

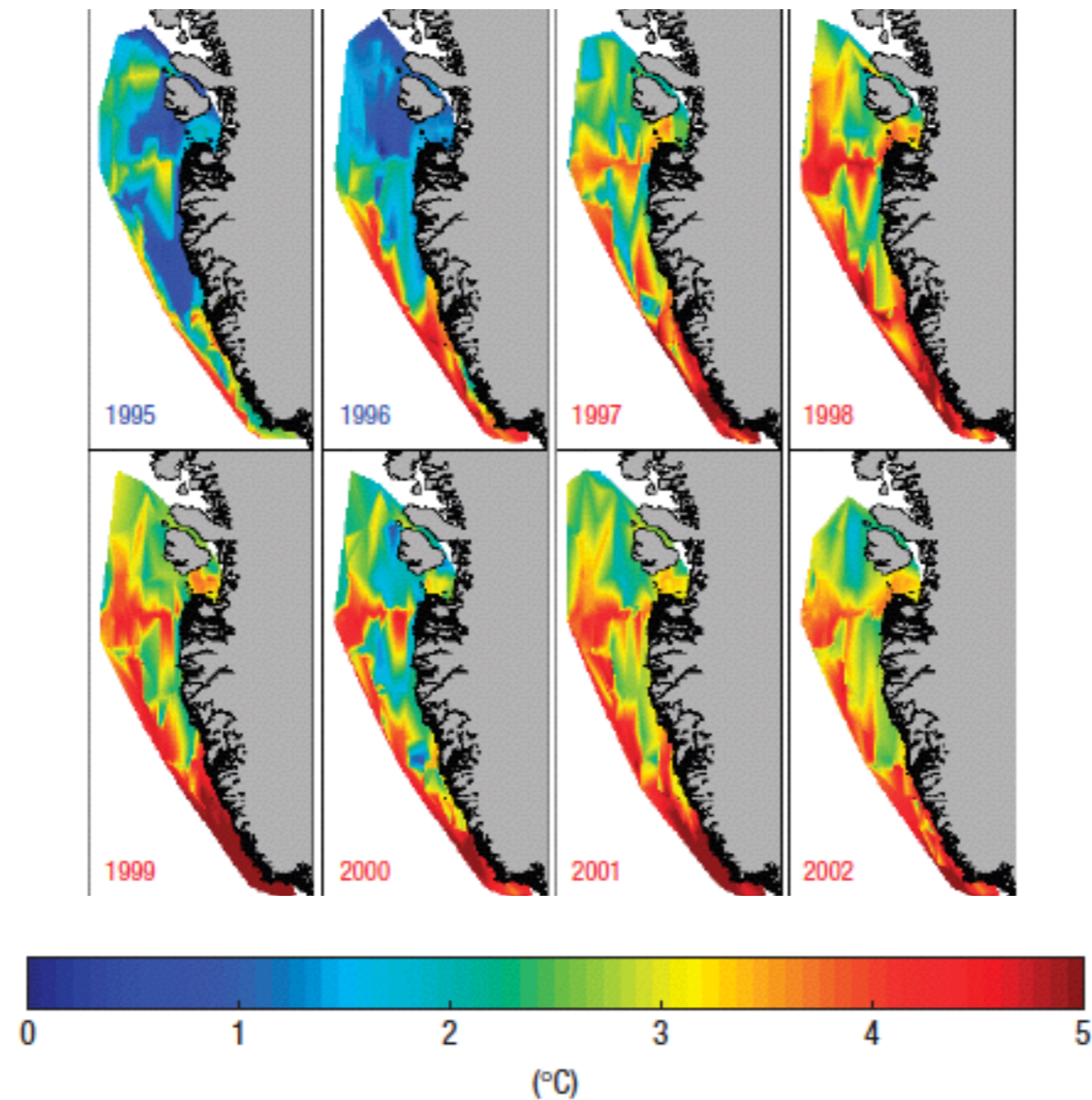
Seasonal variability in warm-water inflow towards Kangerdlugssuaq Fjord

Renske Gelderloos (JHU)

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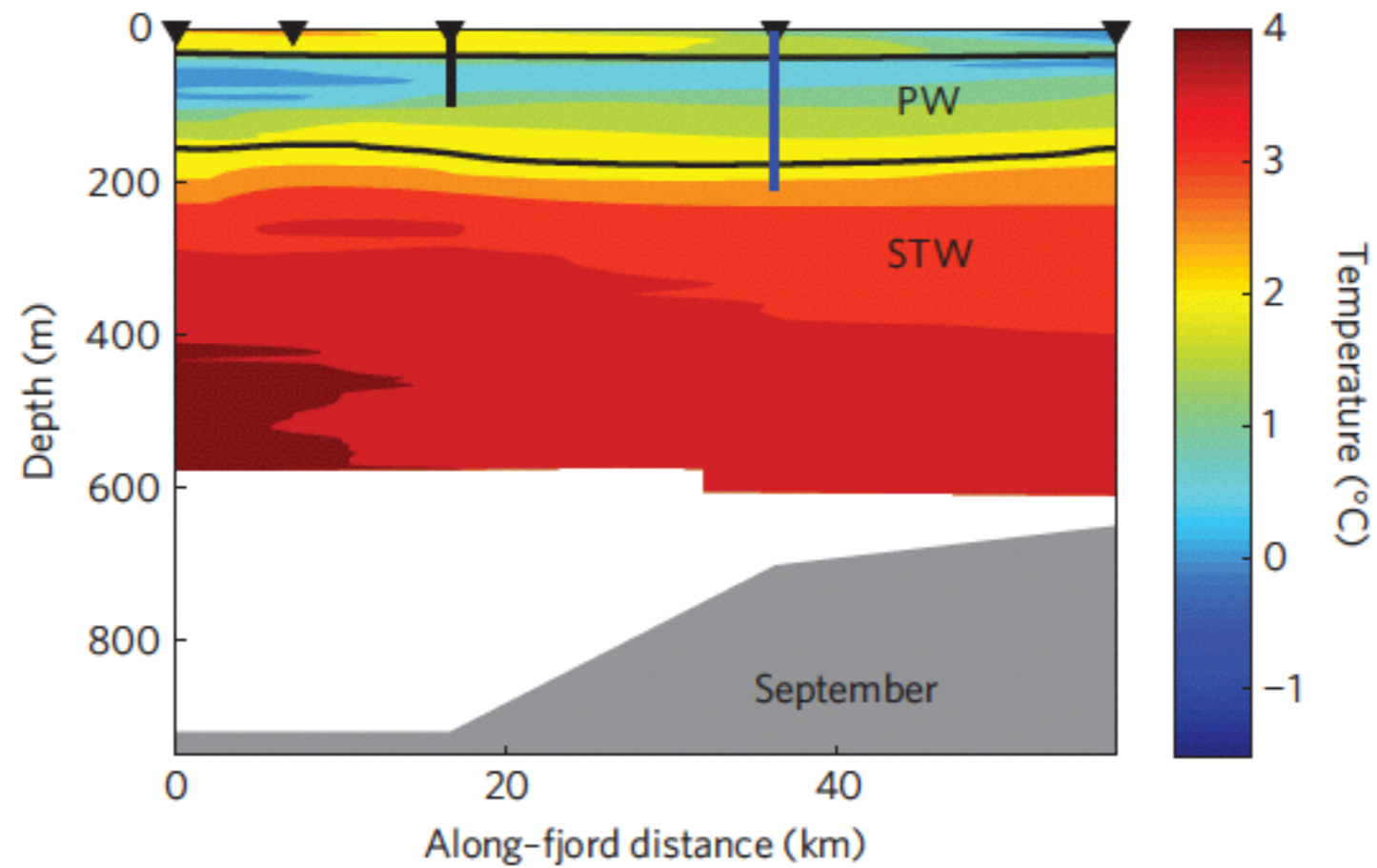


