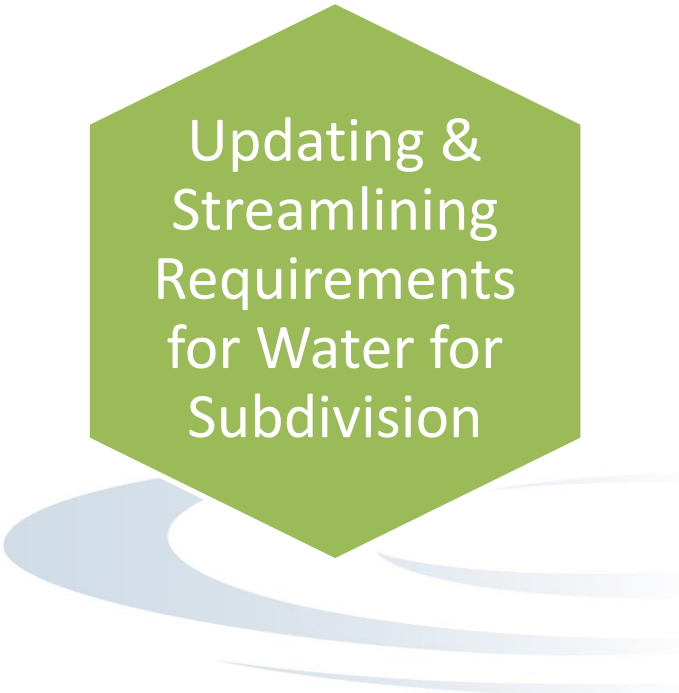


Drinking Water and Watershed Protection – Technical Advisory Committee Meeting Nov. 27th 2014






Updating &
Streamlining
Requirements
for Water for
Subdivision

- Letter from MOTI Approving Officer, Kirsten Fagervik
- Strengthening requirements for water provision for subdivision
- Why? To avoid parcels created with insufficient water over the long term & to minimize cumulative impacts on the water source
- Consistency between agencies → RDN (Subdivision Bylaw 500) and MOTI requirements
- Establish required components (standards of practice) for groundwater reports as a part of development applications

CORRESPONDANCE





Updating &
Streamlining
Requirements
for Water for
Subdivision

Potential Updates:

- Meets the Canadian Drinking Water Guidelines for potable water
- Specified pump testing requirements and consistent required volume per day between MOTI and RDN
- Water must be proven on every lot; not sufficient to use well records from neighbouring ppty as proof of water
- Demonstrates no adverse impacts on surrounding wells, groundwater resources, receiving waters, as determined through a professional hydrogeological assessment within appropriate radius

DISCUSSION

PROGRAM ACTION 3

Land Planning and Development

Goal:

To use the information gathered through Program 2 to protect the Region's watersheds and water resources in land use planning and development decisions.

DISCUSSION



PROGRAM ACTION 3

Land Planning and Development

Objectives:

- ◆ To protect drinking water through the Regional Growth Strategy, OCP policies and designations, and zoning bylaws.
- ◆ To ensure that new development provides proof of adequate and sustainable, good quality drinking water.
- ◆ To ensure that new development minimizes impacts on surface and groundwater resources.
- ◆ To prioritize and develop long-term management plans for watersheds.





3A: LID Standards

3B: Development Application Review

3C: Development Charges

3D: Planning Tools

Upcoming work for 2015 +

- *Guidance on where to start / focus*
- *Key considerations*

DISCUSSION

Program Action 2:
*Water Resources
Inventory & Monitoring*

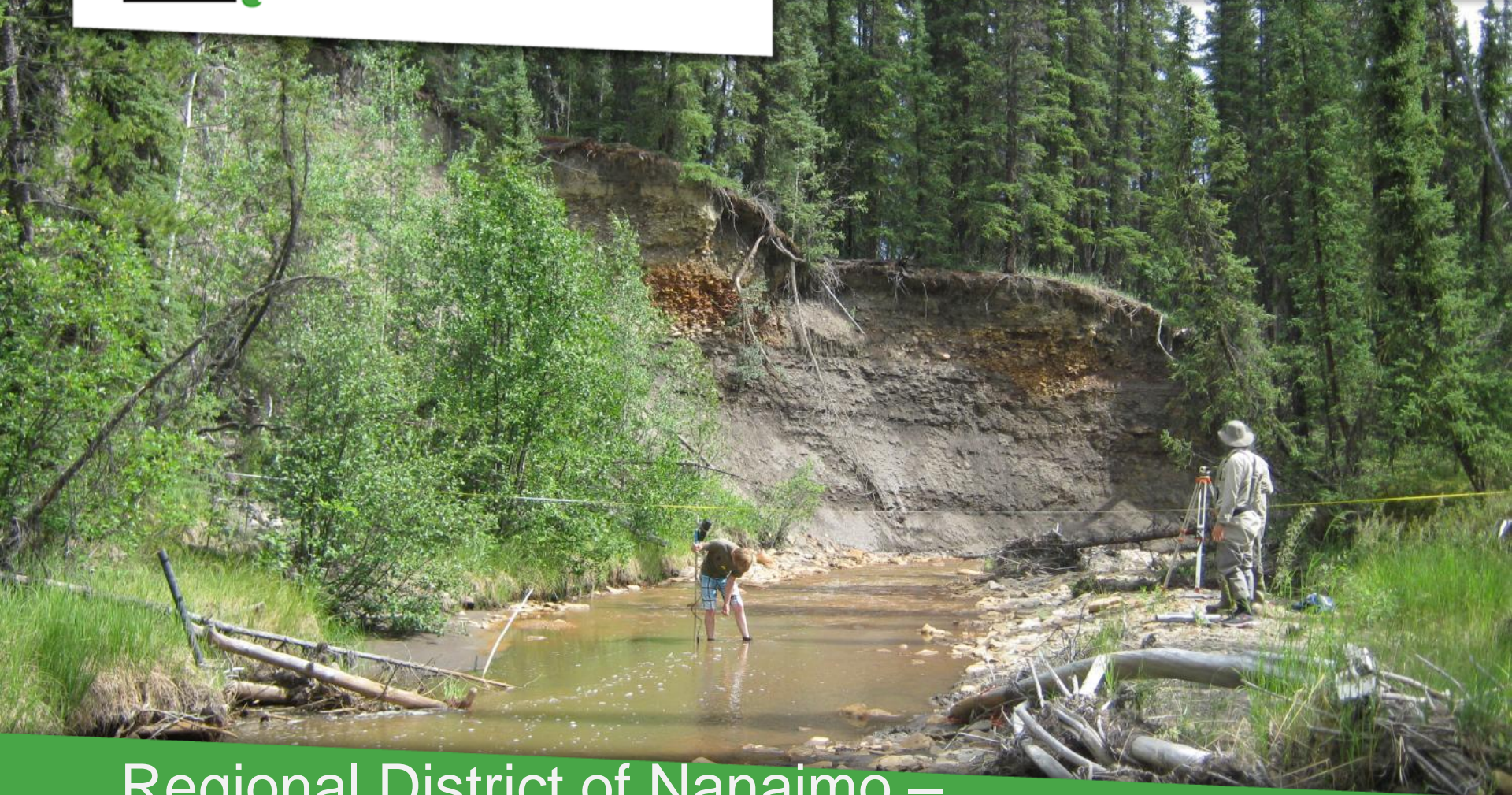
Regional
Hydrometric
and Climate
Monitoring

