



Gateway National Recreation Area Hurricane Sandy





Storm Damage – Sandy Hook





Storm Damage – Sandy Hook





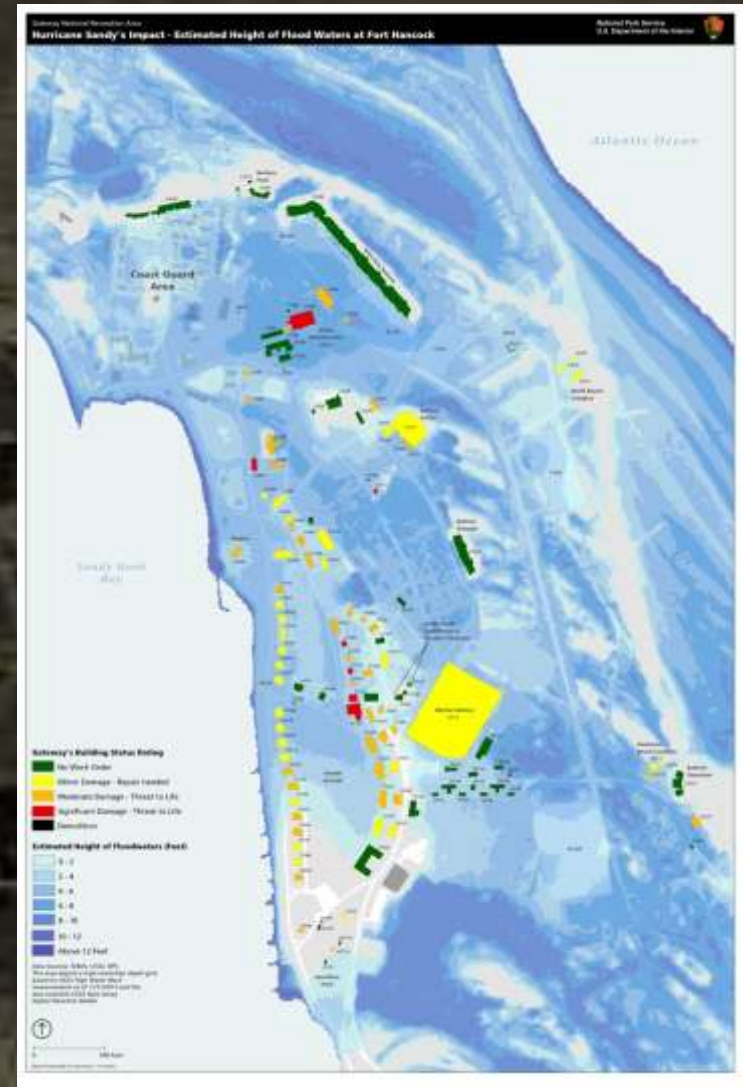
Storm Damage Overview – Sandy Hook

- Iconic lighthouse is in good shape and sustained no damage.
- No builds were washed away or structurally compromised by the storm surge.
- The fresh water and sewage systems were incapacitated and electricity is limited and phone service is limited to cell service.
- We lost all heavy equipment at Sandy including vehicles, emergency, beach cleaners, etc..
- All roads flooded at Sandy and many had significant sand coverage.



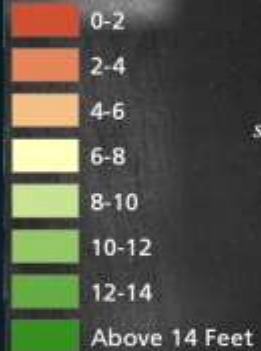
Storm Damage- Fort Hancock Highlights

- The majority of the structures had water in the basements from the storm surge or extremely high ground water levels.
- Wood porches in several Officer Row buildings have been compromised and or damaged.
- Most of the existing utility systems including heating, electric, and HVAC systems need to be replaced because they were in the basement and not elevated.



