Drought Response Preparedness

Are YOU Prepared?

Island Health Drought Information for Owners of Small Water Supply Systems

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island health

This information is being provided to increase water supplier awareness of current drought conditions and to help water suppliers to prepare to take action that will minimize negative impacts during this summer's dry season. It will also aid in preparing for future years in which drought conditions could persist.

What Causes Drought Conditions?

Drought occurs whenever there is insufficient rain or snowfall over an extended period of time, resulting in a water shortage for activities, communities or aquatic ecosystems. In British Columbia, drought may be caused by combinations of insufficient snow accumulation, hot and dry weather or a delay in rainfall.

What Are The Impacts Of Drought?

Drought conditions can impact communities and individuals in many different ways:

- Drought can lead to reduced water availability for household and business uses.
- Under extreme conditions, water systems could run out of potable water (http://www.cbc.ca/news/canada/british-columbia/visitors-scramble-as-water-shortage-shuts-tofino-businesses-1.596279).
- Unable to meet fire suppression requirements.
- Even during less severe droughts, consumers may have limited access to water for outdoor purposes, toilet flushing, dish washing, laundry, bathing, showering and even for cooking and drinking.
- Low intake flows can compromise the disinfection system and reduce the quality and safety of the finished water.

What Are The Environmental Impacts Of Drought?

- Lower stream flows may cause warmer river temperatures, which impacts fish and other aquatic life.
- It can affect the growth of agricultural crops by limiting the water available for irrigation.
- It can also have impacts on groundwater levels. Aquifers can be impacted in a given drought year and following previous drought seasons, as there may not be enough water over the fall and winter to allow for recharging.
- If natural water sources or adequate storage is not available it may also lead to insufficient supplies for forest firefighting.
- There are higher risk of forest fires and urban interface fires.

What Are The Economic Impacts Of Drought?

- Drought season in British Columbia coincides with summer tourism and the associated increased demand for water. Reduced water availability during the summer can have significant economic impacts where communities rely on the summer tourism industry.
- Lower yields in agricultural crops cause prices to rise.
- There are higher costs for water systems that run out of sufficient volumes of water and then must buy water from other sources.

Is Your Water System Prepared For Drought?

In order to determine if your water system is prepared for drought, you should assess your response to the following questions:

- ✓ Do you know what provincial drought level your geographical area is at?
- ✓ Do you know how to find information on drought levels, drought management and drought planning?
- ✓ Do you know how to find provincial information on snow pack, stream flow or aquifer levels?
- ✓ Does your water system have a drought response plan?

HOW TO CREATE A DROUGHT RESPONSE PLAN

The most basic objective of a drought response plan is to ensure customers have an adequate water supply to meet their minimum needs during water shortages. A basic plan addresses water shortage problems through a series of stages based on conditions of supply and demand with accompanying triggers, goals and actions. Each stage is more conservative in water use than the previous since water supply conditions continue to deteriorate.

1. **Be clear on what you are trying to achieve in your plan and the required steps to get there.**
    - Is your drought response plan based on clear triggers, goals and actions?
    - Does it consider past and present well water levels, well pumping rates, surface water levels, snow pack or rainfall?
    - Do you implement water use restrictions?
    - Do water use restrictions become more stringent as provincial drought levels increase or do you have other triggers that result in restrictions becoming more stringent?
    - Are water use restrictions mandatory or voluntary?
    - Does your drought response plan consider different communication and conservation strategies for different user groups such as residential, commercial or agricultural groups?

2. **Ensure that consumers are well informed.**
    - Do you have an effective plan for communicating drought conditions and required consumer actions to all water users?
    - Do you educate your water users on the value of water conservation? The true costs of providing water should be reflected in your water pricing.
    - Do you have a water conservation plan? This helps to increase public awareness and action on the importance of conservation as well as delay the likelihood of drought conditions in your community. Do you include/engage the community in the development of the water conservation strategies and water use restriction requirements?

3. **Are there Operational Improvements to be made that will increase water efficiency?**
    - Are steps taken to prevent water loss via water distribution system leakage?
    - Do you have water meters on all water service connections?
    - Do customers pay for water based on the amount of water used?
    - Do you know the long term water storage capacity of your water source?
    - Do you know or have you calculated what your annual or peak daily water demand will be five years from now?
    - Have you looked at alternatives such as increasing storage capacity or developing alternative water sources?

4. What emergency preparations have you made?

- Do you know where you can access alternative potable water sources and for how long they will be accessible in case your current water supply is unusable due to extreme drought conditions?
- Have alternative water sources been approved by your local Drinking Water Officer?
- Do you know how you will refill water storage tanks or distribution pipes with an alternative potable water supply?
- Can you turn off your water intake to prevent water loss or pump damage from cavitation?
- In case your current water supply is unavailable due to extreme drought, do you know how much supplementary potable water from an alternative source will be needed to meet the basic heath and sanitation needs of your customers? And do you know how much this will cost?
- Have you spoken to any other water supplier about drought management and supplying emergency water or have any you made any reciprocal agreements for assistance?

5. What about firefighting provisions?

- Will you be able to maintain a water supply for firefighting?
- Have you identified alternative water sources for firefighting?

