The Oil Spill of 2010: Ensemble Analyses of Trajectories

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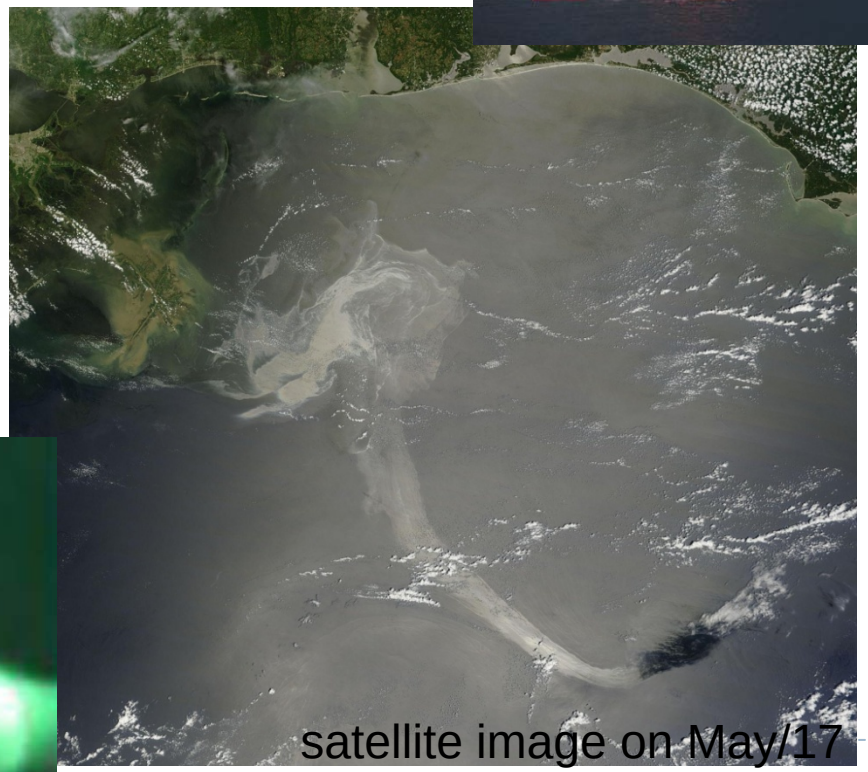
Oil Spill in Gulf of Mexico 2010