REPORTS





KERR WOOD LEIDAL
consulting engineers



Regional District of Nanaimo –
Drinking Water and Watershed Protection
Regional Hydrometric and Climate Monitoring Scoping Study

Outline

- Scoping Study Goals and Objectives Scope
- Review of Existing Climate and Hydrometric Monitoring Network
- List of Program Objectives and Ranking Criteria
- Data standards
- Introduction to hydrometric/climate monitoring stations and costs
- Next steps

Water Resource Inventory and Monitoring Program #2

Goal:

Improve information about the Region's water resources in terms of both quality and quantity, in **support of better land use decisions and public understanding.**

Objectives:

1. Inventory existing climate and water monitoring sites
2. Improve stream monitoring for water level, flow and temperature.
3. Improve groundwater monitoring
4. Catalogue and distribute data in consistent user-friendly format.

Data Gap identified in Water Budget Study

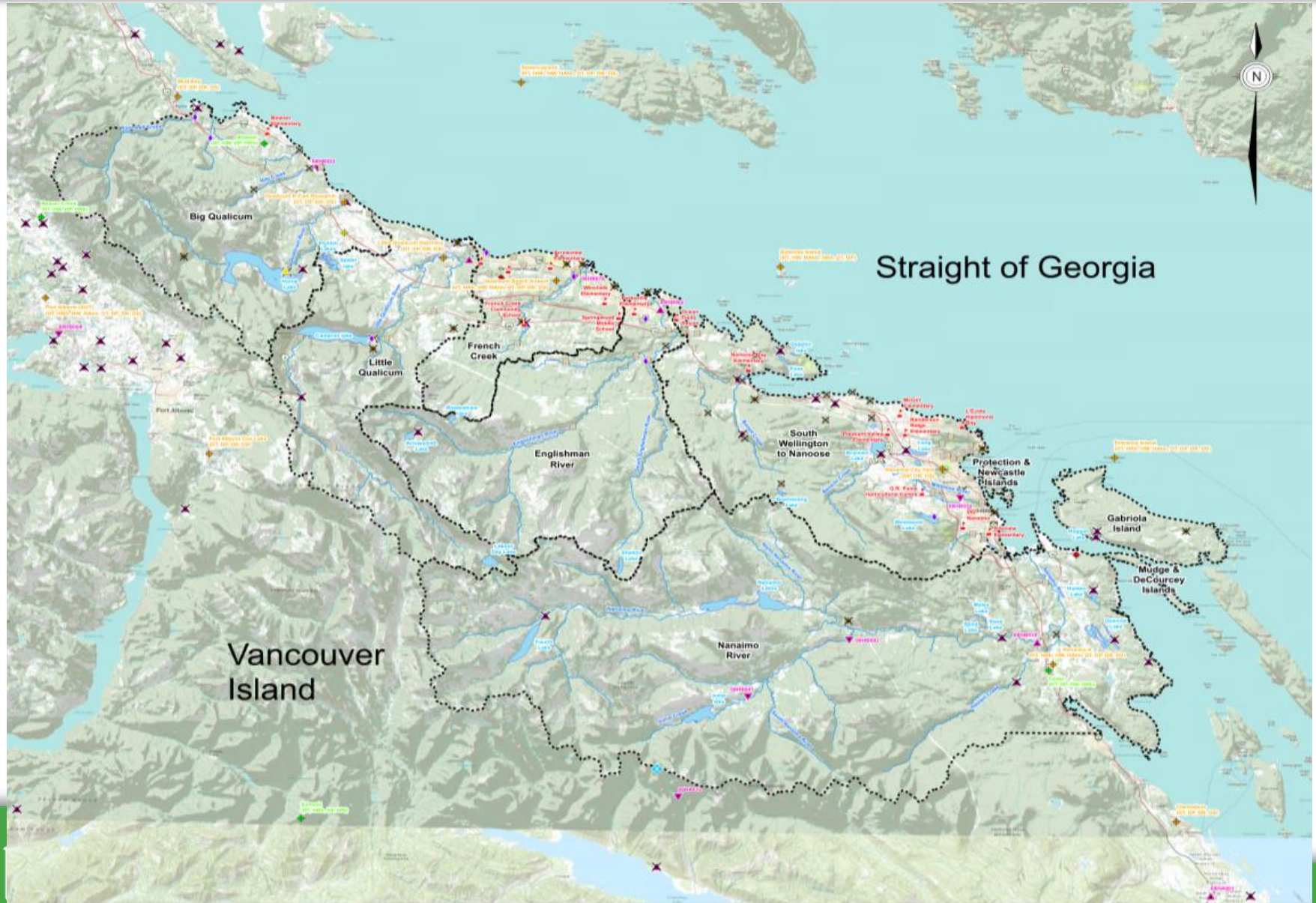
Scoping Study Scope

1. Summarize existing climate and hydrometric network
2. Review Program Goals and Objectives
3. Framework and Criteria for Ranking Potential Monitoring Sites
4. Recommend hydrometric and climate data standards
5. Recommend data catalogue and distribution system
6. Ranked list of recommended sites
7. Implementation Plan including costs for installation, maintenance and training
8. Identify potential stakeholders and partnerships in on-going maintenance of program.

Existing Hydrometric and Climate Monitoring

Agency	Data Collected	Number of Active Stations
Water Survey of Canada	Water Level, Stream Flow	8
Department of Fisheries and Oceans	Water Level, Stream Flow	3
BC Conservation Foundation	Water Level, Stream Flow	8
Environment Canada	Climate Data/Marine	8
MFLNRO	Climate Data	5
MFLNRO	Snow Data	2
School Monitoring Network	Climate Data	17
MoTI	Climate Data	1
Community Watershed Monitoring	Water Quality	50

Regional District of Nanaimo - Stations



WHY? Climate/Network Data Objectives from Stakeholders

- a) General Water/Climate Information/Public Awareness
- b) Water Resource Management -- Allocations & Operations
- c) Watershed Health Tracking
- d) Interpreting Water Quality Data and Groundwater Data
- e) Low Flow/Conservation Flow Monitoring
- f) Planning for impacts of Climate Change: Flood and Water Availability Forecasting
- g) Regional Water Availability Studies
- h) Land Use Decisions
- i) River Engineering and Drainage Design
