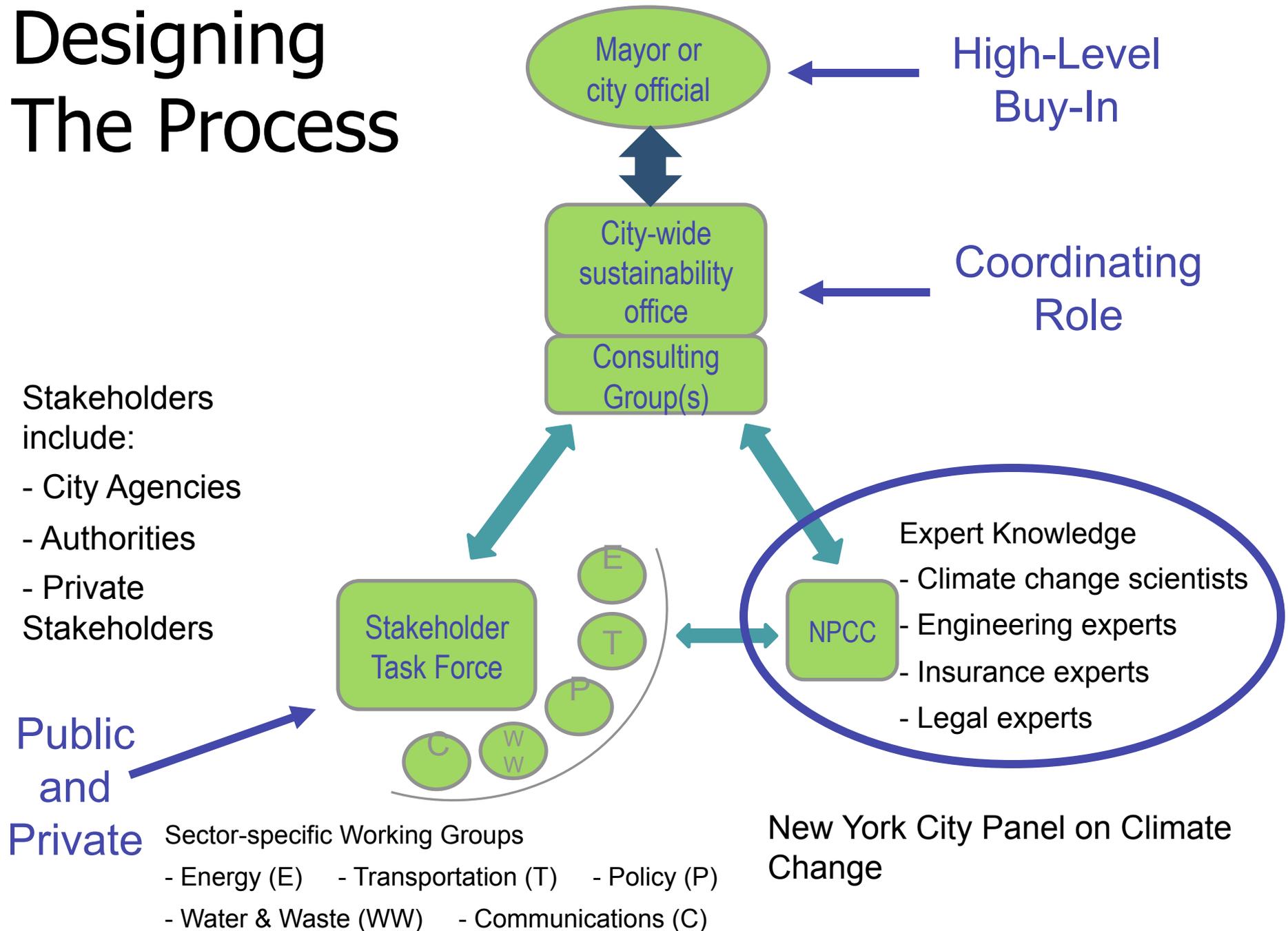


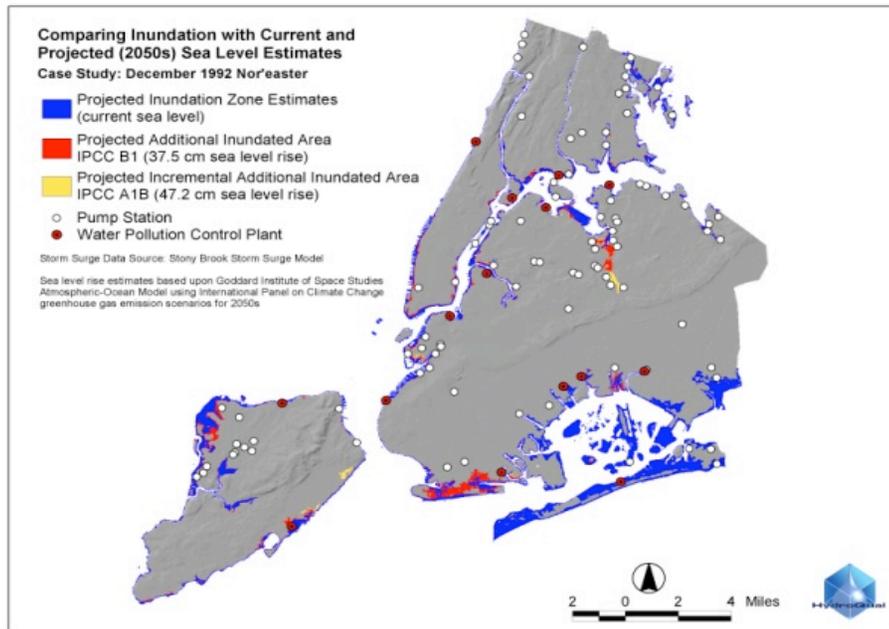
# Center for Climate Systems Research

- **Mission: To provide climate and climate impact information to stakeholders for climate solutions**
- **Key Projects**
  - **Climate projections, impact and adaptation assessment for NYC, NY state**
  - **Climate change risk in the urban northeast (NOAA-RISA)**
  - **Coordinating science lead for NASA centers' climate change adaptation activities**
