CNL(25)61

ICES Advice Highlights

Photo by Nick Hawkins

sal.oth.all

North Atlantic Salmon Stocks

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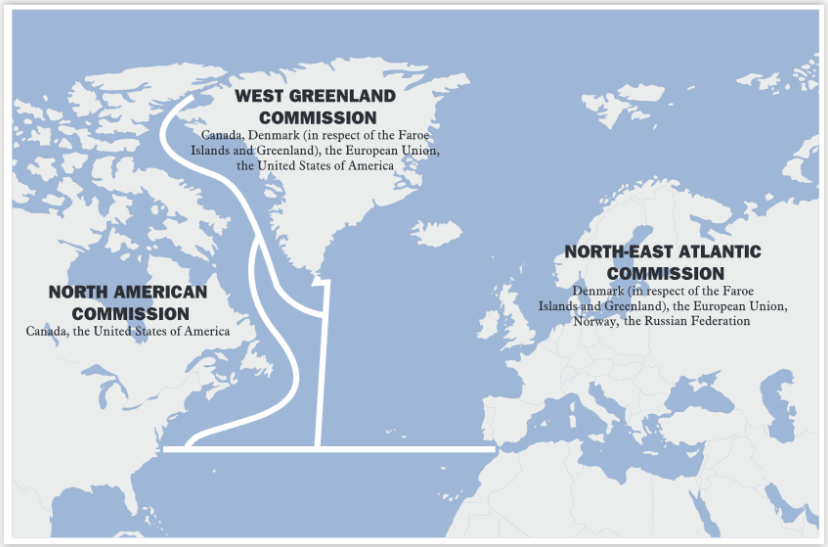
Background

- NASCO Commissions: North American (NAC), West Greenland (WGC) and North-East Atlantic (NEAC)
- Management framework for Atlantic salmon in the North Atlantic



NASCO Request

1. With respect to Atlantic salmon in the North Atlantic area:

1.1 provide an overview of salmon catches and landings by country, including unreported catches and catch and release, and production of farmed and ranched Atlantic salmon in 2024

1.2 report on significant new or emerging threats to, or opportunities for, salmon conservation and management

1.3 provide a compilation of tag releases by country in 2024

1.4 identify relevant data deficiencies, monitoring needs and research requirements

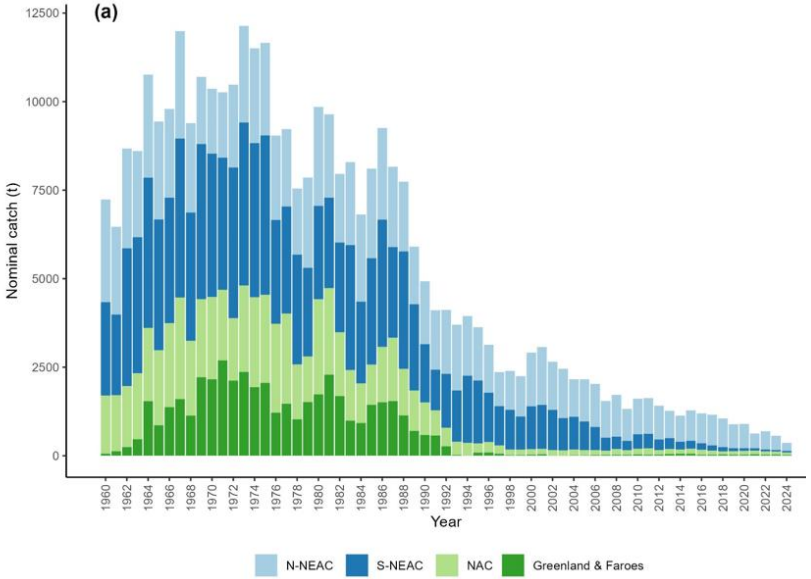
1.1 Nominal Catch

- Reported whole weight of fish caught and retained
- Released fish not included
- No RF catch data for 2024

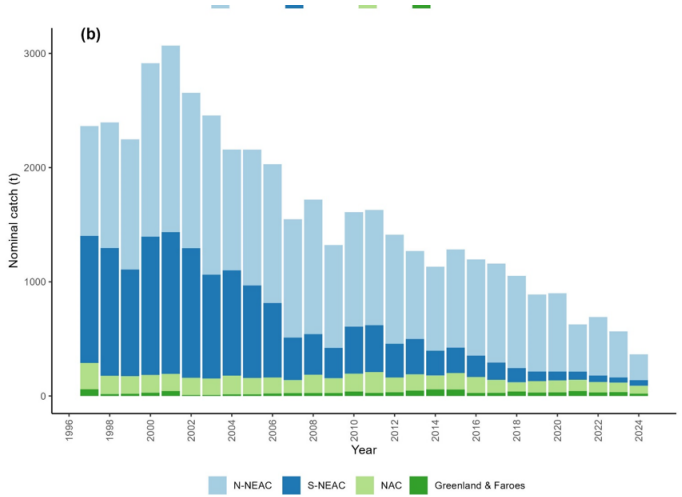
from Table 1: *sal.oth.all*

Year	2021	2022	2023	2024
NEAC	487	569	448	276
NAC	100	91	83	69
WGC	43	31	33	20
Total	**630**	**691**	**564**	**364**

1960 – 2024



1998 – 2024



Northern Europe
Southern Europe
North America
Greenland & Faroes

Figure 1: *sal.oth.all*

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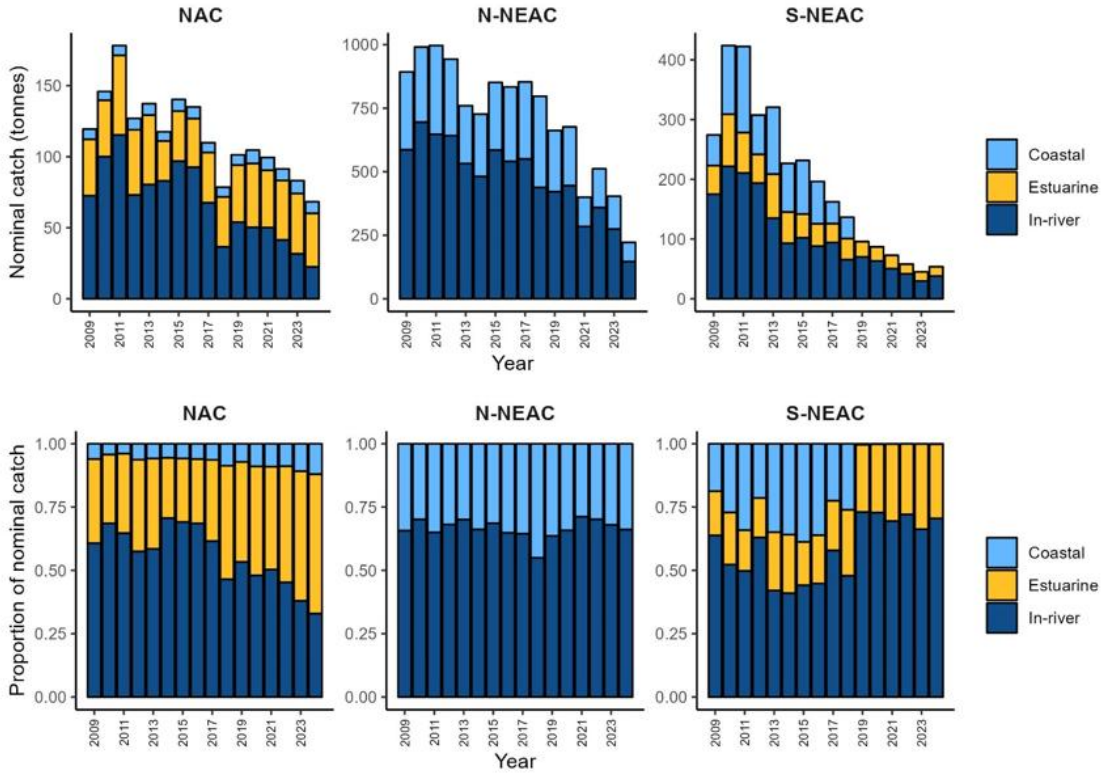
1.1 Location of Catches

Coastal Catches (~mixed stocks)

- N-NEAC: 33% - 44% since 2008
- S-NEAC: 0% since 2021
- NAC: < 10% since 2007



(Figure 2: sal.oth.all)

1.1 Unreported Catches

- Legal under-reporting, non-reporting and illegal catch (tonnes)

from Table 3: *sal.oth.all*

Area	2022	2023	2024
NEAC	174	133	78
NAC	18	16	13
WGC	10	10	10
Total	**201**	**159**	**101**

ToR 1.1 Catch-and-Release (C&R)

- ~145 000 salmon (483 t) released in 2024
- Percentage released in 2024 ranged from:
  - 8% in France to 98% UK (Scotland)
- Rate reflects varying management practices and angler attitudes
- Practice of C&R generally increasing

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1.1 Farming and Sea Ranching

Farmed

- North Atlantic 2024: ~ 2 million tonnes
  - 79% in Norway and 9.5% in UK (Scotland)
- Worldwide - ~ 2.9 million tonnes
- Farmed = 8000x wild harvest

