From the Barents Sea to the St. Lawrence: a trans North Atlantic Sightings Survey

NAMMCO

T-NASS

DESPORTES *et al.*

NASS Background

- Generate precise **estimates of absolute abundance** for cetaceans throughout N-NA waters
- Assess **trends** in distribution and abundance

►► **Input to management** for recommending safe catch limits - direct & indirect - for species subjected to:

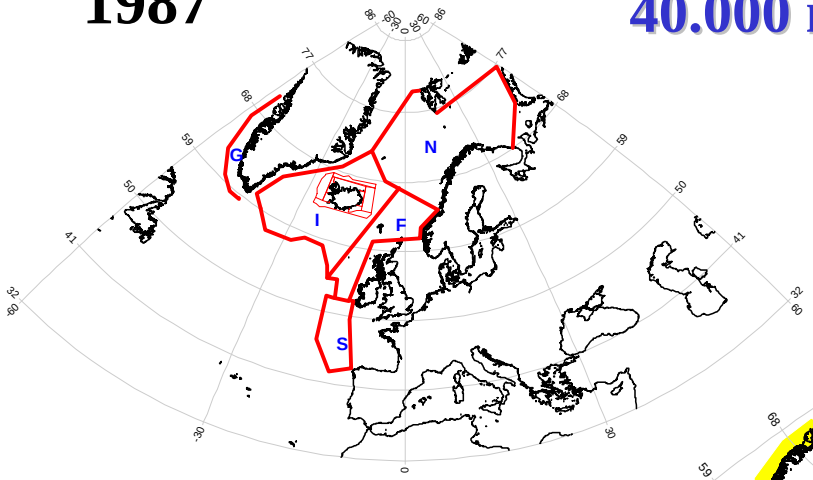
- direct and/or indirect catch
- environmental changes (global warming, increases in anthropogenic marine noise and marine pollution).

NASS 1987 – 2001: 16 years

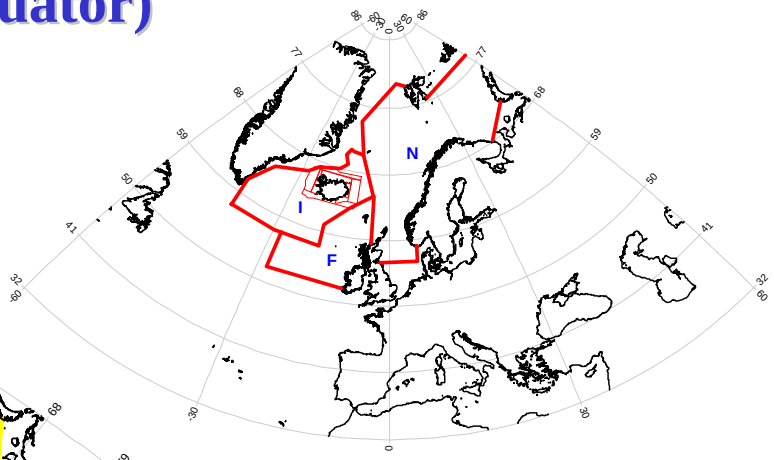
2 million nm^2 (W. Europe)

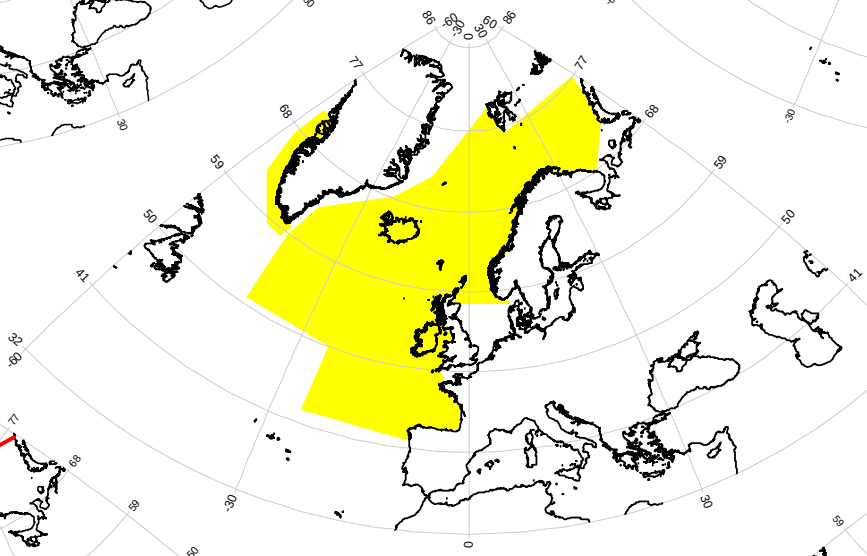
40.000 nm (2 x Equator)