Ocean water has warmed up

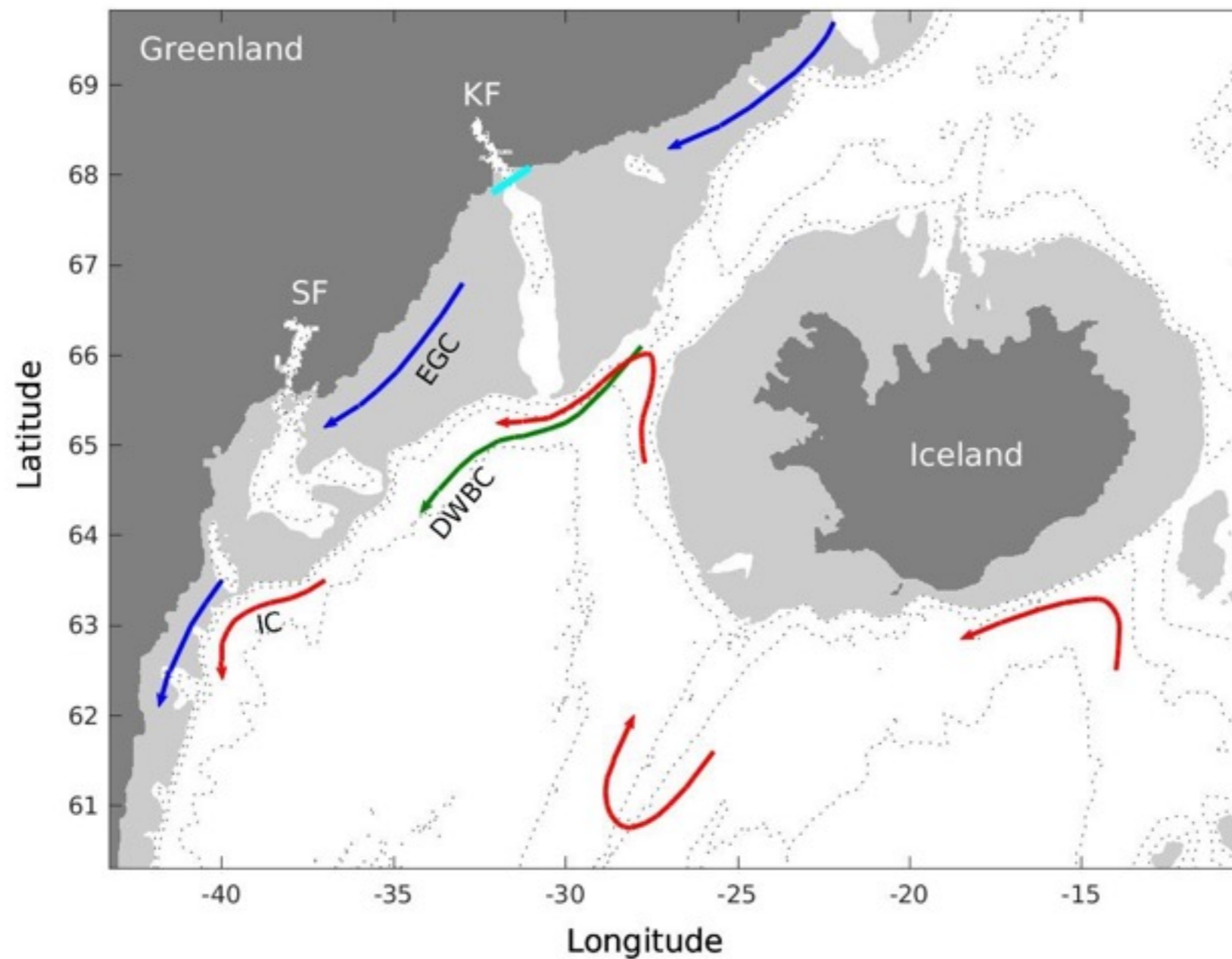


Holland *et al.* (2008), Nat. Geosc.

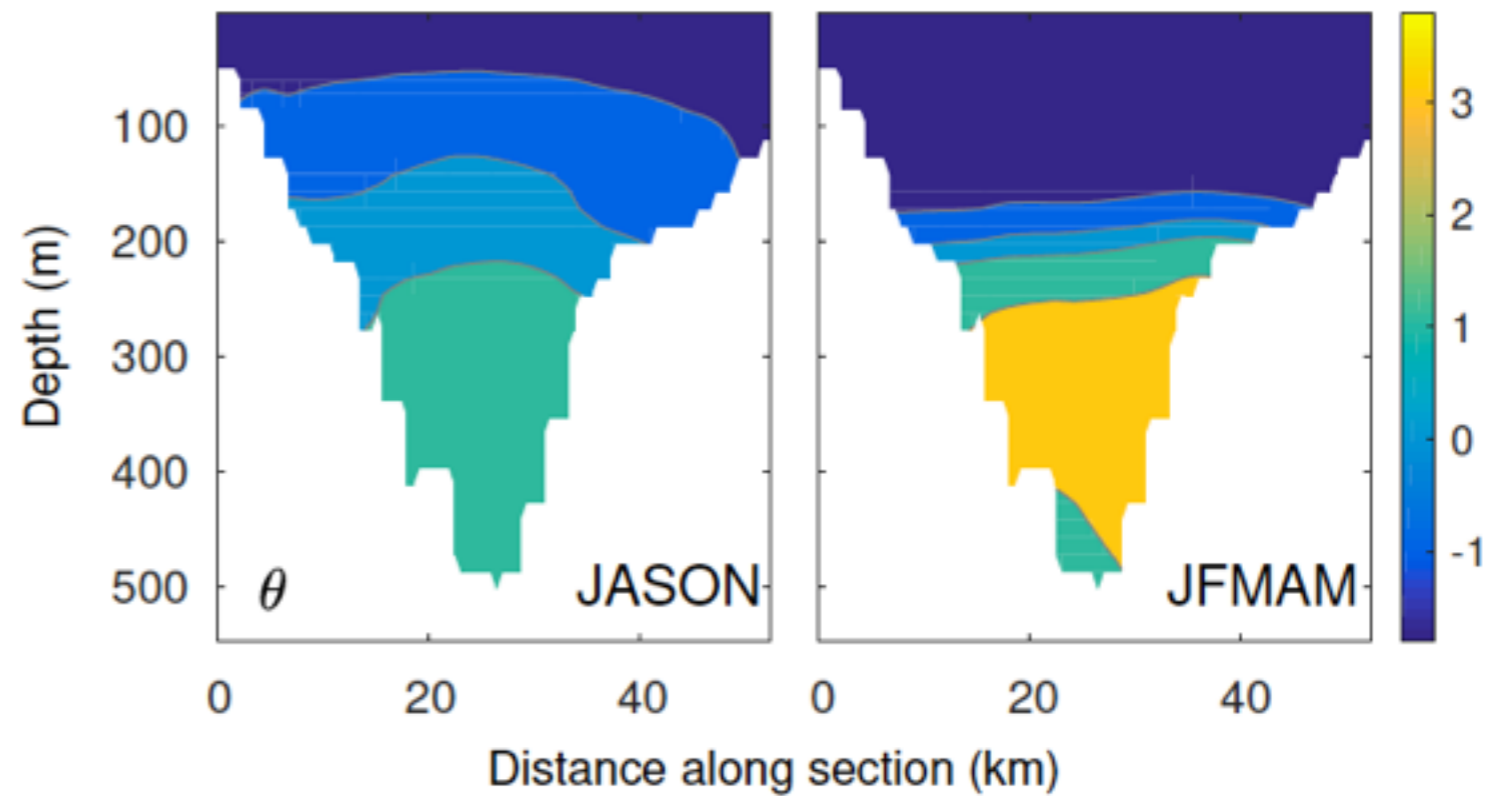
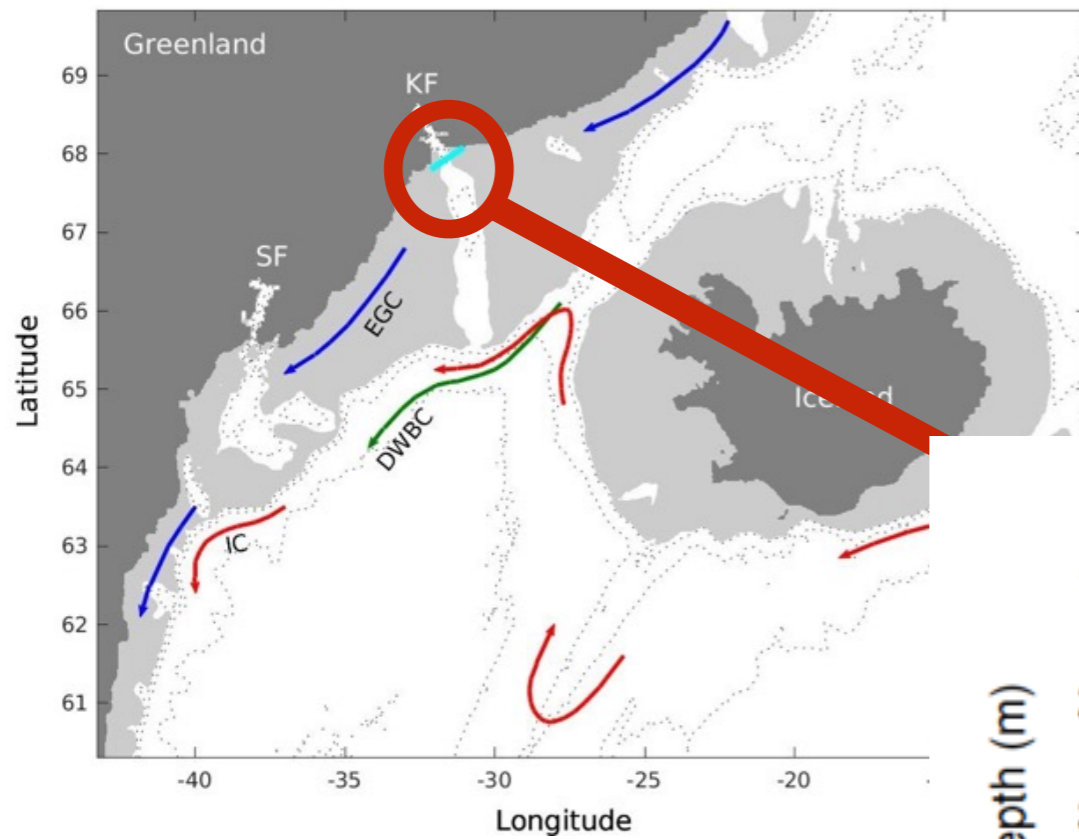
... also inside the fjords