ELEVATION AT SANDY HOOK BASED ON 2007 LiDAR DATA

Feet Above Sea Level



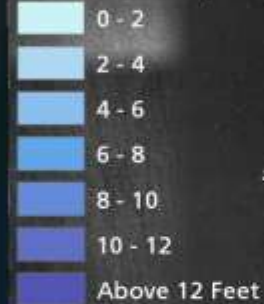
Sandy Hook Bay

Atlantic Ocean

Areas show in green are higher elevations and are less likely to flood, while areas in red are lower elevations and more prone to flooding.

HURRICANE SANDY'S STORM SURGE

Estimated Height of
Floodwaters (Feet)



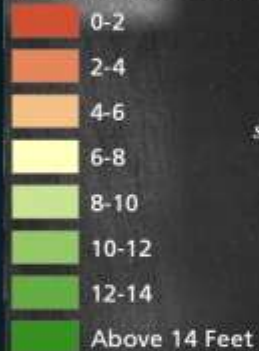
Sandy Hook Bay

Atlantic Ocean

FEMA, using tide gauges and post-storm observations, modeled the depth of flooding. This map shows which areas flooded during Hurricane Sandy. There is a strong correlation between the depth of flooding and elevation above sea level. The model does not account for wind or direction of storm.

ELEVATION AT SANDY HOOK BASED ON 2007 LiDAR DATA

Feet Above Sea Level



Sandy Hook Bay

Atlantic Ocean

HYPOTHETICAL EVENT: 7 FOOT STORM SURGE

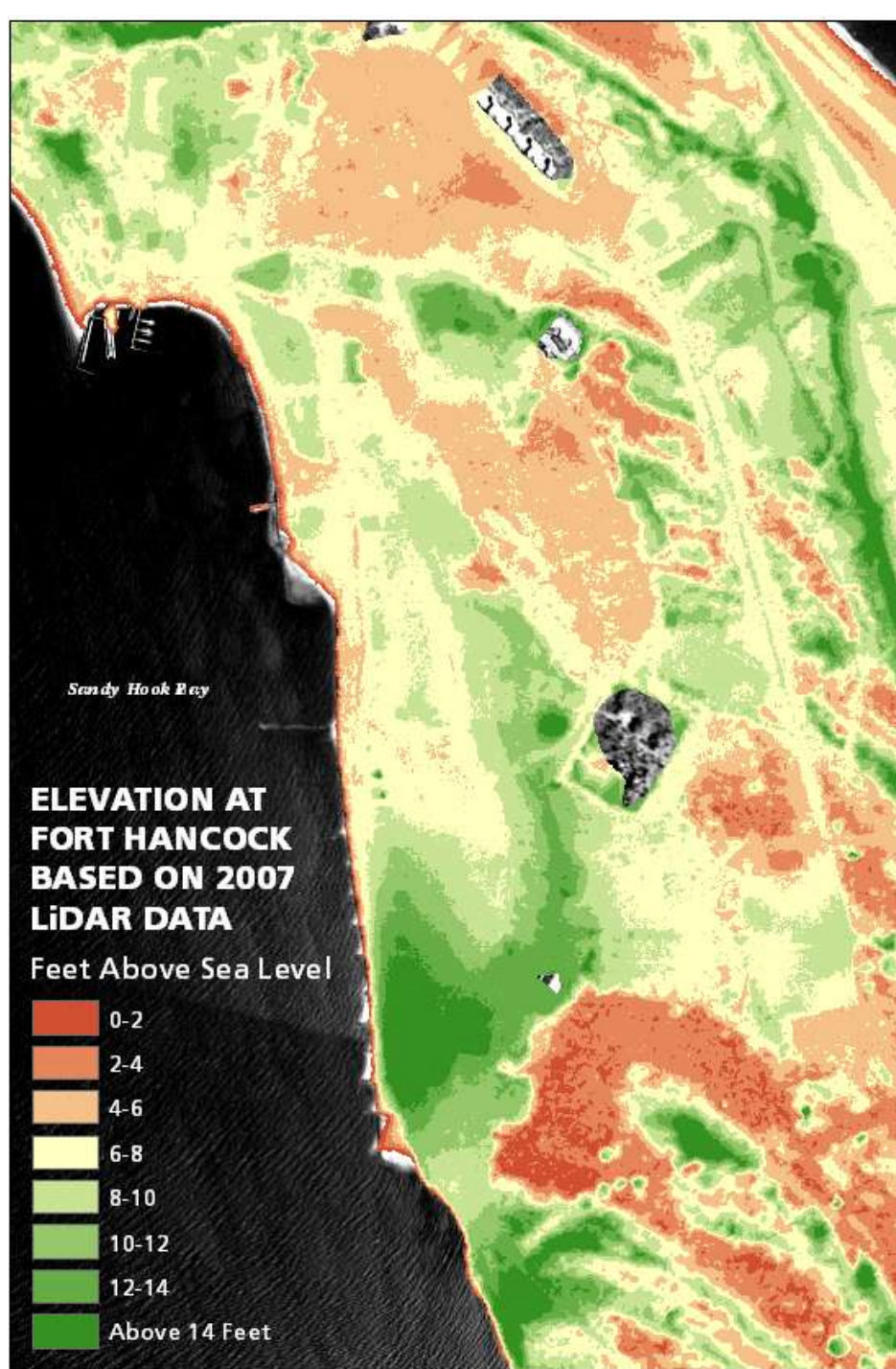
Estimated Height of
Floodwaters (Feet)

