

Adapt CT – outreach efforts for resilience and adaptation



Juliana Barrett – CT Sea Grant /Extension

Bruce Hyde – CLEAR/Extension



Uncertainty

“As we know, there are known knowns.
There are things we know we know.
We also know there are known unknowns.
That is to say, we know there are some
things we do not know.
But there are also unknown unknowns,
the ones we don't know we don't know.”



- Former Sec. of Defense
Donald Rumsfeld

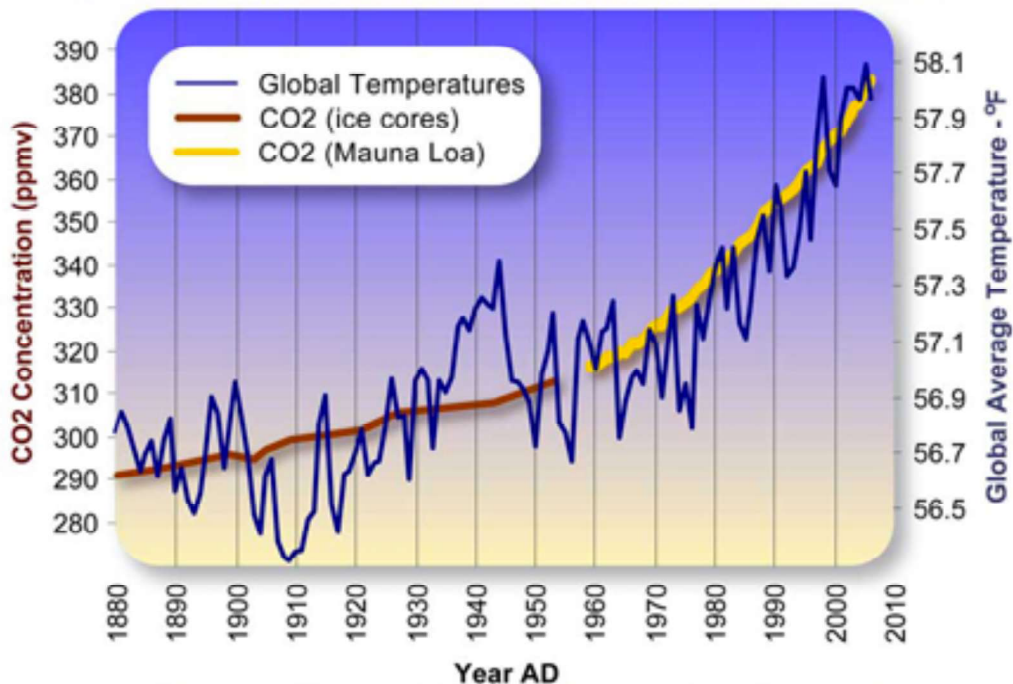
What are the climate change impacts we know we're dealing with in terms of adaptation and resilience?



The known knows...



Global Average Temperature and Carbon Dioxide Concentrations, 1880 - 2006



Data Source Temperature: ftp://ftp.ncdc.noaa.gov/pub/data/anomalies/annual.land_and_ocean.90S.90N.df_1901-2000mean.dat
Data Source CO2 (Siple Ice Cores): <http://cdiac.esd.ornl.gov/ftp/trends/co2/siple2.013>
Data Source CO2 (Mauna Loa): <http://cdiac.esd.ornl.gov/ftp/trends/co2/maunaloa.co2>
& http://www.esrl.noaa.gov/gmd/webdata/ccgg/trends/co2_mm_mlo.dat

