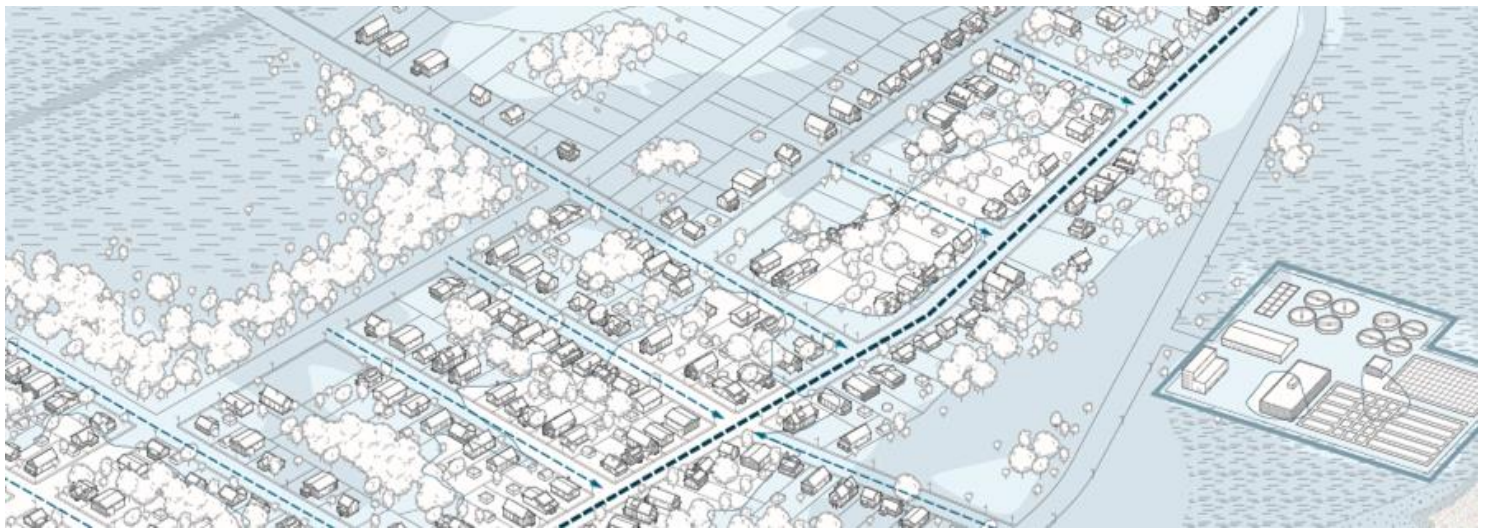


23 July 2019



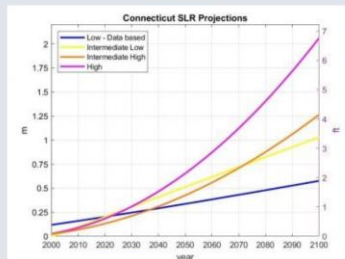
New Planning and Visualization Tools for Sea Level Rise



Sea Level Rise Projections for Connecticut

CIRCA recommends that Connecticut plan for the upper end of the range of values projected of sea level rise or up to **20 inches (50cm) of sea level rise higher than the national tidal datum in Long Island Sound by 2050** and that it is likely that sea level will continue to rise after that date.

LEARN MORE



Creating a Resilient Connecticut: A CIRCA Forum on Science, Planning, Policy & Law | May 11, 2018

Posted on March 19, 2018 by Lauren Yaworsky



Friday, May 11, 8:15 am to 4:30 pm

UConn School of Law

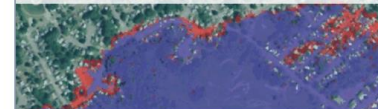
Reading Room, William F. Starr Hall

45 Elizabeth St. Hartford, CT 06105

- “Municipal Resilience Planning Assistance Project” was funded through the [State of Connecticut Department of Housing](#) CDBG-Disaster Recovery Program and the [US Department of Housing and Urban Development](#).
- Combined science, policy, and planning at the state and local levels to address vulnerable communities along Connecticut’s coast and inland waterways to climate change.
- Developed tools for municipalities to assess vulnerable infrastructure to inundation by river flow, sea level rise, and storm surge in the next 25-50 years.

<https://circa.uconn.edu/projects/municipal-resilience-planning/>

FEATURED TOOL



Sea Level Rise Projections

MAP VIEWER

FINAL REPORT .PDF

FEATURED TOOL

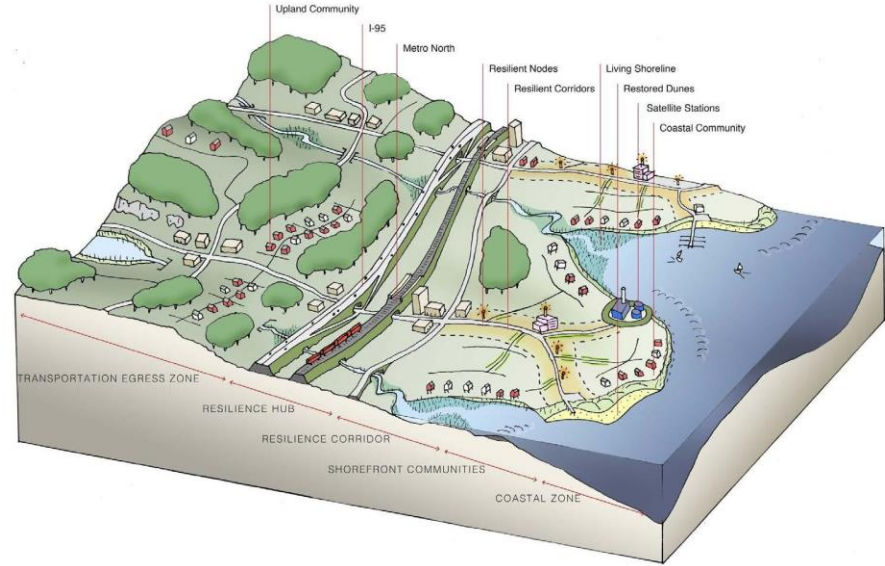
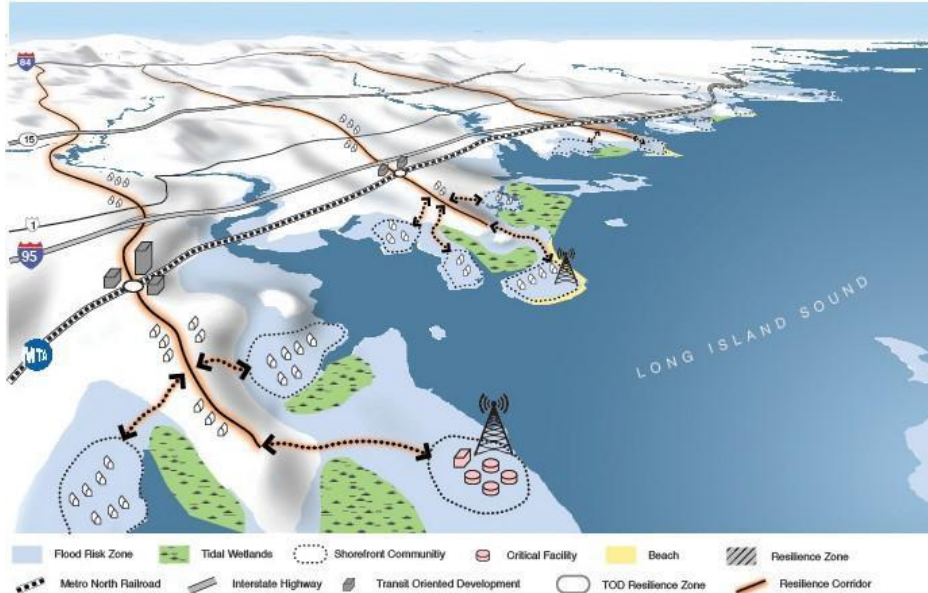


