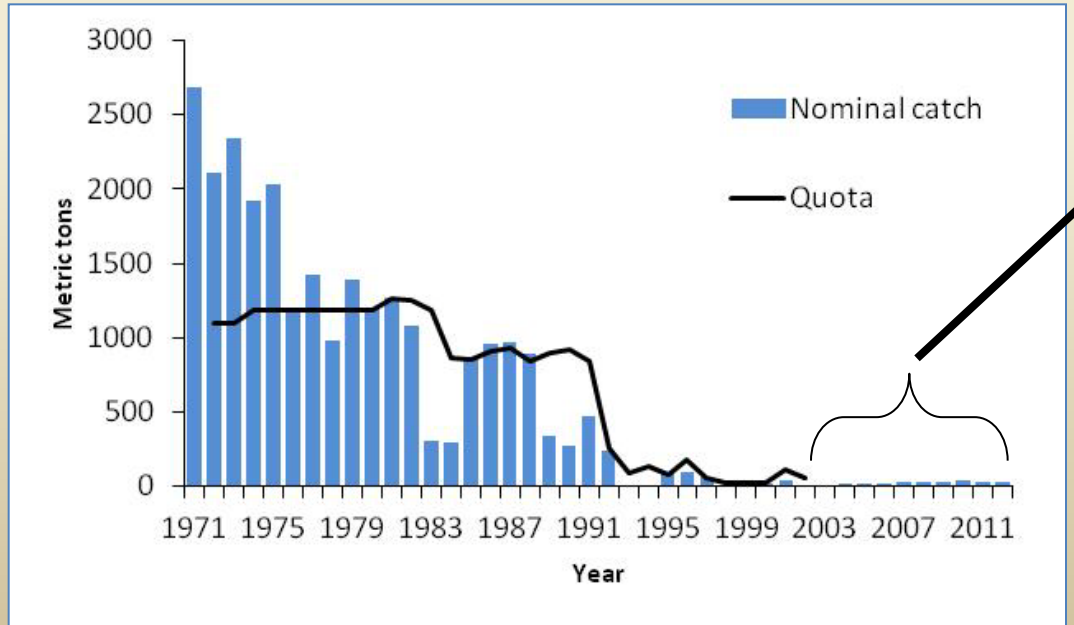
The West Greenland Fishery

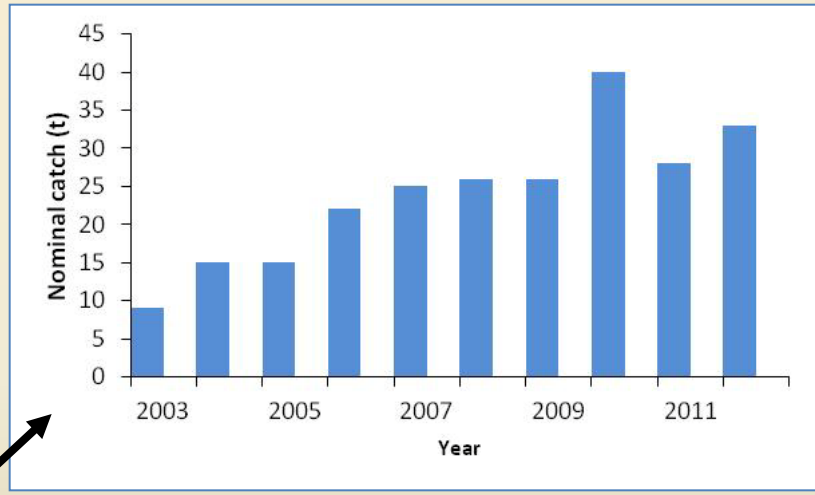
- Fishing season in 2012 - 1 August to 31 October
- Fishery open to licensed fishermen (can use 20 salmon nets) and unlicensed fishermen (use 1 salmon net)
- All catches must be reported to Greenland authorities
- Fishers have been allowed to sell to hotels, institutions and local markets only
- However, in 2012 the Greenlandic fisheries minister allowed fishermen to sell to fish factories also. Export ban continues, so all fish sold within Greenland
- Unclear what effect this had on effort & total harvest

Key events of the 2012 fisheries

Catch in 2012

- Reported catch of 33.1 t (32.6 t in W. Greenland & 0.5 t in E. Greenland)
- 2012 catch increased by 20% on 2011 (27.5 t)
- Unreported catch of 10 t

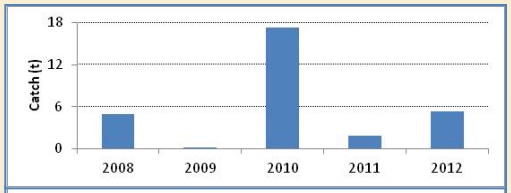




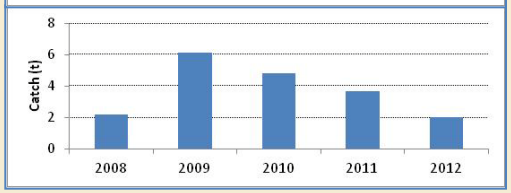
Catch distribution in 2012

- Distribution of catch broadly similar to previous years – NB note exception for 2010 in Div. 1A & relatively high catch in Div. 1C in 2012

