

NOAA NWS AHPS Flood Mapping Services

**Victor Hom
National Weather Service
Office of Climate Water and Weather Services**

The National Weather Service (NWS) Hydrology Program is working to improve the communication of flood risk and impacts through the use of Advanced Hydrologic Prediction Service (AHPS) Flood Inundation Maps. Developed in partnership with other government agencies, NOAA's flood maps provide information on the spatial extent and depth of flood waters in the vicinity of NWS river forecast locations. Combined with river observations and NWS river forecasts, the AHPS Flood Inundation Maps provide decision-makers additional information to support flood operations and mitigate the impacts of flooding.

Following the devastating floods caused by Hurricane Floyd (1999), NOAA worked closely with the North Carolina Floodplain Mapping Program (NCFMP), FEMA, and United States Geological Survey (USGS) to develop flood maps and integrate them into the NWS Flood forecast services. NOAA's Coastal Services Center and NWS combined efforts and leveraged the updated flood hazard data, new topographic information, and improved hydraulic models to bring the first set of AHPS Flood Maps on-line in October 2007. NOAA has now expanded this service to about 50 sites across the United States (<http://water.weather.gov/ahps/inundation.php>).

The development of the AHPS Flood Inundation Maps requires the use of Digital Elevation Model (DEM) terrain data, engineering hydraulics, and Geographic Information System (GIS) tools. Most importantly, high resolution DEM, derived from LiDAR (Light Detection and Ranging) data, are becoming increasingly available. DEM data depicts terrain features across the surface of the earth and more importantly provides for river channel, cross-sectional, and floodway characteristics data, needed for hydraulic modeling. The simulation of flood flows in the hydraulic model produces the water surface profiles. Flood profiles are then integrated with the DEM to outline the areal extent of flooding and coupled with GIS tools to produce the flood depth grids and inundation shapefiles for AHPS.

NWS is seeking Federal, regional, and local partners, such as local river authorities and academia, to develop real-time forecasts flood inundation maps. To ensure national consistency, NWS maintains the NOAA Guidelines for AHPS Flood Mapping and provides programmatic guidance and checks on the development of the map libraries. NWS headquarter and regional staff works with the local NWS field offices for quality assurance and quality control of the flood mapping deliverables to capture local hydrologic and hydraulic expertise into the maps. NWS will then help facilitate the delivery of the products for implementation onto NOAA NWS AHPS Web Services.

NOAA NWS AHPS Flood Inundation Mapping Service provides a decision support tool to empower emergency managers to make effective decisions with visual understanding of the forecast flood impacts. NOAA NWS would like to work with partners to make this available nation-wide.