

Scoping the Public Health Response to Drought

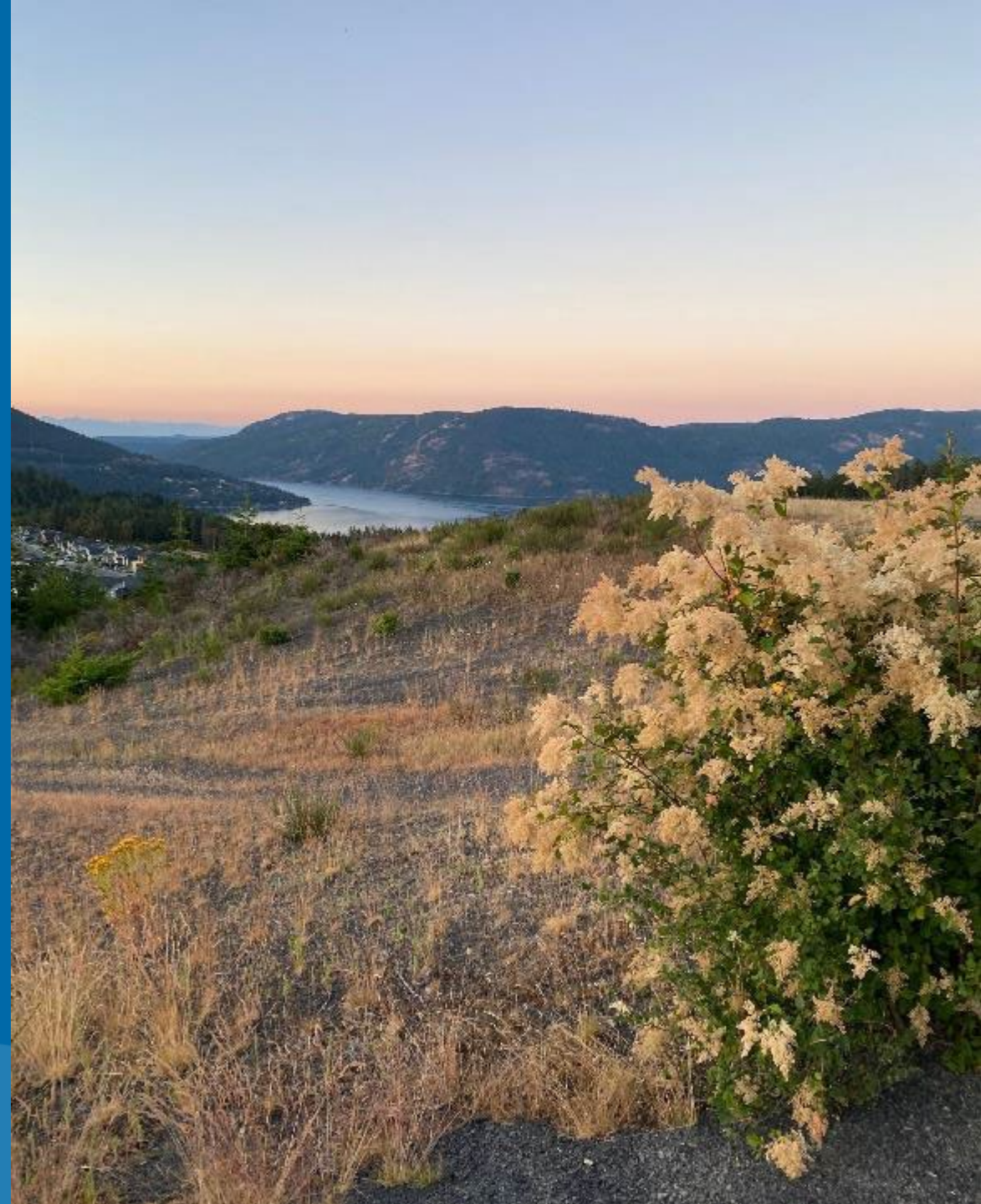
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Healthy Environments Team



