Notes from 2015 Drought Workshop organized by the Okanagan Basin Water Board

13 August 2015
Kelowna, B.C.

Two key themes emerged from the 2015 Drought Workshop: communication and collaboration. It is clear that planning at the local, regional and provincial scales has matured since the first Okanagan drought workshop in 2009, and that we are all learning and adapting our efforts.

This summary document has two main sections following the general layout of the workshop. The first section is a general summary of drought response plans for the province of BC and for the Thompson Okanagan Region. This is intended to capture a snapshot of "where we are", although it is certainly not complete without inclusion of local drought response plans. The second section is a summary of lessons learned and the way forward, and draws primarily from presentations and questions from the latter part of the afternoon. The conclusion section addresses some of the uncertainties and concerns that were expressed around planning for the near and distant future.

In April, the OBWB retained a consultant (Kellie Garcia of Summit Environmental) to recommend improvements to drought preparedness in the Okanagan, both at a local water supplier level and basin-wide. The project involves taking an inventory of our current situation (i.e. where water suppliers are at with their drought management plans and tools) and working with a focus group to develop recommendations for more effective and coordinated planning and response. The outcomes of this workshop will be considered by the project team and integrated into the recommendations.

The comments given here reflect a summary and synthesis of the statements made by presenters and audience members, and do not necessarily reflect the views of senior or local governments or any specific water user group.

1. Where we are: Provincial and Regional Plans

The **BC Drought Response Plan** was developed in response to the 2009 drought. It establishes a process for setting four drought levels and required actions that are implemented by the regional offices. This plan uses the hydrological definition of a drought, which means that the watershed or catchment is the level of designation, but hydrology is not the only condition considered. The plan also prioritizes ecosystem, economic and social impacts. The provincial River Forecast Centre plays a key role in

both monitoring and prediction, and the roles and responsibilities of other agencies is clearly laid out in this plan.

In 2015, there has been significant reallocation of staff and resources in response to severe drought designations across the southern part of the province. Although currently most monitoring occurs in larger rivers, lakes and streams, staff do conduct field assessments in affected areas.

The BC Drought Response Plan includes internal and external communication protocols for sharing information with Cabinet, other provincial agencies (including Health and Job Training), federal agencies (DFO, Environment Canada and Agriculture and Agri-Food Canada), other levels of government, the public and media.

An important part of the Plan is the provision for strategic, technical and regional working groups. It emphasizes voluntary compliance and reductions rather than regulatory action.

The **Thompson-Okanagan Drought Response Implementation Plan** (completed in June 2015) establishes a process for assessment (collection of general and then more specific information) and targeted action. The regional staff includes hydrologists, agriculture specialists, aquatic biologists and water stewardship officers. As a first step, watershed vulnerability is determined based on the presence or absence of reservoirs or other storage.

There are two types of regulatory response, which have been described as "sharp" and "blunt" tools. The first is action implemented under Section 9 of the *Fish Protection Act*. This allows for a more flexible, targeted response by Provincial authorities. Under Section 9, specific stream reaches can be targeted, and staff can work with local users to develop step-wise plans to reduce consumption and minimize impacts especially for agricultural users. The second response is under First in time, first in right (FITFIR), considered a blunt tool that is not necessarily logical or scientifically-based for maintaining downstream flows, but follows licensing seniority rules. The latter is considered to be more difficult to implement, and can potentially lead to conflicts between users.

2. What's working and where to go from here

Drought evaluation occurs at the watershed scale, so the scale of planning and engagement should be the same. Because water management in one community affects its neighbours, especially during times of drought, it is necessary to have a unified and coordinated resource management approaches. Such approaches to sustainable water management should be undertaken even during normal years; ours is a water-limited landscape, and water is a precious resource that requires collaborative

management. The successful reintroduction of salmon populations in the Okanagan provide an example of innovative and creative approaches to collaboration across boundaries.

Four themes emerged during the afternoon's presentations and question periods: Monitoring and Reporting; Communication; Drought Response and Enforcement; and Adapting and Improving Existing Infrastructure and Drought Plans. Key points raised by presenters or audience members are summarized under each theme.