Graphic Design: Michael Ernst, The Woods Hole Research Center



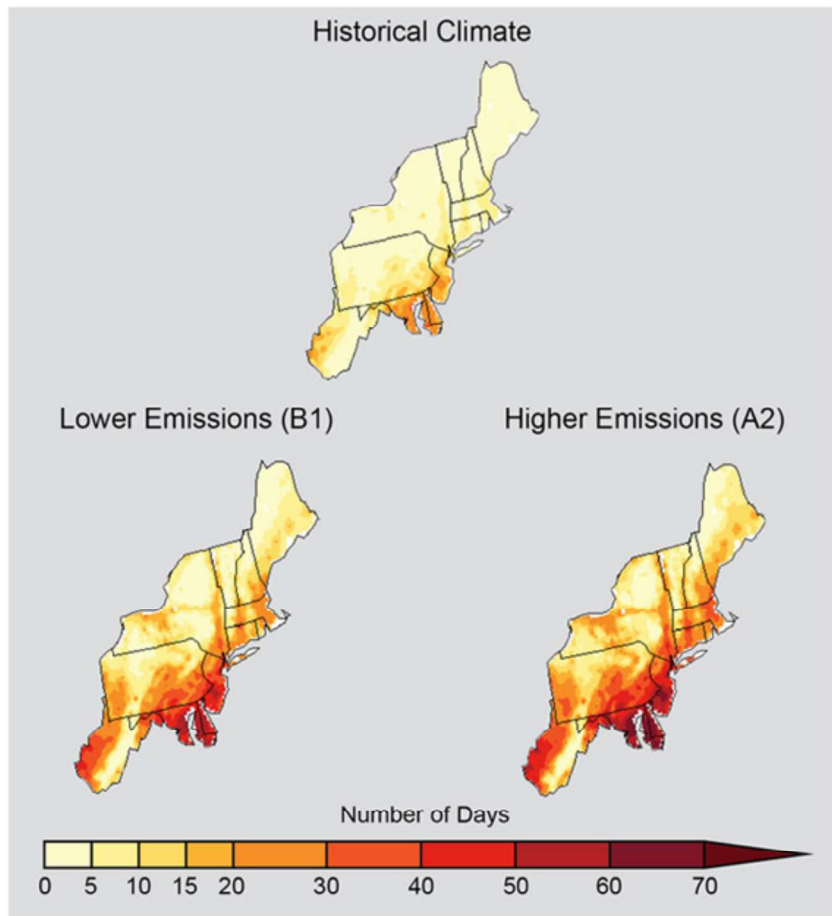
Figure 3. Global Temperature & CO2 Concentration Since 1880. Data from NOAA's National Climate Data Center (NCDC) & Oak Ridge National Laboratory.

Air Temperature in the Northeast

More frequent days with temperatures above 90°F

Source: USGCRP (2014)

Projected Increases in the Number of Days over 90°F



Warmer Water Temperatures and Changes in Fish

Warmer Long Island Sound reeling in southern fish

Study says changes consistent with global warming

By JUDY BENSON
Day Staff Writer

In the classic 1948 film noir "Key Largo," gangster Johnny Rocco dines on what was then a unique subtropical cuisine: pompano and champagne.

But in the 64 years since actor Edward G. Robinson so famously licked his chops over the meal, pompano have ceased to be a species found only in southern waters. In fact, it's now conceivable that a southeastern Connecticut fisherman could serve such a meal from his own Long Island Sound catch.

"We're getting some strange fish we haven't seen before, and some that we used to get only occasionally we're seeing more often," said Jon Hillyer, owner of Hillyer's Tackle Shop in Waterford, Tuesday. "A lot of guys are catching them by mistake while they're fishing for bluefish or porgies, and some of them we can't even identify. And some of the things we used to see, like tomcod and smelt, we don't get any more."

The shifting diversity of fish species in Long Island Sound is the subject of a study published last month
[SEE LOCAL FISHERMEN PAGE A5](#)



