

**PLANNING & ZONING REMOTE PLAN OF CONSERVATION AND DEVELOPMENT SUBCOMMITTEE MEETING MINUTES**  
**16 JUNE 2020, 7:25 P.M**

**Call to Order** by Mr. Sulkis at the request of Chairman Quish was at 7:35 pm.

**Roll Call:** B. Broesder, J. Kader, P. Kearney, /(STAFF) J. Griffith, D. Sulkis, M. Greene

**Absent:** J. Castiglione, J. Quish

Mr. Sulkis ran the meeting in the absence of Chairman Quish. He introduced John Truscinski, Director of Resilience Planning at Connecticut Institute for Resilience & Climate Adaptation (CIRCA), saying CIRCA is an important resource for the POCD's deliberation on shoreline resilience.

**A. Review and discussion of the following sections and the related action items:**

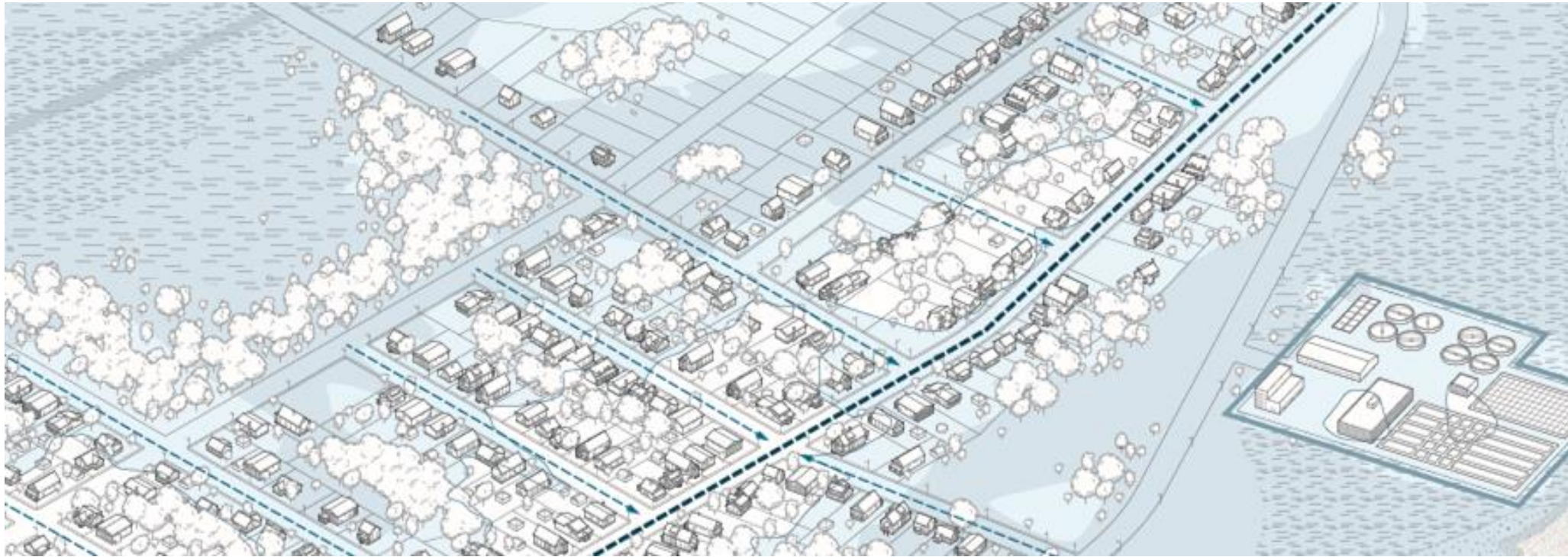
- 1) Coastal Resources and Long Island sound POCD section, pages 41-70
- 2) Guest participant, John Truscinski, Director of Resilience Planning at Connecticut Institute for Resilience & Climate Adaptation (CIRCA).

Mr. Truscinski discussed the mission of the group as originating with Storms Irene and Sandy. He characterized it as a partnership between CT DEEP and UCONN with the goal of making the science of shoreline risk accessible to coastal cities and towns. He said the project transitioned from the Department for Housing under HUD to the states via grants to study local impacts of climate change. He grouped CIRCA projects into categories including Planning, Tech Support, Capacity Building, and Engagement Activities. He said the institute gathers input and modeling from scientists in many academic disciplines. He said CIRCA focuses include building resilient Transit-Oriented District (TOD), resilient corridors, the creation of affordable housing that preserves quality of life, adapting critical infrastructure that is too expensive to move, and creating buffers. Mr. Broesder asked about adapting critical infrastructure. Mr. Truscinski said CIRCA has supported planning for wastewater treatment and electricity generation in Bridgeport. He said part of CIRCA's mission is also to share learning from coastal towns as such projects are undertaken. He said resilience corridors were a conceptual framework for transportation running east and west, leveraging geographic ridge lines that run north and south. He said some mid-Atlantic states are much flatter whereas there is some higher ground in CT and such elevations can be exploited. He said "Resilient Bridgeport" is a demonstration project on the scale of about 46 million dollars. He said Fairfield and New Haven counties are the focus of the grant due to impacts of Sandy and Irene. He said regional infrastructure issues are being examined with an eye to developing implementable projects. He described the science CIRCA is working on as helping communities know what to expect from sea level rise. He presented a chart that illustrates a predictive model based on assumptions about the amount of carbon to be burned in coming decades, noting a rise of 20 inches by 2050 being the upper boundary of this model. He said the model is to be updated every 10 years by UCONN. He said beyond 2050 there will continue to be sea level rise, but that far into the future, confidence in the predictive power of the model is reduced. He said cities and towns can use a "no regrets" goal such that the worst case scenario is always targeted for planning. He said UCONN scientists produced a report indicating that modest changes in mean temperatures will have a big impact on flood risk. He referred to a New London tide gauge taking measurements from 1938 to 2020. He explained how intervals of storm surges are calculated, saying they will become more frequent and deeper in the same low-lying areas, creating chronic flooding conditions in some places. *[Addition details from the presentation are attached.]*

Mr. Sulkis thanked Mr. Truscinski for an informative presentation. Mr. Kader asked if buffering marshlands were part of the project and whether government should buy up at-risk properties. Mr. Truscinski said CIRCA is trying to provide the science, but doesn't recommend policy. He said it is prudent to adhere to building standards that don't create greater risks and that it makes sense to allow high risk areas to return to a natural state. Mr. Sulkis asked about mapping that shows current flood plain versus a 50 year projection as it relates directly to Milford, noting that most shoreline uses in the city are residential. Mr. Truscinski said he could produce a document modeling that projection for Milford in a short time frame. He said there are vulnerability assessments created as an index based on adaptive capacity and sensitivity to risk. Mr. Broesder asked about the ideas section; Mr. Truscinski said there is a change in the approach FEMA is using by trying to fund pre-disaster assessment of critical needs prior to storms and prioritizing which services must be protected. He spoke of identifying zones of shared risk, then engaging residents and stakeholders to envision the future. Mr. Sulkis noted ways that the city already incorporates some of these practices. Mr. Truscinski said such planning will be a long term process but starting sooner is better than later. Mr. Sulkis asked Mr. Truscinski for a copy of his presentation and promised to share it with the subcommittee members, along with the Milford model, when he received it.

- Approval of minutes from 5/19/20 POCD Subcommittee Meeting was unanimous.
- Member suggestions --None
- Adjournment was at 8:36.

Attest: M.E. Greene, Rec. Sec'y



# CIRCA Tools for Building Resilience in Connecticut

**John Truscinski**  
Director of Resilience Planning  
Connecticut Institute for Resilience and Climate Adaptation  
Marine Sciences University of Connecticut

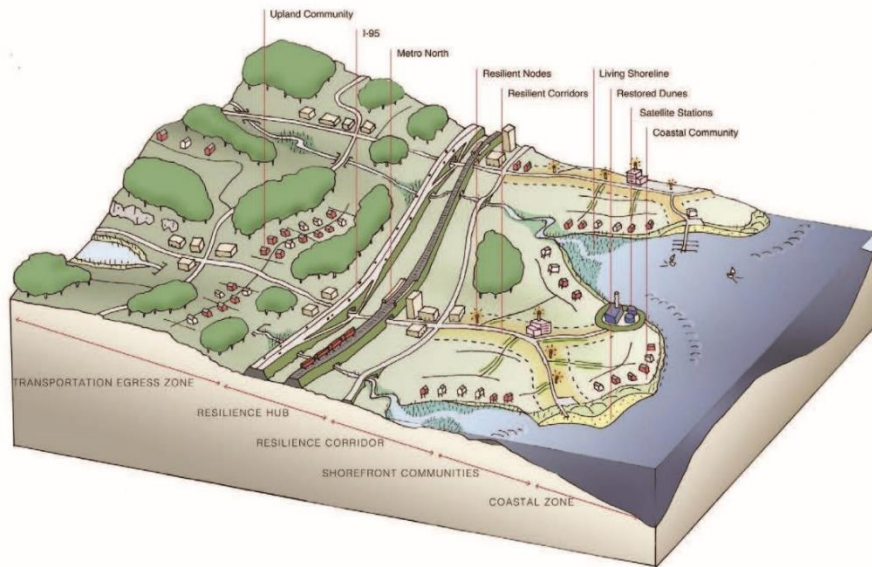
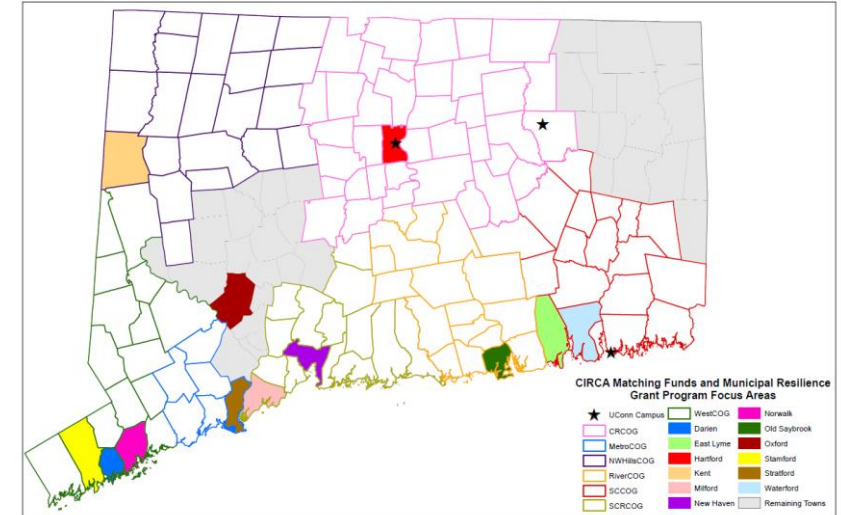
June 16<sup>th</sup>, 2020

# CIRCA Mission

Increase the resilience and sustainability of vulnerable communities in Connecticut's coastal and inland areas to severe storms and the growing impacts of climate change on the natural, built, and human environment in response to critical, identified needs and priorities.

