

# Vulnerability Assessment Demonstration and Application

*Panelists:*






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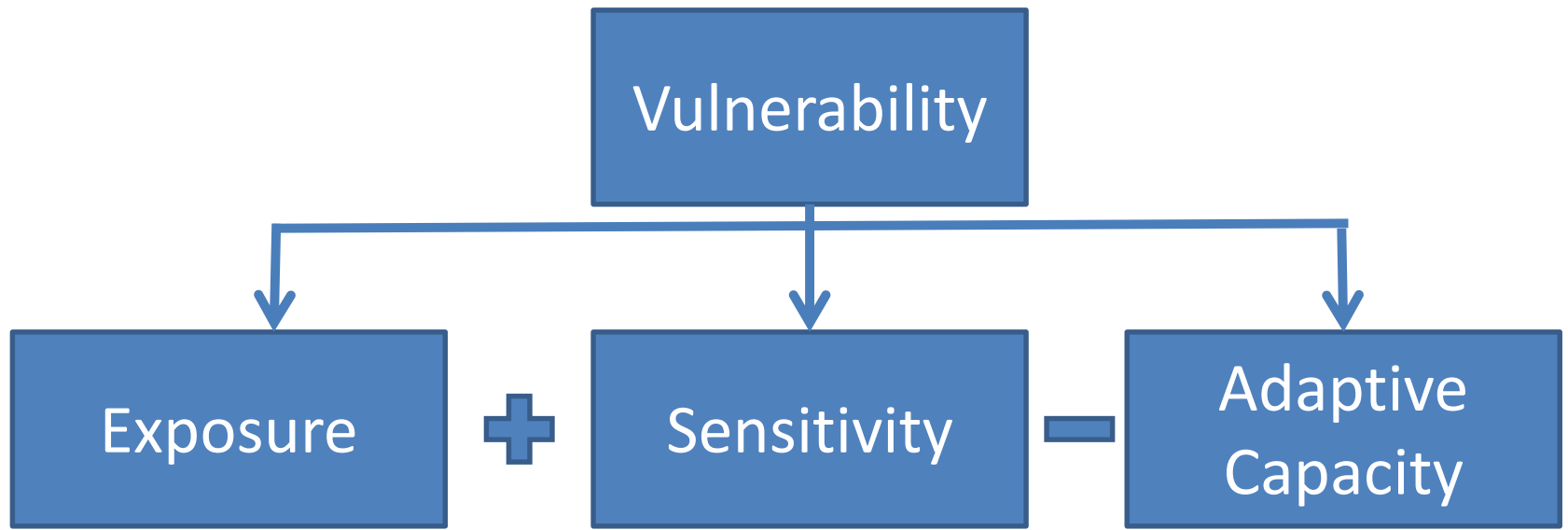
**Caterina Massida, Data Analyst, CIRCA**

