Climate Change and Agriculture:

How Small-Scale Farmers in New England are Interpreting and Reacting to Environmental Changes

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HAMPSHIRE COLLEGE

Research Goals

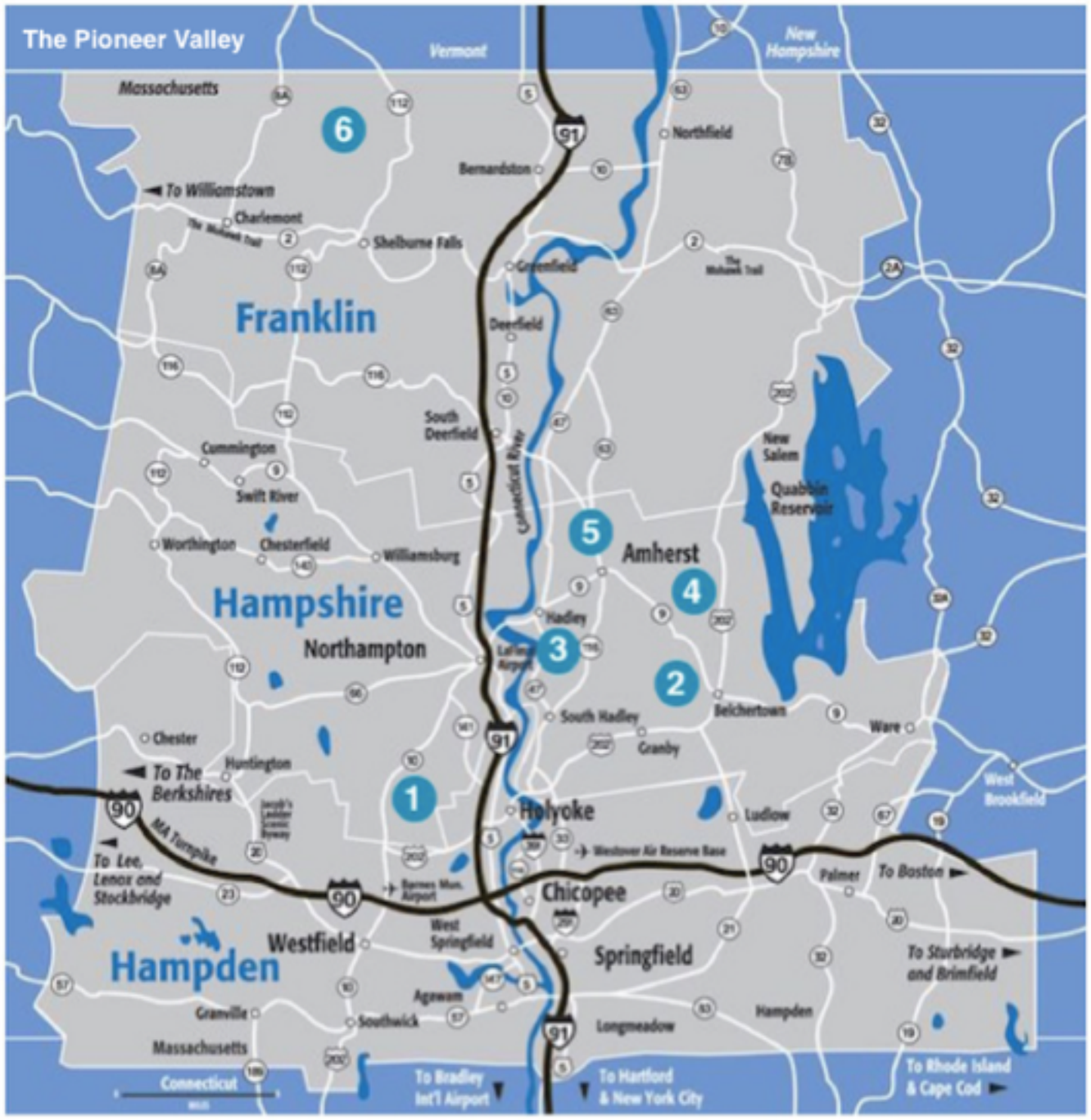
- Hypothesis: There is a relationship between farmer perceptions/experiences and established expectations for climate change impacts on farms.

