

Collaborative Project to meet Societal and
Industry-related Challenges



2021 - 2025

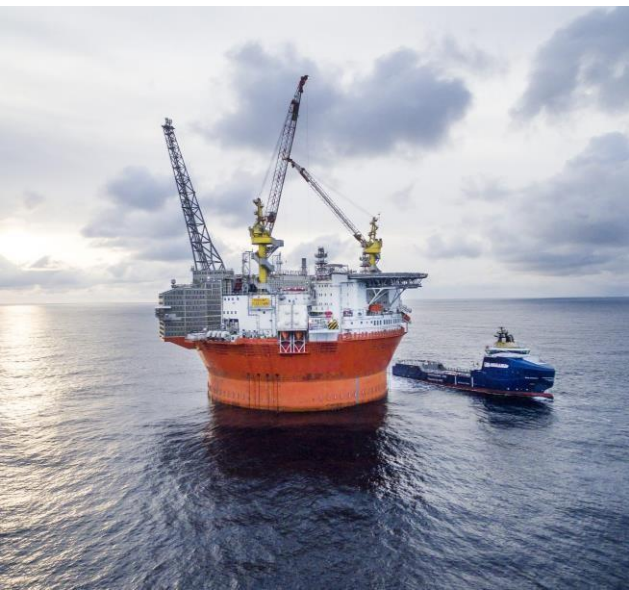
MARCIS

Marine spatial planning and cumulative impacts of blue
growth on seabirds

Tone Kristin Reiertsen, project leader

Anna LK Nilsson, WP2 co-PI



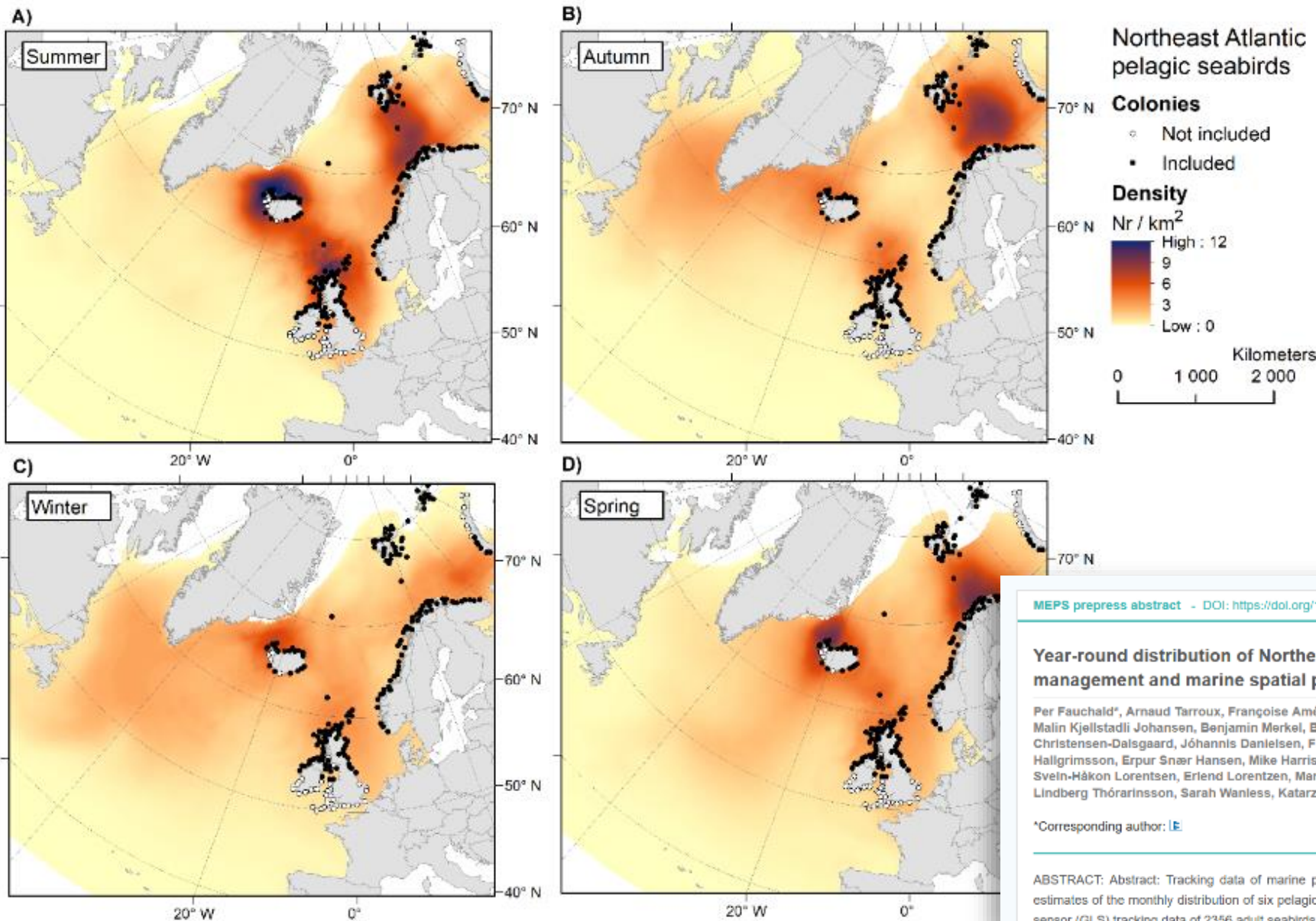


Mål og utfordringer

- Utvikle et rammeverk for å vurdere kumulative effekter av marin arealbruk på sjøfugl og trekkfugl
- Veksten av marin og kystnær industri øker presset på biomangfoldet
- Utvikle et verktøy for marin arealplanlegging

→ [MARCIS App](#)

Sjøfugl & Menneskelige aktiviteter (anthropogene stressorer)



MEPS prepress abstract - DOI: <https://doi.org/10.3354/meps13854> <https://doi.org/10.3354/meps138>