**Jessica LeClair, Program Manager - Community Engagement & Outreach, Sustainable CT**



# Why Vulnerability Assessment?

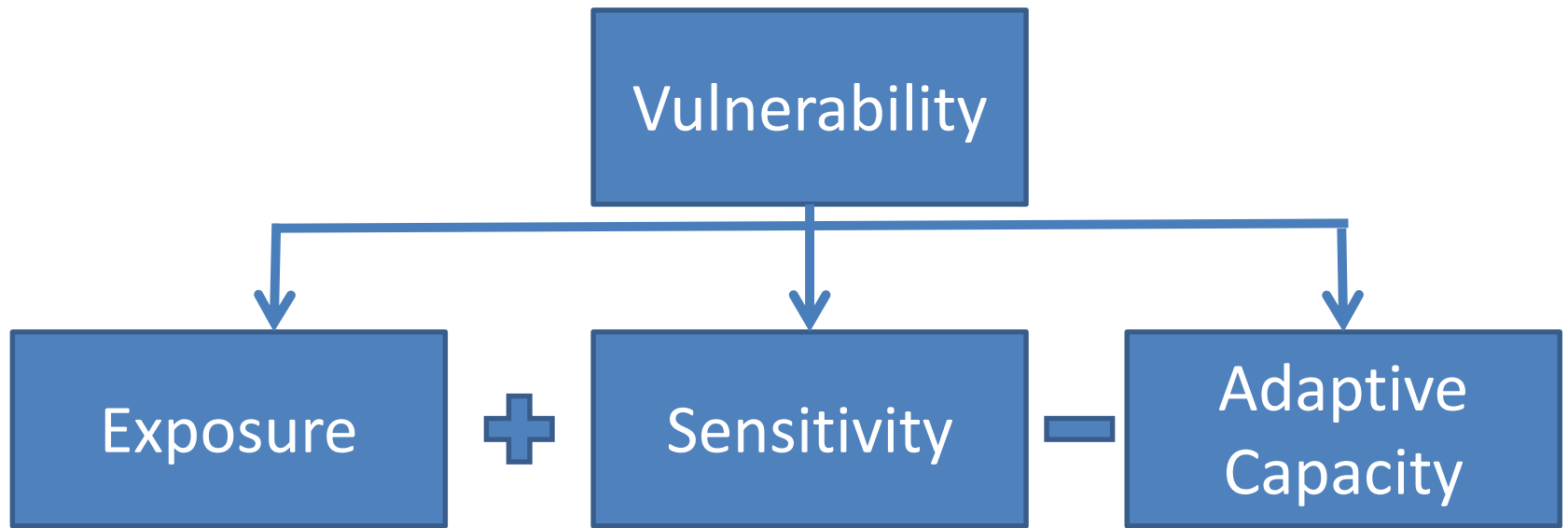
-  Understanding when and how to adapt
-  Evaluating existing and future vulnerabilities to climate change
-  Inform & prioritize projects in urban land use planning
-  Identify impacts to community assets
-  Strategically allocate limited resources