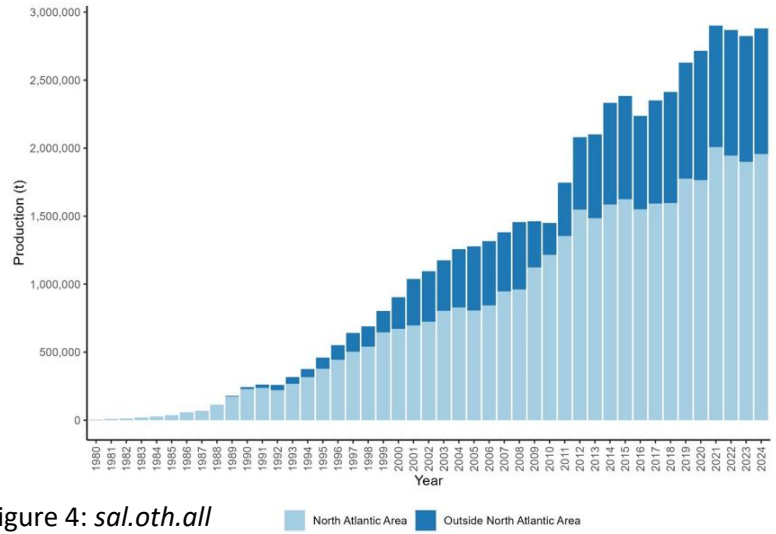


Figure 4: *sal.oth.all*

Ranched

- North Atlantic 2024: 19 t
  - 79% in Iceland

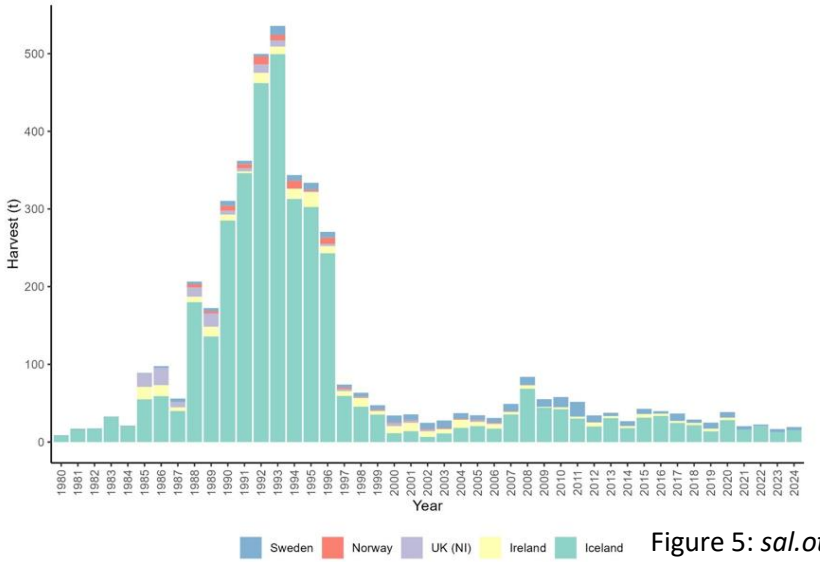
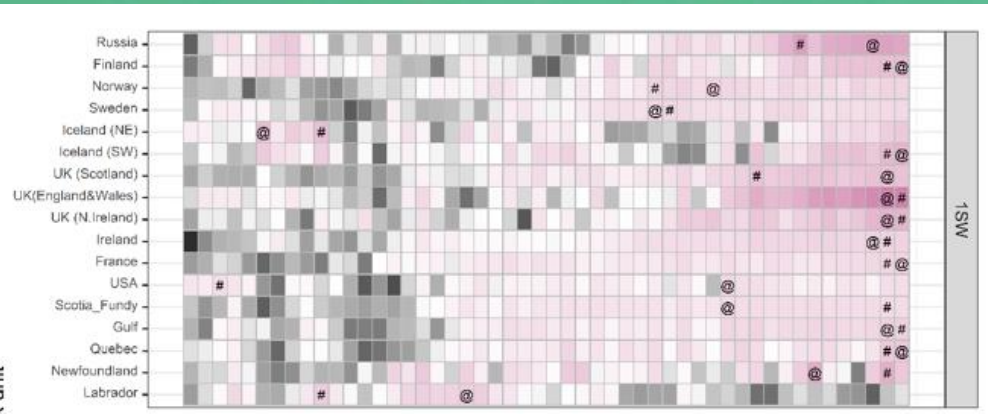


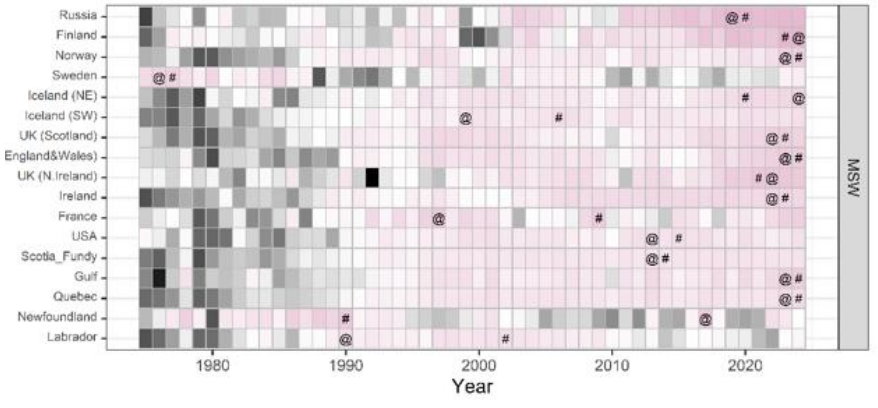
Figure 5: *sal.oth.all*

1.2 Emerging Threats and Opportunities

Threats

- Record or near-record low returns of 1SW and MSW salmon in the majority of countries/jurisdictions in 2023 or 2024.
- The labels below are the years when the lowest (@) and second lowest (#) abundances over the entire time period occurred for the stock units.
- Some unprecedented closures of recreational fisheries in 2024.
- Recent low abundances, declines in estimated post-smolt survival, and a general absence of any improvements in abundance across stocks in the North Atlantic highlight the concern that large-scale marine stressors at the North Atlantic scale are impacting salmon.





1.2 Emerging Threats and Opportunities

Threats (2)

- Lough Neagh (UK: Northern Ireland) – 25% smolts had lamprey scars, up from 19% previous year
- Mass mortality of returning salmon to Ballisodare River (Ireland) caused by gill damage by marine phytoplankton, mechanical damage while navigating barriers under low water conditions, and secondary Saprolegnia (skin fungus) infections

Opportunities

- Quebec implemented new science using the relationship between 1SW returns in one year and 2SW return the following year, to protect 2SW salmon returns in 2024 on the basis of record low returns of 1SW salmon in 2023.

1.3 Tag Releases

- 2024: 1.16 million salmon marked
- Mainly adipose fin clips (0.8 million), then coded wire tags (260,000)
- Mainly hatchery juveniles: 1.1 million
- ~82 000 wild juveniles and ~4500 wild adults
- ~61 000 internal tags/marks

1.5 Data Deficiencies, Monitoring Needs, and Research Requirements

- As in previous years, stock status modelling excludes Denmark, Spain, Portugal & Inner Bay of Fundy because their time series are too short for the model
- Recommend that all countries/jurisdictions submit salmon data through the ICES data call process (all but Faroes, Russian Federation now)
- No data for Russian stock units for 2021-2024. This prevents ICES from reporting on the status of these stock units

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Atlantic salmon from Northeast Atlantic

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Photo by Alan Walker

NASCO Request

2. With respect to Atlantic salmon in the North-East Atlantic Commission area:

2.1 describe the key events of the 2024 fisheries;

2.2 review and report on the development of age-specific stock conservation limits, including updating the time-series of the number of river stocks with established CLs by jurisdiction;

2.3 describe the status of the stocks, including updating the time-series of trends in the number of river stocks meeting CLs by jurisdiction

Summary of advice

- Zero catch advice for mixed stock fishery off Faroes Islands in 2025/26 and 2026/27 (as last year)
- Fishing should be on stocks at full reproductive capacity. Mixed stock fisheries present challenges to this
- All non-fisheries human impacts should be minimized
- Habitat quantity and quality should be restored

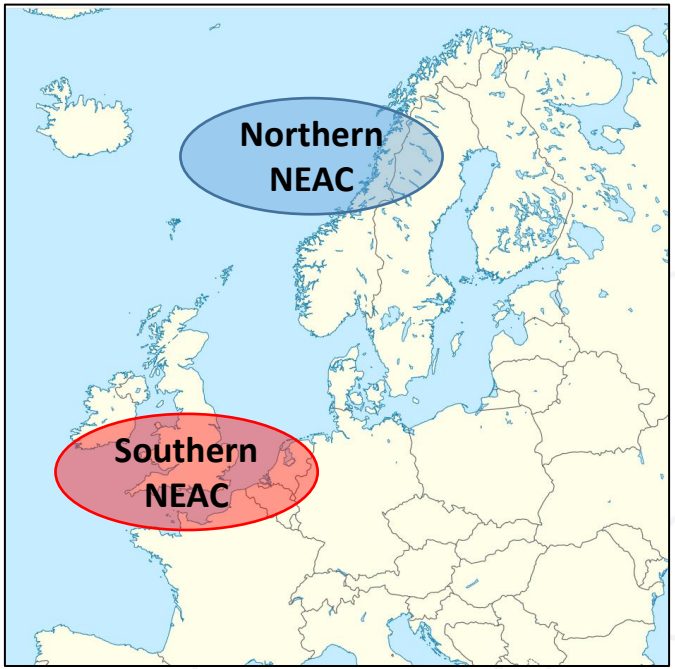
Background

- Northeast Atlantic Commission (NEAC) stocks are combined into two groups for the provision of management advice for fisheries at West Greenland and Faroes

Southern group (Southern NEAC) :

- UK (Scotland)
- UK (England and Wales)
- UK (N. Ireland)
- Ireland
- France
- Spain
- Iceland (south/west region)

- Total of 7 stock units



Northern group (Northern NEAC) :

- Russia
- Finland
- Norway
- Sweden
- Denmark
- Iceland (north/east region)

- Total of 11 stock units

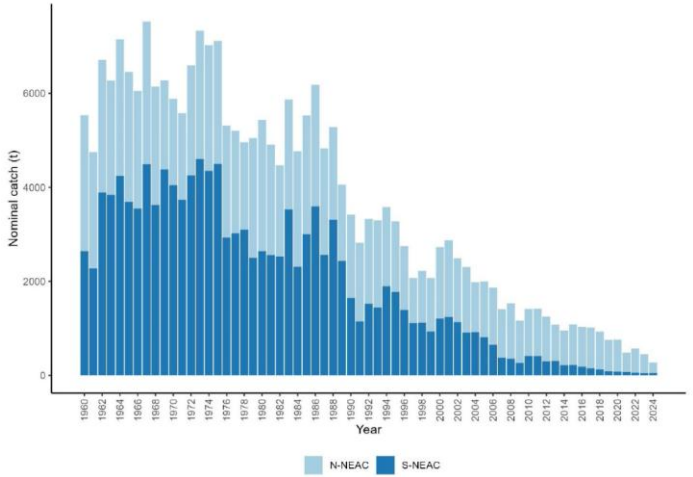
2.1 Key Events 2024 Fisheries: Catch

- No significant changes in the gear types used
- No fishery Faroes since 2000
- 2024 values don't include Russia Federation