August 28th, 2024



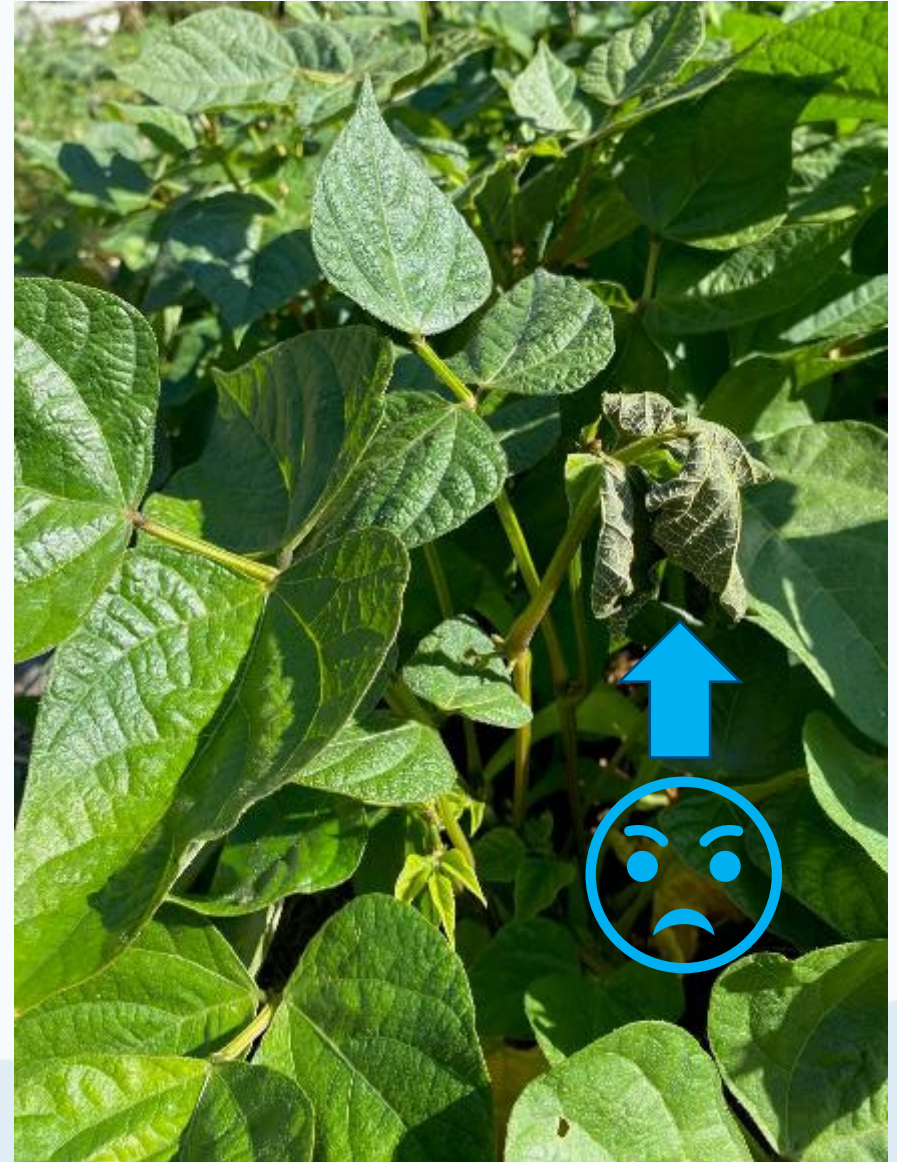
Joining you today
from the
traditional and
unceded territories
of the Coast Salish,
Nuu-chah-nulth
and
Kwakwaka'wakw
Peoples.





What is a drought?

- Changes in the amount of precipitation falling AND the “thirst” of the atmosphere (evaporative demand).
 - Can have a drought even when precipitation doesn’t change... or increases!
- Future climate for Island communities: 10% increase in precipitation, but 2-8x more HOT days (> 29C) by 2100.
- So how will climate change-induced drought impact public health?



CLIMATIC CHANGES

Long-term decrease in summer rainfall

Long-term year-round warming

Decrease in snowpack

Increased evaporation

Ecological Consequences of Less Water in Watershed

Overexploitation of ground and surface water

Concentration of contaminants in freshwater

Increased water temperatures

Shallower recreational waters

Drying of forests and landscapes

Saltwater intrusion

Harmful algal blooms

Loss of valued species/relatives (salmon, cedar)

Soil compaction and deterioration

More dust, smoke, and plant allergens in the air

Increased wildfire risk

Less water to fight fires

Health Impacts

Inadequate drinking water quality and quantity

Increase in water- and vector-borne disease

Deteriorated relationship with water and land

Increased risk of brain and spinal cord injuries due to unsafe swimming.

Food insecurity

Increased extreme heat exposure

Respiratory health impacts

Improve DWS resilience and conservation

Increased disease surveillance and impact assessment

Safeguard recreational water

Supporting food safety and security

Promote resilience to extreme heat

Support respiratory health

Community building & MH supports

PUBLIC HEALTH RESPONSE TO DROUGHT

What is the role of public health in drought response?

Central Saanich couple faced with potentially large water bill after unnoticed leak

A Central Saanich couple estimates their next water bill will be to the tune of over \$3,000 after discovering a leak in their water main.

Black Press Media
Apr. 13, 2017 7:00 AM



Improving drinking water system resilience

- Water conservation:
 - Water use restrictions/bylaws; water metering and leak detection
- Water source and water system assessments
- Monitoring for chemical changes in source water
 - Increased risk of contaminants in overdrawn wells (nitrate, orthophosphates, chlorides, sulfates, arsenic)
 - Elevated P and N in low flow rivers;
 - Communicating risks of harmful algal blooms
 - Saltwater intrusion into overexploited aquifers
 - May need to issue (and help rectify) water advisories



Improving drinking water system resilience – Groundwater

- Used for both community systems and private systems
 - Chemical/microbiological testing and monitoring quantity are not common practices
 - Individual scale - Very limited information on individual wells (depth and sometimes productivity)
 - Basin scale - Very limited groundwater mapping, few govt monitoring wells
- Actions:
 - Resource list for homeowners if their well goes dry (water haulers, drillers, tank rentals, info on water storage, etc)
 - Encourage well owners to follow municipal restrictions
 - Volunteer well monitoring networks

