

Bruk av data fra fiskeflåten til ressursforvaltning

Karl-Johan Reite,
SINTEF Fiskeri og havbruk

Innhold

- Utfordringer med dagens metoder
- Mulighetene
- Veien videre



Utfordringene med dagens metoder:

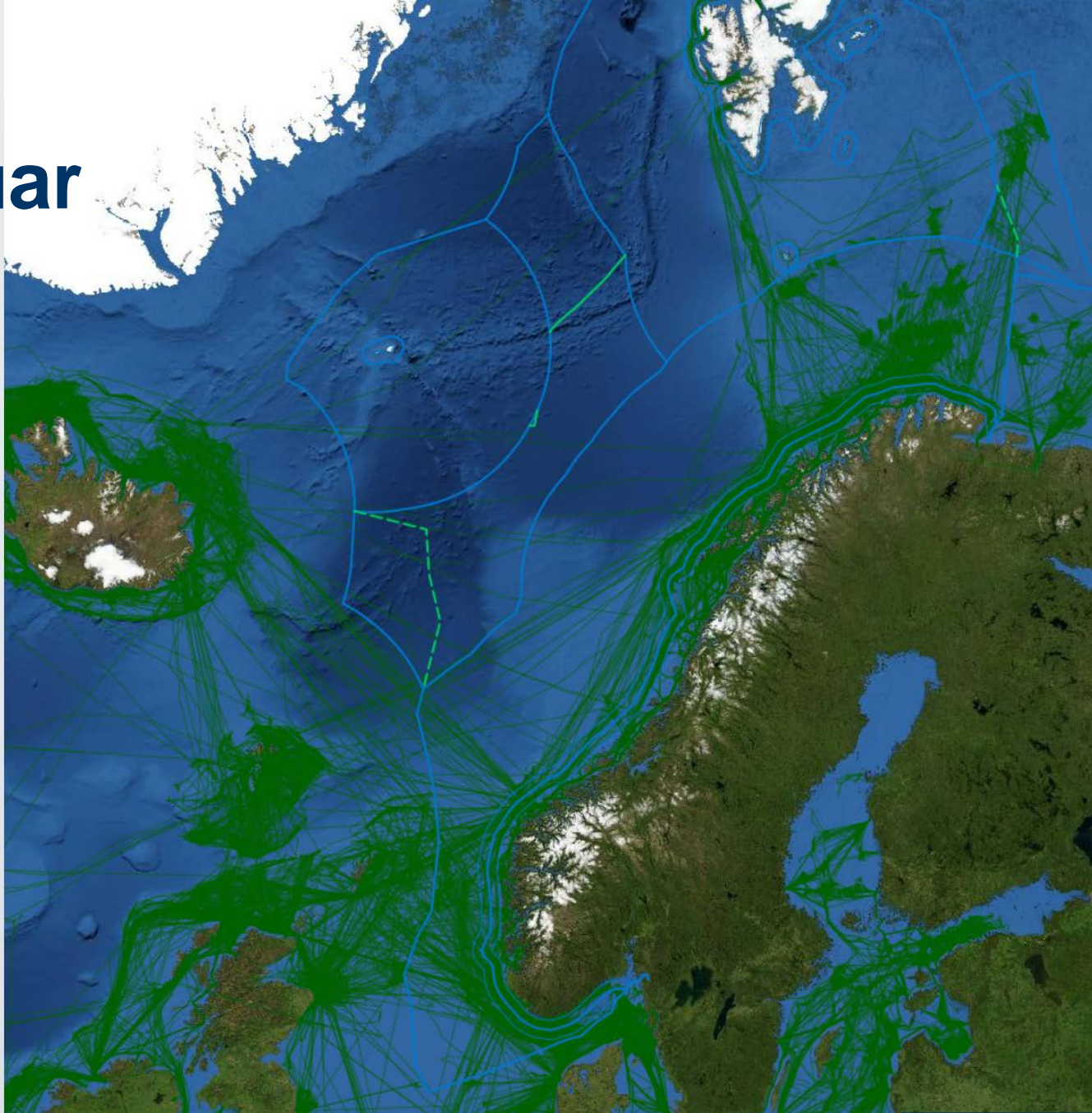
Få fartøy

- Sårbart
- Lite dekning
- Vandringsmønster forandres

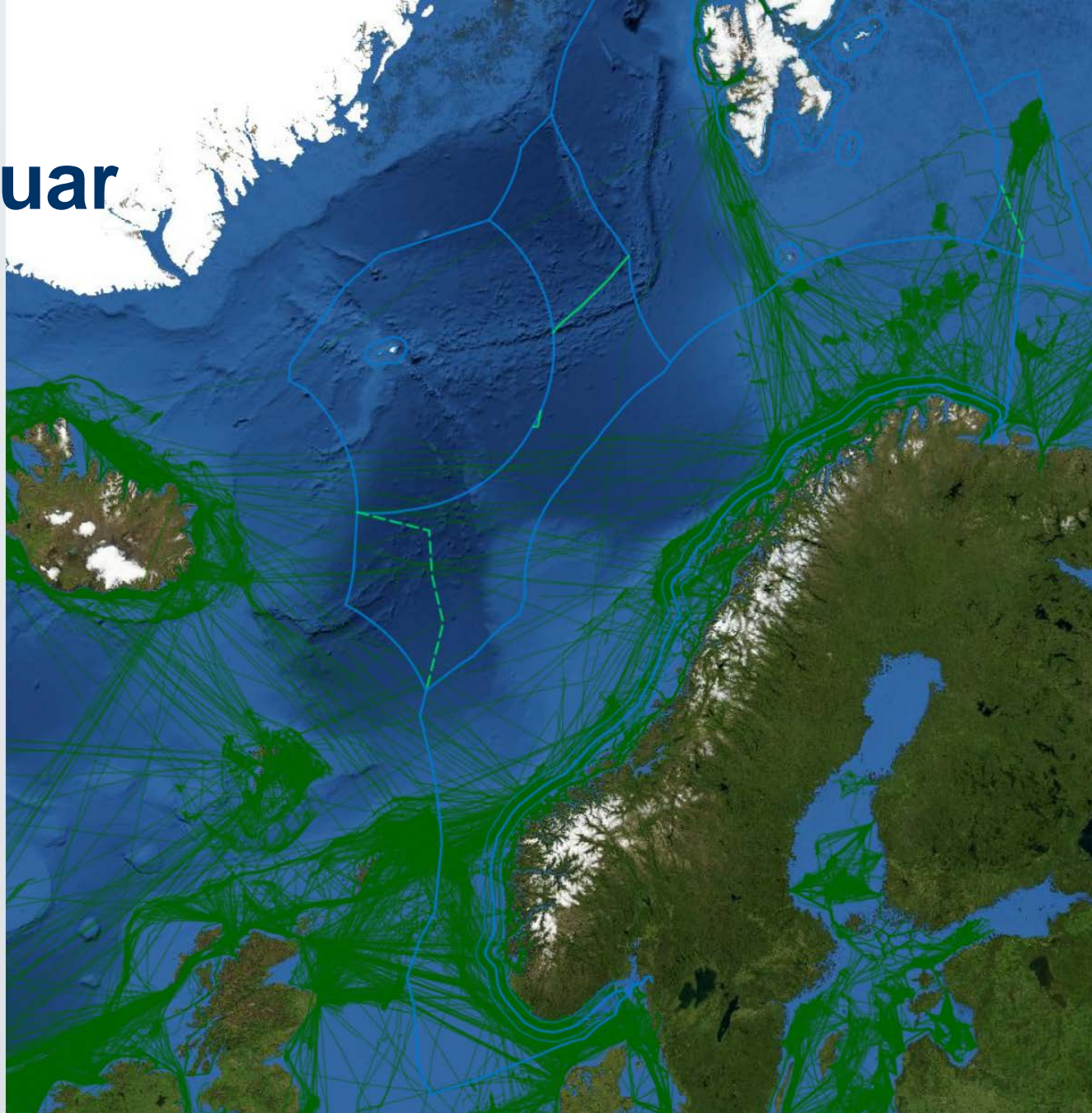
Hvor går fiskefartøyene?

- Kommende bilder viser AIS-data for fiskefartøy, måned for måned.
- Dataene er hentet fra Havbase.no.

