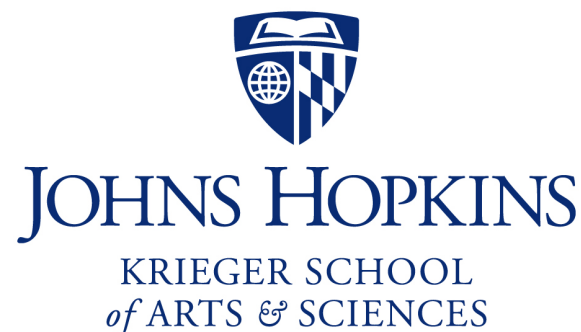


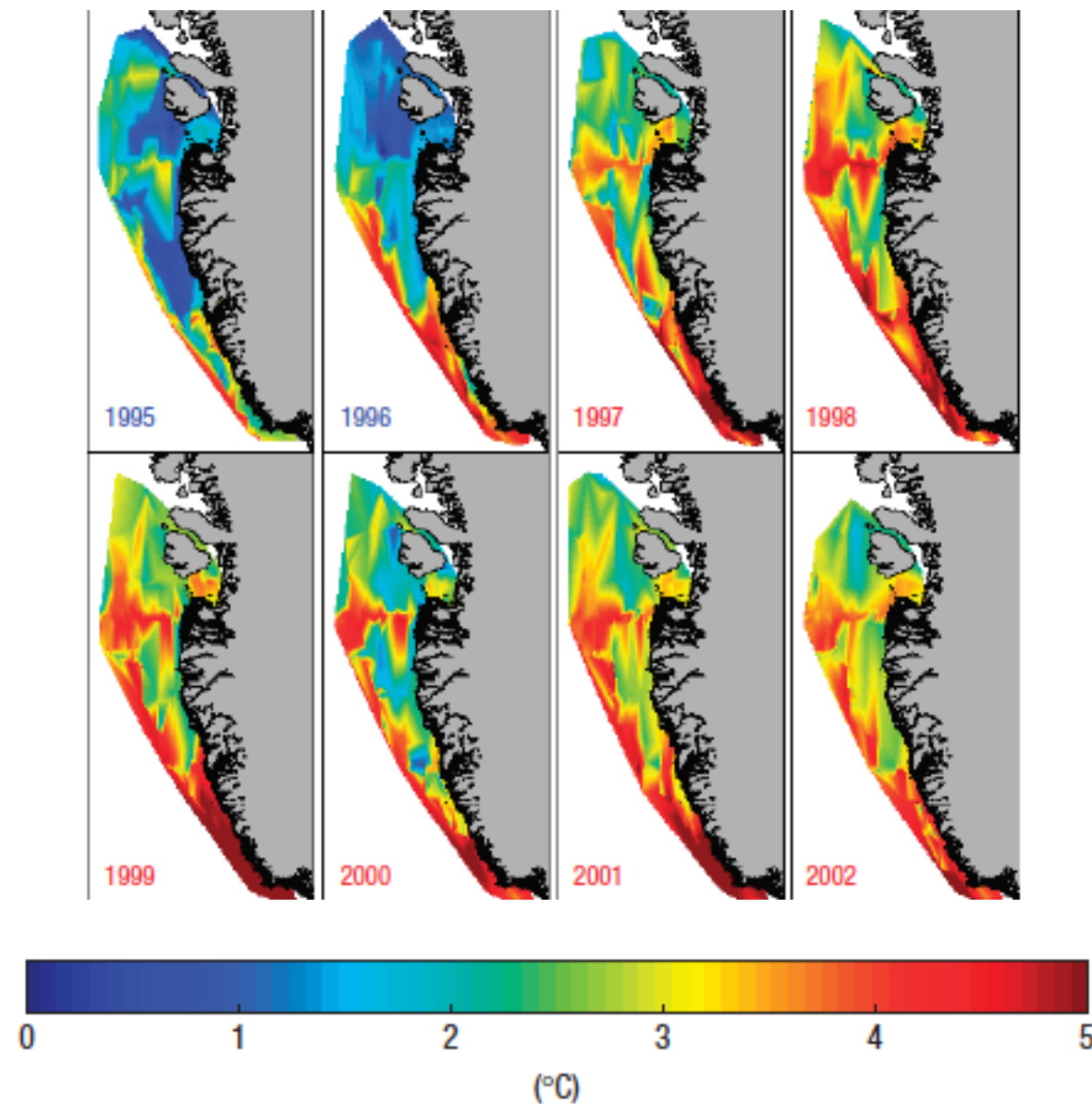
Seasonal variability in warm-water inflow towards Kangerdlugssuaq Fjord

Renske Gelderloos (JHU)

Tom Haine (JHU), Inga Koszalka (GEOMAR),
Marcello Magali (ISMAR-CNR)

