Upper Platte Basin Drought Contingency Plan

Drought Task Force Meeting #4

June 27, 2023

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Safety Moment

- Look out for extension cords!
- Emergency exits
- Tornado shelter
- 911 caller
- Restrooms

Supply Check

- Nametag
- Device with web-access to use for mentimeter polling activities (cell phone, laptop, tablet)
- Photo Release
  - If you **DO NOT** want to have your photo taken and used on the UPBDCP website, make sure you check the box next to your name on the sign-in sheet

Today's Agenda

- Welcome and Introductions
- Drought Planning Recap
- Review of May 23 Drought Tabletop Exercise
- Draft Drought Plan Overview
- Discussion
- What Comes Next?

Introductions

Tell us who you are! (Name, Role, Organization)

Drought Planning Recap

How did we get here?

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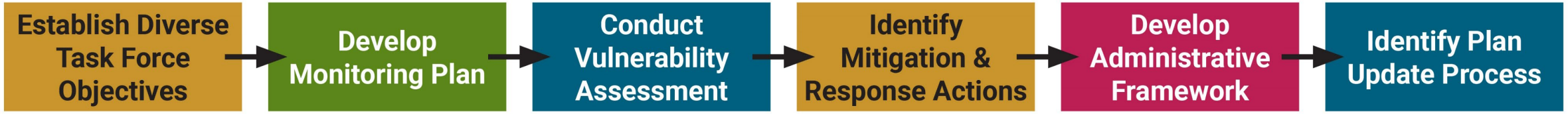
Project Background

- Development of a drought contingency plan was identified as a key element in the basin-wide IMP
- Pursued and secured grant funding through BOR's WaterSMART program
- Similar to IMPs – Overarching basin-wide drought plan to support individual NRD and individual stakeholder drought plans with implementation of mitigation and response actions
- Coordination and communication is key

Bureau of Reclamation Drought Planning

- 6 elements to the plan development process



Roles and Responsibilities

Primary Stakeholder Group:

- Consists of Platte Basin Coalition members
  - Central Platte NRD
  - North Platte NRD
  - South Platte NRD
  - Tri Basin NRD
  - Twin Platte NRD
  - Nebraska Department of Natural Resources

Duties:

- Provide guidance and oversight in plan development, background information, review
- Support plan development
- Decision-making authority responsible for plan content and approval

Roles and Responsibilities

Drought Task Force:

- Consists of diverse group of water-related interests:
  - Agriculture
  - Environment / Wildlife
  - Financial
  - Groundwater Irrigators
  - Groundwater Users
  - Irrigation Districts
  - Municipalities
  - Public Power Districts
  - Surface Water Users
  - Recreation Users

Duties:

- Provide focused input to the plan development team
- Assist in the understanding of vulnerabilities and impacts of drought in the basin
- Provide input on potential mitigation and response actions.

Drought Task Force Mtg #1

July 21, 2022

- Project Background
  - Reviewed roles and responsibilities
  - BOR planning process
  - Outlined roles and responsibilities
- Initial Vulnerability Assessment
  - Discussed vulnerabilities to each sector
  - Identified potential impact severity
- Initial Mitigation Action Identification

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Drought Task Force Mtg #2

March 29, 2023

- Drought Monitoring
  - Discussed available tools, those in use currently, and potential applications
  - Looked at historic drought impacts to determine how monitoring could benefit
  - Discussed impact indicators by sector
- Vulnerabilities
  - Refined list of sector vulnerabilities
  - Prioritized short-term and long-term drought vulnerabilities for each sector
- Mitigation & Response Actions
  - Discussed what actions would be beneficial to each sector

Drought Task Force Mtg #3

May 23, 2023

- Monitoring Data
  - Identified the most beneficial indicators and indices, based on feedback
  - Presented basic timeline of monitoring elements and timing
- Mitigation and Response Actions
  - Discussed recommended actions, by sector
- Drought Tabletop Exercise
  - Used the 2012 drought and the 2003-2006 drought as reference
  - Small groups talked through single and multi-year drought scenarios
  - Identified what data they're paying attention to, what coordination needs to take place, considered mitigation and response actions, and specific triggers for actions

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Review – May 23rd Tabletop Exercise

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What Did We Learn?

- Identified need/desire for better/longer lead time forecasting tools
- Evaluated monitoring protocols effectiveness during simulated (historic) droughts – both short and long-term
- Evaluated effectiveness of mitigation/response actions by sector - both short and long-term

“Forward-Looking” Monitoring

- Challenges:
  - Reliability/Diversity – not all droughts same type, same cause, etc.
  - Multiple factors drive drought conditions – similar conditions can yield different outcomes due to complexity
  - Some indices have relatively short historic record – limits verification dataset
  - You want to limit false positives – “cry wolf”
- Recommendations
  - EDDI (evaporative demand) 1, 3, 6, and 12-month – Useful for demand trends – has been effective in flash drought prediction in combination with precipitation forecasting (30, 60, 90-day forecast).
  - SPI (standard precip. index)- relative comparison amongst the indices values (1 month vs. 3 month, etc.) to evaluate trends in and out of drought conditions – ‘drought momentum’ (per T. Shannon)

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Mitigation & Response Actions

- Allocations/metering – how is timing of drought related to allocation period?
  - Telemetry benefits
- Commingled irrigation = water supply options
  - Regulation or legal changes required?
- Conjunctive Management
  - Surface Water Storage operational changes (decisions on early releases? or restrict competing uses if necessary?)
  - New projects and monitoring
  - N-CORPE-type Augmentation Pumping (look at current triggers for using existing projects)
- Education & Public Outreach
  - Management, Crop Diversity, personal water conservation, etc.

Mitigation & Response Actions Cont.

- Increased and more consistent communication on drought conditions and resources available
- Varying crops and seed spacing
  - Plant drought tolerant cover crop early, terminate if conditions are good?
- Public and private well interference issues
- Options for power plant cooling water
- Drought dashboard: Supply and Demand data?

Mitigation and Response Action Effectiveness

Sector	Mitigation or Response Action	Effectiveness
Agriculture	Emergency Hay/Forage Programs (Response)	High
Agriculture	Comingled Irrigation (Mitigation)	High
Agriculture	Irrigation Scheduling and Groundwater Controls (Response)	High
Agriculture	Livestock Protection, Shade and Water (Response)	Medium
Agriculture	Soil and Rangeland Health (Mitigation)	Medium
Agriculture	Irrigation Efficiency (Mitigation)	Medium
Agriculture	Groundwater Recharge Projects (Mitigation)	Medium
Agriculture	Additional Surface Water Storage/Conjunctive Management (Mitigation)	Medium
Agriculture	Erosion Conservation Measures (Mitigation)	Medium
Agriculture	Crop Variety and Seed Spacing (Response)	Medium

Mitigation and Response Action Effectiveness

Sector	Mitigation or Response Action	Effectiveness
Energy	Increase Availability of Cooling Water (Mitigation)	Medium
Energy	Protect Power Infrastructure from Fire Threats (Mitigation)	Medium
Energy	Improve Efficiency of Water Delivery (Mitigation)	Medium
Energy	Load and Peak Demand Management (Response)	Medium

Mitigation and Response Action Effectiveness

Sector	Mitigation or Response Action	Effectiveness
Municipal/ Industrial/ Domestic (M/I/D)	Emergency/Fire Water Storage (Response)	Medium
M/I/D	Emergency Potable Water (Response)	Medium
M/I/D	Increase Groundwater Quality Monitoring (Mitigation/Response)	Medium
M/I/D	Increase Groundwater Quantity Monitoring (Mitigation/Response)	Medium
M/I/D	Water Use Restrictions (Lawn Irrigation) (Response)	Medium
M/I/D	Develop Emergency Action Plan (Mitigation)	Medium
M/I/D	Drill Deeper Production Wells/Replace Infrastructure	Low

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Mitigation and Response Action Effectiveness

Sector	Mitigation or Response Action	Effectiveness
Environmental	Protect Ecosystem Functions (Control Invasive Species) (Mitigation)	Medium
Environmental	Increase Riparian Buffer Zones (Mitigation)	Medium
Environmental	Improve Drought Resilient Habitats (Mitigation)	Medium
Environmental	Controlled (Prescribed) Burns (Mitigation)	Medium
Environmental	Improve Wildlife Protection (Mitigation)	Medium
Environmental	Coordinate Wildfire Suppression (Response)	Medium
Environmental	Habitat Recovery (Response)	Medium

Mitigation and Response Action Effectiveness

Sector	Mitigation or Response Action	Effectiveness
Recreation	Lake Dredging and Aquatic Habitat Restoration (Mitigation)	Medium
Recreation	Watershed WQ Management (Mitigation)	Medium
Recreation	Drought Resilient Recreational Facilities (Mitigation)	Medium
Recreation	Fish and Game Regulations During Drought (Response)	Low

Mitigation and Response Action Effectiveness

Sector	Mitigation or Response Action	Effectiveness
Socio-Economic	Improve Drought Resilience of Public Services (Mitigation)	Medium
Socio-Economic	Increase Air Quality Monitoring (Response)	Medium
Socio-Economic	Coordinate Disaster Relief (Response)	Medium
Socio-Economic	Coordinated Emergency Response (wildfire for example) (Response)	Medium
Socio-Economic	Access to Mental Health Resources (Mitigation)	Low
Socio-Economic	Public Outreach for Drought Education and Available Financial Assistance (Mitigation)	Low
Socio-Economic	Prepare and Train for Disease Outbreaks (Mitigation)	Low

BREAK

We'll see you back here in about 15 minutes!