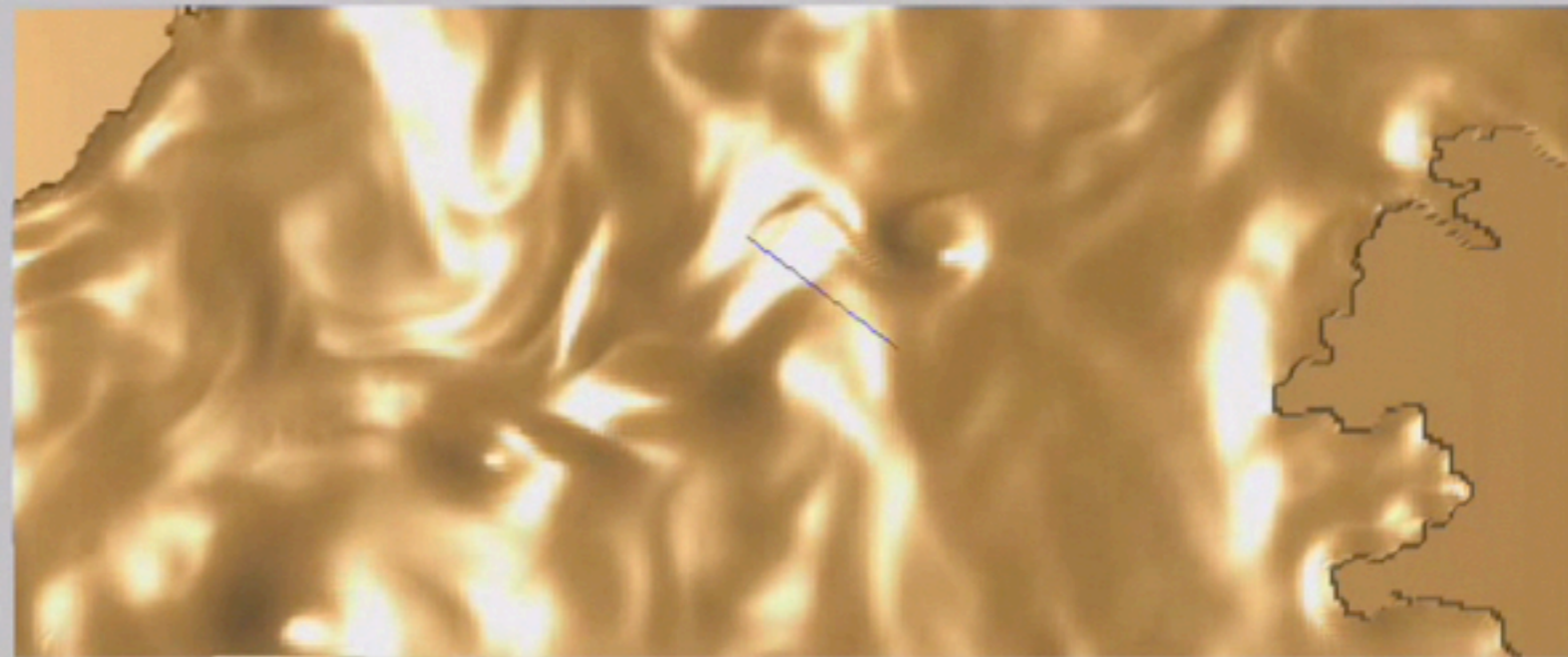
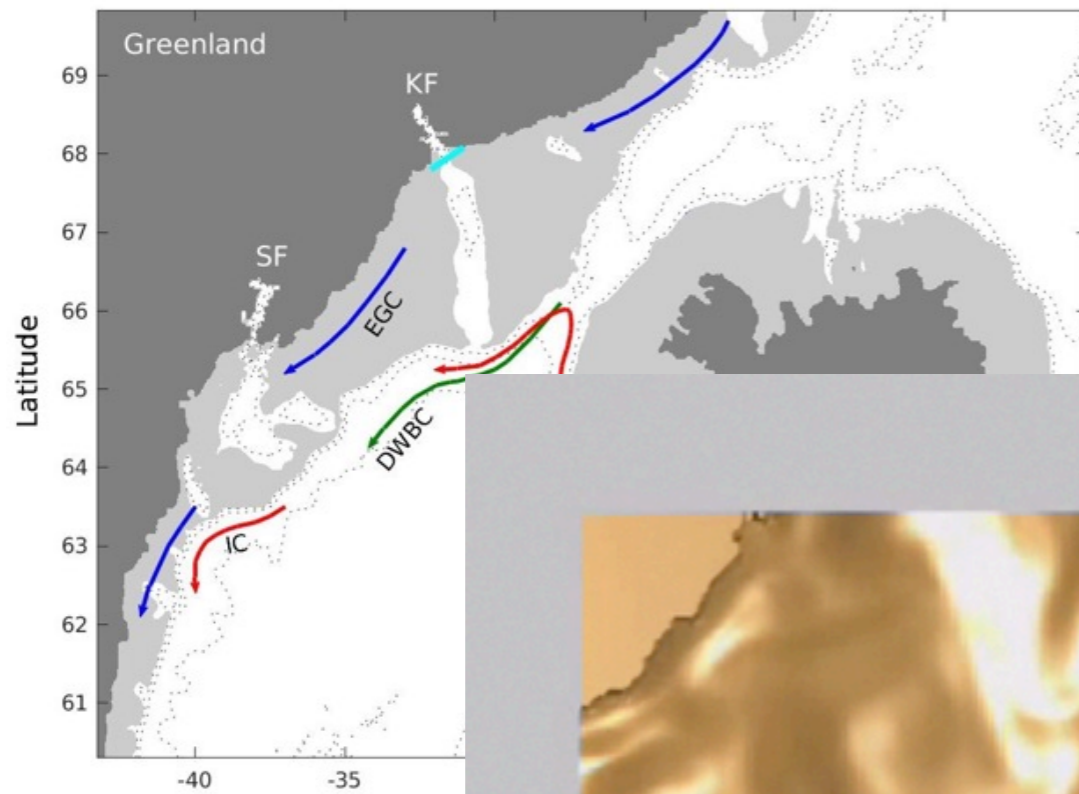
Main current systems



