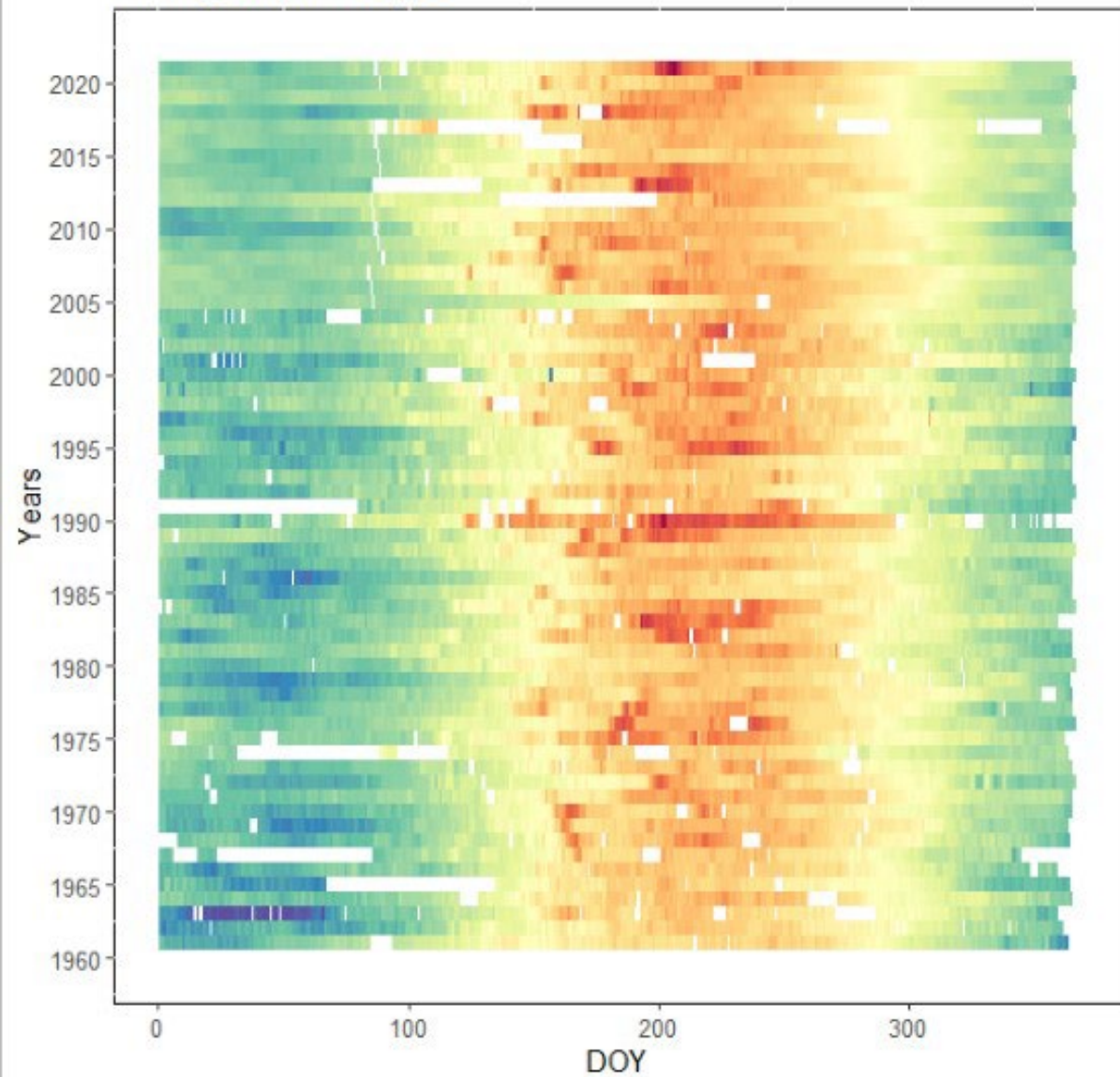


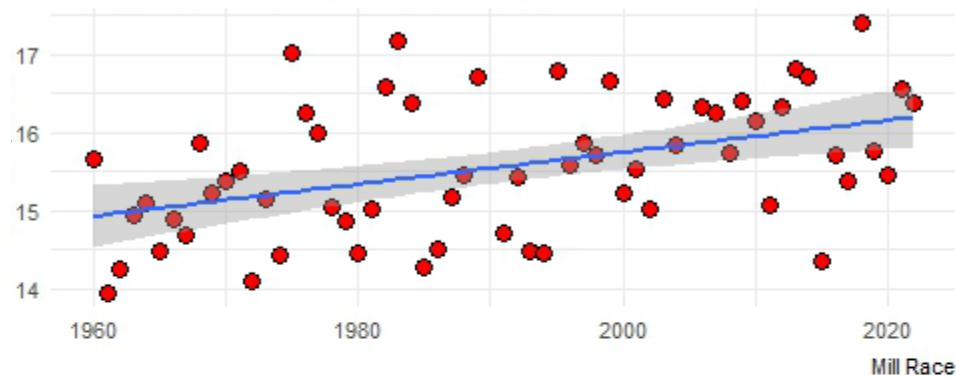




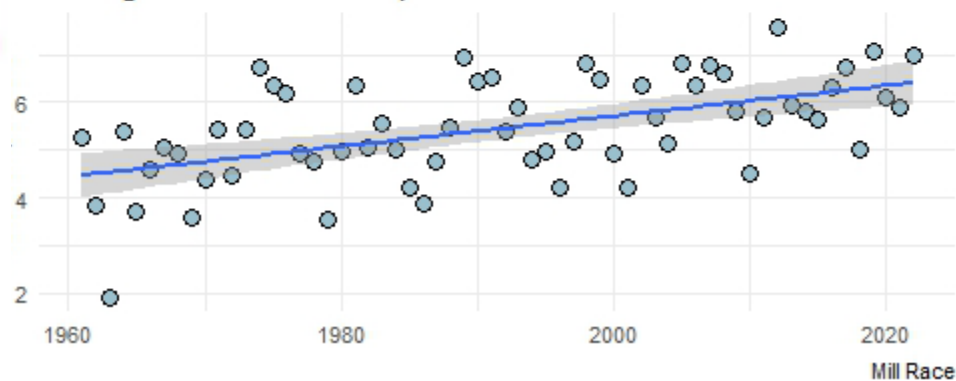
midnight water temps



Average Summer water temperatures



Average Winter water temperatures



Lines indicate significant trends at  $p < 0.05$   
Summer trend =  $0.2^{\circ}\text{C}$  per decade  
Winter trend =  $0.3^{\circ}\text{C}$  per decade



