

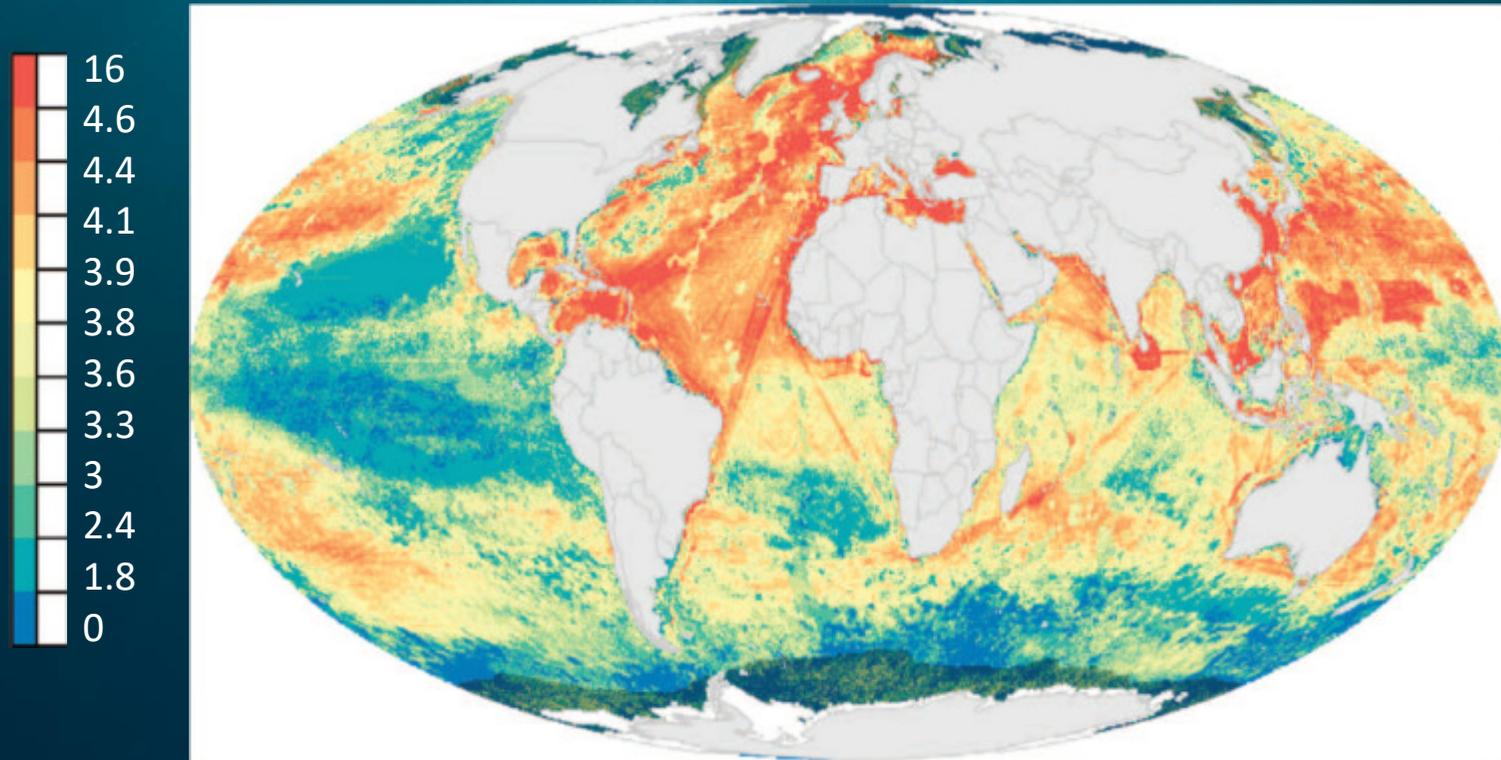
What's the catch with lumpsuckers?

A North Atlantic review of seabird bycatch in lump sucker gillnet fisheries

Signe Christensen-Dalsgaard, Tycho Anker-Nilssen, Alexander Bond, Kim Magnus Bærum, Rory Crawford, Erpur Snær Hansen, Martine Kadin, Lotte Kindt-Larsen, Mark Mallory, Flemming Ravn Merkel, Aevan Petersen, Jennifer Provencher, David Schonberg-Alm & Guðjón Már Sigurðsson



Extensive pressure on marine environment

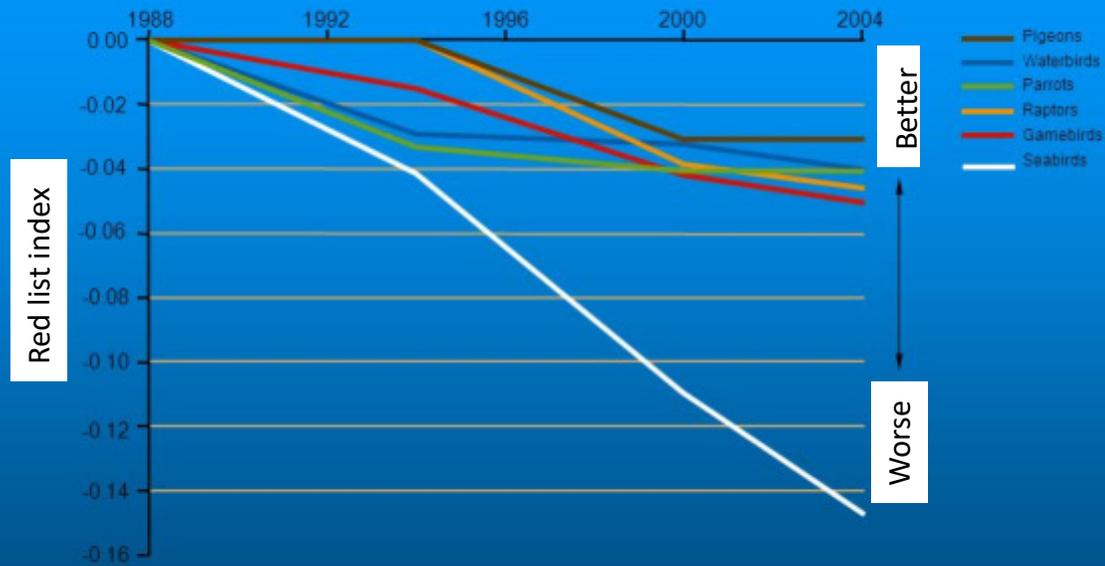


Cumulative human impact to marine ecosystems as of 2013 (Halpern et al. 2015)