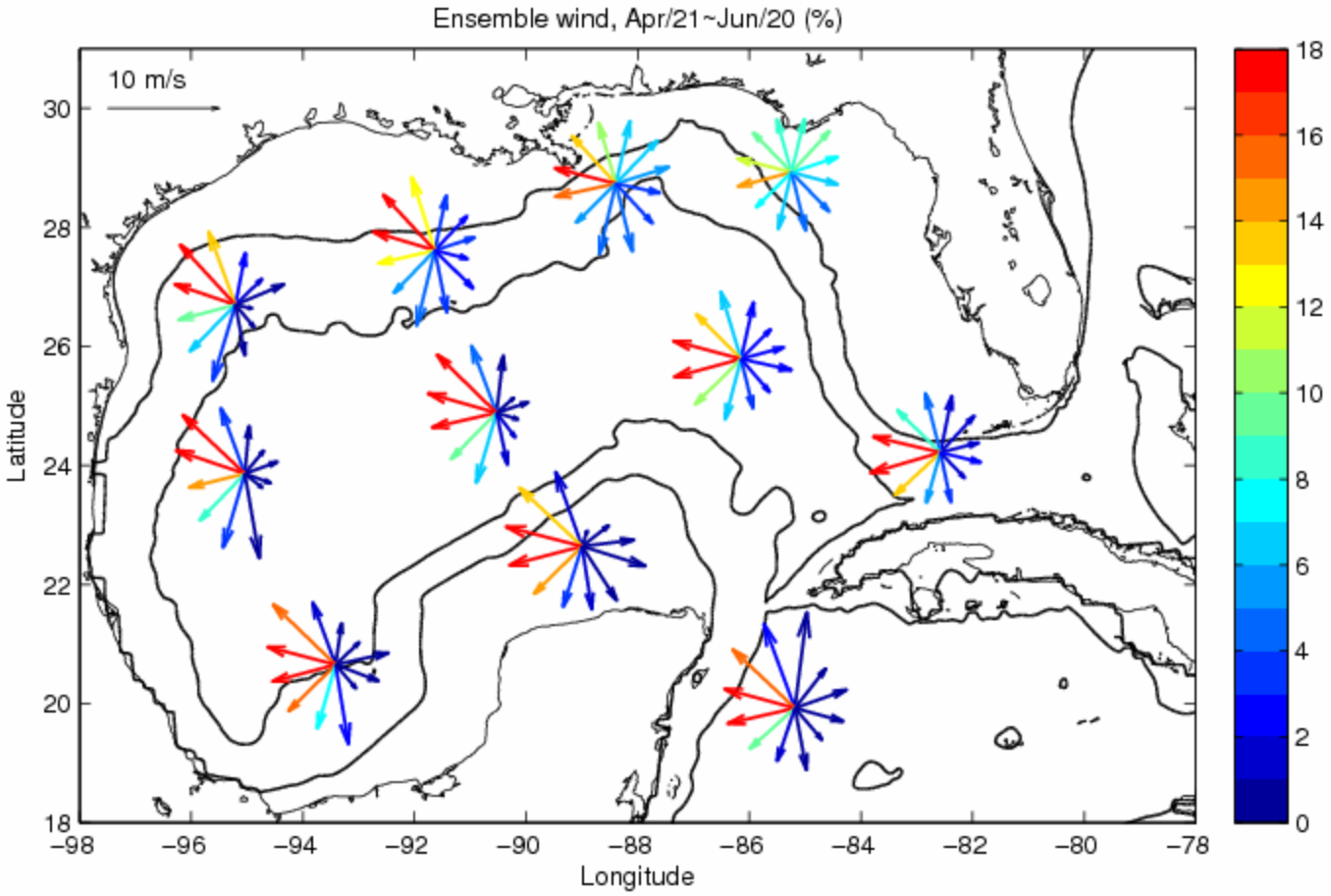
It may take 2~3 months to stop leaking



satellite image on May/17

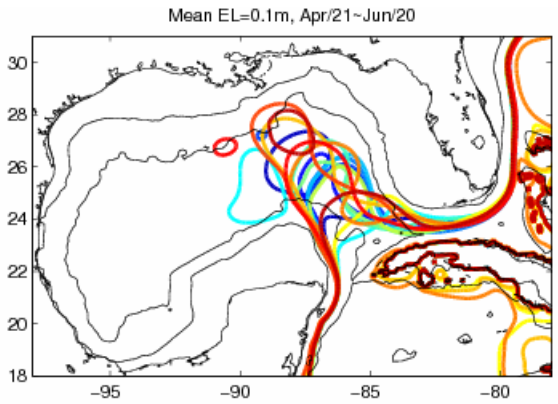
Photo by US coast guard

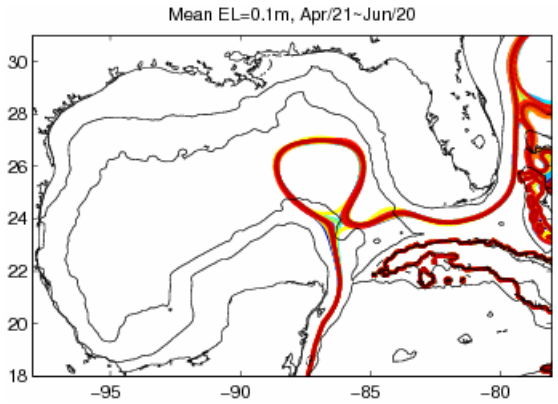
Wind condition



Experiments

Name	Grid	Period	note
Basic	Fine	2000-2007 (8)	
C_grid	Coarse	1993-2007 (15)	
C_grid_fixLC	Coarse	1988-2008 (21)	Fix Loop Current

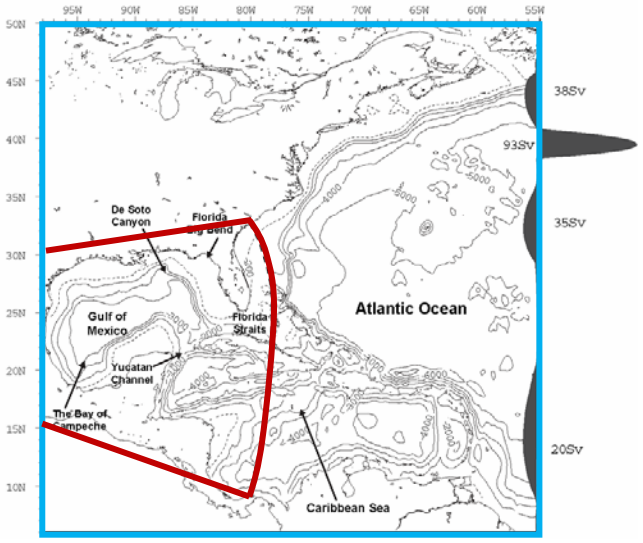




Method: simulated drifters

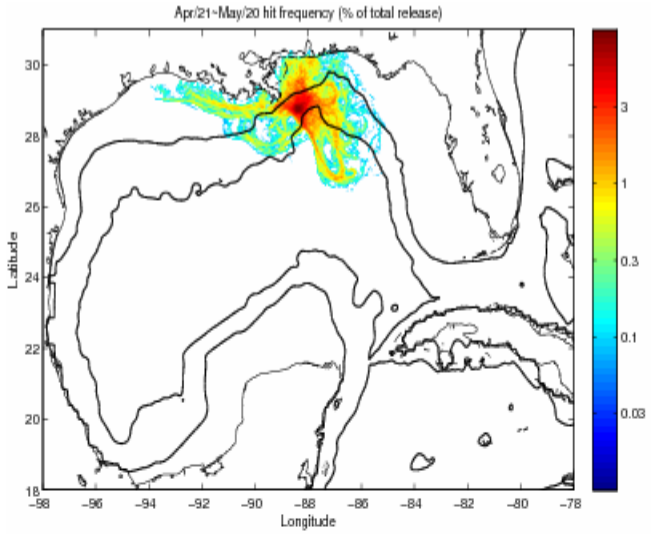
MODEL: GOM model

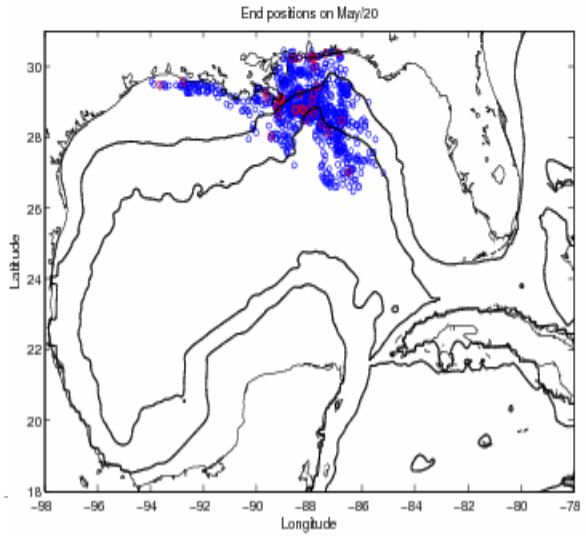
- Resolution: 5km/10km
- Location: accident site and 4 surrounding grid points.
- Time: Apr/21-Jun/20
- Frequency: Daily release, using 3 hourly data
- Depth: surface/ 800m



