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:

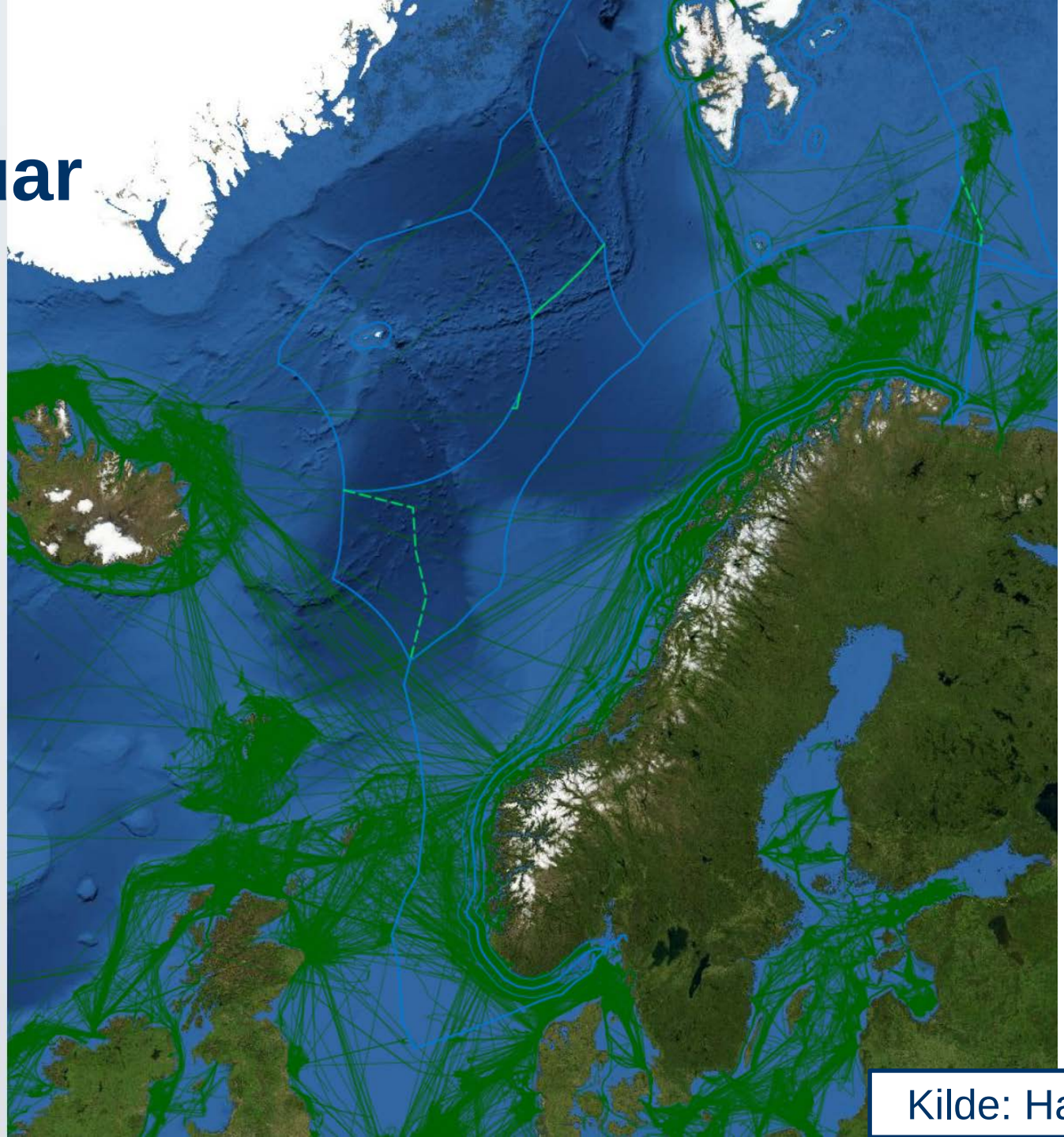
<u>Få fartøy</u>

- 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



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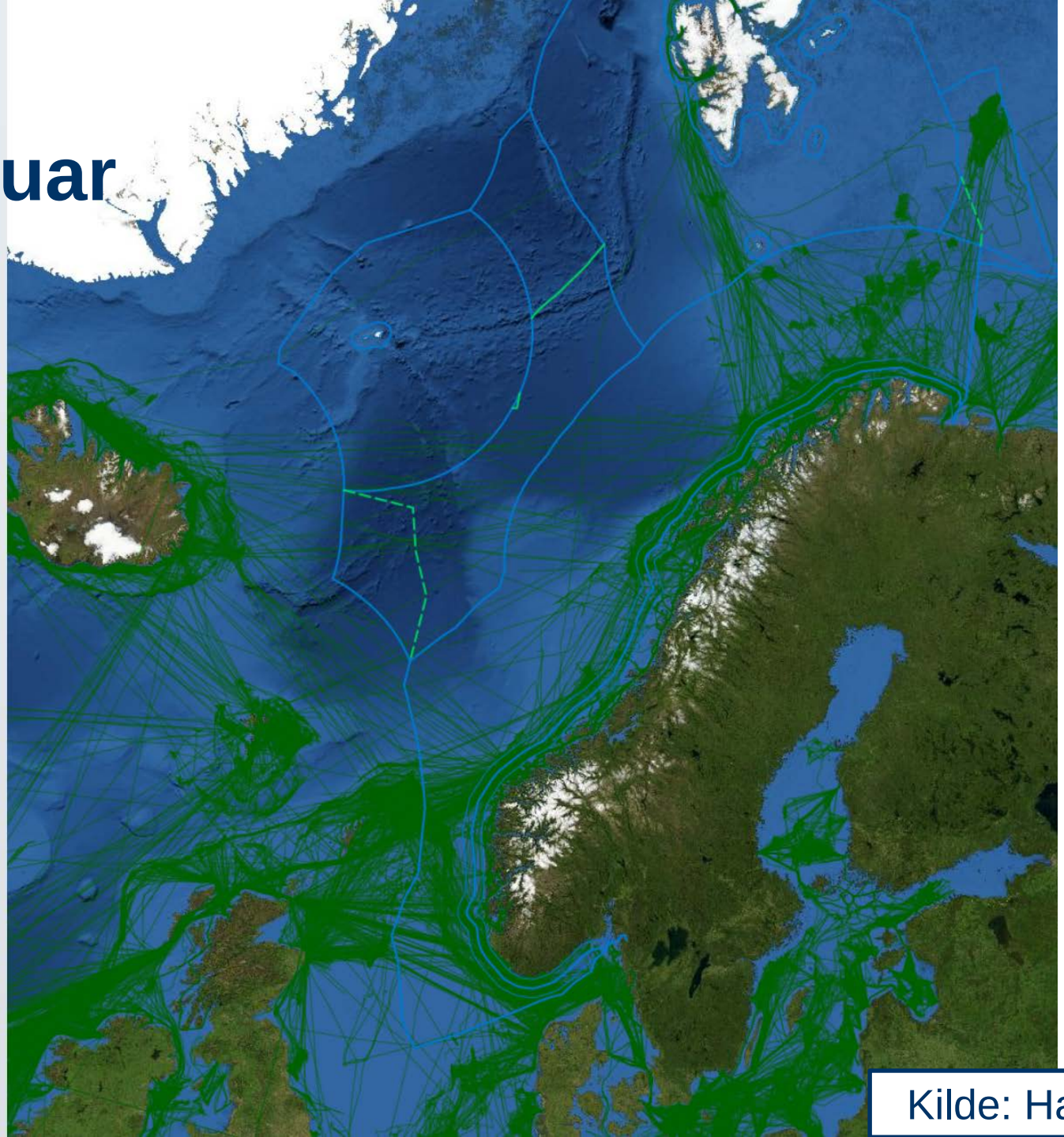

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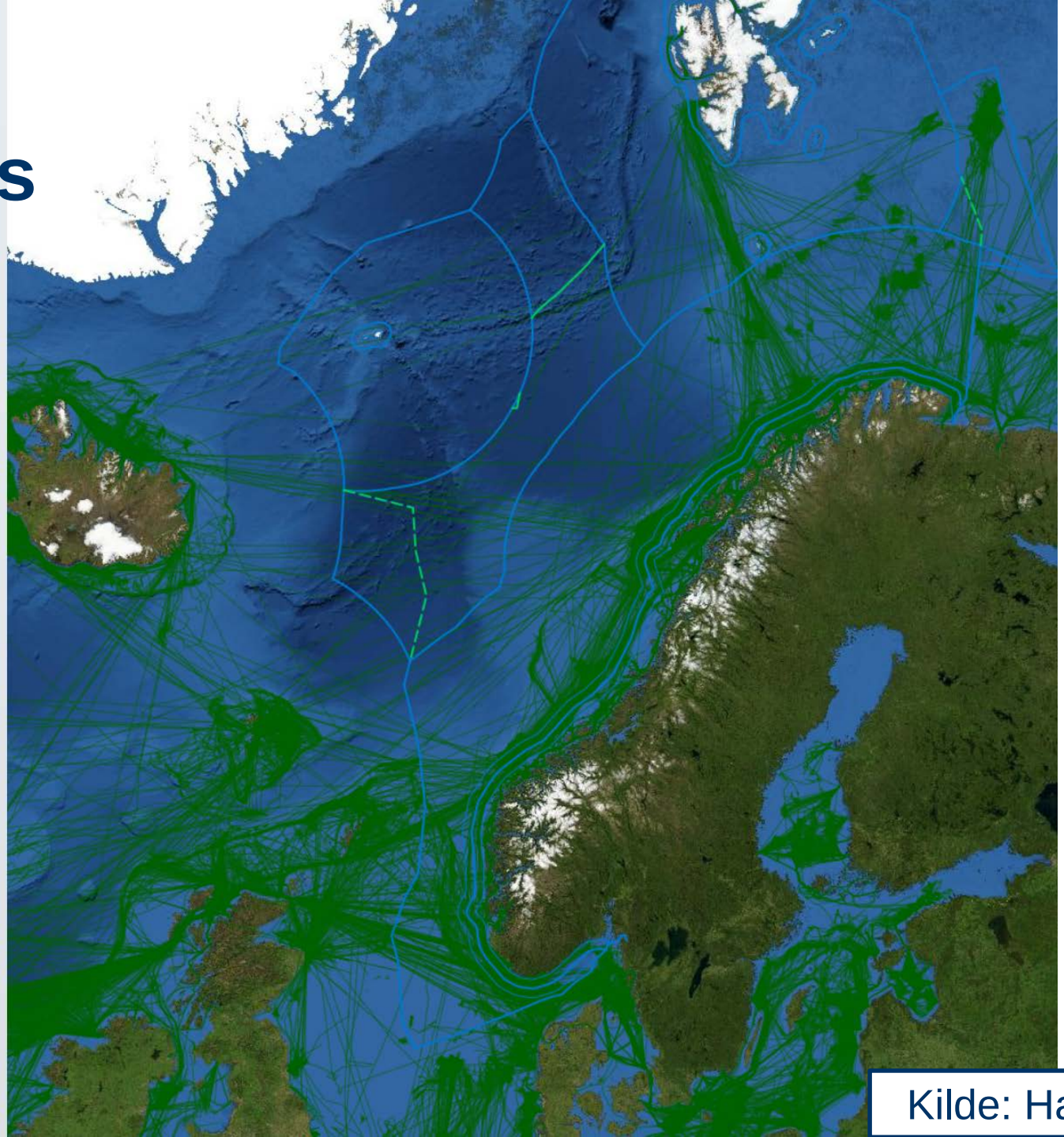

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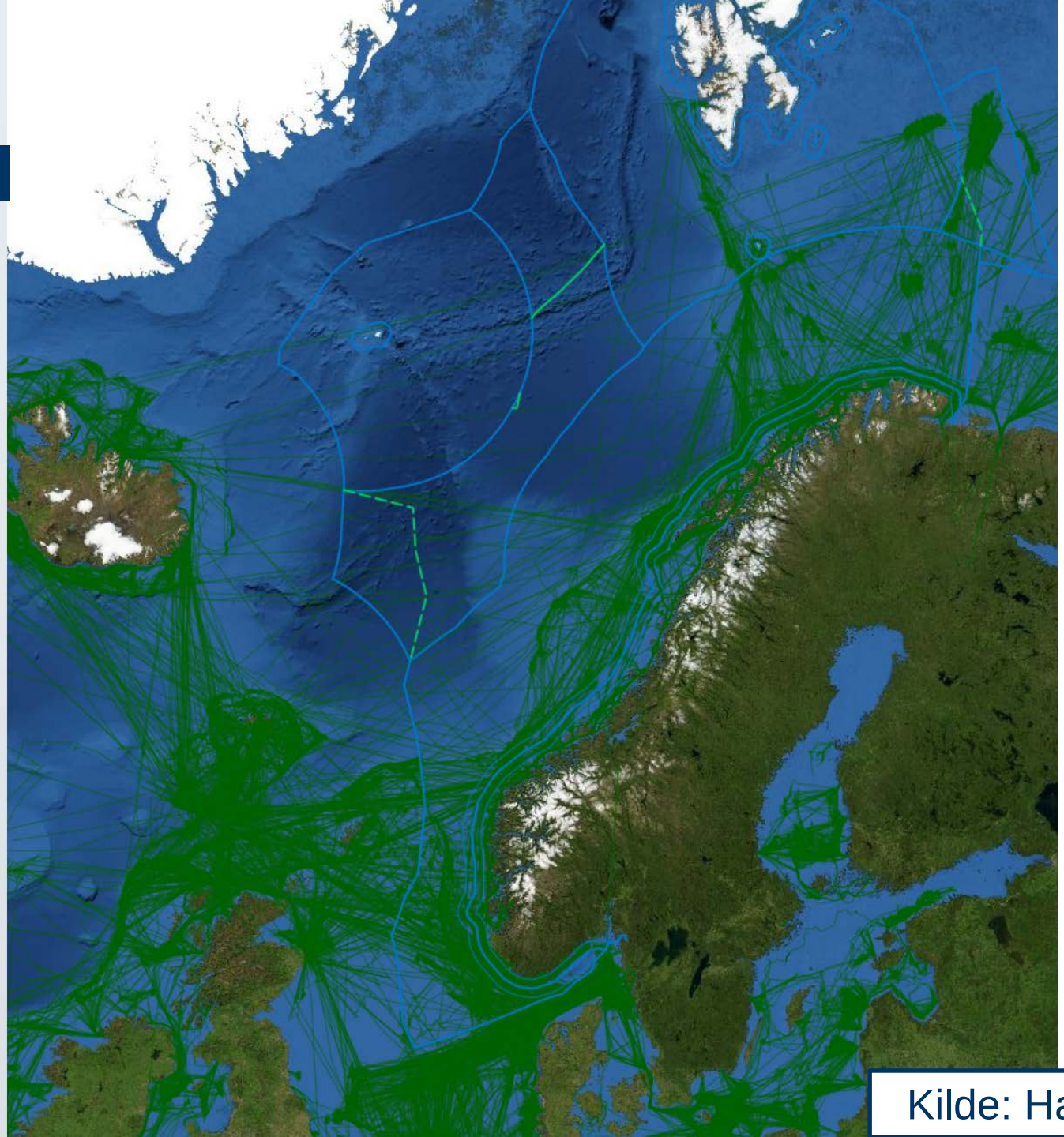

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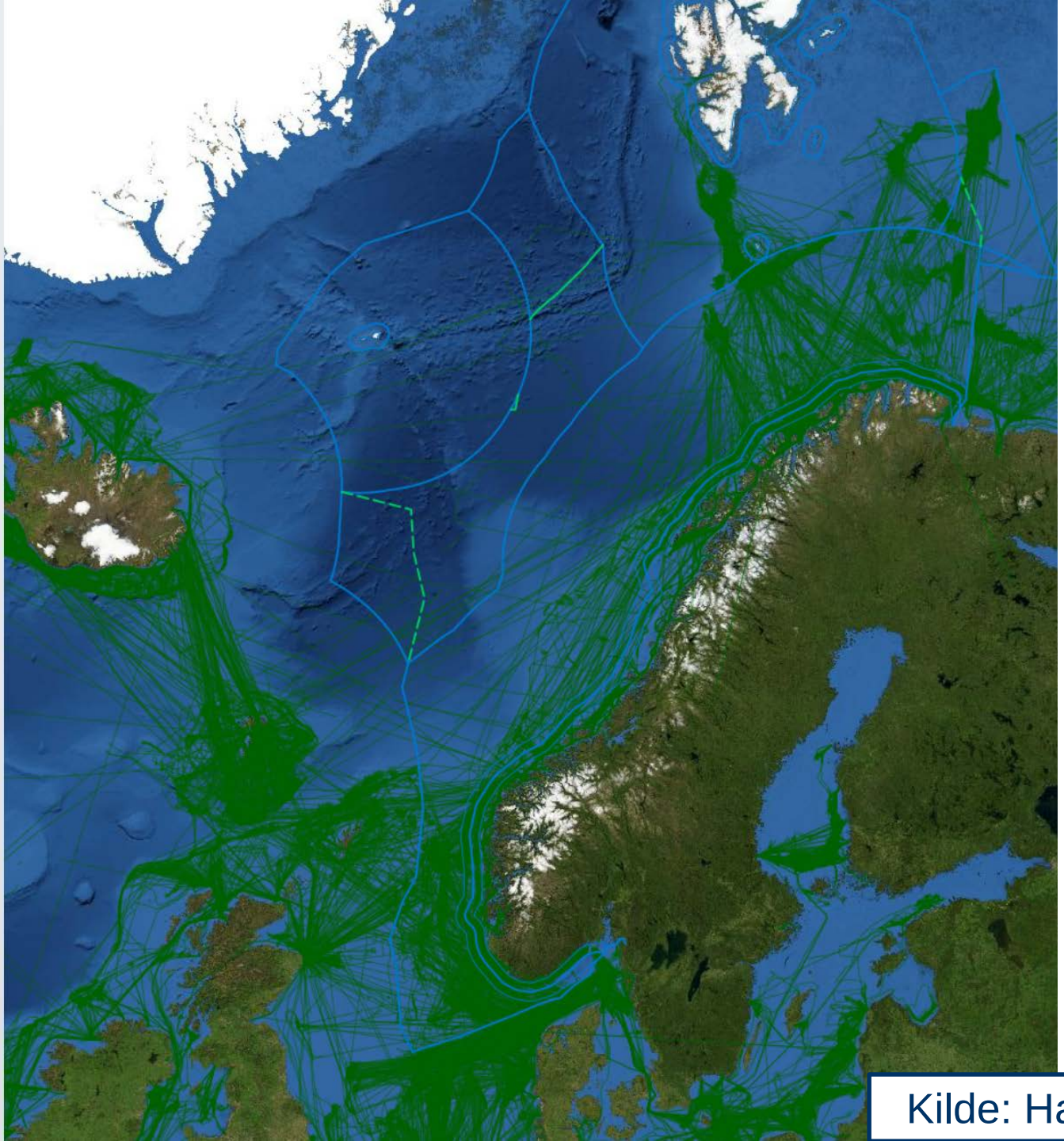
AIS mai



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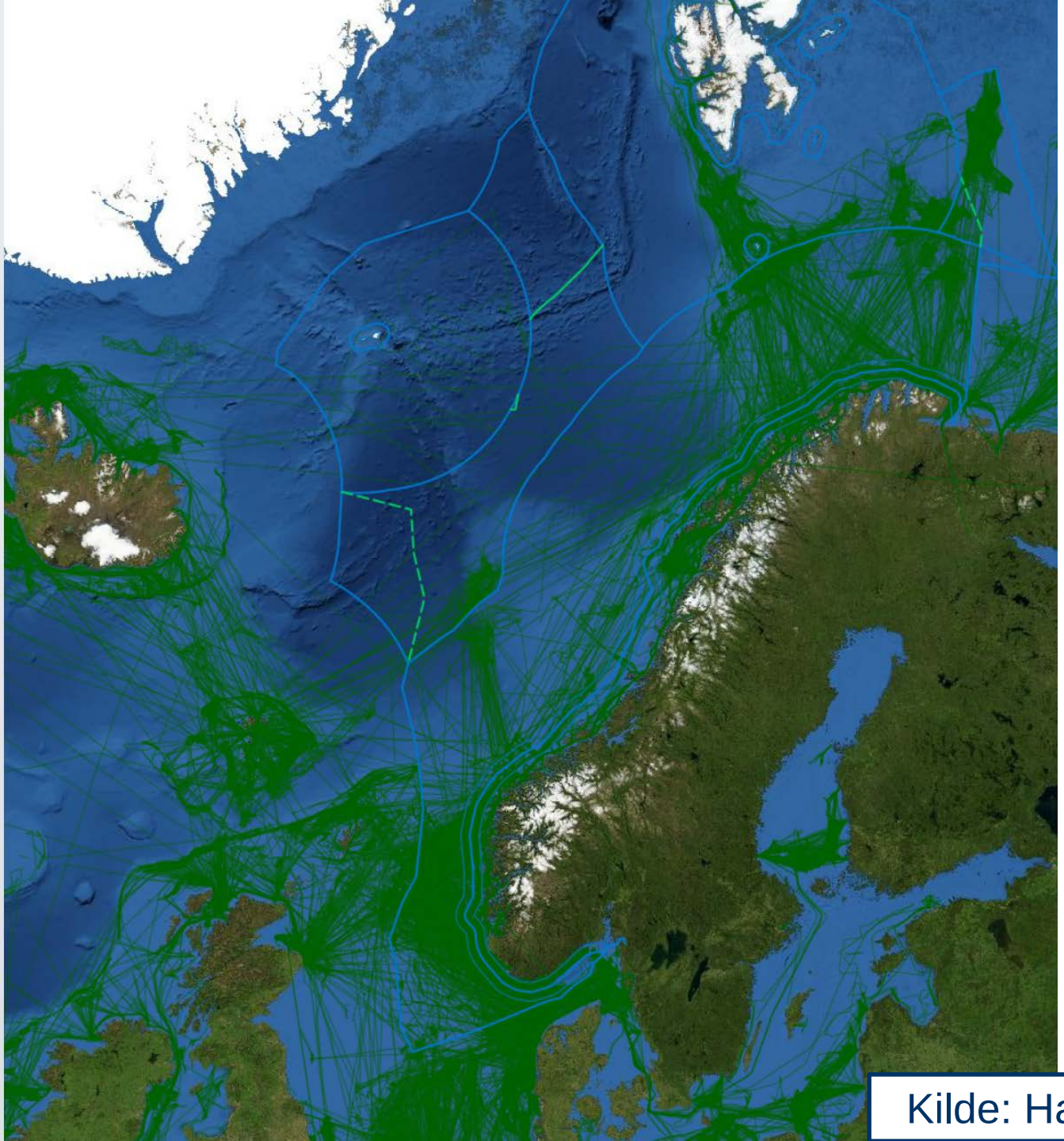

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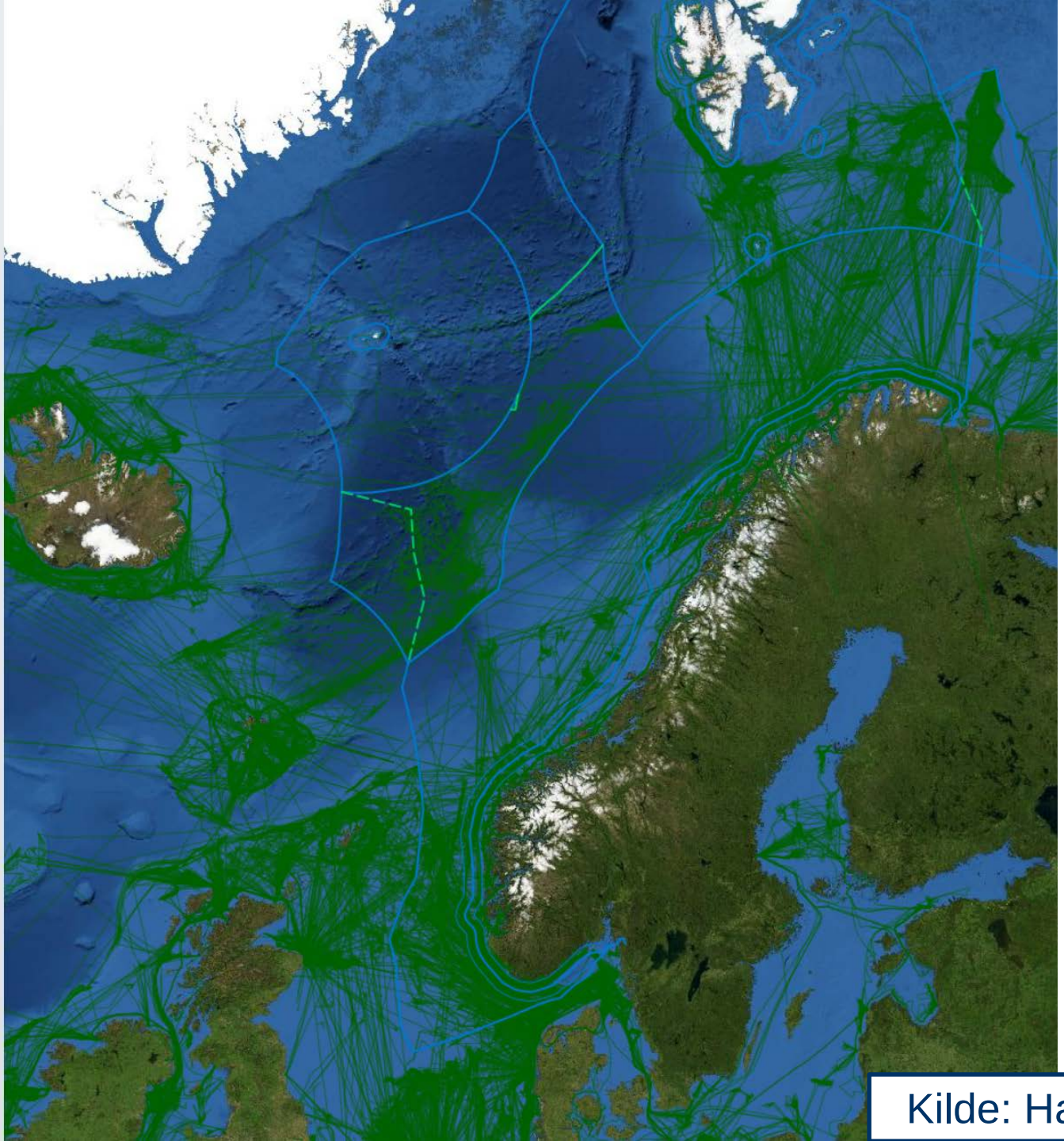
AIS juli



