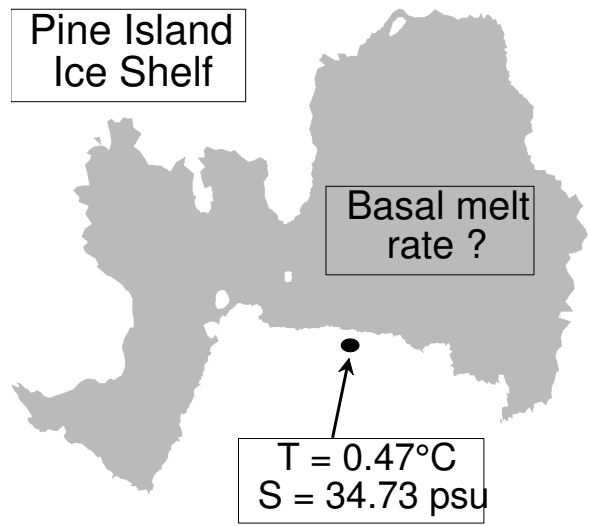


**Input**  
Far field ocean temperature and salinity



### 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<sub>1</sub> to box<sub>n</sub> (Appendix A - Reese et al., 2018) ( $T_a$ ,  $S_a$ )

Box-id

$T_a$  ( $^\circ\text{C}$ )

$S_a$  (psu)

### Plume model

1. Characteristic freezing-point and heat exchange coefficient (eq. 4 and 5)  $T_{f,gl}$  and  $\Gamma_{TS}$
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  $\dot{m}$

### Grounding line height

Solve the advection equation to obtain  $z_{gl}$

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

$z_{gl}$  (m)

**Output**  
Basal melt rate field  $\dot{m}$

