

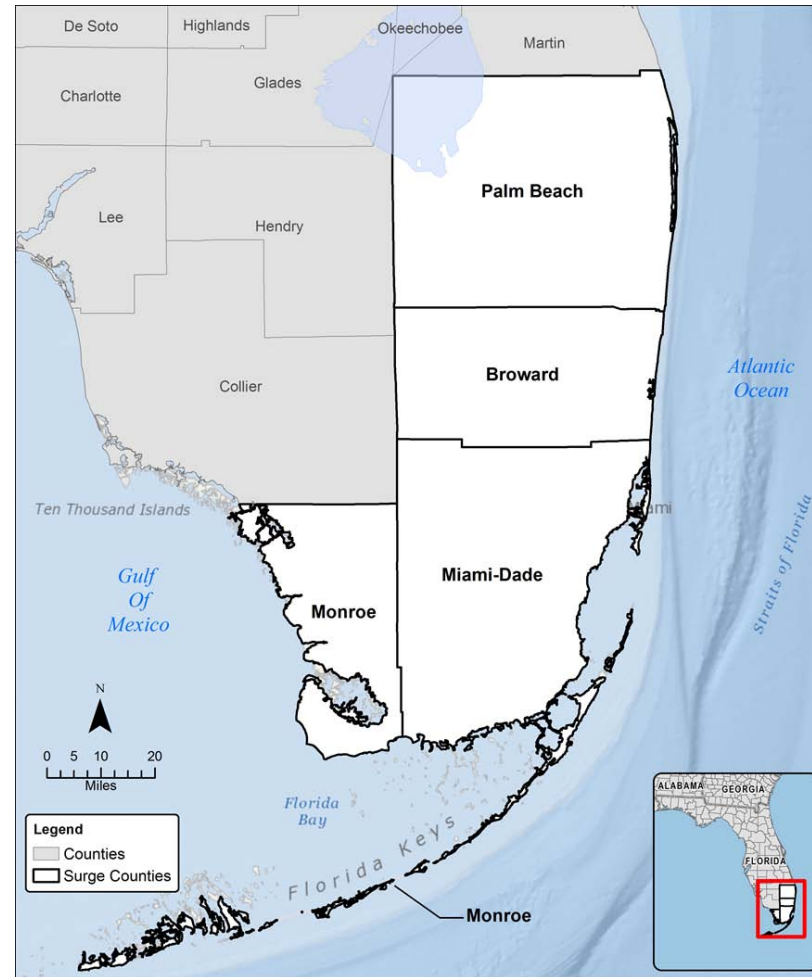
# South Florida Surge Study

Status Update  
July 16, 2015

# Overview

- Study Location
- Objectives
- Methodology
  - Wave and Surge Modeling
  - Hazard Zone Mapping
- Project Schedule

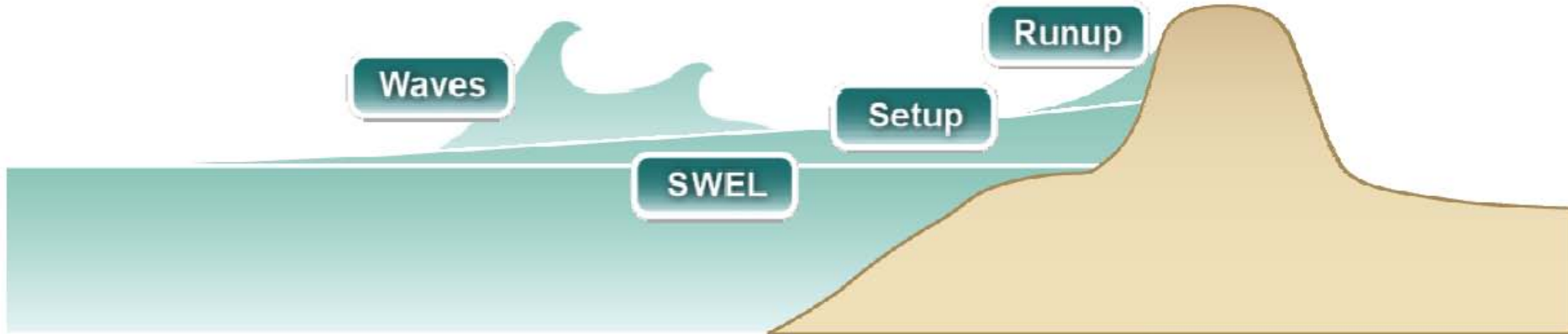
# Location



# Basic Elements of a Coastal Flood Risk Study

Base Flood Elevation (BFE) on FIRM includes 4 components:

1. Storm surge stillwater elevation (SWEL)
  2. Amount of wave setup
  3. Wave height above storm surge (SWEL) elevation
  4. Wave runup above storm surge elevation (where present)
- } Determined from storm surge model



# Southeast Florida Coastal Study – Surge and Wave Modeling

- **ADCIRC and SWAN Coupled Model**
  - Identical, unstructured mesh with shared parallel computing infrastructure
  - Run sequentially in time
  - Wave induced water level changes
- **Mesh Development**
  - Good elevation data critical for terrain and bathymetry
  - Identification of significant coastal features



# Southeast Florida Coastal Study – ADCIRC Mesh Development

- **Grid resolution drives costs**
  - What resolution is good enough? Too much or too little?
  - Canal/riverine features, levees/berms, hydraulic constrictions
- **Extensive sensitivity analyses**
  - Grid sizes, channel features/conveyance



