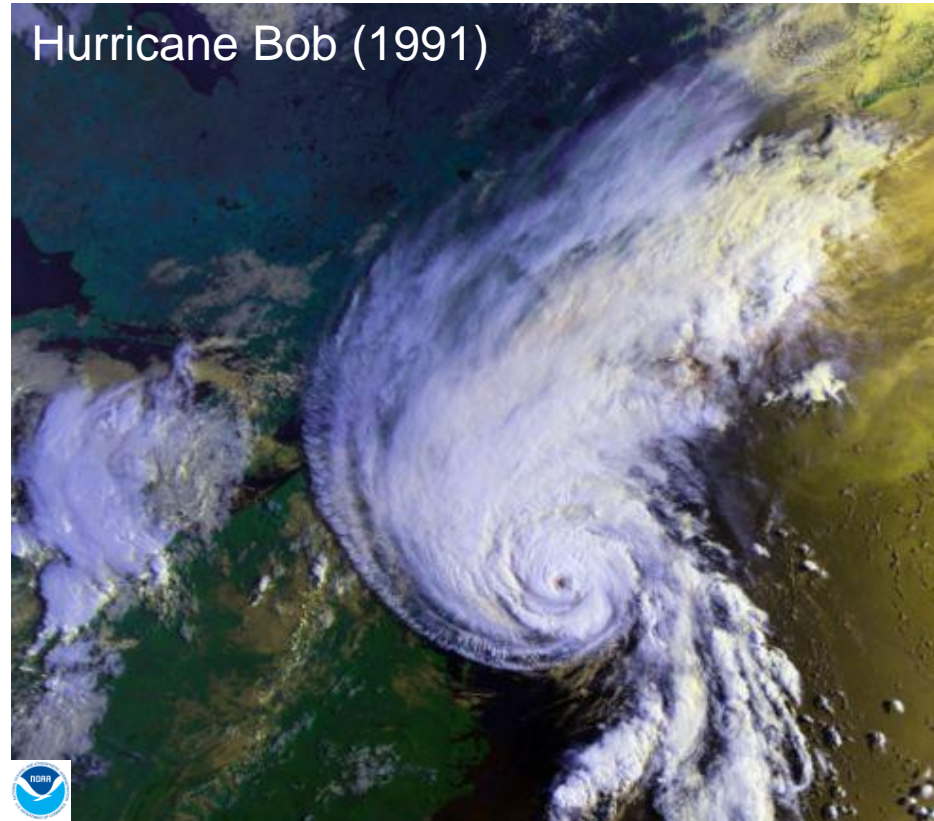


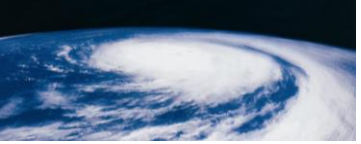
The New England Hurricane Hazard

Northeast Hurricane Mitigation
Leadership Forum
July 10-11, 2008
Newport, RI

Dail Rowe
WeatherPredict Consulting, Inc.

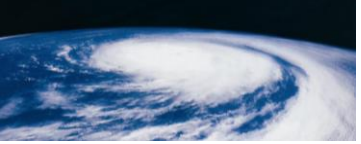
Hurricane Bob (1991)