Overview of Draft Drought Plan

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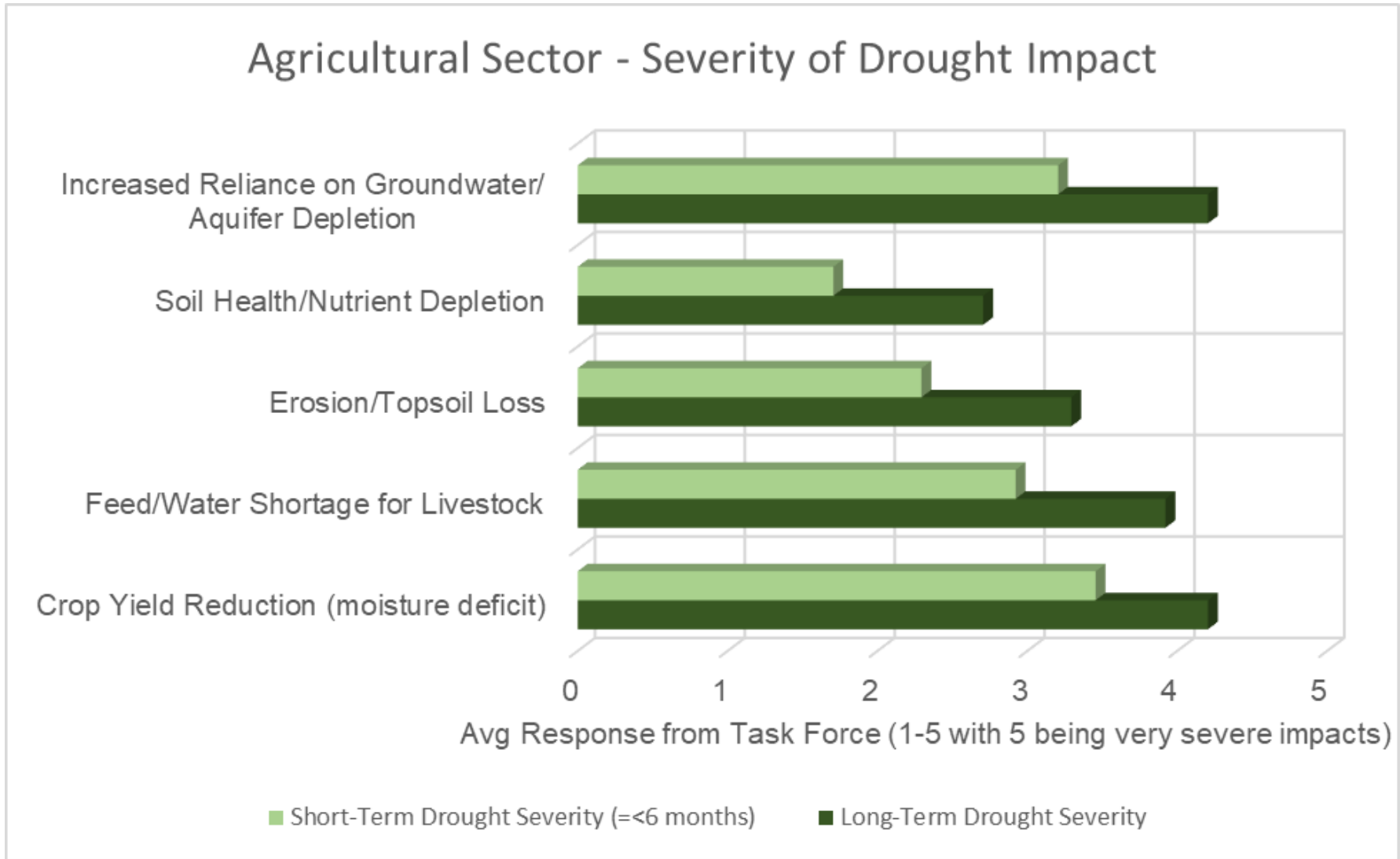
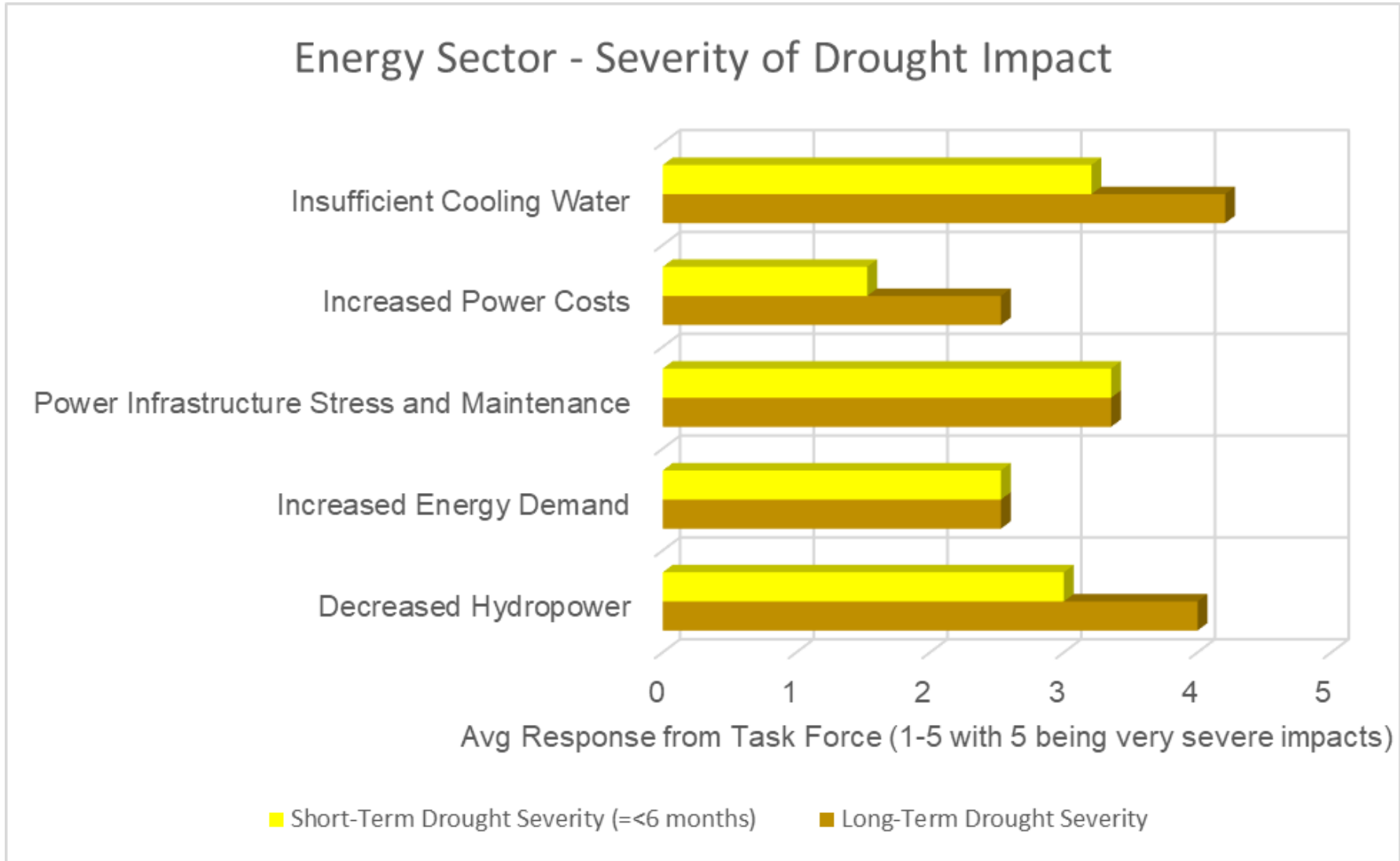
Document Contents

