Interactions of Water Bodies with Transportation Infrastructure in Nassau and Suffolk County

Task 2.1:

SBU lead – Chris Gobler

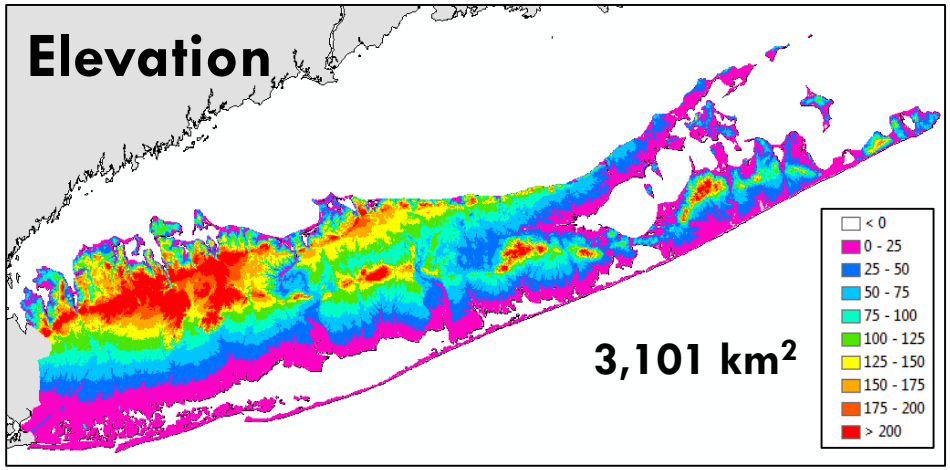
Resiliency Institute for Storms & Emergencies

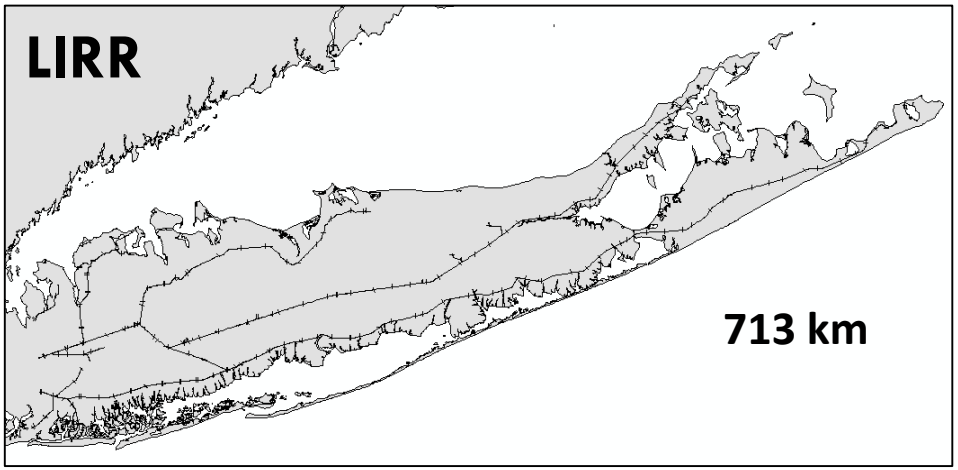
TASK 2.1 OBJECTIVES, SBU

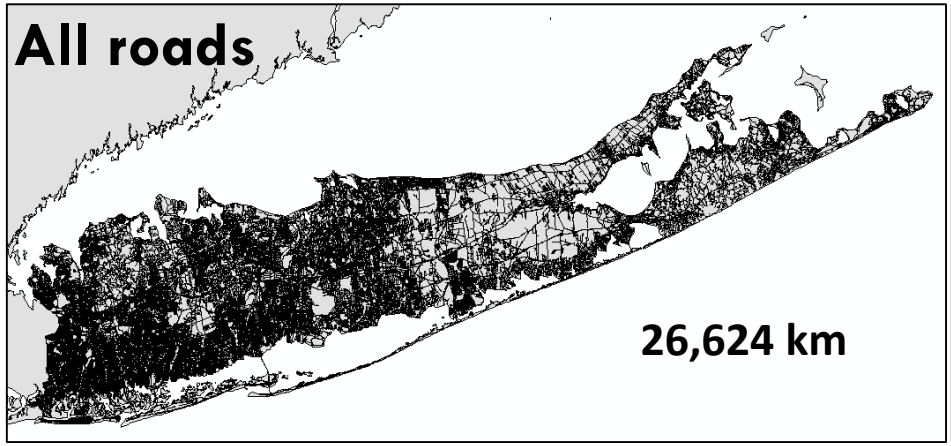
Using a geospatial approach to assess the vulnerability of Long Island's road and rail network during:

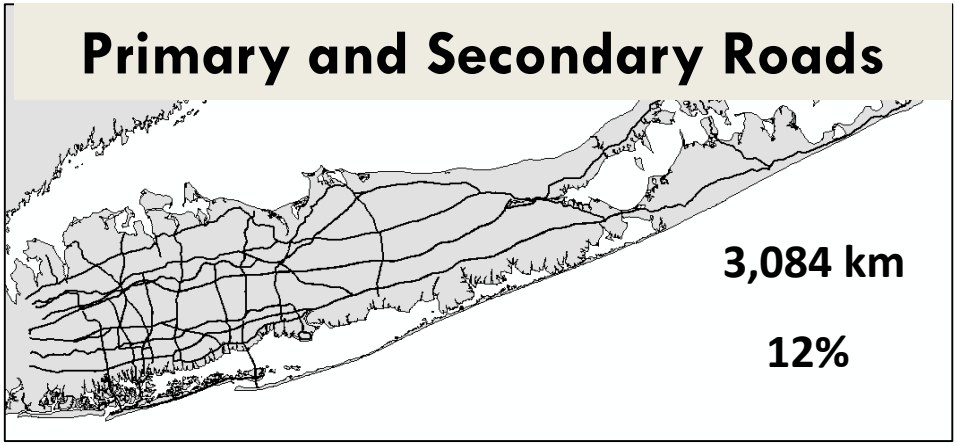
- **Multiple sea level rise scenarios**.
- **Hurricane Sandy and multiple coastal storm surge scenarios**.