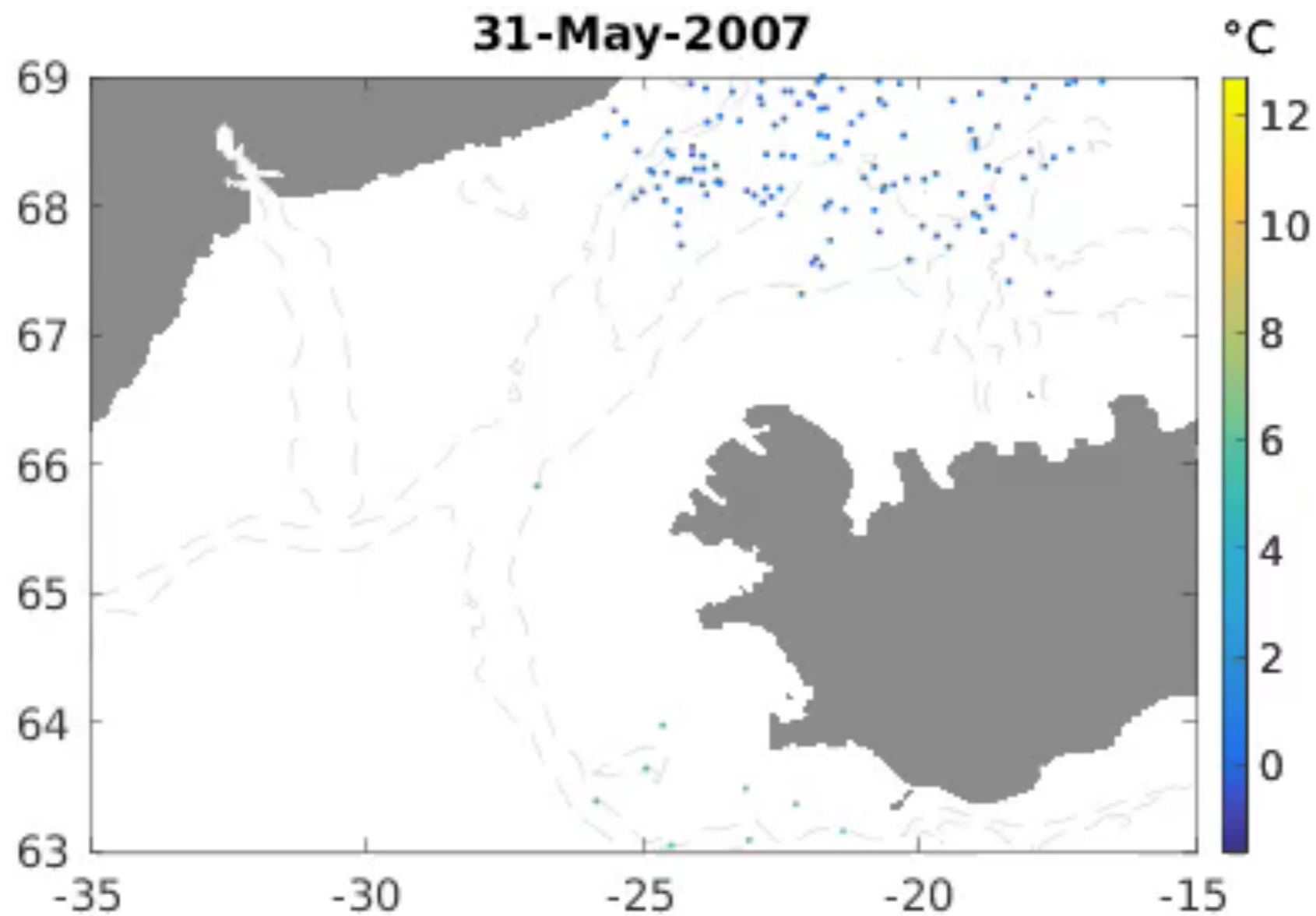
Kangerdlugssuaq Fjord entrance



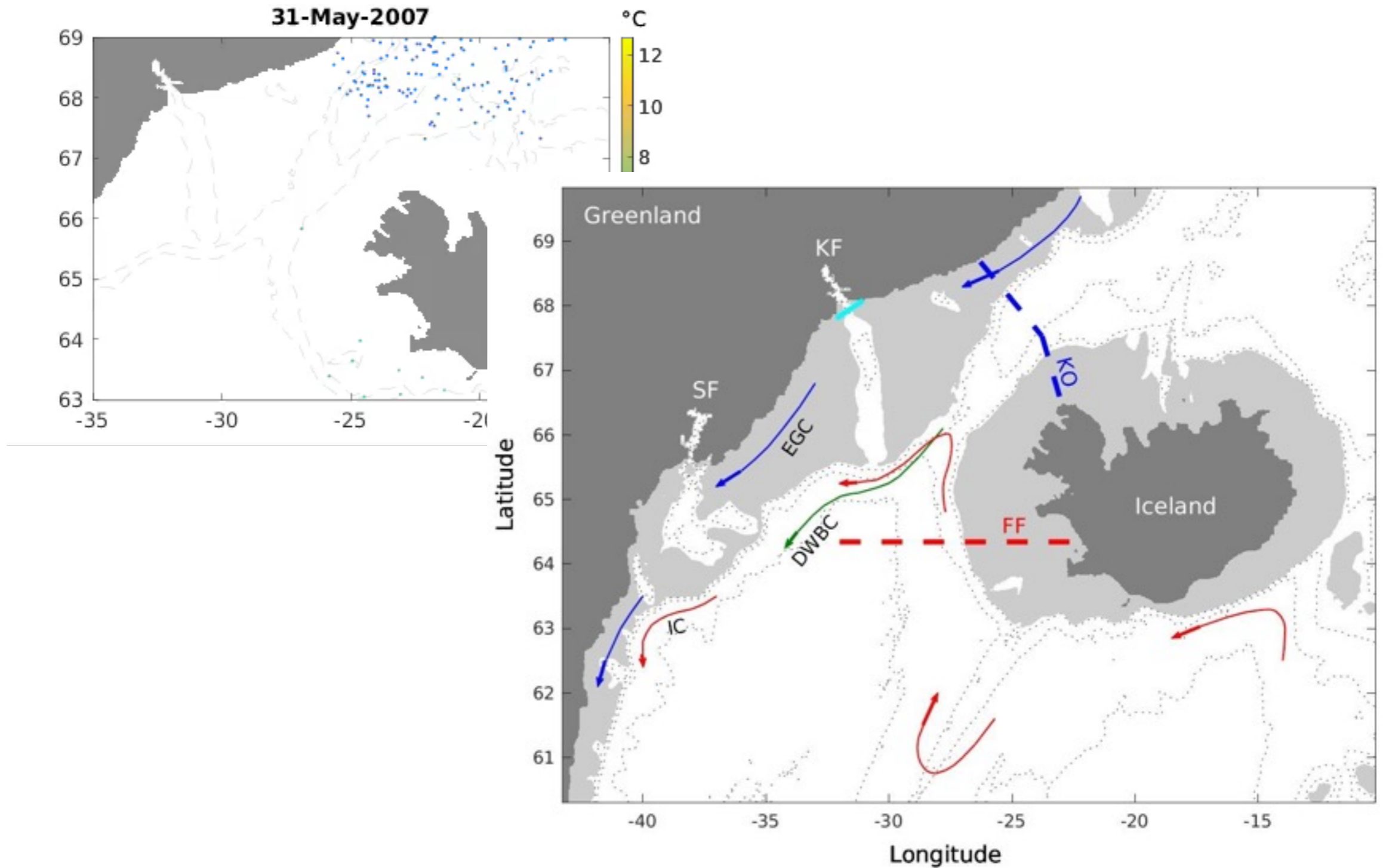
A Eulerian view



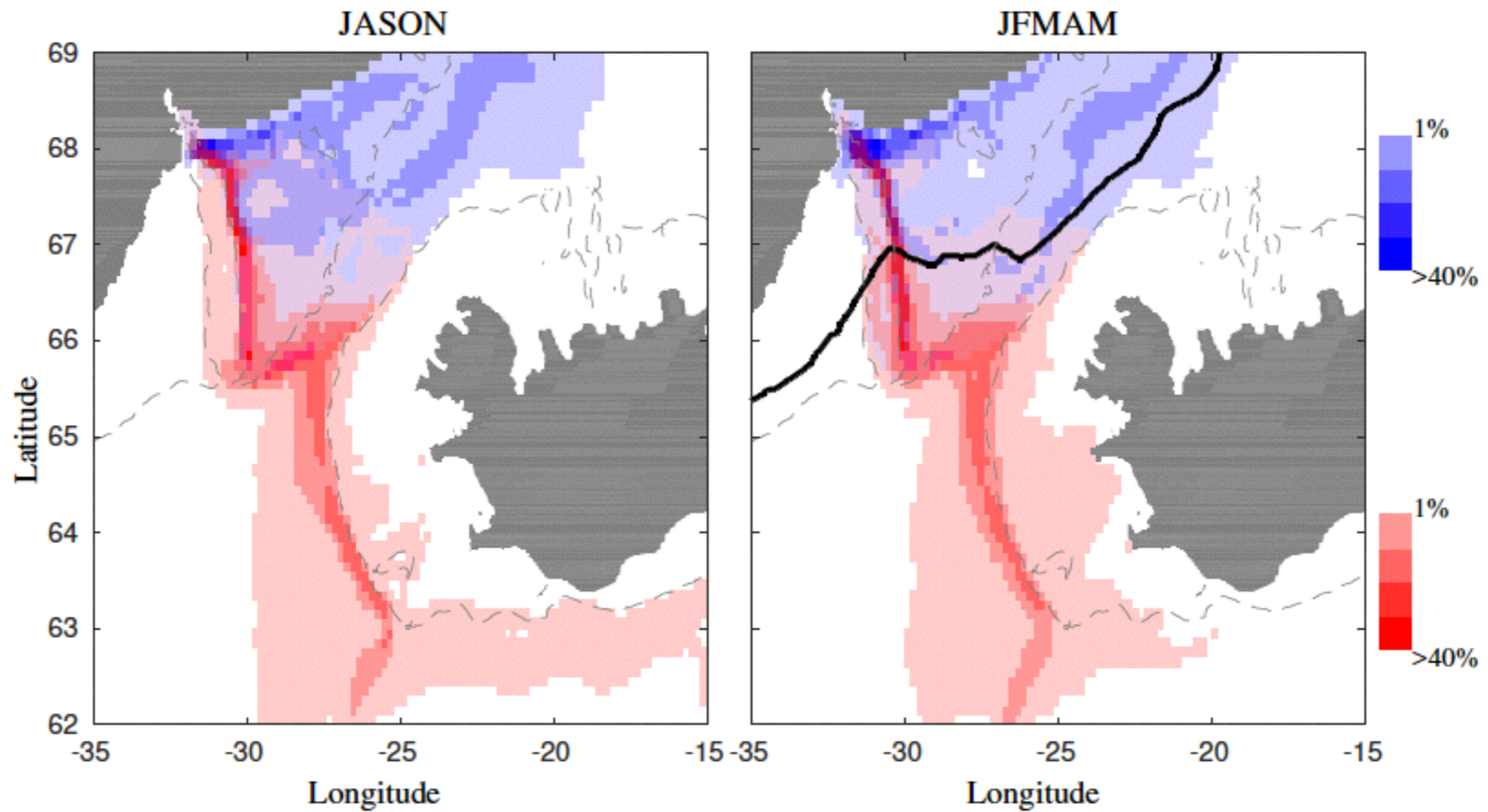
Lagrangian particles