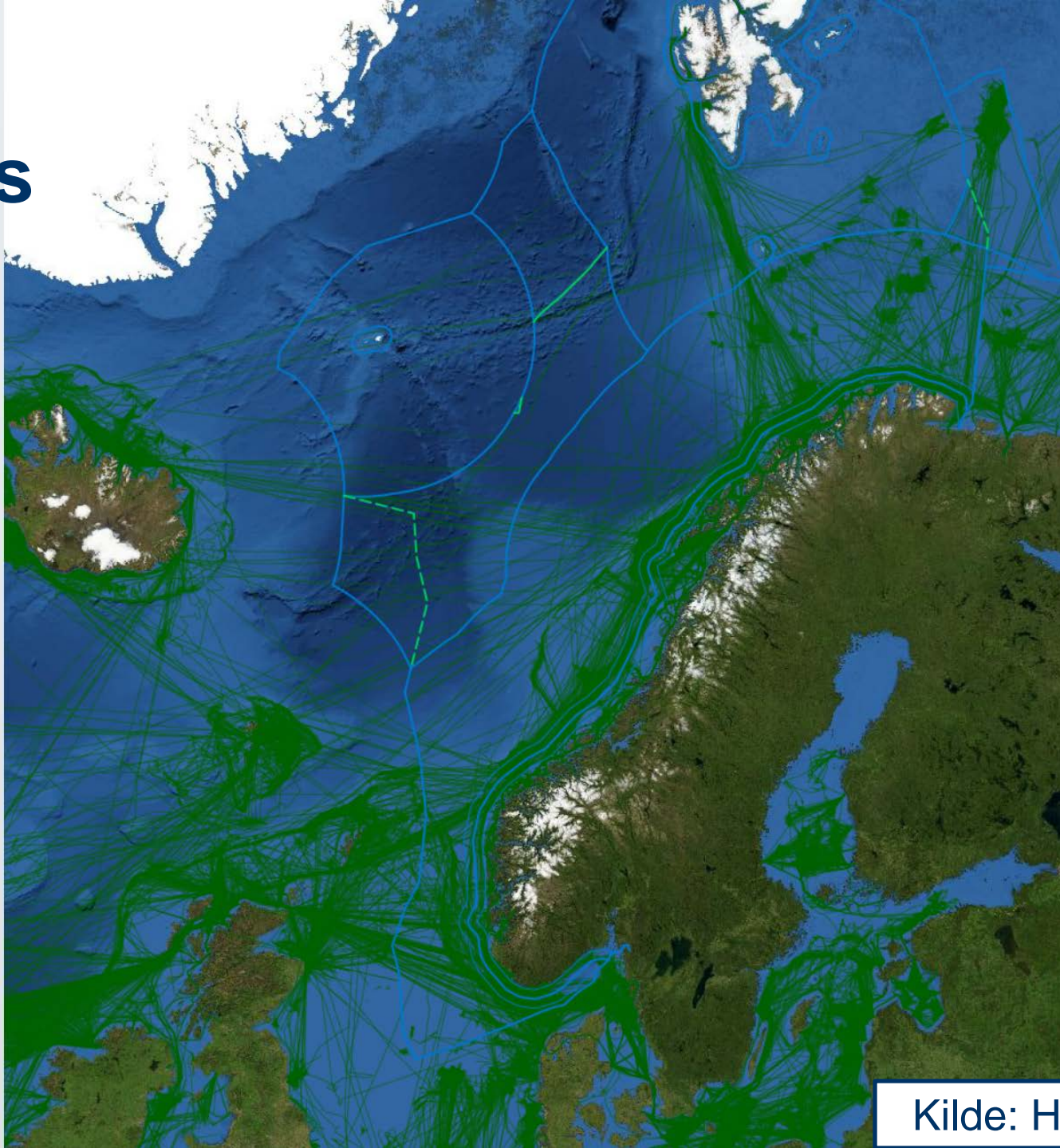
AIS januar



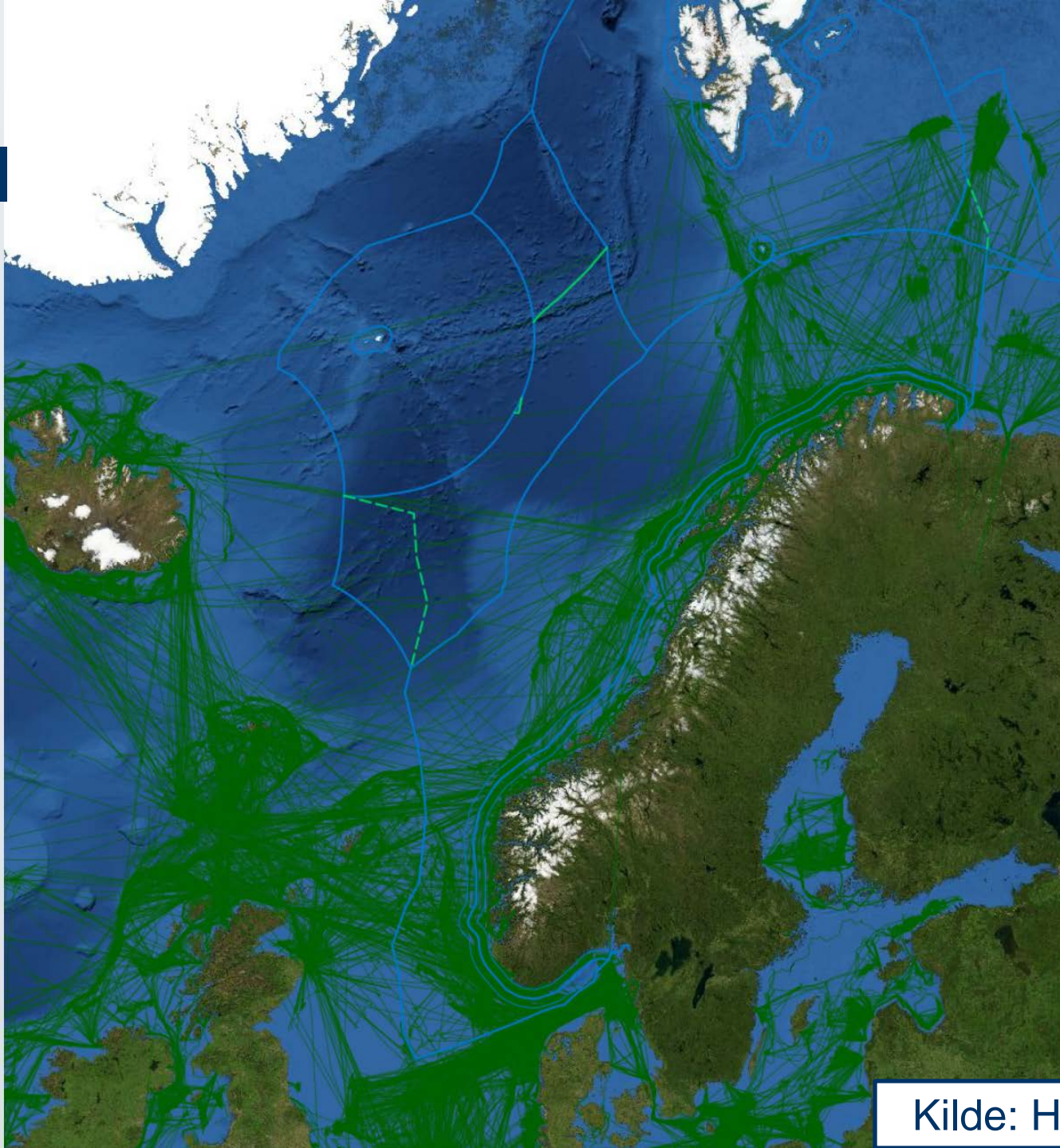
AIS februar



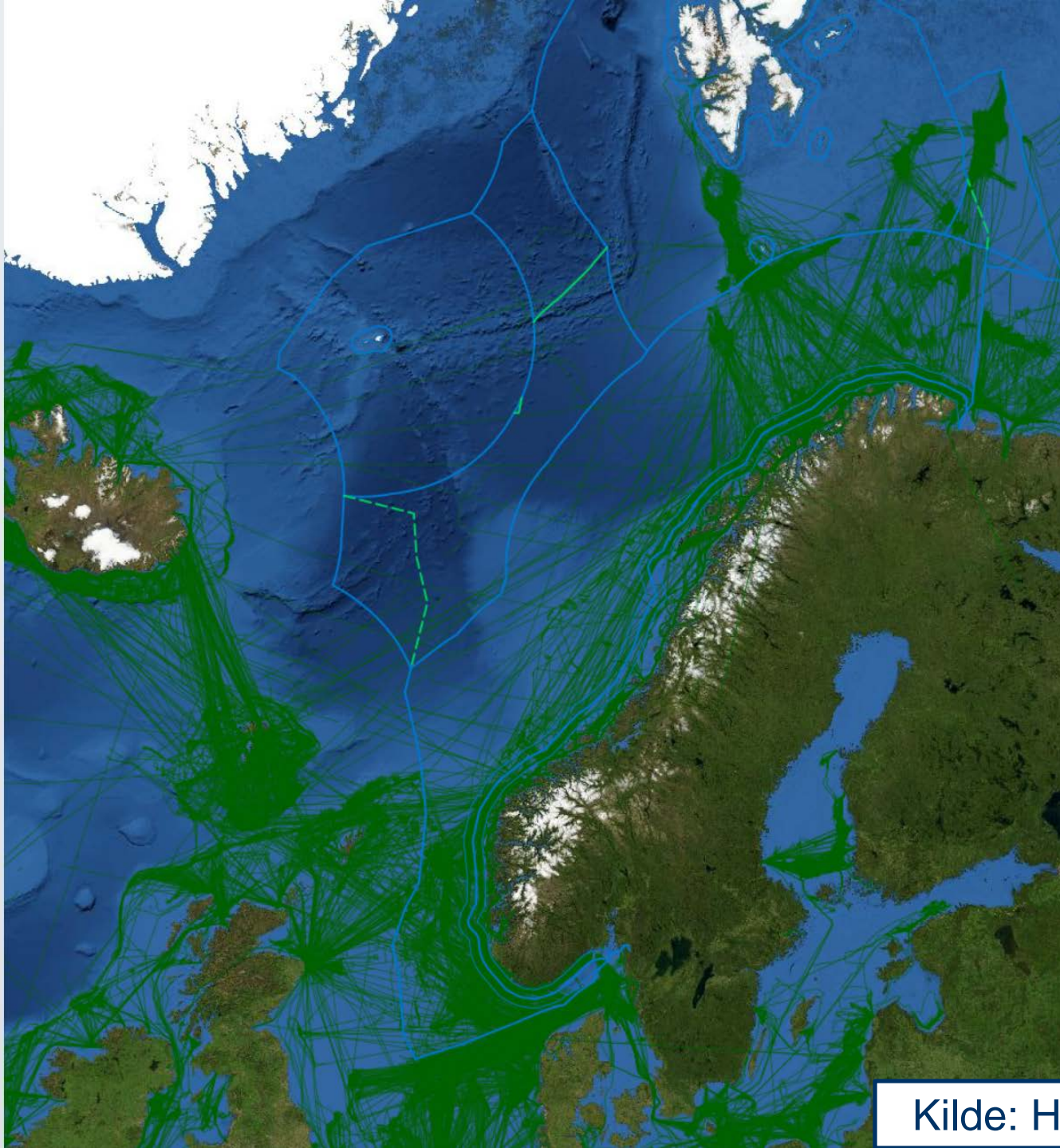
AIS mars



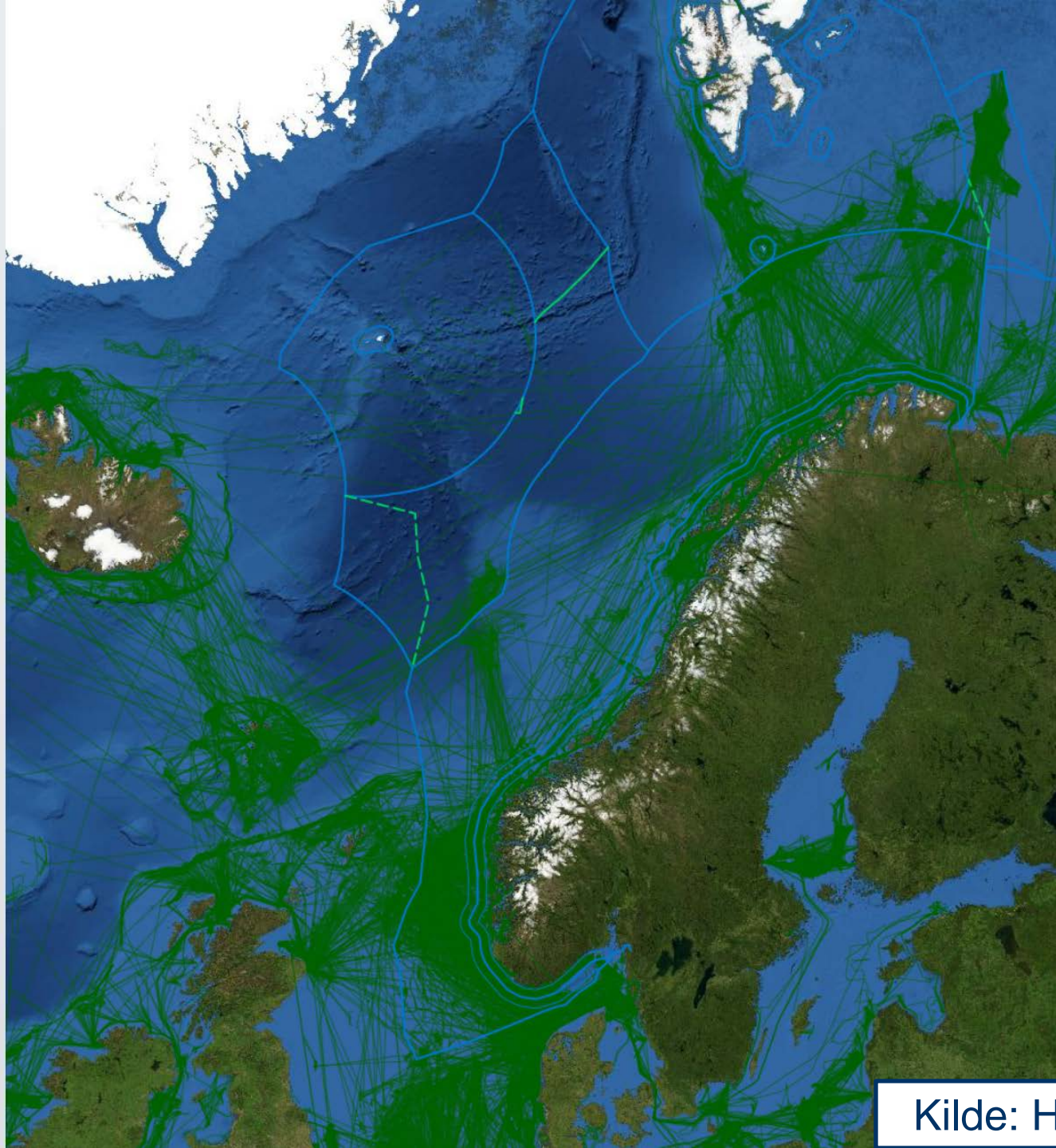
AIS april



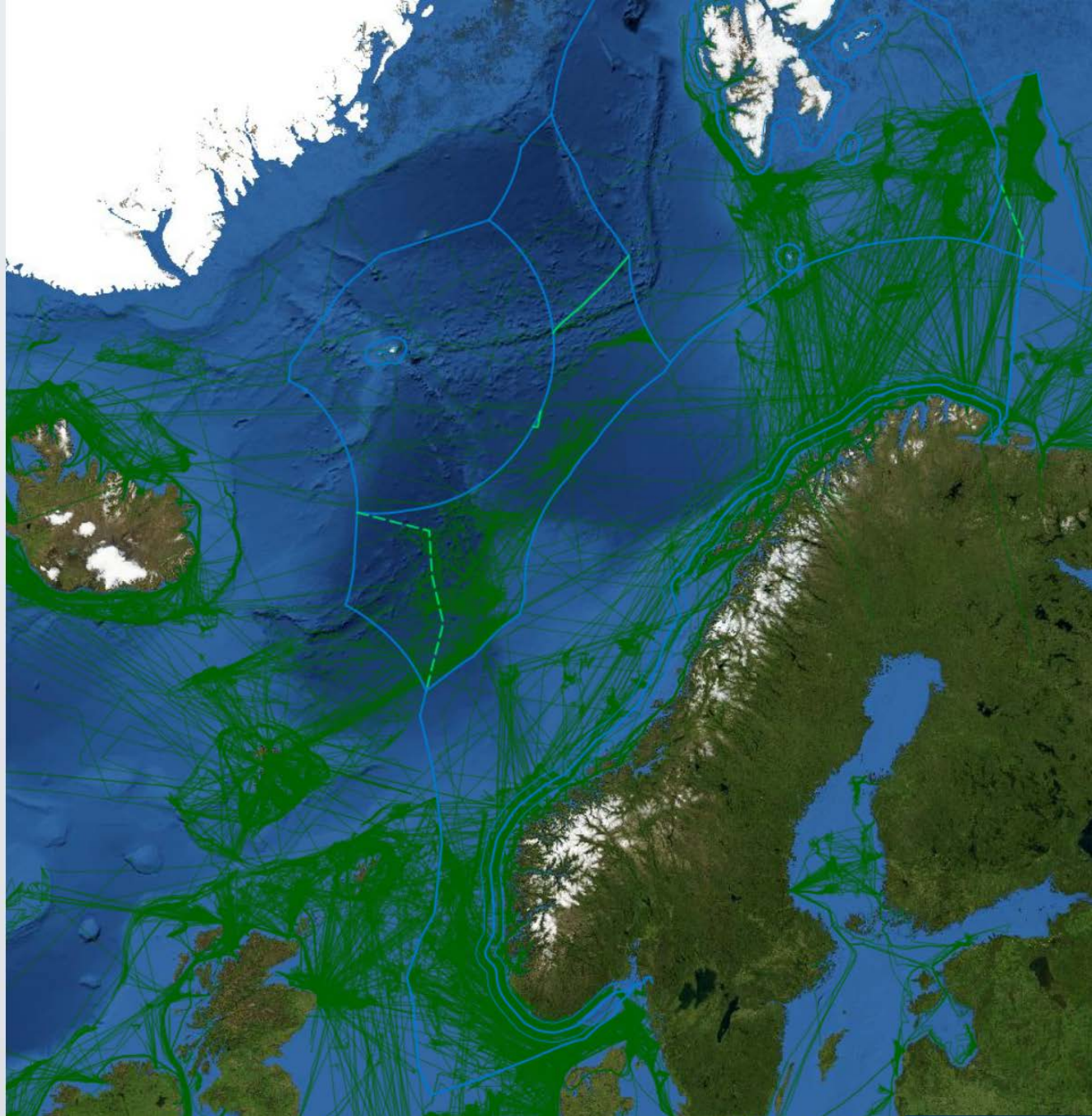
AIS mai



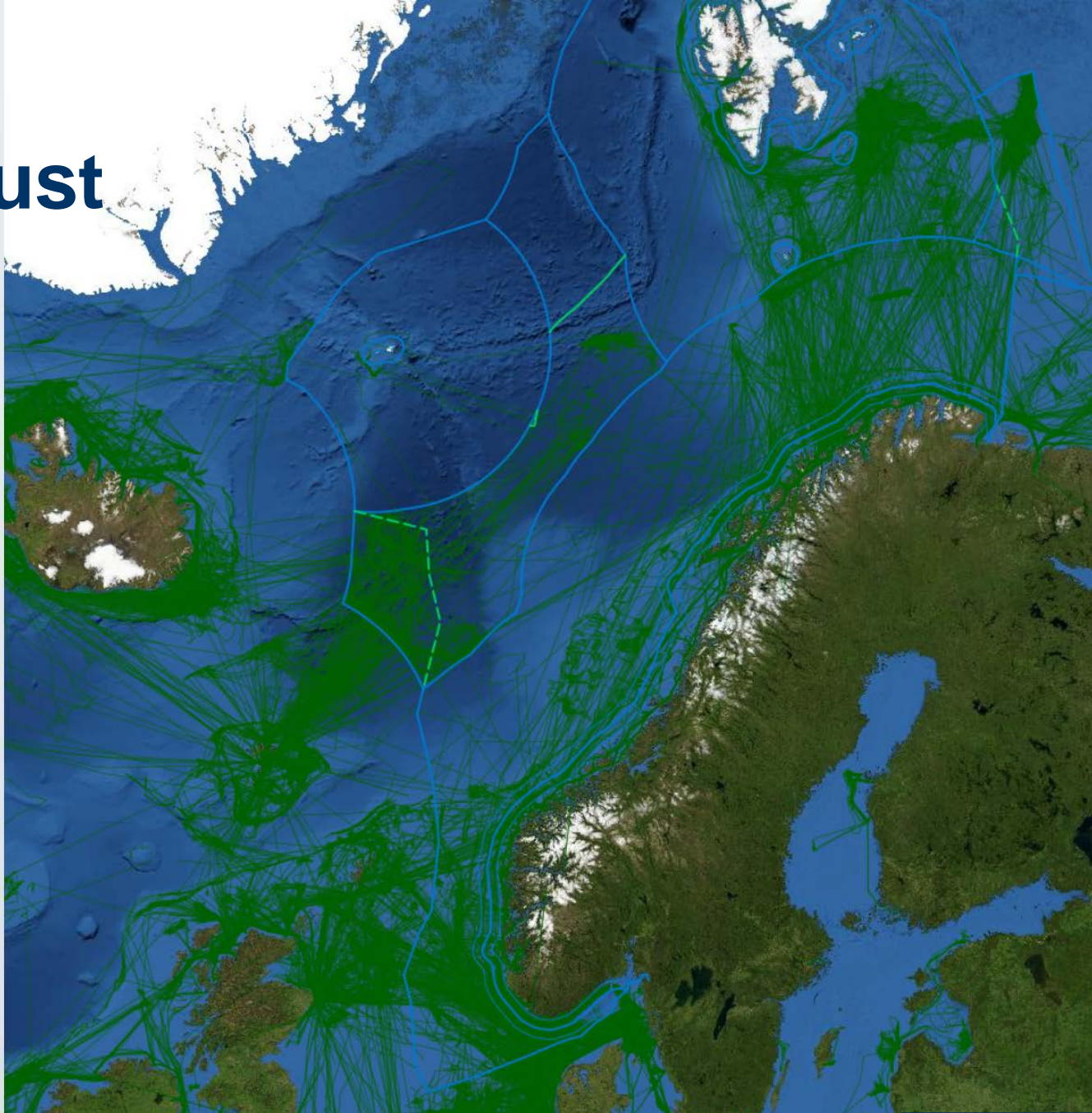
AIS juni



AIS juli



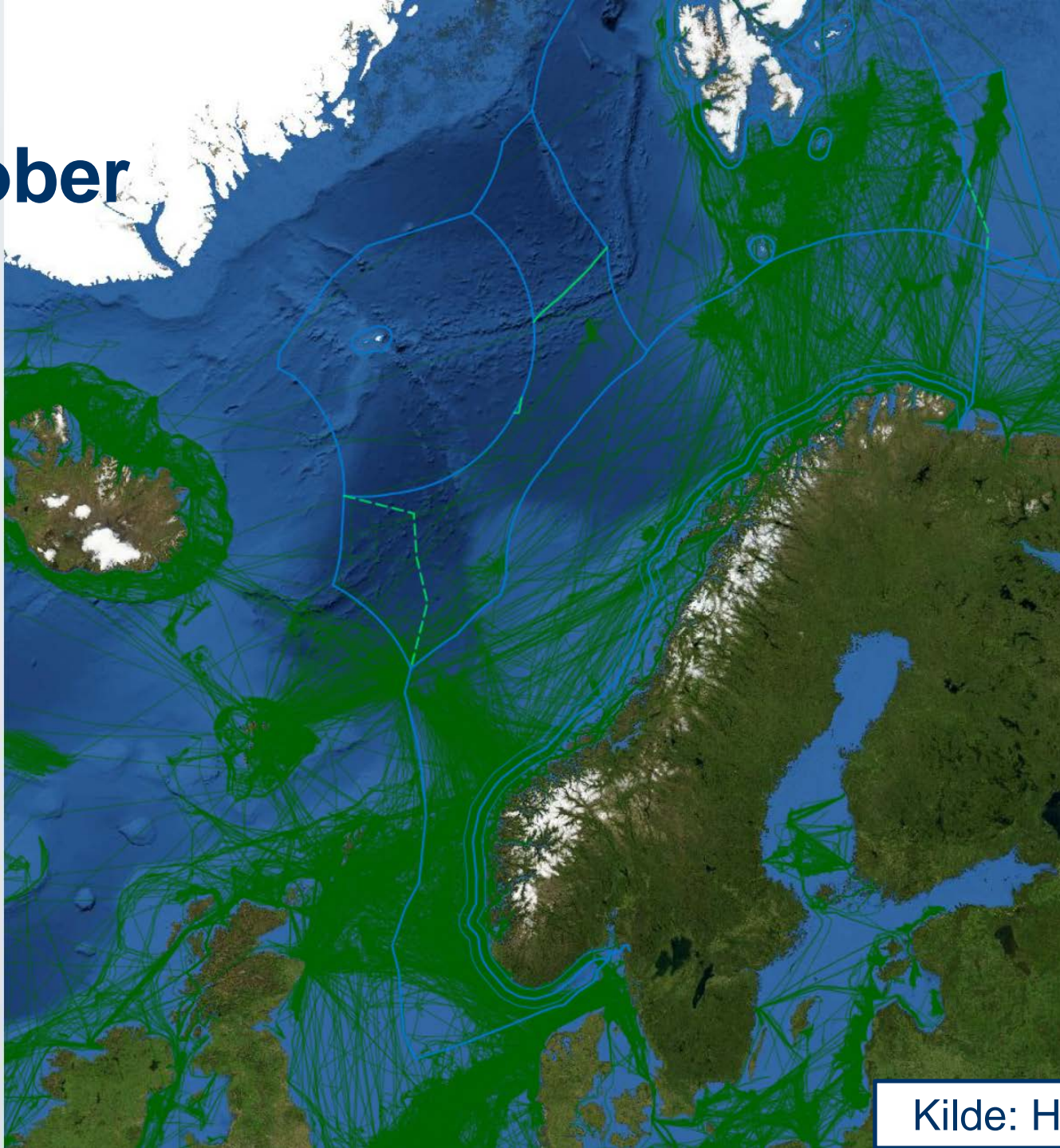
AIS august



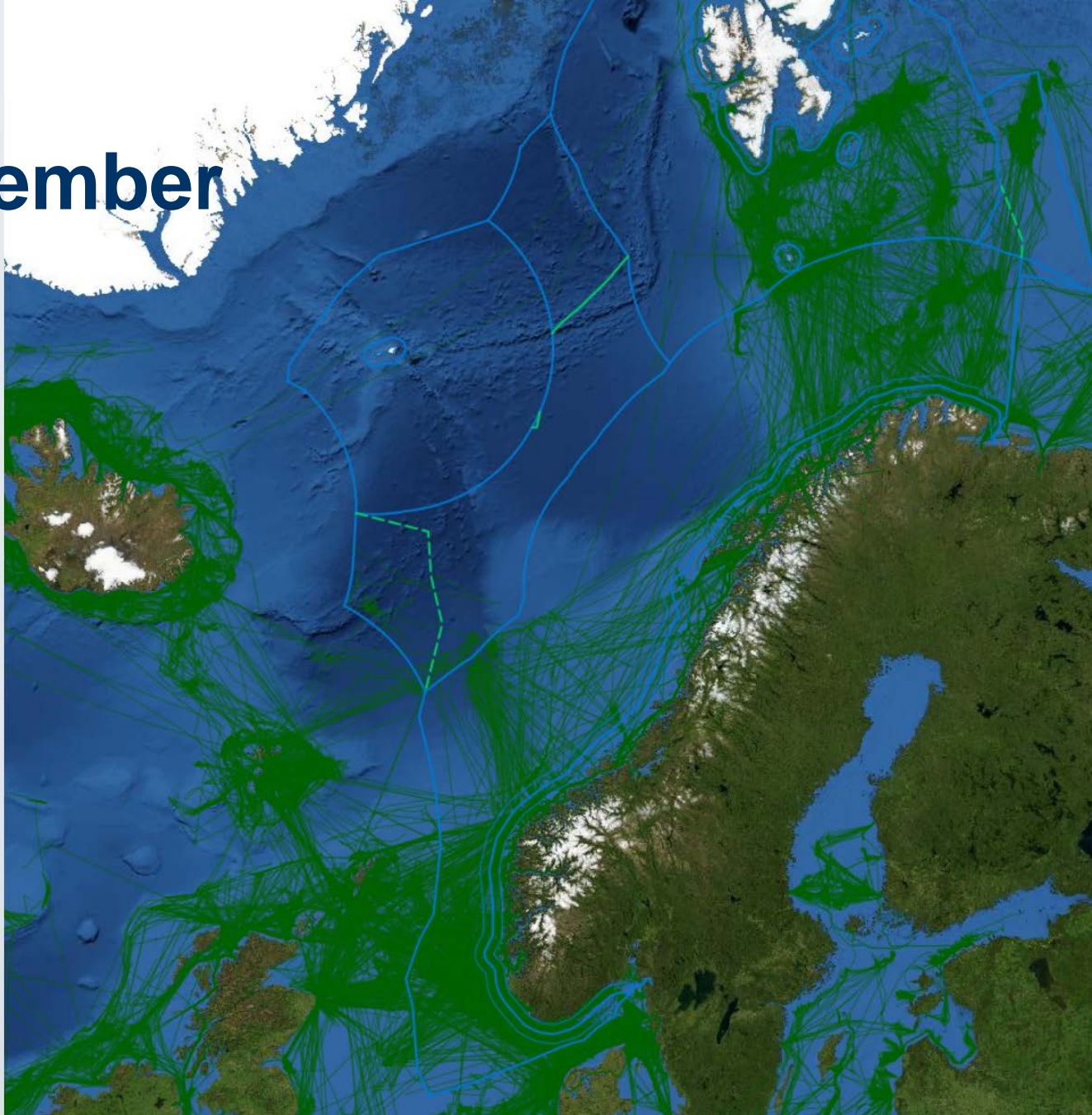