Monitoring and Reporting

- Water use monitoring
    - New *Water Sustainability Act* will have stronger provisions for monitoring and reporting
    - Need metering to identify large users, and get timely feedback on conservation efforts
    - Need inventories of all water users, including municipal users (e.g. fountains and spray parks)
        - Inventory should include how water is managed (automated vs. manual, recirculation)

- Hydrologic monitoring
    - Provincially, larger systems are generally monitored but smaller and perhaps more sensitive/vulnerable tributaries are not
    - If local or regional agencies are monitoring, how can they share data and collaborate?
    - There are numerous manual gauges in the upper reservoirs; these should be automated
    - Federal authority for hydrometric monitoring (Water Survey of Canada) are members of provincial Technical Working Group and are learning about needs in BC

Communication

- Coordinated and unified approach to water management across the valley requires consistent definitions, interpretation, enforcement and messaging
    - Messages from multiple levels of government can be confusing; need a valley-wide drought response plan and water use restriction policies
    - Even within a catchment, different utilities are affected differently – is this message confusing?
    - As part of public education and compliance message, emphasize how conservation in one community helps another – draw real connections
    - The myth of abundance is especially strong in some communities

    - Irrigation practices are often based on perception rather than logic (e.g. Vancouver saw dramatic reductions in water use after rain events that were too small to significantly increase soil moisture)

- Have a communication plan already in place, but stay flexible and dynamic
    - Expect to repeat your message next year, and each year after that (i.e. even in normal years)

- Leadership is important
    - Explore options for how can local governments and utilities can support water users to use their water as effectively as possible
    - Make sure your organization is being seen to "walk the walk" – report out how water being used in parks and public spaces, and what measures being taken in-house to reduce consumption
    - Make sure that internal responses/mitigation practices are consistent with message going out to the public

- Collaborate with water sector and user organizations to effectively deliver messages to specific users (e.g. BC Tree Fruit Growers Cooperative to reach a portion of agricultural users)

- Interagency and intergovernmental communication
    - Can be a challenge identifying points of contact, especially when staffing changes occur
    - Need to expand the dialogue between municipal/regional governments and agricultural groups – learn from each other

- Because of lag times in the system and relatively narrow operating ranges, managers of Okanagan Lake need time to respond to changes in upstream conditions

Drought Response and Enforcement

- Plans require supporting regulations and/or bylaws for enforcement, depending on if they are at the provincial or local level

- Enforcement requires monitoring and staff time, as well as an effective communication plan

- Provincially, there are specific tools within the *Water Sustainability Act* to regulate large groundwater users, which will come into force in 2016

- Currently, the province determines drought levels based on "hydrological drought" indicators (i.e. basin snow indices, volume runoff forecasts, precipitation, streamflow) – some participants gave feedback that the provincial response plan should also include indicators for other types of drought (meteorological, agricultural, or socioeconomic)

- De-escalation requires rapid response as environmental conditions change (and effective communication if the change is not large enough to justify de-escalation)

- Regulatory responses
    - Encourage flexible, cooperative and step-wise responses (not sudden shutdowns)
    - Province is able to and should continue to collaborate with large water users (especially agricultural users) in developing mitigation strategies
    - When restricting water use by agricultural users, consider crop type (e.g. tree fruits vs. annual crops), growth stage (stress at some stages can be advantageous) and crop economic value
    - Be aware that it can take 2 weeks or more for crops to recover after irrigation resumed, and for some crops (e.g. tree fruits) it may take up to 3 years for full recovery
    - System should consider local cooperative actions (e.g. informal agreement between neighbours for alternate watering days)

- Voluntary responses
    - Move away from negative incentives ("water shaming") to positive ones
    - Include regularly-updated feedback on how well different neighbourhoods are doing at reducing use (e.g. Penticton)
        - Requires capacity to measure water use
    - Province needs to provide more clarification on what is meant by 30% voluntary reduction – 30% of what? For communities that are already practicing extensive water conservation a further 30% reduction is difficult.