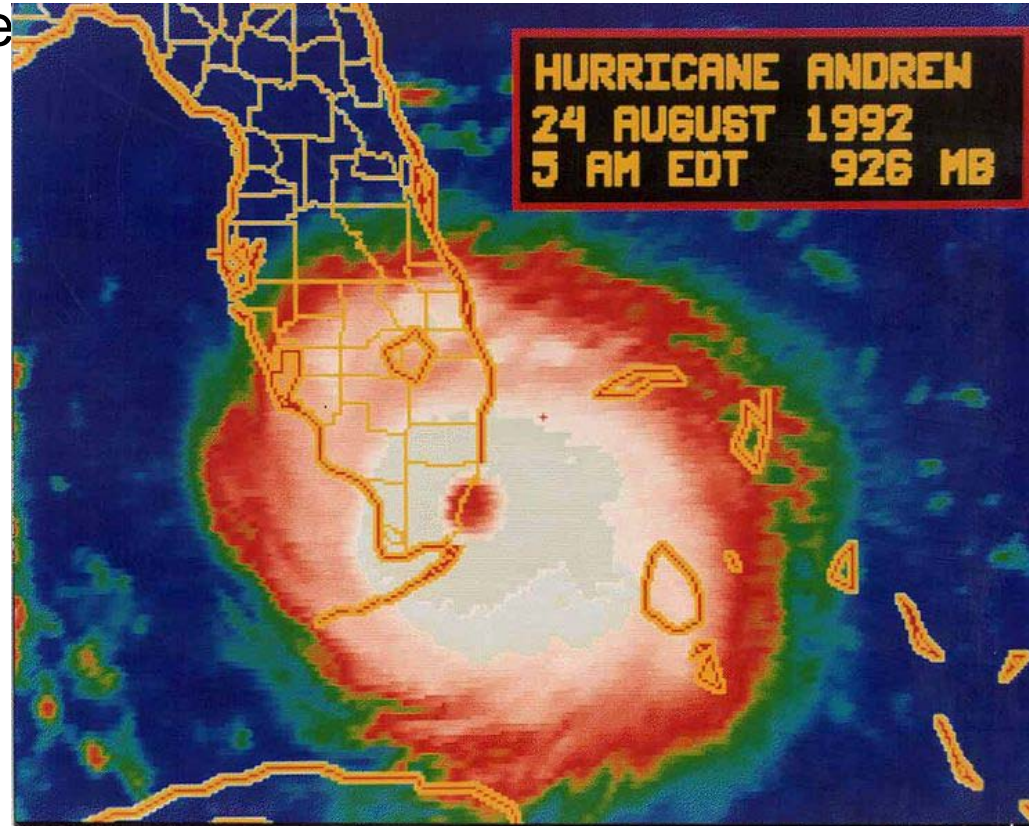
# Southeast Florida Coastal Study – Model Forcing and Validation

- **Tides**

- ADCIRC response to tide
- Simulate multiple tides and examine results

- **Historic Events**

- Explore existing data
- Create wind field for historic events
- Simulate event and examine results



# Southeast Florida Coastal Study – Statistical Approach

- **Develop an array of synthetic storms**
- **Five primary parameters**
  - Central pressure deficit
  - Radius to maximum wind speeds
  - Storm track heading
  - Forward velocity
  - Shoreline crossing point
- **Run enough storms to give valid statistical sample set**



## Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update

Final Draft

February 2007

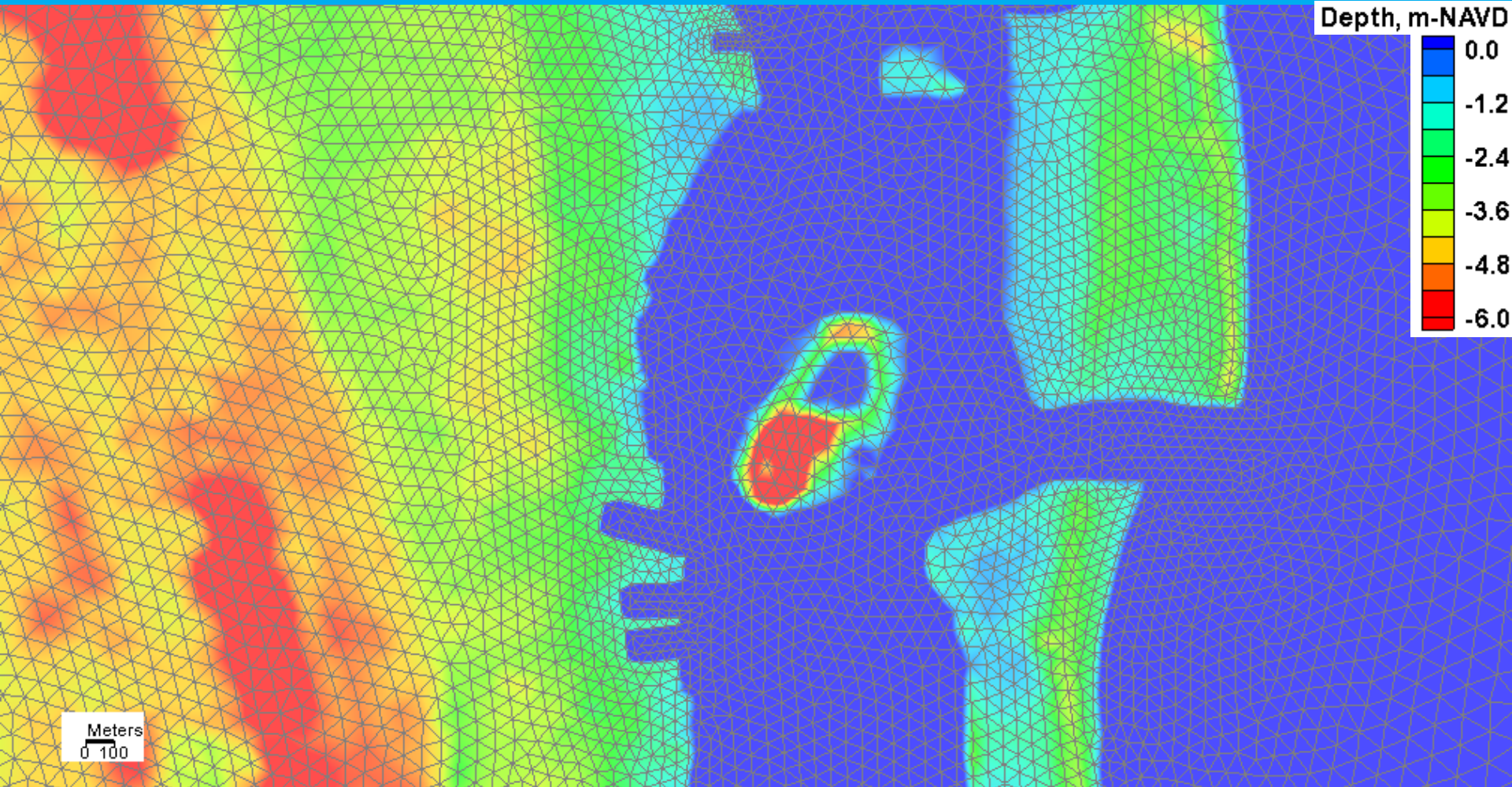