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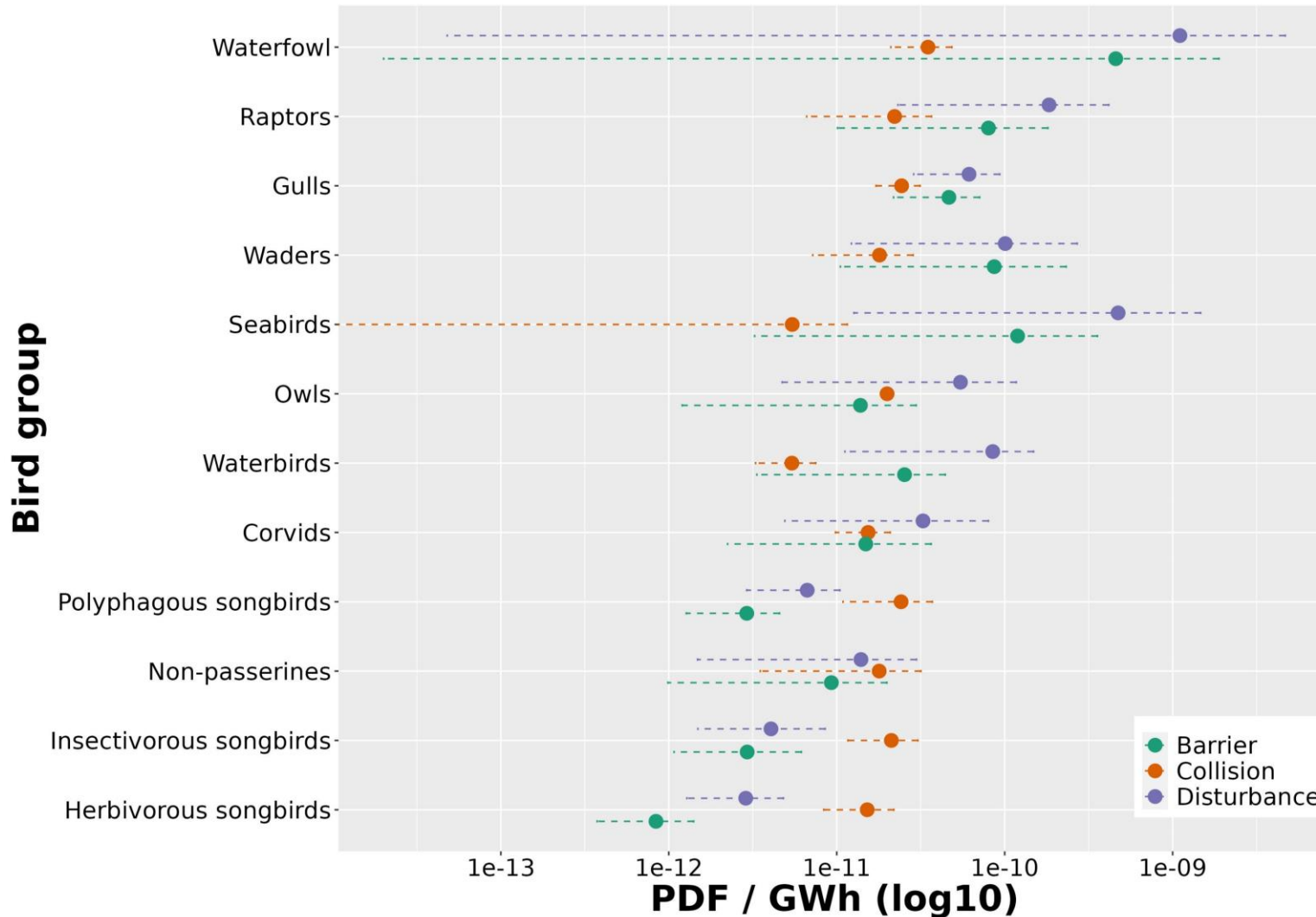
Year-round distribution of Northeast Atlantic seabird populations: applications for population management and marine spatial planning

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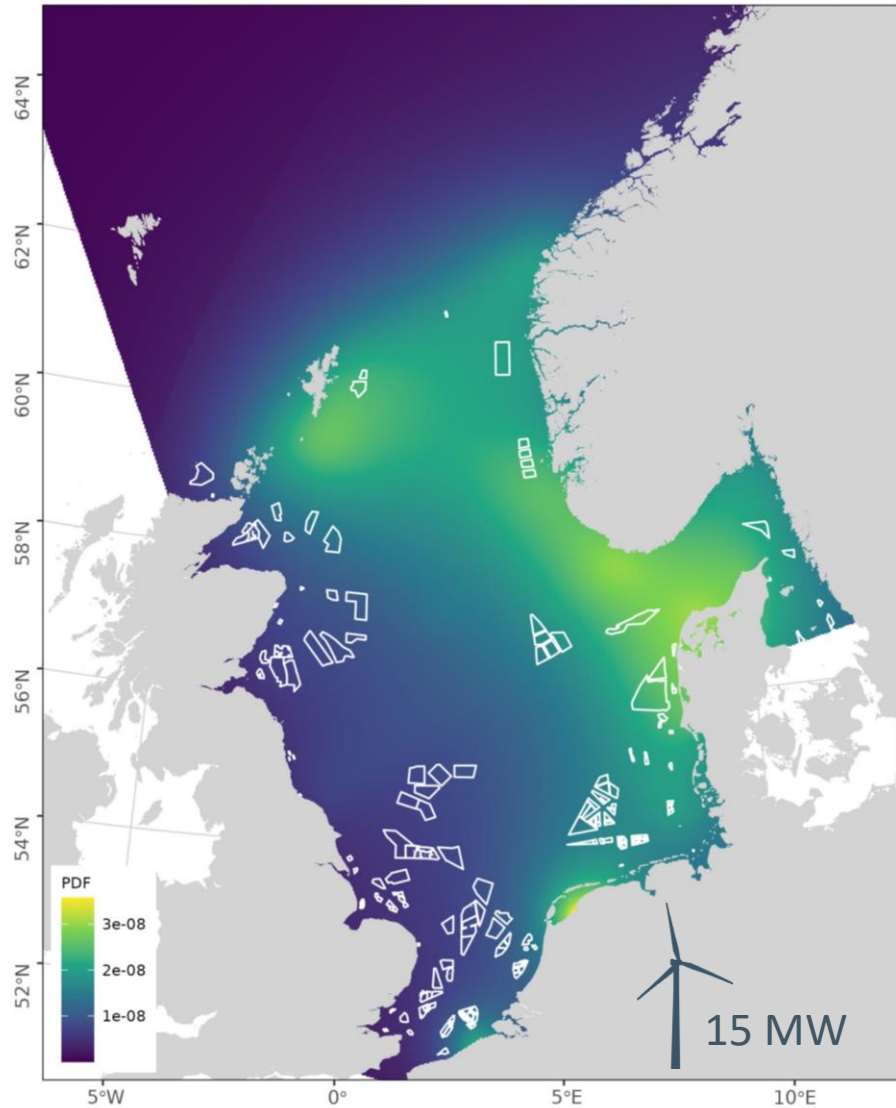
ABSTRACT: Abstract: Tracking data of marine predators are increasingly used in marine spatial management. We developed a spatial dataset with estimates of the monthly distribution of six pelagic seabird species breeding in the Northeast Atlantic. The dataset is based on year-round global location sensor (GLS) tracking data of 2356 adult seabirds from 2006-2019 from a network of seabird colonies, data describing the physical environment, and data