2024	Southern NEAC	Northern NEAC	Total NEAC
Catch (t)	**49**	**227**	**276**
Catch as % of NEAC total	18	82	
Unreported catch			**78**
Location of catches			
% in-river	67	67	67
% in estuaries	33	0	6
% coastal	0	33	27

Table 1a,b: sal.neac.all

- NEAC Reported Nominal Catch 2024 lowest in the time series for Northern, and 2nd lowest in Southern areas



- Sea age split:
  - Southern NEAC (~78% 1SW)
  - Northern NEAC (~68% 1SW)

2.1 Key Events 2024 Fisheries: Exploitation Rate

- Exploitation rates have decreased since the early 1980s
- Rates on 1SW and MSW salmon are similar within regions

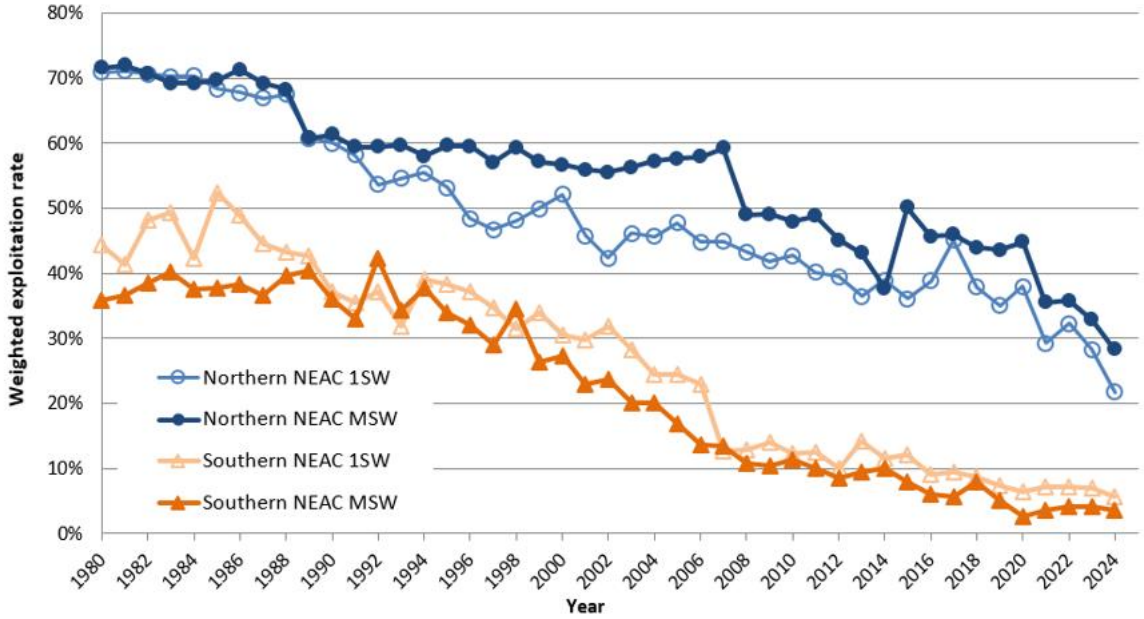


Figure 3: sal.neac.all

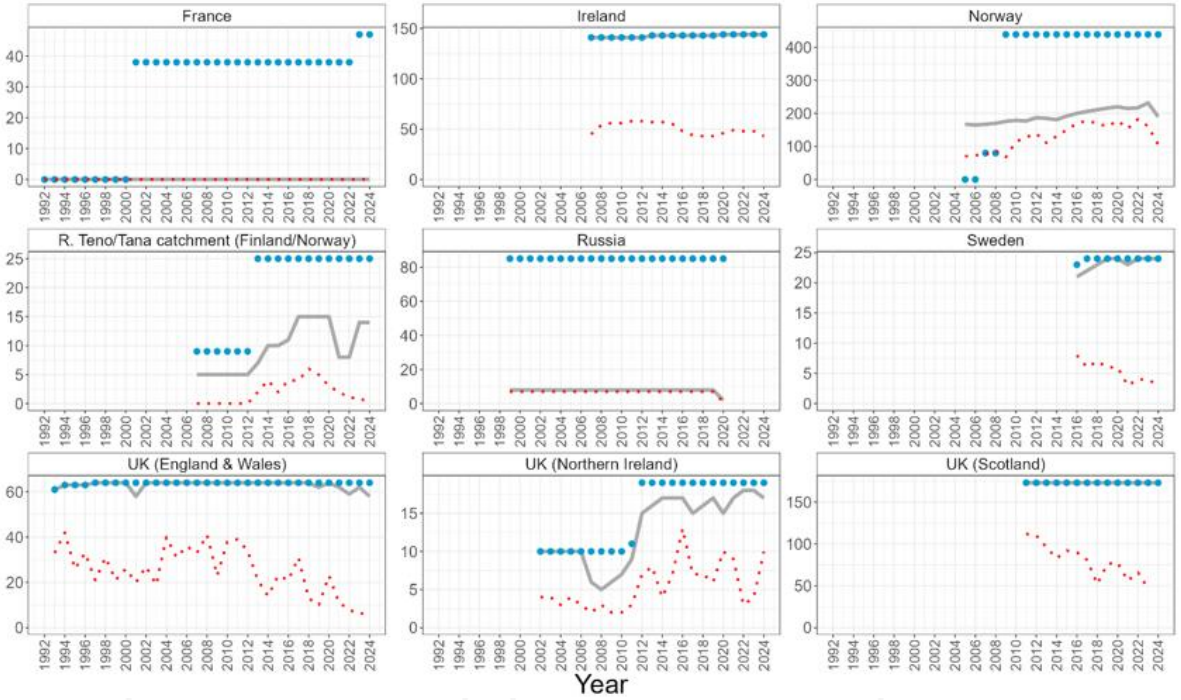
2.2 Stock Conservation Limits (CLs): the number of river stocks with CLs

- Nine jurisdictions with river-specific CLs
- Russia & Iceland – CLs for several rivers but not used for national assessments

● ● ● number of rivers with CLs

— number assessed

. . . number = / > CLs



Teno/Tana values are for tributaries with separate CLs

Figure 4: sal.neac.all

2.3 Stock Status: Trends in Rivers Meeting CLs

Table 4 Atlantic salmon from the Northeast Atlantic. Summary of the attainment of Conservation Limits (CLs) in 2024 (2023 for UK [Scotland]) and trends based on all available data in the NEAC area.

Country /Jurisdiction	Rivers with CLs (number)	Rivers assessed for compliance (number)	Rivers attaining CL (number)	Assessed rivers attaining CL (%)	Trend in the last 10 years
Northern NEAC					
Russian Federation	*	*	*	*	Unknown
Norway/Finland (Tana/Teno)	25	14	0	0	Decreasing
Norway	439	190	106	56	Decreasing
Sweden	24	24	3	12	Decreasing
Southern NEAC					
UK (Scotland)	173	173	47	27	Decreasing
UK (Northern Ireland)	19	17	10	59	Variable
UK (England & Wales)	64	58	7	12	Decreasing
Ireland	144	144	48	33	Minor variability
France	47	0	n/a	n/a	n/a

* No data available.

Table 4: sal.neac.all 2025

2.3 Stock Status: Return Rates (Marine Survival proxy)

- Wild and hatchery rates available

- Northern
  - 1SW declining trend since 1980 though wild flattening & hatchery increasing
  - 2SW very variable but declining
- Southern
  - 1SW declining trends though hatchery flattening
  - 2SW wild declining trend but shallower

- Continuing poor survival in the marine environment

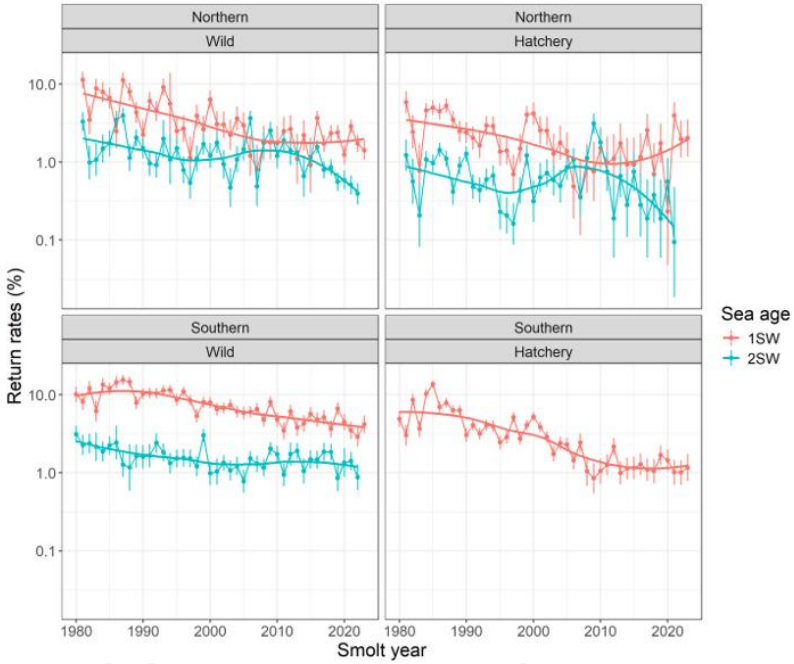


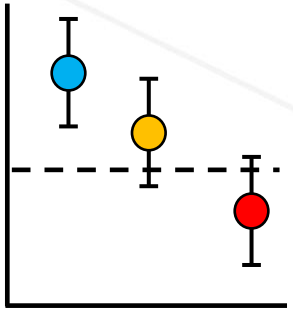
Figure 5: sal.neac.all

2.3 Stock Status

- The status of stocks in the Northeast Atlantic was assessed relative to the probability of returns and spawners exceeding CLs at the stock complex and national levels
- Returns to ‘rivers’ - local fisheries = Spawners

Risk Assessment Framework

- Full Reproductive Capacity :
  - 5th percentile of spawner estimate is above CL
- At Risk of Suffering Reduced Reproductive Capacity:
  - Median spawner estimate above CL, but 5th percentile below
- Suffering Reduced Reproductive Capacity:
  - Median spawner estimate below CL



2.3 Stock Status: stock complex level

- Northern NEAC

- Returns: 1SW and MSW returns stock components were at full reproductive capacity, but among the lowest in the time-series.
- Spawners: 1SW spawners was at full reproductive capacity (14th) but MSW spawners was at risk of suffering reduced reproductive capacity and the 5th lowest in the time series.