Planning processes and response plans will vary between individual water systems. Numerous government agencies across North America provide drought planning tools for water suppliers. Although most of these resources are designed for large water systems, they can be modified for use by smaller systems. One resource, the USA Rural Community Assistance Program, lists seven steps to developing a plan (http://www.rcap.org/dokaug2014).

SEVEN STEPS TO EFFECTIVE DROUGHT CONTINGENCY PLANNING:

1. ***Public involvement***, which is, forming a committee of stakeholders who encourage and support public "buy-in."
2. ***Define goals and objectives***, such as targets for reduced consumption, identifying which customers can and should be restricted and which cannot, legal requirements, minimum flow requirements, etc.
3. ***Assess supply and demand*** – identify all existing and potential water supply sources and balance these against average and peak demand, historic demand trends, use by customer sector, interior vs. exterior use, and projected future demand.
4. ***Define a system-specific drought index***, such as ground and/or surface water storage, stream flows, soil moisture, rainfall deficit, well drawdown levels, or other indices.
5. ***Identify potential mitigation measures***, such as water audits, alternative supplies, leak detection and repair, public education, restrictions/bans on non-essential use, pricing disincentives (surcharges), and finally, rationing.
6. ***Assess potential impacts of mitigation measures***, such as reduced revenues, customer acceptance, rate equity, legal implications, history, and implementation costs.
7. ***Develop and implement the plan*** using the management strategies, templates, and statistics assembled during the assessment process.

What Makes A Drought Management Plan Successful?

Community/water users' engagement in the development of your response plan will encourage buy-in from the users and a higher likelihood of compliance with voluntary water reductions. Early and frequent communication with the water users about water supply conditions and water system responses is critical to successful drought management.

Planning for drought is not the same as water conservation and applying water use restrictions. Water conservation and applying water use restrictions are just one part of drought planning. There are permanent measures that require ongoing effort and, if successful, may limit the need to apply other measures identified through drought planning. Drought planning is the bigger picture that includes all the short term and long term measures that are necessary to prevent or minimize drought impacts in advance. Drought response includes emergency measures for when water conservation just wasn't enough.

Should Your Emergency Response Plan Include Planning For Drought?

Under section 10 of the *Drinking Water Protection Act*, water suppliers are required to have written emergency response and contingency plans in the event of an emergency or abnormal operational circumstance affecting its water supply system or drinking water source. Historically, these emergency response plans have addressed short term events such as elevated turbidity, a temporary loss of power or disruption to a water treatment process.

Considering the drought level we are experiencing in 2015, record low rainfall and that Vancouver Island is experiencing its second year in a row with record low snow packs, it would be prudent for water suppliers to start developing longer term responses to seasonal water shortages. Water shortage events and resulting water supplier responses to drought conditions should be included in the water system ERP or included as an appendix or attachment to their existing emergency response plan.

Where Can I Find Additional Resources?

Links to additional resources are provided on the next page to help water suppliers plan and respond to current and future drought conditions. If you have any questions, please contact your local Environmental Health Officer. It's important to note that Health Protection staff are not experts in the field of drought management, but will do their best to work with water suppliers, to provide information and to support water suppliers during times of drought.

DROUGHT PLANNING TEMPLATES

Washington State Water Shortage Response Plans for Small Public Drinking Water Systems
http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/DrinkingWaterEmergencies/EmergencyPublicationsforWaterSystems/WaterShortageResponsePlans

Kansas State Drought Response Plan Template for Rural Water Districts
http://www.kwo.org/reports_publications/drought.htm

BC Ministry of Environment Dealing with Drought Handbook
http://www.livingwatersmart.ca/drought/docs/drought_handbook2009V2.pdf

BRITISH COLUMBIA DROUGHT RESOURCES

British Columbia Drought Levels
http://www.livingwatersmart.ca/drought/

British Columbia Drought Response Plan June 2010
http://www.livingwatersmart.ca/drought/docs/2010/bc_drought_response_plan_june-2010.pdf

British Columbia Ministry of Environment River Forecast Centre
http://bcrfc.env.gov.bc.ca/lowflow/

British Columbia Groundwater Observation Well Network
http://www.env.gov.bc.ca/wsd/data_searches/obswell/map/

British Columbia Ministry of Agricultural; Farm Management Strategies
http://www.agf.gov.bc.ca/emergency/Drought/Drought.htm

WATER CONSERVATION

Environment Canada Wise Water Use
https://www.ec.gc.ca/eau-water/default.asp?lang=En&n=F25C70EC-1#s3

What Can You Do?
http://www.livingwatersmart.ca/drought/action.html

BC Ministry of Environment Water Conservation Strategies
http://www.env.gov.bc.ca/wsd/plan_protect_sustain/water_conservation/http://www.env.gov.bc.ca/wsd/plan_protect_sustain/water_conservation/wtr_cons_strategy/toc.html

BC Ministry of Environment Water Use Efficiency Catalogue for British Columbia
http://www.env.gov.bc.ca/wsd/plan_protect_sustain/water_conservation/wtr_use_eff_cat_bc/toc.html