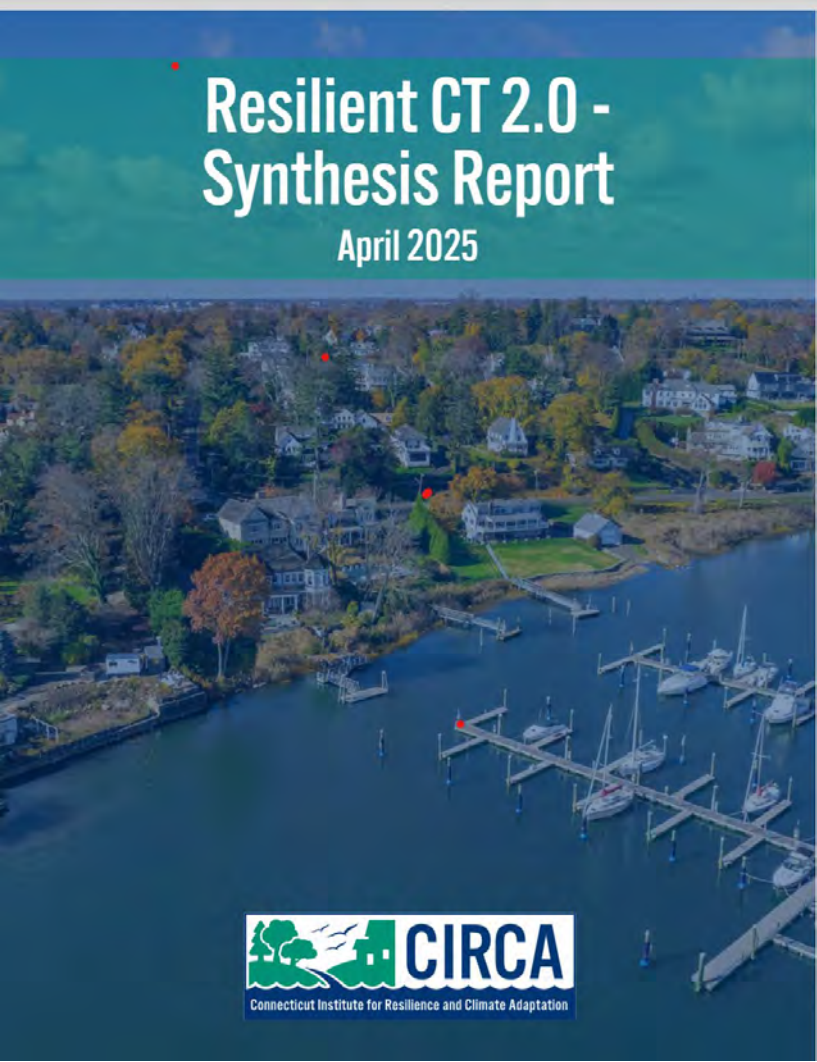# CIRCA SUMMIT 2025

Jim O'Donnell,

Executive Director, CIRCA
Professor, Department of Marine Sciences

Thursday Nov. 13th, 2025

Resilient CT 2.0 - Synthesis Report

April 2025

Resilient CT 1.0 & 2.0 Areas

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EAST HADDAM

Hydrologic Study Area Overview

First Resilient East Haddam Public Workshop

Restored Stream with Rehearsal Space Removed

Before | After

Yantic River/Norwich, Bozrah, Franklin

Highlights of this project
- Multiple Towns
- Coordination with SEC
- Quick Response

Jan. 10, 2024, 12:18 p.m. ET

A Backus Hospital van submerged in the Yantic River behind the William W. Backus Hosp in Norwich after flooding Wednesday.
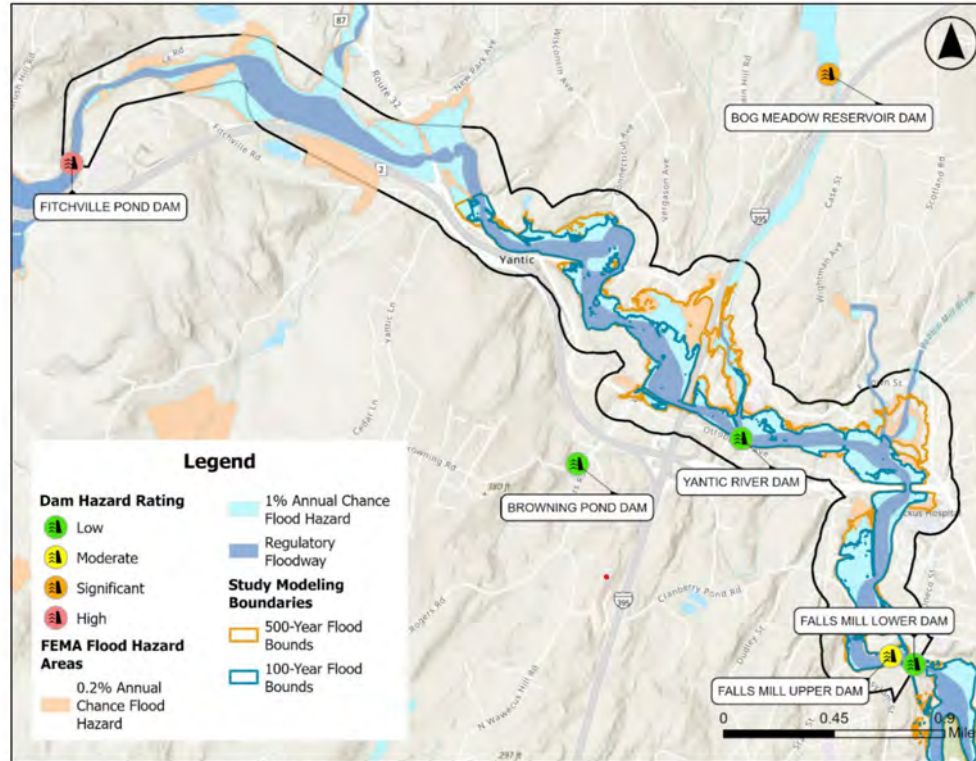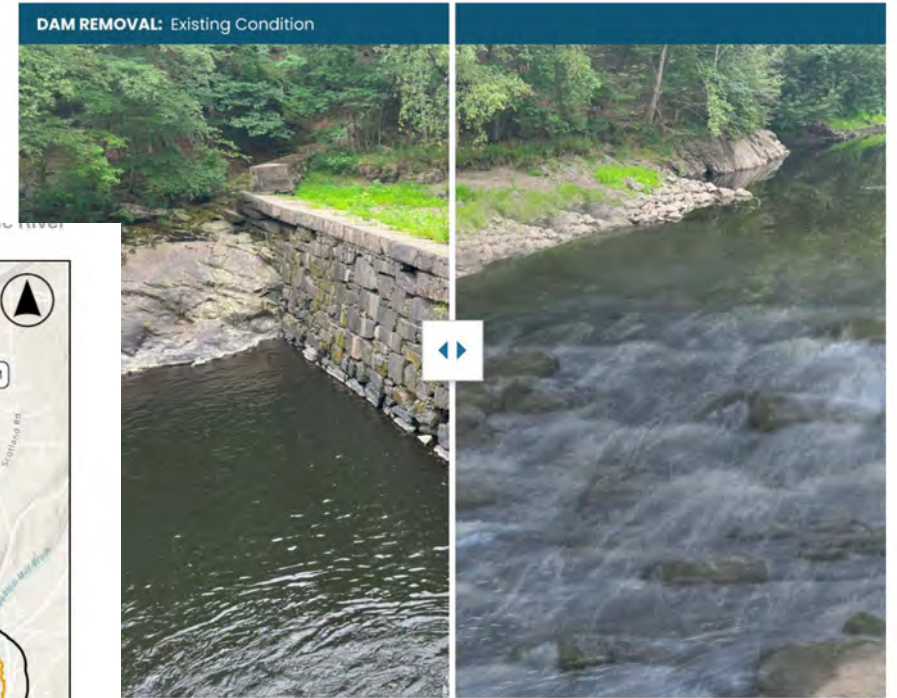
John Shishmanian/For The Bulletin