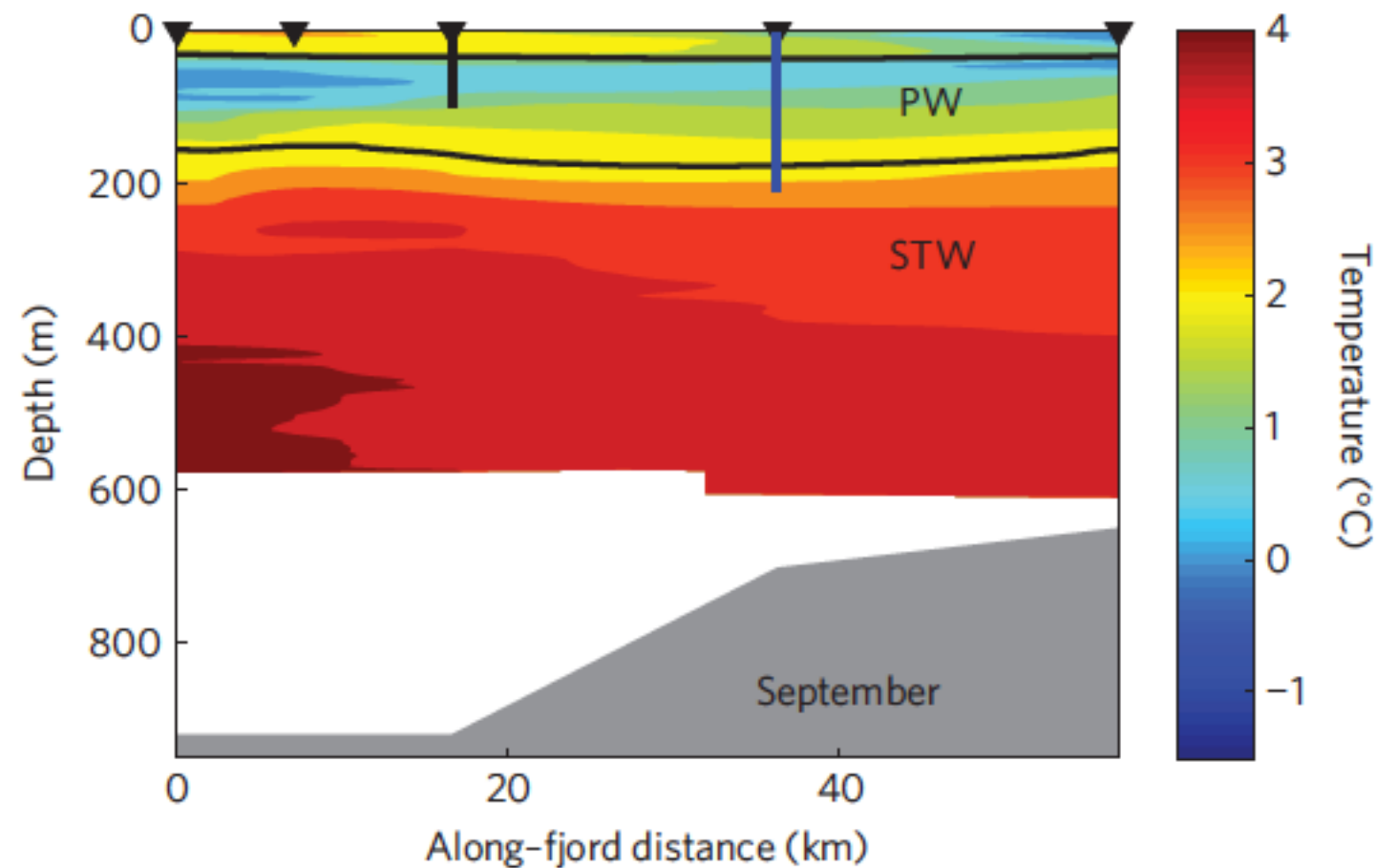


Ocean water has warmed up

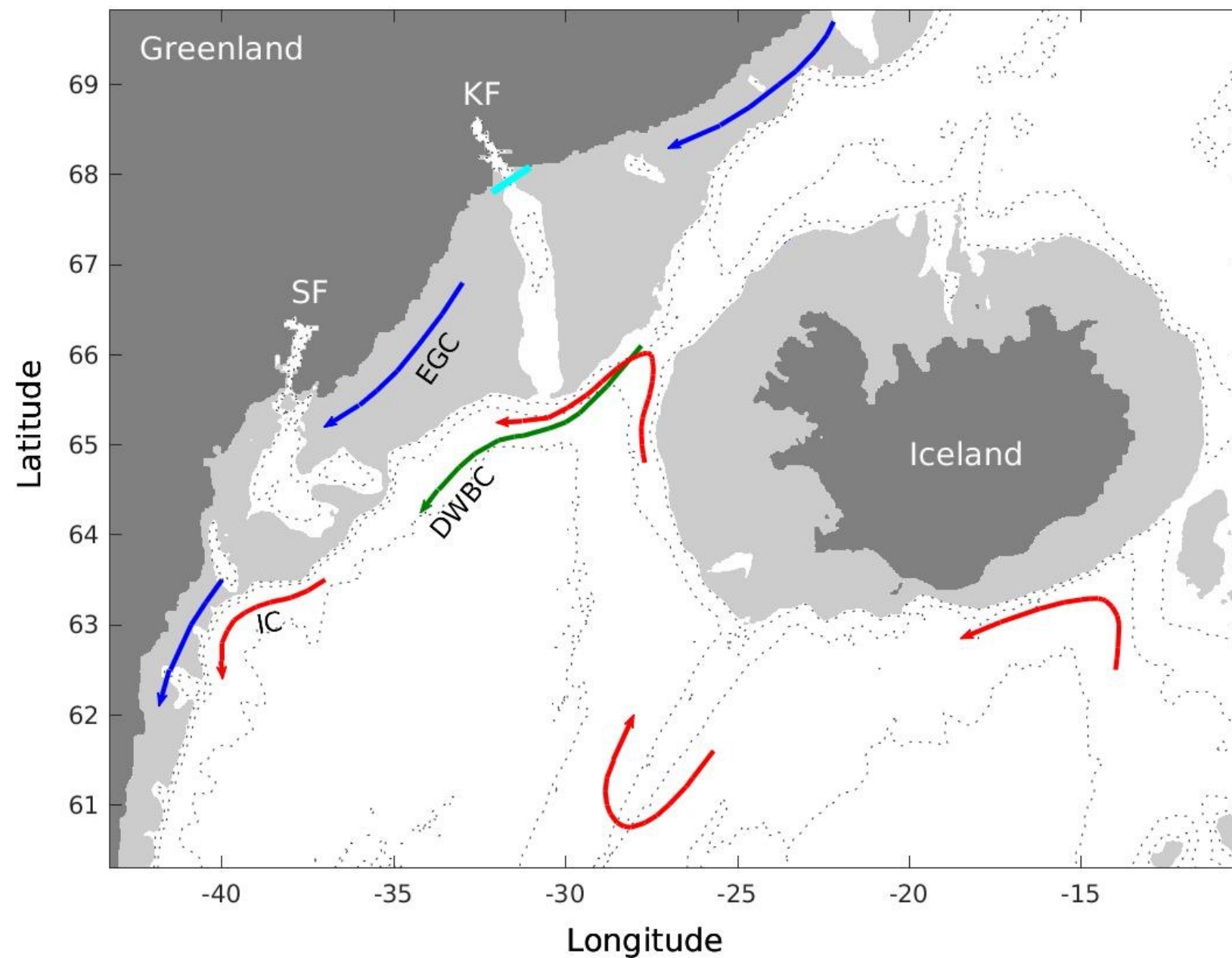


Holland *et al.* (2008), Nat. Geosc.