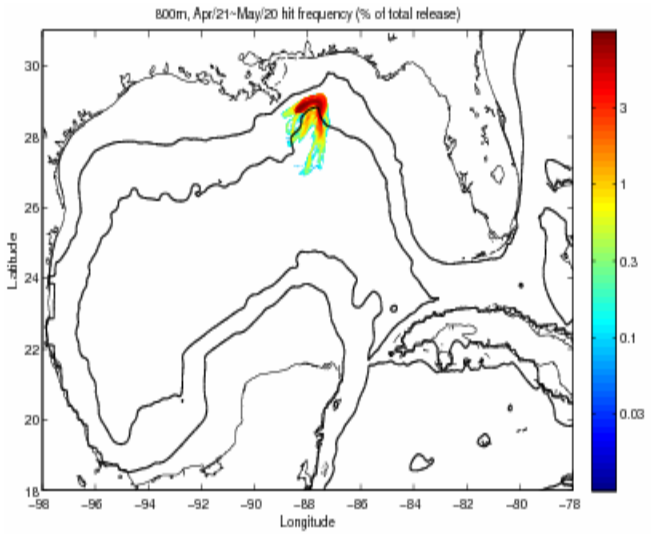
Apr/21~May/20 (30days)

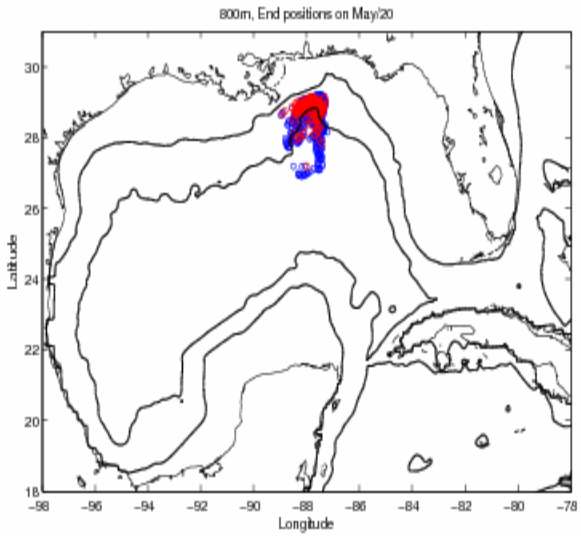
Z=0m





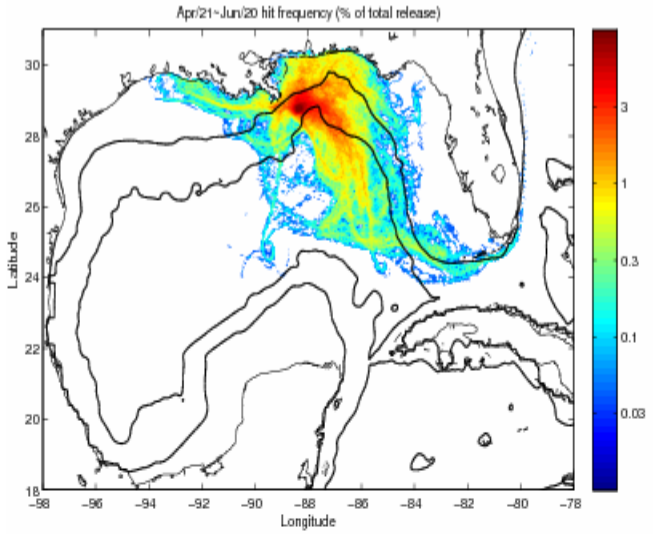
Z=-800m

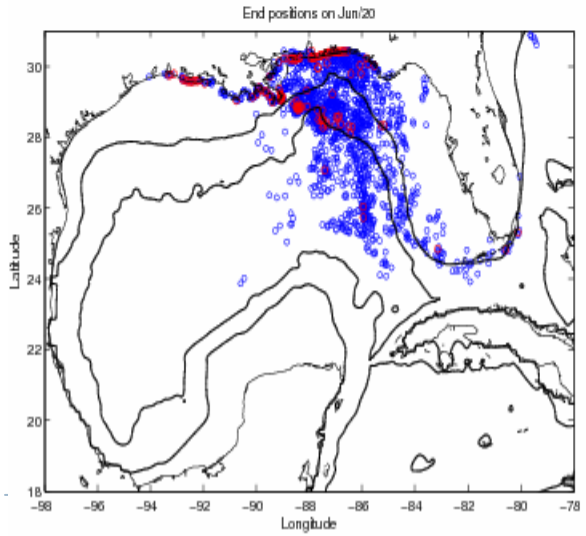




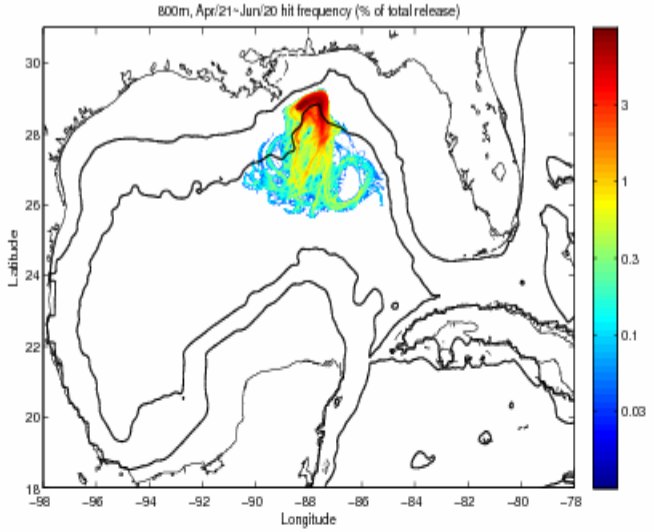
Apr/21~Jun/20 (60days)