1987

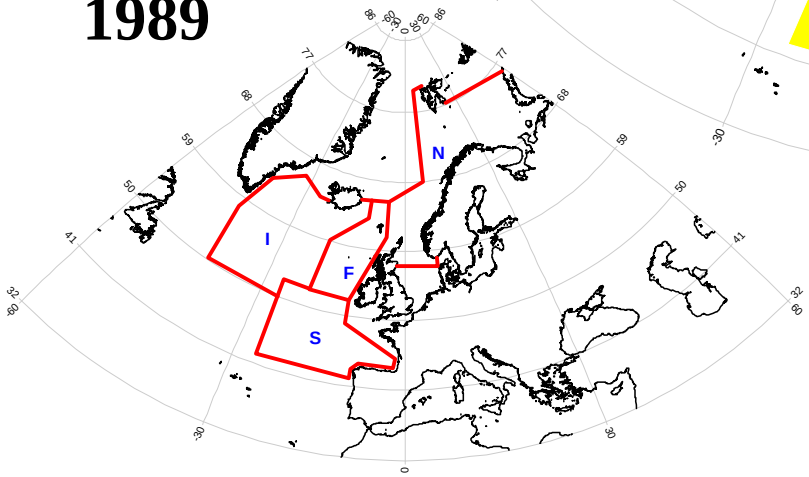


1995

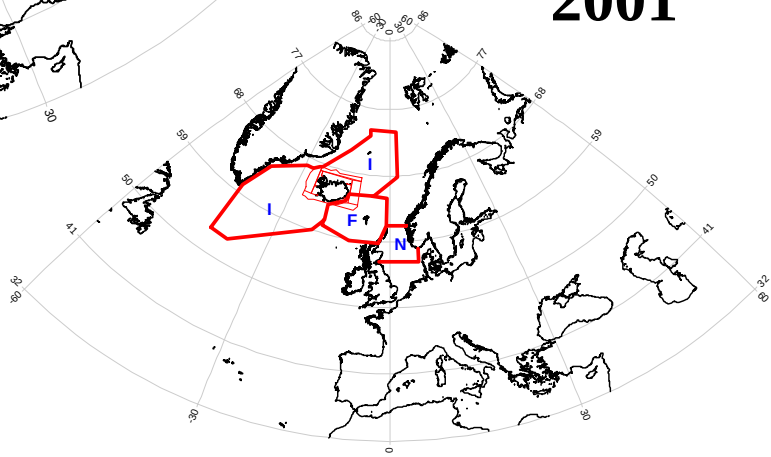




1989

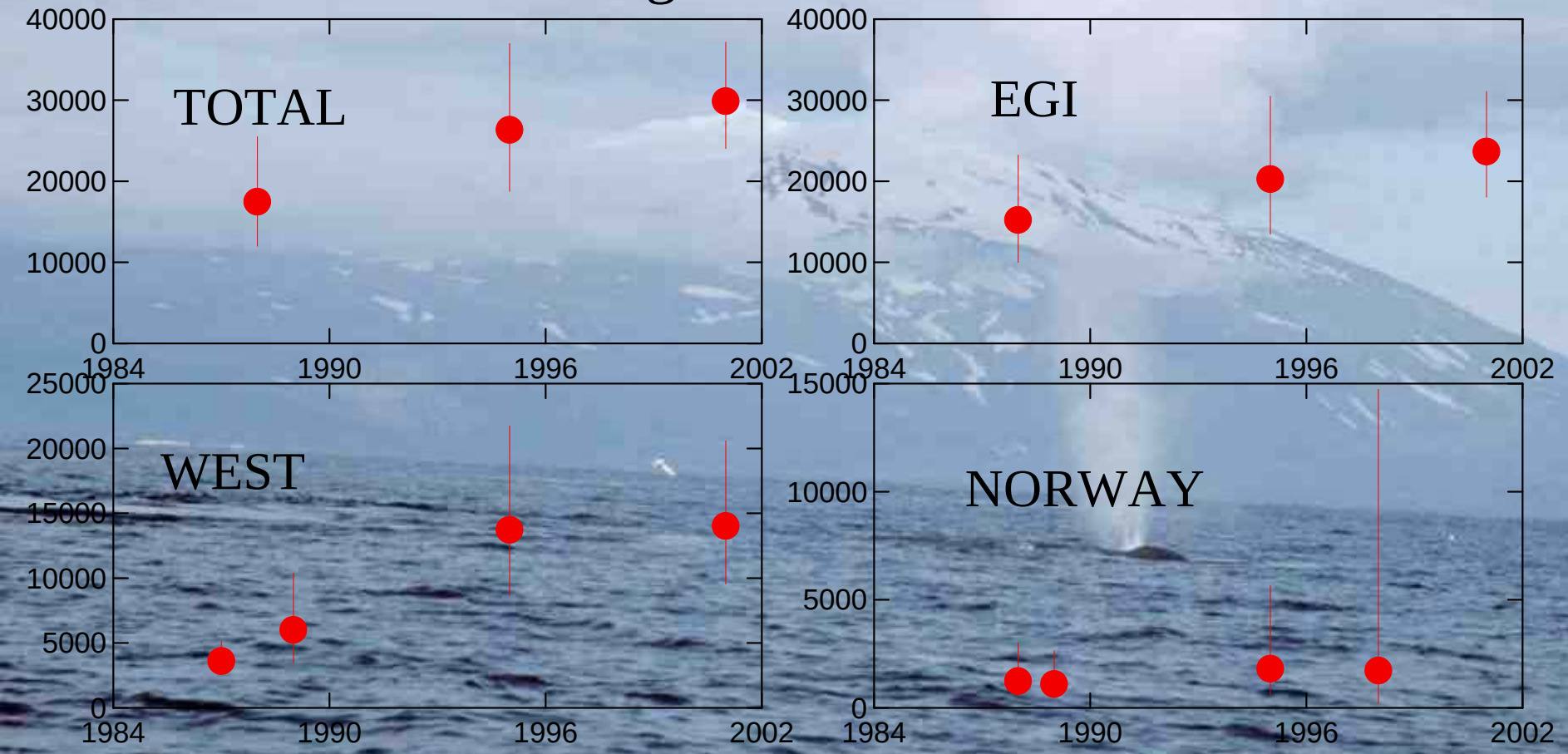


2001



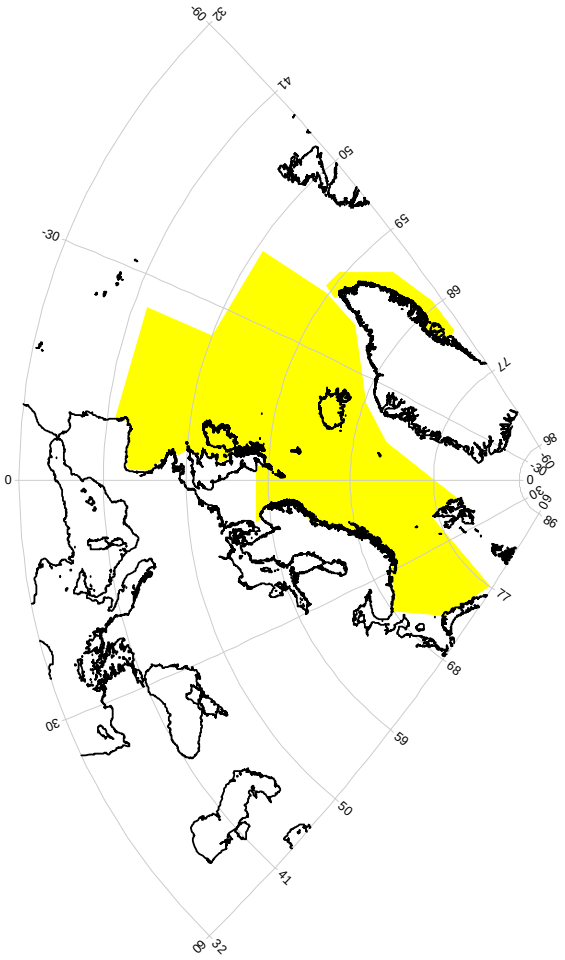
- *NASS shows relatively rapid changes in the distribution and abundance of fin and humpback whales in Central North Atlantic, no trends in minke whales.*
- *Recovery from whaling, but other factors likely involved*

e.g. FIN WHALES



Why an even larger-scale survey?

- ***Stock areas large, boundaries uncertain & NASS does not cover full stock area for all species***
- ***Migration patterns vary from year to year***
- ***Recovering populations: expanding ranges***
- ***Covering areas of the eastern and western Atlantic that have never been covered simultaneously (or never been covered)***
- ***Reducing further uncertainty from possible movements of whales between surveyed and non-surveyed areas.***



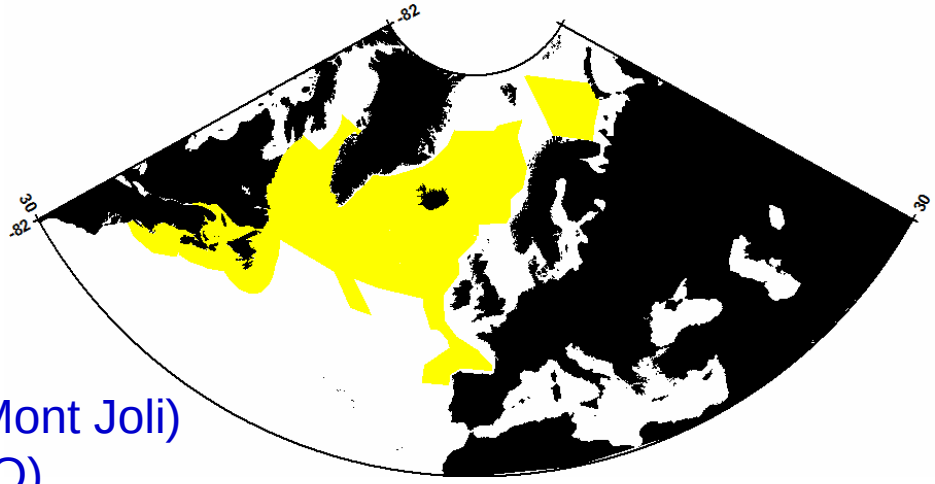
2007 special

- ***As broad a coverage as possible* – *invite other jurisdictions from WA + co-ordinate with planned surveys by non-member countries* *(Dream: a trans-Atlantic survey)***
- ***A truly coordinated survey* - *timing, spatial contiguity, methodology: synoptic estimates***

Also maximizing output

- Extending T-NASS coverage at 'low cost': observers on opportunistic surveys - simultaneous in contiguous areas.
- Acoustic surveying for sperm whale and beaked whales, for which visual survey is not adequate,
- Share of know-how with PINRO Russian scientists, so data from contiguous areas become compatible.