# CIRCA Initiatives

- Connecticut Towns need guidance and support for planning and implementation
  - Between 2016-19 CIRCA awarded and administered grants to towns and COGS with CTDEEP funds. (k\$745 and k\$400 match)
  - Developed sea level, temperature and precipitation, and river flow projections (7 projects k\$550, 11 faculty)
  - Matching grants (11 projects, k\$330 with k\$1000 match)



## • Resilient Connecticut

CIRCA and State Agencies Fostering Resilience (SAFR) have embarked on a demonstration regional planning process

- Funded by HUD through DOH
- Region planning in Fairfield and New Haven Counties

Goal: identify projects that towns can't address alone, and develop implementable plans

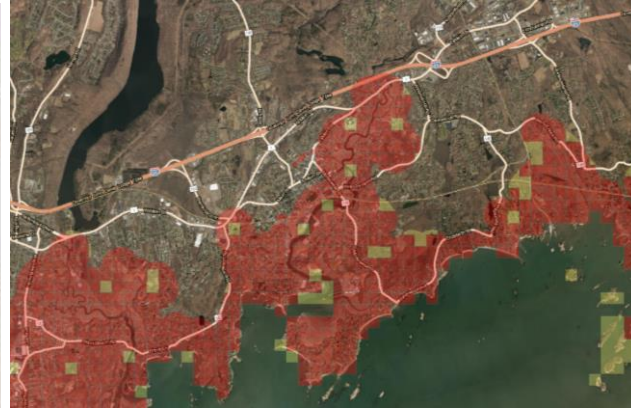
# Resilient Connecticut

## Planning



- Resilient Connecticut Planning Framework
- Regional Resilience Planning
- Implementation Planning for Pilot Projects

## Technical Support



- Flood Risk and Vulnerability Assessment
- Climate Impact Modeling
- Adaptation Option Evaluation & Data Collection

## Capacity Building



- Applied Field Research
- Climate Impacts to Public Health in CT
- Economics & Cost/Benefit Development
- Legal & Policy Recommendations

## Engagement

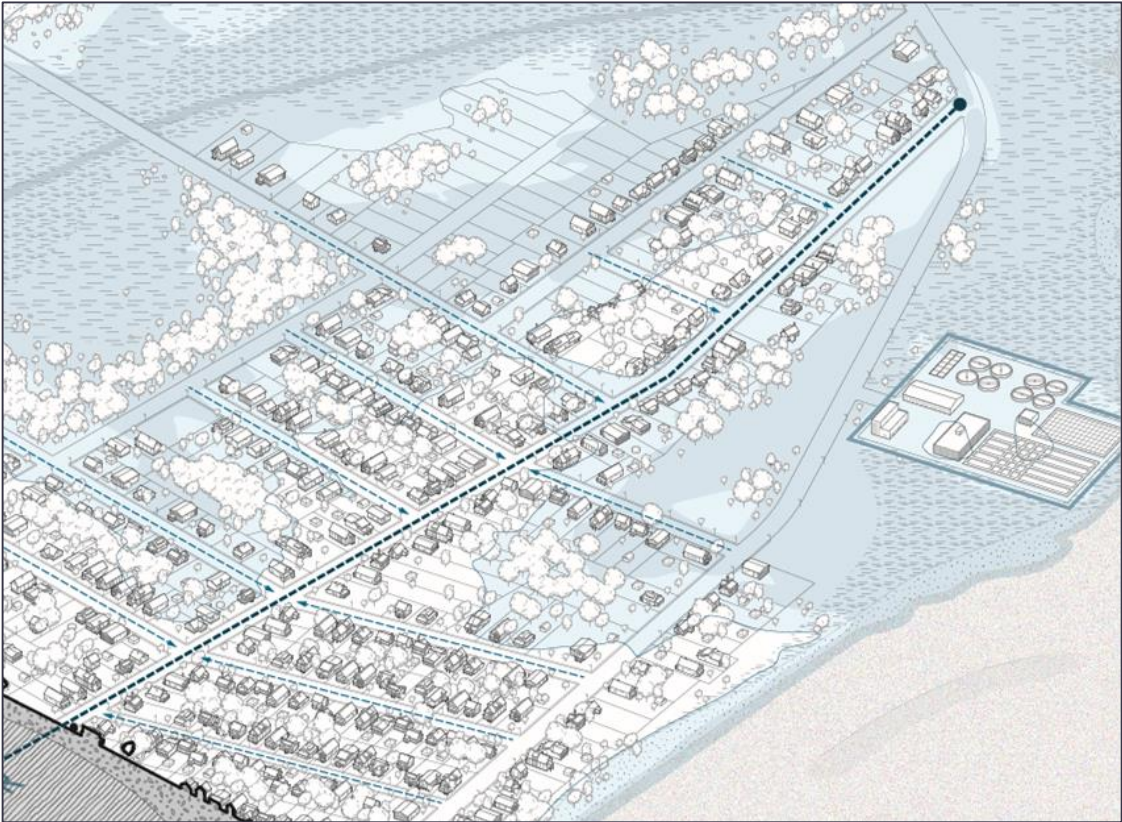
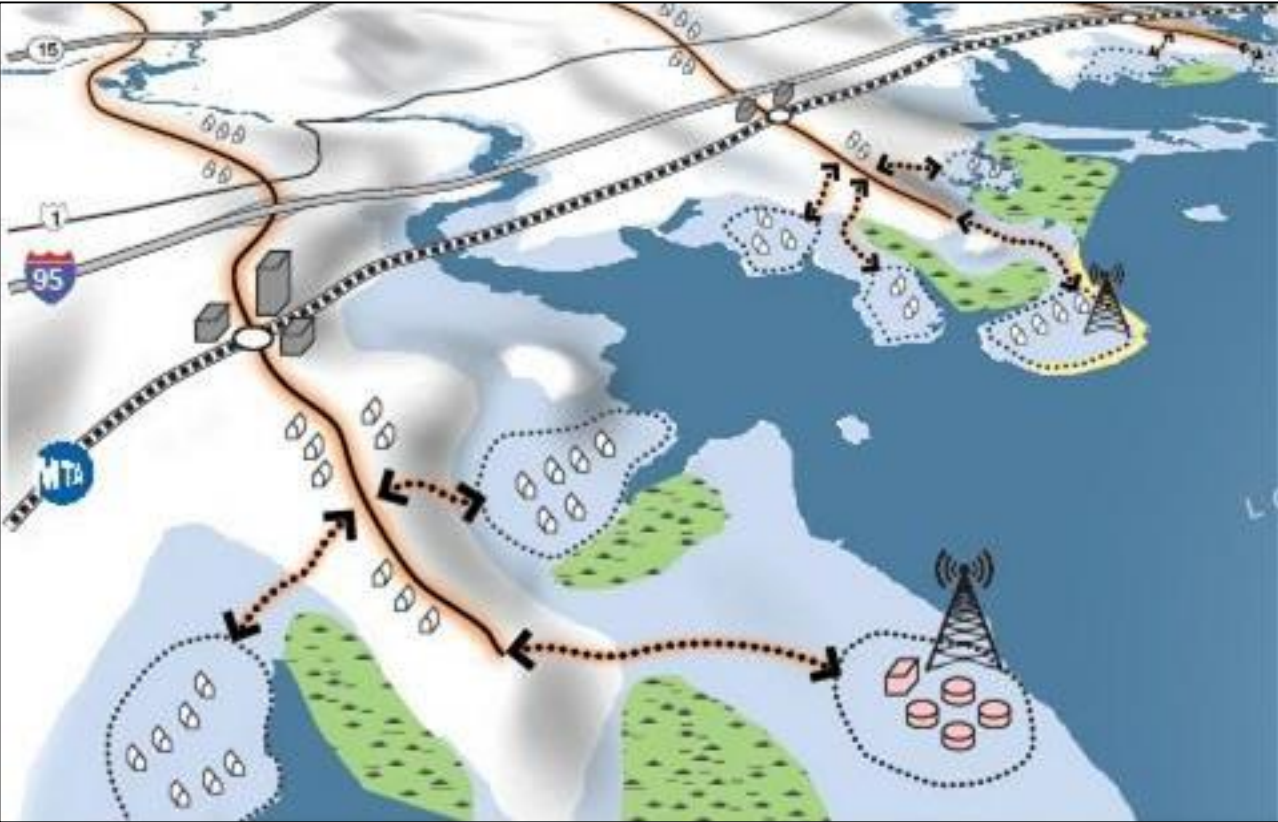


- Resilient Connecticut Annual Summit
- Monthly Webinar Series
- Resilient Connecticut Collaborative and Working Groups
- Workshop Series

# Long-term Vision for Establishing Resilient Communities

- Focus community development around transit (resilient TOD)
- Create corridors resilient to climate change (resilient corridors)
- Create opportunities for affordable housing, preserving and enhancing the quality of life for existing affordable communities
- Develop energy, economic, and social resilience
- Increase transit connectivity
- Adapt structures and critical infrastructure in the flood zone to withstand occasional flooding
- Protect communities through healthy buffering ecosystems, where critical services, infrastructure, and transport hubs are located on safer, higher ground, and where strong connections exist between the two

# Resilience Corridors



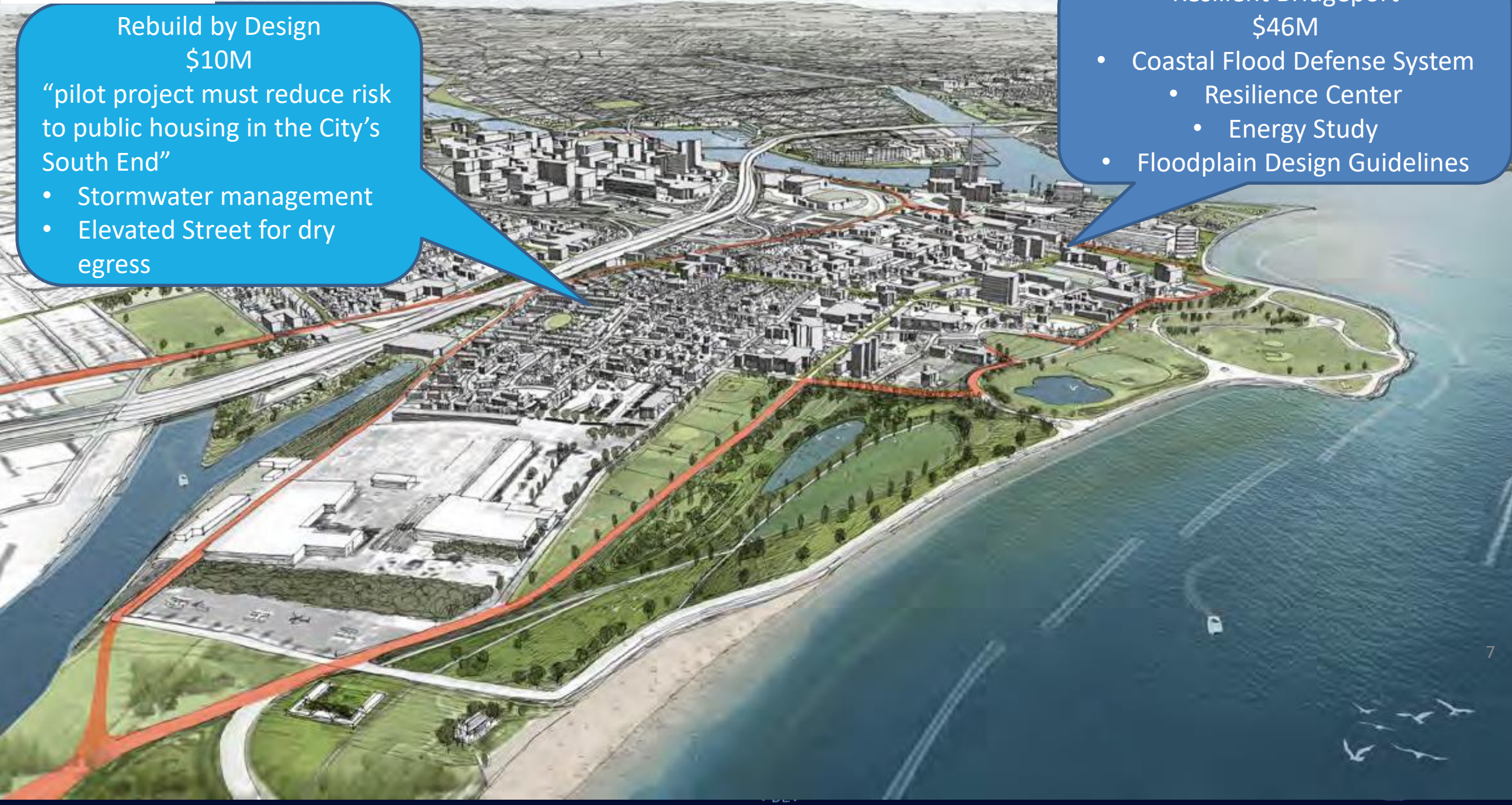
Rebuild by Design  
\$10M

“pilot project must reduce risk to public housing in the City’s South End”