- Explore farmer perception of climate change-driven impacts in depth through small amount of in-person interviews

- Discover biophysical issues farmers are facing and adaptations to these issues

- And thus, explore this relationship

Study Area: The Pioneer Valley

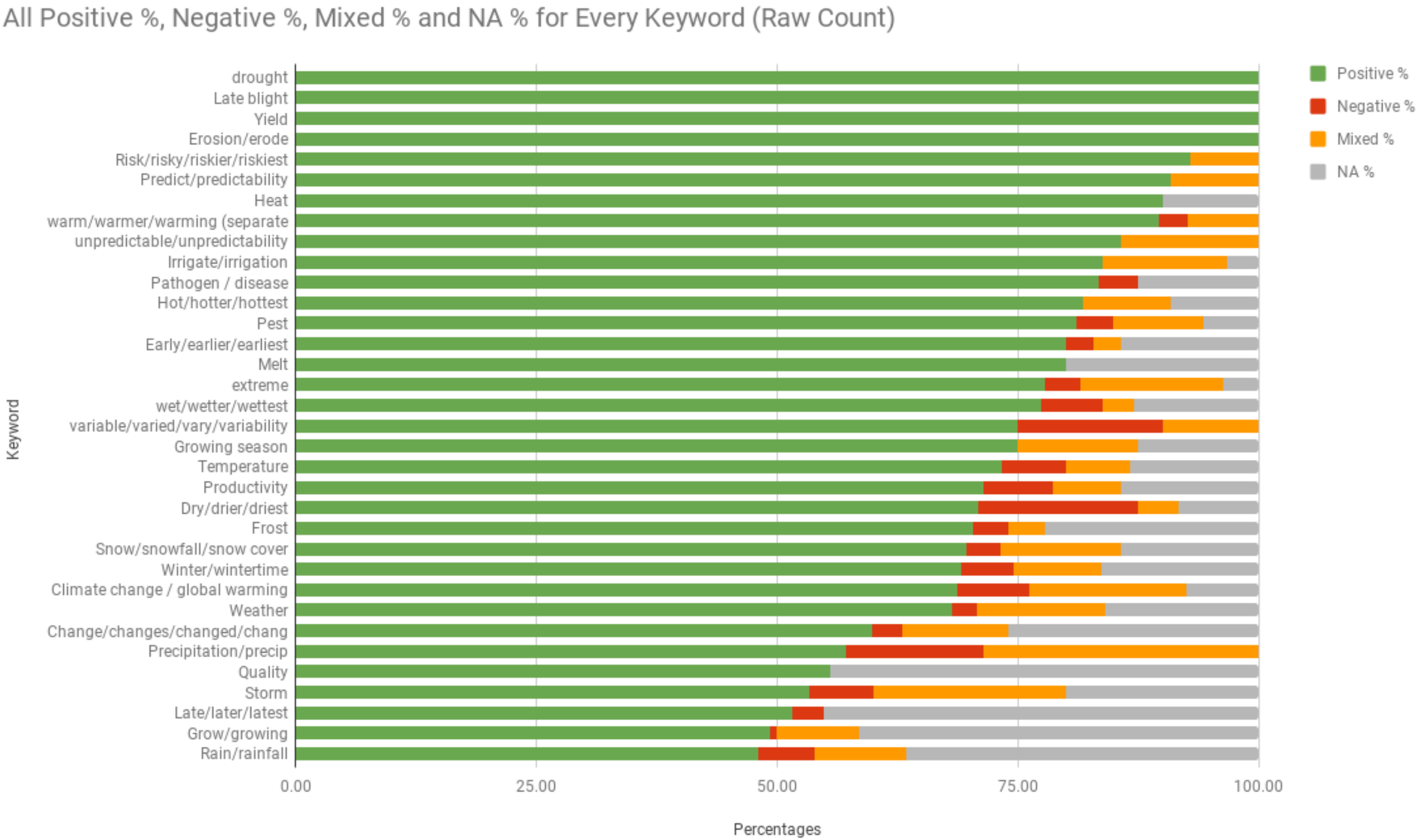


- Western Massachusetts
- Connecticut River Valley
- Franklin, Hampden, Hampshire Counties
- 2,261 farms, average of 67 acres, types of farms
- 6 locations so far, with 7 total interviews and 8 participants
- Veggie farmers, sugaring, livestock, haying

