

Lessons learned from studies of climate information brokering and usability: Thresholds, seasonality, and other complications

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The Charge for this Presentation

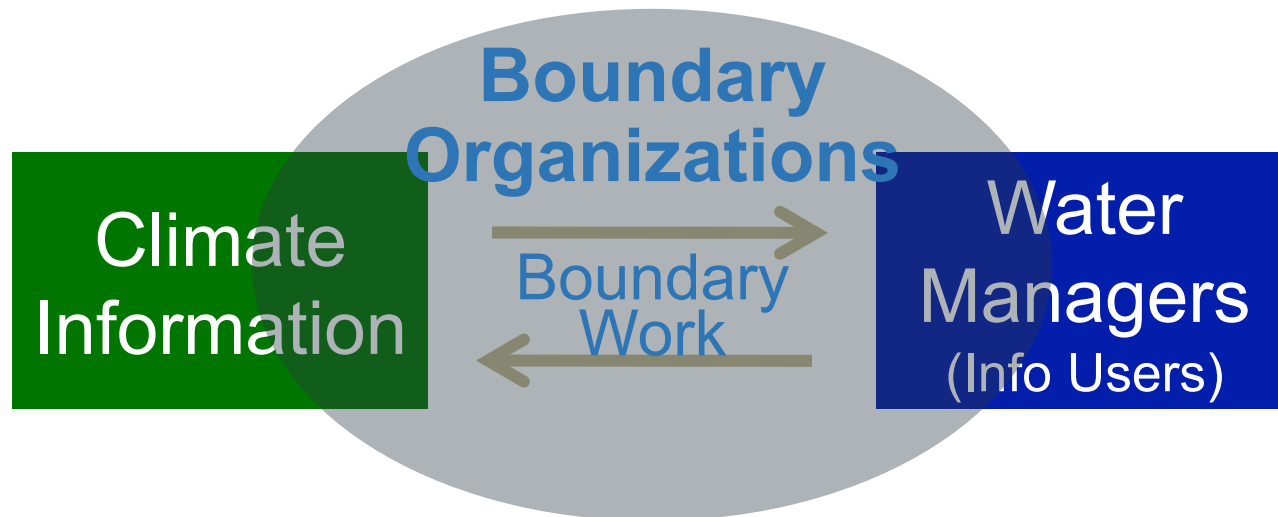
- To present relevant experiences, results, and **insights—from your experience and perspective**—about 1) what phenomenon are most important for assessing impacts and informing decisions in your field/sector, 2) the potential ways in which higher resolution products may or may not enhance capability relevant to your work, and 3) what more is needed to improve the credibility, impact relevance, and usability of potential future high resolution datasets.
- Providing specific examples of impacts and/or decision criteria that illustrate where you think opportunities (or challenges) to the usability of high resolution information exist would be most helpful.

Lessons Learned from Studies of CI Brokering & Usability

- How we produce science that makes it more likely to be usable?
- Why users' use ultimately use it and for what purpose?
- What gets in the way of use and how we might overcome those barriers?

Examining Climate Information Uptake among Water Managers

- From a survey of >600 water managers in the PNW and SW USA
- Most important predictors of climate information use:
 - system size, collaboration, info seeking, risk perception, and distance