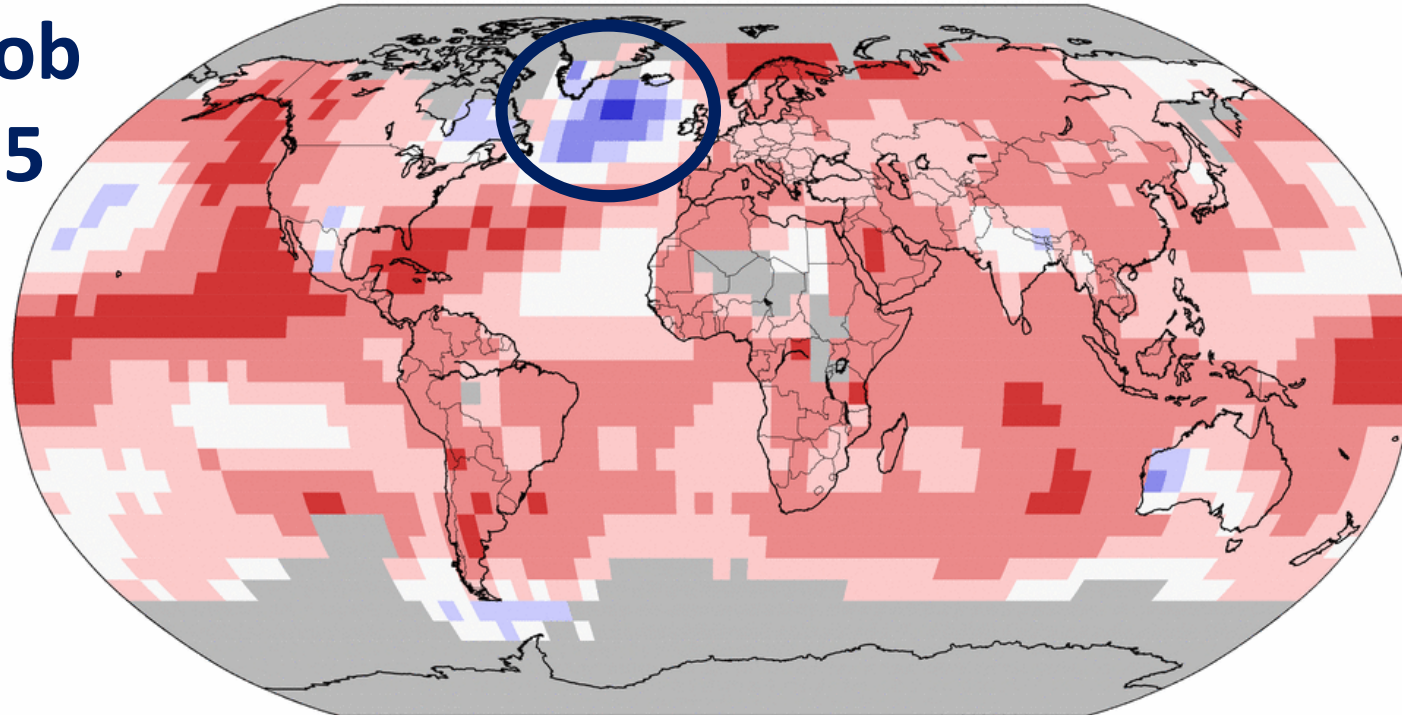
# Global vs local changes

Land & Ocean Temperature Percentiles Mar 2015–May 2015

NOAA's National Centers for Environmental Information