- Southern NEAC

- Returns: 1SW and MSW returns stock components were at risk of suffering reduced reproductive capacity, being 5th and 2nd lowest in their time-series.
- Spawners: The 1SW and MSW spawners stock components were suffering reduced reproductive capacity, both 5th lowest in their time-series.

2.3 Stock Status: 2024 NEAC stock complexes

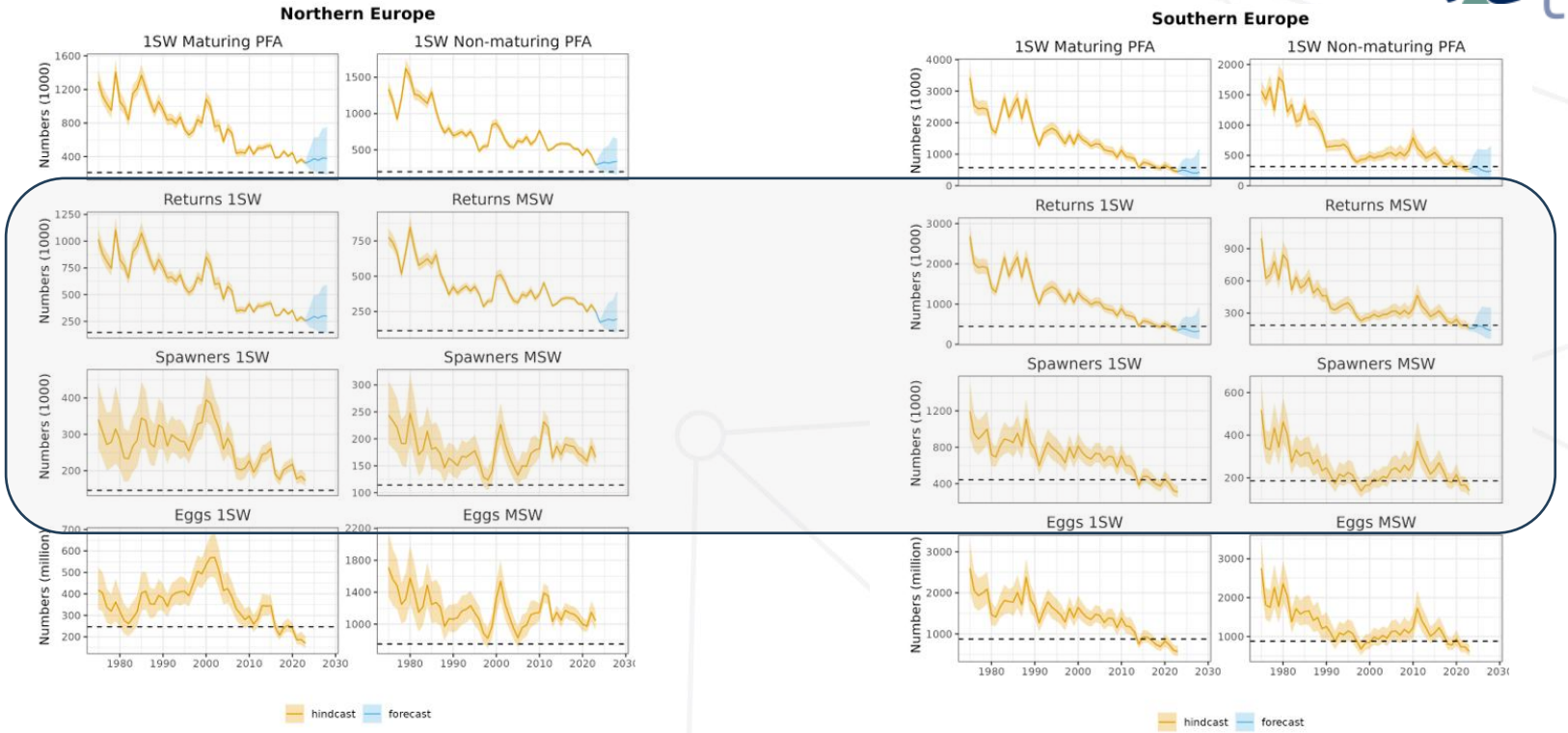


Figure 7: sal.neac.all

Figure 8: sal.neac.all

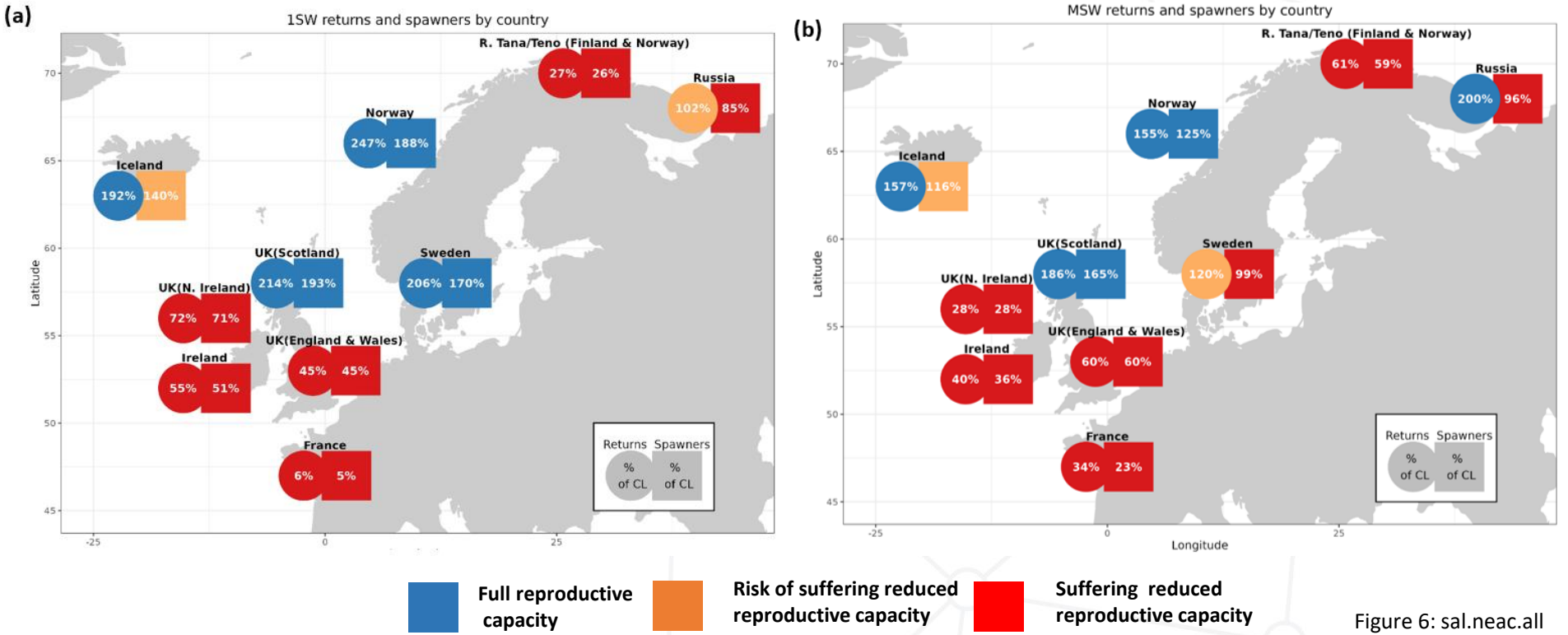
2.3 Stock Status: Countries/jurisdictions level

- Northern NEAC countries
  - 1SW returns in Norway, Sweden and Iceland (northeast) were at full reproductive capacity; elsewhere either suffering, or at risk of suffering, reduced reproductive capacity
  - MSW returns in Norway and the Russian Federation were at full reproductive capacity; elsewhere either suffering, or at risk of suffering, reduced reproductive capacity
  - **Most return estimates were among the lowest in the time-series**
  - Spawner patterns similar, except reductions in Iceland (1SW & MSW), Sweden (1SW) and the Russian Federation (1SW & MSW) show the impact of homewater exploitation
  - Spawner estimates ranks varied but were lowest on record for River Tana/Teno

- Southern NEAC countries
  - All 1SW and MSW returns and spawners were suffering reduced reproductive capacity, except for UK (Scotland).
  - **All 1SW and MSW returns were amongst lowest in the time-series.**
  - Spawner estimates ranks more variable but lowest in France 1SW and UK (Northern Ireland) MSW

- **Overall: more stocks in Southern NEAC countries were suffering, or at risk of suffering, reduced reproductive capacity compared to Northern NEAC countries.**

2.3 Stock Status: returns & spawners



Full reproductive capacity

Risk of suffering reduced reproductive capacity

Suffering reduced reproductive capacity

Figure 6: sal.neac.all

sal.nac.all

Atlantic salmon from North America

NASCO Request

3. With respect to Atlantic salmon in the North American Commission area:

3.1 describe the key events of the 2024 fisheries (including the fishery at Saint Pierre and Miquelon);

3.2 update age-specific stock conservation limits based on new information as available, including updating the time-series of the number of river stocks with established CLs by jurisdiction;

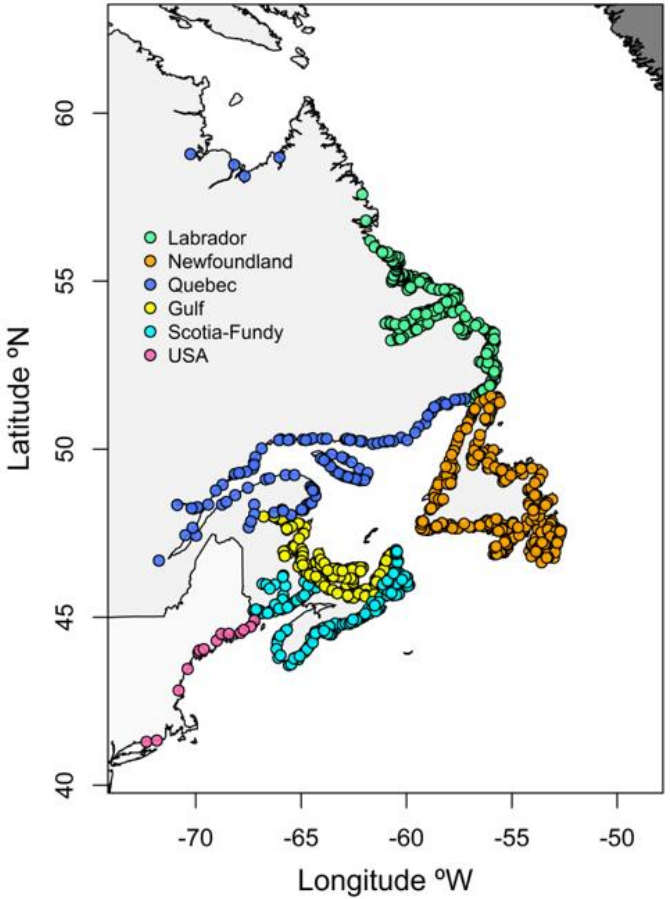
3.3 describe the status of the stocks, including updating the time-series of trends in the number of river stocks meeting CLs by jurisdiction.