- j) Others?

Partners / Stakeholders

Water Survey of Canada

Min. of Forests Lands Natural Resource Operations

Min. of Environment

BC Conservation Foundation

Municipal Water Purveyors

Regional District of Nanaimo

Vancouver Island University

Forestry Industry – Timber West & Island Timberlands

Potential Ranking Criteria

1. Existing Station?
2. Discontinued Station Location vs. Brand new site location
3. Specific Purpose vs. General Purpose
4. Natural vs. Regulated Watershed
5. Geophysical Characterization (Coastal Lowlands vs Mountain)
6. Watershed Size or Climate Station Density
7. Tie into Ground Water Monitoring Program
8. Site Access and Land Tenure

Data Standards – Resource Information Standards Committee

Developed by MoE Science and Information Branch - 2009

Station set-up and data quality guidelines

Data Grade	Description	Water Level Accuracy	Discharge Accuracy
Grade A*	Highest Level. Similar to National WSC Standard. Requires “perfect” field conditions to achieve.	< +/- 2 mm	< +/- 7%
Grade B	Same operational techniques with allowance for more difficult field conditions.	< +/- 5 mm	< +/- 15%
Grade C	Manually operated sites. Less rigorous procedure for rating curve.	< +/- 1 cm	< +/- 25%

* Grade A also includes Grade A R/S for rated structures (weirs, etc.)

Climate Station Standards

1. World Meteorological Organization Standards
2. Environment Canada Standards
3. Forest Weather Network Standards (MFLNRO)
4. RISC – Snow Pillow Standards



Hydrometric Monitoring

1. Select location with stable channel
2. Develop Rating Curve
(Water Level vs Flow Relationship)
 1. Measure Water Level
 2. Calculate Flow using Rating Curve
 3. Update Rating Curve as necessary



Site Considerations

1. Automatic vs Manual
2. Telemetry for real time data?
3. Continuous vs. Spot measurements

Costs

Hydrometric Stations – Install cost \$10,000 to \$20,000

Maintenance \$8,000 to \$15,000 per year

Climate Station – Install cost \$5,000 to \$10,000

Maintenance Costs – depends on location

Snow Pillow - Install cost \$30,000 to \$40,000

Maintenance cost \$10,000 to \$15,000 per year

Spot Flow Measurements – costs for training (volunteers) ~\$550,
equipment purchase \$\$ or rental ~\$175/day

Next Steps

1. Refine Goals/Objectives
2. Refine ranking criteria
3. Site Ranking
4. Implementation plan/costs
5. Identification of potential stakeholders and partners

Draft Report Prior to End of 2014



Thank you

Contact:

