

Merging Grids

Inundation Workshop

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Background

- Numerical model grids
 - Focus on a specific area
 - Invariably overlap as more are created
 - Areas of overlap lead to confusion
- **Which grid do I use?**
- NWS's current storm surge model (SLOSH) is **not** an exception.
 - Roughly 36 CONUS grids (aka basins)
 - In places 3 or more basins overlap

Solution 1

Do Nothing

- The user is intelligent enough to choose
 - Intelligent users are selecting the basins for the evacuation studies
 - Guidance can be provided during a storm
- Issues
 - It hinders educational efforts
 - The general public wants access and don't want to read instructions
 - It hinders product development

Solution 2

Use a Uniform Grid

- NWS's first storm surge model (SPLASH) used a single uniform grid that paralleled the coastline
 - When a storm threatened, one selected a subgrid based on the storm
- Issues:
 - Computationally expensive
 - High resolution everywhere?
 - Maintenance
 - How to update bathy/topo?
 - How to update derived products?
 - Boundary conditions could be challenging

Solution 3

Automatic Merging

- Step 1: Reduce over lap areas with masks
- Step 2: Algorithm: For each grid cell:
 - If both are dry, answer is dry
 - If one is dry, take the other's wetness above ground and divide by 2
 - If both are wet, average wetness above ground
- Issues
 - Inconsistent with Evacuation Plans
 - Algorithm demonstrates inconsistencies
 - Moves away from native grid

Solution 4

Manual Merging

- Merge all 36 CONUS SLOSH basins by hand using ESRI
 - Done for MEOWs and MOMs
- Issues
 - Inconsistent with Evacuation Plans
 - Maintenance
 - Difficult to do in real time

Solution 5

Merging by Research

- Determine which SLOSH basins were used by evacuation plans in which county
 - Advantage: Consistent with Evacuation
- Issues
 - Interagency effort
 - Who are the POCs?
 - Still inconsistent on county boundaries
 - What should be used off shore?

Summary

- Viable solutions
 2. Use a uniform Grid
 3. Automatic Merging
 4. Manual Merging
 5. Merging by Research
 6. Other?
- Preferred solution?