

Green River Lowlands Scenario Planning

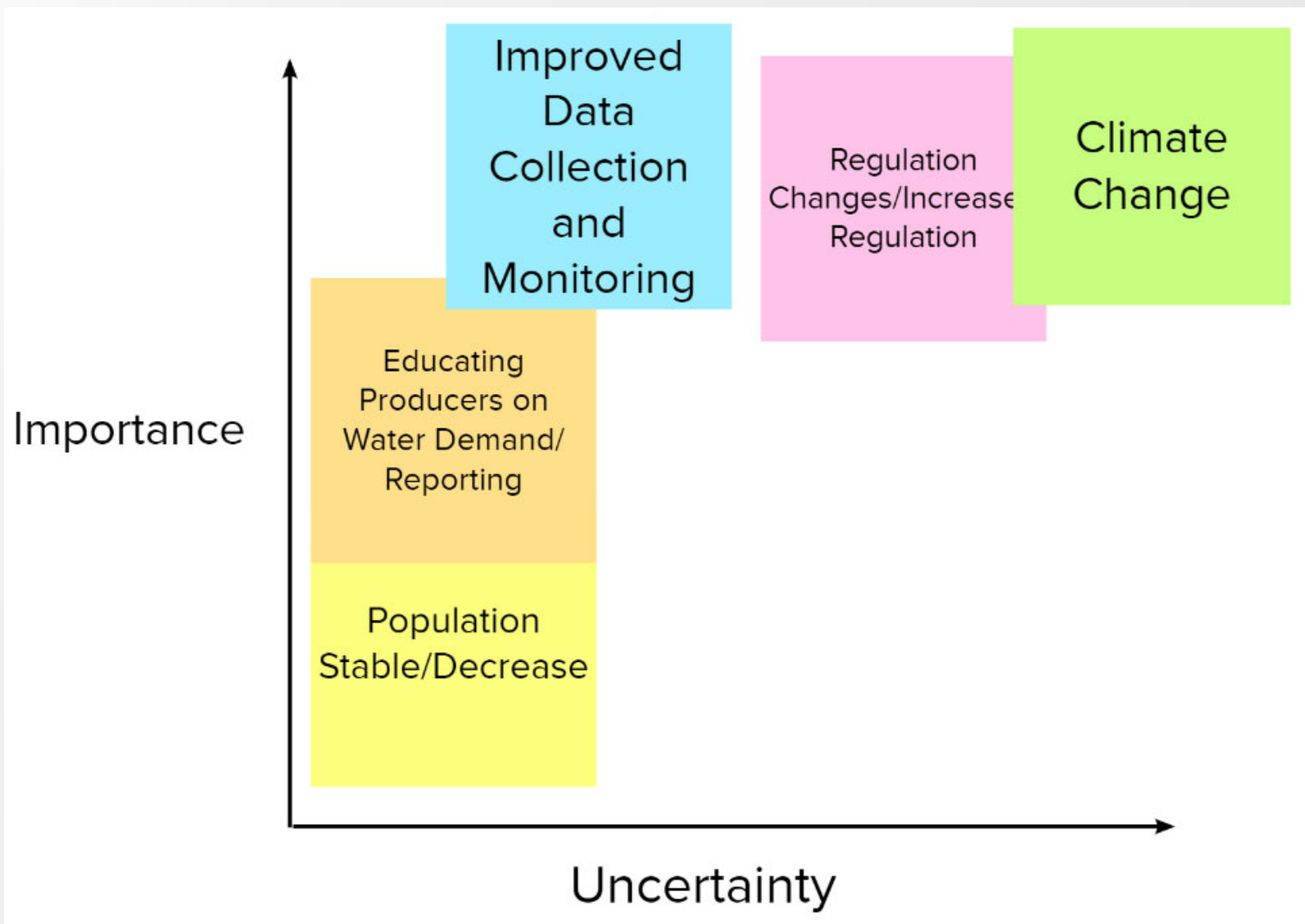
Update on Workshop 2

February 10, 2023

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Predictable
Regulations,
Goes Where
Climate Goes