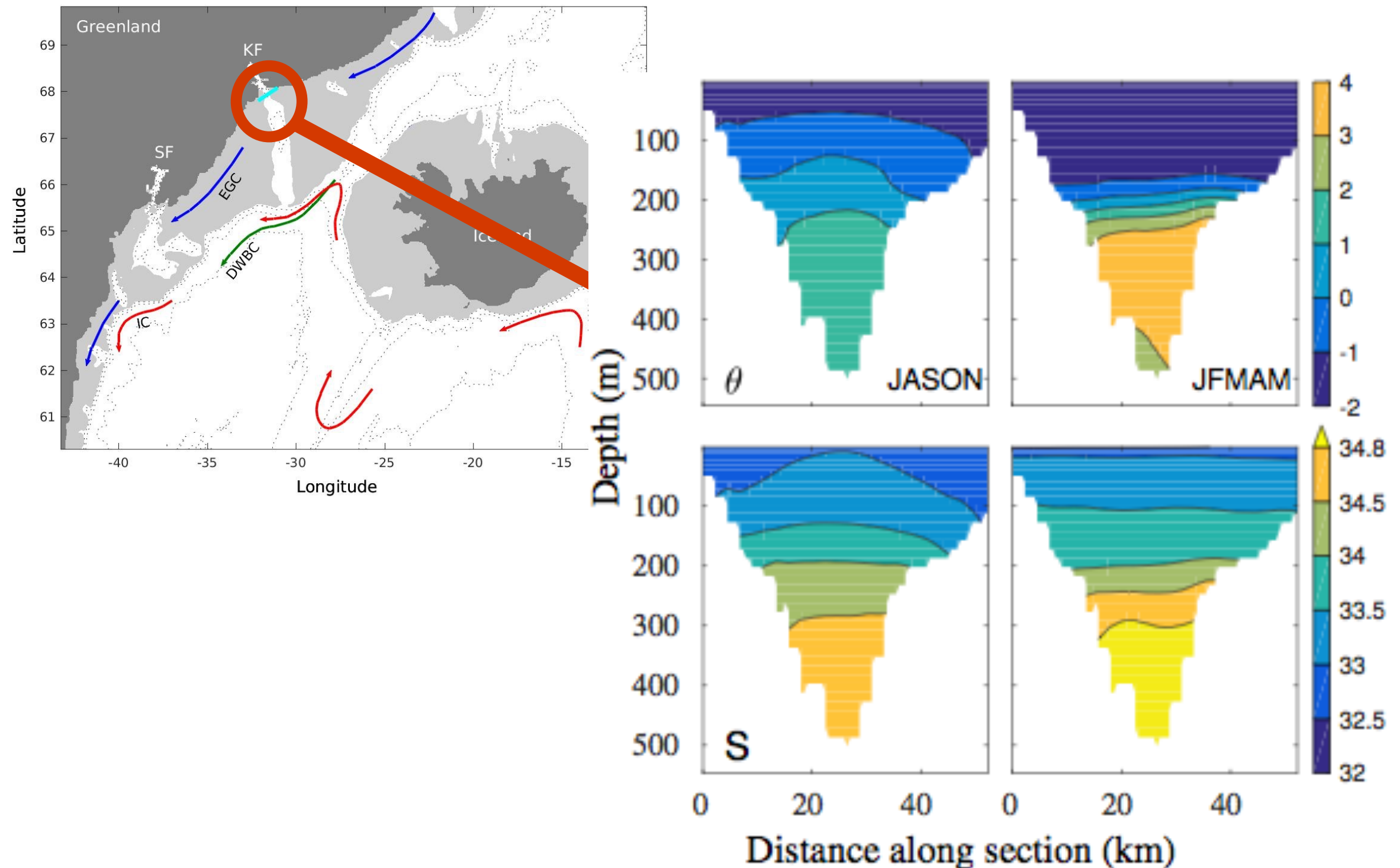
... also inside the fjords



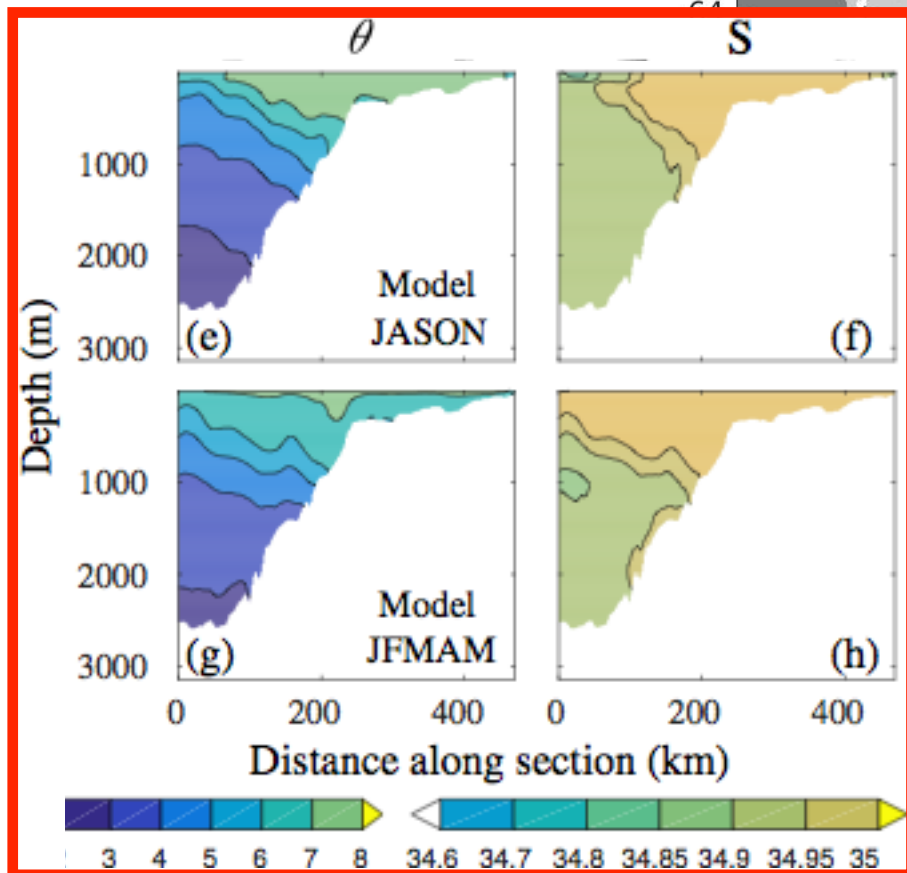
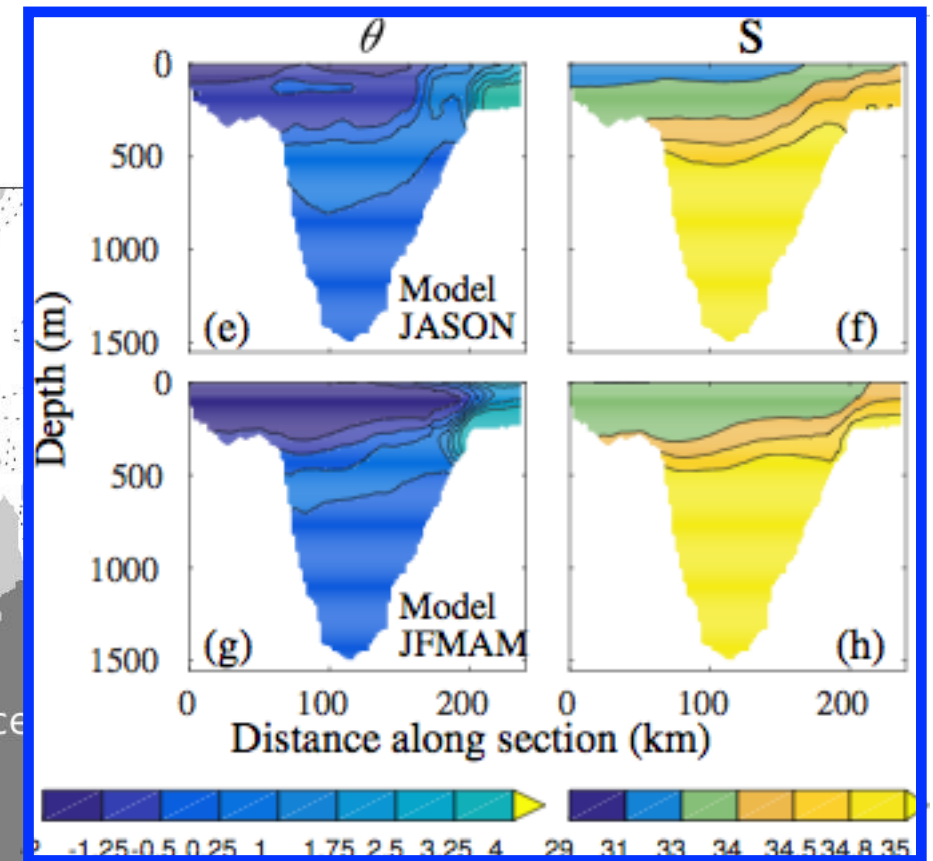
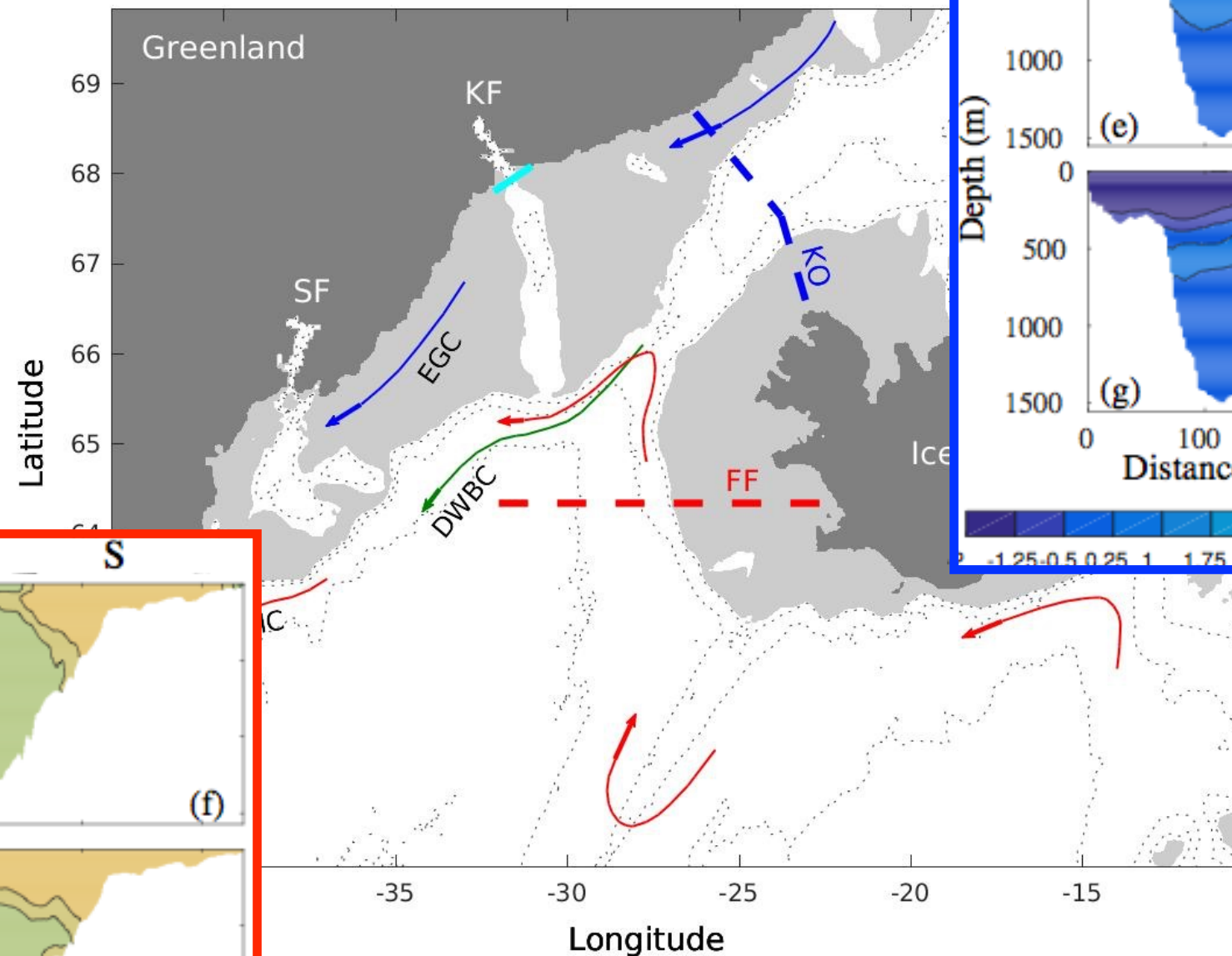
Regional ocean circulation