- Stormwater management
- Elevated Street for dry egress

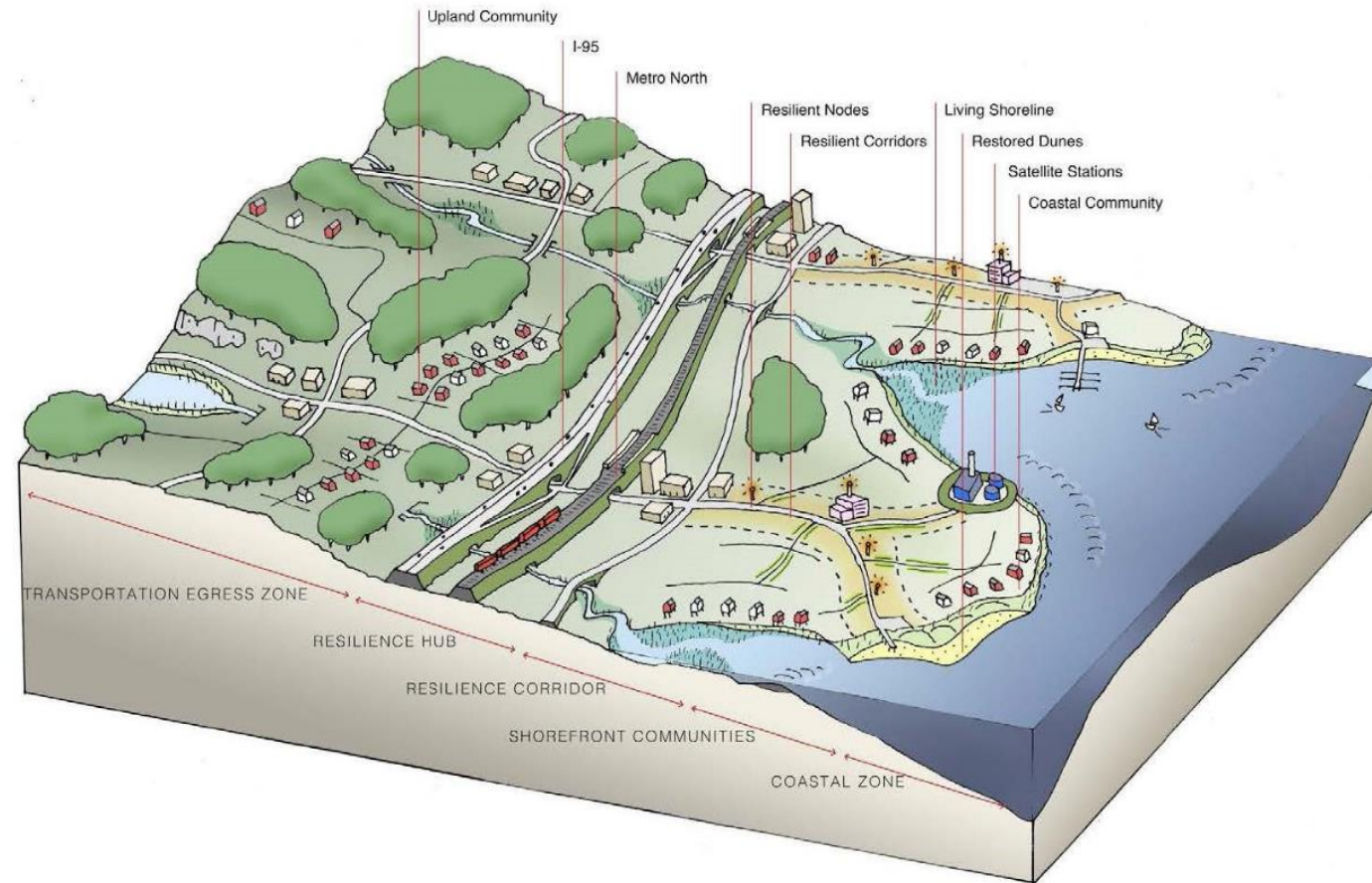
Resilient Bridgeport  
\$46M

- Coastal Flood Defense System
  - Resilience Center
  - Energy Study
- Floodplain Design Guidelines



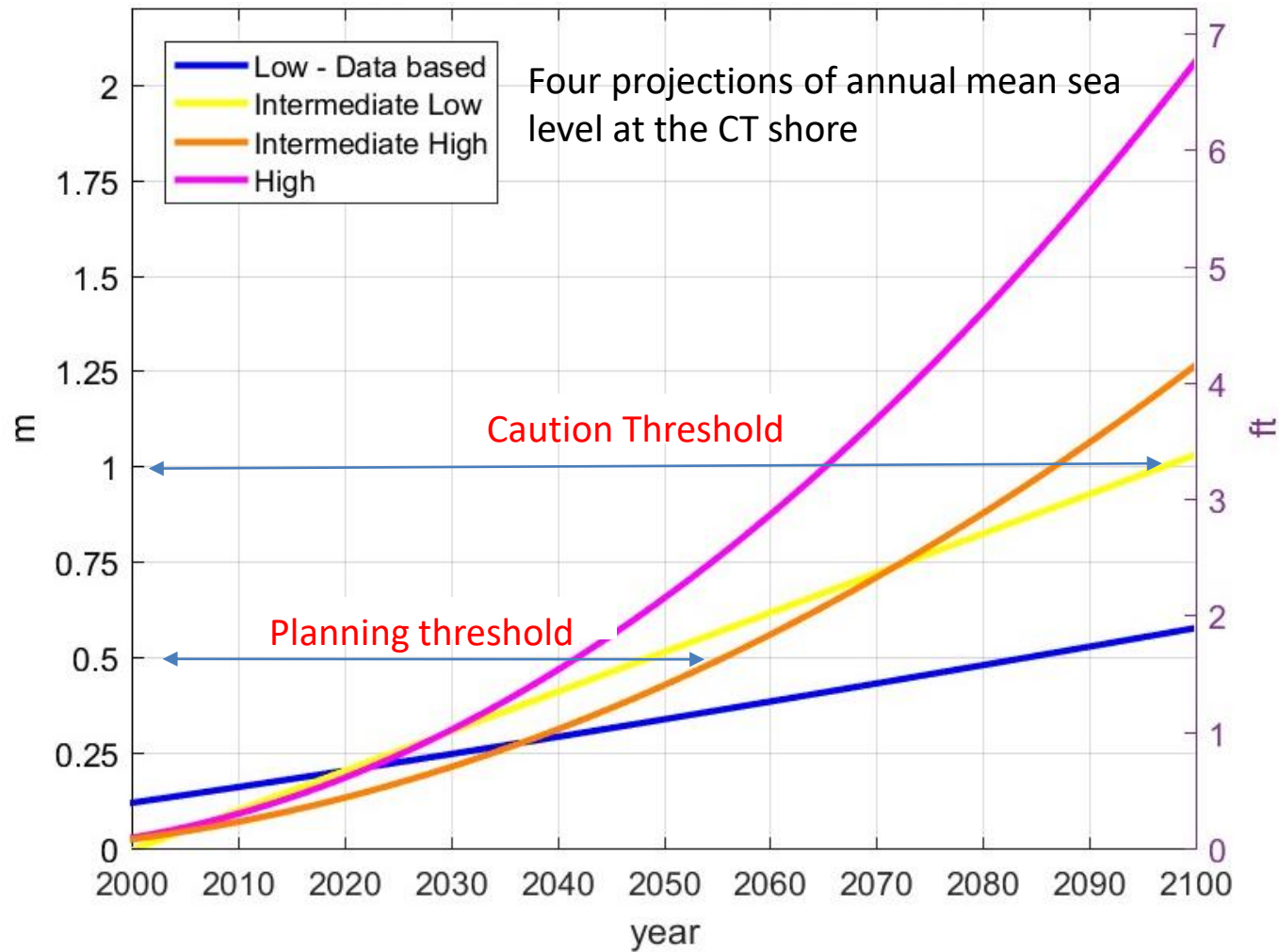


# Resilient Connecticut



- Identify projects that towns can't address alone
- Assess regional infrastructure challenges & opportunities
- Identify “resilience corridors”, “zones of shared risk” & resilient TOD opportunities
- Develop implementable plans & pilot projects with broad co-benefits

**Figure 1.** Sea level rise projections for Connecticut based on local tide gage observations (blue), the IPCC (2013) RPC 4.5 model simulations near Long Island Sound (yellow line), the semi-empirical model predictions are in orange and the magenta shows the ice mass balance projections.