Seabirds under pressure

Source: Birdlife International

Red List Indices for selected species-groups



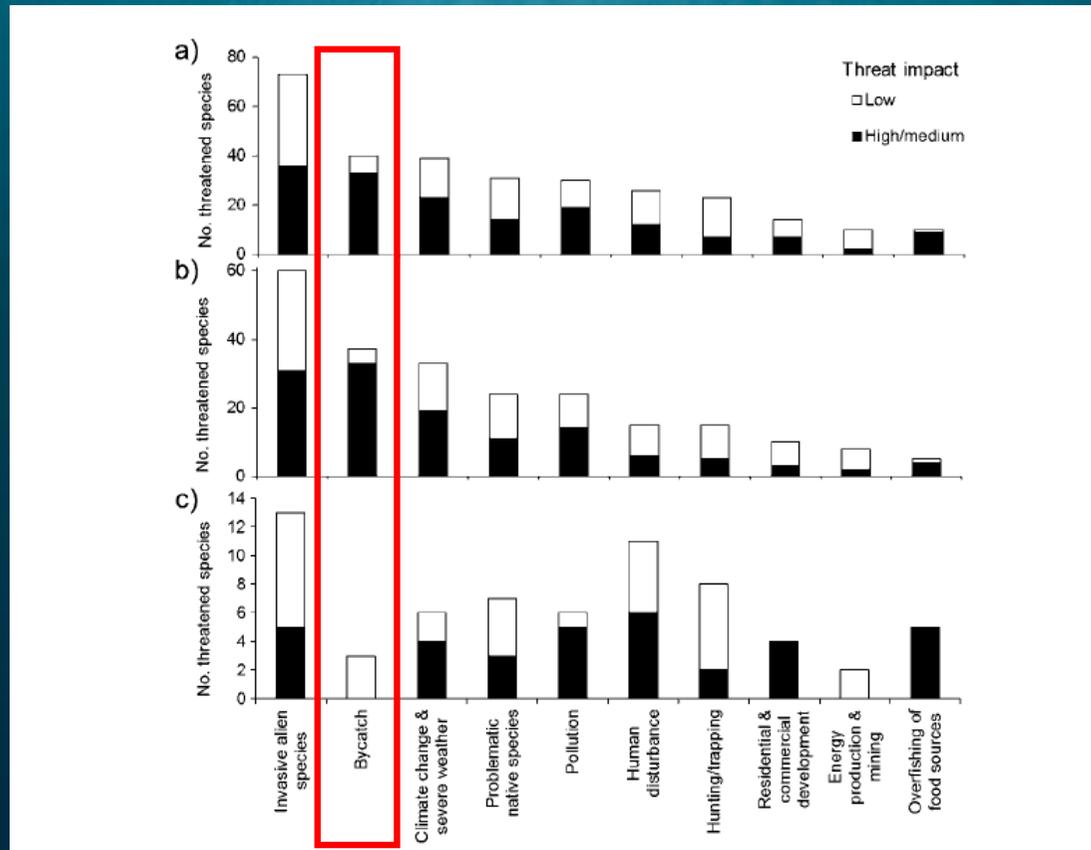
STATE OF THE WORLD'S BIRDS 2004

Indicators for our changing world

Extensive pressure on marine environment



Extensive pressure on marine environment



Threats to threatened (a) seabirds (n = 346 species); (b) pelagic seabirds (n = 197 species); (c) coastal seabirds (n = 146 species) (from Croxall et al. 2012)



Incidental bycatch of seabirds

- **Large numbers of seabirds killed worldwide:**
 - Longline fisheries take an estimated 160 000 seabirds annually (Anderson et al. 2011)
 - Gillnet fisheries take an estimated 400 000 seabirds annually (Žydelis et al. 2013)
- **Population decline in many seabird species associated with incidental bycatch** (Croxall et al. 2012)
- **Much research has focused on bycatch in longline fisheries**
- **Significant knowledge gap on the effects of small-scale, local fisheries** (Pott & Wiedenfeld 2017)

Fishing for lumpsuckers

- **Small-scale gillnet fishery using small boats**
- **Targets primarily females for the roe**
- **Fishing takes place in inshore waters**
- **Seasonal fishery (March – August)**

Fishery MSC-certified in

- **Greenland (2015)**
- **Iceland (2014, suspended in 2018)**
- **Norway (2017)**