Legend

Dam Hazard Rating
- Low
- Moderate
- Significant
- High

FEMA Flood Hazard Areas
- 0.2% Annual Chance Flood Hazard

- 1% Annual Chance Flood Hazard
- Regulatory Floodway

Study Modeling Boundaries
- 500-Year Flood Bounds
- 100-Year Flood Bounds

BOG MEADOW RESERVOIR DAM

FITCHVILLE POND DAM

Yantic

YANTIC RIVER DAM

BROWNING POND DAM

FALLS MILL LOWER DAM

FALLS MILL UPPER DAM

0   0.45   0.9 Miles

Figure 14: Regional Dams, FEMA and Study Model Floodplains

DAM REMOVAL: Existing Condition

Recommended Interventions:
- removing the Upper Falls Dam
- widening the river channel
- implementing managed retreat

https://resilientconnecticut.uconn.edu/zoning/

Climate Resilient Zoning For Municipal Land Use Commissioners Training

In 2021, the Connecticut legislature passed Public Act 21-29 which included a requirement for land use boards to attend four hours of training every two years starting in 2023. CIRCA has created three online training modules on zoning policies that can be adopted to increase municipal climate resilience and together will fulfill one hour of the training requirement. The modules can be accessed below.

If a commission would like to have a live, online or in-person presentation of these materials, please contact circa@uconn.edu.

| MODULE 1: CLIMATE CHANGE IMPACTS ON CONNECTICUT | MODULE 2: RESILIENT ZONING TO ADDRESS CLIMATE VULNERABILITIES | MODULE 3: ZONING TOOLS TO ADDRESS CLIMATE VULNERABILITIES |

Zoning Fact Sheets

Examples of zoning policies municipalities could modify and/or adopt to enhance local climate resilience are linked in the adjacent boxes. Where applicable, model ordinances and examples of where the policies have been adopted are included. Check back as more fact sheets will be added soon.