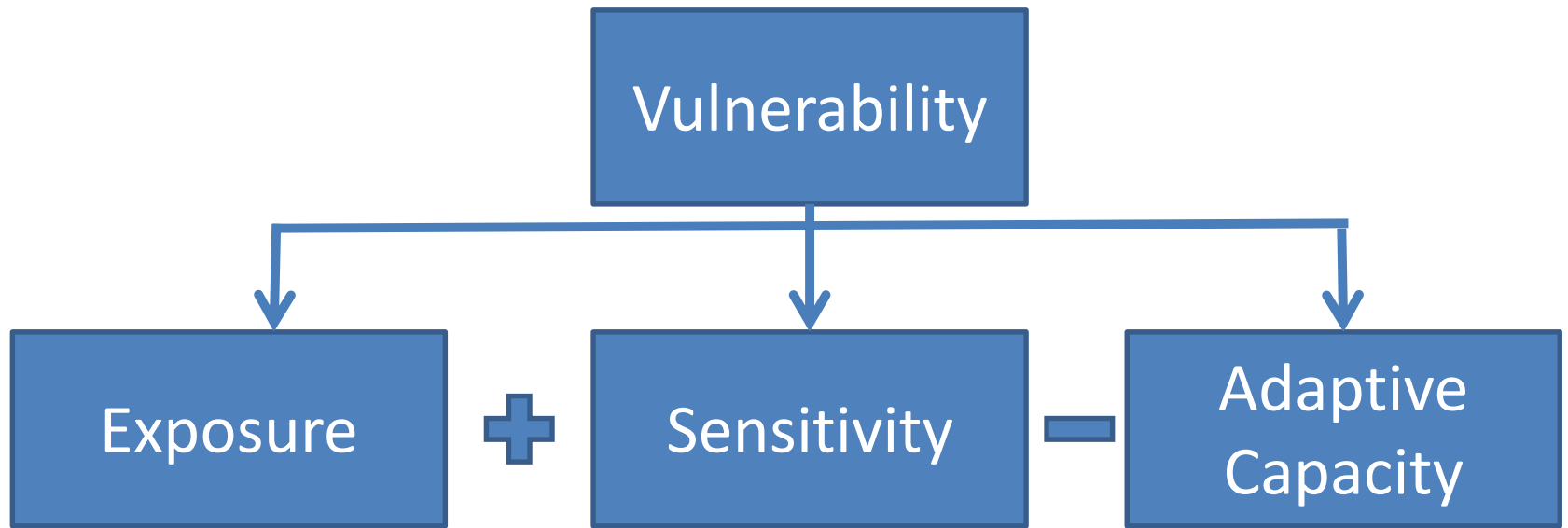
Magnitude of the  
climate change

Degree of Impact

Ability to Cope



Elevation	Building	Income
Low-lying	Structure in flood plain	Uninsured
Ridgeline	Elevated structure	Insured



**Exposure (E)**

- Flood inundation
- Slope
- Storm surge
- Wave power
- High tide
- Soil flooding