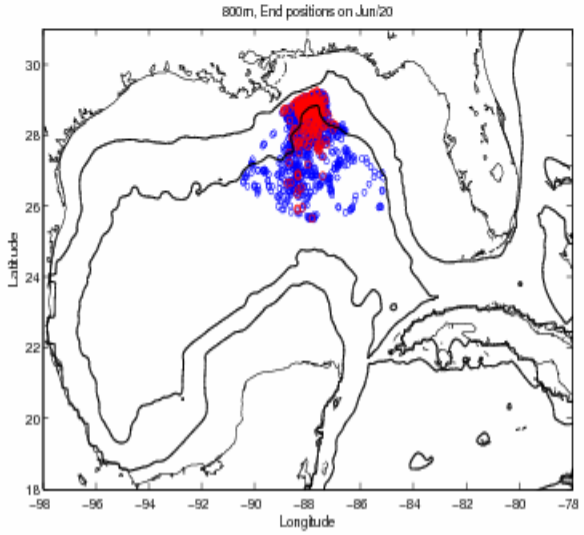
Z=0m





Z=-800m



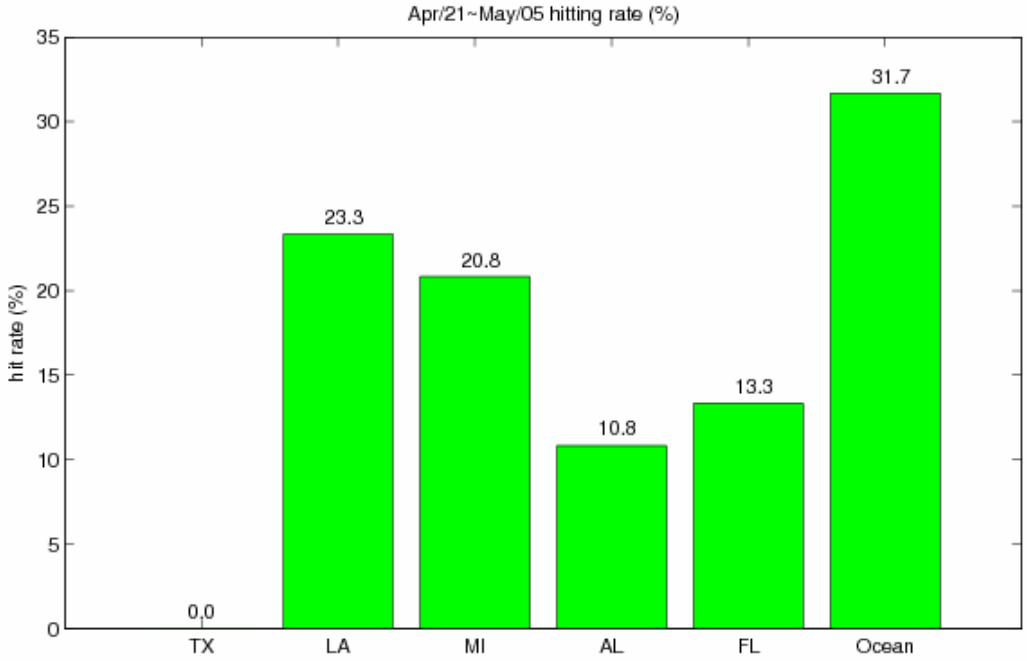


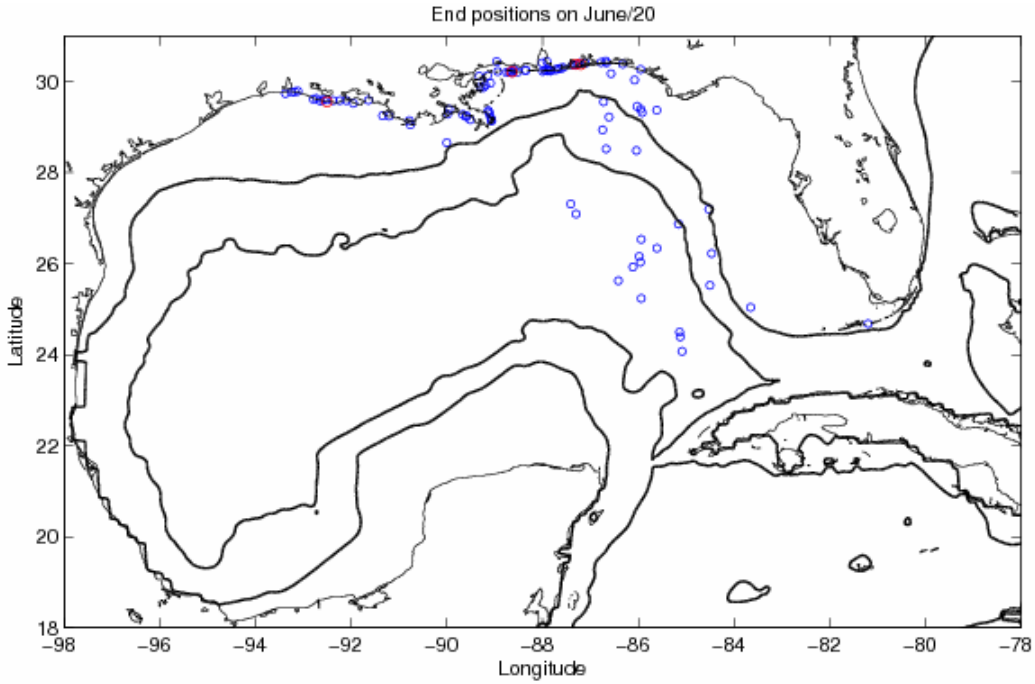
04/21

05/05

tracking