Transferable Development Rights .pdf

Overlay Zones for Climate Resilience .pdf

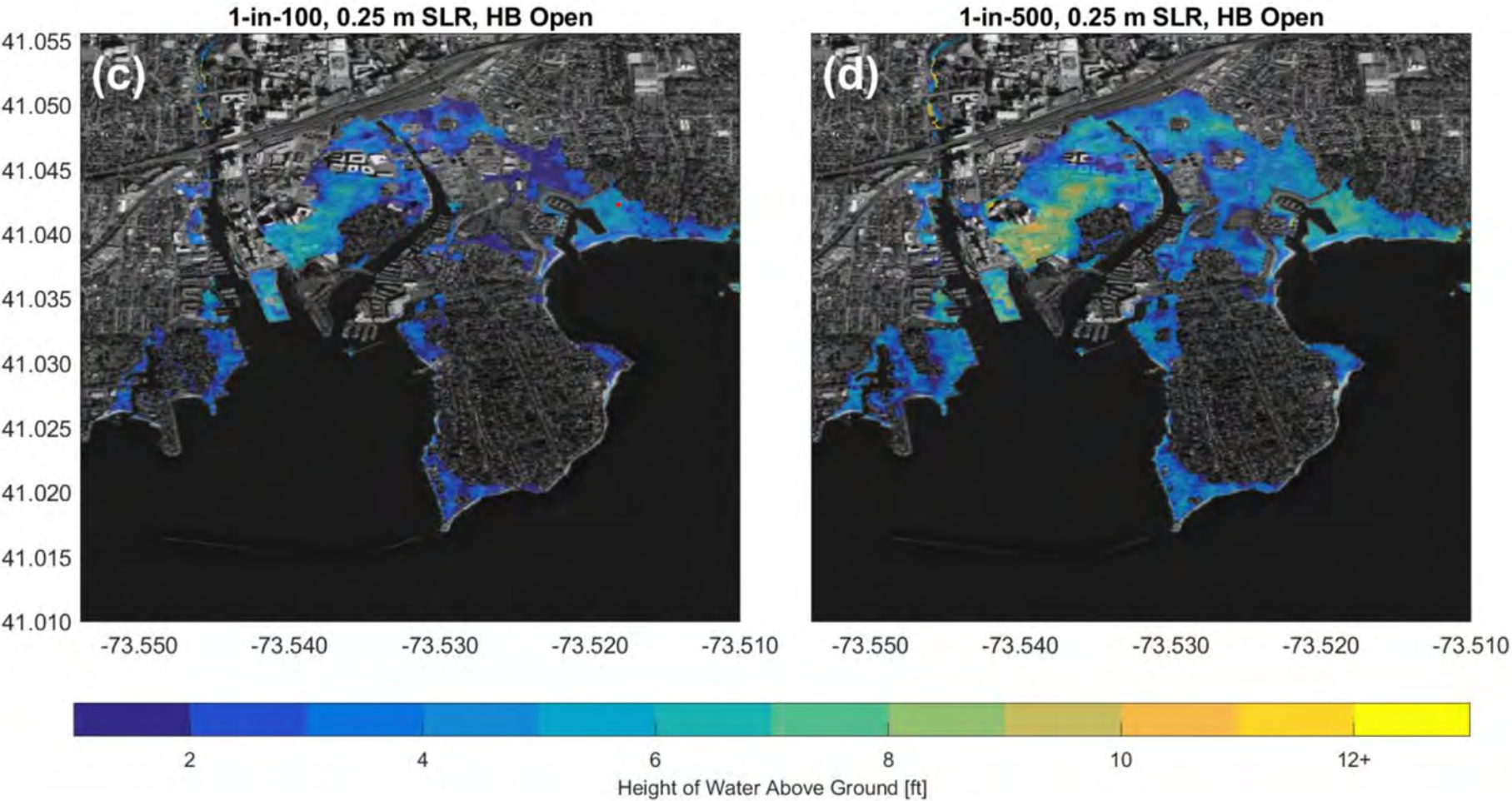**Reducing Parking Minimums**

Tree Protections Landscape Standards

Minimum Lot Size Reductions .pdf

Maximum Lot Coverage .pdf

Other Projects: (1) Stamford Future Flood Vulnerability

1-in-100, 0.25 m SLR, HB Open

1-in-500, 0.25 m SLR, HB Open

Height of Water Above Ground [ft]

Other Projects: (2) Mystic Future Flood Vulnerability

RESILIENT MYSTIC

TRANSPORTATION INFRASTRUCTURE AT RISK

Coastal flooding in Downtown Mystic brings severe impacts to critical roadways and transportation corridors, including evacuation routes, state and local roads, and the Northeast Regional railroad tracks.

Today, Amtrak passengers take the train to visit Mystic, with three to five Northeast Corridor trains stopping there daily. High-velocity floods can wash out train tracks from below, while impacts to the train station and related switch or signal equipment could affect the timeliness or availability of railroad service. If flood affects Routes 1 and 27 as major transportation corridors, it could seriously cripple Downtown Mystic's regional connectivity (more on this topic on **page 24**).

Local evacuation routes currently direct travelers north to I-95, one of the nation's busiest interstate highways. Simultaneously, traffic caused by flood diversions or damage to I-95 could bring traffic in Mystic to a standstill. Given