RESULTS – GIS PLOTS









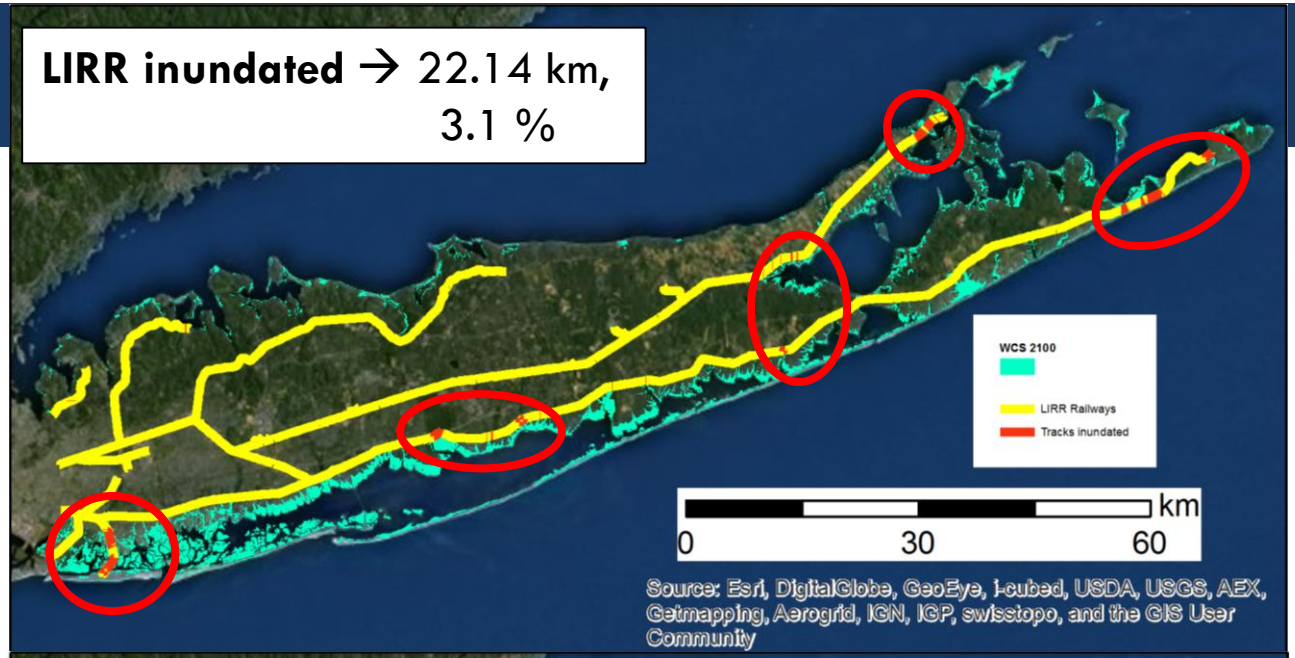
km
0 30 60

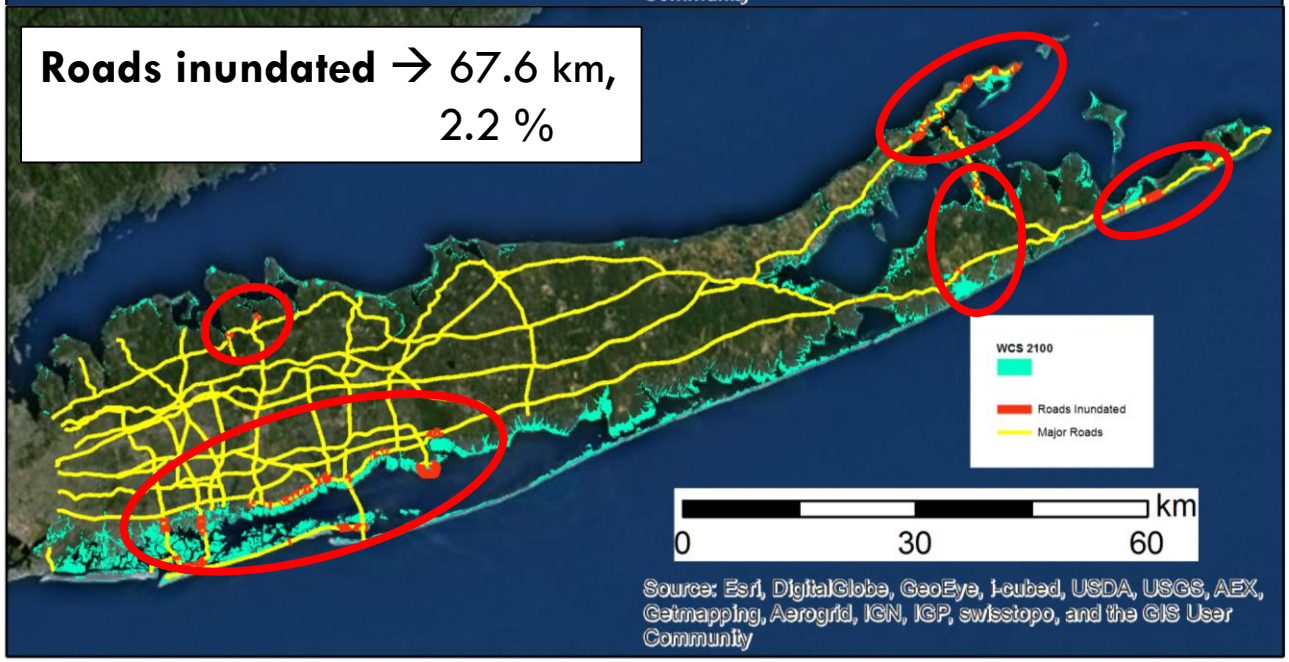
NAD 1983 UTM Zone 18N

How will sea level rise effect flooding of roads and rails?

Sea Level Rise: Year 2100 (6.6ft)