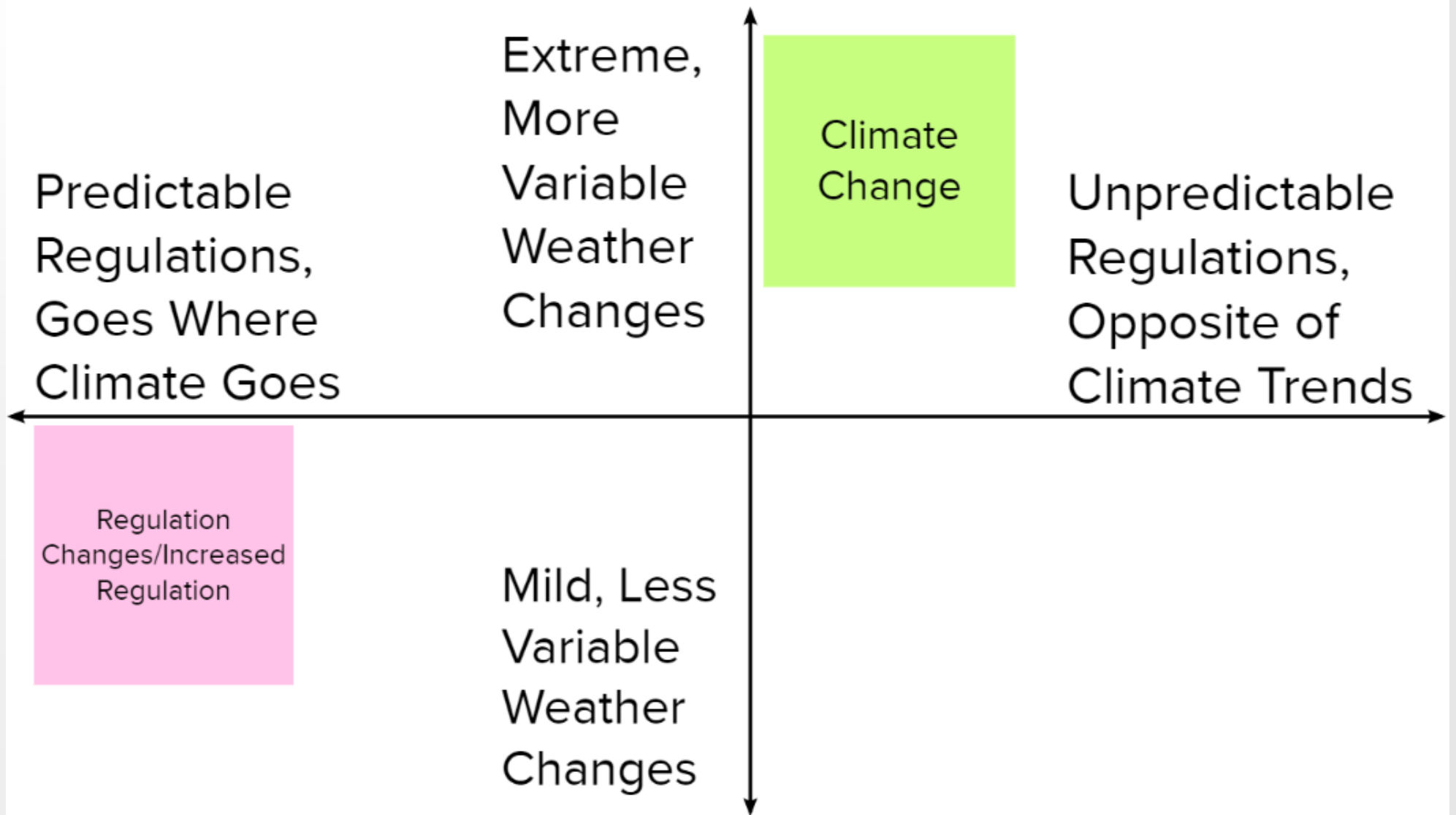
Extreme,
More
Variable
Weather
Changes

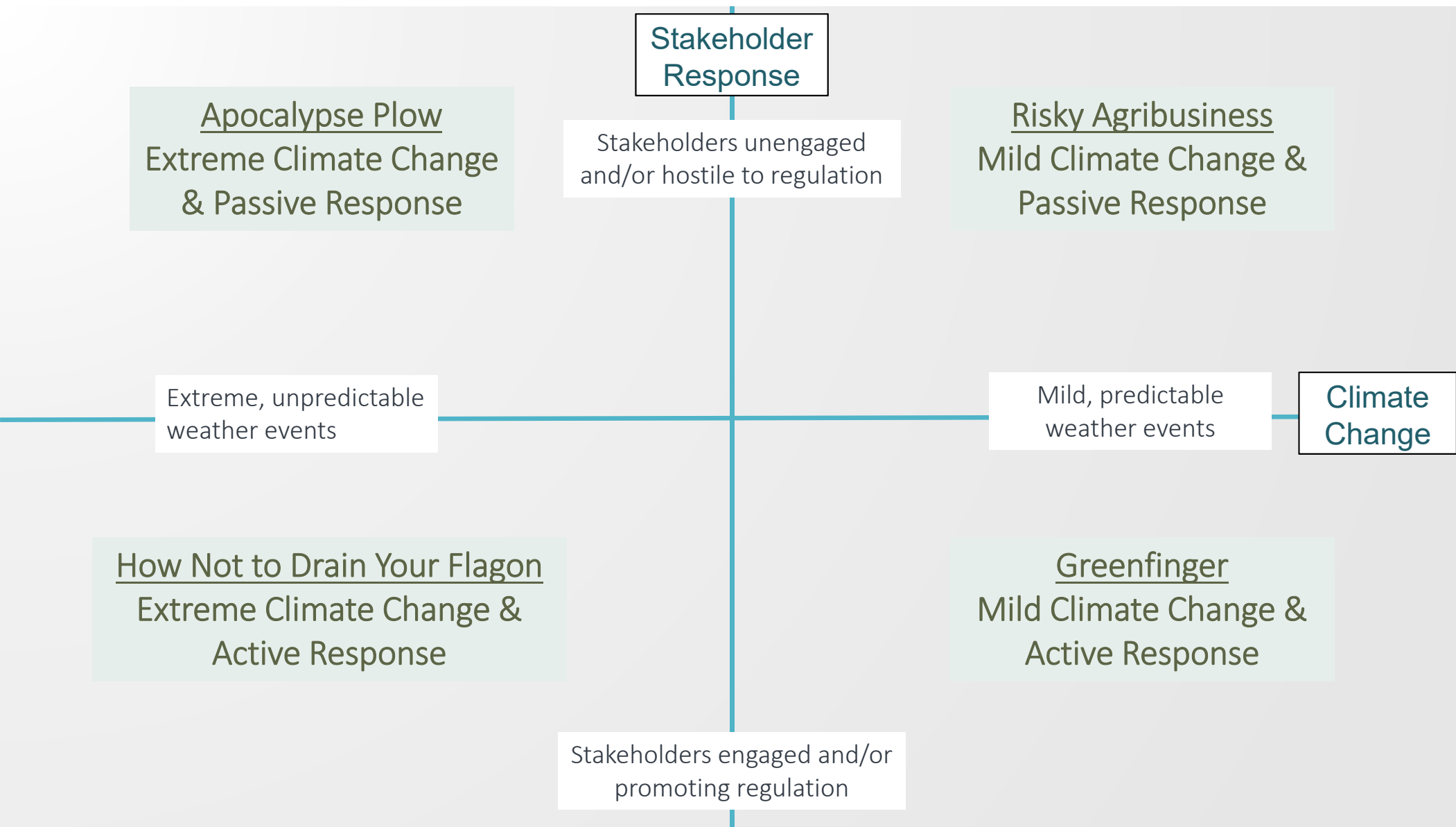
Climate
Change

Unpredictable
Regulations,
Opposite of
Climate Trends

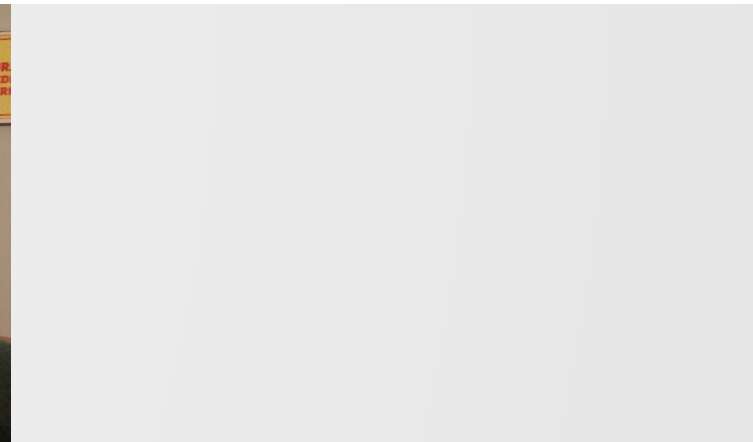