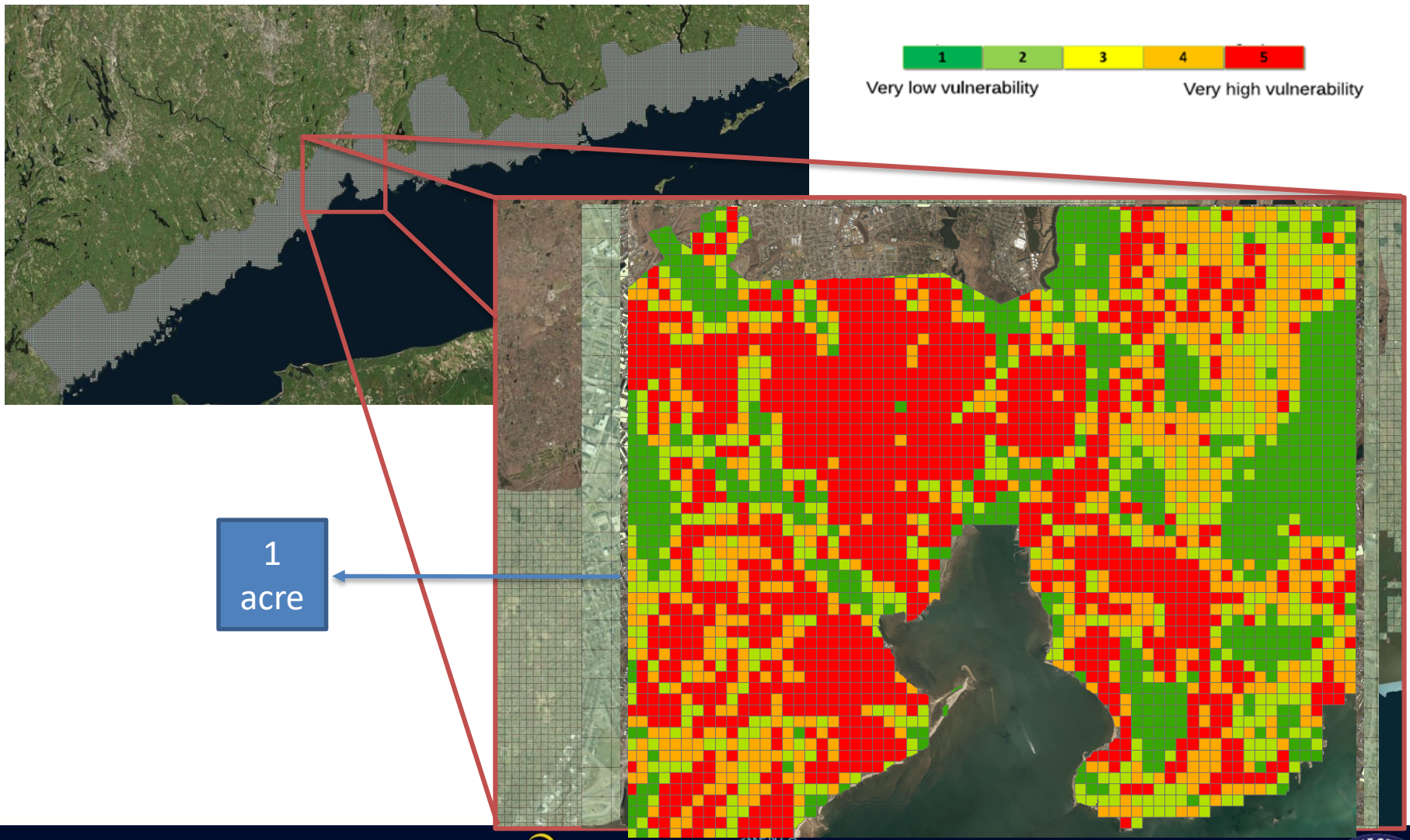
**Sensitivity (S)**

- Population density
- Land use
- Child and elderly population
- Low income and non-working population

**Adaptive Capacity (AC)**

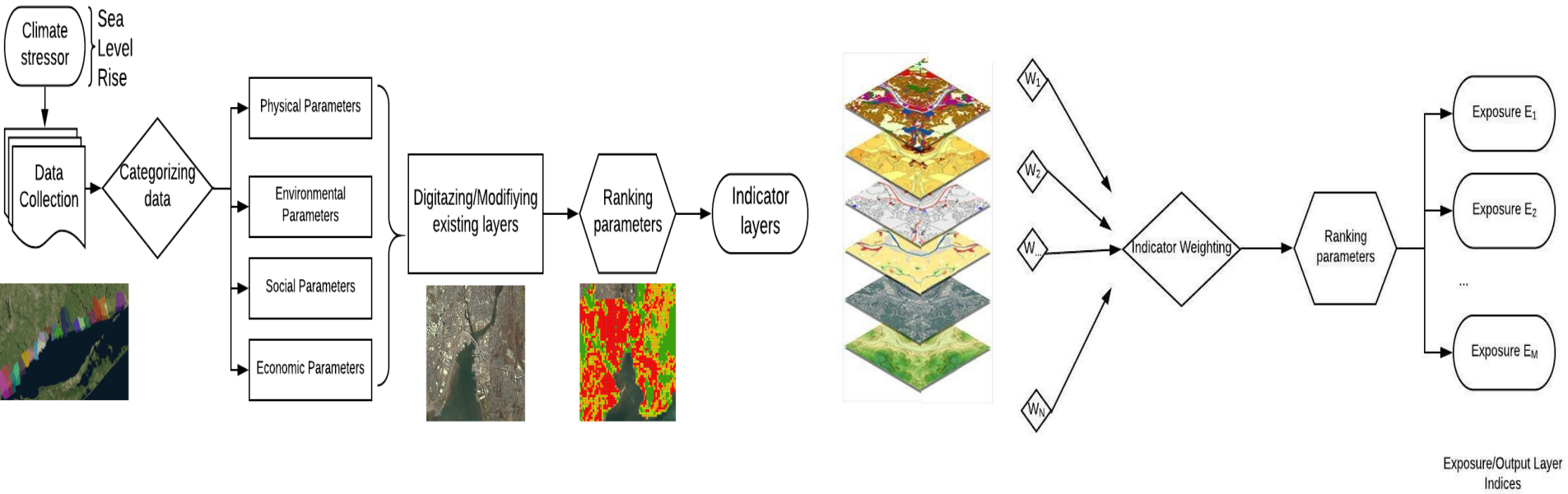
- Shelters
- Proximity to I-95
- Resilience Infrastructure
- Natural habitat