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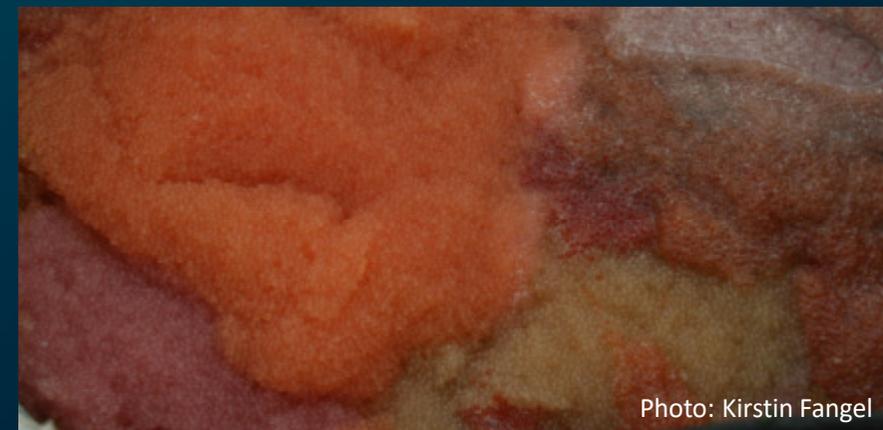
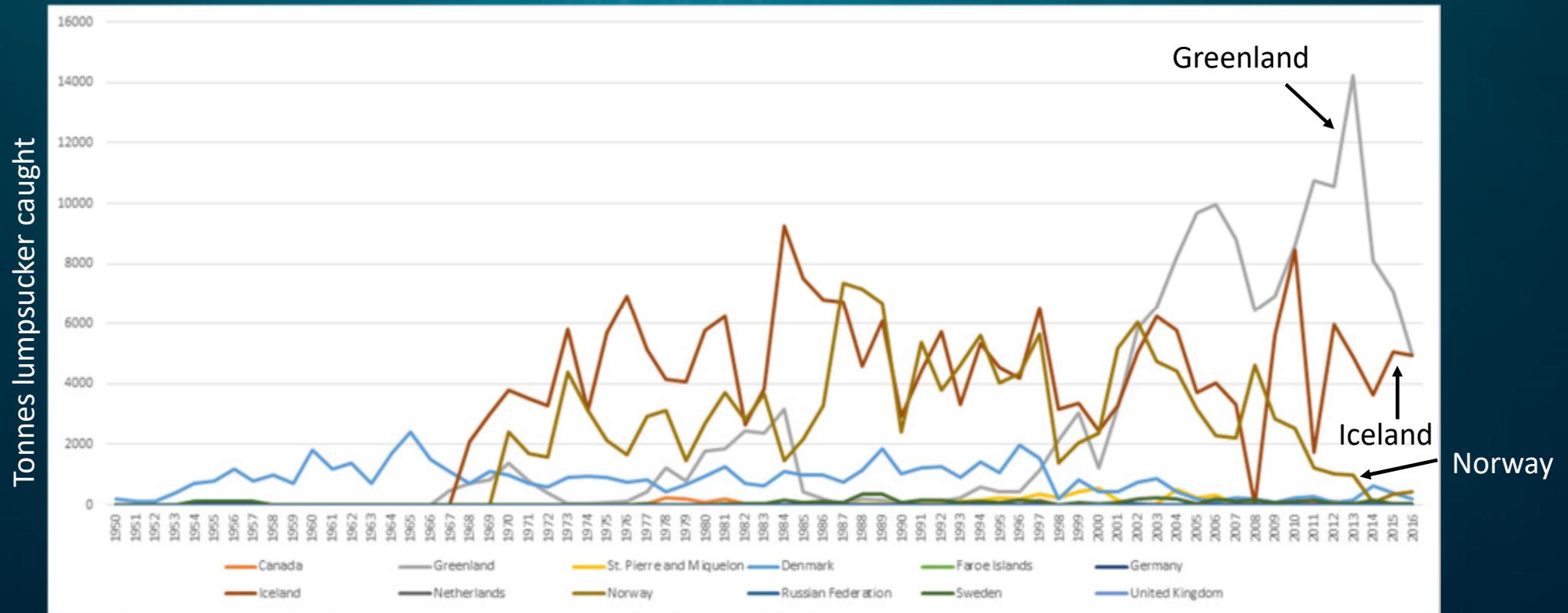


Photo: Kirstin Fangel

Fishing for lumpsuckers



Fishing for lumpsuckers



Bycatch in the lumpsucker fishery

Seabird bycatch has been identified as a considerable issue in this fishery in:

- Iceland (Petersen 2002, Pálsson et al., 2015)
- Greenland (Merkel, 2011)
- Norway (Fangel et al., 2015)

Magnitude of bycatch apparently related to time and location of fishery

CAFF Circumpolar Seabird Expert Group, ACTION ITEM (2014):

“Pursue opportunities for an assessment of the lumpsucker fishery in the Circumpolar Arctic”



Photo: Kirstin Fangel

Review on bycatch in lumpsucker fishery

Workshop financed by the Nordic Council of Ministers

- Participants from: **Canada, Iceland, UK & Norway**
- In contact with: **Denmark, Faroes, Greenland & Sweden**

Aims identified:

- Review existing knowledge
- Quantify overall bycatch
- Assess impacts on the most-hit species
- Identify priorities and mitigation measures



Photo: Kirstin Fangel

Methods

➤ Bycatch rates based on existing information

- Onboard registration of bycatch (Iceland, Norway)
- Self-reporting of bycatch (Greenland, Norway)
- Photo registration of bycatch (Denmark)
- Literature review (Canada)

➤ Estimates of bycatch calculated

- Estimates per trip calculated (Denmark, Iceland, Norway)
- Raised values calculated for whole fishery (Iceland, Norway)
- Total bycatch estimated (Greenland)



Photo: Kirstin Fangel

Results – extent of bycatch

	E Canada	Greenland	Iceland	Denmark	Norway
Red-throated diver		10 ⁰ -10 ¹	10 ⁰ -10 ¹		10 ⁰ -10 ¹
Great Northern diver	10 ⁰ -10 ¹		10 ⁰ -10 ¹		
Northern gannet			10 ⁰ -10 ¹		
Great cormorant			10 ² -10 ³		10 ¹ -10 ²
European shag			10 ² -10 ³		10 ¹ -10 ²
Long-tailed duck		10 ¹	10 ⁰ -10 ¹		10 ⁰
Common eider	10 ⁰ -10 ¹	10 ³	10 ¹ -10 ²	10 ¹ -10 ² (?)	10 ¹ -10 ²
King eider		10 ²			
Velvet scoter				10 ¹ -10 ² (?)	
Black-legged kittiwake			10 ⁰ -10 ¹		
Common tern	10 ⁰ -10 ¹				
Razorbill			10 ⁰ -10 ¹		10 ⁰ -10 ¹
Common guillemot			10 ² -10 ³	10 ¹ -10 ² (?)	
Brünnich's guillemot			10 ¹		
Black guillemot		10 ¹	10 ² -10 ³		10 ¹ -10 ²
Atlantic puffin			10 ⁰ -10 ¹		10 ⁰ -10 ¹

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Diving seabird species

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Great cormorant



European shag



Common eider



Common guillemot



Black guillemot



But what does this mean?