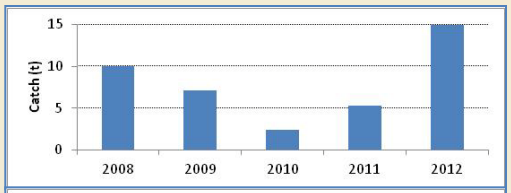
1A



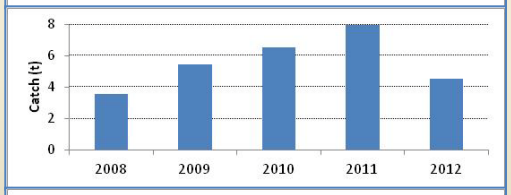
1B



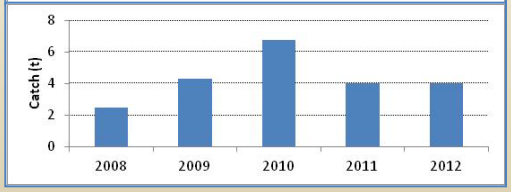
1C



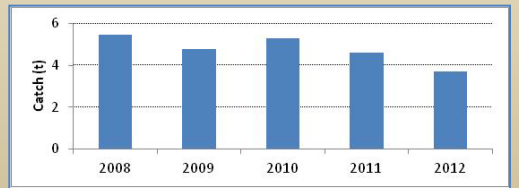
1D



1E



1F



Effort and Landings

- 533 reports from 122 fishers in 2012 (394 reports from 117 fishers in 2011)
- In recent years (except 2006 & 2011), in at least one of the divisions where international samplers were present, the sampling team saw more fish than were reported as being landed.
- In 2012 there were discrepancies in 2 NAFO areas. The total discrepancy was almost 2 t and the adjusted catch at West Greenland (used in assessments) was 34.6 t

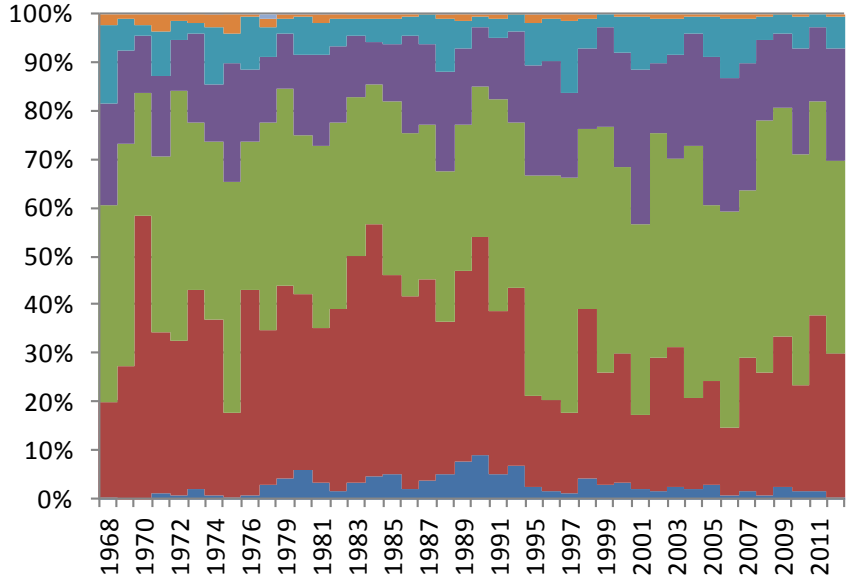
Year		Catch by NAFO Division (kg)						
		1A	1B	1C	1D	1E	1F	Total
2006	Reported	5427	2611	3424	4731	2636	4192	23 021
	Adjusted							
2007	Reported	2019	5089	6148	4470	4828	2093	24 647
	Adjusted						2252	24 806
2008	Reported	4882	2210	10024	1595	2457	4979	26 147
	Adjusted				3577		5478	28 627
2009	Reported	195	6151	7090	2988	4296	4777	25 496
	Adjusted				5466			27 975
2010	Reported	17263	4558	2363	2747	6766	4252	37 949
	Adjusted		4824		6566		5274	43 056
2011	Reported	1858	3662	5274	7977	4021	4613	27 407
	Adjusted							
2012	Reported	5353	784	14991	4564	3993	2951	32 636
	Adjusted		2001				3694	34 596

International sampling programme

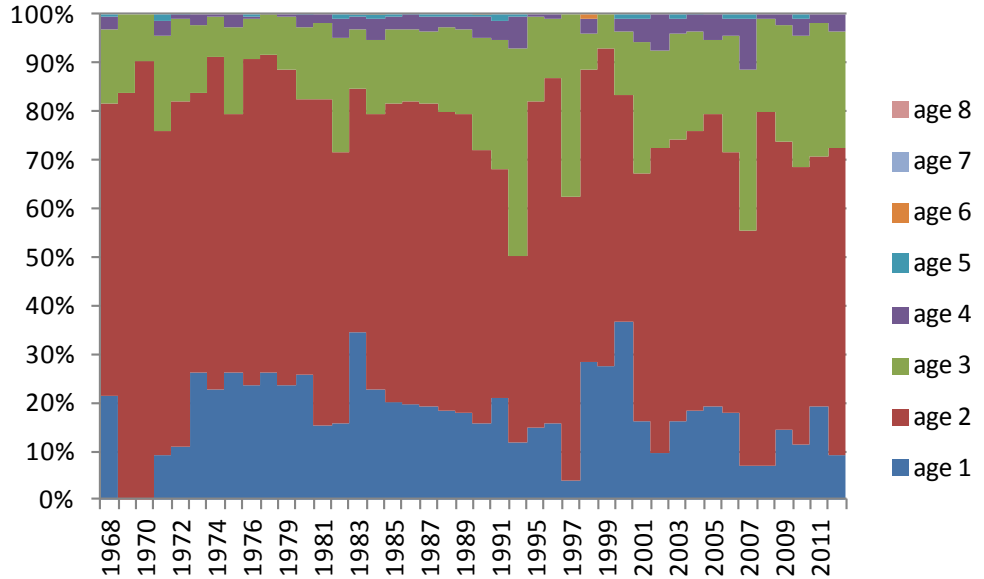
- International sampling programme initiated by NASCO in 2001, continued in 2012
- Samplers from Greenland Institute of Natural Resources, USA, Canada, Ireland, UK (Scotland), and UK (England & Wales)
- Sampling August to October
  - 69 sampling days in total
  - covering 6 of the 14 weeks
- Samplers located in 3 of the 6 NAFO areas: Sisimiut (1B), Maniitsoq (1C), Qaqortoq (1F)
  - Unable to sample at Nuuk (1D) - difficulties with access to fish
  - No sampling in East Greenland
- 1,378 fish sampled (~14% of total reported catch - by weight). Information collected on:
  - Length & Weight
  - Tags
  - Scale samples (age)
  - Tissue samples for DNA analysis

