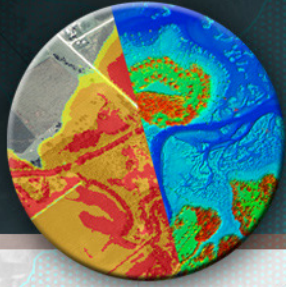


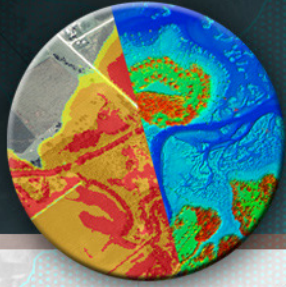
Zone A Flood Elevations Overview

Poughkeepsie, NY
July 31, 2013



Dutchess County Town of Poughkeepsie

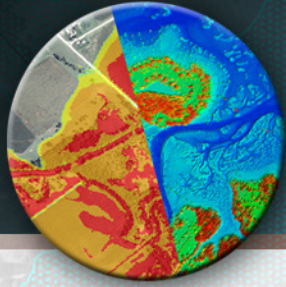
- **General Purpose**
 - Dutchess County Overview
 - Mapping Resources
 - Zone A Flood Elevation Calculation
 - Elevation Interpolation between cross-sections
 - Resources
 - Questions



Dutchess County Overview

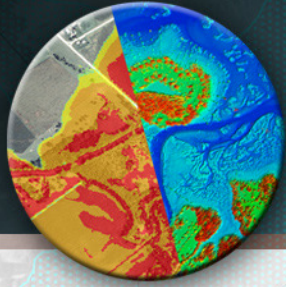
Countywide FIRM Information

- Effective May 2, 2012
 - Base Map Information updated using orthoimagery dated April 2006
 - Updated topographic information provided by NYSDEC was used for floodplain boundaries
 - Digital FIRM data available for use
- Town of Poughkeepsie
 - Flood hazard areas of unrevised detailed streams were redelineated and mapped using updated topography
 - No new modeling
 - Flood hazard areas using approximate methods were re-analyzed and mapped using updated topography
 - New modeling



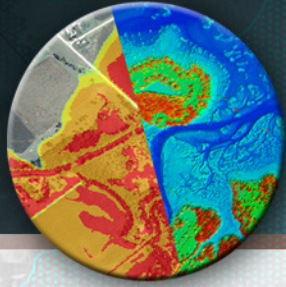
FEMA Procedure of H&H of streams

- Presently streams are studied using
 - ✓ Approximate methods (Zone A)
 - ✓ Limited Detail methods (Zone AE)
 - ✓ Detail methods (Zone AE)
- Floodplains are delineated based on flood elevations.
- Flood elevations
 - ✓ Discharges: Computed using hydrologic analysis
 - ✓ Elevations: Computed using hydraulic analysis



How are Zone A's developed?

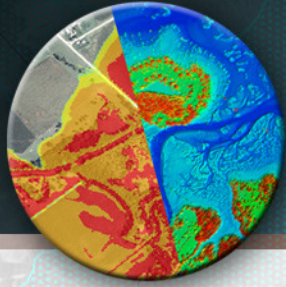
- Hydrology:
 - ✓ USGS regression equations (SIR 2006-5112)
 - ✓ Gage analysis (Log Person Type III)
- All these methods are also acceptable for detailed studies



How are Zone A's developed?

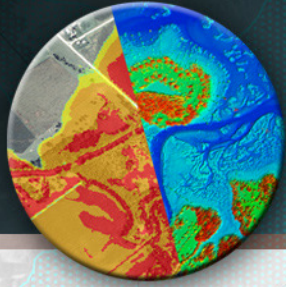
Hydraulics:

- Cross sections extracted from LIDAR based terrain at suitable intervals (500 to 1000 ft)
- Manning's n-values assigned according to county or statewide land-use data set
- Boundary Conditions
 - ✓ Known water surface elevations
 - ✓ Slope area method
 - ✓ Mean High High Water (tidal conditions)
- Delineate the floodplains using computed WSE's