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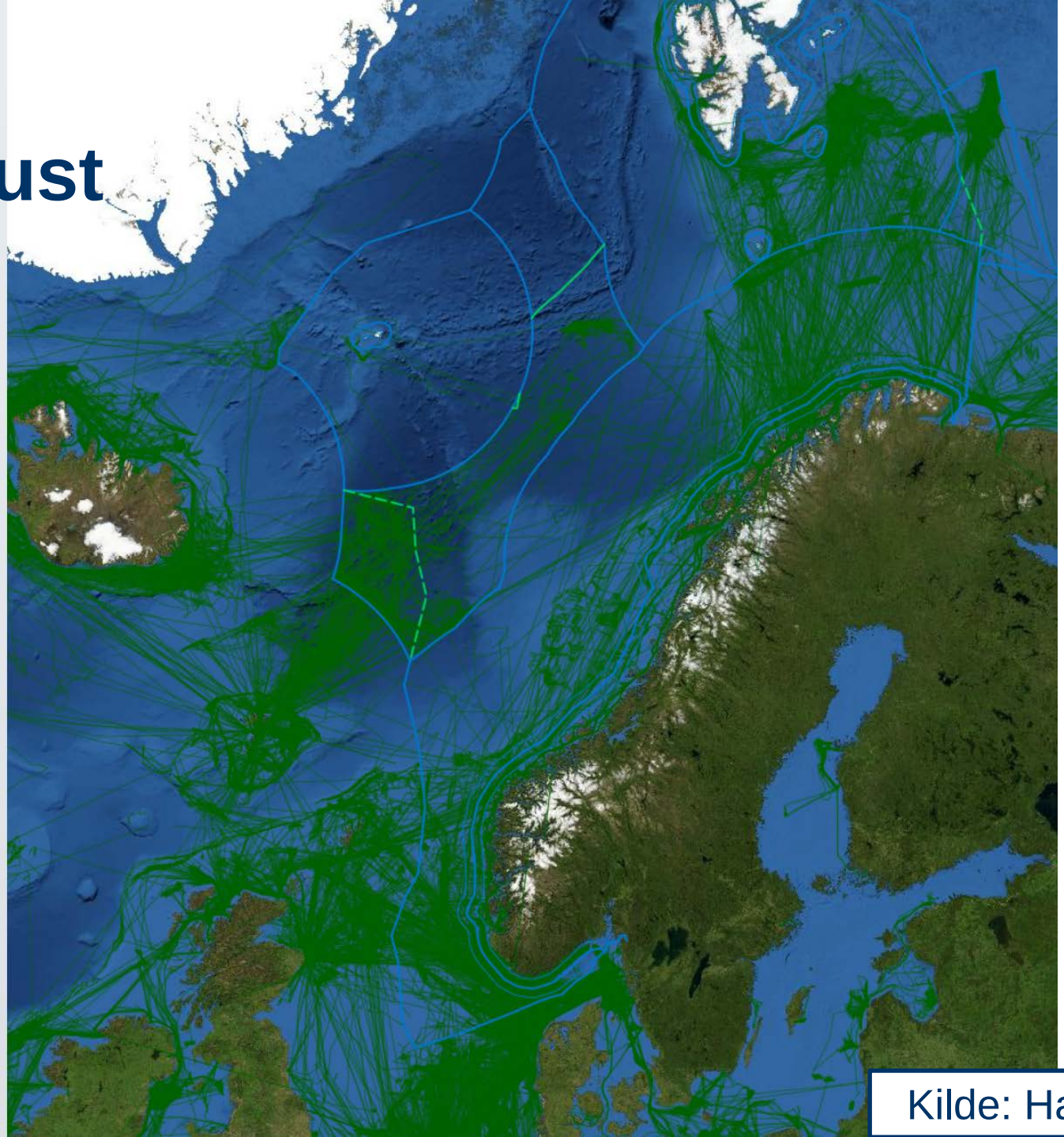

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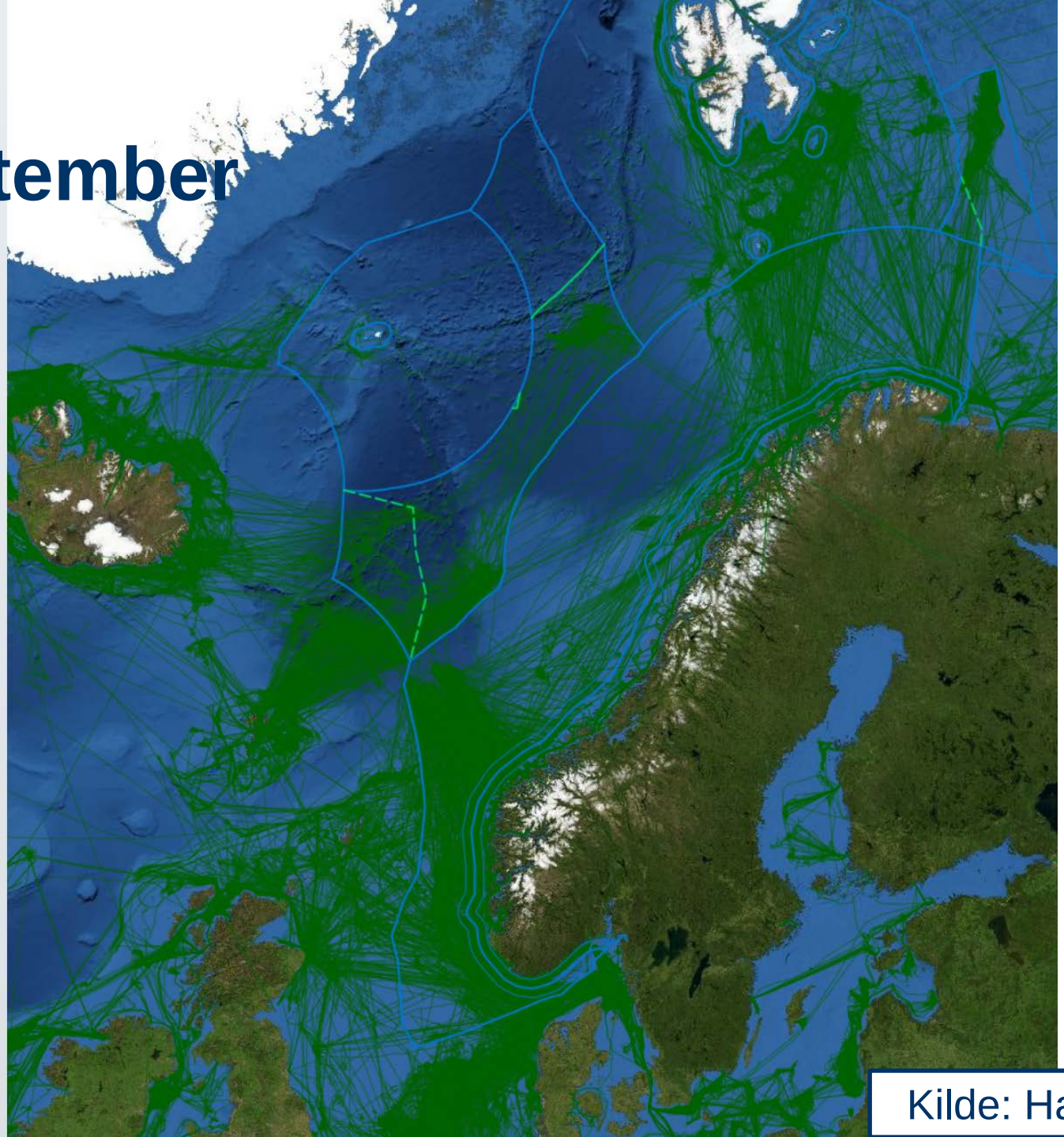

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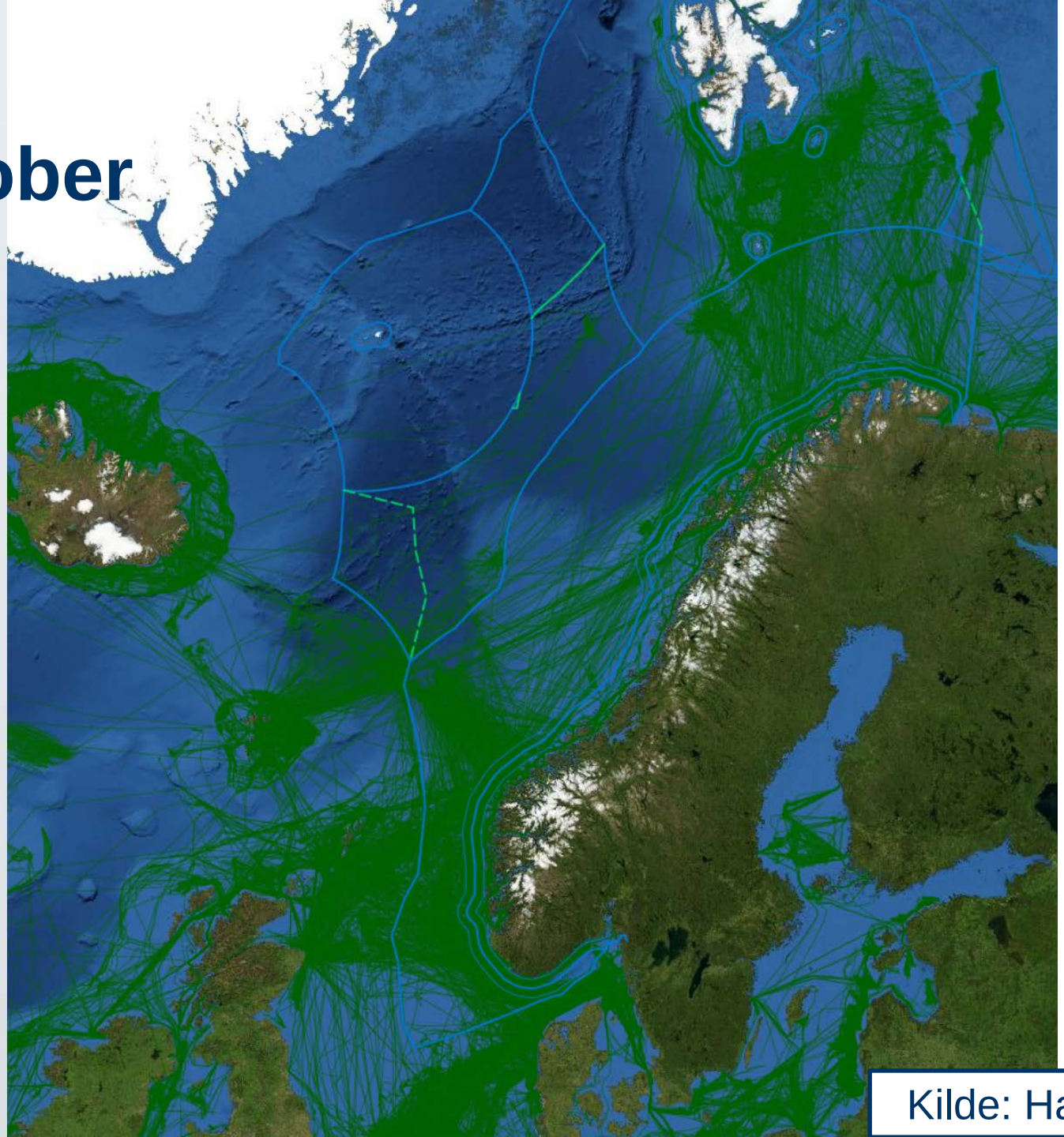

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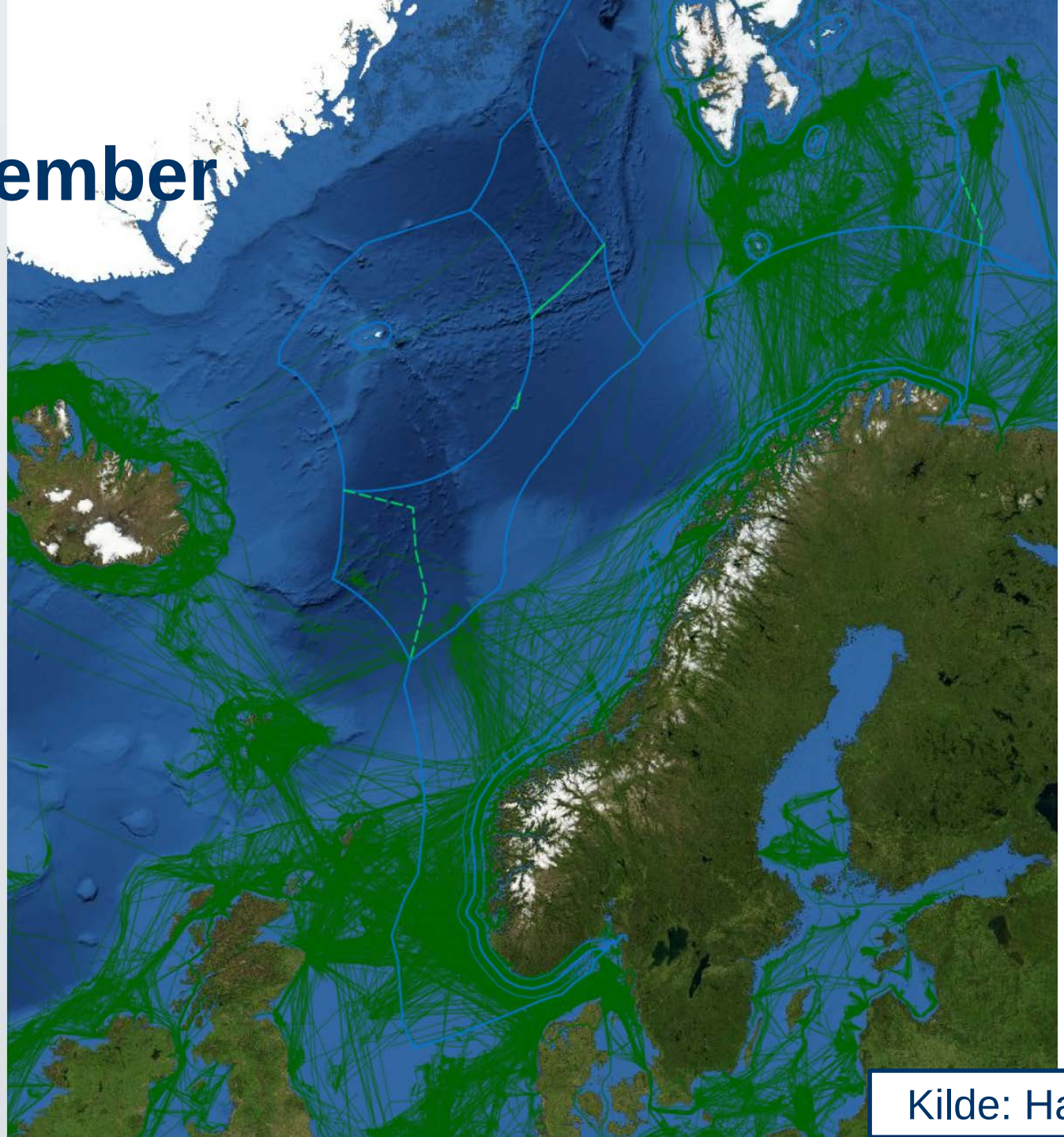

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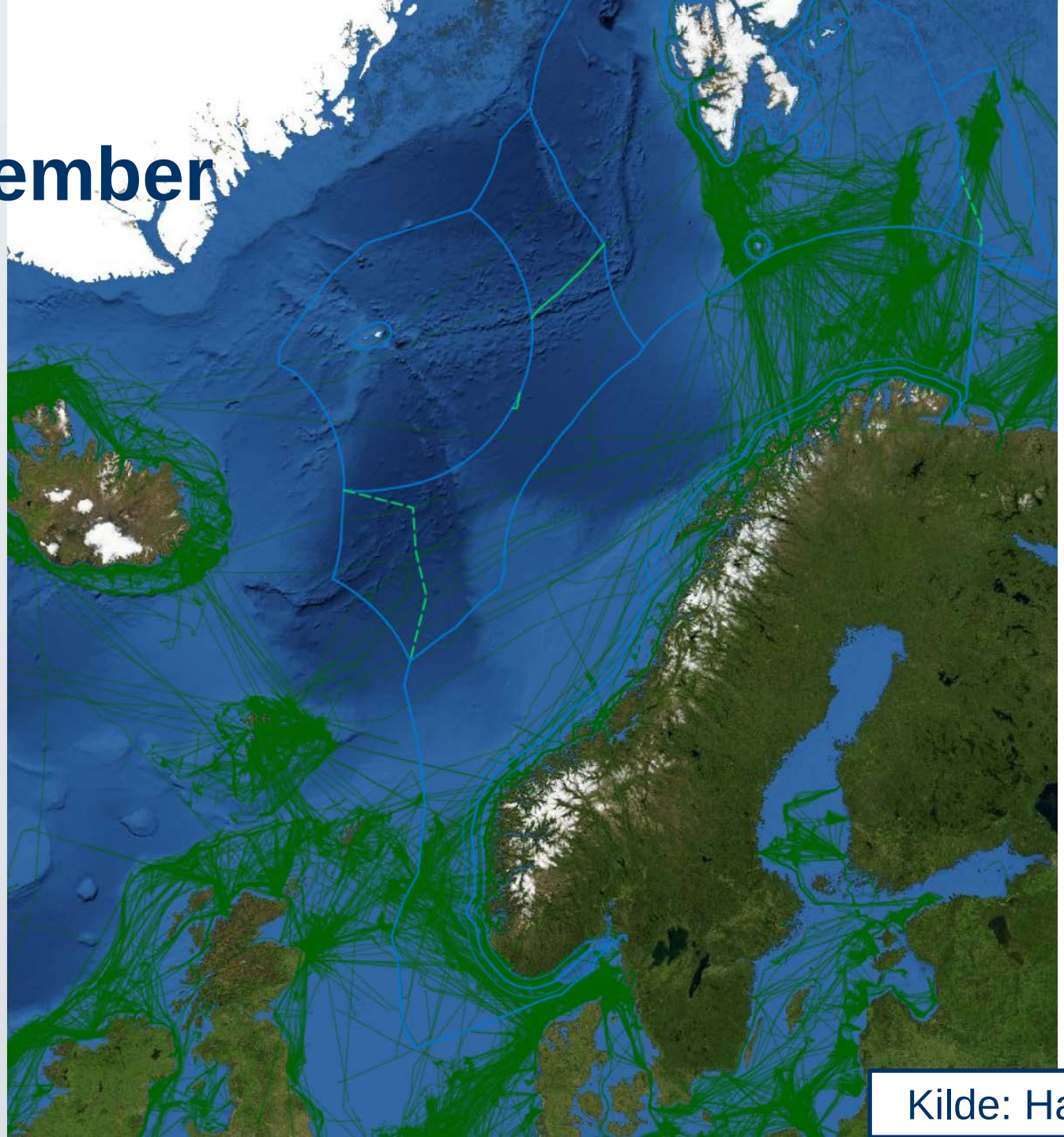

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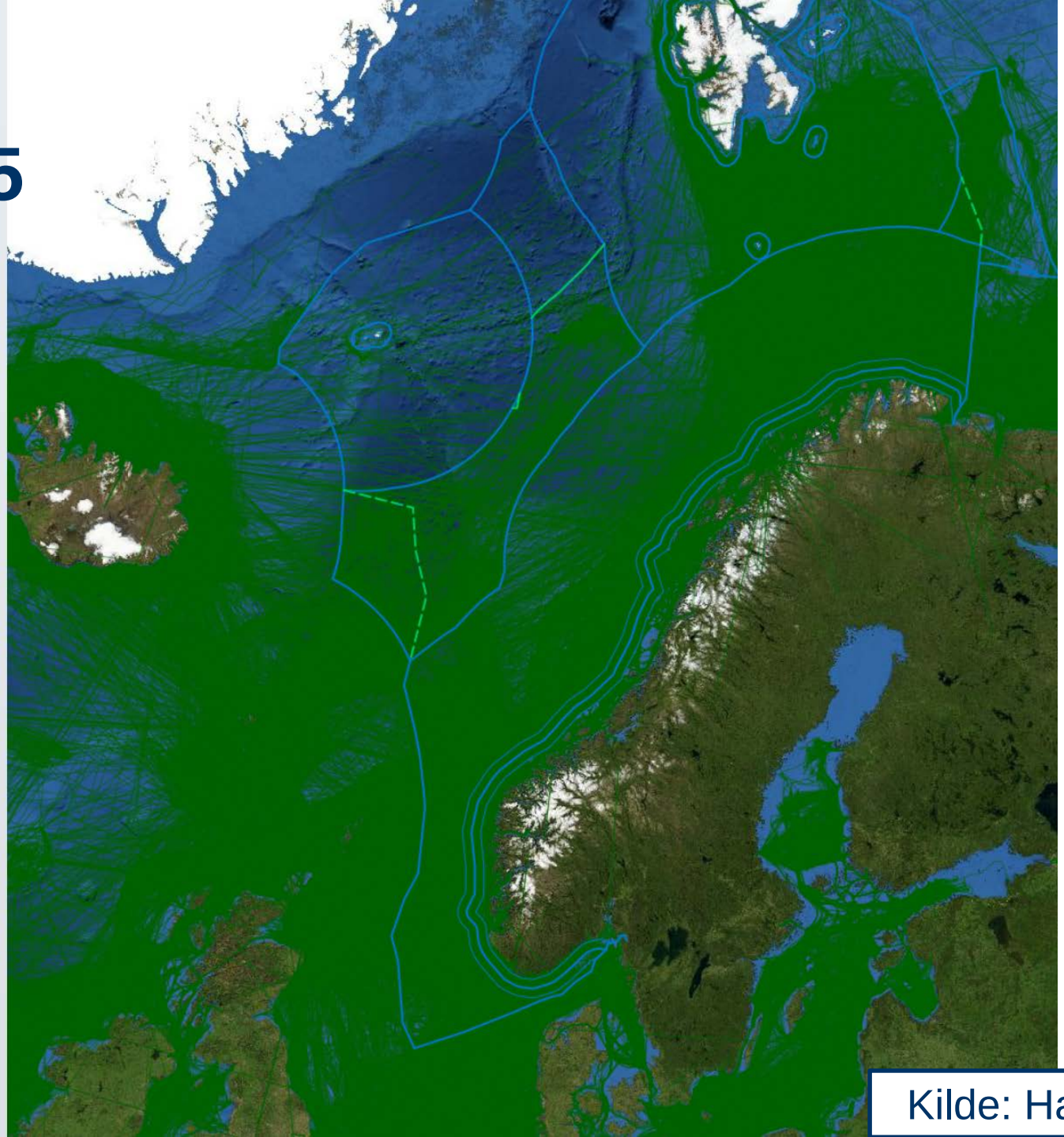
AIS 2015

