# **MOSART-inundation**

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### **MOSART** as river model in E3SM





#### Hong-Yi Li et al. (2013, 2015)

### **Inundation model built upon MOSART**

3





A floodplain inundation model was coupled with MOSART to represent flood extent based on river discharge, channel geometry, and DEM

Luo et al. (2017)

# **MOSART-inundation application in Amazon Basin**





River discharge (\*1000 cms) near the outlet of the basin

- Inundation model is able to capture the spatial pattern of the flood fraction
- Magnitude and timing of the river discharge is better captured with inundation

### **MOSART-inundation global application**



Mao et al. (to be submitted)



## Implications and future opportunity

- Timing and magnitude of water (and sediment, heat, nutrients) transported from land to ocean
  - Two-way coupling between ELM and MOSART-inundation to represent wetting/drying of floodplain (including vegetation effect)
  - Integrating MOSART-inundation, MOSART-sediment, and MOSART-BGC with WM to represent effects of water management on flooding, sediment transport, and nutrients
- Land-ocean interactions at the costal region
  - Develop two-way coupling between MOSART and MPAS-O to represent backwater effect
  - MOSART-salinity to deal with salt water intrusion in the surface water from backwater effect?