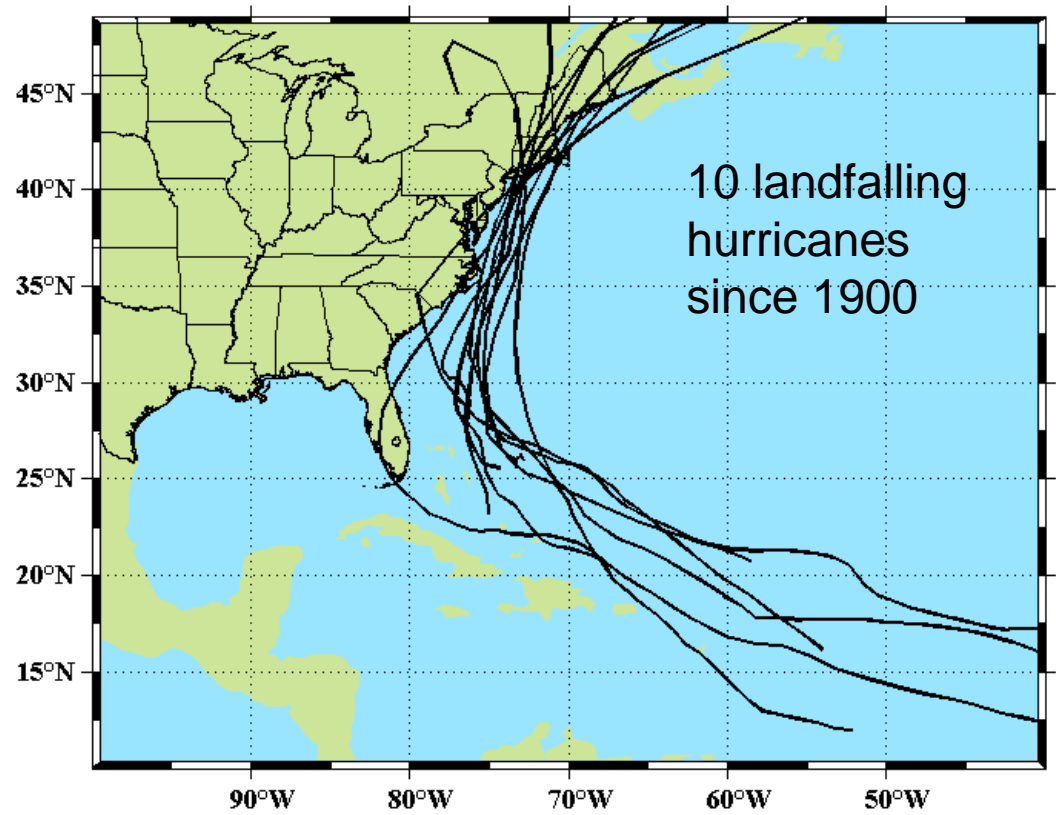
Today's Discussion

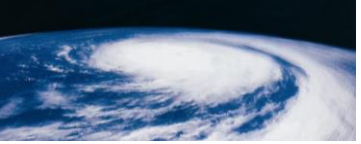
- How often?
- How strong?
- New England hurricanes and Atlantic Sea-Surface-Temperatures
- Global Warming?
- New England hurricane characteristics



New England Hurricane History

Name	Year	Overland SS Category
#2	1904	1
#3	1916	1
#4	1938	3
#7	1944	3
Carol	1954	3
Edna	1954	3
Donna	1960	3
Belle	1976	1
Gloria	1985	3
Bob	1991	2



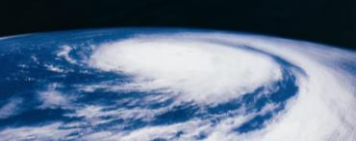


New England Landfall Frequency

Intensity	Return Period in Years
Any hurricane	~10
Cat 2+	15-20
4	Possible?
5	Never