the degree of flood impacts to Mystic's road network, advance notice for evacuees would be required during a flood of this magnitude. This would also apply to those who do not live in Mystic but rely upon these evacuation routes, such as residents of Mason's Island, who use a causeway to Mystic as a connection to the mainland.

LEGEND
- ⭐ Emergency Response (Police, Fire Department, EMS)
- 🚉 Railroad Station
- — Street - Flood Impacted
- —◄— Evacuation Route - Non-Flood Impacted
- —◄— Evacuation Route - Flood Impacted
- — Railroad - Non-Flood Impacted
- — Railroad - Flood Impacted
- — FEMA Zone AE

Projected Future 10% AEP Flood Event Depth with 20" of Sea Level Rise
- <1 ft
- 1-2 ft
- 2-3 ft
- 3-4 ft
- 4-5 ft
- > 5 ft

Current and Future Conditions Analysis | 23

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Other Projects: (3) Flood Sensors Demonstration

Stamford, CT June 2024

Other Projects: (4) Thatchbed Island Erosion
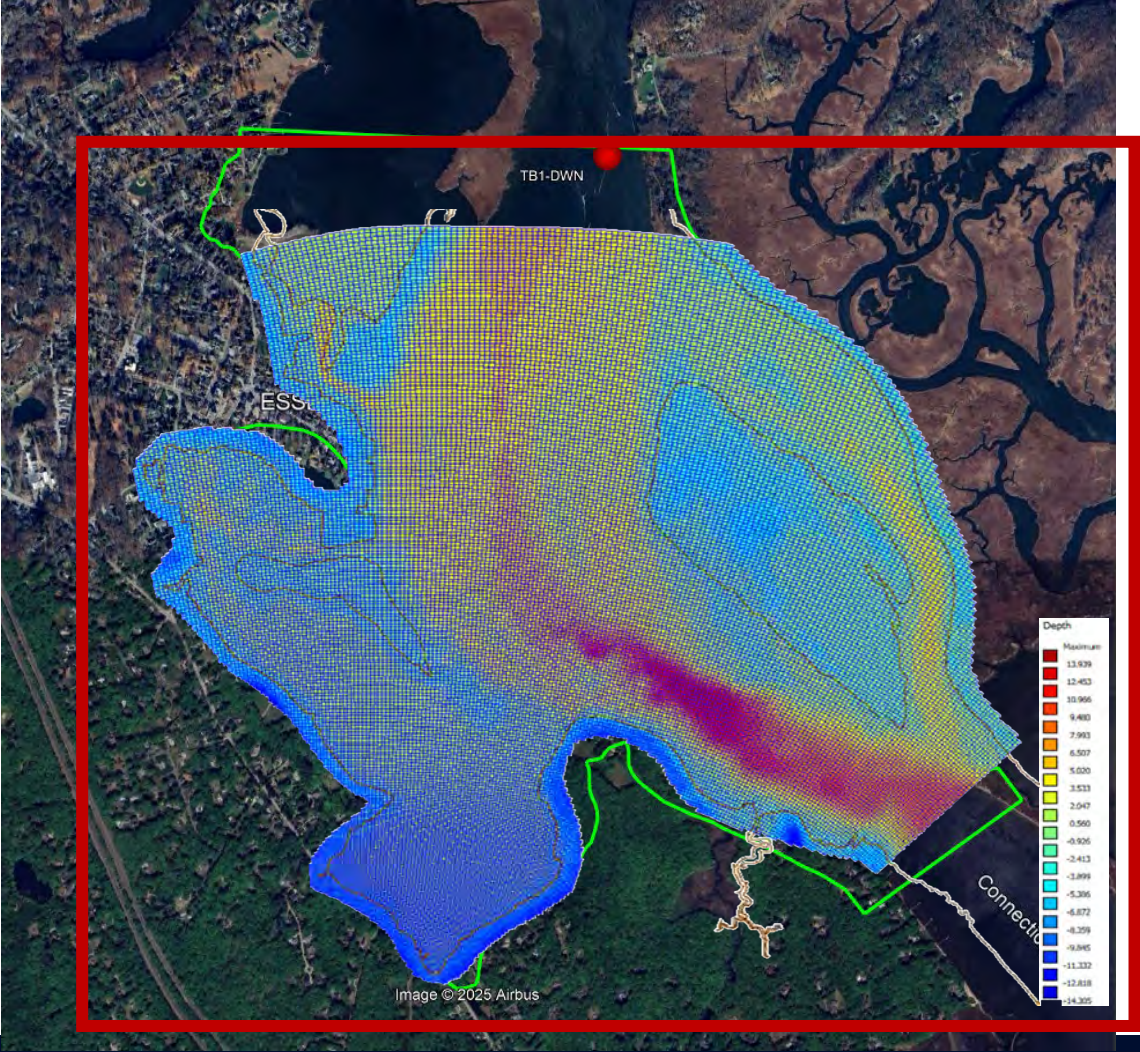
Other Projects: (5) Climate and Equity 2024 Grant Program

Support from CT DEEP (with RGGI funds)

- **Alliance for the Mystic River Watershed** (Eastern Pequot Tribal Nation, Groton, Ledyard, Mashantucket Pequot Tribal Nation, North Stonington, Stonington) Develop a Community Resilience Advisory Group,

- **Connecticut Roundtable on Climate and Jobs** (Bridgeport): Advance EmpowerED initiative for climate resilience and community trust-building.