River Flow Rates Map Viewer

Interactive graphs of return interval for flow rates on Connecticut river networks

RIVER FLOW MAP VIEWER

Resilient Connecticut, HUD National Disaster Resilience Grant



**CONNECTICUT INSTITUTE FOR
RESILIENCE AND CLIMATE ADAPTATION**

Zones of Shared Risk



Municipal Scale: Zones of Shared Risk

Access – ability to enter/exit area

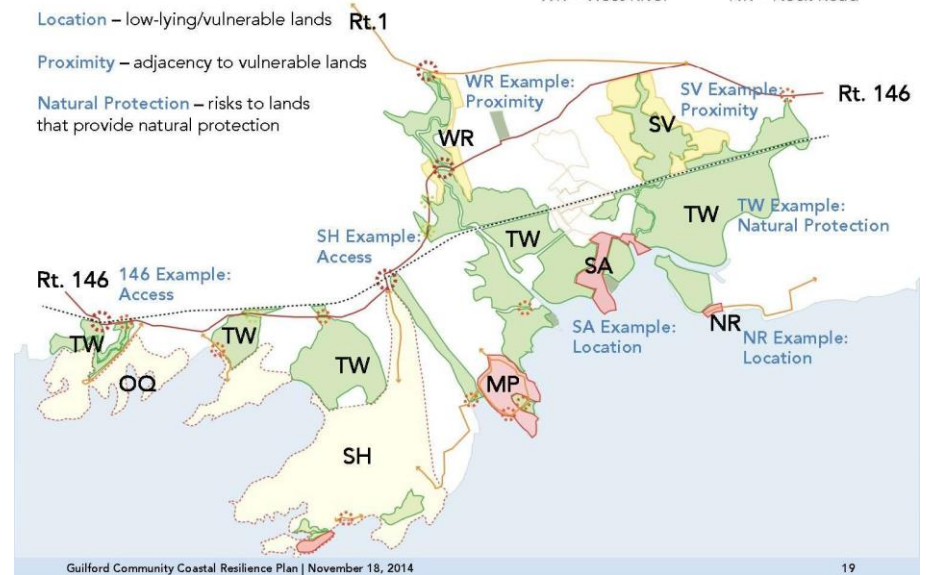
Location – low-lying/vulnerable lands

Proximity – adjacency to vulnerable lands

Natural Protection – risks to lands that provide natural protection

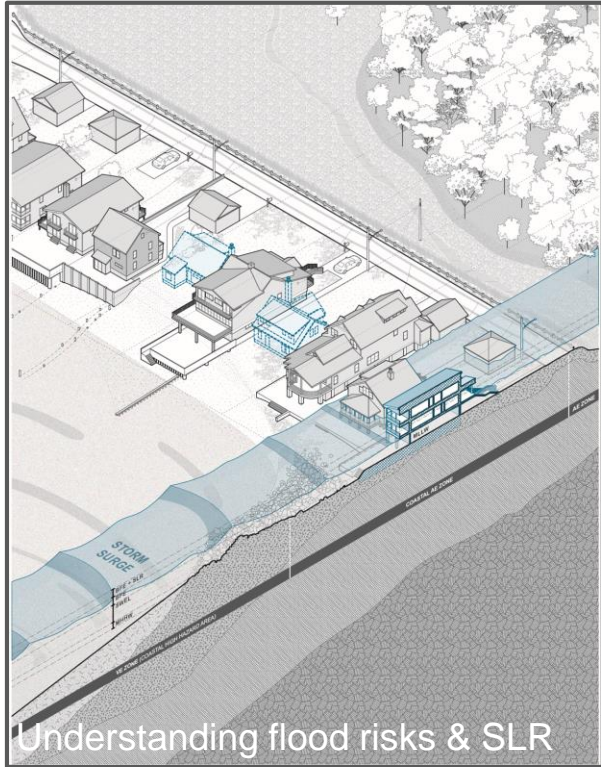
TW – Tidal Wetlands
 OQ – Old Quarry
 SH – Sachem's Head
 WR – West River