Safeguarding recreational water

- Warmer shallower water = increased risk of pathogens and harmful algal blooms
- Drought associated with injuries in recreational water, perhaps because water is shallower.
- **Key message:** still need to preserve those recreational opportunities (connection to the land)
 - More signage, closer oversight?
 - Citizen science: BC [Algae Watch Observation Map \(arcgis.com\)](https://arcgis.com)



Increasing surveillance and impact assessment



- GI illness generally because of rec water and less water for hygiene.
- Increased risk of foodborne GI illnesses during drought:
 - *Campylobacter*, *C. perfringens*; *Vibrio vulnificus*, *E. coli*
 - **Key Message: Don't conserve water in a way that compromises hygiene**
- Vector-borne: mosquitoes and West Nile Virus,
 - Luckily, ticks don't like drought!

Supporting food safety and security

- Food safety: need to conserve water without compromising hygiene
 - Las Vegas project: 2,453 dipper wells at 1,134 food establishments using 106.4 million gallons of drinking water per year = use of 653 average homes!!!
 - Need guidance available to help food establishments and processors to reduce water use.
- Food security:
 - Strengthen partnerships like with food hubs, food baskets, school meal programs, etc.





Promoting resilience to extreme heat

- Working with local governments and community groups to support heat response planning and community heat health checks
- Urging preparedness at home
- Surveillance for heat-related illness to inform our response

Supporting respiratory health

- Smoke, dust storms, aeroallergens from stressed trees
- Actions:
 - Public education on air quality monitoring and alerts and how to use them.
 - **Expanding the network of community PM2.5 sensors to parts of the island where AQHI forecasting is not available.**
 - Resources on indoor air quality
 - Augmenting respiratory health programs and services

Edmonton

Why an explosion of pollen is driving allergies bonkers this spring

'Spruce trees ... are just loaded like Christmas trees with all of these cones'



Christy Climenhaga · CBC News · Posted: Jun 10, 2022 6:00 AM PDT | Last Updated: June 10, 2022



Pollen is being released in huge quantities across Western Canada, such as this floating cloud photographed in Regina. (Kirk Fraser/CBC)

[Why an explosion of pollen is driving allergies bonkers this spring | CBC News](#)

MENTAL HEALTH

IN RURAL AND REMOTE AUSTRALIA

OCTOBER 2016



1 IN 5
people in
Australia
experience
mental illness

BUT

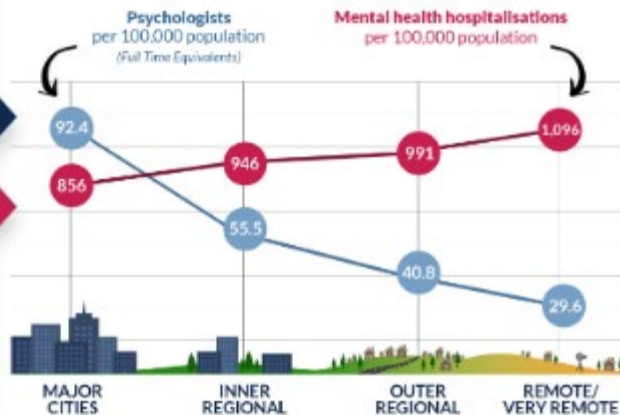


RURAL
medicare
expenditure is
40%
LESS than in
major cities

REMOTE AUSTRALIA has
ONE-THIRD
the number of
Psychologists
compared with major cities

AND

20% MORE
HOSPITALISATIONS
due to mental illness



the suicide rate among
MEN IN REMOTE AREAS
is
2X
HIGHER
than in major cities

the suicide rate among
YOUNG INDIGENOUS PEOPLE
is
5X
HIGHER
than non-Indigenous people

NEED TO TALK TO SOMEONE?