- **Make the Road Connecticut** (Hartford, Bridgeport): Staff training on climate intersection with health, housing, and education justice.

- **New Haven Leon Sister City Project** (New Haven): Funding for a youth campaign called DeCARbonize the Oceans engagement

- **Northeast Neighborhood Partners Inc. / North Hartford Partnership** (Hartford): . Develop a process for donating compost to local farms and community gardens.

- **Radical Advocates for Cross-Cultural Education / RACCE** (Waterbury): Expand project to deploy a network of air quality monitoring devices in Waterbury,

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Science/Technical Publications

- Onat, Y., N. Govert, M. Buchanan, D. Murphy, M. McGaffin, C. Dickes, L. Duskin, V. Vetre, J. Truscinski, and J. O'Donnell (2025). **Development of a Statewide Climate Change Vulnerability Index for Heat and Flood: A Comprehensive Assessment of Connecticut for Resiliency Planning**. Geographies (2025), 5(3), 28; https://doi.org/10.3390/geographies5030028
- Onat, Y, M. Buchanan, L. Duskin, C. Massidda, J. O'Donnell (2025) **A State-Specific Approach for Visualizing Overburdened Communities: Lessons from the Connecticut Environmental Justice Screening Tool 2.0.** Sustainability 17 (10), 4535. https://doi.org/10.3390/su17104535
- Zheng Ren, Nalini Ravishanker, Marc de Vos, Namitha Viona Pais, Rohan Chhatre, James O'Donnell (2025) **Attention-Based Ensemble Learning for Hindcasting Significant Wave Heights and Estimating Extreme Return Levels** , Ocean Engineering (in Press)
- Zavell, M.D., M.E.P. Mouland, D. F. Barnum, Z. Chen, S. Siedlecki, J. O'Donnell, M. De Vos, C.M. Matassa, E.T. Schultz, and H. Baumann. (2025) **Experiments and ocean models predict diminishing benefits of offshore overwinter in northern stock black sea bass (Centropristis striata)**. Mar. Ecol. Prog. Ser. (In Review)
- Zheng Ren, Marc de Vos, Nalini Ravishanker, Namitha Viona Pais, James O'Donnell, (2025) **Systematic Evaluation and Enhancement of Significant Wave Height Forecasting Using Attention-Based LSTM Networks and Model Optimization**, Ocean Modelling (submitted)
- Zheng Ren, Marc de Vos, Nalini Ravishanker, Namitha Viona Pais, James O'Donnell, (2025) **Noise-Augmented and Probabilistic Deep Learning for Significant Wave Height Forecasting with Attention-Based LSTM Models**. Submitted to Applied Ocean Research
- de Vos, M, Y. Onat a and J. O'Donnell (2025) **Tide-surge interactions in an estuary: a case study in Long Island Sound**, Cont. Shelf Research (submitted)
- de Vos, M, Y. Onat and J. O'Donnell (2025) **Evaluation of high-resolution downscaled CMIP6 projections for adaptation to climate extremes in Connecticut**. Climate Services (submitted)
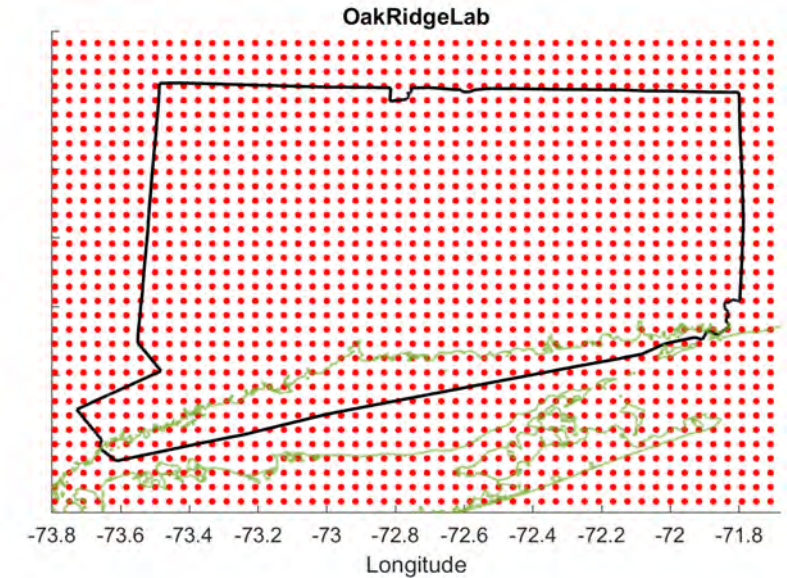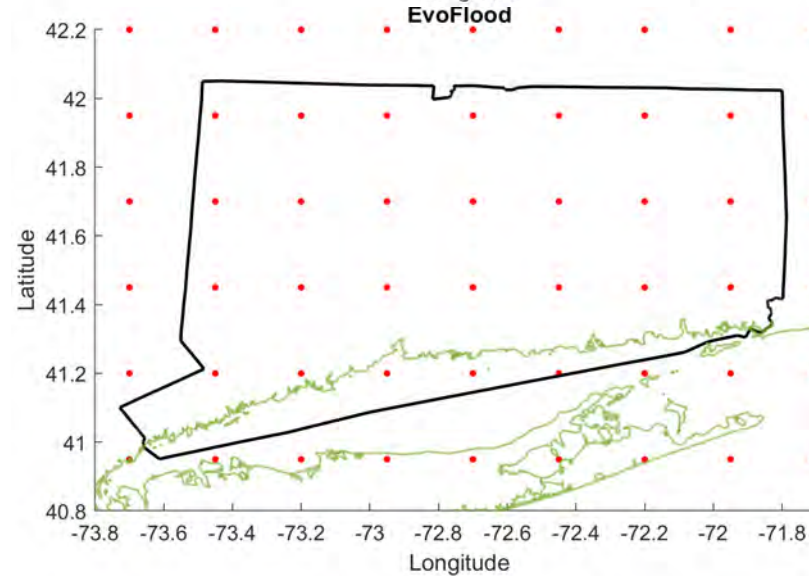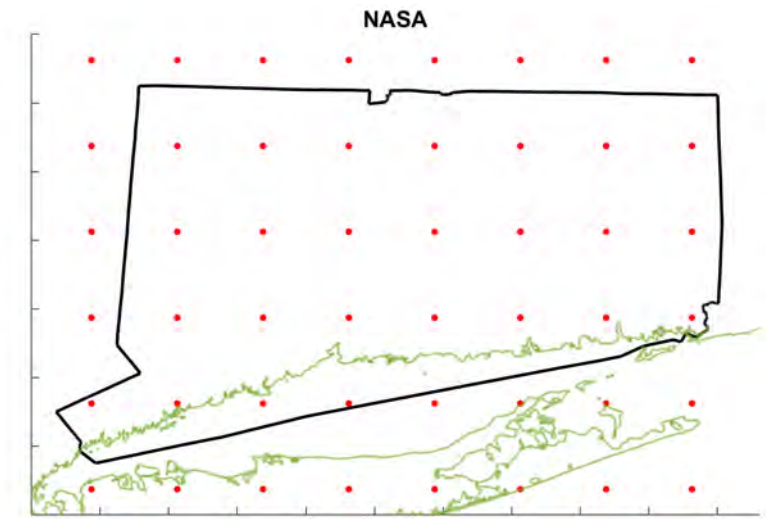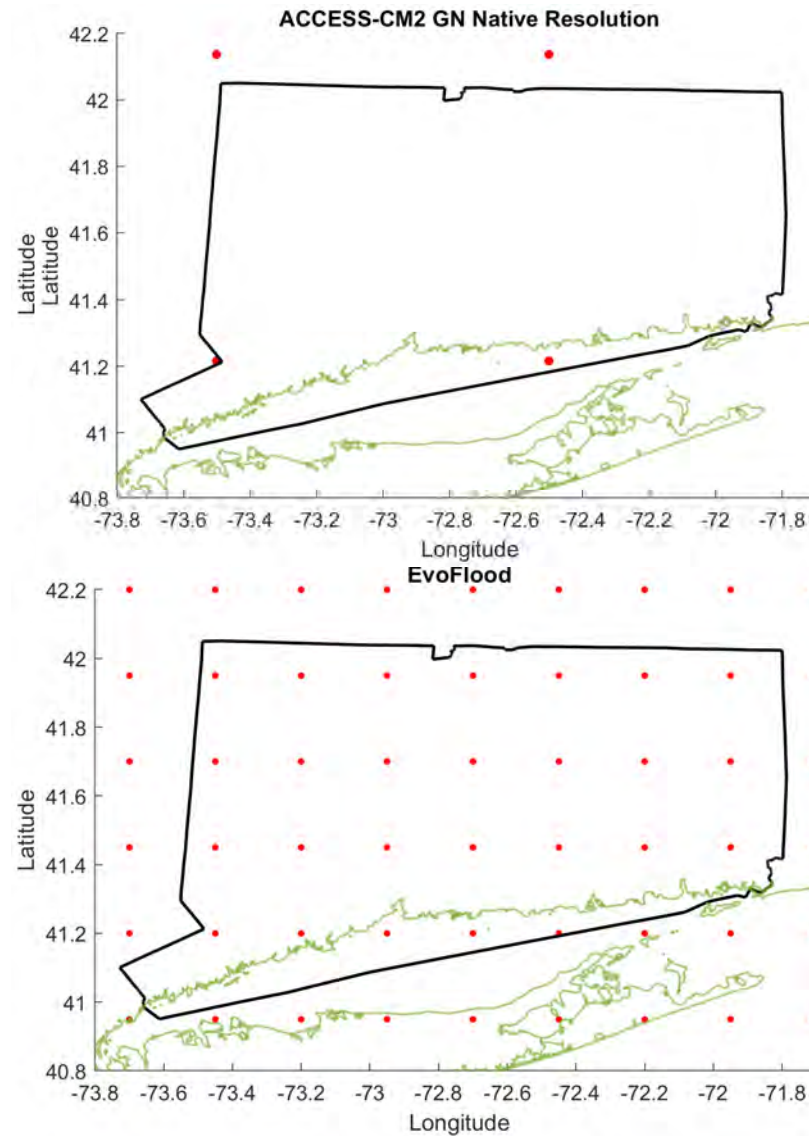
"Localizing" Climate Projections