MP – Mulberry Point
 SA – Seaside Avenue
 SV – Soundview Road
 NR – Neck Road



Visualizations

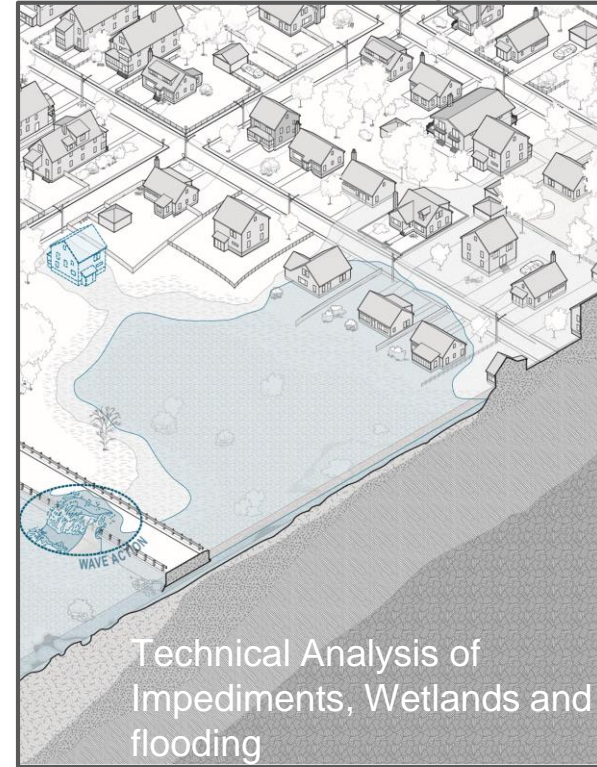
Barrier beach with housing

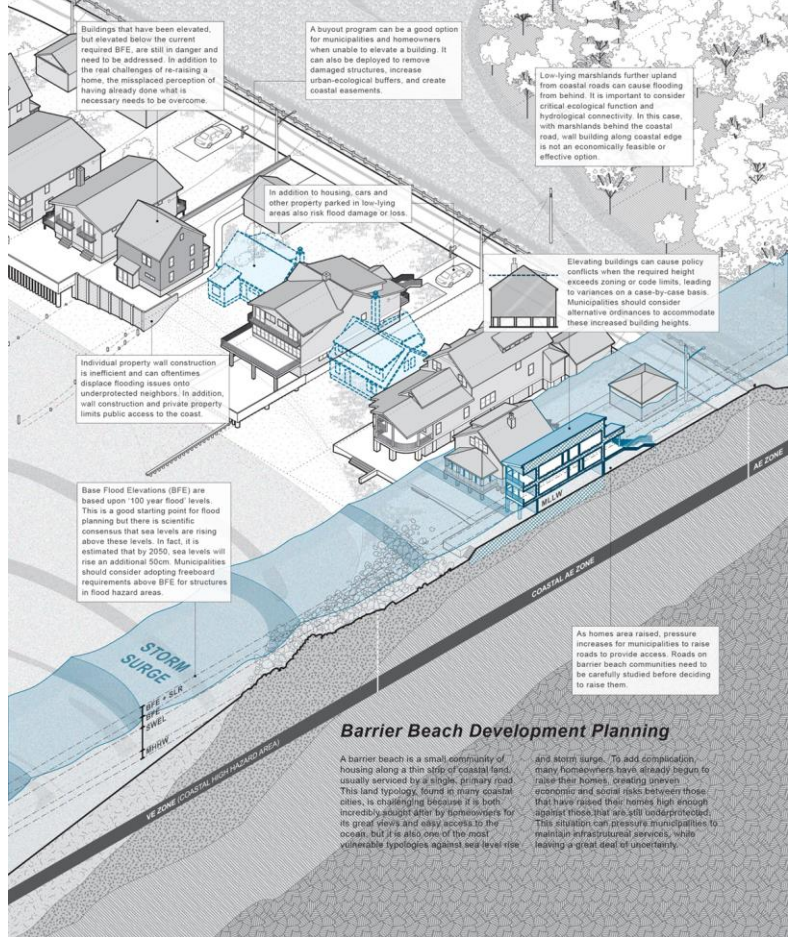


Peninsula and impounded marsh



Inland marsh with housing

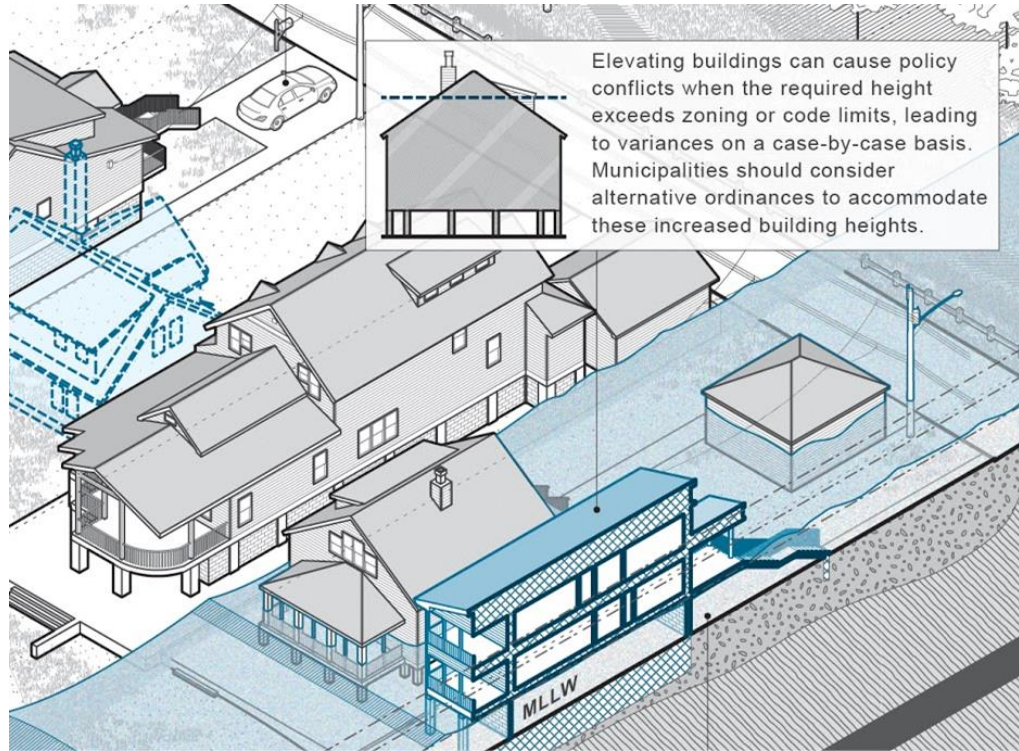




Barrier Beach Development Planning

A barrier beach is a small community of housing along a thin strip of coastal land, usually serviced by a single, primary road. This land typology, found in many coastal cities, is challenging because it is both incredibly sought after by homeowners for its great views and easy access to the ocean, but it is also one of the most vulnerable typologies against sea level rise

and storm surge. To add complication, many homeowners have already begun to raise their homes, creating uneven economic and social risks between those that have raised their homes high enough against those that are still underpermitted. This situation can pressure municipalities to maintain infrastructural services, while leaving a great deal of uncertainty.



Barrier Beach Development Planning

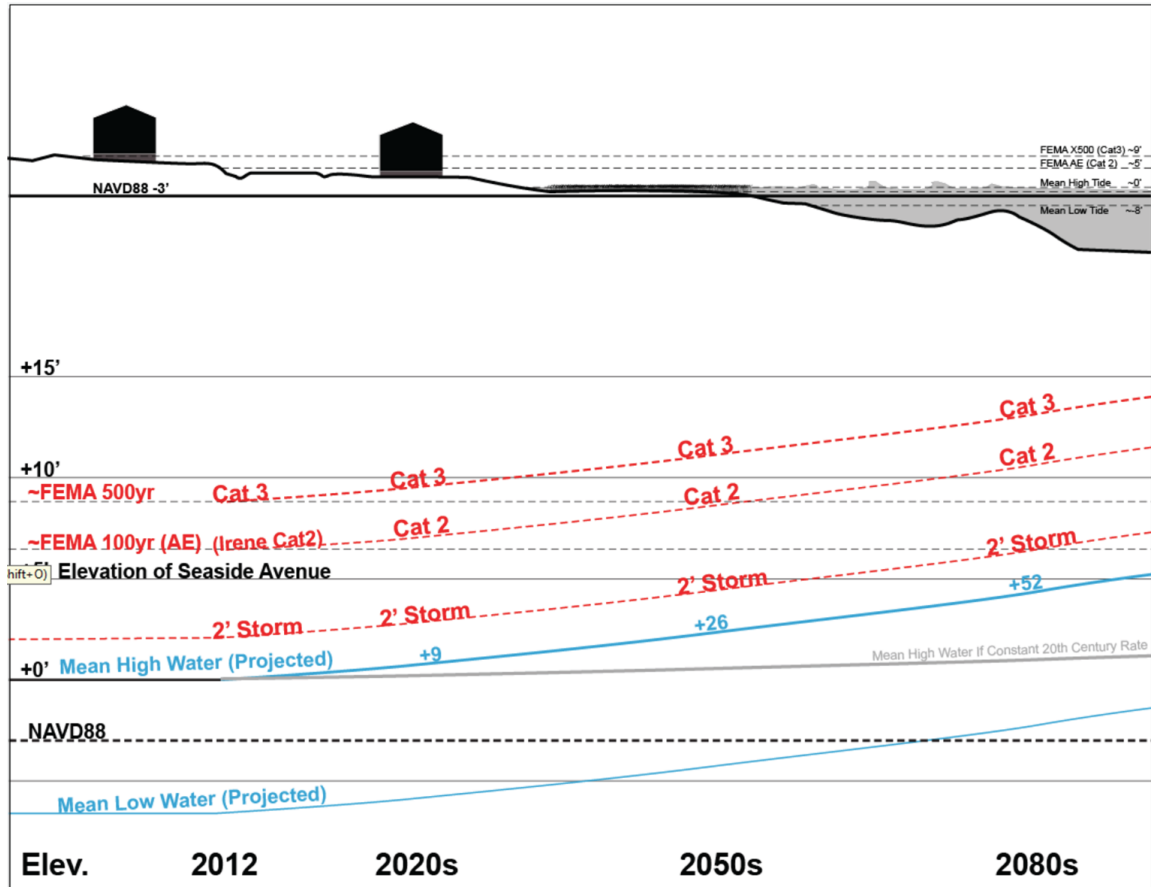
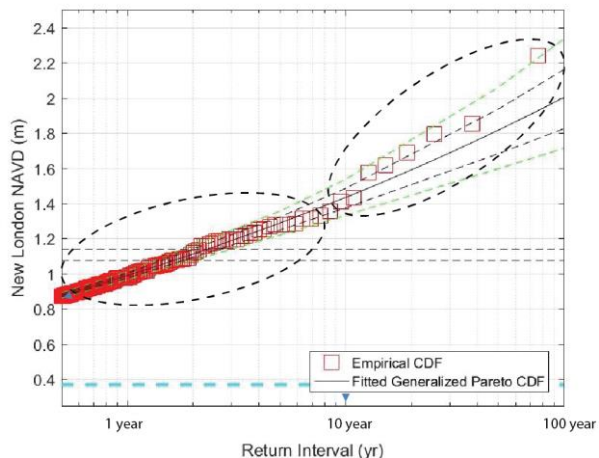