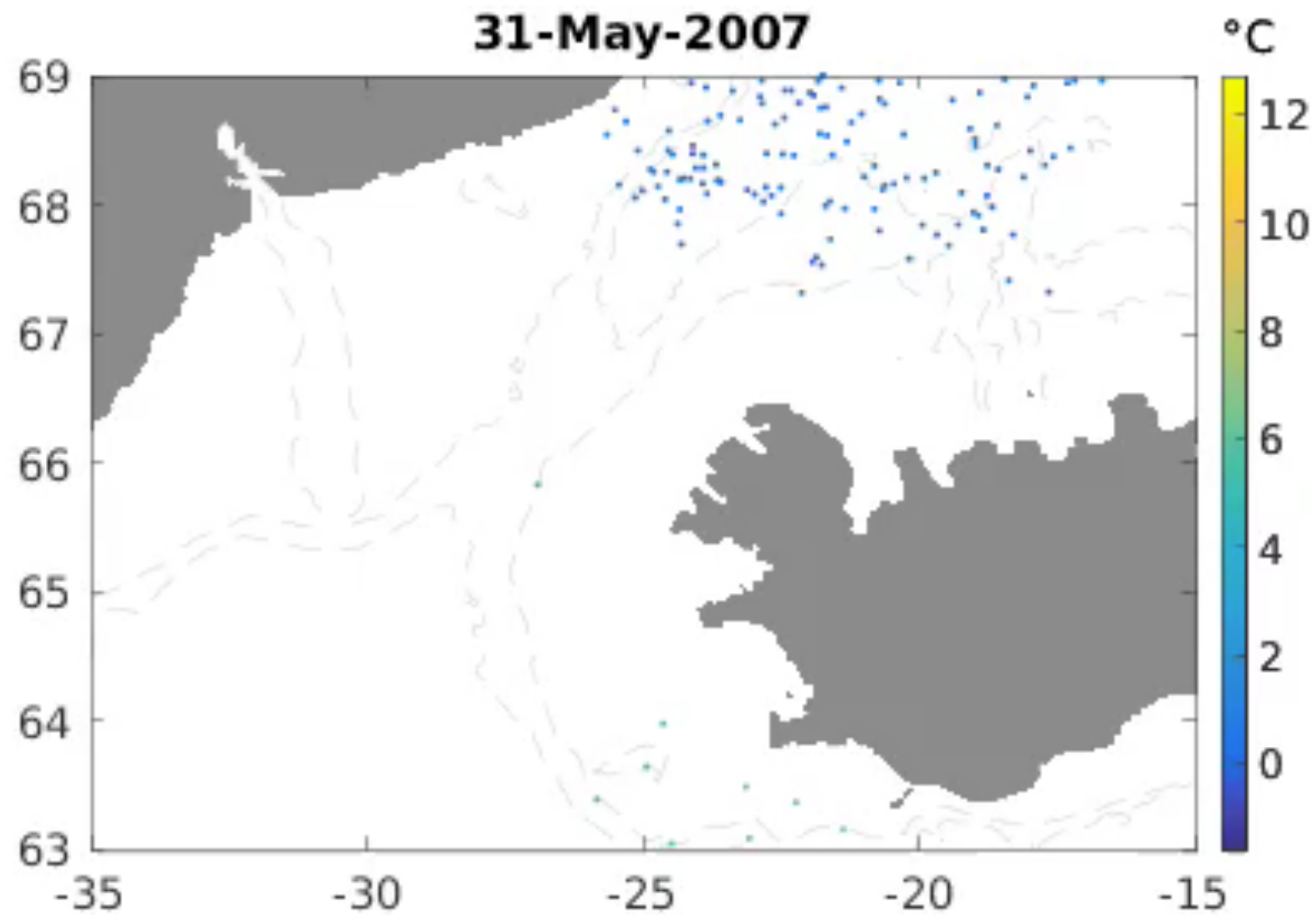
Kangerdlugssuaq Fjord entrance



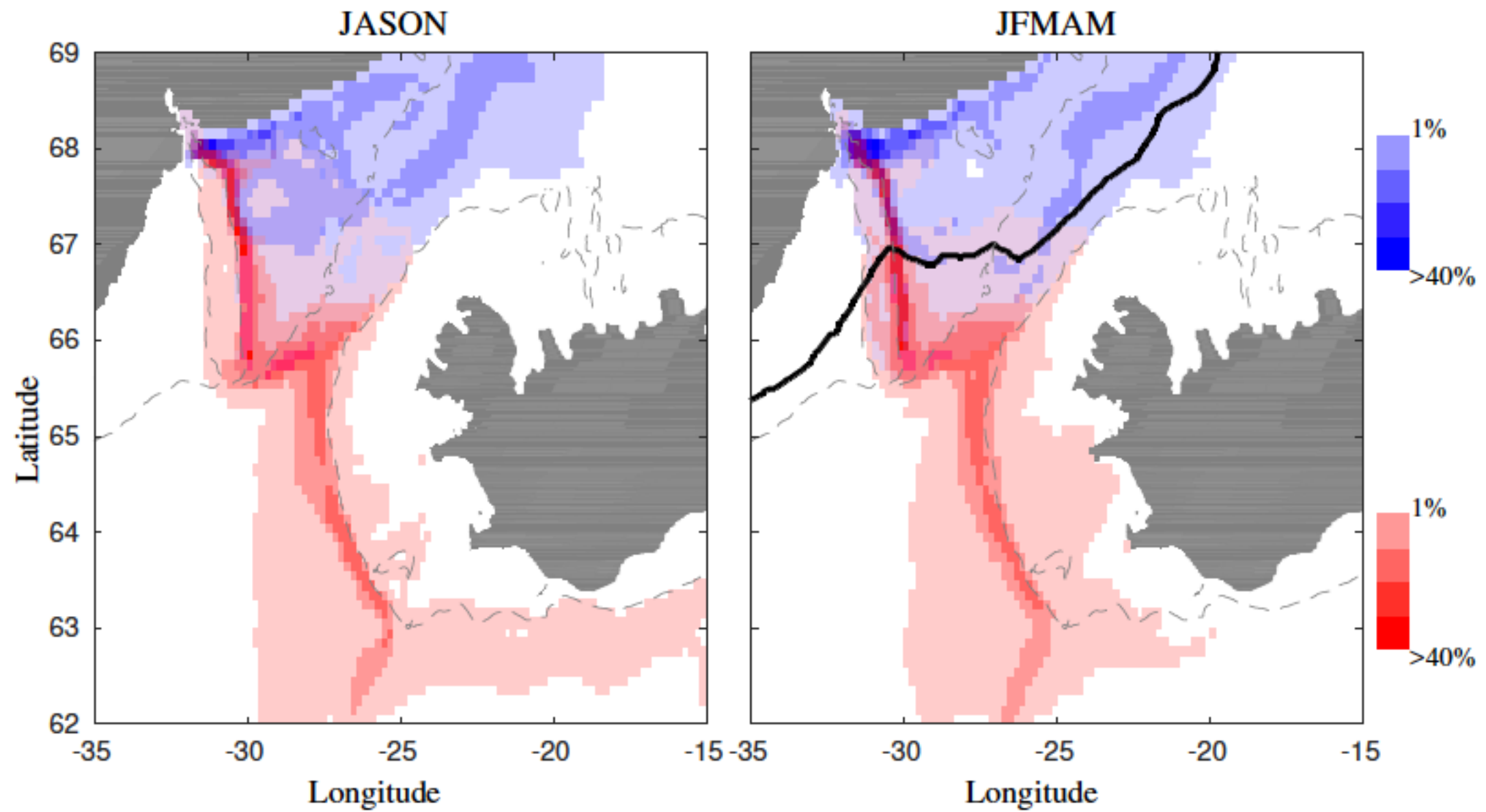
Upstream control sections



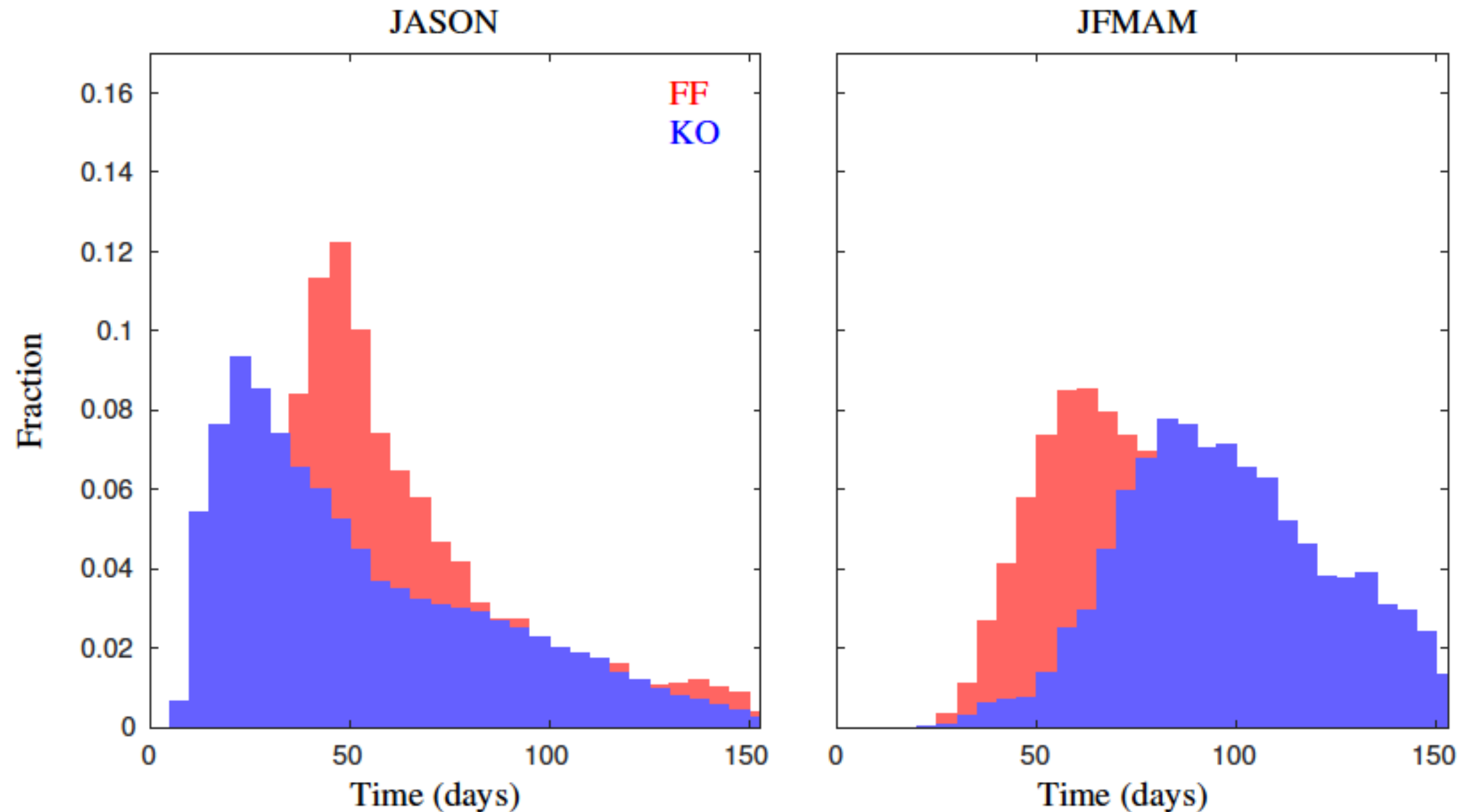
Particle trajectories



Pathways

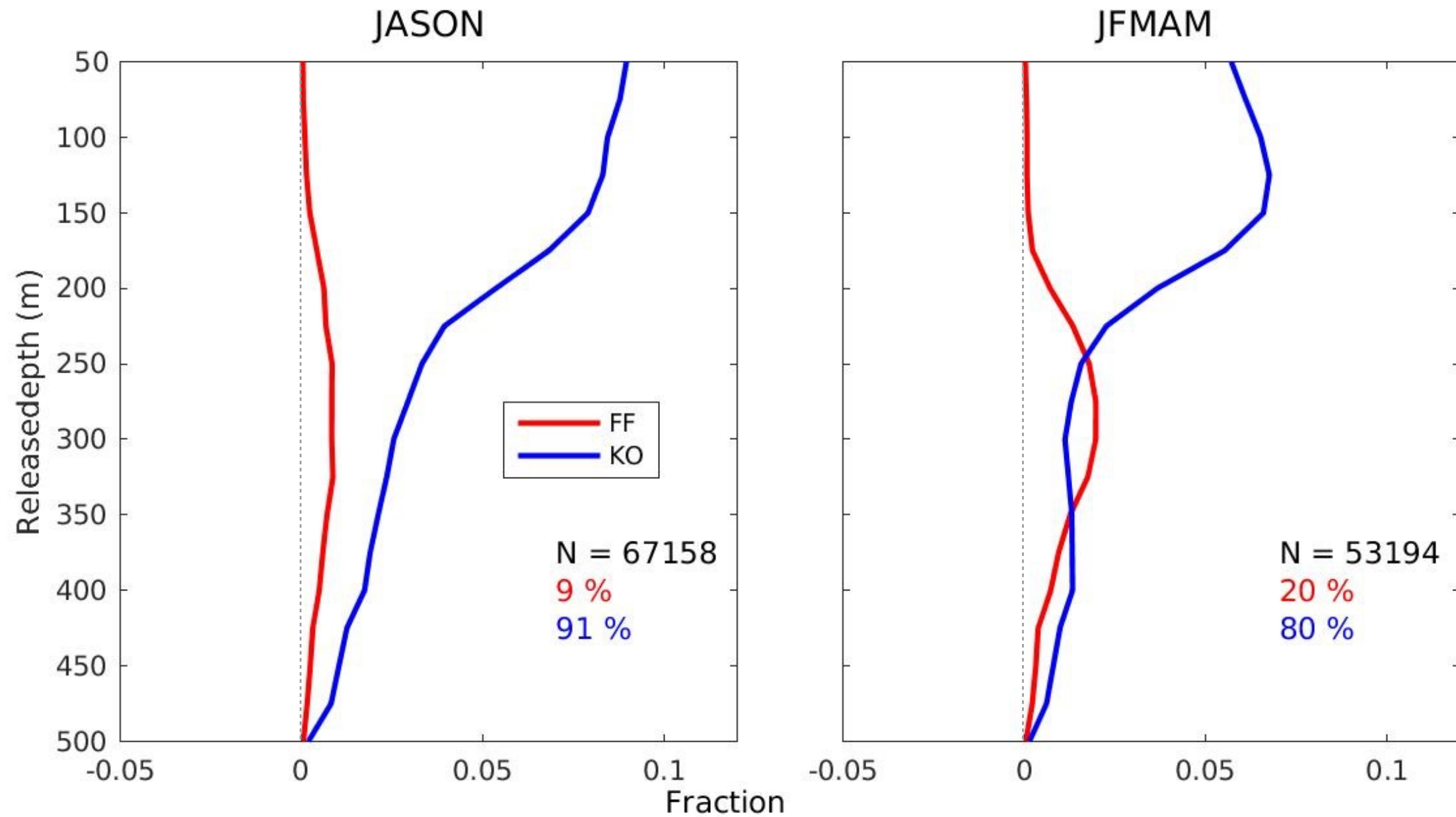


Particle transit times

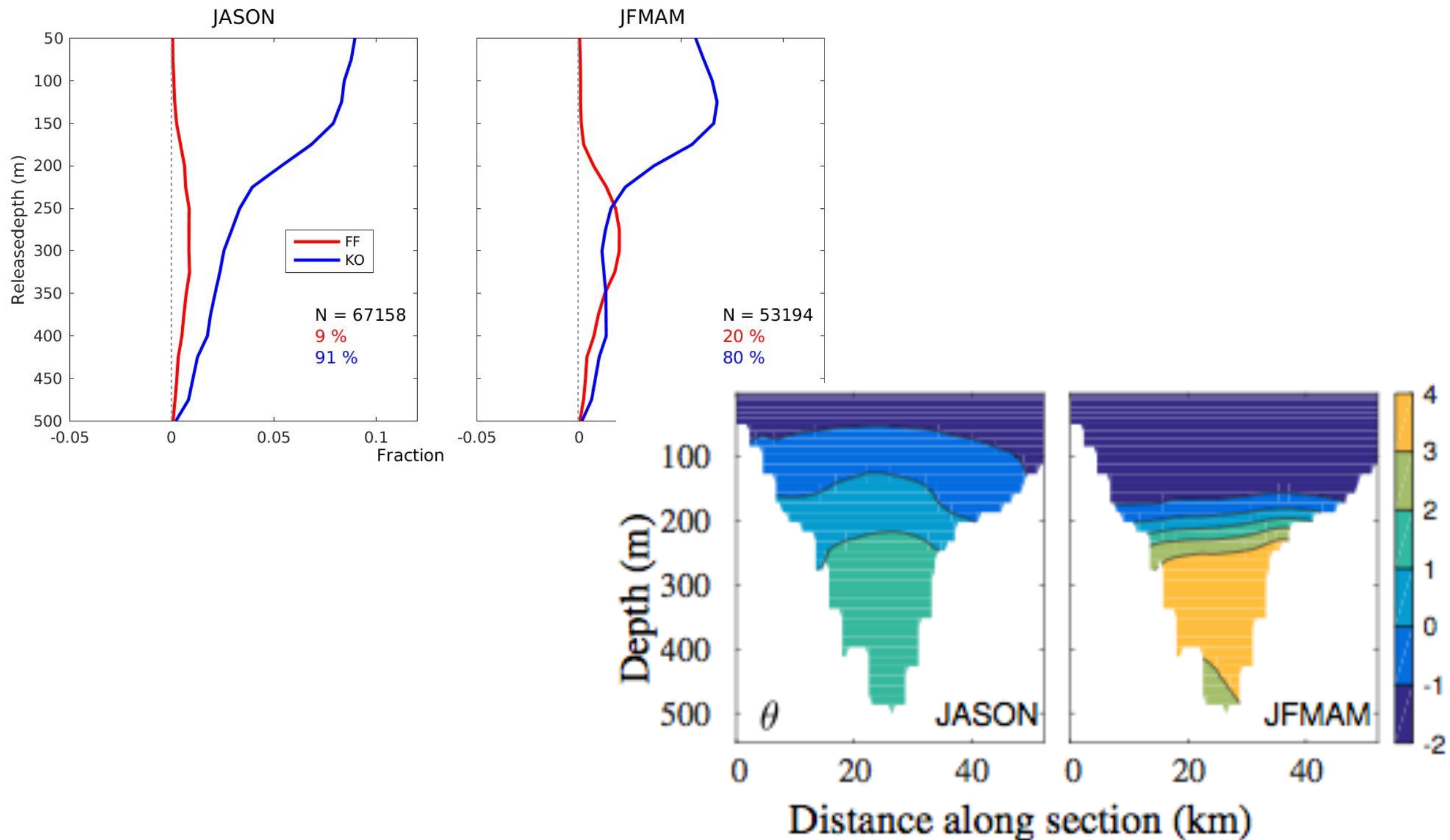