Biological Characteristics – River Age

North American



European

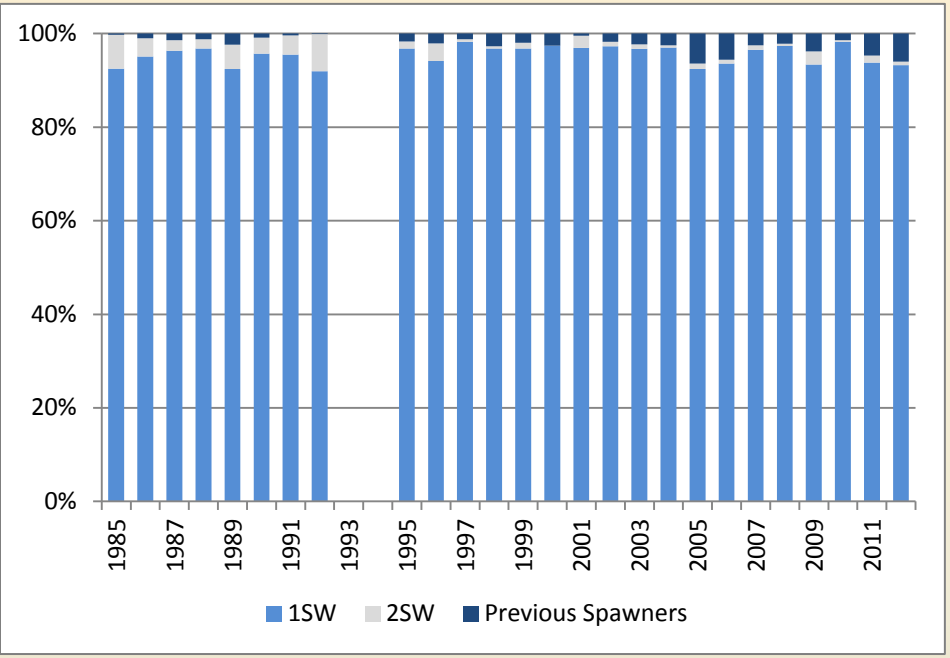


	age 1	age 2	age 3	age 4	age 5	age 6	age 1	age 2	age 3	age 4	age 5	age 6
2010	1.6	21.7	47.9	21.7	6.3	0.8	11.3	57.1	27.3	3.4	0.8	0
2011	1.0	35.9	45.9	14.4	2.8	0	18.3	54.9	25.4	1.4	0	0
2012	0.3	29.8	39.4	23.3	6.5	0.7	9.3	63.0	24.0	3.7	0	0

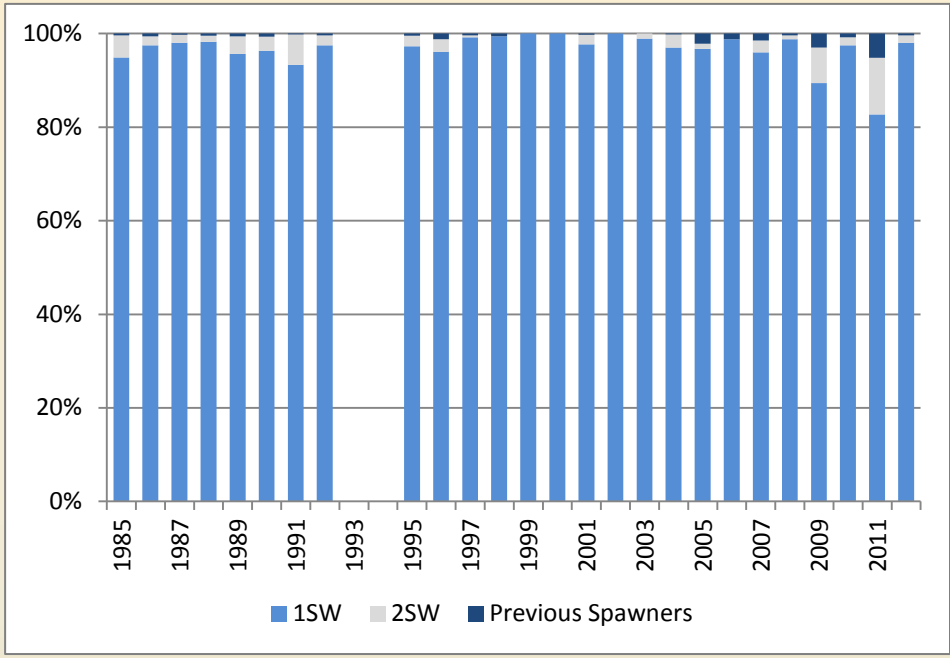
- Wider range and older ages for NA salmon - in 2012, 93% river-age 2 to 4
- European salmon typically younger - in 2012 87% river-age 2 to 3