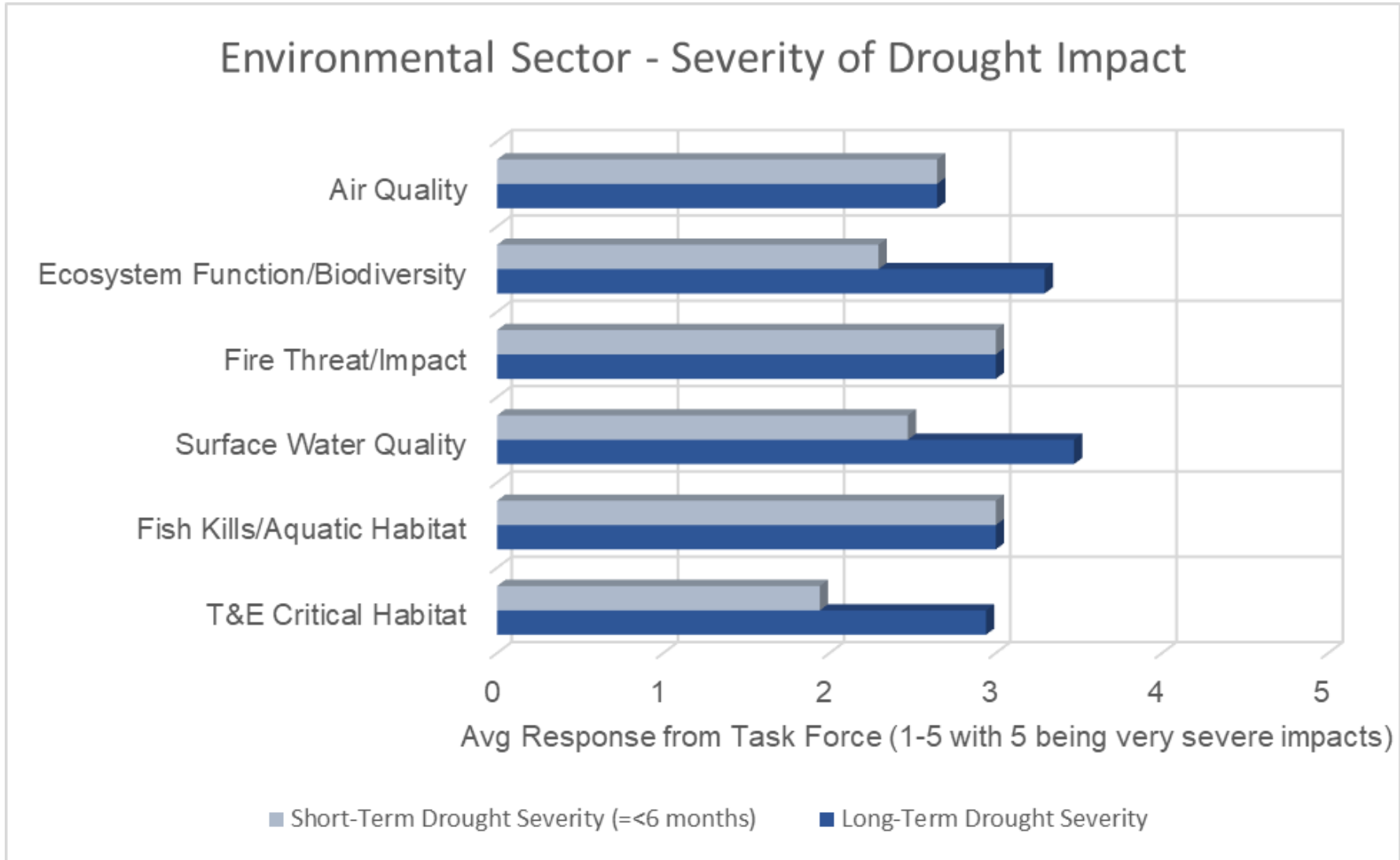
- Plan Background
- Basin Description
- Vulnerability Assessment
- Monitoring Protocols
- Drought Management
  - Mitigation Measures
  - Response Actions
- Operational & Administrative Framework