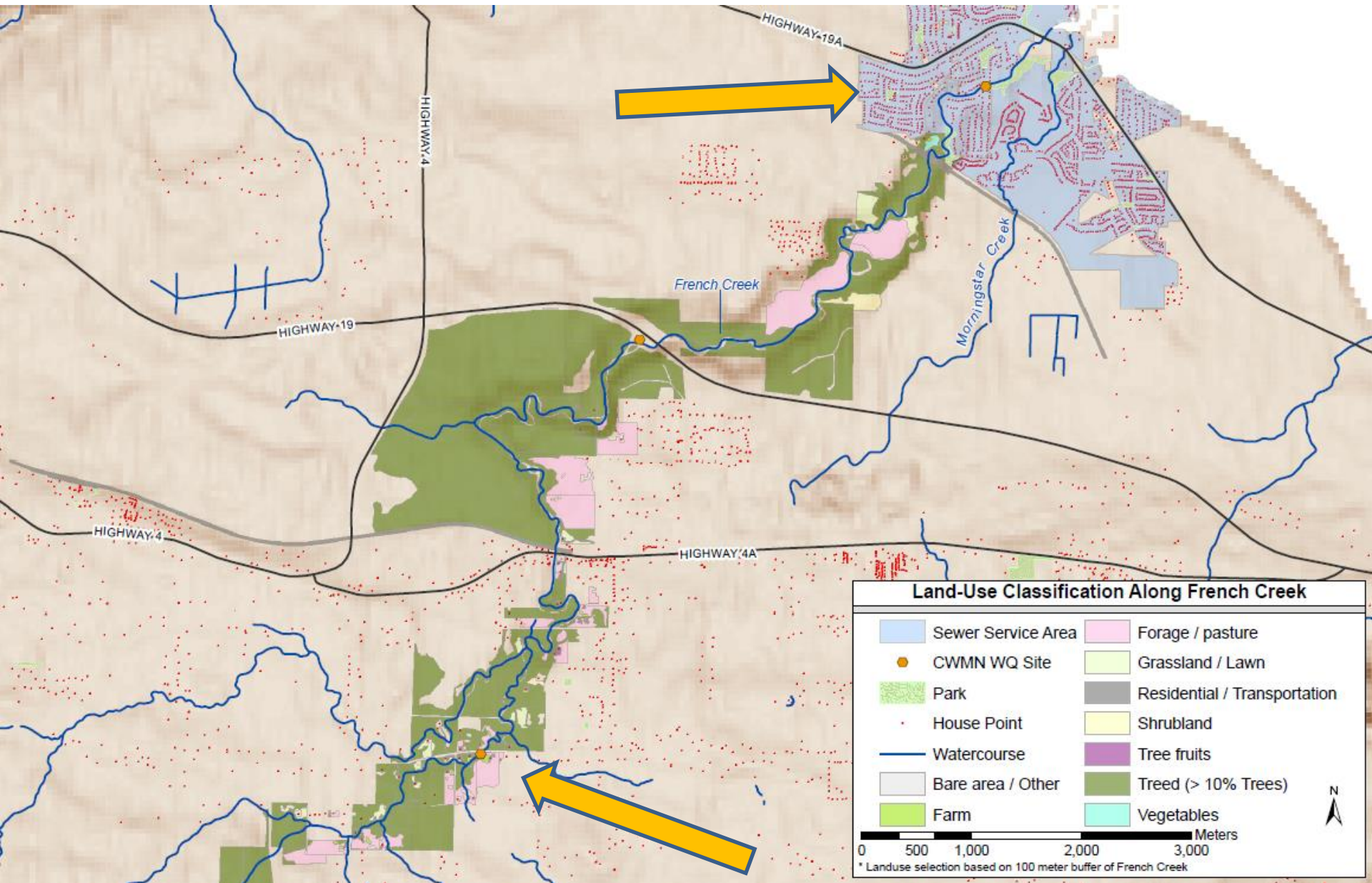
**Craig Sutherland
Kerr Wood Leidal Associates
Ltd.
250-595-4223**

- 3-Year Trend Report, MOE
- Analyze water quality data from sample periods in 2011 – 2013
- Covers the data collected by 5 stewardship groups
- Has helped inform monitoring in 2014

Community
Watershed
(Water Quality)
Monitoring
Network



REPORTS



Program Action 5:
Water Use Management
Program Action 2:
Water Resources
Inventory & Monitoring

