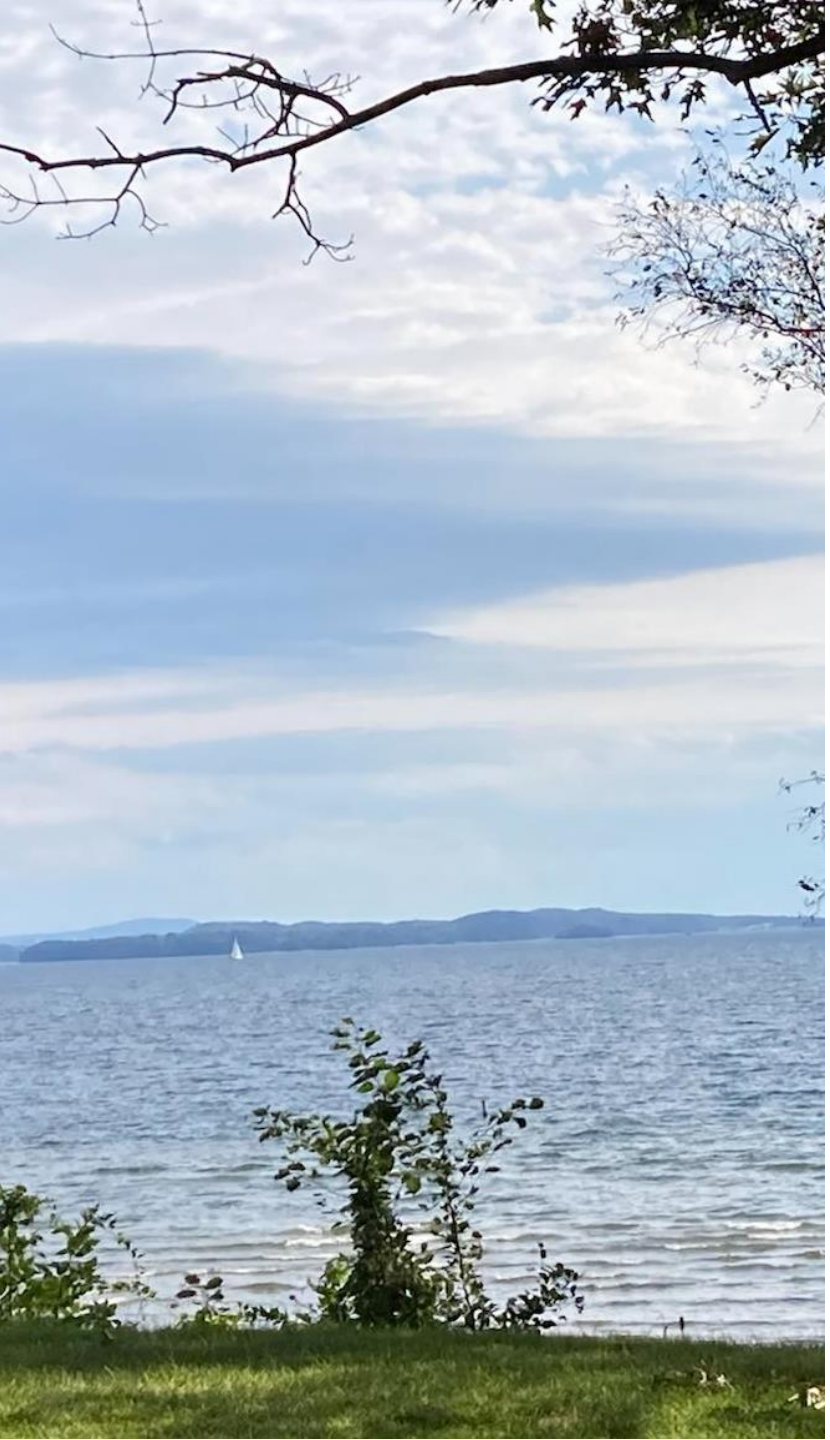
FEMC
Forest Ecosystem Monitoring Cooperative

Tracking Shifts in Disturbance Regimes

December 16th 2021

FEMC Annual Conference



Defining Disturbance

Disturbance events that cause changes to or disrupt the function and services of forest ecosystems

Disturbance regimes the patterns of a given disturbance event(s) and its impacts.

Guiding Project Questions

- What are the **key drivers and responses** to disturbance?

- What are the historical and anticipated shifts in trends in **extent, severity, frequency**

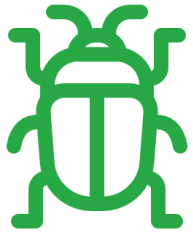
- What **sources** are available for baseline and monitoring information?

