

Information + Workshop Package

Information + Workshop Details

Bring your ideas!

We encourage workshop participants to begin thinking about how we might use information design and data visualization to address water consumption and conservation in Vancouver. Please come to the workshop with some ideas in mind for potential directions.

To help spark your thinking, we've identified 6 key topics for consideration:

1. **SOURCE** - Where does water come from?
2. **USE/FUNCTION** - What is our water used for?
3. **CONSUMPTION** - How much water do we use?
4. **AVAILABILITY** - How much water is available? (stored)
5. **CONSERVATION** - How can we conserve water?
6. **ENVIRONMENTAL IMPACT** - How does water usage impact the environment and how does it relate to climate change?

In generating ideas, we encourage participants to think about a range of formats that your design idea might take, such as: public installation, data journalism, critical or speculative design, interactive visualization, campaign, infographic, computational interface, social media, guerilla urbanism....etc.

We also encourage participants to consider what your overall objective might be. Will you seek to educate? To provoke? To call to action? To illustrate? To motivate? To speculate?

Resources & Data:

Because the workshop is going to be fast-paced, we've helped you out by pulling together some data sets and resources that we think will be helpful! These have been organized and color-coded based on the themes above. For your reference, each of the resource pages contains the color-coded legend at the bottom of the page (like below). Please take a look and review the materials in advance if you can - the more familiar you are with the data available, the more your group can accomplish.

- **SOURCES** - Covers topics such as snowfall, rainfall, snowpacks and groundwater
- **USE/FUNCTION** - Covers most common water-uses, such as drinking, showering lawn-sprinkling, cleaning; water quality and filtration systems
- **CONSUMPTION** - Contains data regarding water consumption by municipality and region, and can overlap with topics found in use and function
- **AVAILABILITY** - Contains data regarding reservoir levels and stored water supply
- **CONSERVATION** - Contains information regarding current progress, tips, and future endeavors to improve water conservation
- **ENVIRONMENTAL IMPACT** - Discusses climate change, water usage on a global scale, environmental factors, comparisons and futures. (This is a separate category)

Workshop Schedule:

09:30	Registration, Coffee, Open Brainstorming
10:00	Workshop Kick-Off + Group Brainstorming
10:30	Group Formation (Teams of 4-6)
10:45	Datawrapper and Databasic Tutorial
11:00	Team Work Begins
12:00	Working Lunch and Prototyping (lunch will be provided)
14:45	Presentations and Sharing (~5 minutes per group)
16:00	Workshop Ends

Please bring to the workshop:

- Laptop + charger
- Tablet/smartphone (if you think you'd like to create a mobile solution)
- Sketchbook
- USB
- Applicable software/tools
(Suggested data visualization tools, listed from simplest to most advanced:
[Databasic](#), [Datawrapper](#), [Infogram](#), [Google Fusion Tables](#), [CartoDB](#),
[Tableau Public](#)) (Suggested PDF-to-Excel conversion tools:
[Cometdocs](#), [Tabula](#))
- Materials for physical prototyping if you have a specific idea/method in mind
- Writing/drawing tools (we will provide large paper, post-its and markers)