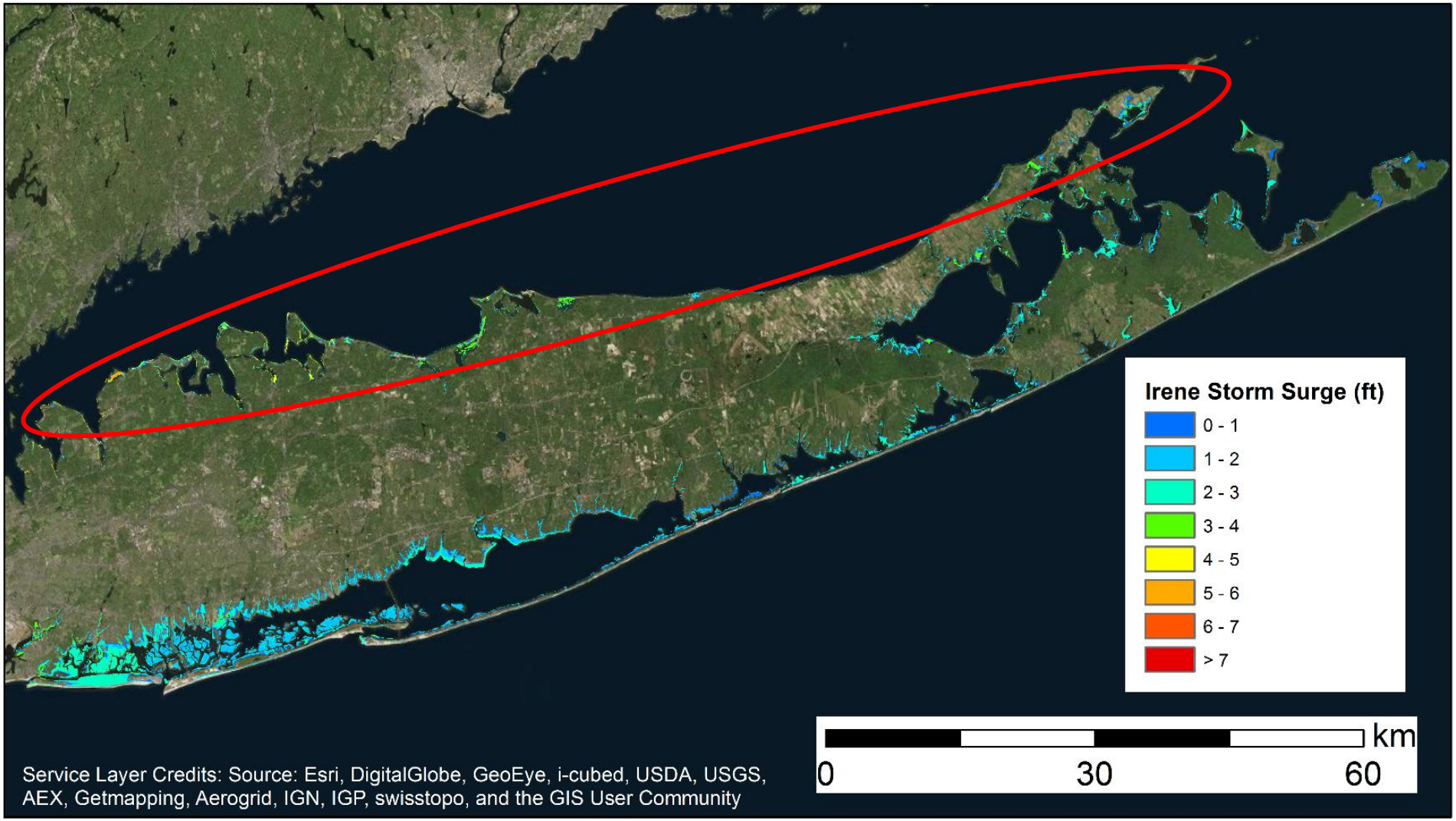
Land Inundated:
270 km²
= 8.7%





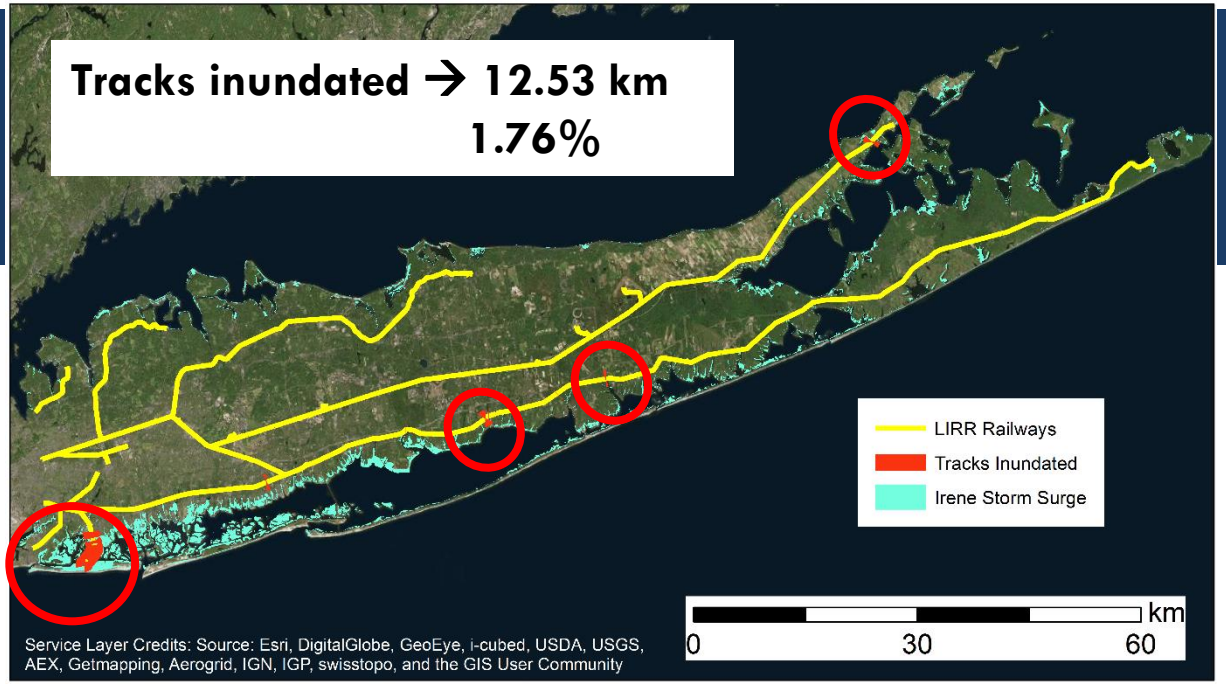
Hurricane Irene

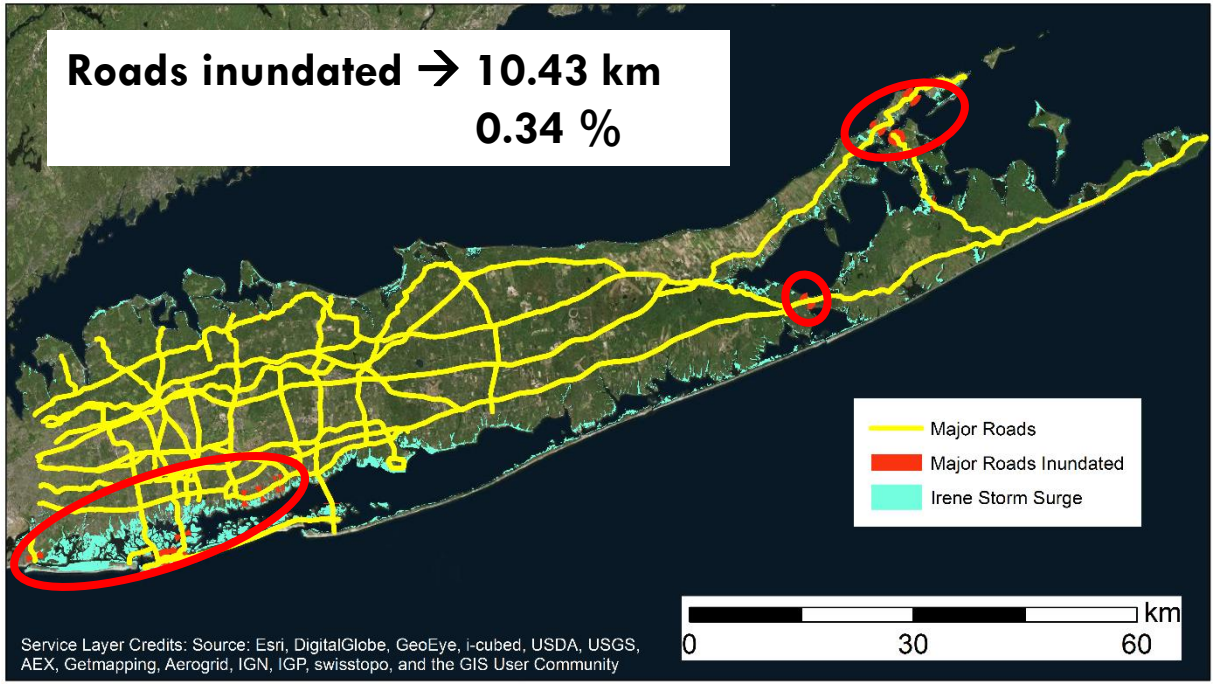
Hurricane Irene