Selected Drivers

Extreme Weather

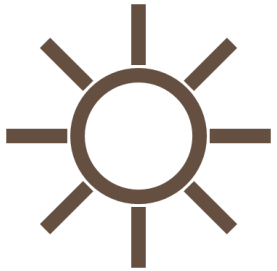
- Flooding
- High Winds

Fire



Pests

- Advancing Invasives
- Established Invasives
- Native Pests



Drought

Outputs

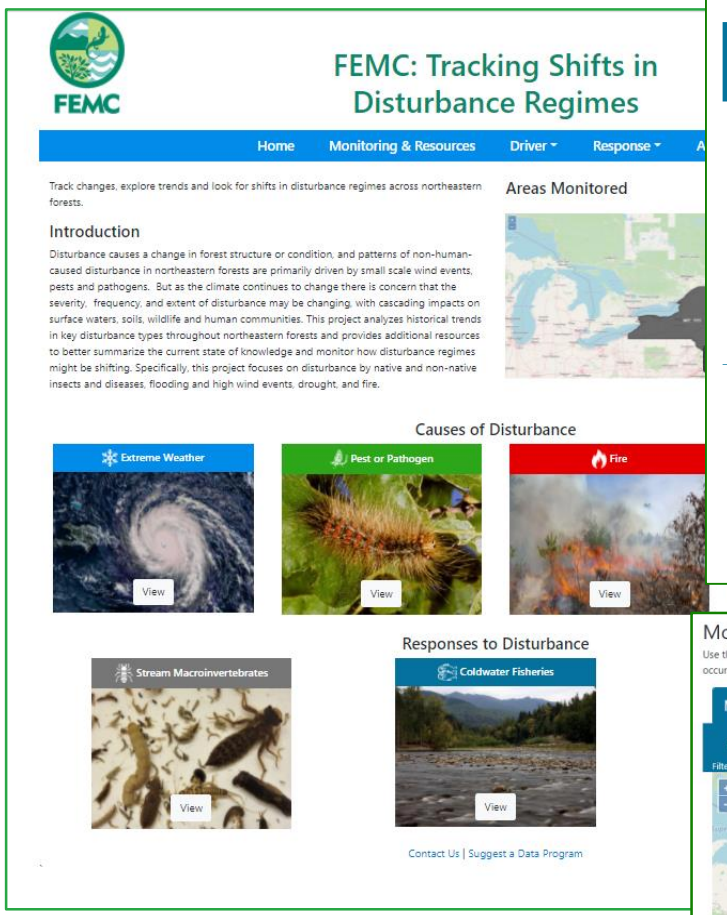
Resource Finder

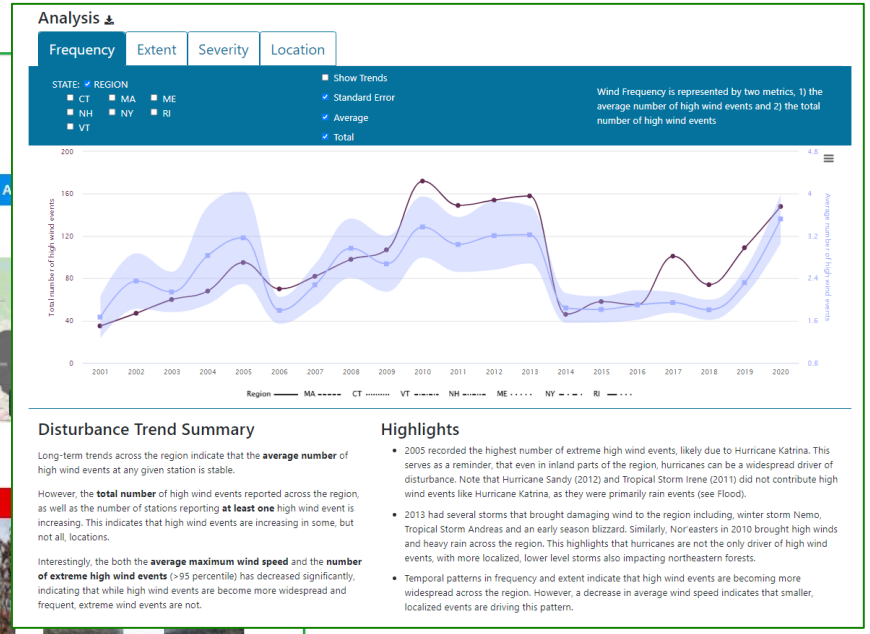
To identify where monitoring of forest disturbance is occurring and quickly find data

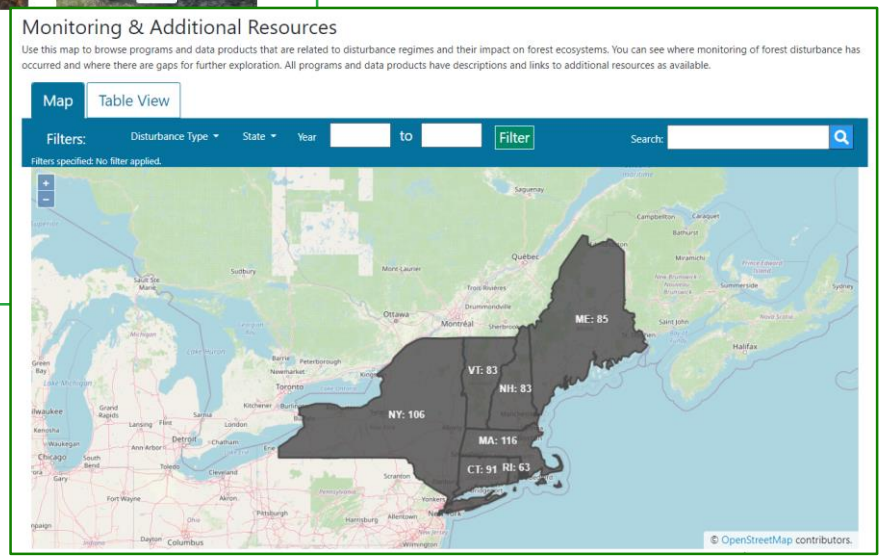
Trend Analysis

To provide an overview of patterns in each disturbance and analysis of change over time

