

sDIC Breakdown

How do biology, circulation, and CO₂ exchange individually influence sDIC anomalies during a climate event?

$$\frac{d(sDIC')}{dt} = J'_{circ} - J'_{bio} - J'_{ex}$$

- (1) Create sDIC' for each simulation. This is $\frac{DIC}{S} * 35$ where DIC and S are integrated over the upper 100m.
- (2) Take the central difference of (1) using `gradient` from Matlab or some equivalent function. This results in $\frac{d(sDIC')}{dt}$. Remove the ensemble mean to generate anomalies.
- (3) Compute J'_{bio} by **Jint_100m_DIC** minus ensemble mean.
- (4) Compute J'_{ex} by **FG_CO2/HMXL** (or by dividing by 100m for consistency?) minus ensemble mean.
- (5) Compute J'_{circ} by (2) + (3) + (4). Although bad practice, this results in a residual, so no need to remove ensemble mean.
- (6) Regress all four terms onto mode of interest (e.g. NPGO) for region of interest (e.g. CalCS). This gives you the relative contribution of each term to the sDIC anomaly.