- Adopt online tool for reporting water waste (which can be integrated with reporting of illegal dumping and potholes)
    - Integrate with geographic analysis to identify neighbourhoods or users that can be targeted for education or enforcement (effective use of limited resources)

Adapting and Improving Existing Infrastructure and Drought Plans

- Many expressed need for a drought response and/or water sustainability plan that encompasses the entire Okanagan basin

- Food security concerns
    - An effective water supply plan for agriculture requires that the entire community cooperates in water use reduction
    - Need to balance water supply and economic expansion
    - Consider the larger picture – for example, when forage crops here fail, likely also to fail in Alberta and Saskatchewan and there may be limited alternative sources

- Preventive measures and conservation
    - There is room in the new *Water Sustainability Act* for water sustainability plans that may provide a framework for preventive action (or at least risk reduction)
    - There is a need to coordinate provincial and local/regional drought response plans
    - Different groups have different stage definitions and levels of response (compare Vancouver vs. RDNO/Duteau Creek)

- Build flexibility into management plans and infrastructure
    - E.g. Penticton connecting irrigation zones to all sources (highland and lake); build resilience into operation
    - E.g. Osoyoos Lake Board of Control built flexibility into lake level operating plan, and had to practice it in 2015
        - Specific inflow conditions for their drought definition were not met, although regions around the lake were declaring droughts
        - The Board realized that this was a special situation that would require adaptation
        - Condition 10 allows for temporary variance from regulatory operating procedures
        - Has allowed lake level to remain within normal operating range, which expands the range of management options downstream (e.g. release of water during salmon spawning or to meet needs for agriculture)

- Want all parties included in the planning and response stages
    - Draw on the knowledge and experience of different groups

    - E.g. RDNO assembled a Drought Response Team of all large water users serviced from Duteau Creek; the team modified and improved the Drought Management Plan for Duteau Creek
- Some expressed desire to increase storage, either at scale of individuals or utilities, though challenges exist in dam safety and liability
    - We often emphasize "new" technology and innovations, but should also look to the past and traditional practices of water management, including land use management in headwaters
    - Existing water supply management infrastructure at the landholder level is often multi-generational, with adopted customs and habits of use that often do not lend themselves to cooperative practices
- Be aware that many things change, including our goals
    - The Okanagan River Fish Water Management Tool (FWMT) and environmental flow needs are currently targeted at Sockeye/Kokanee salmon, but there are ongoing efforts to increase Chinook salmon populations so must also consider the future

3. A certainly uncertain future?

The 2015 hydrograph was shifted 3 weeks earlier than the normal curve. Peak flows occurred earlier, the low flow period started earlier, and there was a coincidental earlier onset of demand. When the shape of the hydrograph changes this dramatically, forecasting methods become less reliable and uncertainty increases. Climate scientists predict that El Nino conditions will continue to strengthen through the rest of the year, and that the warm "blob" of water in the North Pacific Ocean will continue to persist, affecting winter temperatures and precipitation patterns. Water managers are planning for drought/water scarcity conditions to continue into the near future.

On top of these near-future uncertainties, we are unsure what climate change will bring. Climate models indicate that our extremes will become more frequent and extreme (dry periods and conditions will become drier, while wet periods and conditions will become wetter). How can we plan for this uncertainty?

It was clear by the end of workshop that everyone wants to do their part to mitigate the impacts of drought in the Okanagan. There is considerable variability in resource vulnerability across the Okanagan; communities and utilities relying on high elevation reservoirs appear more vulnerable that those with valley bottom lake and groundwater sources. In the water-limited Okanagan, our "normal" condition can be considered to be the Province's stage 1 or 2, and that water conservation should be practiced every year, not just during times of drought.

In order to move forward, we need to ensure that all users are doing their part to use our water effectively and sustainably. But, as we move forward, we need to ask if we can continue to rely on individuals/private citizens (and often the same individuals from one year to another) to lead and fundraise community-based efforts for water management or advocacy? The province must take a leadership role in some of these efforts and provide funding support. We can achieve great strides when we work together.

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