The Past Matters: Communicating climate science for agricultural decision support

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Introduction

Scientists rely on observed historical weather and climate data to inform current and future climate model projections. Similarly, farmers use past biogeophysical events and personal social experiences to inform management decisions. These historical data, events, and experiences become reference points or *analog years* and may be used to understand how to best respond to the current situation.

Research suggests that agricultural traditions and past experiences can be important predictors of future management decisions. To understand barriers and facilitators of effective science communication for agricultural decision support, this research examines how time perspective interacts with the reception and use of scientific information.

Methods

- Data gathered from surveys and interviews of climatologists and farmers in the Midwest, USA
- Purposeful sample of extension and state climatologists surveyed (n=19) and interviewed (n=13) in Spring 2012
- Stratified random sample of farmers with minimum 80 acres of corn production and $100,000 gross annual sales surveyed (n=4,778) in February 2012 and interviewed (n=159) in 2013
- Qualitative analysis of interview transcripts using Nvivo 10 software to detect common topics and themes

Results and Discussion

- Social and cultural factors influence the reception of scientific information to inform short- and long-term management planning
- Beliefs about climate change vary between agricultural stakeholder groups and may create challenges for effective communication
- Historical weather trends have stronger influence in farm decisions than annual or longer term outlooks

> "Using analog years…trying to find ways to use the historical climate or things that people can remember or put into context as a guide for the future." – NE Climatologist
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> "If we had a flood last year, we probably wouldn't be thinking irrigation this year." – MO Farmer
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> "We've had yield mapping here since 1995 so we've got a very long history of yield mapping so we can look at trends... and put realistic goals in for nitrogen." – MI Farmer
>
> "It's tough to buck tradition. This is how Grandpa did it…all your neighbors are doing it...there's peer pressure." –MI Farmer
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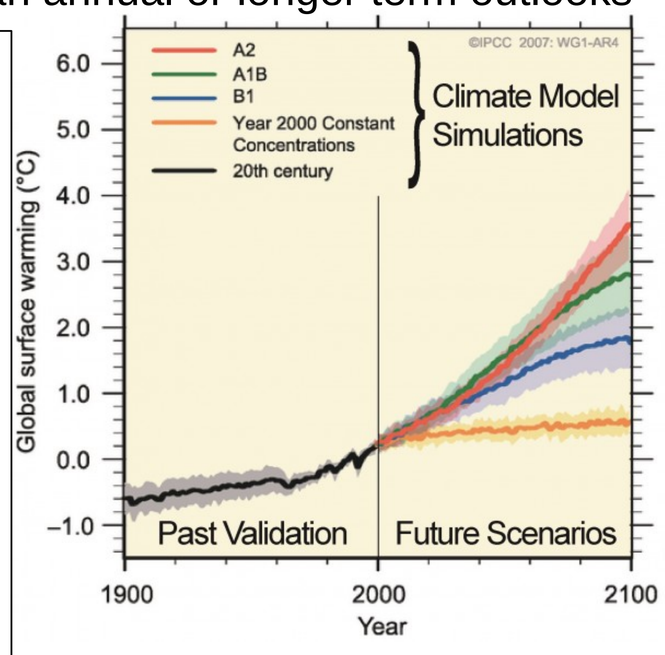
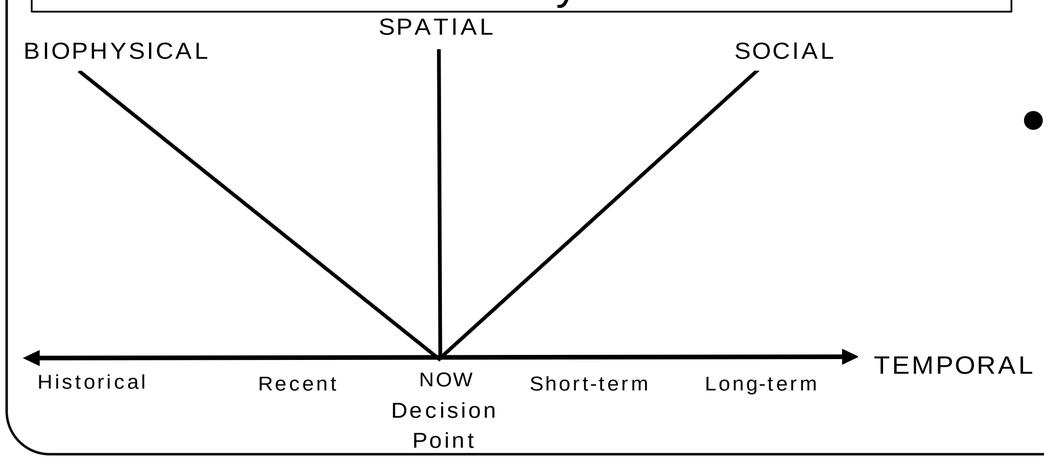
> "It was a big change to think about doing it that way, because, you know, Dad and Grandpa hadn't ever farmed that way." – MN Farmer



- Decision making results from assessing multiple scales, including temporal scale
- Historical and recent past experiences are weighted to determine short- and long-term potential future outcomes
- Agricultural management decisions, such as post harvest tillage, may be unevenly influenced by historical traditions relative to long-term future goals



Conclusions and Recommendations

- Past experiences, traditions, and analog years are important reference points to assess changes in climate and appropriate agricultural management techniques
- Communication strategies should provide information about historical observations that inform future models
- Framing scientific information relative to a time scale that includes that past may help activate and engage agricultural audiences
- Time scales conveyed in terms of human generations may be an effective way to communicate science for resource conservation and management

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