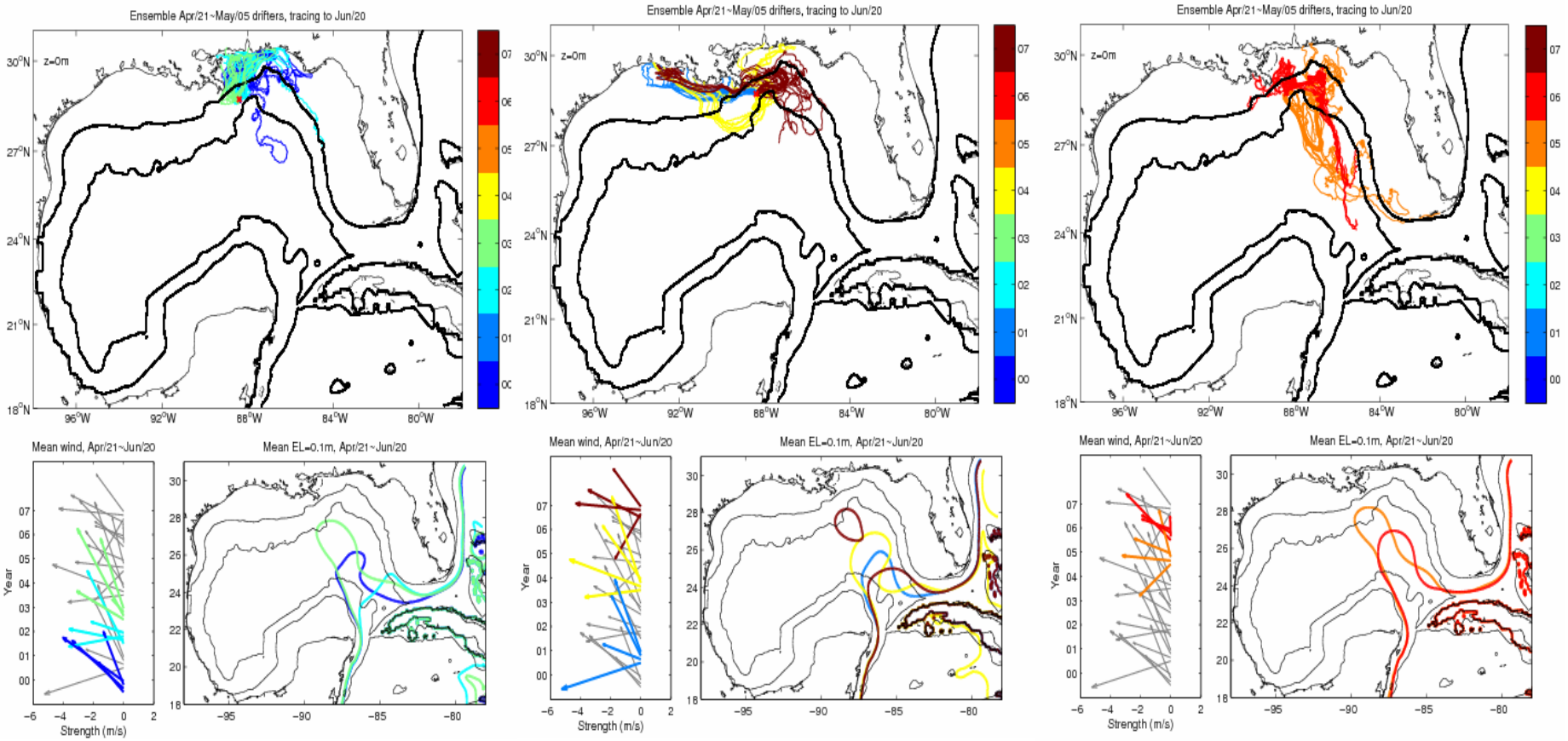
06/20





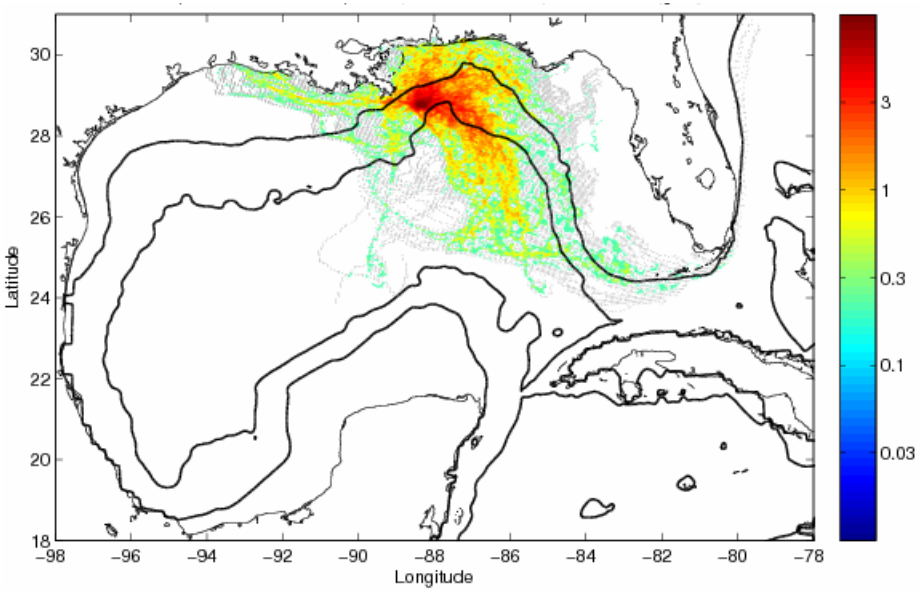
Basic case (fine-grid, 8-year ensemble)

- Trajactories, wind, and SSH(0.1m)