AIS september



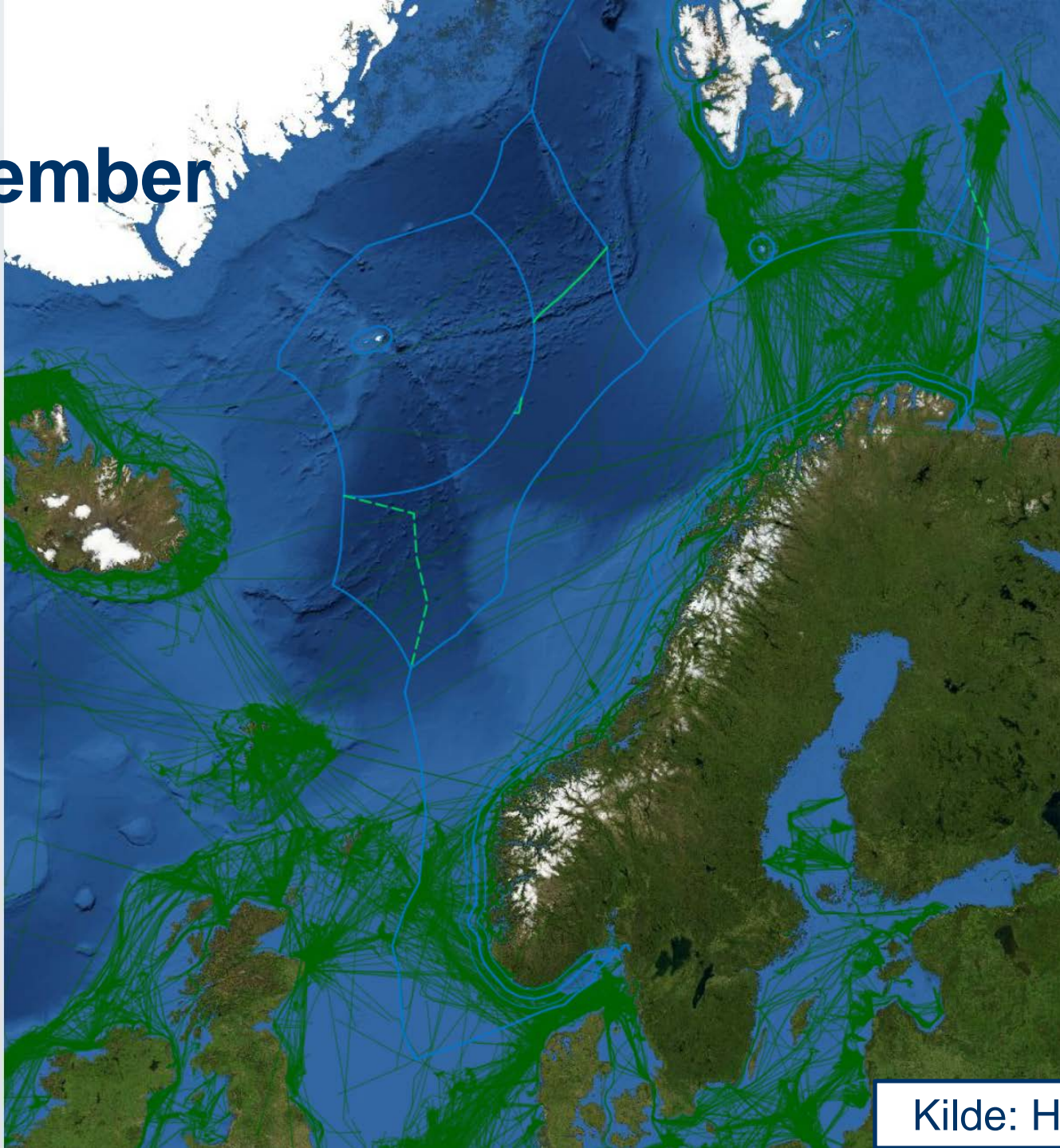
AIS oktober



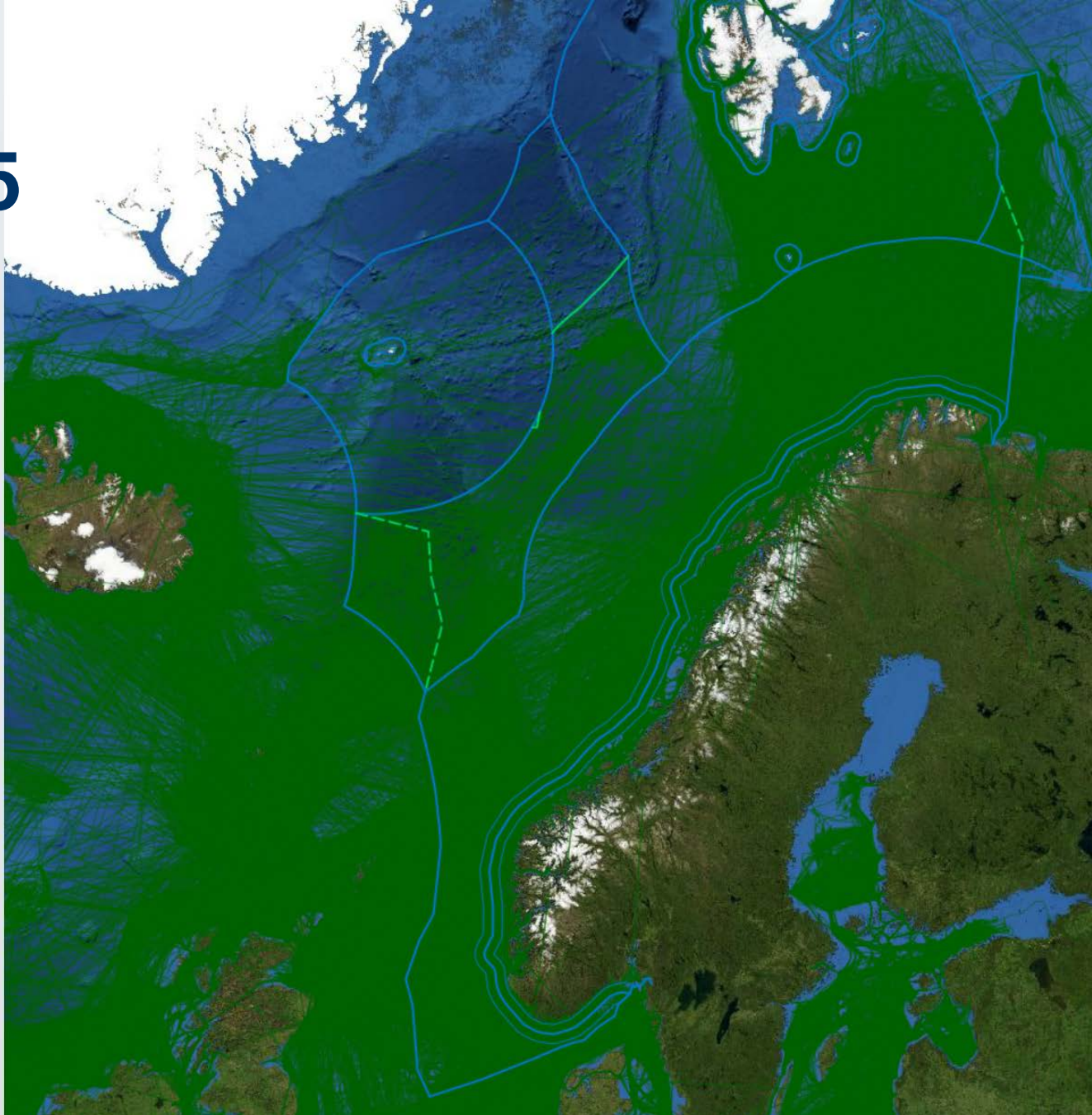
AIS november



AIS desember



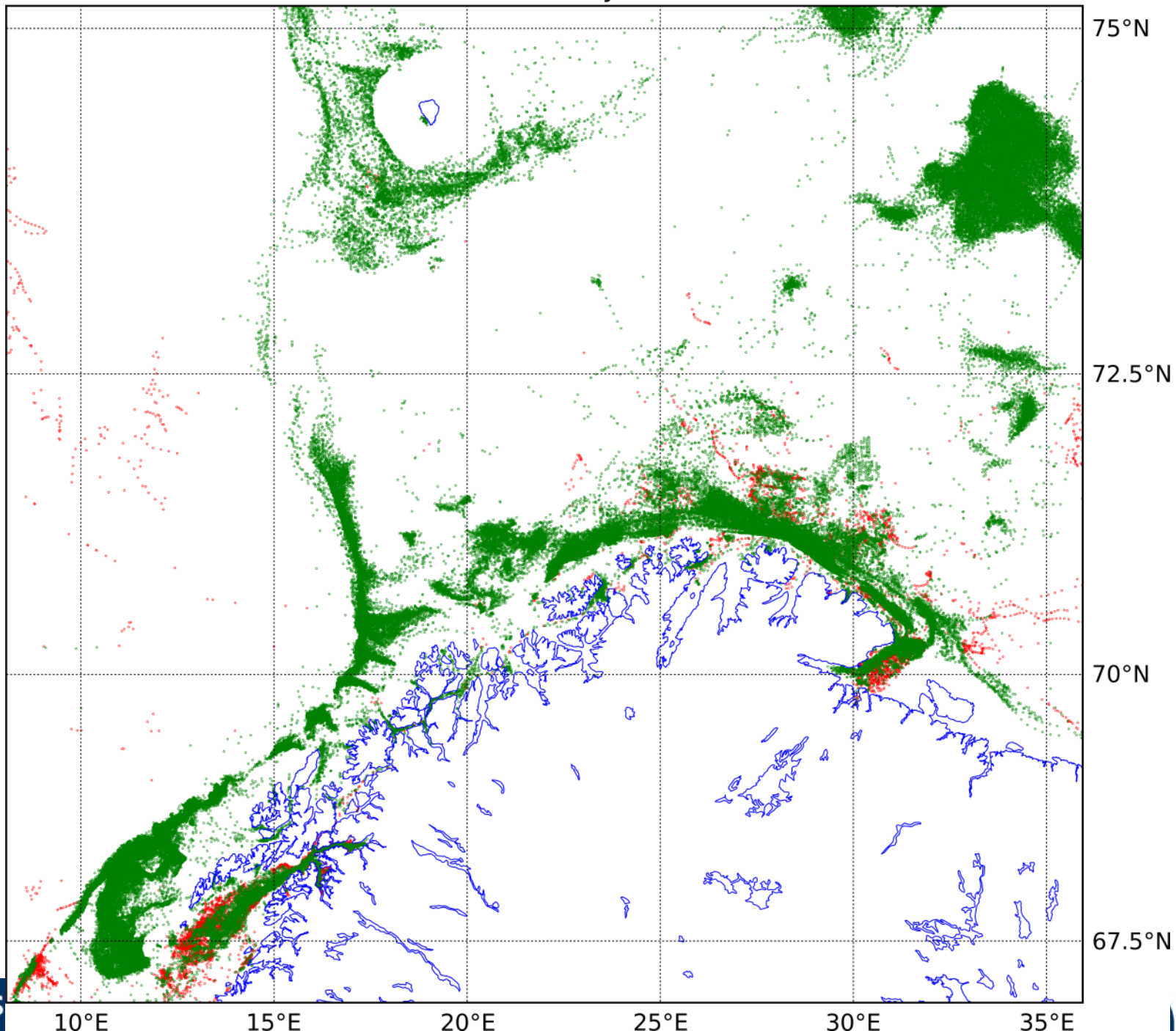
AIS 2015



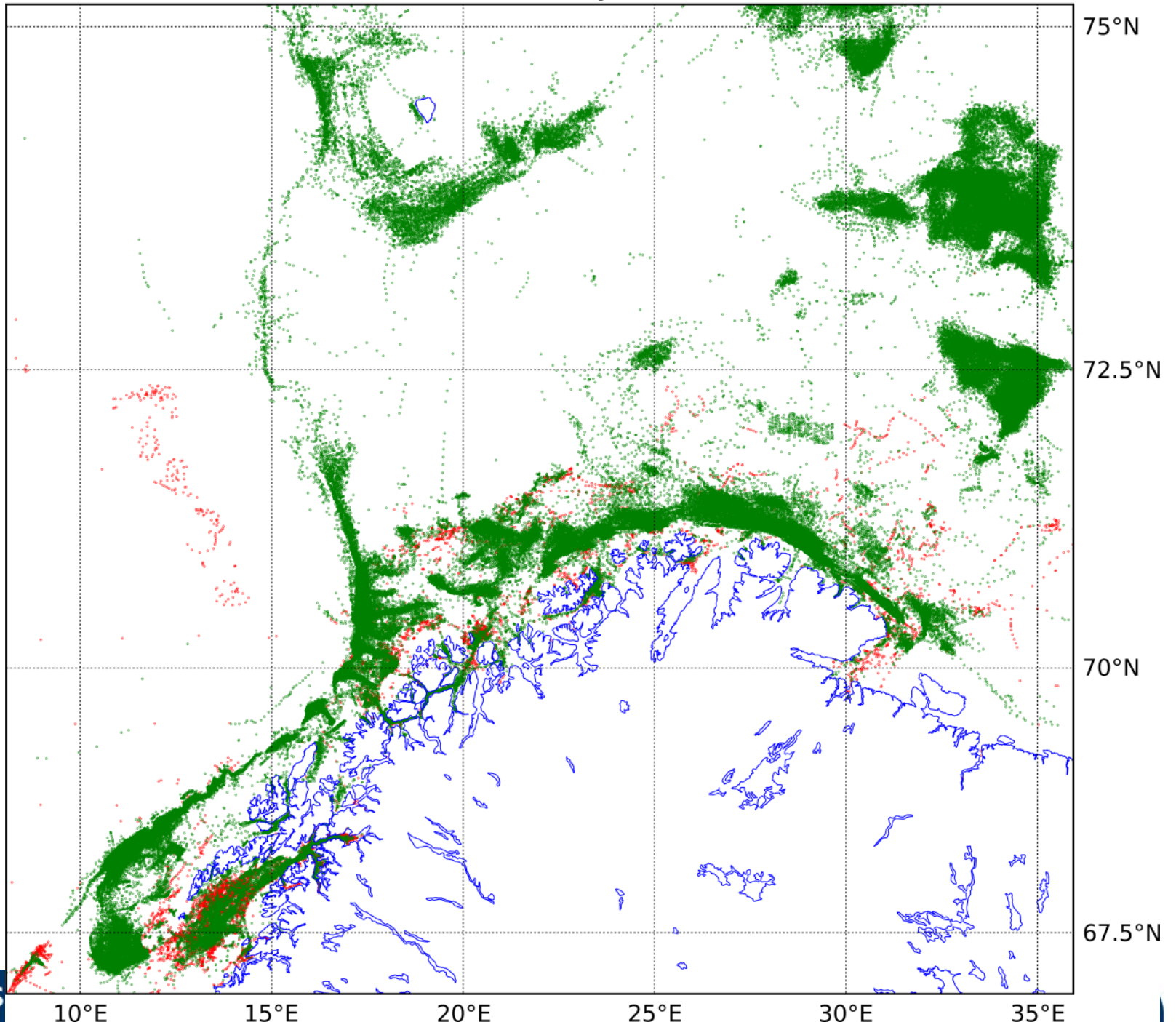
Hvor fiskes det?

- Følgende data viser posisjoner der fiskefartøy har hatt mindre enn 5 knop fart
- Grønne punkt er antatt bunnfiske
- Røde punkt er antatt pelagisk fiske