CONNECTICUT INSTITUTE FOR RESILIENCE AND CLIMATE ADAPTATION

Differentiating hurricanes from nor'easters

Understanding the impact of sea level rise (slr) overtime

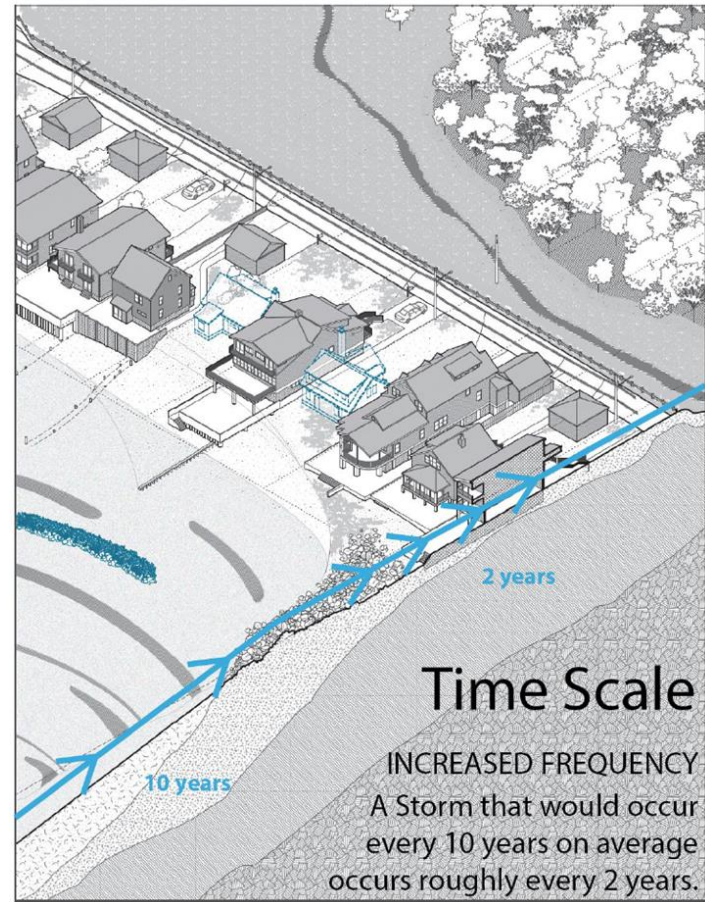
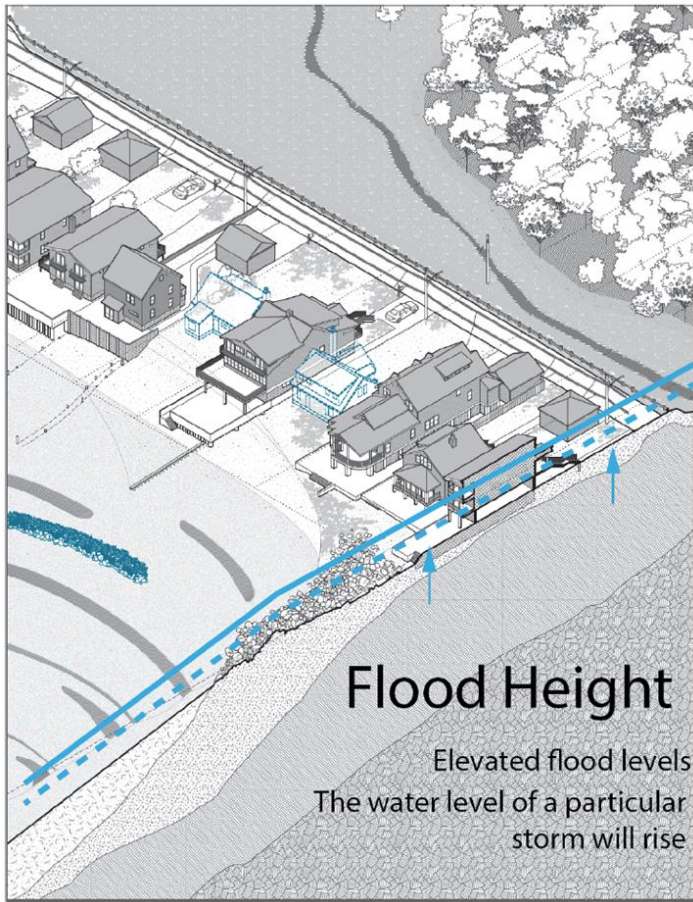
Understanding the combined impact of SLR and storms

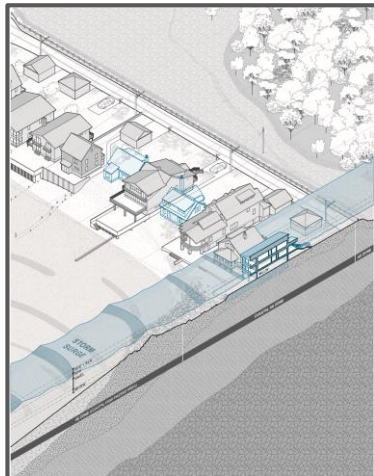


UEDLAB



CONNECTICUT INSTITUTE FOR RESILIENCE AND CLIMATE ADAPTATION

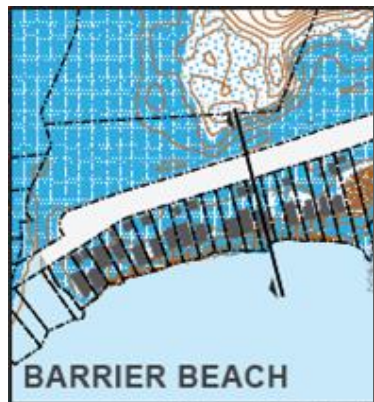




Fairfield, 1880



Fairfield



East Haven, 1893



East Haven



they may be more resilient by sea level rise.

Coastal features subject to constant wave and wind energy likely took many years to reach a type of steady state. When modified, the forces remain, often pressuring the site back towards stability. The result is that areas heavily altered are usually the most impacted by storm events. Fighting this rebound effect can be extremely difficult and expensive.

Ocean Beach in New London is one such case. In the 1934 aerial, notice the number of homes built on the beach. The hurricane of 1938 washed over the barrier beach and destroyed and damaged many of the homes, evident in this photo taken by the Air Guard right after the hurricane. Today it is the home of Ocean Beach Park.

See the same area from a different perspective (below). The left is just after the 1938 hurricane and the right is today. The houses have been replaced by a recreational area. The sand spit is now a jetty built by the US Army Corps of Engineers.