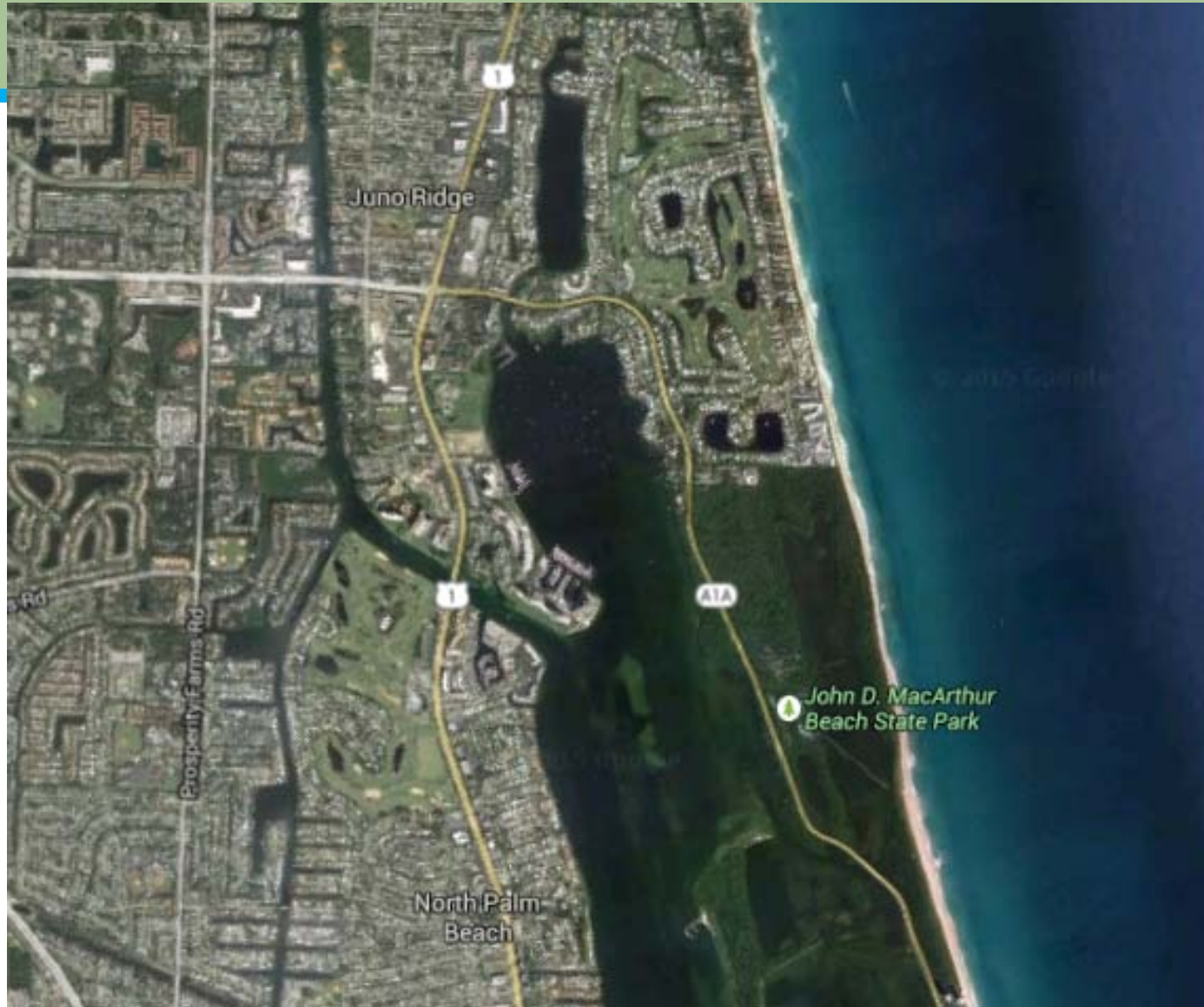
# Palm Beach Inlet



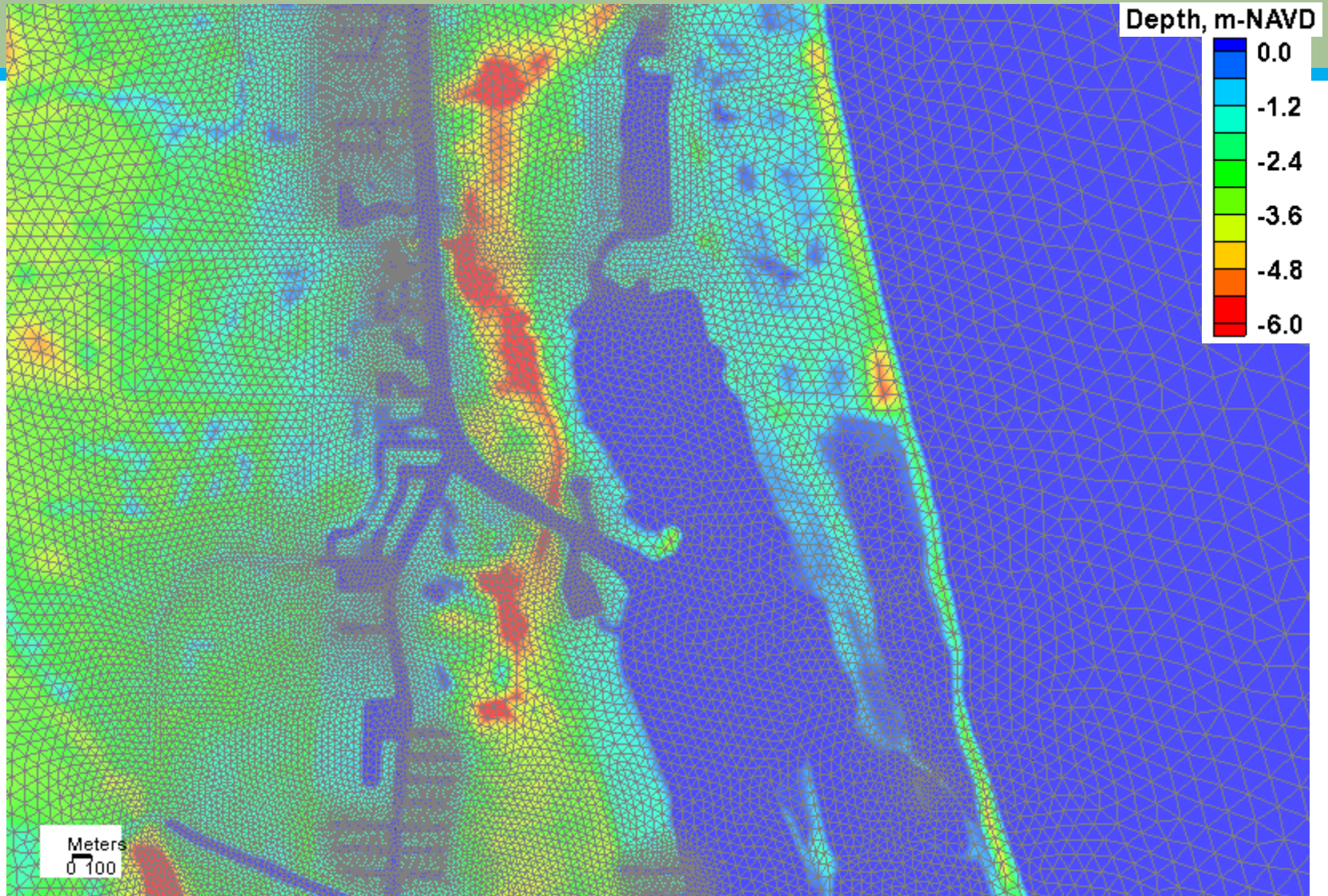
# Palm Beach Inlet



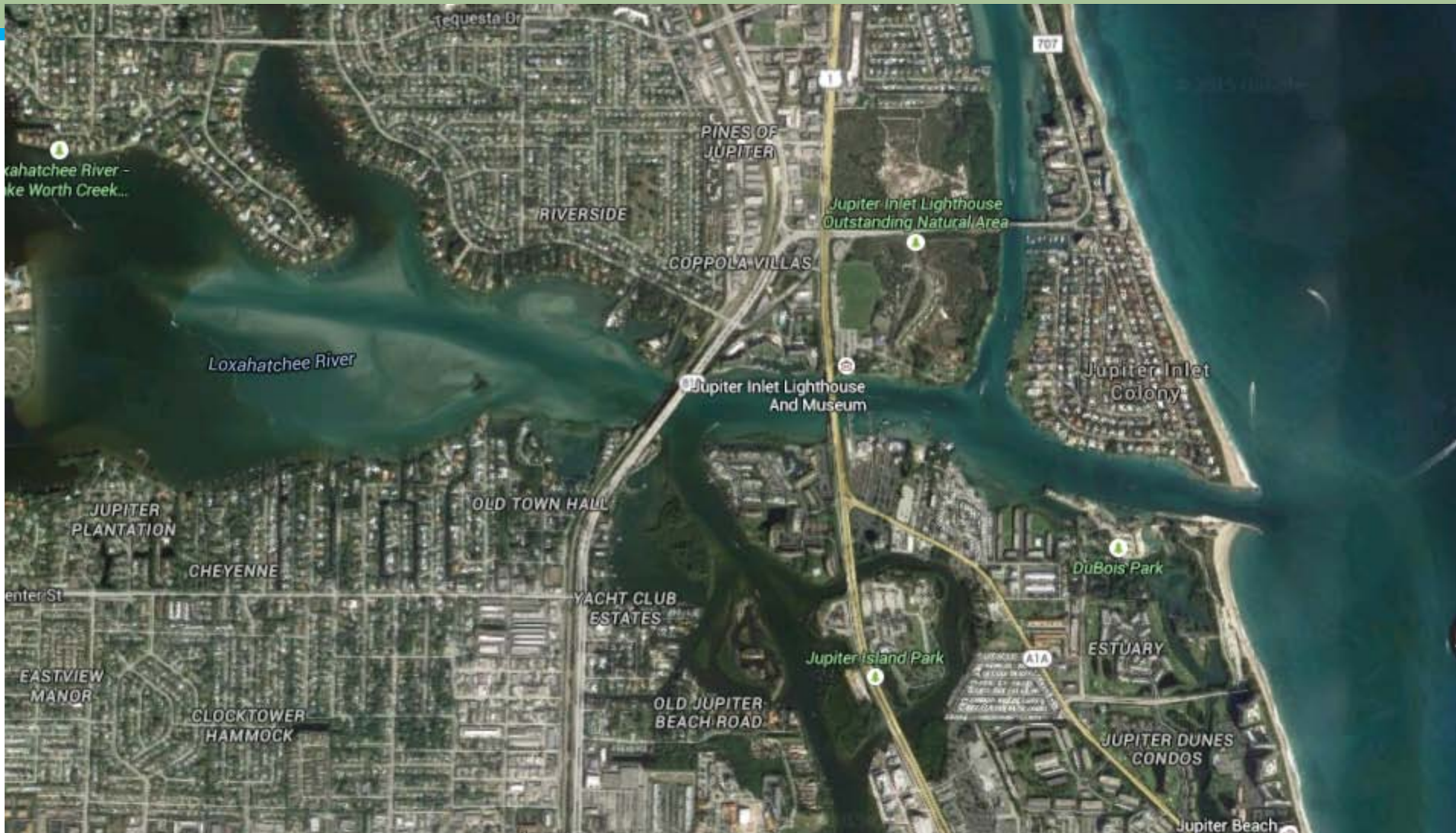