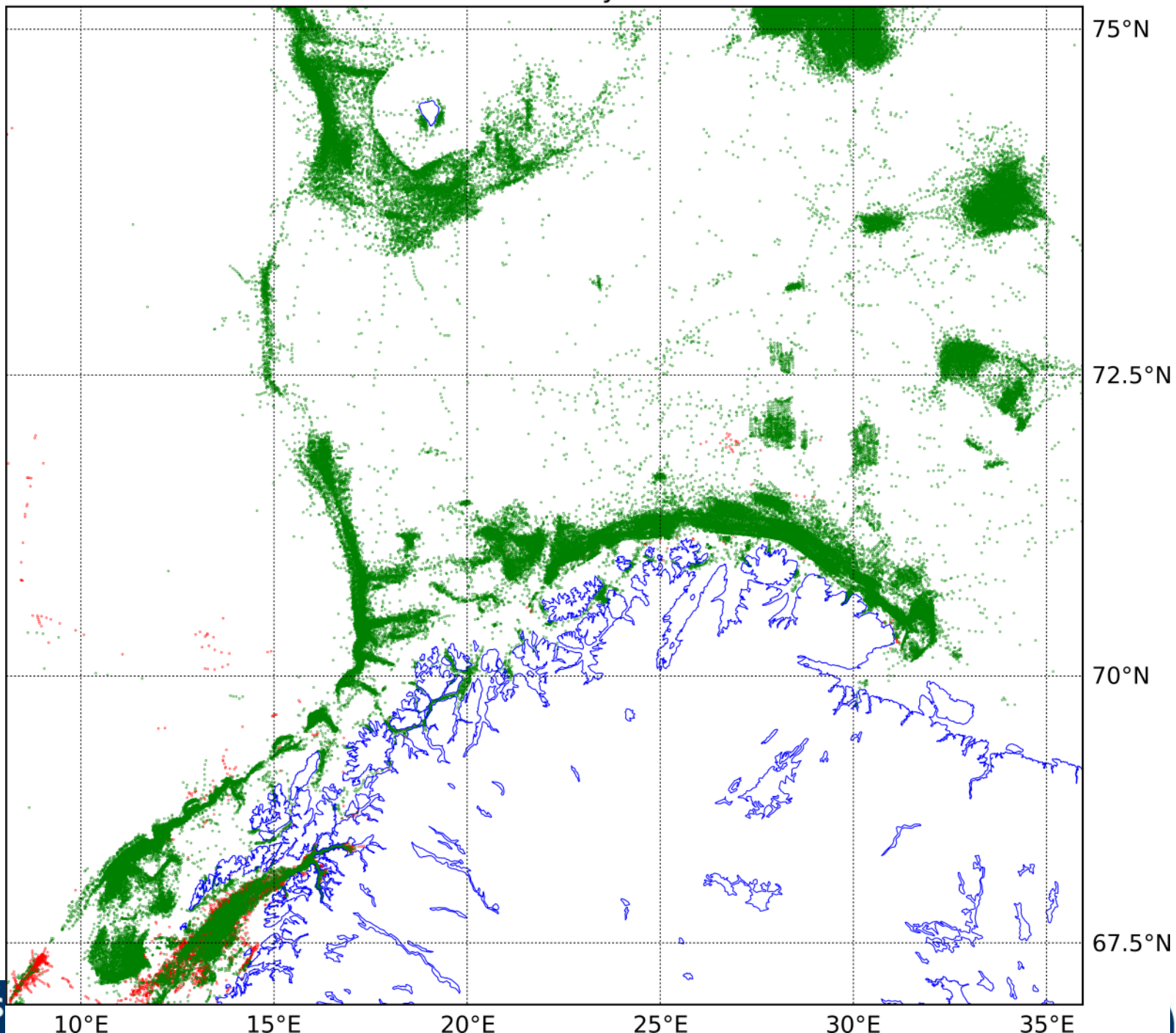
Fisheries activity: 2002



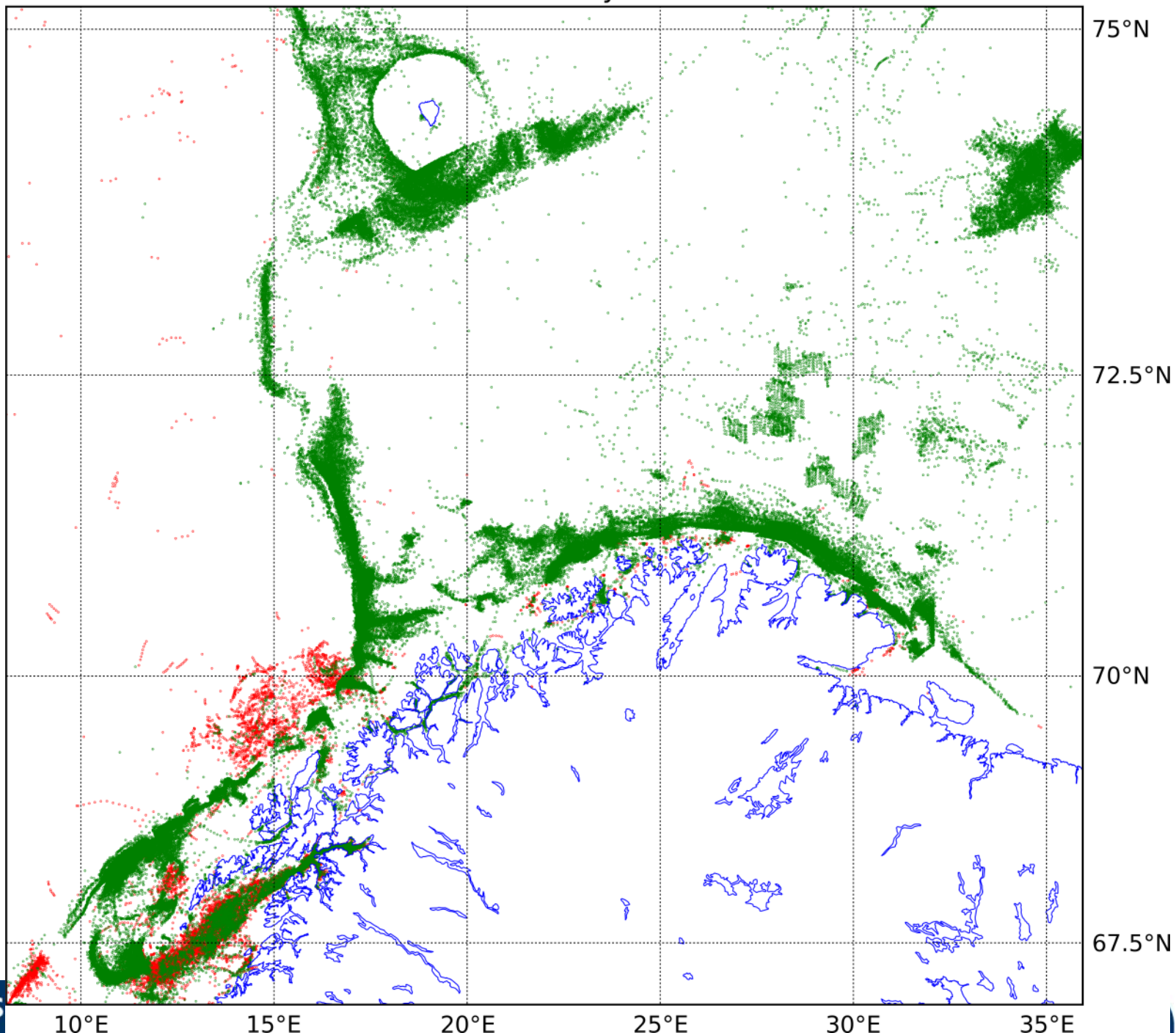
Fisheries activity: 2003



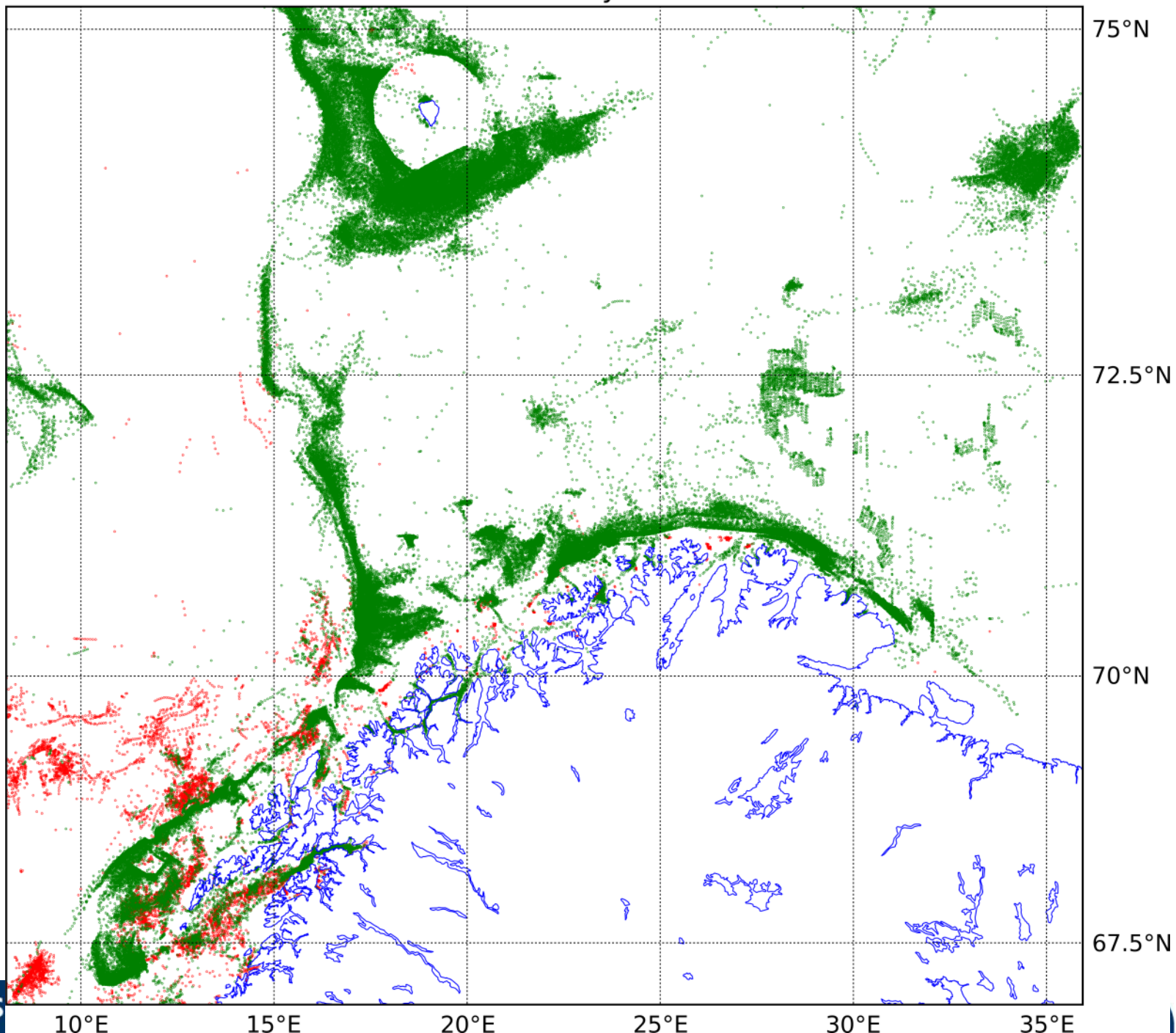
Fisheries activity: 2004



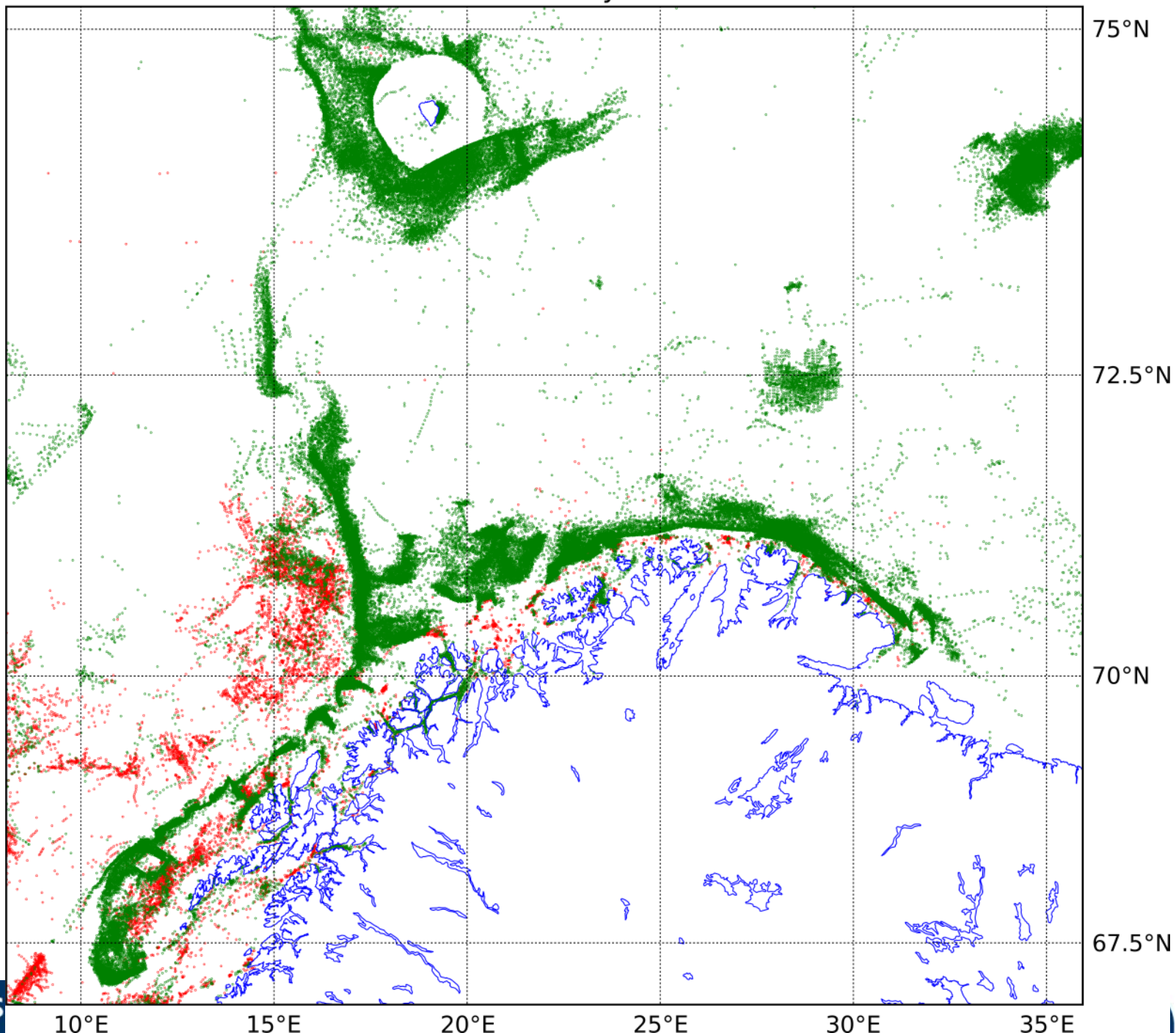
Fisheries activity: 2005



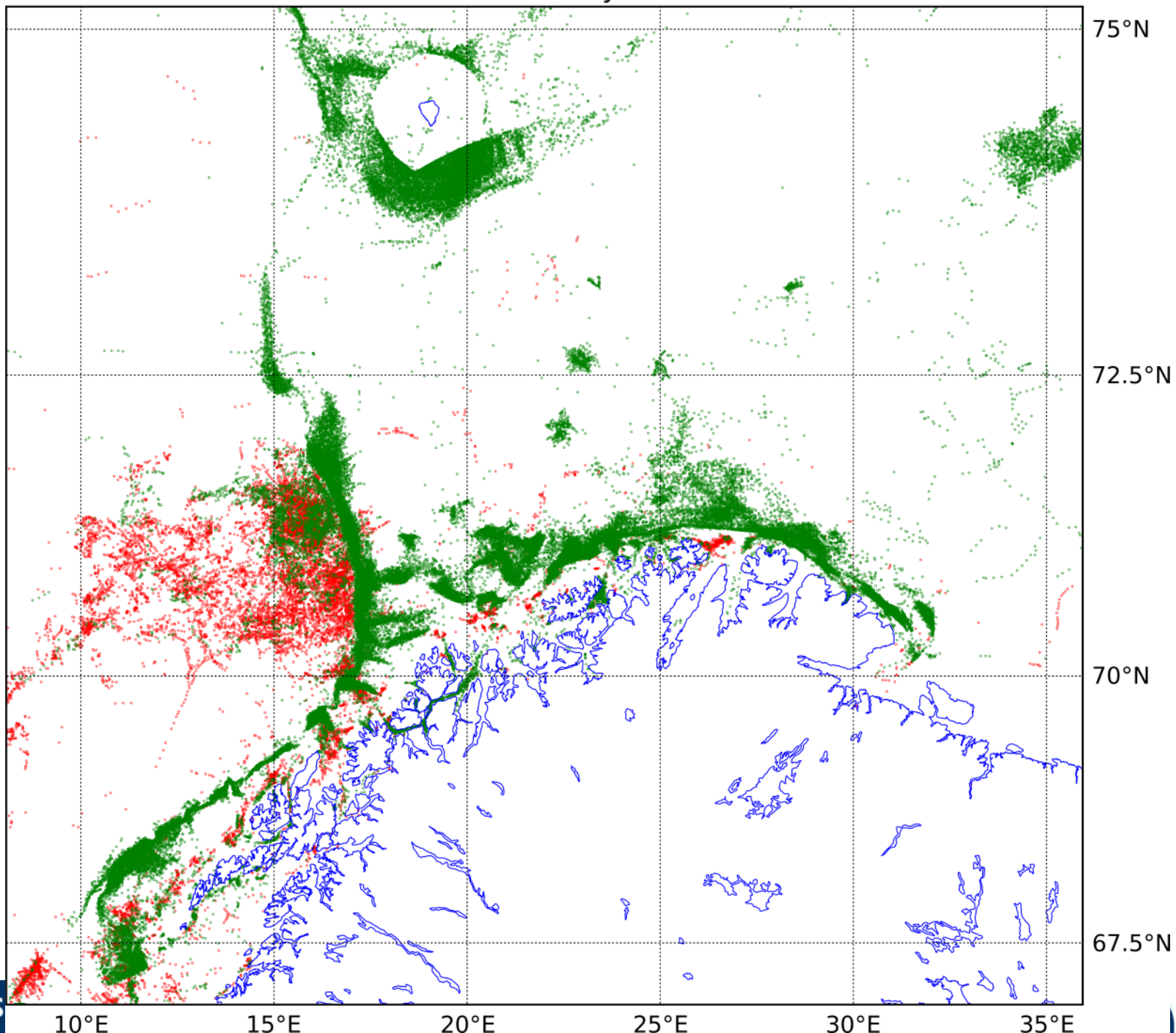
Fisheries activity: 2006



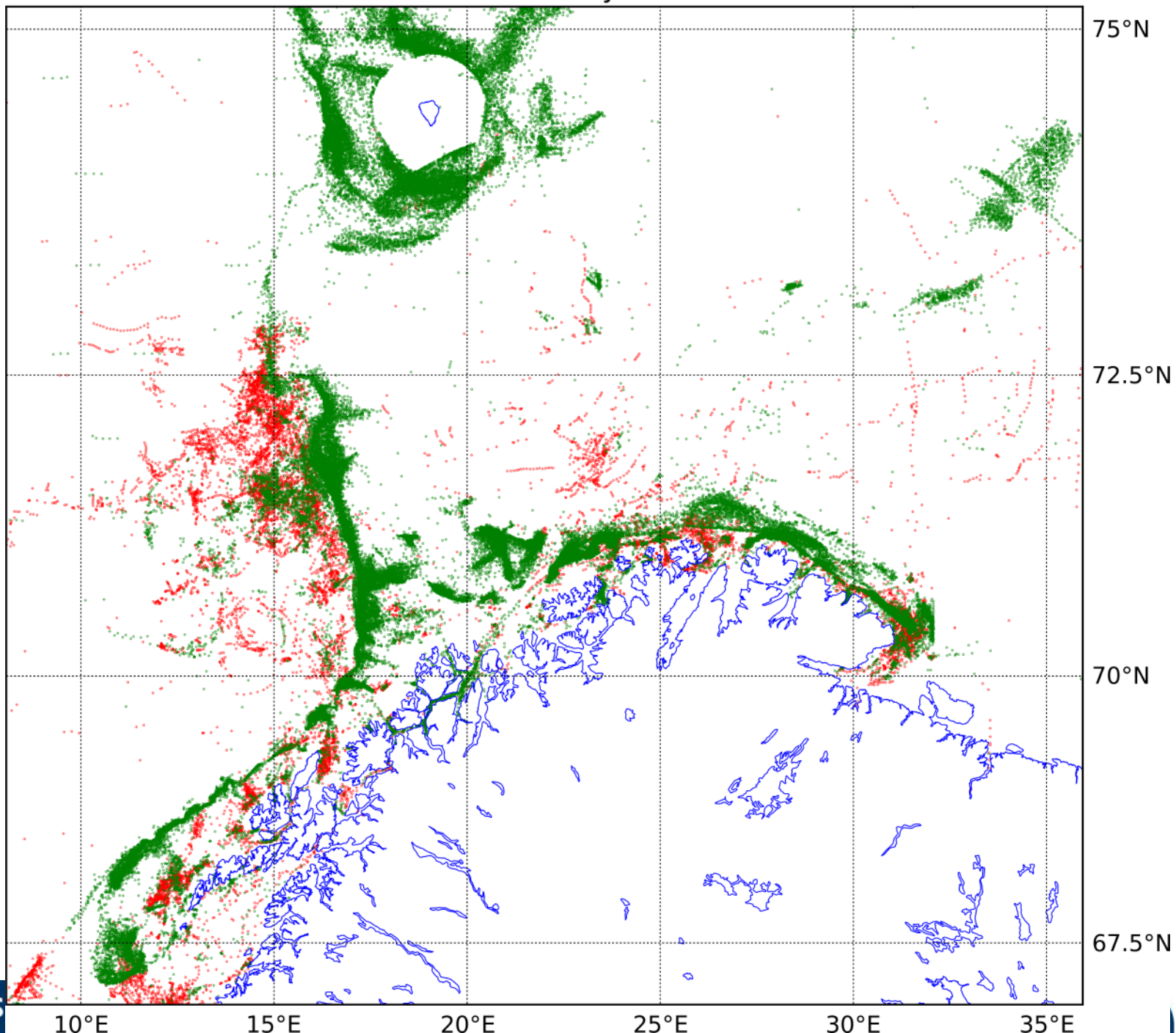
Fisheries activity: 2007



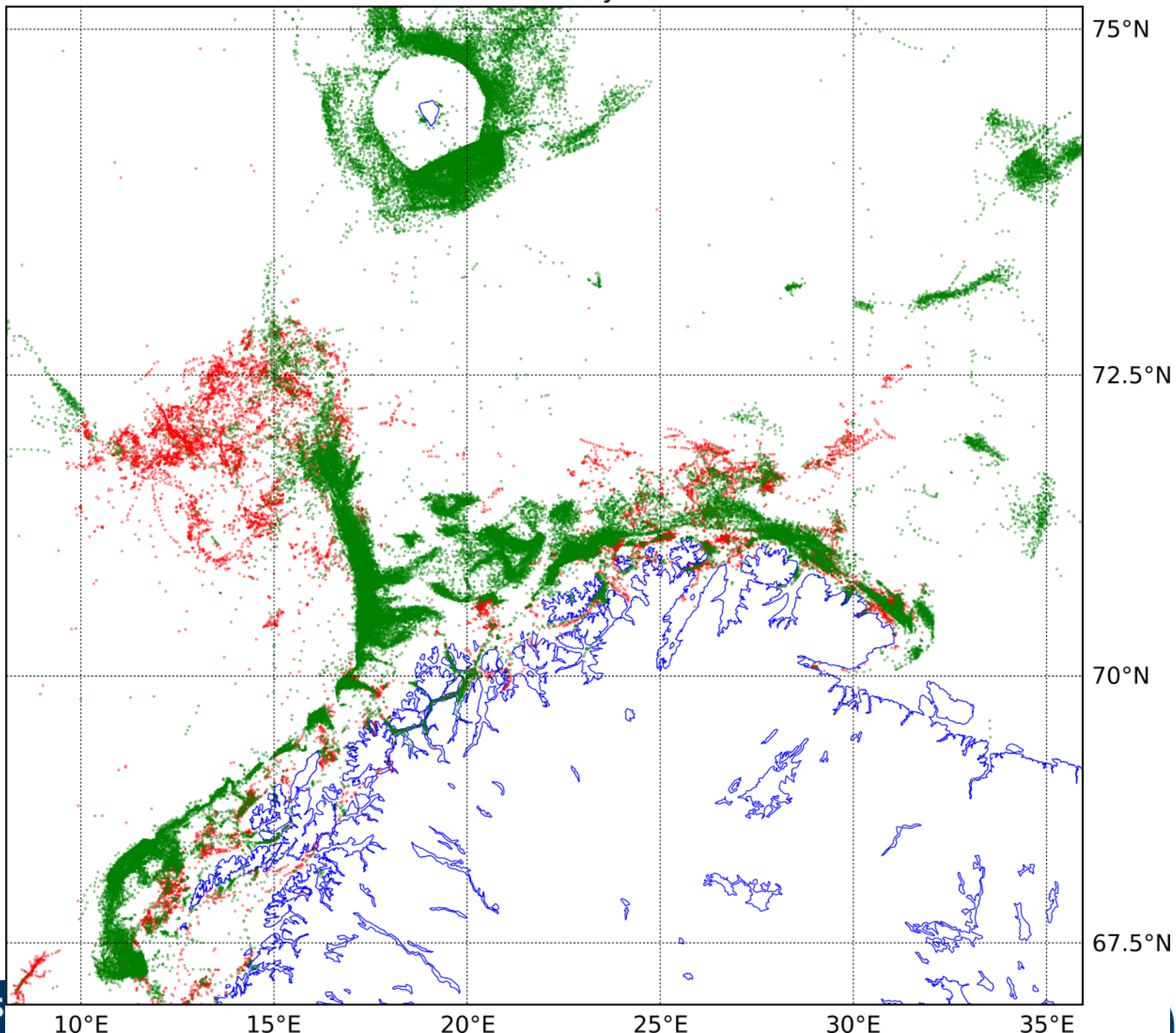
Fisheries activity: 2008



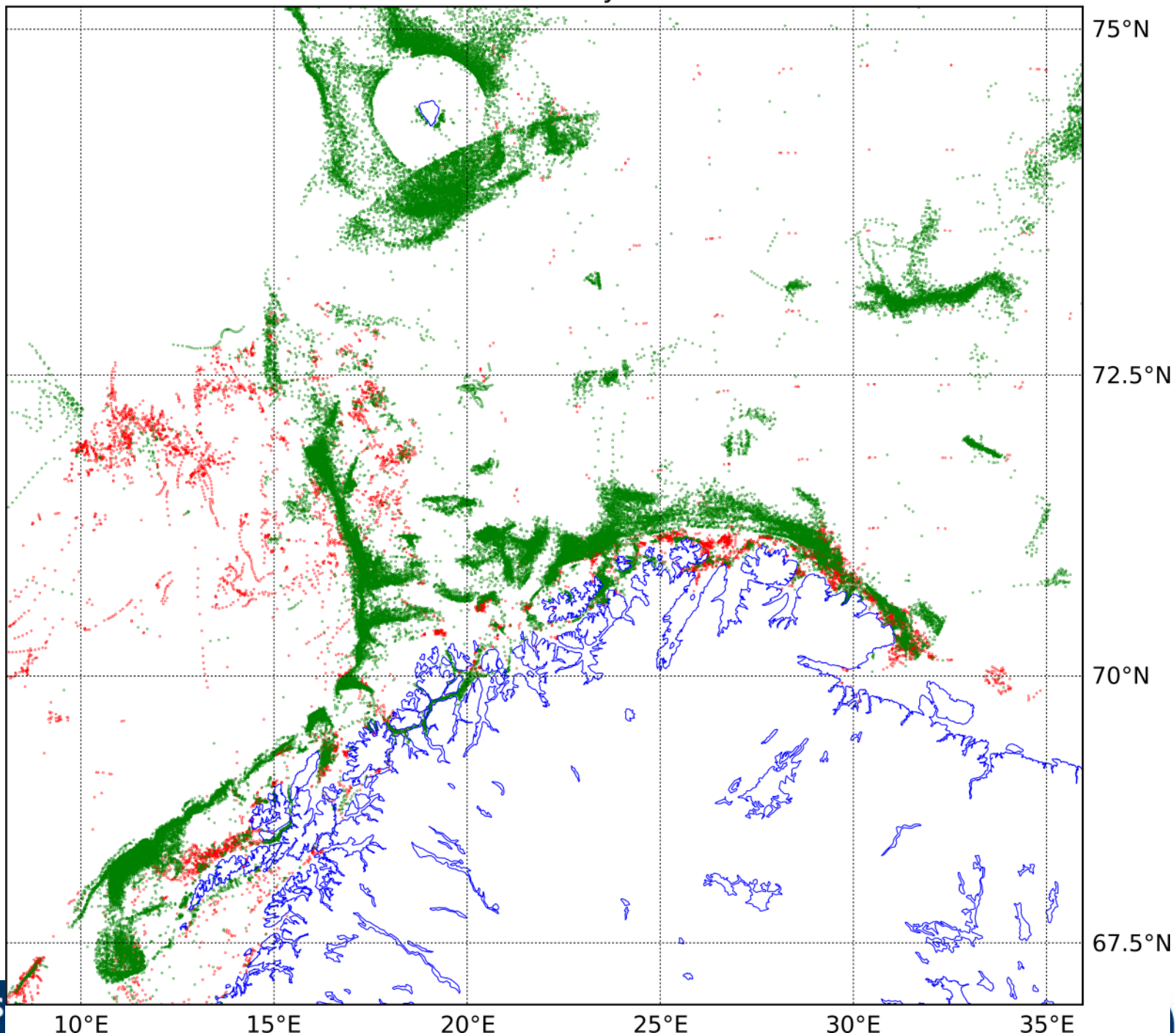
Fisheries activity: 2009



Fisheries activity: 2010

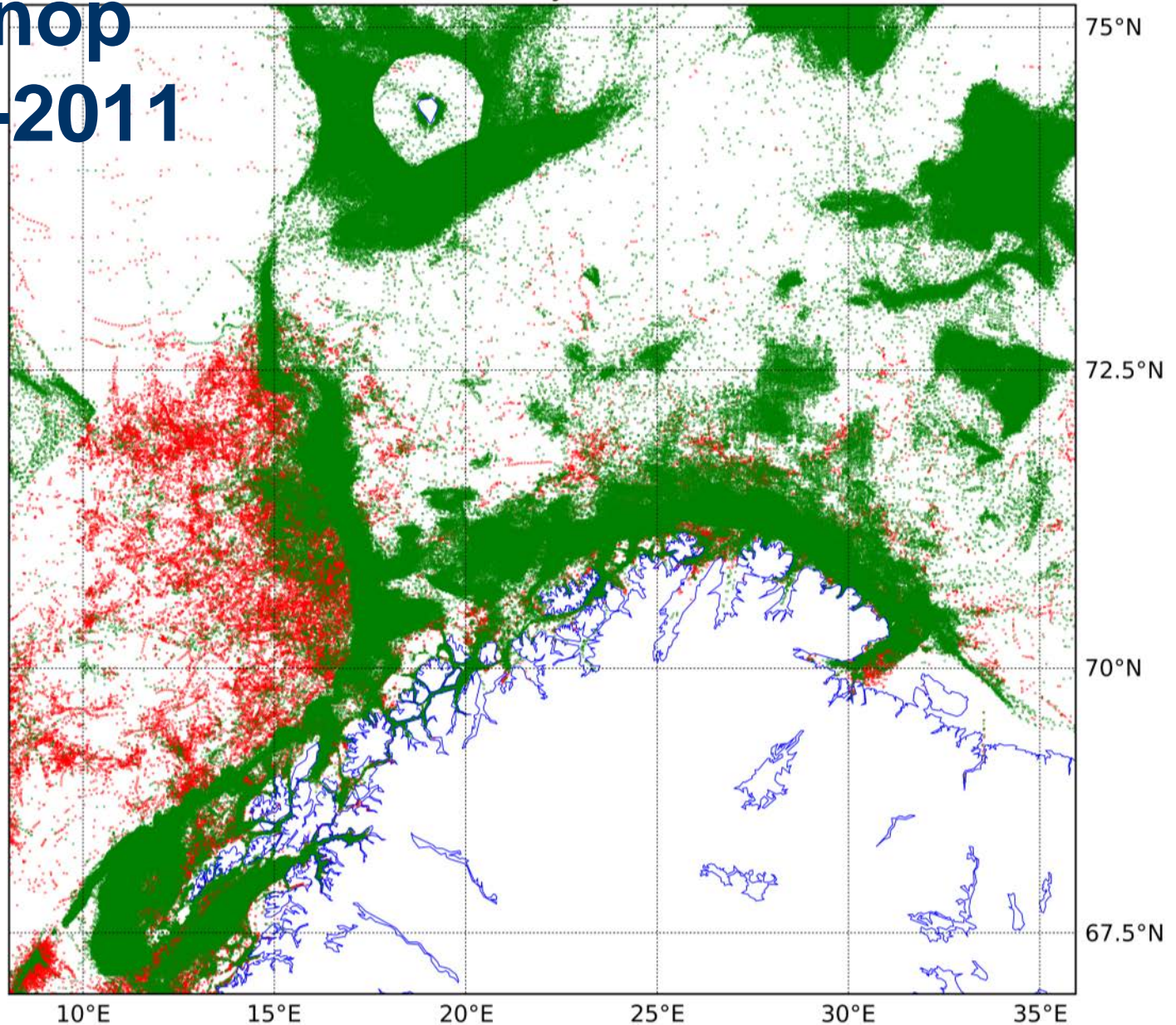


Fisheries activity: 2011



Fisheries activity: 2002 - 2011

< 5 knop
2002-2011



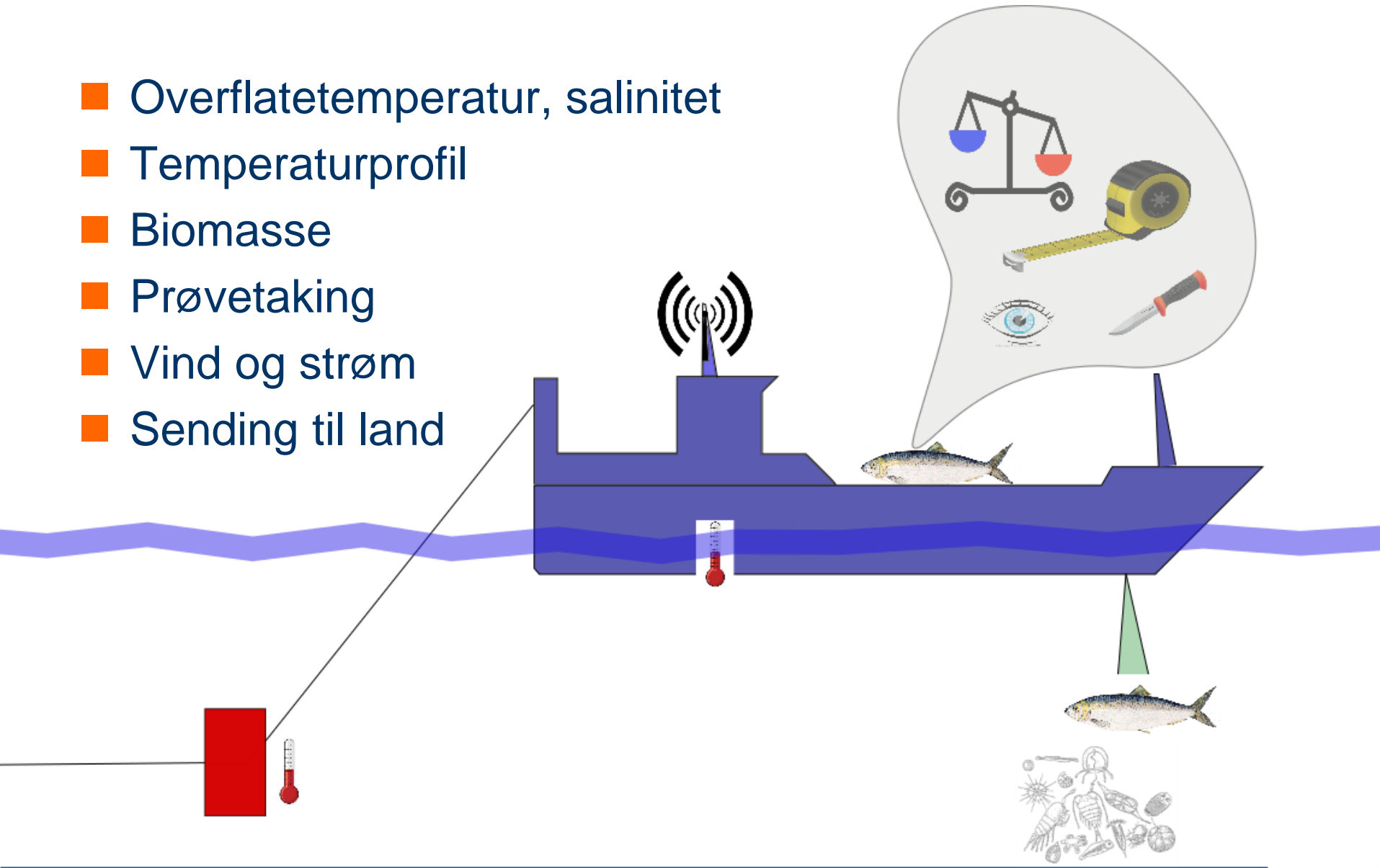
Fiskefartøy "over alt"

MEN

- Ujevn fordeling
- Varierer med år
- Varierer med sesong

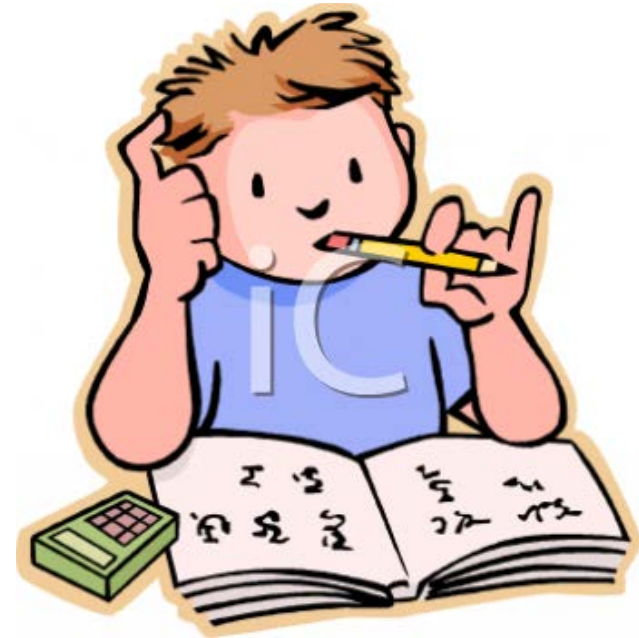
Fiskefartøy som datakilde

- Overflatetemperatur, salinitet
- Temperaturprofil
- Biomasse
- Prøvetaking
- Vind og strøm
- Sending til land

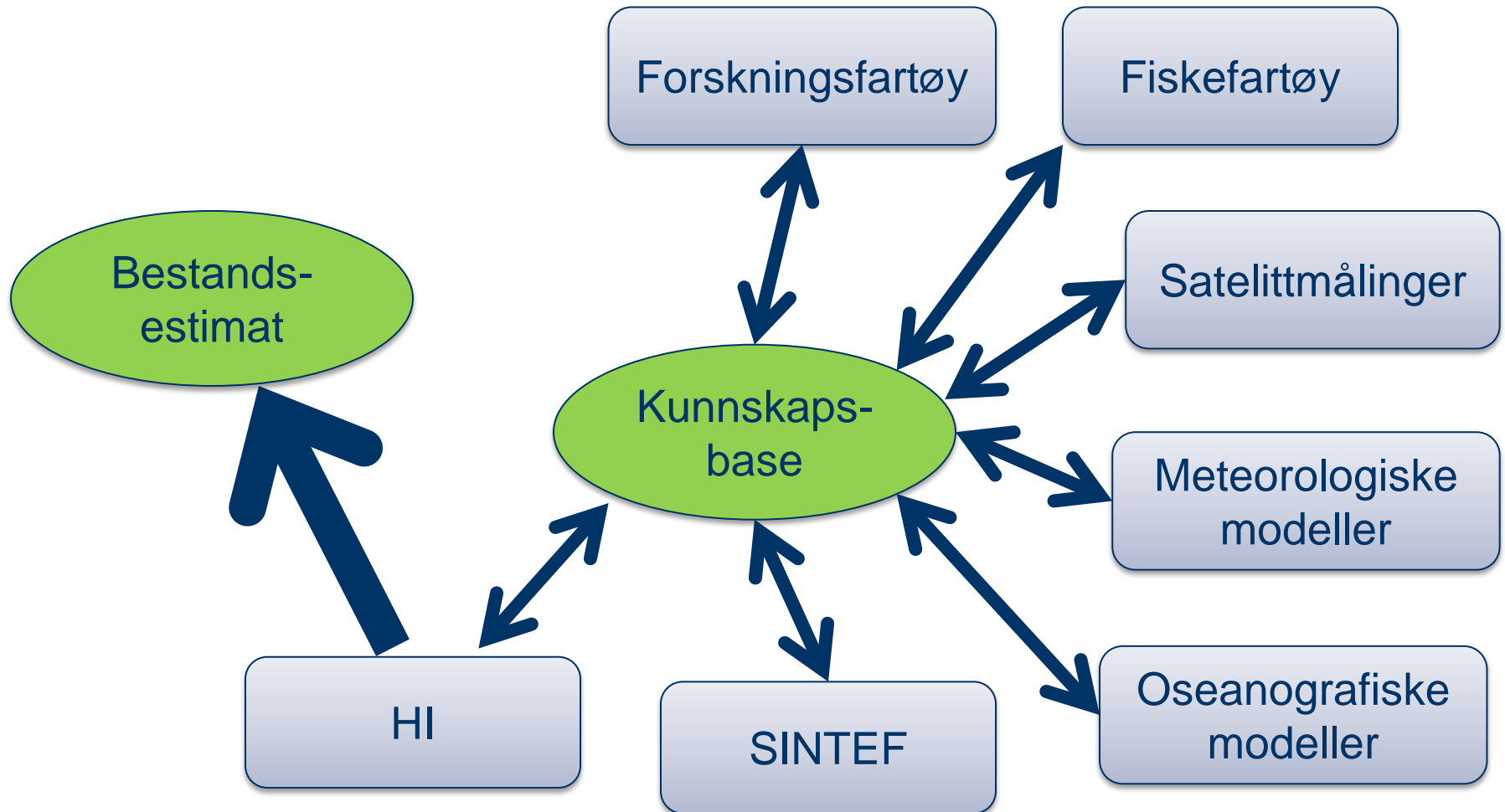


Utfordringer

- Kalibrering
- Behandling av data ombord
- Overføring av data til land
- "Datavasking"
- Integrasjon med bestandsmodeller
- Kostnader per fartøy
- Tillit
- Samvirke mellom bestand, vandringsmønster og hvor fartøyene går.