2007 / planning



NAMMCO countries

- **Greenland** (GINR)
- **Iceland** (MRI)
- **Faroe Islands** (MNH)
- **Norway** (IMR, Bergen)

Adjacent areas

- **Canada** (DFO St John's & Mont Joli)
- **Russian Federation** (PINRO)

Opportunistic surveys

- **ICES redfish survey in the Irminger sea (+2 vessels)**
- **MAR-ECO survey on the Atlantic ridge (+1 vessel)**
- **Pelagic Norwegian/Russian survey in the Norwegian sea (+2 vessels)**

Associated surveys

- **European CODA** (SMRU as coordinator)
- **American SNESSA** (NMFS Woods Hole)

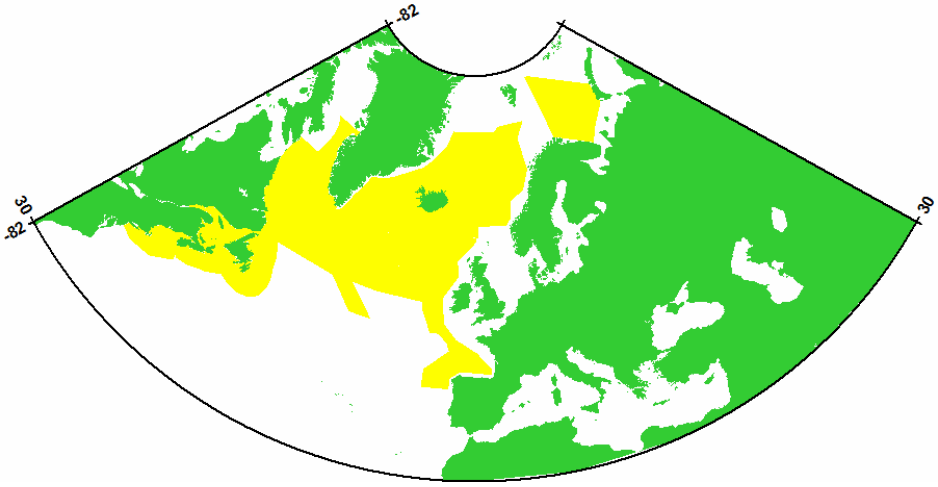
Coordination

- **NAMMCO** (Pike and Acquarone)
- **Desportes** (Faroes)