Methods

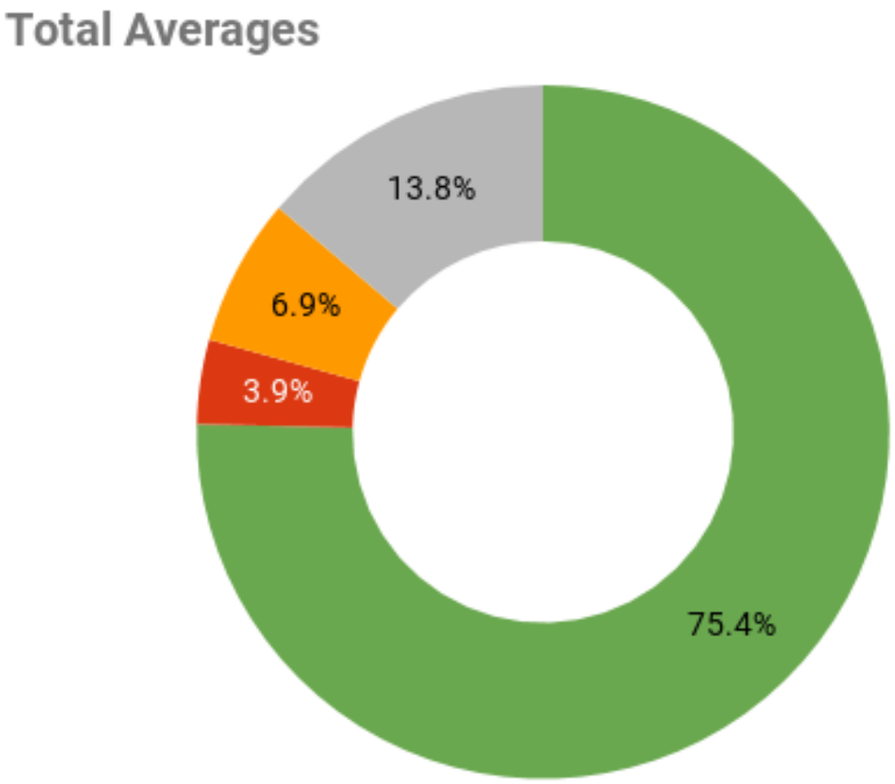
- Literature Review to establish expectations and keywords
- In-person interviews; recorded & transcribed
    - *What issues have they faced? To what do they attribute these changes? What adaptations have they implemented?*
- Keyword list, word count (raw count), and correlations
- Positive, negative, mixed, and not-applicable
- “In-vivo” coding (basically just pulling quotes!)