Average return periods

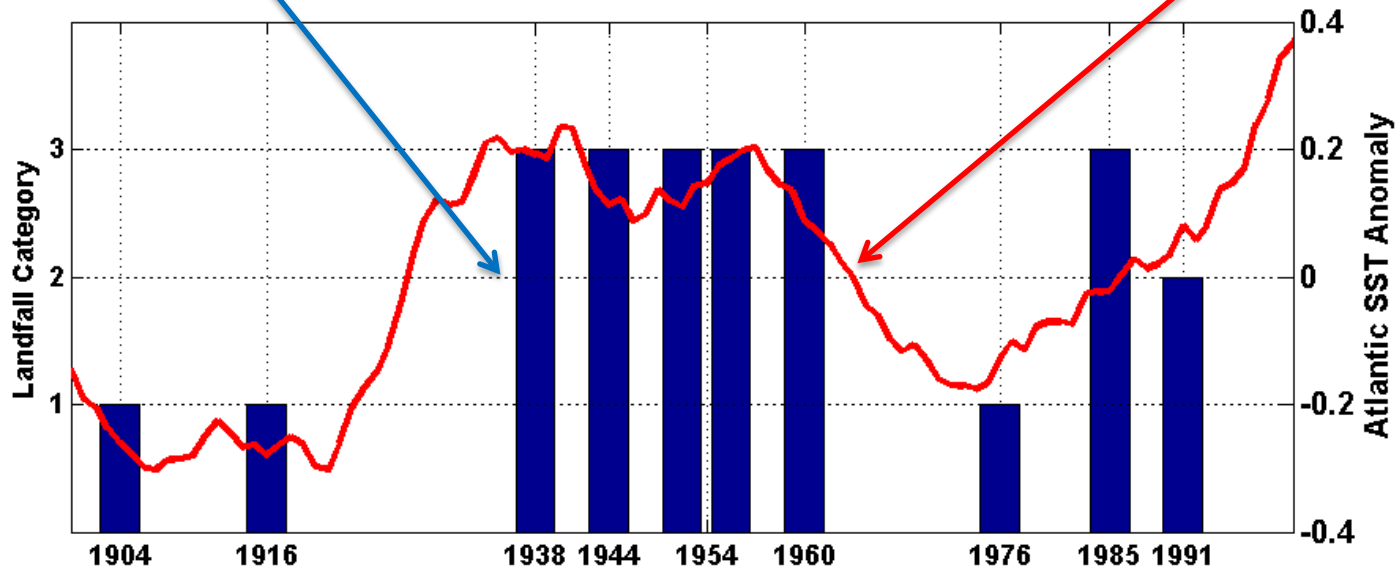
- Computed using meteorological judgment and extreme value statistics
- Based on the National Hurricane Center's HURDAT dataset extending from 1851 – present



Climate and NE Hurricane Frequency

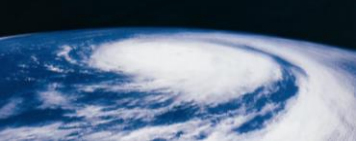
New England Landfalling
Hurricane Intensity

Atlantic Sea-Surface-Temperature



When Sea-Surface-Temperatures are high, New England Landfalling Hurricanes are:

- More frequent
- Stronger



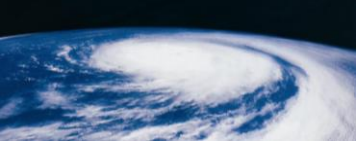
Global Warming and NE Hurricanes

Rapidly Evolving Science...

The latest science suggests that hurricanes will be

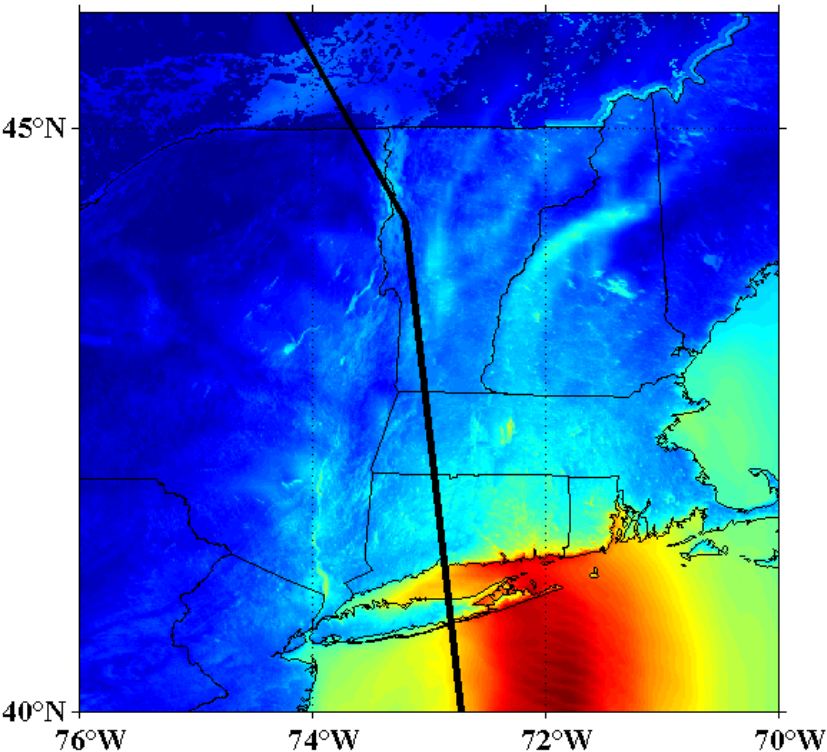
- **Stronger** (slightly),
- **Wetter** (significantly), and
- **Frequency** (??)

in a globally-warmed world.