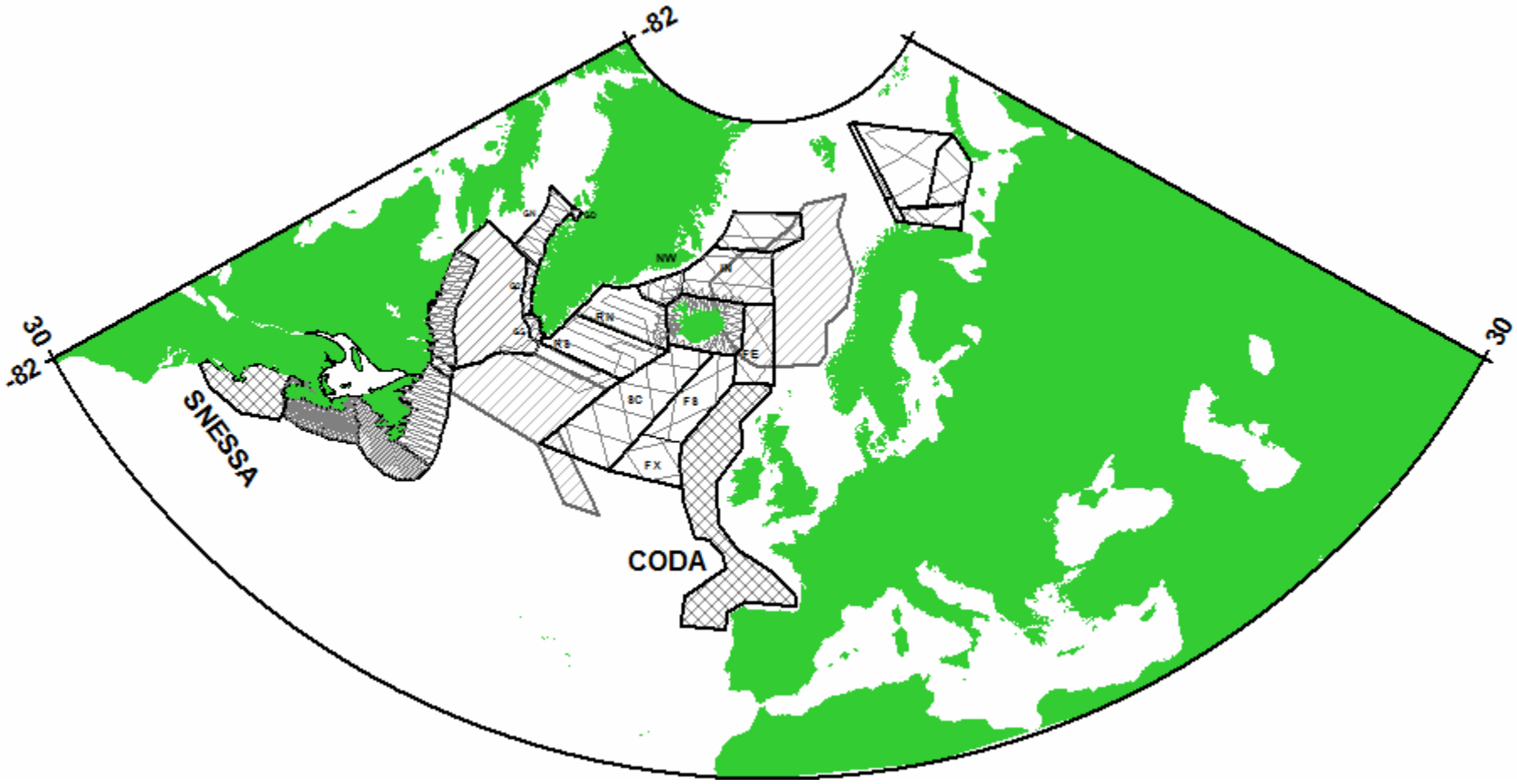
2007 / planning

- **T-NASS Planning Group:**

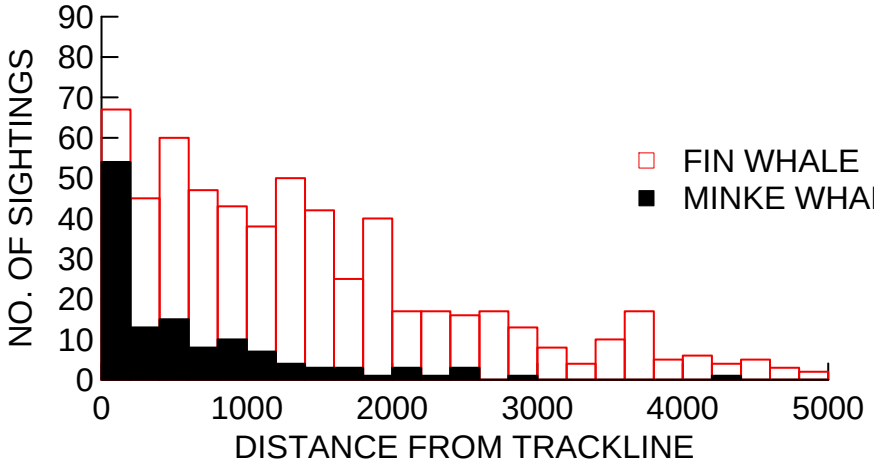
  T-NASS partners + CODA + SNESSA + IWC + ext. Experts
- **T-NASS: supported by IWC**
- **TNASS: sub-project of the IPY umbrella project ESSAR - Ecosystem Studies of Sub-Arctic and Arctic Regions**

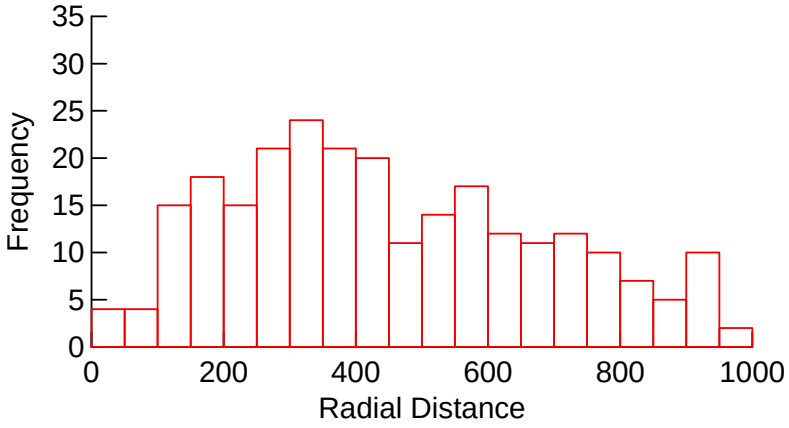


2007 / planning



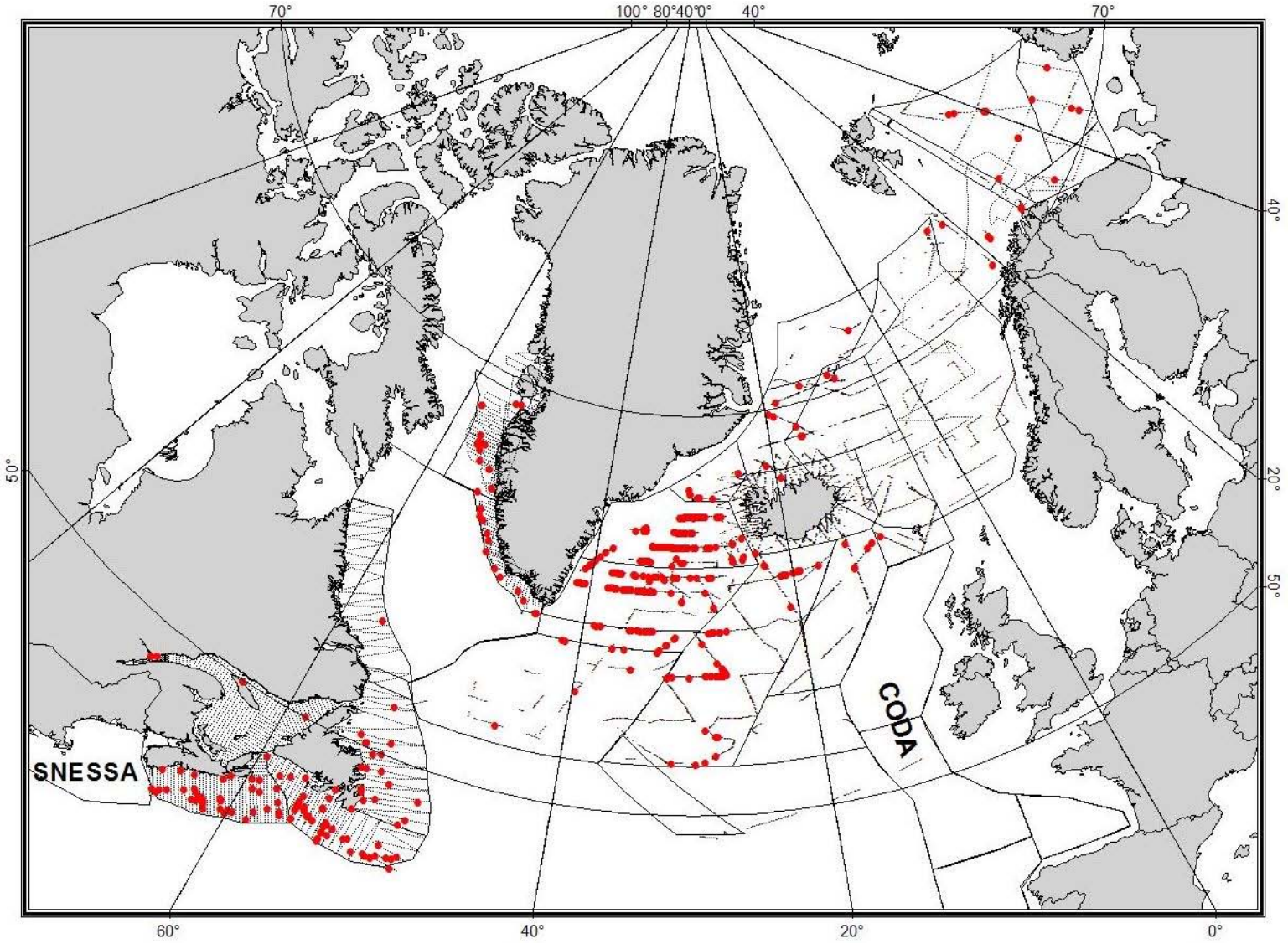
NASS & 2007 / Methods





- ***Standard line transect methods***
- ***Aerial - cue counting for minkes***
- ***Double platform for allowing correction of g(0) (otherwise neg. Bias)***

2007 / results



2007 / results - effort

Survey Effort		Northern North Atlantic	Trackline, nm			Area
			planned	on effort	%	nm^2
MAIN TOTAL		**12**	**69.928**	**57.781**	**83**	**1.474.530**
SHIPBOARD	ICELAND	Irminger sea	3.700	2.027	55	246.363
		North Iceland	3.021	891	29	117.344
		South centre Iceland	2.711	2.500	92	119.116
	FAROES	East-Southeast Iceland	2.761	1.520	55	128.740
	GREENLAND	West Greenland	2.129	814	38	57.771
	NORWAY	Barents Sea east of 28E	4.008	2.230	56	264.939
	TOTAL	**7**	**18.330**	**9.982**	**54**	**934.273**
AERIAL	ICELAND	Iceland coastal shelf	6447	5080	79	85.546
	CANADA	Newfoundland and Labrador	27.205	26.063	96	214.555
		St. Lawrence Gulf	6643	6.643	100	68.523
		Scotian Shelf	4935	4.919	100	52.344
		Canadian offshore	cancelled			0
	GREENLAND	West Greenlandic shelf	6368	5.094	80	119.289
	TOTAL	**5**	**51.598**	**47.799**	**93**	**540.257**