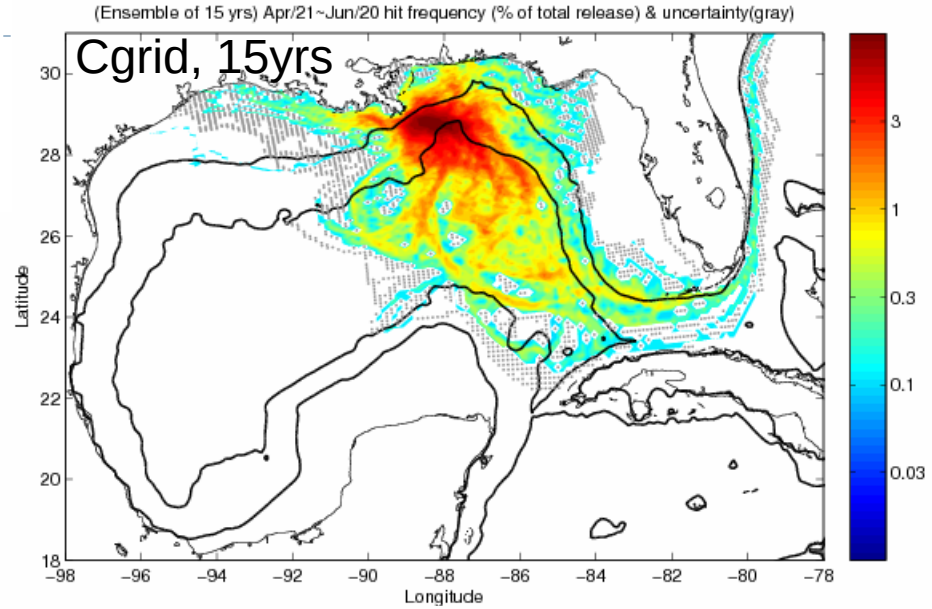


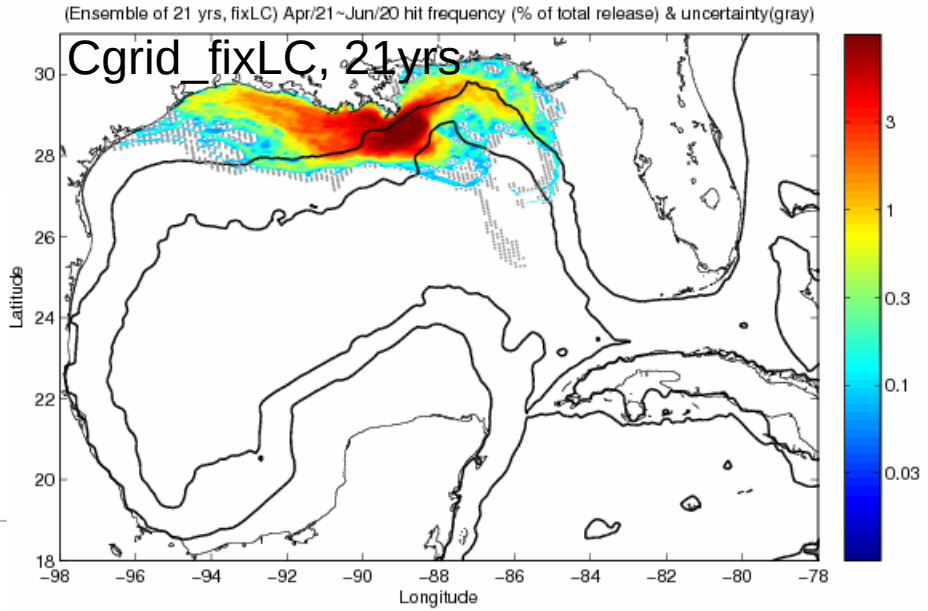
Visitation frequency and uncertainty

Basic, 8yrs

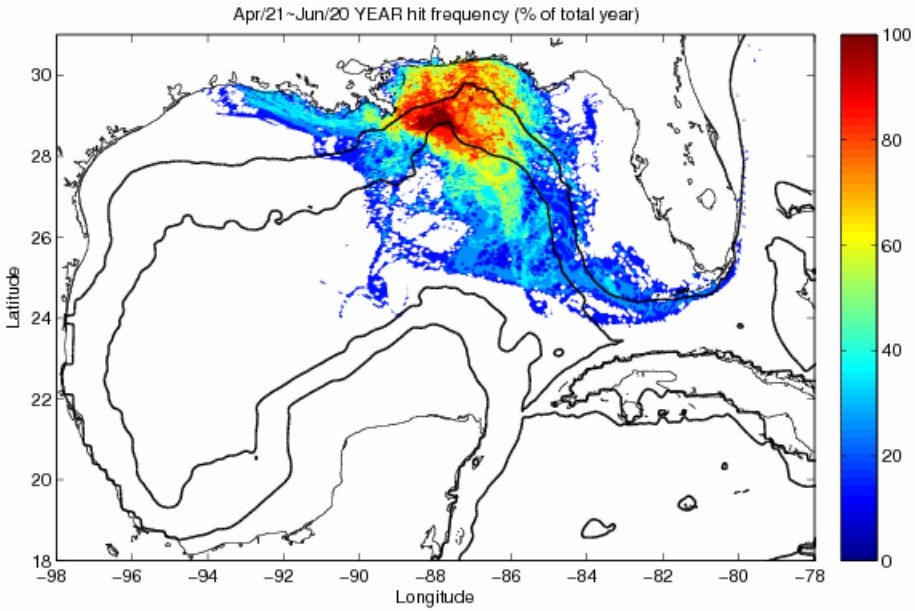


Release for 2 months and trace for 2 months



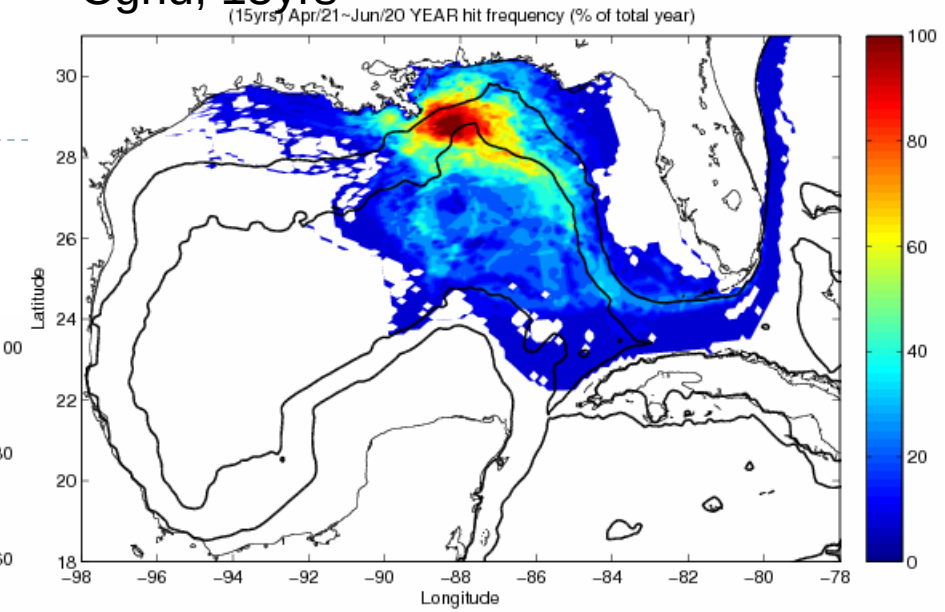


Year's visitation frequency

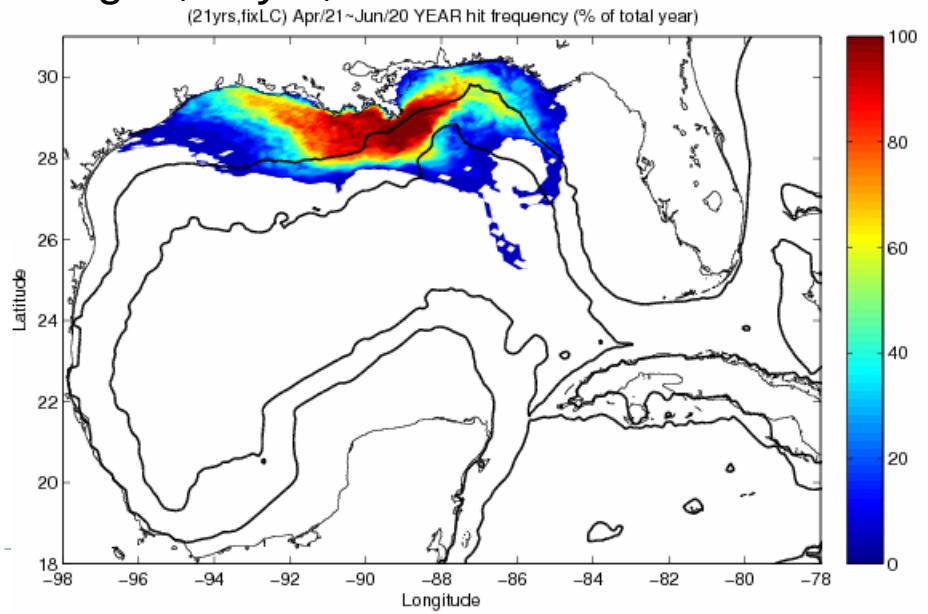