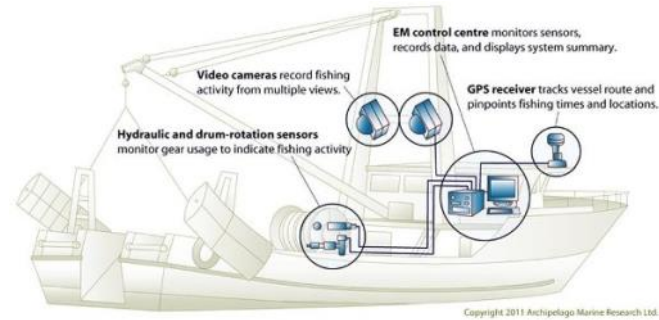


Informasjonsflyt



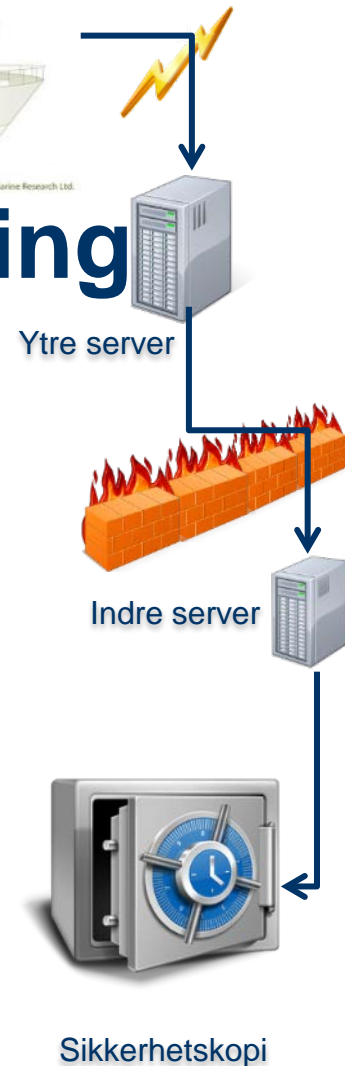
SINTEF's mulige bidrag

- Datainnsamling og databehandling
- Modellering av vandringsmønster og romlig fordeling
- Automatisert prøvetaking

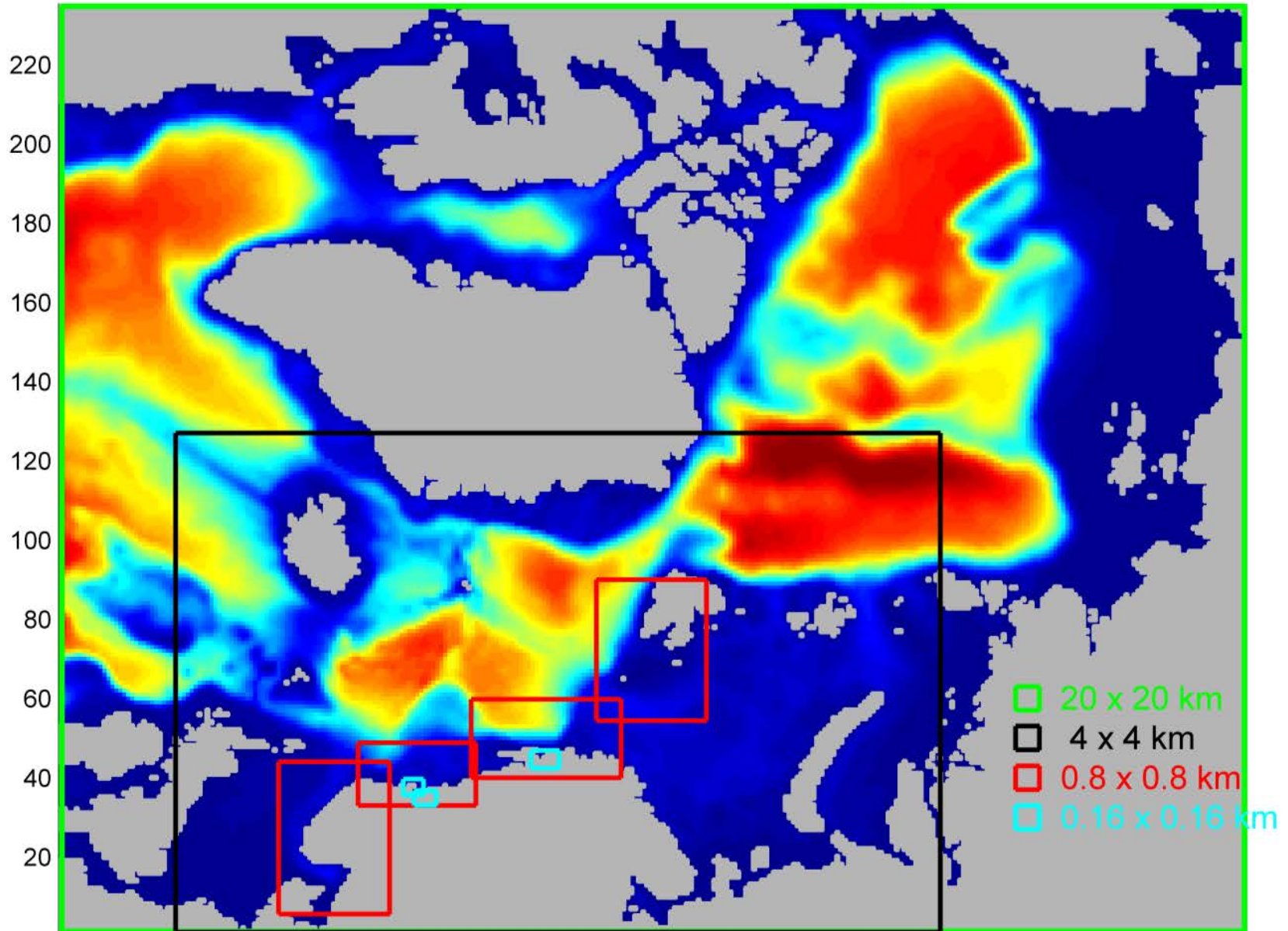


Datainnsamling og databehandling

- System utviklet ved SINTEF
- Samler sensor- og måledata fra ulike kilder
- Effektiv innsamling av store datamengder
- Overføring til servere på land
- Benyttes av prosjektene Improvedo, Danteq, PurSense, SFI Move, EcoShrimp, eSushi, Hybrid sjark
- SINTEF Marine Datasenter for lagring og analyse, basert på "Big Data".



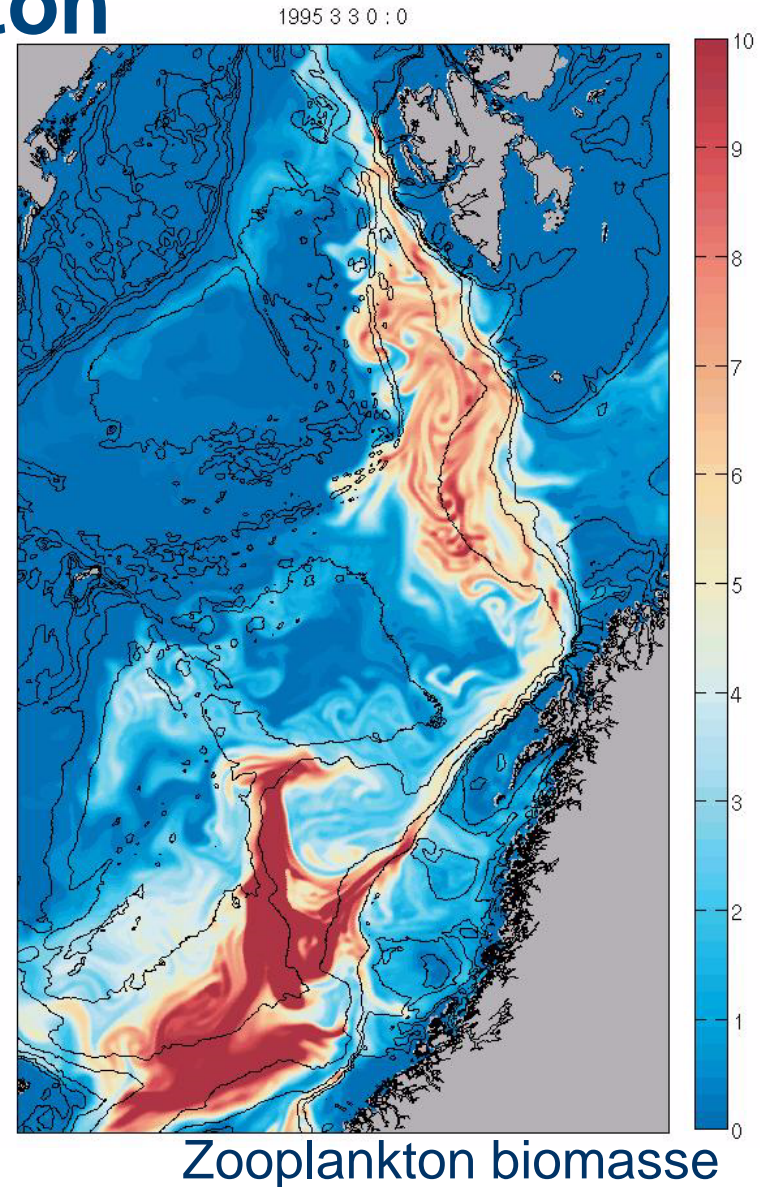
Modellering av havmiljøet - SinMod



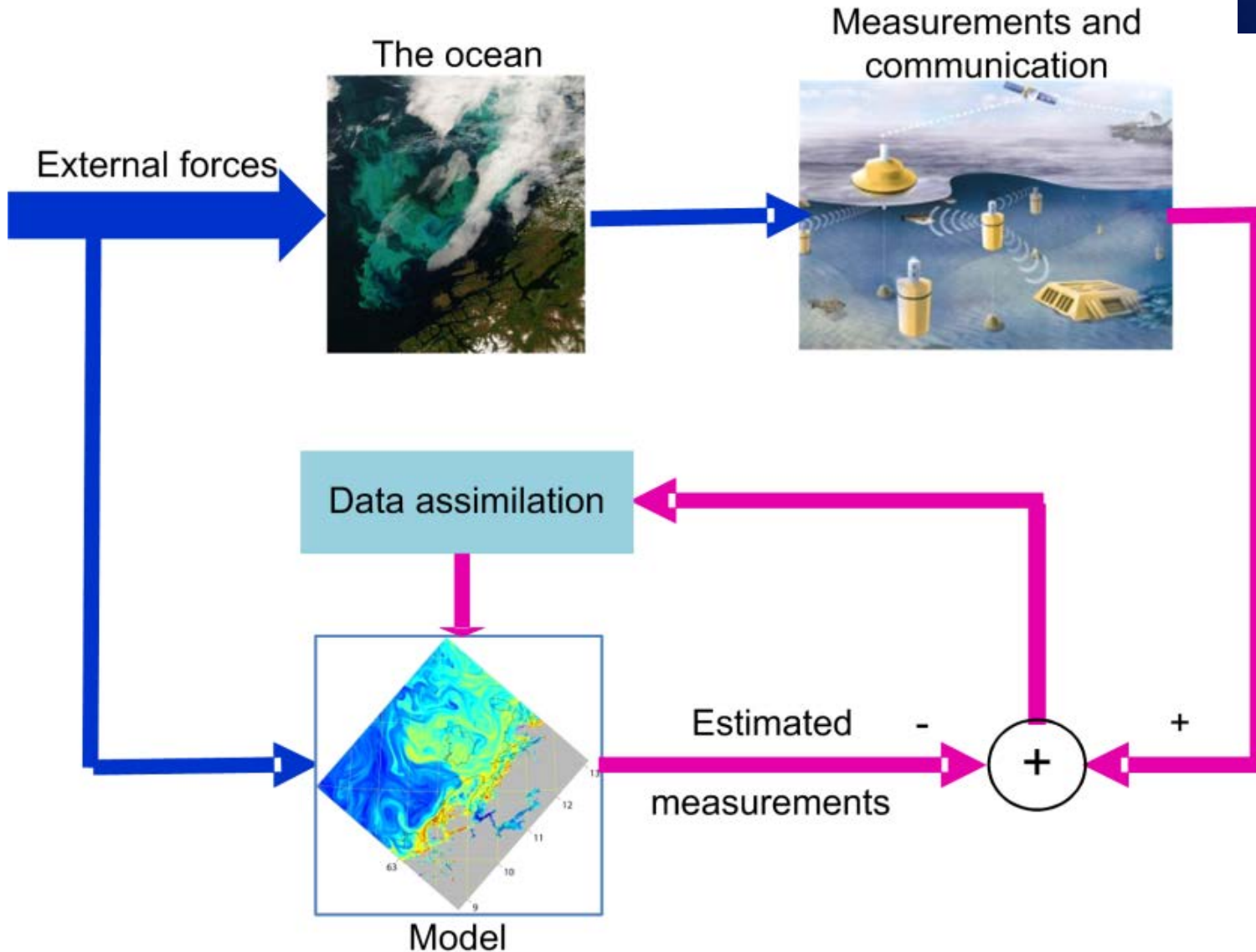
Fordeling av zooplankton

Modeller for havstrømmer, temperatur og plankton har stadig blitt forbedret (ikke minst takket være økning i datakraft).

Gode modeller for fiskebestander (vekst og utbredelse) er komplisert.



Tilstandsestimering



Automatisk prøvetaking med maskinsyn

SINTEF Foodscanner

Vektestimater:

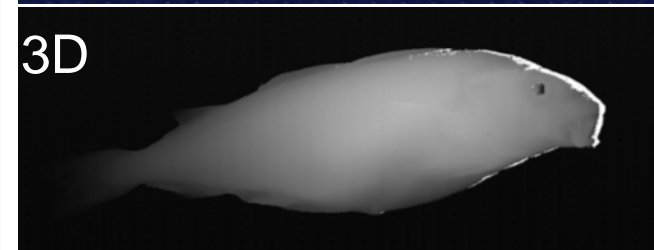
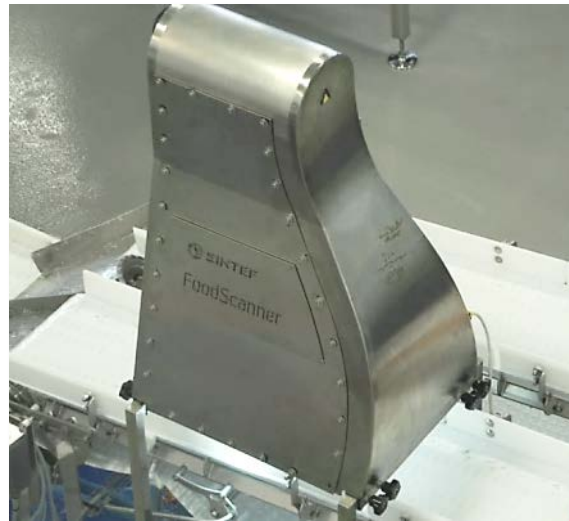
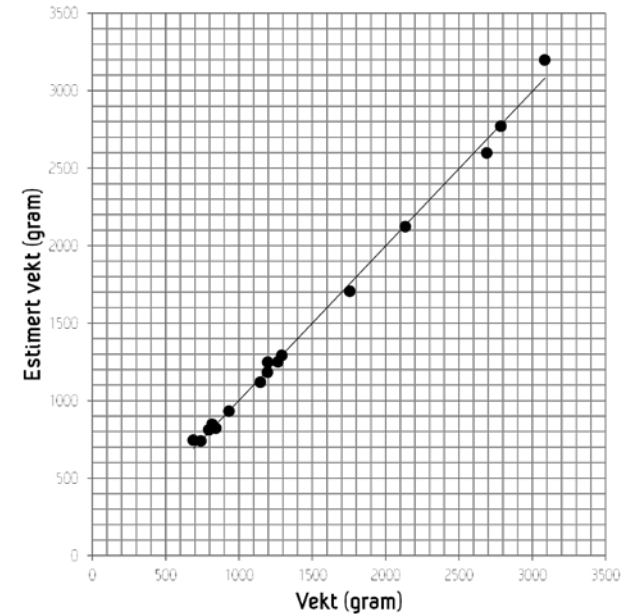
Gjennomsnittlig feil 32 gram (2.3%).

Artsbestemmelse:

Torsk-hyse: 100% riktig

Videreføring:

Melbu Systems



Veien videre

■ Finansiering:

- FHF forprosjekt for å vurdere mulighetene, ledet av HI
- SINTEF satser egne midler innen "Big Data" og skalerbarhet
- Det fins aktuelle utlysninger innen EU

■ Kort sikt:

- Demonstrere dataflyt fra fartøy til forskning
- Sjøvannstemperatur
- Biomassemåling

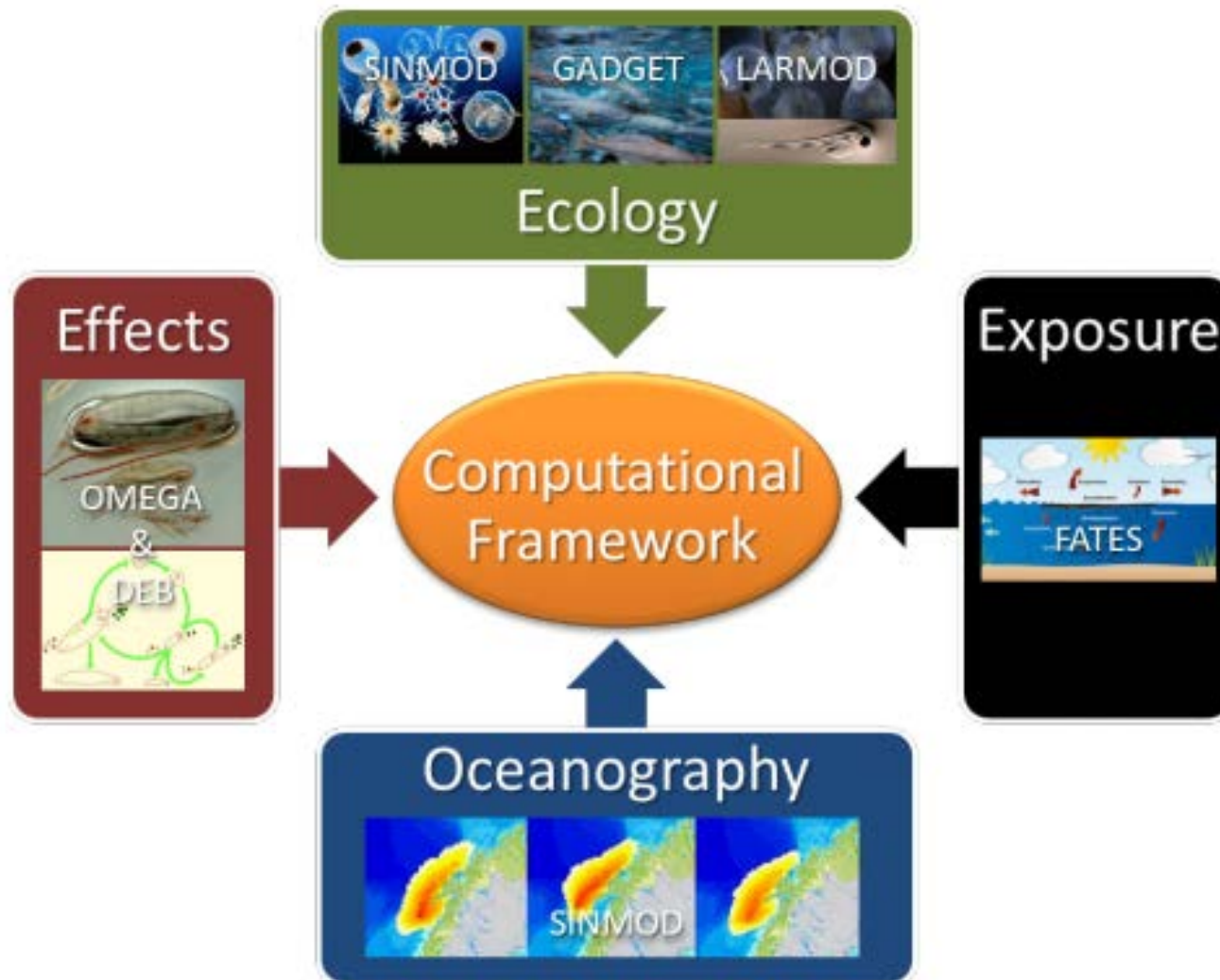
■ Lenger sikt:

- Metodeutvikling
- Masseinstallasjon i fartøy
- Oppbygging av historiske data

Oppsummering

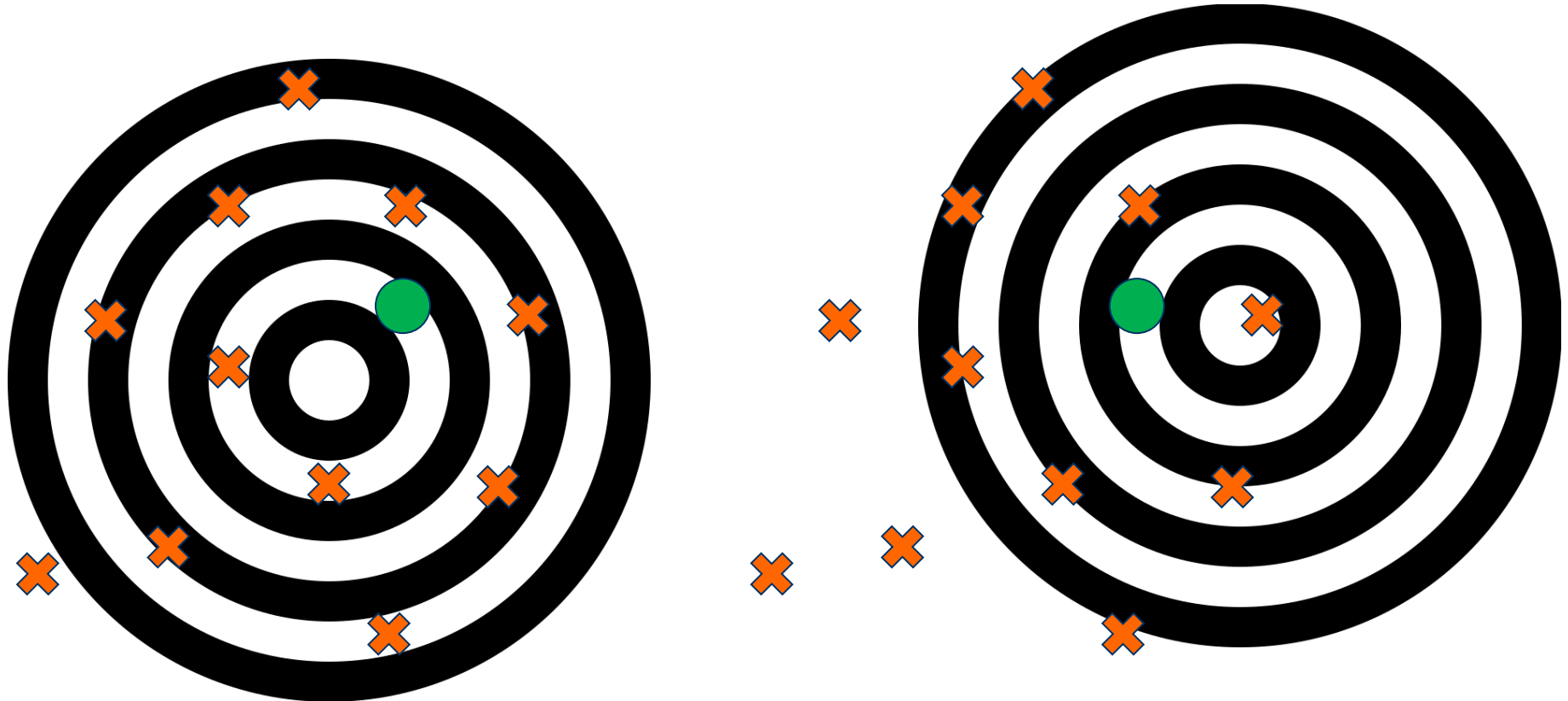
- Fiskeflåten kan gi bedre dekning av havområdene
- Et stort antall fartøy kan kompensere for unøyaktige målinger
- Det er konkret arbeid på gang

Bestandsmodellering

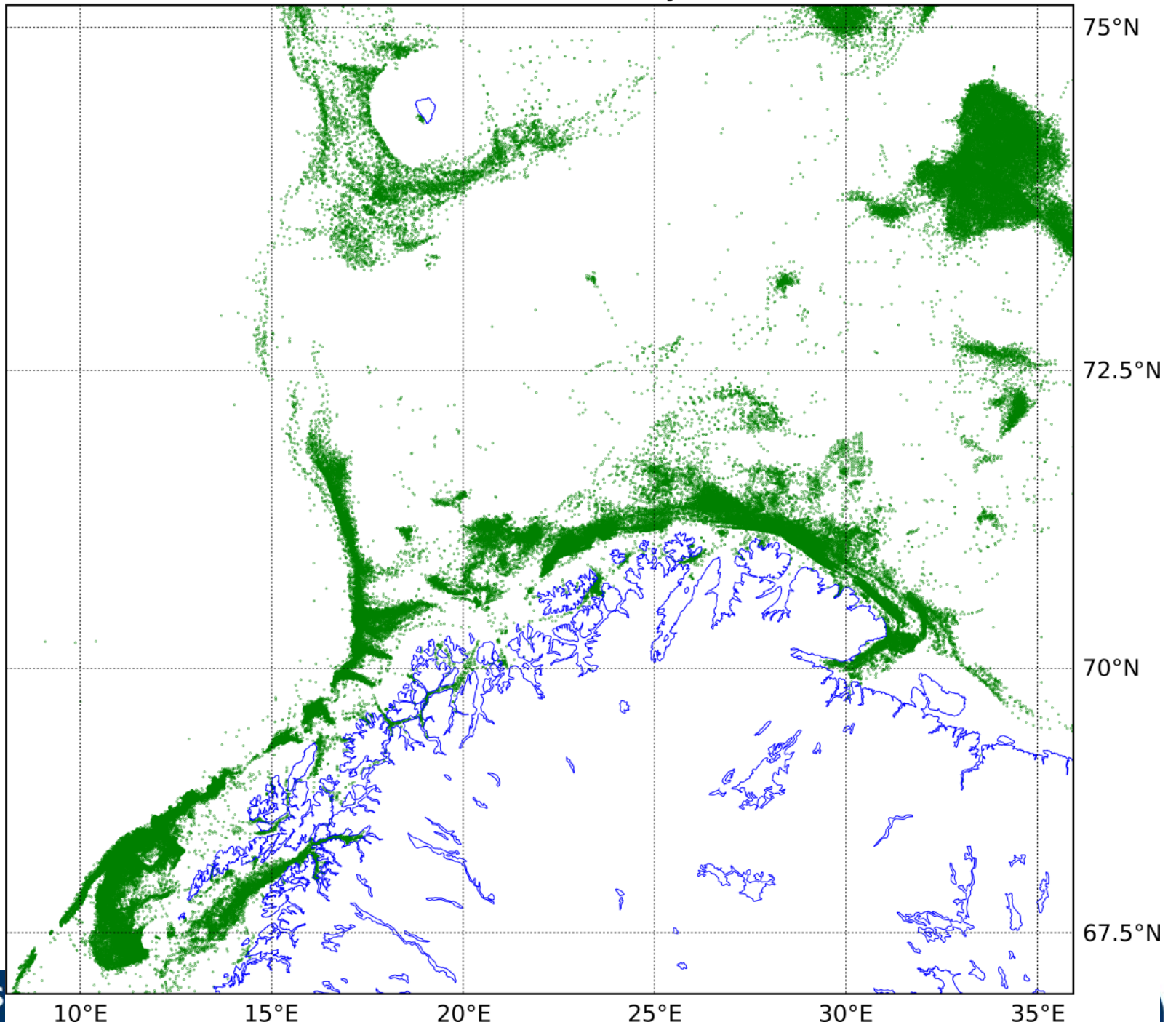


Hvordan utnytte dette?