Lidar data, Downloaded from CT ECO



CONNECTICUT INSTITUTE FOR RESILIENCE AND CLIMATE ADAPTATION

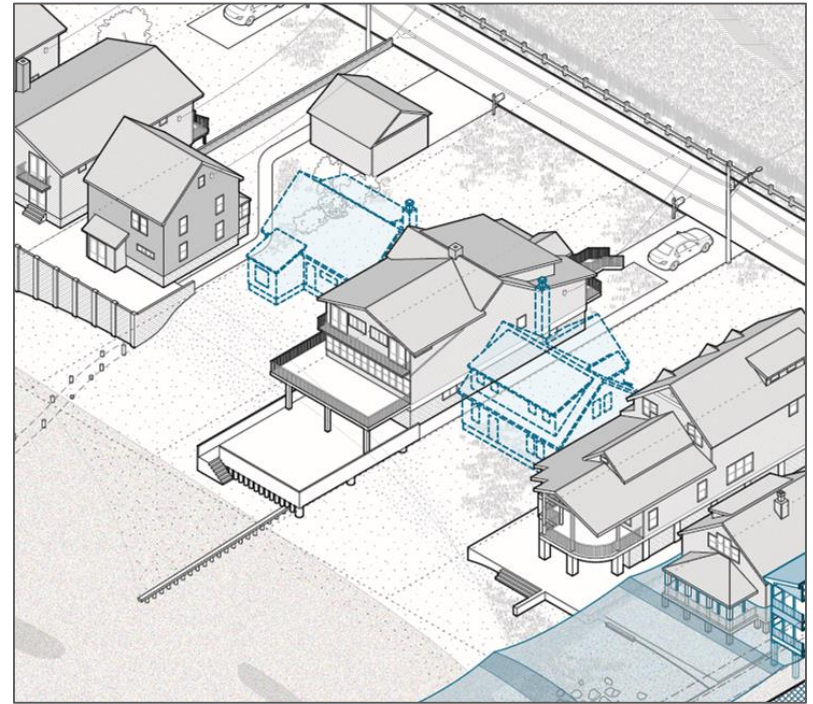
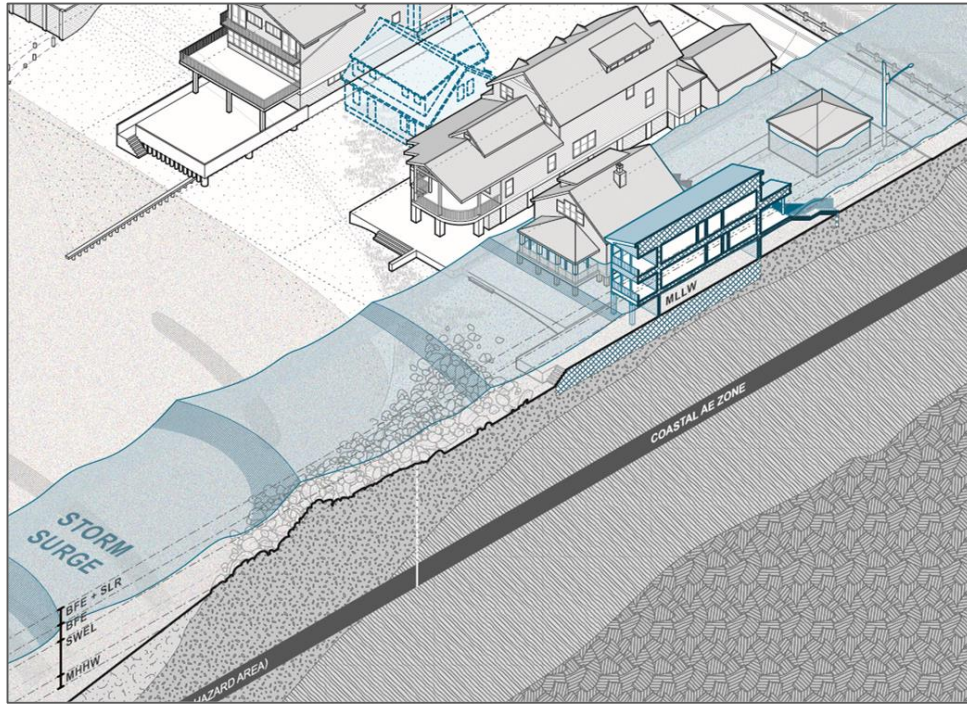