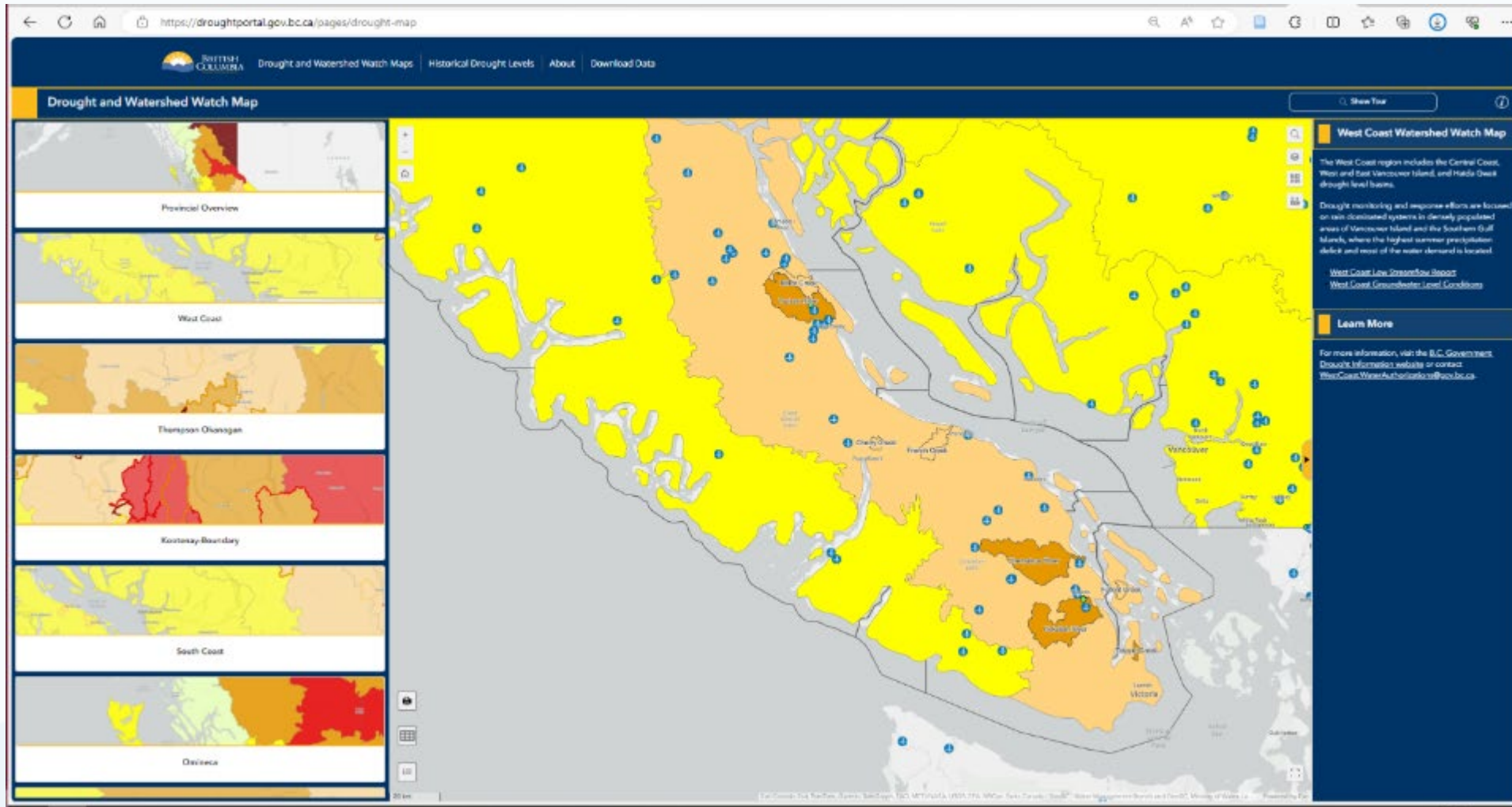
If you or someone you know is experiencing mental health difficulties,
talk to your local GP, mental health professional or a trusted friend or family member.
If you are in crisis call 000 or Lifeline's 24hr Telephone Crisis Support on 13 11 14.

Community building and mental health supports

- Extensive evidence of impacts on mental, especially for farm workers, youth, and older males
- Actions:
 - Partner with rural and agricultural organizations to bolster rural mental health programs
 - E.g., Australia's National Mental Health Strategy... suicide prevention for ag workers, rural mental health programs, community building

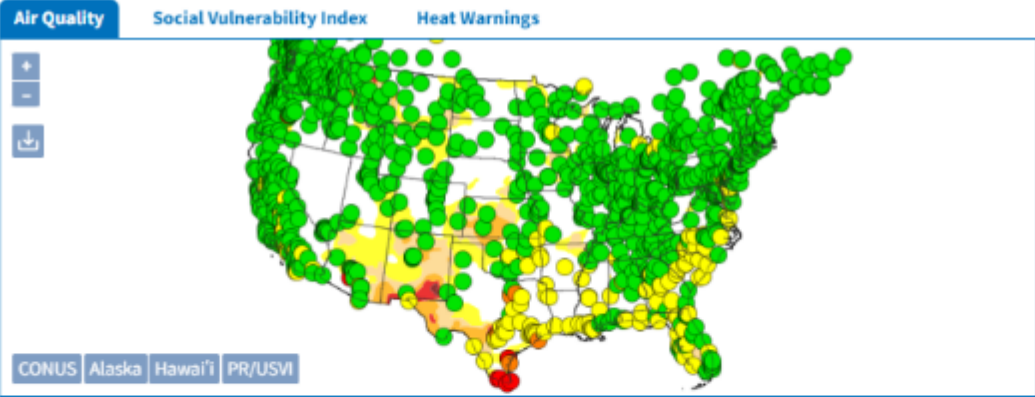
**How do we capture and communicate
the impacts of drought on community
health?**

BC Drought Information Portal (gov.bc.ca)



Also offers:

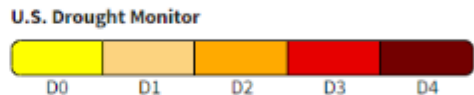
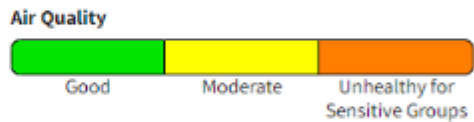
- Drought and watershed watch maps
- Historical drought maps and data available



The U.S. Air Quality Index (AQI) is designed to communicate whether air quality is healthy or unhealthy. This map displays the AQI at sensors across the U.S. alongside the current U.S. Drought Monitor, as of 10 a.m. Eastern.