Basic, 8yrs

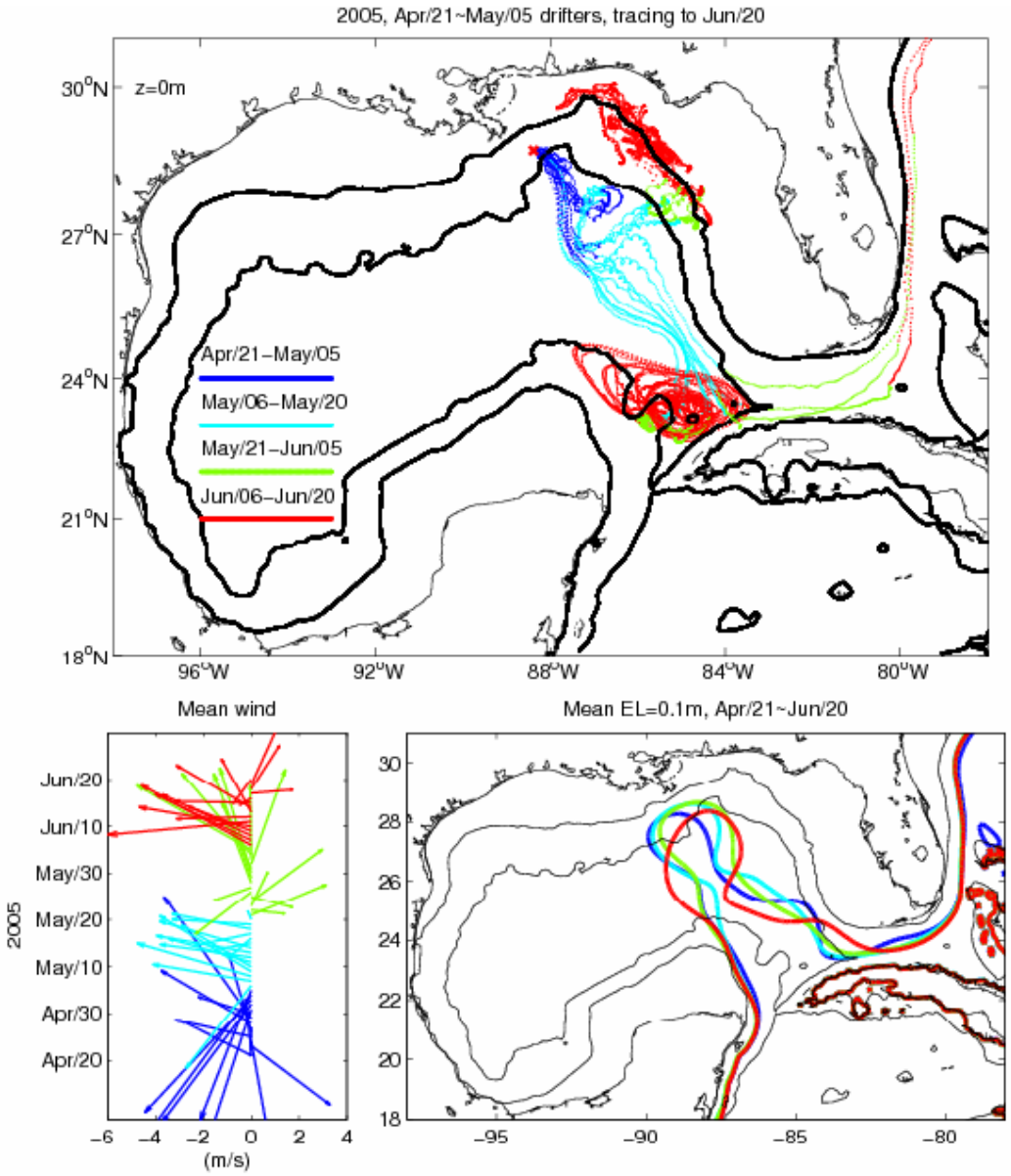
Cgrid, 15yrs

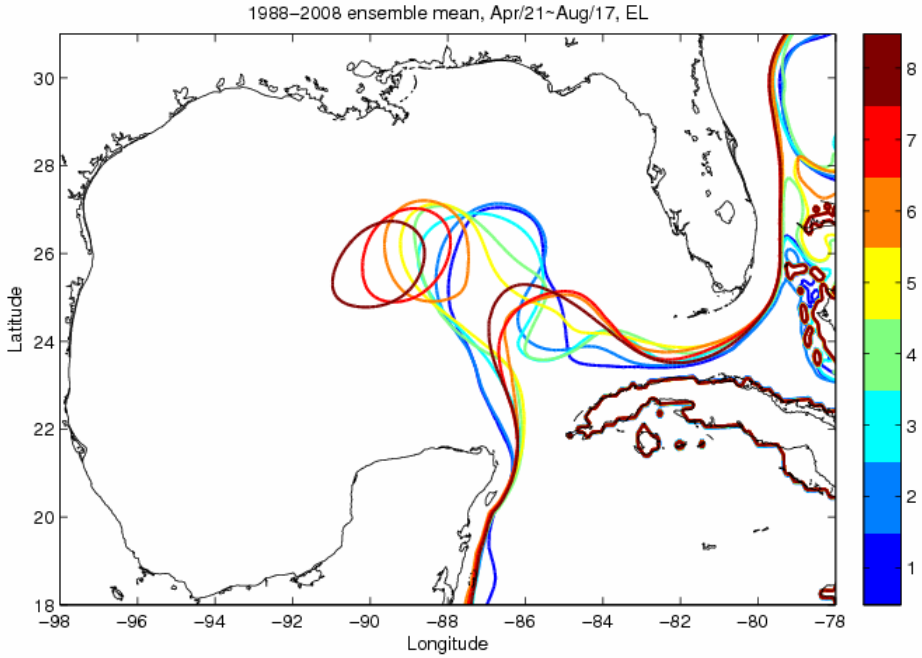


Cgrid, 21yrs, fixLC

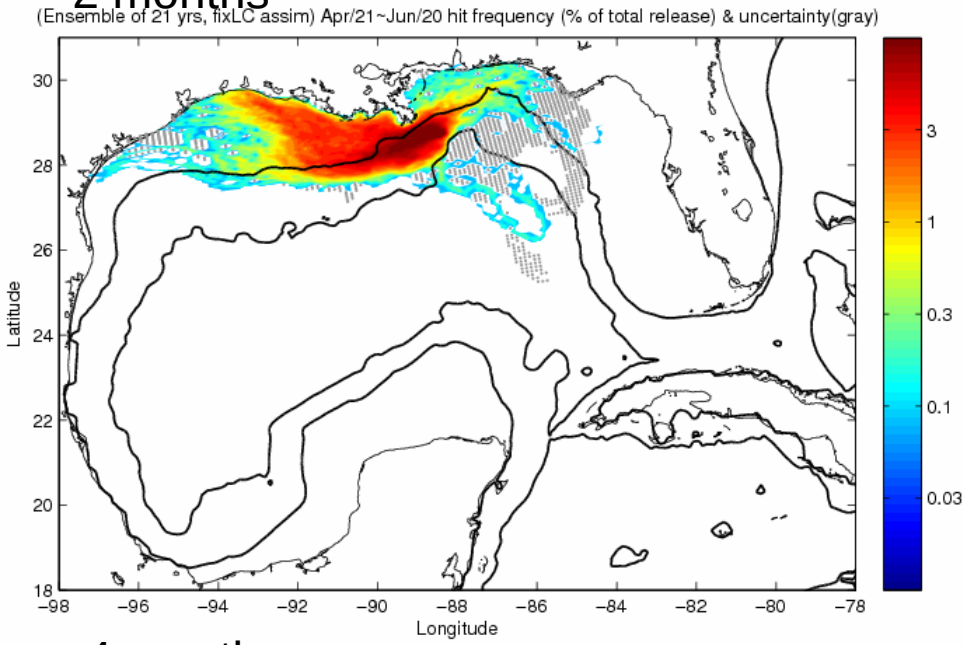


2005-Moves out of Gulf

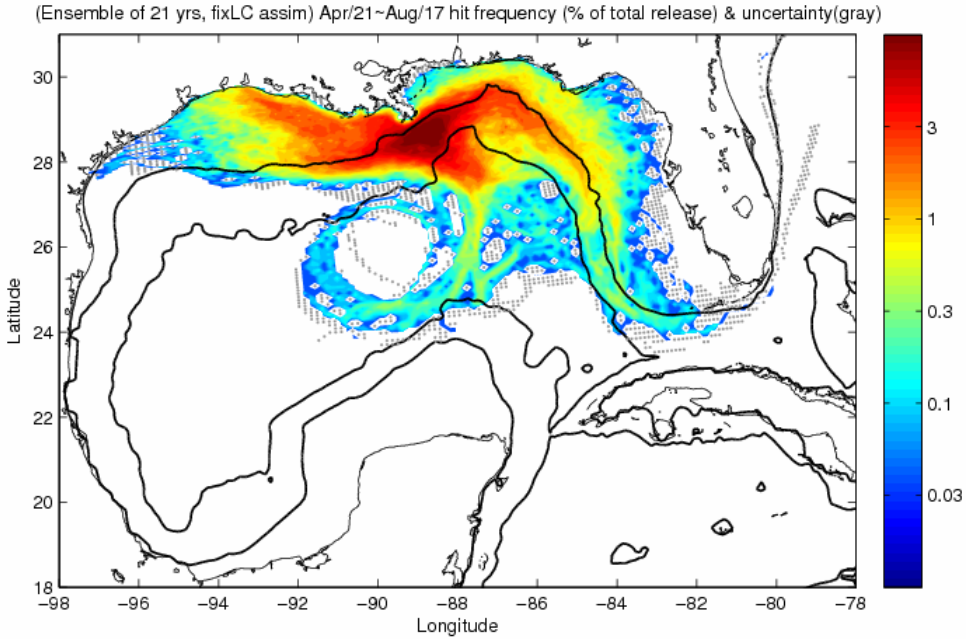




2 months



4 months



Summary

- Drifters tend to move north & west during the early stages 1~3 weeks of release – caused by the southerly, southeasterly and easterly winds
- Later, drifters are entrained in the Loop, and move towards the Straits of Florida – especially if Loop is extended
- Effects of wind are more "predictable" compared to the Loop Current

Coarse grid

- Trajactory
- Wind
- SSH(0.1m)