Life-cycle impact assessment

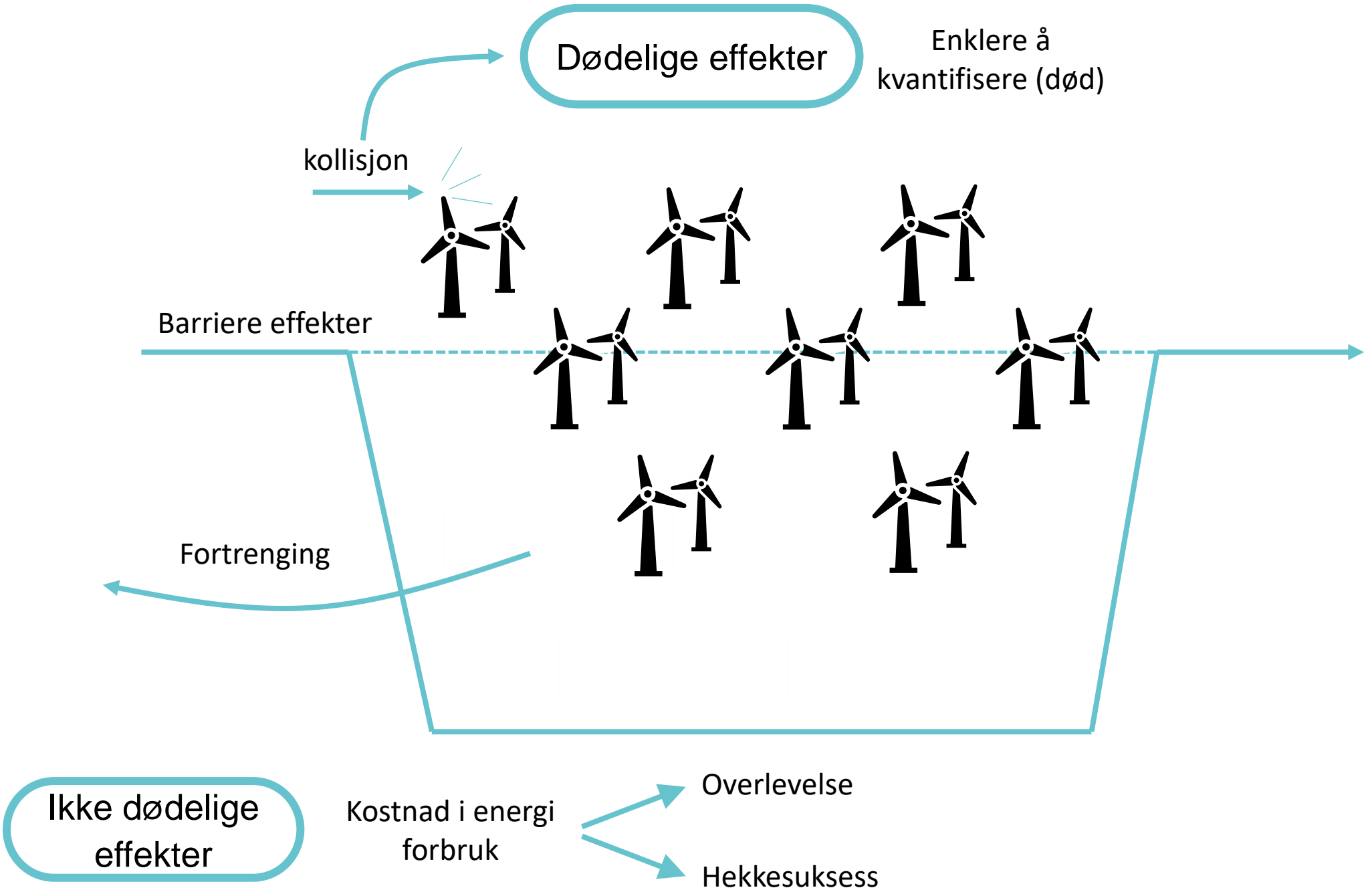


- 147 GW offshore vind i Nordsjøen i 2030
- Evaluert effekter på trekkfugldiversiteten
 - ▶ Kollisjon
 - ▶ Barriere
 - ▶ Forstyrrelse
- Modellerte distribusjoner basert på ringmerkingsdata

Cumulative impacts map



- Coastal hotspots
 - ▶ Vannfugl
- Norge <-> Danmark
 - ▶ Vadefugl
 - ▶ Rovfugl
 - ▶ Måker
- Shetland <-> Norge
 - ▶ Sjøfugl
 - ▶ Ugler



Dødelige effekter

Enklere å kvantifisere (død)

kollisjon

Barriere effekter

Fortrenging

Ikke dødelige effekter

Kostnad i energi forbruk

Overlevelse

Hekkesuksess

Eksempel fra Trollvind: resultater av simulering

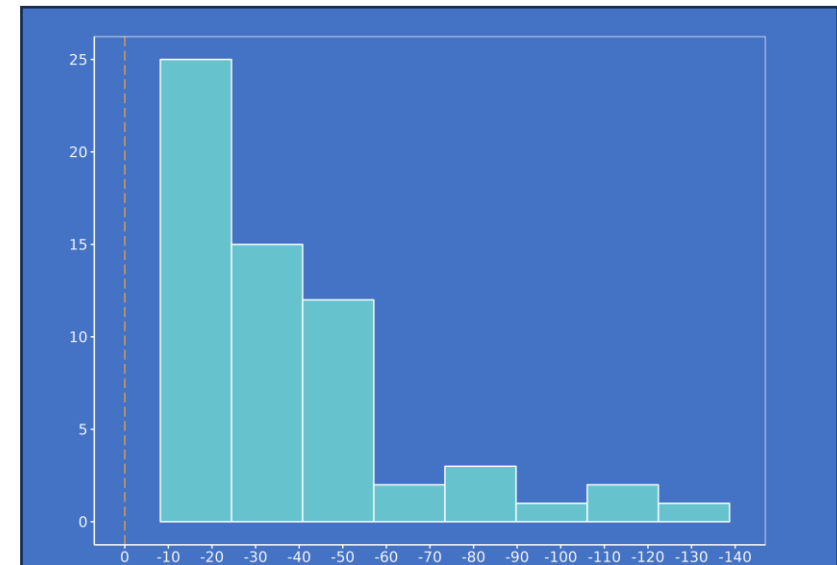
Krykkje:

- Den modellerte utbredelsen viser at 27,7% overlapper med Trollvind-anlegget minst en gang
- Svært lav predikert kollisjonsrisiko (<0,001%)



lomvi:

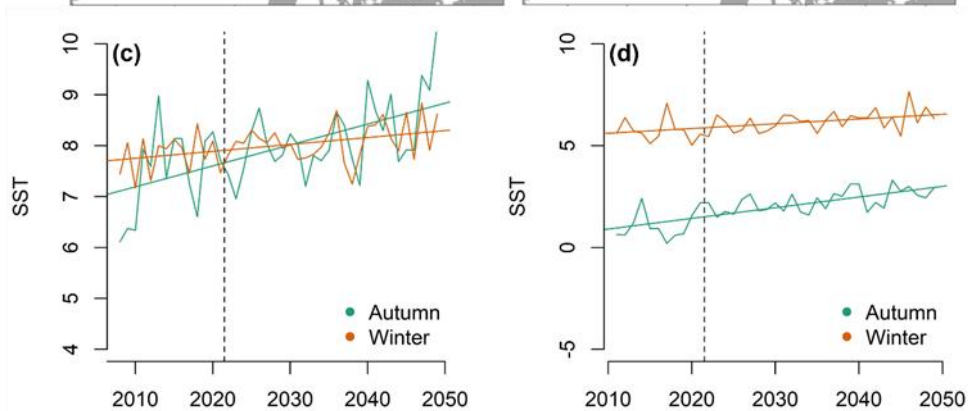
- Ubetydelig endring (- 2,33 g) i gjennomsnittlig vekt for hele bestanden
- Stor individuell variasjon



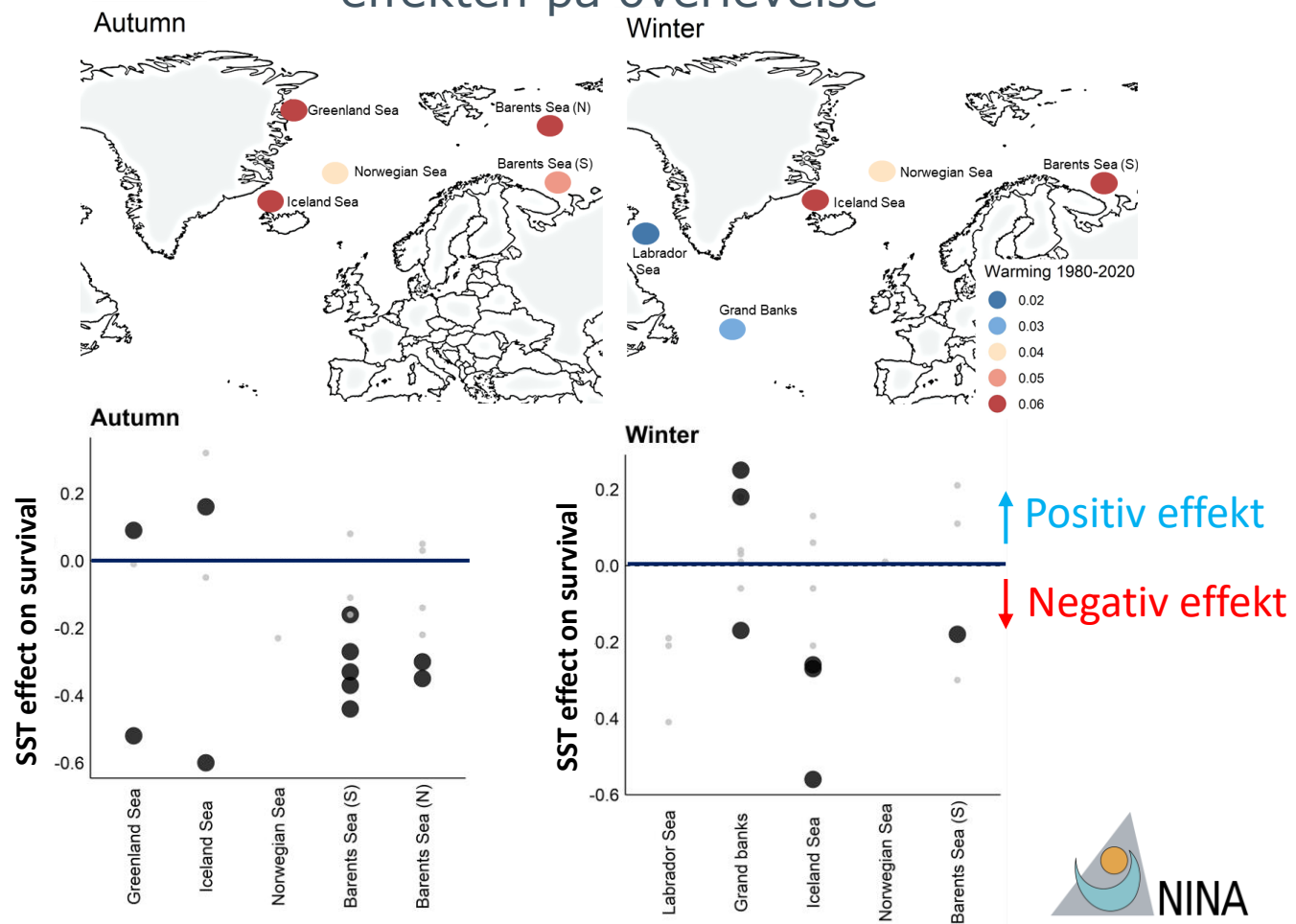
Endring i lomvivekt over hele vintersesongen (g)

Stressor: Klimaendringer

Effekten av SST på demografiske rater

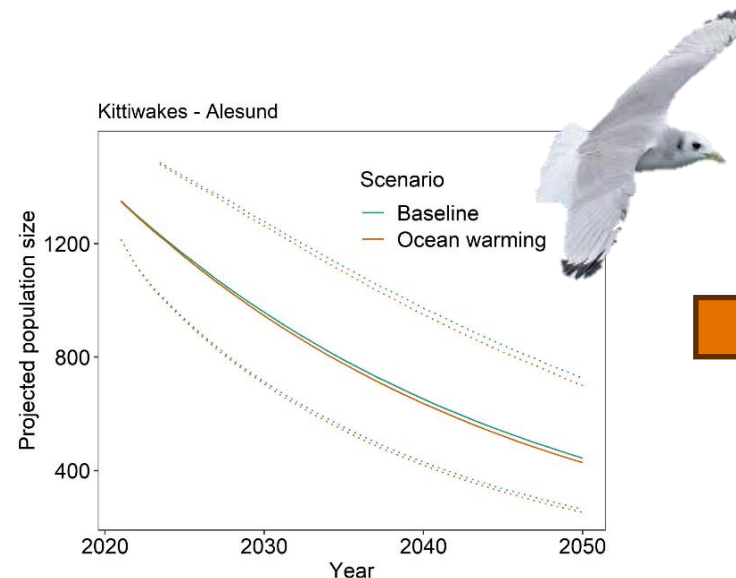
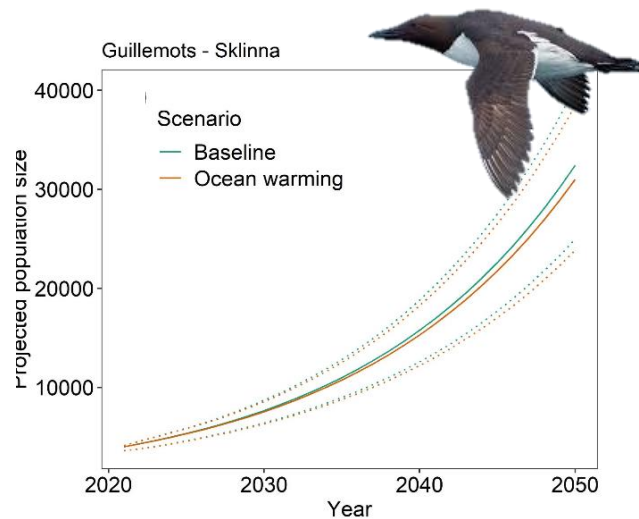