Technical report with detailed analysis and methodology







Website to explore analyses and find additional monitoring resources

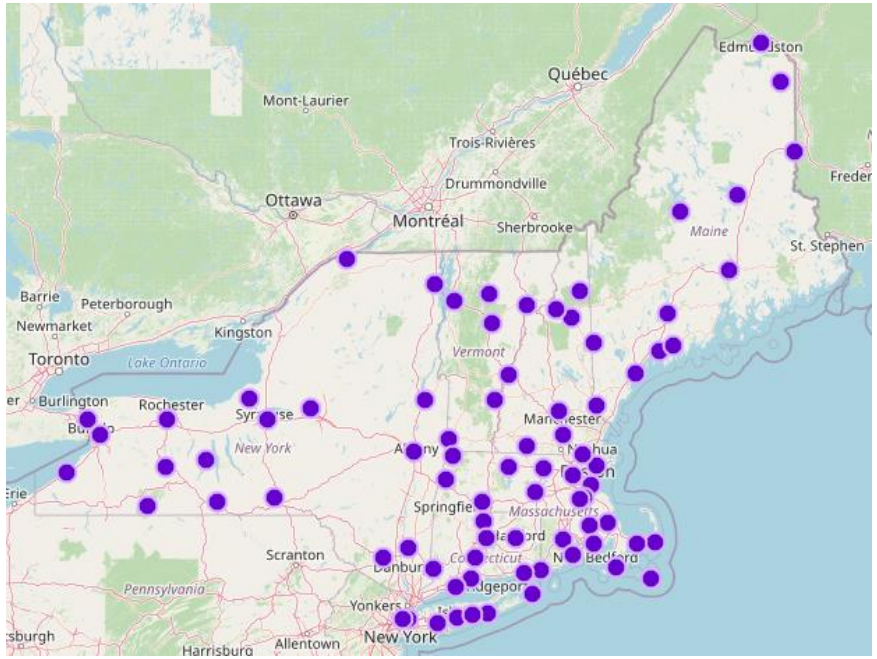
www.uvm.edu/femc/disturbance

Drivers with significant trends over time

Driver: High Winds

“High wind” → greater than 55 mph

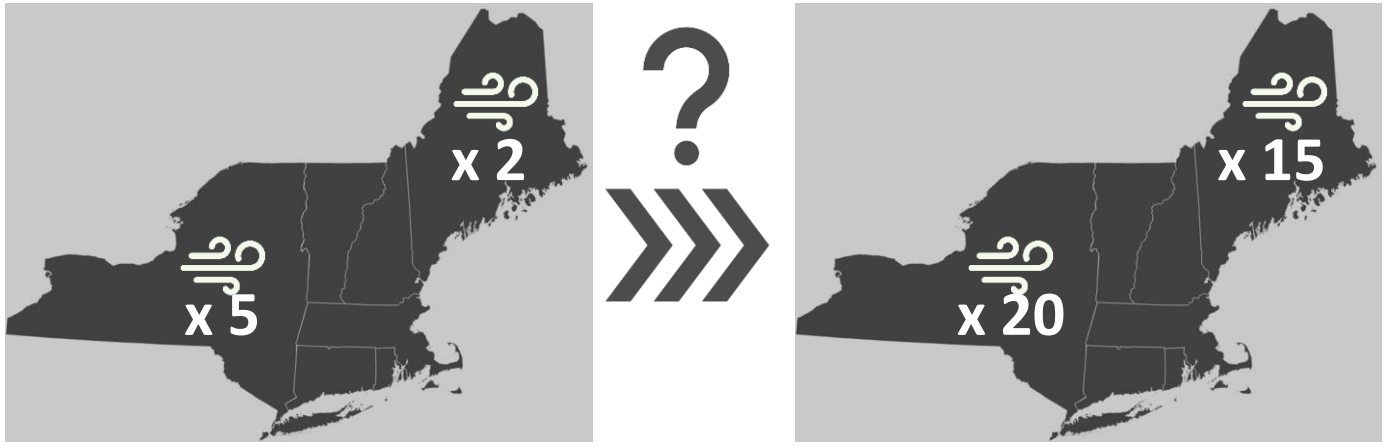
2001 to 2020



1,886 events across 73 stations

Data source: fastest 5-second wind speed dataset from the NOAA Global Daily Summaries dataset

