# Downscaling from Model Output onto High Res TopoBathy Data and Maps

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# Surge Models

- Surge models (e.g., SLOSH, ADCIRC, etc.) generally have res of hundreds of meters
  - Some grids reach tens of meters, but kilometer scales also occur
- Features only roughly approximated by grid or special features needed to represent them
  - Coasts, levees, islands, jettys, highways, streams, …
- However many subgrid scale features not included
  - Buildings, smaller roads, bridges, infrastructure, …
- Surge simulations have vertical uncertainty from 0.3 m on up to more than meter

# Topobathy DEMs

- LIDAR-based DEMs generally have resolution 30 m or 10 m
- Vertical accuracy is 15 cm

# How do we map onto high resolution DEMs?

- Models are coarser, have more vertical uncertainty
  - Model grids *approximate* physical features
- Subgrid scale features (levees, jettys, rivers, streams, …) generally are bigger and not aligned with actual locations
  - Mismatches occur: flooding will appear to cross where barriers like levees in DEMs, or streams will appear much too wide
- Large model cells will wet disconnected low-lying "puddles" in the DEM that appear unrealistic