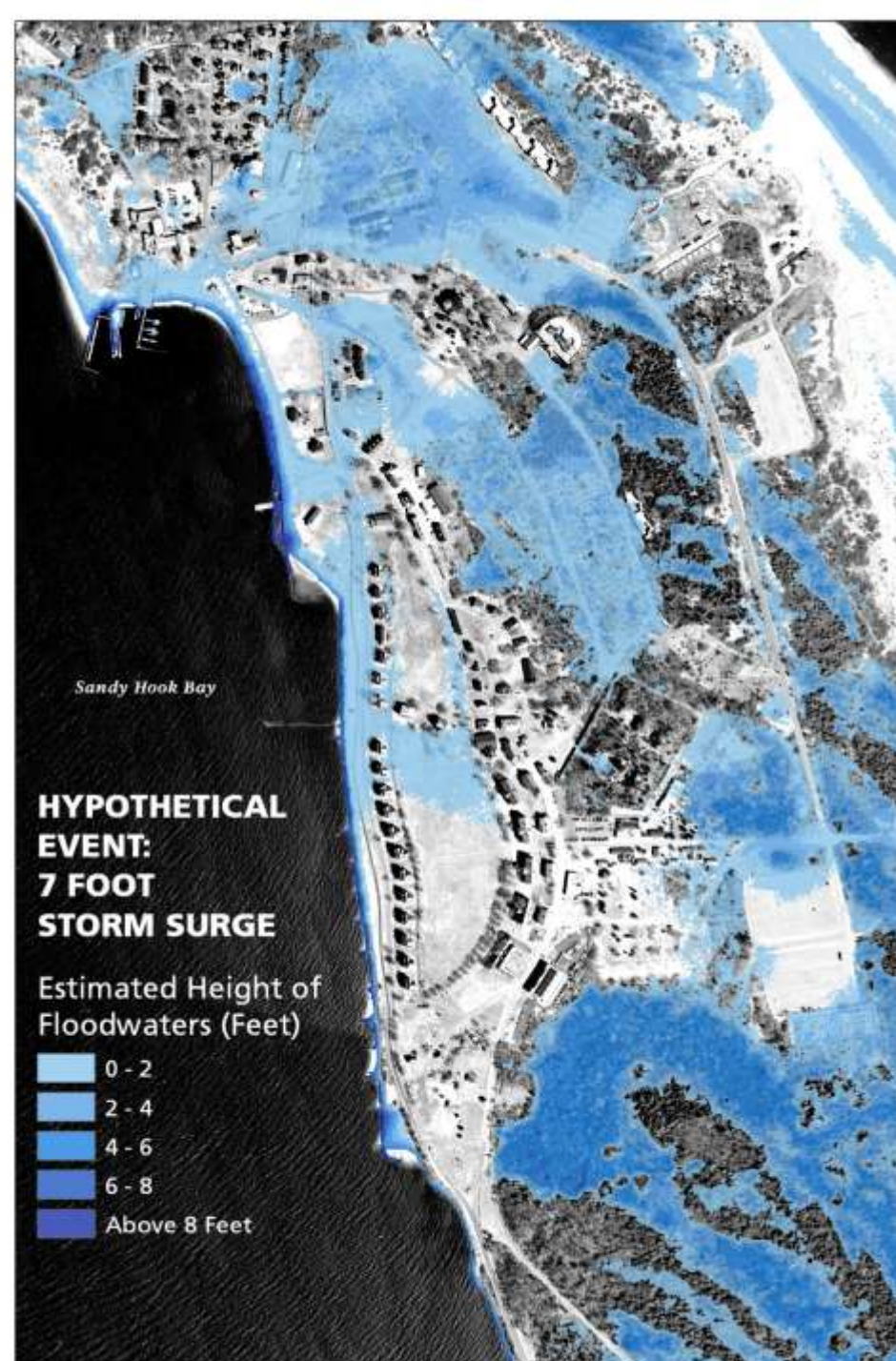
