



Introducing EPOC – and its Arctic Elements

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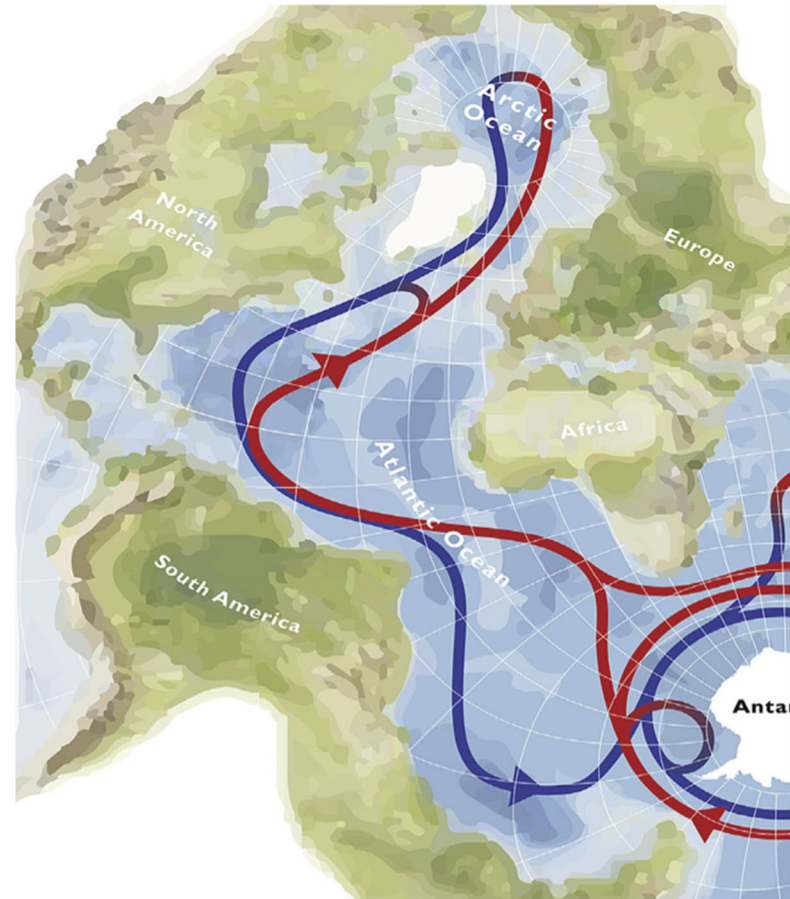


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Aim

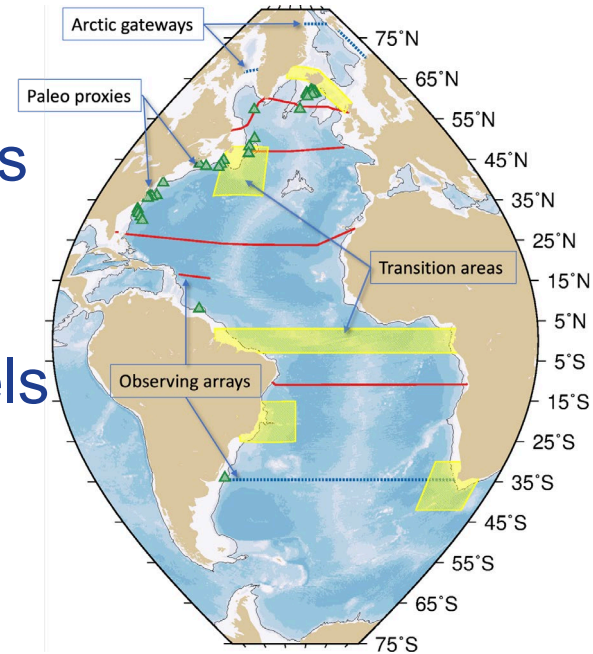
EPOC will generate a new **conceptual framework** for the Atlantic meridional overturning circulation (AMOC), to understand how it **functions in the Earth system** and **impacts weather and climate**.



A schematic of the AMOC as a conveyor belt, from the Southern Ocean to the Arctic. (Handmann et al. 2021)

How conveyor-like is the great ocean conveyor?