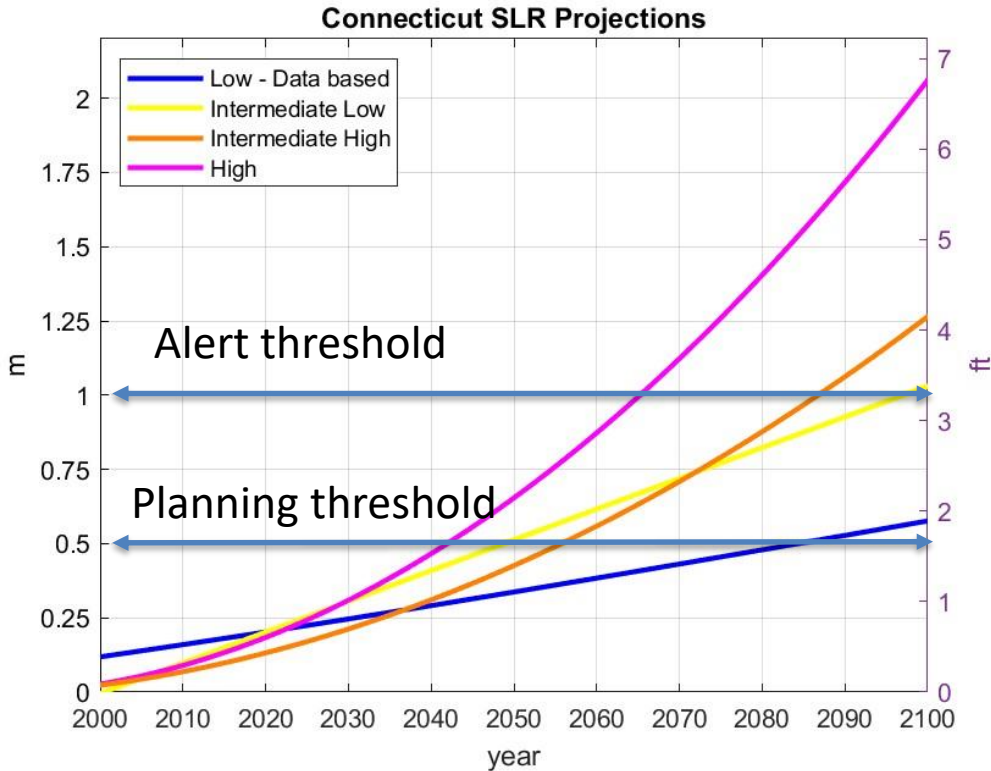


20in/50cm at 2050

Decadal Review

Alert people about the prospect of 100cm by 2100

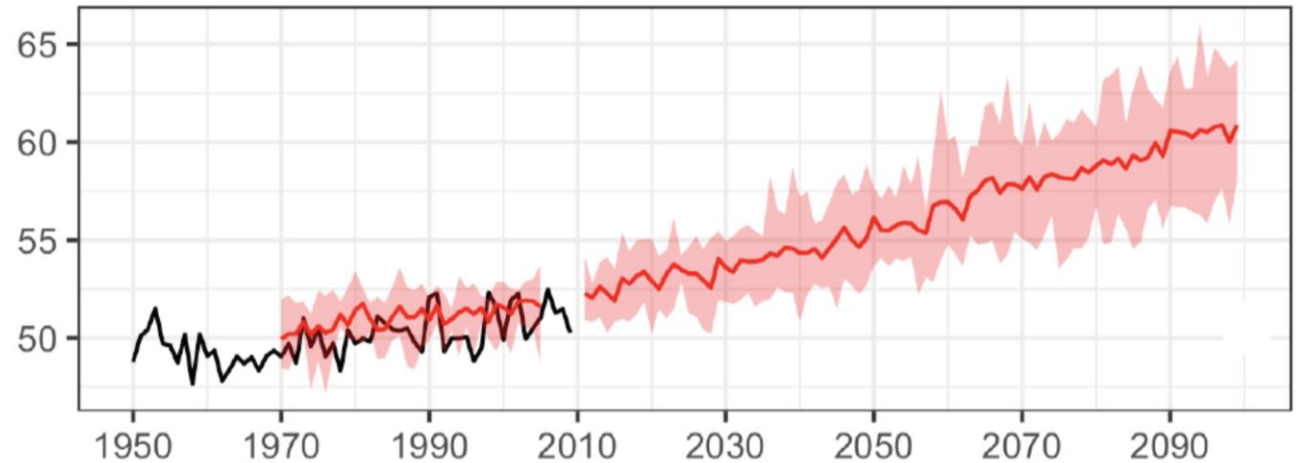
# Climate Change in Connecticut



O'Donnell, 2018

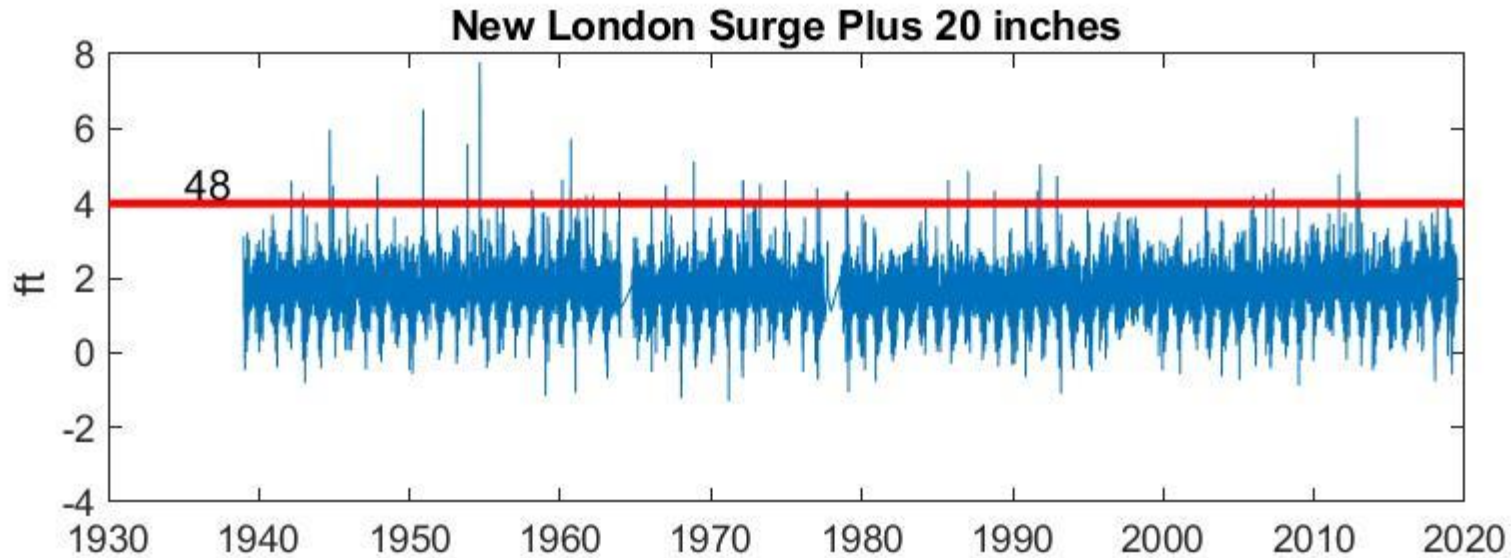
<https://circa.uconn.edu/sea-level-rise/>

Measurements and model projections (with no CO2 reductions) of annual mean temperature in CT – CIRCA's PCSAR report (Seth et al, 2019)



**Plan for:**  
**Sea level rise UP TO 20 inches (0.5m) by 2050**  
**Air warming UP TO 5°F (3°C) by 2050**

# Modest changes in mean sea level have a big impact on flood risk

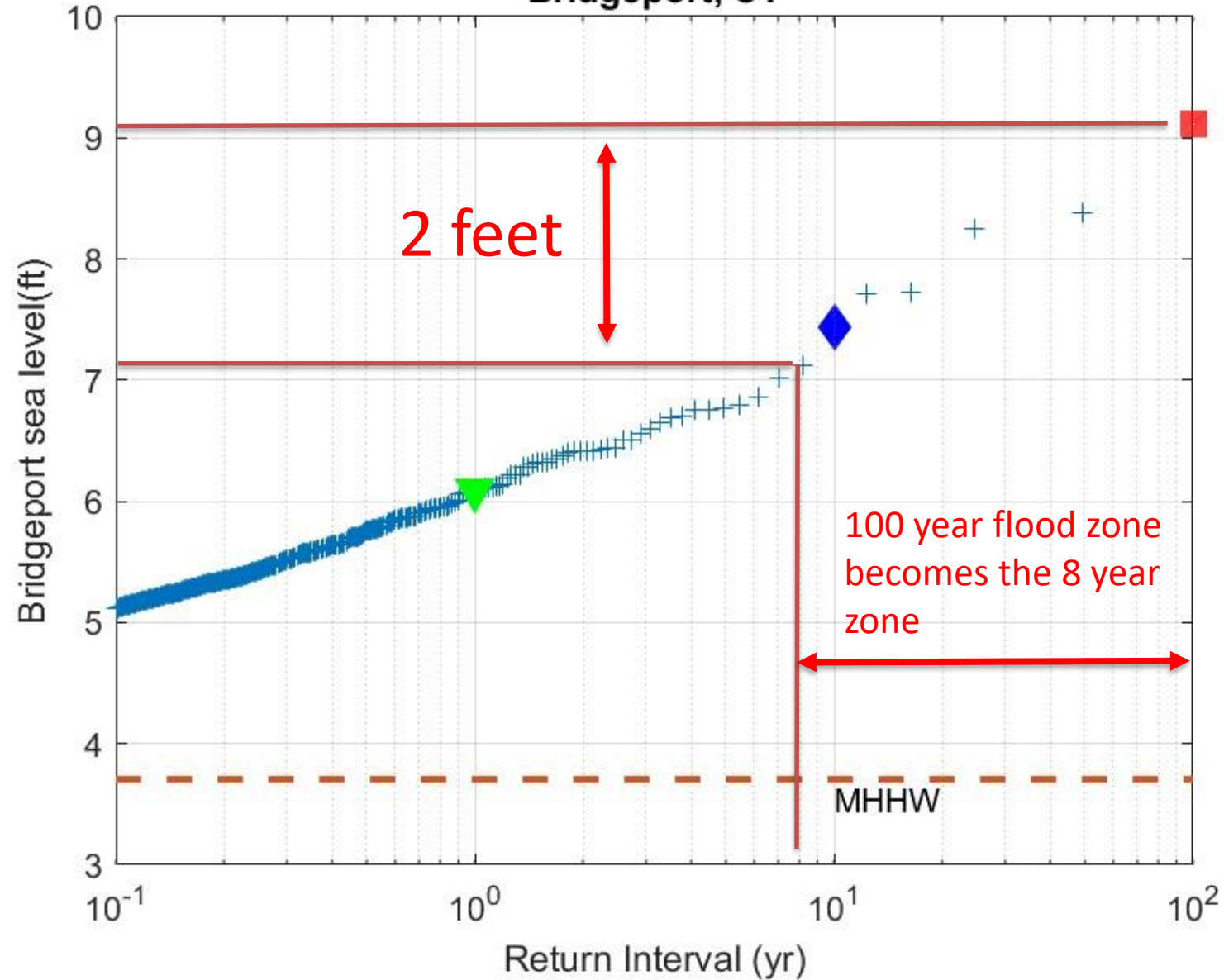


NOAA's New London Tide Gage



- Places that flood now when the surge is 4 ft have a 5/80 risk per year or 6% annual chance.
- With a 20 inch mean SLR, that risk increases to 48/80 or 60% annual chance.

# Bridgeport, CT



# Connecticut's patches of risk

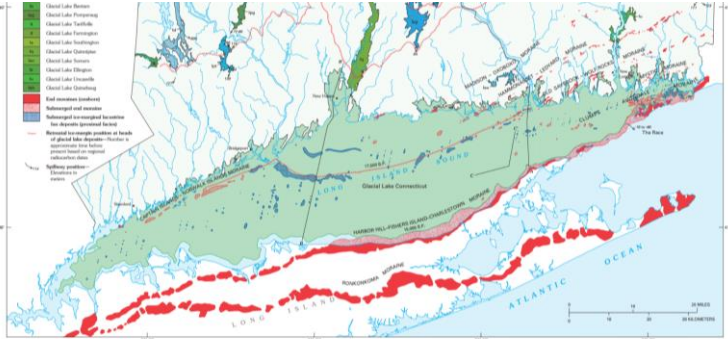
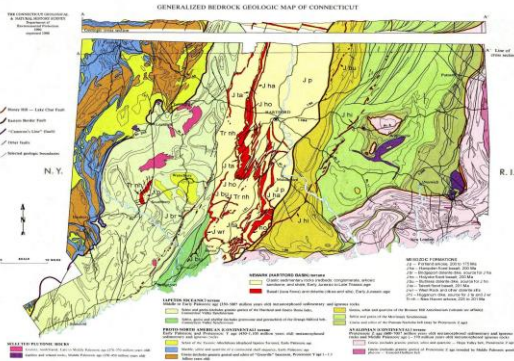
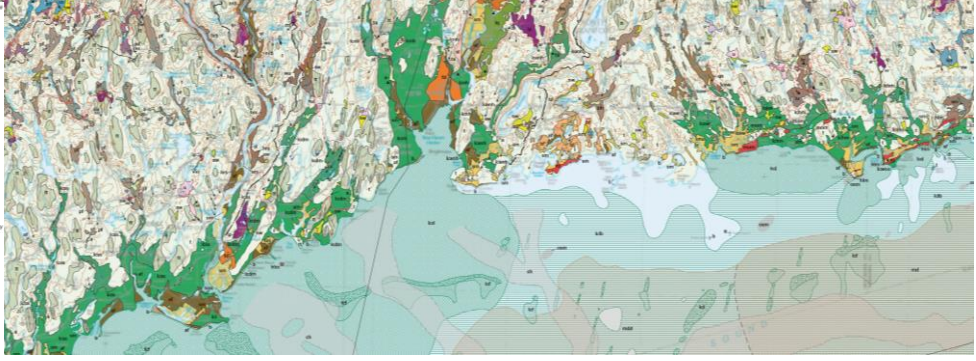
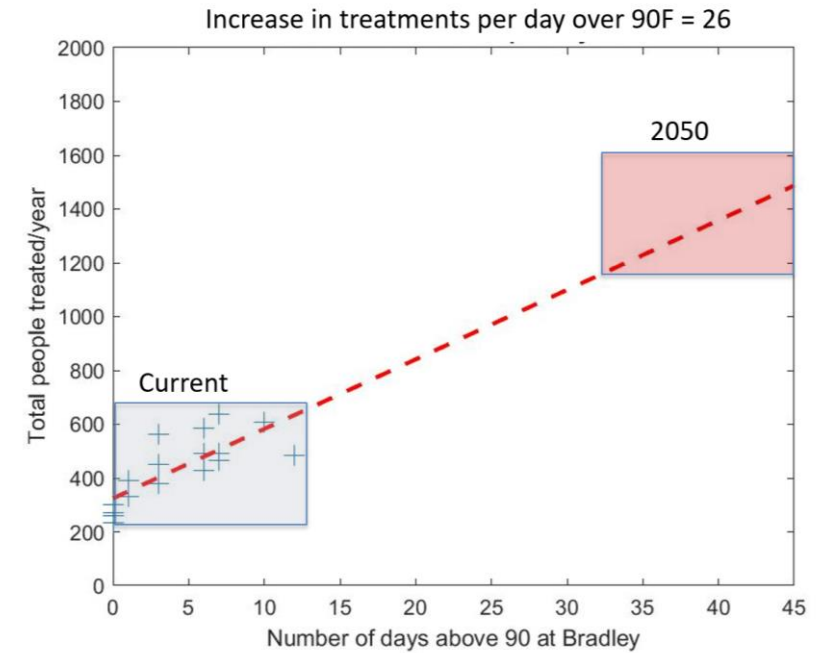
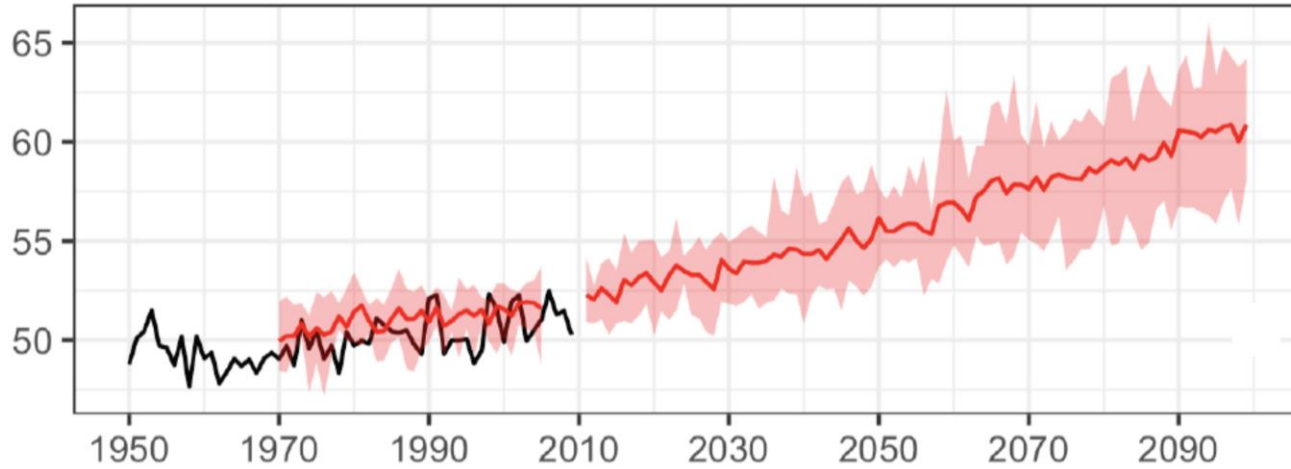


Figure 4—Major glacial lakes in Connecticut and selected drainage patterns during the Wisconsinan deglaciation. The direction of glacial flow is accompanied by an arrow. The distribution of the Boscawen moraine is from Linsley (2014).