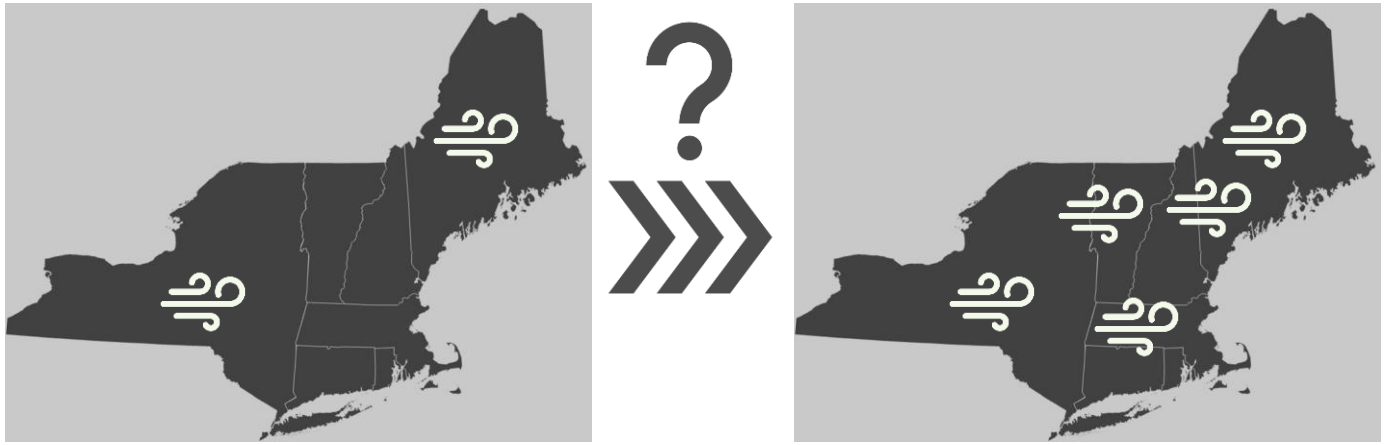
High Winds



Becoming More Frequent?

No

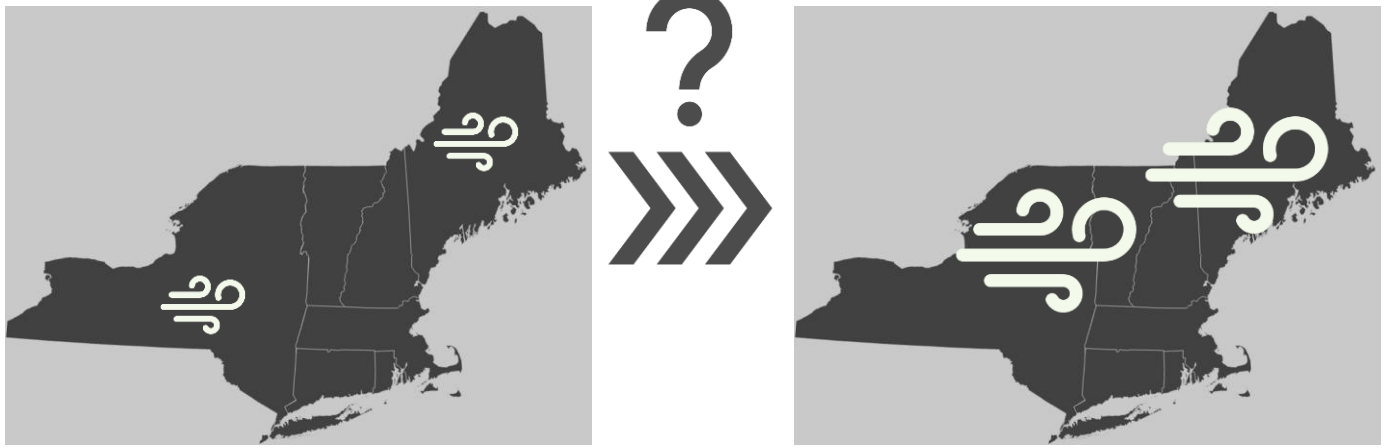
Small decrease in Vermont



Happening in More Places?

Yes

Regionally and in MA



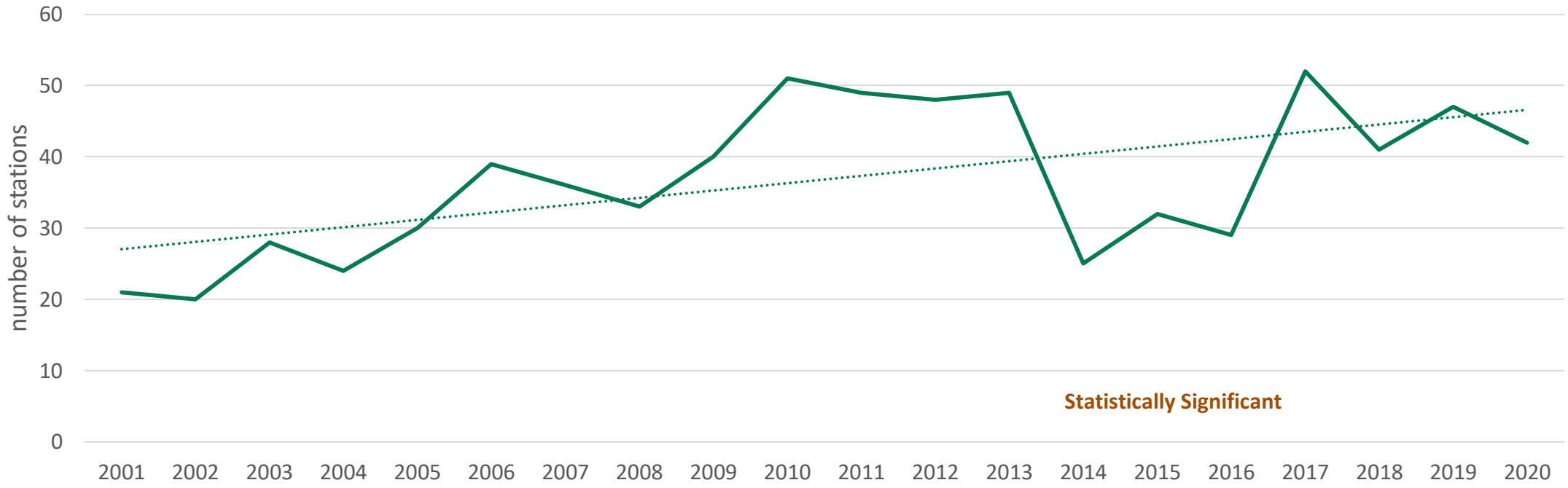
Getting More Severe?