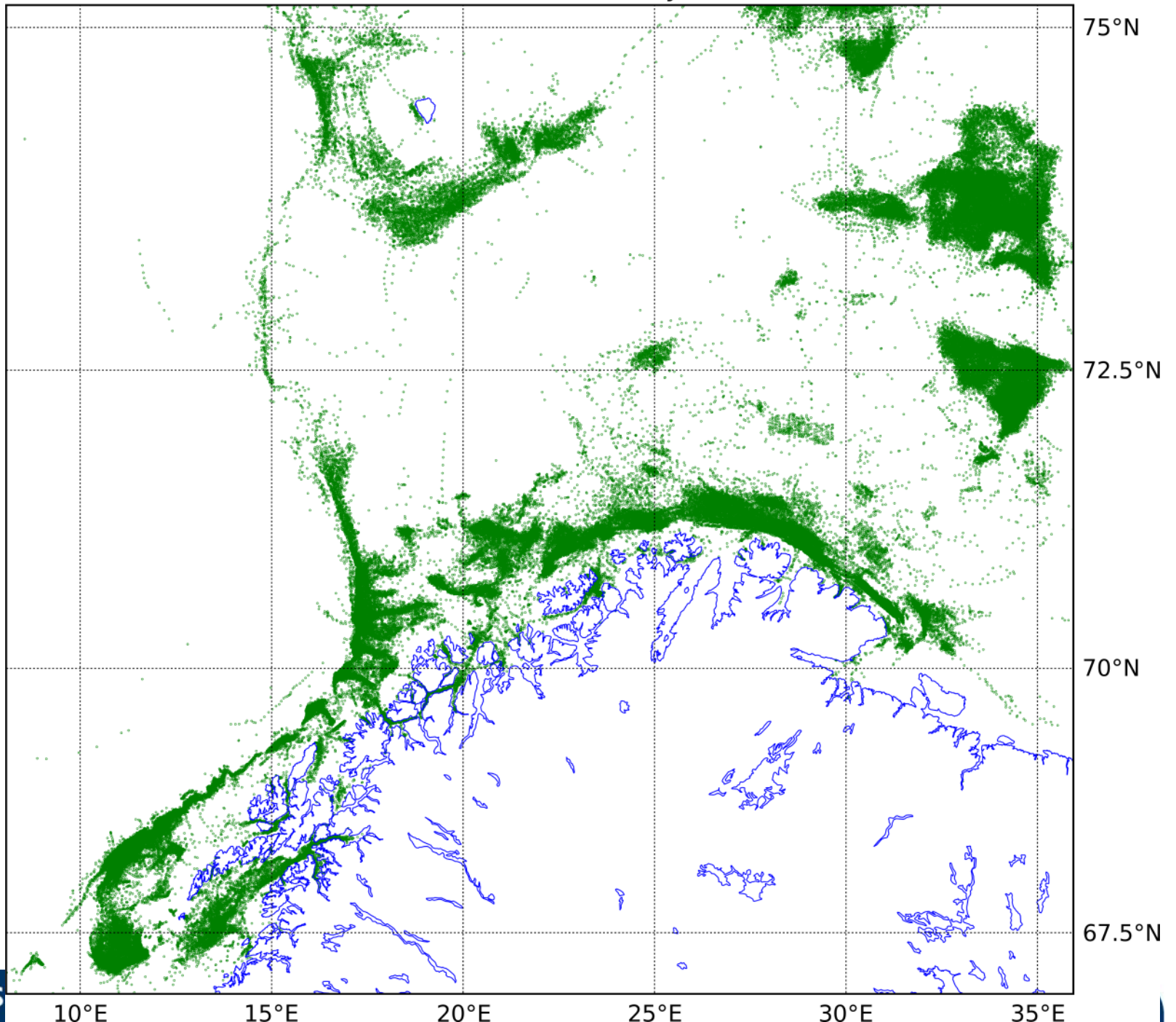
- Optimalisere kostnad vs nytte
- Mange billige "datainnsamlere" eller få dyre?