Land Inundated = 187 km^2, 6 %

Hurricane Irene

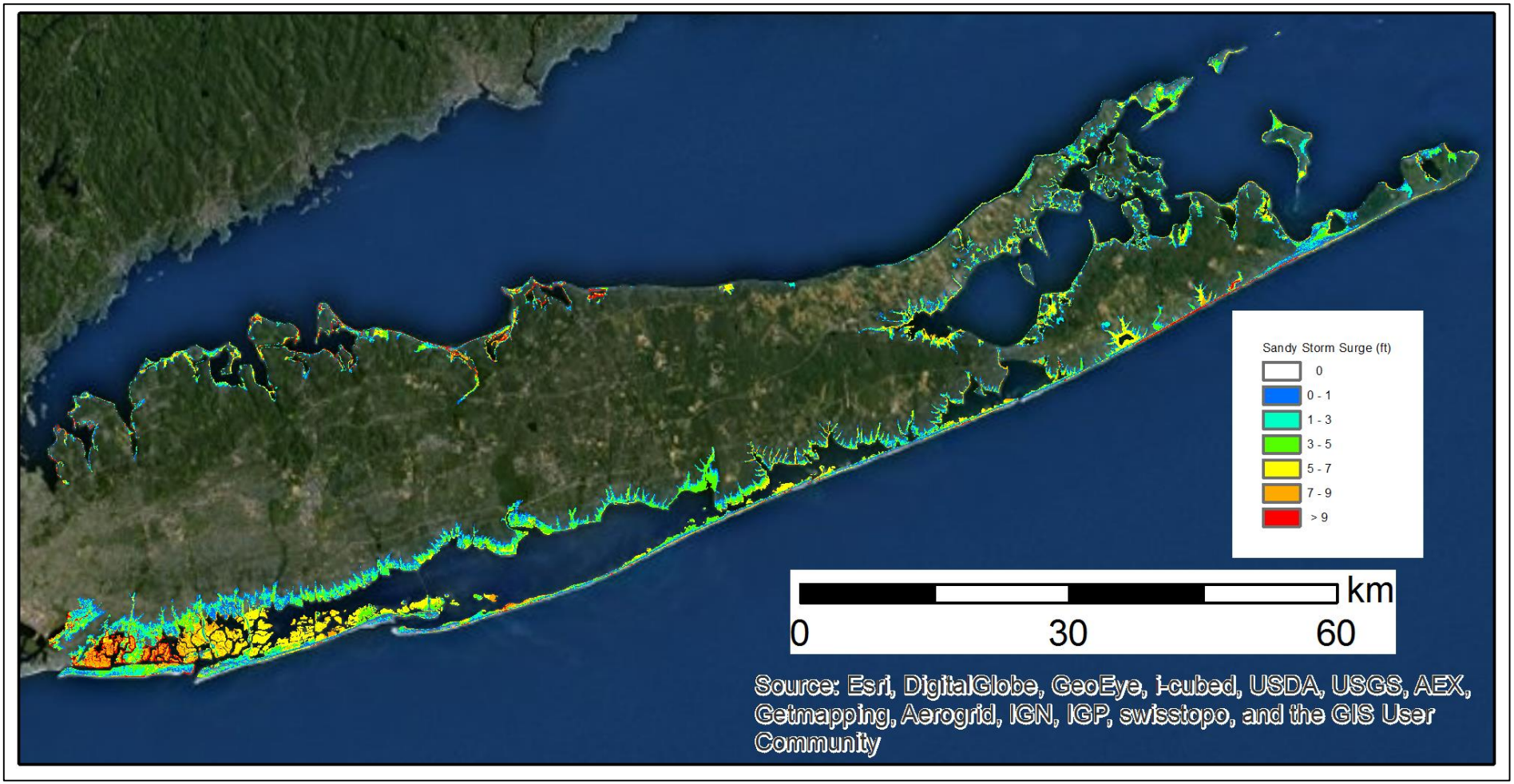




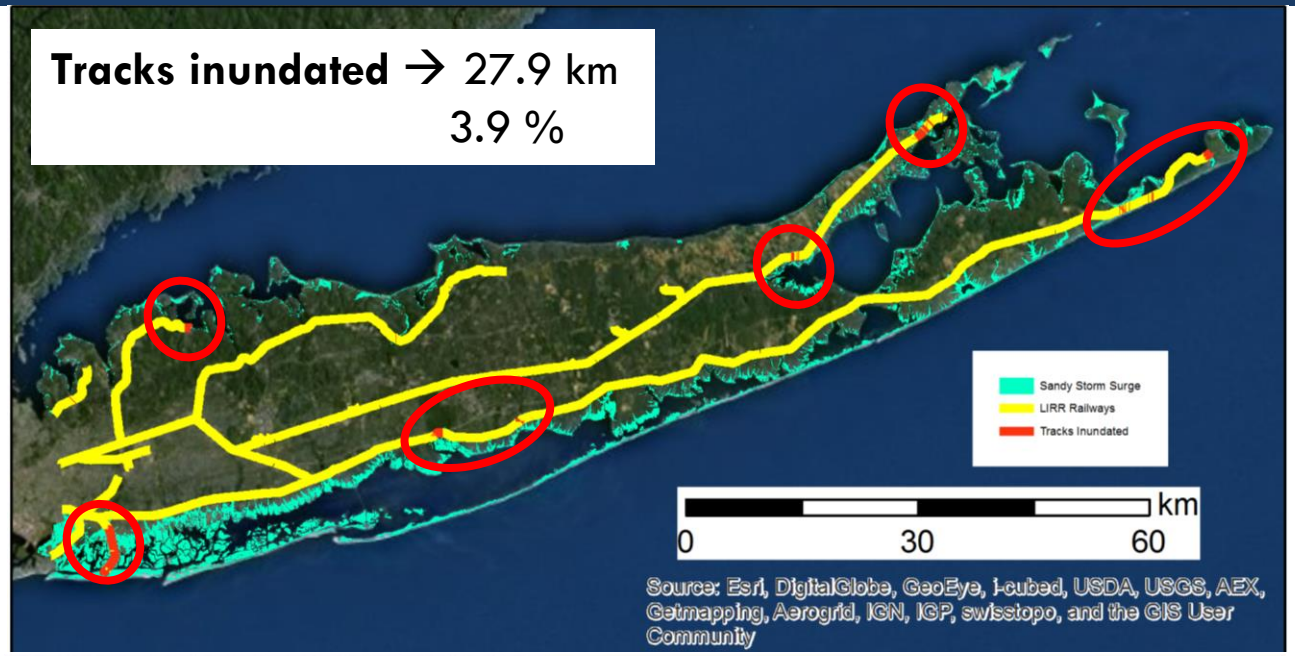
Superstorm Sandy

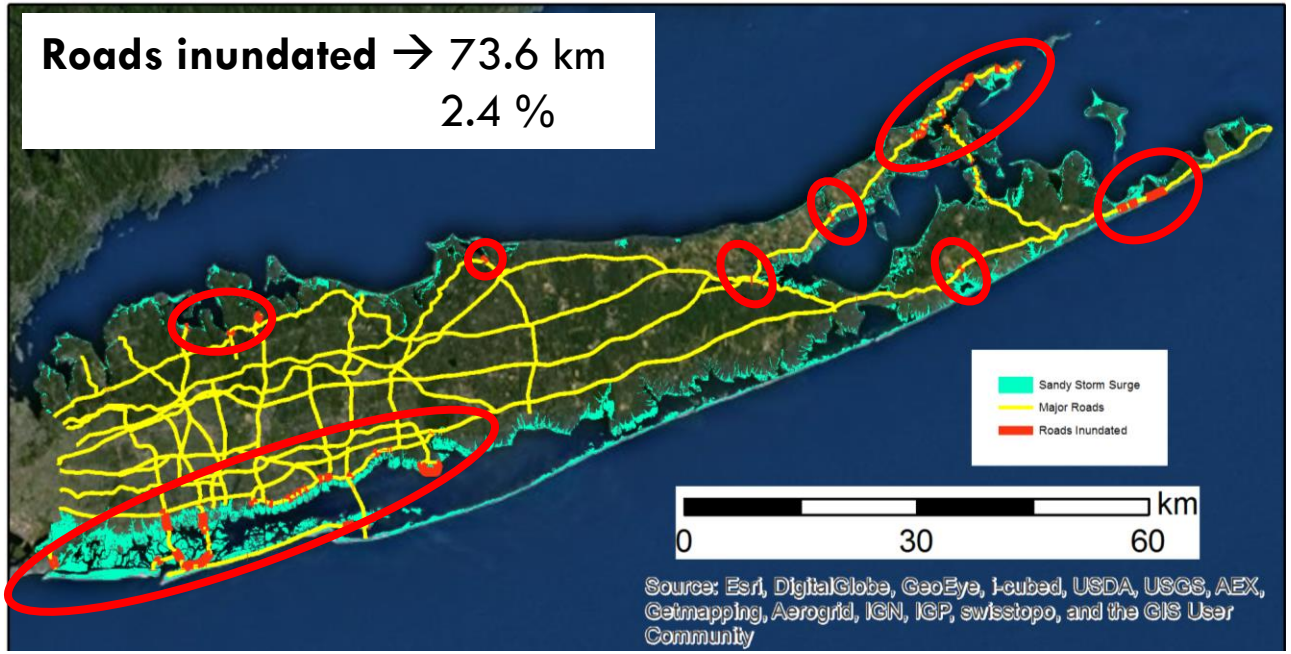
Superstorm Sandy