# Design of Coastal Vulnerability Index





# Methodology



# Multi scale Assessment

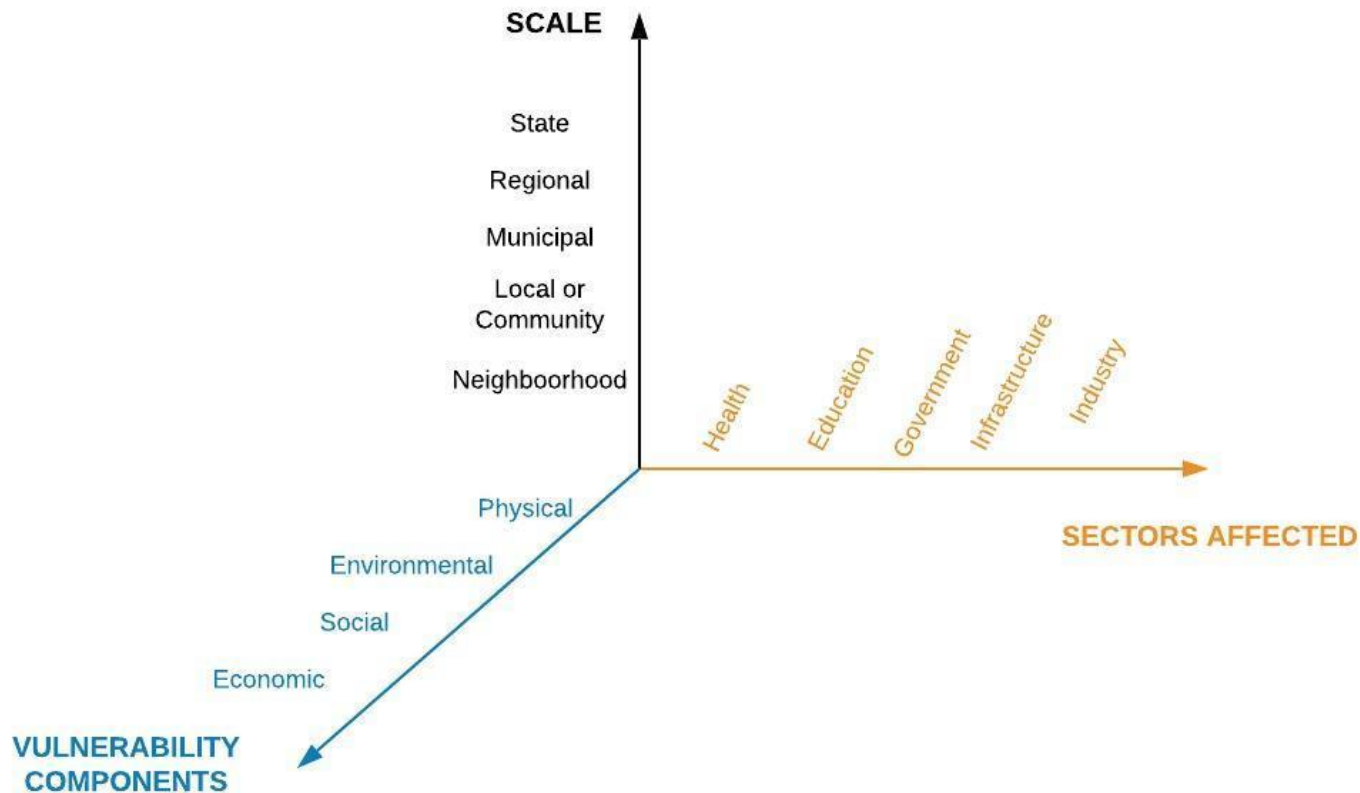


Image edited from: <http://www.charim.net/methodology/53>



# Coastal Vulnerability Assessment



# Regional/COG Analysis

## Coastal Vulnerability Index

### Area of Interest

Metro

### Assessment Type

- Individual Layers
- Output Layers
- Weighted Exposure

### Select Input Layer

Select an input layer to examine.