No, getting less

Regionally, MA, NH, NY and VT

Are high wind events happening in more places?

Number of stations reporting **1 event**

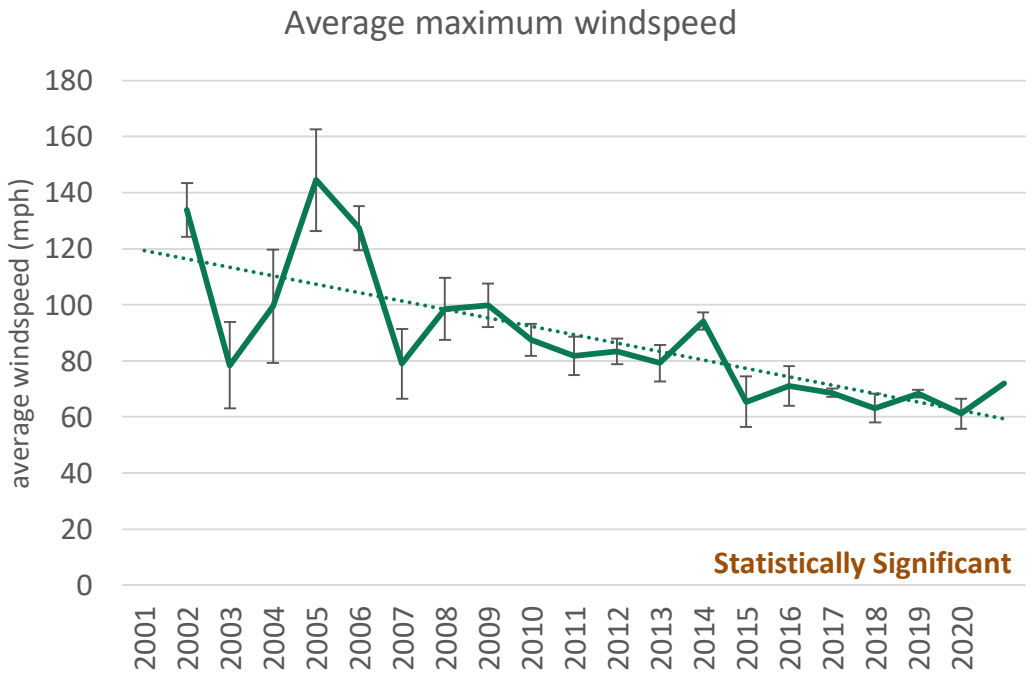


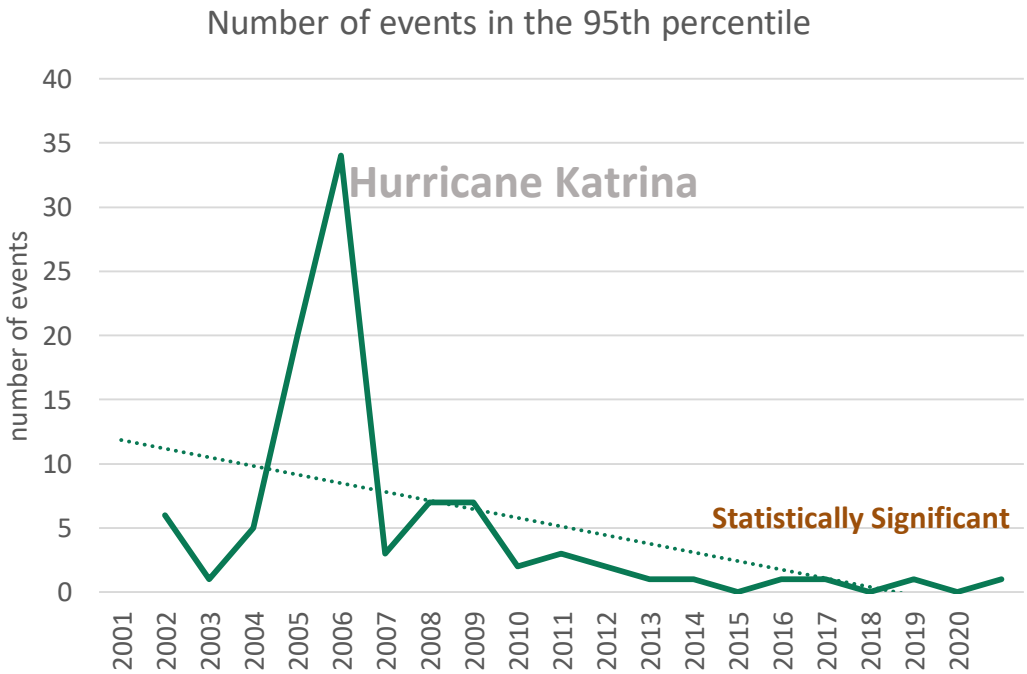
Yes

Regionally, as well as Massachusetts

Are high wind events getting more severe?