Source(s): [AirNow](#)

Legend



Updates

Public Health Wildfire

[VIEW INTERACTIVE MAP](#) [LEARN MORE](#)

DATA VALID: 05/27/24

11.32%

of counties in Moderate to Exceptional (D1-D4) Drought also have high Social Vulnerability risk

30

National Weather Service heat warnings

[Learn more about these data](#)

[Feedback](#)

Drought and Public Health Map

- [Public Health | Drought.gov](https://www.drought.gov)
- Simultaneously tracking air quality, social vulnerability and heat
- These are the most available datasets!

NDMC Drought Impact Reporter (arcgis.com)



https://unldroughtcenter.maps.arcgis.com/apps/dashboards/46afe627bb6042f85944d70069c09cf

Drought Impact Reporter Dashboard

National Drought Mitigation Center, University of Nebraska

Last Updated: 5/24/2024

Filter Options

- Filter by Start Date: Last 90 Days
- Select State/Territory: Select one or more
- Select County: Select State First
- Agriculture Impacts: No Filter
- Business & Industry Impacts: No Filter
- Energy Impacts: No Filter
- Fire Impacts: No Filter
- Plants & Wildlife Impacts: No Filter
- Relief, Response & Restrictions Impacts: No Filter
- Society & Public Health Impacts: No Filter
- Tourism & Recreation Impacts: No Filter

1,000 km / 500 mi

Esri, USGS | Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS | National Drought Mitigation Center, University of Nebraska

Powered by Esri

Impacts are shaded in red. Darker shades indicate higher number of impacts.

Drought Impact Reporter Advanced Search

Click [HERE](#) to access the DIR Advanced Search.

The DIR Advanced Search provides:

- Enhanced filtering capability.
- Ability to download filtered reports.
- Search and filter by keyword.
- Filter by impact span rather than just start date.
- Table view with filtering and export ability.

1 of 1476

County Impacts

Limited to 1,500 impacts in order of most recent. Displayed impacts correspond to filter selections.

County: Zapata County
State: TX

Duration: 5/24/2024 - 6/23/2024

Title: Low Rio Grande River exposed green, grassy river banks at Zapata, Texas

Description: The low level of the Rio Grande River at Zapata exposes green, grassy river banks, rocks, tires and other debris that would normally be underwater. Having enough water is a concern for Zapata as the town only has a day and a half worth of emergency water supplies. Drought, heat and the lack of water payments from Mexico have dropped the water level very low. Border Report (McAllen, Texas), May 24, 2024

Impact ID: 59255

Impact Source: <https://moderator.droughtreporter.unl.edu/RSS/feed/impacts>

Impact Category: Agriculture: 0

Number of State Impacts by Category

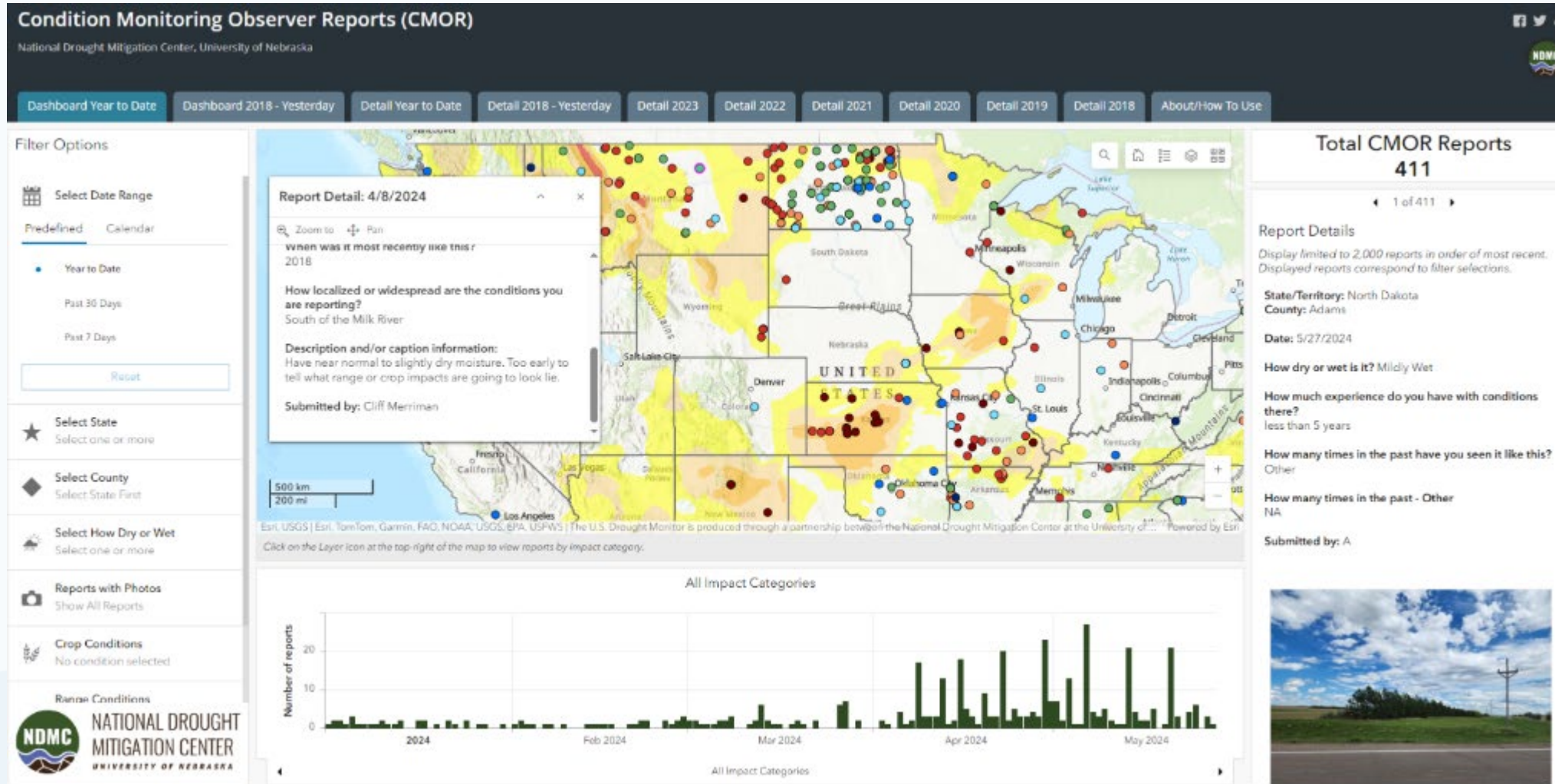
Counts correspond to filter selections at left