Biological Characteristics – Sea Age

North American



European

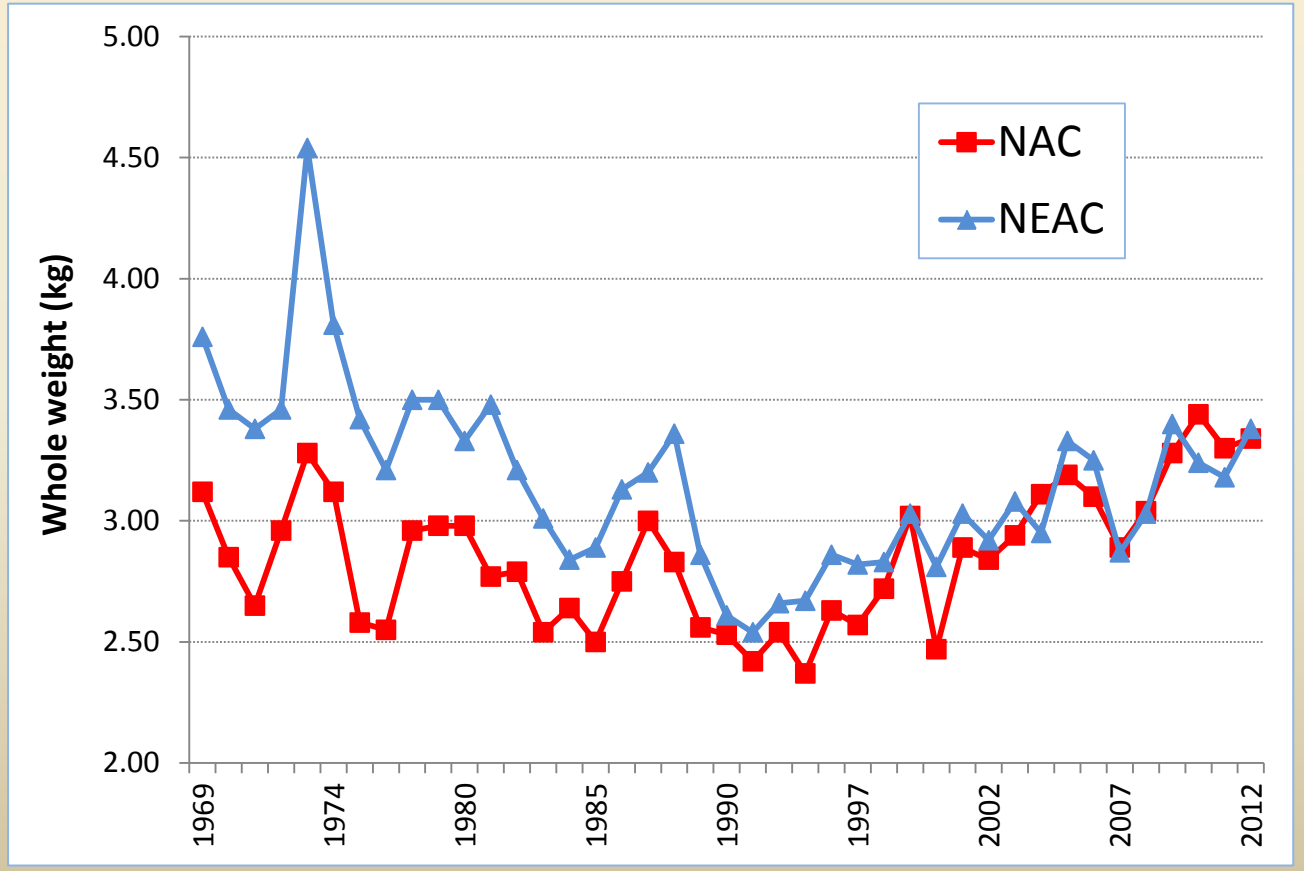


	% 1SW	% 2SW	% PS
2010	98.2	0.4	1.4
2011	93.8	1.5	4.7
2012	93.2	0.7	6.0

	% 1SW	% 2SW	% PS
2010	97.5	1.7	0.8
2011	82.8	12.1	5.2
2012	98.0	1.6	0.4

Biological Characteristics – Mean Whole Weight 1SW salmon

- Mean weights have been increasing since mid 1990's
- Mean weights of NEAC origin 1SW salmon recently similar or lower than NAC - in contrast to 1970's to 1990 when NEAC salmon were heavier
- Time series of weight data to be analysed to account for date of capture and length of fish, to better describe condition of fish



Tag recoveries in 2012

- 17 adipose fin-clipped salmon sampled, none carried tags
- 6 tags recovered (returned to Nature Inst.):

NAFO 1B

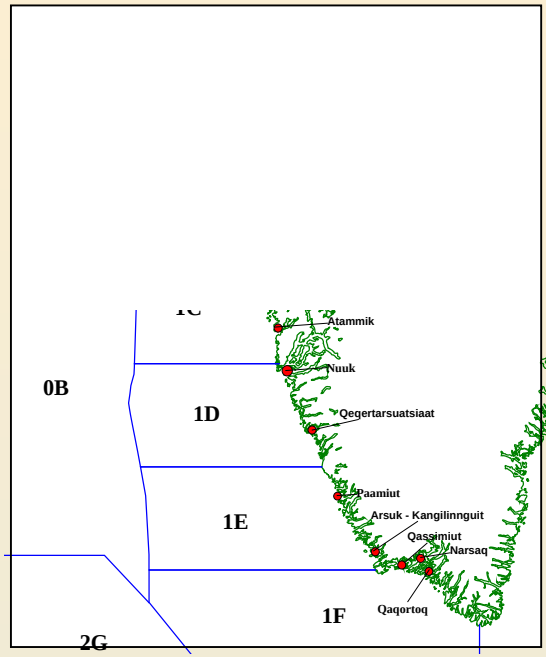
1. Canada, Miramichi, adult release 2011

NAFO 1D

2. Canada, Miramichi, adult release 2011
3. Canada, Miramichi, adult release 2011
4. Canada, Campbelton, kelt release 2012