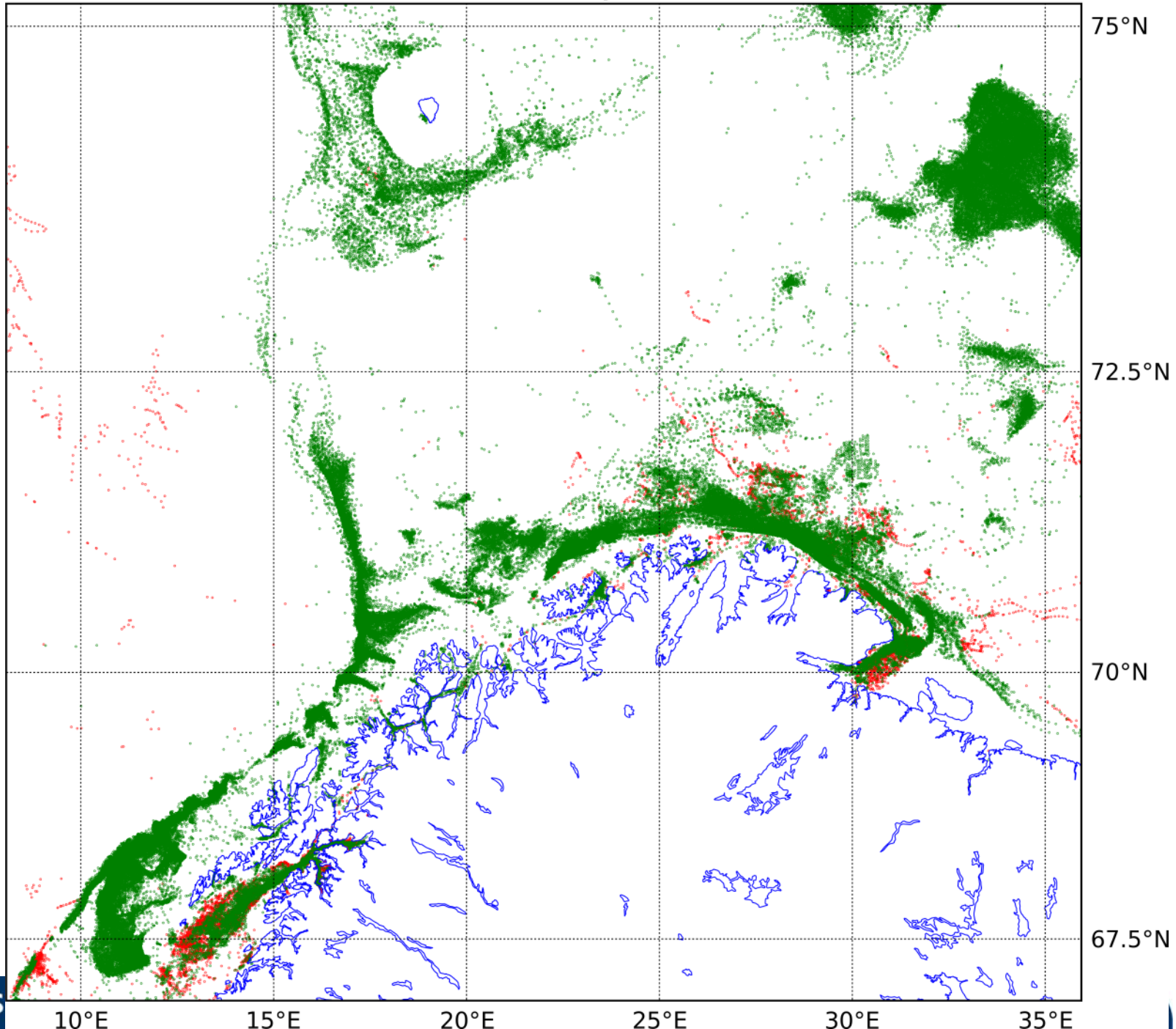


Kilde: Havbase.no

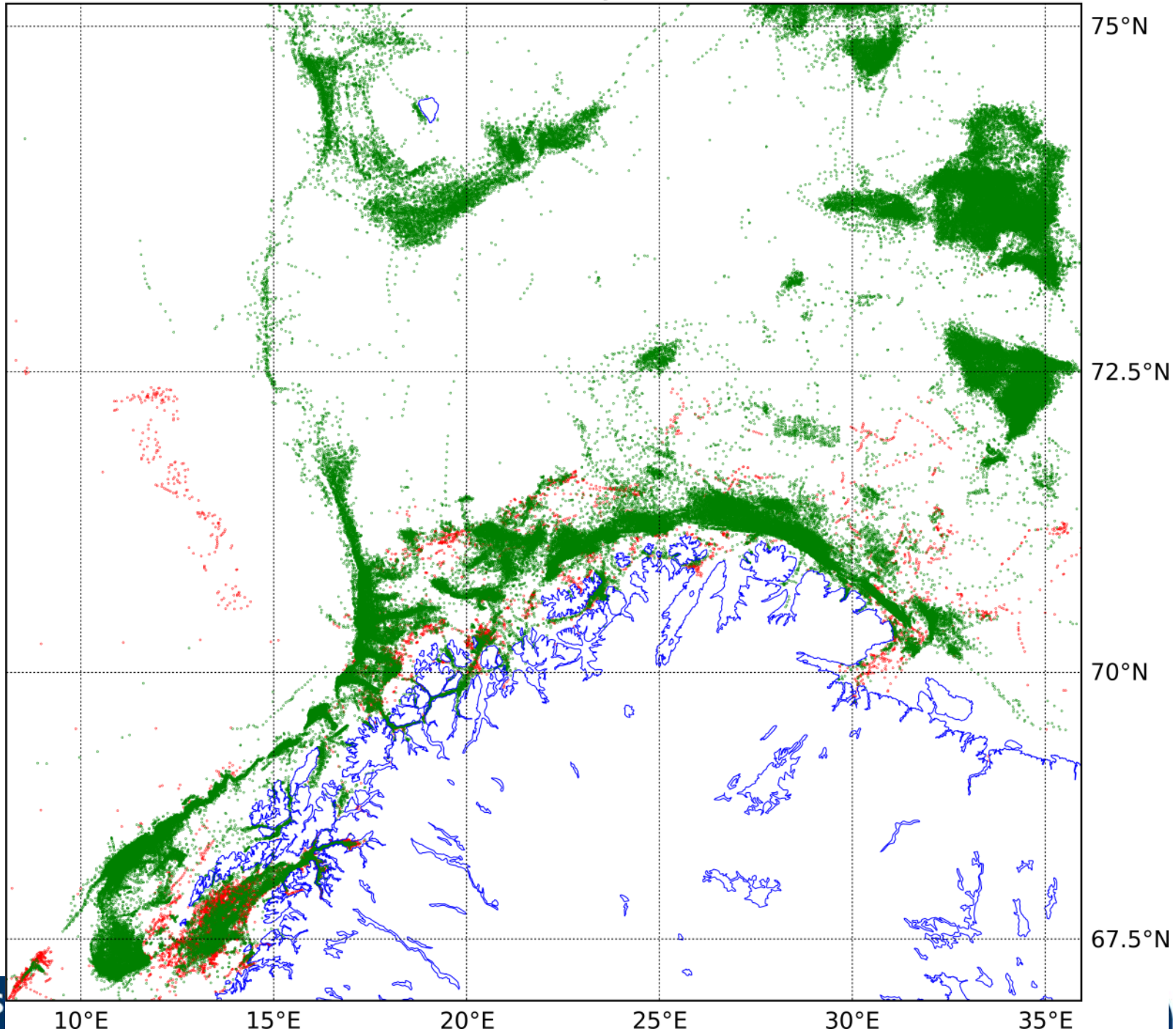
Hvor fiskes det?