Water Use Reporting Centre

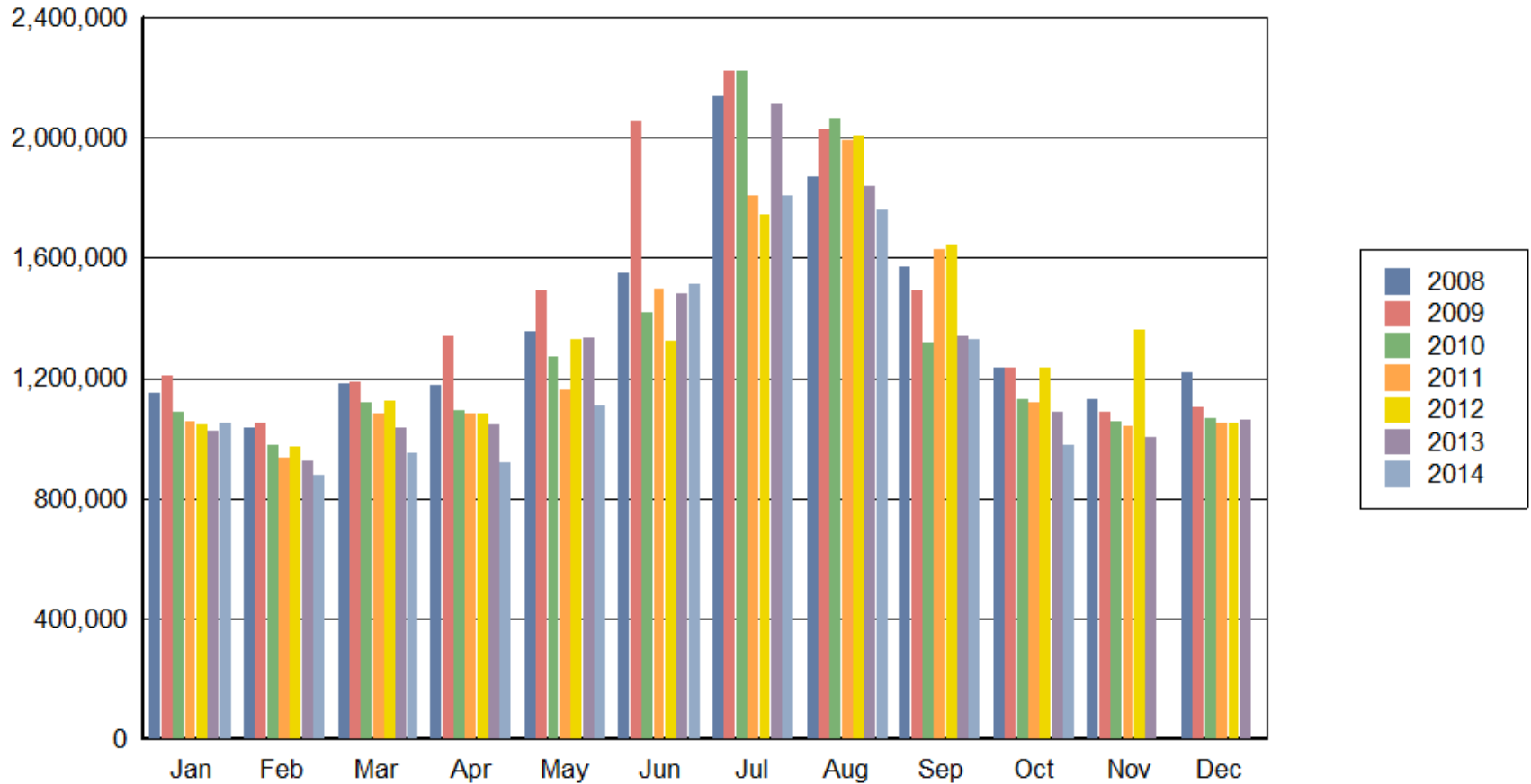
- BC WURC - purpose is to serve as a secure interface to store demand (and supply) data to help improve water budget calculations and inform water allocation decisions
- Regional /basin-wide view of water use
- Track trends over time, produce reports easily
- Implemented in 2014 for RDN municipal water purveyors – *thank you for data input!*
- Plan to roll-out to Improvement Districts and other large users in the RDN spring 2015

UPDATES



Monthly Total Water Consumption

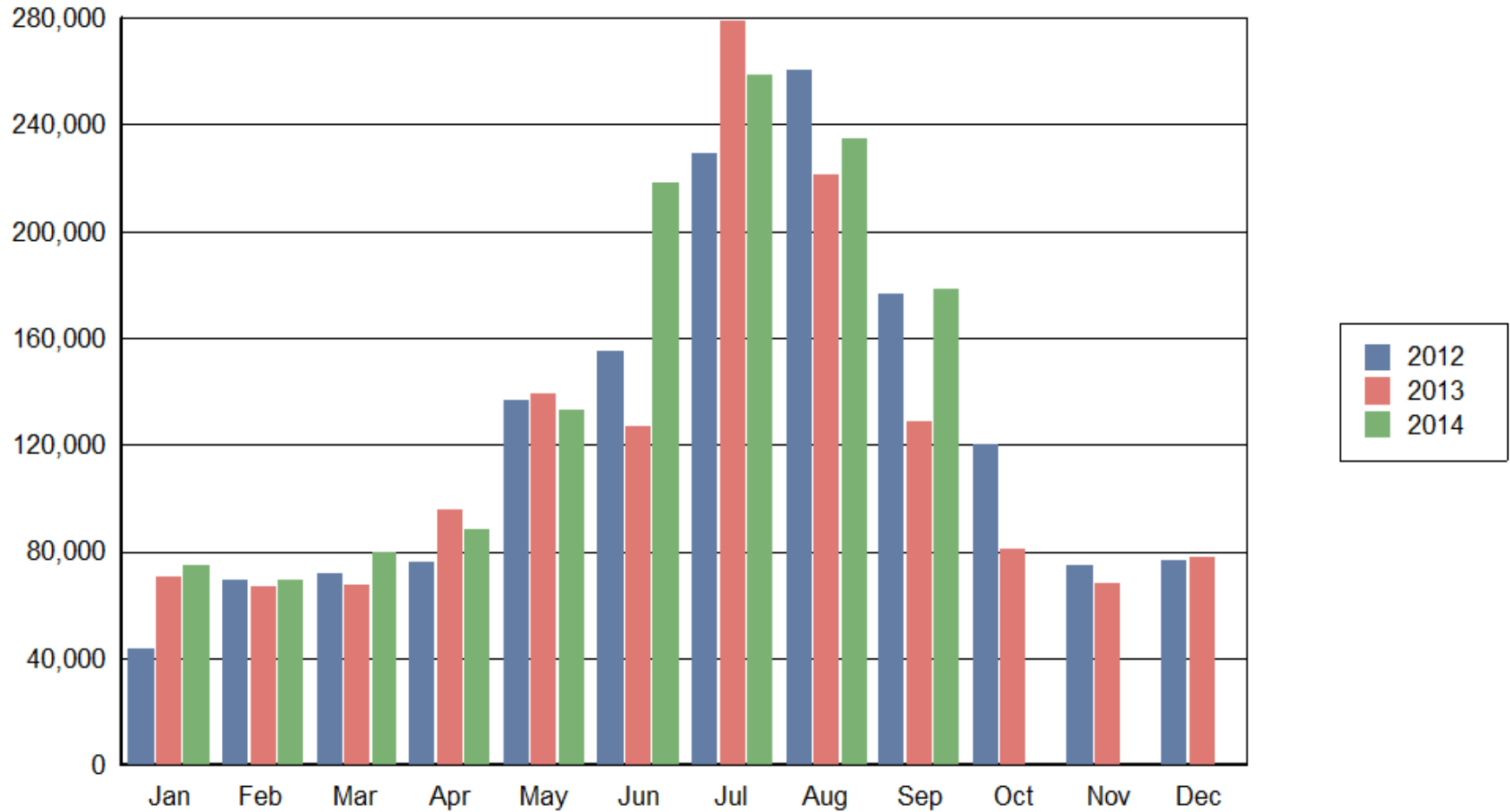
CITY OF NANAIMO All water usage 2008 - 2014



cubic meters (m3)