- **Observations** (arrays and multi-observational approaches), spanning the Atlantic to the polar oceans
- **Paleo proxies** across multiple western boundary locations & systematically re-evaluated for robustness using models
- Numerical ocean and climate **models** simulating past and future changes
- **Dedicated process study** to examine mechanisms that sustain or break coherence

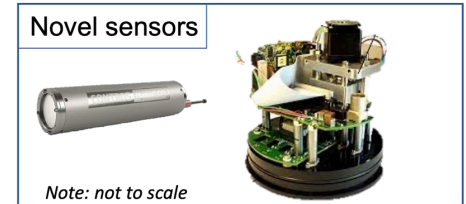
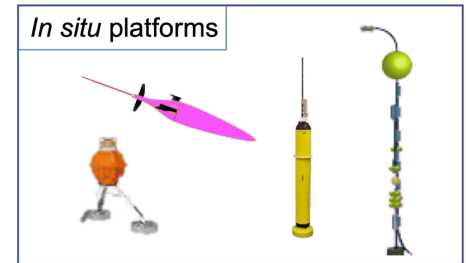
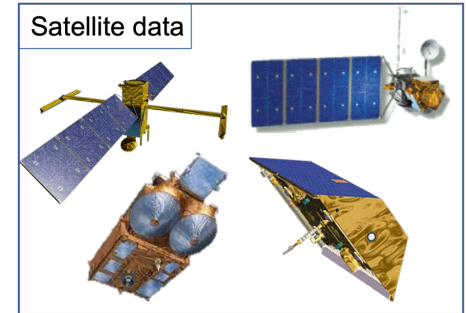


How conveyor-like is the great ocean conveyor?

Identifying the potential for rapid change and expected impacts of AMOC changes.

Generating a recommendation for future optimised AMOC observing based on

- new technological advances and
- new understanding from 20+ years of AMOC observing



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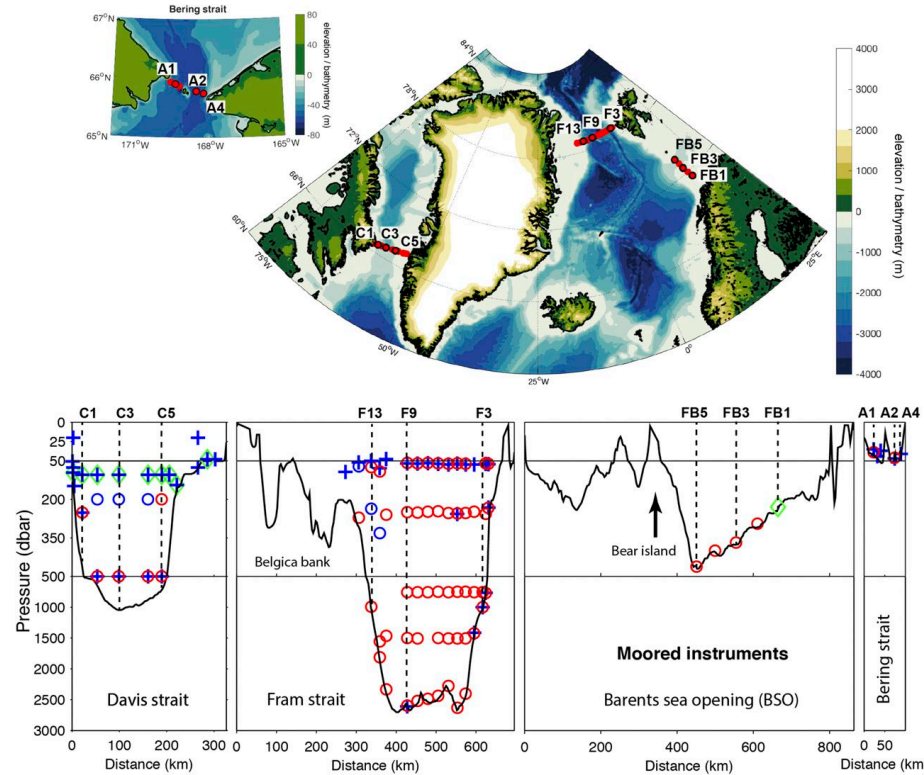
WP1, Task 1.2

Determine the volume, heat and freshwater transports into and out of the Arctic over 2004-2020, using an observational inversion

- Prepare and aggregate year-round data from the four Arctic boundary arrays as input for the inverse model

**Fram Strait; Barents Sea Opening;
Bering Strait; Davis Strait**

- Calculate time series (monthly) of Arctic heat- and freshwater fluxes back to 2004 and extend up to 2020