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

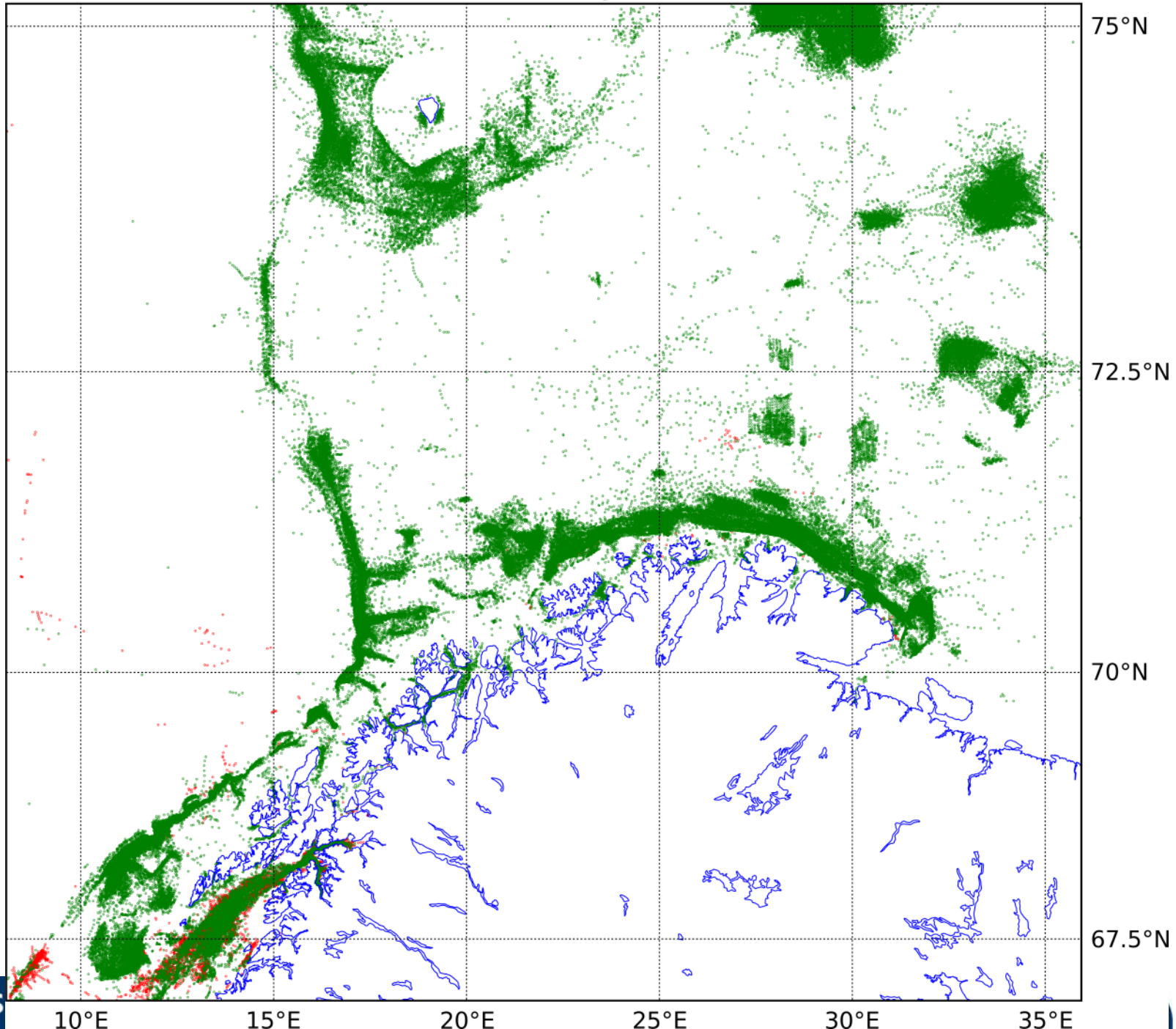
Fisheries activity: 2002



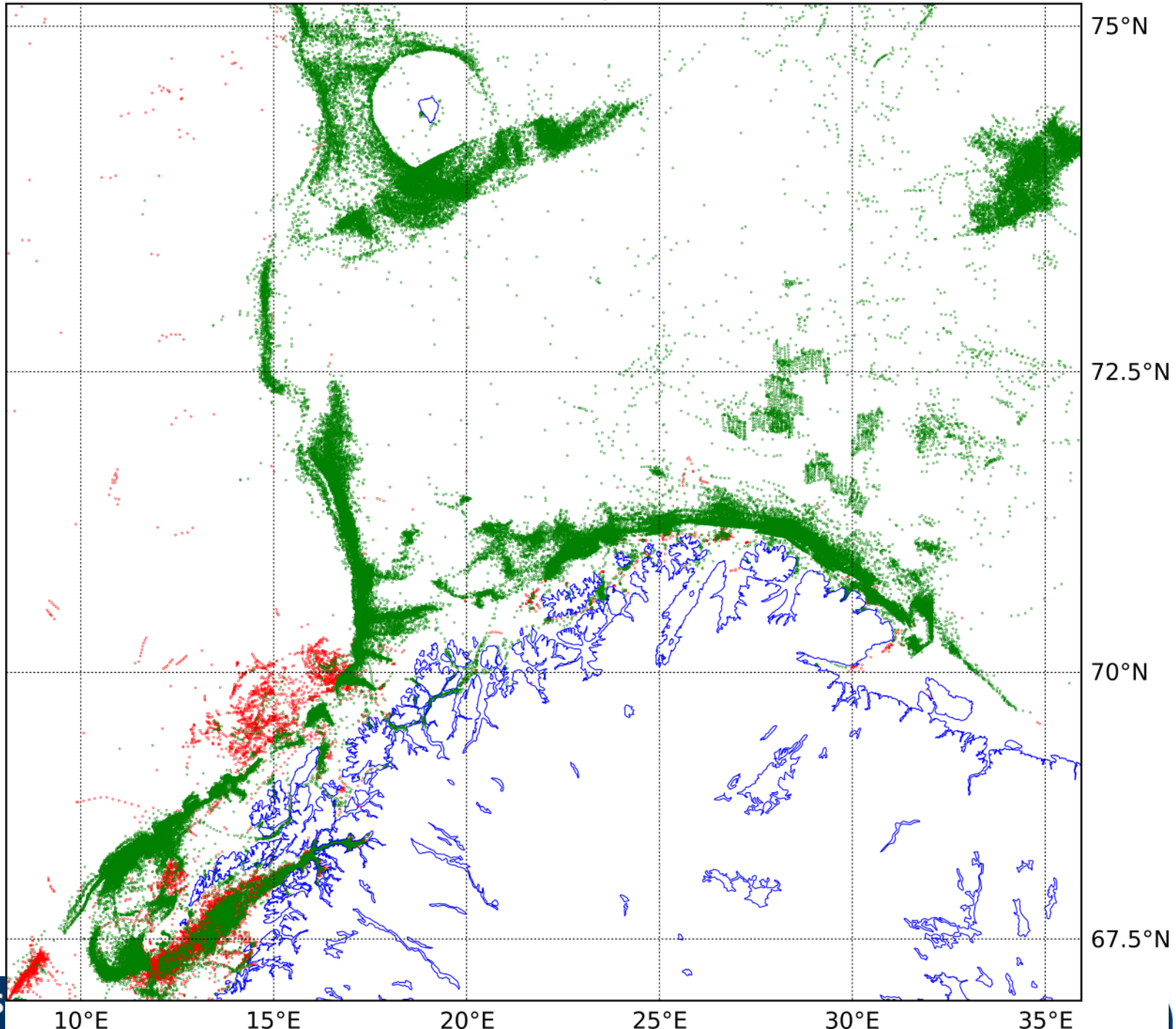
Fisheries activity: 2003



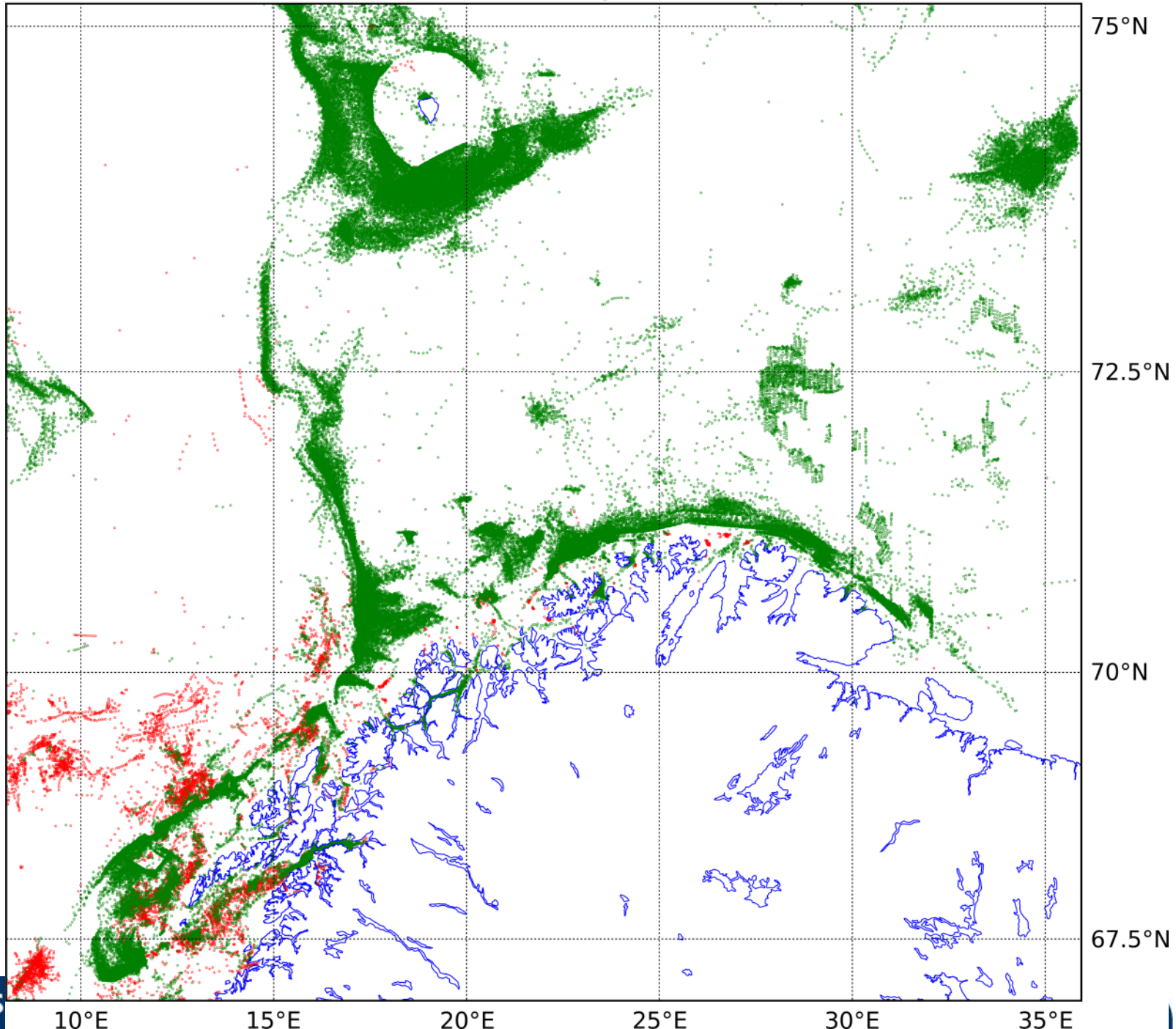
Fisheries activity: 2004



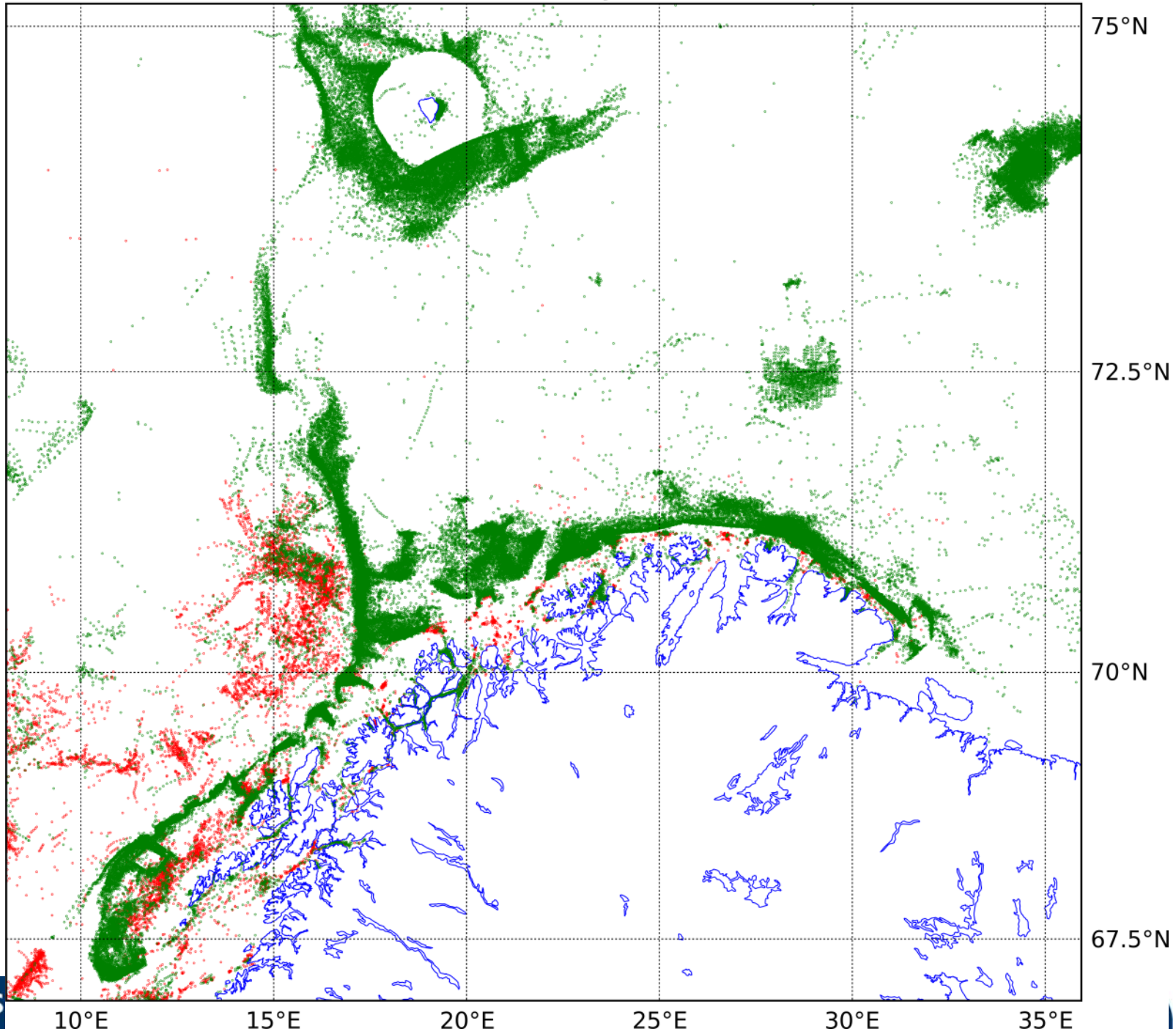
Fisheries activity: 2005



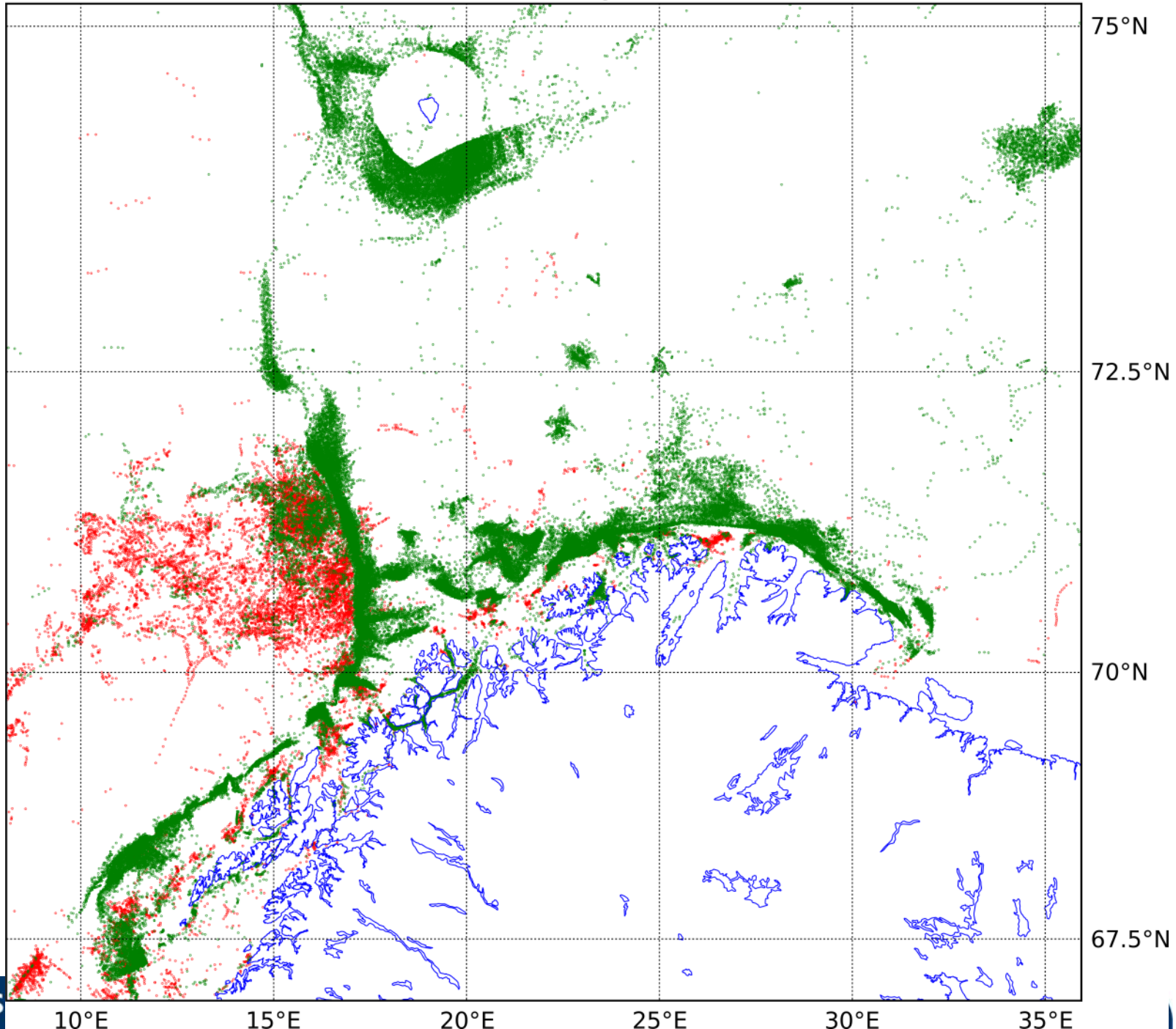
Fisheries activity: 2006



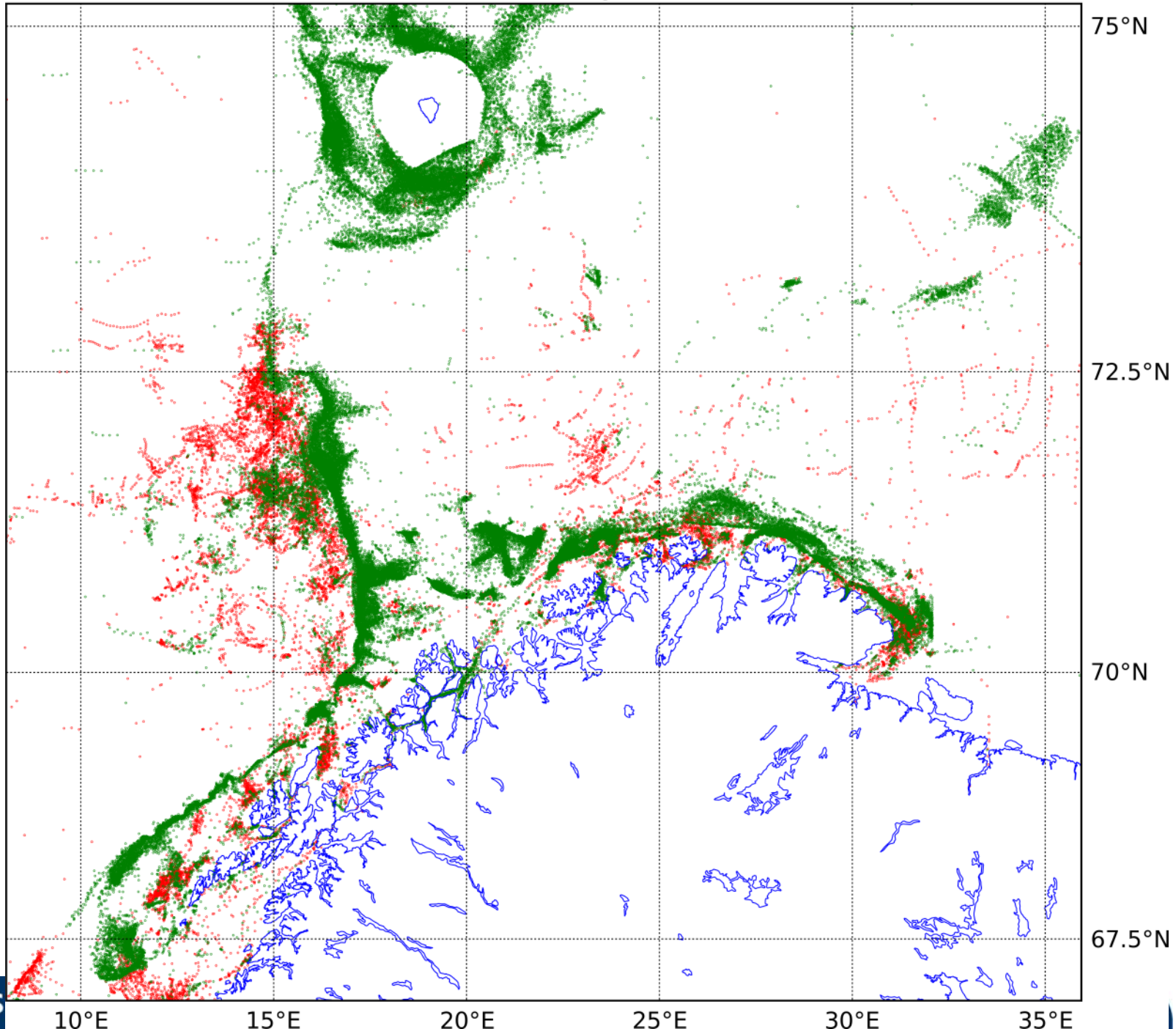
Fisheries activity: 2007



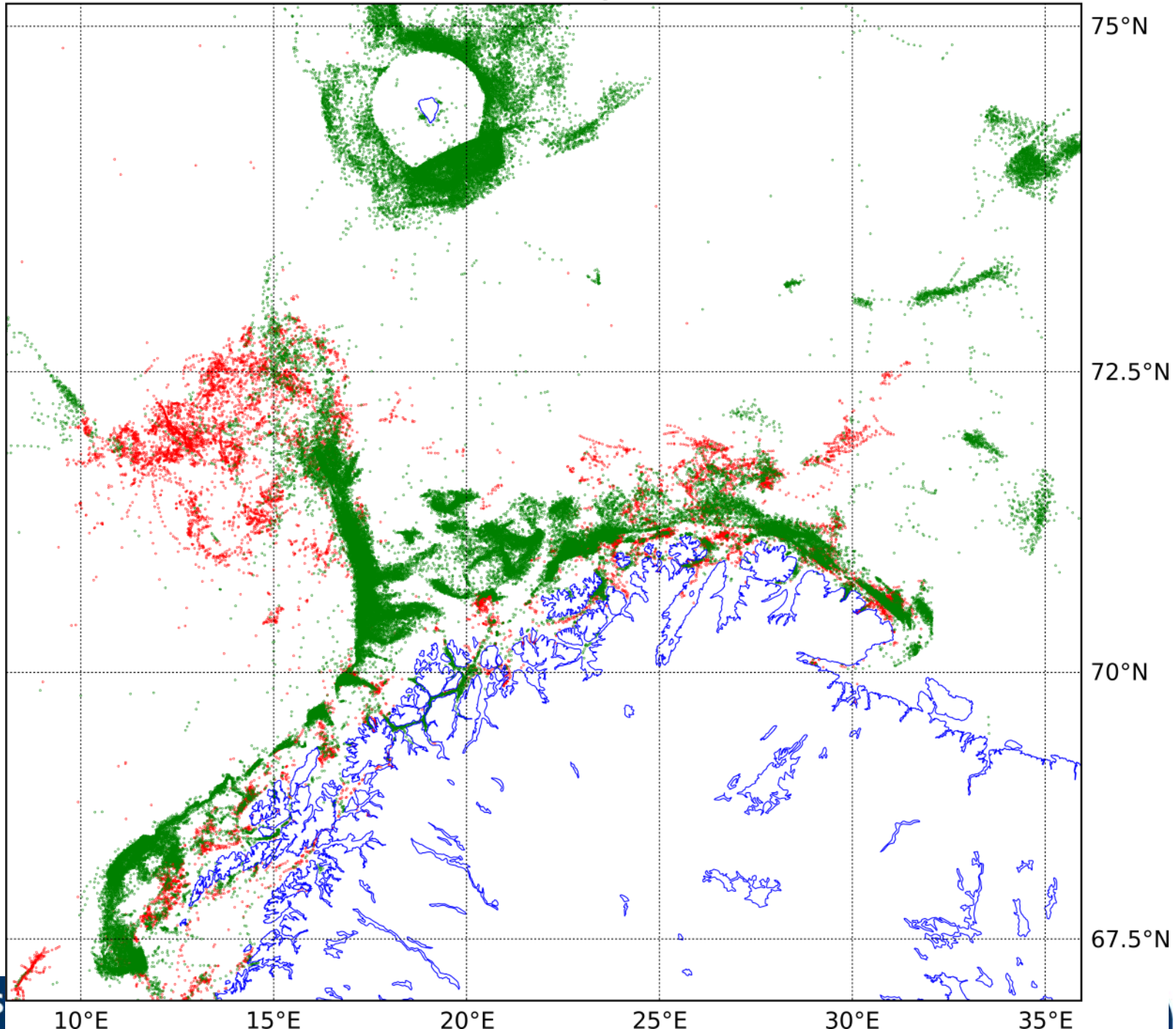
Fisheries activity: 2008



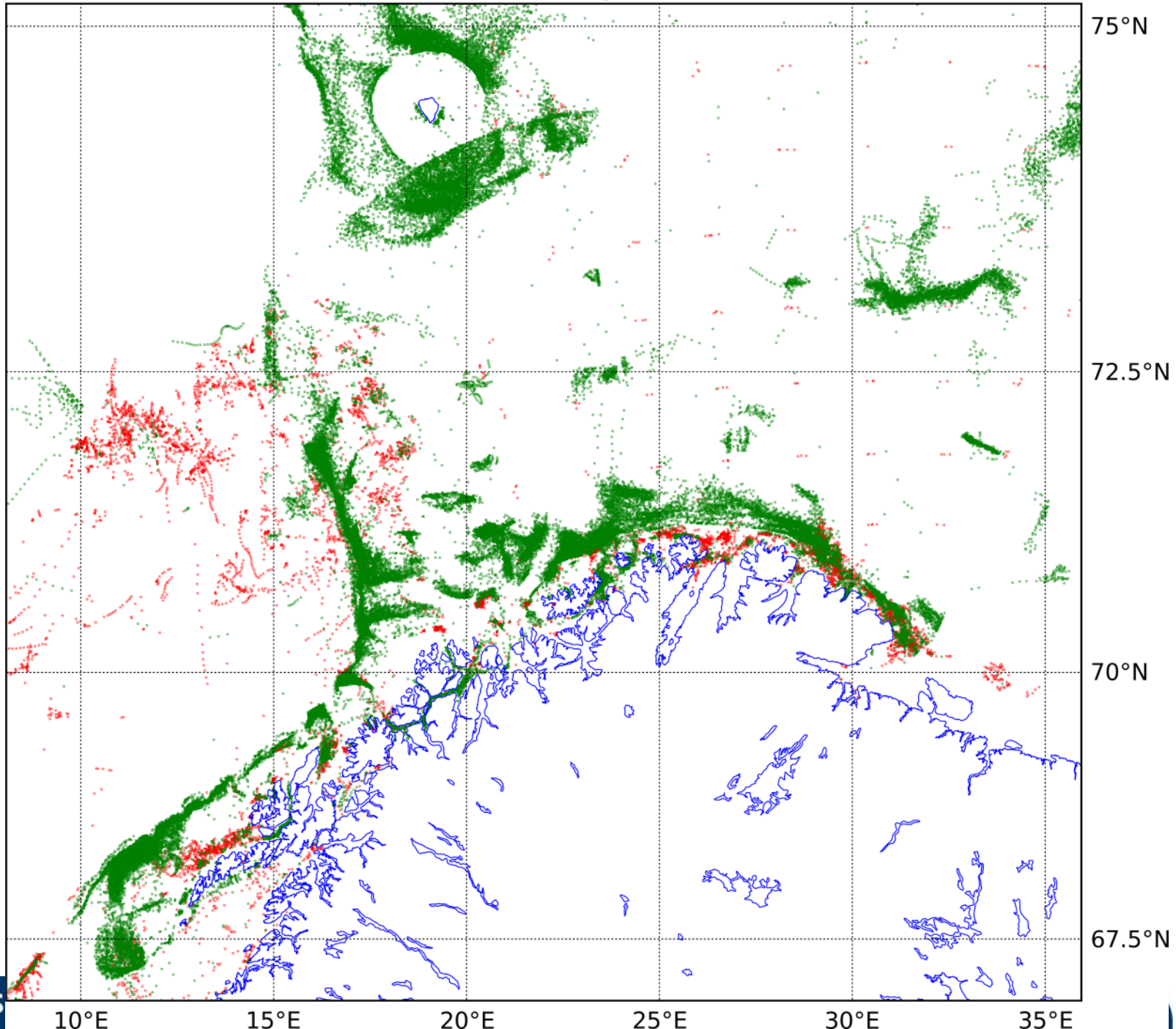
Fisheries activity: 2009



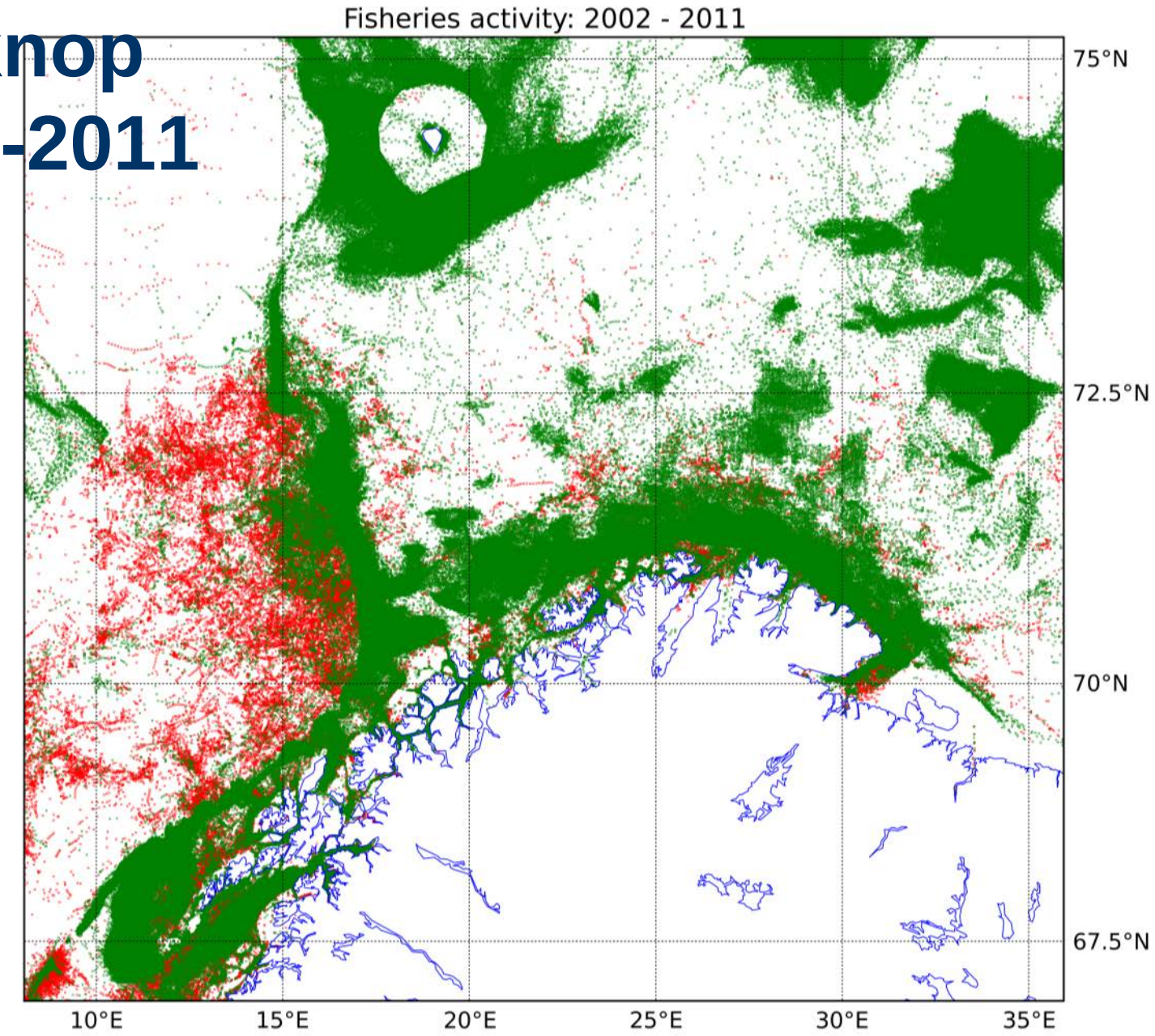
Fisheries activity: 2010



Fisheries activity: 2011



< 5 knop 2002-2011



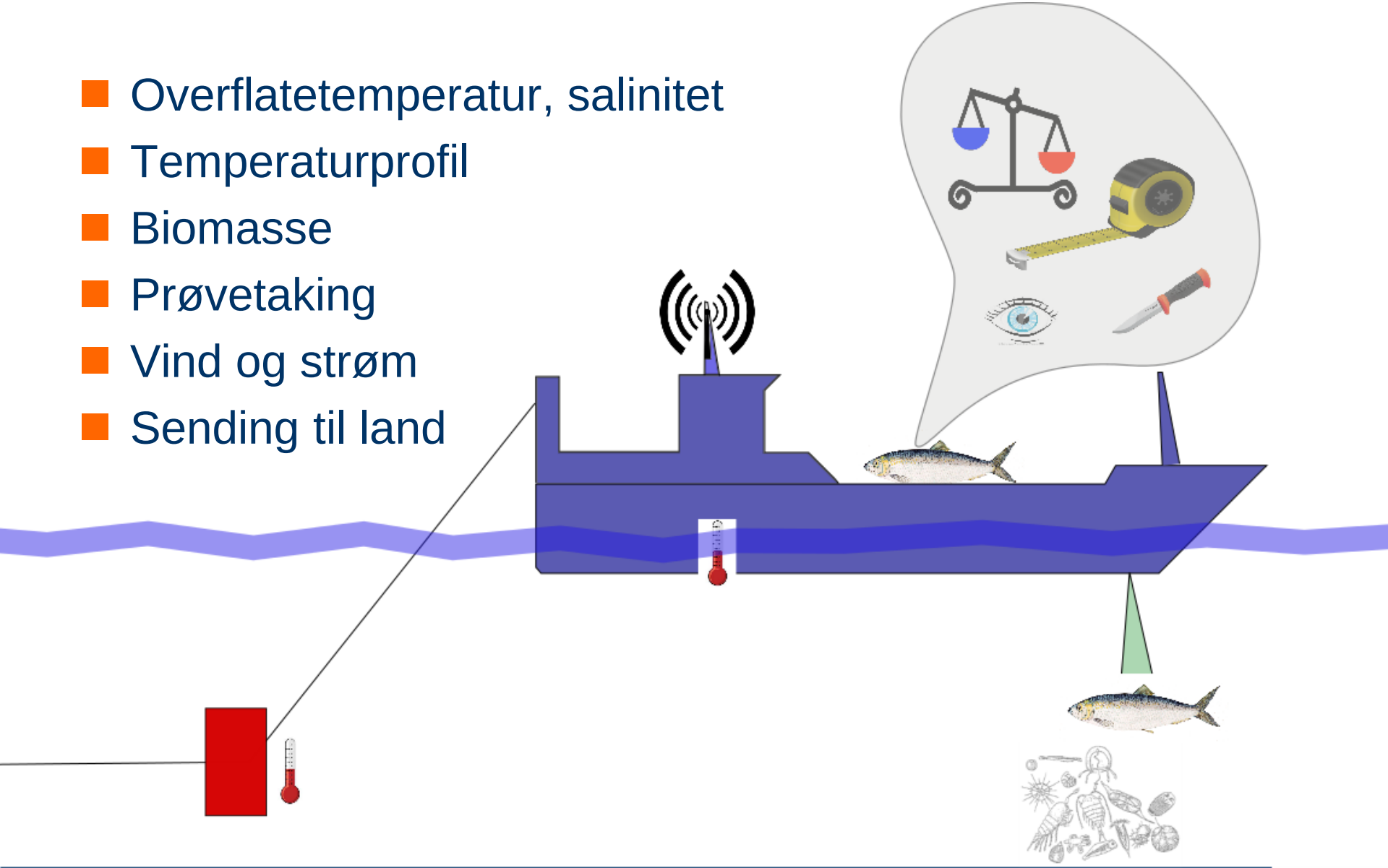
Fiskefartøy "over alt"

MEN

- Ujevn fordeling
- Varierer med år
- Varierer med sesong

Fiskefartøy som datakilde

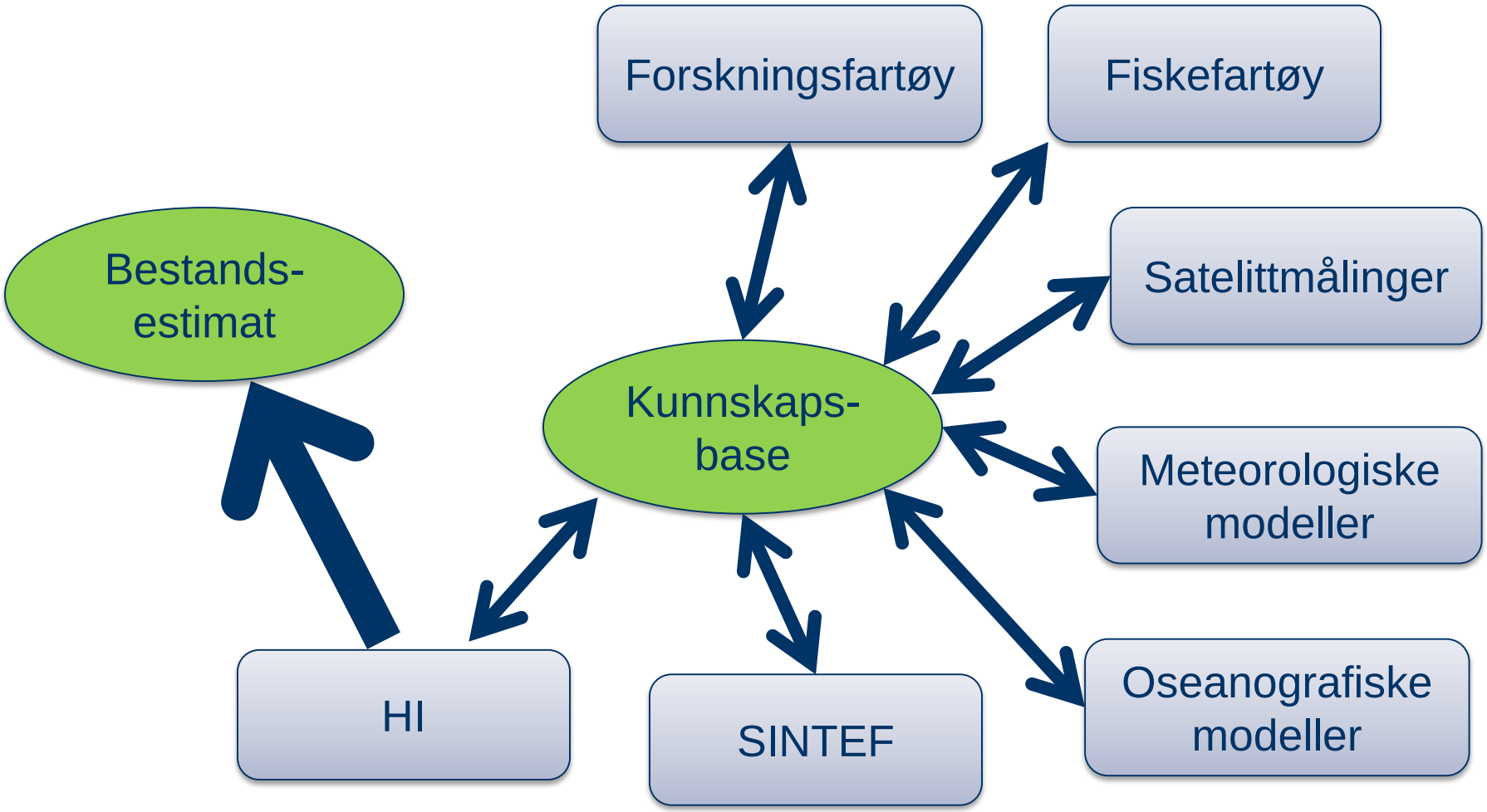
- Overflatetemperatur, salinitet
- Temperaturprofil
- Biomasse
- Prøvetaking
- Vind og strøm
- Sending til land



Utfordringer

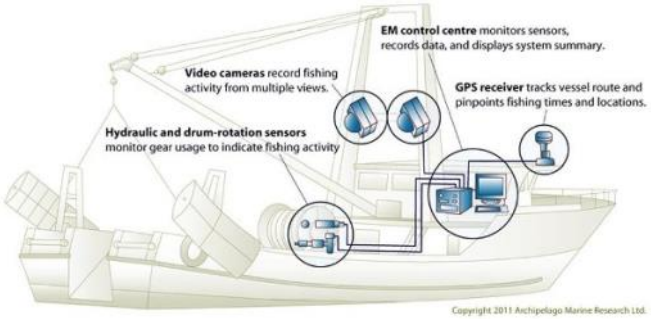
- Kalibrering
- Behandling av data ombord
- Overføring av data til land
- "Datavasking"
- Integrasjon med bestandsmodeller
- Kostnader per fartøy
- Tillit
- Samvirke mellom bestand, vandringsmønster og hvor fartøyene går.

