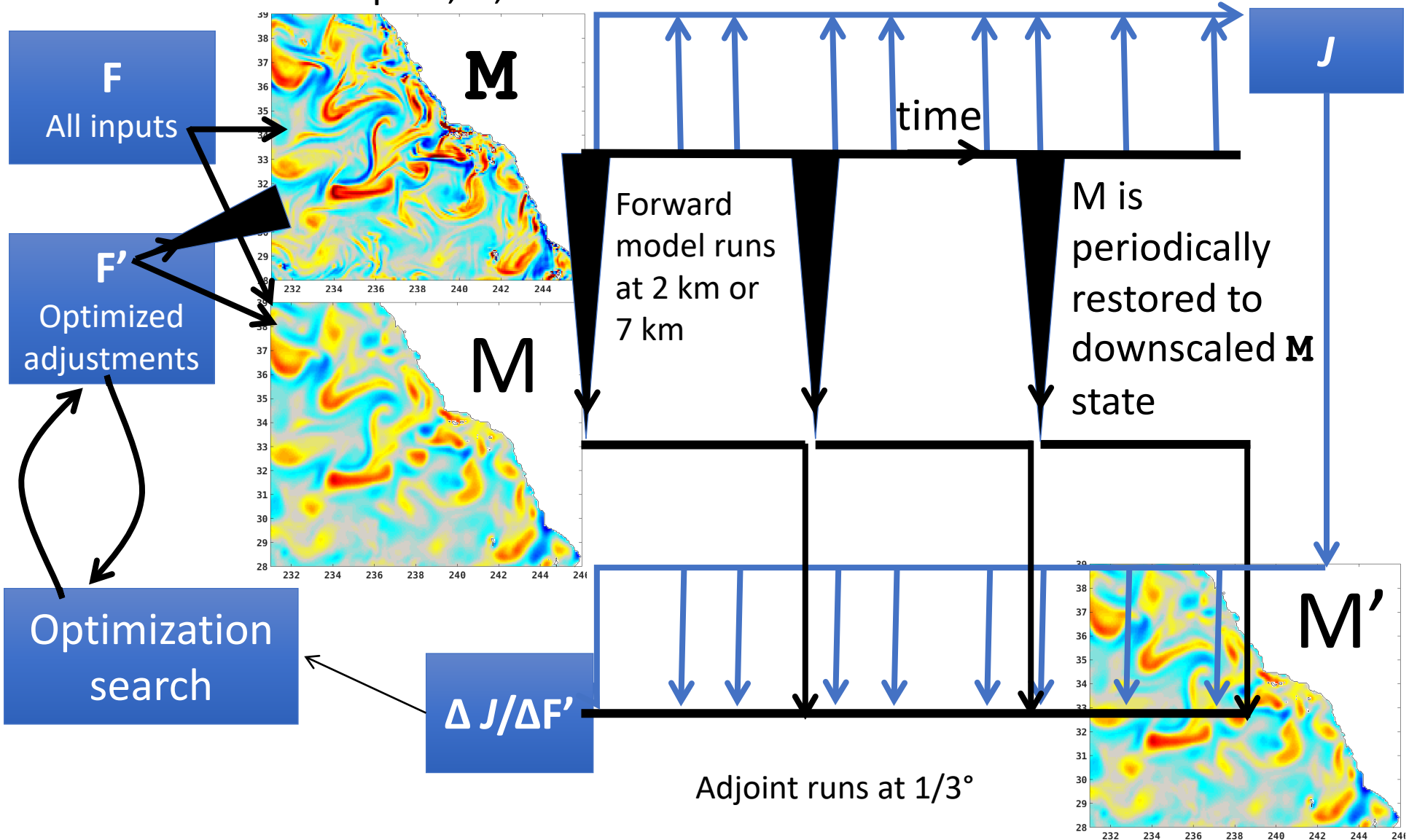
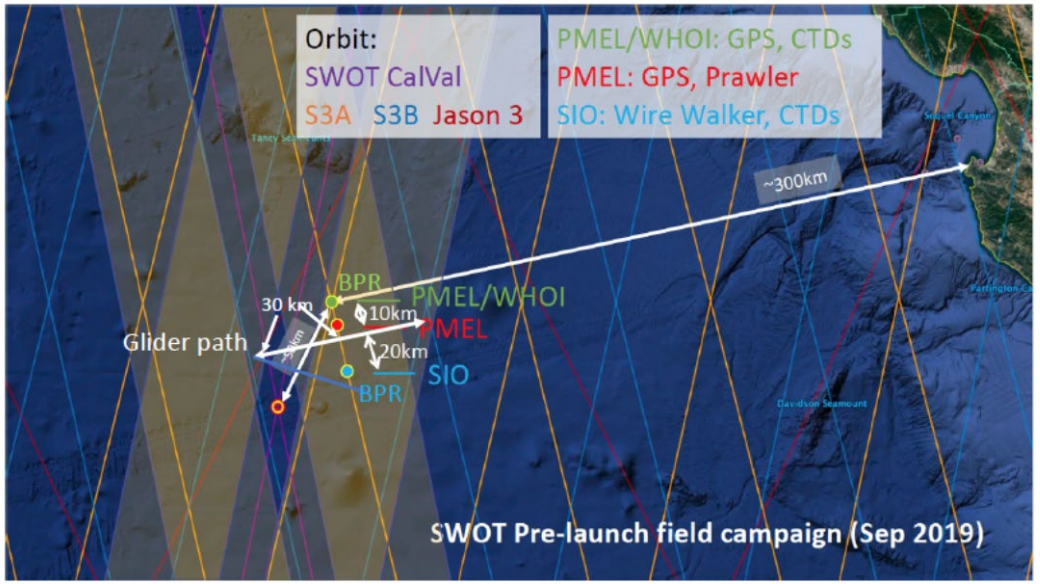
Inversion and Assimilation Synergy with Regional Validation