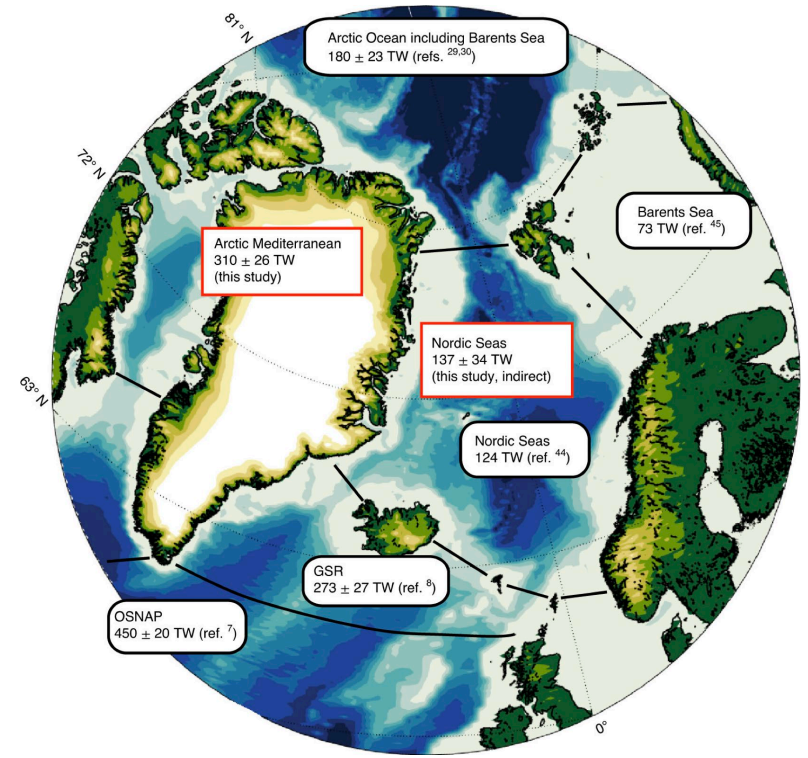
Tsubouchi et al., 2018

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WP1, Task 1.5.2

Assess origins of heat transport into the Arctic and the relationship between Arctic freshwater export and freshwater transport at lower latitudes

- Assess the upstream conditions (subpolar North Atlantic) responsible for heat and freshwater transport anomalies through the Arctic gateways based on observational datasets
- Determine whether heat transport into the Arctic is more strongly determined by ocean transports or air-sea fluxes



Tsubouchi et al., 2021

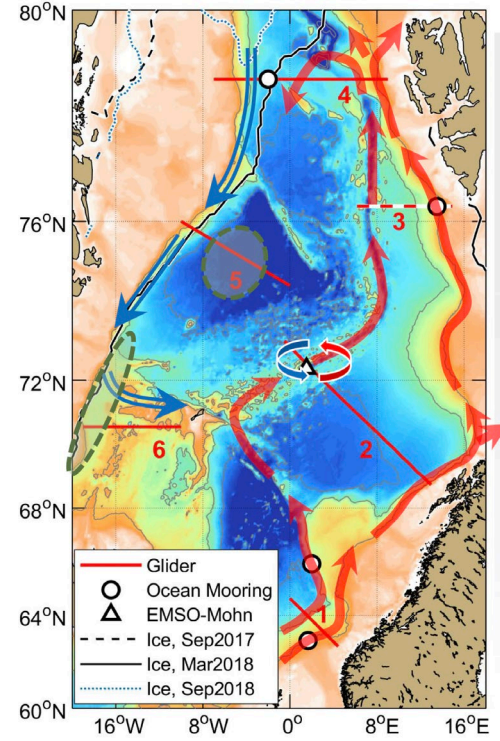
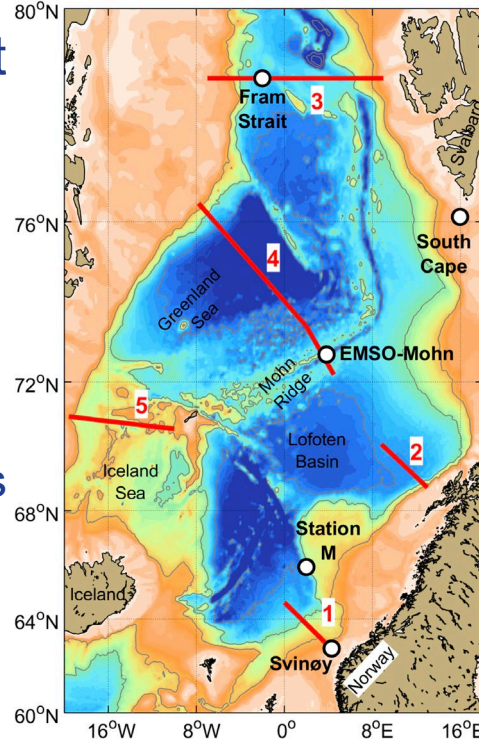
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Using glider data from the NorEMSO project
(<https://www.uib.no/en/noremso/>)
<http://norgliders.gfi.uib.no/>

WP1, Task 5.4

Generate glider-based transport estimates in an Arctic gateway

- Assess the strengths and weaknesses of employing endurance gliders versus conventional moored platforms for quantifying transports in the Fram Strait and the Nordic Seas
- Glider data (2021-2022) from **NorEMSO** project



Thank you

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