Informasjonsflyt

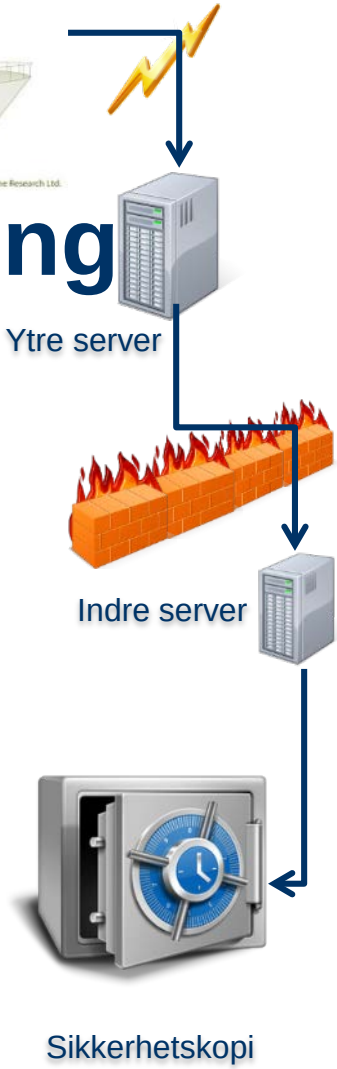


SINTEF's mulige bidrag

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

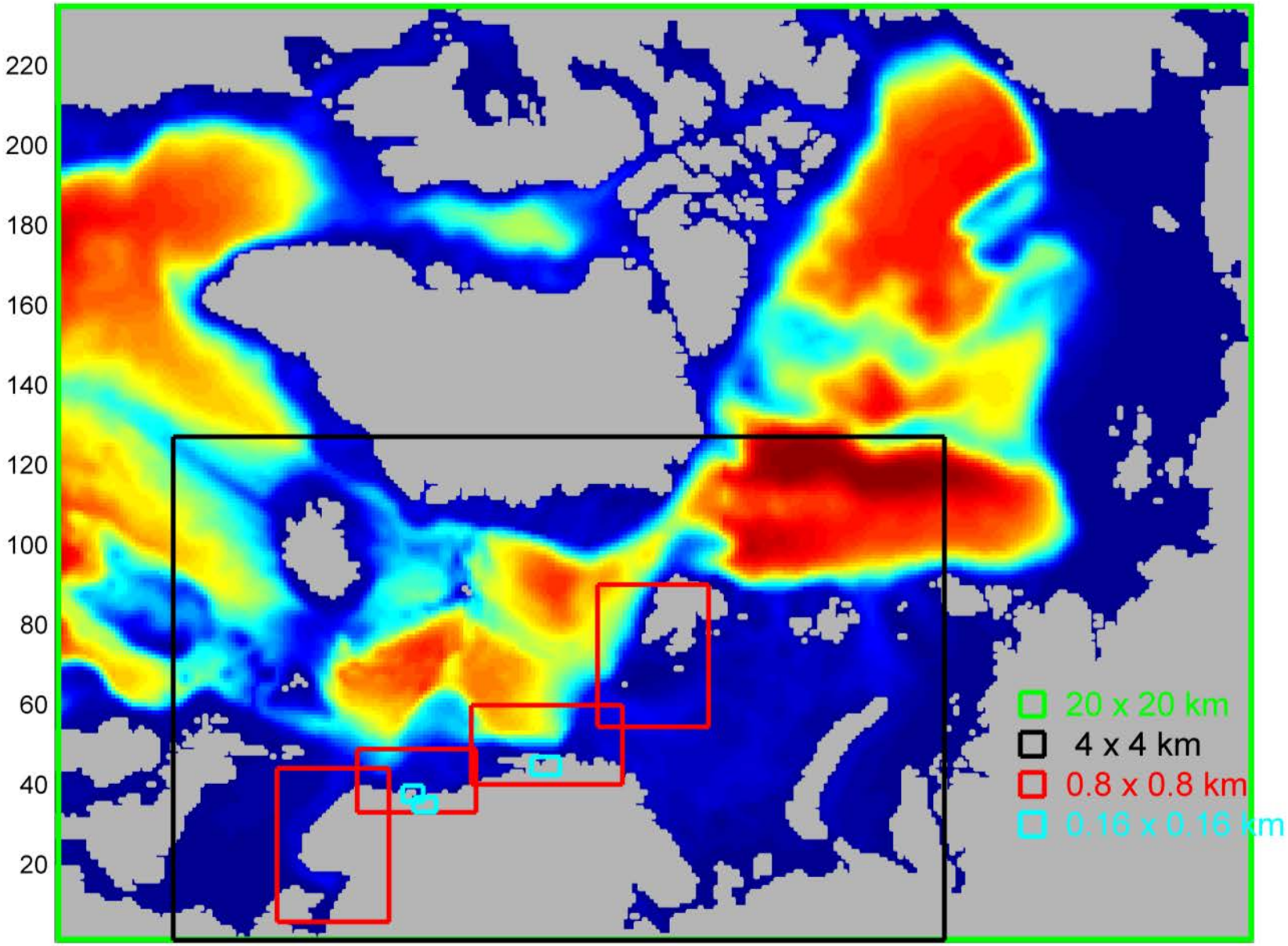


Datainnsamling og databehandling



- 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".

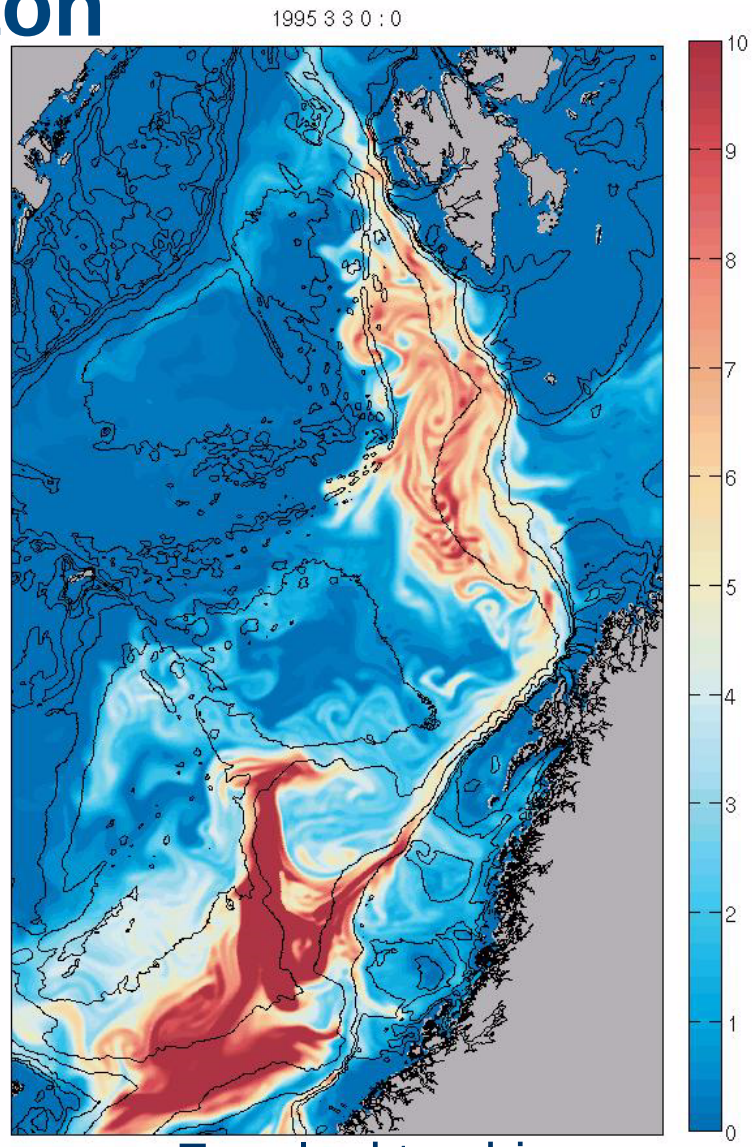
Modellering av havmiljøet - SinMod



Fordeling av zooplankton

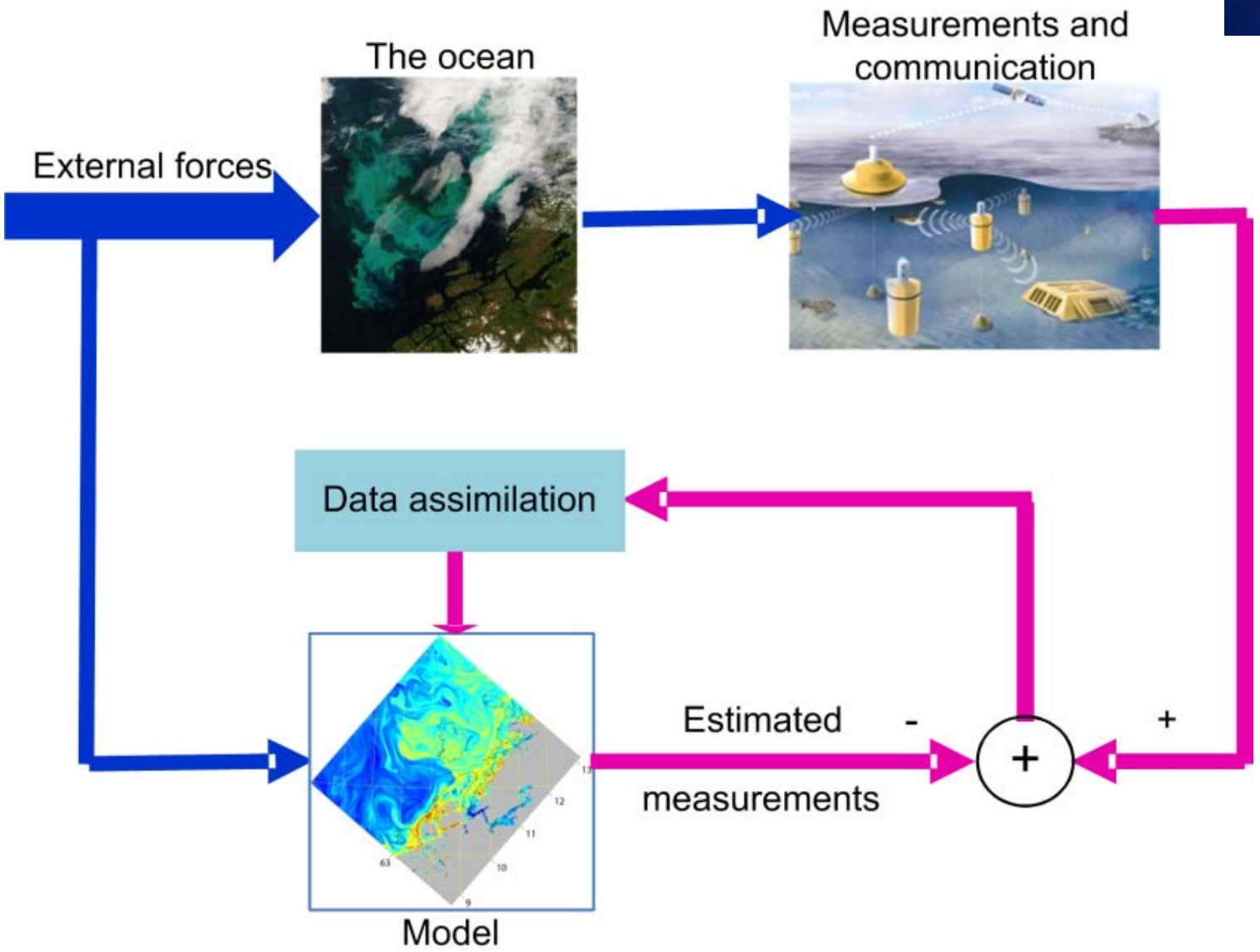
Modeller for havstrømmer, temperatur og plankton har stadig blitt forbedret (ikke minst takket være økning i datakraft).

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



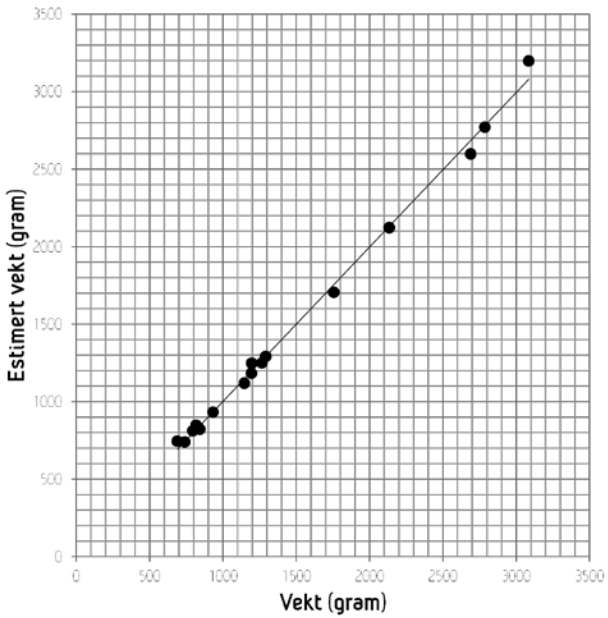
Zooplankton biomasse

Tilstandsestimering



Automatisk prøvetaking med maskinsyn

SINTEF Foodscanner



Vektestimat:

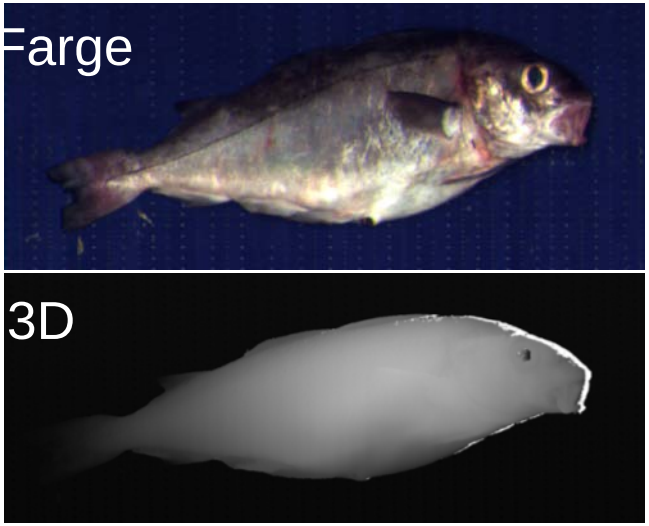
Gjennomsnittlig feil 32 gram (2.3%).

Artsbestemmelse:

Torsk-hyse: 100% riktig

Videreføring:

Melbu Systems



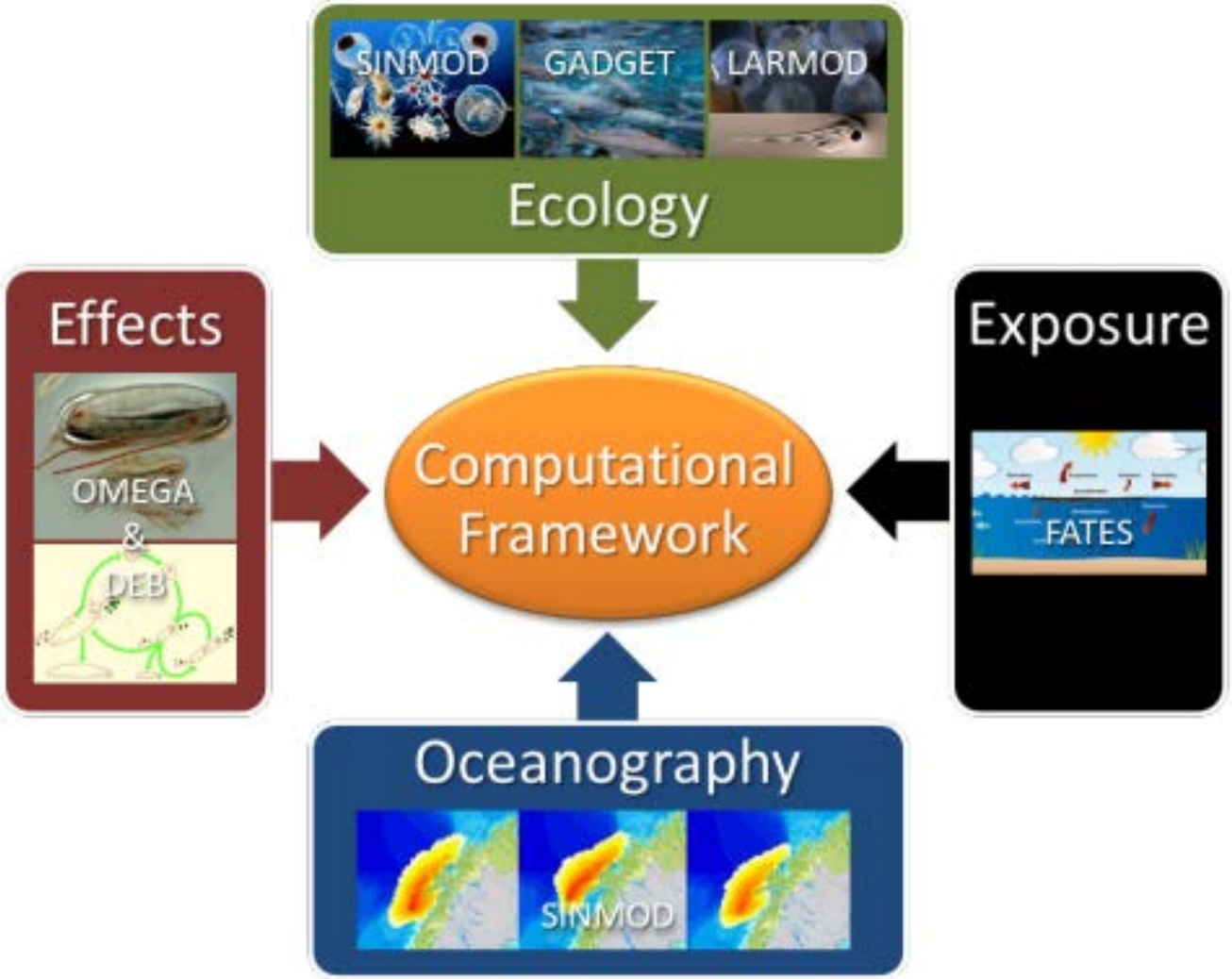
Veien videre

- 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

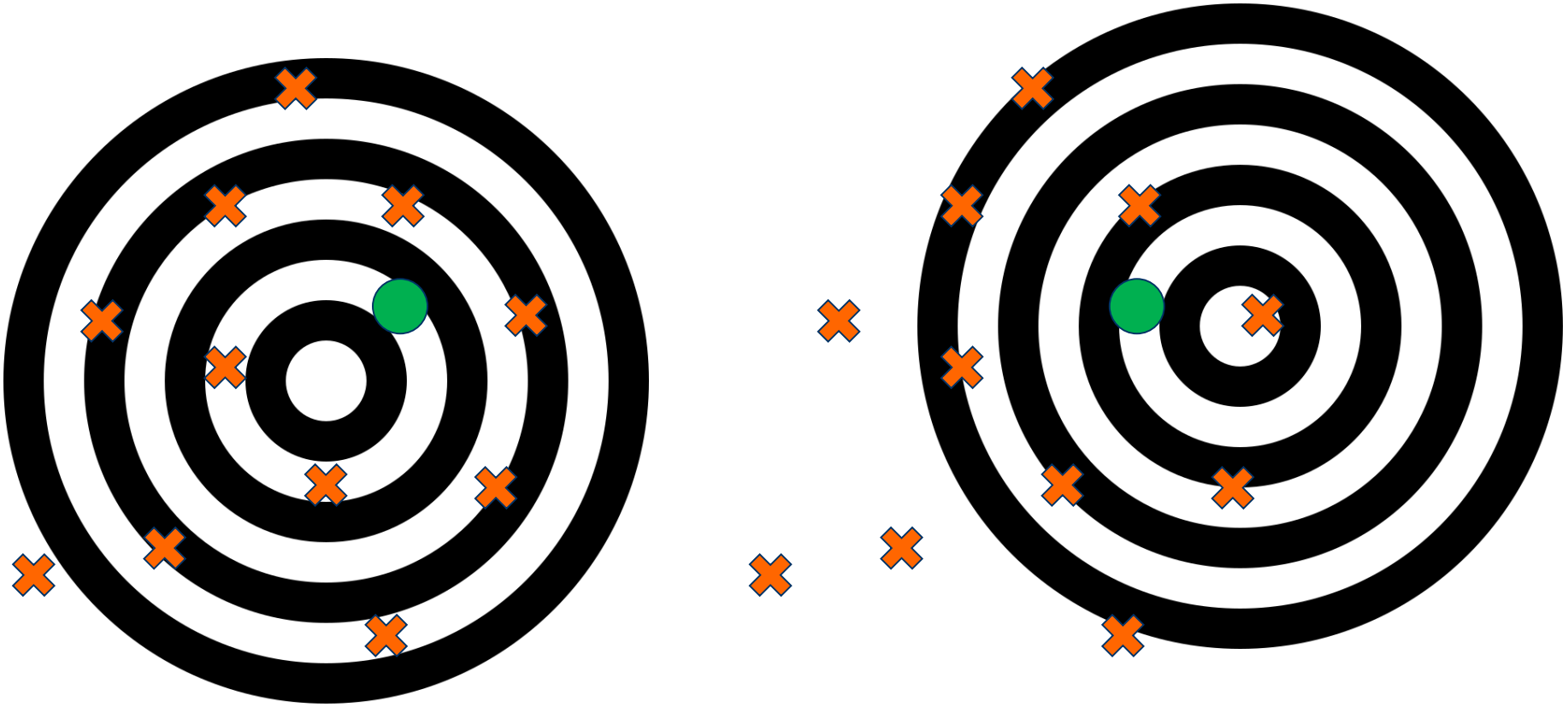
- Fiskeflåten kan gi bedre dekning av havområdene
- Et stort antall fartøy kan kompensere for unøyaktige målinger
- Det er konkret arbeid på gang

Bestandsmodellering

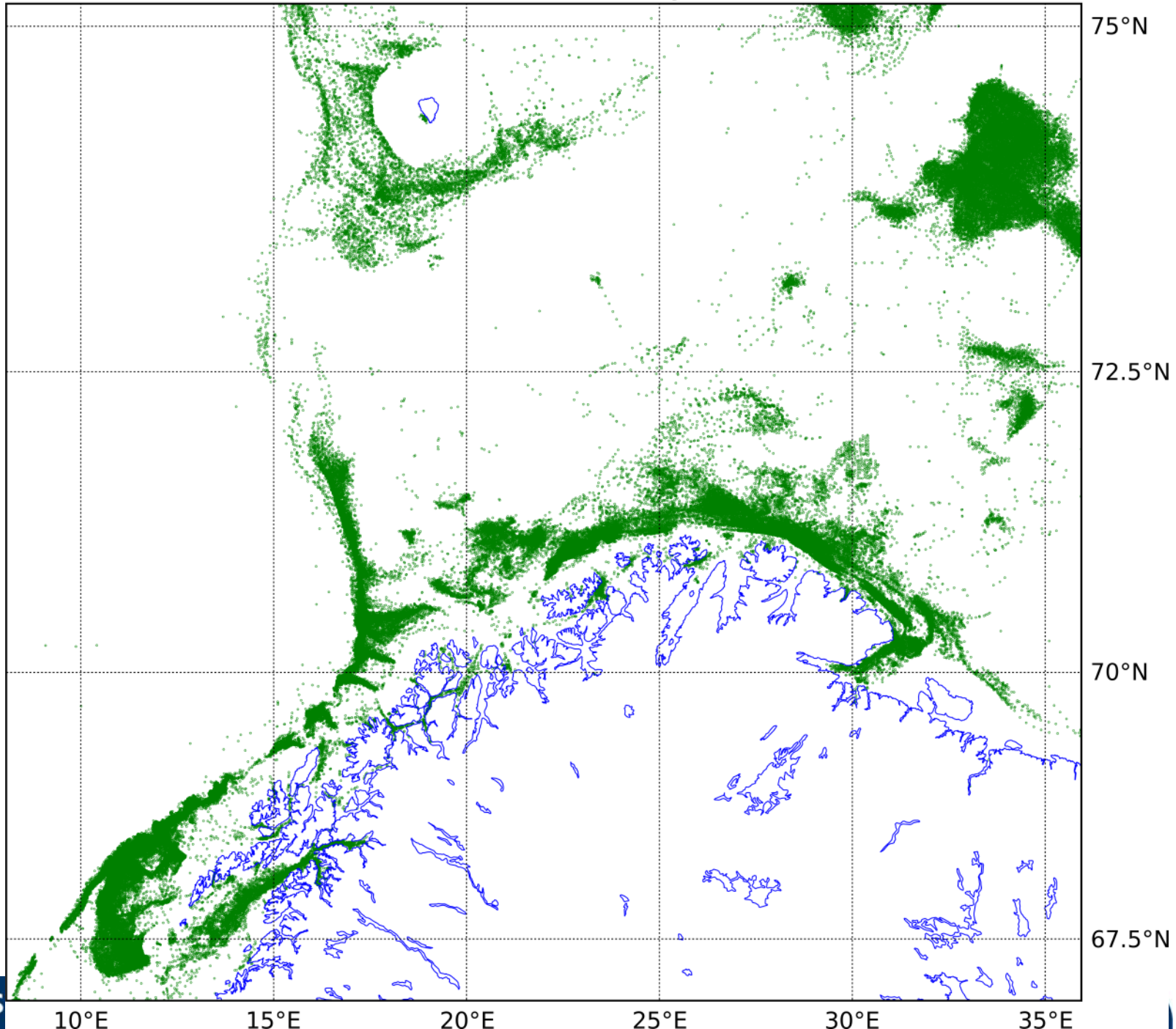


Hvordan utnytte dette?