Information + Resources & Data Package

TITLE/AUTHOR/SOURCE	DATA TYPE & URL	SUMMARY / NOTES
RAW DATA & NUMERIC TABLES		
<ul style="list-style-type: none"> ● ● ● ● ● 	<p>City of Vancouver, Open Data Catalogue.</p>	<p>Open Data Catalogue</p> <p>Database includes data set package regarding water distribution mains, water transmission mains, dedicated fire protection network, water abandoned mains, water control valves, water (fire) hydrants, and water pressure zones</p>
<ul style="list-style-type: none"> ● ● 	<p>HYDAT Database</p>	<p>HYDAT Database</p> <p>HYDAT is a relational database that contains the actual computed data for the stations listed in HYDEX. These data include:</p> <ul style="list-style-type: none"> • Daily and monthly means of flow, water levels and sediment concentrations (for sediment sites). • For some sites, peaks and extremes are also recorded.
<ul style="list-style-type: none"> ● 	<p>Government of British Columbia, Automated Snow Pillow Data</p>	<p>Raw Data Set</p> <p>Downloadable csv files. Current year near-real time hourly data, and graphs of snow water equivalent from Oct 1 to end of the snow season. Data sets include Snow Water Equivalent, Snow Depth, Cumulative precipitation, and Air Temperature</p> <p>+ Raw Snow Water Equivalent (mm) Oct 1,2011 –Sept 30, 2015.</p>
<ul style="list-style-type: none"> ● 	<p>Government of Canada, Water Office database.</p>	<p>Hydrometric Data</p> <p>Access to real-time hydrometric data collected at over 1800 locations and access to historical data collected at over 7600 water office stations (active and discontinued) in Canada.</p>
<ul style="list-style-type: none"> ● 	<p>Statistics Canada. <i>Table 153-0063 - Households and the environment survey, primary type of drinking water consumed, Canada, provinces and census metropolitan areas (CMA), every 2 years (percent), CANSIM (database)</i></p>	<p>CANSIM Table 153-0062</p> <p>Type of water consumed for drinking, by province and Metro region, 2007-2013</p> <ul style="list-style-type: none"> • includes municipal and non-municipal water supply • Includes tap, bottled, both, other, and don't know, for consideration
<ul style="list-style-type: none"> ● 	<p>Statistics Canada. <i>Table 153-0106 - Population served by drinking water plants, by source water type for Canada, provinces, territories and drainage regions, occasional (persons), CANSIM (database)</i></p>	<p>CANSIM Table 153-0106</p> <p>Population served by drinking water plants, by province and drainage regions, 2005-2013</p>

●	Statistics Canada. <i>Table 153-0123 - Treatment of main source of water by households, Canada, provinces and census metropolitan areas (CMA), every 2 years (percent), CANSIM (database)</i>	CANSIM Table 153-0123	Treatment of main source of water, by province and Metro region, 2007-2013
●	Statistics Canada. <i>Table 153-0105 - Potable water volumes processed by drinking water plants, by source water type for Canada, provinces, territories and drainage regions, occasional (cubic metres), CANSIM (database)</i>	CANSIM Table 153-0105	Potable water processed by water treatment plants, by province and drainage regions, 2005-2013
●	Statistics Canada. <i>Table 153-0104 - Households and the environment survey, indoor water conservation practices, Canada, provinces and census metropolitan areas (CMAs), every 2 years (percent), CANSIM (database)</i>	CANSIM Table 153-0104	Use of water conservation methods like low volume toilet/shower head, by province & Metro region, 2011-2013
MAPS & TOOLS			
● ● ● ● ●	Government of British Columbia Water Science & Data	Data Tools & Maps	Database and collection of tools to analyze groundwater data, water rights information, monitoring and reporting data such as surface water quantity and snow survey data, flood and drought maps, and the BC Water Resources Atlas interactive map
●	WaterMonitor. North America WaterWatch. 2016	Map	Map of real-time streamflow compared to historical streamflow for the day of year.
● ●	The Environment Canada Data Explore	Windows-based application of the HYDAT Database	ECDE allows users to easily browse and extract hydrometric information right from their own desktop. Includes: <ul style="list-style-type: none"> • interactive maps, advanced filtering of station information • Graphical and tabular views of water level, discharge and sediment data • Copy and paste feature for maps and graphs for insertion into reports and presentations • Bulk export tool to simultaneously extract data for a number stations
● ●	Government of BC. <i>British Columbia Drought Information Portal 2016</i>	Interactive Map & Web Portal	Contains interactive maps displaying 2016 drought regions, and 7-day average streamflows. Also contains both historical & current information regarding droughts and their environmental impact.