Sandy: 334 km^2 inundated, 11% of land



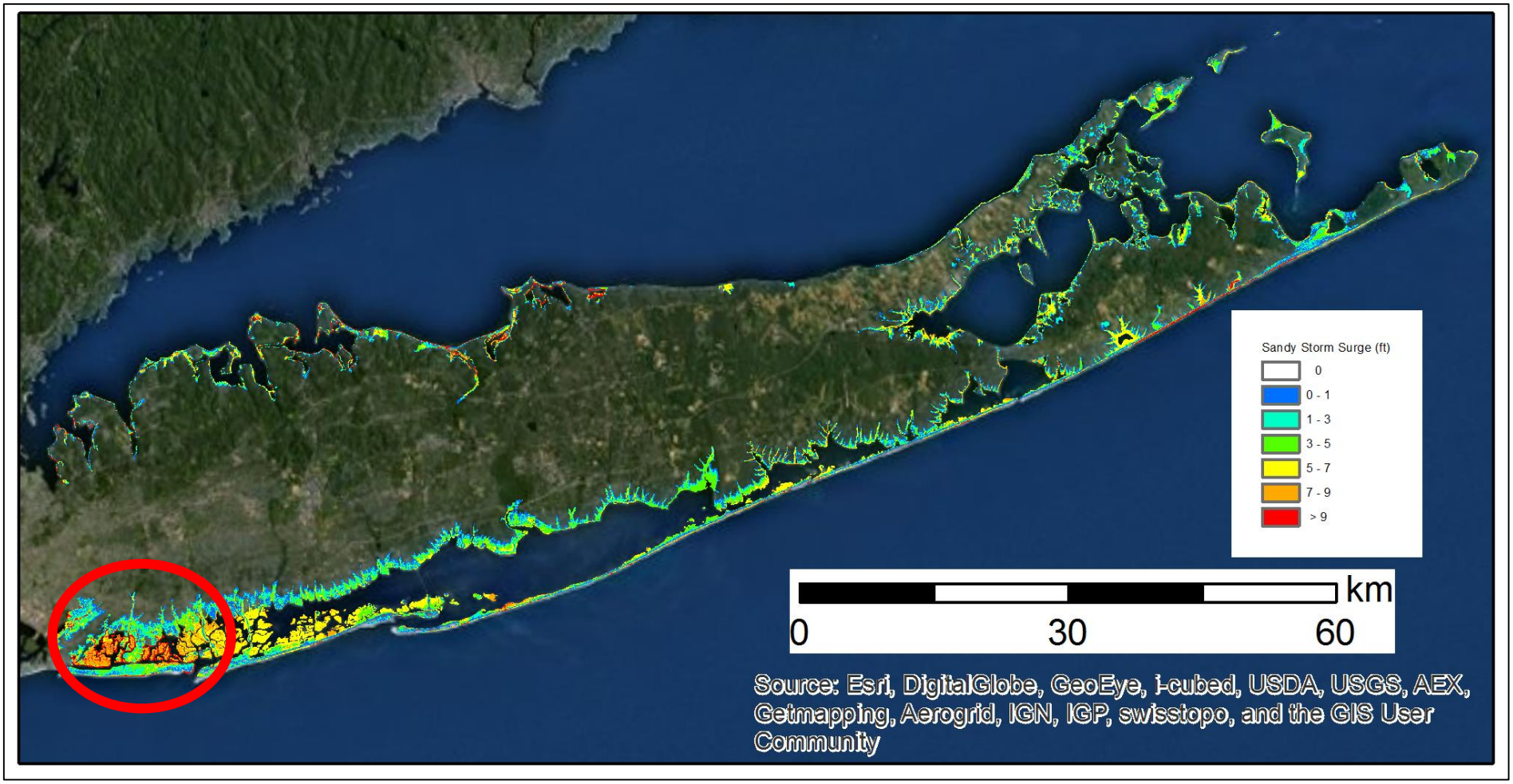
SUPERSTORM SANDY





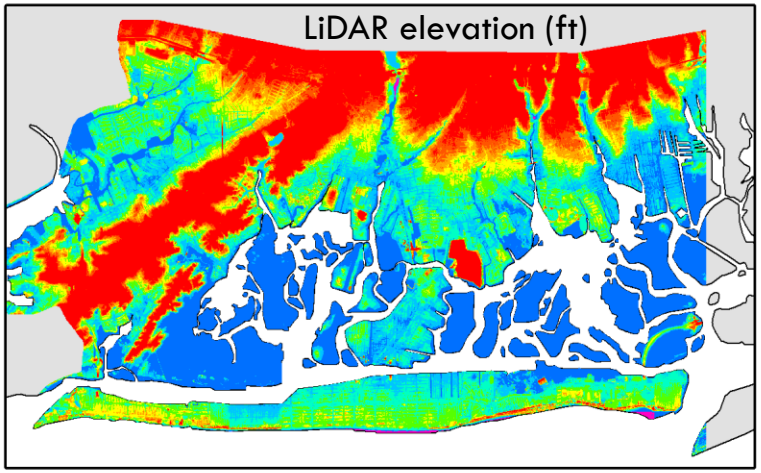
NAD83 18N

Superstorm Sandy



NAD83 18N

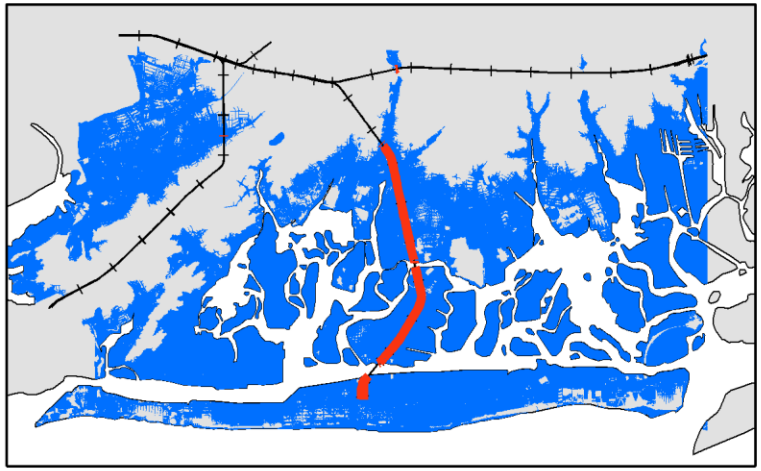