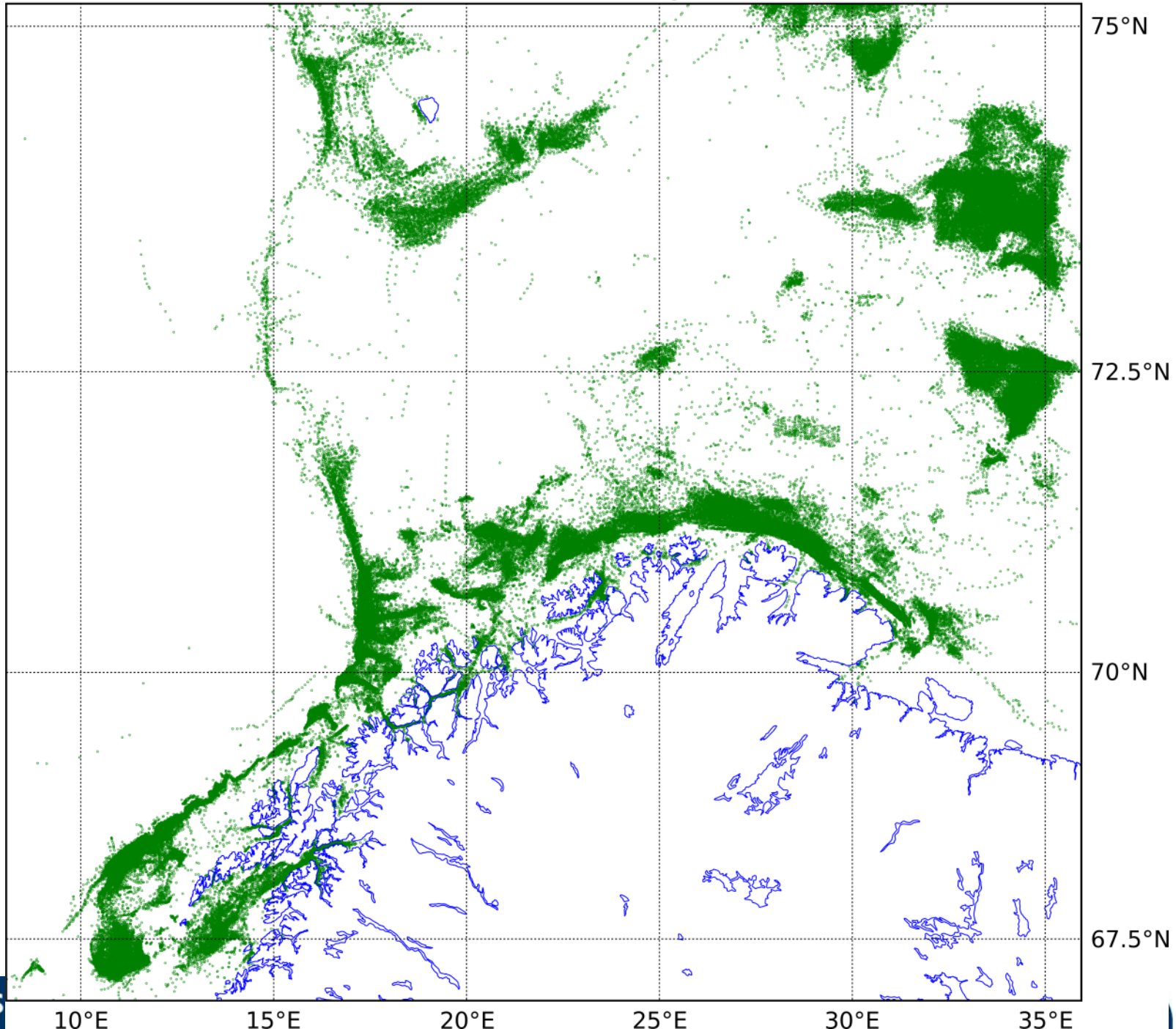
- Optimalisere kostnad vs nytte
- Mange billige "datainnsamlere" eller få dyre?



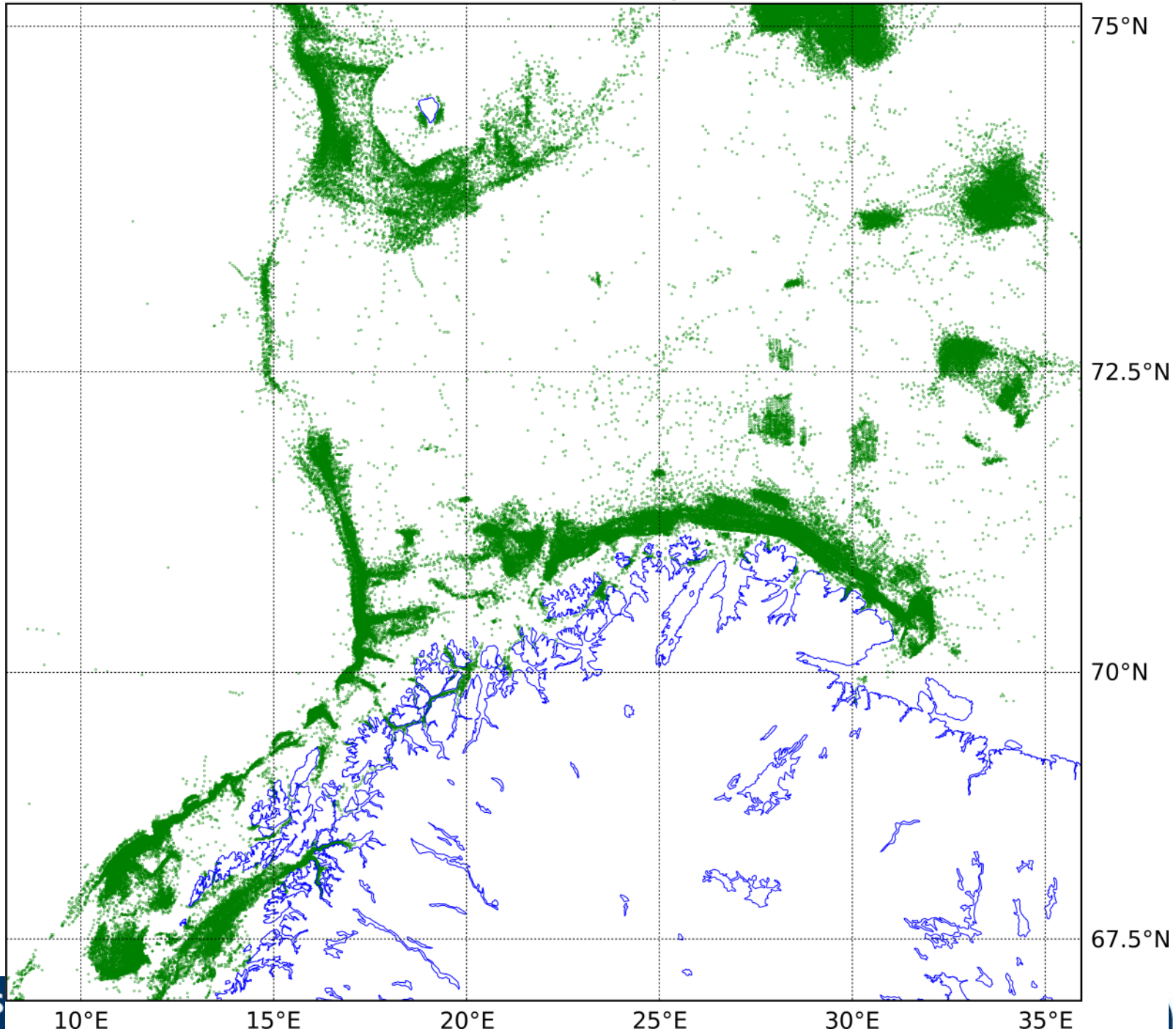
Demersal fisheries activity: 2002



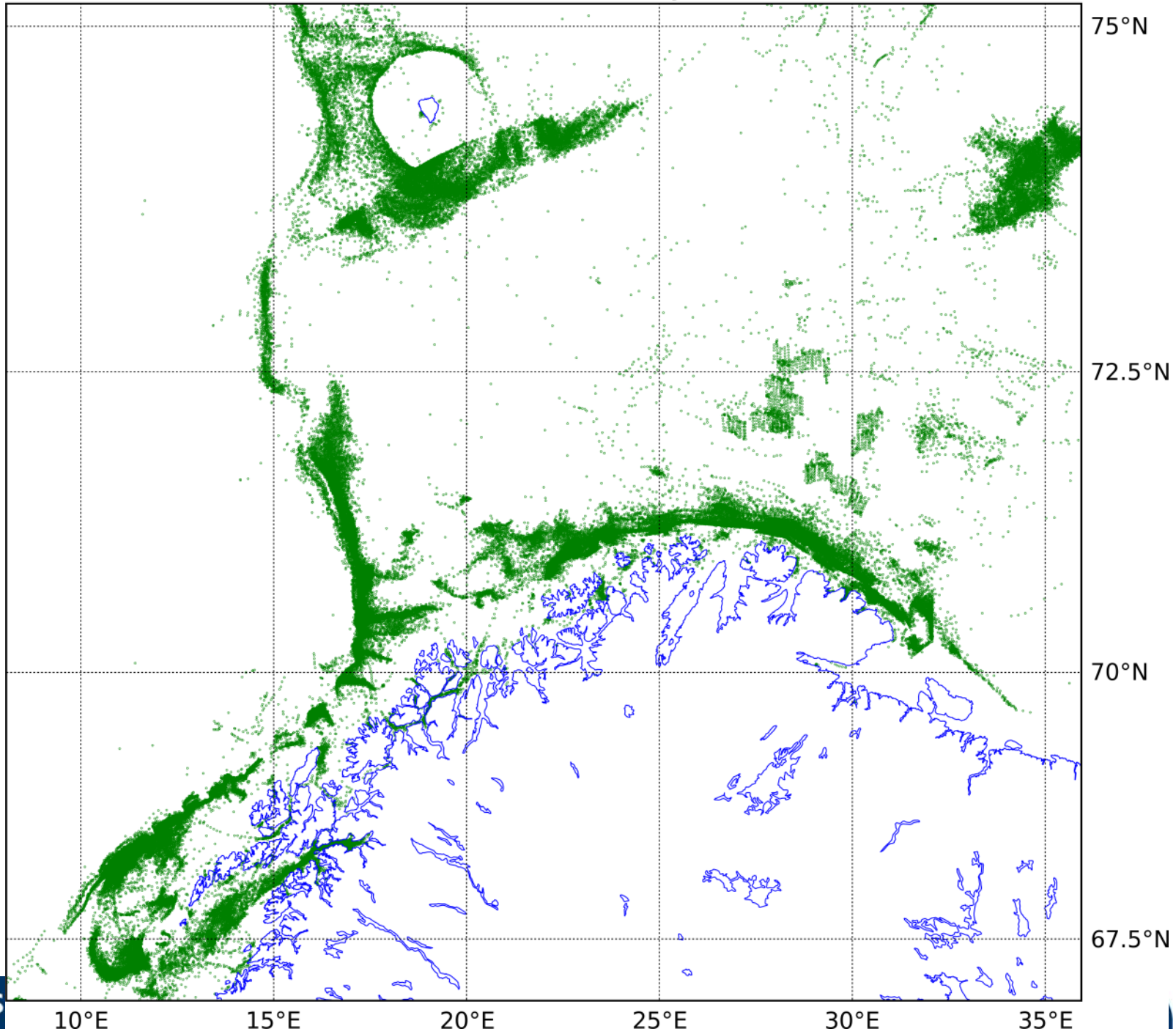
Demersal fisheries activity: 2003



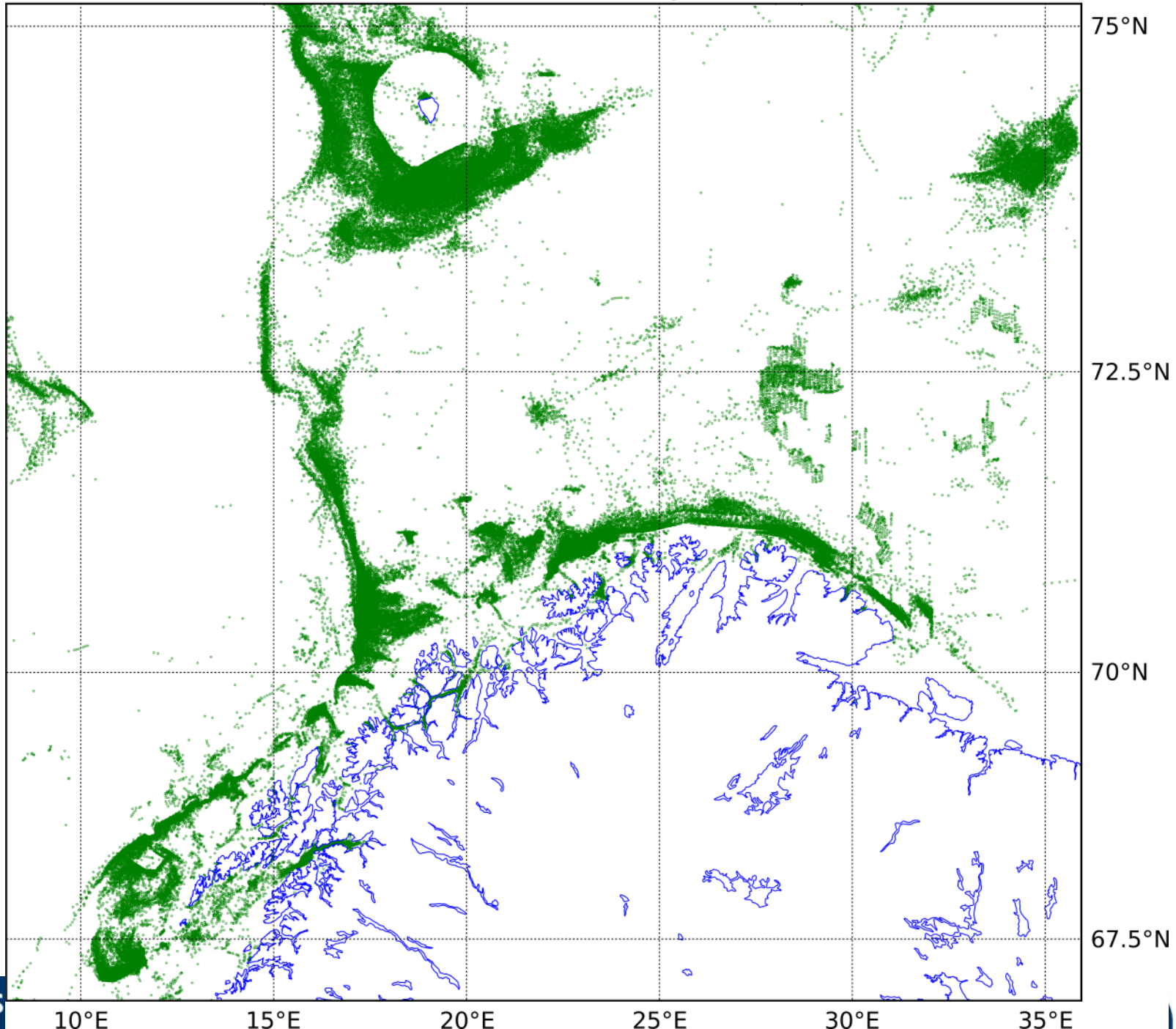
Demersal fisheries activity: 2004



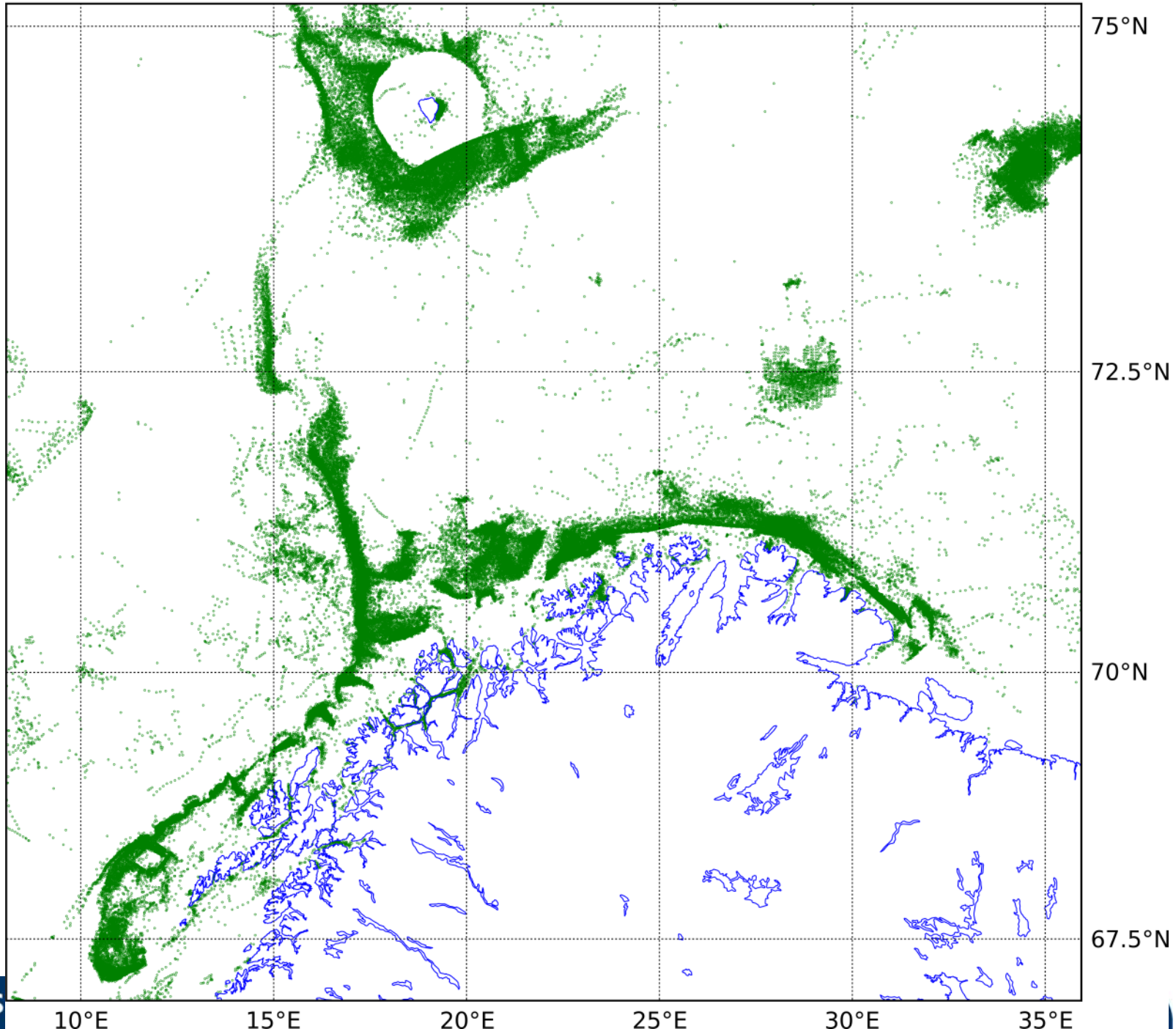
Demersal fisheries activity: 2005



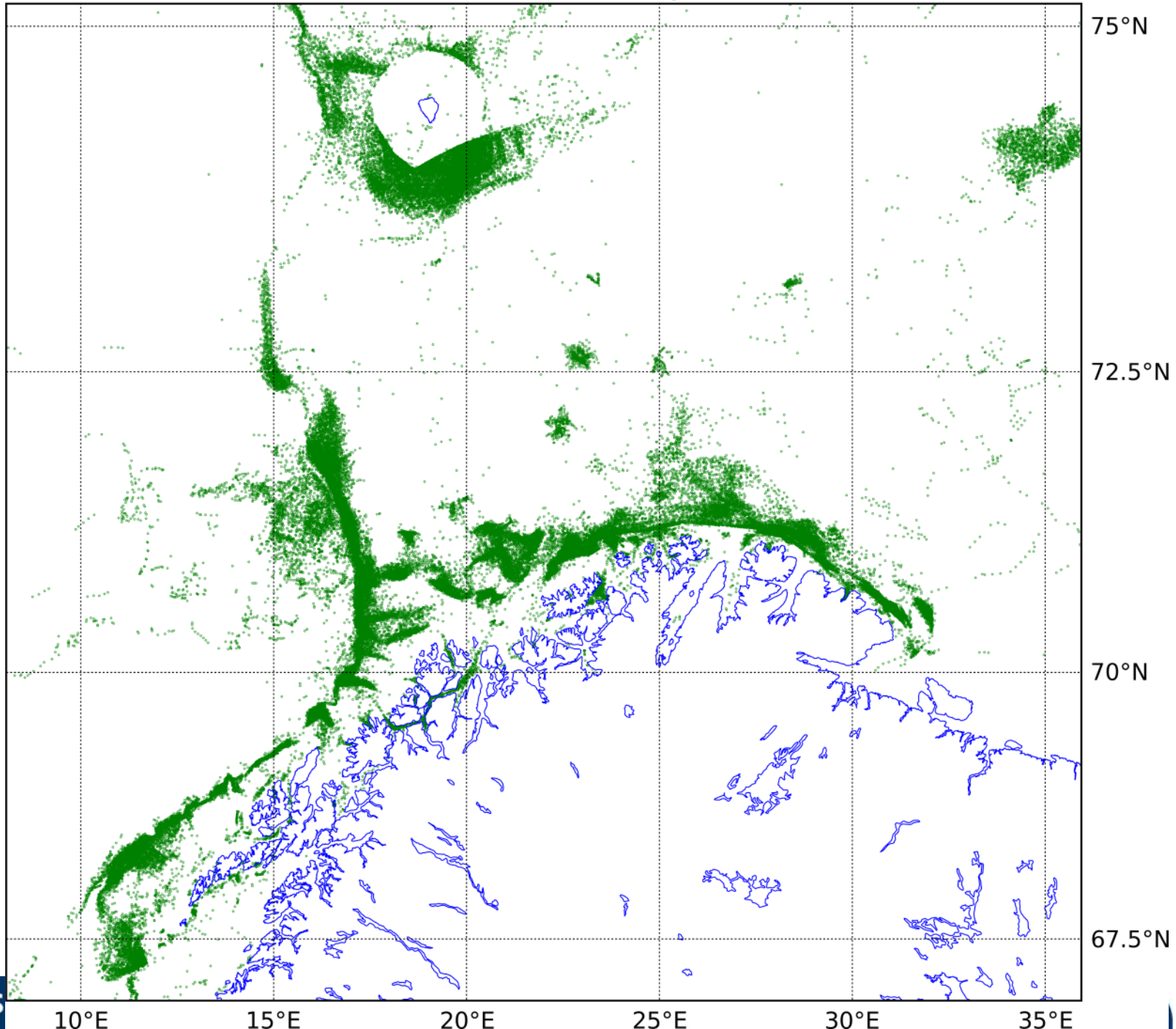
Demersal fisheries activity: 2006



Demersal fisheries activity: 2007



Demersal fisheries activity: 2008



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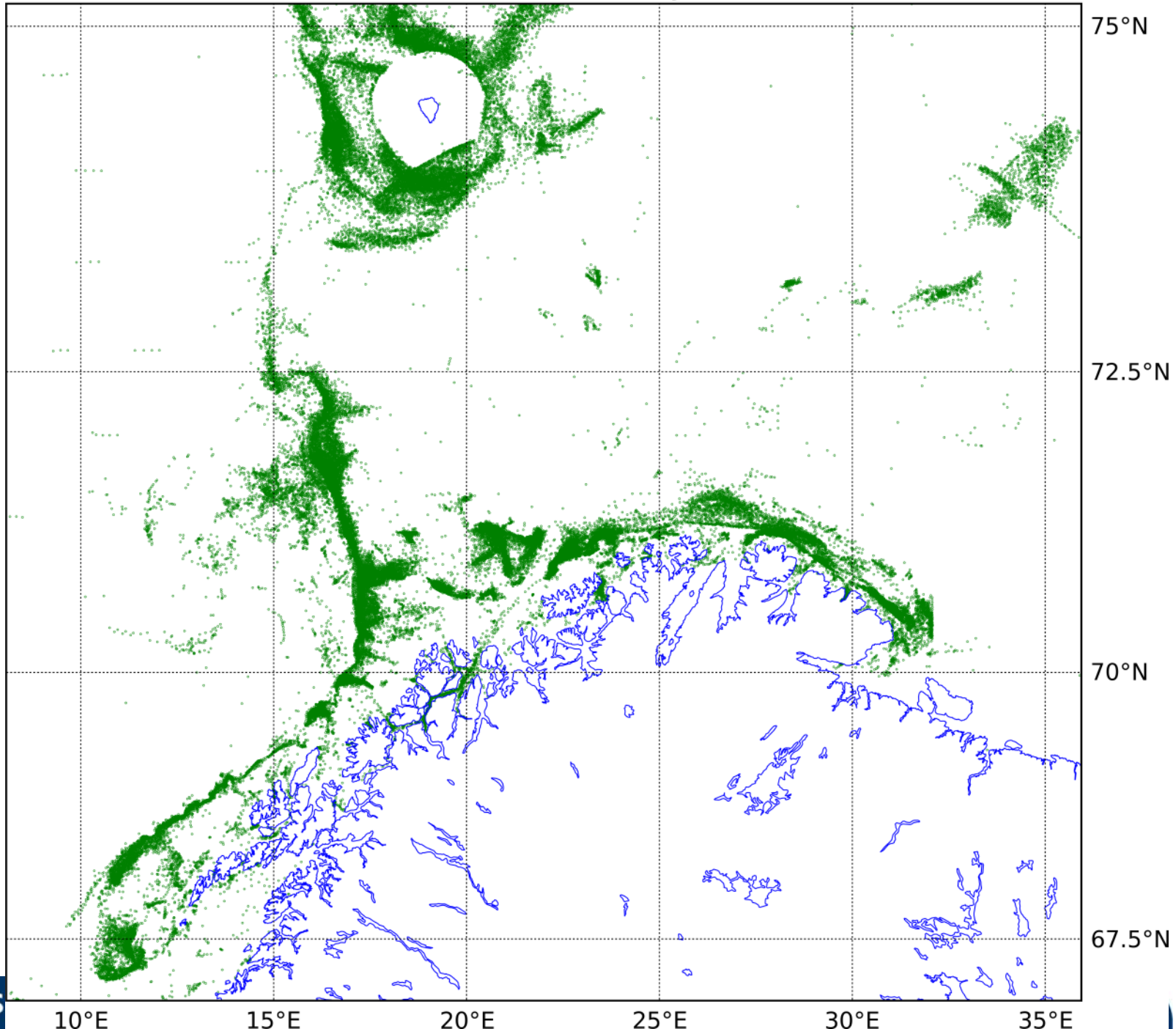

