Flood Forecast Inundation Mapping

Resource for Flood Mitigation Planning and Community Outreach

Alan Haynes
Service Coordination Hydrologist
NOAA/NWS California Nevada River Forecast Center

FMA Monthly Luncheon Meeting
July 18, 2013
DID YOU HAVE A CHANCE TO REVIEW MY POWERPOINT PRESENTATION?

IT'S FULL OF TECHNICAL JARGON AND IT'S WAY TOO LONG.

DID YOU EVEN LOOK AT IT?

WHY WOULD I LOOK AT SOMETHING LIKE THAT?
Discussion Points

• Flood Forecast Inundation Maps?
• Process of Map Development.
• Flood Forecast Inundation Maps Support Mitigation Activities.
• How do we Get Started?
Stream Gages & River Forecasts

Over 9000 USGS gages reporting current stream conditions in NWIS

NWS AHPS Points (not all locations are forecast points)
Stream Gages & River Forecasts

**Daily Streamflow Conditions**
Select a site to retrieve data and station information.
Monday, July 08, 2013 16:30ET

**USGS Gaging Locations In California and Nevada**

**NWS Flood Forecast Points For California and Nevada**
Flood Forecasts Inundation Maps

Takes flood forecasts to a new level.

Graphically represent the river obs/forecasts and link to impacts to help communicate risk and Consequences (i.e. show where the water will impact as it rises and spread from the river channel)

Standard AHPS displays

NWS Inundation Map Library
Process for Map Development

- **Data requirements**
  - River gage with measurements and a developed Rating Curve
  - Known flood impacts.
  - As-Built information for bridges and other structures along the river.
  - Sewer & Culvert information (*need to know what is plugged/gated and what is not.*)
Process for Map Development

• Data requirements.
  • Digital Elevation Mapping (Grid cells 3 m or less); LiDAR data (2 ft. vertical interval accuracy is the min). If the “mapped area” involves multiple LiDAR collections,
    • metadata needs to be compatible for merging

• Model Requirement
  • Hydraulic Analysis (calibrated HEC-RAS, MIKE 2D, etc. model for the project area.) – provided/work performed by technical partner
Process for Map Development

- **Graphics Generation**
  - Shape files of inundation areas and associated “depth” information developed — *provided/work performed by technical partner*
  - Graphics quality controlled by NWS and local/state reps then processed by NWS contractor for display on NWS AHPS webpages.
NWS AHPS Flood Mapping Project Process
From Deliverables to End-Product
NWS AHPS Flood Mapping Process

Four Phases

Phase I
PLANNING

NWS QA

Phase II
ENGINEERING & ANALYSIS

NWS, Partners, and/or Contractor

QC

Phase III
IMPLEMENTATION

NWS AHPS Contractor

QC

Phase IV
OPERATION & MAINTENANCE

AHPS Contractor

NWS & Partners

NWS, Partners, and/or Contractor

NWS & Partners

NWS, Partners, and/or Contractor

NWS & Partners
Example NWS Flood Forecast Inundation Webpage

Cedar Rapids, IA

[Map of flood inundation locations]

http://water.weather.gov/ahps/inundation.php

http://water.weather.gov/ahps2/inundation/inundation_google.php?gage=cidi4
USGS FIM Mapper – more than just maps
Features of USGS FIM Web Mapping Website/Application

- **Decision Matrix** – ability to show two linked dependent sites for one reach
- **Display of leveed areas** *(Currently USGS has a slightly different approach to Levees than NWS, but both are working toward a common approach.)*
- **NWS forecast** expanded and color coded display
- **WaterAlert** – User defined text alerts for stages (USGS standard)
- **WaterWatch** – Sets historical context of flood flows (USGS standard)
Flood Forecast Inundation Maps support Mitigation Activities

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<thead>
<tr>
<th>Activity</th>
<th>Description</th>
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<tr>
<td>Enhance the FEMA FIRM’s</td>
<td>Improved modeling would be incorporated into updated RiskMap projects.</td>
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<tr>
<td>Count for CRS credit to reduce flood insurance policy costs</td>
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<tr>
<td>Flood fight preparations– Can clarify risk areas for different forecast levels.</td>
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<tr>
<td>Graphics in KMZ and Shape files for ingest into your Common Operation Picture programs.</td>
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<td>Can combine with economic loss data to estimate potential flood damages. (USGS FIM website can provide this information as a query)</td>
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<td>Outreach tool - engages local community in preparedness and response by providing a visual of potential flood impacts.</td>
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<td>Aid in the recovery process/damage assessments</td>
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<tr>
<td>Aid with Environmental an ecological assessments</td>
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Environmental Aspects/Benefits

- Ecological studies of floodplains
  - E.g. frequency of inundation
- Riparian wetland applications
  - 7-day inundation areas for Wetland Reserve Program
- Hazardous substance spills
  - EX - MI Kalamazoo River Oil Spill
We are interested, what are the costs and who do we contact?

- **Costs vary depending on:**
  - Complexity of the location
  - Additional model development – cost for model development could vary significantly
  - Once underlying data sets are available cost to develop the webpage on the NWS AHPS page is ~ 4K per location.
- **Work with your Local NWS Service Hydrologist and USGS representative to start the process.**

*NWS is partnering with other federal, state, and local agencies to expand this capability across the United States.*
Potential Locations in California & Nevada

- Truckee R at Vista
- Carson R
- Bear Creek at McKee Rd
- Santa Clara & Ventura Rivers – Ventura County
Contact Information

Alan Haynes
Service Coordination Hydrologist
California Nevada River Forecast Center
916-979-3056 x328
Alan.Haynes@noaa.gov

Charles Berenbrock, PE
Hydrologist
CA USGS Water Science Center
916-278-3227
ceberenb@usgs.gov