Species	Area	Breeding pairs (thousands)	Estimated bycatch p.a. (95% CI)	Proportion taken % p.a. (min-max)
Black guillemot	Greenland	200	13 (0-20)	0.00 (0-0.01)
	Iceland	10-15	1937 (1069-2863)	7.7 (3.6-14.3)
	Norway	35	178 (60-312)	0.25 (0.1-0.4)
	All Atlantic	363 - 445	2128 (1129-3195)	0.26 (0.1-0.4)
Common eider	Greenland	90	4128 (3789-4541)	2.3 (2.1-2.5)
	Iceland	300	2335 (1162-3669)	0.39 (0.2-0.6)
	Norway	87	0 (0-0)	0.00
	All Atlantic	1600 - 1750	6463 (4951-8210)	0.19 (0.1-0.3)
Great cormorant	Greenland	>5	5 (0-10)	0.05 (0-0.1)
	Iceland	4.6	306 (162-484)	3.3 (1.8-5.3)
	Norway	19	60 (21-99)	0.16 (0.1-0.3)
	All Atlantic	51	371 (183-593)	0.36 (0.2-0.6)
European shag	Iceland	3.8	313 (166-494)	4.1 (2.2-6.5)
	Norway	28	88 (31-146)	0.15 (0.1-0.3)
	All Atlantic	73-74	401 (197-640)	0.27 (0.1-0.4)

