

National Flood Interoperability Experiment

The National Flood Interoperability Experiment (NFIE) is a one-year collaboration, from September 2014 to August 2015, between the National Weather Service and its government partners, and the academic community and commercial partners, that is designed to demonstrate a transformational suite of science and services for the next generation of national flood hydrology and emergency response. Its intent is to better connect, in both directions, the flow of information among the federal, state and local entities responsible for measurement, forecasting and planning for floods, with the corresponding entities in the emergency response community. This experiment leverages new communications standards that simplify the exchange of water information among disparate producers and consumers, as well as integrating cutting edge hydrologic modeling and analysis techniques from the research community. The NFIE will be conducted through the new National Water Center, recently established by NOAA-National Weather Service on the Tuscaloosa campus of the University of Alabama to support and expand the forecasting function of the thirteen regional River Forecast Centers, and to develop a new seamless suite of analyses and guidance data sets for the water budget variables spanning the entire continental United States.

The NFIE will address the following questions:

- How can real-time hydrologic simulations at high spatial resolutions, covering the nation, be developed using a next generation “HydroFabric” – a framework of open water data services in space and time.
- How can this lead to improved emergency response and community resilience?
- How can an improved interoperability framework support the first two goals and lead to sustained innovation in the research to operations process?

The NFIE will consist of two phases:

- A *Mobilization Phase* from September 2014 to May 2015, when the initial elements of the HydroFabric will be assembled within the existing systems of the participating federal, academic and private partners. And,
- A *Summer Institute*, from June to August 2015, when students and faculty from the University of Alabama and from other universities around the country will join with the NOAA-National Weather Service and other partners to assemble, demonstrate and explore alternatives for the next generation flood data, modeling, forecasting and inundation mapping system for the United States.

The Consortium of Universities for the Advancement of Hydrologic Science, Inc, will help to coordinate the participation of the academic community in the NFIE.

The experiment takes place in parallel with several other federal initiatives supporting open information exchange. An Open Water Data Initiative was recently launched by the Federal Geographic Data Committee and the Advisory Committee for Water Information, which will be administered by the Subcommittee on Spatial Water Data. The FGDC and ACWI are the principal bodies for coordination of geospatial and water information at the federal level. Prior to this, an initiative was formed between the National Oceanic and Atmospheric Administration (NOAA), US Geological Survey (USGS), and the US Army Corps of Engineers (USACE) in 2011, called Integrated Water Resources Science and Services (IWRSS). FEMA is an anticipated critical addition to the consortium. IWRSS is a new business model for the federal agencies whose missions include monitoring, forecasting and management of water resources. The National Water Center concept of operations is under development to support the IWRSS partnership and complimentary water resources related missions across NOAA. An important first-task for IWRSS is to develop interoperability and data synchronization of essential information across all agencies when dealing with regional water emergencies, thus establishing a *Common Operating Picture for Water Resources*.

The NFIE will culminate in a near-real time system capable of characterizing the state of surface water resources, specific to flood or near flood stage on a spatial domain that spans the continental United States, and at a resolution that facilitates decision-making within the emergency management community. The NFIE is an initial activity that will help the federal partners develop and refine the requirements for a high-resolution real-time water resources modeling and forecasting platform. While such a platform will require significant resources to develop and implement, the NFIE will facilitate some of the data organizational strategies as well as aid in the development of novel dissemination techniques.