… 2.7 x equateur …

2007 / results - effort

2007	platforms	Area	Miles on effort	Surveyed area* nm^2
T-NASS Main shipboard + aerial	12	Trans northern North Atlantic	57.781	1.474.530
T-NASS Extension	5	Irminger, Norwegian and Barents Seas + mid Atlantic ridge	5.253	
CODA Shipboard	5	European Atlantic offshore waters	5.400	522.429
SNESSA shipboard + aerial	2	Cape Hatteras to Bay of Fundy (coastal + offshore)	2.899	
2007 TOTAL			72.628	1.996.959 + SNESSA & TNASS Extension

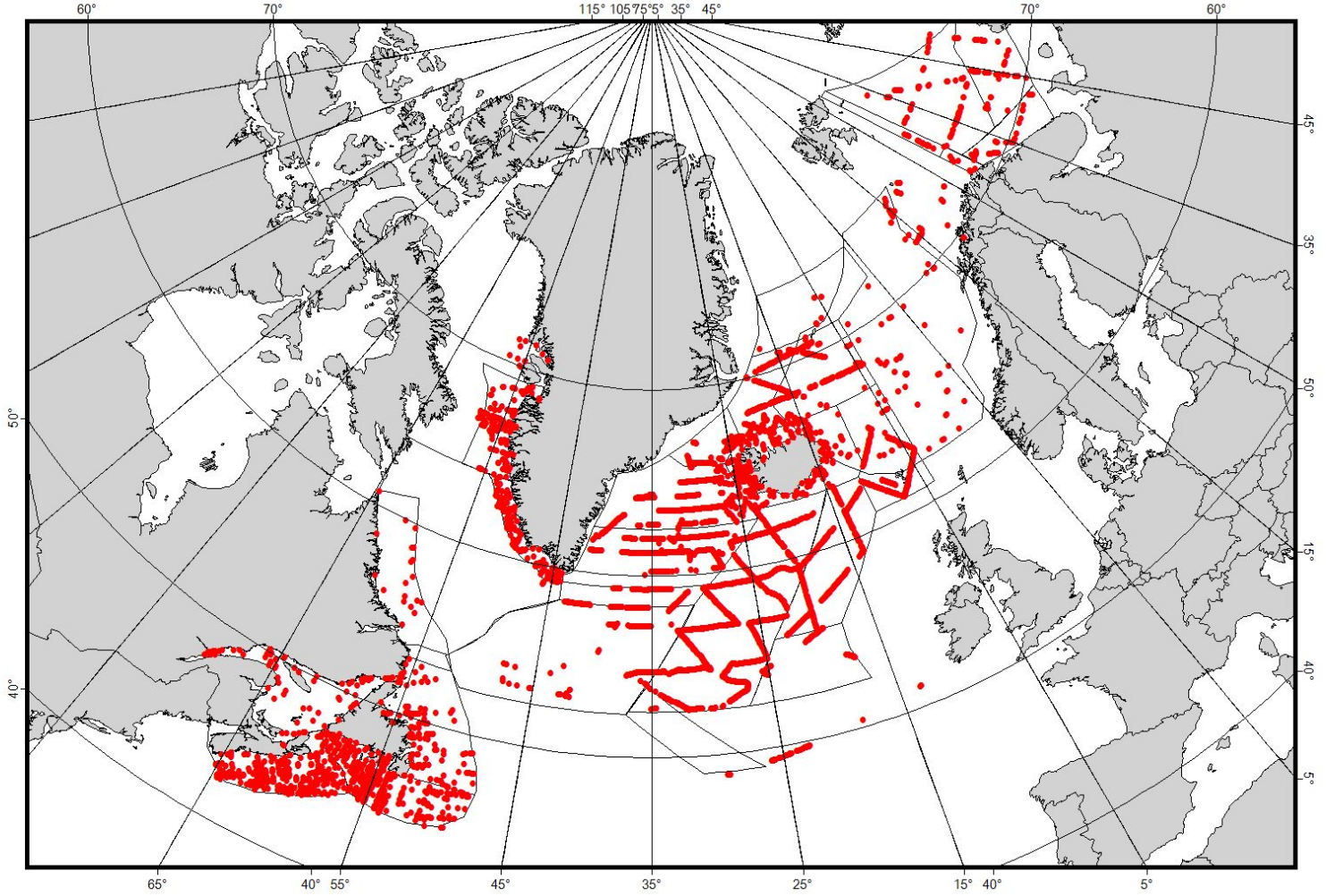
2007 / results - sightings

T-NASS 2007 On Effort Sightings	TOTAL	SHIPBOARD						AERIAL					Extension		
		Irminger Sea	South Centre Iceland	North Iceland	East - Southeast Iceland	West Greenland	Eastern Barents Sea	Iceland coastal	N. Foundland Labrador	St Lawrence Gulf + Cap breton	Scotian Shelf	West Greenland	Mid atlantic Ridge	Irminger Sea	Norwegian & Barents Sea
Blue whale & Bowhead whales	33	1	4	8					4	6	5	1		4	
Fin whale + fin / sei	516	235	69	20	3	2	15	7	73	4	44	25		10	9
Sei whale + sei / humpback	64	13	31		1	1			1		2	5		7	3
Common minke whale + mw/bw	445	5		19	9	36	88	70	53	24	86	27			28
Humpback whale	411	10	1	66	4	8	11	58	144	32	51	21		1	4
Sperm whale & Pigmy spermwhale	117	28	27	4	7			4	11		11 + 1		9		27
Beluga & Narwhal	210								5	203		2			
Northern bottlenose whale	50	2	9	2	13	2		1	10		3		1	4	3
Cuvier's & Sowerby's beaked whales	3		1								1		1		
Unid. beaked whale	28	1	10					3			13		1		
Killer whale	56	5		3	3			11	1		7			2	24
Long-finned pilot whale	166	41	12		13	1		9	10	7	37	15	11	10	
White sided dolphin	157	8	15					3	92	13	15		6	4	1
White beaked dolphin	344	5		25			35	105	68	16	2	58		2	28
Lagenorhynchus sp.	64						64								
Common dolphin	266								28	2	201		35		
Bottlenose, Striped & Risso's dolphins	23				2			1		1	15		4		
Harbour porpoise	289		9		10	3	37	119	36	25	4	46			
Unidentified	690	48	9	26	33	4	4	40	48	125	283	21	16	20	13
22 species	3944	402	197	173	98	57	254	431	584	458	781	221	84	64	140