Summary of advice

- Zero catch advice for mixed stock fisheries in 2026 and 2027 (as last year)
- Fishing should be on stocks at full reproductive capacity. Mixed stock fisheries present challenges to this
- All non-fisheries human impacts should be minimized
- Habitat quantity and quality should be restored

Background

- North American Commission (NAC) stocks are grouped into 6 stock units:
- Labrador
- Newfoundland
- Quebec
- Gulf
- Scotia-Fundy
- USA



3.1 Key events 2024: Catch

- No fisheries in USA since 1999
- No commercial fisheries in Canada since 2000
- Canada has Indigenous, Labrador resident subsistence & recreational fisheries
- SPM has professional & recreational licenses

Total NAC catch: 68.3 t

CA: 66.6 t SPM: 1.7 t USA: 0 t

Unreported: 13 t

% coastal – 12%

C&R: Canada 30,776 = 78% catch

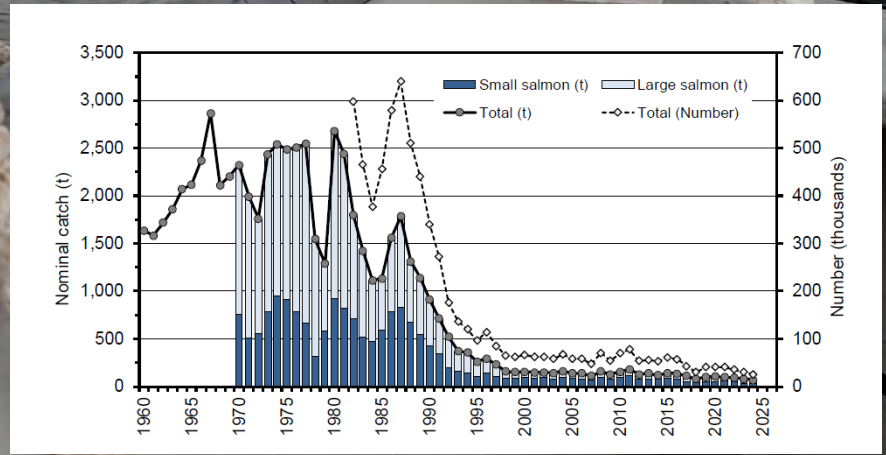


Figure 1: sal.nac.all

3.1 Key Events 2024: Exploitation Rates

- Exploitation rates decreased in the early 1990s
- Rates on 1SW and MSW salmon are similar

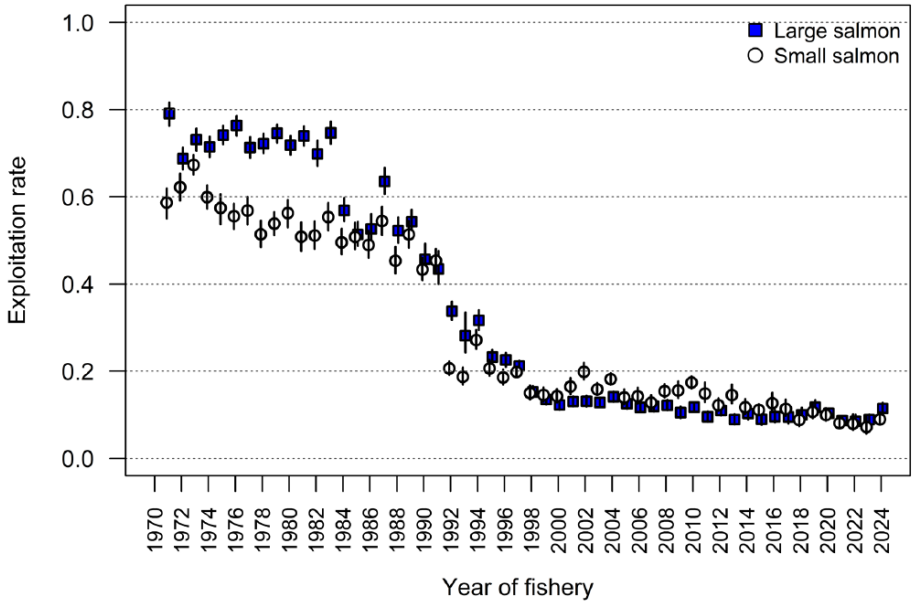


Figure 3: sal.nac.all

3.1 Origin and Composition of Catches: Labrador Indigenous and Subsistence Fisheries

- Baseline 21 genetic groups

- 772 salmon sampled (6% of the catch)
- >95% of the sampled catch came from the three Labrador groups
- No USA origin salmon in the sampled catch


Photo: Melita Paul


Photo: Charlene Kippenhuck


Photo: Amanda Normore


Photo: Wanda Lee Mesher

3.1 Origin and Composition of Catches: Saint Pierre and Miquelon

- 45 salmon sampled (8% of the catch)
- >97% of the sampled catch came from Quebec, Gulf & Newfoundland
- Large salmon mainly from the Gulf group (85%)
- Small salmon mostly from Newfoundland (94%)

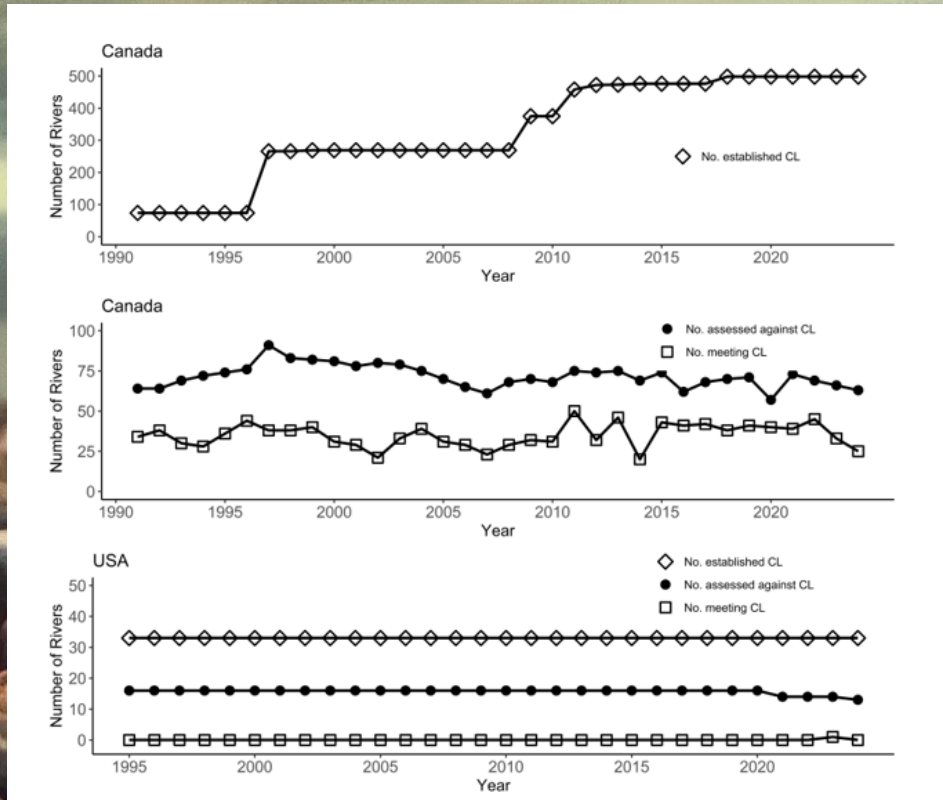
3.2 River Stocks with Established Conservation Limits (CLs)

Canada:

- CLs for 498 rivers since 2018
- 57 to 91 rivers assessed annually from 1991-2022
- percent achieving CL ranged from 26% to 70% with no temporal trend

USA:

- CLs for 33 rivers since 1995
- 13 rivers assessed annually since 2021
- none met CLs in 2024



3.3 Status of Stocks: River-Specific CL Attainment

- 76 assessed rivers assessed
- 25 (33%) achieved or exceeded CLs
- 39 (51%) were less than 50% CL
- Large deficiencies <10% CLs in 18 assessed rivers

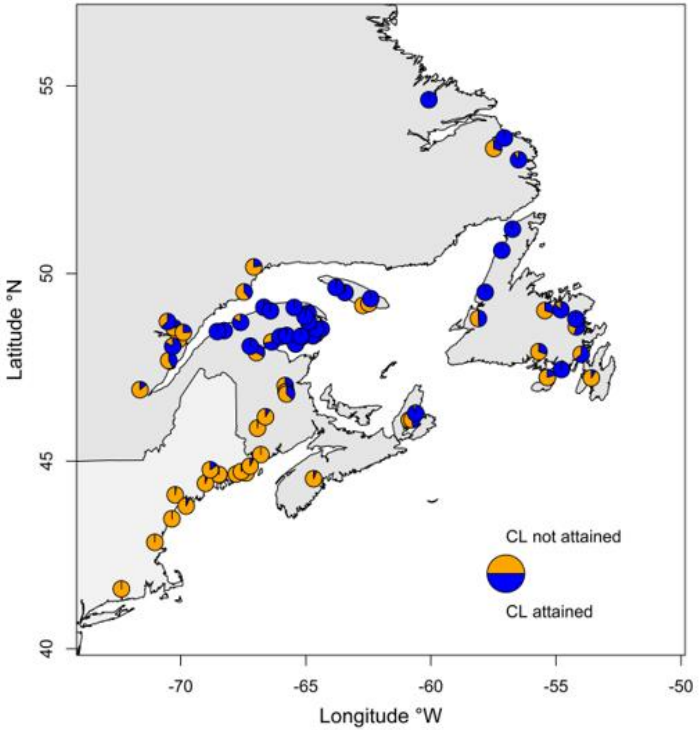


Figure 14: *sal.nac.all*

3.3 Status of Stocks: Returns

1SW (mainly small salmon)

- 288 300 fish (amongst lowest in 55y time series)
- 94% returns were to Newfoundland and Labrador
- Among lowest in time-series for Gulf, Quebec and Scotia-Fundy
- Decreased from previous 5y mean in all regions except USA that stayed low.