Data Source: GHCN-M version 3.3.0 & ERSST version 4.0.0

## The Cold Blob Spring 2015



Record Coldest

Much Cooler than Average

Cooler than Average

Near Average

Warmer than Average

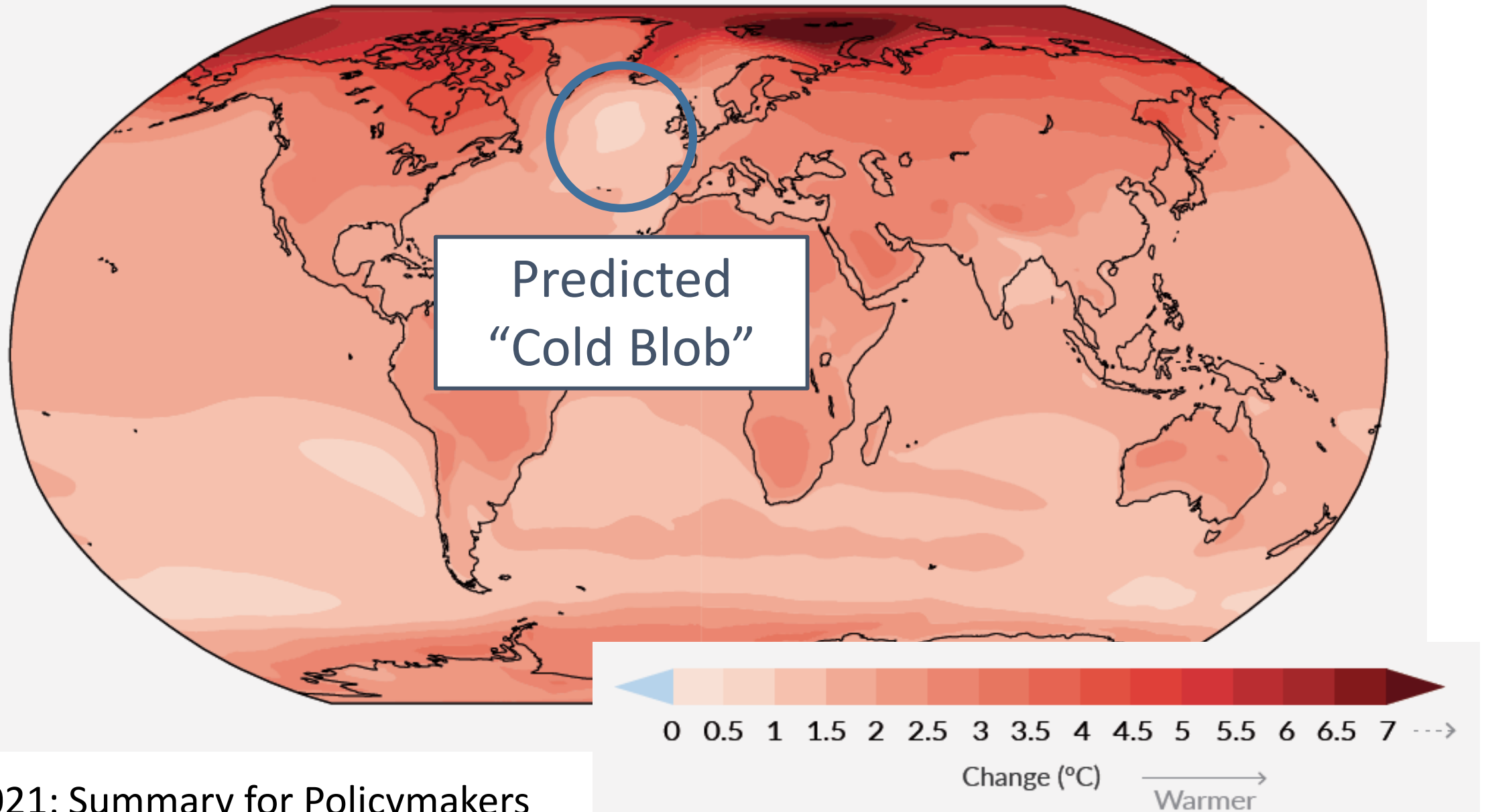
Much Warmer than Average

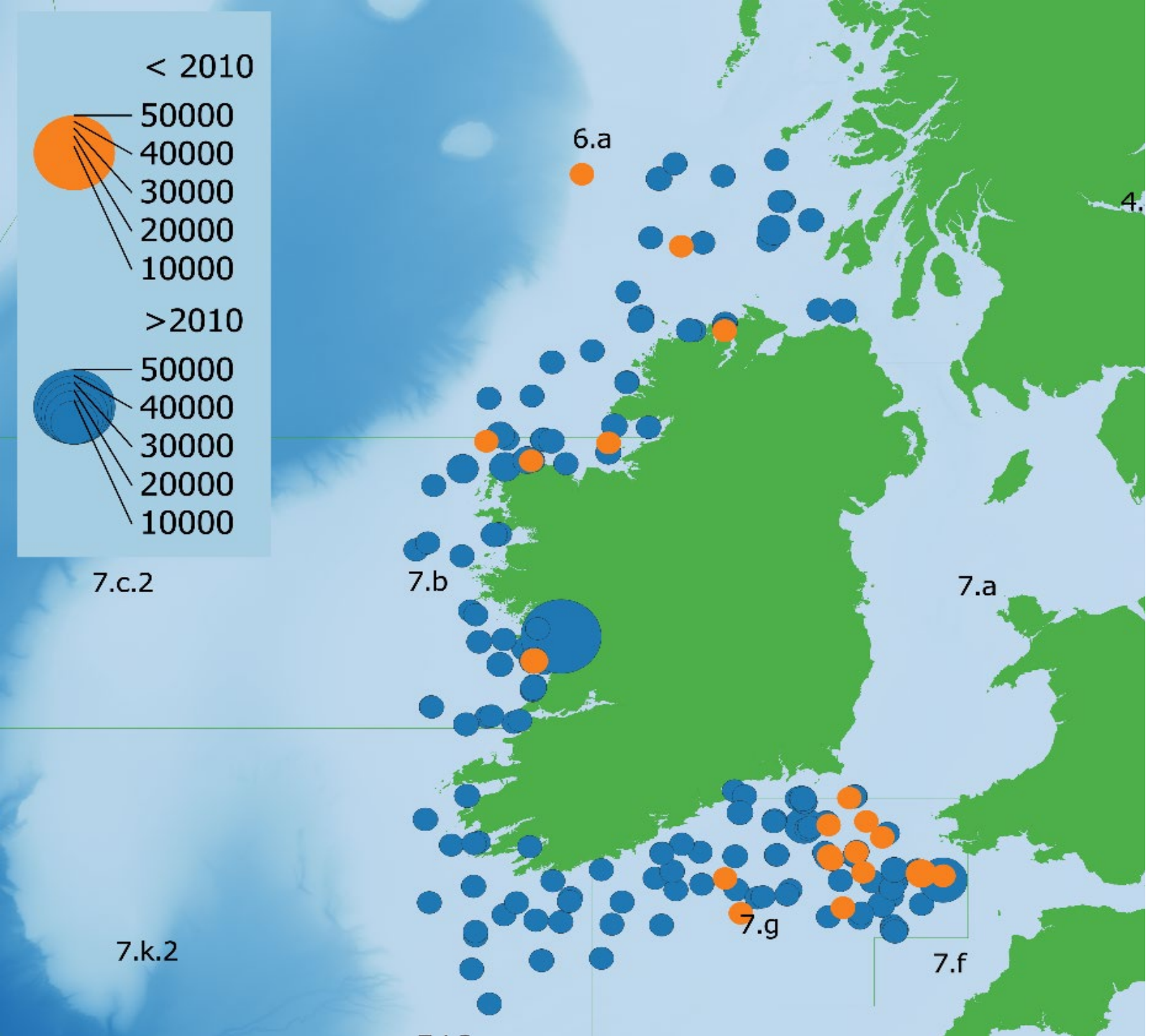
Record Warmest