African Pompano



Atlantic Moonfish

Water Temperature: Interior rivers and streams



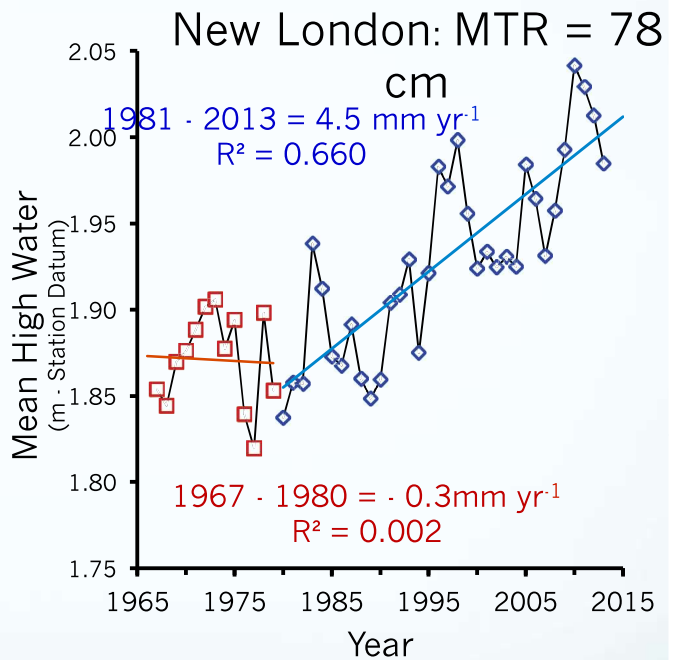
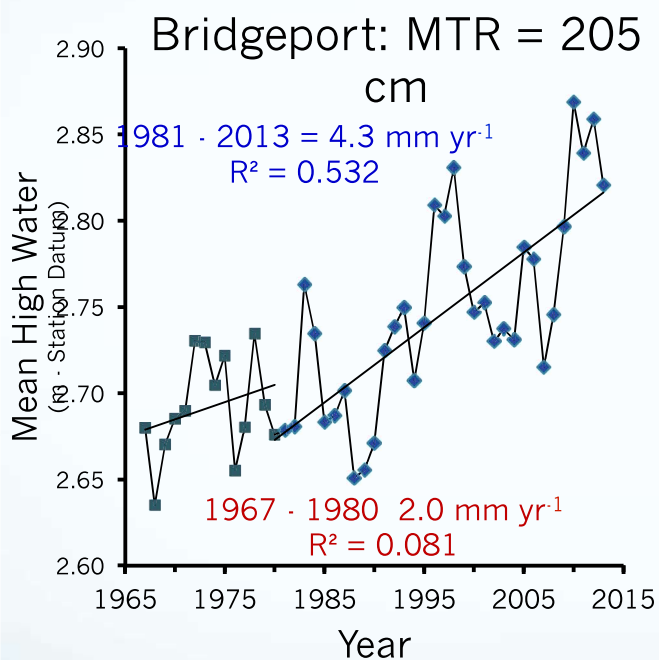
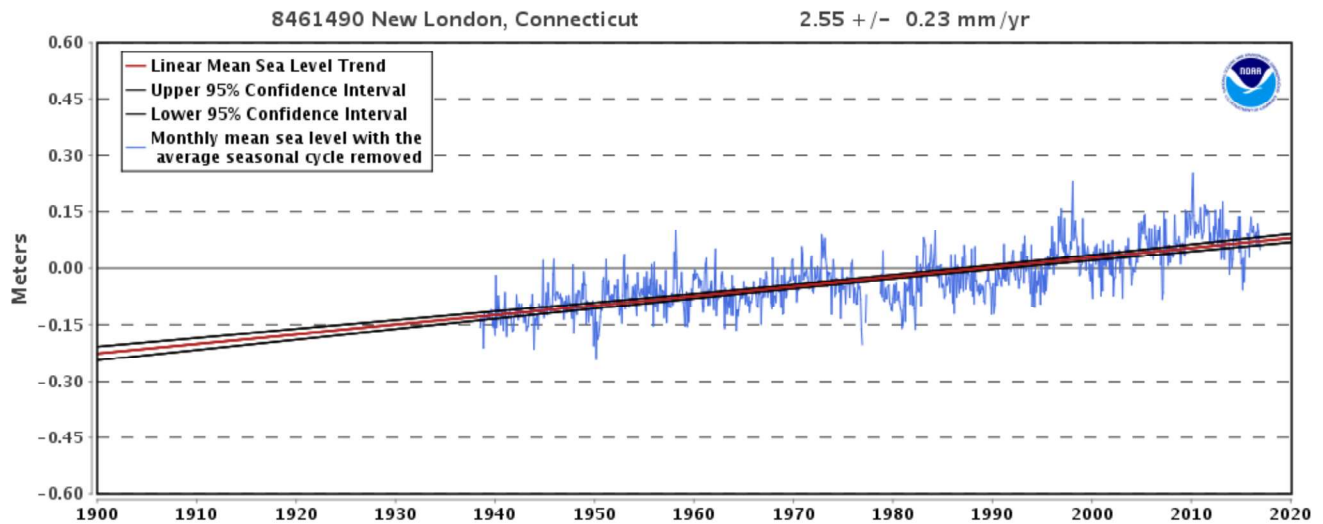
Examples of healthy riparian zones
http://www.sca.nsw.gov.au/__data/assets/image/0015/44520/Riparian.jpg

Sea Level Rise (Global)

Global sea level rose about 17 cm (6.7 in) in the last century. The rate in the last decade, however, is nearly double that of the last century.