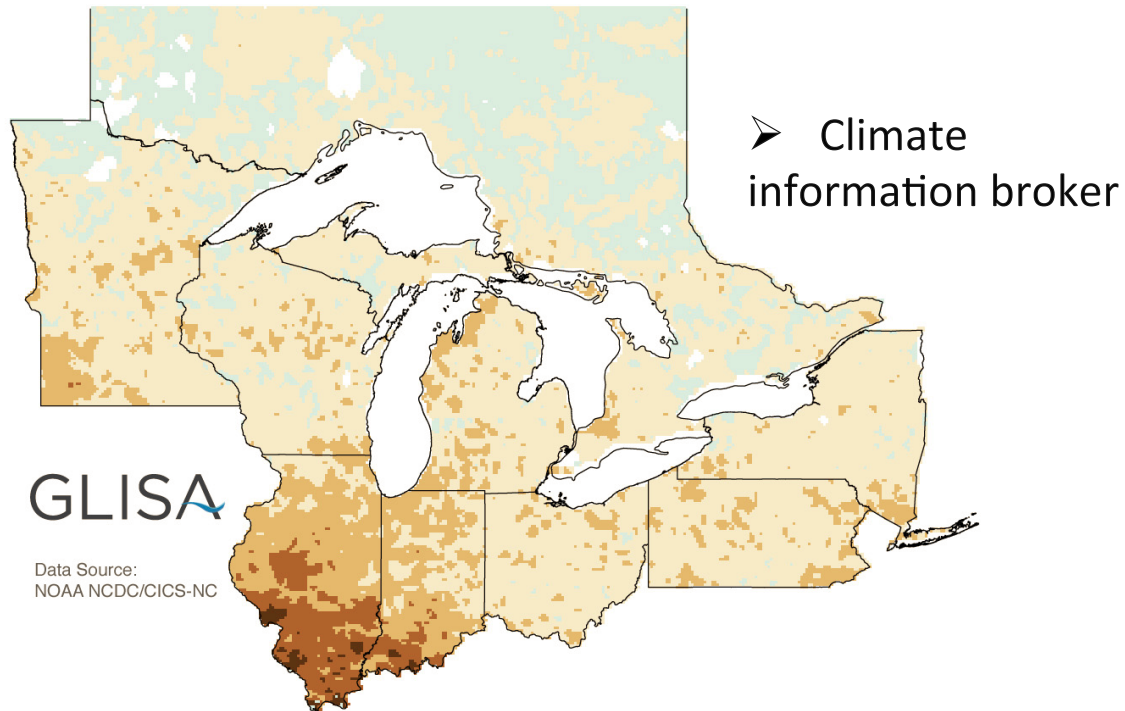
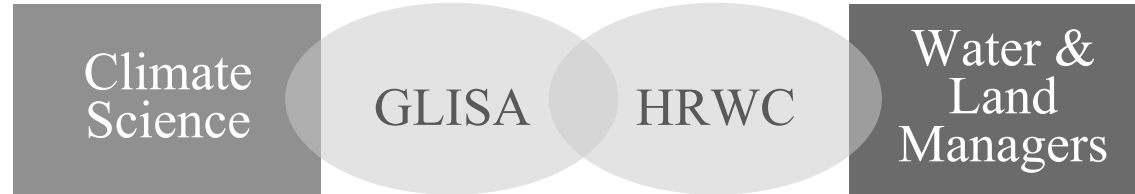


- Regional Integrated Sciences & Assessments (RISAs)

Examining Climate Information Uptake among Water Managers

- From interviews >30 water managers working with RISAs in the PNW and SW
- Examples of use ranged from:
 - Using climate impacts reports as additional emphasis/support to secure more water and to conserve more water
 - Using climate change temperature and precipitation projections as input into system models to understand system performance under changed conditions

Examining Info Use in the Context of a Boundary Chain



- Science-based organization provides information and research to member governments; helps state agencies identify and resolve watershed issues; and provides education and stewardship in the watershed.

Examining Info Use in the Context of a Boundary Chain

- To link climate information producers/brokers to address local climate change impacts and information needs
- Three working groups:
 - Water Infrastructure (water utilities, wastewater, stormwater)
 - In-stream Flows (dam operators, fisheries managers)
 - Natural Infrastructure (land managers)

Water Infrastructure – Stormwater/Flooding



June 27, 2013, a storm delivered 2.2 inches in three hours. Ann Arbor streets flooded – students rejoiced (kayaking in the street at the corner of Division and Hill)

Water Infrastructure – Stormwater/Flooding

“...daily precipitation totals may not help much since it doesn't really get at what is taxing the infrastructure which are these short, very intense rain events that overwhelm the system”