Measurements and model projections (with no CO2 reductions) of annual mean temperature in CT – CIRCA's PSCAR report (Seth et al, 2019)



**Plan for:            Sea level rise UP TO 20 inches (50 cm) by 2050**  
**Warming of UP TO 5°F (°C) by 2050**

- Projected changes in annual temperature extremes for the high CO<sub>2</sub> (RCP8.5) scenario
  - All temperature indices examined show large changes in response to continued, accelerating warming.
  - Tropical nights (TR: T<sub>min</sub> > 68°F) quadruple from 10 days (present) to more than 40 days at mid-century and nearly 70 days in late century.
  - Warm spell days (WSDI) occur ~4/year (present), and increase to 48/year by mid-century and more than 100/year by late century.
  - Frost days (FD: T<sub>min</sub> < 32 °F) decrease from 124 days (present) by 39 days at mid-century and by 64 days in late century.

CT-PCSAR August 2019



# Summary

- Sea level is going up ... Plan for up to 20 inches by 2050.
- The frequency of coastal flooding will increase... by a factor of 5.
- There are many predictable consequences... increased insurance cost, property value losses, increased repair costs.
- Sea Level could be a meter higher by 2100
- In much of CT the flood plain will not expand (very much), flooding will be more frequent and deeper.
- Temperature is going to increase... maybe up to 5F by 2050.
- Precipitation is likely to increase, and be delivered in more intense events
- Addressing this will be complicated and costly, but so is the alternative.

# CIRCA Planning Tools



Layers

- Sea Level Rise Layers
- Mean Higher High Water
- Mean Higher High Water Plus 1 foot SLR
- Mean Higher High Water Plus 20 inches SLR
- 100 Year Flood Event (NOAA tide gauge)
  - Low-lying Areas
  - Inundated Areas
- 100 Year Flood Event Plus 1 foot SLR
- 100 Year Flood Event Plus 20 inches SLR
- Continuous LiMWA Line

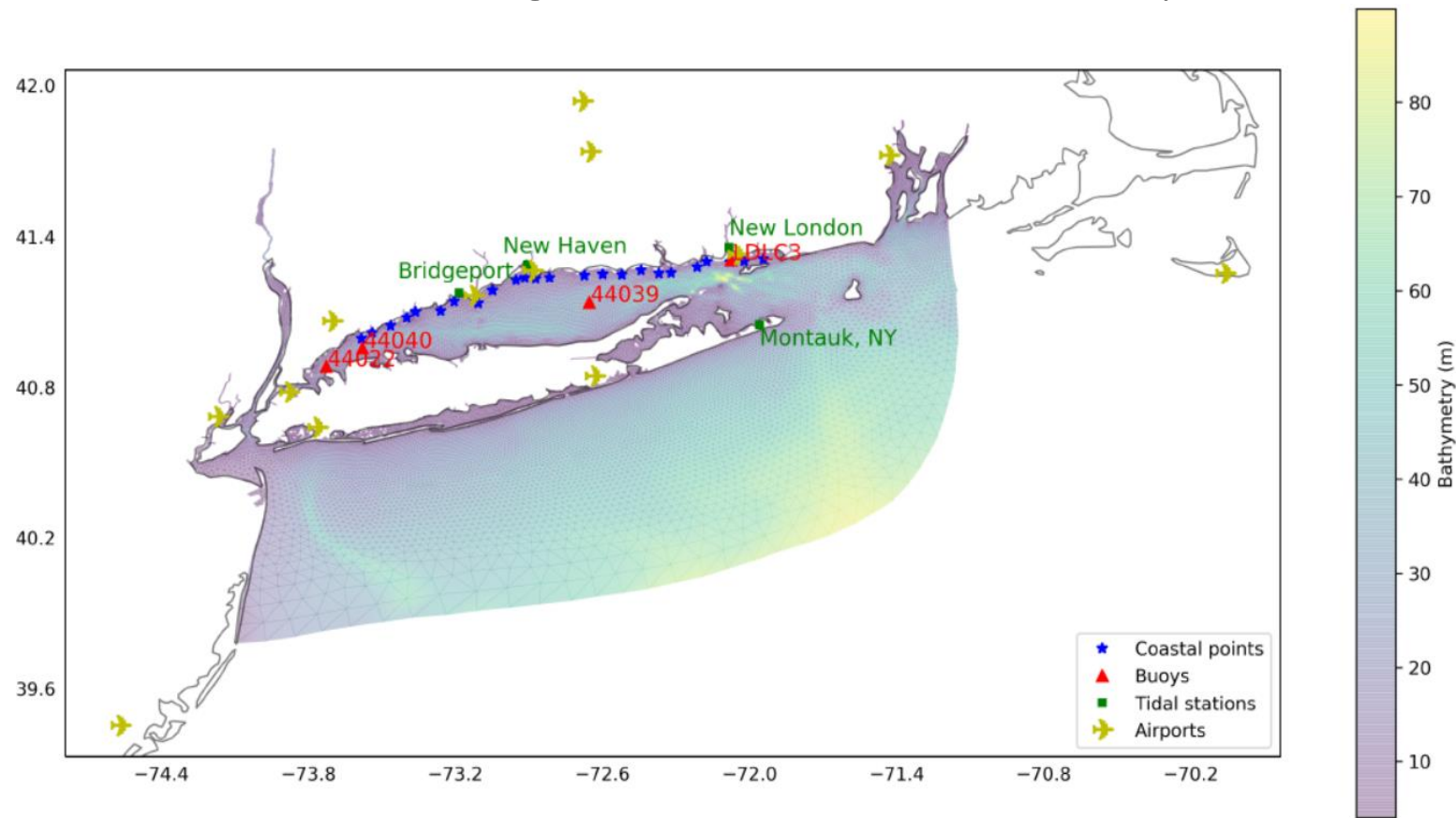
-72.771 41.280 Degrees

0.4mi

CRCOG/State of CT, USDA FSA

POWERED BY 

## LIS Ocean Modeling and Flood Return Interval Analysis



- Modeled 44 highest storms during 1950-2018
- Estimated annual exceedance probability of the water level and significant wave height from high resolution LIS domain

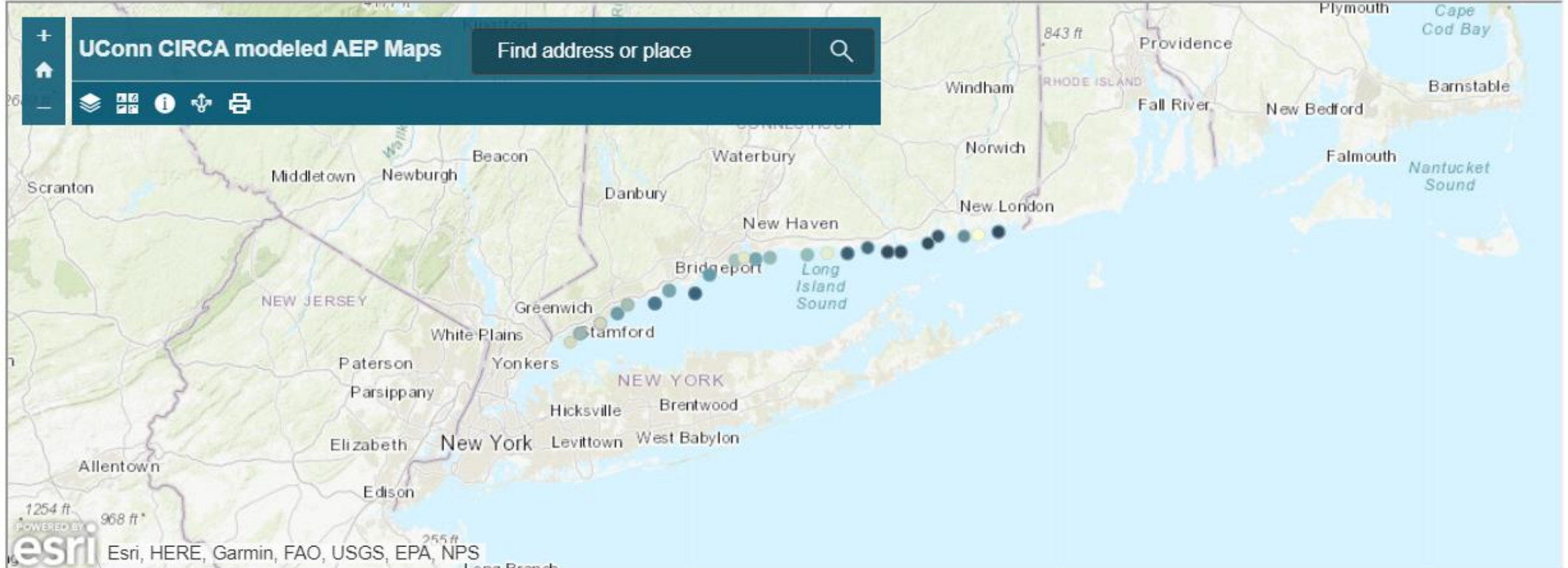
# Connecticut Coastal Towns Storm Annual Exceedance Probability/Return Interval Viewer

This viewer presents the projected storm surge water levels and significant wave heights, which may contribute to a better understanding of extreme storms to guide decision-makers. The anticipated sea level of 20 inches by 2050 can be added to the different flood scenarios. More information on the methodology is presented in the Documents.

To use the viewer, please click on the drop-down menu to choose the town. Different projections of storm surge and significant wave height projections will activate automatically for different towns. The user can compare different towns by Add Town option.