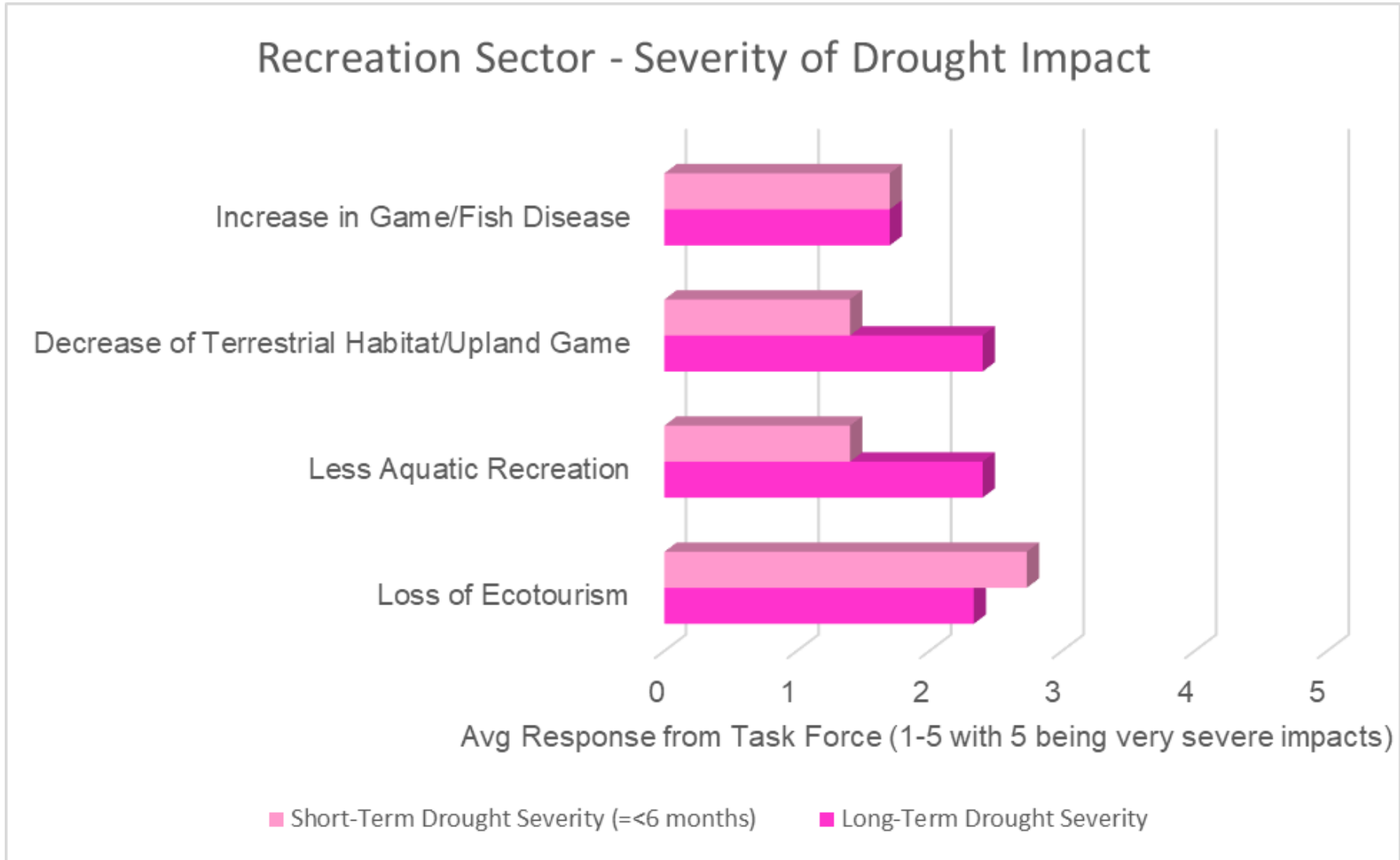
Vulnerability Assessment

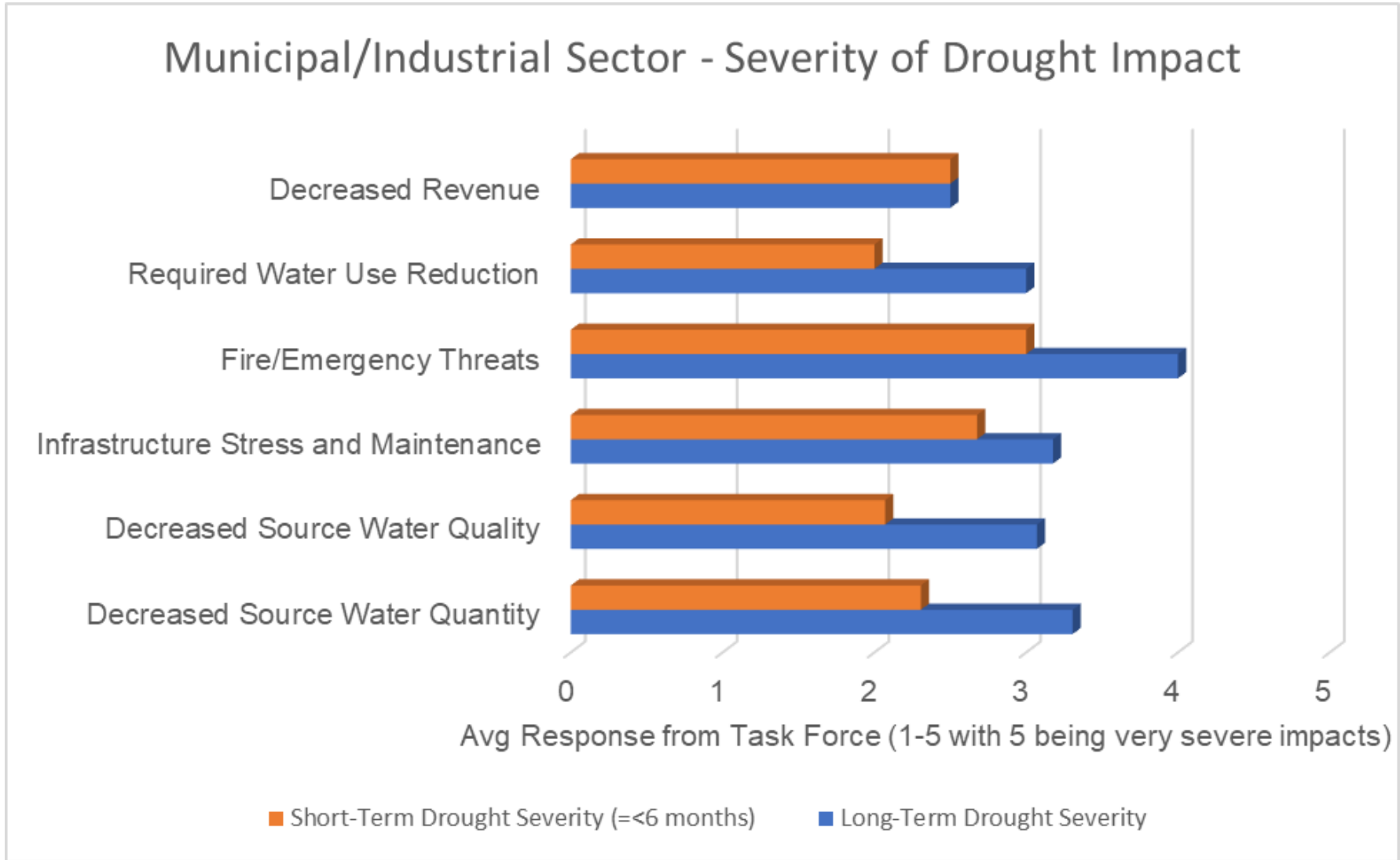
- An evaluation of the risks to critical resources withing a planning area and the factors contributing to those risks
- Drought impacts were divided into Agriculture, Energy, Municipal & Industrial Supply, Environmental, Recreation, and Socio-Economic sectors
  - Looked at major impacts/vulnerabilities in each sector
- Historic impacts of short-term and long-term droughts
- Potential future vulnerabilities

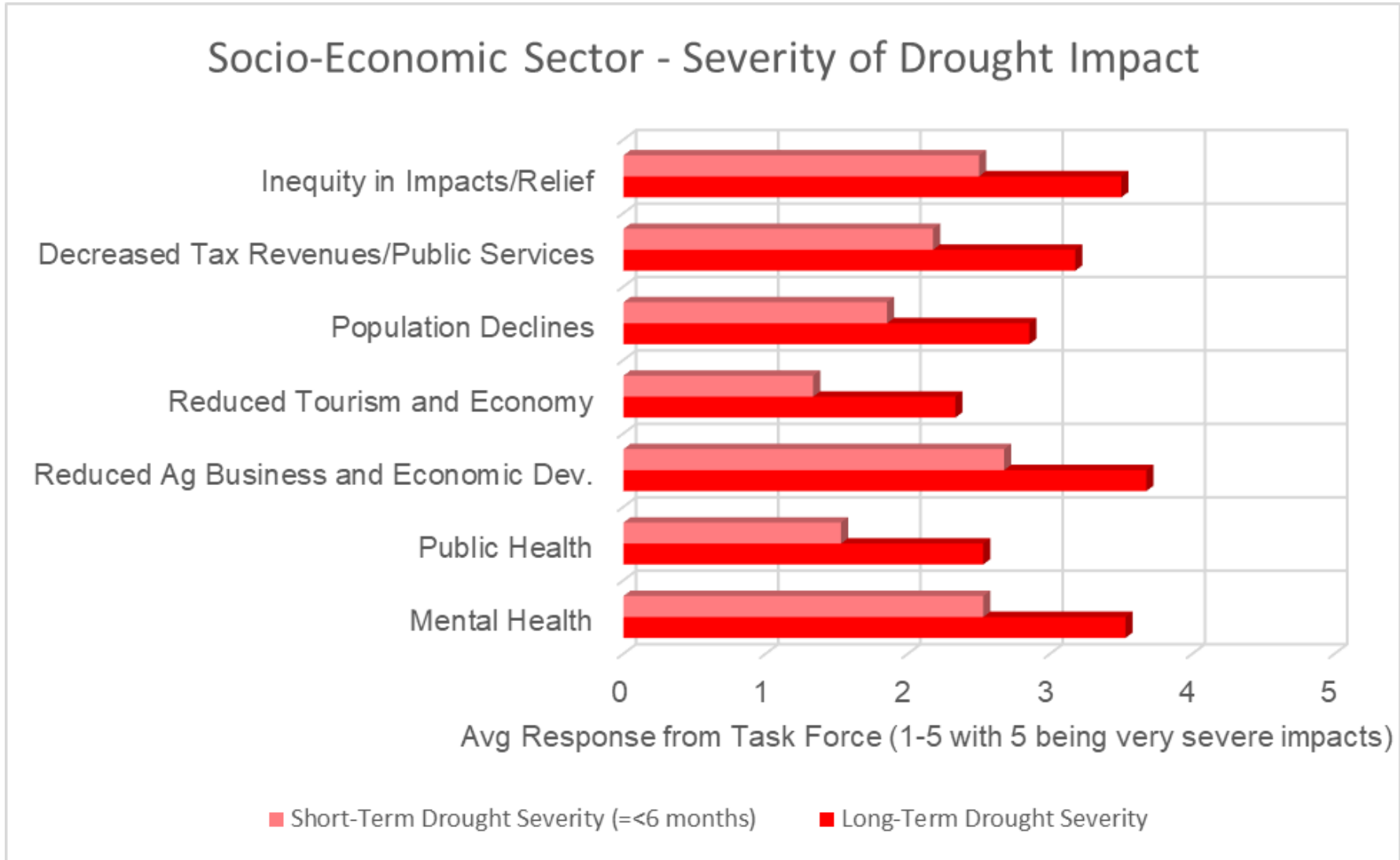

Agricultural Sector - Severity of Drought Impact
Increased Reliance on Groundwater/ Aquifer Depletion
Soil Health/Nutrient Depletion
Erosion/Topsoil Loss
Feed/Water Shortage for Livestock
Crop Yield Reduction (moisture deficit)
0
1
2
3
4
5
Avg Response from Task Force (1-5 with 5 being very severe impacts)
Short-Term Drought Severity (=<6 months)
Long-Term Drought Severity


Energy Sector - Severity of Drought Impact
Insufficient Cooling Water
Increased Power Costs
Power Infrastructure Stress and Maintenance
Increased Energy Demand
Decreased Hydropower
0
1
2
3
4
5
Avg Response from Task Force (1-5 with 5 being very severe impacts)
Short-Term Drought Severity (=<6 months)
Long-Term Drought Severity


Environmental Sector - Severity of Drought Impact
Air Quality
Ecosystem Function/Biodiversity
Fire Threat/Impact
Surface Water Quality
Fish Kills/Aquatic Habitat
T&E Critical Habitat
0
1
2
3
4
5
Avg Response from Task Force (1-5 with 5 being very severe impacts)
Short-Term Drought Severity (=<6 months)
Long-Term Drought Severity


Recreation Sector - Severity of Drought Impact
Increase in Game/Fish Disease
Decrease of Terrestrial Habitat/Upland Game
Less Aquatic Recreation
Loss of Ecotourism
0
1
2
3
4
5
Avg Response from Task Force (1-5 with 5 being very severe impacts)
Short-Term Drought Severity (=<6 months)
Long-Term Drought Severity


Municipal/Industrial Sector - Severity of Drought Impact
Decreased Revenue
Required Water Use Reduction
Fire/Emergency Threats
Infrastructure Stress and Maintenance
Decreased Source Water Quality
Decreased Source Water Quantity
0
1
2
3
4
5
Avg Response from Task Force (1-5 with 5 being very severe impacts)
Short-Term Drought Severity (=<6 months)
Long-Term Drought Severity


Socio-Economic Sector - Severity of Drought Impact
Inequity in Impacts/Relief
Decreased Tax Revenues/Public Services
Population Declines
Reduced Tourism and Economy
Reduced Ag Business and Economic Dev.
Public Health
Mental Health
0
1
2
3
4
5
Avg Response from Task Force (1-5 with 5 being very severe impacts)
Short-Term Drought Severity (=<6 months)
Long-Term Drought Severity

Vulnerability Assessment - Let's Discuss

- Are there vulnerabilities that haven’t been addressed?