FF: 56 —> 73 days
KO: 44 —> 97 days

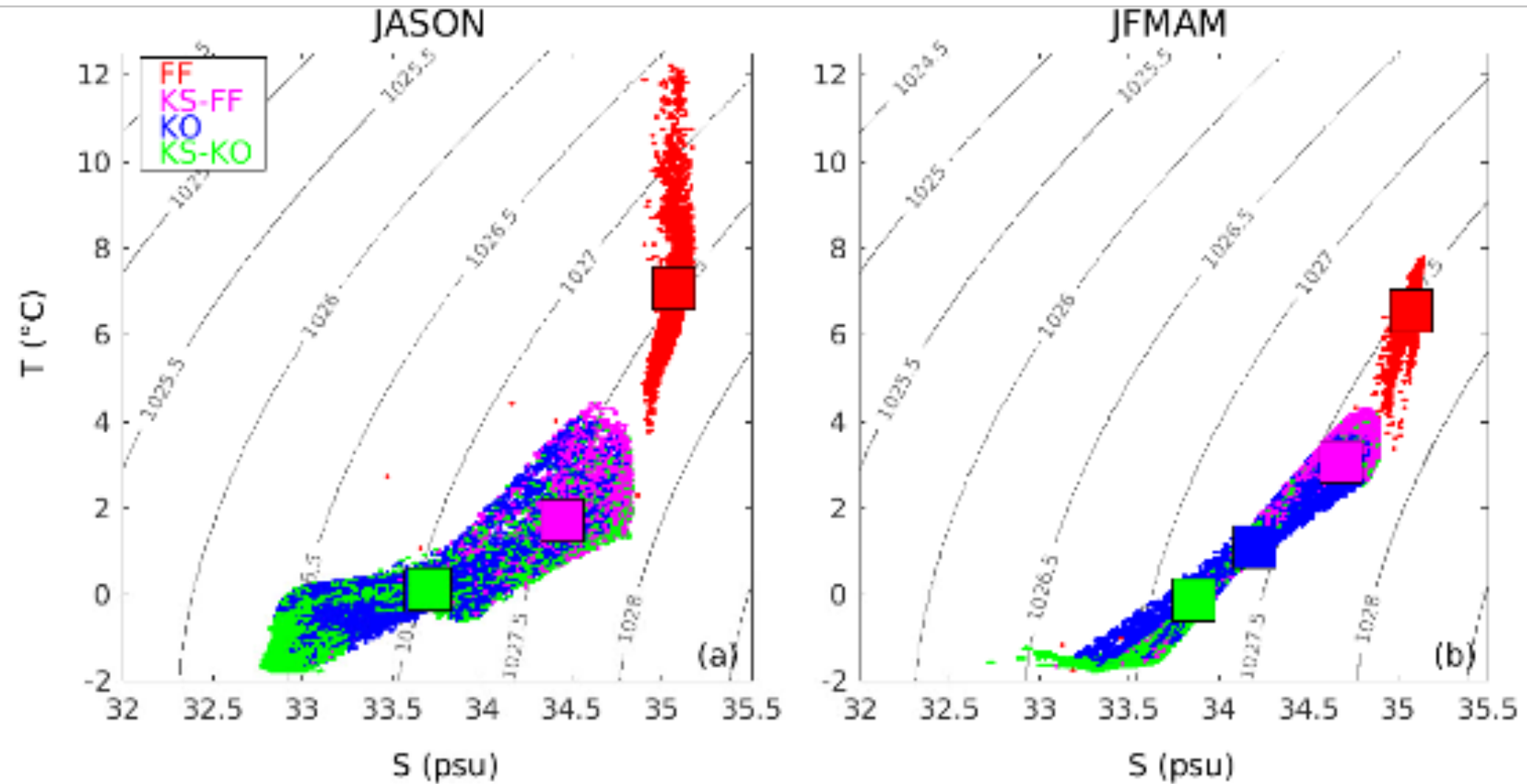
Depth distribution



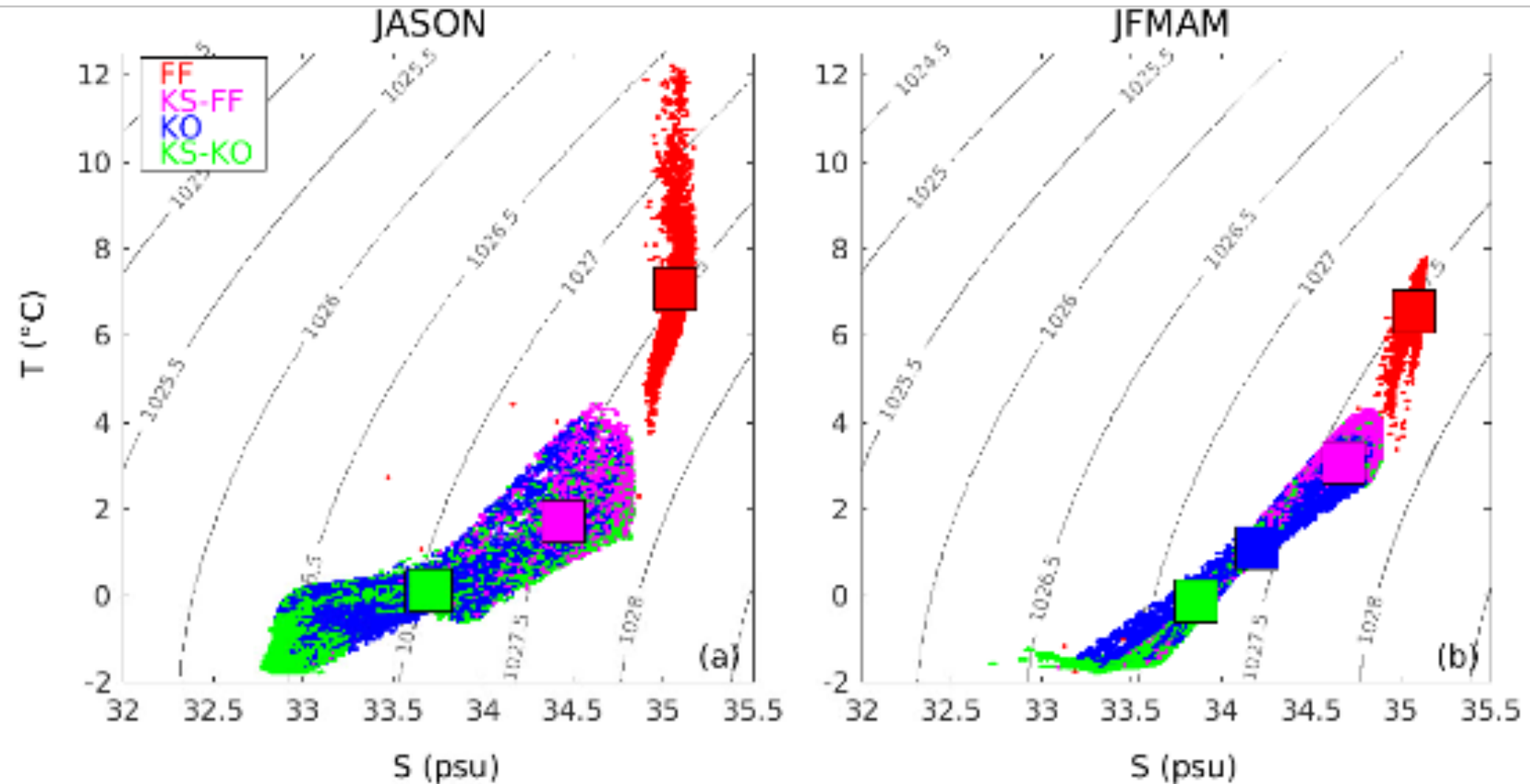
Depth distribution



T/S transformation

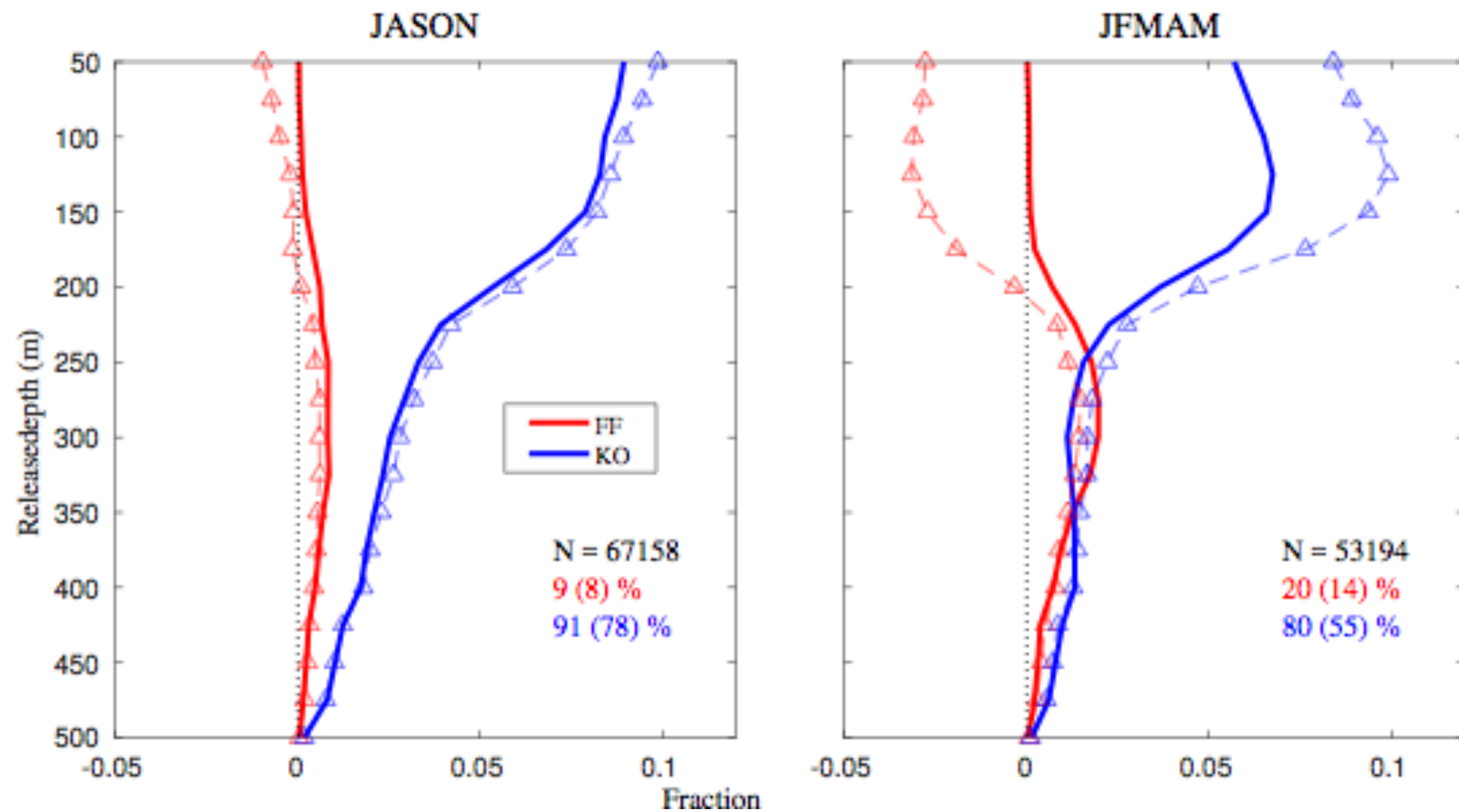


T/S transformation



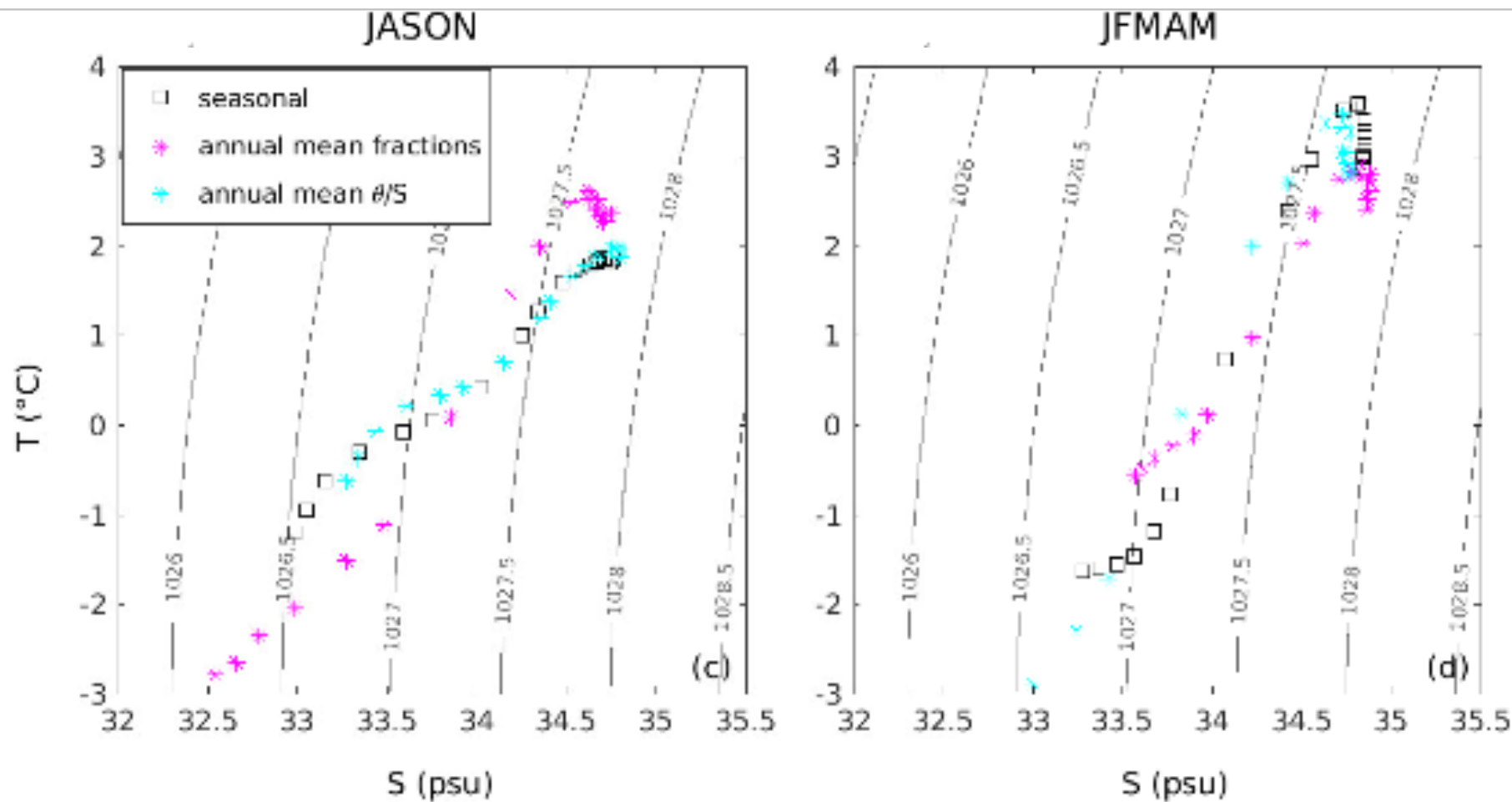