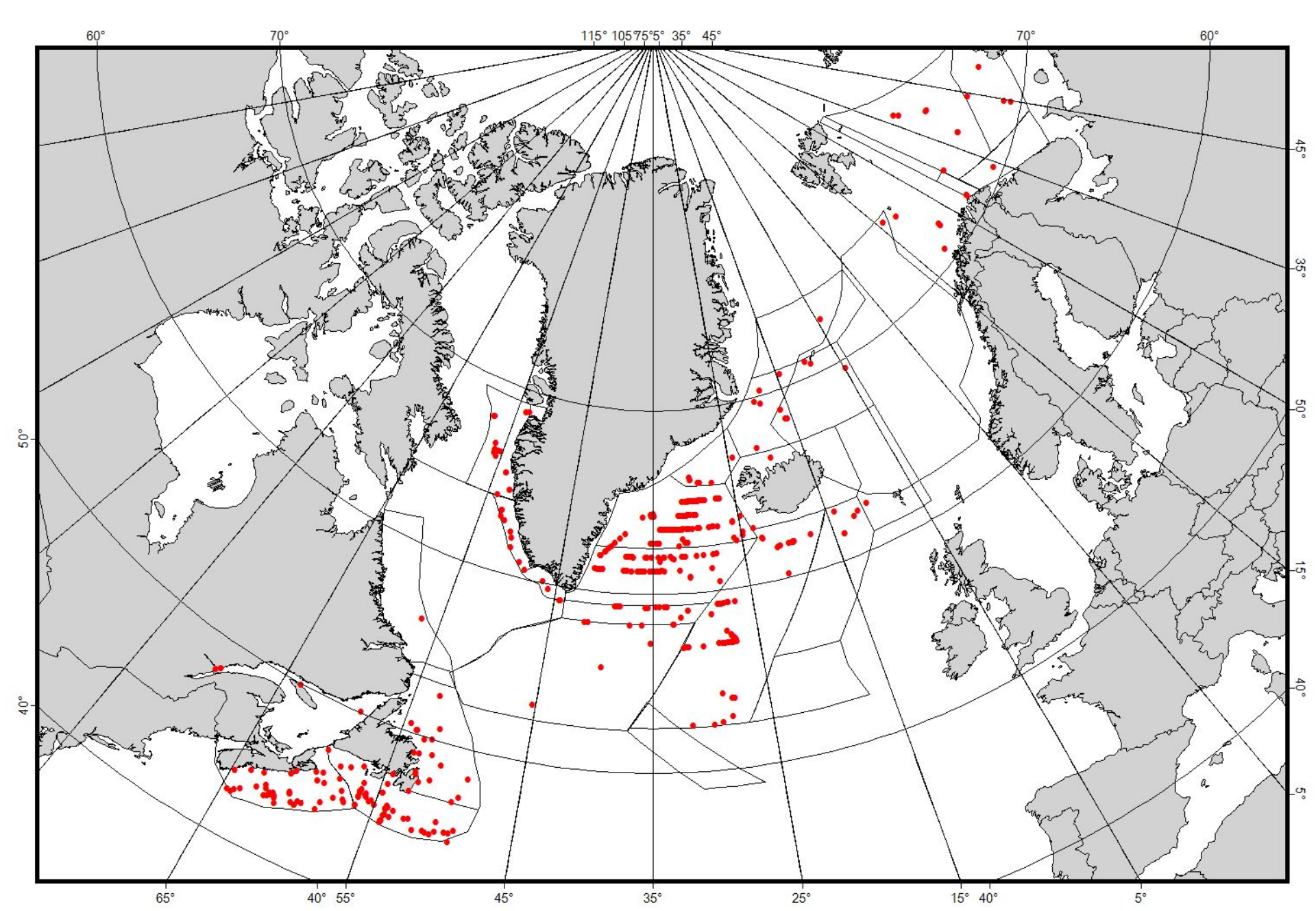
2007 / results - sightings

2007 // On Effort Sightings	T-NASS	CODA	SNESSA
Blue & Bowhead whale	32 + 1	1	
Fin whale + fin / sei	516	356	84
Sei whale + sei / humpback	64	18	6
Common minke whale + mw / bw	445	23	75
Humpback whale	411		251
Right whale			44
Sperm & Pigmy sperm whale	128 + 1	65	8
Beluga & Narwhal	208 + 2		
Northern bottlenose whale	50	3	1
Sowerby's beaked whale	2	7	1
Cuvier's beaked whale	1	15	
Unid. beaked whale	28		2
Killer & False killer whale	56	3 + 1	
Long-finned pilot whale	166	88	20
long/short finned p.w.		4	2
White sided dolphin	157	20	36
White beaked dolphin	344		1
Lagenorhynchus sp.	64		
Bottlenose dolphin	11	39	15
Common dolphin	266	149	64
Striped dolphin	5	54	1
Common/striped		74	
Risso's dolphin	7	3	31
Harbour porpoise	289	3	571
All unidentified	690	171	271
TOTAL	3944	1097	1484

