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## Panel - Real World Applications: Overview of Virginia Beach Center for GIS' Geoprocessing of Storm Surge Models

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# Overview of Virginia Beach Center for GIS' Geoprocessing of Storm Surge Models

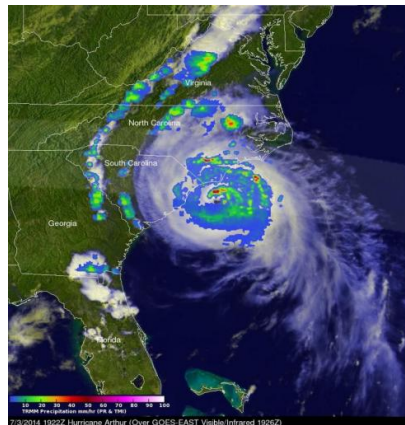
In Support of the City's  
Emergency Operations Center

Hampton Roads Sea Level Rise/Flooding Adaptation Forum  
Real World Applications User Panel  
January 23, 2015

Dave Arnold  
Systems Analyst

# Objective

- Overview of recent storm surge model applications by Virginia Beach's Center for GIS in support of the City's Emergency Operations Center (EOC)
  - in the context of the hurricane preparation exercise in June 2014 and Hurricane Arthur, July 2014



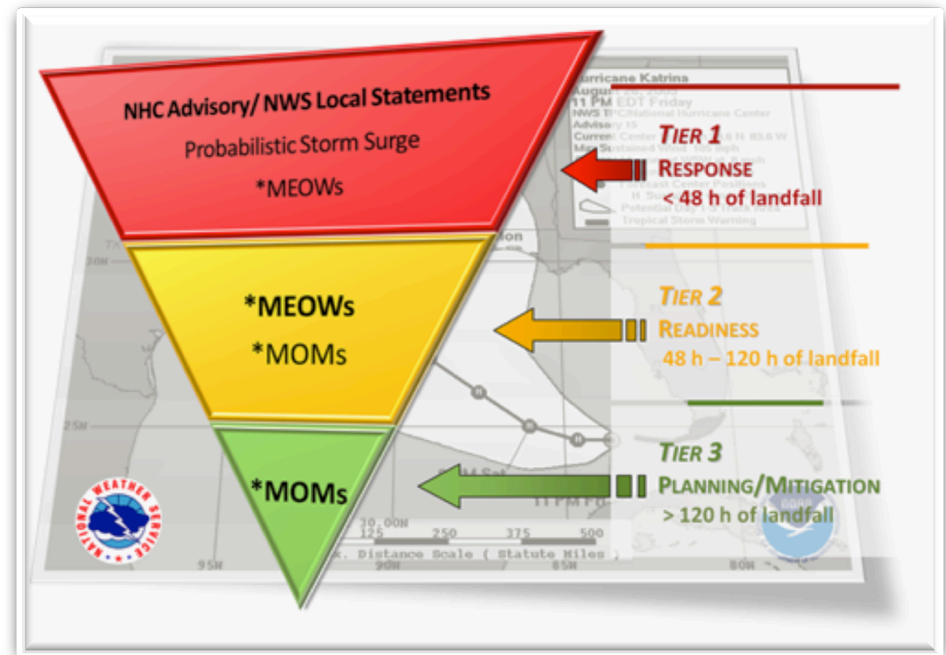
# The Decision Wedge



**P-Surge:** Probabilistic Storm Surge shows the overall chances that the specified storm surge height will occur at each individual location on the map during the forecast period indicated

**MEOW:** Maximum Envelope of Water refers to the maximum level the water reaches at any point in time and can be chosen based on storm direction, forward speed, and tide.

**MOM:** Maximum of Maximum is a composite of the maximum storm surge height for all hurricanes of a given category and tide.

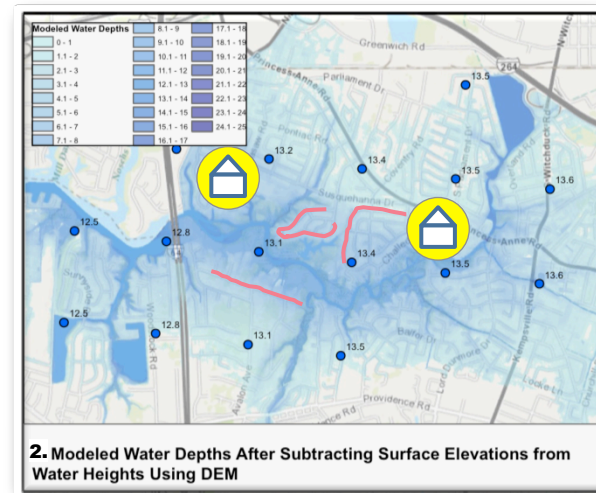
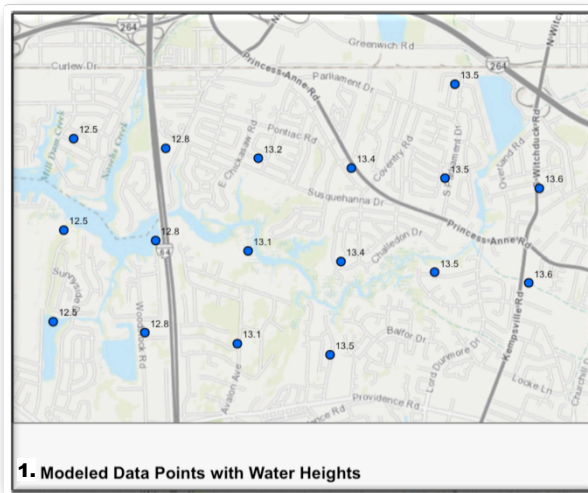