# Simulated change at 2°C global warming



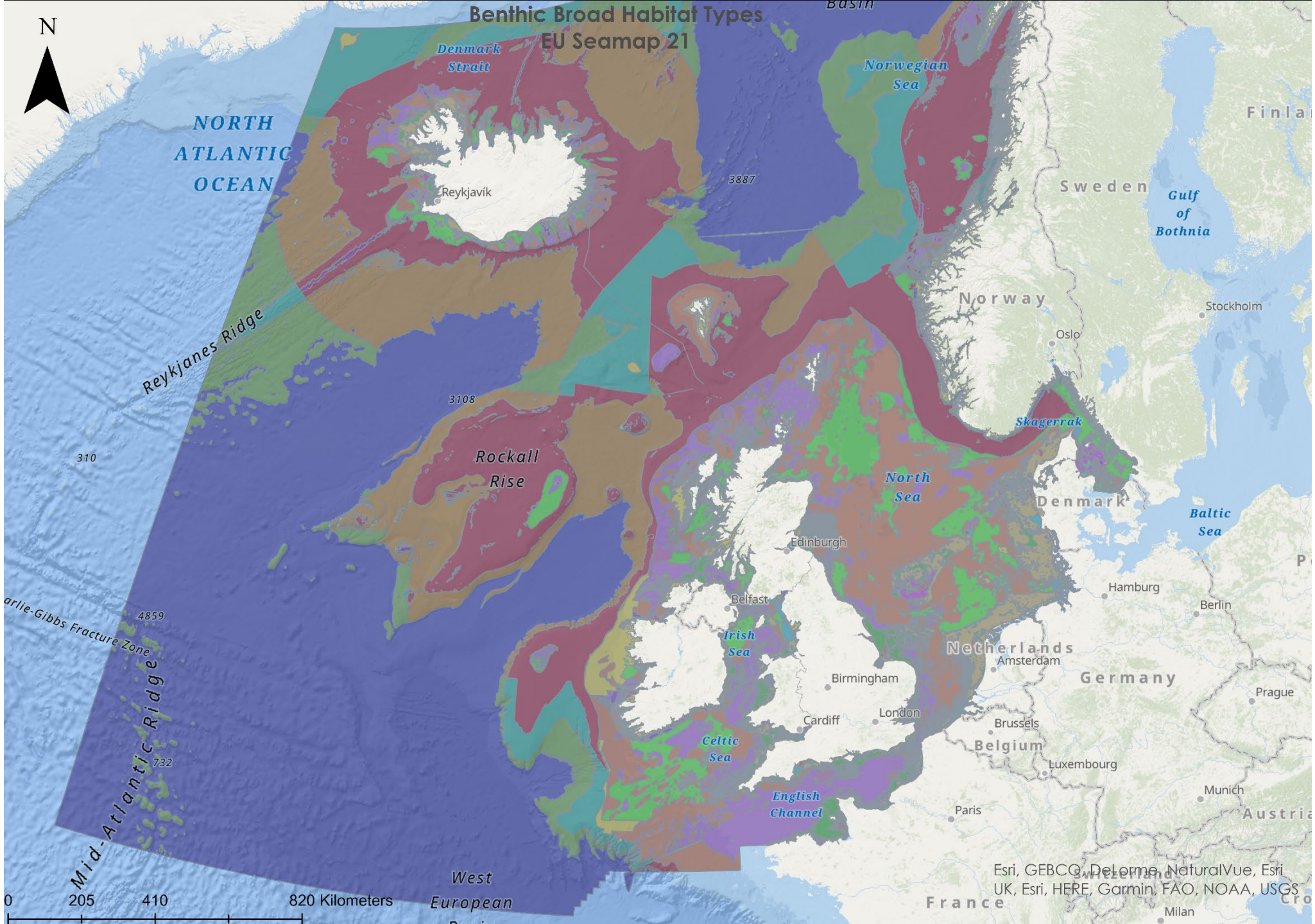


Distribution of European anchovy from 2003-2009 (orange) 2010-2020 (blue)