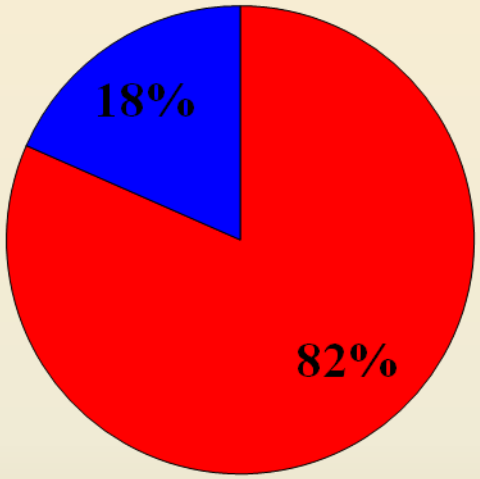
NAFO 1F

5. Canada, Miramichi, adult release 2011
6. Sweden, Lagan, smolt release 2011



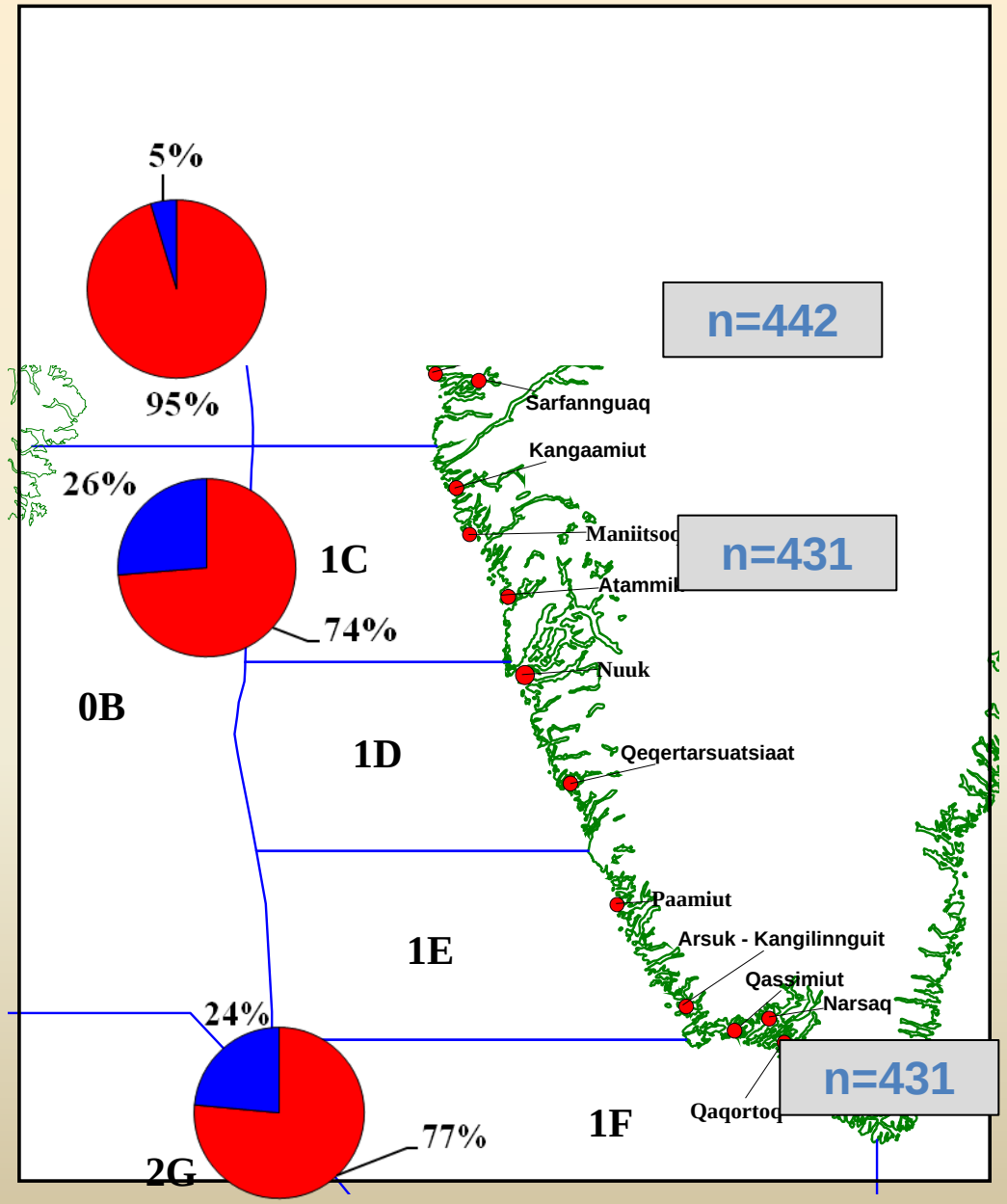
Continent of Origin - 2012

2012 Continent of Origin by NAFO Divisions

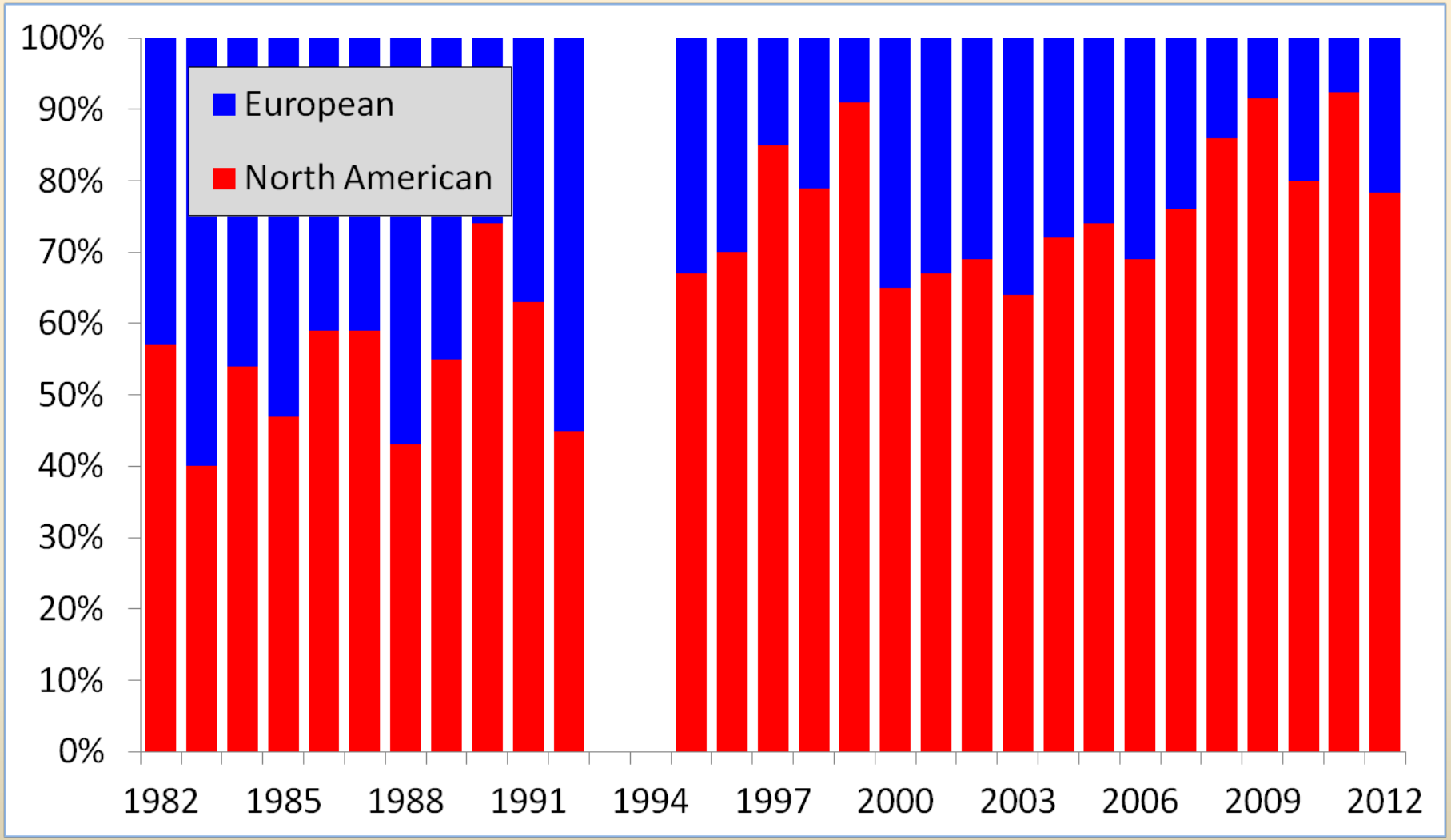


North American Origin

European Origin



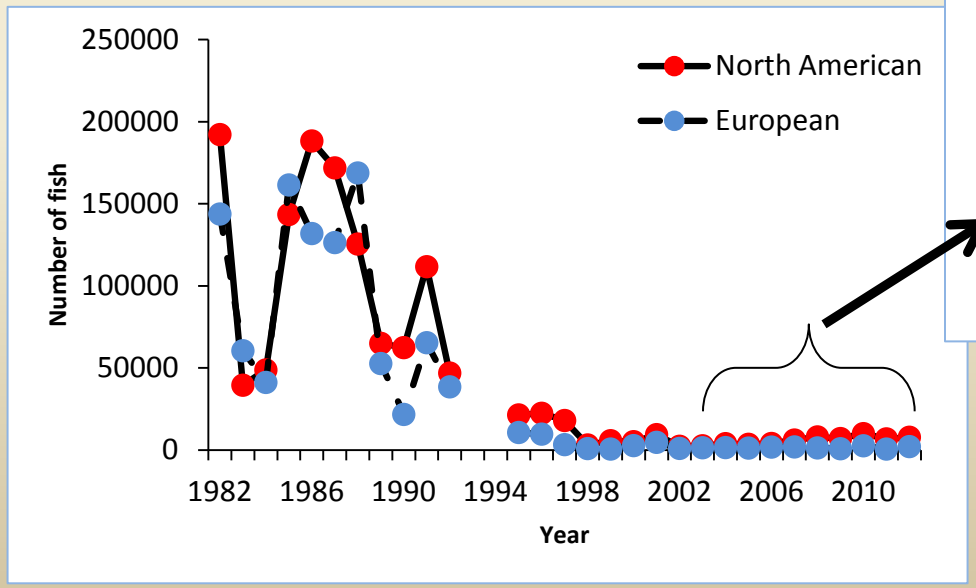
Continent of Origin

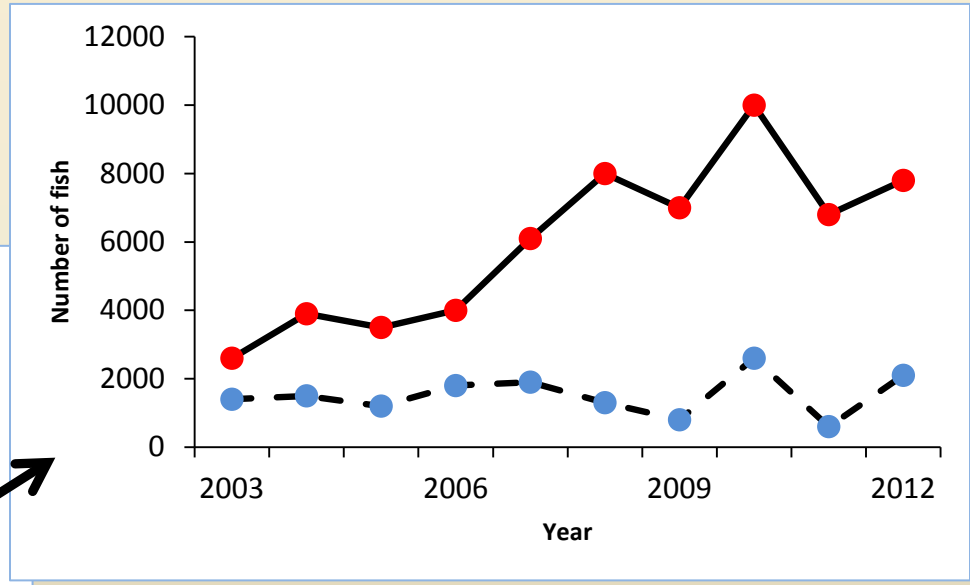


- **Proportion NAC origin has been increasing since early 1980's**

Number of salmon caught at WG

- Number of salmon caught at WG in 2012
  - 7 800 from NAC
  - 2 100 from NEAC
- Among lowest in time series, but second highest (combined numbers for NAC & NEAC) in last 10 years





Summary of Stock Status

- For West Greenland, stock status of 1SW non-maturing salmon (destined to be 2SW salmon) from North America and the Southern NEAC MSW complex are relevant

- Stock status summarised in terms of:
  - Recruitment (expressed as Pre-Fishery Abundance - PFA)
  - Spawners
  - Exploitation rates