Category	Number of Impacts
Total	~60
Agriculture	~55
Business & Industry	~45
Energy	~5
Fire	~5
Plants & Wildlife	~5
Relief, Response & Restrictions	~55
Society & Public Health	~55
Tourism & Recreation	~5
Water Supply & Quality	~5

Click on the arrows below to see state and county category and time series charts.

County Impacts | State Impacts | City Impacts | County Impacts, 2005 - Present | State Impacts, 2005 - Present | City Impacts, 2005 - Present

Citizen Science - Condition Monitoring Observer Reports (CMOR) (arcgis.com)



The screenshot displays the CMOR web application interface. At the top, the title "Condition Monitoring Observer Reports (CMOR)" is shown, along with the National Drought Mitigation Center, University of Nebraska logo. Below the title is a navigation bar with tabs for "Dashboard Year to Date", "Dashboard 2018 - Yesterday", "Detail Year to Date", "Detail 2018 - Yesterday", "Detail 2023", "Detail 2022", "Detail 2021", "Detail 2020", "Detail 2019", "Detail 2018", and "About/How To Use".

The main interface is divided into several sections:

- Filter Options:** Includes a "Select Date Range" section with "Predefined" and "Calendar" options. Under "Predefined", there are options for "Year to Date", "Past 30 Days", and "Past 7 Days". A "Reset" button is also present.
- Select State:** A dropdown menu to "Select one or more" states.
- Select County:** A dropdown menu to "Select State First" and then "Select one or more" counties.
- Select How Dry or Wet:** A dropdown menu to "Select one or more" conditions.
- Reports with Photos:** A button to "Show All Reports".
- Crop Conditions:** A dropdown menu with "No condition selected".
- Rainfall Conditions:** A dropdown menu with "No condition selected".

The central part of the interface features a map of the United States with colored dots representing reports. A "Report Detail" pop-up window is open for a report dated 4/8/2024. The pop-up contains the following information:

- Report Detail: 4/8/2024**
- When was it most recently like this?** 2018
- How localized or widespread are the conditions you are reporting?** South of the Milk River
- Description and/or caption information:** Have near normal to slightly dry moisture. Too early to tell what range or crop impacts are going to look lie.
- Submitted by:** Cliff Merriman

Below the map is a bar chart titled "All Impact Categories" showing the "Number of reports" over time from 2024 to May 2024. The chart shows a significant increase in reports starting in April 2024, peaking in May 2024.

On the right side of the interface, there is a "Total CMOR Reports" section showing "411" reports. Below this is a "Report Details" section with the following information:

- State/Territory:** North Dakota
- County:** Adams
- Date:** 5/27/2024
- How dry or wet is it?** Mildly Wet
- How much experience do you have with conditions there?** less than 5 years
- How many times in the past have you seen it like this?** Other
- How many times in the past - Other:** NA
- Submitted by:** A

At the bottom right, there is a photo of a landscape with a utility pole and a cloudy sky.