To navigate through the drop-down viewer, please use

[MUNICIPAL STORM SURGE AND SIGNIFICANT WAVE HEIGHT LEVEL WORKSHEET](#)



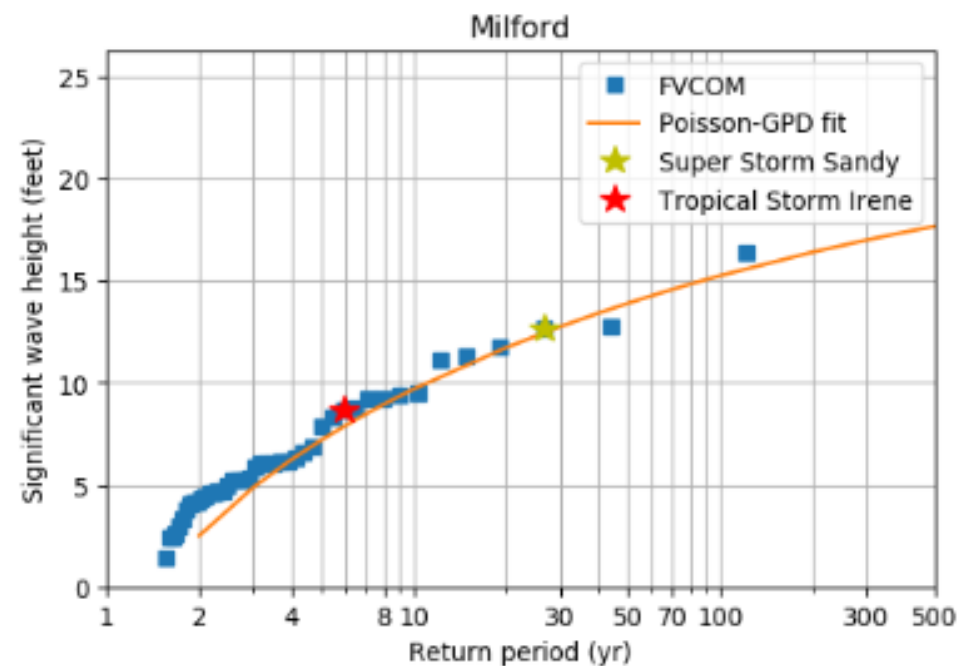
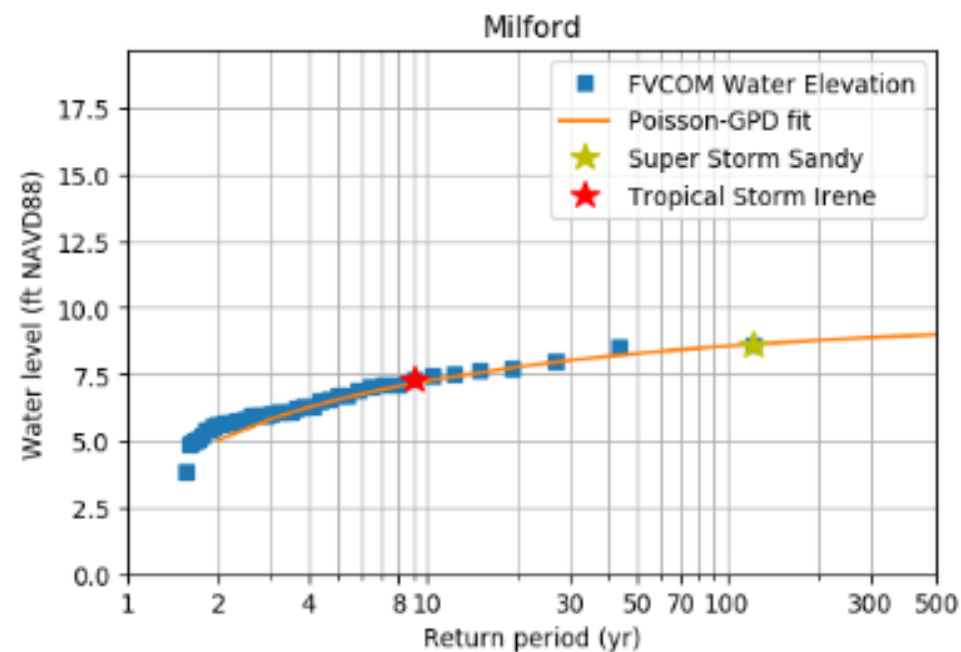
## Milford

Lat: 41.184357° N

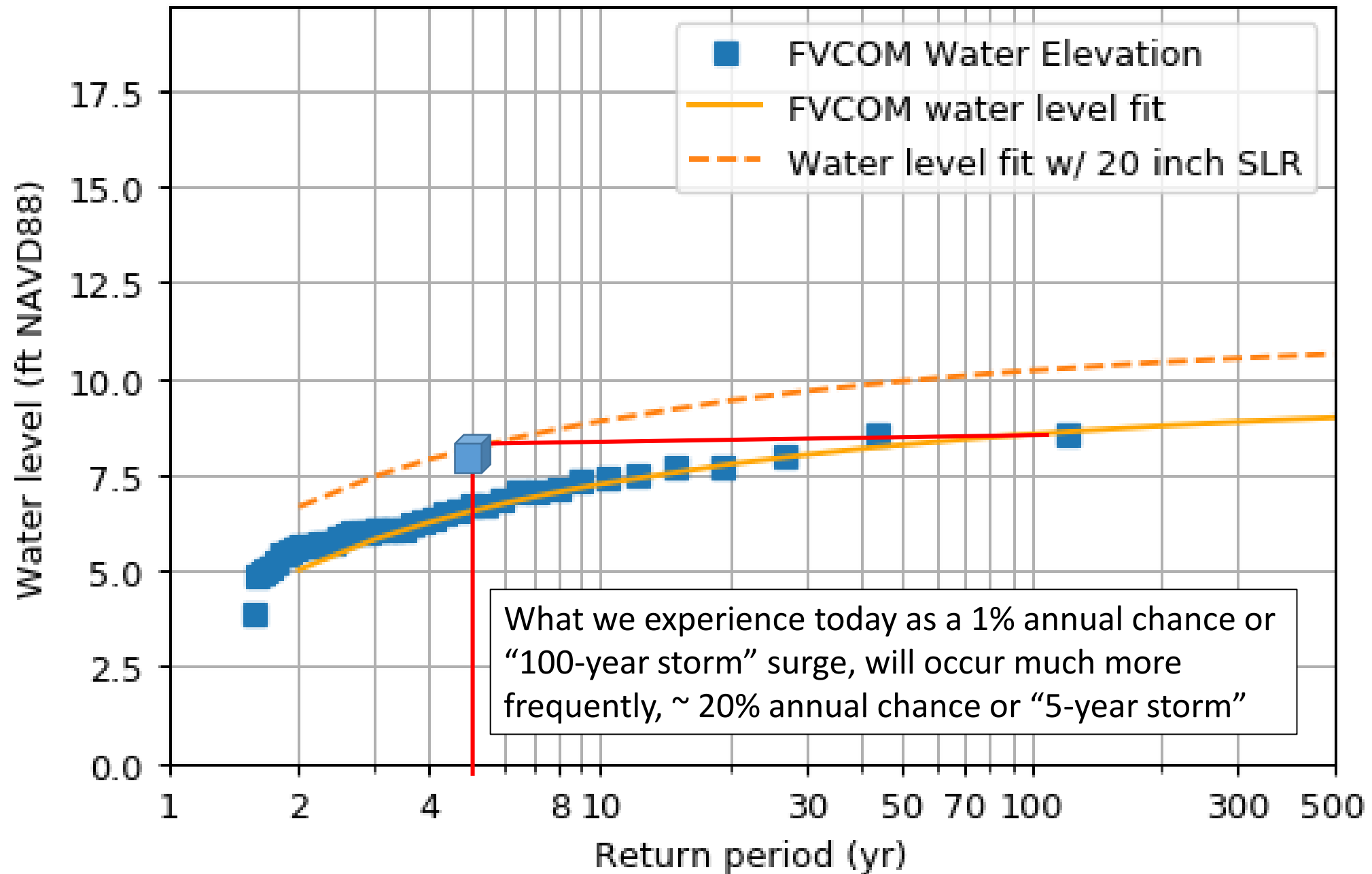
Lon: -73.04857° E

Depth: 16 ft

Return Period (year)	h (ft)	Hs (ft)
2	5.03	2.50
3	5.82	4.86
4	6.26	6.23
5	6.54	7.18
6	6.76	7.89
7	6.92	8.46
8	7.05	8.93
9	7.16	9.33
10	7.26	9.67
20	7.78	11.70
30	8.02	12.72
40	8.17	13.39
50	8.28	13.87
60	8.36	14.25
70	8.43	14.56
80	8.48	14.81
90	8.52	15.03
100	8.56	15.23
200	8.78	16.38
300	8.88	16.97



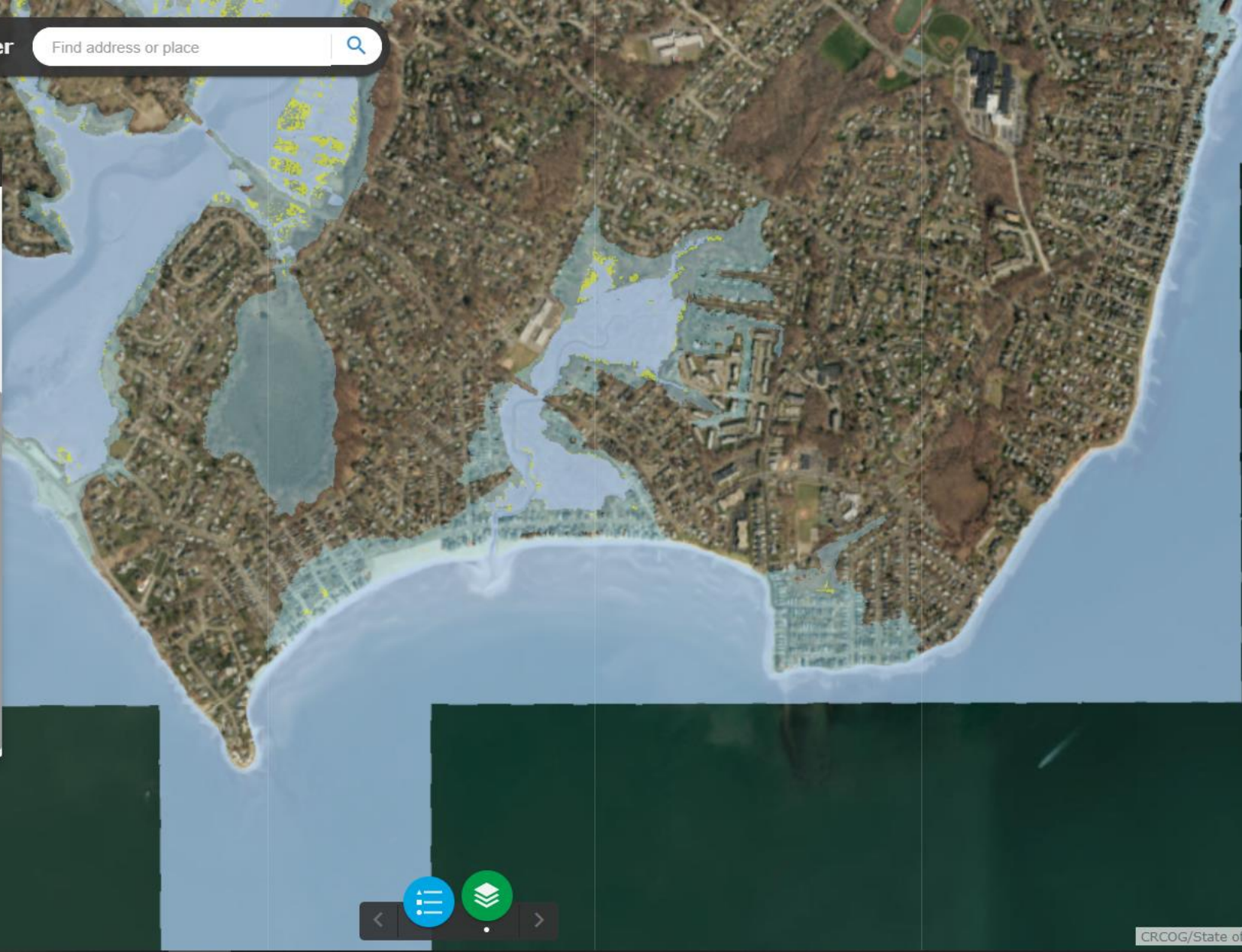
# Milford





**Layer List** - X

- 100 Year Flood Event Plus 1 foot SLR ...
- 100 Year Flood Event Plus 20 inches SLR ...
- 10 Year Flood Event (FVCOM) ...
- 10 Year Flood Event Plus 20 inches SLR (FVCOM) ...
- 30 Year Flood Event Plus 20 inches SLR (FVCOM) ...
- 30 Year Flood Event (FVCOM) ...
- 100 Year Flood Event (FVCOM) ...
- 100 Year Flood Event Plus 20 inches SLR (FVCOM) ...
- 500 Year Flood Event (FVCOM) ...
- 500 Year Flood Event Plus 20 inches SLR (FVCOM) ...
- Continuous LIMWA Line ...