PUBLICATIONS / AGENDAS / SURVEYS / BULLETINS

<ul style="list-style-type: none"> ● ● ● ● 	<p>Government of Canada. <i>Water Quantity Monitoring and Water Survey of Canada</i>. 2014.</p>	<p align="center">Publication</p>	<p>Includes information and data regarding water quantity, quality, use, availability, and consumption by sector.</p>
<ul style="list-style-type: none"> ● ● ● ● ● 	<p>MetroVancouver Water Services Department. <i>2014 Water Consumption Statistics Report</i>. 2015.</p>	<p align="center">Publication</p>	<p>Water Consumption Statistics (2014) Prepared by the Metro Vancouver's Water Services Department, this document presents statistics and charts (by member municipality) outlining annual MV system and municipal water consumption in 2013.</p> <ul style="list-style-type: none"> • includes population, peak ratios, per capita usage, average flows and factors affecting consumption in recent years.
<ul style="list-style-type: none"> ● ● ● ● ● 	<p>City of Vancouver. <i>Vancouver Water Utility Annual Report 2014 Quality Control Annual Report</i>. 2014.</p>	<p align="center">Publication</p>	<ul style="list-style-type: none"> • data includes source water quality, map of water sampling stations, metals analysis and water quality results • Includes information regarding water quality projects, distribution and management plans and maintenance programs, and the Greenest City Water Consumption Goal (L/p/C) (progress marked from 2005-2015)
<ul style="list-style-type: none"> ● 	<p>Government of British Columbia, <i>Snow Survey Data</i></p>	<p align="center">Survey</p>	<p>Raw Data: access to current year and archived manual snow survey data, as well as real-time automated snow pillow data, maps and graphs. Snow Survey and Water Supply Bulletin is also available.</p>
<ul style="list-style-type: none"> ● 	<p>Government of British Columbia, <i>Snow Survey and Water Supply Bulletin</i>, January 2016</p>	<p align="center">Bulletin</p>	<p>Includes data from snow surveys and basin snow water index</p>
<ul style="list-style-type: none"> ● 	<p>Waterdrop. <i>Interview With the City of Vancouver's Water Conservation Manager</i>. June 26, 2008.</p>	<p align="center">Interview</p>	<p>Water Conservation Program Manager in 2008 projects included: public engagement of indoor and outdoor water use, incentive programs (water efficiency kits and rain barrels), providing education on lawn sprinkling, provide law enforcement and regulations when necessary, etc.</p> <ul style="list-style-type: none"> • We have 6.5% of the world supply of fresh water, right here in Canada • Canada is ranked as one of the largest per capita water users (next to the US) • Includes information regarding initiatives and improvements by date, from 1993-2008