*NHC Storm Surge Decision Wedge*

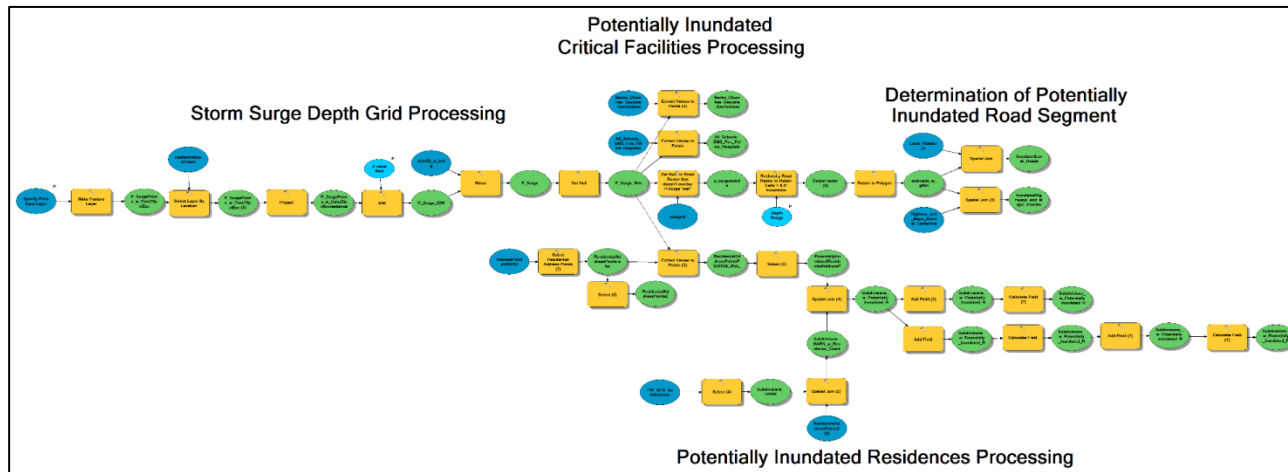
The data/information you have about a particular storm event determines which SLOSH product you use.

# Within 48 Hours of Storm's Landfall: P-Surge

- Purpose of further geoprocessing of P-Surge data
  - To identify facilities, roads, and residential areas within the City that are vulnerable to flooding based on forecasted storm surge.



# P-Surge Geoprocessing Using ArcGIS Desktop w/ ModelBuilder



## MAIN INPUTS

- SLOSH P-Surge Data Points (initially 20% exceedance)
- Address Points
- Critical Facilities
- Roads
- LiDAR Derived Digital Elevation Model (5' resolution)
- Subdivision Boundaries