(Credit: go_greener_oz/ Flickr)



Bridgeport

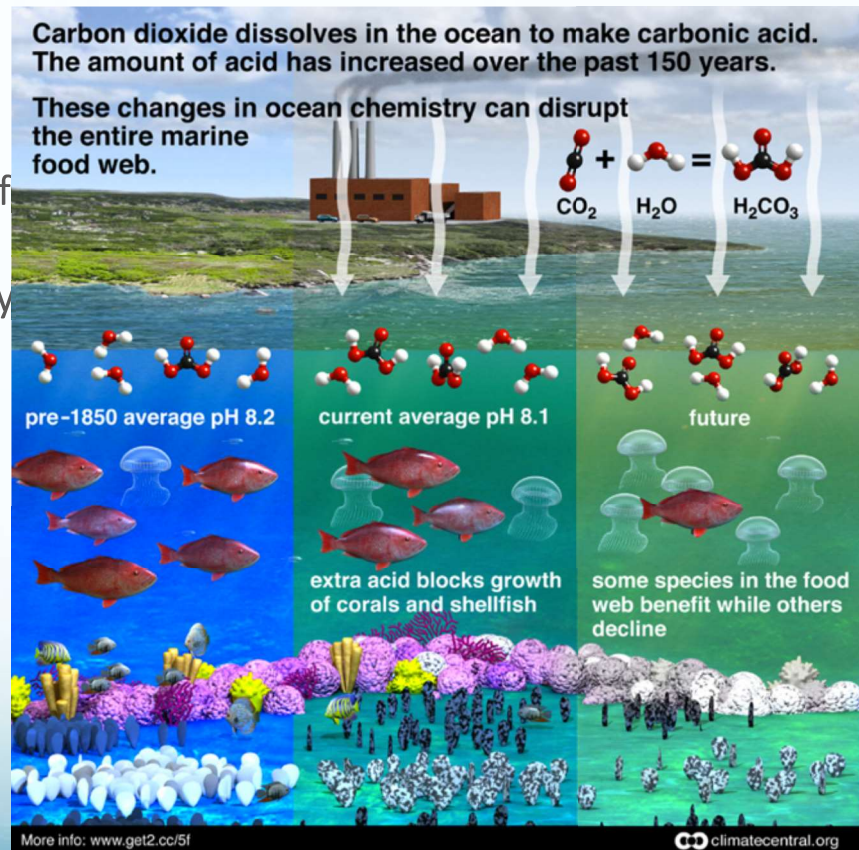


New London

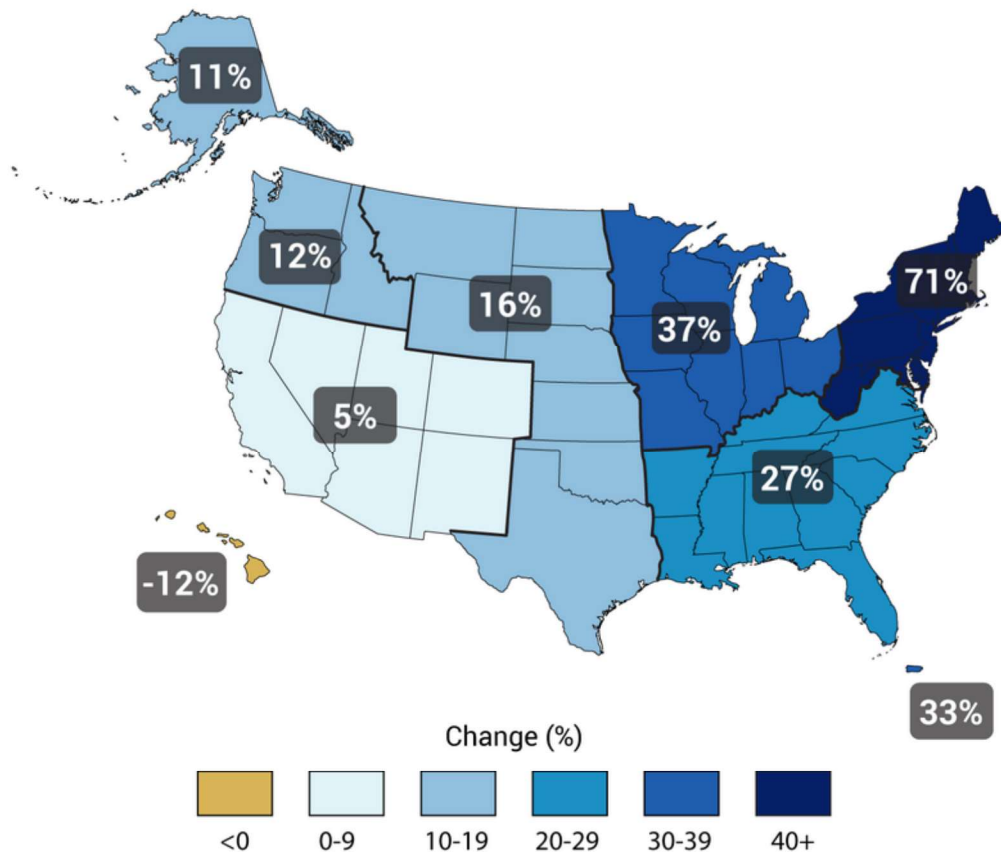
From Scott Warren, Professor Emeritus, Connecticut