<ul style="list-style-type: none"> ● ● ● ● ● 	<p>MetroVancouver. <i>Water Supply Forecast and Water Consumption Update for Summer 2016</i>. April 4, 2016</p>	<p>Agenda Report</p>	<p>Report details the current status of water supply, source, and consumption rates as of April 2016.</p> <p>Data includes: peak day and average day per capita water use by region (1985-2015) winter per capita water use in region (1993-2016), population growth and water use (1985-2015), percentage full of stored water and source lakes at time of writing</p>
<ul style="list-style-type: none"> ● 	<p>West Vancouver Council Report, Oct 26, 2015. Water Conservation Program UPdate.</p>	<p>Agenda Report</p>	<p>Details updates of programs currently in place, and provides data regarding universal metering and improved leak detection in reducing overall consumption. Chart shows average per capita daily water usage dwindling from 2004-2015. Summary of 2015 drought response and 2016 plans and initiatives.</p>
<ul style="list-style-type: none"> ● ● 	<p>UBC, Faculty of Applied science. <i>Water Use in Metro Vancouver. 2015</i>.</p>	<p>Report</p>	<p>Includes interactive chart that compares the water consumption in Seattle, Portland and Vancouver, in 2013. Clicking on each section will show an additional breakdown by municipality.</p>
NEWS ARTICLES			
<ul style="list-style-type: none"> ● ● ● ● 	<p>CBC News. <i>BC Drought: Metro Vancouver water use dropping but reservoirs still low</i>. July 24, 2015.</p>	<p>News Article</p>	<p>Data includes daily water consumption in summer of 2015, as well as total storage of water in reservoirs in relation to usage (2015).</p>
<ul style="list-style-type: none"> ● ● ● 	<p>Hunter, Brock. <i>Water usage dropping in Metro Vancouver</i>. NEWS 1130. July 26, 2015.</p>	<p>News Article Consumption Chart</p>	<p>“If we can stick to under 1.2 billion litres a day as a region, the reservoirs will last until November.”</p>
<ul style="list-style-type: none"> ● 	<p>Shore, Randy. <i>B.C Water Use Target in Sight</i>. The Vancouver Sun. March 3, 2016.</p>	<p>News Article</p>	<ul style="list-style-type: none"> • “BC is on pace to reduce water consumption 33% by 2020.” • “Total water use- including residential, industrial and agricultural customers” - is down 18% since 2009, from an average of 606 litres per person per day to 494...”
<ul style="list-style-type: none"> ● ● 	<p>Lindsay, Bethany. <i>Drought not over in Metro Vancouver, despite the rain</i>. Vancouver Sun. July 25, 2015.</p>	<p>News Article</p>	<ul style="list-style-type: none"> • “More than 16 mm of rain fell in downtown Vancouver on Sunday and the North Shore mountains...received 37.5 mm...But more than 140mm would be necessary to get the region’s supplies back into the healthy range.” • “Canadians are profligate water users, consuming about 350 litres per person, per day, compared with about 150 litres per person, per day in Europe.”

<ul style="list-style-type: none"> ● ● 	Vancouver Observer. <i>How to thrive in a Vancouver drought.</i> July 22, 2015.	News Article	Offers alternatives to using fresh water depleted from reservoirs, such as using second-use household water
<ul style="list-style-type: none"> ● 	The Georgia Straight. Water conservation kits from the City of Vancouver, Burnaby and more. July 21, 2015.	News Article	Describes the water saving kits sold from the City of Vancouver, to homes for personal use. Kits will reduce up to 20% of water usage and help save up to 15% on water-heating bills.
<ul style="list-style-type: none"> ● 	Azpiri, Jon. <i>Metro Vancouver considering water meters for all homes.</i> Global News. April 19, 2016.	News Article	<ul style="list-style-type: none"> • Metro Vancouver may soon keep tabs on your water use and charge you for every drop. • Installation is in effort to raise awareness of water consumption. • Monitoring water use by meter requires significant cost • Stage 1 water restriction dates in debate
<ul style="list-style-type: none"> ● ● ● 	The Early Edition. <i>Water restrictions for Metro Vancouver to start earlier in 2016.</i> CBC News. Jan 07, 2016.	News Article	“The snowpack at this time of the year has a benefit to skiers but not for future water supply in the summer because it could effectively be all gone...”
<ul style="list-style-type: none"> ● ● ● 	<i>Level 3 drought declared for parts of Vancouver Island, Gulf Islands.</i> CBC News. May 30, 2016.	News Article	<p>“The region will likely experience significant water supply shortages in 2016 unless there is substantial precipitation between now and the end of June...”</p> <ul style="list-style-type: none"> • Gives most current update on Vancouver’s present water supply situation.
WEBSITES			
<ul style="list-style-type: none"> ● ● ● ● ● 	The partnership for water sustainability in BC. <i>Waterbucket, Water Use and Conservation.</i>	URL	<p>Contains information regarding protection and management of natural and engineered water resources in British Columbia, such as conservation strategies, consumption patterns, conservation calculator, volume of sourced water, etc.</p> <p>Recommended article: Metro Vancouver prepares for a repeat of drought conditions in 2016.</p>
<ul style="list-style-type: none"> ● 	Government of BC. <i>Long-term trends in Groundwater Levels in B.C.</i> Environmental Reporting B.C. Updated June 2014.	URL	Contains information regarding protection and management of natural and engineered water resources in British Columbia, such as conservation strategies, consumption patterns, conservation calculator, volume of sourced water, etc.
<ul style="list-style-type: none"> ● ● ● 	MetroVancouver Reservoir and Conservation Information	URL	Includes information on reservoir levels, in addition to water conservation at home, its significance, daily consumption, accessibility to clean safe water, and lawn sprinkling regulation