NE Hurricane Characteristics

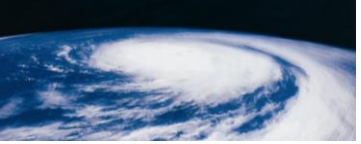
1938 Hurricane



Simulation of the maximum winds created by the 1938 hurricane.

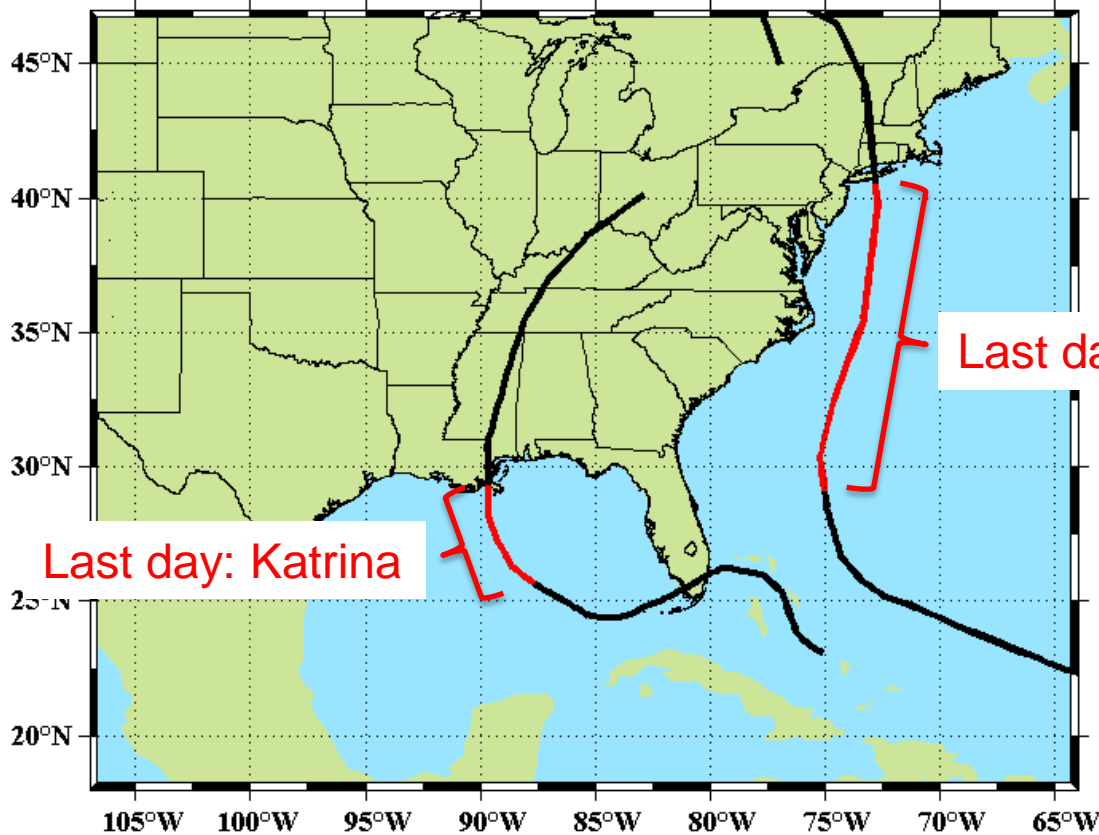
New England hurricanes pose a unique threat. These storms are:

- **Wide**
 - North of 40° = 300 miles
 - South of 35° = 180 miles
- **Strong on the right side**
- **Wet**
- **Significant inland damage**
- **Fast**
 - North of 40° = 30 mph
 - South of 35° = 12 mph



NE Hurricanes Move Rapidly

The 1938 Hurricane and Katrina Tracks

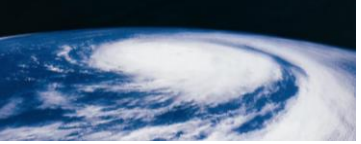


Far away does not mean safe!