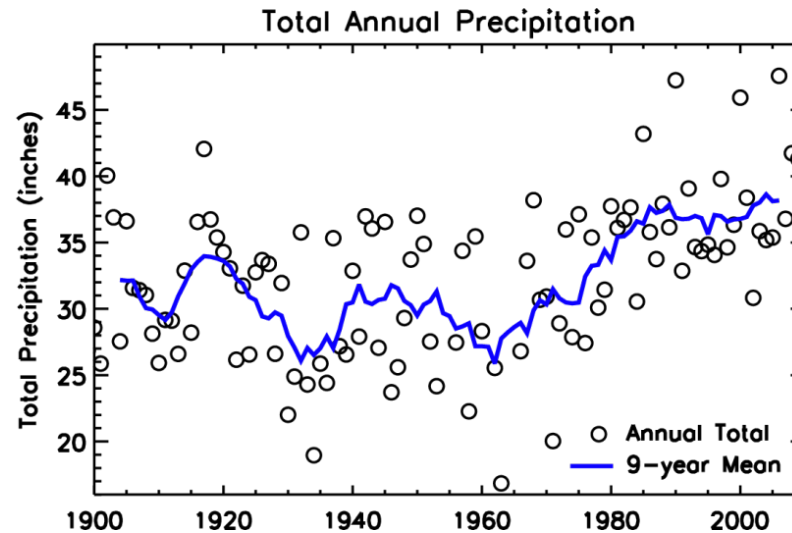
– Washtenaw County Engineer

Water Infrastructure – Stormwater/Flooding

- Intense precipitation events are typically reported in 1-inch or half-inch intervals
- For rainfall, thresholds of 1.25 and 1.75 inches of precipitation per day were more relevant for these stormwater managers
 - >1.25 inches nuisance flooding tends to occur
 - > 1.75 inches, green infrastructure gets overwhelmed.

Water Infrastructure – Stormwater/Flooding

- What information was used in the end?



That's **23 more** than **30 years** ago.

- How was it used?
 - Awareness building, education, more support for better stormwater management and green infrastructure, etc.
- Other efforts:
 - Address significant vulnerabilities in stormwater management
 - Working with state to change design storm

In-Stream Flows - Dam operators



- Many older dams not designed for future floods.
- Past flooding resulted in loss of life and property



In-Stream Flows - Dam operators

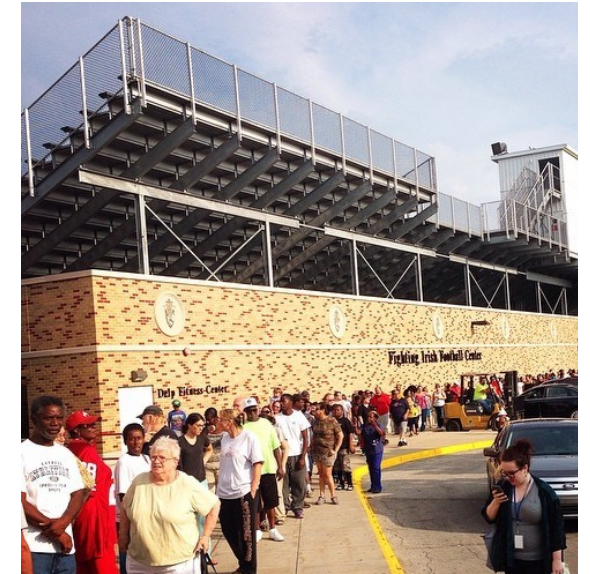
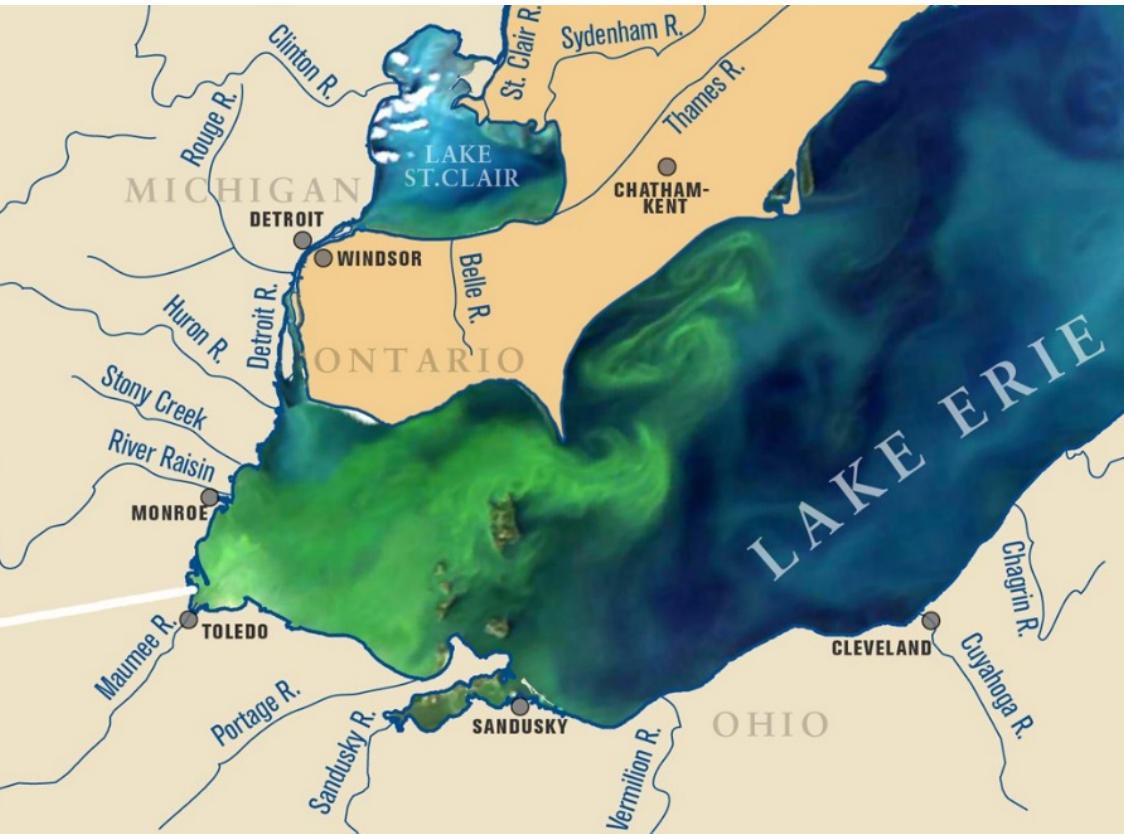
“We need predictions about future rain events and river flows in advance to improve dam operation and allow us to optimize for both flood management and hydropower production.”

