National Aeronautics and Space Administration
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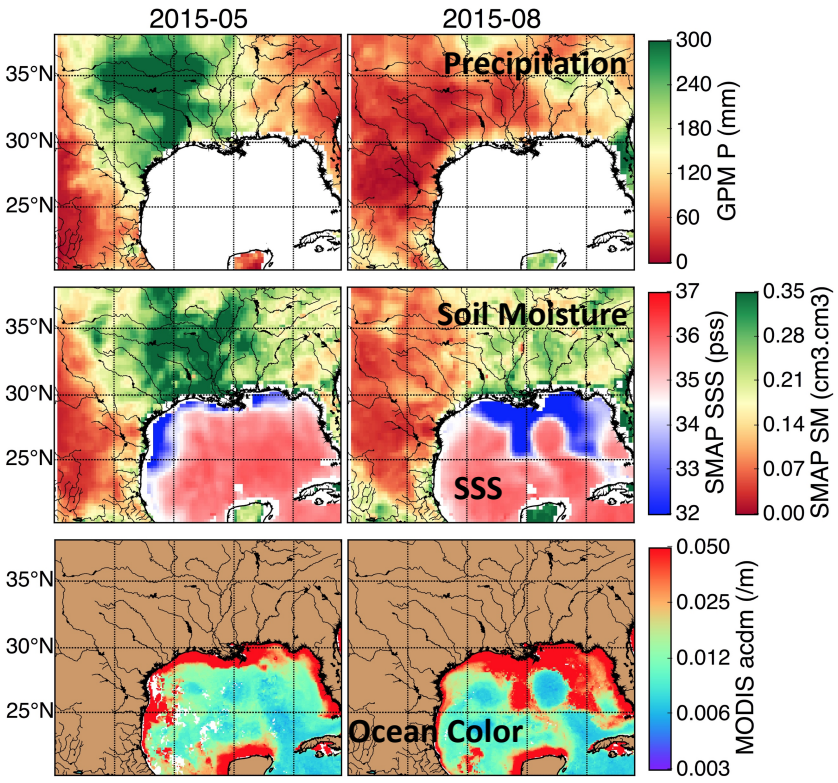
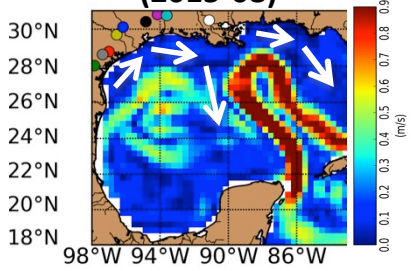
A combined land/sea assessment of the impacts of the May 2015 severe Texas flooding event (Séverine Fournier)



May and August 2015 GPM precipitation, SMAP soil moisture and sea surface salinity (SSS) and MODIS Ocean Color.. Vectors: JASON-2 surface currents.

Current Speed & schematics (2015-08)



August 2015 surface current speed (JASON-2) showing the Loop Current, its eddy, and schematics of the flow pattern that shaped the "horseshoe" freshwater plume

Problem: Severe flooding occurred in Texas in May 2015 affecting human society, terrestrial environment & marine ecosystems. A predictive system for severe flood events in the ocean would be beneficial.

Finding: Satellite observations (SMAP, GPM/TRMM, MODIS, JASON-2, GRACE, and SMOS) are used synergistically: Intense rainfall caused saturated soils and record river discharges that pulsed a large amount of freshwater into the Gulf of Mexico (GoM); The unusually strong Loop Current and its eddy shaped the freshwater into a rare "horseshoe" pattern in the central GoM.

Significance: Multi-variate satellite observations are essential to provide integrated assessment of land/sea impacts associated with flooding.

The freshwater plume may impact the extent of the GoM hypoxic ("dead") zone and the Flower Garden Bank coral reef ecosystem.

Fournier S., J.T. Reager, T. Lee, J. Vasquez, C.-H. David, and M.M. Gierach (2016). SMAP observes flooding from land to sea: the Texas event of 2015. *Geophysical Research Letter, in press*

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