



## **SMAP observes flooding from land to sea: The Texas event of 2015**

Severine Fournier, John Reager, Tong Lee, Jorge Vazquez-Cuervo, Cedric David, and Michelle Gierach  
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California, USA

Floods can have damaging impacts on both land and sea, yet studies of flooding events tend to focus on only one side of the land/sea continuum. Here we present the first two-sided analysis, focusing on the May 2015 severe flood in Texas. Our investigation benefits from simultaneous measurements of land-surface soil moisture and sea surface salinity from NASA's recent Soil Moisture Active Passive (SMAP) mission as well as ancillary data. We report the comprehensive chronology of the flood event: above average rainfall preceding the flood caused soils to saturate; record rainfall then generated record river discharge; subsequently, an unusual freshwater plume associated with anomalous ocean currents formed in the north-central Gulf of Mexico. Together with the Mississippi River plume further east, the Texas plume created a rare "horseshoe" pattern that have potential biogeochemical implications. Such integrated land/sea analysis of flood evolution can improve impact assessments of future extreme flooding events.