Metrics: Average **max windspeed** and **95th percentile**





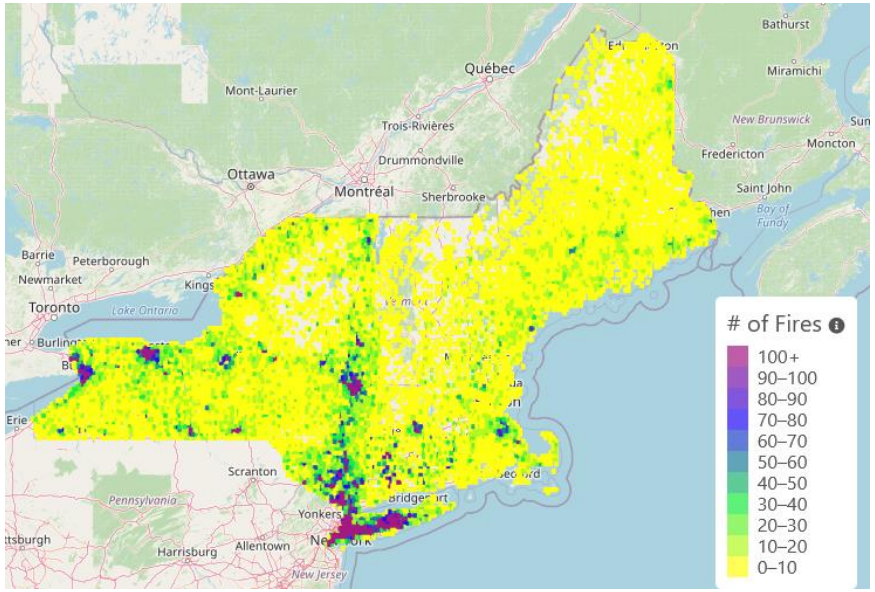
No, they are getting less severe

Regionally, and in Maine, New Hampshire, New York, and Vermont

Driver: Fire

“Fire” → Any fire with acreage reported

1992-2018



125,116 fires

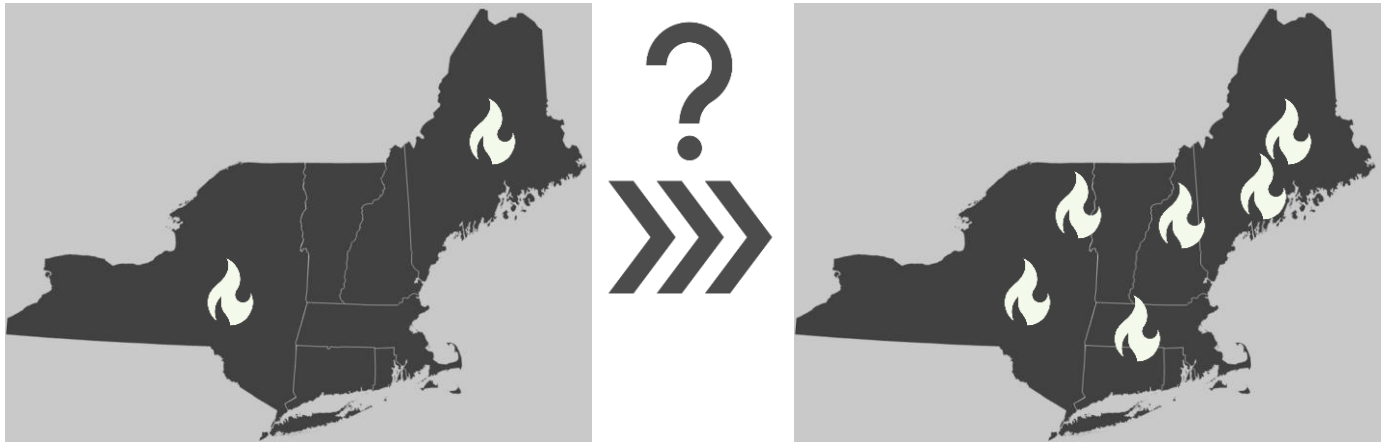
Data source: The Fire Program Analysis (FPA) fire-occurrence database

Fire

Becoming More Frequent?