Drought Monitoring

- Provides a means of measuring drought and provides framework to predict probability of drought or confirm existing drought
  - Intended to complement existing monitoring efforts
- Details on indices and indicators considered for the plan
- Evaluation of the usefulness of indices and indicators in drought monitoring, based on drought impacts
- A look at monitoring performed by other agencies
- Monitoring plan recommendations

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Drought Monitoring

- Recommended indicators and indices for the monitoring plan need the following characteristics:
  - Have a history of use in the Upper Platte River Basin of at least 30 years
  - Be widely collected throughout the Upper Platte River Basin
  - Likely to continue to be collected
  - Collected by others and distributed online
  - Be updated in a timely fashion

Drought Monitoring

Recommended indicators and indices for the monitoring plan:

- Standardized Precipitation Index (SPI)
- Standard Precipitation Evapotranspiration Index (SPEI)
- Evaporative Demand Drought Index (EDDI)
- Palmer Drought Severity Index (PDSI)
- Snow Depth and Content (SWE)
- Stream Flow
- Reservoir Storage
- Deciles

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Drought Monitoring - Recommendations

- Intended to complement existing drought monitoring efforts
- Information would be presented as real-time (current drought conditions) and forecast (if drought will develop or ease)
- Supplemental to NDMC drought monitoring – additional context
- Drought severity notification categories of “Drought Watch” and “Drought Warning”
  - Drought Watch: notes that conditions are favorable for a drought to start
  - Drought Warning: issued during drought, when there is high confidence that an impact has or will occur

Drought Monitoring – Draft Recommendations

Drought Watch Conditions

- Above normal evaporative demand
  - EDDI, 1 month > 3 month > 6 month > 12 month and at least one of these is more than +1
- On-going trend toward drought, evidence of below-average precipitation
  - SPI, 1 month < 3 month < 6 month < 12 month and at least one of these is less than 0
- Potential decreased crop yields/poor pasture conditions/increased irrigation
  - SPEI -1 to 8-month is less than -1; or
  - EDDI - 1- to 8-month is more than +1
- Summer flows below normal
  - Remaining SWE in the North Platte Basin in June is less than 6-inches or less than 4-inches in the South Platte Basin.
  - Surface Water Storage – (NEED TRIGGER - storage and time)

Drought Warning Conditions

- A likely decrease in crop yield production and higher energy demands (cooling)
  - During summer, either SPEI (1- to 3-month) is less than -1 or EDDI (1- to 3-month) is more than +1. Drought Indicators and thresholds verify by county and crop type.
- Others?
  - Fire risk? (nebraskawildfirerisk.com)
  - Heating degree days?
  - River flows (Grand Island gage, for instance)

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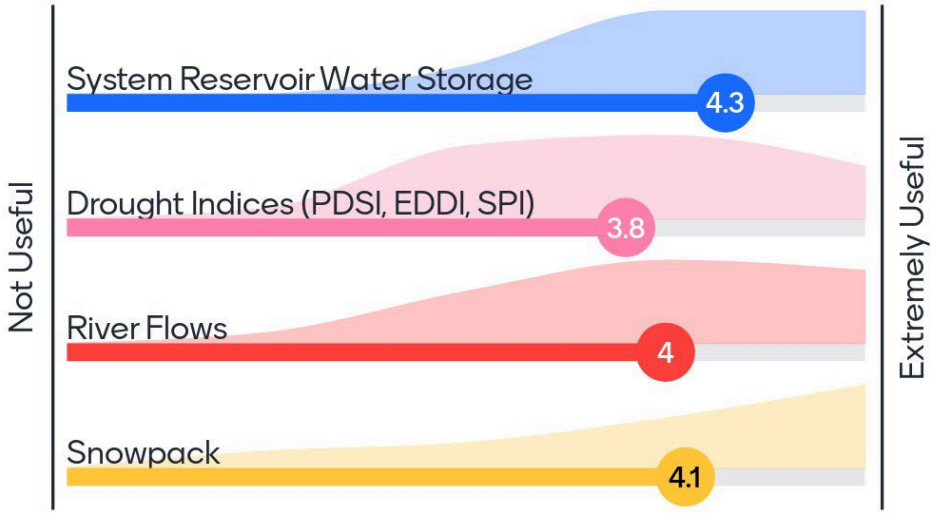
Drought Monitoring - Recommendations

Monitoring Element	Timing
System Reservoir Water Storage	Year-round
Drought Indices (PDSI, EDDI, SPI)	Year-round
River Flows	Year-round
Snowpack	February – June
Water Delivery/Runoff Forecasts (BOR, etc.)	February-April
Aquifer Levels	Spring and Fall
Allocation Status (Where Applicable)	Spring/Summer

Mentimeter Activity Results

Mentimeter

Rate the usefulness of the following monitoring options



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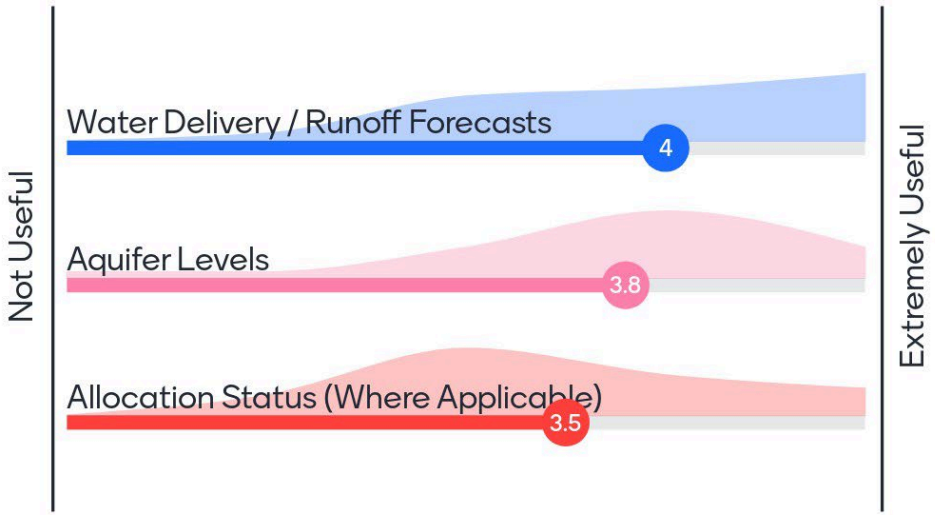
Mentimeter Activity Results

Mentimeter

Rate the usefulness of the following monitoring options



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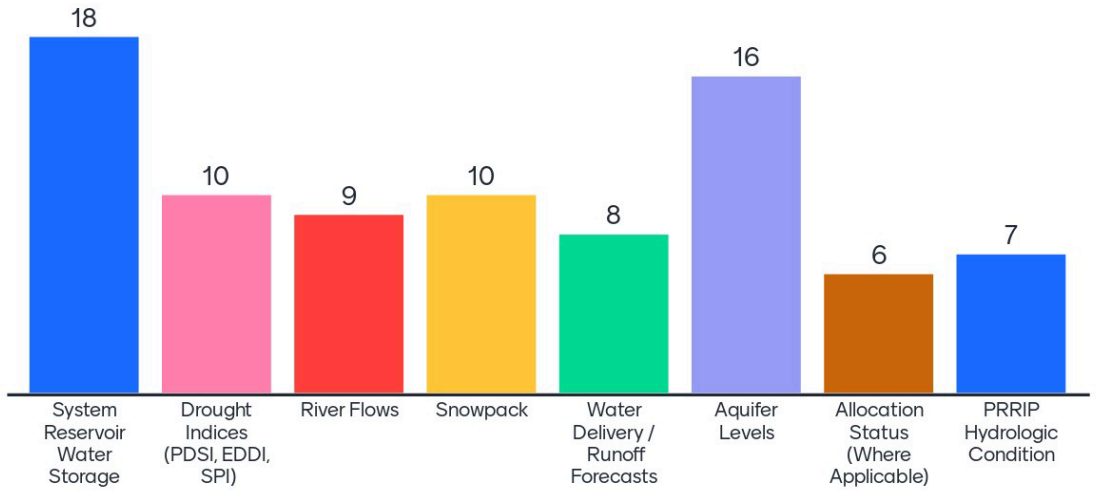
Mentimeter Activity Results

Mentimeter

October - December, Which of these tools are you looking at?



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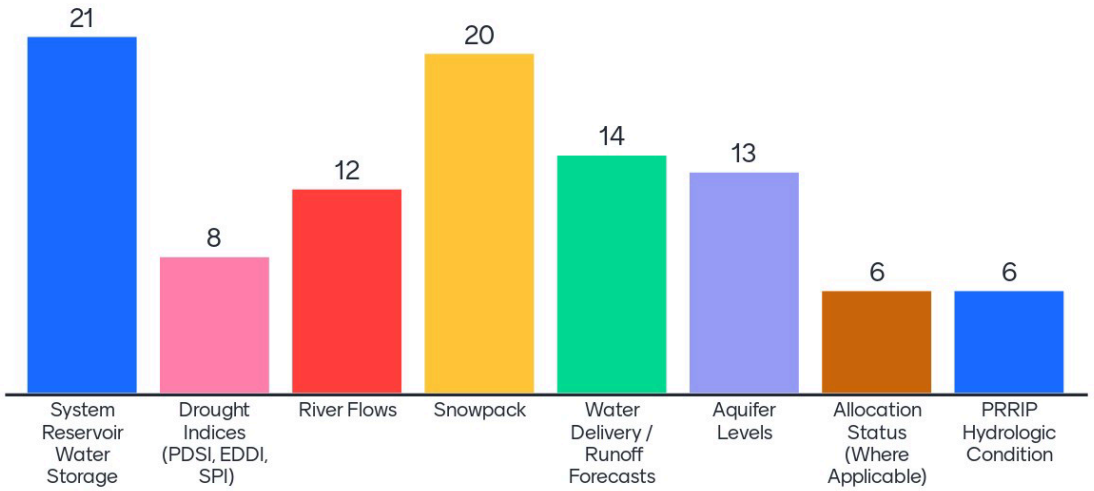
January - April, Which of these tools are you looking at?