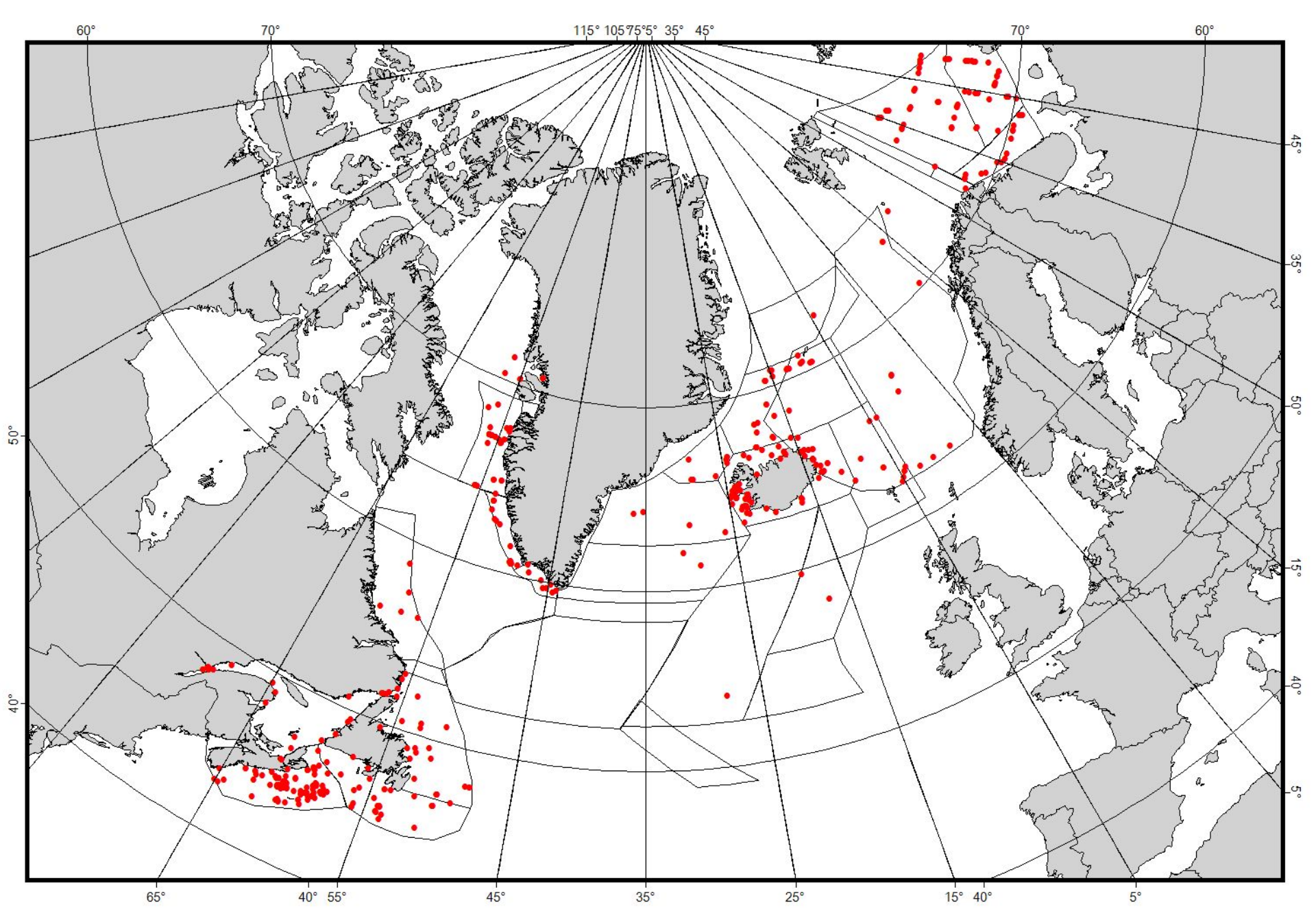
2007 / results - distribution



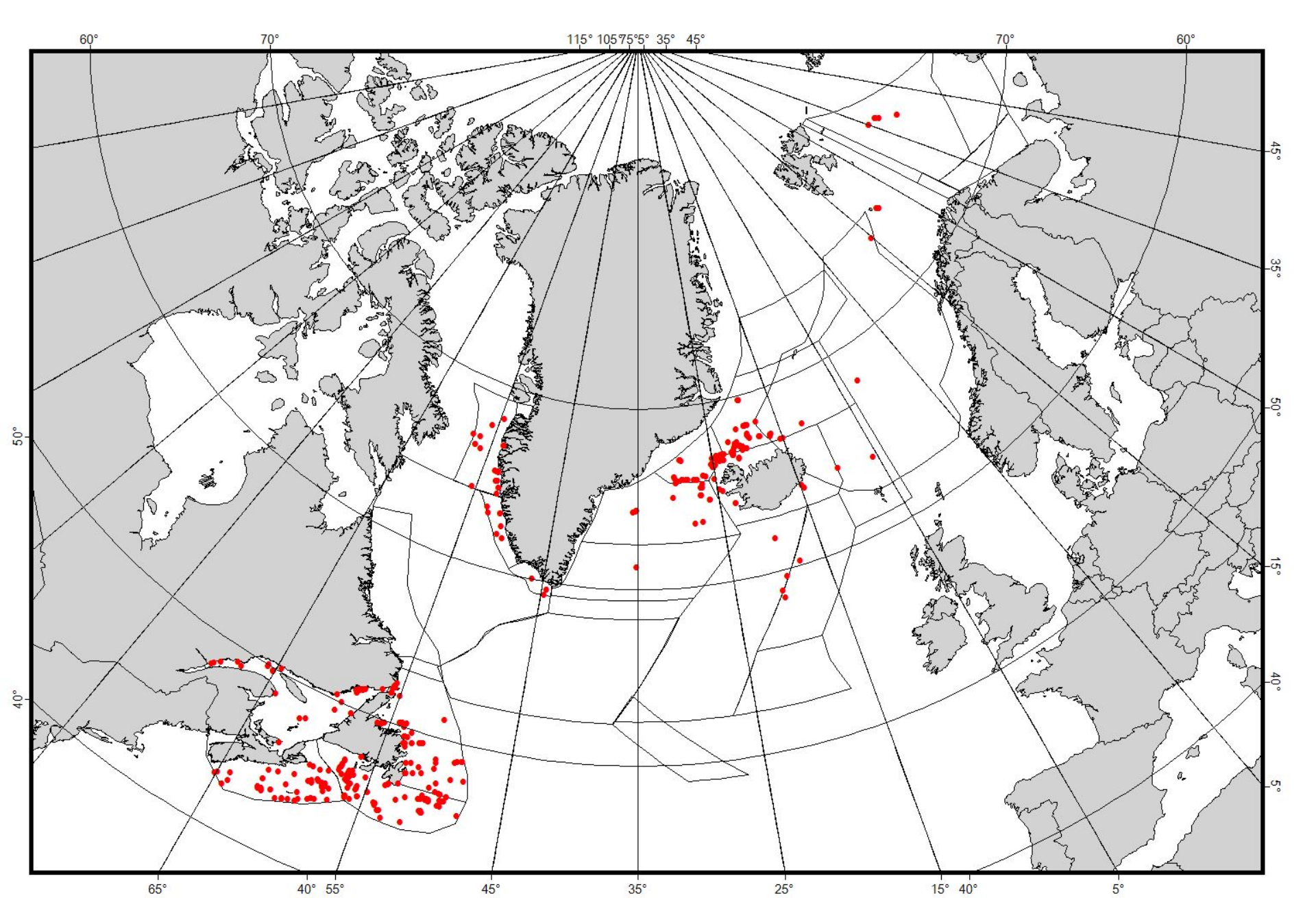
T-NASS all



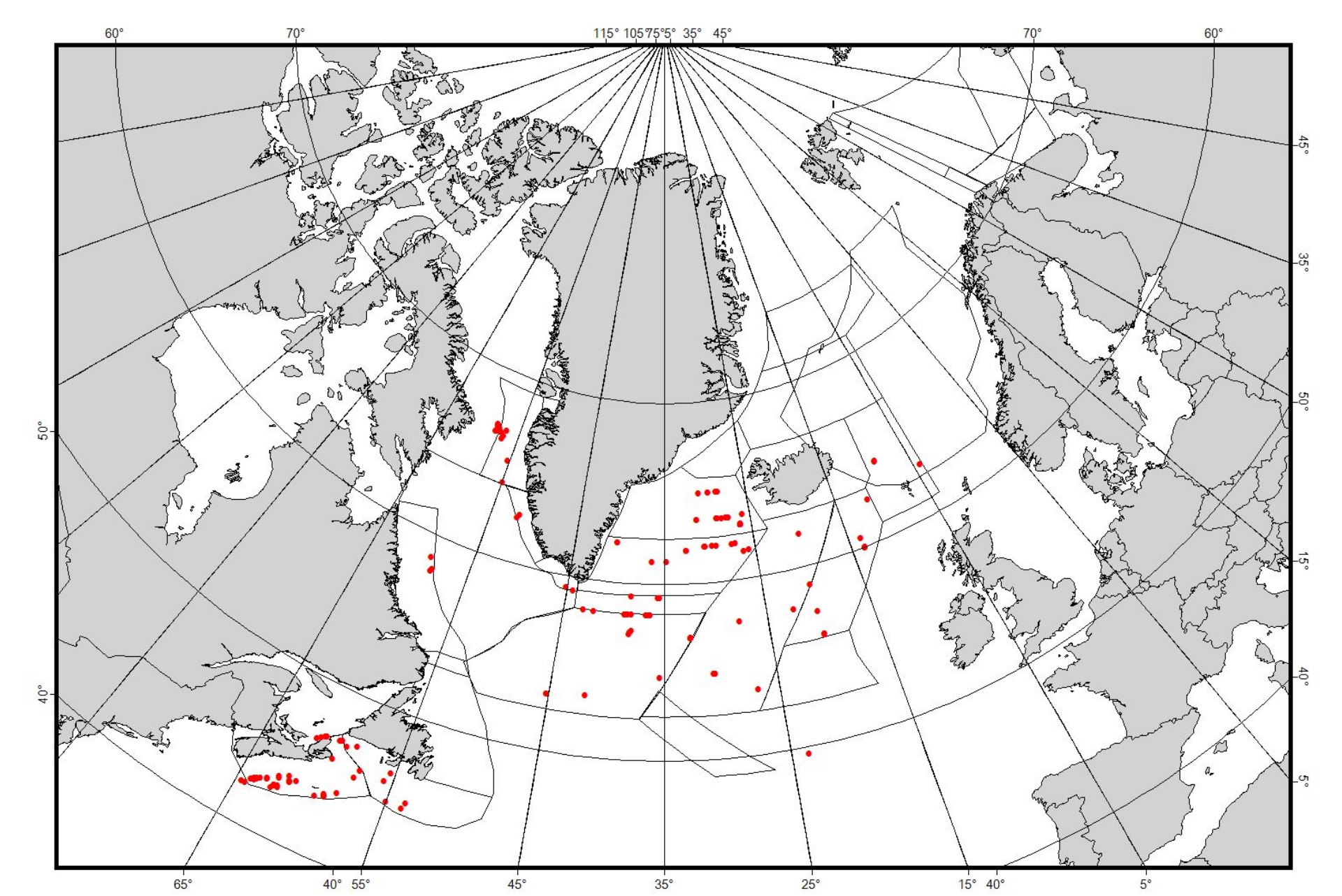
T-NASS fin whale



T-NASS minke whale

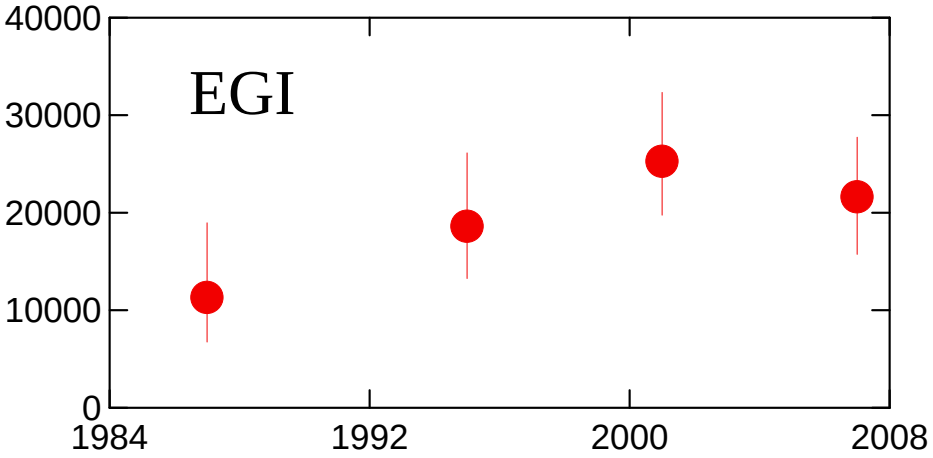


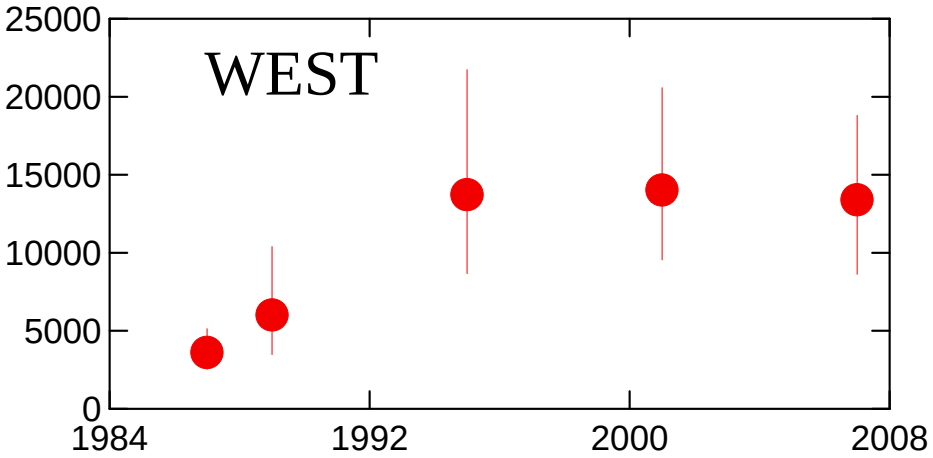
T-NASS humpback whale



T-NASS pilot whale

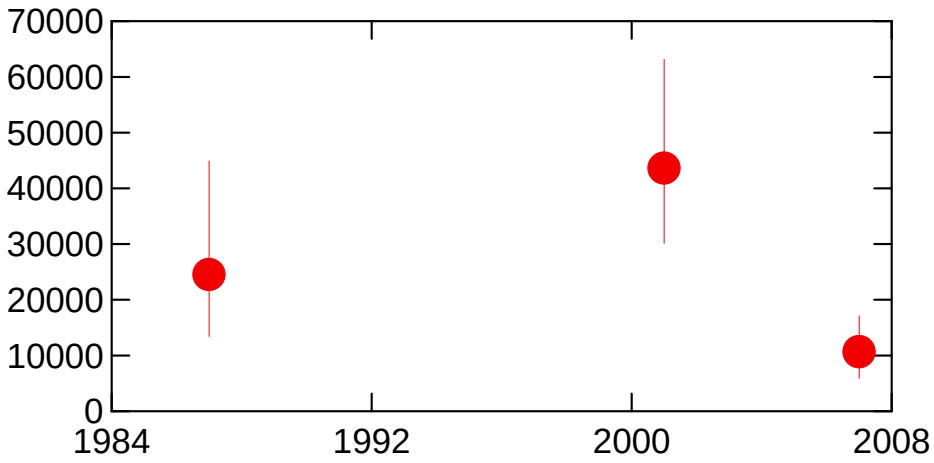
1987 - 2007 / Trends





Fin whale – Central atlantic

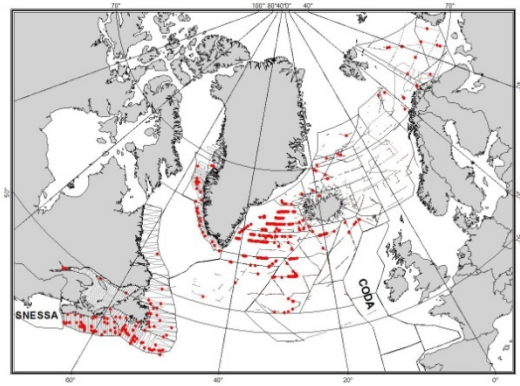
1987 - 2007 / Trends



Minke whale – Coastal Iceland

(a limited part of the range)

T-NASS / conclusion



SNESSA + TNASS + CODA

First complete synoptic coverage of the northern North Atlantic.

- The largest areas ever covered simultaneously
- Covering areas of the eastern and western Atlantic that have never been covered simultaneously in previous surveys.
- Reduces uncertainty from possible movements of whales between surveyed and non-surveyed areas.
- Better understanding of the dynamics of cetacean populations in the entire North Atlantic.

An obligatory reference

T-NASS / going further

- Importance of synoptic surveys in interpreting distribution shifts.
- Take into account changes in distribution in planning future surveys: including user knowledge
- Understanding dynamic changes in spatial distribution due to ecosystem changes and functional responses: importance of considering a 'whole' ecosystem
- T-NASS results in the light of the oceanographic data from the IPY ESSAR cluster: a unique opportunity for understanding cetacean dynamics in the North Atlantic, and especially the Arctic region.

Thanks to co-authors

DFO, Canada:	J. Lawson & J.F. Gosselin
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