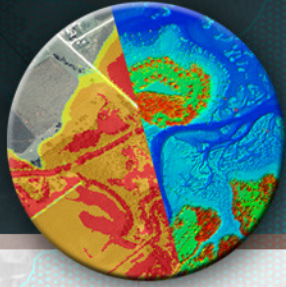
Web application

- <http://worldmap.harvard.edu/maps/Poughkeepsie>

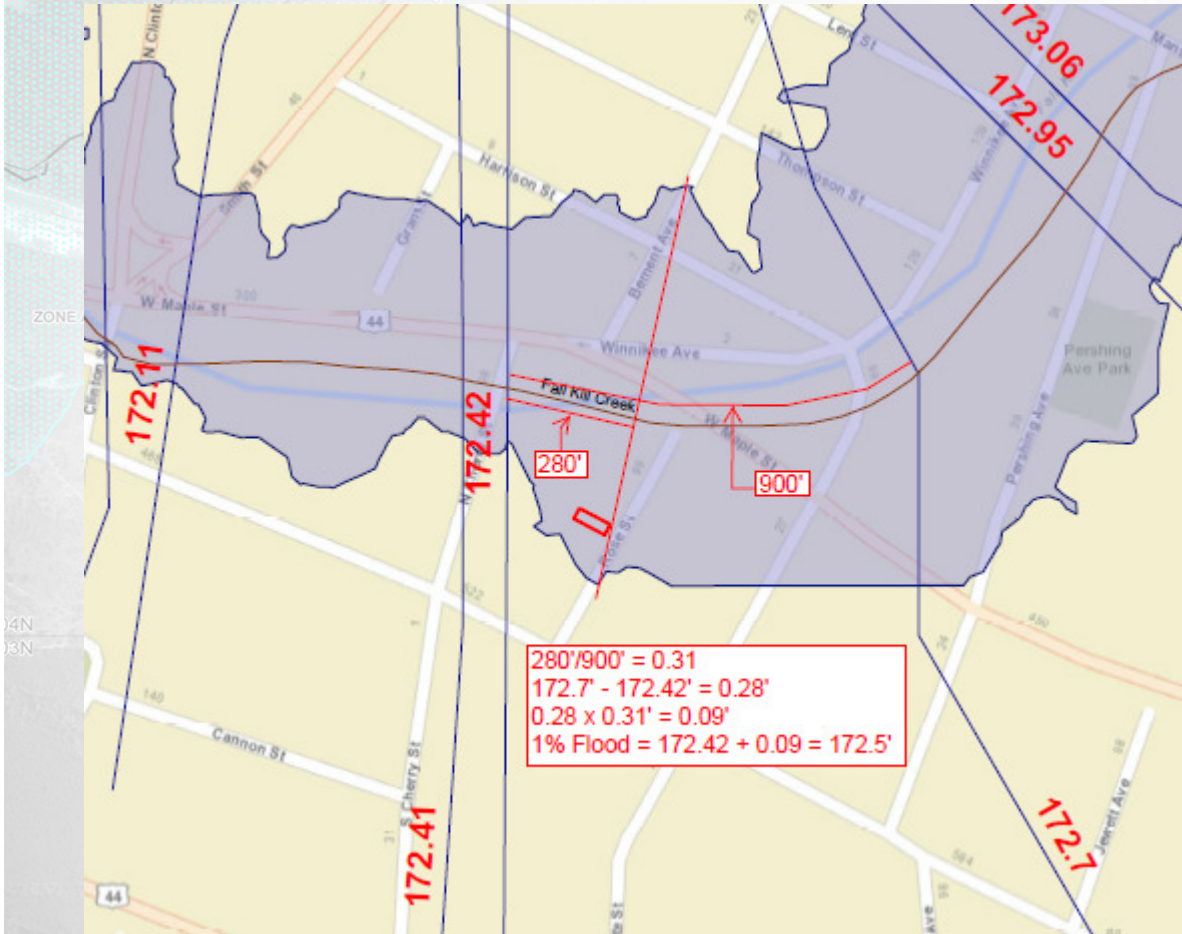


Flood Elevation Interpolation

- Interpolation between cross sections
- Assumes water surface (WS) is at constant slope between sections
- $\text{Slope} = \text{change in WS elevation} \div \text{distance between sections}$
- $\text{WS elevation increase} = \text{distance to structure from downstream section} \times \text{slope}$
- Examples



Poughkeepsie Flood Elevation Interpolation



$$S = (EI \text{ u/s} - EI \text{ d/s}) / \text{dist}$$

$$\Delta EI = S \times L$$

$$S = 172.7' - 172.42' = 0.28' / 900' = .0003111$$

$$\Delta EI = .000311 \times 280' = 0.09'$$

$$\text{Site EI} = 172.42' + 0.09' = 172.51'$$

Poughkeepsie Flood Elevation Interpolation



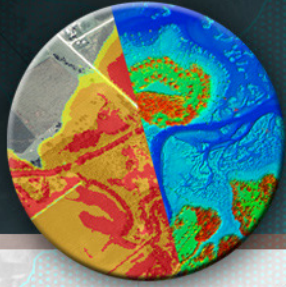
$$S = (EI \text{ u/s} - EI \text{ d/s}) / \text{dist}$$

$$\Delta EI = S \times L$$

$$S = 172.69' - 169.15' = 3.54' / 405' \\ = .00874$$

$$\Delta EI = .00874 \times 166' = 1.45'$$

$$\text{Site EI} = 169.15' + 1.45 = 170.6'$$



Poughkeepsie Resources

MSC

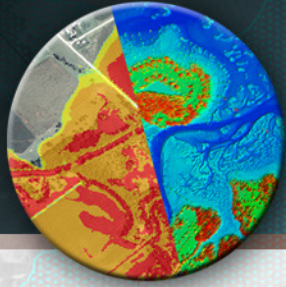
<https://msc.fema.gov/webapp/wcs/stores/servlet/>

FEMA 285

<http://www.fema.gov/library/viewRecord.do?id=2215>

Web Application

<http://worldmap.harvard.edu/maps/Poughkeepsie>



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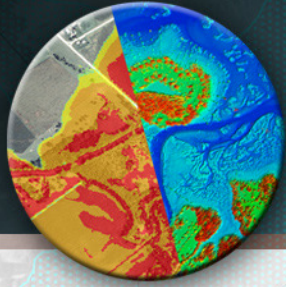
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Questions?