MSW (including maiden and repeats)

- 92 000 fish (2nd lowest in time series)
- 61% of returns were to Labrador & Newfoundland
- Decreased from 5y mean in all regions

2SW (subset of MSW)

- 54 400 fish (2nd lowest in time series)
- Most of the returns were to Labrador (43%), Quebec (28%) and Gulf (22%)
- Decreased from 5y mean in all regions

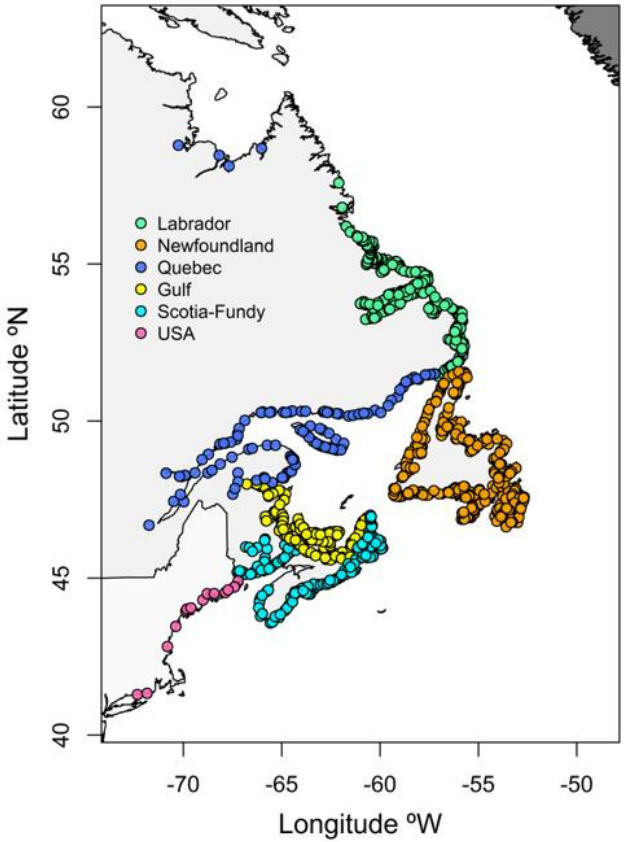


Figure 2: sal.nac.all
Map of salmon rivers by stock unit

3.3 Status of Stocks: 2SW Returns & Spawners vs CLs

- Median returns & spawners <CLs all stock units
- Particularly large deficits in returns for Scotia-Fundy

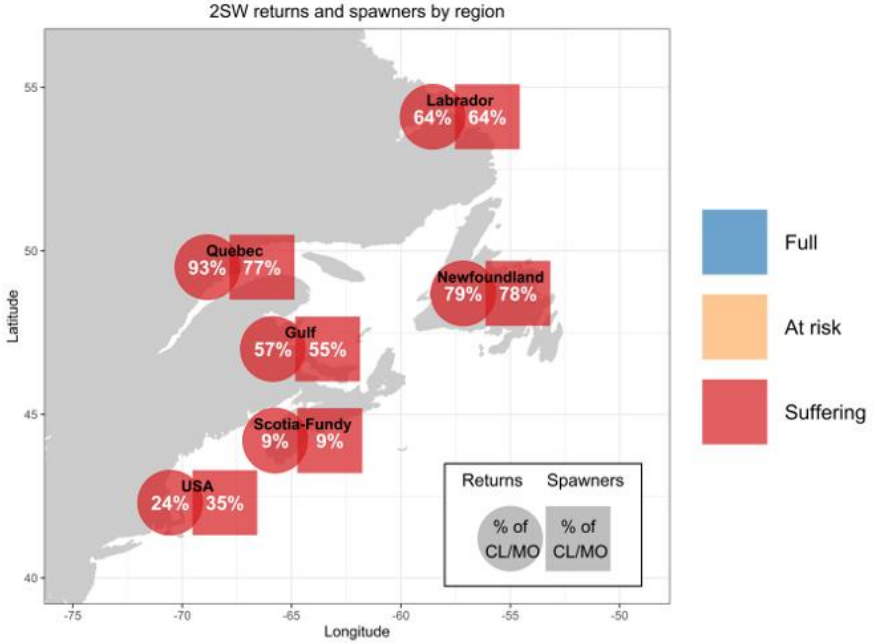
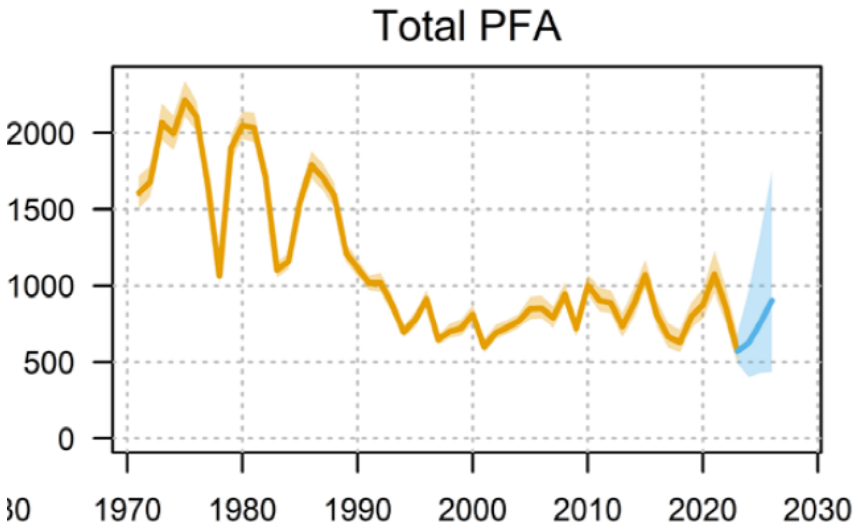


Figure 12: *sal.nac.all*

3.3 Status of Stocks: Pre-Fishery Abundance

post-smolt salmon at sea (recruits) prior to all marine fisheries (on 01 January of first sea winter)

- declining trend from 1970s to 1990s, then persistent low abundance



from Figure 5: *sal.nac.all*

sal.wgc.all
Atlantic Salmon at West Greenland

Science for sustainable seas

NASCO Request

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

4.1 describe the key events of the 2024 fisheries

4.2 describe the status of the stocks

Summary of advice

- Zero catch advice for mixed stock fishery in West Greenland in 2026 (as last year)
- Fishing should be on stocks at full reproductive capacity. Mixed stock fisheries present challenges to this
- All non-fisheries human impacts should be minimized
- Habitat quantity and quality should be restored

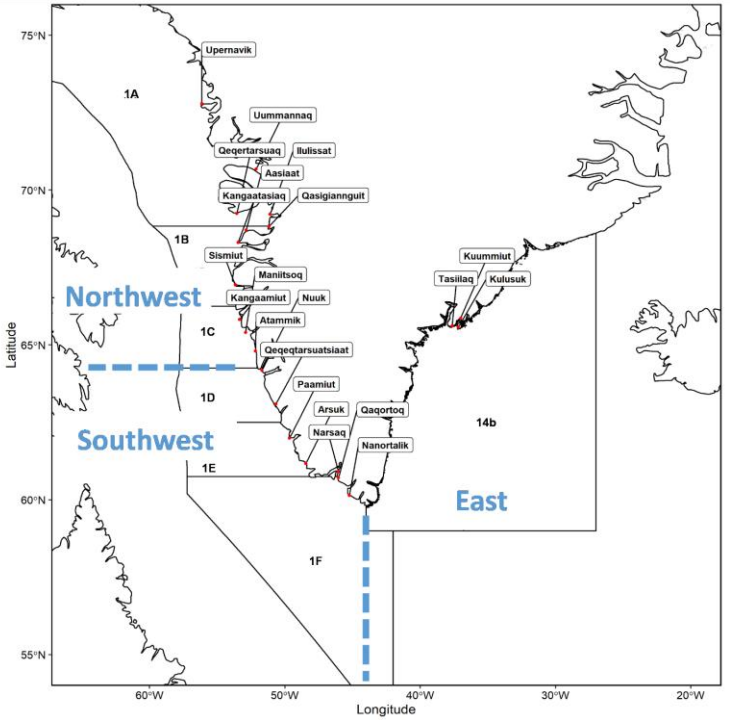
4.1 Key Events 2024 Fisheries

- *Management Plan for Atlantic Salmon in Greenland (2021-2025)*
  - 3 areas with specified seasons and 2 user groups
  - area/user group-specific quotas

Management Areas	Fishing season	User Group	% of TAC by area	% of TAC by user group
Northwest	01 Sep – 31 Oct		40%	
		Commercial		28%
		Recreational		12%
Southwest	01 Aug – 30 Sep		60%	
		Commercial		42%
		Recreational		18%
East Greenland	15 Aug – 15 Oct		3 t annually	
		Commercial		50%
		Recreational		50%

  - close fisheries when registered catch = 49% quota

Figure 1: sal.wgc.all



4.1 Key Events 2024 Fisheries

- **2024**
  - 27 t WG quota (+3 t EG)
  - 19.9 t catch WG (20.8 t total)
  - All Greenland – 75% caught by commercial fishers, 25% by recreational fishers
  - 10 t unreported catch estimate (a historic estimate)