Circle Beach Road 1934, Madison

http://cteco.uconn.edu/map_services.htm



CONNECTICUT INSTITUTE FOR RESILIENCE AND CLIMATE ADAPTATION



Barrier Beach Development Planning



Long isolated low-lying road

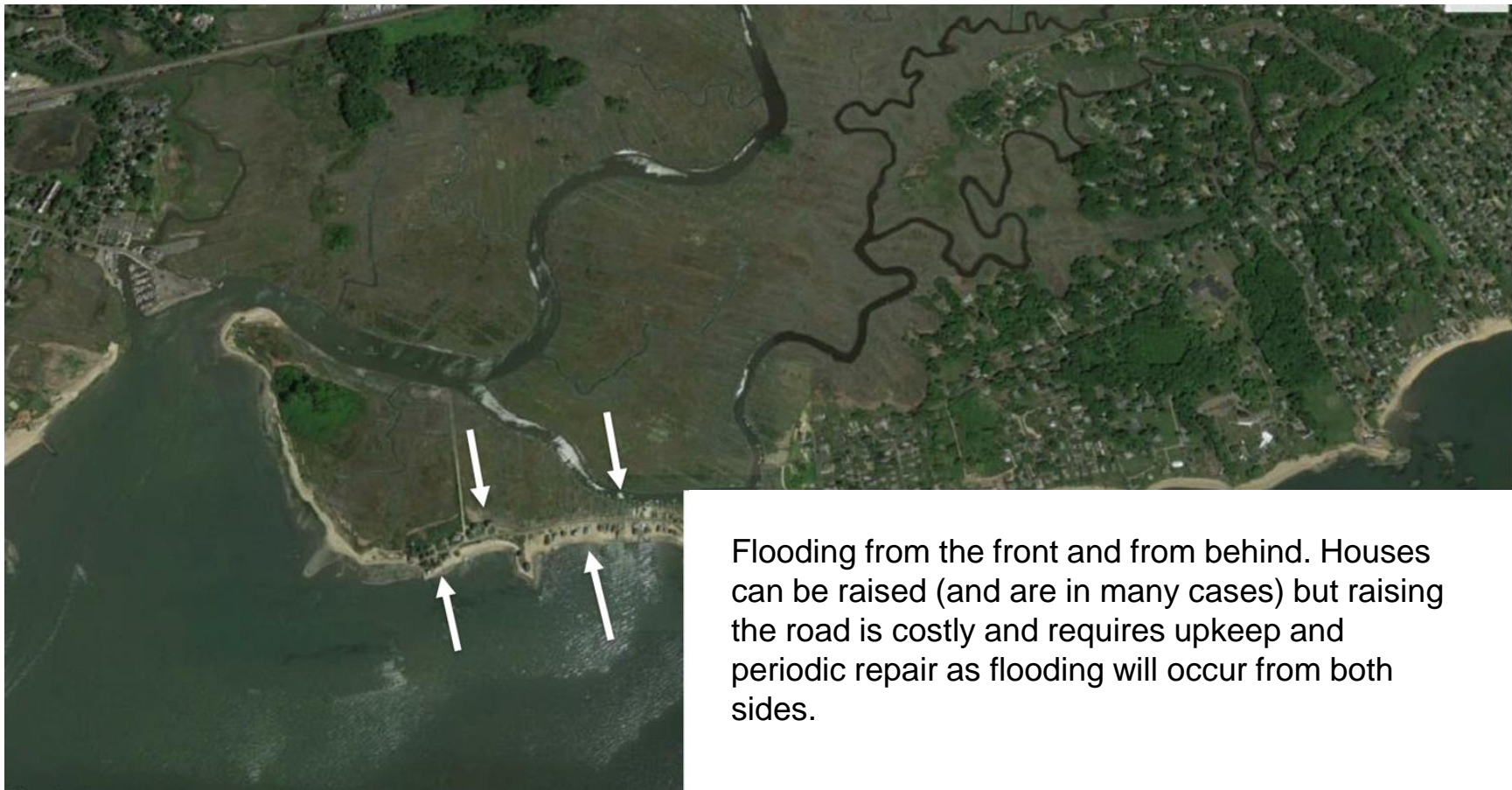


Zones of shared risk:
Isolated Housing area
with one egress

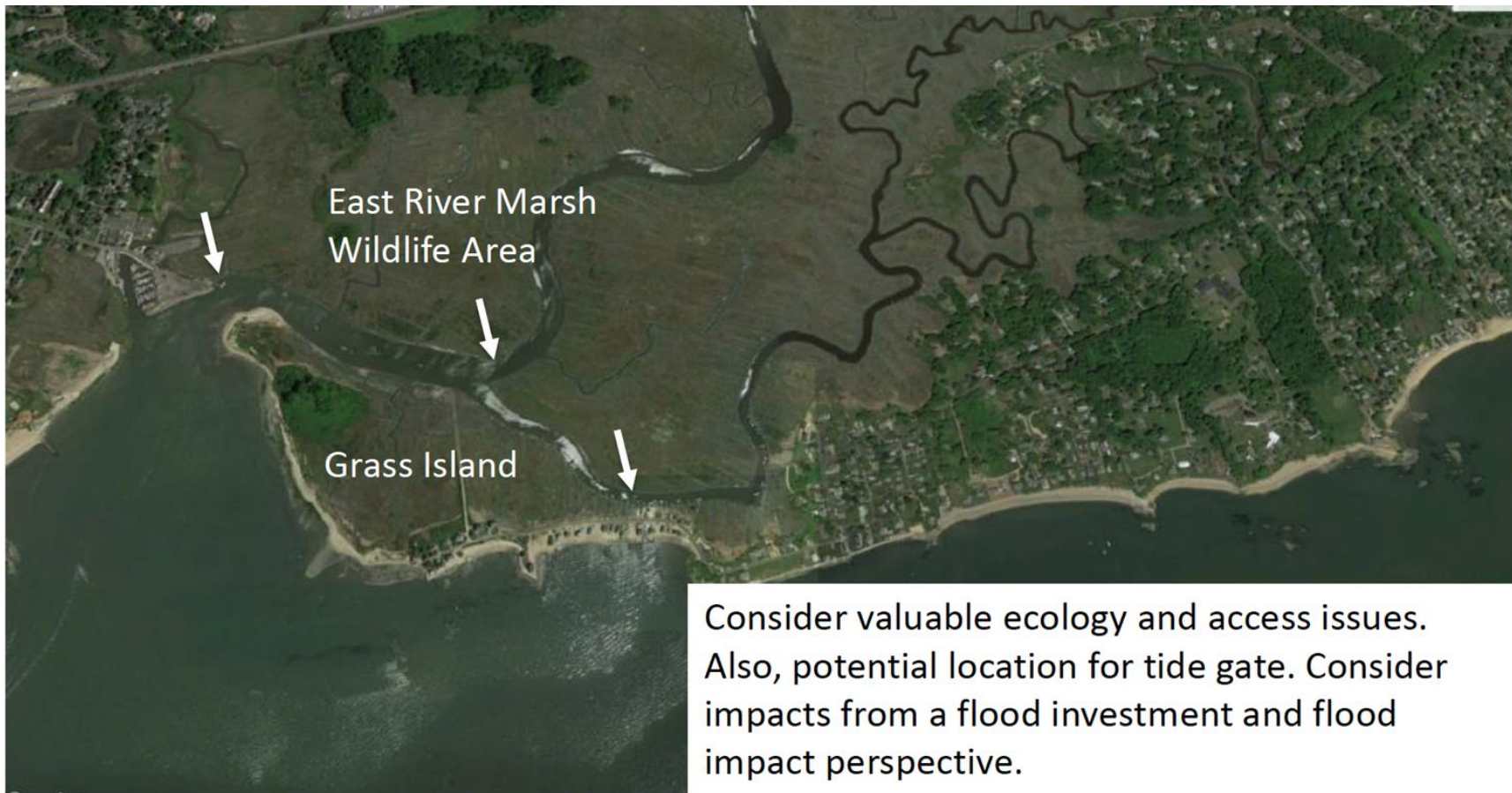


Potential for septic failure and a lack of options for sewage. Demand on municipality to provide services to homeowners.

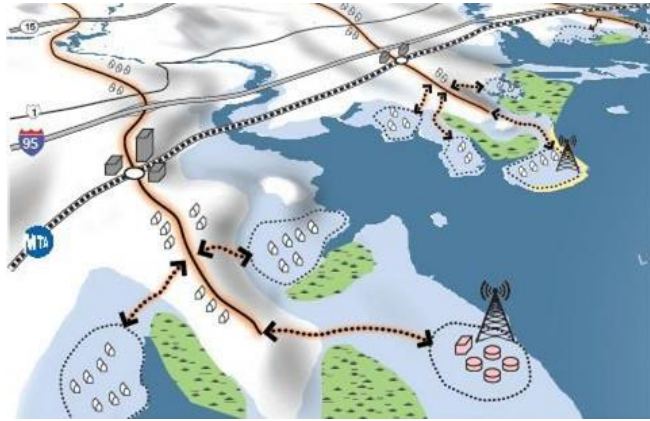




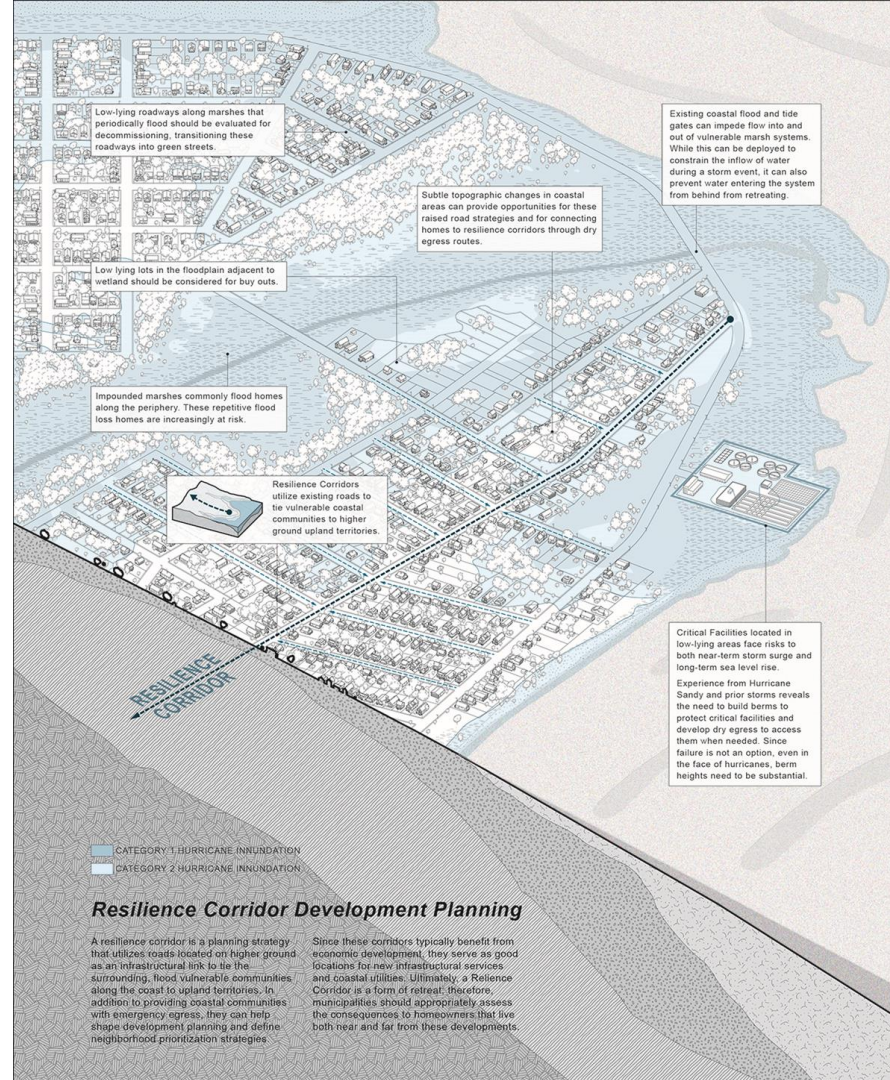
Flooding from the front and from behind. Houses can be raised (and are in many cases) but raising the road is costly and requires upkeep and periodic repair as flooding will occur from both sides.