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Mentimeter Activity Results

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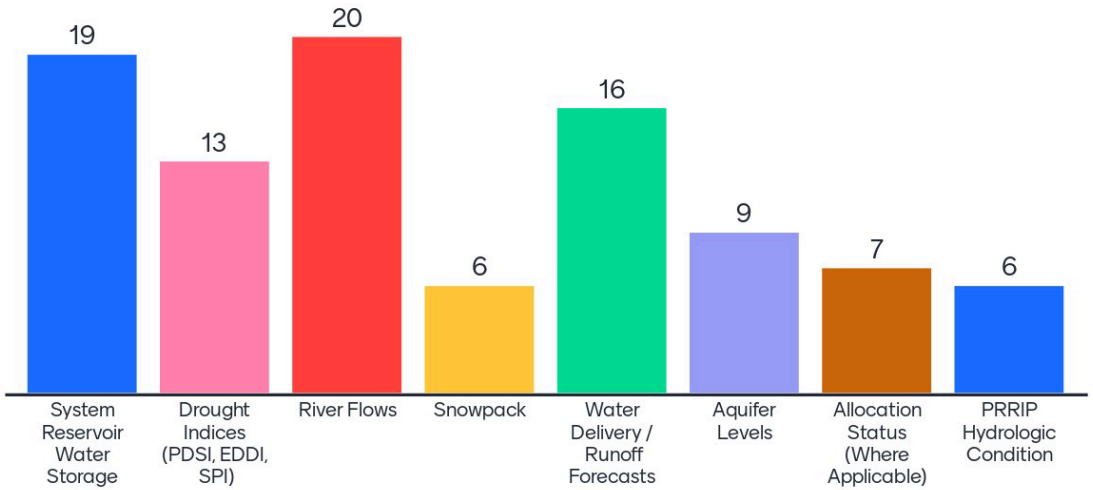
May-September, Which of these tools are you looking at?



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Mentimeter Activity Results

Mentimeter

What are some existing triggers you use with current monitoring systems?

19 Answers

River flows, storage levels.	Storage levels in Lake McConaughy as related to FERC license requirements.	Ground water levels. UNL drought monotor
drought indices, PRRIP target flows, system storage, river flows	capacity of McConaughy, UNL drought monitor	PRRIP targets, instream flow targets, SW user demands (call on the river)
Weather service and/or USGS river flows	Storage levels, river flows	End of Irrigation season storage use to determine if contract canals can purchase additional water.

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Mentimeter Activity Results

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What are some existing triggers you use with current monitoring systems?

19 Answers

River flow snow pack	Current EA volume and release plans	Snowpack and runoff forecast is important through end of June, not only how much snowpack there is but how it comes off/melts is just as important at times.
Previous allocation use, drought monitor, aquifer levels	Snow pack, river flows, groundwater levels	Rainfall, area of coverage,
Drought inducies, PRIP target flows, groundwater level changes	how full the wetlands are	Spring USBR runoff projection vs. USBR reservoir available capacity.McConaughy above or below 800 kaf in spring.South Platte June-July temperature and precip forcasts.El-Nino strength

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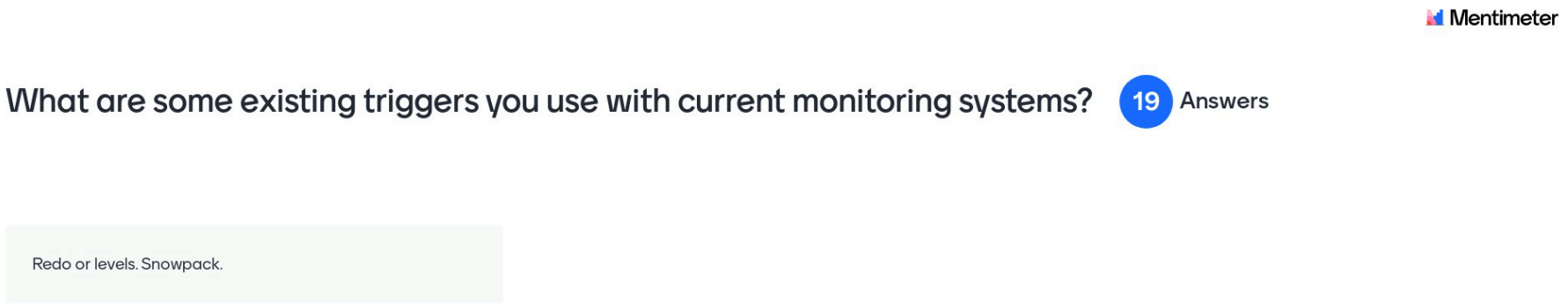

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Mentimeter Activity Results

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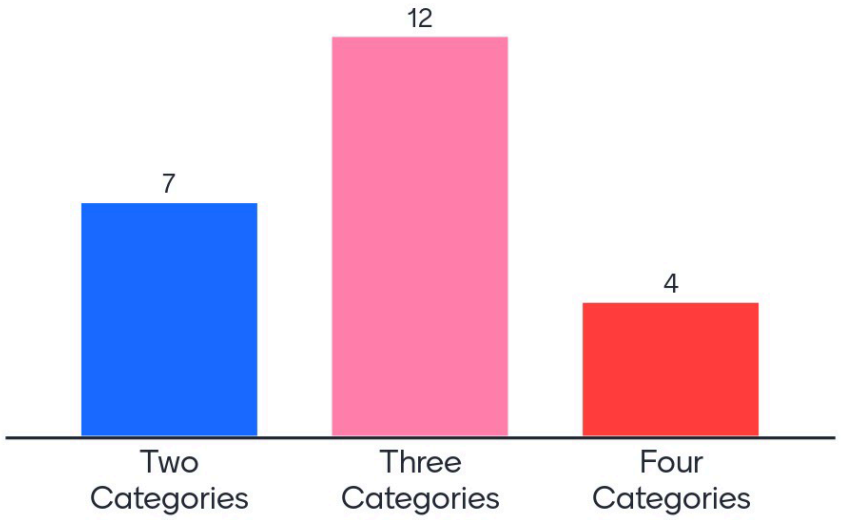
How many drought severity categories should be established?



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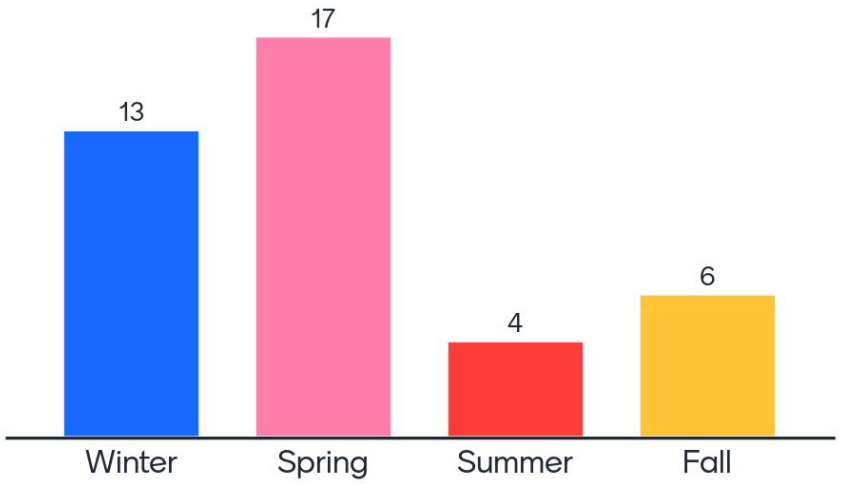
Mentimeter Activity Results

Mentimeter

What are critical time periods for making decisions



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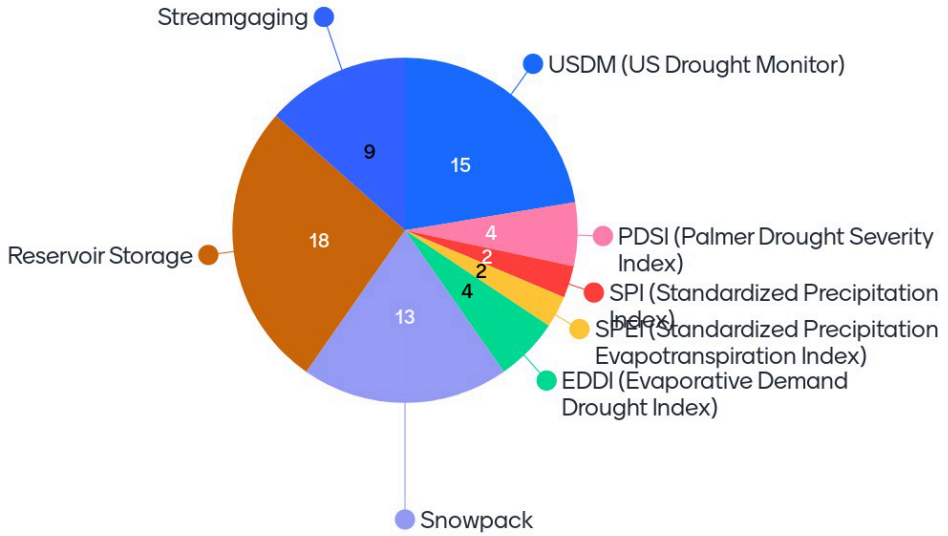
Mentimeter Activity Results