# Lake Worth lagoon, canals



# Lake Worth lagoon, canals

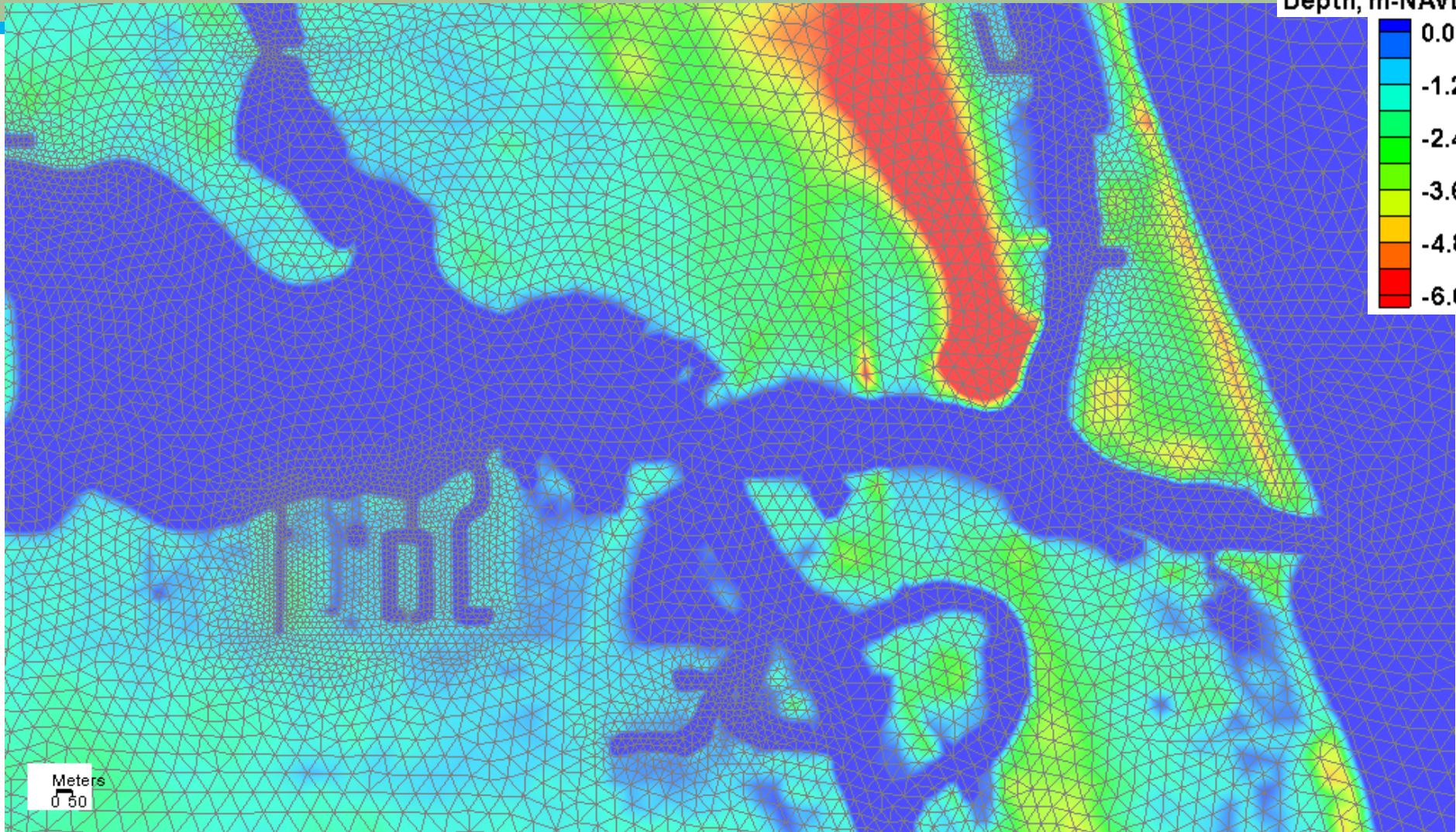
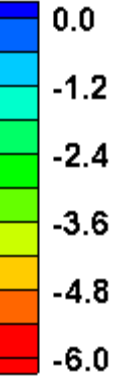


