DHS Science and Technology Directorate

Flood Apex Program: Rethinking America's Costliest Disaster

The Department of Homeland Security Science and Technology Directorate (S&T) created the Flood Apex Program at the request of the Federal Emergency Management Agency (FEMA) administrator. It brings together new and emerging technologies designed to increase communities' resilience to flood disasters and provide flood predictive analytic tools. The Flood Apex Program supports S&T's visionary goal of resilient communities.

Key Objectives

The key objectives of the Flood Apex Program are to: reduce fatalities and property losses from future flood events; increase community resilience to disruptions caused by flooding; and develop better investment strategies to prepare for, respond to, recover from and mitigate against flood hazards.

It will deliver these objectives by building on existing programs and efforts at the federal, state, and community levels; operationalizing new forecasting and alerts methods and technologies; and empowering communities with the right data and decision support tools to enable pre- and post-event flood resilience planning.

The effort will culminate in a National Flood Decision Support Toolbox—a suite of knowledge products, data sources, models, and visualization tools to support decision-making.

Six Flood Apex Research & Development Tracks:

Work under the program follows six activity tracks, each of which will contribute products to the toolbox over the four-year life of the program (2016 – 2020).

1. Reduce Flood Fatalities

According to the National Weather Service (NWS), more than 80 flood fatalities occur annually, based on a 30-year average. Most deaths result from people driving their vehicles into flood waters or wading in flooded areas. The program aims to reduce flood fatalities by 10 percent per year through automated geo-targeted alerts and warnings integrated with the NWS's "Turn Around, Don't Drown" campaign.

2. Reduce Uninsured Losses

FEMA estimates more than 50 percent of property owners in areas with significant flood risk may be uninsured or

under-insured against flooding. Flood Apex intends to reduce uninsured losses by 10 percent annually by providing new tools and outreach efforts to encourage adequate flood insurance coverage.

3. Improve Mitigation Investment Decisions

Over the last 30 years, property damages from floods have cost an average of $7.9billion annually. To reduce these losses, communities need better tools to support investment decisions. Flood Apex aims for a one percent reduction per year in property loss—saving $80 million annually—through the use of new community decision support tools.

4. Enhance Community Resilience

A major priority of the program is to integrate the concept of resilience into flood risk management planning and investment decisions at all levels of government, especially the local community level, including the use of quantitative measures of vulnerability, risk, and recovery.

5. Improve Management of Flood Support Data

Decision makers often lack timely access to the critical data and information they need to plan for and respond to floods. Flood Apex will focus on new tools to develop (1) more accurate terrain elevation data and (2) comprehensive structure and building "footprint" maps linked to insurance and tax assessment information.

6. Improve Predictive Flood Analytics

Changes in climate and expanded urbanized areas require better flood prediction tools for both planning and response. Flood Apex will review existing tools, including Hazus, FEMA's software to estimate potential losses from disasters, and the latest NWS models, for speed, accuracy, ease of use, and data needs.