Elevation

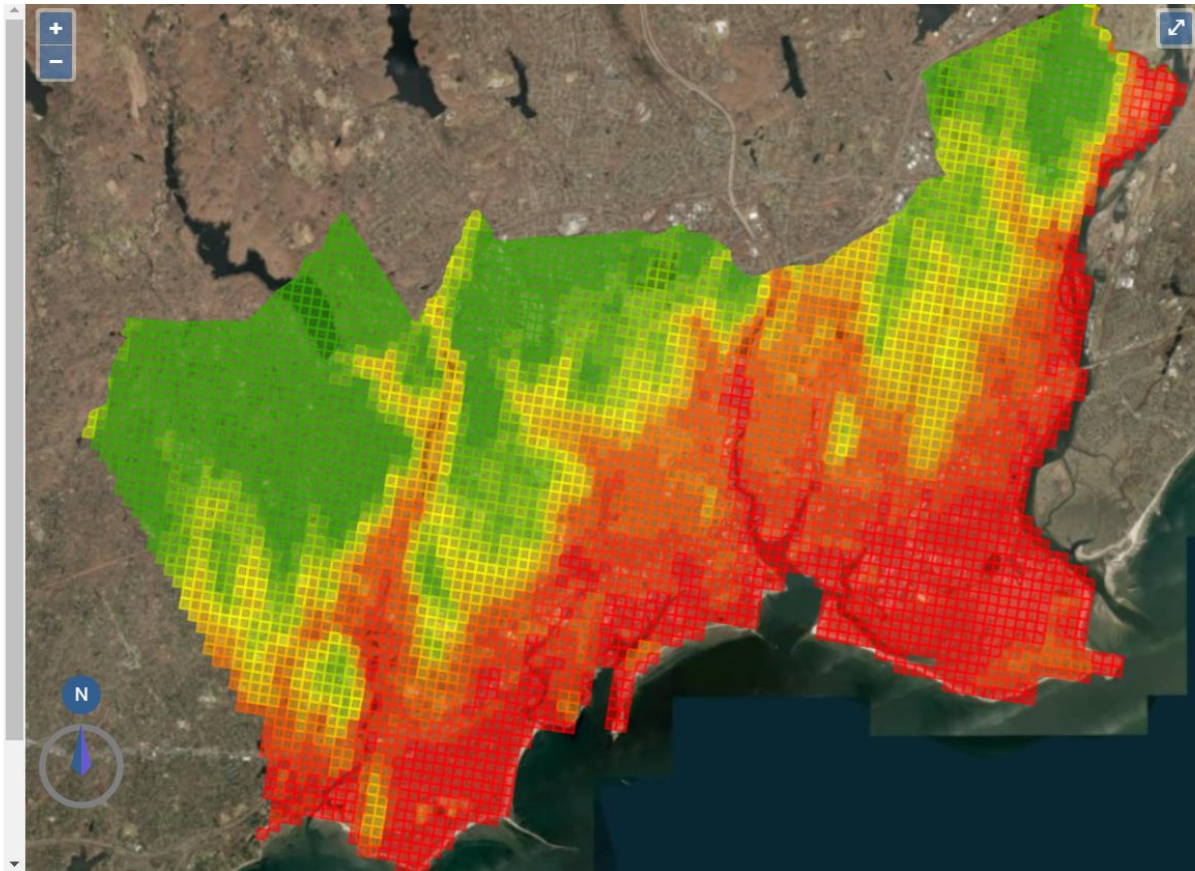
### Base Layer

- Satellite
- Street Map
- Topographic Map

### View Options

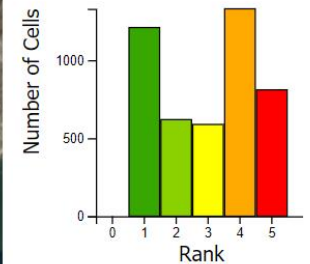
Change the map display.