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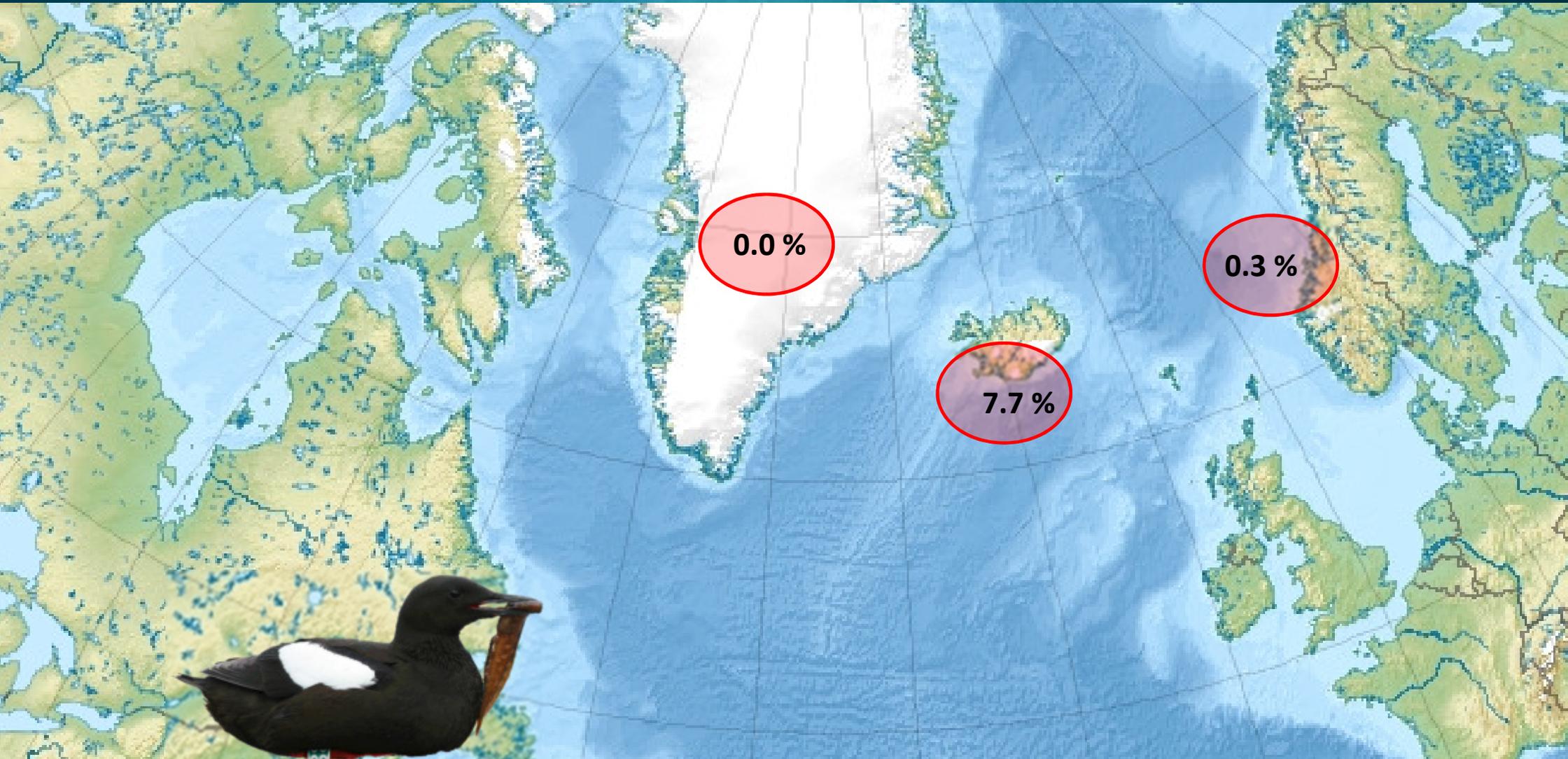
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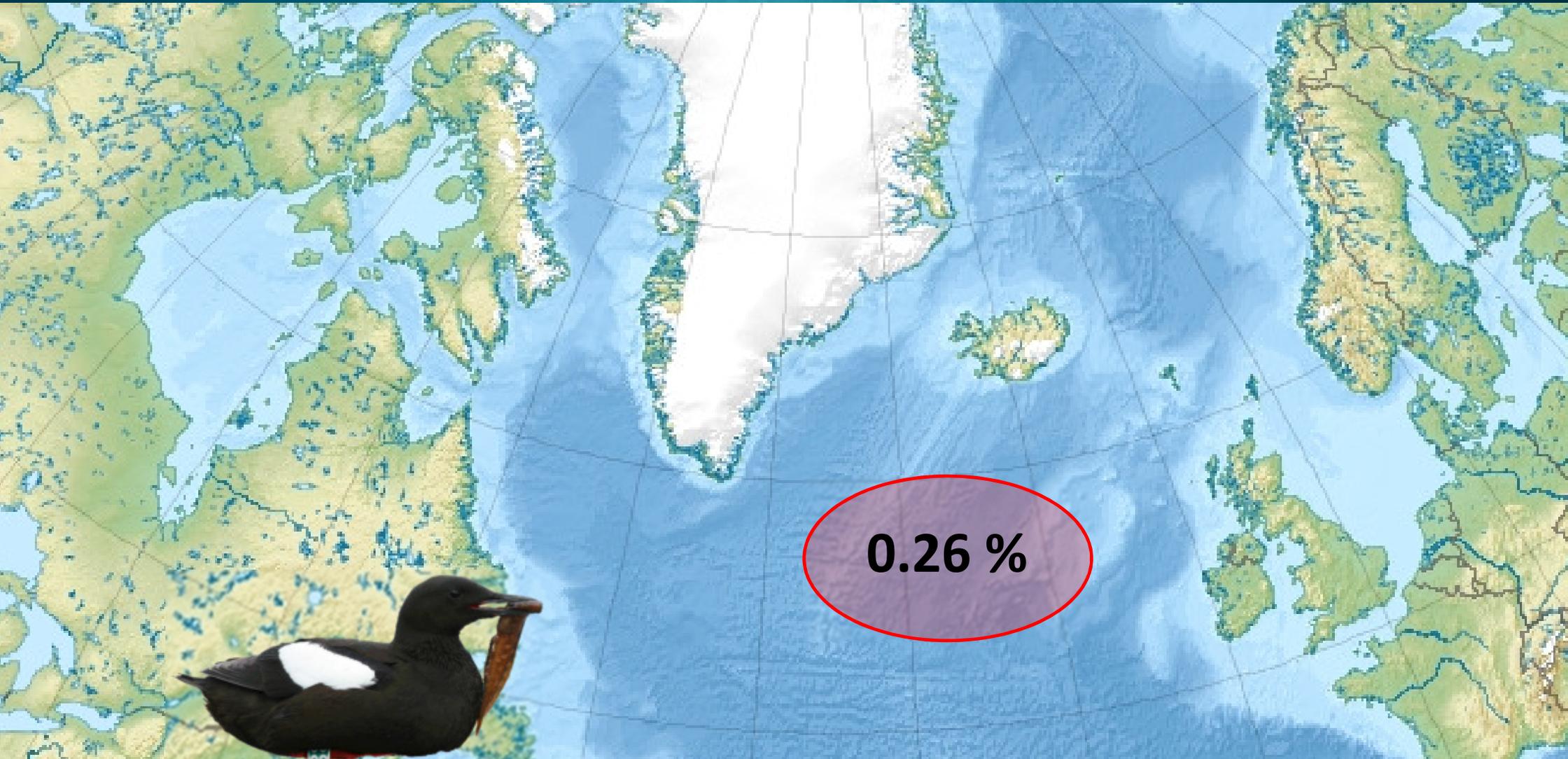
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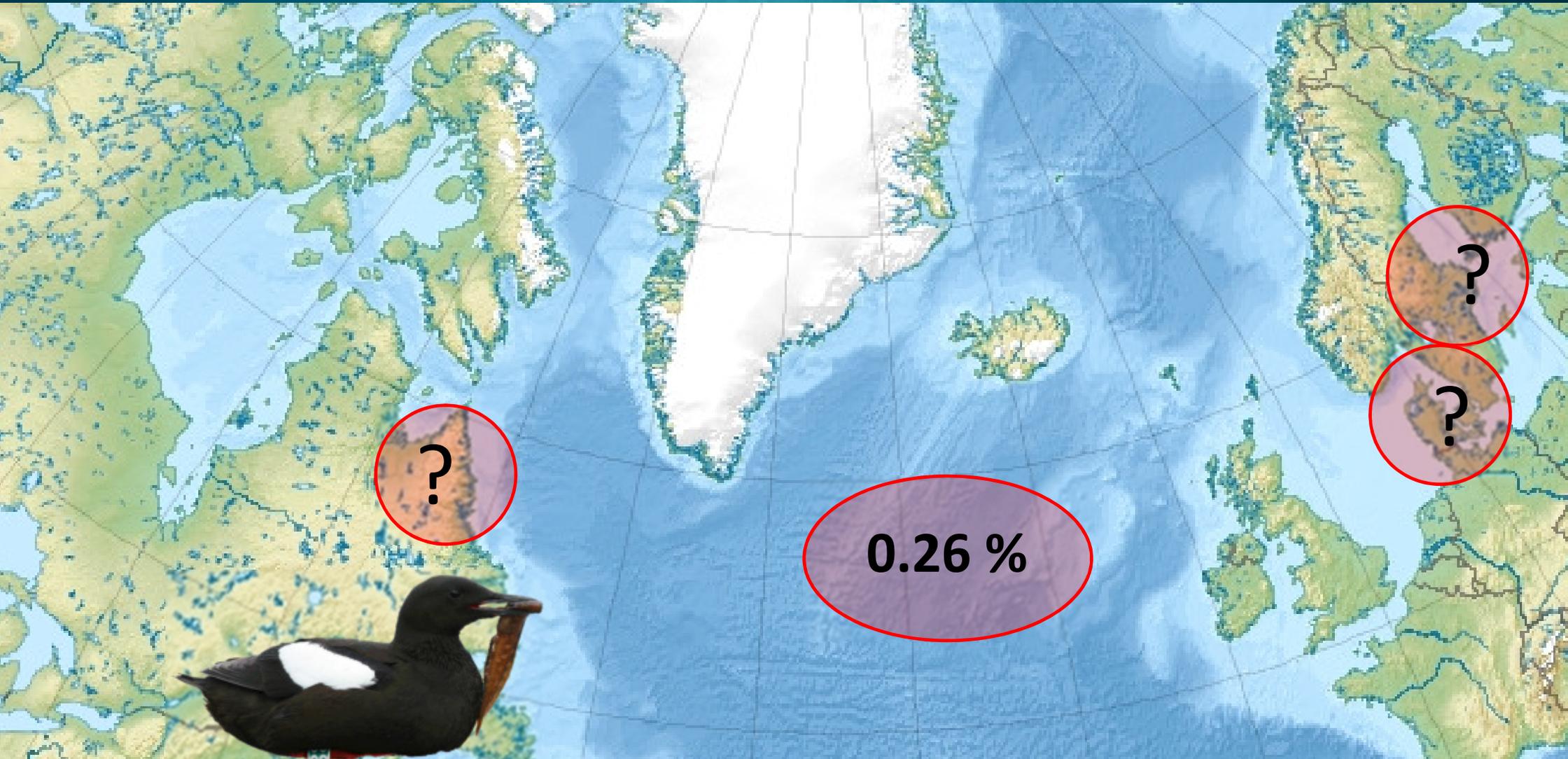
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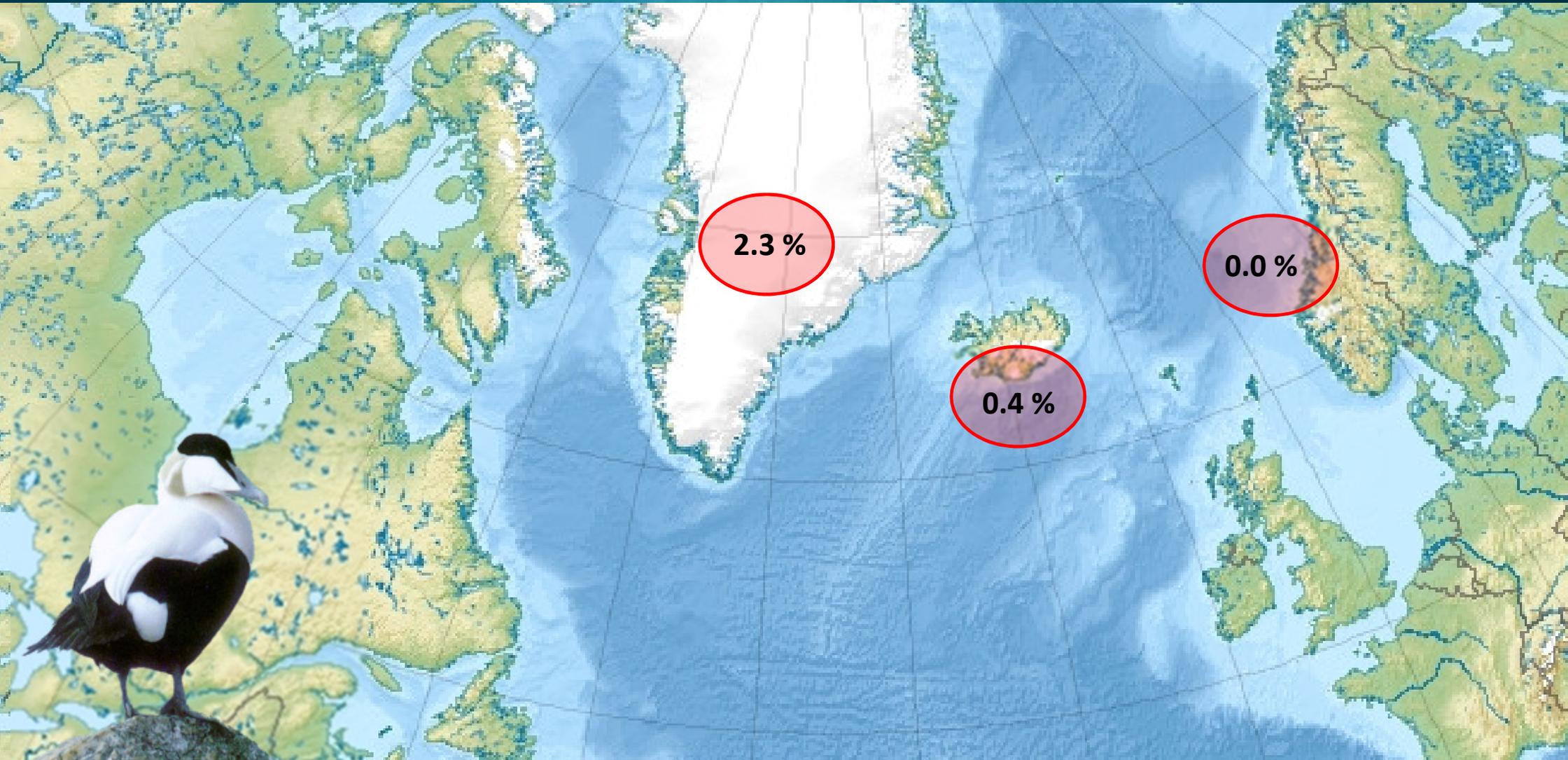
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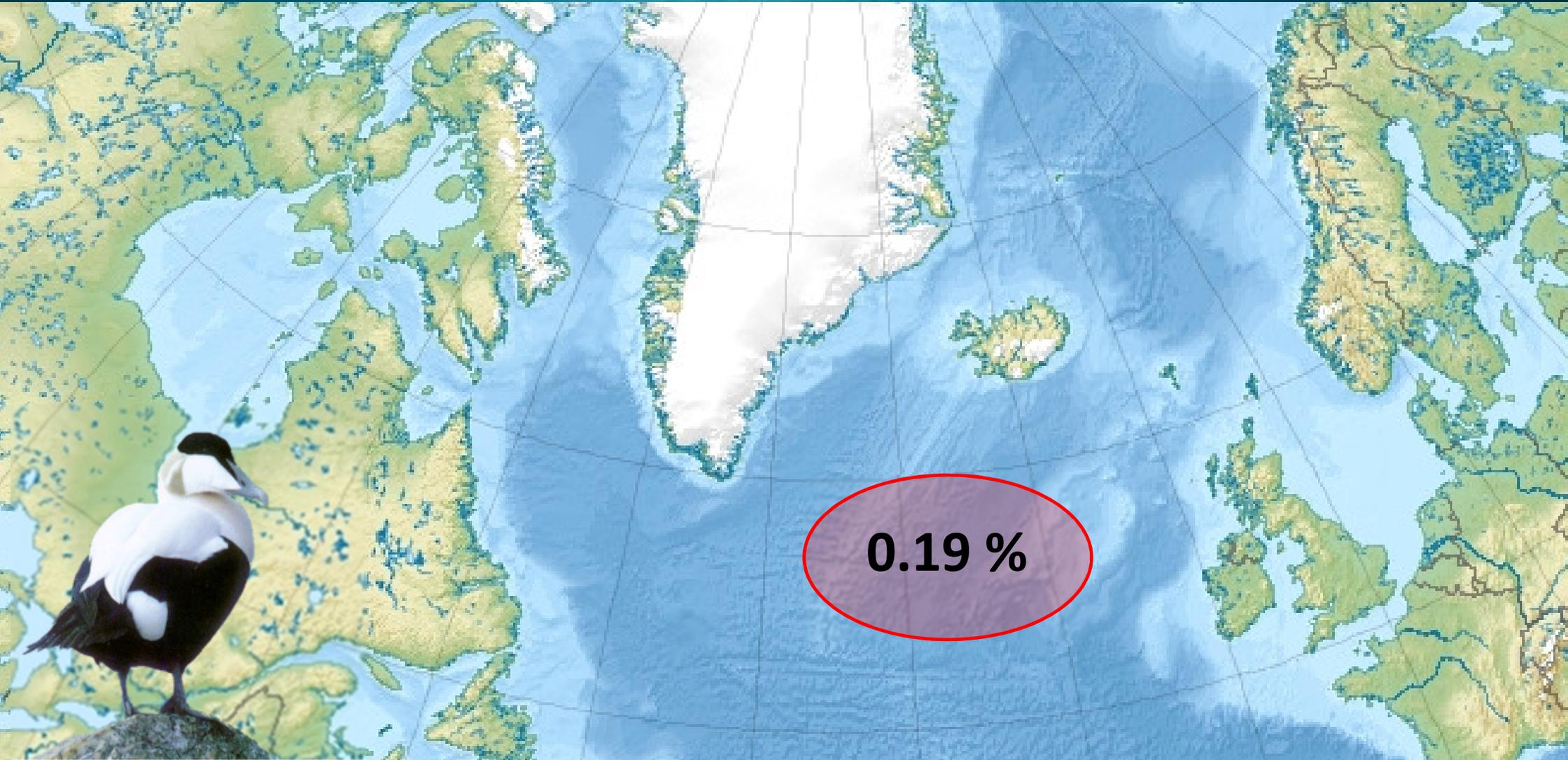
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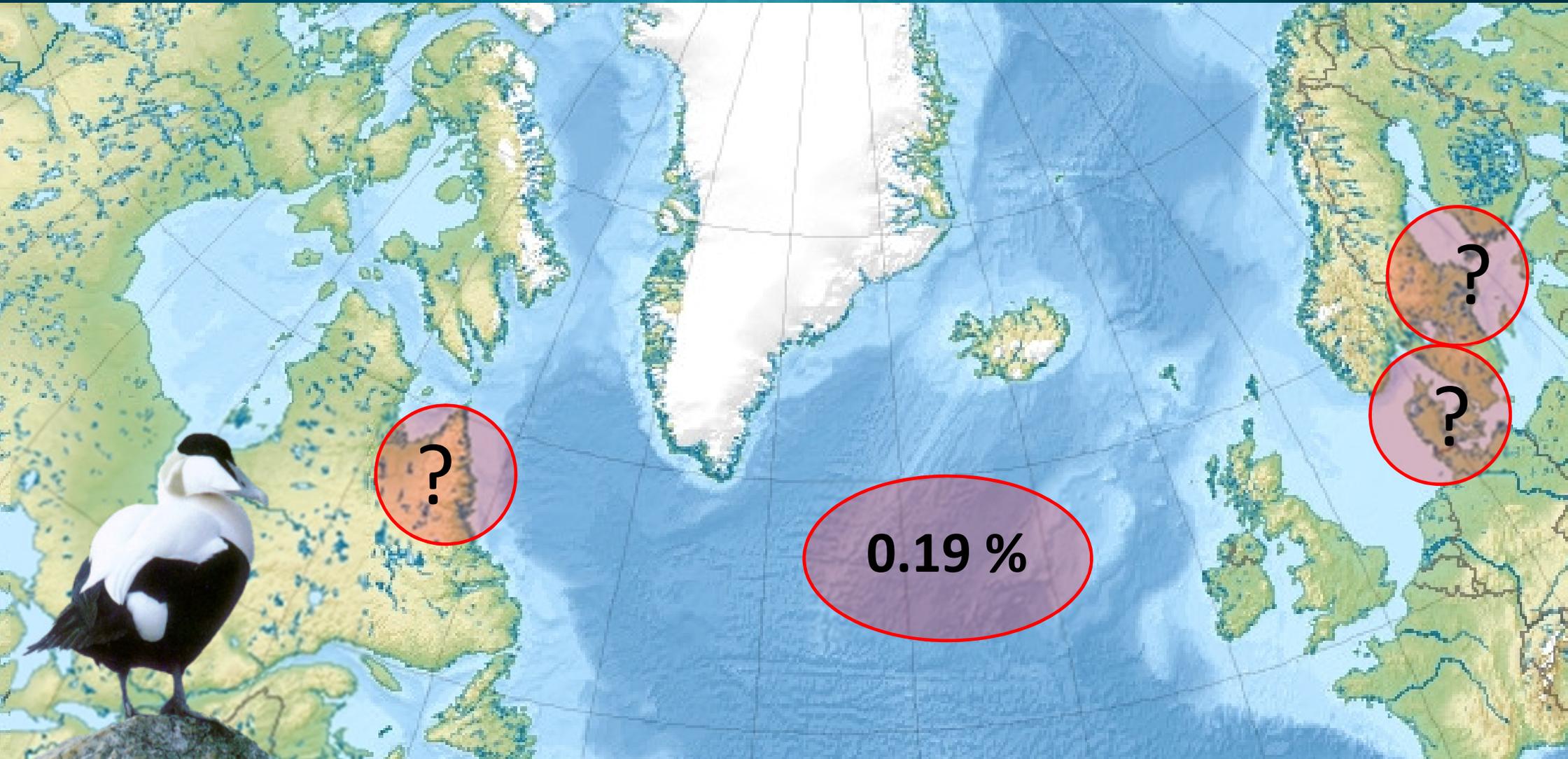