$$\begin{bmatrix} \theta_{KS} \\ S_{KS} \end{bmatrix} = f_{V,FF} \begin{bmatrix} \theta_{FF} \\ S_{FF} \end{bmatrix} + f_{V,KO} \begin{bmatrix} \theta_{KO} \\ S_{KO} \end{bmatrix}$$

T/S transformation



$$\begin{bmatrix} \theta_{KS} \\ S_{KS} \end{bmatrix} = f_{V,FF} \begin{bmatrix} \theta_{FF} \\ S_{FF} \end{bmatrix} + f_{V,KO} \begin{bmatrix} \theta_{KO} \\ S_{KO} \end{bmatrix}$$

T/S transformation



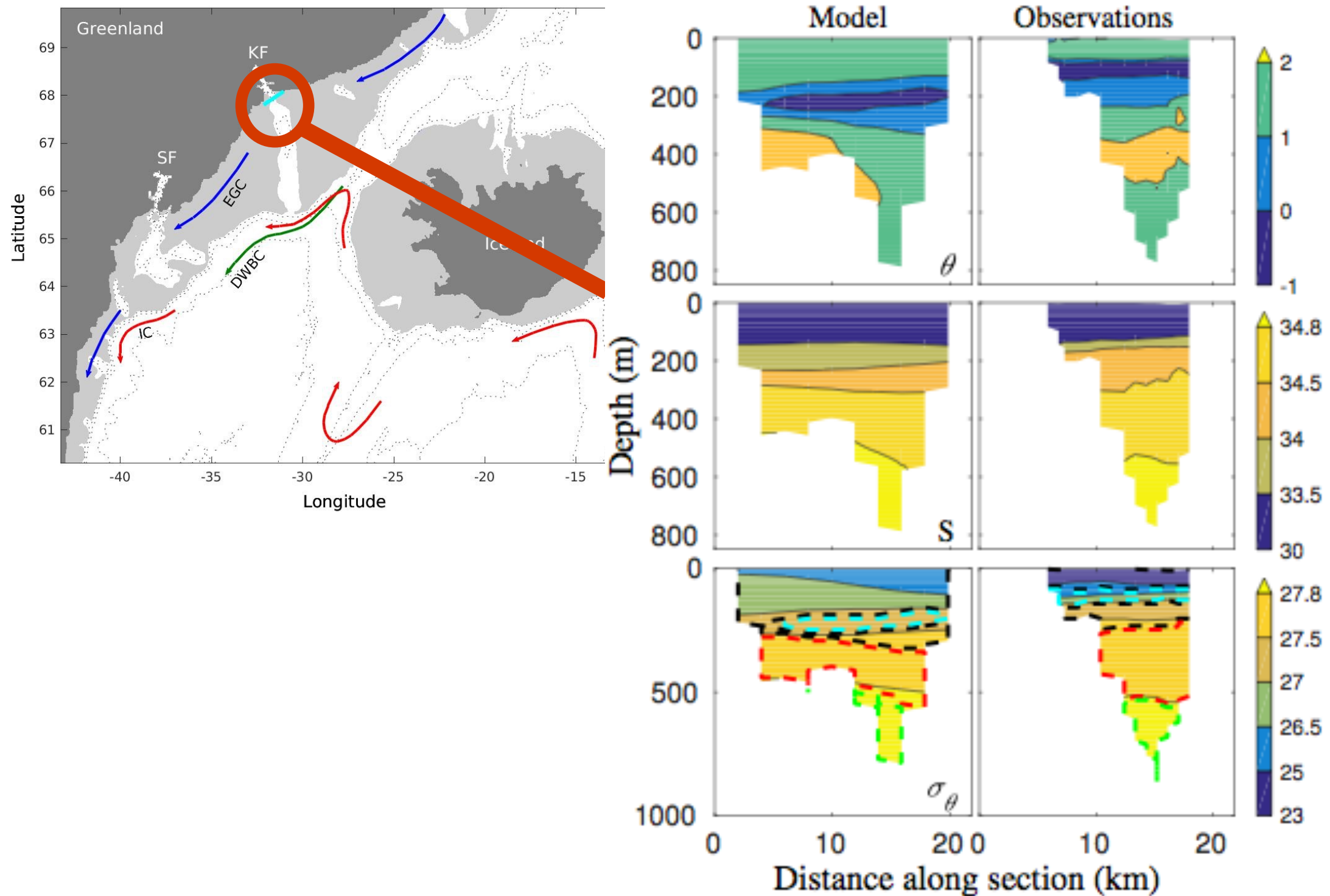
$$\begin{bmatrix} \theta_{KS} \\ S_{KS} \end{bmatrix} = f_{V,FF} \begin{bmatrix} \theta_{FF} \\ S_{FF} \end{bmatrix} + f_{V,KO} \begin{bmatrix} \theta_{KO} \\ S_{KO} \end{bmatrix}$$