Ocean Acidification

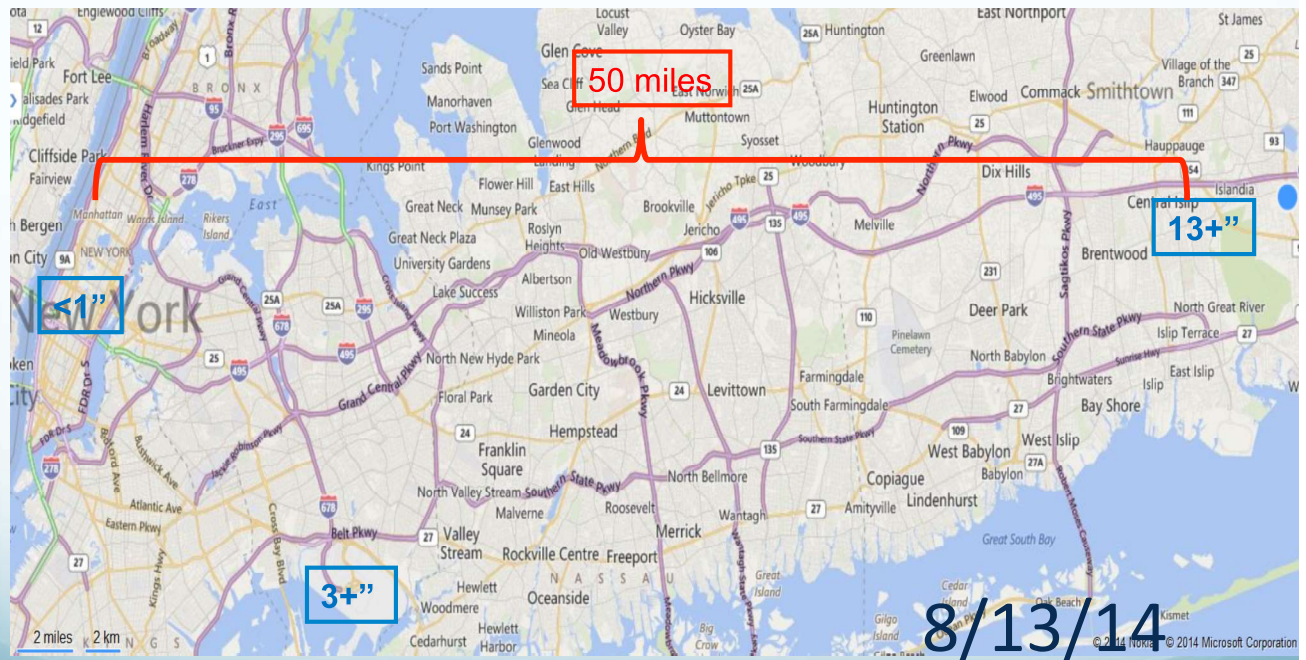
Since the beginning of the Industrial Revolution, the acidity of surface ocean waters has increased by about 30%.