Yes

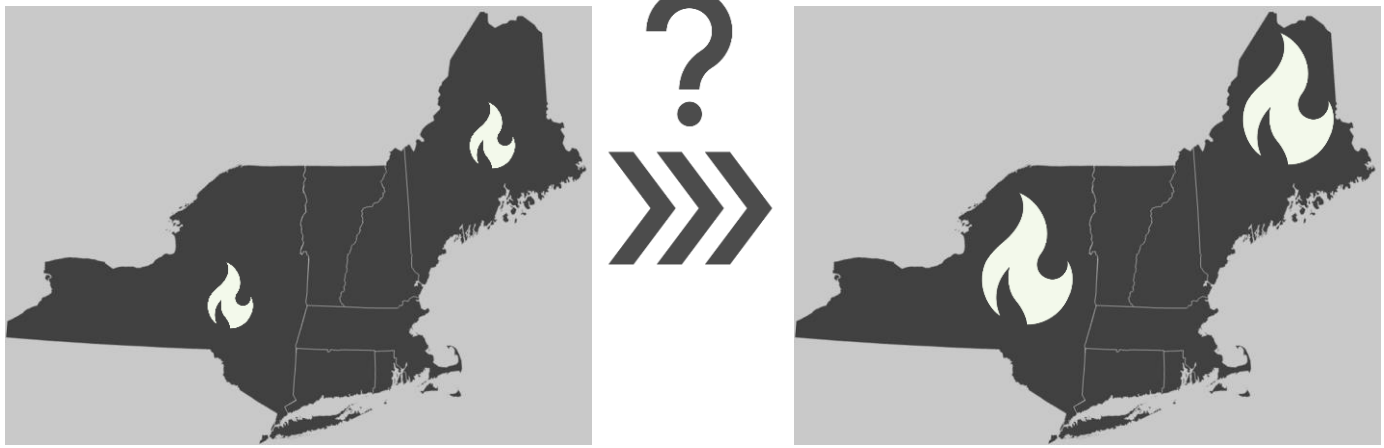
Regionally, and in Connecticut, Massachusetts, New York and Vermont



Burning More Overall Area?

No

However, average area getting smaller regionally



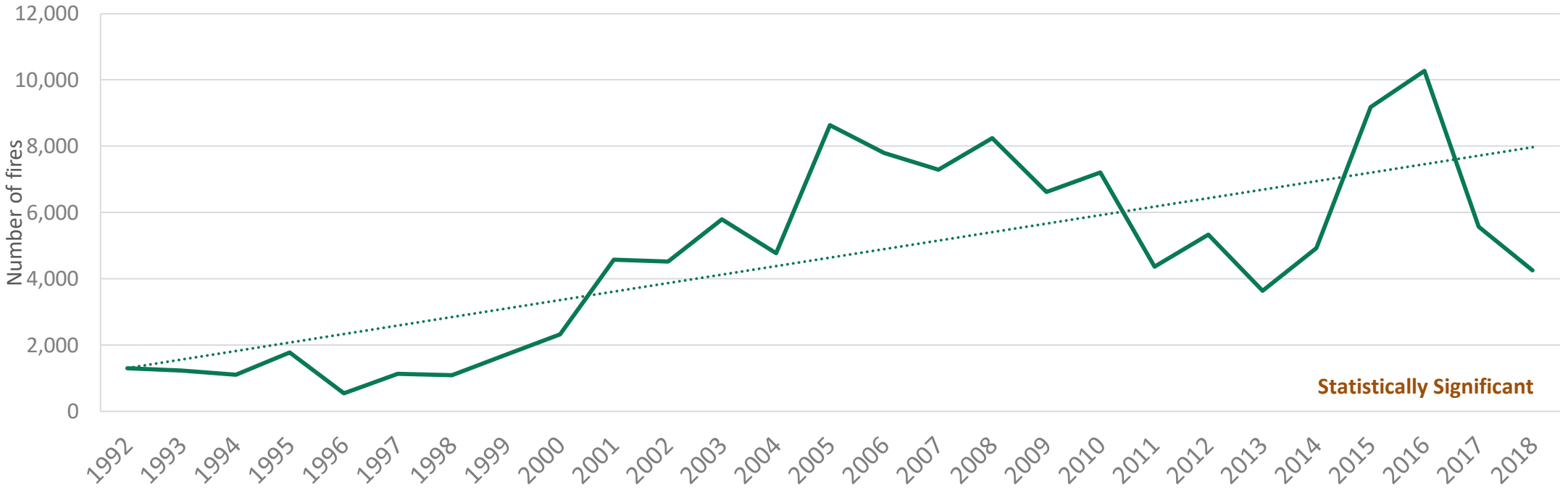
Burning More Area at Once?

No

Maine and Rhode Island show decreases, while Massachusetts and Vermont show increases

Are fires becoming more frequent?