Focus on southwest Nassau County



Roads/Rails inundated

Surge/Sea level rise

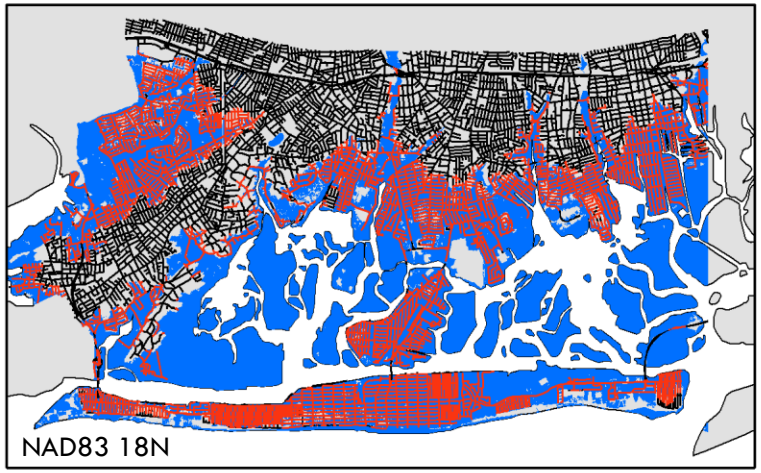
km
0 5 10



Rails

← **Sandy**
15.5 km (19.4%)

SLR 2100 →
8.5 km (10.6%)

