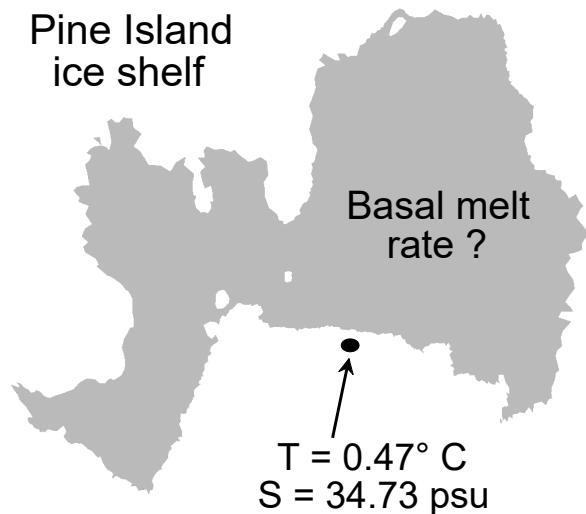
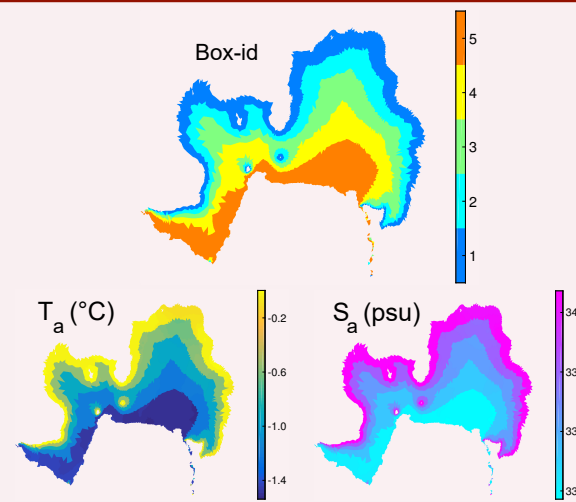


Input
Far-field ocean
temperature and salinity



- PICO**
1. Define boxes based on relative distance from GL and ice front (sect. 2.3 - Reese et al., 2018)
 2. Calculate sub-shelf ocean temperature and salinity fields from box_1 to box_n (Appendix A - Reese et al., 2018) (T_a , S_a)

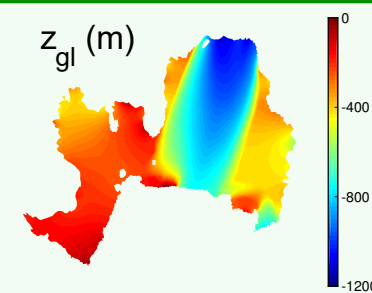


- Plume model**
1. Characteristic freezing point and heat exchange coefficient (eq. 4 and 5) $T_{f,gl}$ and Γ_{TS}
 2. Geometric factor and length scale (eq. 6 and 7) $g(\alpha)$ and l
 3. Dimensionless coordinate (eq. 8) \hat{X}
 4. Melt rate scale, dimensionless melt curve, and melt rate (eqn. 9 and 10) M , $\hat{M}(\hat{X})$ and \dot{m}

Solve the
advection
equation to
obtain z_{gl}

Grounding line height

$$\begin{cases} \mathbf{v} \cdot \nabla z_{gl} + \epsilon \Delta z_{gl} = 0 & \text{in } \Omega \\ z_{gl} = z_{gl0} & \text{on } \Gamma \end{cases}$$



Output
Basal melt rate field
 \dot{m}