  - **Climate decision support for agriculture in the Southeast U.S. and Central America**
  - **Climate change impacts in Bangladesh**
  - **Global crop modeling project**

# Designing The Process



# Key Risks and Integrated Impacts: Sea Level Rise and Infrastructure



Lamont-Doherty Earth Observatory, Google Earth, and NYSEMO

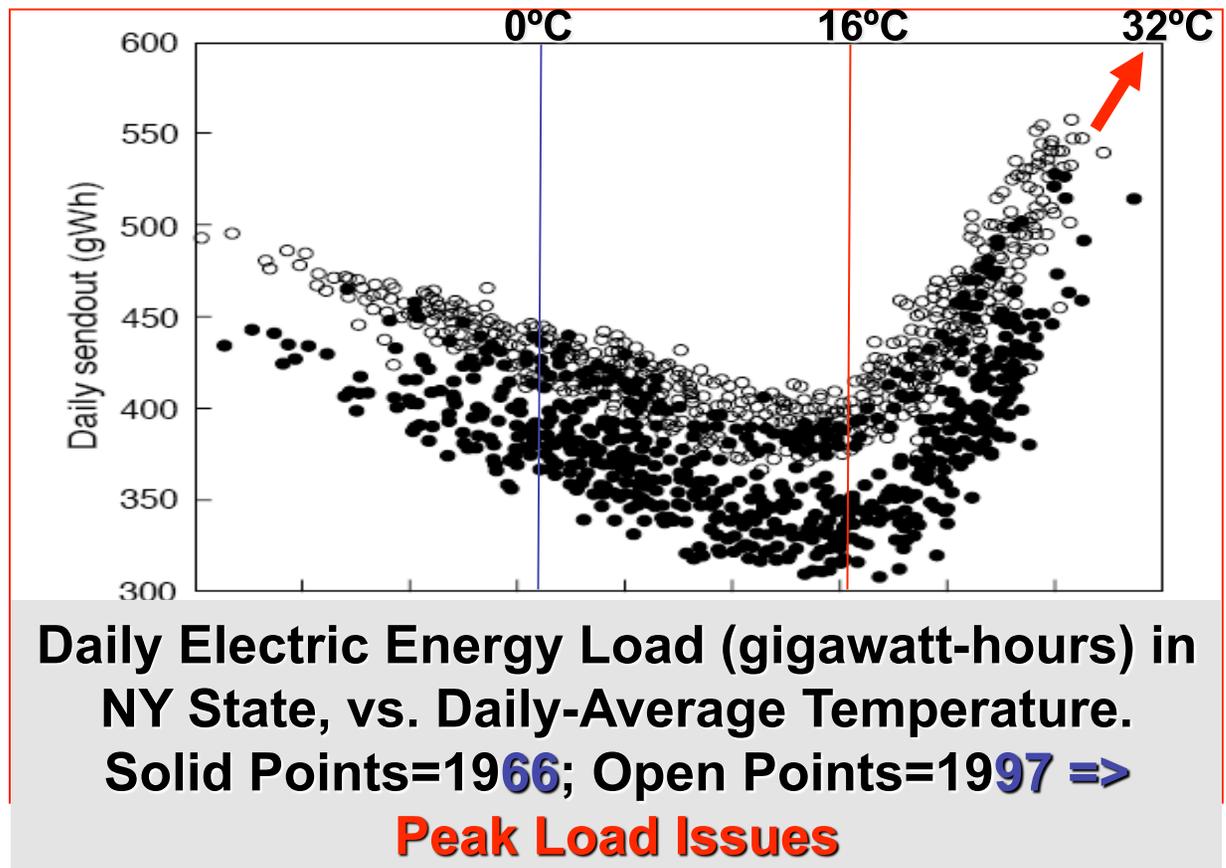
**Infrastructure  
disproportionately  
affected:**

