

Drought Management for a Changing Climate

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Overview of Presentation

- **Living Water Smart** website
- **History** of Drought Policy Development in BC
- **Guidance** BC Drought Handbook
- **Policy** BC Drought Response Plan
- **Legislation** Existing Water Act & Fish Protection Act and New Water Sustainability Act
- **Operational Response** Drought Management "Teams" Roles and Responsibilities Communication, Info Sharing, Partnerships, Actions and Enforcement
- Ongoing **Adaptive Management**

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<http://www.livingwatersmart.ca/>

The screenshot shows the homepage of the Living Water Smart website. The navigation menu on the left includes links such as 'Living Water Smart', 'Living Water Smart: Stock', 'Living Water Smart: Brochure', 'Living Business Community', 'Engaging Communities to Change', 'Choosing to be Water Smart', 'Excellence in Water Stewardship Award', 'Water Act Modernization', 'Living Water Smart', 'Drought Information', 'Water Strategy', 'Northwest Water Strategy', 'Get Involved', 'News and Events', and 'Did You Know...'. The 'Living Water Smart' link is circled in red. The main content area features a large image of a person swimming with the text 'water makes life on earth possible.' Below this, there is an 'Important Notice' section with a red header, stating: 'Please see [Information Bulletins / Advisories](#) for the latest updates on drought. While angling closures are not always directly related to drought, this season low streamflows and hot, dry weather has resulted in high stream temperatures resulting in the need for angling closures. For more information on these angling closures please see: <http://www.atw.gov.bc.ca/fish/anglingclosures/anglingclosures> * [Fish Alert: Drought affects your web](#) (Aug. 14, 2015)'. A map of BC showing drought-related areas is also visible.

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History- Drought Management in a Changing Climate

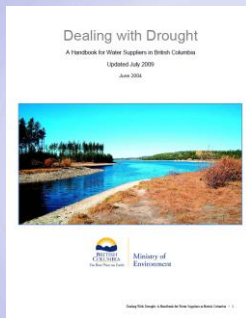
- 2003 - start of multi-year Drought, some carry over into 2004 and 2005
- 2003 Deputy Minister Committee struck Sept 2003
- 2004 Drought Handbook (guidance) issued
- 2006 some drought issues – Tofino runs out of water
- 2009 Drought – adhoc drought management teams
- 2009 Consultation and first BC Drought Response Plan (policy) approved
- 2009 Water Act Modernization started
- 2015 Drought – more organized drought management teams
- 2015 BC Drought Response Plan updated (policy)
- 2016? – El Nino? future response to second year of drought in 2016?
- 2016 WSA regulations anticipated with new provisions

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Dealing with Drought Handbook



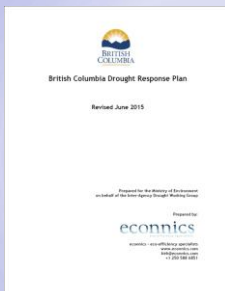
- Guidance Document for water suppliers including local government, irrigation districts water boards and other entities who supply water to users
- Basin Drought Management Plans
- Water Supply Service Area and/or Watershed Drought Management Plans
- Companion document to BC Drought Response Plan (policy)

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BC Drought Response Plan



- Provincial policy framework for responding to drought in BC
- Defines drought levels, triggers, core indicators, thresholds, advisories and other possible responses
- Defines roles, responsibilities and lines of communication
- Guides Drought Management "Teams"
- Scalable and Adaptive

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Drought Level

Drought Level Classification:				
Level	Conditions	Significance	Objective	Target
1 (Green)	Normal Conditions	There is sufficient water to meet human and ecosystem needs	Preparedness	Ongoing reductions in community water use
2 (Yellow)	Dry Conditions	First indications of a potential water supply problem	Voluntary conservation	Minimum 10% reduction
3 (Orange)	Very Dry Conditions	Potentially serious ecosystem or socioeconomic impacts are possible	Voluntary conservation and restrictions	Minimum additional 20% reduction
4 (Red)	Extremely Dry Conditions	Water supply insufficient to meet socio-economic and ecosystem needs	Voluntary conservation, restrictions and regulatory response	Maximum reduction
Loss of Supply		Potential loss of a community's potable or fire fighting supply	Emergency response	Ensure health and safety

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How did Drought Levels change in 2015?

Hydrological Drought Levels

2015 Drought Level Summary

7-Day Average Streamflow Map

Drought Advisories

Contact Us

Basins

15-May

28-May

25-Jun

03-Jul

09-Jul

15-Jul

21-Jul

23-Jul

05-Aug

06-Aug

20-Aug

03-Sep

17-Sep

01-Oct

Northwest

Stikine

Northwest

Peace

East Peace

Stikine-Nass

Nechako

Upper Fraser

Middle Fraser

Upper Columbia

Lower Columbia

West Kootenay

East Kootenay

North Thompson

South Thompson

Okanagan-Kettle

Kettle (separated July 23)

Nicola

Similkameen

Skagit

Lower Fraser

South Coast

Vancouver Island

Haida Gwaii

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Drought Indicators

Table 3 provides a summary of the different indicators and their time of use. Table 4 sets out the quantitative thresholds for the core indicators.