Avg. horizontal resolution in CMIP6 models ~ 1° (110 km, 70 mi)

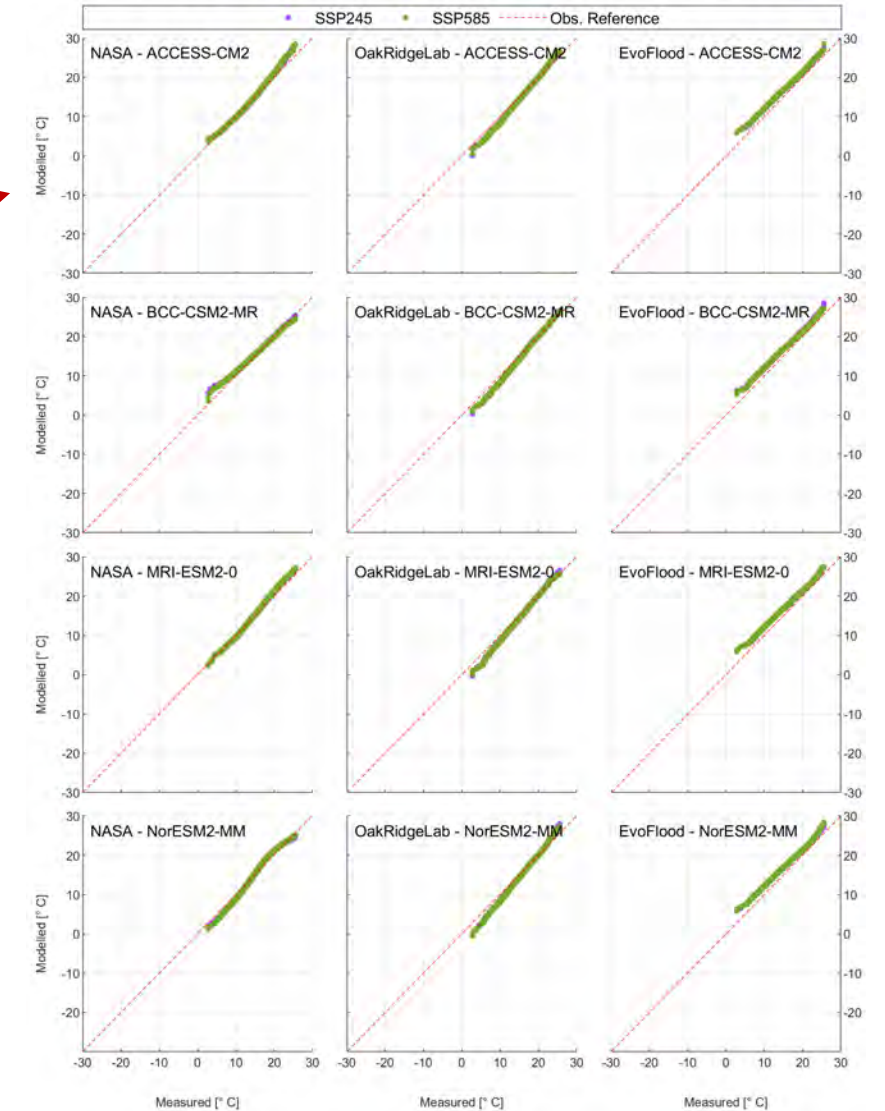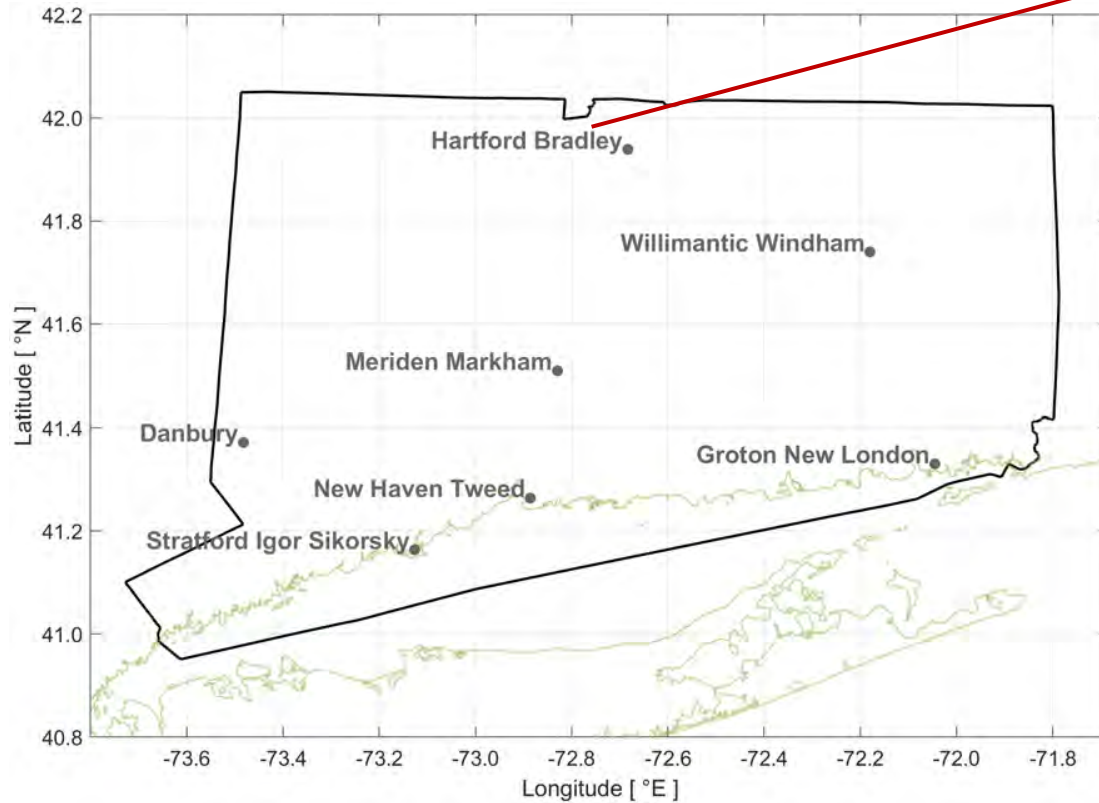(Probably) too low for local planning

Downscaling: increasing resolution of GCMs
- Dynamically
- Statistically

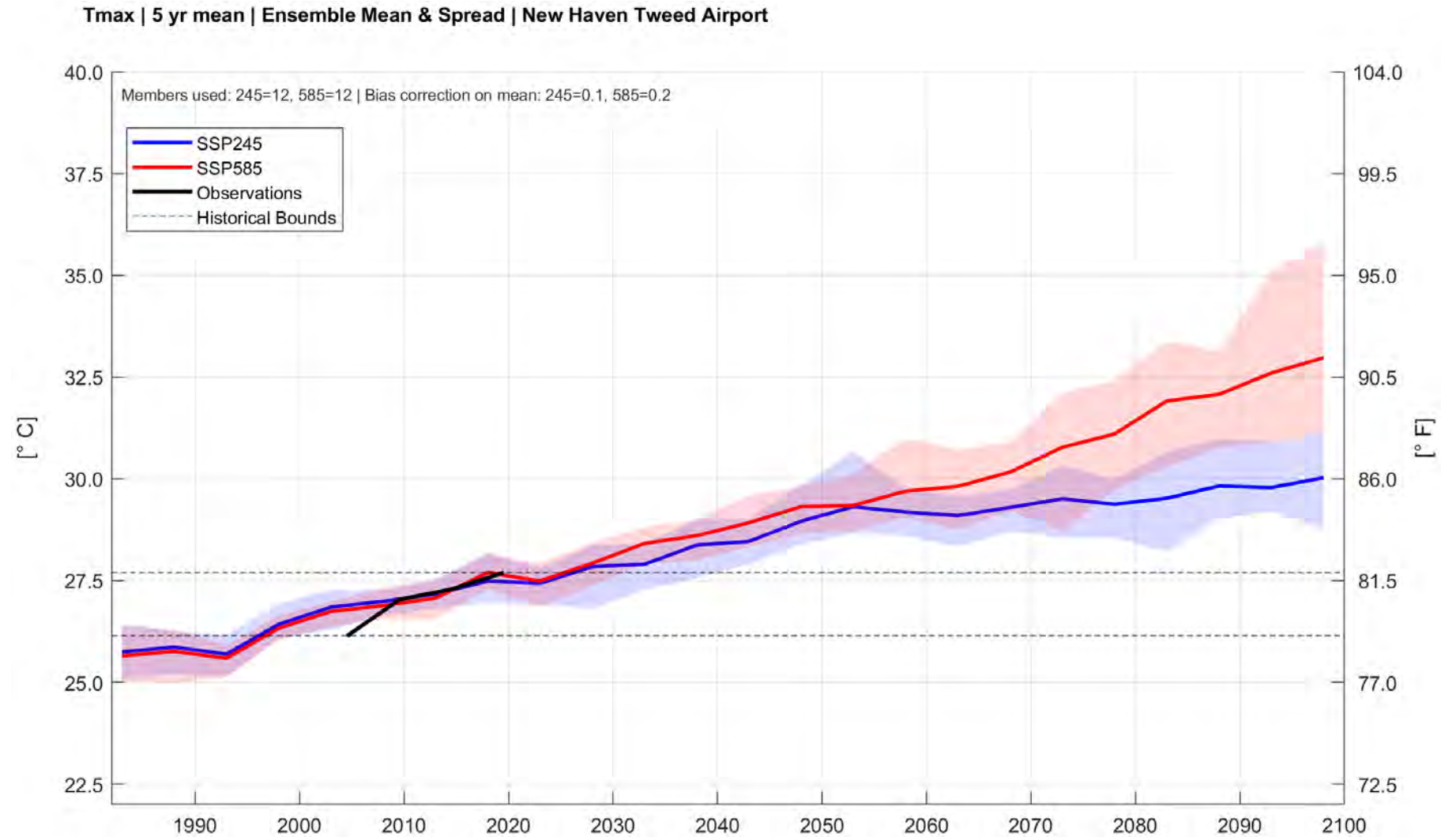# How reliable are climate projections of *extremes* in Connecticut?