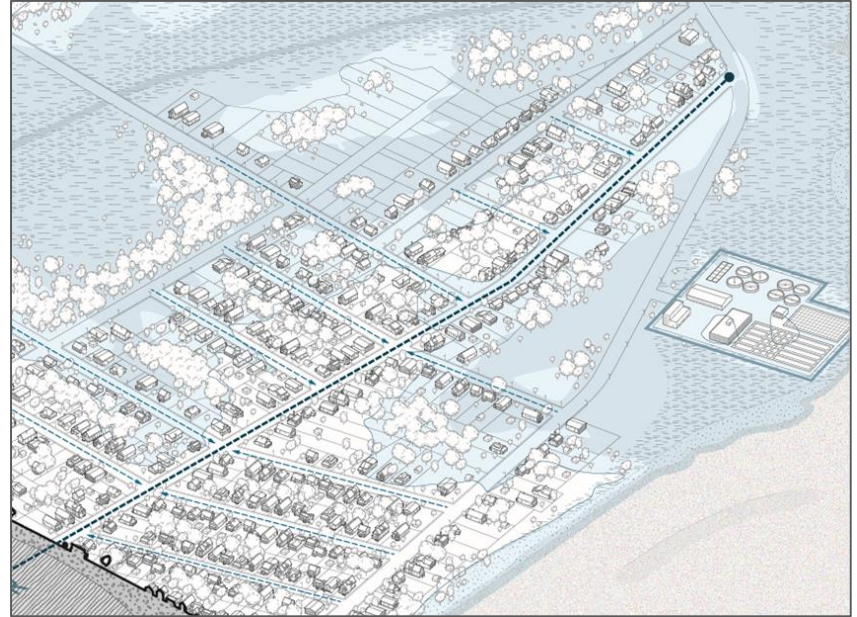
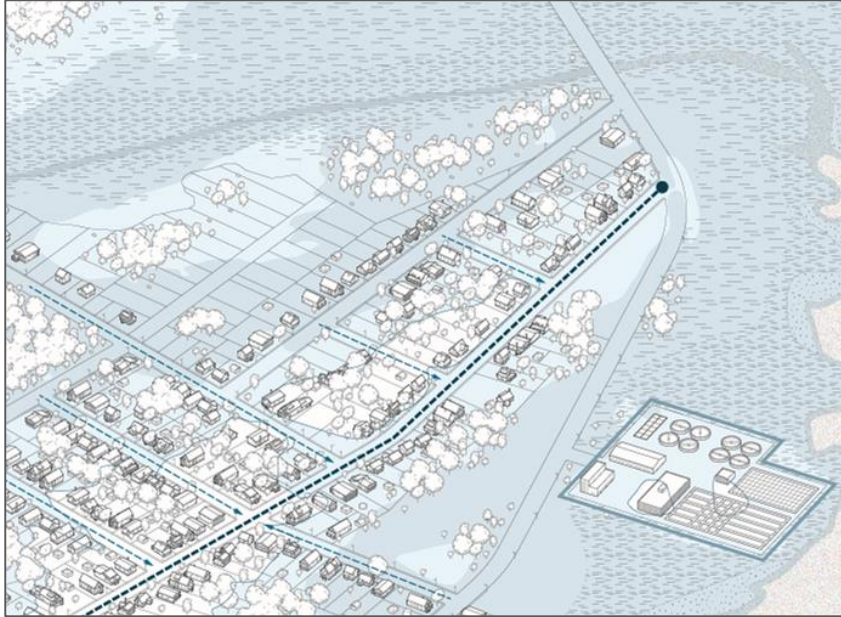
Consider valuable ecology and access issues. Also, potential location for tide gate. Consider impacts from a flood investment and flood impact perspective.



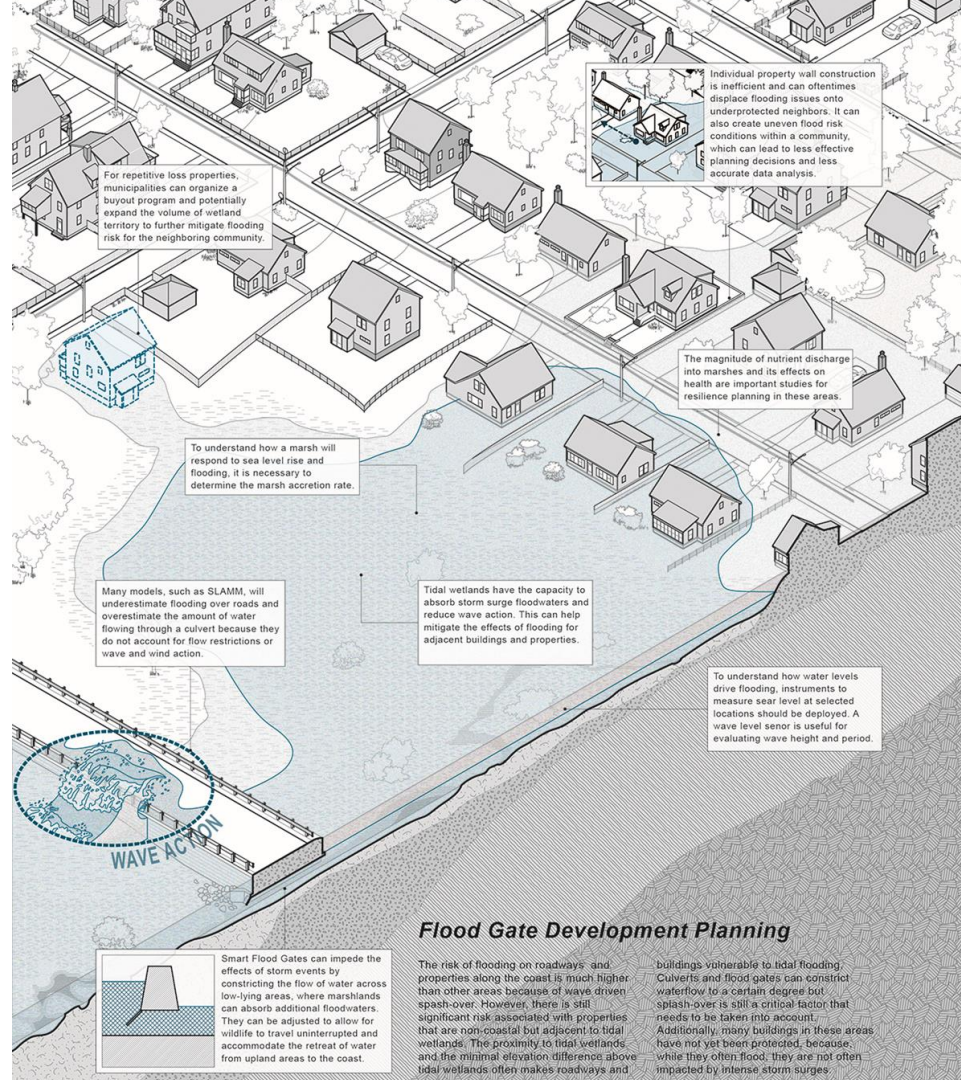
Resilience Corridor Development Planning