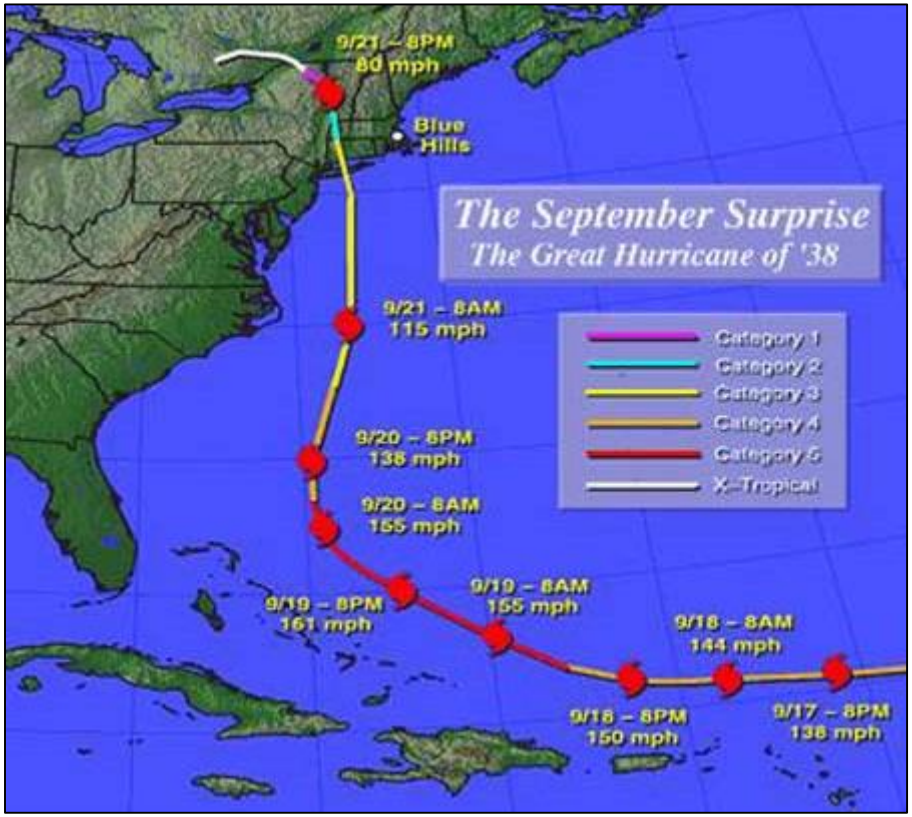


Roads

← **Sandy**
585 km (49%)

SLR 2100 →
333 km (28%)

HURRICANE OF 1938



The Patchogue Advance

LONG ISLAND'S LEADING NEWSPAPER

Late Bulletin

PATCHOGUE, N. Y., FRIDAY, SEPTEMBER 23, 1938 — 16 Pages — Five Cents

21 Deaths from Hurricane in Suffolk; Many Missing; Damage Totals Millions

Death List Of Storm In Suffolk

The Worst Storm Loss, Many Years

Colonies on Beaches Demolished — Mainland Also Hard Hit

Villages and Towns Have Big Task Clearing and Repairing Roads, Docks and Bridges

Less Than Score Buildings Intact At Cherry Grove

Harry T. Weeks Describes Scene at Beach Colony

Frightful Scenes at Whampton

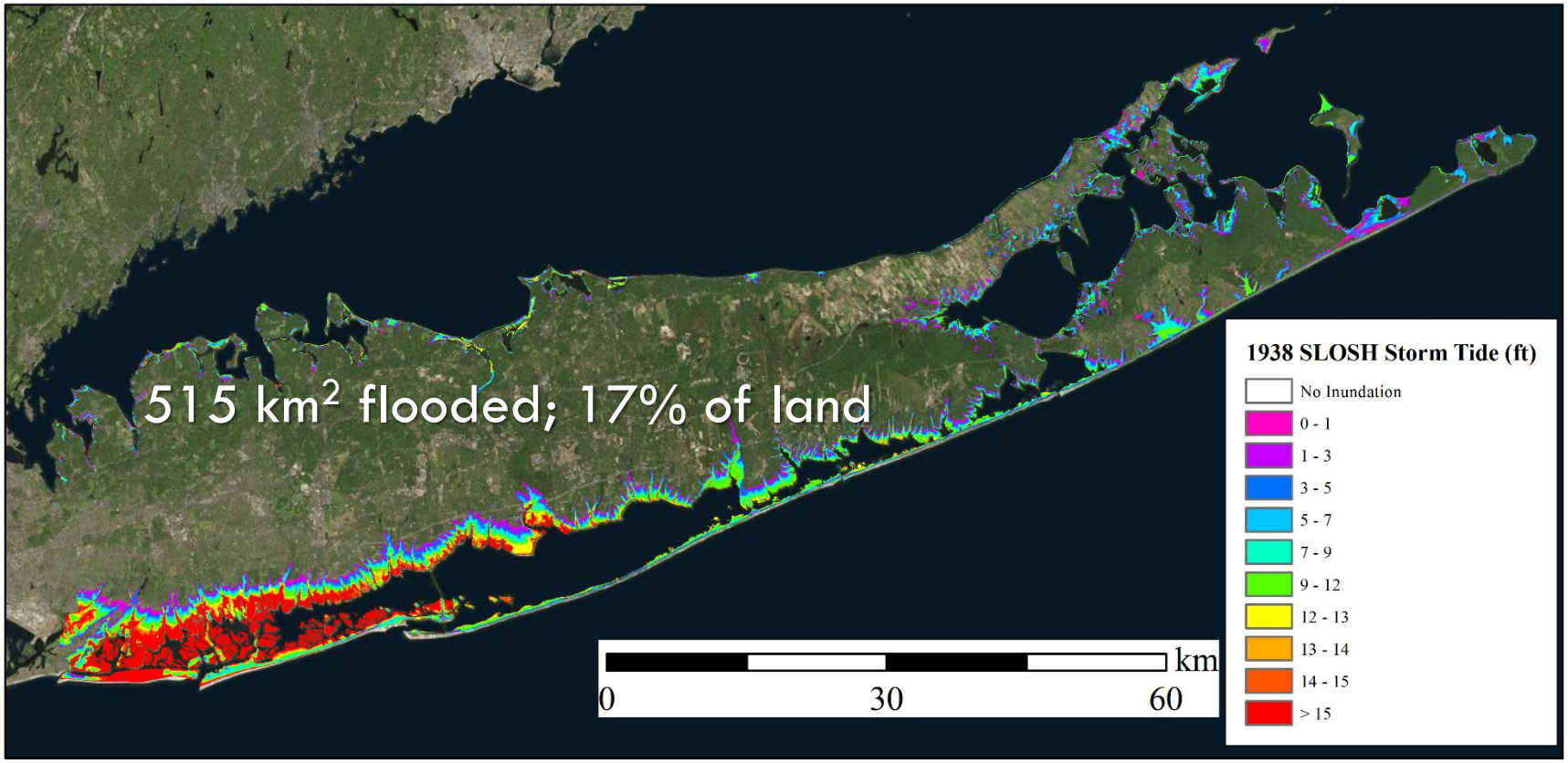
Survivors Tell of Giant Waves

By JOHN T. TUTHILL, JR.