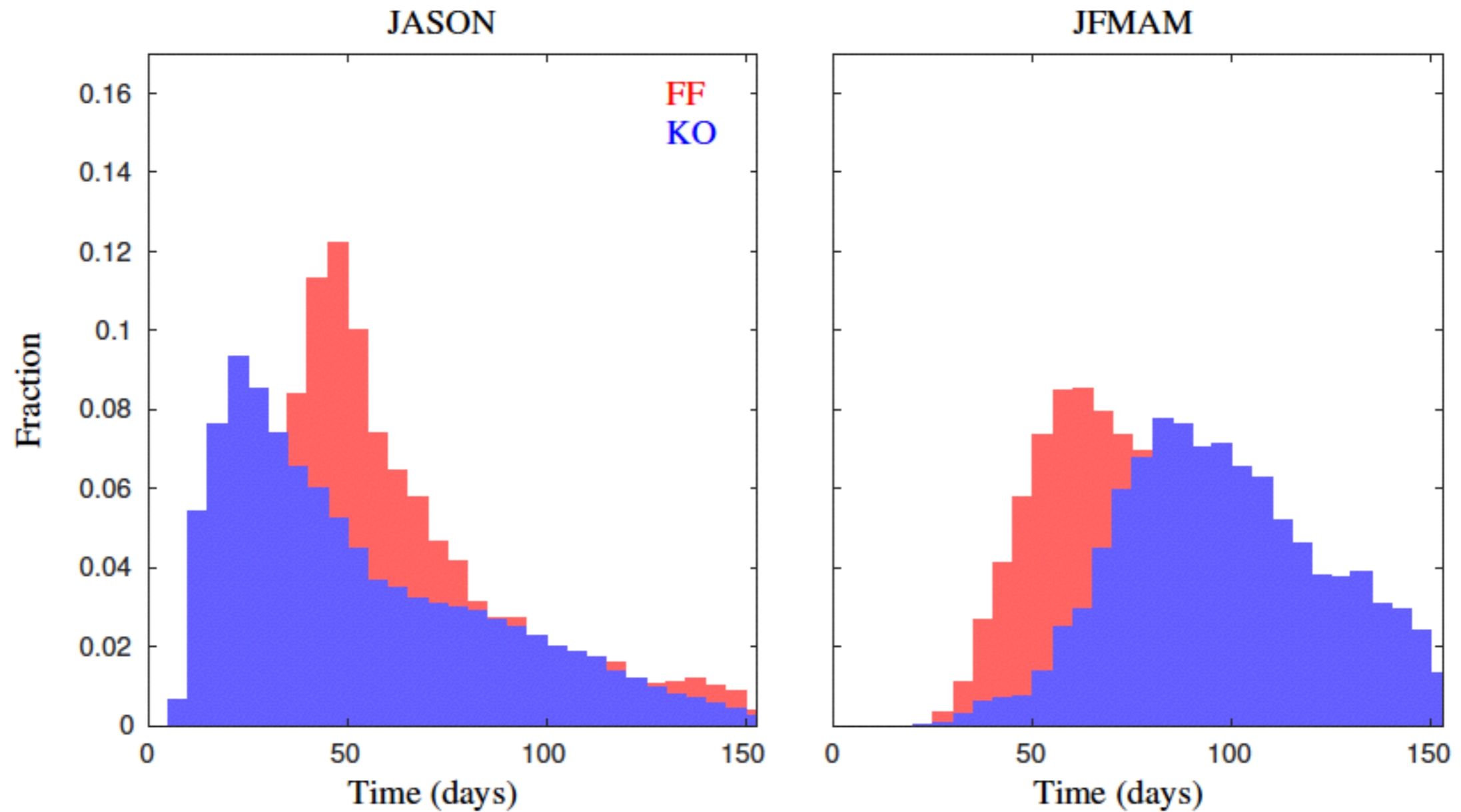
Control sections



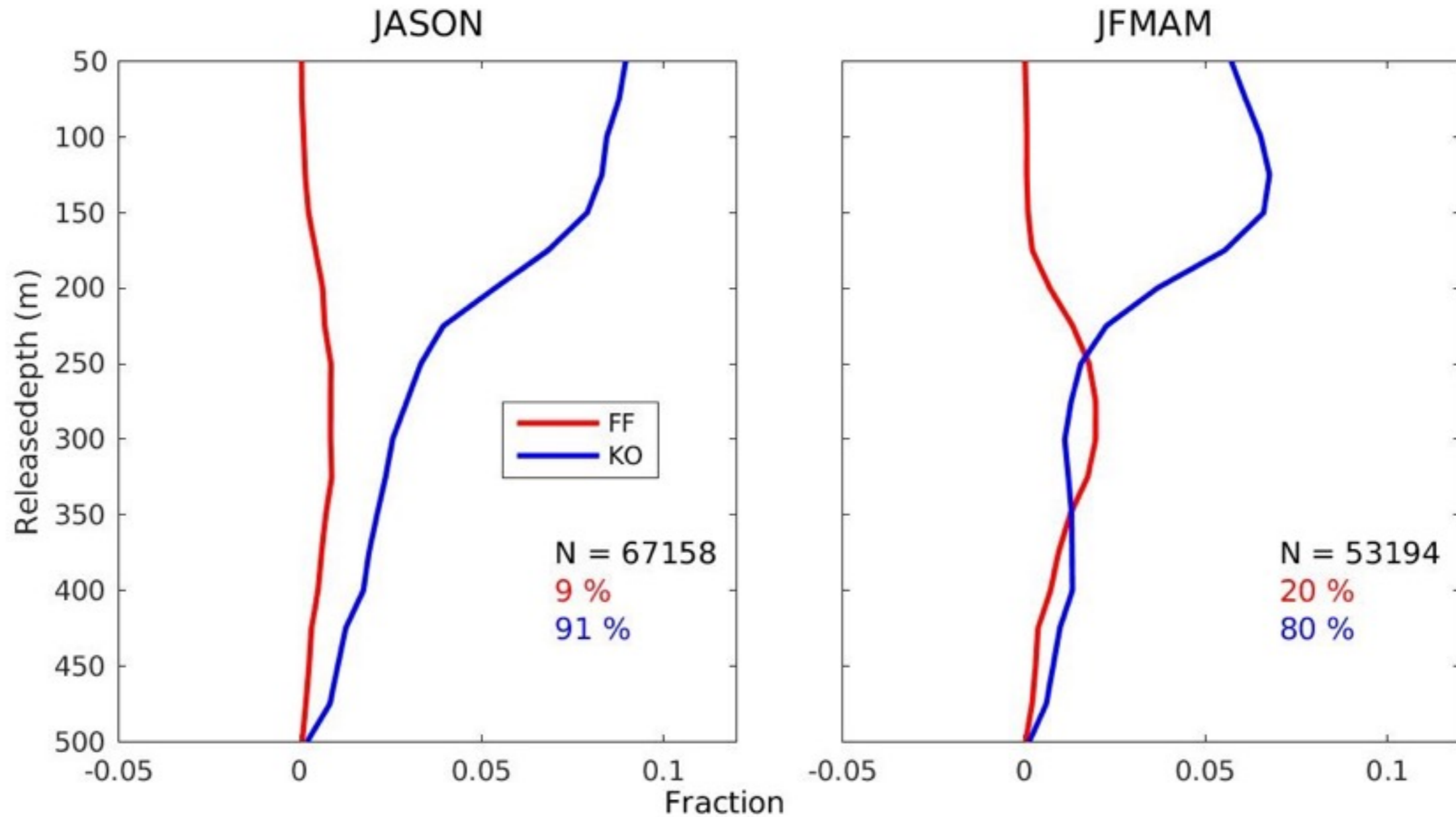
Pathways



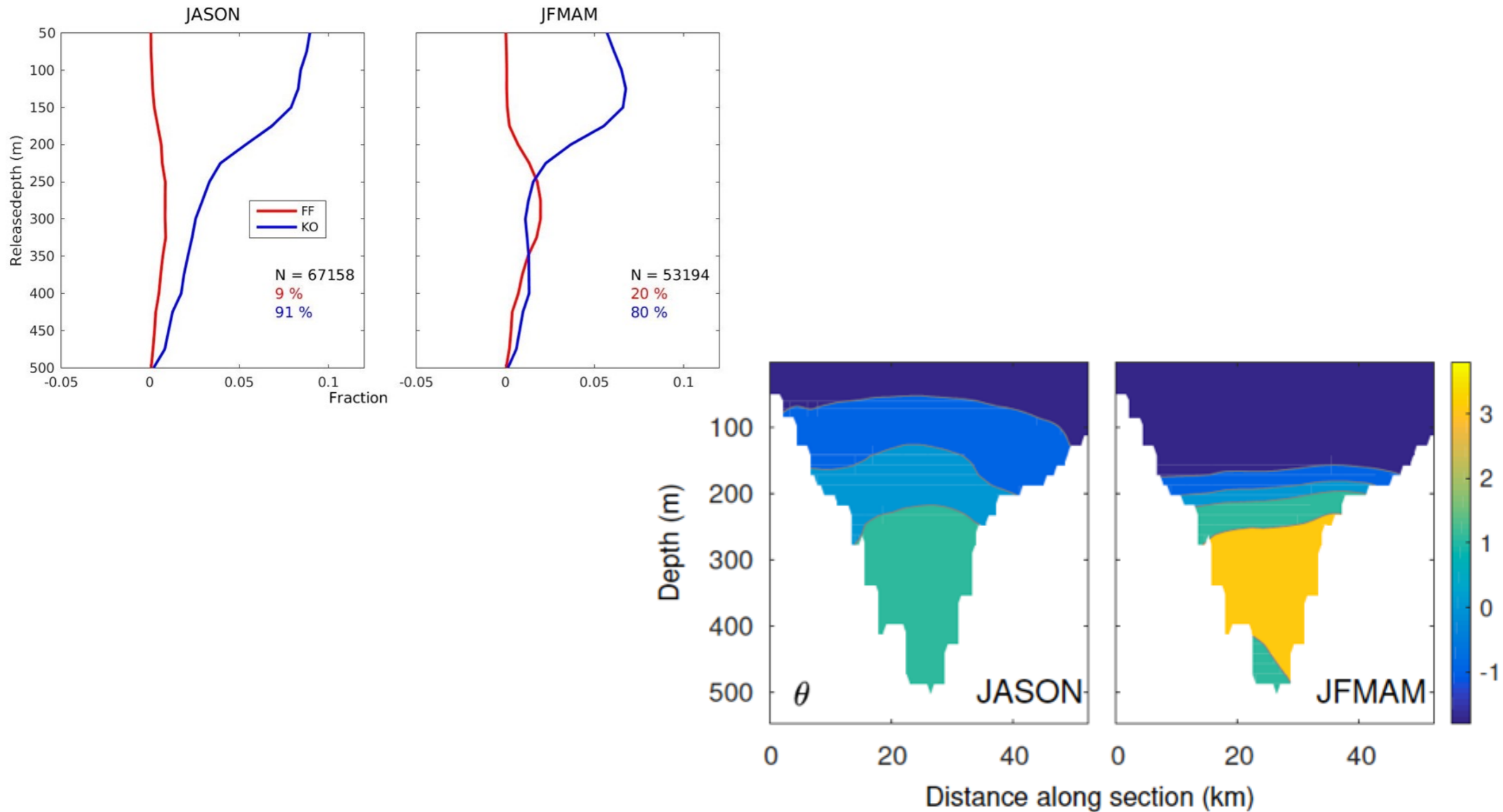
Particle transit times



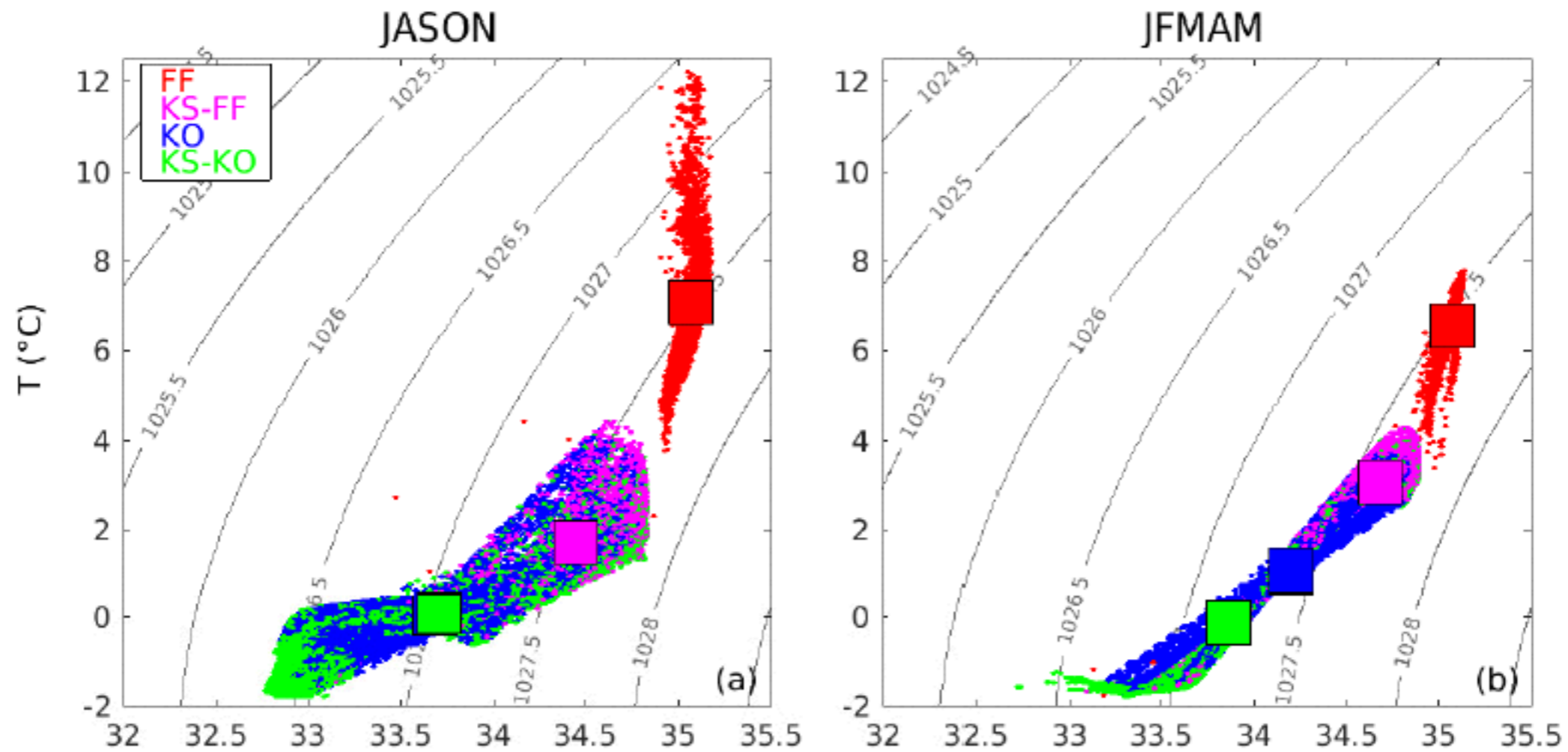