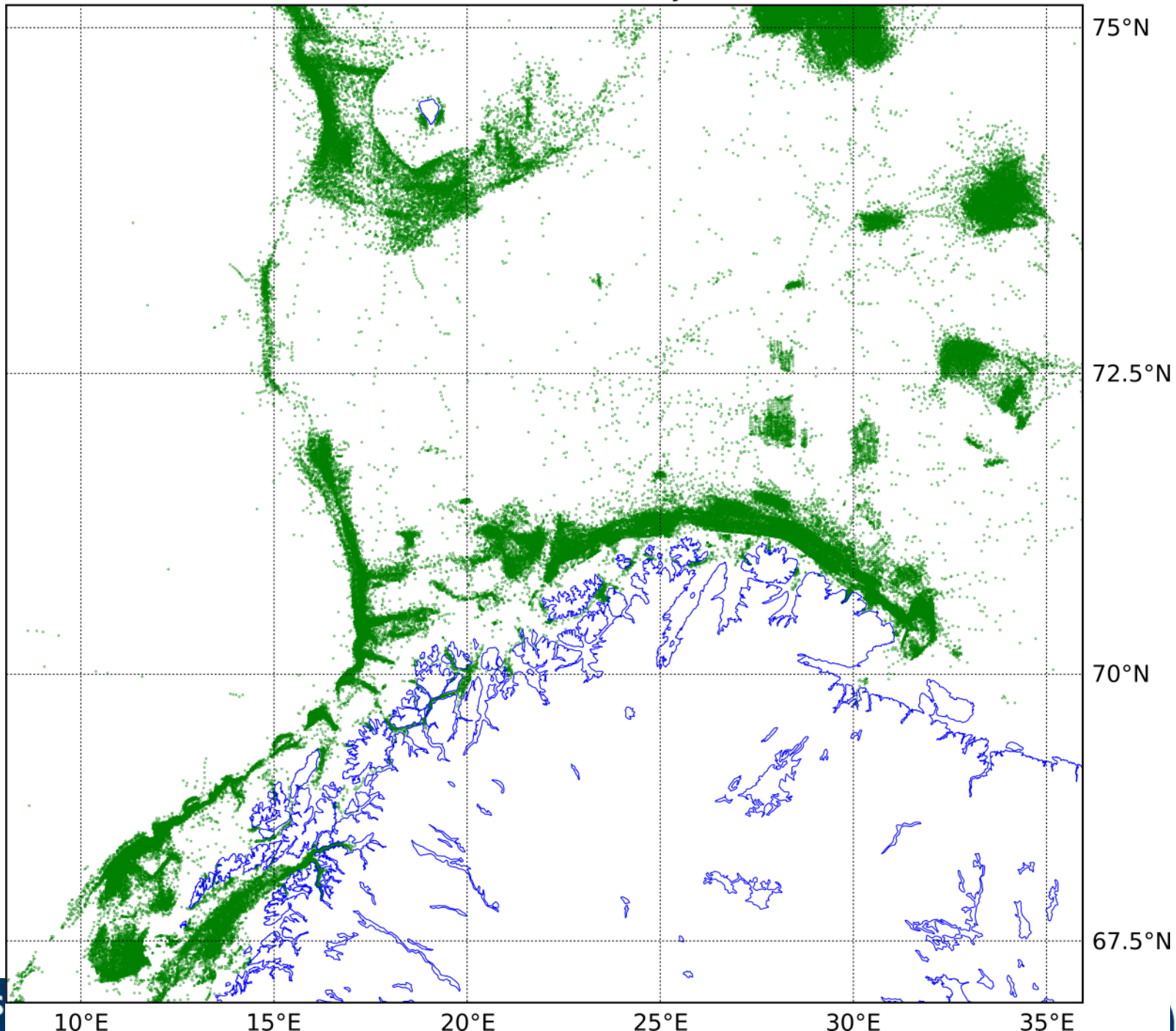
Demersal fisheries activity: 2002



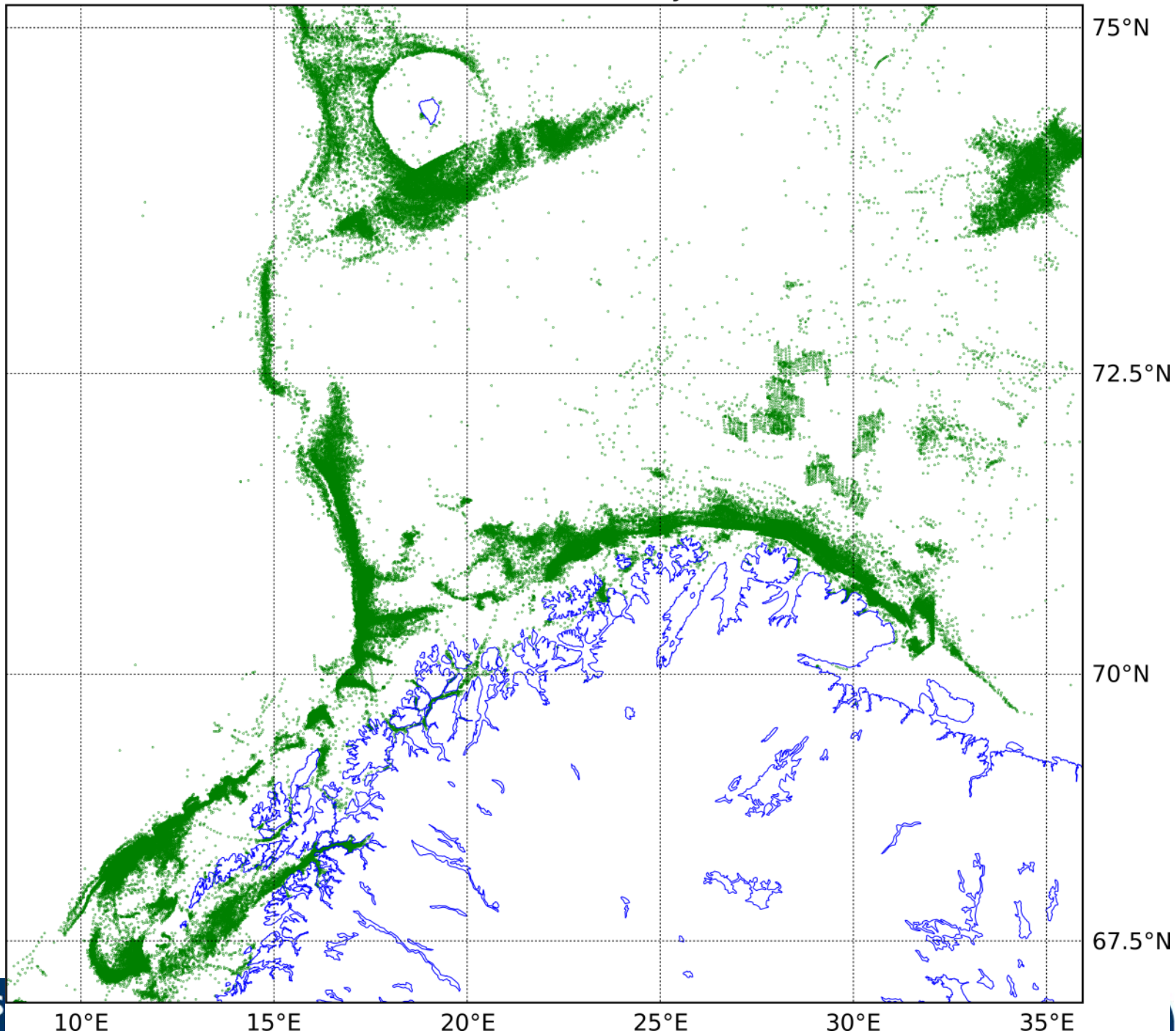
Demersal fisheries activity: 2003



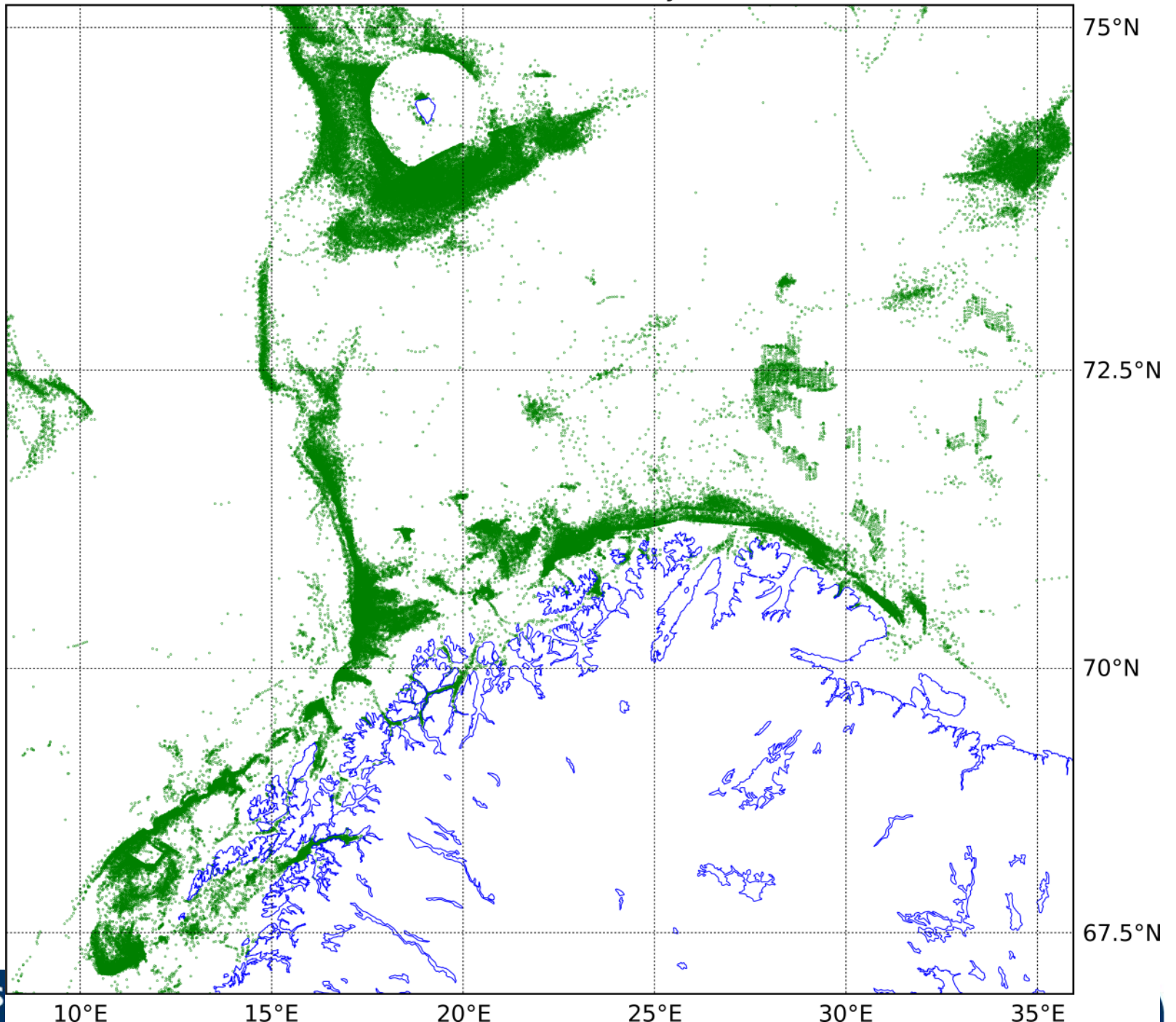
Demersal fisheries activity: 2004



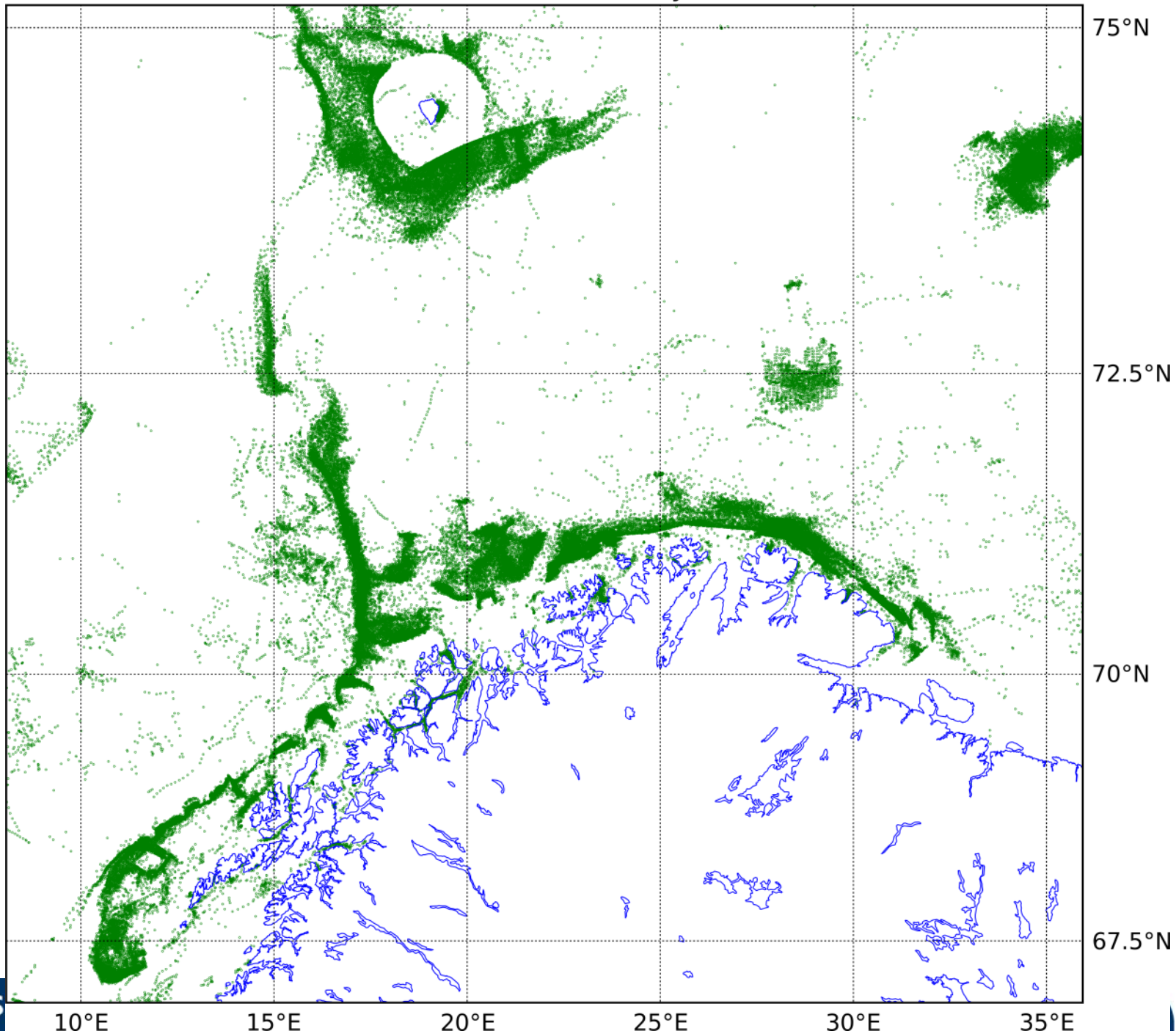
Demersal fisheries activity: 2005



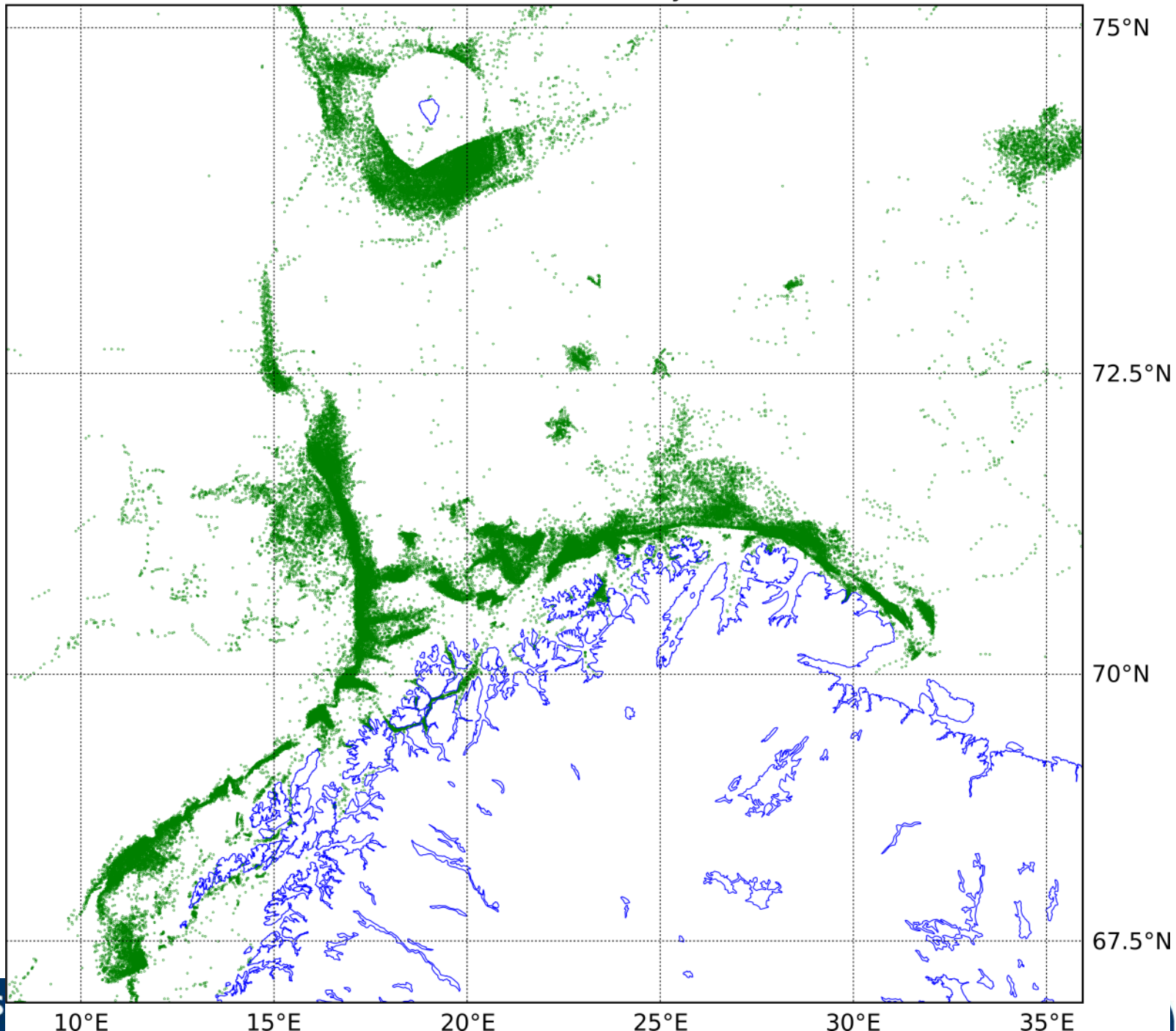
Demersal fisheries activity: 2006



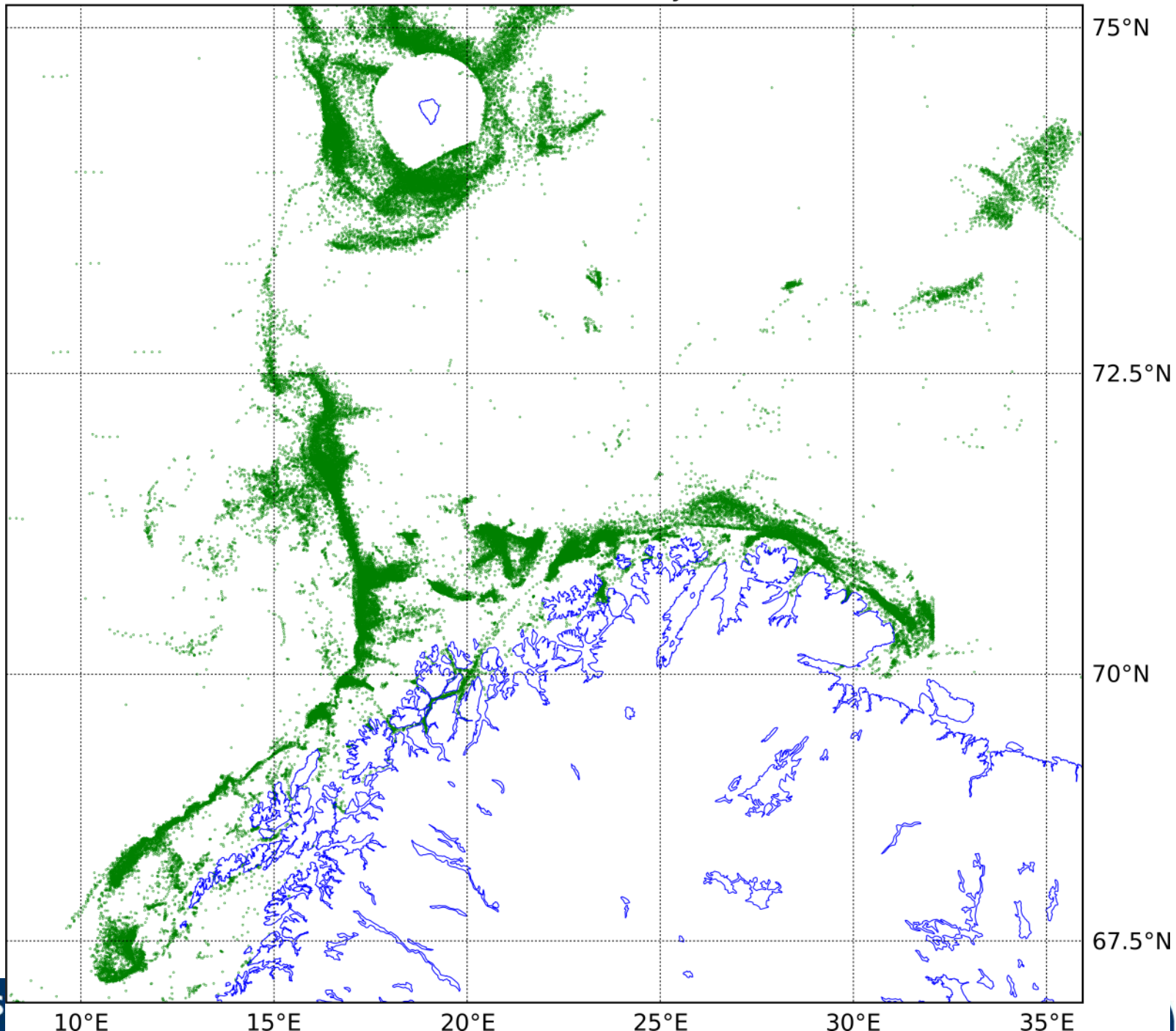
Demersal fisheries activity: 2007



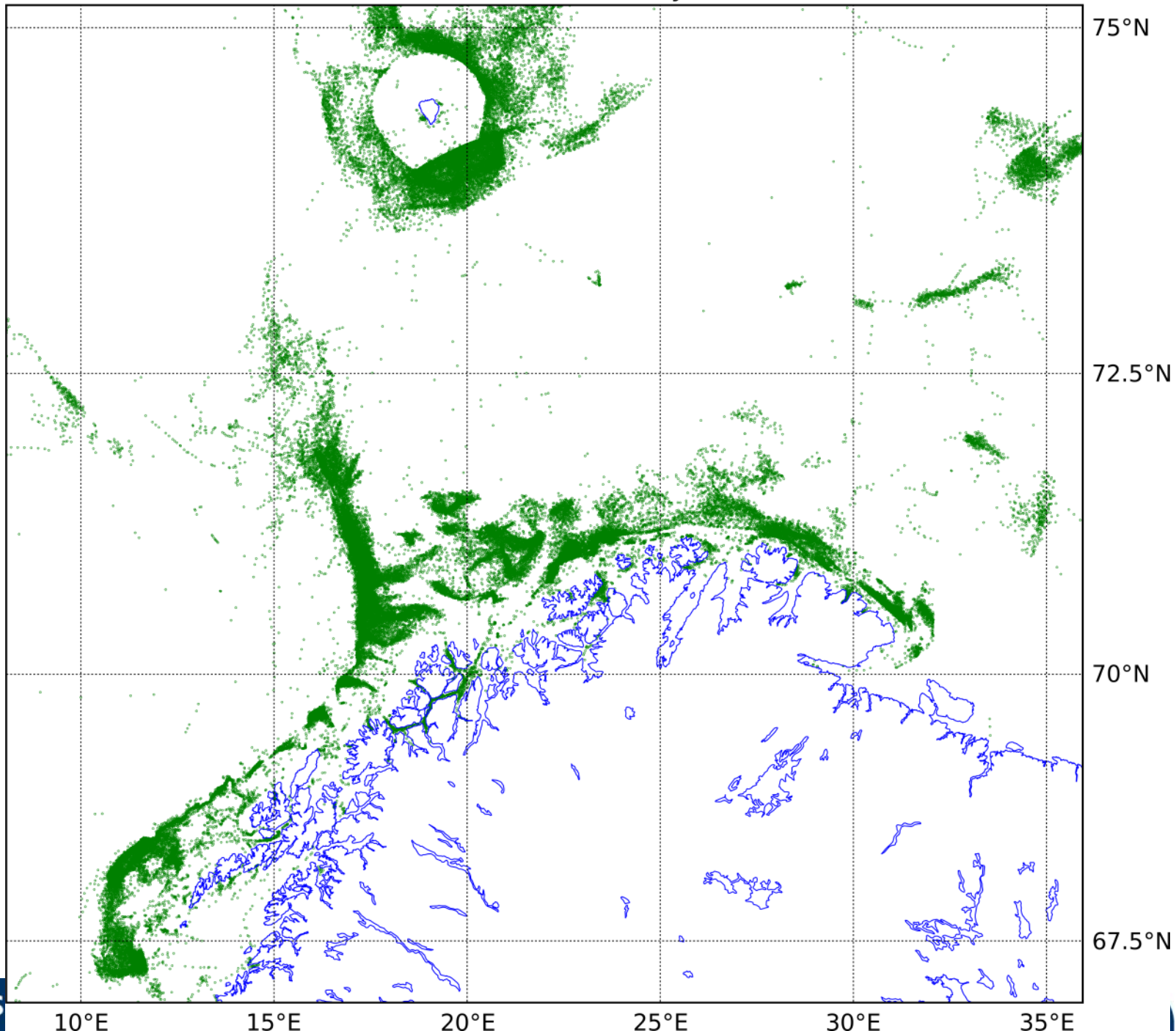
Demersal fisheries activity: 2008



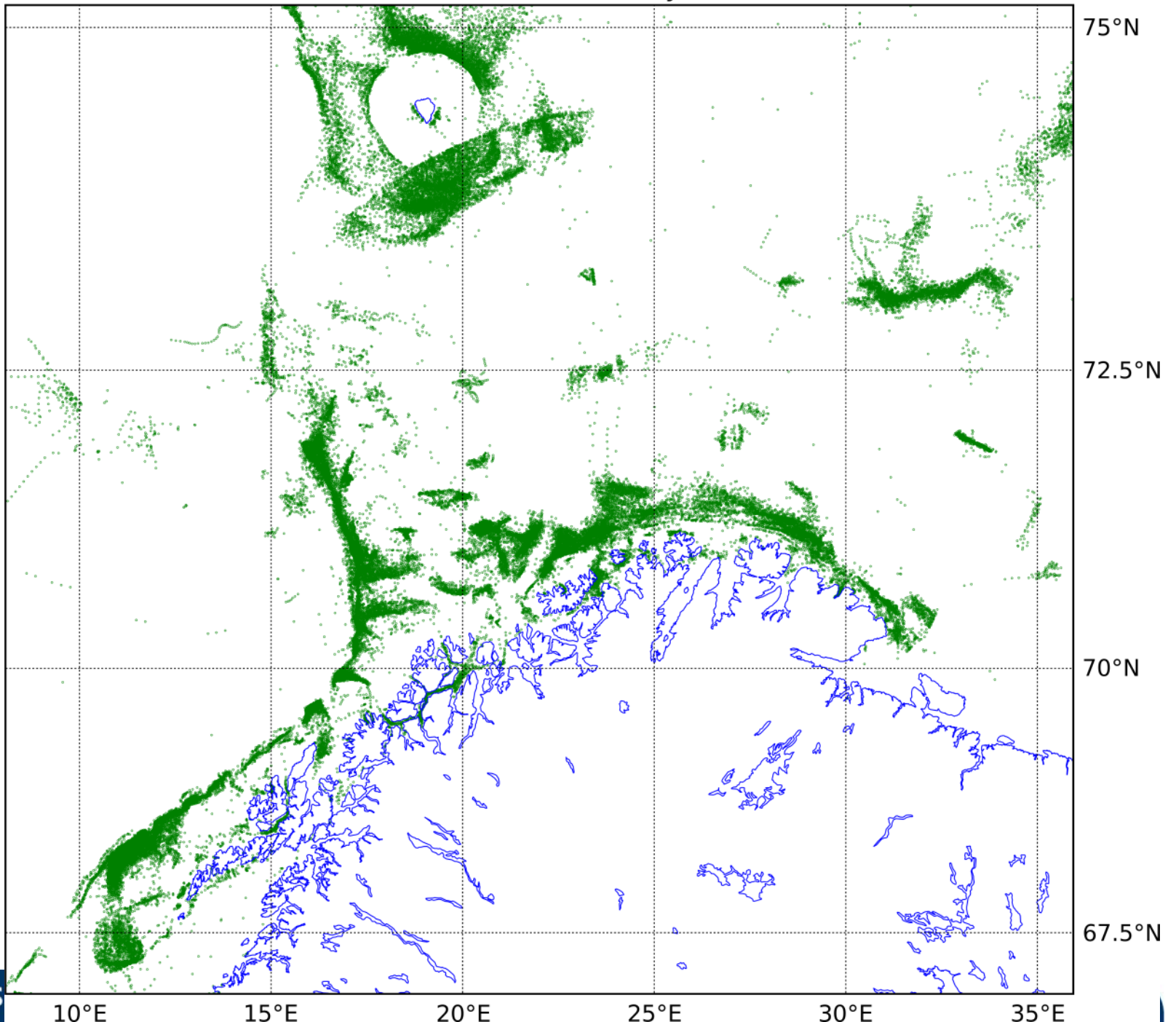
Demersal fisheries activity: 2009



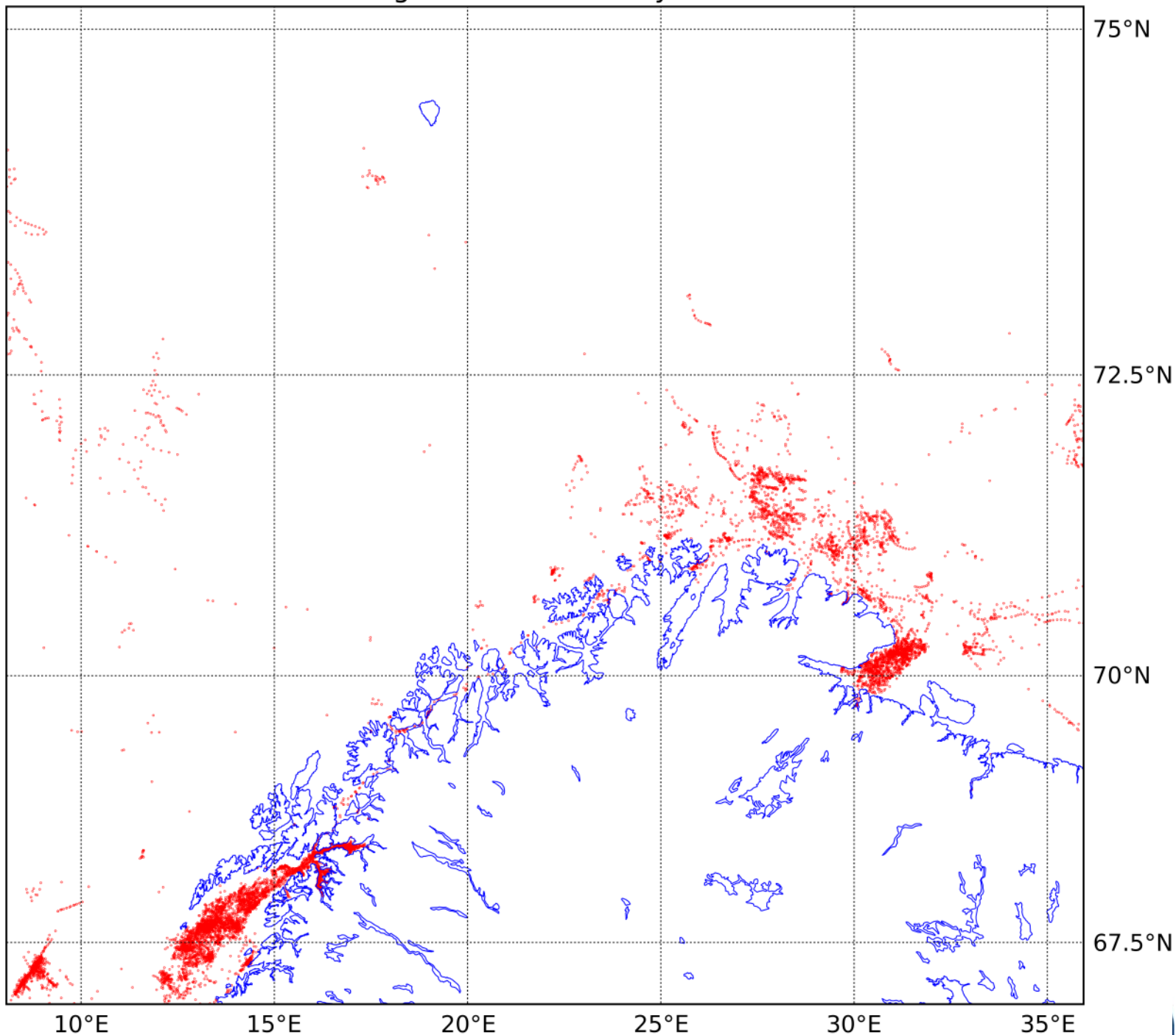
Demersal fisheries activity: 2010



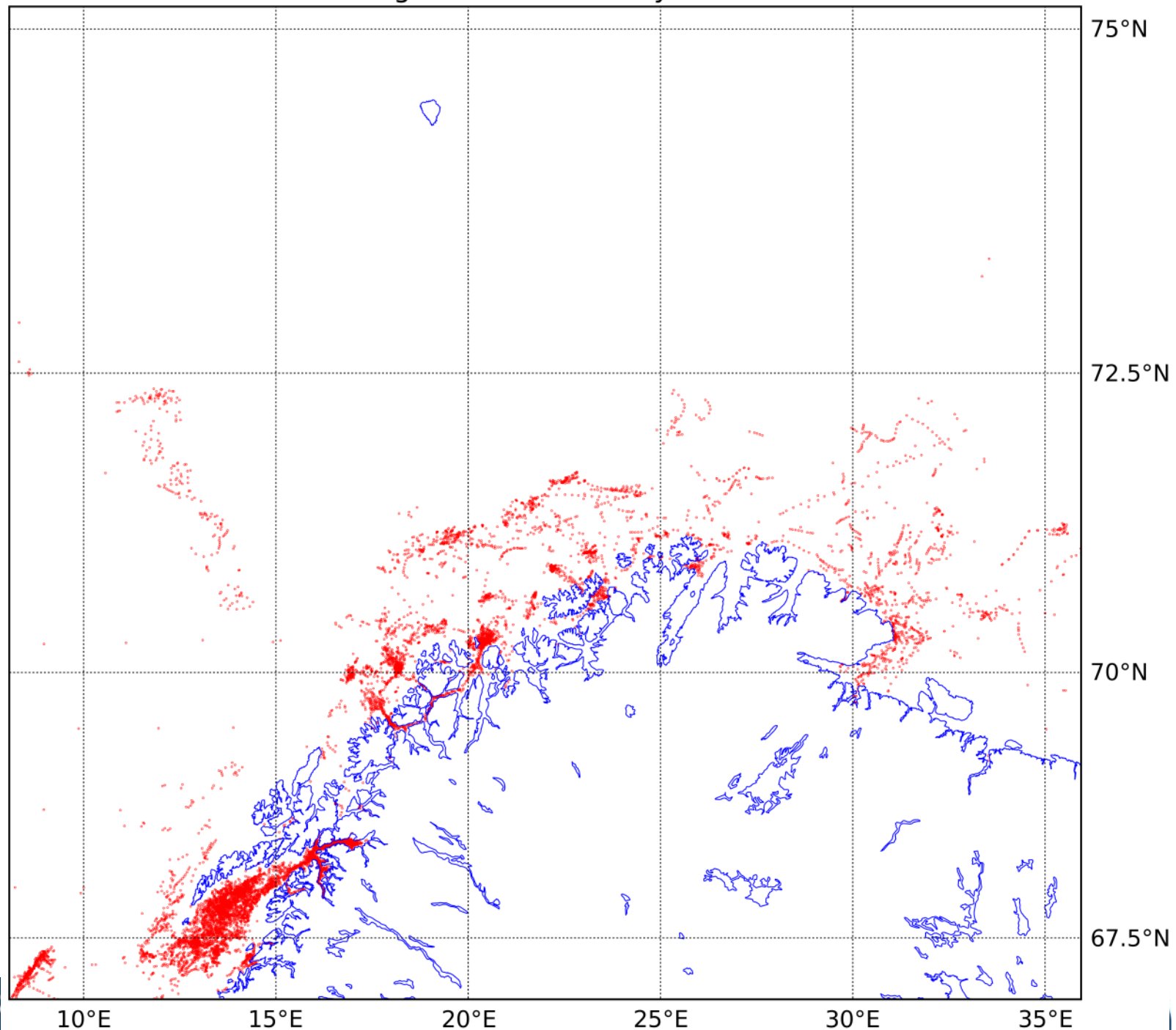
Demersal fisheries activity: 2011