-73.057 41.219 Degrees

0.2mi



CRCOG/State of CT, USDA FSA

POWERED BY **esri**





**Layer List**

- 100 Year Flood Event Plus 1 foot SLR ...
- 100 Year Flood Event Plus 20 inches SLR ...
- 10 Year Flood Event (FVCOM) ...
- 10 Year Flood Event Plus 20 inches SLR (FVCOM) ...
- 30 Year Flood Event Plus 20 inches SLR (FVCOM) ...
- 30 Year Flood Event (FVCOM) ...
- 100 Year Flood Event (FVCOM) ...
- 100 Year Flood Event Plus 20 inches SLR (FVCOM) ...
- 500 Year Flood Event (FVCOM) ...
- 500 Year Flood Event Plus 20 inches SLR (FVCOM) ...
- Continuous LiMWA Line ...

-73.034 41.198 Degrees

0.2mi



CRCOG/State of CT, USDA FSA

POWERED BY esri





# CIRCA Coastal Vulnerability Index

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.

## Climate Variables

Maximum high tide

Storm surge

Max. Wind speed

Sea level rise

Wave height

## Social Vulnerability

Socioeconomic factors

Household composition & disability

Minority status & language

Housing

Transportation

Pop. density

## Ecological Factors

Aquifer protection area

Erosion rate

Erosion/Accretion rate

Marsh and water bodies

Natural habitat

Salt water limit

Soil flooding class

Impervious surface

Elevation

## Built Environment

Rail lines and stations

Street elevation

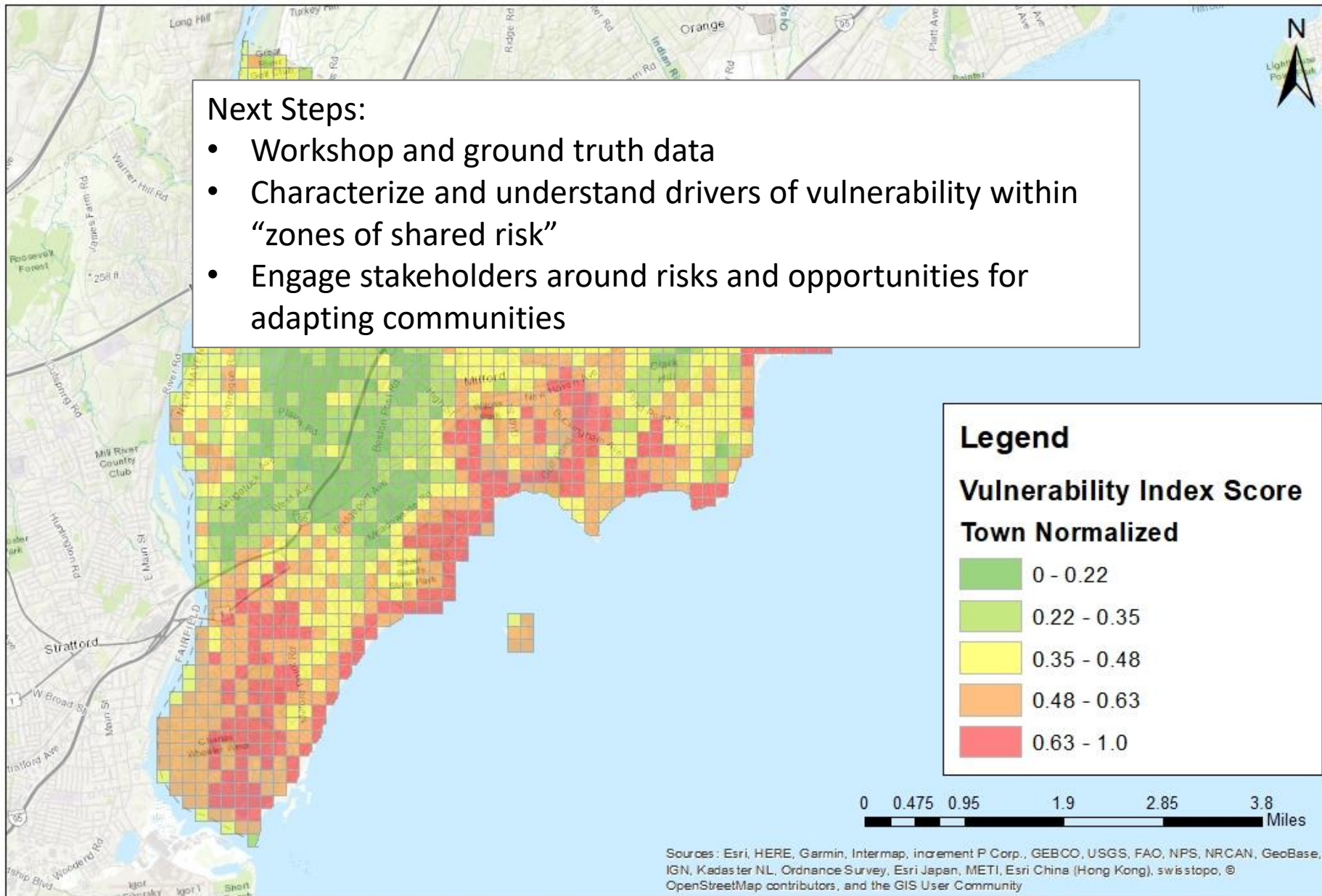
Proximity to egress

Buildings

Submerged cables and pipelines

Coastal protection infrastructure

Critical infrastructure



## Milford Coastal Vulnerability Map



**PRIORITY: Life Saving**

**EFFORT: Stabilization of Lifelines**



A lifeline enables the continuous operation of **government functions** and **critical business** and is essential to **human health** and **safety** or **economic security**.

***Description of the FEMA Community Lifeline Concept (FEMA, 2019).***

The **Community Lifelines** concept was born as a result of the numerous unprecedented multi-billion-dollar disasters that occurred in 2017 and 2018. The Community Lifelines concept is a framework for incident management that provides emergency managers with a reporting structure for establishing incident stabilization. Introducing the Community Lifelines at the federal level was a necessary change, as it allows for FEMA to clearly visualize where to simultaneously deploy its limited resources to multiple entities, including states, tribal nations, and island territories.

# Community Lifelines



lifelines@fema.dhs.gov



fema.gov/media-library/assets/documents/177222

## Definition

A lifeline enables the continuous operation of **critical business** and **government functions** and is essential to **human health** and **safety** or **economic security**.

## Purpose

Root Cause Analysis

Interdependencies

Prioritization

Ease of Communication

## Assessing

Status → What?

Impact → So What?

Actions → Now What?

Limiting Factors → What's the Gap?

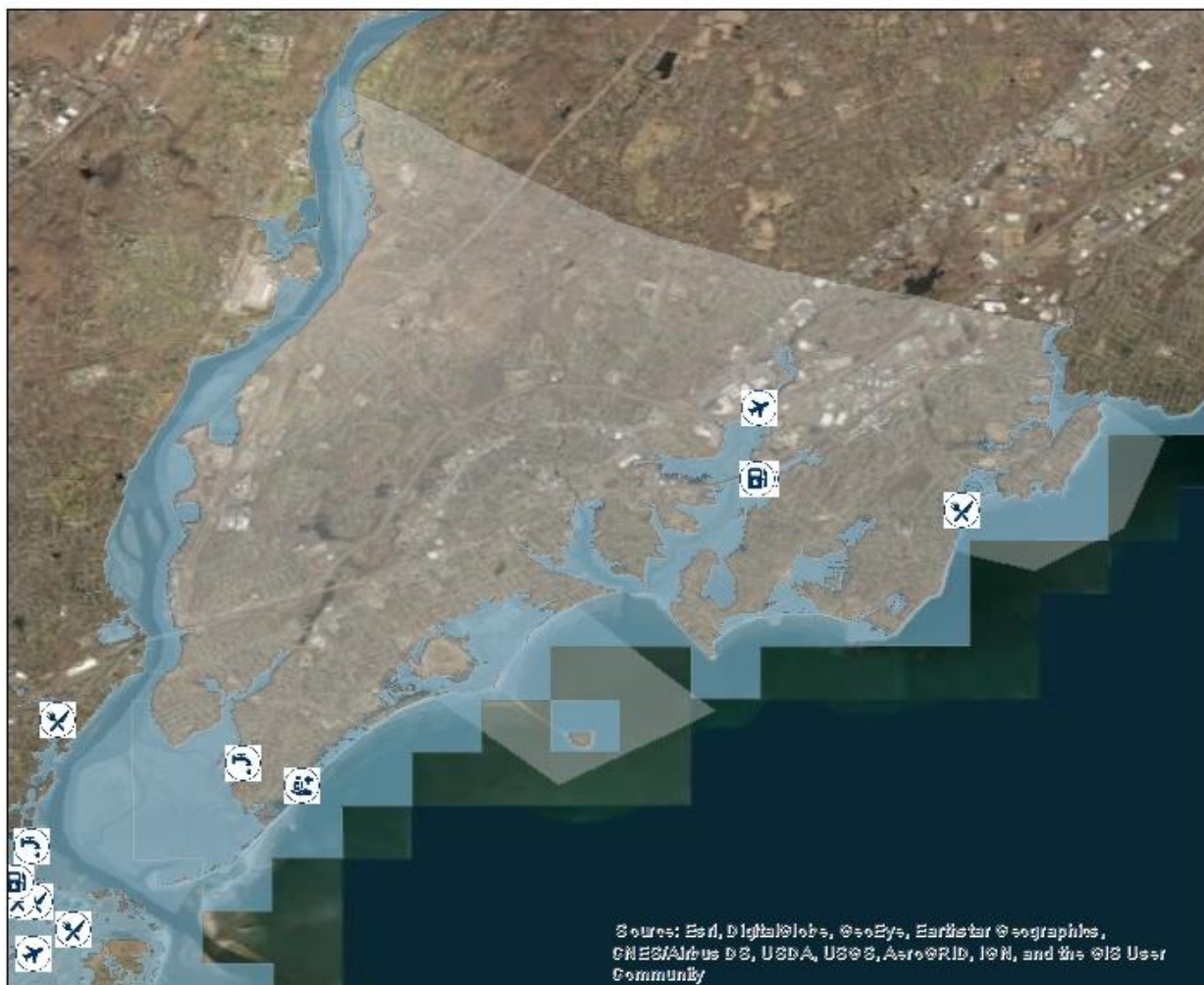
## Stabilization

Occurs when basic lifeline services or capabilities are provided to survivors (may be temporary solutions requiring sustainment).