Preliminary Results



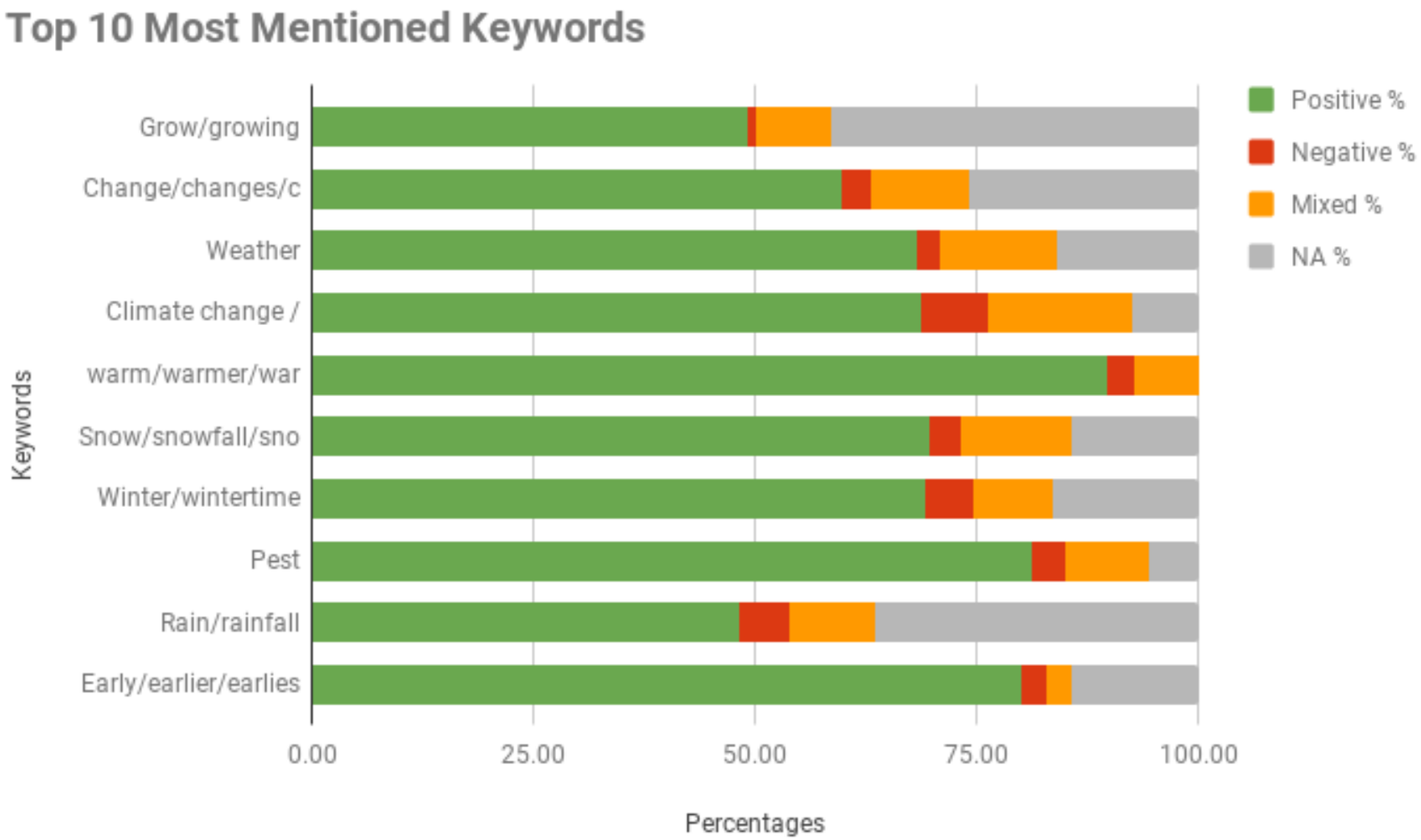
All correlation percentages per keyword, ordered from most positive to least positive

Results Cont.



Average correlation percentages of every interview

The top ten most mentioned keywords across all interviews, ordered from most mentioned to least mentioned



Challenges and Changes

- First Frost Date

- *"When I first got here in 1994, the first 5, 6, 10 years, we would be consistently getting first frost anywhere between Sept. 9th and Sept. 25th, but* ***never past the 25th****. Just* ***never, never, never, never.****"*

- Extreme Weather and Unpredictability

- *I put that in the* ***extreme weather*** *event category because one winter its 0 snow, the next winter a huge amount of snow then the next winter no snow and warm weather for 2 months. […] The weather in the winter seems as* ***variable*** *as in the summer. Just big big storms or some dry spells or nothing, with seemingly no rhyme or reason.* ***The predictability just seems very low.***

- Soil Erosion

- *"…[A]nd with the* ***snow melt****, with the* ***snow not covering the soil*** *for a lot of the winter, there's* ***much more wind erosion****. I see that in places like Hadley and Whately where you drive through fields that are not covered and you see and it's a windy day, and even if the ground is frozen,* ***lots of dust particles get picked up.****"*

Adaptations

- Taking advantage of an earlier growing season start

- *"I am starting a **spring CSA** share. And that was partly motivated by the fact that some years there won't be any snow on the ground and **we can get into the fields in March**. I figure that **I will benefit if it's a freakishly warm spring**, we can yield more for our spring share. So i'll actually get to react to warm winter and warm spring."*

- Preparing for extreme weather and changing growing seasons

- *"We have adjusted our **crop plan date**, planting dates for **increases in growing season**. We've invested in **unheated field houses** because they provide **protection from extreme climate events."***

- Cover cropping, reduced tillage, and enhancing soil quality

- *"It's easier to manage without tilling or **doing reduced till** when I'm doing **cover crops**. […] It's putting **more carbon** in the soil, it's putting **more nitrogen** in the soil, and it is covering the soil so that **soil is not washing away.** If there's even dead cover or even just debris on the ground, there's no wind erosion in the winter, or there's **much reduced wind erosion**."*

Impressions and Further Research

- Positive relationship! Research is projecting certain changes, and farmers are perceiving them in real life.

- Explore this positive relationship further
    - How to close the gap even more?
    - How to include farmers more in agricultural research?
    - How can the dissemination of research be improved?
- Booklet (my own form of dissemination of my research)

Questions?

(Thanks!)