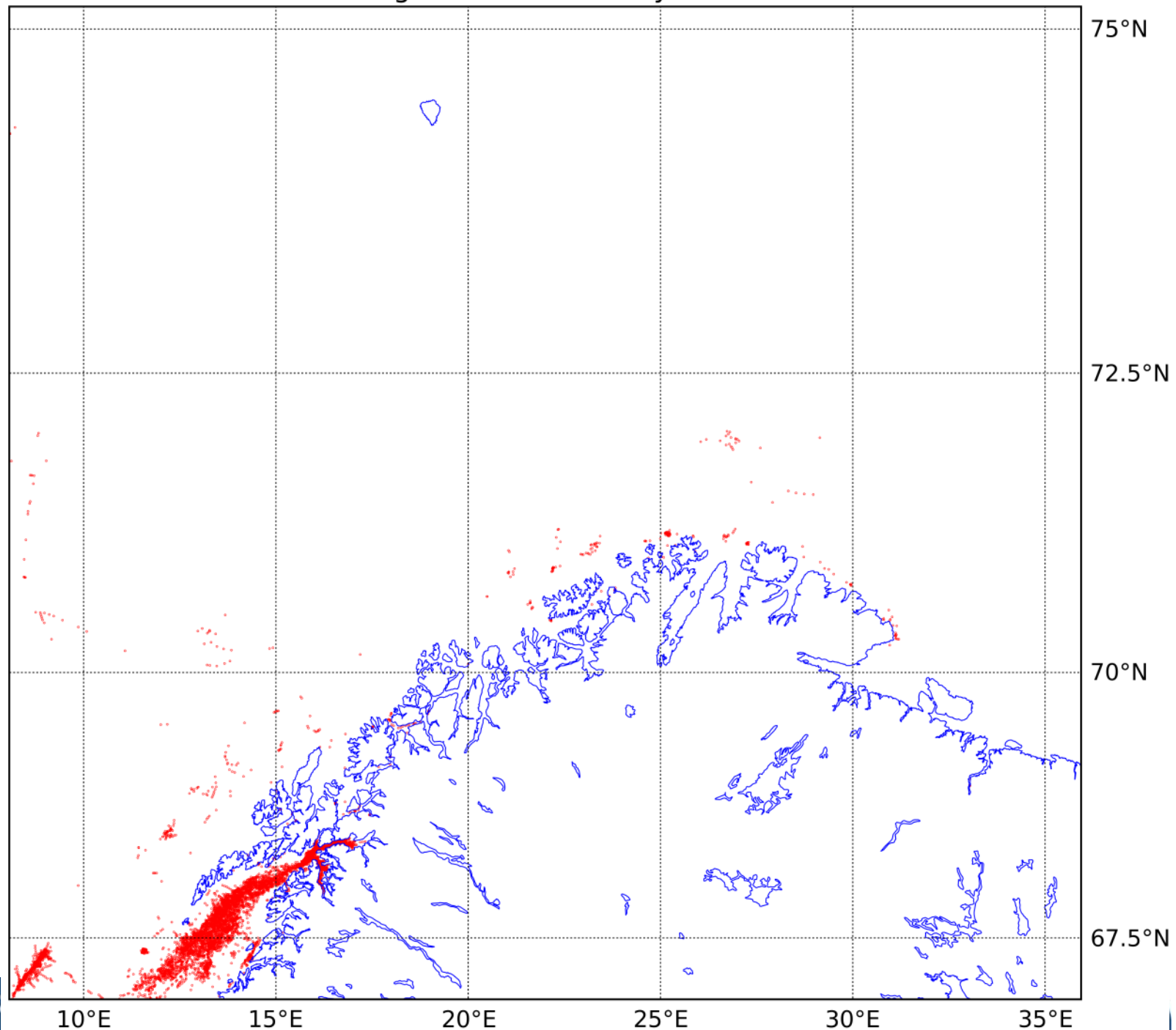
Pelagic fisheries activity: 2002



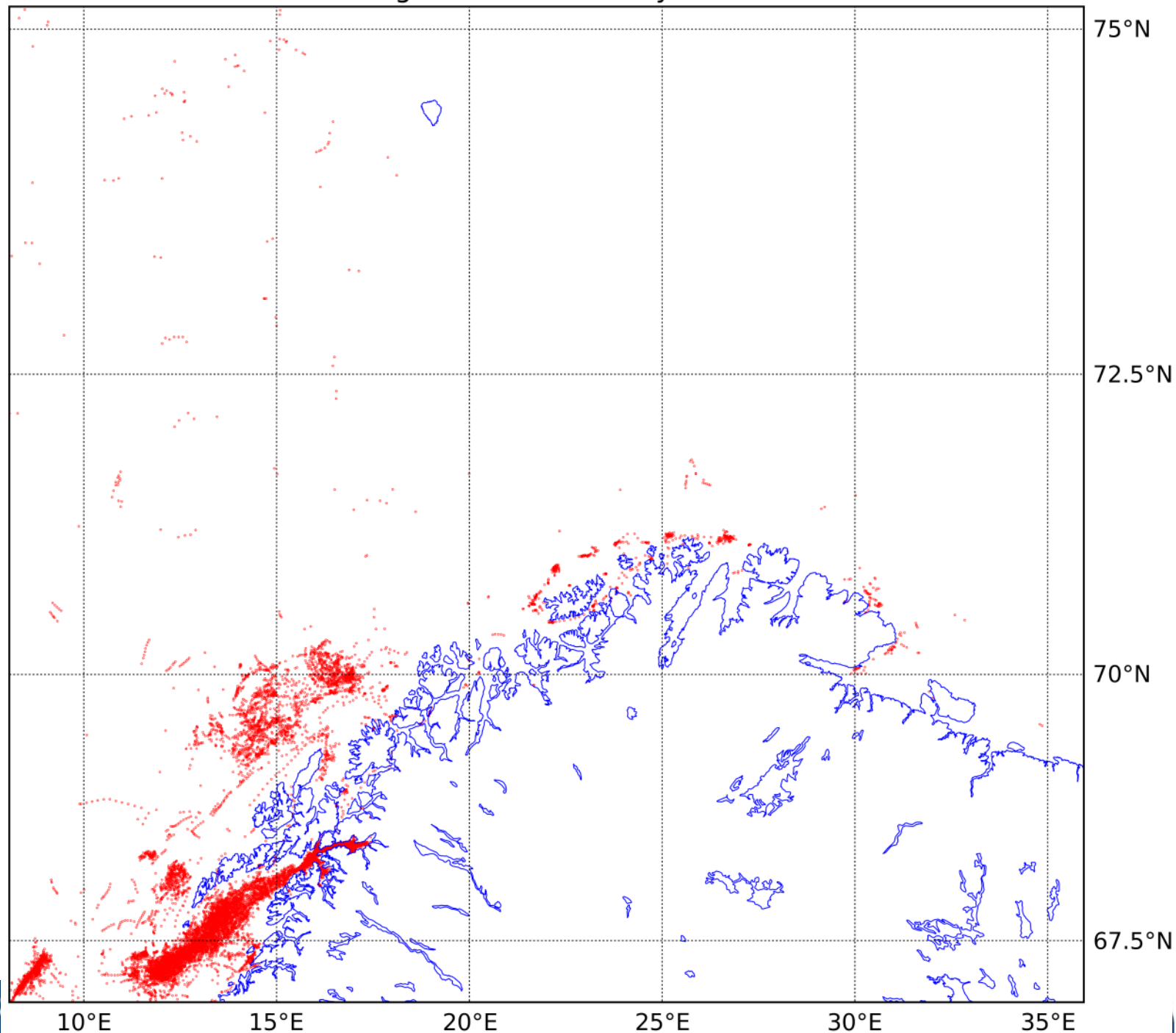
Pelagic fisheries activity: 2003



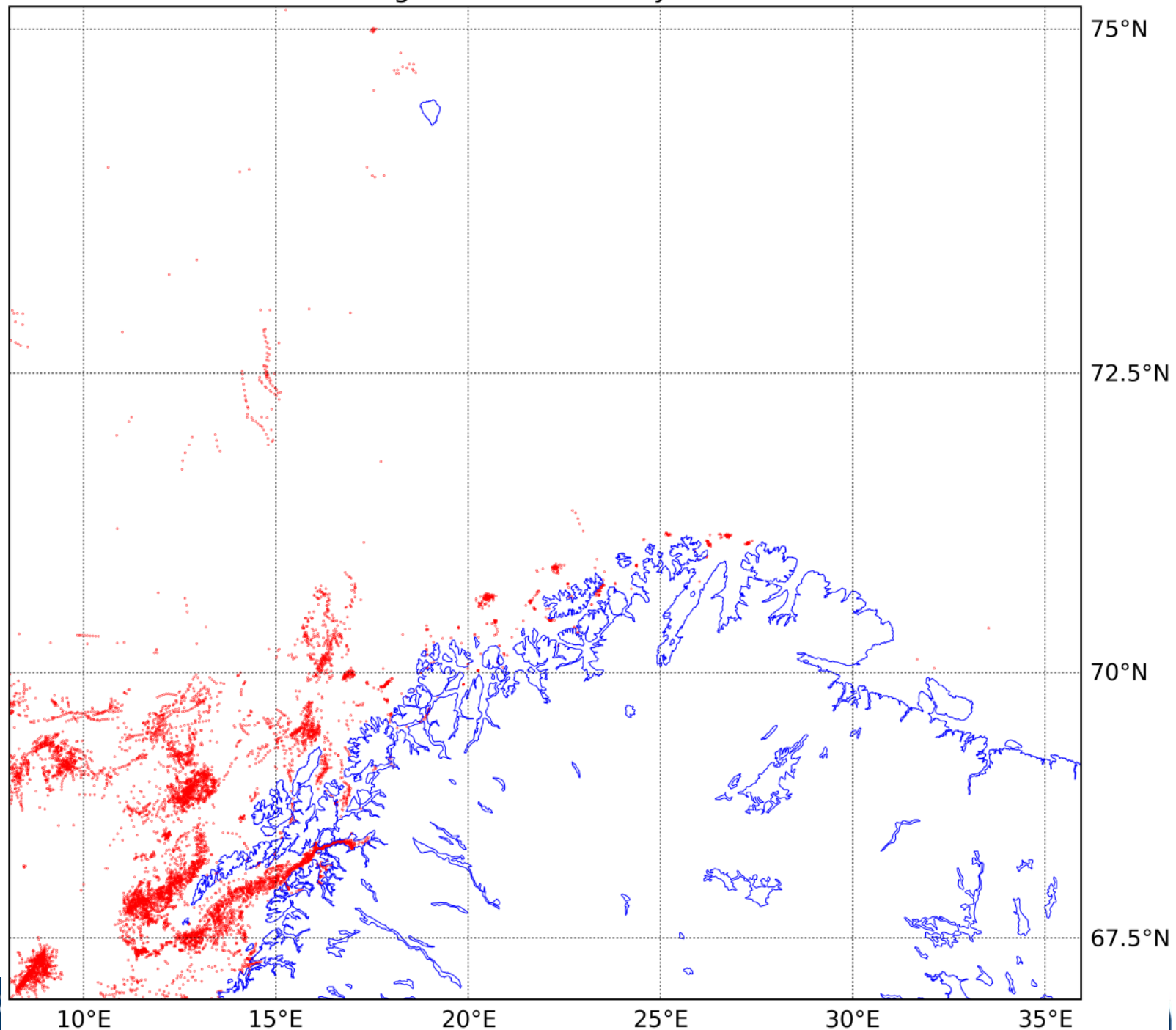
Pelagic fisheries activity: 2004



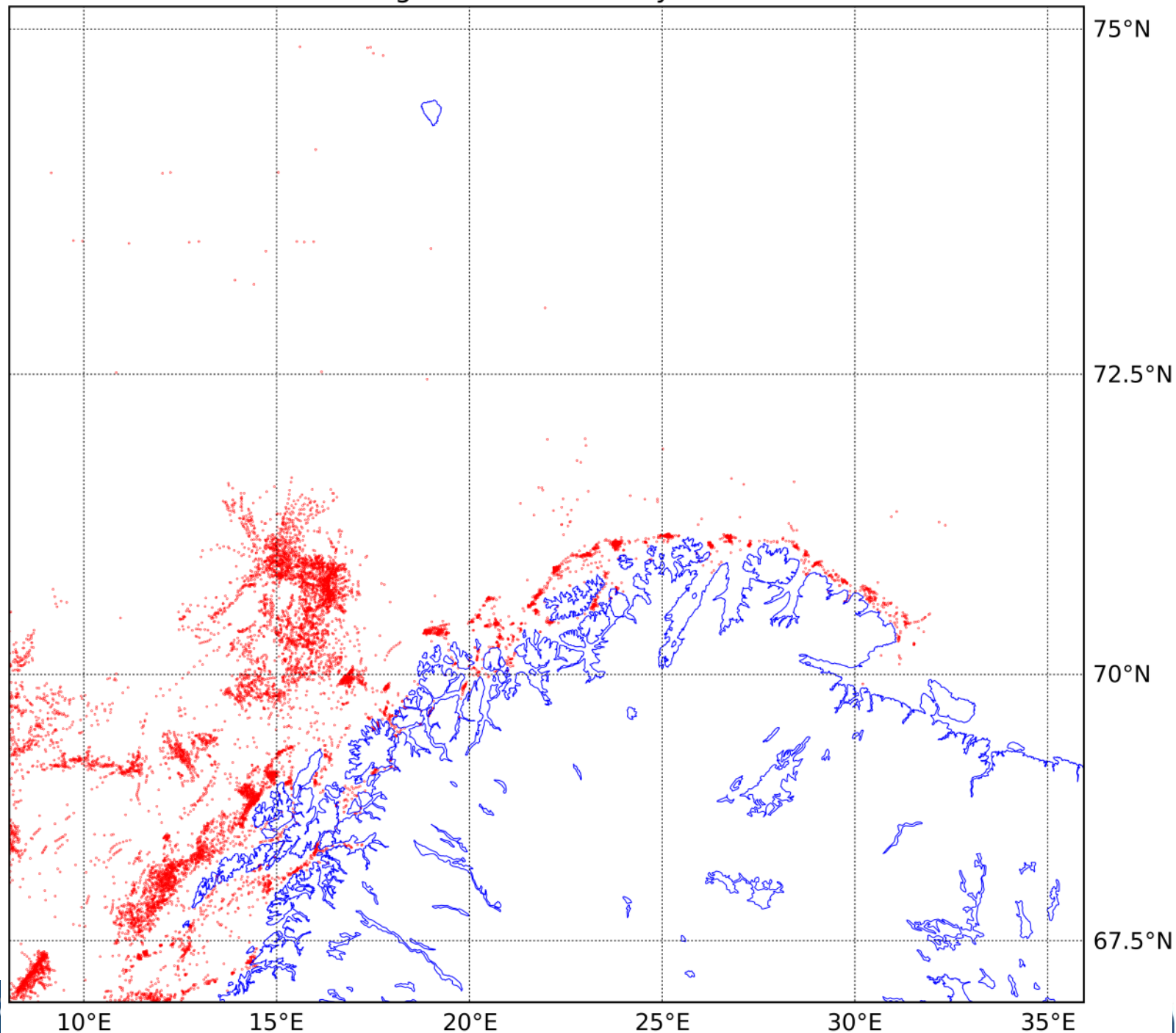
Pelagic fisheries activity: 2005



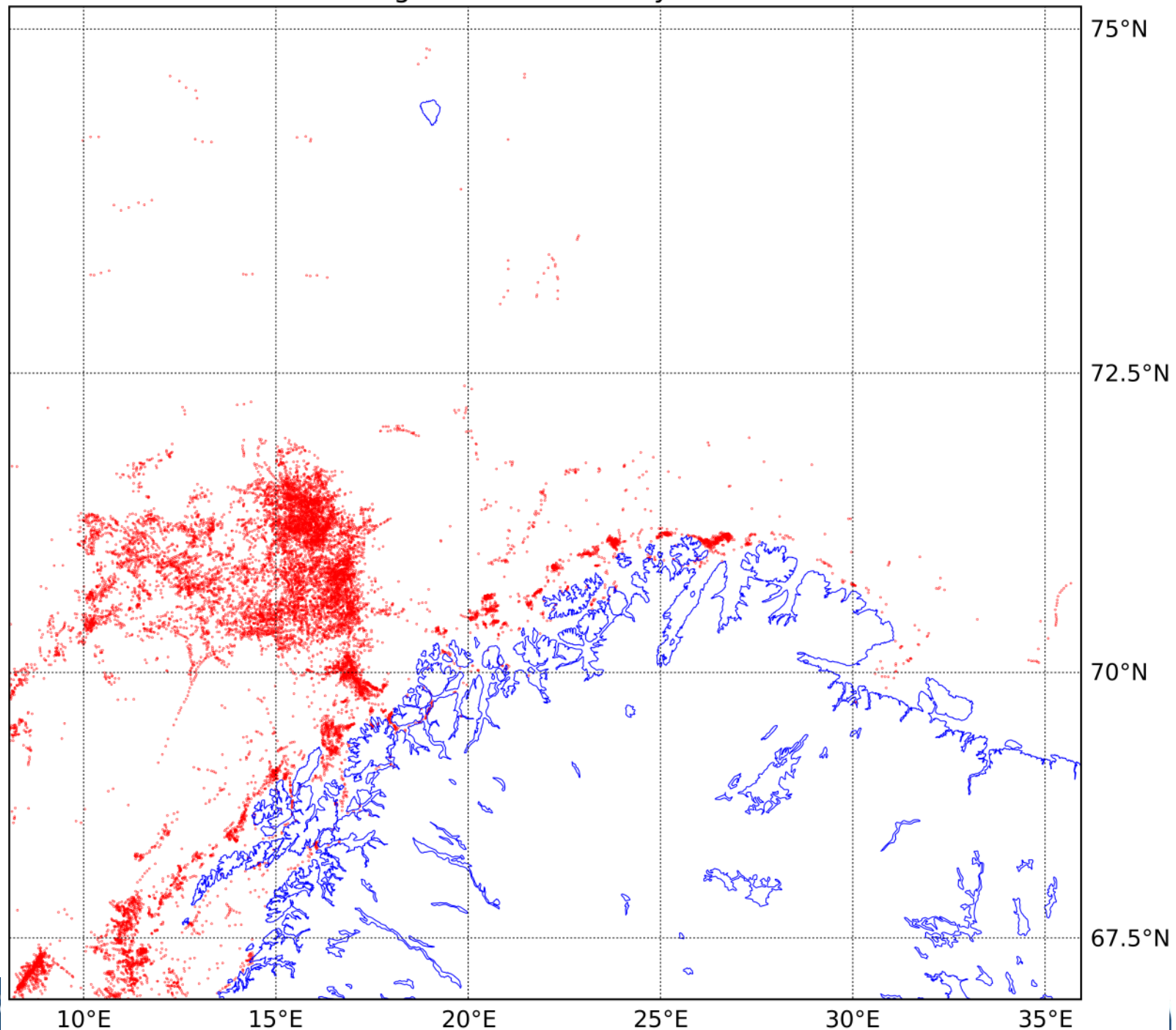
Pelagic fisheries activity: 2006



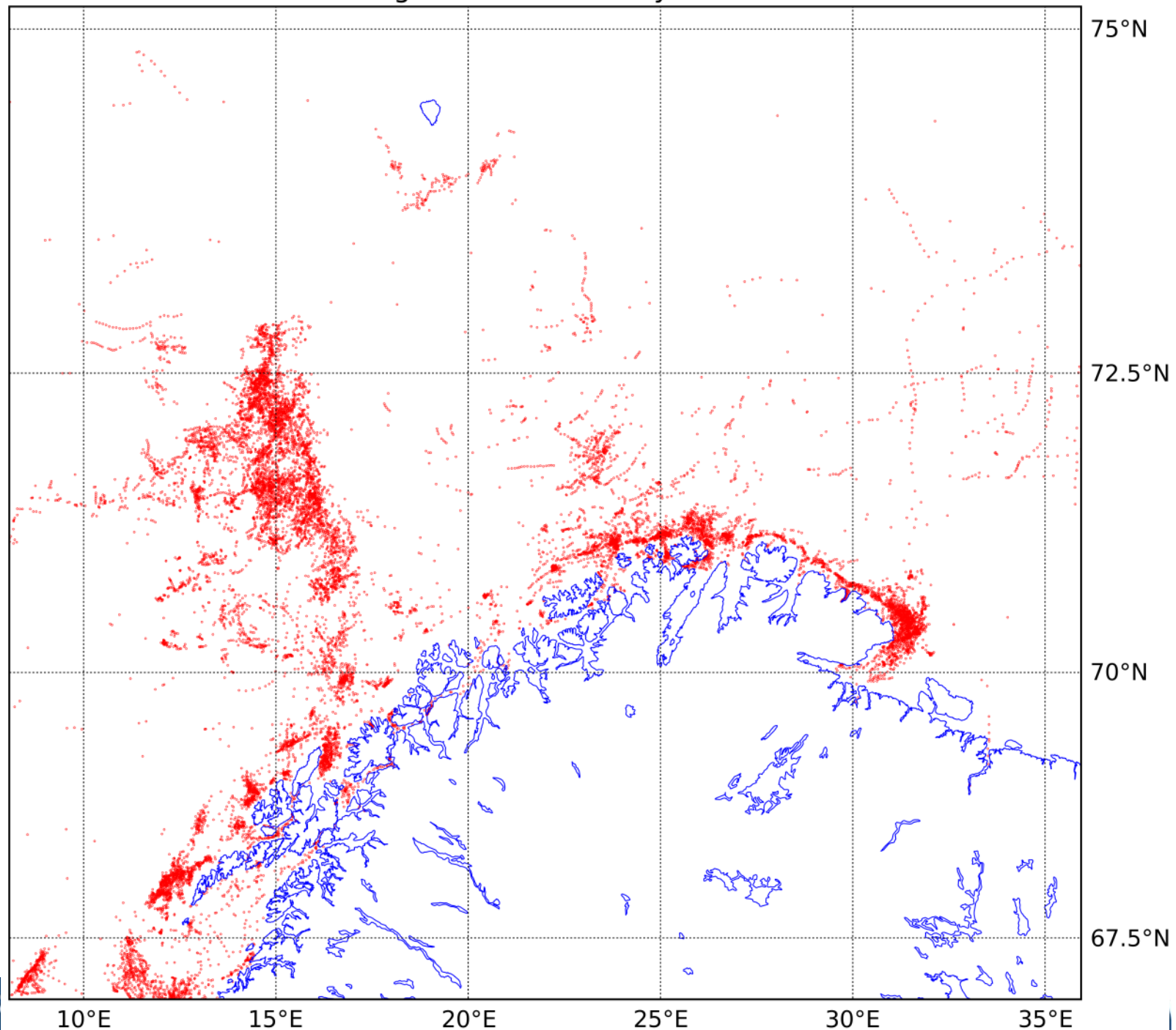
Pelagic fisheries activity: 2007



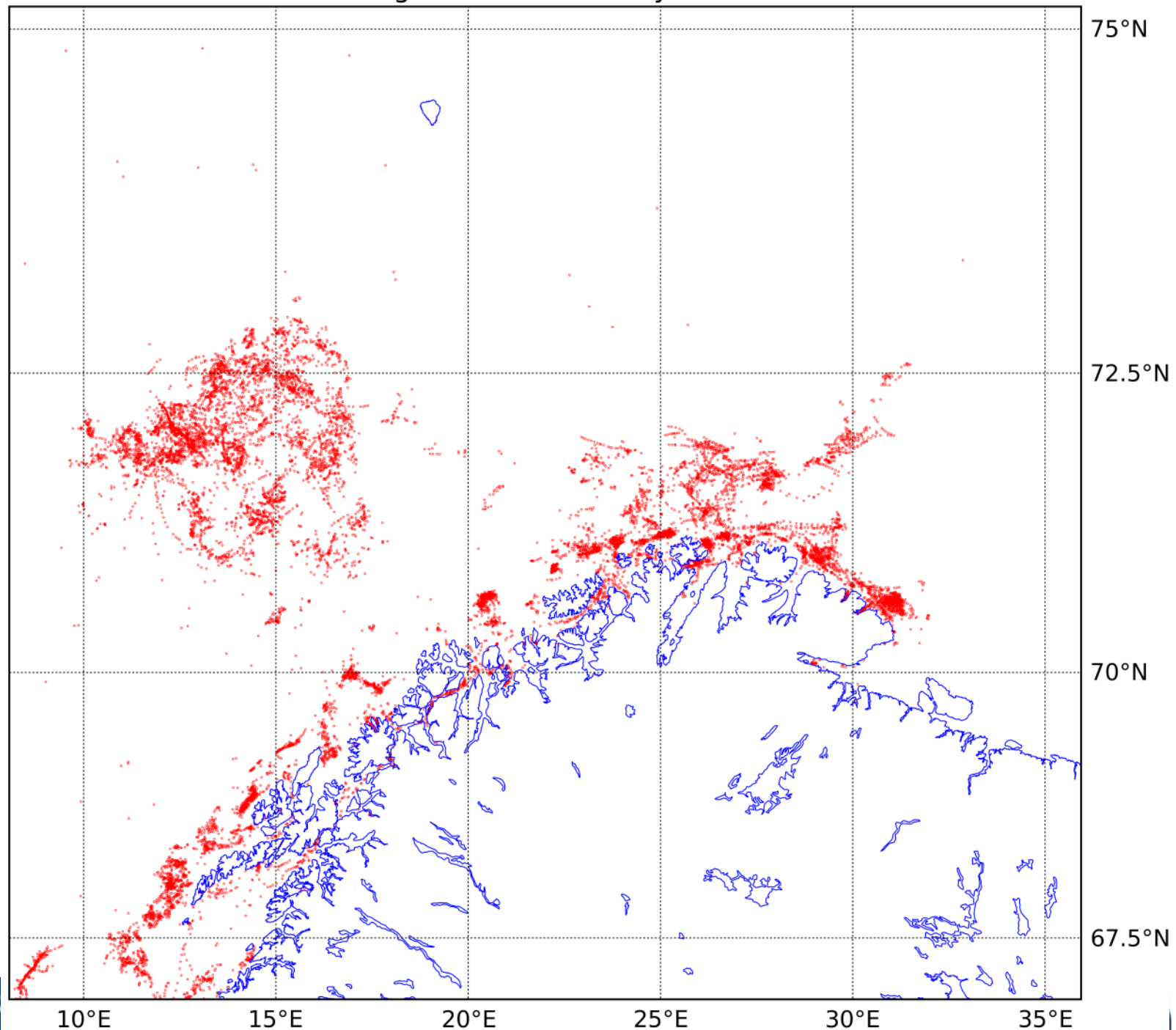
Pelagic fisheries activity: 2008



Pelagic fisheries activity: 2009



Pelagic fisheries activity: 2010



75°N

72.5°N

70°N

67.5°N

10°E

15°E

20°E

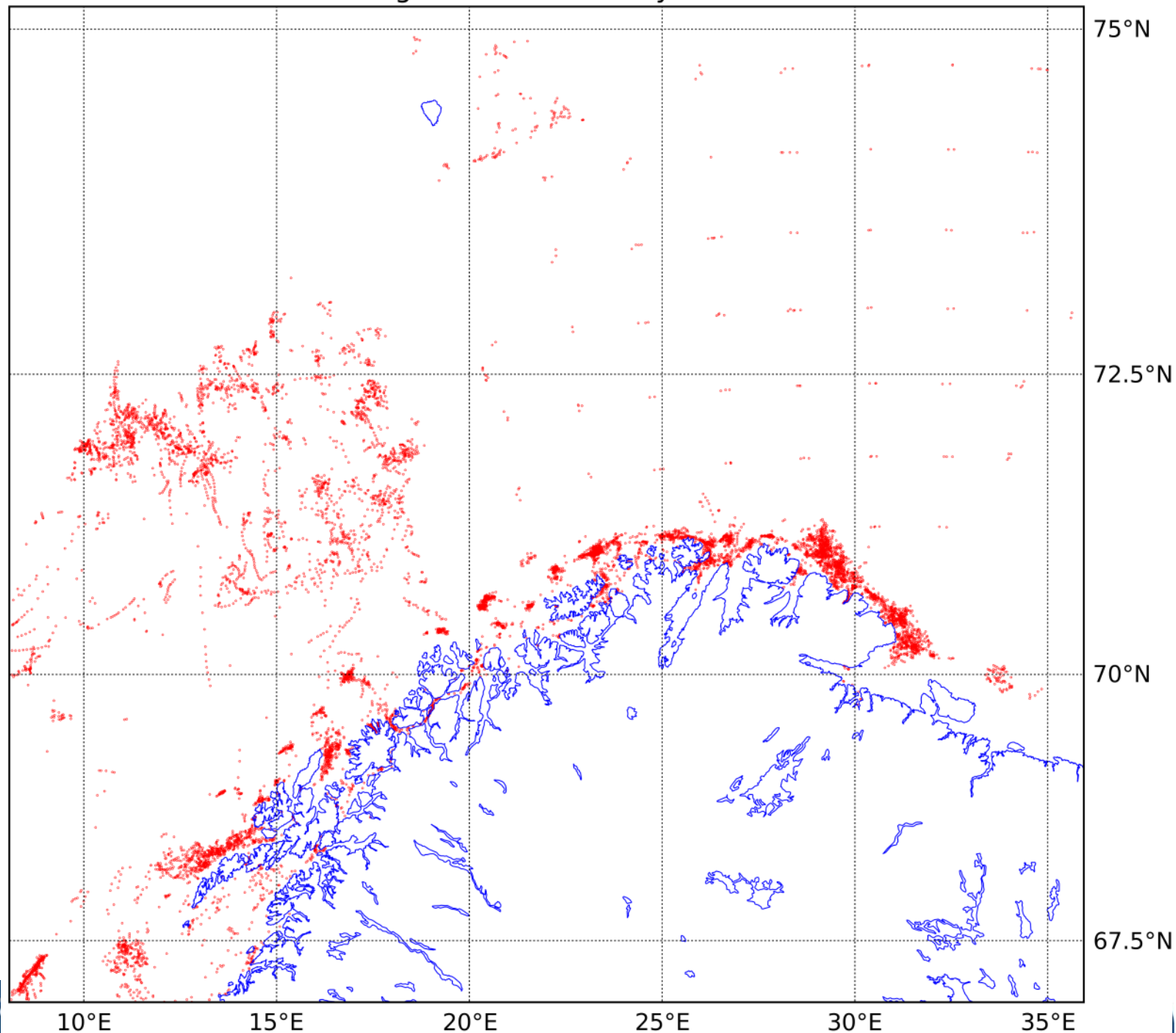
25°E

30°E

35°E



Pelagic fisheries activity: 2011



Integrasjon mot fiskeflåten