**Wastewater Treatment  
Plants  
Harbor Facilities  
Roads  
Airports**

## Impacts: Heat Waves and the Energy and Health Sectors (1)

**During heat waves, even a small increase in temperature can mean a large increase in energy load....**

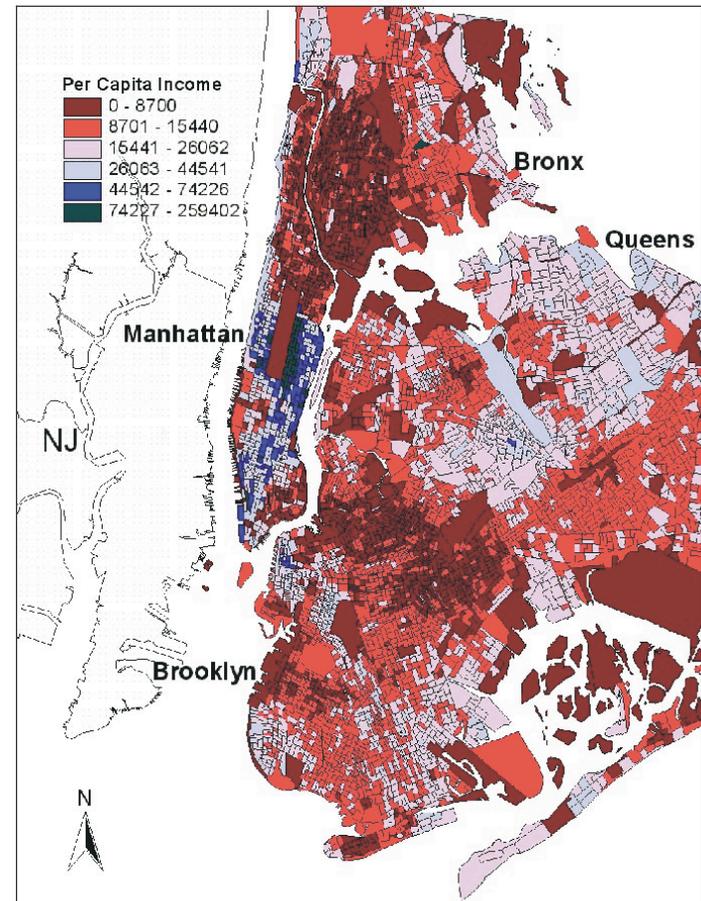
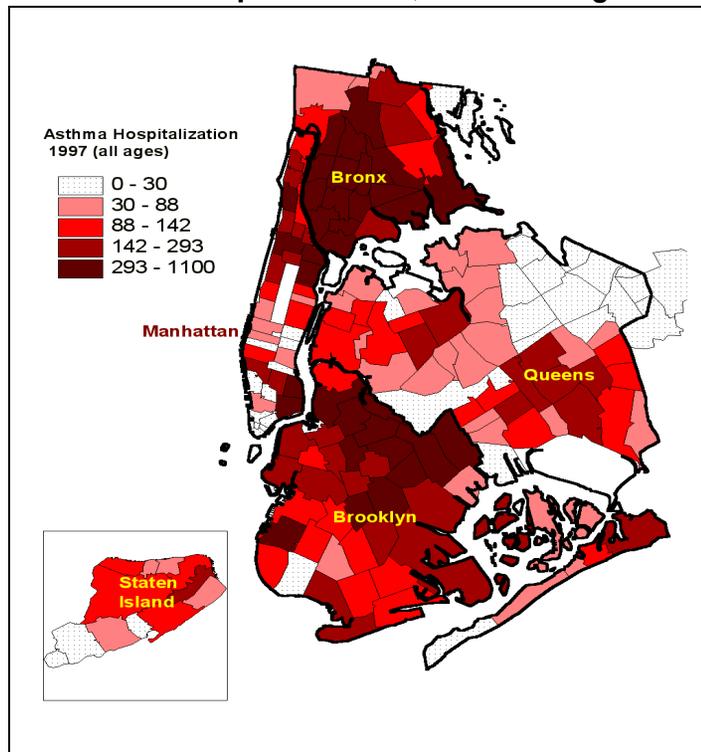
**...Leading to an increased risk of power outages**