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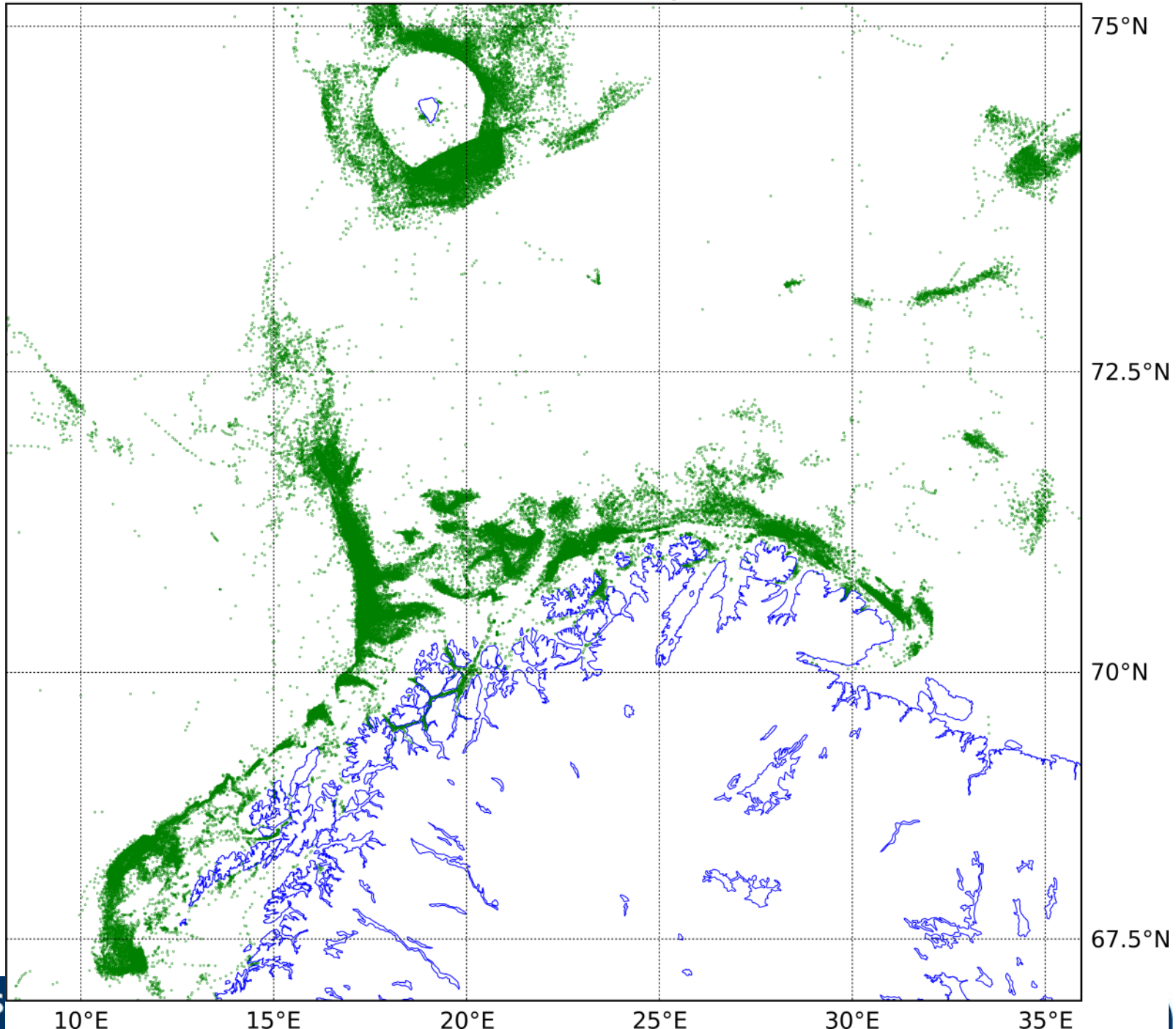
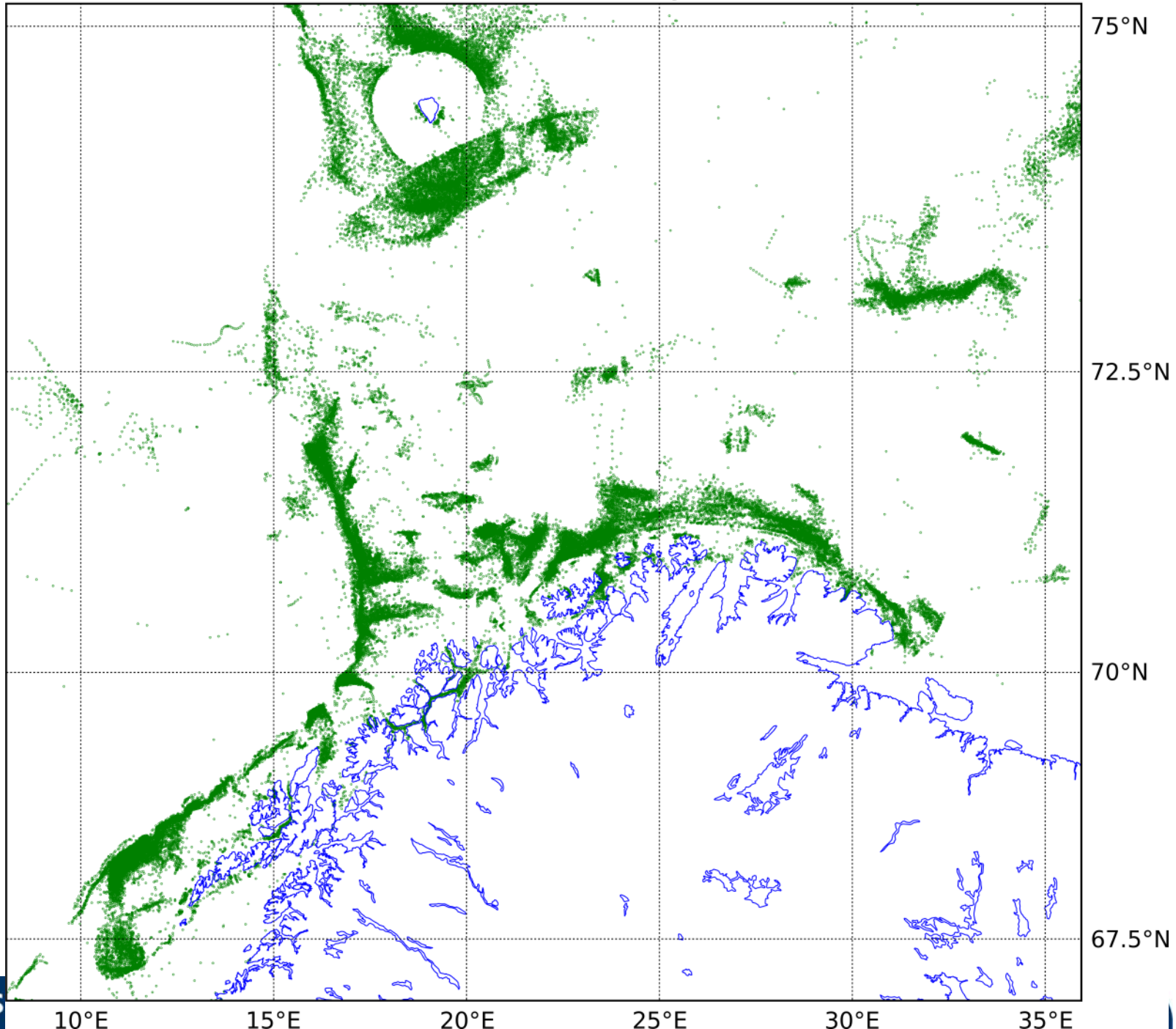
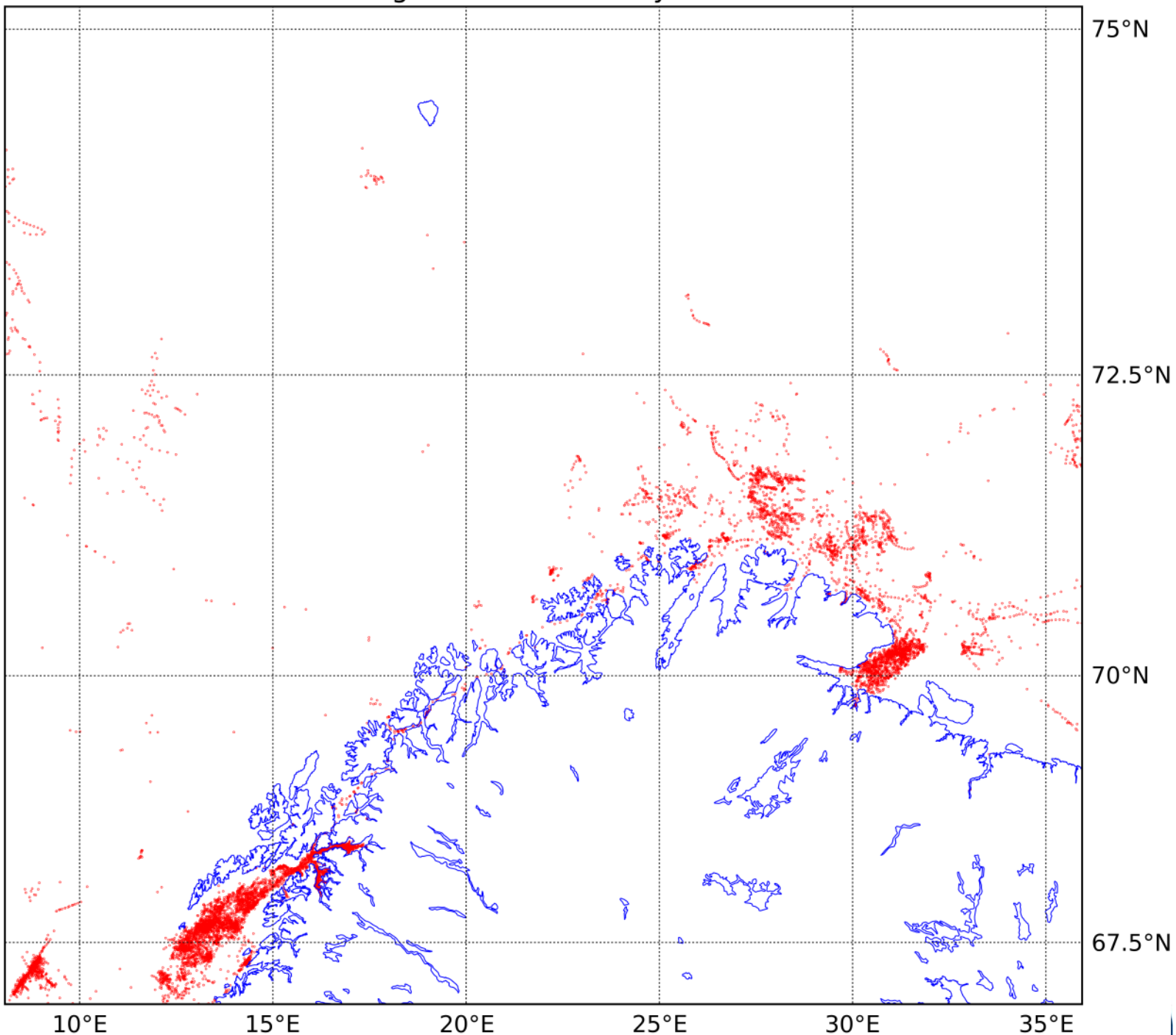


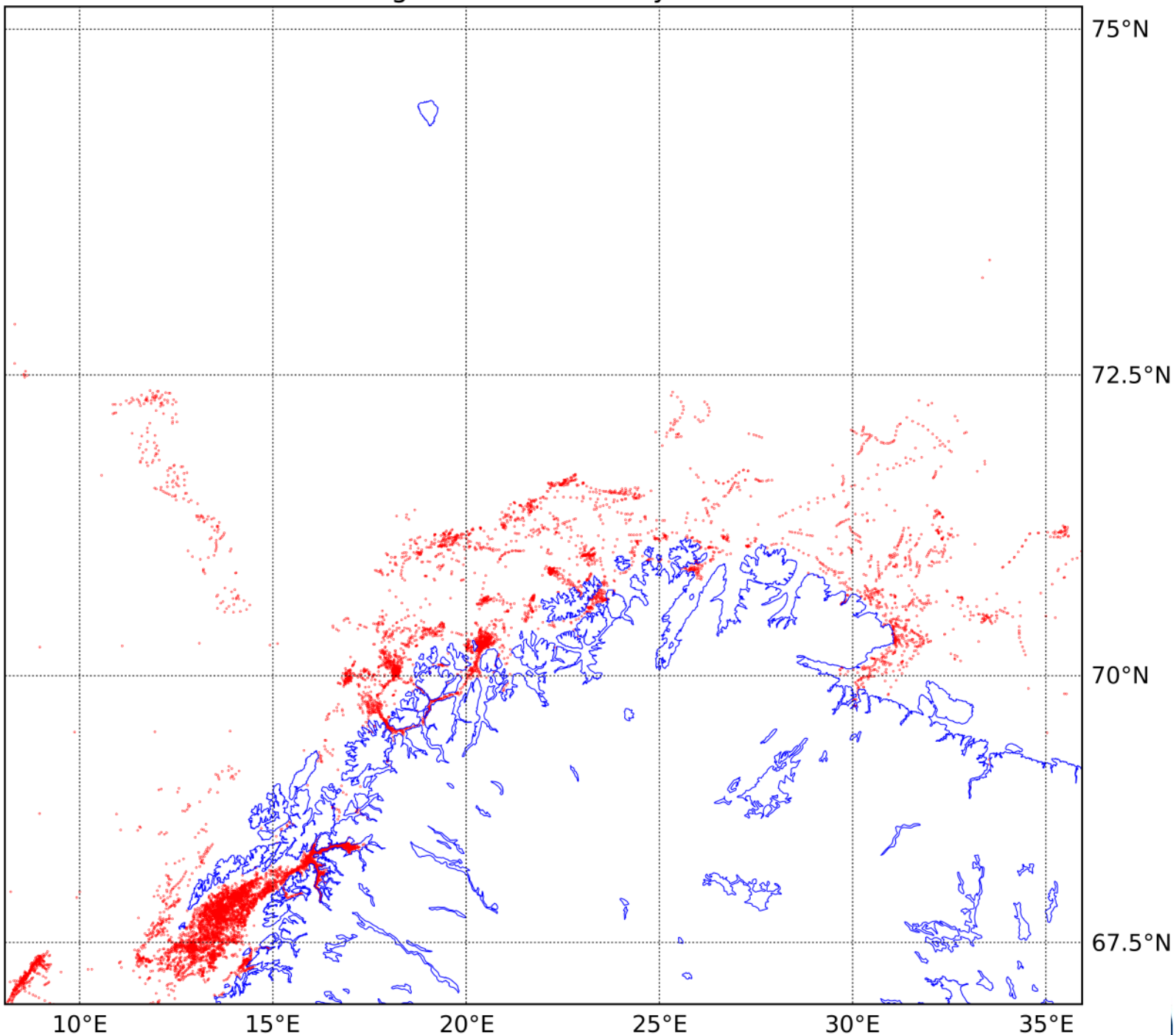
Demersal fisheries activity: 2011



Pelagic fisheries activity: 2002



Pelagic fisheries activity: 2003



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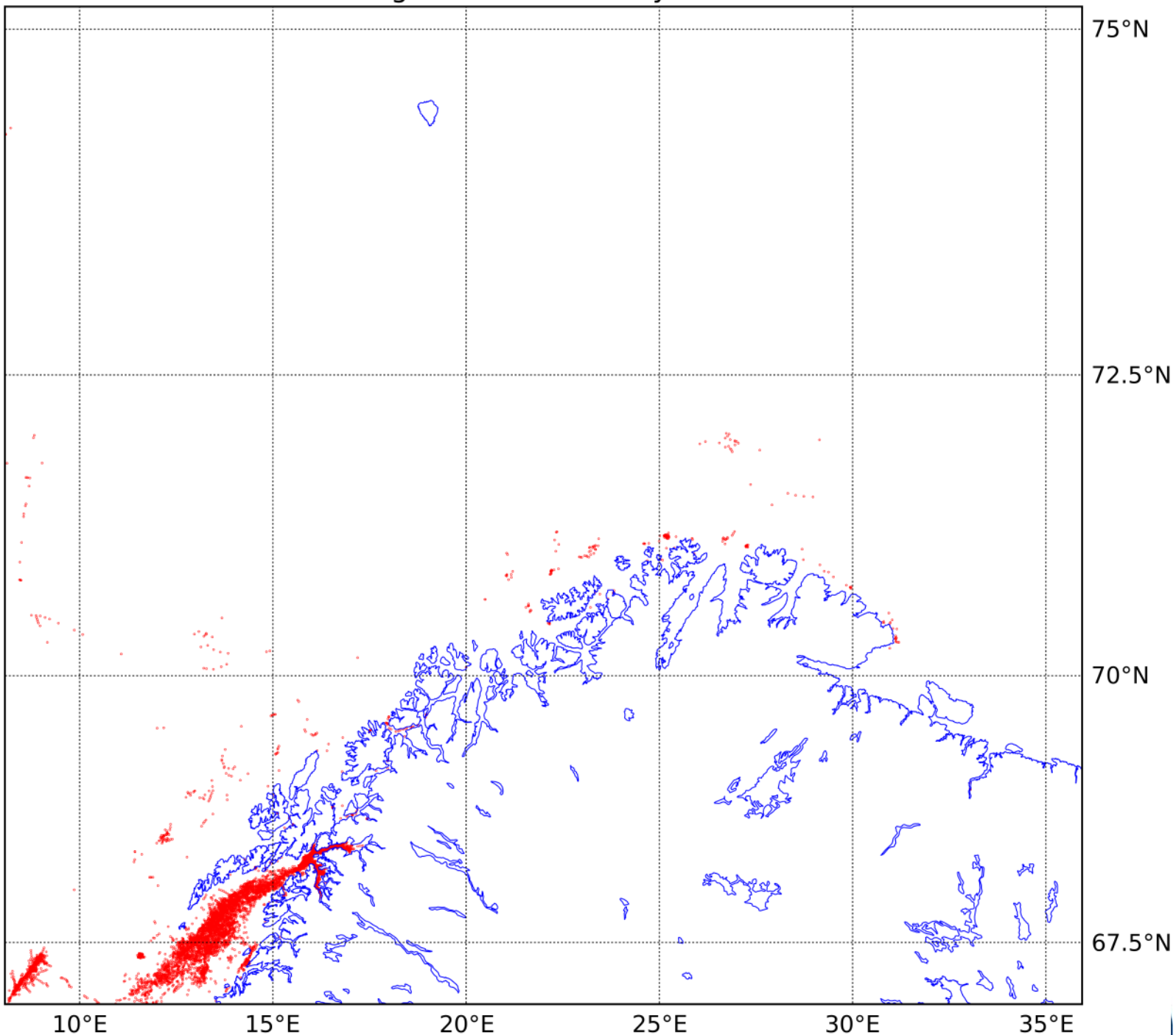

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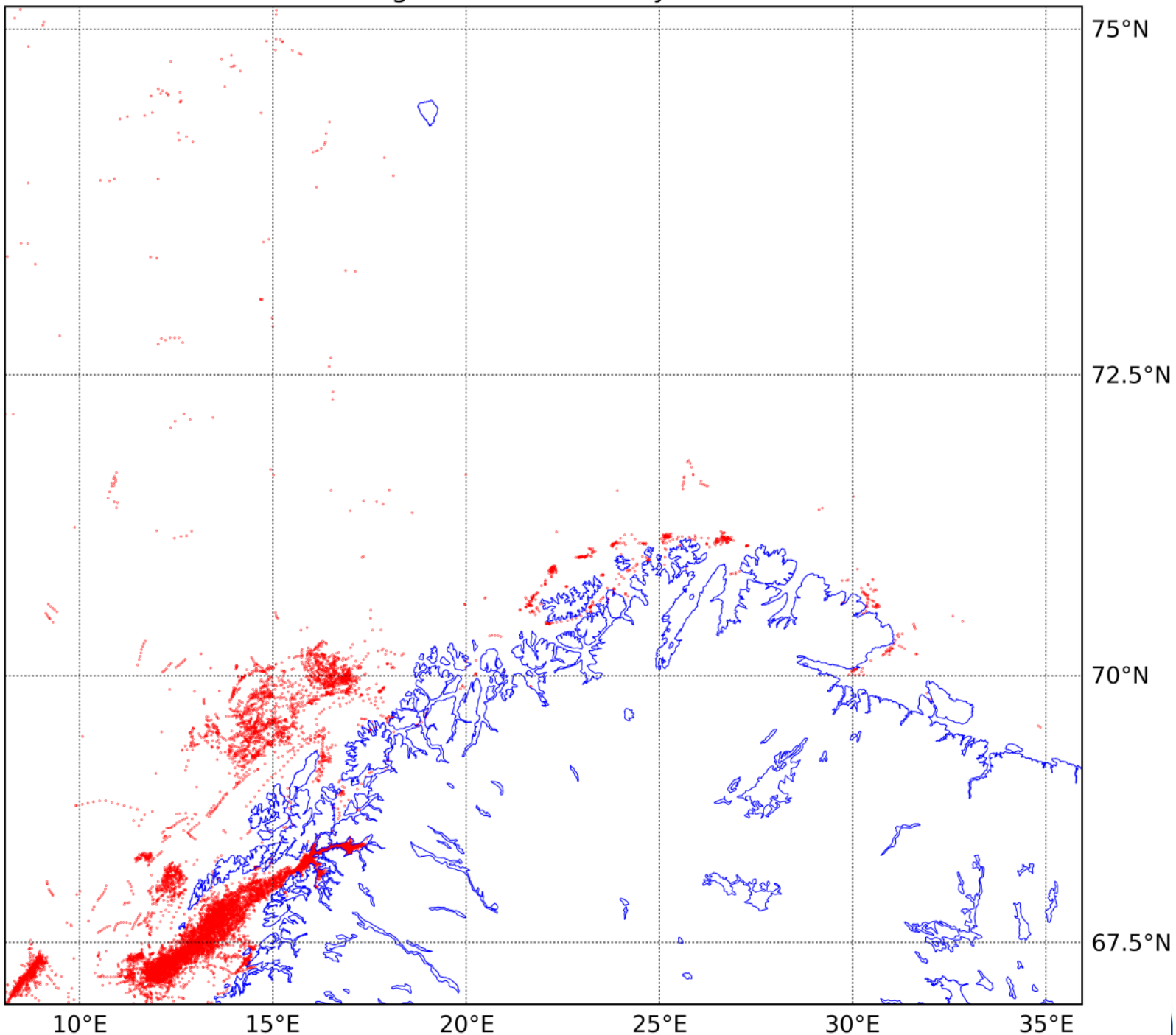