– Huron River, MI Dam Operator

In-Stream Flows - Dam operators

- What information was used in the end?
 - None
- What was done?
 - Build a communication network
 - Add river flow gauges
 - Consider changing regulations to allow more flexibility in managing both dry and wet periods

Exploring How Climate Change May Inform Phosphorus Management



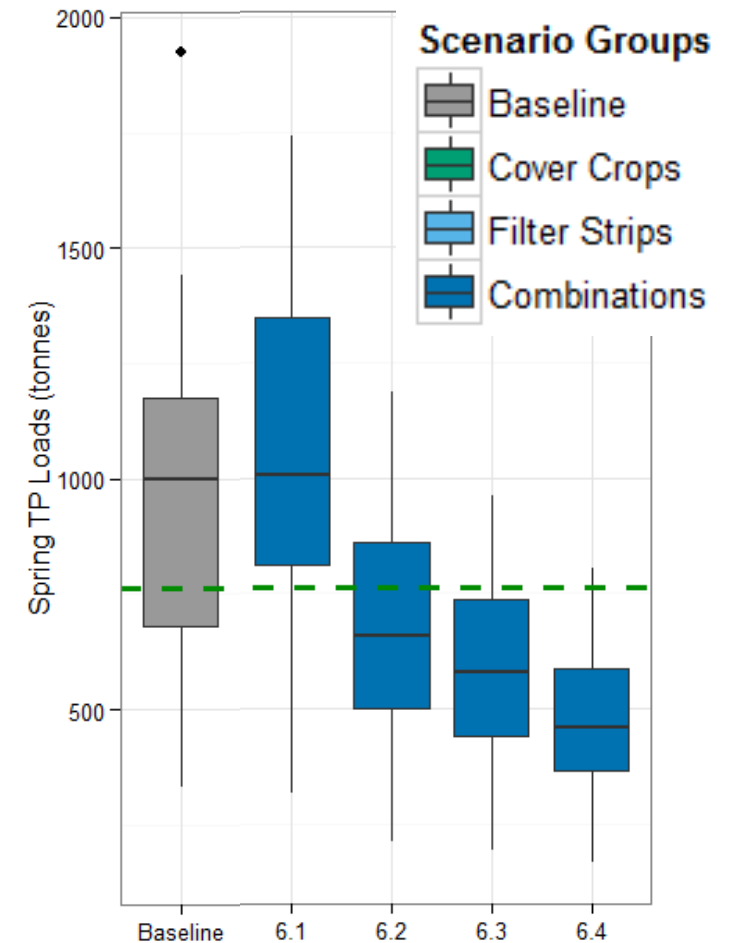
Water crisis grips hundreds of thousands in Toledo area, state of emergency declared

BY TOM HENRY
BLADE STAFF WRITER

Aug. 2014

Exploring How Climate Change May Inform Phosphorus Management

- New phosphorus loading targets set to reduce HABs
- Modeling suggests will take combinations of best management practices to try to achieve targets most of the time
- The big unknown: how will climate change impact spring time phosphorus loading



From: M. Kalcic

Exploring How Climate Change May Inform Phosphorus Management

- The most important climate information is: MAMJ precipitation
- Challenges:
 - Climate model projections all over the place
 - Climate inputs do weird things to SWAT (temp affects crop growth, etc.)
- Will climate info get used?
 - TBD

Questions?