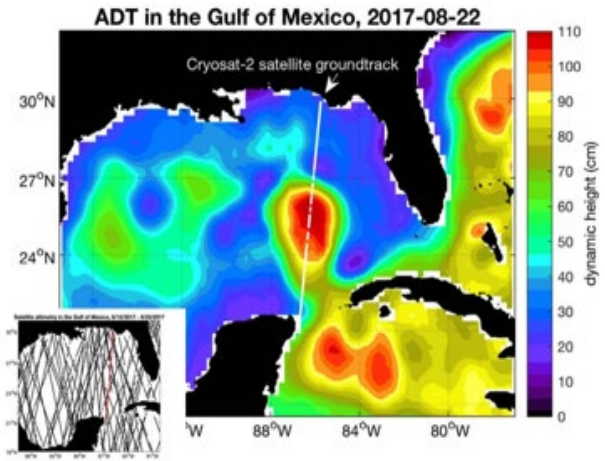
A state-of-the-art high-resolution model, M, an upscaled model, **M**, and its adjoint, **M'**, are used to optimize the large-scale structure of the inputs, **F'**, to **M**

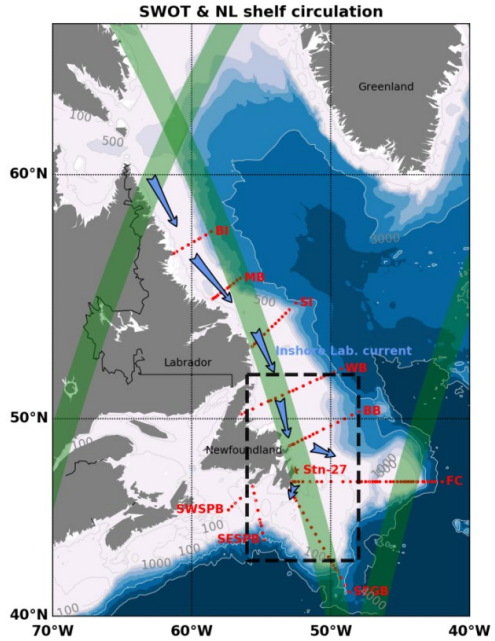
Cost function, ***J***, is calculated by sampling M. It is stored in data space and forces **M'**



Where are targeted assimilation efforts?



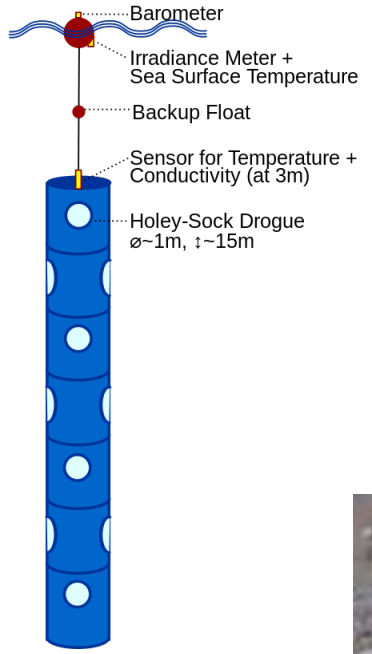




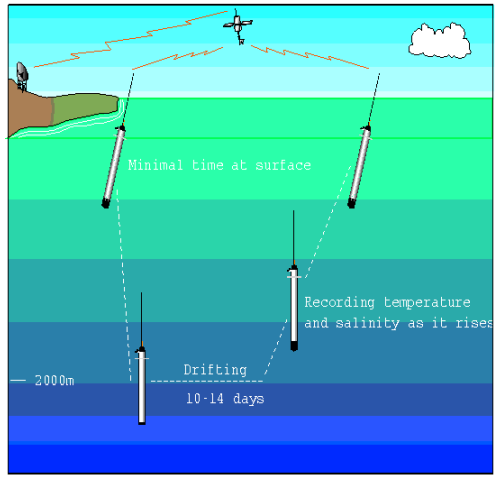
- California Current crossover
  - Target of more than one research group
  - Linked to cal/val and S-MODE activities
  - Moving to smaller scales than previously attempted. What can help us succeed?
- Other areas
  - Gulf of Mexico
  - Canadian coast
  - North Sea and Baltic
  - Mediterranean
  - North Atlantic
  - Australia

Specific in situ data that help address science?

- Surface velocity (e.g. from drifters)



- Temperature and salinity profiles (e.g. from Argo, instrumented elephant seals, CTD casts)



What tools can inversion/assimilation provide to help plan in situ campaigns?

- Observing system design: Using assimilation sensitivities to optimize sampling strategy
- What in situ data will have the most impact on inversion/assimilation? What will help advance model development to support SWOT?
- Goal to project SWOT into interior ocean. How do we get right answer for right reason? And how do we validate?
- Which research groups plan to assimilate in situ data?