## MAIN OUTPUTS

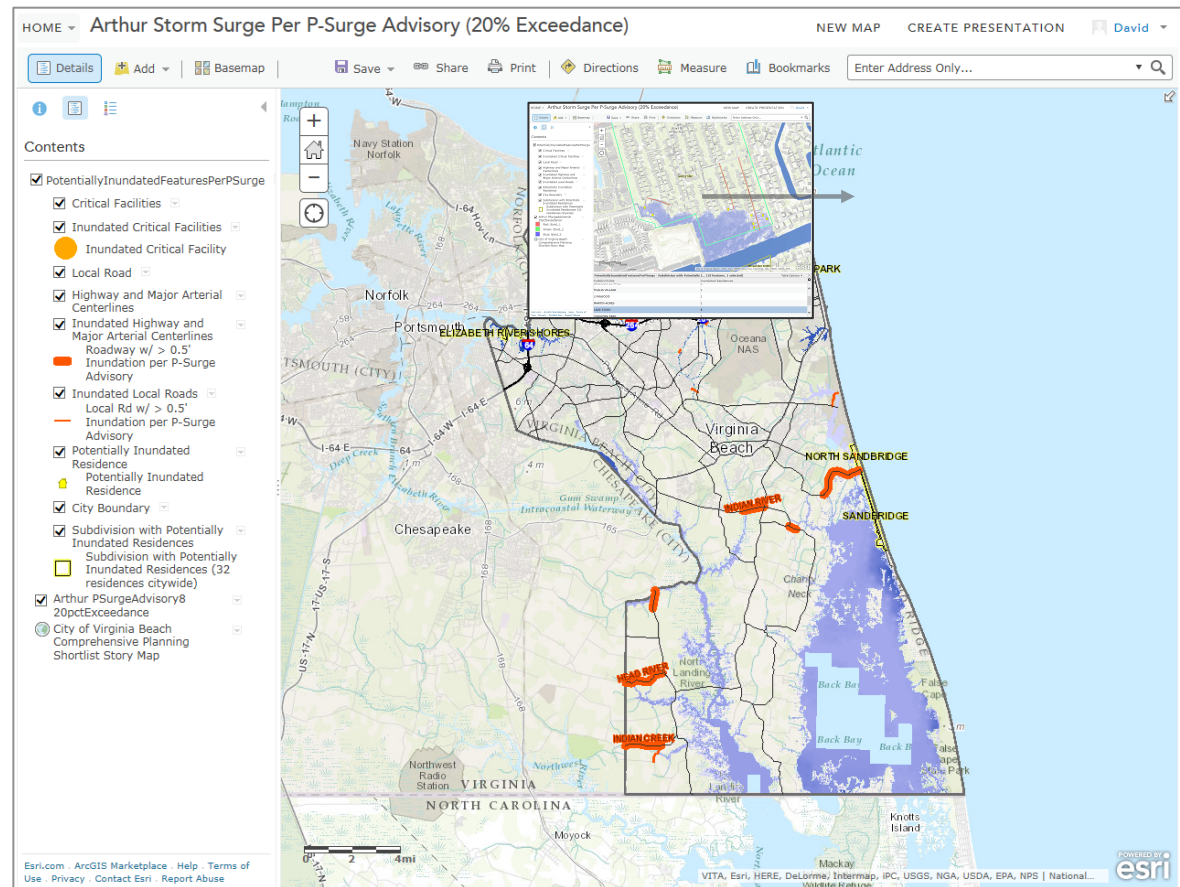
- P-Surge Depth of Inundation Grid
- Potentially Inundated Critical Facilities
- Potentially Inundated Residential Address Points
- Potentially Inundated Road Segments
- Subdivisions with Potentially Inundated Residence Counts

## KEY POINTS

- Currently 26 processes
- Takes approx. 30 minutes to run, using workstation w/ 32 Gb RAM
- Requires ArcGIS Desktop 10.2 w/ Spatial Analyst Extension
- Other inputs/geographic features can be added

# Sharing P-Surge Geoprocessing Results

- Only available to City's Emergency Operations Center
- Use map services hosted locally using ArcGIS Server
- Interactive data/map viewer using ArcGIS Online





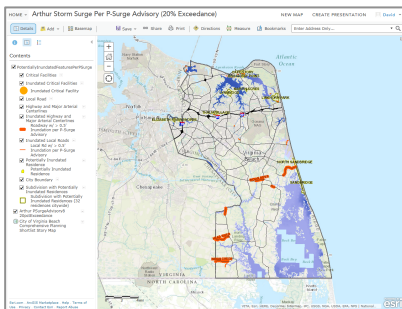
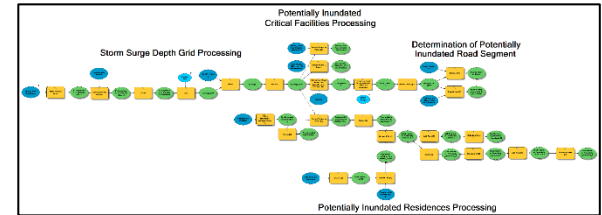
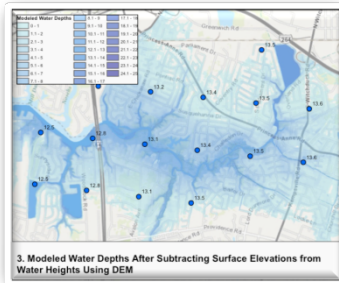
# Lessons Learned/Future Considerations

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- Little variation between P-Surge data releases
- Models and geoprocessing results are not a “crystal ball”
  - Intended to be used in conjunction with other sources of information
  - How to appropriately represent analysis results from data sources at varying scales/resolutions
- Incorporate/evaluate multiple probabilities/scenarios
- Transition geoprocessing from semi-automated to fully automated
- Offer greater interaction/functionality through web mapping applications
- Interactive maps and web applications aren’t always the most effective form of sharing information



# Thank you for your time!



# Questions?