# Jupiter Inlet



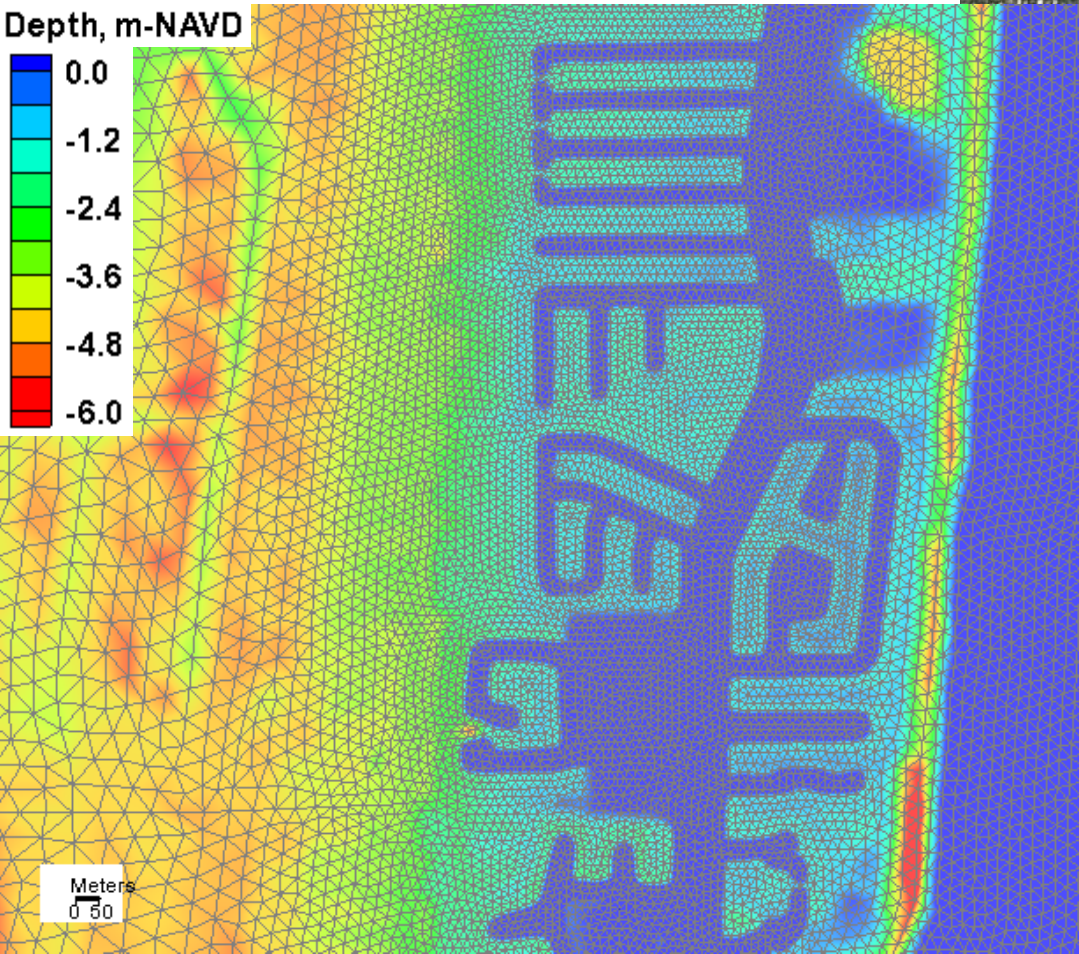
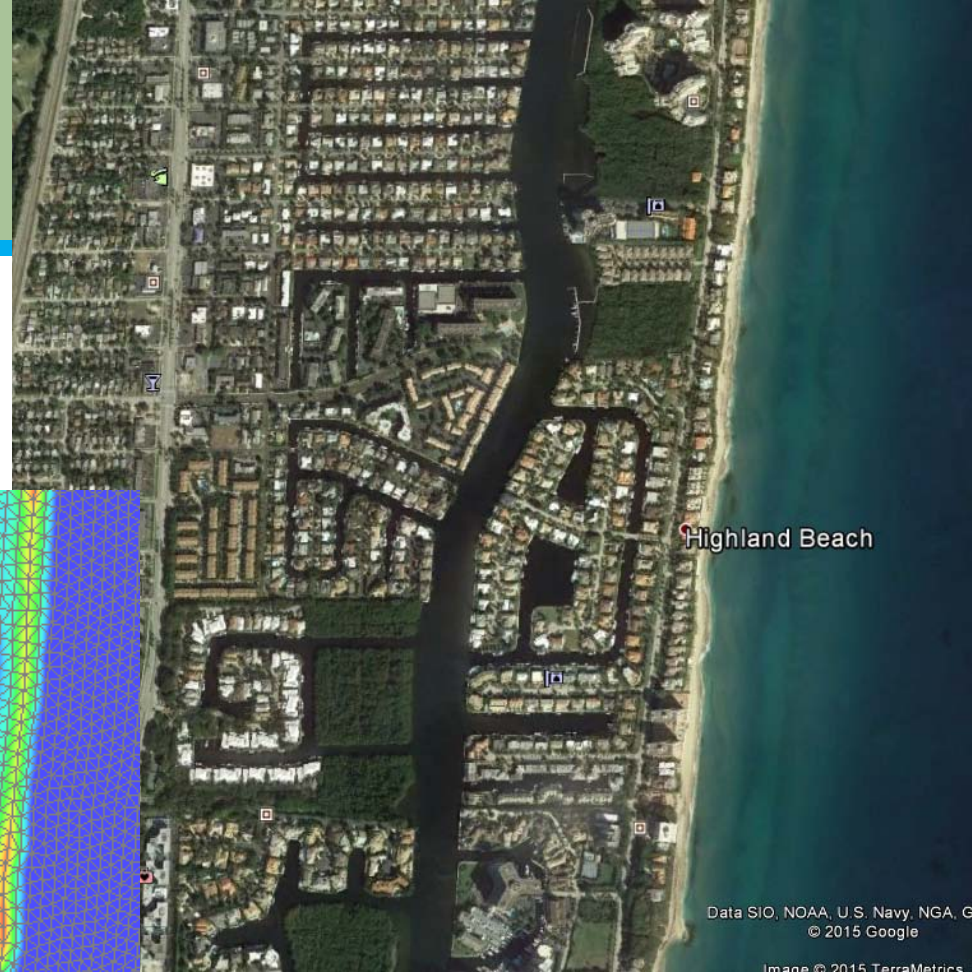
# Jupiter Inlet