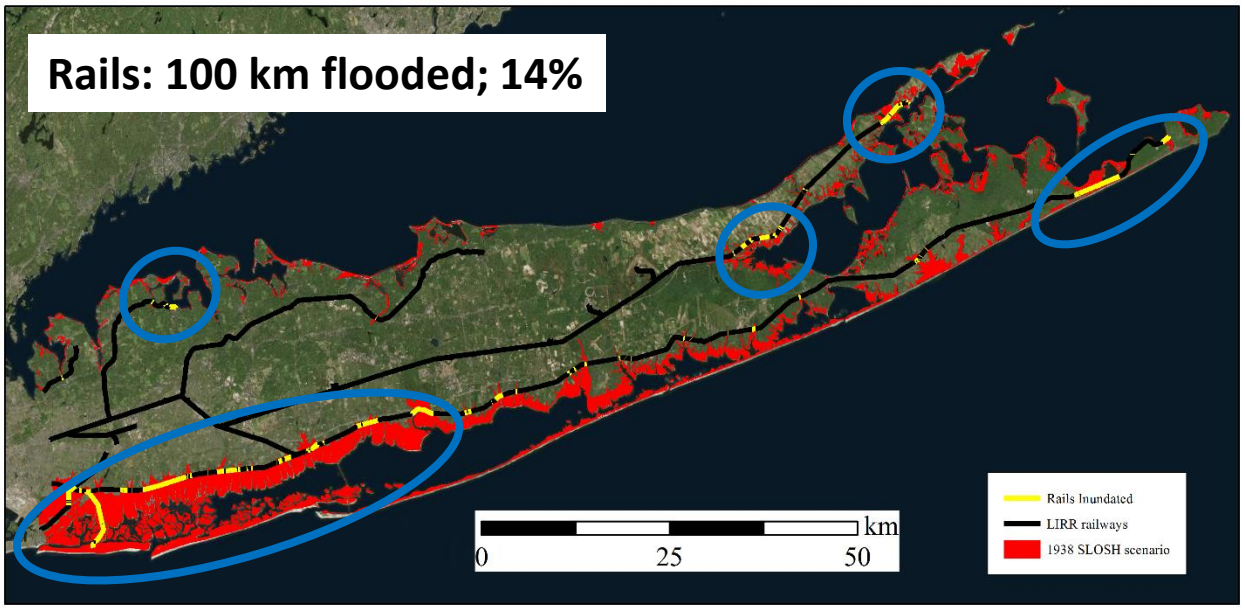
WATERSIDE —

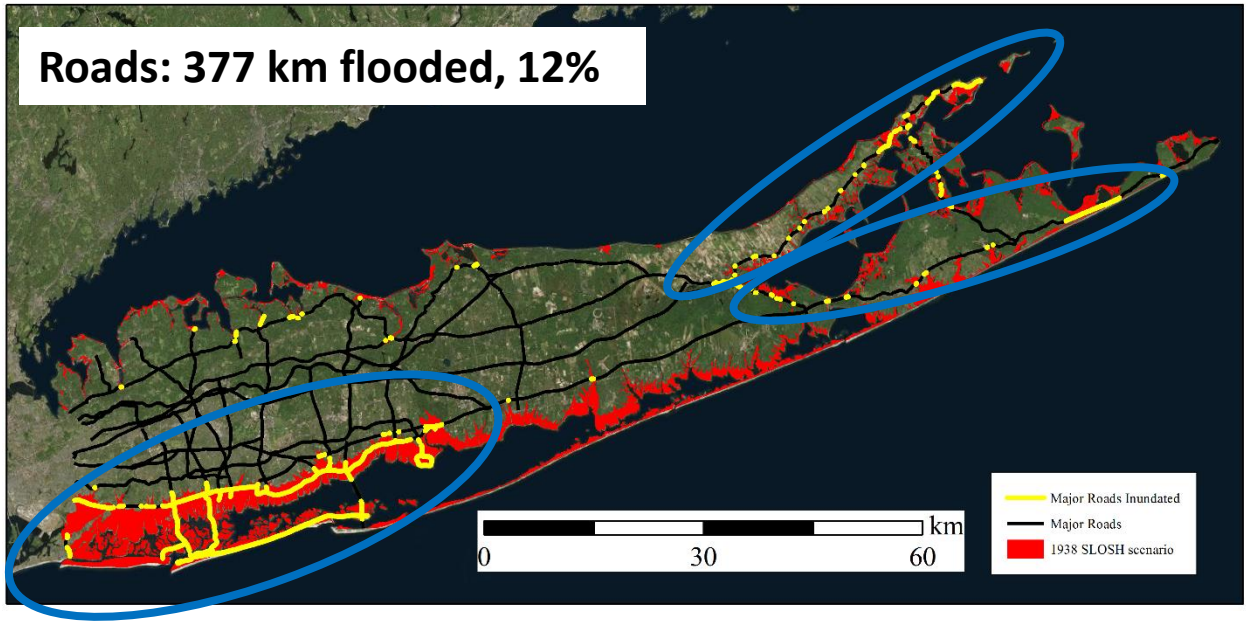
Moving north at 70MPH, Category 3 hurricane; landfall at high tide; fastest moving storm to hit NYS; different storm trajectory than Sandy and Irene; landfall over Suffolk County

Hurricane of 1938



Hurricane of 1938





Conclusions

- Sea level rise 2100: >2% & >3% of roads and rails
- Storm Surge from Sandy caused major inundation; almost 4% of rails and almost 2.5% of major roads
- Hurricane of 1938 flooded 12 and 14% of roads and rails.
- Southwest Nassau County roads and rails are most vulnerable to flooding.
- The North and South fork of eastern Suffolk County flooded under all scenarios; creates evacuation danger.
- Evacuation planning, stabilizing vulnerable roads and rails, improving infrastructure, and further studies are needed to protect Long Island transportation systems.
- Evaluation of multiple storm scenarios using LIDAR elevation data could provide NYSDOT with tools not currently available to them.