Havoppvarming i ikke-hekkeområder til sjøfugl og effekten på overlevelse



Stressor: Klimaendringer

- Bestandsprognoser for Trollvind basert på klimascenarier:
 - ▶ 'Baseline' = bestandstrend til 2050 uten havoppvarming
 - ▶ 'Ocean warming' = bestandstrend til 2050 under havoppvarming basert på en høy-utslipp scenario
- Fortsettelse for øvrige stressorer...



Impact weight: forskjellen i bestandstrend mellom scenarier

$$I(x, y) = \sum_{i=1}^n \sum_{j=1}^m P_i * E_j * \mu_{ij}$$

The MARCIS app



Search places

Earth Engine Apps

Cumulative Impact Assessment tool for the Trollvind OWF

This web-app helps to calculate and visualise the potential cumulative impact of climate change and the planned Trollvind OWF towards Black legged Kittiwake (RTRR) from the Runde colony (c019) and Common Guillemot (LURAA) from the Sklinna colony (c007).

Select a species and follow the required steps, before clicking the "Run analysis" button to calculate and visualise the Cumulative impact map together with its corresponding stressor maps. Please click the "Reset panel" button if you want to re-run the CIA-analysis.

The CIA is the sum product of the individual stressor impacts (given by stressor density x seabird density x the seabirds stressor-specific sensitivity weights).