Mentimeter

Which indicators would be most useful on a dashboard (Choose 3)



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Mitigation Measures

- Implemented prior to the onset of drought conditions to help reduce potential impacts
- Numerous mitigation actions per sector were considered
- Categorized into mitigation projects, programs, or policy

Mitigation Measures

Sector	Mitigation Action	Type
Agriculture	Groundwater Recharge Projects	Project
Agriculture	Irrigation Efficiency	Program
Agriculture	Additional Surface Water Delivery and Storage	Project
Agriculture	Erosion Conservation Measures	Program
Agriculture	Commingled Irrigation	Policy
Energy	Increase Availability of Cooling Water	Project
Energy	Protect Power Infrastructure from Fire Threats	Project
Municipal/Industrial /Domestic	Develop Emergency Action Plans for Water Shortage	Policy
Municipal/Industrial /Domestic	Drill Deeper Production Wells/Replace Older Infrastructure	Project

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Mitigation Measures

Sector	Mitigation Action	Type
Environmental	Protect Ecosystem Functions	Policy
Environmental	Increase Riparian Buffer Zones	Project
Environmental	Improve Drought Resilient Habitats	Project
Environmental	Controlled (Prescribed) Burns	Project
Environmental	Improve Wildlife Protection	Policy
Recreation	Lake Dredging and Aquatic Habitat Restoration	Project
Recreation	Watershed WQ Management	Program
Recreation	Drought Resilient Recreational Facilities	Project
Socio-Economic	Access to Mental Health Resources	Program
Socio-Economic	Public Outreach for Drought Education and Available Financial Assistance	Program
Socio-Economic	Prepare and Train for Disease Outbreaks	Program
Socio-Economic	Improve Drought Resilience of Public Services	Policy

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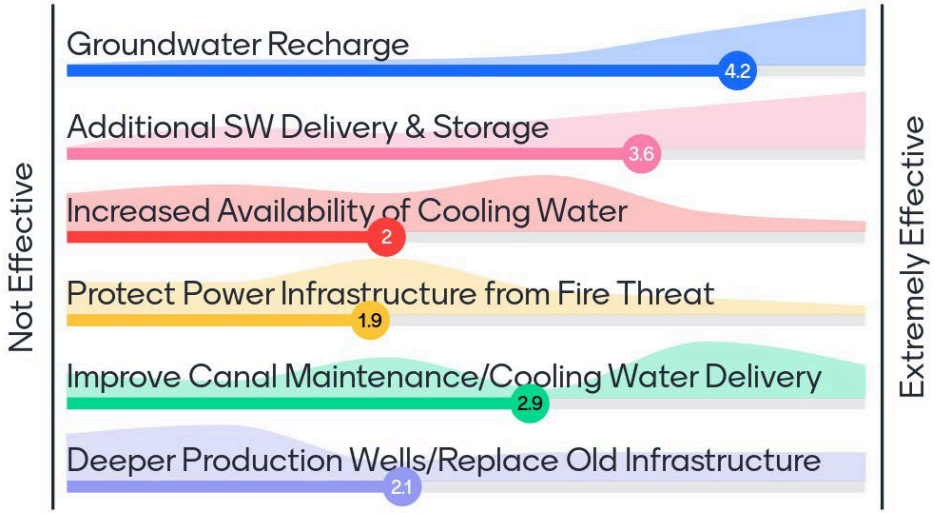
Mentimeter Activity Results

Mentimeter

Please rate the following mitigation PROJECTS by potential effectiveness



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Mentimeter Activity Results

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Please rate the following mitigation PROJECTS by potential effectiveness

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Mentimeter Activity Results

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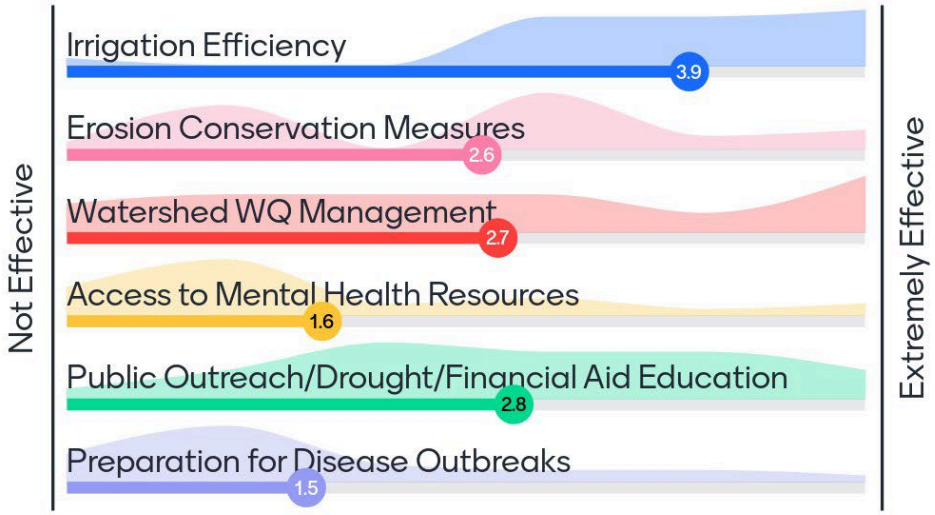
Please rate the following mitigation PROGRAMS by potential effectiveness



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Mentimeter Activity Results

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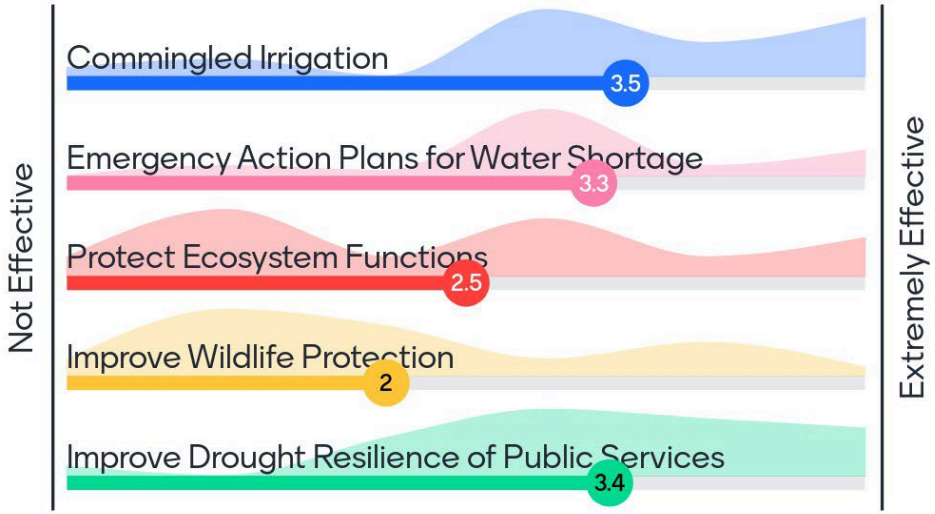
Please rate the following mitigation POLICIES by potential effectiveness



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Response Actions

- Near-term actions triggered during specific stages of drought
- Manage the limited supply, decrease the severity of impacts
- Should be quickly implemented/provide rapid benefits
- Numerous mitigation actions per sector were considered
- Responses categorized into Individual Producer with Assistance, Information/Education, Administrative/Operational, Emergency Response

Response Actions

Sector	Mitigation Action	Type
Agriculture	Crop Variety and Seed Spacing	Individual with Assistance
Agriculture	Livestock Protection, Shade, and Water	Individual with Assistance
Agriculture	Irrigation Scheduling and Groundwater Controls	Info/Education; Admin/Operational
Agriculture	Emergency Hay/Forage (FSA programs, etc.)	Individual with Assistance
Energy	Improve Efficiency of Water Delivery	Admin/Operational
Energy	Load and Peak Demand Management	Admin/Operational
Municipal/Industrial /Domestic	Increase Groundwater Quantity and Quality Monitoring	Admin/Operational
Municipal/Industrial /Domestic	Water Use Restrictions - Voluntary and Mandatory	Info/Education; Admin/Operational