Observed Change in Very Heavy Precipitation



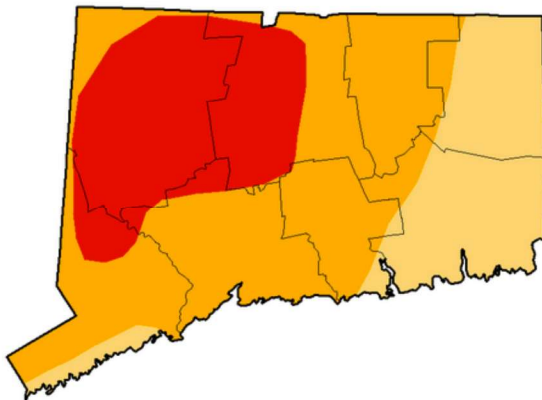
The “Rain Bomb” Phenomenon



Stormwater System Overload



U.S. Drought Monitor Connecticut



February 14, 2017

(Released Thursday February 16, 2017)
Valid 7 a.m. EST

Statistics type: Traditional Percent Area Export table: [PNG](#) [CSV](#) [XLS](#)

| Week | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|--|------|--------|--------|-------|-------|------|
| Current 2017-02-14 | 0.00 | 100.00 | 100.00 | 75.94 | 28.39 | 0.00 |
| Last Week 2017-02-07 | 0.00 | 100.00 | 100.00 | 75.94 | 28.39 | 0.00 |
| 3 Months Ago 2016-11-15 | 0.00 | 100.00 | 100.00 | 69.32 | 44.50 | 0.00 |
| Start of Calendar Year 2016-12-27 | 0.00 | 100.00 | 100.00 | 82.57 | 42.33 | 0.00 |
| Start of Water Year 2016-09-27 | 0.00 | 100.00 | 100.00 | 68.74 | 0.00 | 0.00 |
| One Year Ago 2016-02-16 | 1.87 | 98.13 | 29.76 | 0.00 | 0.00 | 0.00 |

Estimated Population in Drought Areas: **3,574,093**

[View More Statistics](#)

Intensity:

D0 (Abnormally Dry) D2 (Severe Drought) D4 (Exceptional Drought)
D1 (Moderate Drought) D3 (Extreme Drought)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying [text summary](#) for forecast statements.

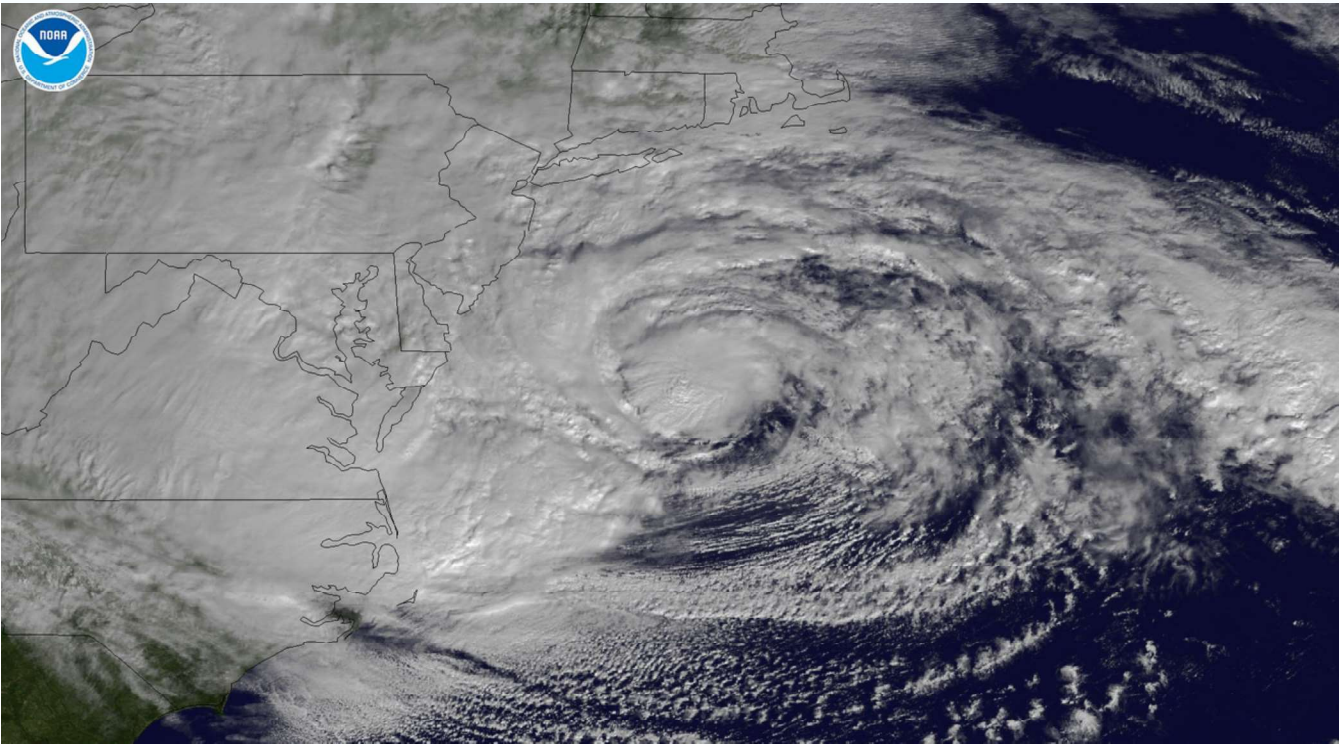
Author(s):