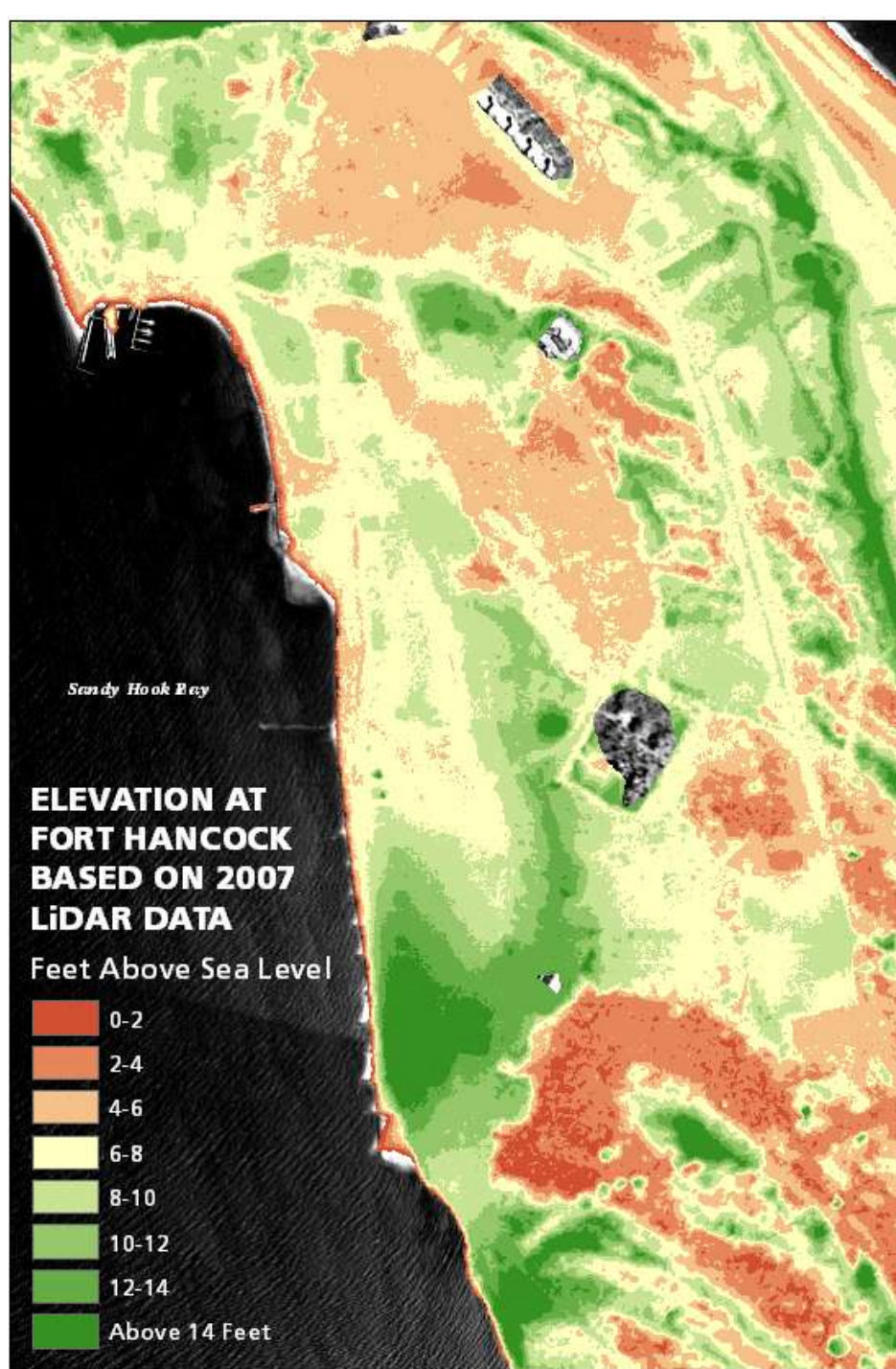