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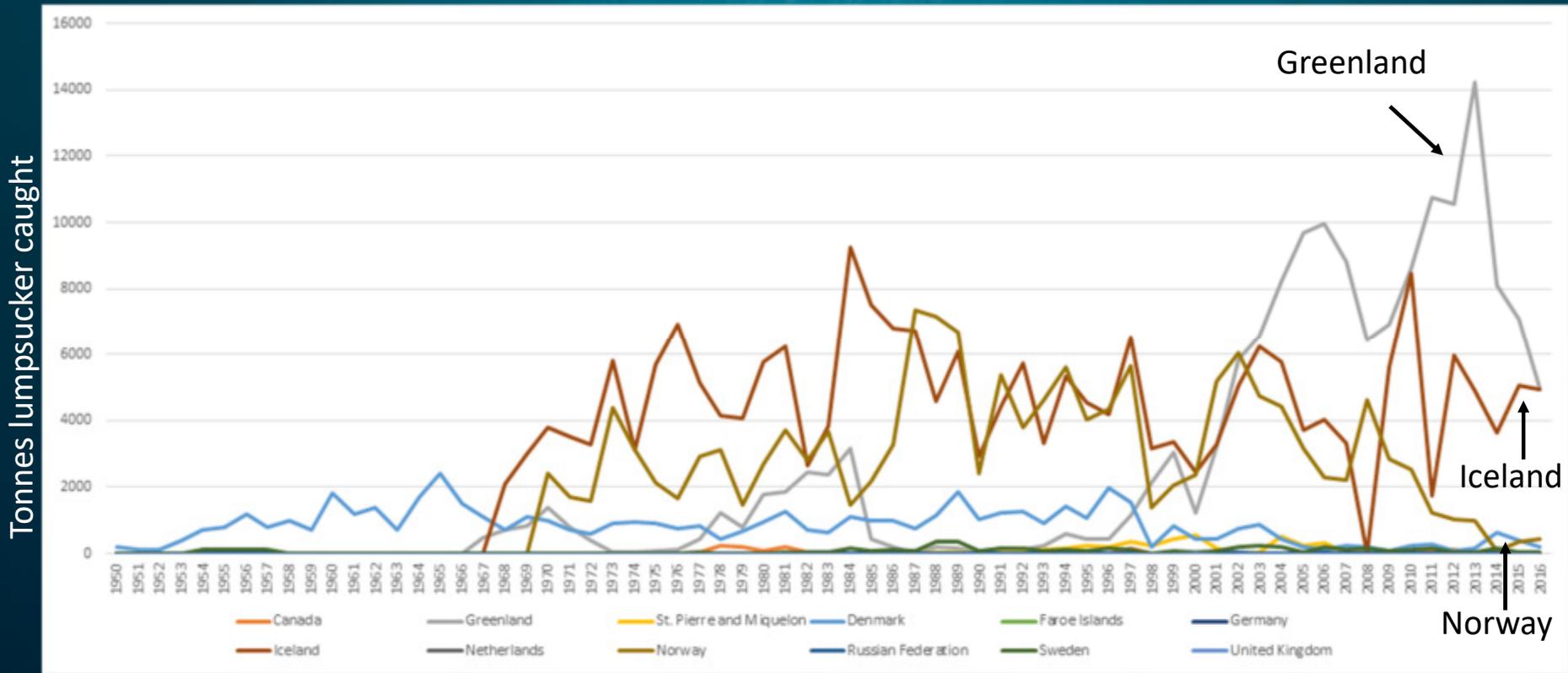
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But what does this mean?



Fishing into the future



Conclusions

- **First pan-Atlantic study on bycatch of seabirds in a specific gillnet fishery**
- **Bycatch of seabirds in lumpsucker fishery**
 - **Primarily coastal diving seabird affected**
 - **Locally relatively high number of birds**
- **Important to consider total bycatch in the small-scale local fisheries**

A photograph of a fishing boat on the water, with mountains in the background. The boat is in the lower left corner, and the mountains are in the upper left corner. The sky is overcast.

Lessons learned and future perspectives

- **Important to assess bycatch in fisheries across national borders**
- **The Lump sucker fishery is just one of many fisheries – considerations across all fisheries**
- **MSC-certification process**
 - **Improve quality control of MSC-process**
 - **Secure follow-up on specific conditions**

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Lessons learned and future perspectives

- **Challenging to review fishery across countries**
 - **Data sources and knowledge base**
 - **Different scales of contribution**
- **Need for guidelines of best practice in data collection from the fisheries, to be able to quantify the bycatch most effectively**

Thanks for your attention 😊

The study has been funded by:

The Nordic Council of Ministers

The Norwegian Environment Agency

This work is dedicated to the memory of our dear colleague, Kirstin Fangel, who initiated this study