Jessica Blunden, NOAA/NCEI

Download: [PNG](#) [PDF](#) [JPEG](#)

[View drought planning resources](#)

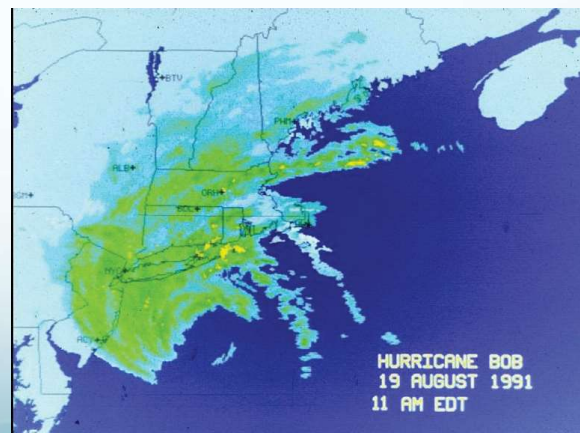
More storms like this?



Disaster Declarations in CT Since 1954

- Of the 30 Federal Emergency and Major Disaster Declarations since 1954, 15 have occurred since 2004.
- Connecticut has had 9 Major Disaster declarations in the past 20 years, 5 have occurred since 2011
- Last Hurricane to hit CT?