Depth, m-NAVD

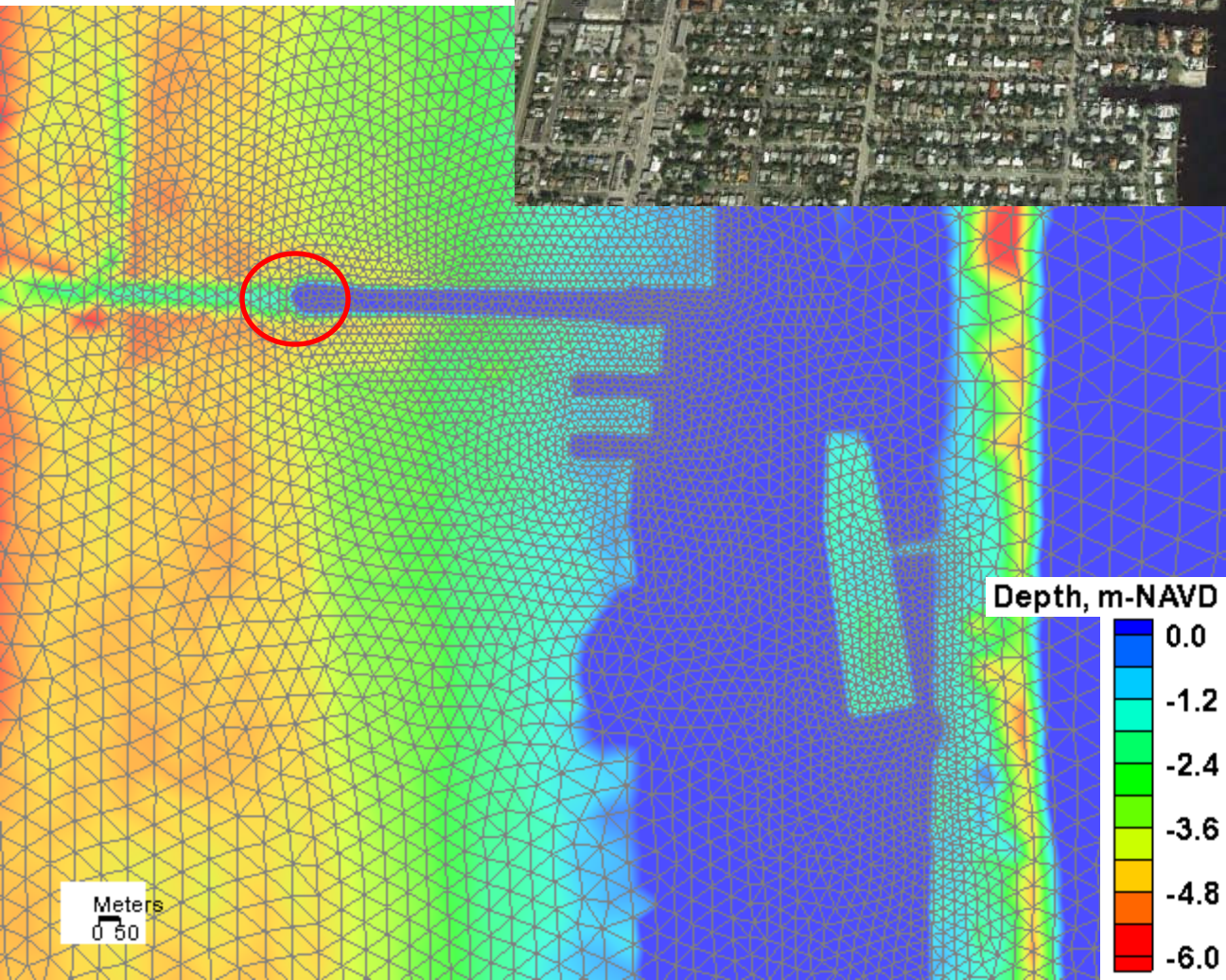


Meters  
0 30

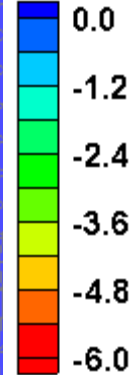
# Highland Beach, FL



# C-51 Canal



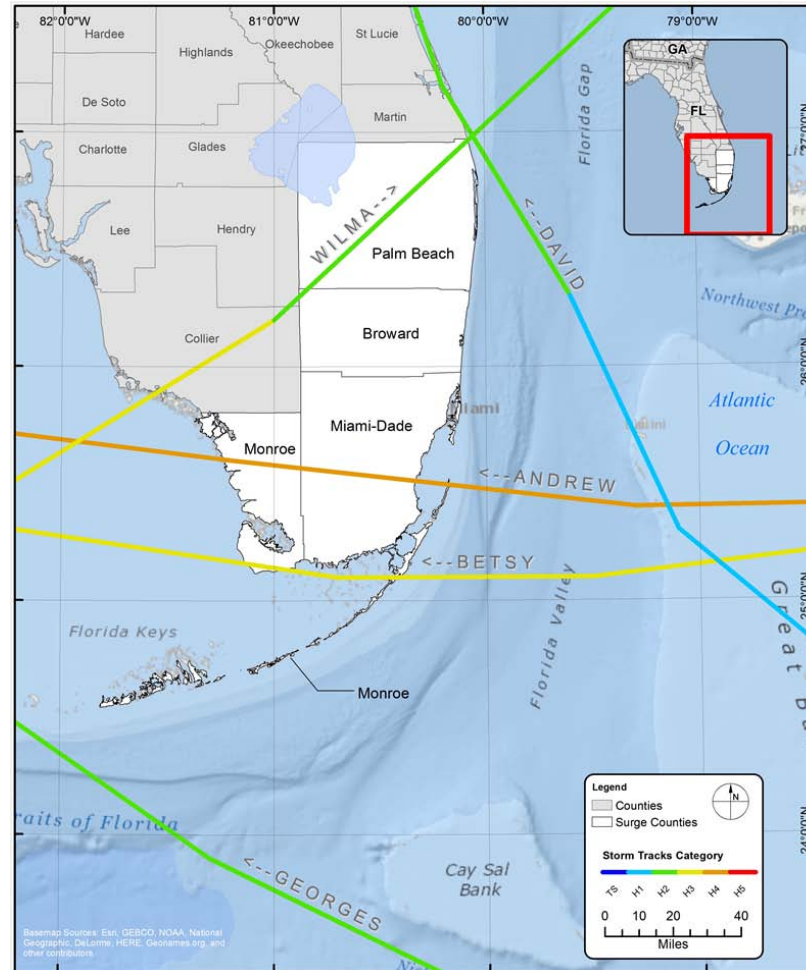
Depth, m-NAVD



Meters  
0 50



# Southeast Florida Coastal Study – Validation Storms

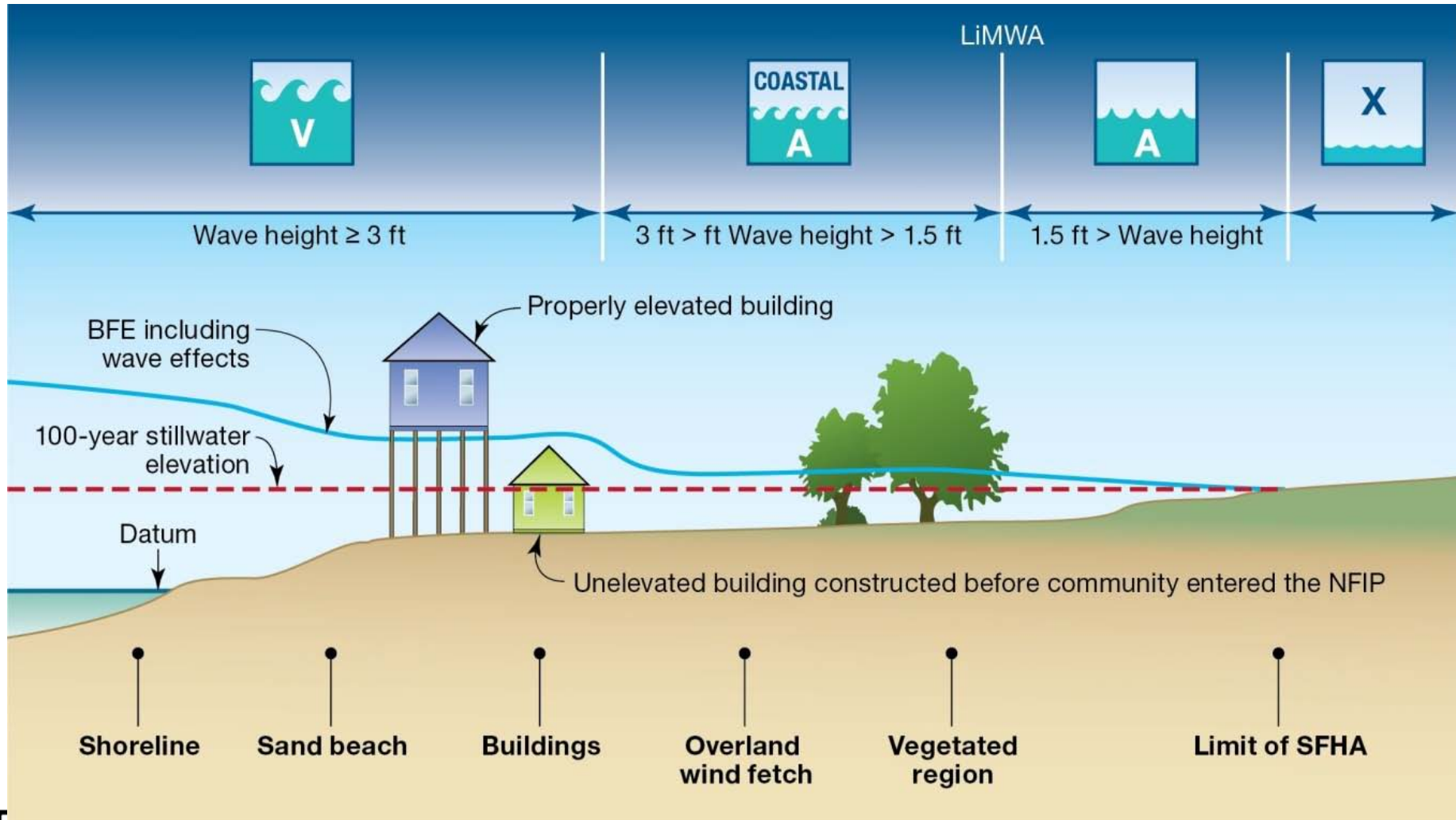


# Southeast Florida Coastal Study

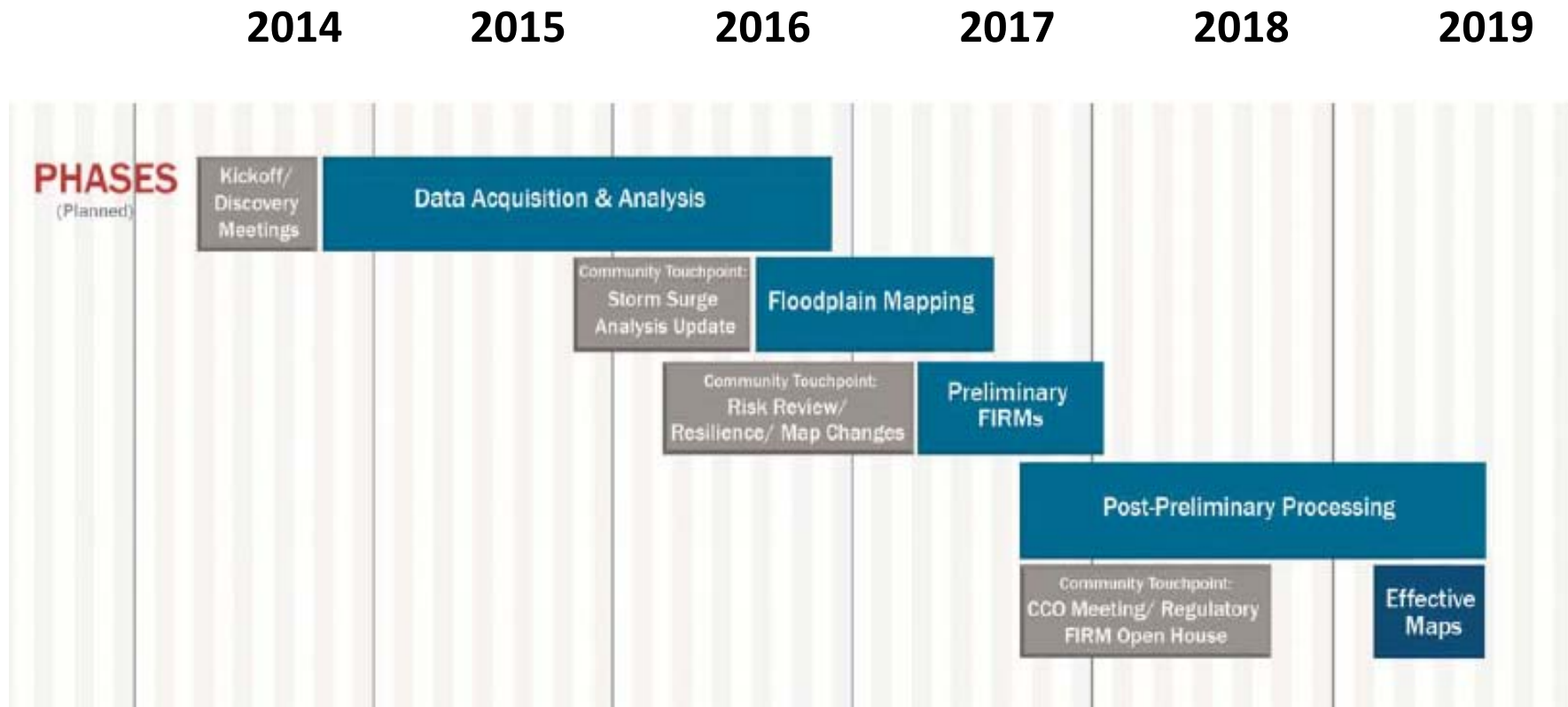
- **Path Forward**

- Complete tide and storm validation
- Complete statistical analysis for JPM-OS
- Develop 1% annual chance event WSEL
  - Storm Surge Analysis Update Meeting
- Perform Overland Wave modeling (WHAFIS)
- Work Maps
  - Flood Risk Review Meetings
- FIRMS and non-regulatory products

# Southeast Florida Coastal Study – Floodplain Mapping



# Southeast FL Coastal Study – Project Schedule



# **BakerAECOM**

An Integrated Production Team