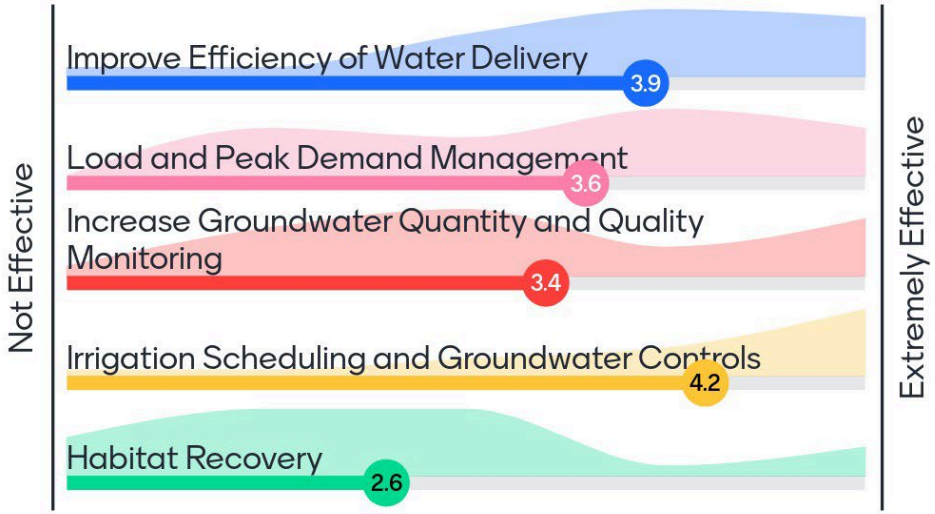
Response Actions

Sector	Mitigation Action	Type
Municipal/Industrial /Domestic	Emergency/Fire Water Storage and/or Access	Emergency Response
Municipal/Industrial /Domestic	Emergency Potable Water	Emergency Response
Environmental	Coordinate Wildfire Suppression	Info/Education; Emergency Response
Environmental	Habitat Recovery	Admin/Operational
Recreation	Fish and Game Regulations During Drought	Info/Education; Admin/Operational
Scio-Economic	Increase Drinking WQ Monitoring	Admin/Operational
Scio-Economic	Increase Air Quality Monitoring	Admin/Operational
Scio-Economic	Coordinate Disaster Relief	Admin/Operational
Scio-Economic	Emergency Response (Red Cross, National Guard, Volunteer Fire Districts, etc.)	Emergency Response

Mentimeter Activity Results

Mentimeter

Please rate the following Admin/Operational response actions by potential effectiveness



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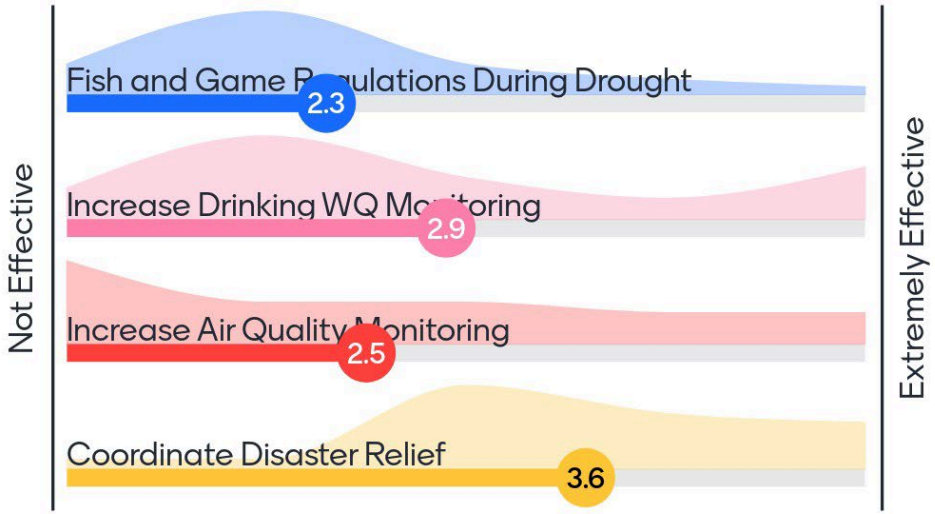
Please rate the following Admin/Operational response actions by potential effectiveness



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Mentimeter Activity Results

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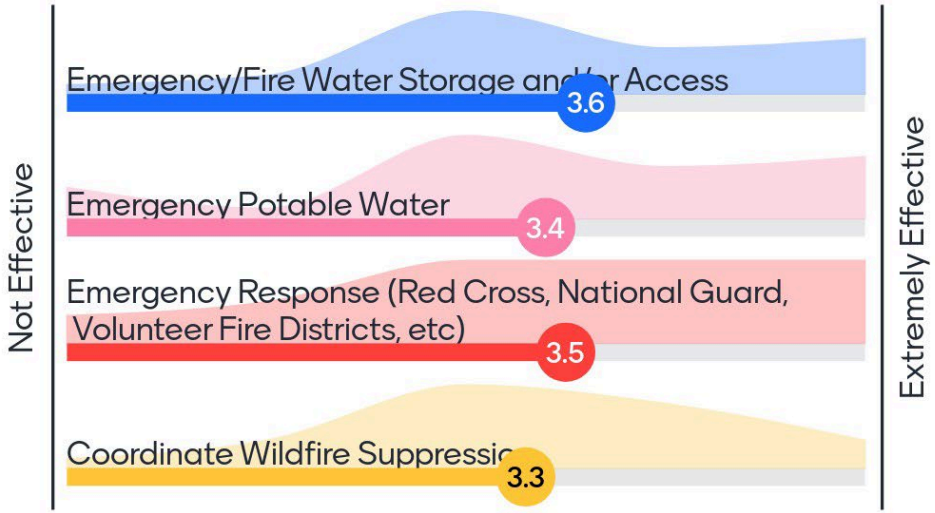
Please rate the following Emergency Response actions by potential effectivenesse



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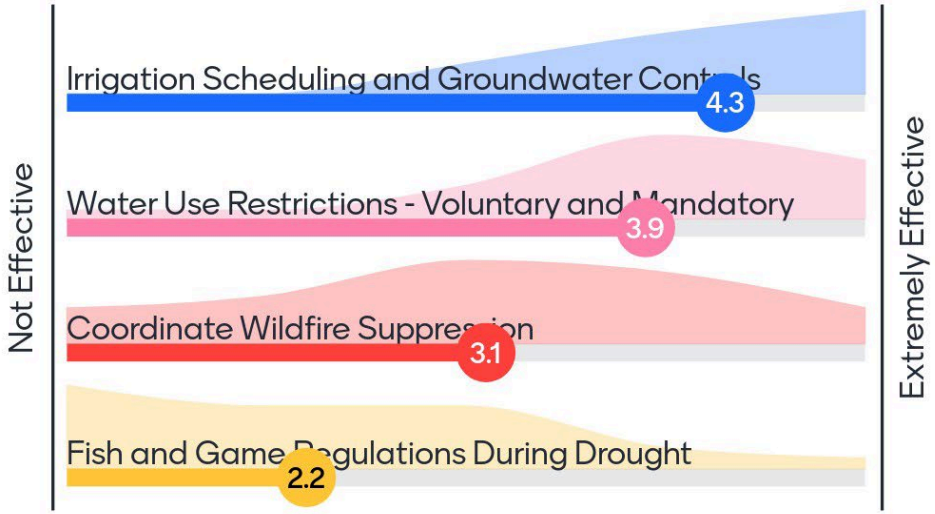
Please rate the following Info/Education actions by potential effectivenesse



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Mentimeter Activity Results

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Are there any mitigation/response actions that aren't currently included? 13 Answers

None	Nothing	use of conservation programs to temporarily retire marginal lands
No	Mandatory metering (can include TPNRD-type power monitoring)	No
None	improving riverine wetlands for storage, water quantity and water quality concerns	A concerted effort of educating the public and getting buy in from local authorities.

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Mentimeter Activity Results

Operational/Administrative Framework

- Drought Dashboard website of indicators/indices
- Drought monitoring part of Platte Basin Coalition's regular meetings
  - Drought conditions report
  - Communication coordination (as needed)
  - On-going mitigation or response actions of individual entities
  - Evaluate/prioritize potential basin-wide mitigation or response actions
- Review of monitoring protocols/plan (annual review)

Let's Talk!

We Want to Hear Your Thoughts on the Plan

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Let's Talk!

- What are your initial reactions?
- What might be missing?

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Do You Have More You Would Like to Share?

Grab a comment form from one of the staff

OR

Use our electronic form

- Visit https://www.surveymonkey.com/r/UPRDCP
- Scan this QR code with your cell phone

What Comes Next?

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What Comes Next?

- This is last planned Drought Task Force Meeting
  - NOTE: We may reconvene this group if substantial changes are needed following reviews
- PBC will review draft
- Draft Plan will be submitted to the Bureau of Reclamation July 31
- PBC/NRD/NeDNR review of the Final Plan will occur in the fall

What Comes Next?

Final Drought Task Force Meeting
June 27

PBC Draft Review
July 12–26

Draft Plan Submittal to BOR
July 31

Submit Final Plan for PBC Approval
September 28

Submit Final Plan to BOR
December

2023

Launch of drought dashboard
Stay tuned!

Incorporate Stakeholder Comments
June 28–July 11

Revise Plan Document
September

NRD & NeDNR Review/Approval
October–November

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Any Questions?

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THANK YOU!

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