Sandy Hook Bay

Atlantic Ocean

Using historic storm data, we created a 7 foot flood model. This is similar to Hurricane Irene and the Dec. 1992 Nor' Easter that impacted Sandy Hook. This map shows which areas are likely to be flooded and to what depth. The following maps show the same data but zoomed into Fort Hancock.





An aerial photograph of Fort Hancock, showing a coastal area with buildings, roads, and vegetation. Several areas are outlined with yellow dashed lines, indicating they are still flooded three days after a storm on November 1st, 2012. The flooded areas are primarily in the central and lower parts of the image, surrounding some buildings and along a road. The coastline is visible on the left, and a large body of water is on the right.

The flooding that occurs during a storm is usually a short term event. The water begins to recede once the storm has passed and the tide begins to fall. This image was captured on Nov 1st, 2012, three days after the storm. Only the areas outlined in yellow are still flooded.

Fort Hancock areas flooded
as of Nov 1st, 2012

 Flooded Area Boundary



Current & Future Infrastructure

System	Type of System	Current Condition	Future
Sewer	Disinfected Clarifier System. Operated computerized controls.	Total 280,000 gal per day of the System - NJ License is 180,000 gal per day. Typical summer capacity is 120,000 gal per day. Currently only 30,000 gal per day- Manual (30 person capacity) operation causing limits.	Disinfected Clarifier System. Operated computerized controls. Submersible pumps and electrical panels will be placed higher with backup generators.
Water	Well – (1)	Water plant flooded, but up and running now. Water for individual building has not been tested therefore not available.	We are upgrading the plant and we placing electric controls higher up and backup generators.
Electric	Above ground & Underground (Combined) JCPL - Not waterproof.	Ground mount transformers and during Sandy they flooded.	All transformers have been replaced on the ground.
Telephone & Data	Hard wired line run underground – Verizon	None	All phone lines at SAHO are owned by GATE. Providers typically brings line to the property line. We will be hiring a contractor to look at best technology solutions.



Sandy Hook Unit

Potential Summer 2013

OPEN

- Beach Areas B, Gunnison and North
- Parking Lots B, G, I, J, K, L, and M
- Horseshoe Cove
- Lighthouse
- Multi-Use Trails (Fort Hancock)
- Ferry
- Some Fishing Areas (see map)
- Nature Trail
- Fisherman's Trail
- Camping
- Guardian Park (picnicking)
- The Chapel at Sandy Hook
- Mobile Restrooms
- Mobile Food Vendors



CLOSED

- Beach & Park Areas C, D, E, and F- (Prominent Beach area)
- Multi-Use Trail-Hartshorne Drive
- Theater
- Some Fishing Areas (see map)
- Concession in D and G (Majority of revenue at area D and Gunnison)
- Showers
- Visitor Center

Sandy Hook National Recreation Area
Anticipated Visitor Experience at Sandy Hook - May 1st, 2013

National Park Service
 U.S. Department of the Interior



Sandy Hook National Recreation Area
Anticipated Visitor Experience at Fort Hancock - May 1st, 2013

National Park Service
 U.S. Department of the Interior