Monthly Total Water Consumption

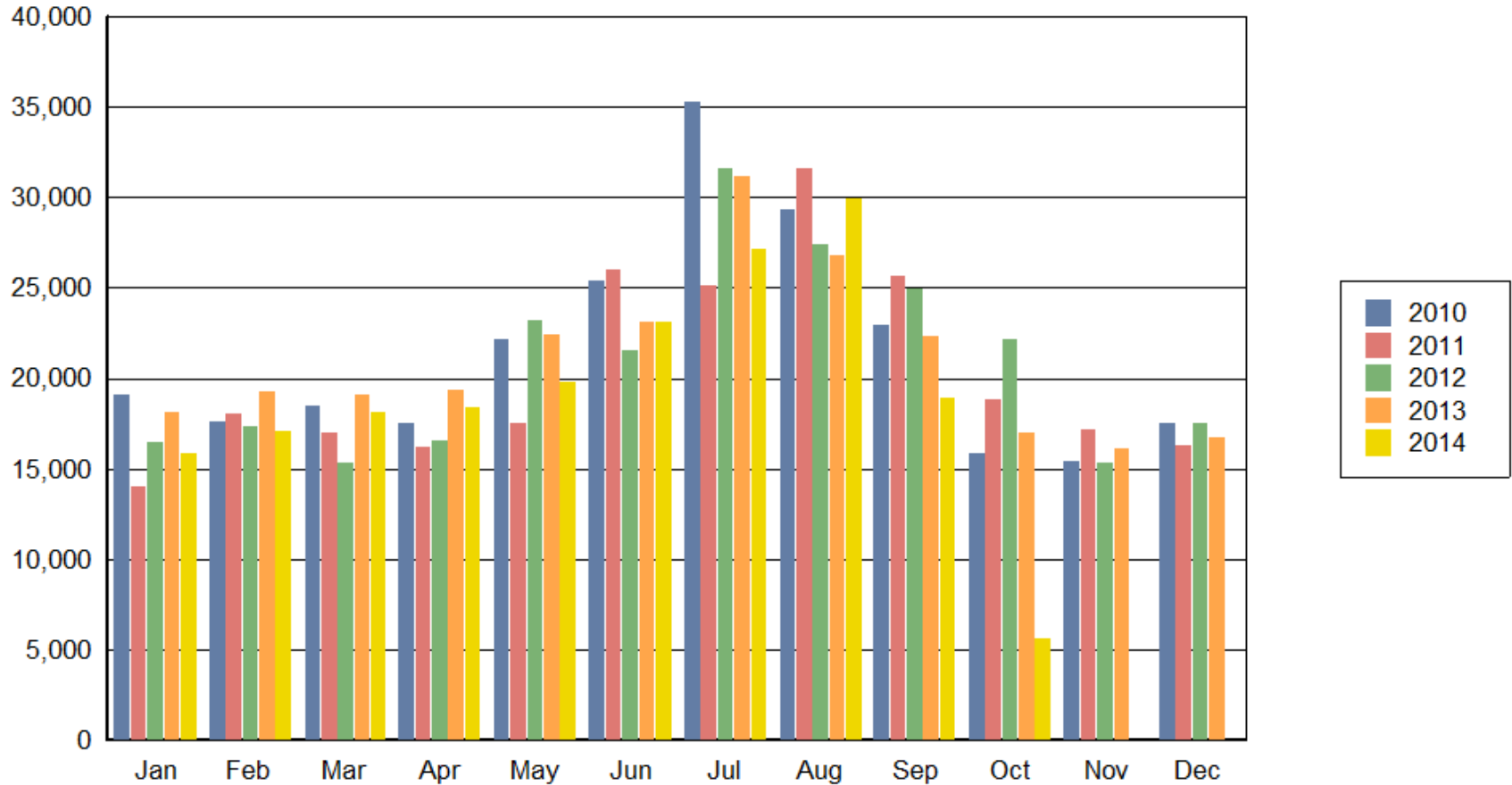
TOWN OF QUALICUM BEACH All water usage 2012 - 2014



cubic meters (m3)