- Sea Level Rise Overlay



3.5	87.50001	100
3.75	75.00001	87.5
4	62.50001	75
4.3	50.00001	62.5
4.5	25.00001	50
4.75	12.50001	25
5	0	12.5

### Selected Area Stats



Statistic	Value
Mean Rank	3.24
Standard Deviation	1.55
Min Rank	1.00
Max Rank	5.00
Data Cell Count	4555
Total Cell Count	4555





# Town/Political Scale

## Coastal Vulnerability Index

### Area of Interest

Stratford

### Assessment Type

- Individual Layers
- Output Layers
- Weighted Exposure

### Select an Output Layer

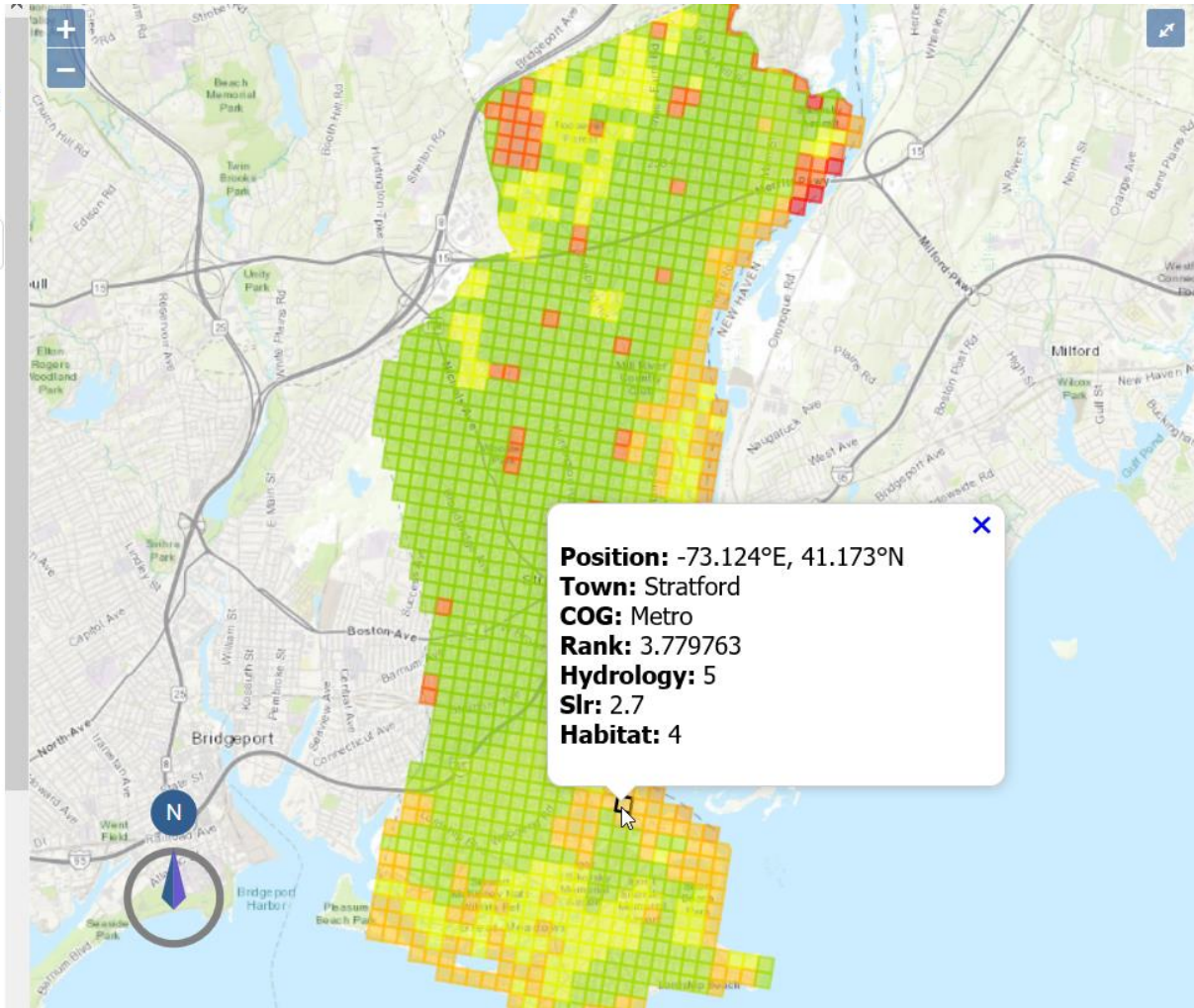
Select an output layer to examine.