<ul style="list-style-type: none"> ● ● ● 	<p>MetroVancouver. <i>Reservoir Levels and Daily Consumption, 2016.</i></p>	<p>URL</p>	<p>Includes information regarding reservoir levels and consumption, from May to October 2016.</p>
<ul style="list-style-type: none"> ● 	<p>City of Vancouver. <i>Greenest City Action Plan.</i> 2014.</p>	<p>URL</p>	<p>Details Vancouver’s initiative to become Greenest City by 2020, progress thus far, recent successes and actions that will be taken between now and 2020</p>
ENVIRONMENTAL IMPACT			
	<p>Fisheries and Oceans Canada. <i>Tidal information and phenomena.</i></p>	<p>Website</p>	<p>Contains information regarding the circumstances, behaviour, characteristics and impact of tidal waves and other water-body phenomena</p>
	<p>Postel, Sandra. <i>Climate Change Poses Existential Water Risks.</i> Featured on National Geographic’s Freshwater Initiative in Water Currents. Feb.17, 2015</p>	<p>News Article</p>	<ul style="list-style-type: none"> • Extrapolates on the future of our our current drought situation by comparing to past drought experiences, such as the “medieval drought” of the middle of the 12-century. • “...the primary way we will experience climate change is through the water cycle – through droughts, floods, depleted rivers, shrinking reservoirs, dried-out soils, melting glaciers, loss of snowpack and overall shortages of
	<p>Jackson, Emily. <i>Heat wave approaches Vancouver, city struggles with water conservation.</i> Vancouver Metro News. Jun 23, 2015.</p>	<p>News Article</p>	<p>“Vancouver had its driest May on record with just under 4.2 mm of rain compared to an average 65 and an abnormally warm winter that didn’t add to the snow pack.” “It made significant headway in 2013 when usage dropped by 18%, but there was an uptick last year with usage only down 16% from the benchmark.”</p>
	<p>Baluja, Tamara. <i>Heat wave in B.C breaks 64 temperature records.</i> CBC News. Jun 29, 2015.</p>	<p>News Article</p>	<p>“Highest temperature was 40.6 C recorded in Warfield, a village outside Trail in West Kootenay, on Saturday.” Mentions extremely low snow pack on Southwest BC Mountains.</p>
	<p>The Province. <i>Warming climate spells future drought trouble for Metro Vancouver.</i> December 17, 2015.</p>	<p>News Article</p>	<p>Interview with Prof. Engineer Kim Stephens, regarding Metro Vancouver’s two “comparatively small” reservoirs and what they were designed for: repeated rainfalls and heavy snow in the mountains, which are not expected to apply over 9 months with a population of about 2.5 million people.</p>

	Pacific Standard. <i>Troubled Water: A Map of Tomorrow's Thirsty Future</i> . 2016.	Article	Discusses the impact of water stress (wherein water-users compete for depleting resources) on a global scale, and the subsequent environmental landscape that hovers on the horizon. Includes an infographic map of the world exposed by water stress by 2040.
	Metzger, Eliot., Reig, Paul. <i>Solving the Fresh Water Crisis</i> . Pacific Standard. 2016.	Article	<p>“The world faces a future of extreme water variability. Water risks and supply disruptions are already affecting business in California, China, India and elsewhere.”</p> <p>“Companies and countries...should ...work with cities, women, & others...[to] change the way we manage the world’s most important resources.”</p>