Monthly Total Water Consumption

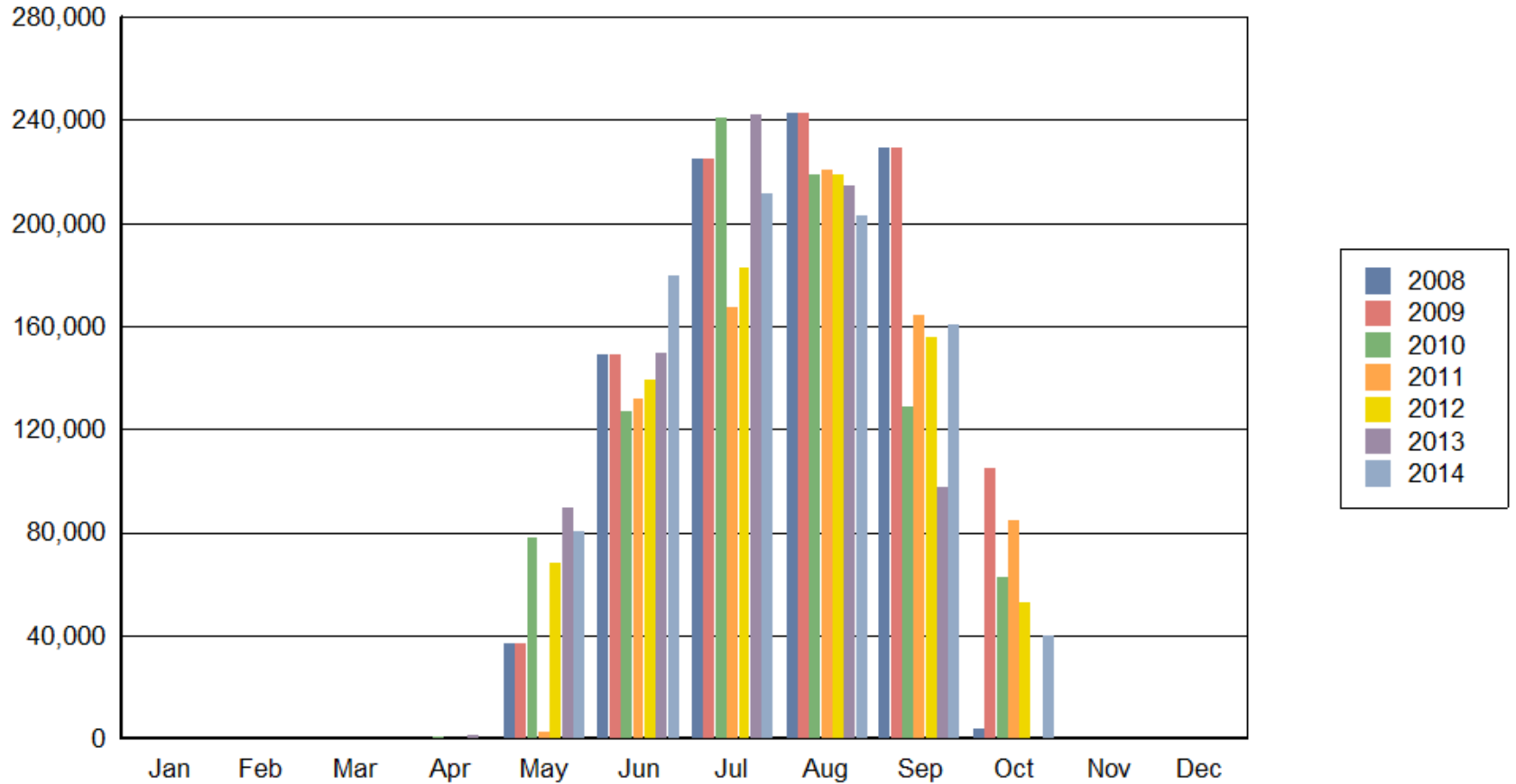
DISTRICT OF LANTZVILLE All water usage 2010 - 2014



cubic meters (m3)

Monthly Total Water Consumption

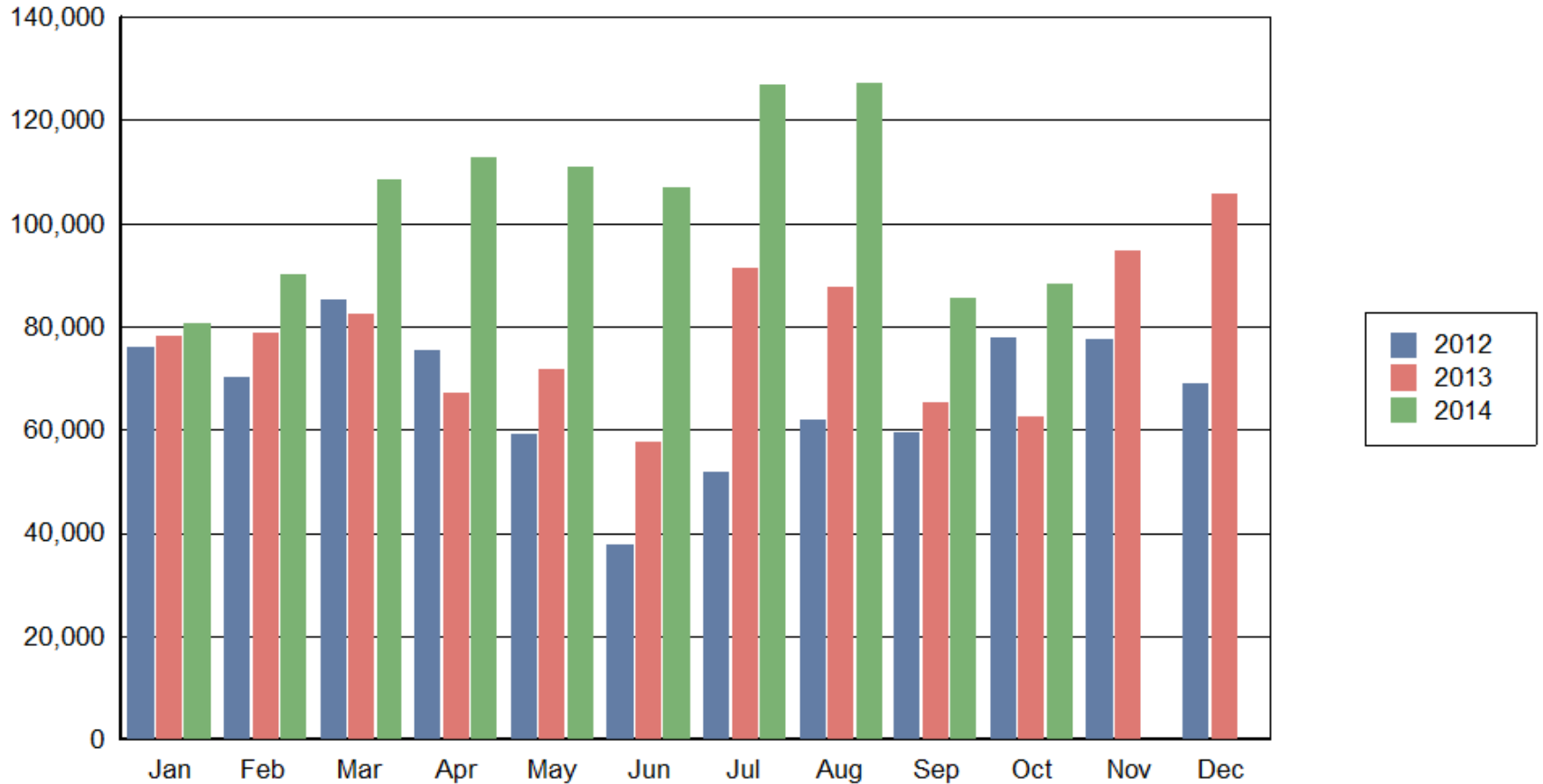
ARROWSMITH WATER SERVICE All water usage 2008 - 2014



