

Physical Processes Impacting Regional Sea Level (PISeaL)

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Objective:

- To separate the sea level into different components
- To understand the processes that influence sea level changes

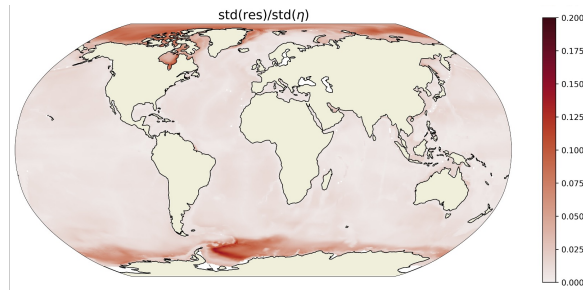


Formulations:

- Sea Level $\rightarrow$ manometric & steric components:

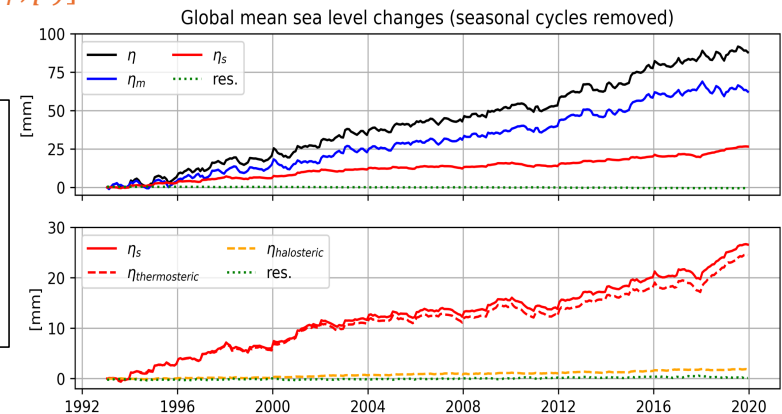
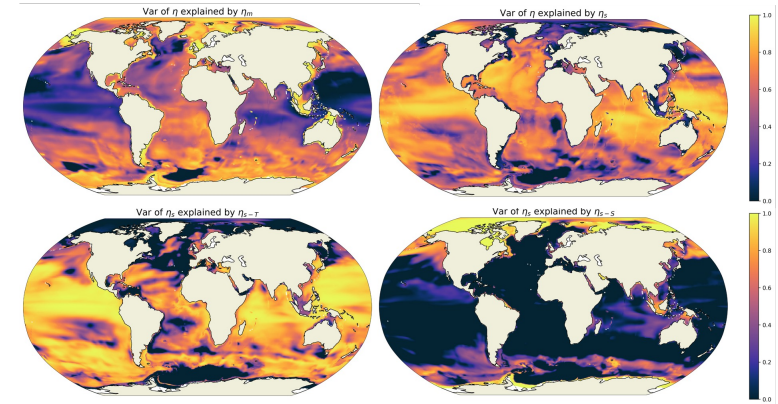
$$\eta = \eta_m + \eta_s = \frac{p_b}{\rho_0 g} - \frac{1}{\rho_0} \frac{H + \eta}{H} \int_{-H}^0 (\rho - \rho_0) dz^*; \rightarrow \eta_s = \eta_{s-T} + \eta_{s-S}$$

$$\eta_s = -\frac{1}{\rho_0} \frac{H + \eta}{H} \int_{-H}^0 [\rho(S_r, T, p) - \rho(S_r, T_r, p)] dz^* - \frac{1}{\rho_0} \frac{H + \eta}{H} \int_{-H}^0 [\rho(S, T_r, p) - \rho(S_r, T_r, p)] dz^*$$



Conclusions:

- Global sea level change is dominated by ocean mass change; steric part is controlled by thermal expansion



- The decomposition is not closed in polar regions: effect of sea ice on sea level