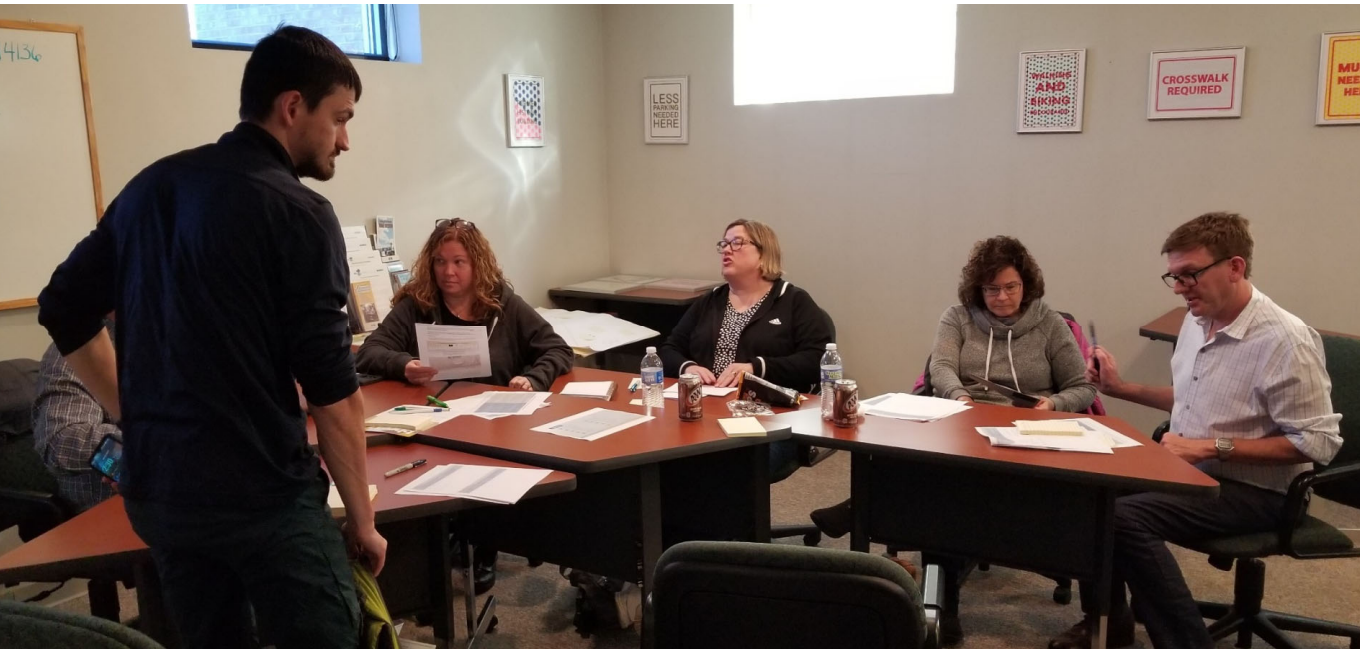
Regulation
Changes/Increased
Regulation

Mild, Less
Variable
Weather
Changes





Workshop 2



November 9, 2022
10 participants



Implications for Each Scenario

- What is likely to happen in each of these futures?

What changes are agricultural producers likely to make?

How is the public likely to react?

What business will we lose?

What business will we gain?

How will ecosystems fare?