4.1 Key Events 2024 Fisheries: Catch

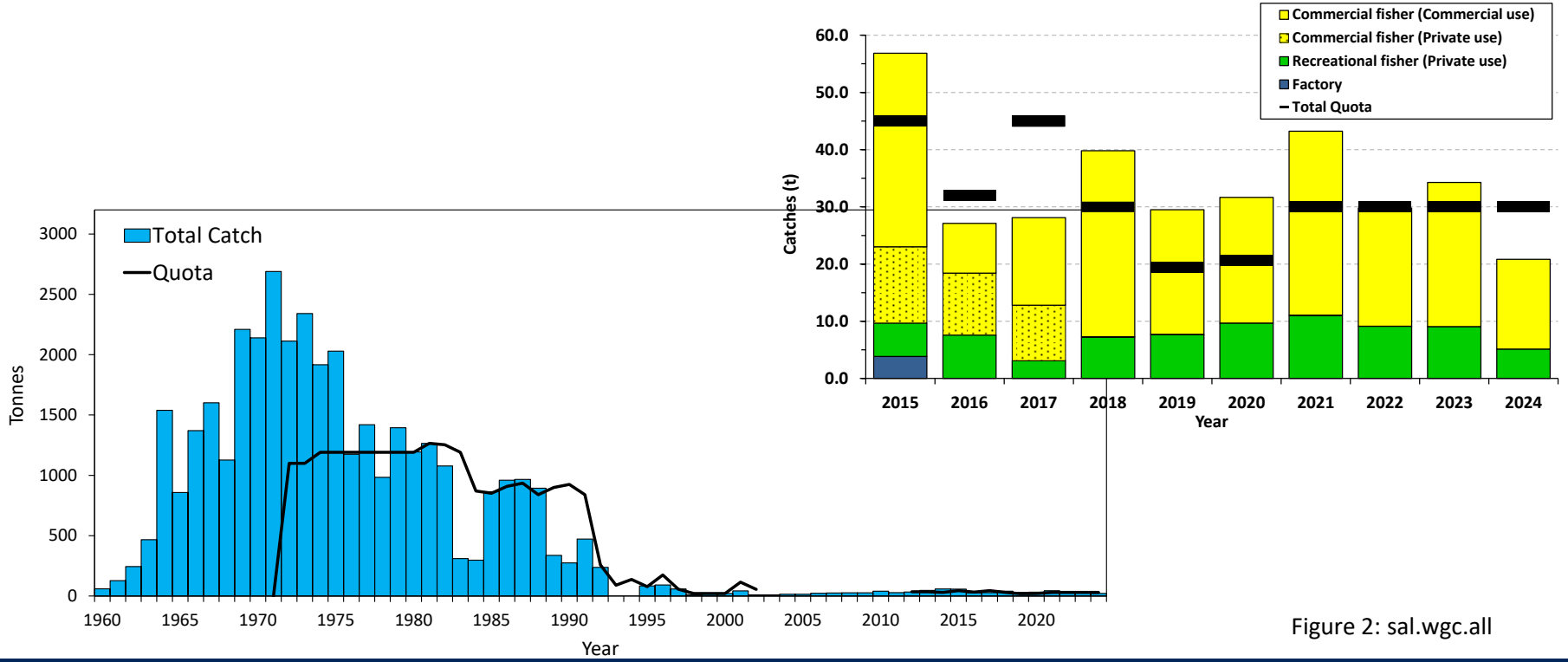
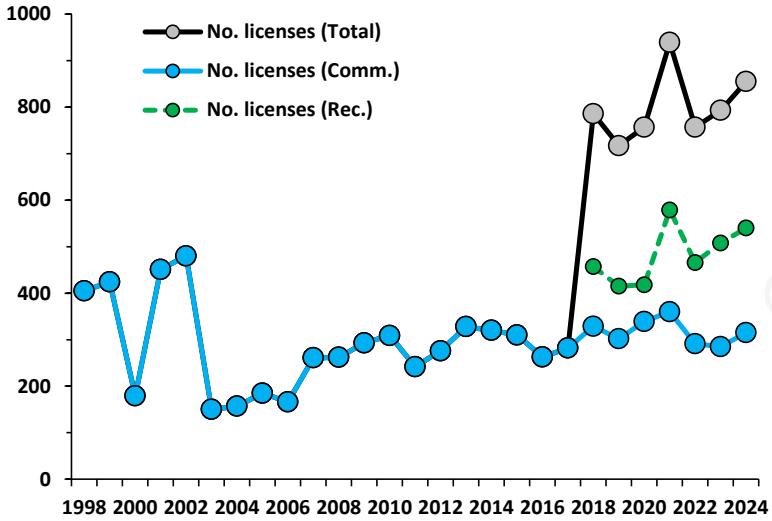


Figure 2: sal.wgc.all

4.1 Key Events 2024 Fisheries: Licenses & Reporting



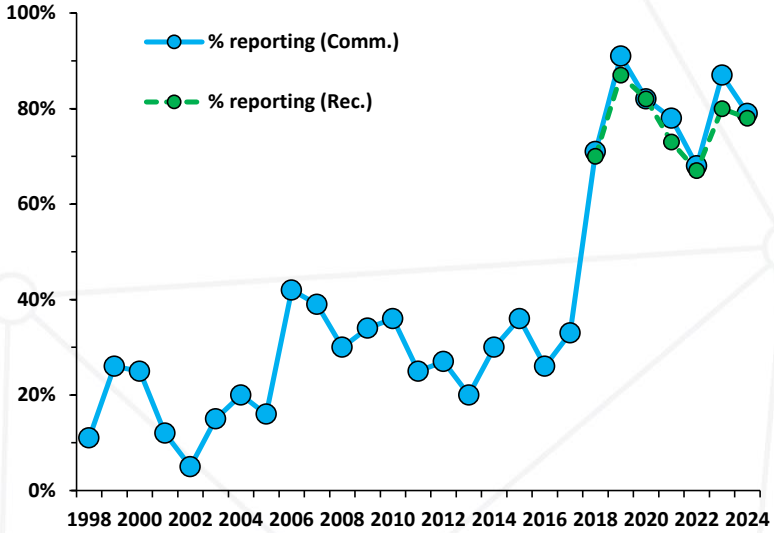


Figure 3: sal.wgc.all

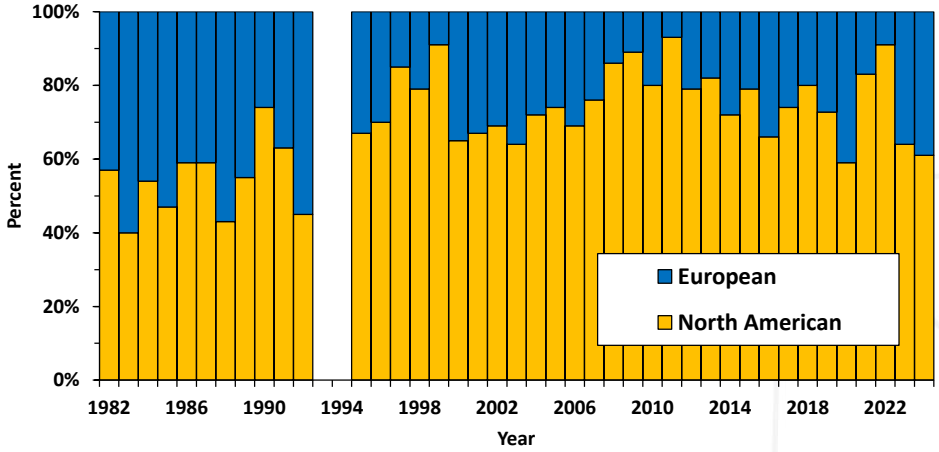
4.1 Key Events 2024 Fisheries: Sampling

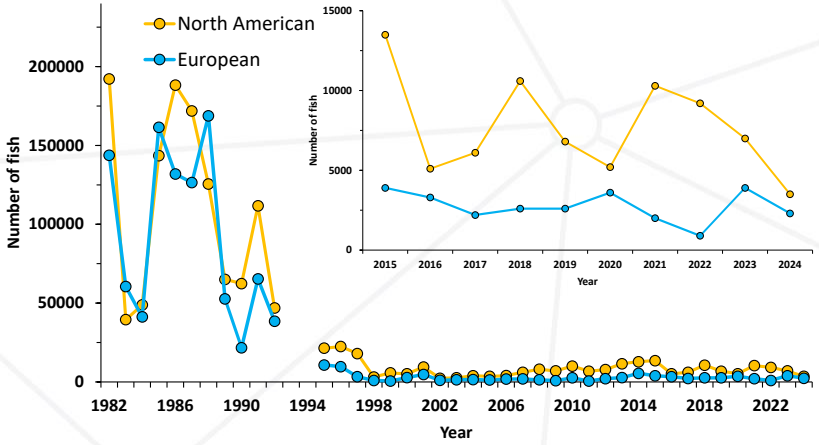
2024

- 5 International Samplers
- 617 samples collected, 10% of reported landings

4.1 Key Events 2024 Fisheries: Continent of Origin

- 61 % North American (~3500 salmon caught)
- 39 % European (~2300 salmon caught)