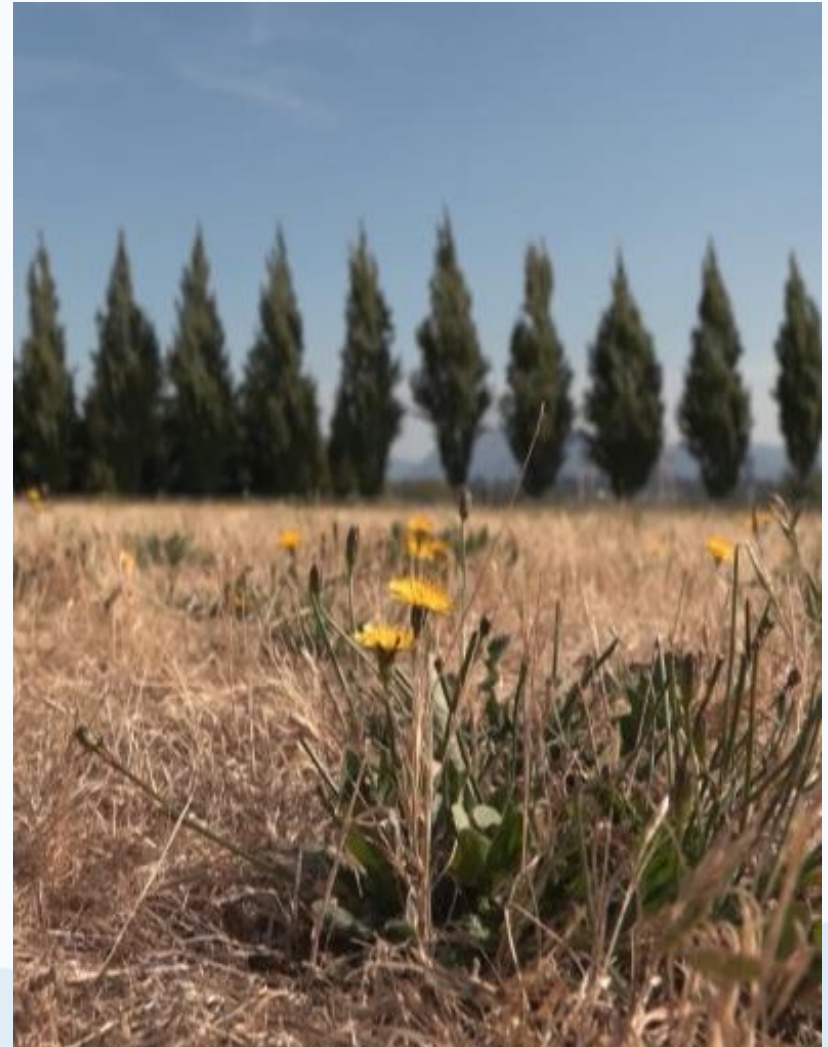
Similar mapping of photos (visual atlas), tweets, media stories to understand impacts of drought.

Emergency Response and Contingency Planning



Environmental Public Health – Environmental Health Officer

- 2015 drought and subsequent 2021 heat dome/drought
- 2023 emergency response planning project
- Legislative authority to enforce the DWPA/R



Emergency Response and Monitoring

- Developed templates and workshops (in person and online) to develop Emergency Response and Contingency Plans specific to drought response
- Tools / resources to help operators quantify use and availability of water
- Mandatory 5-year chemical water testing

Source Water Protection Planning

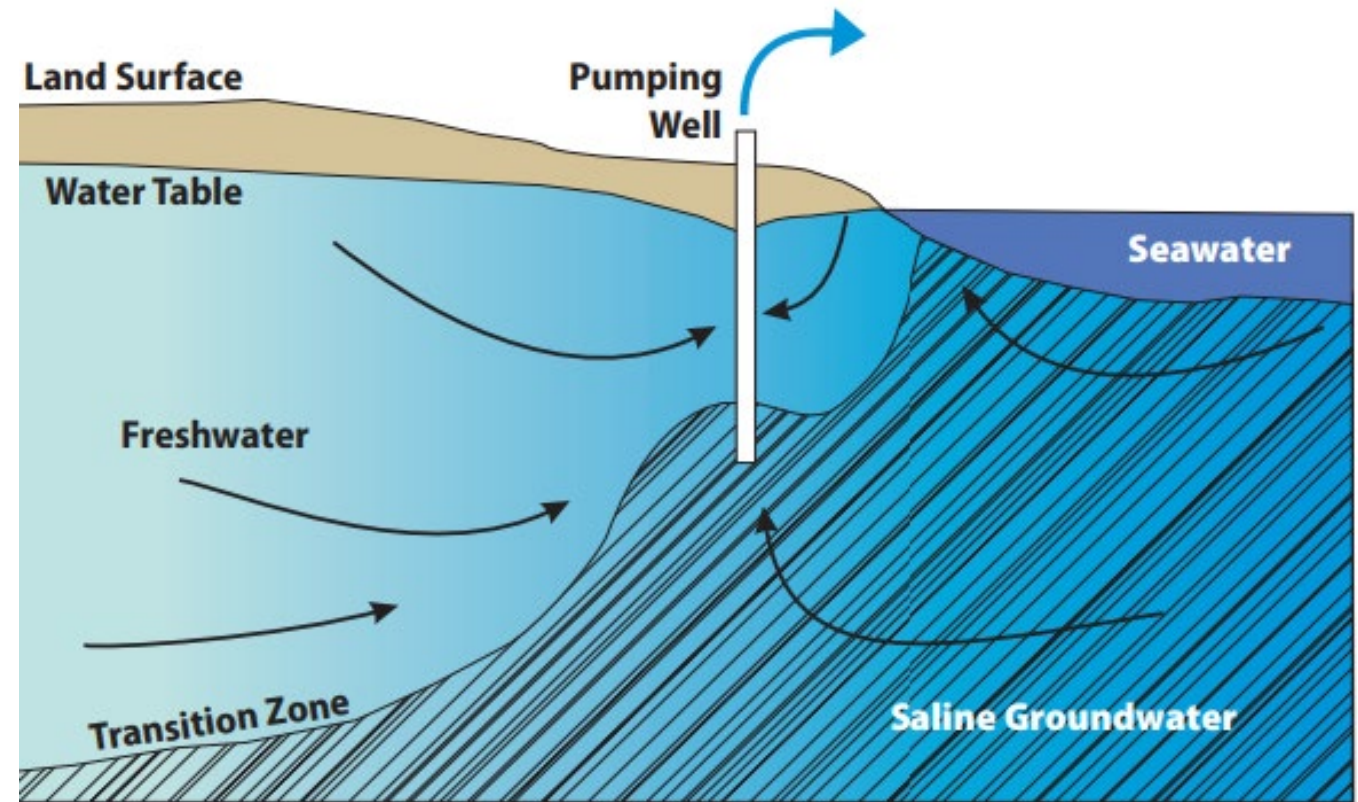
Further Actions to Protect Drinking Water