Hurricane Bob in 1991



Courtesy National Weather Service

Erosion issues



Photo courtesy of Joel Stocker

Erosion is not just a coastal issue

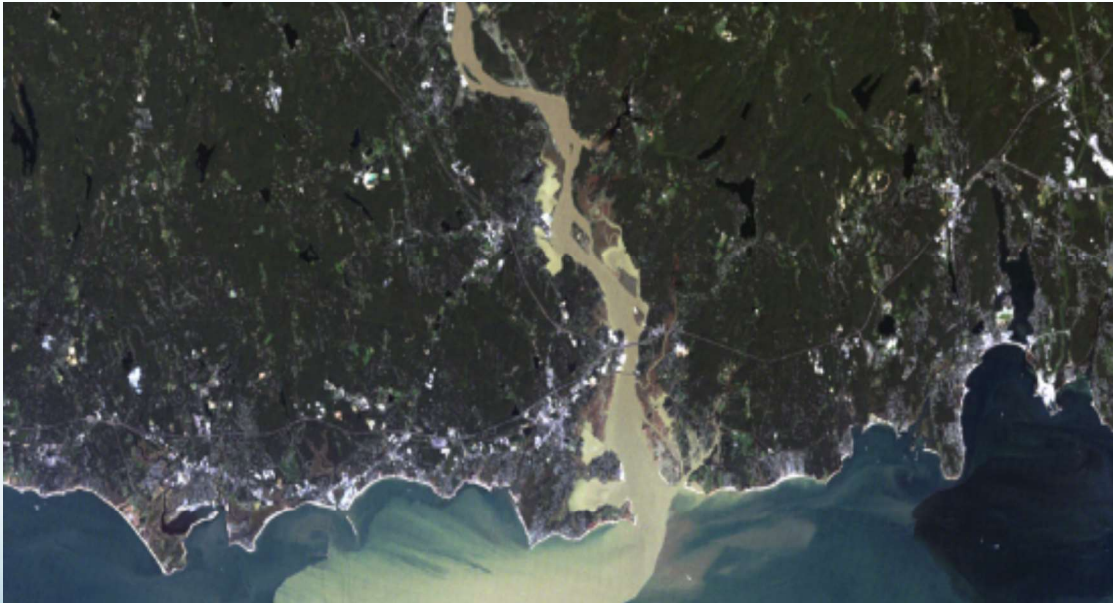


Photo Courtesy:
USGS

Loss of Tax Base



Patsy Lynch/FEMA

New Strategy for UConn Extension to Best Meet the Needs of Stakeholders – the Climate Adaptation Academy

- **What are the priority questions and issues?**
- **A fluid methodology to promote the exchange of ideas and information**
- **What are best practices for the issue?**



CAA sessions held since February 2014 (over 700 attendees from 64 towns and 4 states)

- General climate adaptation outreach for municipal officials and the public
- Flooding– Impacts of Increased Precipitation on Connecticut Communities –What to Expect
- Emergency Responders and Technology
- Living Shorelines I—What Are They and How Do they Work
- Living Shorelines II—Lessons Learned from Existing Projects
- Living Shorelines III—A Design Charrette
- Legal Issues in the Age of Climate Adaptation
- Zoning Issues in the Age of Climate Adaptation
- Climate Change – Its Impacts on the Economy and the Way We Live

Adapt CT: climate.uconn.edu

CAA has morphed into something bigger: Adapt CT

Adapt CT

[Home](#) [Climate Adaptation Academy](#) [Climate Corps](#) [Tools & Assistance](#) [Coastal Resources](#) [News](#) [Contact Us](#)



Connecticut Sea Grant and CLEAR work to provide information, tools, trainings and workshop opportunities to assist municipalities, businesses and residents of Connecticut in their efforts to prepare for and adapt to the impacts of a changing climate.



Climate Adaptation Academy

Promoting an exchange of information between municipal officials, researchers, and other professionals.

[LEARN MORE](#)



Climate Corps

Harnessing student power to assist communities through a unique service learning experience.

[LEARN MORE](#)



Tools & Assistance

Providing useful resources and programs (homegrown and otherwise) for Connecticut residents, communities and municipalities.

[LEARN MORE](#)



Coastal Resources

Providing information on Connecticut's coastal natural resources, current issues and projects along our coast.

[LEARN MORE](#)

UConn Climate Corps

UConn Students in Action

Extension/CLEAR/CTSG

Environmental Science

Environmental Studies

Environmental Engineering



What Municipalities Need

- Data
- Recommendations for models/policies
- Understanding of costs
- How to phase in adaptation
- Money



Andrea Booher/FEMA

Building Resiliency Costs Money

What will it cost to address failures of a large number of septic systems in an area or road flooding?

How much resiliency can we afford?



Photo by Dave Gatley, FEMA photo library

Risk Management

Response requires participation from a wide range of municipal officials

- Mayor or First Selectman: budgeting, decision-making
- Planning Departments: Land use, environmental, transportation
- Engineering and Public Works: roads, stormwater systems
- Public Utilities: water and sewer systems
- EM: access to fires and other emergencies
- Public Health Health: heat related illnesses, infectious diseases
- Social Services: sheltering displaced persons
- Finance and Recreation

Local Residents

AND.....

....And all the expertise and resources available through the individuals and agencies represented in this room.

Where we're headed:

- Undergraduate Course Fall 2017 (focus on local climate impacts and adaptation issues)
- Spring 2018 Student Practicum
- CAA's for 2017: Legal issues continued, Water issues in Middlesex Cty, Erosion issues with EJ Prescott Inc.
- Emergency Preparedness and Story Maps
- Continued work with municipalities on adaptation issues

Thoughts?
juliana.barrett@uconn.edu