Depth distribution



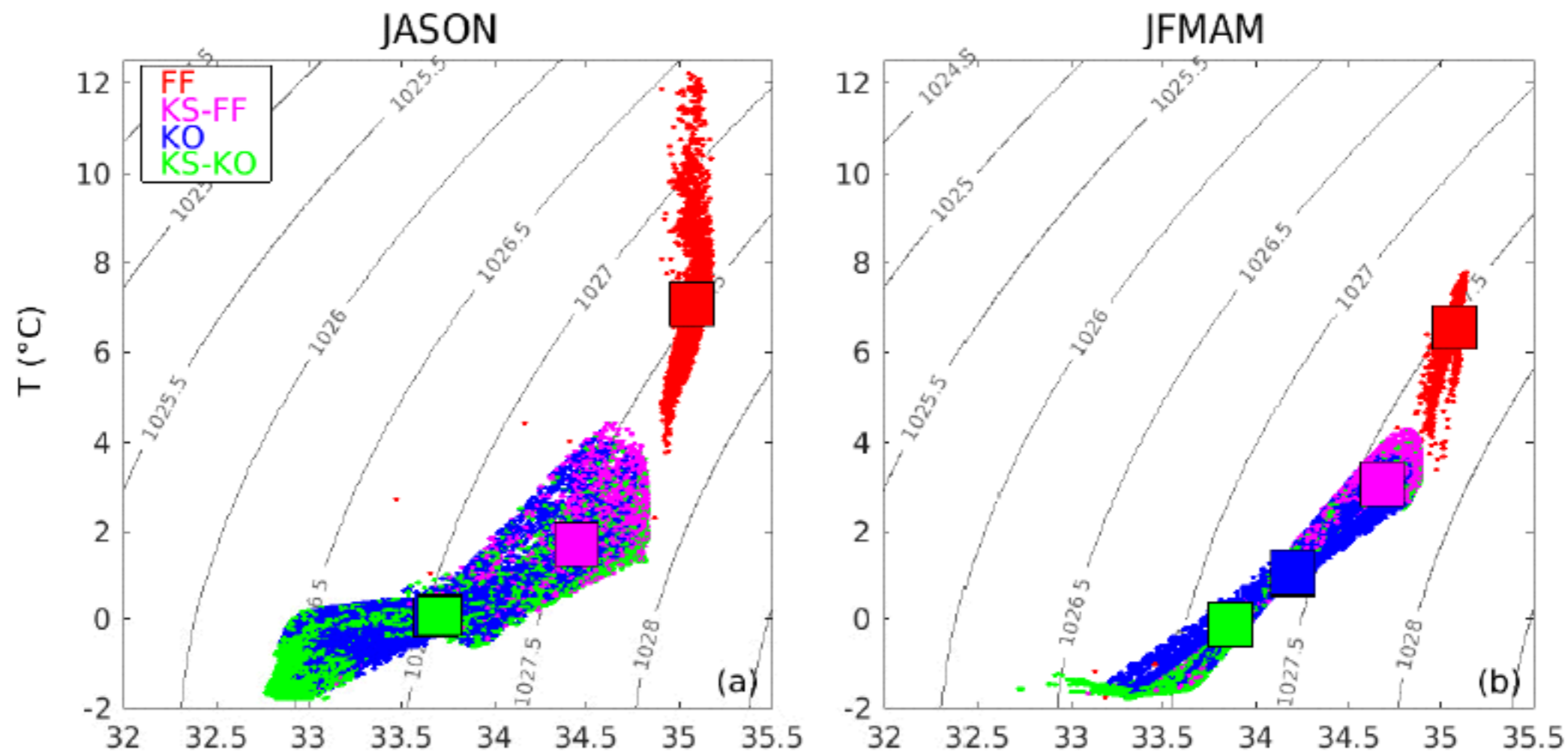
Depth distribution



T/S transformation

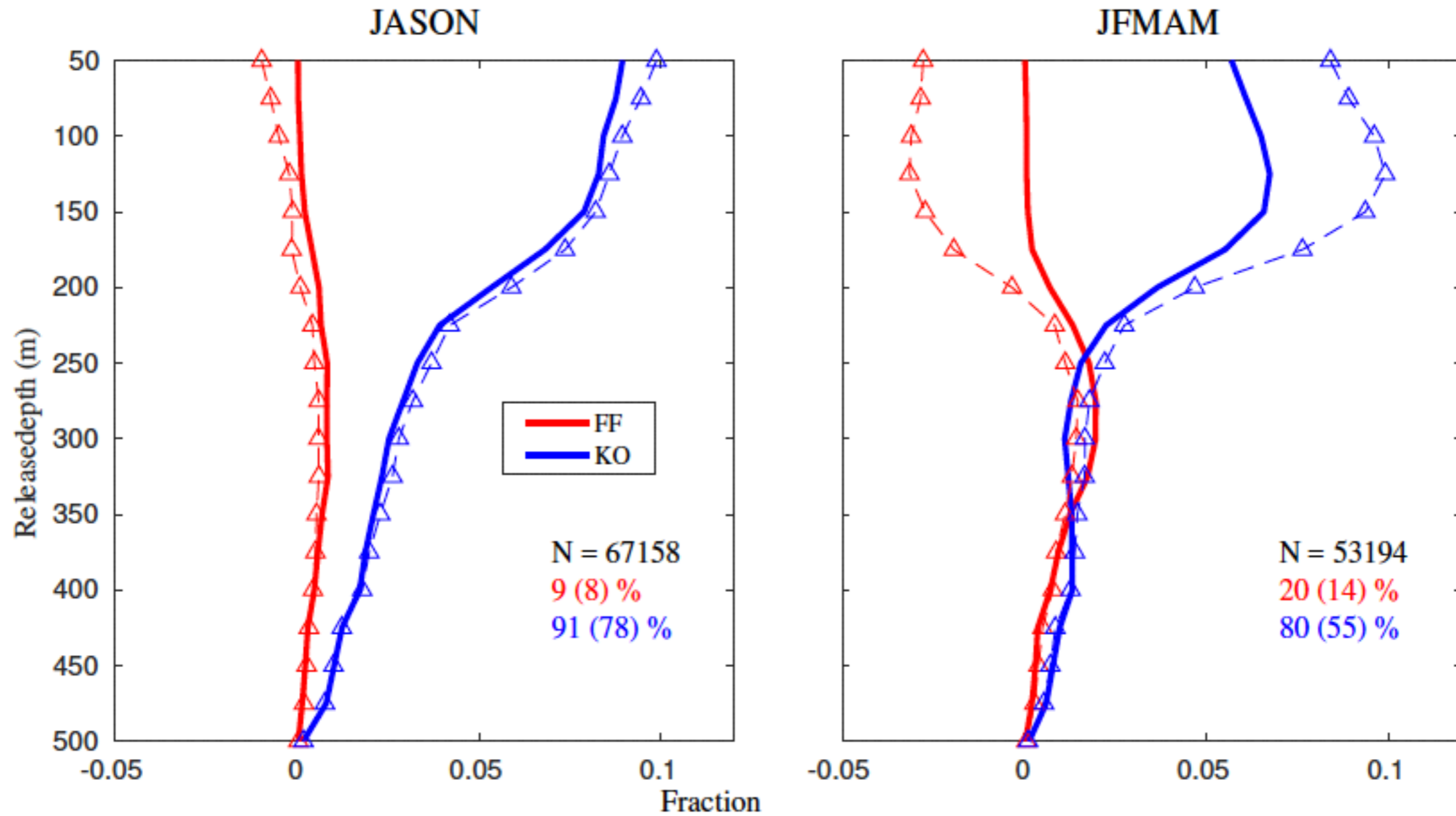


T/S transformation



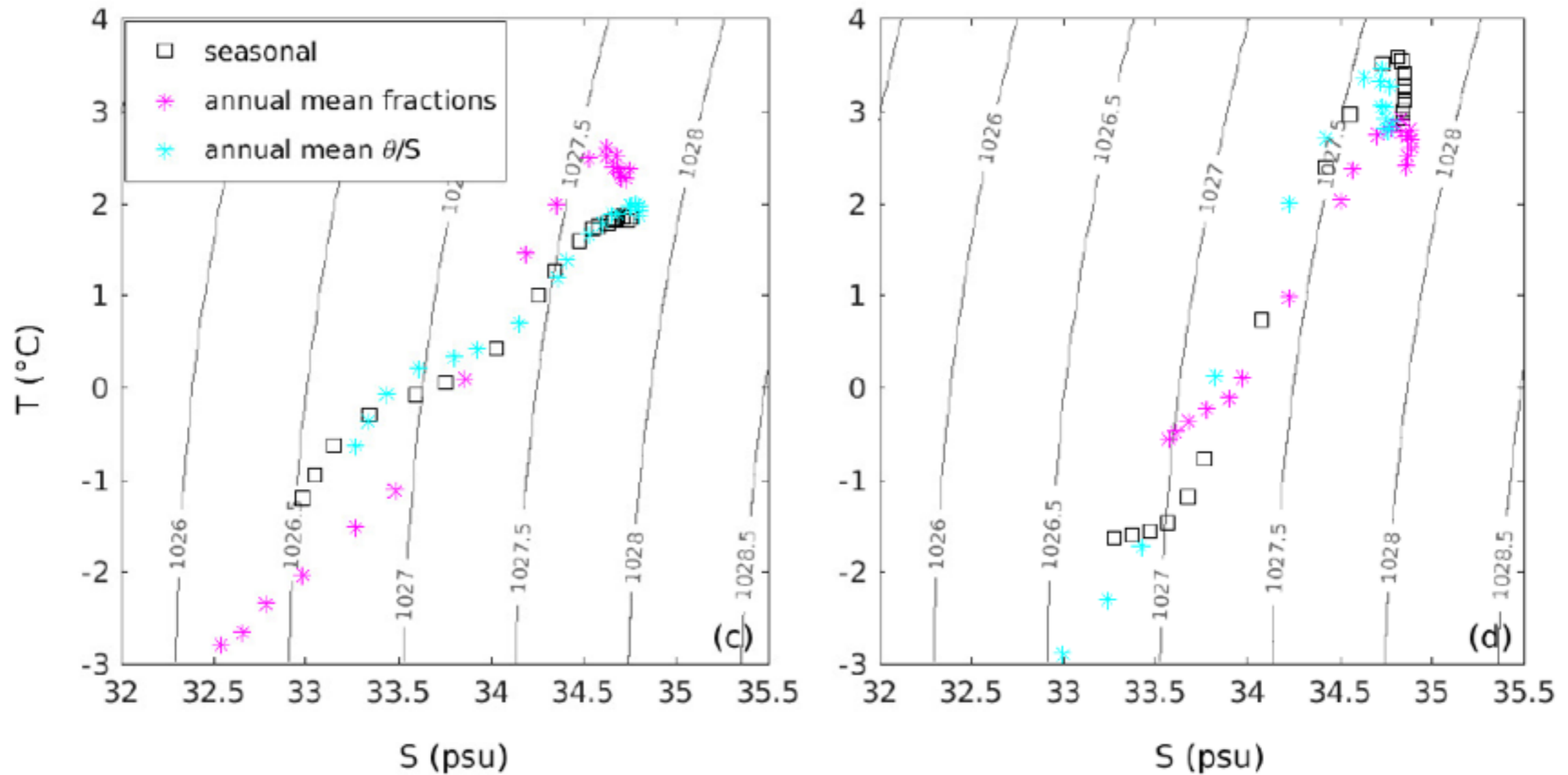
$$\begin{bmatrix} \theta_{KS} \\ S_{KS} \end{bmatrix} = f_{V,FF} \begin{bmatrix} \theta_{FF} \\ S_{FF} \end{bmatrix} + f_{V,KO} \begin{bmatrix} \theta_{KO} \\ S_{DS} \end{bmatrix}$$

T/S transformation



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

T/S transformation



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

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)