Scientific reference: Halpern et al 2008

Start the assessment

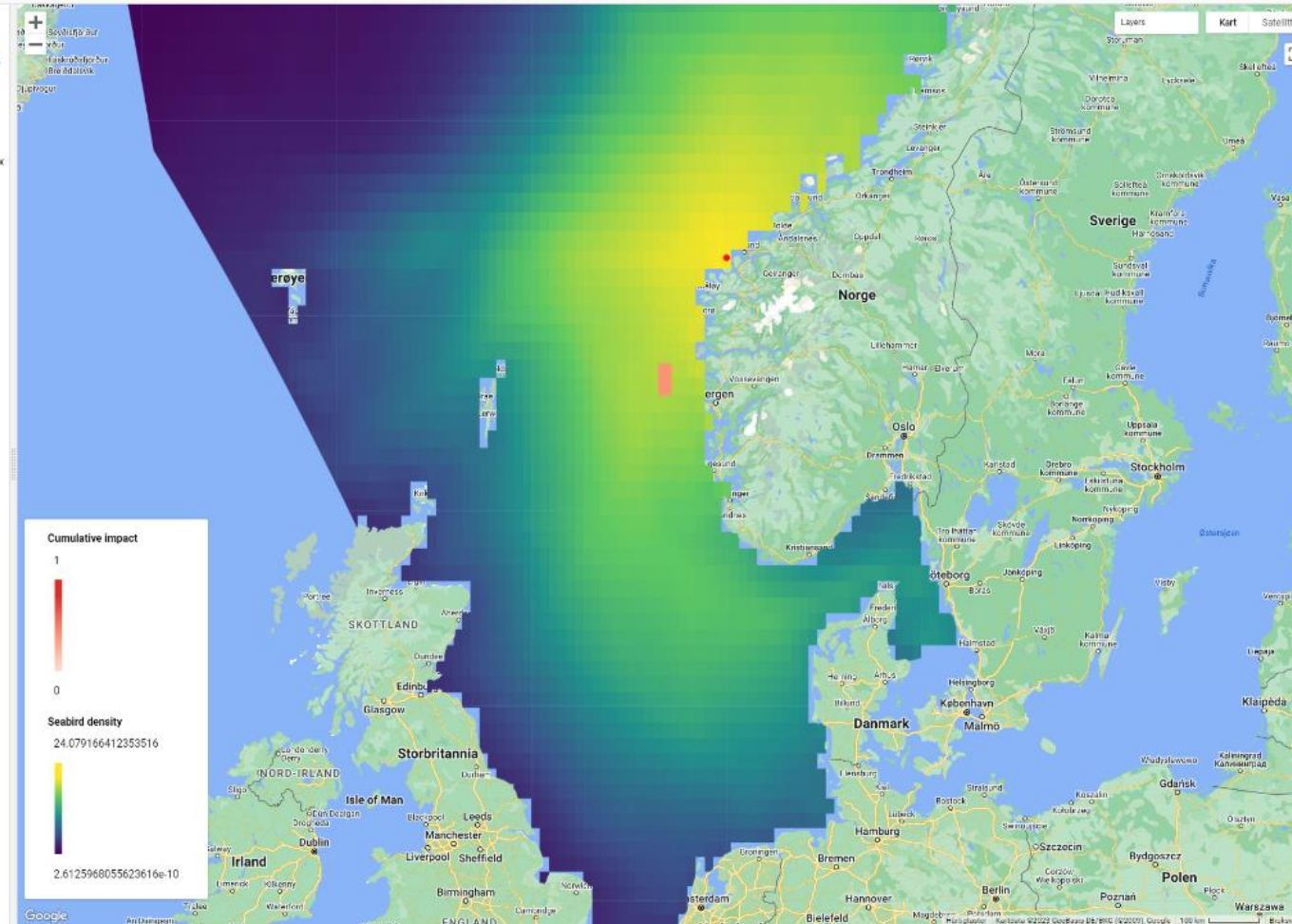
1. Select species: RTRR

2. Select colony: c007

3. Select month: m02

Run analysis

Reset panel

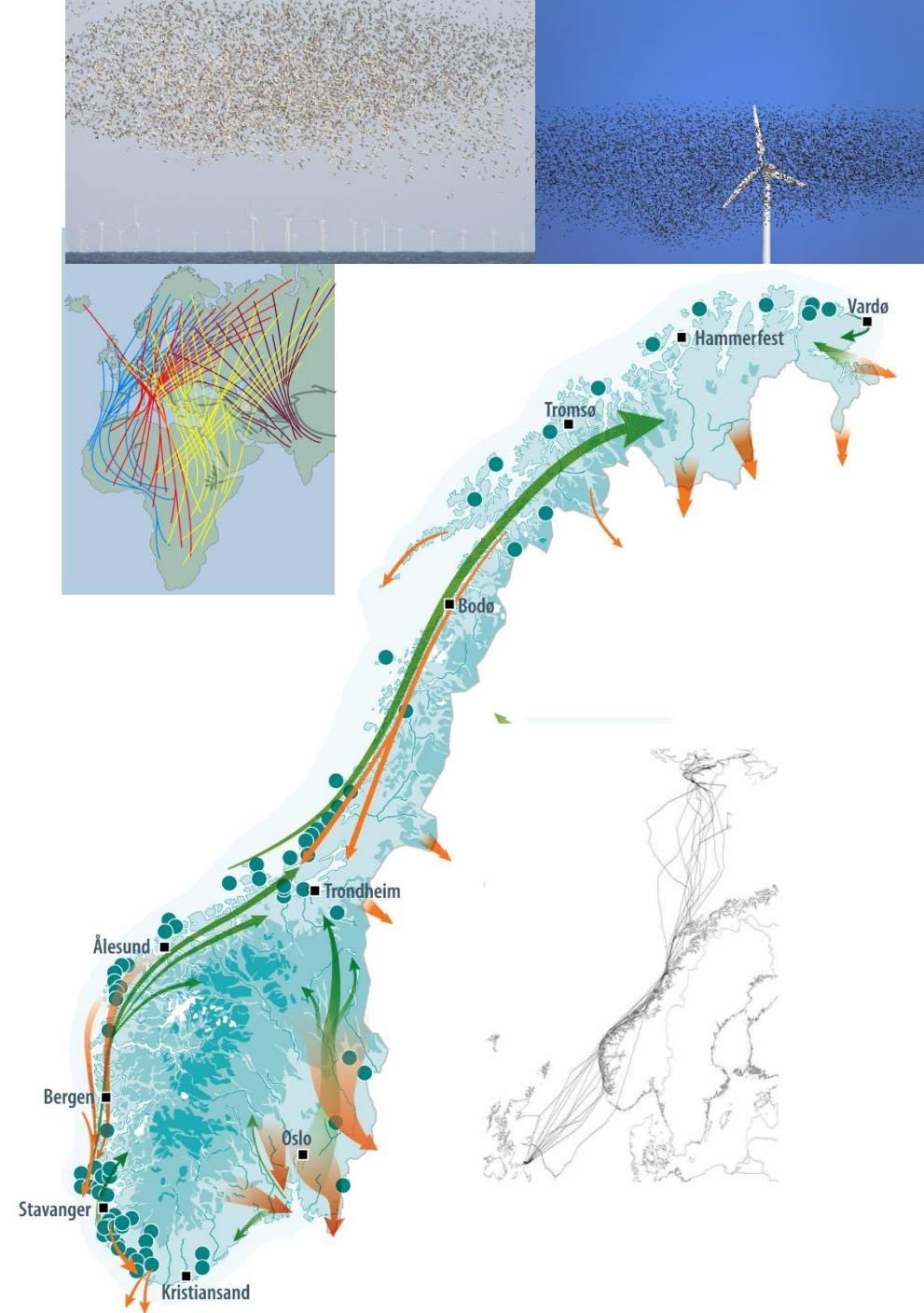


Visualizing avian migration across Norway supporting sustainable coastal and offshore wind energy development



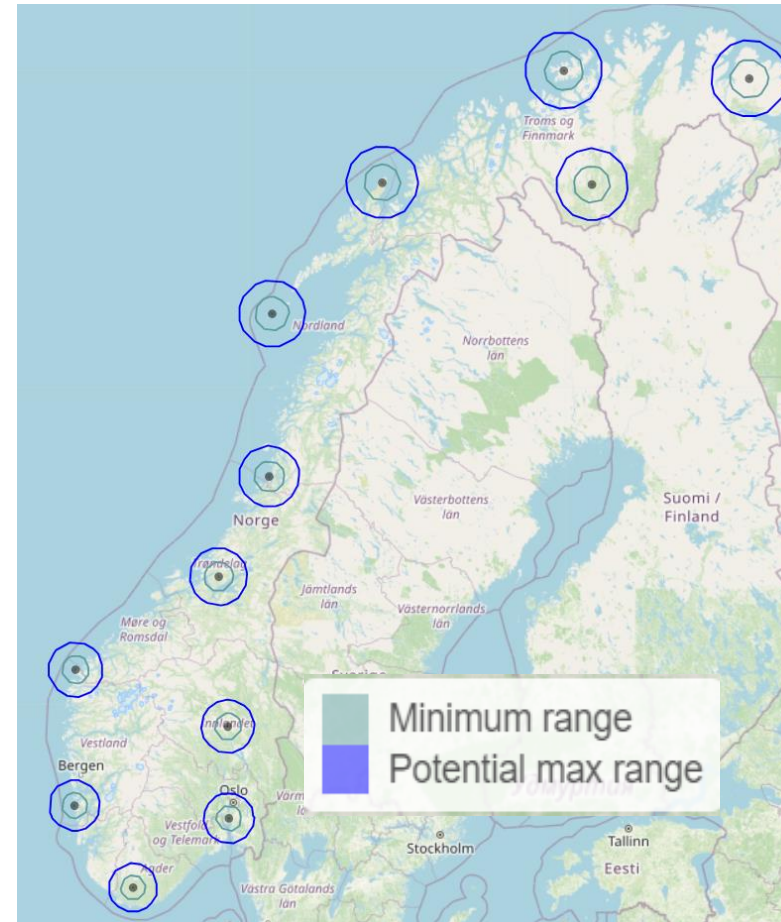
Målsetting

- Kartlegge korridorer for fugletrekk i Norge og tilgrensende marine områder slik at kystnære- og havbaserte vindkraftverk kan etableres med minimalt fotavtrykk
- Prosjektet vil utvikle et dynamisk verktøy for å visualisere fugletrekk i nær sanntid