Conclusions

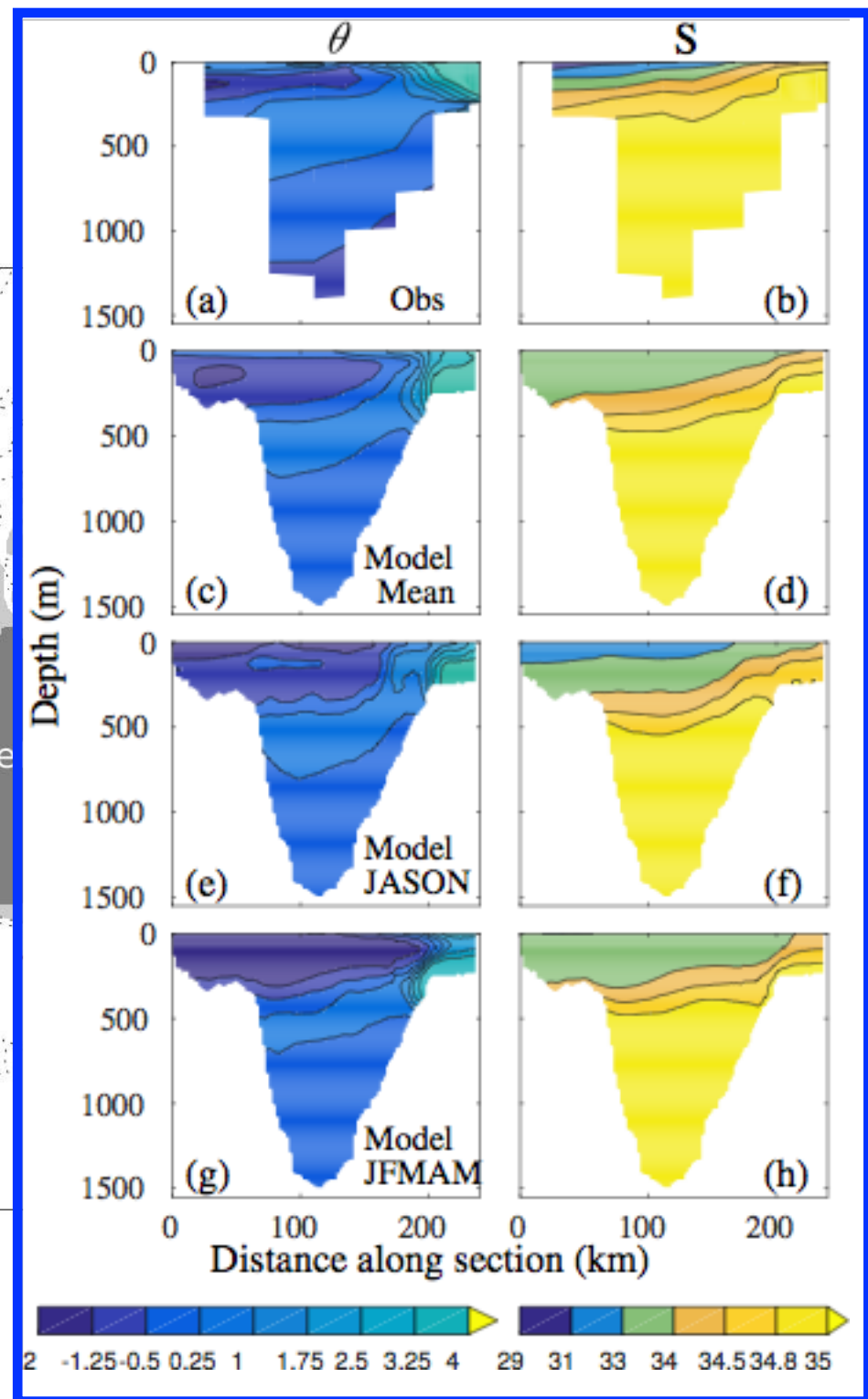
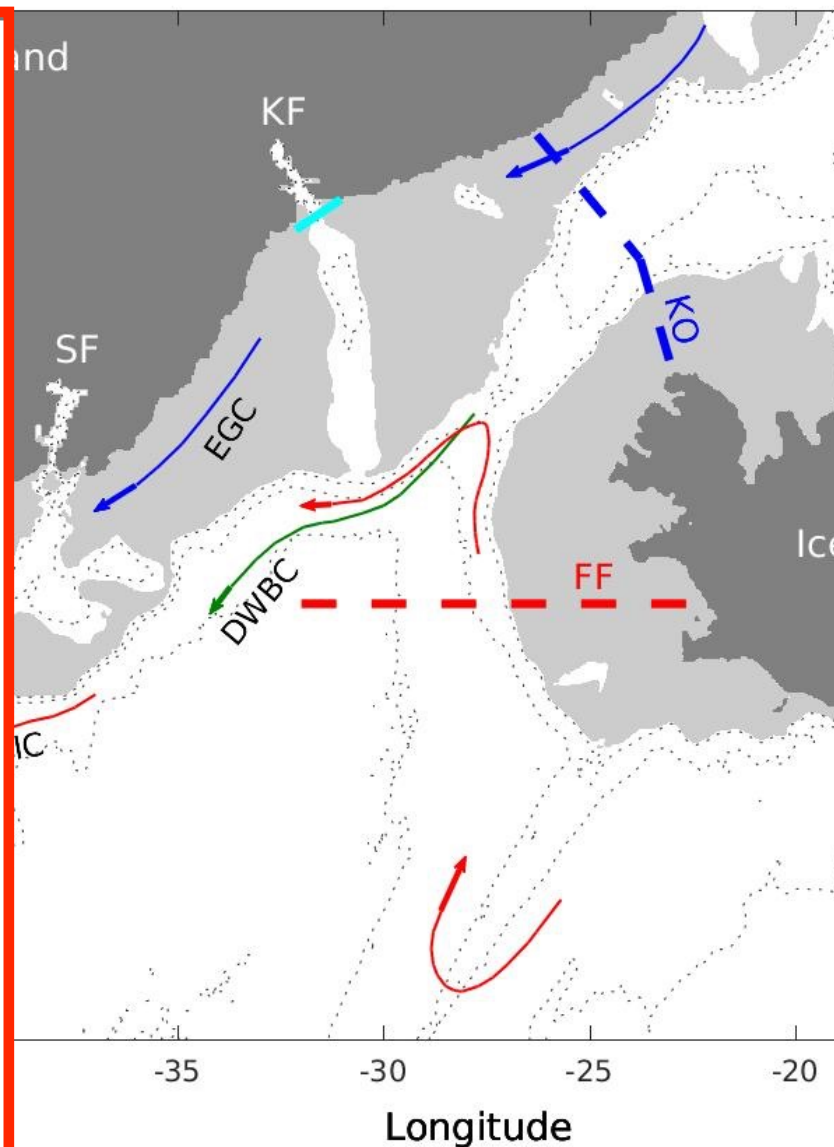
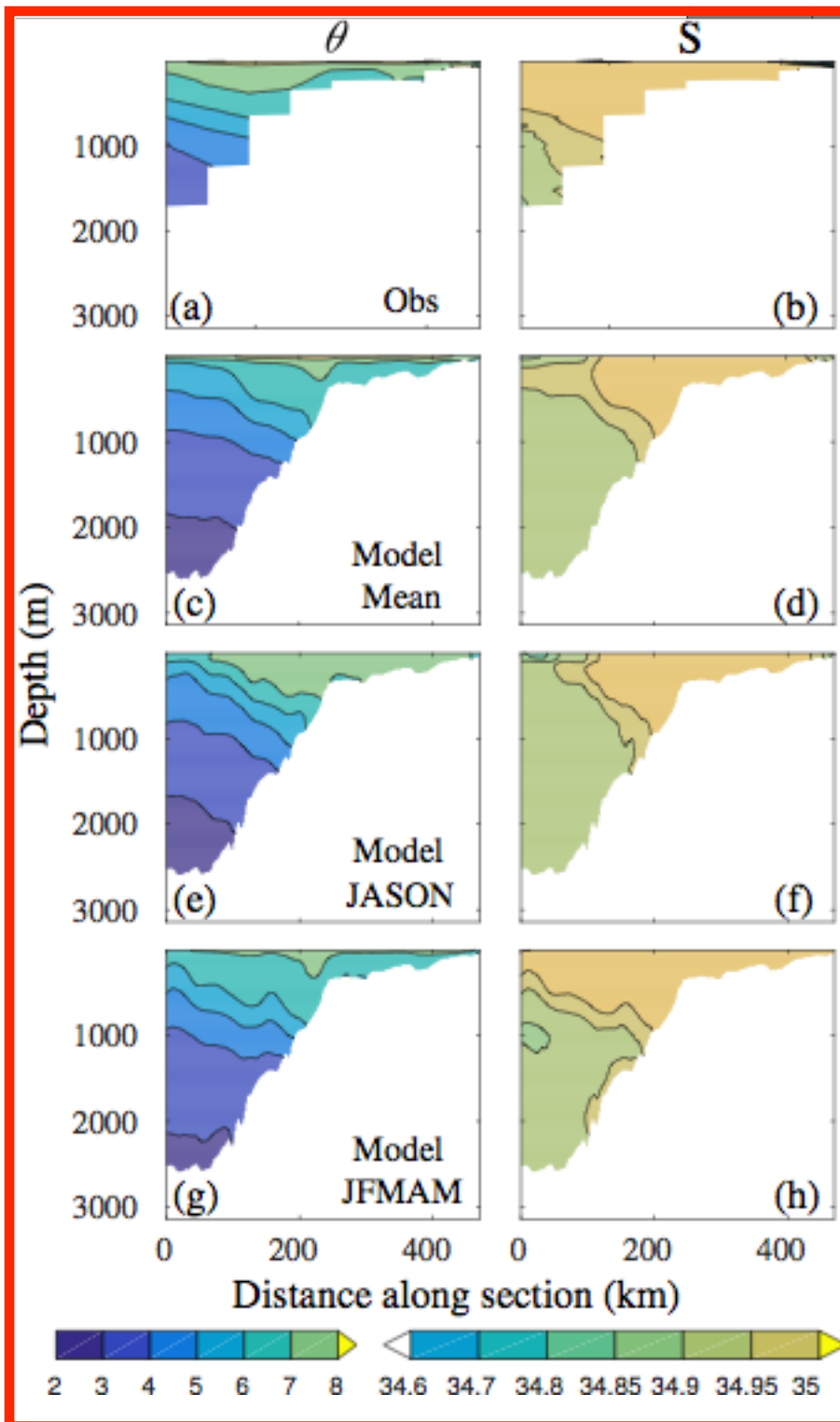
- The ocean water at Kangerdlugssuaq Fjord entrance is warmer in winter.
- The warming is caused by a doubling of the contribution of Irminger Basin water
- The main reason for the doubling is a different pathway, and thus longer transit times for particles from the North; source water property variations have very little impact.

(Caveats: 1 year, 1 fjord)

Kangerdlugssuaq Fjord entrance

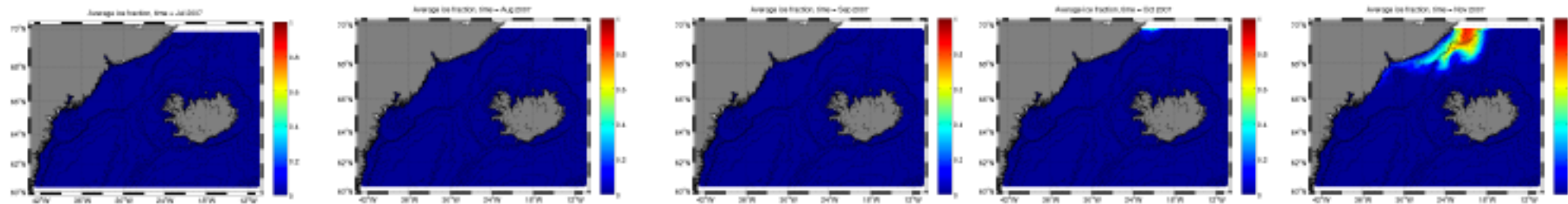


Upstream control sections



Sea ice cover per month

JASON



JFMAM

