



Adjoint Sensitivities & Heat/Volume Budgets in ECCO for Regional Investigation Of the California Current System (SHERLOCCS)

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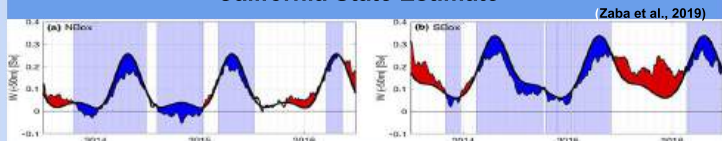
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Overview/Science Questions:

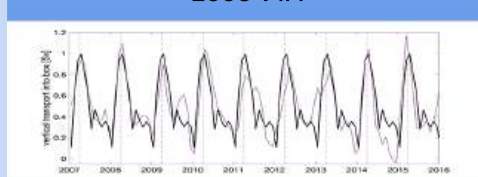
Study anomalously high temperatures between 2014–2015 in the CalCOFI region using a combination of (i) adjoint studies, (ii) attribution experiments and (iii) volume/heat budgets!

50-meter Vertical Transports

California State Estimate



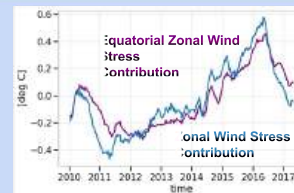
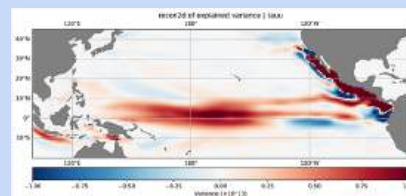
ECCO V4r4



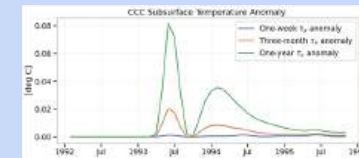
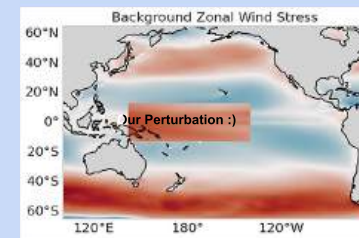
Lessons Learned:

Regional state estimates may have a different focus than global state estimates, adjoint reconstructions can depend on your reference year, ALWAYS copy your mask into your folder, fill in your nans before calculating budgets

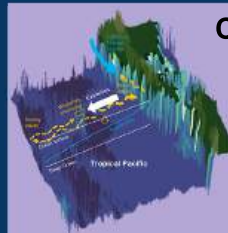
Adjoint Reconstruction of Subsurface θ



Sensitivity Experiments



Conclusions:



Subsurface (100 –210 meters depth) warm anomaly in the CalCOFI region can be attributed to both **remote** and **local** zonal wind stresses fluctuations **Wind stress** fluctuations primarily drive changes in advection and transport that cause warming (likely via planetary waves).