Last day: 1938 Hurricane

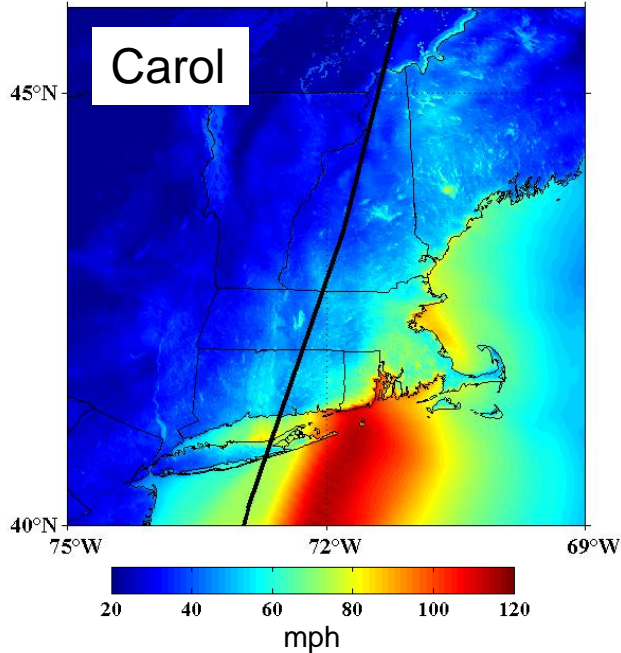
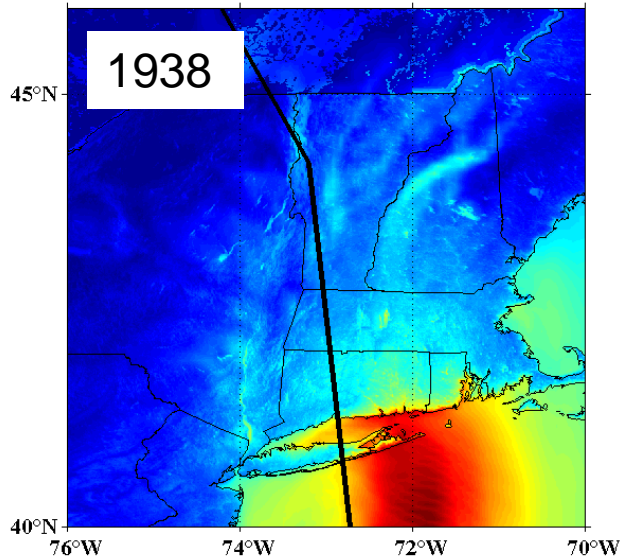
Last day: Katrina

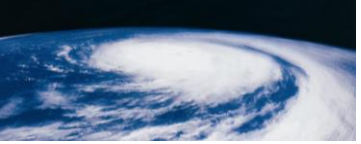
The 1938 Hurricane moved **over twice** as far as Katrina during the last day before landfall.



Improving Our Understanding of Hurricane Risk

- Physics based simulation of forecast and historical hurricane winds, rain, and flood
- Detailed analysis of the historical record





Summary

- New England averages about one hurricane per decade, but there is some evidence that more and stronger hurricanes occur when Atlantic Sea-Surface-Temperatures are warm.
- The science of global warming and hurricanes is evolving rapidly. Present research calls for slightly stronger and wetter storms, but changes in frequency are unknown.
- New England storms pose a different threat than their southern counterparts. They are more asymmetric, wider, faster, wetter, and tend to penetrate farther inland.
- Advances in forecasting, simulation of hypothetical and historical events, and analyses of history will improve our understanding and management of New England hurricane risk.