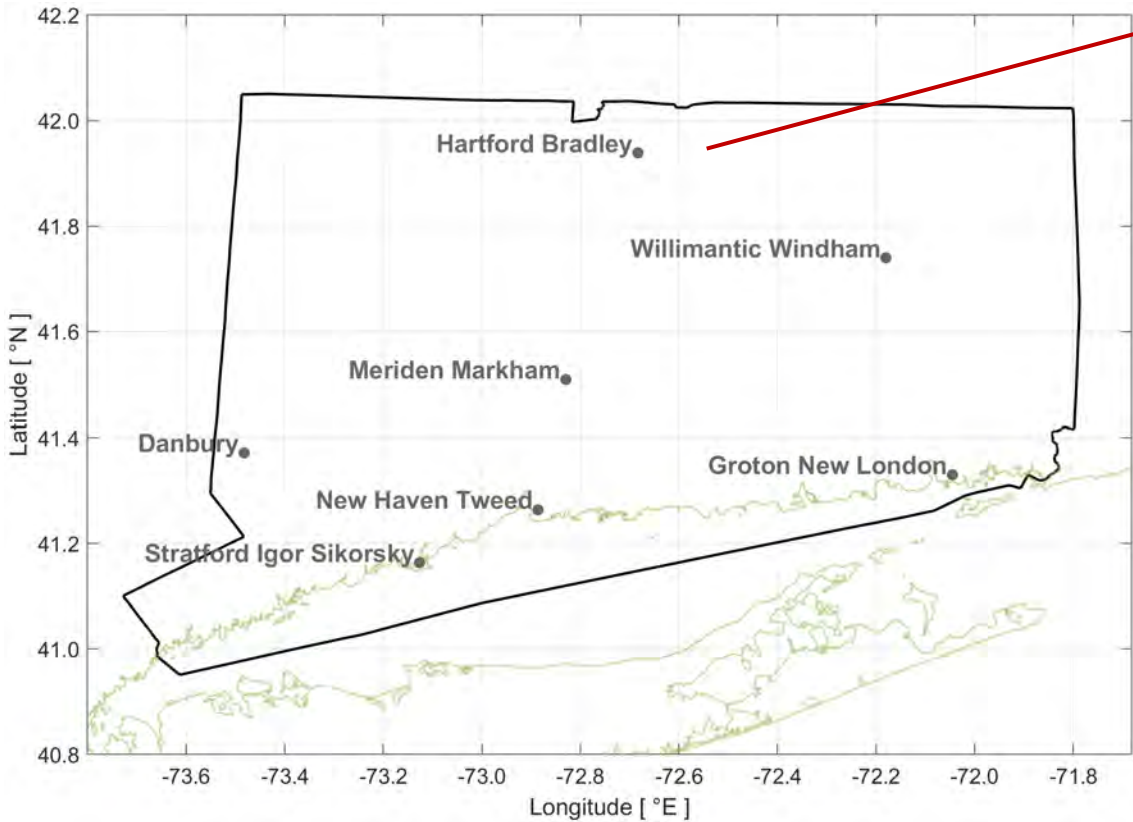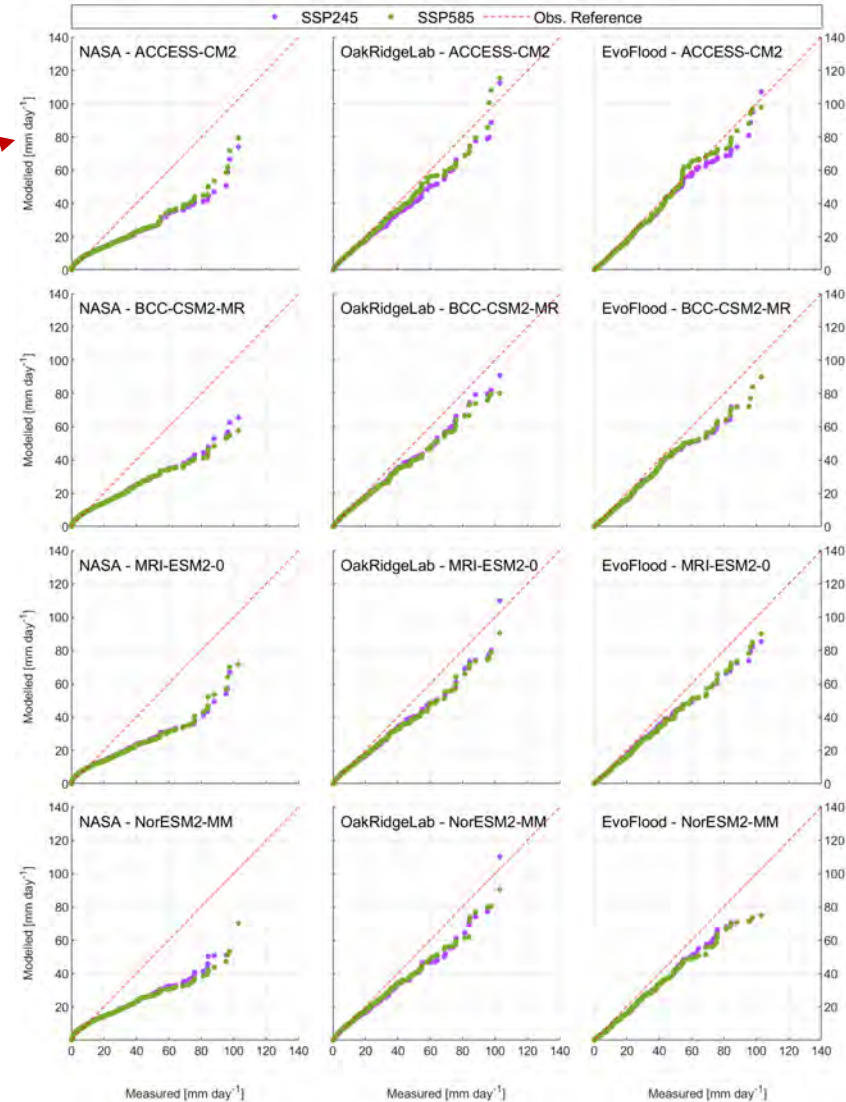**Long term means**

(reliable ensemble members)

Tmax | 5 yr mean | Ensemble Mean & Spread | New Haven Tweed Airport

Members used: 245=12, 585=12 | Bias correction on mean: 245=0.1, 585=0.2

- SSP245
- SSP585
- Observations
- Historical Bounds

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How reliable are climate projections of *extremes* in Connecticut?