Natural Habitat Expc

### Base Layer

- Satellite
- Street Map
- Topographic Map

### View Options



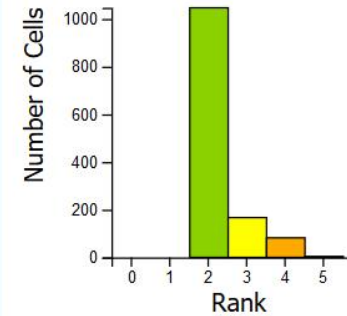
[Back](#)

## Natural Habitat Exposure

This data table is the geometric mean computed using the following input layers: Hydrology, Habitat and Sea Level Rise.

- [Metadata](#)
- [Download GIS Layer](#)

### Selected Area Stats



Statistic	Value
Mean Rank	2.54

# Customized/Weighted Analysis

Assets with higher adaptive capacity and low sensitivity can tolerate impacts to a greater degree and therefore have an overall lower vulnerability.

Assets with higher sensitivity and low adaptive capacity are more susceptible to impacts, and therefore have an overall higher vulnerability.



Adapted from: Adapting Urban Water Systems to Climate Change, A handbook for decision makers at the local level. SWITCH Training Kit. 2011.

Sensitivity

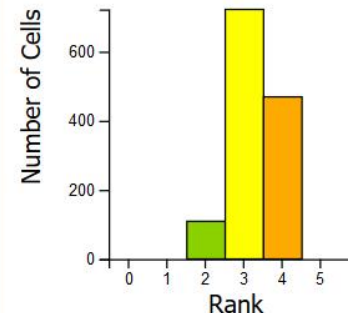
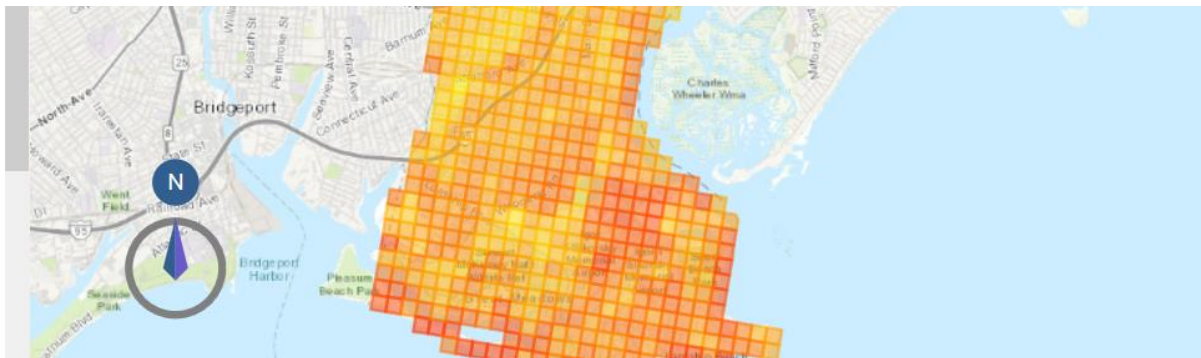


Adaptive Capacity

## Base Layer

- Satellite
- Street Map
- Topographic Map

## View Options



- Building it as a tool that is robust, customizable and multi-scale
- Improves the understanding of vulnerability and adaptive capacity.
- A tool for public engagement and builds awareness
- Informs & prioritizes projects to strategically allocate limited resources