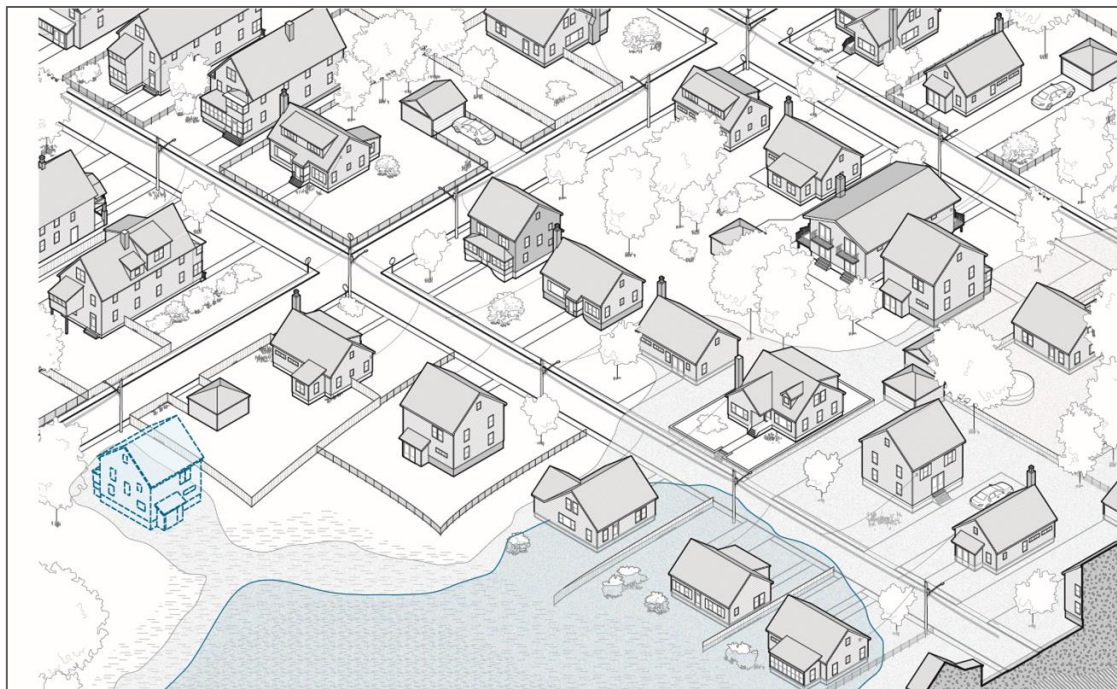
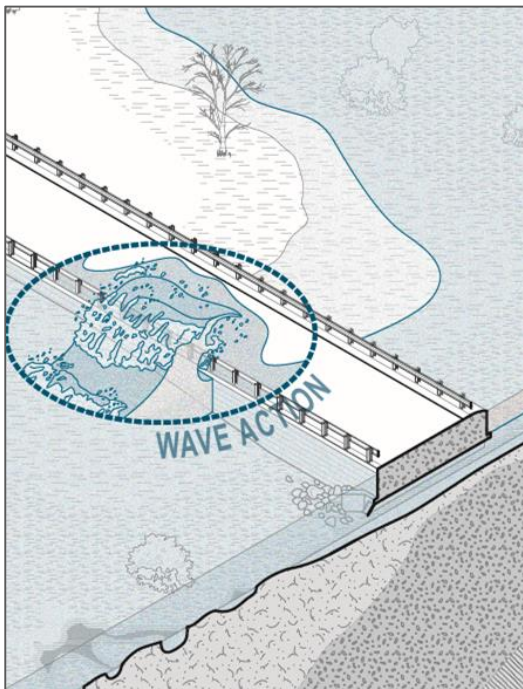
Multifunctional Benefits for Investment in Resiliency



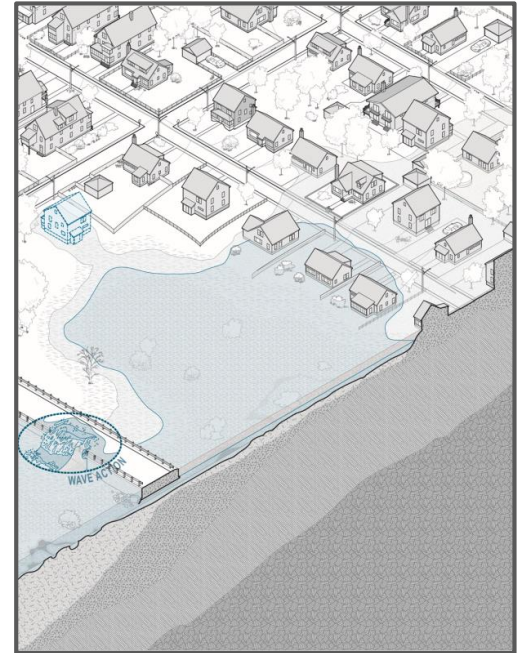
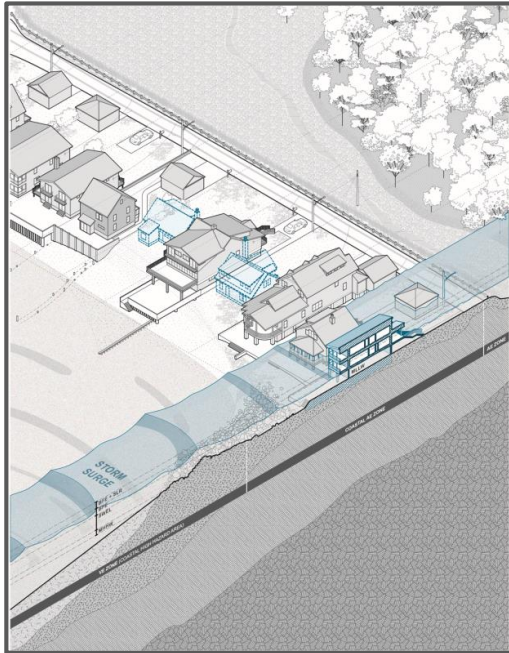
Flood Gate Development Planning



Flood Gate Development Planning



Conclusion



Contact: alexander.felson@uconn.edu



**CONNECTICUT INSTITUTE FOR
RESILIENCE AND CLIMATE ADAPTATION**

Talk Outline (clean up and/or remove)

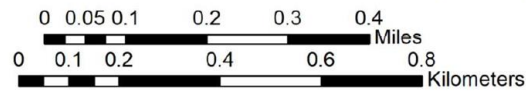
- 1) <Review State of CT challenges and opportunities and need for coordinated communication>
- 2) Projections to the state - TASK 9 WORK AND POLICY AND PLANNING PAPERS and the way that visualization is situated in the grant (specific tools) >
- 3) **Discuss zones of shared risk / Resilience Corridor**
- 4) Example one – barrier beach issue (zones of shared risk definition)
 - a. Understanding the hurricane impact vs. nor'easters
 - b. Pressure of raising homes on the municipalities (services and utilities)
 - c. Broader value for town? Or individual homes – how to prioritize.
- 5) Example two – **Resilience Corridor**
 - a. Critical facility –need to address hurricanes – dry egress is a near term
 - b. Define multifunctional benefits for investment in resiliency for the utility/infrastructure
 - c. Value of a resilience corridor as a raised egress. Functions like a spine providing dry egress
 - d. Homeowners can raise and have access while allowing wetland function to occur
 - e. Roll out methodology using a zones of shared risk approach
 - f. Give and take (built environment and water) (giving and taking of wetland) (wetland takings and mitigation)
- 6) Example three – impounded marsh and housing and the importance of field observations
 - a. Importance of understanding constrictions (wave height, elevation of road)
 - b. Capacity of wetland volume (reduces flood risk) define value for flood abatement
 - c. Wetland function considerations
- 7) Value of visualization as a tool for understanding the tradeoffs and challenges and for understanding the technical risks.
- 8) Feedback regarding the value of the visualizations and the content provided.
- 9) Next steps – vulnerability assessment as a tool to define typological conditions



Contour (ft)

- 0
- 5
- 10
- 15
- 20
- 25
- 30
- 35
- 40
- 45
- 50

Circle Beach Flood Map



- 10 yr
- 10 yr+20 inc SLR