Strategies

- How do we respond (what projects, programs, policies, etc.)?
- Who responds?
- How do we know our strategies are succeeding? (by measuring)

Strategy Measures

- What are the outputs (quantitative)?
- What are the outcomes (quantitative and qualitative)?



Scenario C: How Not to Drain Your

Implications:

- New class of criminal
- more information to be consumed
- higher costs
- increased bargaining power
- businesses need to adapt

Out migration
of businesses

Strategies:

People get around rules
 fines - legal action

Educate public
 Campaign
 Info presentation
 Provide credibility
 Provide incentives to
 the community to change
 types of crops
 Be proactive
 Promote care

Engage water community
 (be the language
 in the room)
 * Consult, clear reason
 for why right in place
 * Make sure on stakeholders
 at hand

Encourages
 * for business to follow
 regulations

* What businesses need
 to be part of which
 don't
 * encourage and reward
 * I think clear to encourage
 the benefits of
 regulations

Construction incentives
 * easy to go under
 a fence
 land
 out-migration

insurance strategy
 - who are we talking
 to? insurance? insurance
 who's the insurance man

Scenario D: Greenfinger

Implications:

Incentive
 programs
 have added
 requirements
 (GONC)

Wells
 are
 closed
 (high capacity
 wells)
 Stop system of
 aquifers

Land is
 purchased
 for reforestation
 (see update
 NY)

Regular
 purchase of
 conservation
 easement/public
 land for
 conservation

Building reserves
 for resiliency

Date
 given used to
 program
 locally

Impact
 loss for
 core of
 impact
 affected
 families
 for long
 time

Greenfinger
 Ordinance
 Plant
 mitigation
 Significant conservation
 values to be seen

Investment
 in the region
 land/forest
 to restore water
 levels
 * encourage the community
 * looks consistently in the
 long term

Strategies:

Flood
 plan
 management

Update
 zoning
 stormwater
 only
 has
 not floor

More aggressive strategies
 for obtaining a license

Scenario Implications Anticipated – Assumes Climate Change a Factor

Implications of Passive Response

- | | |
|---|--|
| <ul style="list-style-type: none">• No action plans for how to respond to current or future events• Ineffective water resources outreach, education• No water conservation incentives or identified outcomes even if incentives are available• Natural hazards like flooding and erosion not dealt with proactively or systematically• Water availability diminished across industries, including manufacturing and recreation/tourism• Concerns about water under/over supply not communicated clearly, regularly, or effectively | <ul style="list-style-type: none">• Inability to effectively address large issues like requests for water from out-of-state businesses and governments or proposed major development in region• Limited coordination and relationships between water users, interest groups, governments, etc.• Little consideration for externalities with respect to water use• Overspend/underspend on infrastructure• Haphazard or no replenishment of natural systems and tree canopies |
|---|--|

Scenario Implications Anticipated— Assumes Climate Change a Factor

Implications of Active Response

- Water resources criteria added to building codes, zoning ordinances, stormwater management ordinances, floodplain management, etc.
- Incentive programs (tax increment districts, enterprise zones, etc.) have additional requirements supporting responsible water use
- Regular purchase of conservation easement and public land for conservation
- Agriculture and industry have ample water supply throughout the year
- Variety of important stakeholders are engaged in conversations about water conservation, water demand/supply
- Water conservation as a habit in personal and professional endeavors
- Systematic, long-term investment in built and natural environment related to water (reservoirs, delivery networks, streambanks, tree canopies)

Scenario Strategies Possible – Assumes Climate Change a Factor

Strategies Possible with a Passive Response

Measuring

- Track land use changes using assessor records, remote sensing data, etc.
- Track conservation programs enrollment data (land trusts, state, federal, etc.)
- Use NAICS/SIC codes, tax revenue, etc. to compare growth/decline in water-dependent industry
 - Track water-dependent recreation/tourism growth/decline
- Monitor use of central-pivot and other agricultural and industrial irrigation systems

Mitigating

- Many mitigation actions unlikely under passive response scenarios
- Standard updates to land use and zoning maps/ordinances, storm water ordinances, and hazard mitigation plans
- Floodplain management without monitoring, enforcement