How reliable are climate projections of *extremes* in Connecticut?

Maximum daily temperatures: mixed reliability
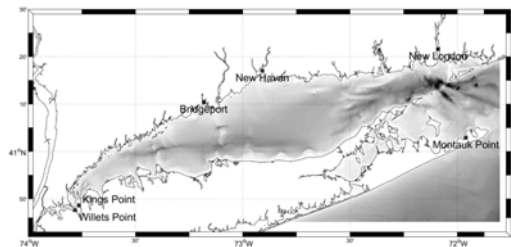
Minimum daily temperatures :   high reliability

Daily average wind speeds: mixed reliability
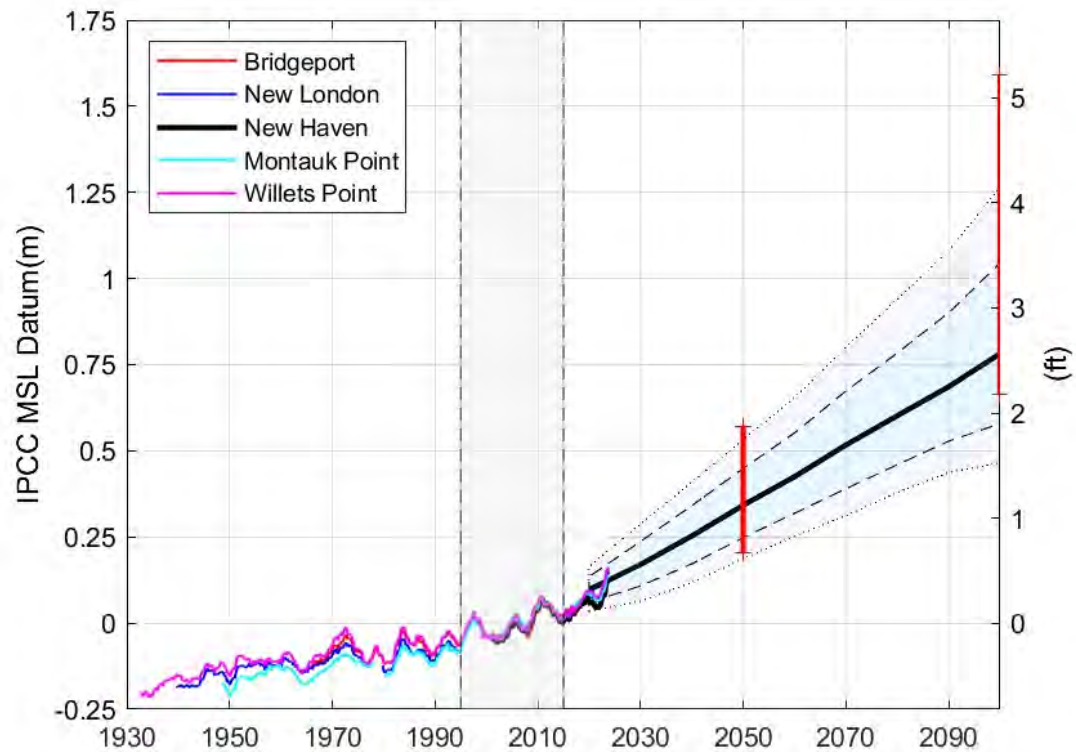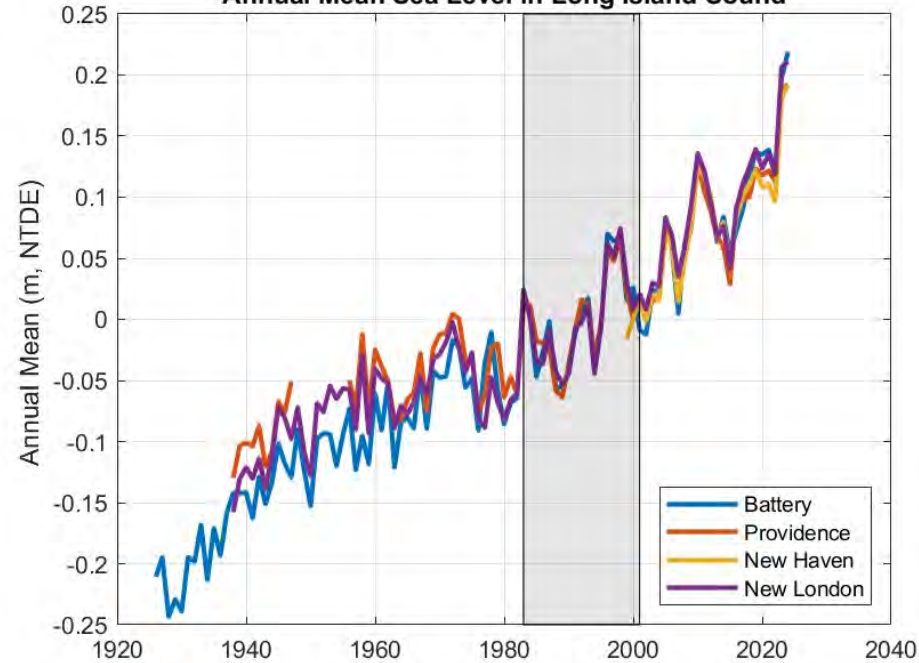
Daily average precipitation: low reliability

Relative humidity: inconclusive

Updated Mean Sea Level Observations and Predictions for Connecticut?

What's Next?

1. Resilient Connecticut in Northeast and Northwest

2. Review Resilient Connecticut 1.0 projects to assess potential for effective interventions

3. CT FLOOD Alert Network

4. Continue engagement with EJ community groups

5. Develop workforce training and standards

6. Assist municipalities in the FEMA and CT DEEP funding competitions.