Table 3: Drought Indicators Criteria Summary

Indicator		Timing of Use	
		Early Season (Jan-May)	Seasonal (June-Oct)
		Basin Snow Measures	7-Day Average Streamflow
Core Indicators	Seasonal Volume Runoff	30 Day Percent of Average Precipitation	
	Forecasts		
Supplemental Indicators	Aquifer Levels		
	Individual Indicator Hydrometric Station Results		
	Multi-Year Trends		
	Reservoir Inflows		
	Wildfire Danger Class Ratings		

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Drought Thresholds

Table 4: Core Indicator Thresholds

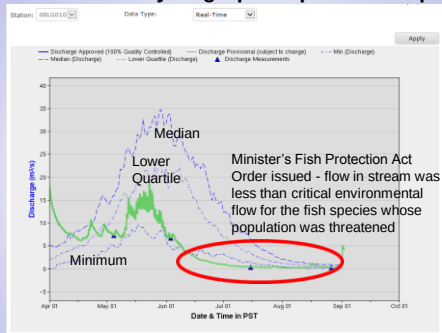
	Level 1 (Green)	Level 2 (Yellow)	Level 3 (Orange)	Level 4 (Red)
Basin Snow Measures†	>80%	80-65% of normal	<65% of normal	
Seasonal Volume Runoff Forecasts	>80%	80-61% of normal	60-45% of normal	<45% of normal
30 Day % of Average Precipitation ‡	>80%	80-51% of average	50-25% of average	<25% of average
7-Day Average Streamflow	>25 percentile	11-25 percentiles	6-10 percentiles	<6 percentiles

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Coldwater River Hydrograph - April until Sept 2015



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Coldwater River August 2015



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Drought Advisories

Water use reduction order rescinded for Coldwater	September 18, 2015
Angling re-opened in the Okanagan Region	September 16, 2015
Water use reduction order reinstated for Coldwater	September 2, 2015
Horsety River re-opened for angling	August 26, 2015
Drought affects your well	August 24, 2015
Fishing closure announced for Lower Mainland	August 21, 2015
Increased flows on Nicola River to help salmon	August 17, 2015
North Thompson drought level increased	August 17, 2015
Water conservation urged for Kootenay Columbia region	August 7, 2015
Water conservation urged for Middle Fraser	August 7, 2015
Water conservation urged as final Okanagan area increases drought rating	August 5, 2015
Water conservation urged for North Thompson	August 5, 2015
Water use reduction order to protect fish	July 31, 2015
Drought level increased in four areas of southern B.C.	July 27, 2015
Water conservation urged and fishing closures implemented in the Nicola	July 21, 2015
Fishing closures announced for South Coast	July 20, 2015
South Coast/Lower Fraser drought level increased	July 20, 2015
Fishing closures part of comprehensive drought response	July 10, 2015
Fishing closures part of comprehensive drought response	July 3, 2015
Water conservation urged for South Coast/Lower Fraser	June 30, 2015
Islanders urged to conserve water	June 8, 2015

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Drought Management "Teams"



- Provincial Federal Local and First Nations Coordination
- Regional and Provincial Lines of Sight
- Roles, Responsibilities and Lines of Communication
- Monitoring Communication Conservation Enforcement

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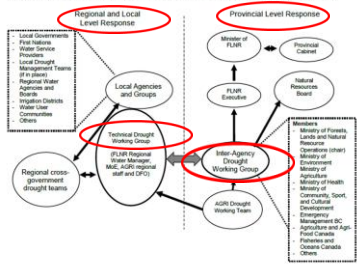
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Drought Management "Teams"

June 2015

Figure 1: Key Coordinating Bodies and Individuals Involved in Drought Response



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Existing Water Act and Fish Protection Act

- Use of third party – the "Bailliff"
- Regulate based on precedence of water licences; First-In-Time-First-In-Right (or FITFIR)
- Issue Minister's Order under Fish Protection Act

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New Water Sustainability Act Division 5 – Temporary Protection Orders Regulating During Time of Scarcity

- s86 Declare Drought by Minister
- s87 Order - Critical Environmental Flow Threshold for stream and potential to regulate by FITFIR
- s88 Fish Protection Order by Minister when a fish population is threatened - regulate water without FITFIR, but protecting essential household indoor needs

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New Water Sustainability Act Helpful New Tools Becoming Available

- All new licence decisions will need to consider **Environmental Flow Needs** (aquatic ecosystem including fish)
- **Non domestic Groundwater users will be licenced**, and thus there is an ability to regulate groundwater during drought
- Forthcoming – Division 4 - **Water Sustainability Plans** and S135 - **Regulations closing or restricting access to water source**

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Summary

- Continue to communicate, share information, and effectively coordinate stakeholders during times of drought
- Continue to develop Drought Management Plans at provincial regional and local levels
- Harmonize drought response by coordinating and reviewing from local, regional and provincial perspective to prioritize response at provincial scale
- Continue adaptive management – make ongoing adjustments for an effective response
- Q and A?