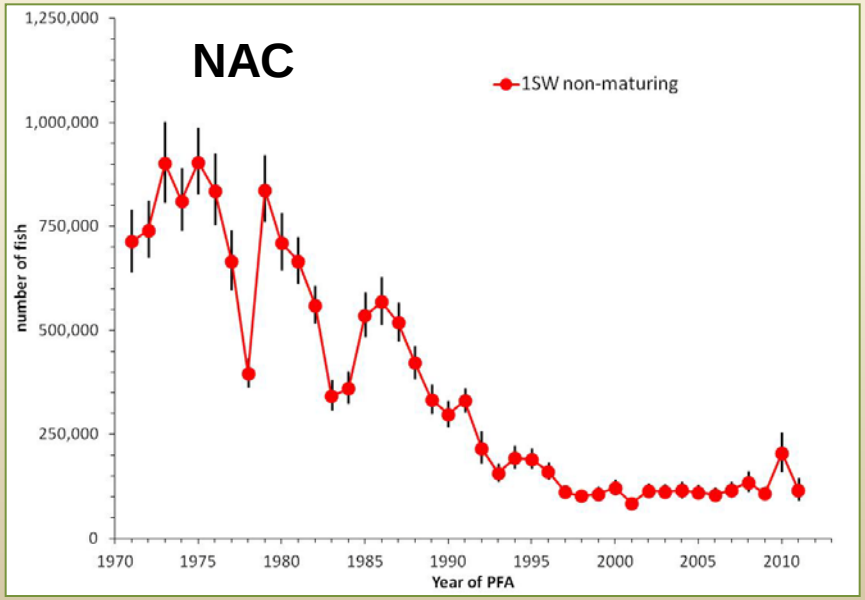
Summary of Stock Status – Recruitment (PFA)

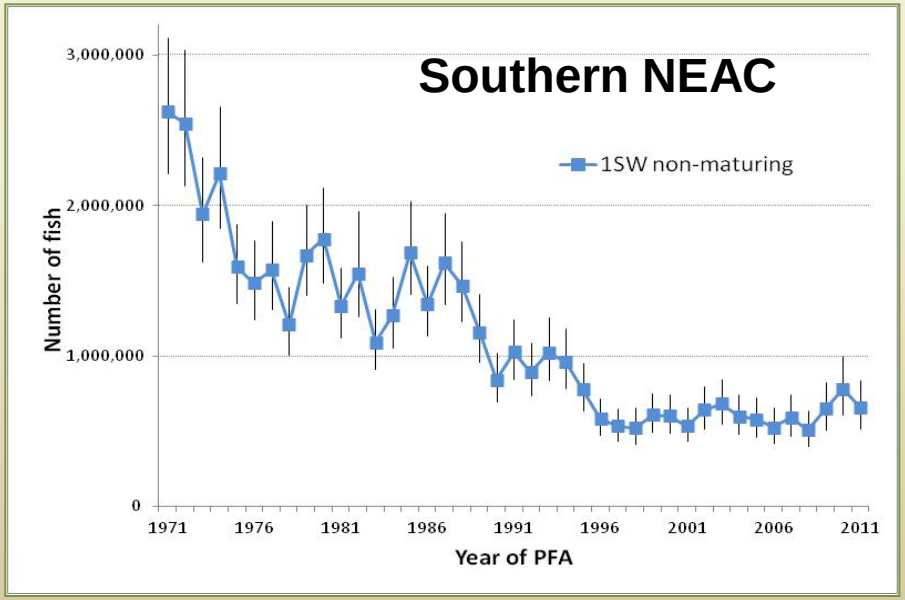
NAC:

- PFA of non-maturing 1SW salmon suggests continued low abundance
- PFA in 2011 decreased by 43% from 2010; ranked 30th of 41-year time series

Southern NEAC:

- PFA of non-maturing 1SW complex has declined to low levels since 1996
- PFA in 2011 decreased by 16% from 2010; ranked 28th of 41-year time series





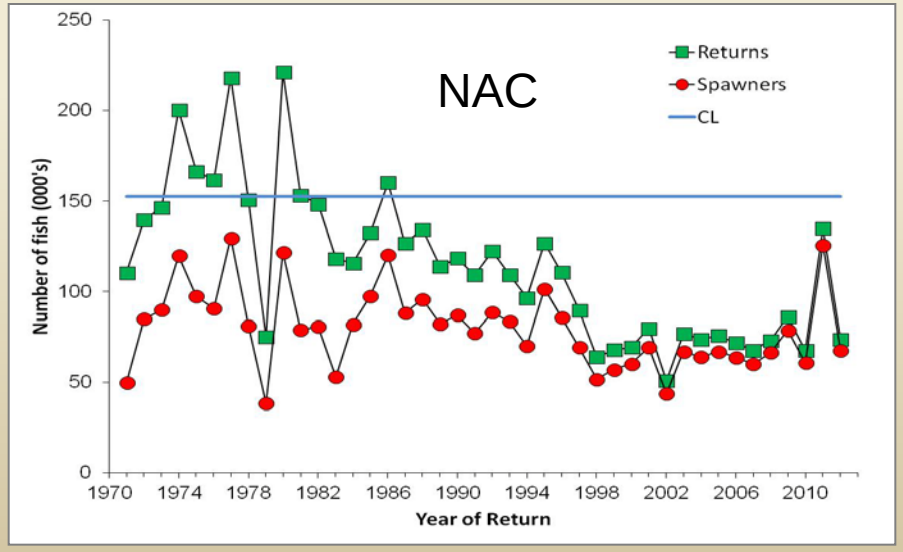
Summary of Stock Status - Spawners

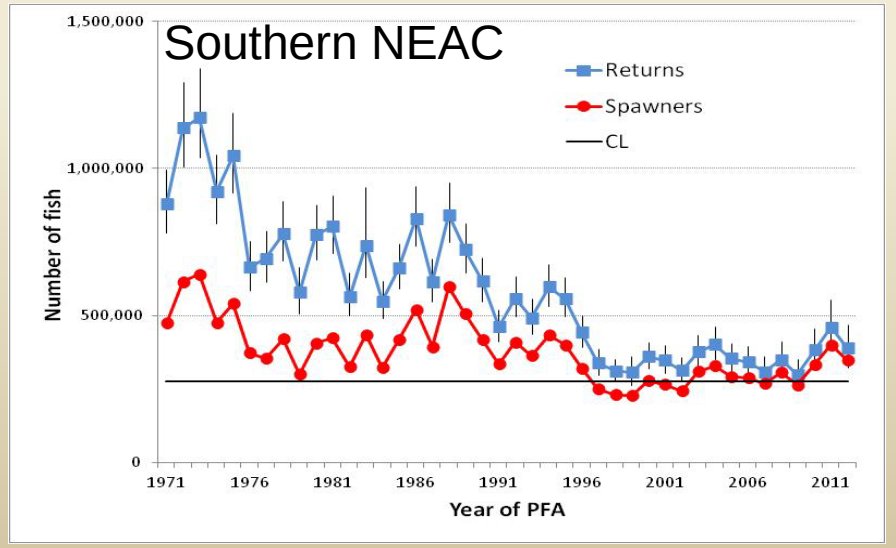
NAC:

- 2SW spawner estimates below CLs in all six regions in 2012 and for NAC overall during the entire time series
- Varying numbers of river stocks failing to meet CLs, particularly in Scotia-Fundy and USA

Southern NEAC:

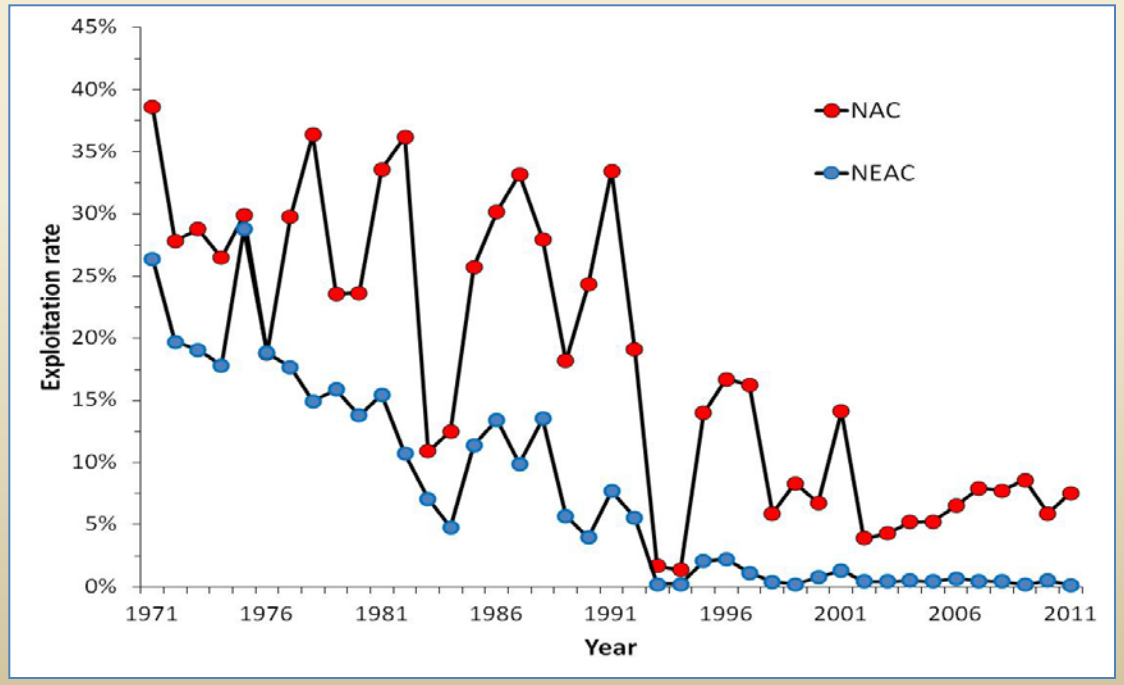
- Declining trend in MSW spawner numbers, although small increase in last 3 years
- Since 1997, often either at risk of or suffering reduced reproductive capacity, but currently above CL
- Within all countries, individual river stocks are not meeting CLs





Summary of Stock Status – Exploitation rate

- Exploitation rates derived by dividing the recorded harvest at WG by the PFA estimate for the corresponding year for each complex [N.B. latest estimate for 2011]
- 2011 exploitation rate for NAC was 7.5%, an increase on 2010 and close to previous 5-year mean (7.3%) [Peak value in 1971 of 39%]
- 2011 exploitation rate for NEAC was 0.1%, a decrease from the previous year's estimate (0.5%) and among the lowest in the time series [Peak value in 1975 of 29%]



Summary of Stock Status

- The overall abundance of stocks contributing to the West Greenland fishery is very low compared to historical levels and among the lowest levels recorded.
- Six of the seven stock complexes exploited at West Greenland are currently below conservation limits and thus suffering reduced reproductive capacity.
- Despite increasingly more restrictive fishery management measures in recent decades, returns in these regions have remained near historical lows and many populations are currently threatened with extirpation.
- Continued low abundance of salmon stocks across North America and in the North East Atlantic, despite these measures, further strengthens the conclusions that factors other than fisheries are constraining production.

Recommendations

- ICES supports the efforts of the Greenlandic authorities to improve catch data collection and recommends that the authorities facilitate the coordination of sampling within factories receiving Atlantic salmon, if landings at factories are allowed in 2013.
- ICES recommends that the Greenland catch reporting system continues and that logbooks be provided to all fishers. Efforts should continue to encourage compliance with the voluntary logbook system. Detailed statistics related to catch and effort should be made available to ICES for assessment.
- ICES recommends that arrangements be made to enable sampling in Nuuk as a significant amount of salmon is landed in this community on an annual basis.
- ICES recommends that the longer time-series of sampling data from West Greenland should be analysed to assess the extent of the variation in fish condition over the time period corresponding to the large variation in productivity as identified by the NAC and NEAC forecast models.
- ICES recommends a continuation and expansion of the broad geographic sampling programme (multiple NAFO divisions) to more accurately estimate continent of origin and biological characteristics of salmon caught in the West Greenland mixed stock fishery.

Advice generated by ICES in response to terms of reference from NASCO

Supporting information and details in the report of the ICES Working Group on North Atlantic Salmon available at:
http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WGNAS/wgnas_2013.pdf

Acknowledgements

Members (20) of participating countries (11) to the Working Group on North Atlantic Salmon, 3 – 12 April, 2013

WGC sub-group chair: Tim Sheehan (USA)