**= More stress on systems**

# Impacts: Heat Waves and the Energy and Health Sectors (2)

## Asthma Hospitalizations, 1997 –All Ages

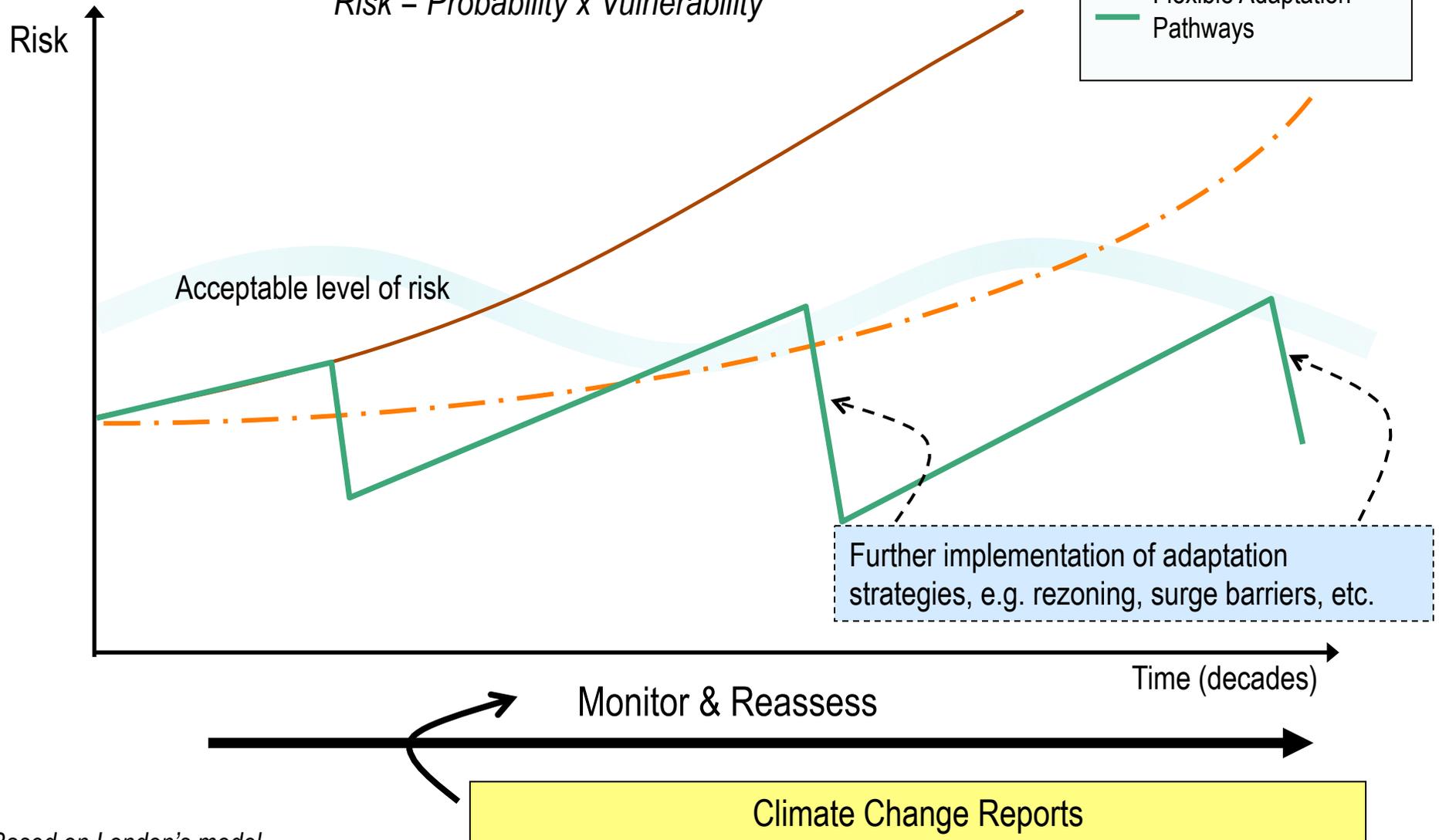


**Vulnerability**  
**Non-linearity**  
**Remote climate hazards**  
**Combined effects of multiple climate hazards**  
**= Cascading uncertainty**

# Flexible Adaptation Pathways

*Flexible Adaptation Pathways to managing flood risks*

$$\text{Risk} = \text{Probability} \times \text{Vulnerability}$$



*Based on London's model*

# Potential Uses

- **Repository for large data sets, processed in multiple formats**
  - **Indicator and monitoring networks**
  - **Basic analysis kit**
  - **Visualization tool**
- **Integrated impact modeling**

# Coastal Flood Risk for NYC Subways



**Worst-track storm surge flood zones for Saffir-Simpson Cat.1 in red, SS2 in brown, SS3 in yellow, and SS4 in green. Shaded lines are subways, black lines are rail systems.**

**Lamont-Doherty Earth Observatory, Google Earth, and NYSEMO**