Metric: **Number** of fires reported



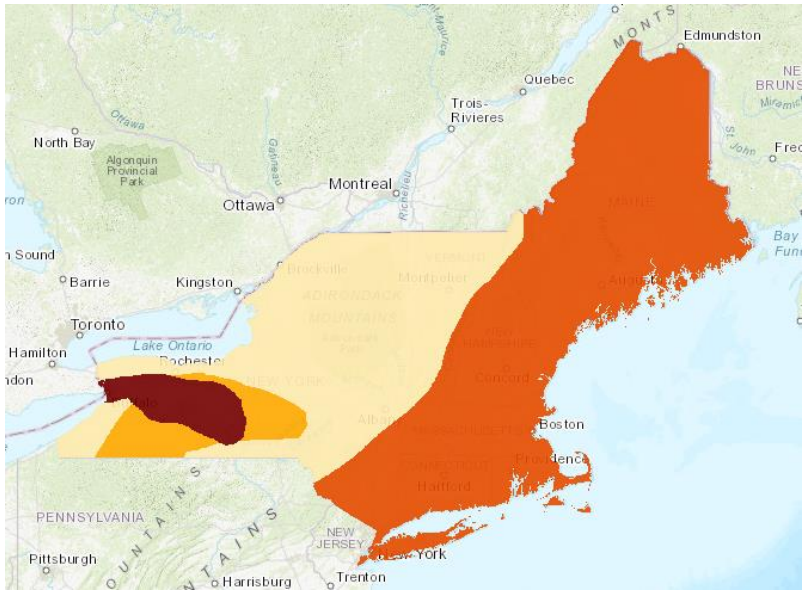
Yes

Regionally, and in Connecticut, Massachusetts, New York and Vermont

Drivers without evidence of a trend over time

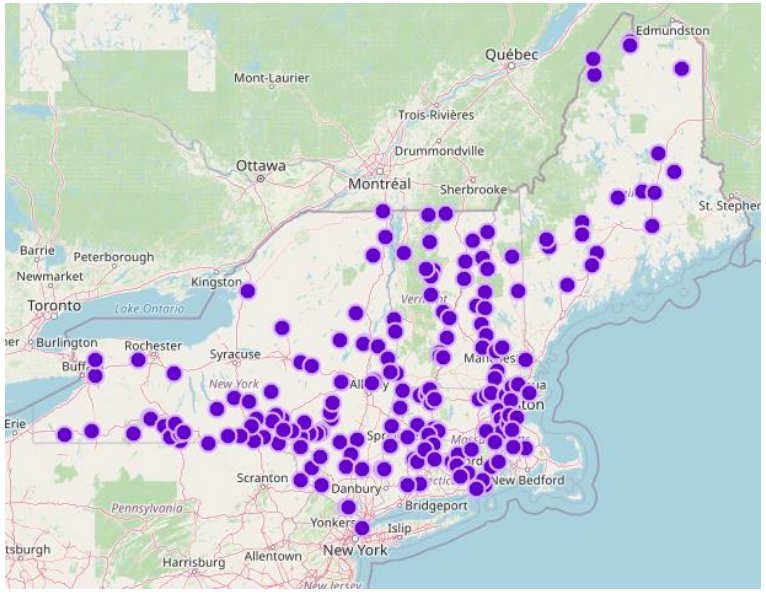
"Drought" → Any level of drought status

2000-2020



"Flooding" → Gauge levels above flood stage

2008 to 2020



179 stations

"Damage" → Area defoliated or killed

1918-2020

> 130,000 polygons

Potential Next Steps

- Customizable charting to visualize data multiple drivers
- Inform future research to connect 'drivers' with 'responses'
- Continue to add resources to increase breadth

Acknowledgments: Advisory Committee

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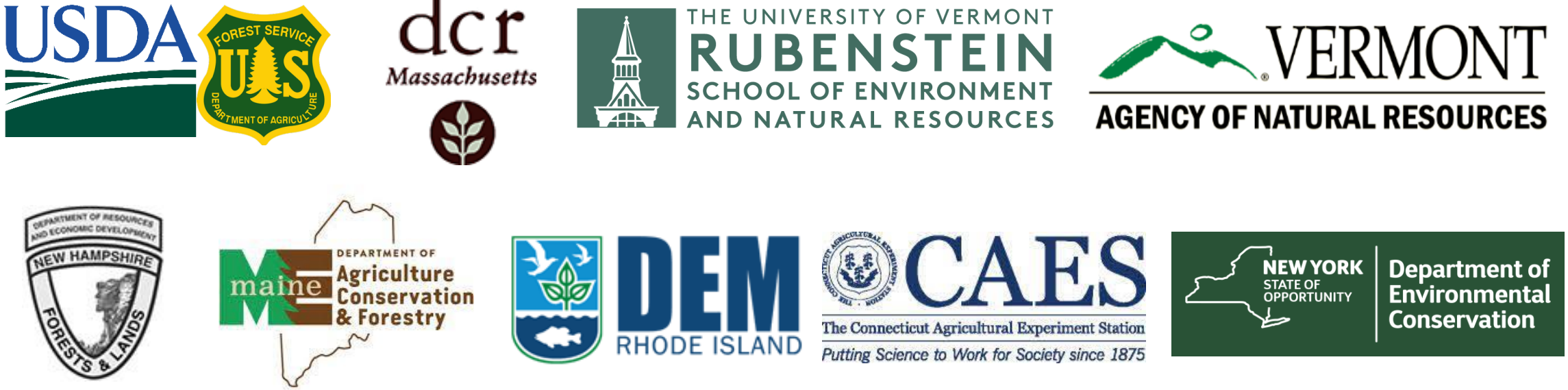
Dan McKinley, Kyle Lombard, and David Orwig

Acknowledgments: Funding



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Thank you!

www.uvm.edu/femc/disturbance

james.duncan@uvm.edu
pia.ruisi-besares@uvm.edu