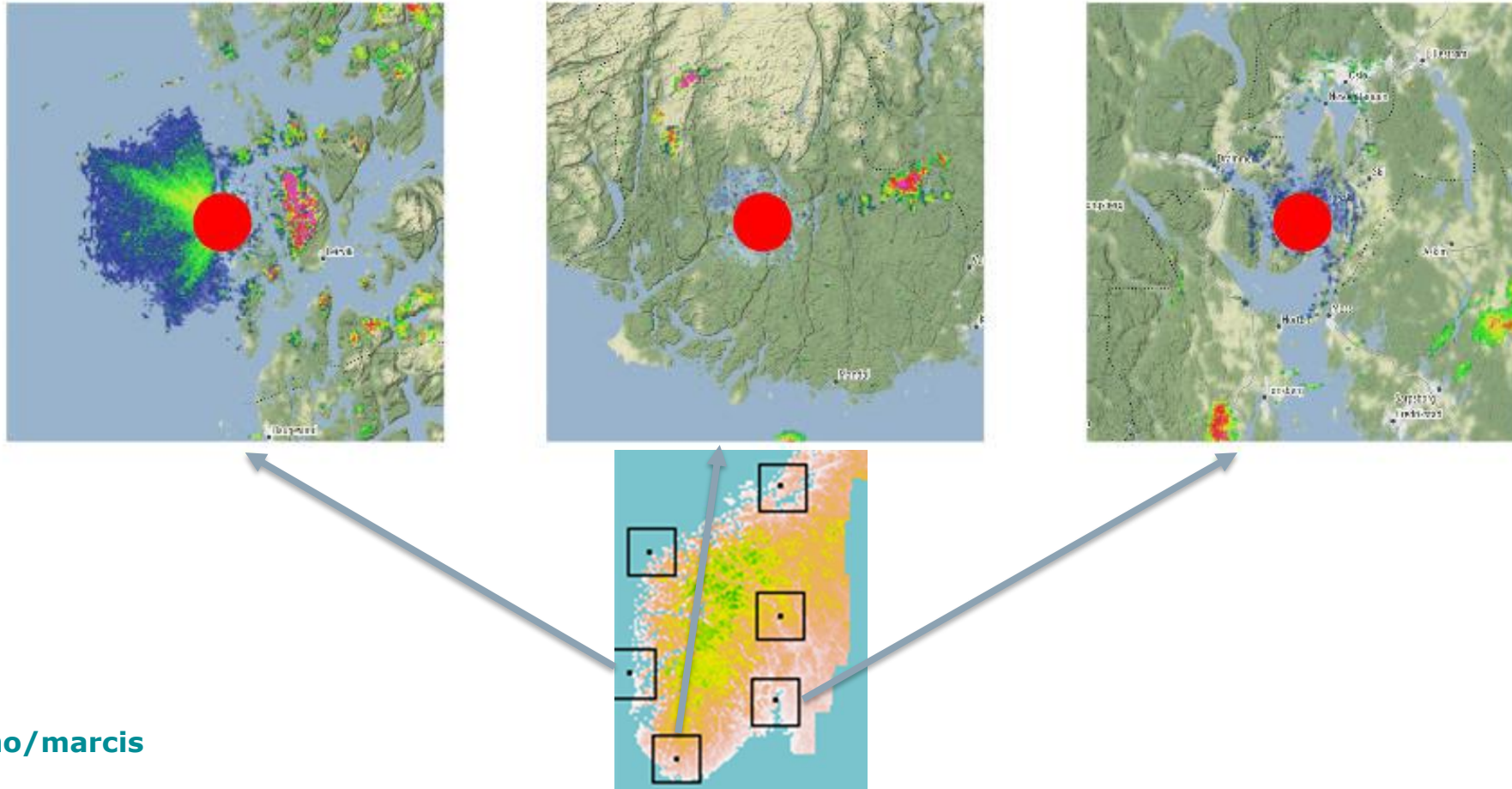
Nasjonalt kartlegging av viktige trekk- korridorer mha værradardata

- Kontinuerlig overvåking på stor spatiell skala (25km - ~50km radius)