- Targeting “Source to Tap” assessments for water systems
- Identify and address risks
- Considering quantity as well as quality



Saltwater Intrusion

- Consider risks at time to land development / densification
- Monitoring
- Strategies to mitigate risk



Water Conservation Planning

Conservation needs to become our normal practice



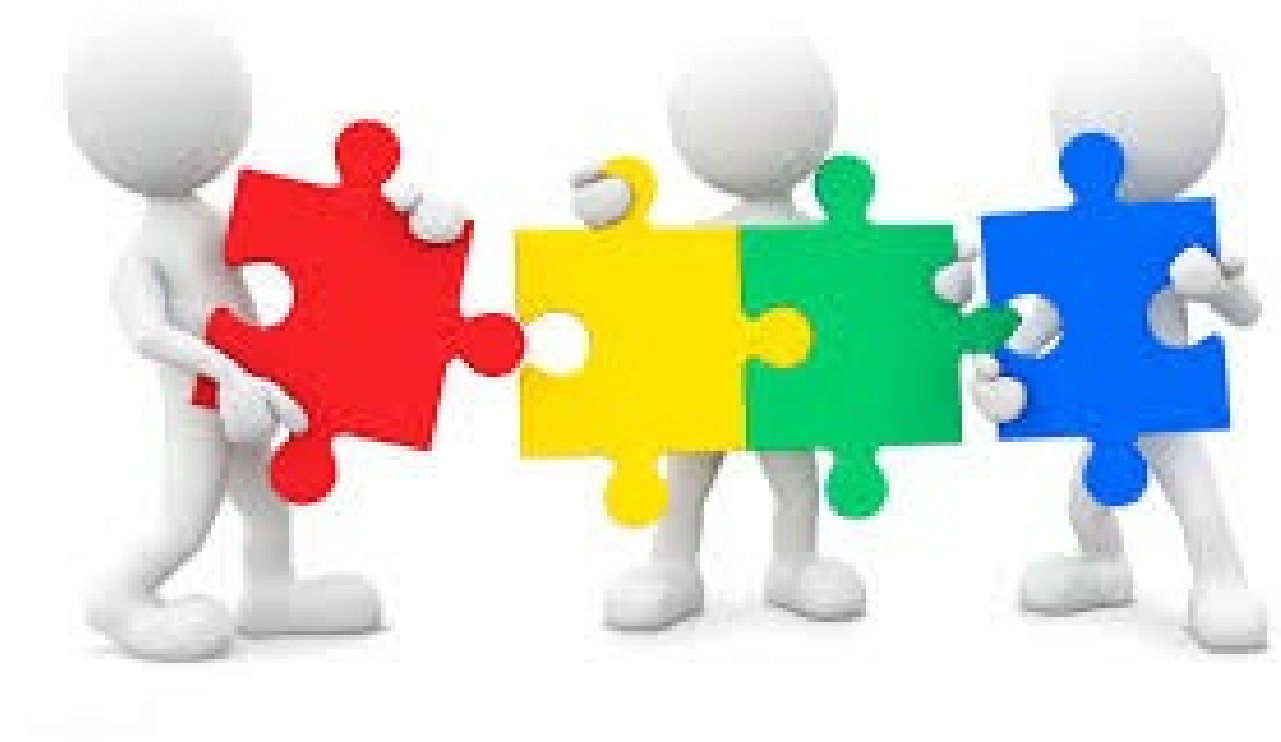
- Drinking water systems as well as consumers
- Conservation verses expansion
- Asset management planning

One small change.
One big difference.



Collaboration and Partnerships

- Round tables with Ministry of Water Land and Resource Stewardship
- West Coast Technical Drought Working Group
- Local Government
- Internal Departments



What areas of your practice are being impacted by drought?

Does your practice bring other opportunities to mitigate the health impacts of drought?

THANKS!

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