Scenario Strategies Possible, cont'd – Assumes Climate Change a Factor

Strategies Possible with an Active Response

Measuring

- Aforementioned measurement strategies
- Track animal husbandry, crop production changes with voluntary local reporting
- Track water consumption in households using conservation subsidies
- Model selected stormwater flows and field tile drainage

Mitigating

- Water-focused updates to land use and zoning maps/ordinances, storm water ordinances, and hazard mitigation plans
- Support adoption of water reduction habits and measures through outreach, education, and incentives
 - Begin conservation outreach and education at a younger age
 - Develop programming along with public works, agricultural, and conservation groups
- Charge large water users appropriate rates and institute temporary higher rates in times of scarcity
 - Use additional revenue to support water conservation programs

Scenario Strategies Possible, cont'd – Assumes Climate Change a Factor

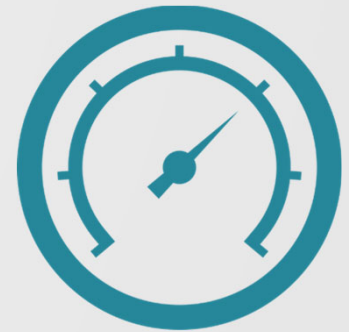
Strategies Possible with an Active Response

Mitigating, cont'd

- Provide water-use evaluations for homes and businesses
- Subsidize installation of low-flow fixtures and appliances
- Expand monitoring of central-pivot and other agricultural and industrial irrigation systems
- Incentivize agricultural producers to diversify crops planted and livestock reared (i.e., crops and livestock that consume less water)
- Expand training offerings for well drillers, public works workers, landscapers and other water professionals
- Tie business permitting and/or incentive programs to exceptional water management performance, impact fees
- Ensure that water use is part of business attraction RFI review process
- Infrastructure (natural or built) supports water reserves
 - Land is purchased for recharge
 - Water systems are measured and fortified
- Invest in Hennepin Canal Feeder infrastructure to regulate water level

Indicators

- When an unknown becomes known.
- What are the indicators of each future?
 - *What qualitative or quantitative data do we use to establish each indicator?*
- Who monitors each indicator?
- Contingent Responses - When should we respond to each indicator (that is, when should we implement a strategy)?
- Robust Responses - What strategies should we implement regardless of indicators?



Indicators

crop insurance claims
-?

flood insurance claims
- FEMA

wind insurance claims
-?

of heat stroke deaths

↳ public health

↓
water borne illnesses

- # Days above 100°F
- # Nights above 70°F

↓
Average

Weather service + ISWS

of municipal cases

of permits + types

well permits

changes in

- Crop production over 5 years

- ~~Marshall Farm Bureau~~
+ NRCS
- ~~EMF~~ ~~CHRD~~

- # of Businesses leaving or change in businesses

- ~~Small businesses~~

- # of municipal ordinance fines

~~Start~~
Date of 1st + last frost

Indicators

Climate Change	
Indicator	Source
# and type of crop insurance claims	USDA
# of flood insurance claims	FEMA
# of wind insurance claims	NOAA, NGOs
# of heat stroke deaths and waterborne illness	Health Dept.
# of average days above 100 degrees F and nights above 70 degrees F	ISWS, NWS
Changes in crop production over 5 years	Farm Bureau, NRCS
Dissolved oxygen levels of rivers, lakes, etc.	EPA, USGS
Water temperature of rivers, lakes, etc.	EPA, USGS
Flood stage frequency	NOAA
Hydroelectric output	n/a
Depth of freeze	National Weather Service, NOAA
Tree canopy coverage/heat island analysis	NGOs

Regulations and Response	
Indicator	Source
# of municipal cases	Survey of local gov't
# and types of permits	Survey of local gov't
# of well permits	Survey of local gov't
# of municipal ordinances	Survey of local gov't
# and type of businesses coming/leaving	BEA, NGOs
Municipal water main breaks and water use restrictions	Survey of local gov't
Land acreage in conservation	IDNR, NGOs
General land cover data	Survey of local gov't
Municipal water use and discharge	Survey of local gov't, EPA, USGS, ISWS
Development in floodplain	Survey of local gov't

Next Steps