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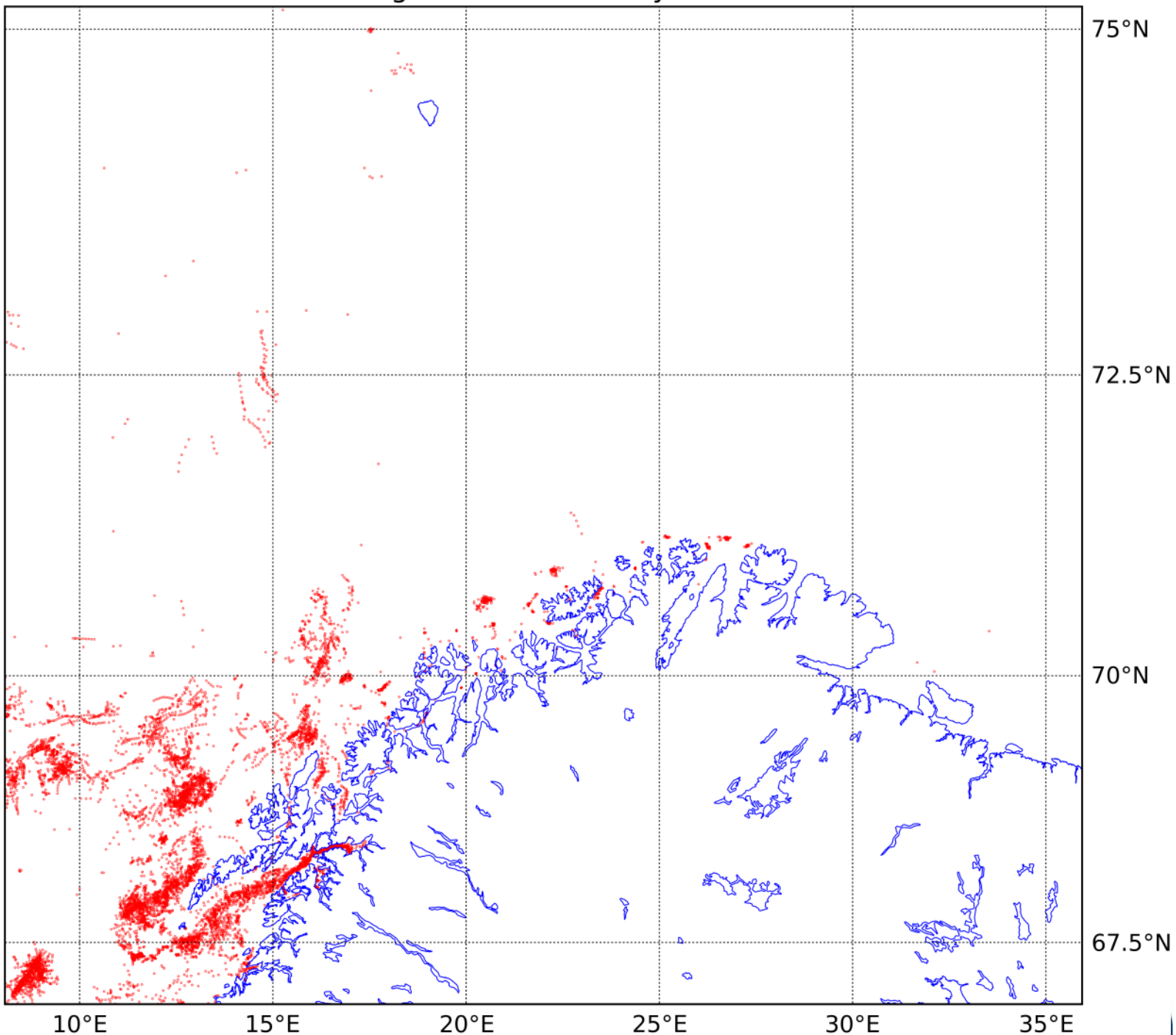

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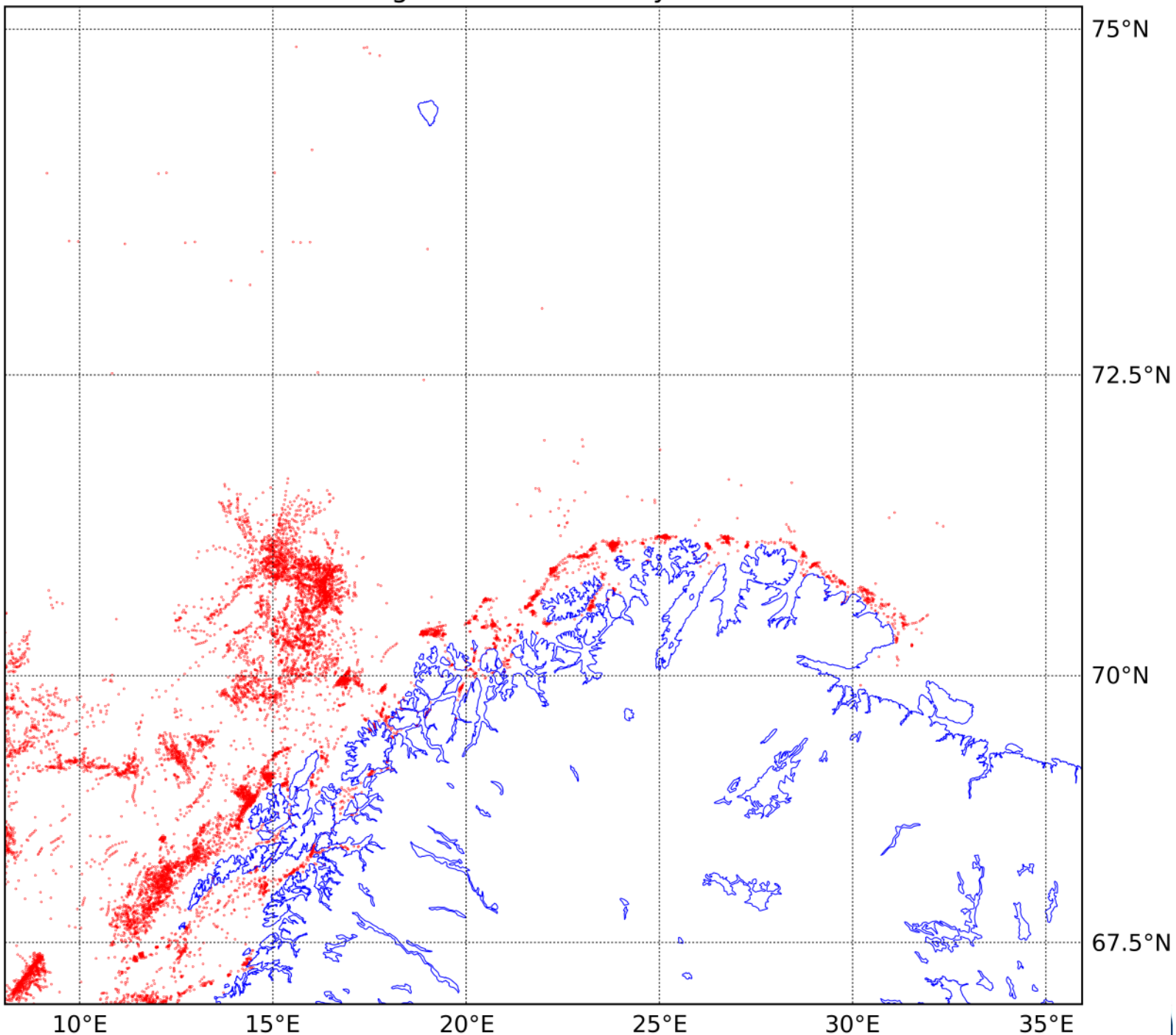

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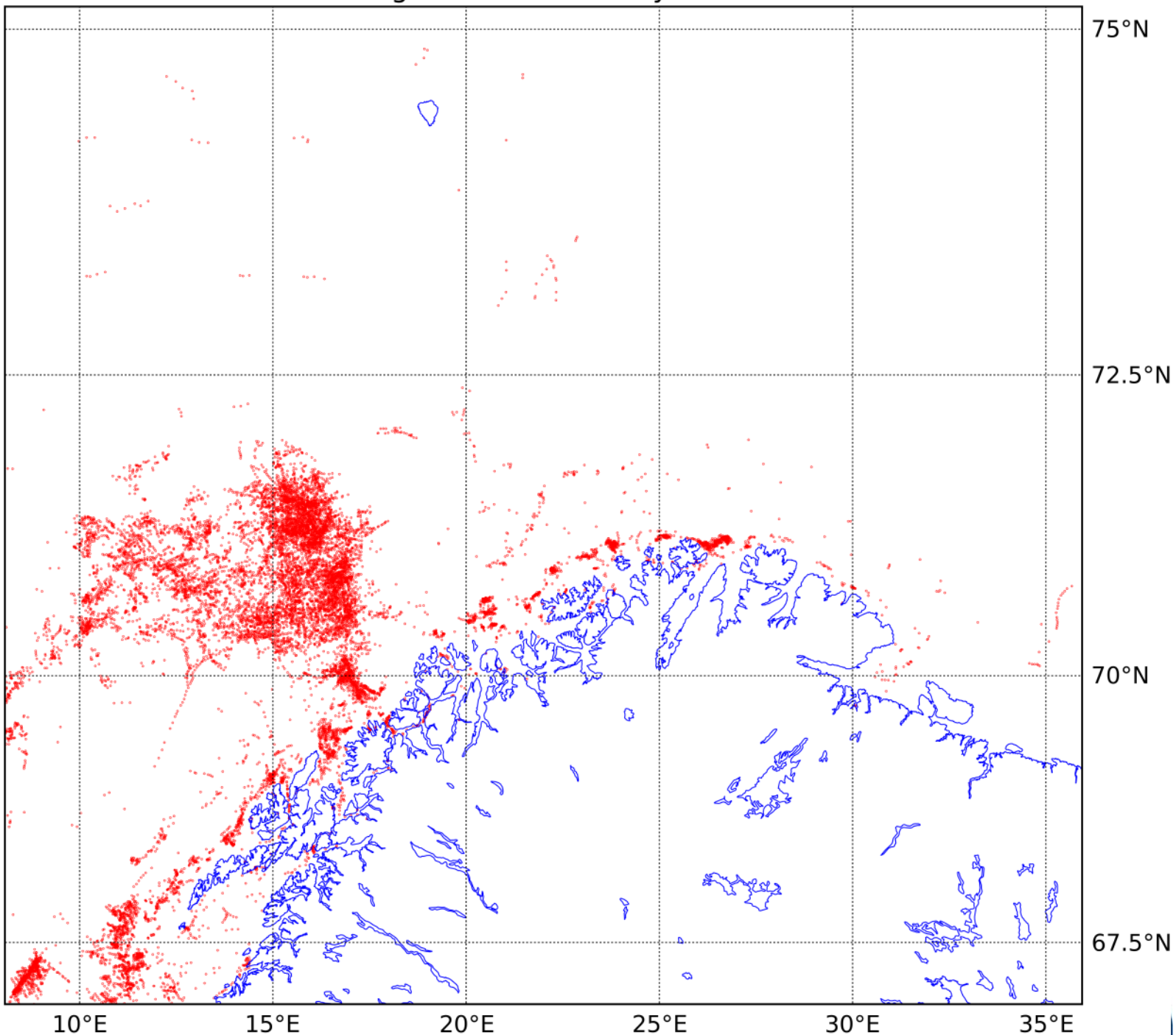

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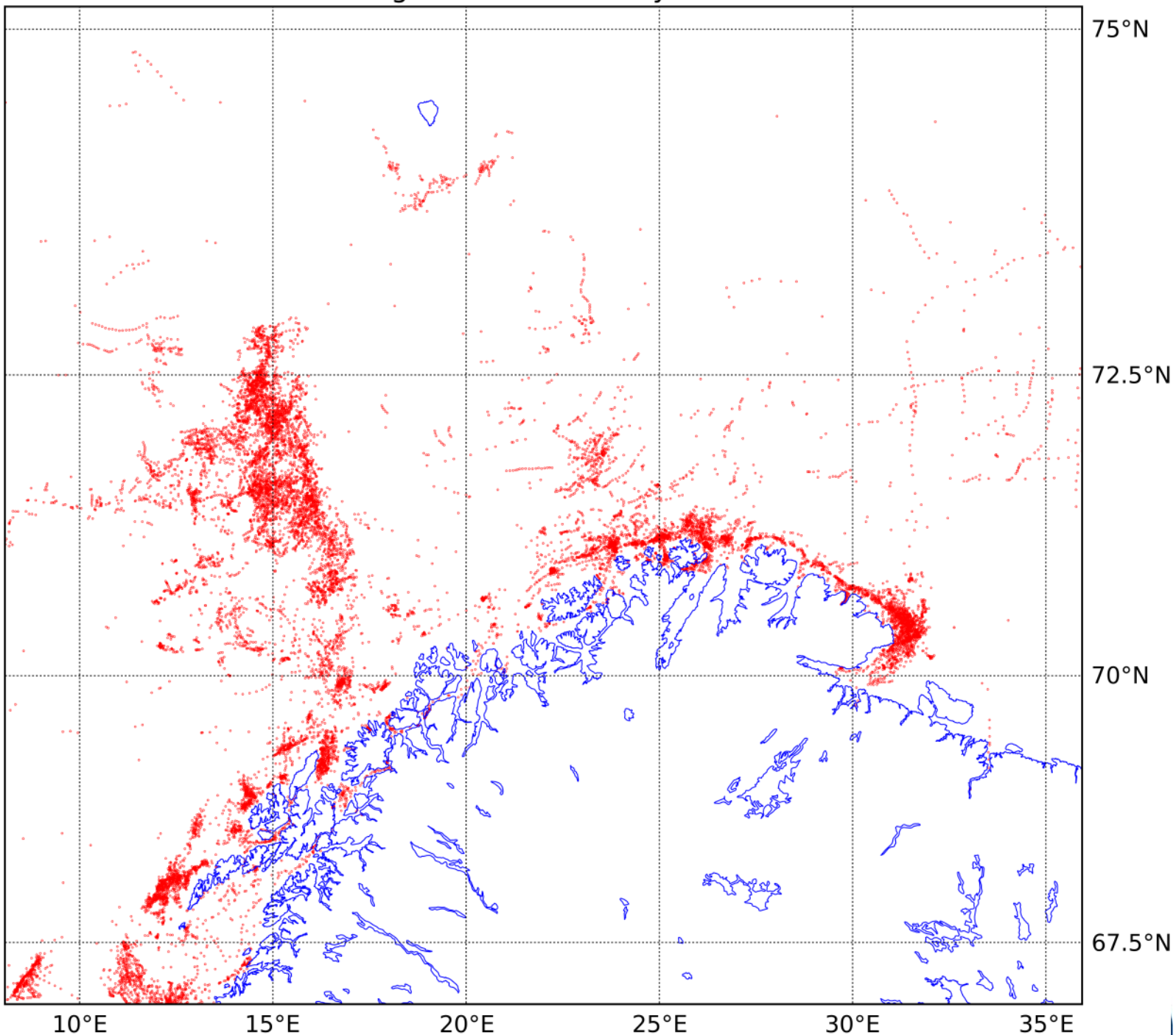

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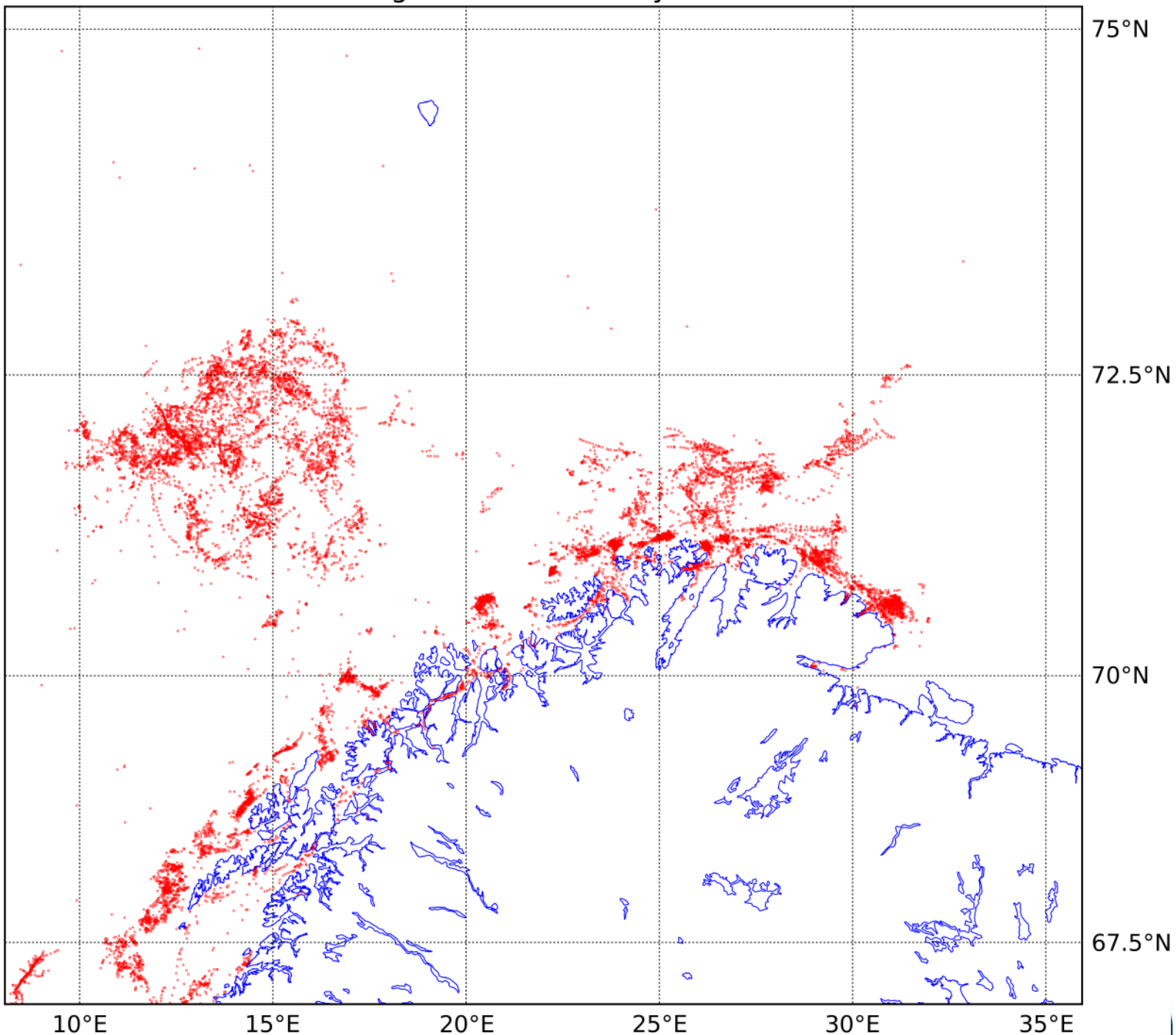

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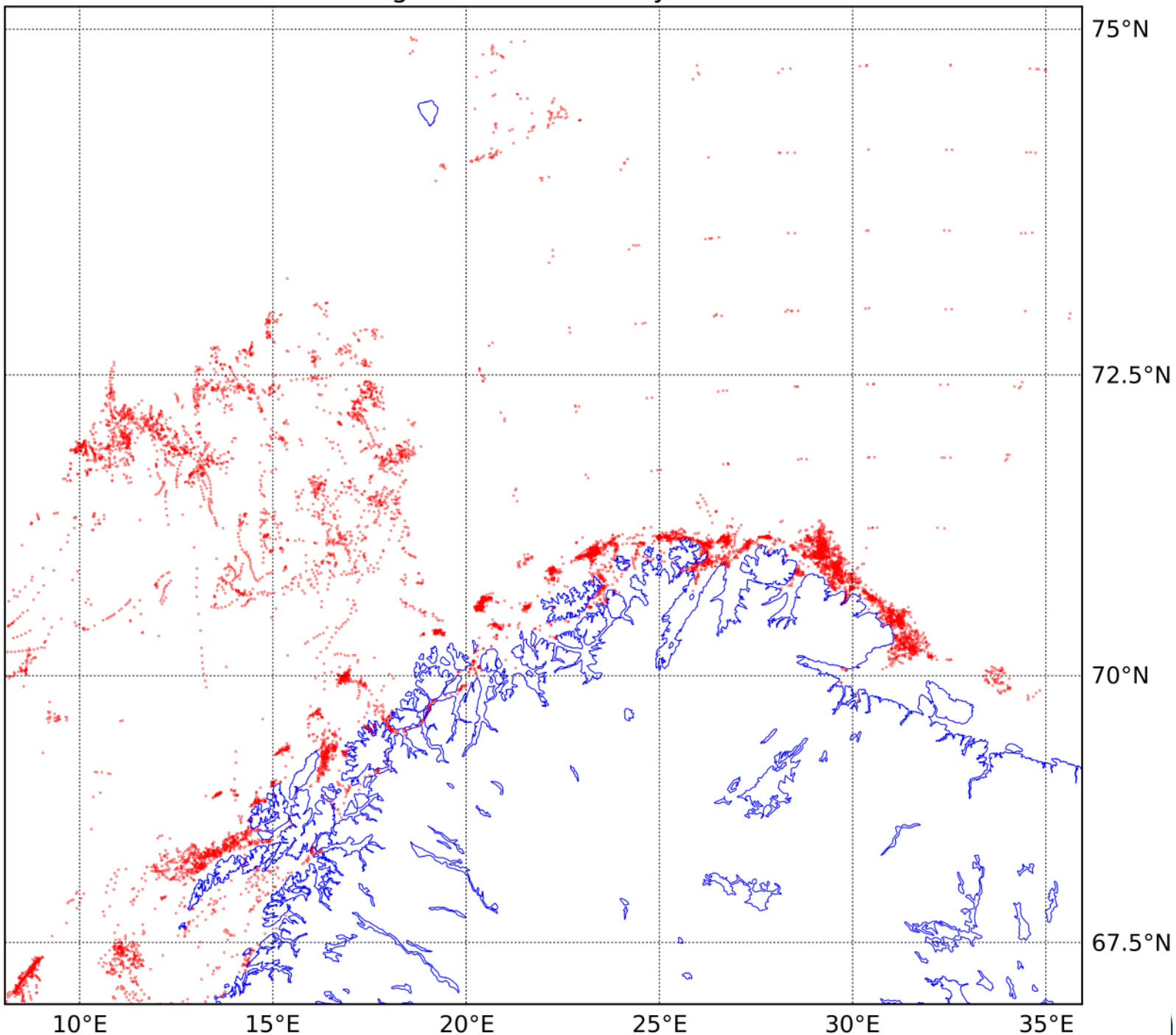
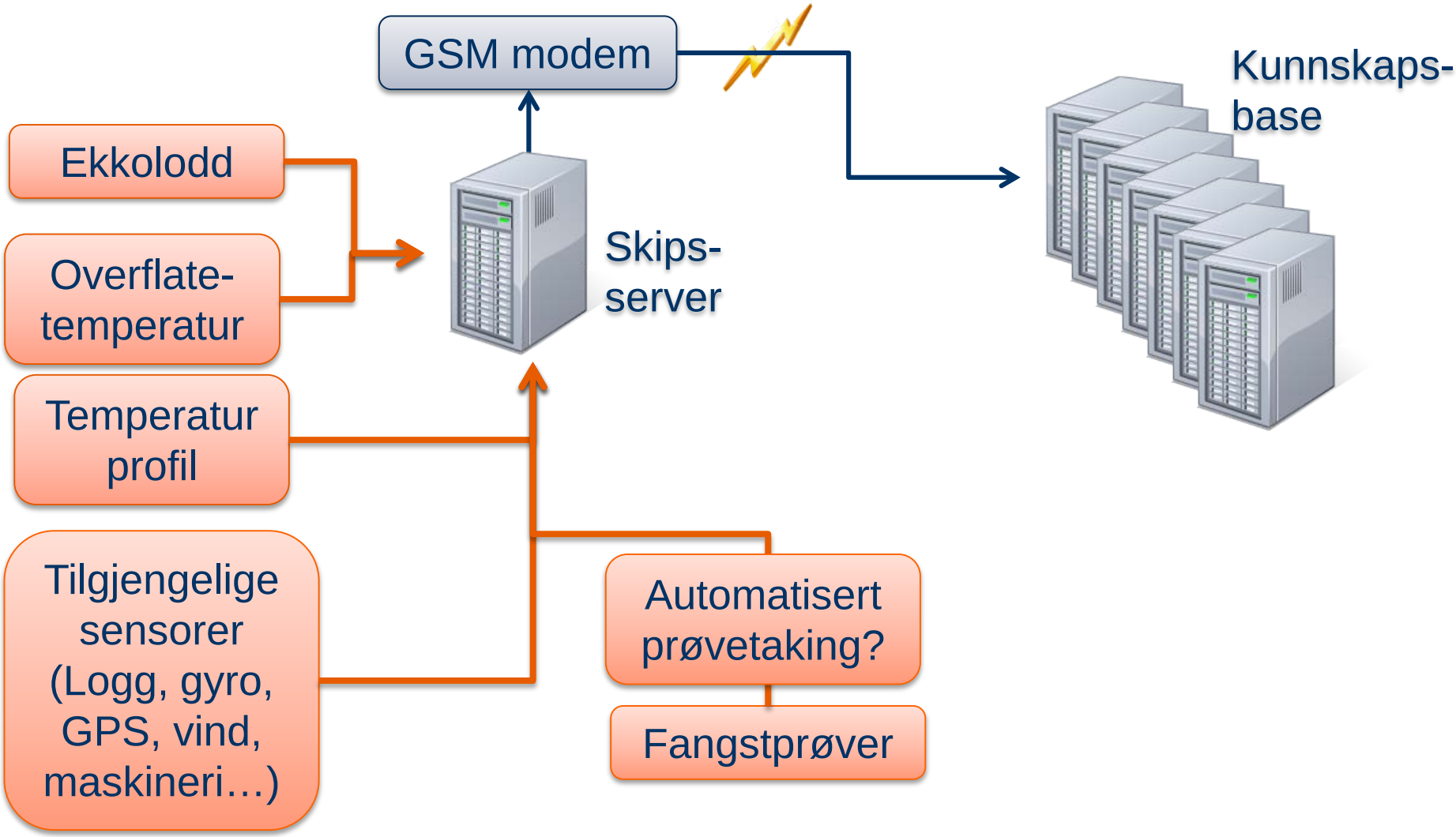
Integrasjon mot fiskeflåten