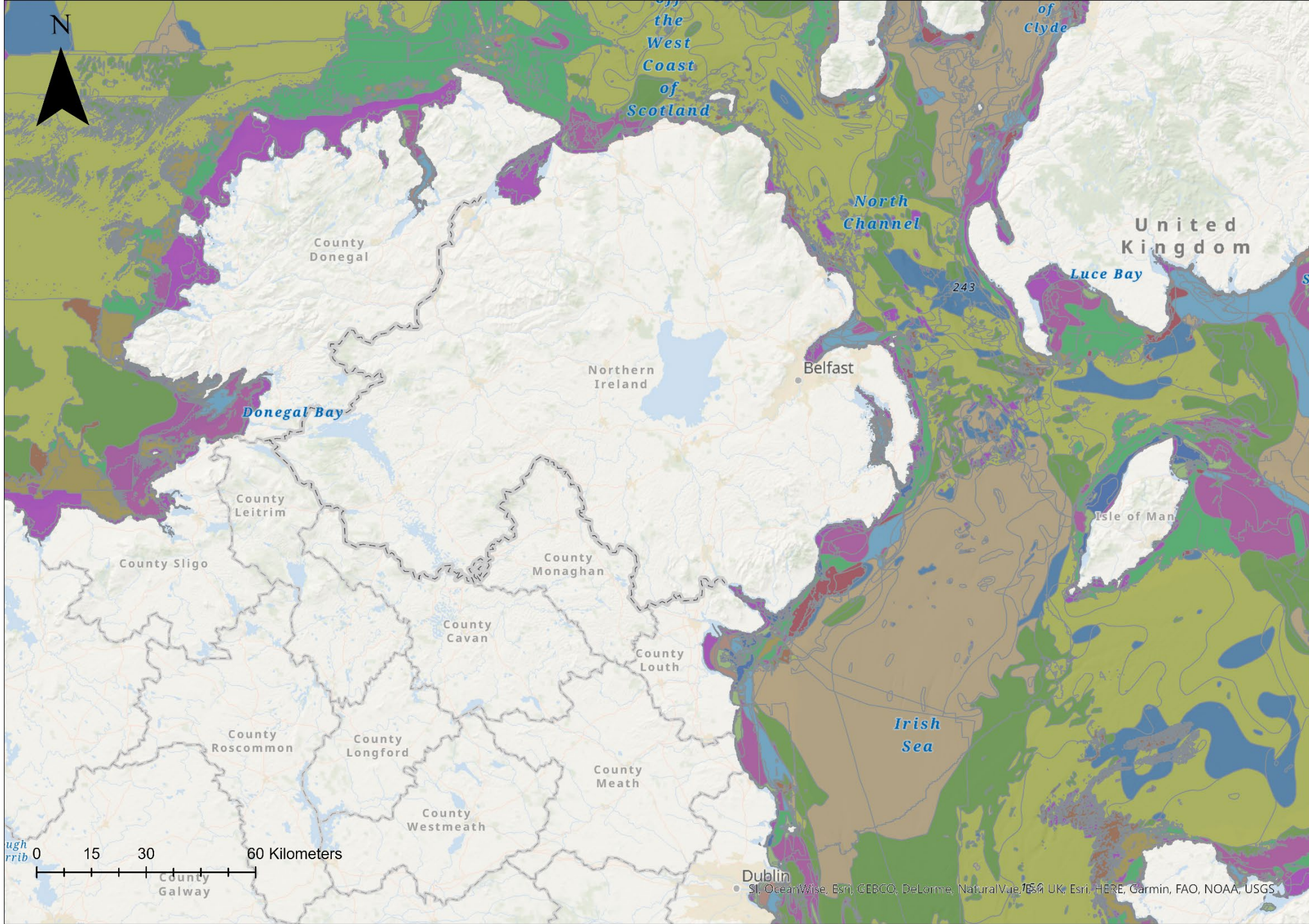


# Benthic Broad Habitat Types

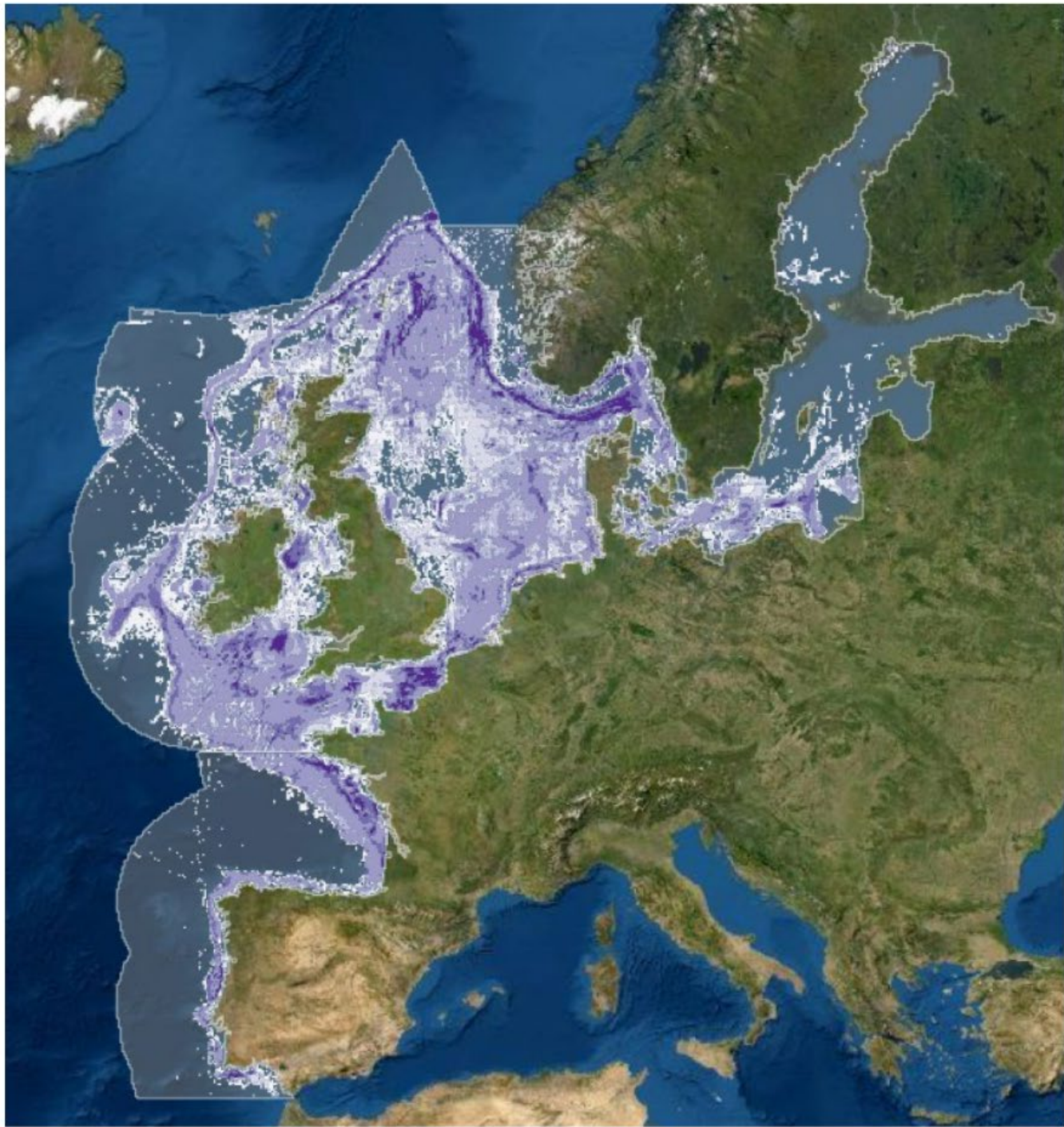
## EU Seamap 21











**SAR (average 2013-2018)**

- 0-0.1
- 0.1-0.5
- 0.5-1
- 1-5
- 5-10
- >10
- No trawling in the (sub)-regions

# Tralee Bay area: A hot spot for elasmobranch species (14 species)



Species	Indigenous to Europe	IUCN Global Redlist	Irish Redlist	European Redlist	NE Atlantic Redlist	OSPAR TDSL	CFP	CMS (Bonn)
Thornback Ray	No	Near threatened	Least concern	Near threatened	Near threatened	Yes	Generic ray TAC	No
Painted Ray	No	Least concern	Least concern	Near threatened	Near threatened	No	Generic ray TAC	No
Stingray	No	Data deficient	Endangered	Least concern	Least concern	No	-	No
Undulate Ray	No	Endangered	Endangered	Near threatened	Endangered	No	Excluded from generic TAC	No
Blonde Ray	No	Near threatened	Near threatened	Near threatened	Near threatened	No	No	No
Spotted Ray	No	Least concern	Least concern	Least concern	Least concern	Yes	Generic ray TAC	No
Spurdog	No	Endangered	Vulnerable	Endangered	Critically endangered	Yes	PSL	App II
Angel Shark	No	Critically endangered	Critically endangered	Critically endangered	Critically endangered	Yes	PSL	App I, II
Common Skate	No	Critically endangered	Critically endangered	Critically endangered	Critically endangered	Yes	PSL	No
Tope	No	Vulnerable	Vulnerable	Vulnerable	Data deficient	No	Longline only	App II
Gt. spotted dogfish	No	Near threatened	Least concern	Near threatened	Near threatened	No	-	No
White skate	No	Endangered	Critically endangered	Critically endangered	Critically endangered	Yes	PSL	No
Cuckoo ray	Yes	Least concern	Vulnerable	Least concern	Least concern	No	Generic ray TAC	No





