# United States National Ocean Service's Operational and On-Demand Coastal Storm Surge Forecasting Systems Development and Skill Assessment

Sergey Vinogradov (1), Edward Myers (1), Yuji Funakoshi (1,2), Saeed Moghimi (1,2), Jaime Calzada (1,2)

(1) NOAA, National Ocean Service, United States, (2) UCAR, United States

Evolving requirements and new developments in coastal ocean modeling pave the way for new features and upgrades of the storm surge operational forecast systems (OFS). Since 2012, United States National Ocean Service (NOS) develops and transitions to operations a series of state-of-the-art storm surge OFS products. Increasing complexity and need for a better integration across the national suite of numerical weather prediction components requires redesign of existing OFS products to allow for more flexible and efficient update cycles, and better compatibility with upcoming new applications.

NOS storm surge products include a continuously-running extra-tropical surge forecast (ESTOFS), on-demand ensemble hurricane surge guidance (HSOFS), and high-fidelity Named Storm Event Model (NSEM) coupled hindcast/reanalysis system. ESTOFS provides coastal surge and tide forecast along the US East and Gulf Coasts and in the Caribbean (Atlantic domain), US West Coast and Hawaii (Pacific domain), and US territories from Palau to Marianas and Marshall Islands (Micronesia domain). HSOFS and NSEM are focused on the Atlantic domain, but are designed to be relocatable on demand.

These systems share the same modeling framework, although different applications have yielded a variety of new features (e.g., wave and riverine coupling, data assimilation, etc). In order to combine these innovations across the suite of NOS storm surge products, the underlying OFS platform is being redesigned. We will provide details on a new approach, and also discuss operational and hindcast skill assessment with some preliminary results for 2018 year including major landfalling storms Florence and Michael.