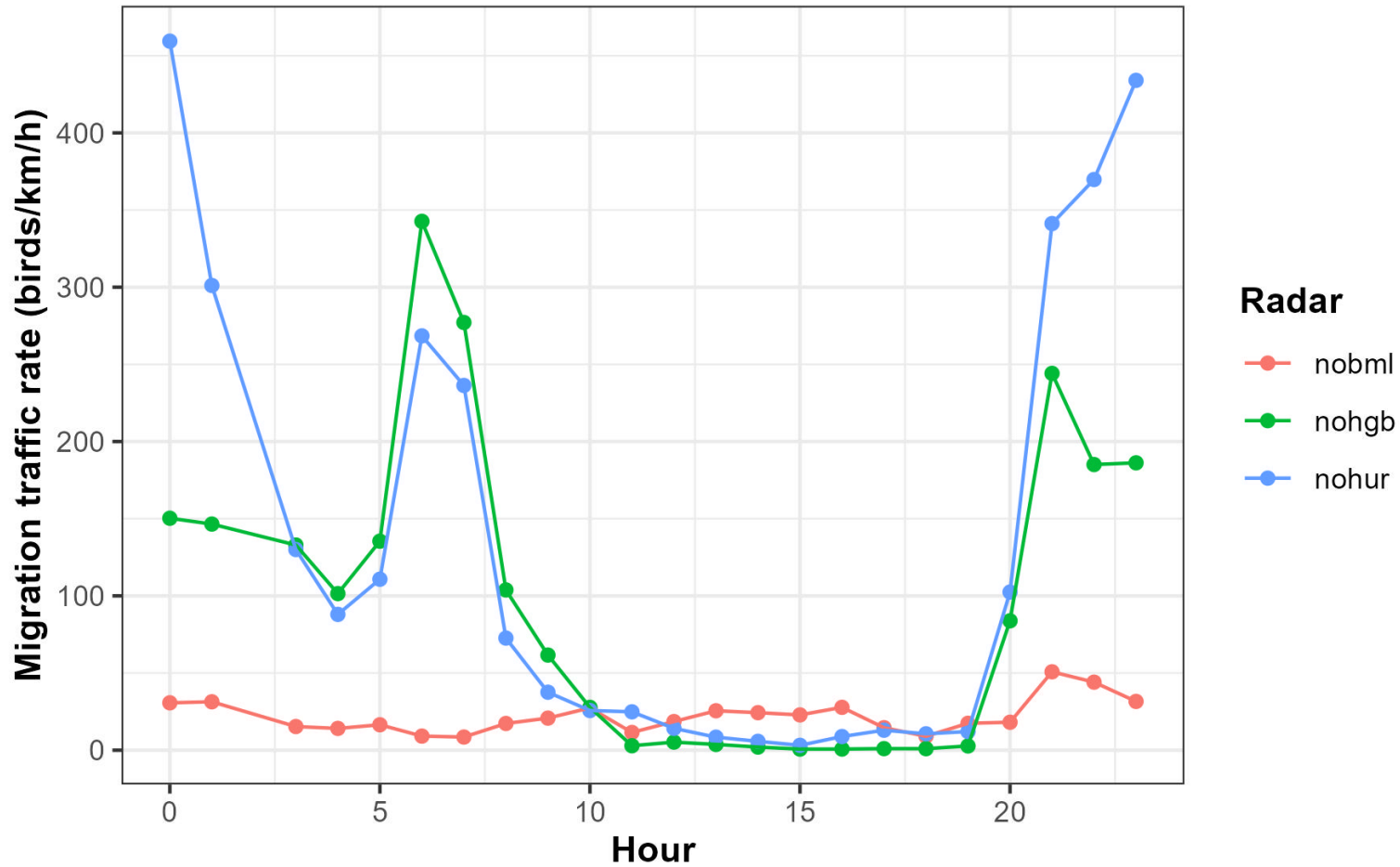


Onset of nocturnal migration

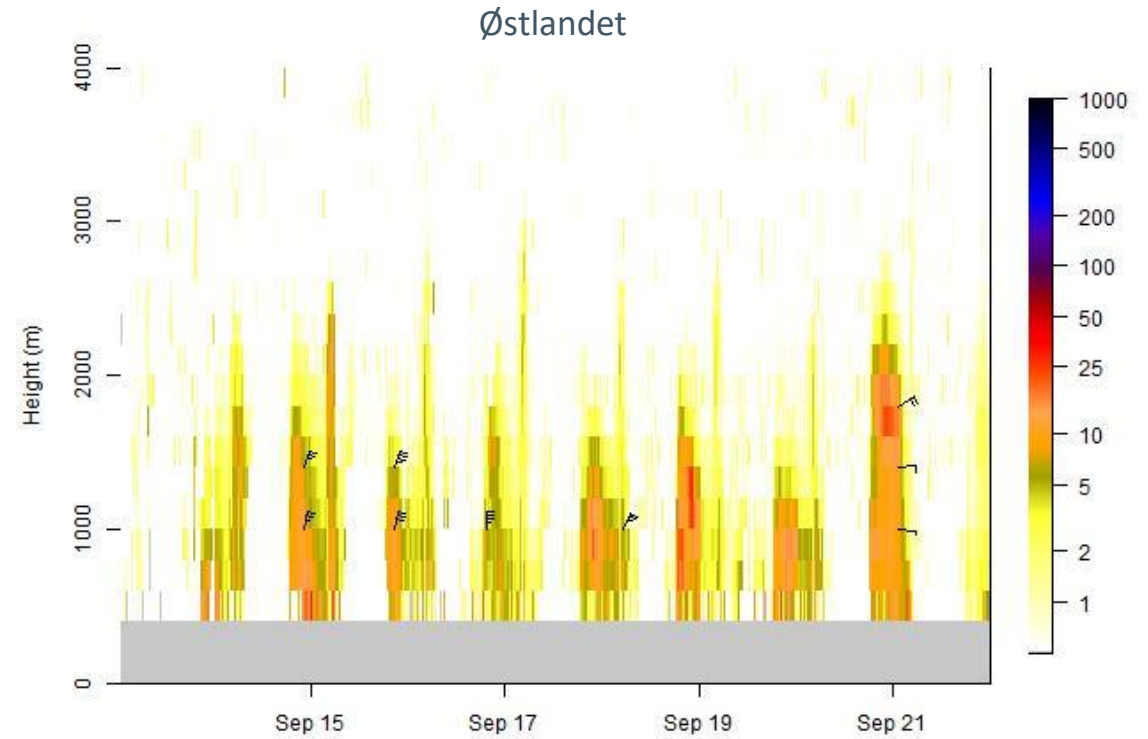
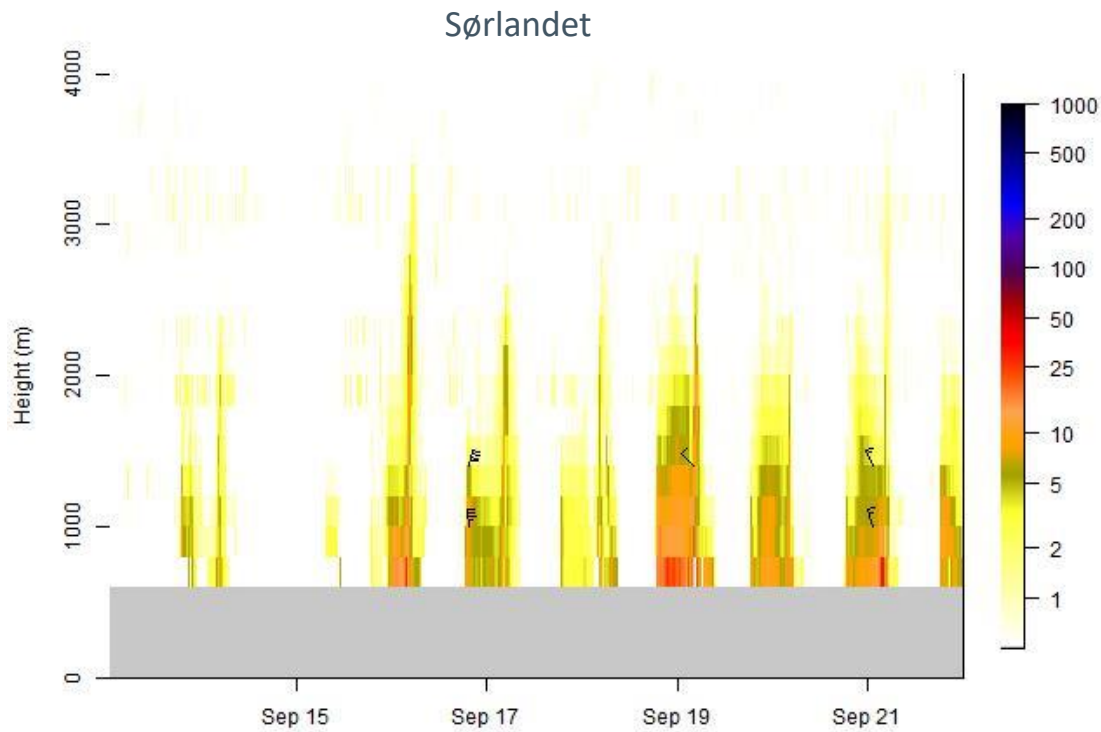
2022-09-18 20:06:38



Average hourly migration quantity 13-21st of September 2022



Altitudinal distribution



Lokal kartlegging av trekkbevegelser og adferd

Utsira



www.nina.no/marcis

Lista



MARCIS & VisAviS – Samarbeidspartnere