COMPONENTS of Lifelines

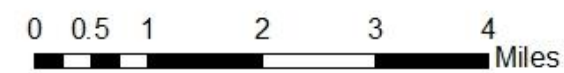


# Milford flooded lifelines

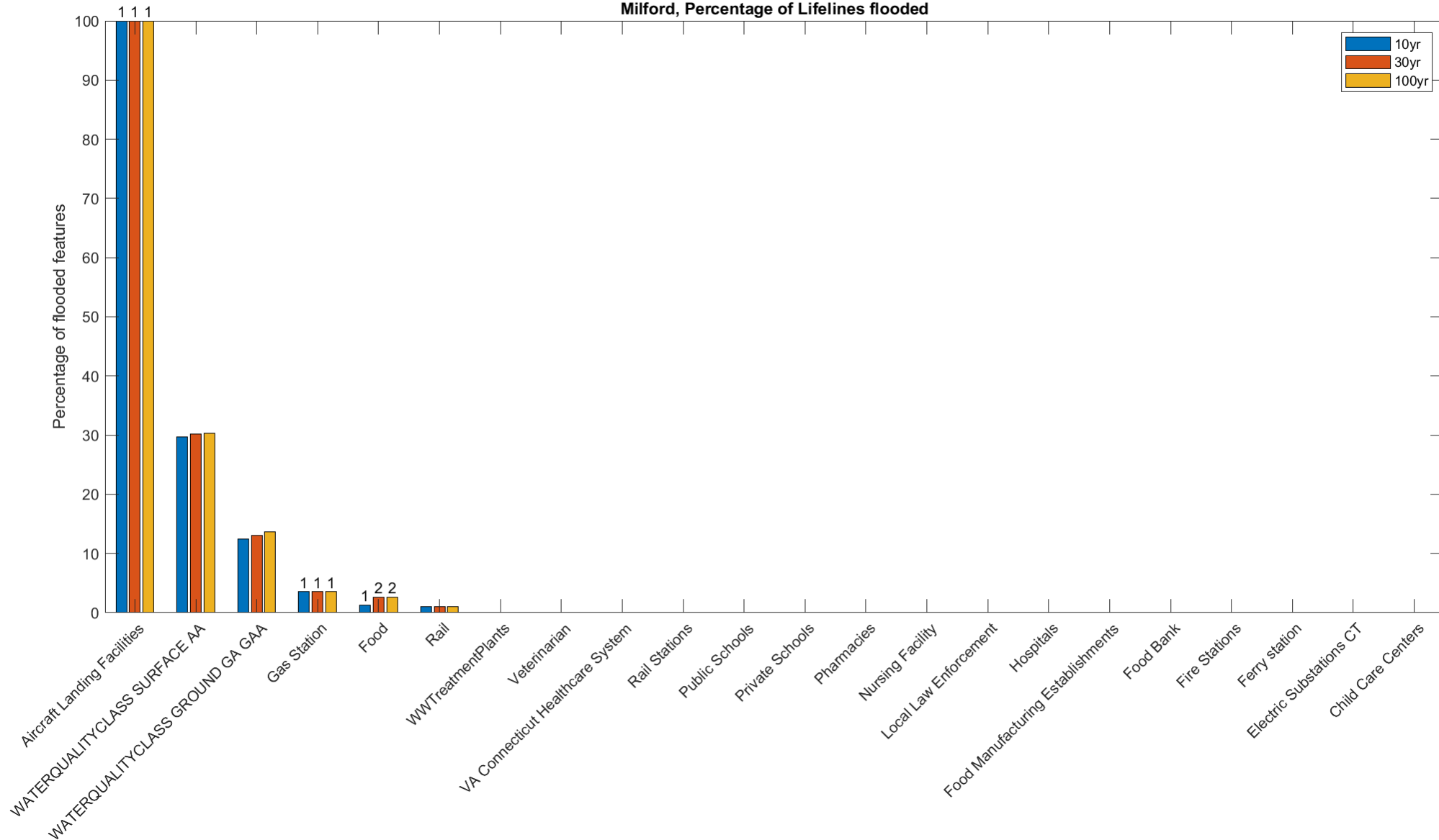


- Aircraft\_Landing\_Facilities
- WWTreatmentPlants
- Veterinarian
- Gas\_Station
- Food
- slr 100yr
- slr 100yr 20inch

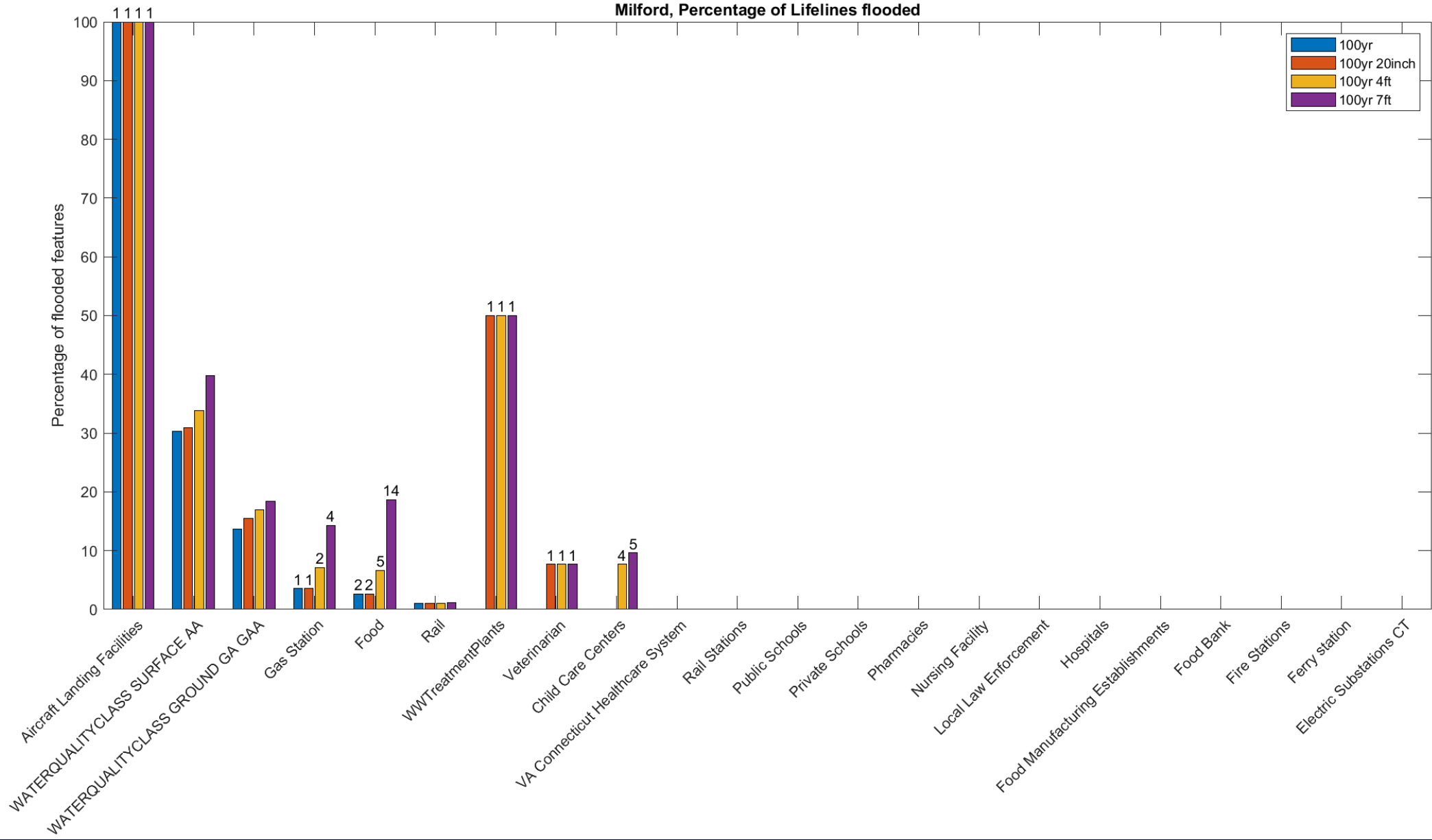
Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Milford, Percentage of Lifelines flooded



Milford, Percentage of Lifelines flooded







Find address or place

## Legend

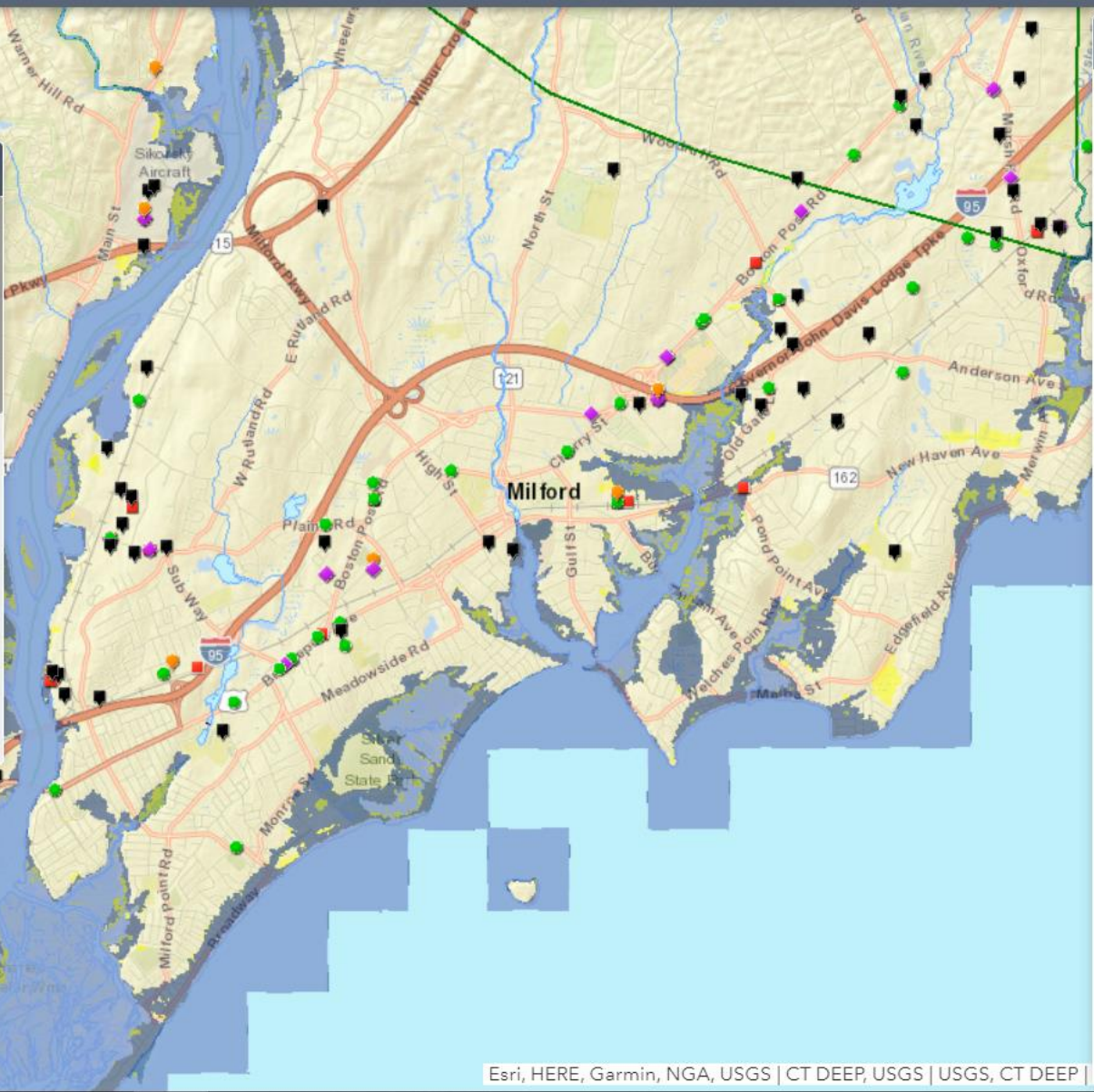
### EPCRA TierII Locations

- Resource Conservation and Recovery Act - Active Sites
  - Small Quantity Generator
  - Large Quantity Generator
  - Treatment, Storage, and Disposal Facility
- Toxic Release Inventory - Sites

### Connecticut Sea Level Rise Layers

- Mean Higher High Water
  - Low-lying Areas
  - Inundated Areas

100 Year Flood Event Plus 20 inches SLR



## About

CT Toxics Users & Climate Risk public viewer is a tool for businesses to assess the vulnerability of their location to climate-related natural hazards. This is especially important for those businesses that may store hazardous chemicals, materials and/or wastes on site. It will also assist EPCRA-regulated facilities with compliance to [CGS 22a-610\(e\)](#) requirements regarding updating hazard mitigation plans and applicable evacuation plans. Businesses are encouraged to:

1. Locate their facility(ies) on the map by entering an address or zooming in on the map,
2. Determine which (if any) flood zones intersect their property,
3. Consider how events such as heavy precipitation, hurricane surges or sea level rise, may affect them, and
4. Implement best management practices to prevent damage or contamination from toxic on-site materials.

The viewer also allows businesses to gauge their proximity to other facilities managing toxic materials that may impact normal operations, if flooding affects those facilities.

Similarly, emergency preparedness and response planners can use the viewer; it includes facilities that are EPCRA Tier 2

# What to do?

- Ensure evacuation routes are high enough
- Protect critical infrastructure
- Don't intensify development in flood zone
- Guide and facilitate residents to build to higher standards
- Reduce CO2 emissions
- -----
- Identify zones of shared risk
- Consult with all residents/users of ZSR on options
- Look for synergy (TOD + Resilience)
- Establish a fund to secure federal and state matching funds
- Participate in FEMA CRS

# Recommendations from 2012 POCD

- New or substantially improved structures should be compliant
  - Additional freeboard or more stringent standards?
- Seek to acquire repetitive loss structures when they become available
- Maintain open space in the floodplain where it exists and prevent new development in the floodplain
- Recommends that regional partnerships are needed to address water quality issues in the various watersheds

Thank You!

[Resilientconnecticut.uconn.edu](https://resilientconnecticut.uconn.edu)

[John.truscinski@uconn.edu](mailto:John.truscinski@uconn.edu)

**UConn**