Figures 4 and 5: sal.wgc.all

4.1 Key Events 2024 Fisheries: Region of Origin

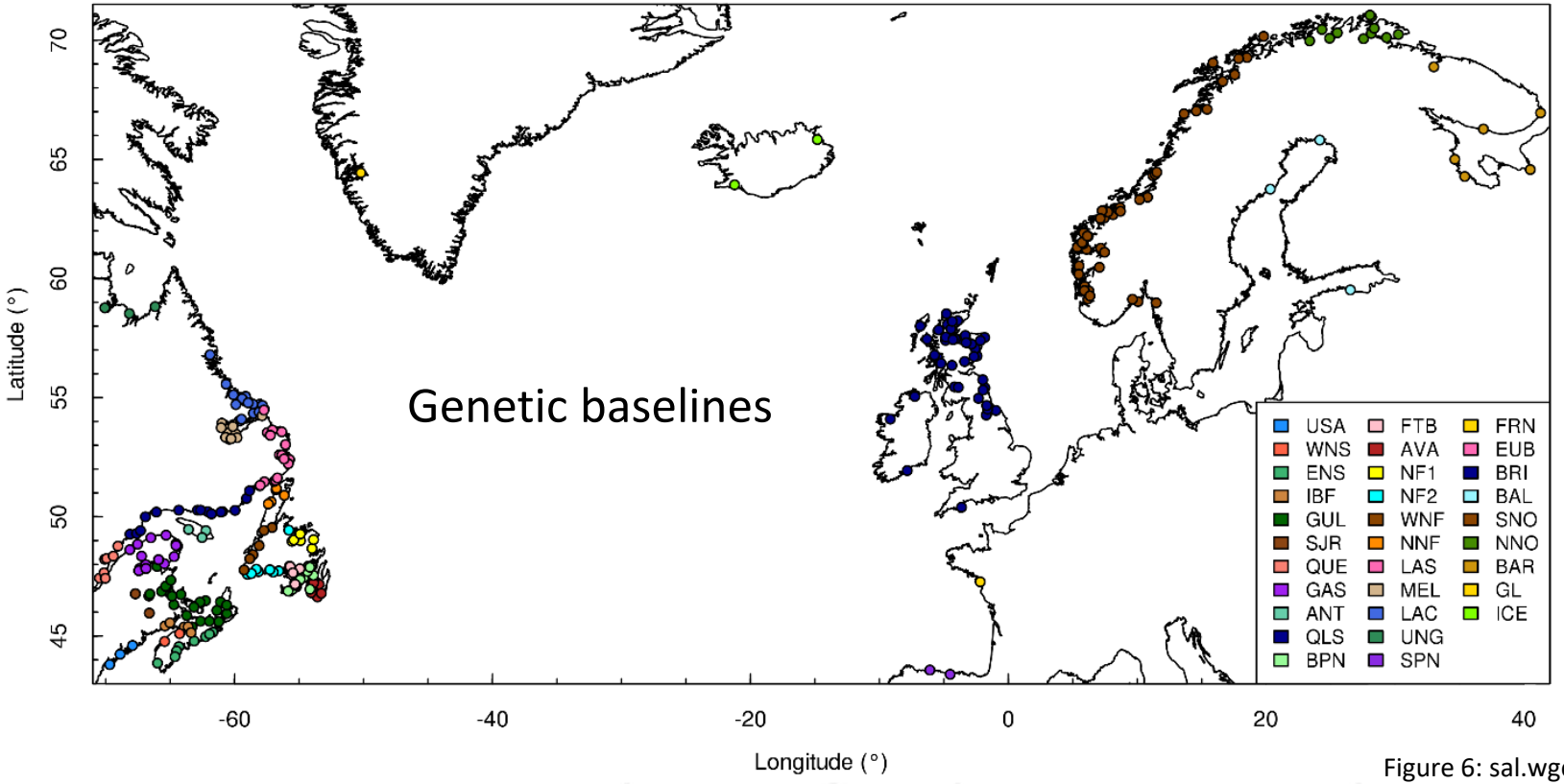
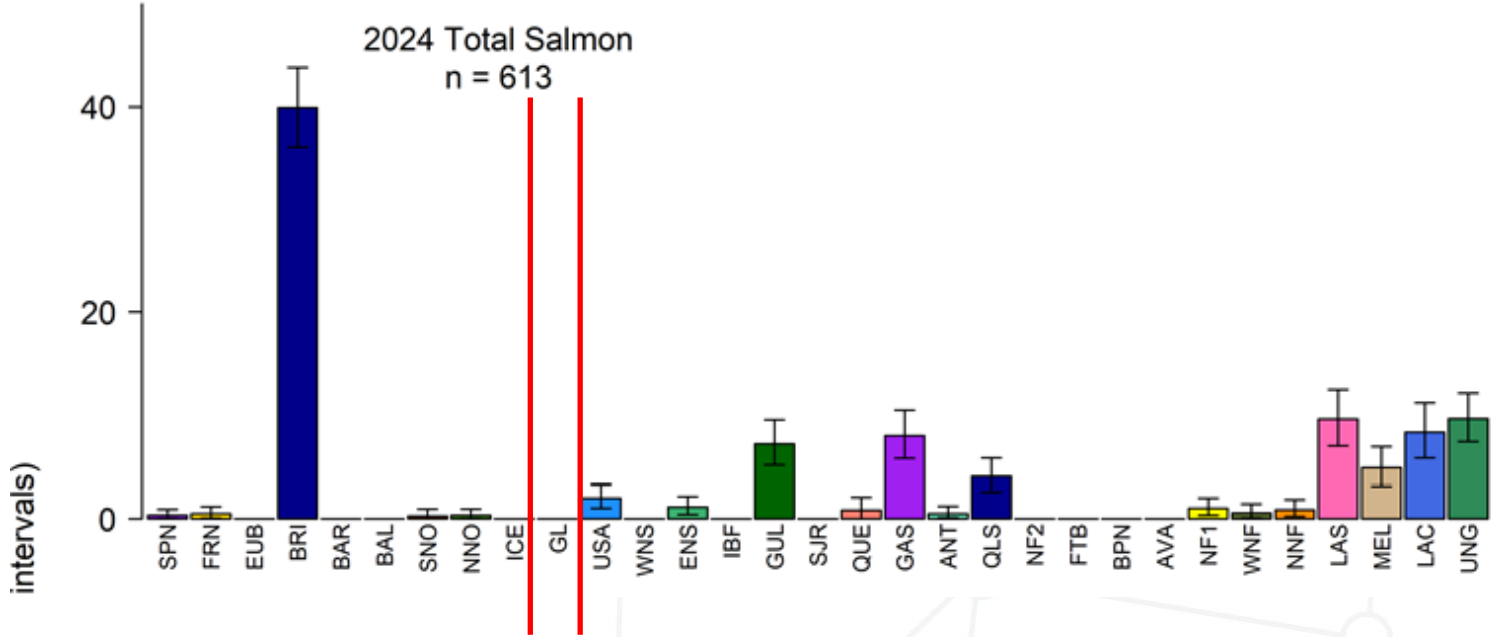


Figure 6: sal.wgc.all

4.1 Key Events 2024 Fisheries: Region of Origin

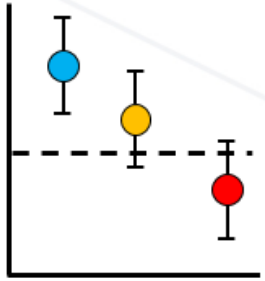


4.2 Status of Stocks: Risk Assessment Framework

- Management advice for West Greenland fishery based on catch of non-maturing 1SW salmon, that would return as 2SW/MSW to the 6 regions of North America (NAC) and the southern region of Northeast Atlantic (S-NEAC), relative to regional Conservation Limits (CLs)

Risk Assessment Framework

- Full Reproductive Capacity :
  - 5th percentile of spawner estimate is above CL
- At Risk of Suffering Reduced Reproductive Capacity:
  - Median spawner estimate above CL, but 5th percentile below
- Suffering Reduced Reproductive Capacity:
  - Median spawner estimate below CL



4.2 Status of Stocks: Spawners

- 6 of 7 Stock complexes < CLs/MOs

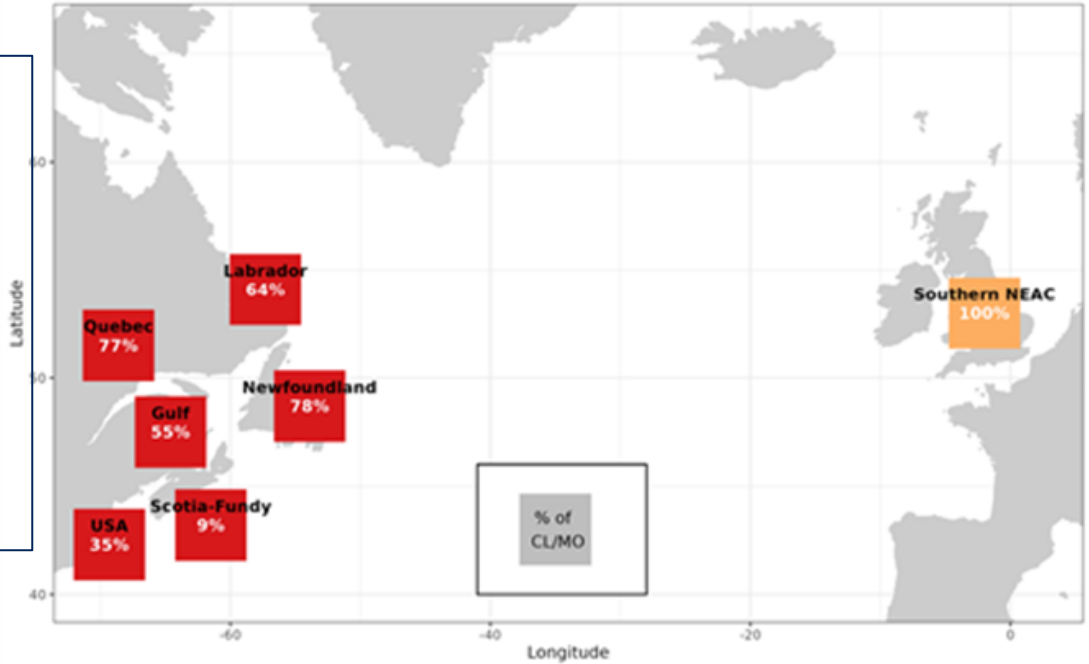
< CL:

Labrador, Quebec

Gulf, Newfoundland

< MO

Scotia-Fundy, US



S-NEAC

'at risk'

Figure 7: sal.wgc.all

4.2 Status of Stocks: Exploitation

- Catch / PFA = Exploitation rates
- These remain low:
  - North American: 6.8 %
  - European: 2.6 %

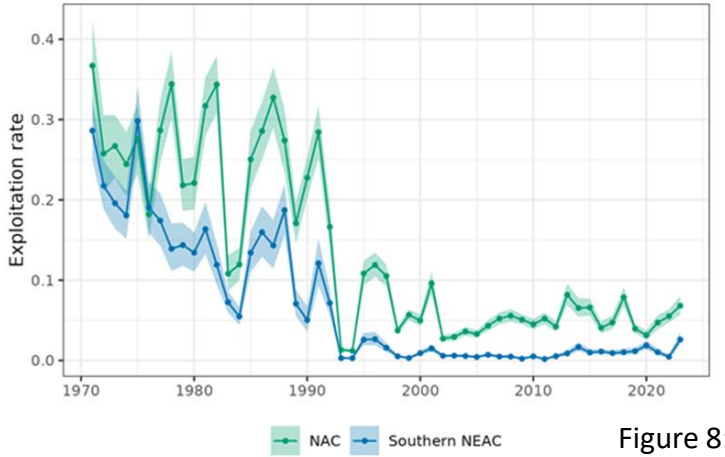


Figure 8: sal.wgc.all

4.2 Status of Stocks: Summary

- Despite major changes in fisheries management in the past few decades and increasingly more restrictive fisheries measures, salmon returns have remained near historical lows
- It is likely, therefore, that other factors besides fisheries are constraining production


ICES
CIEM
Thank you
Photo by Nick Hawkins