cubic meters (m3)

Monthly Total Water Consumption

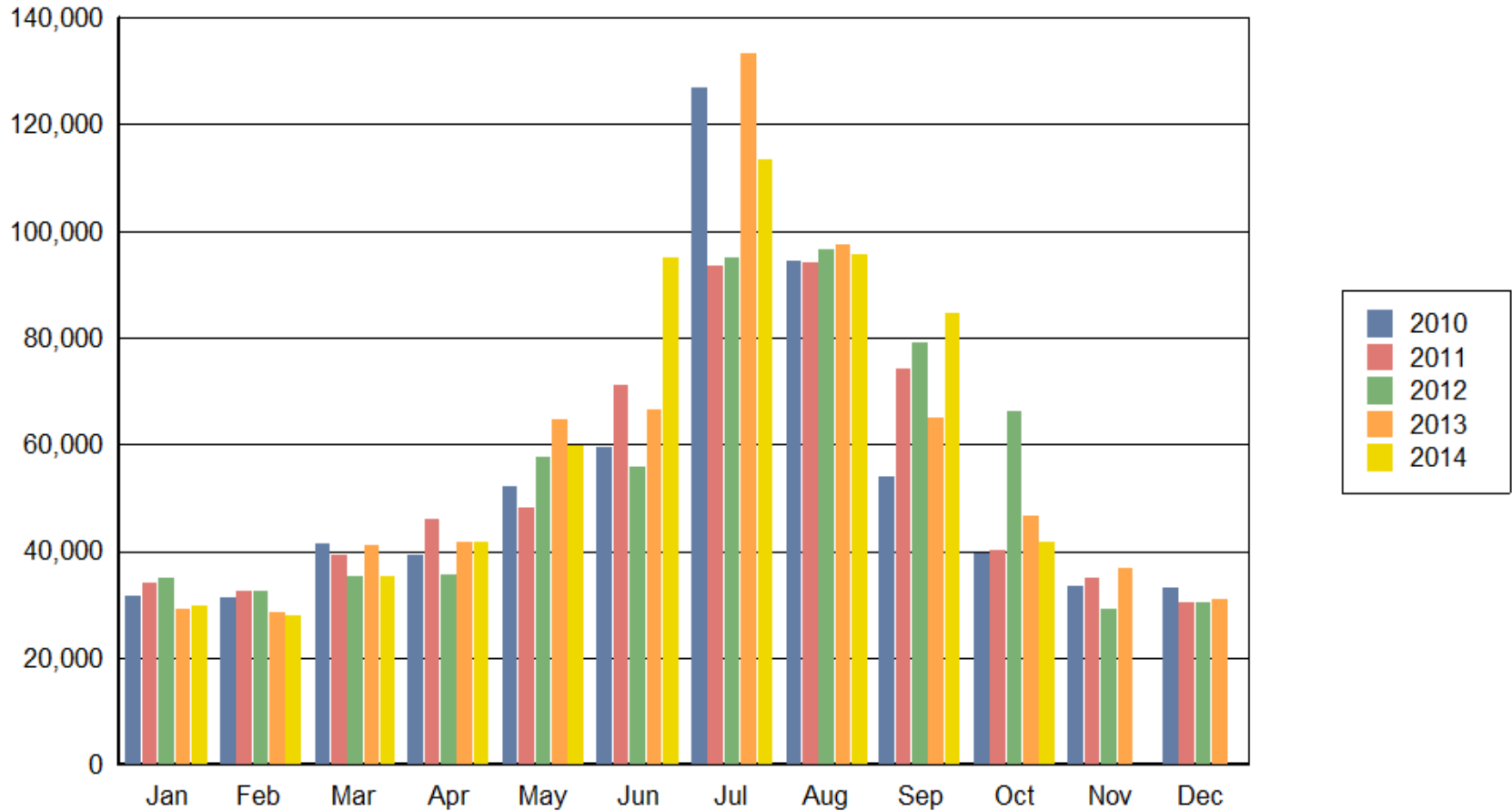
CITY OF PARKSVILLE All water usage 2012 - 2014



cubic meters (m3)

Monthly Total Water Consumption

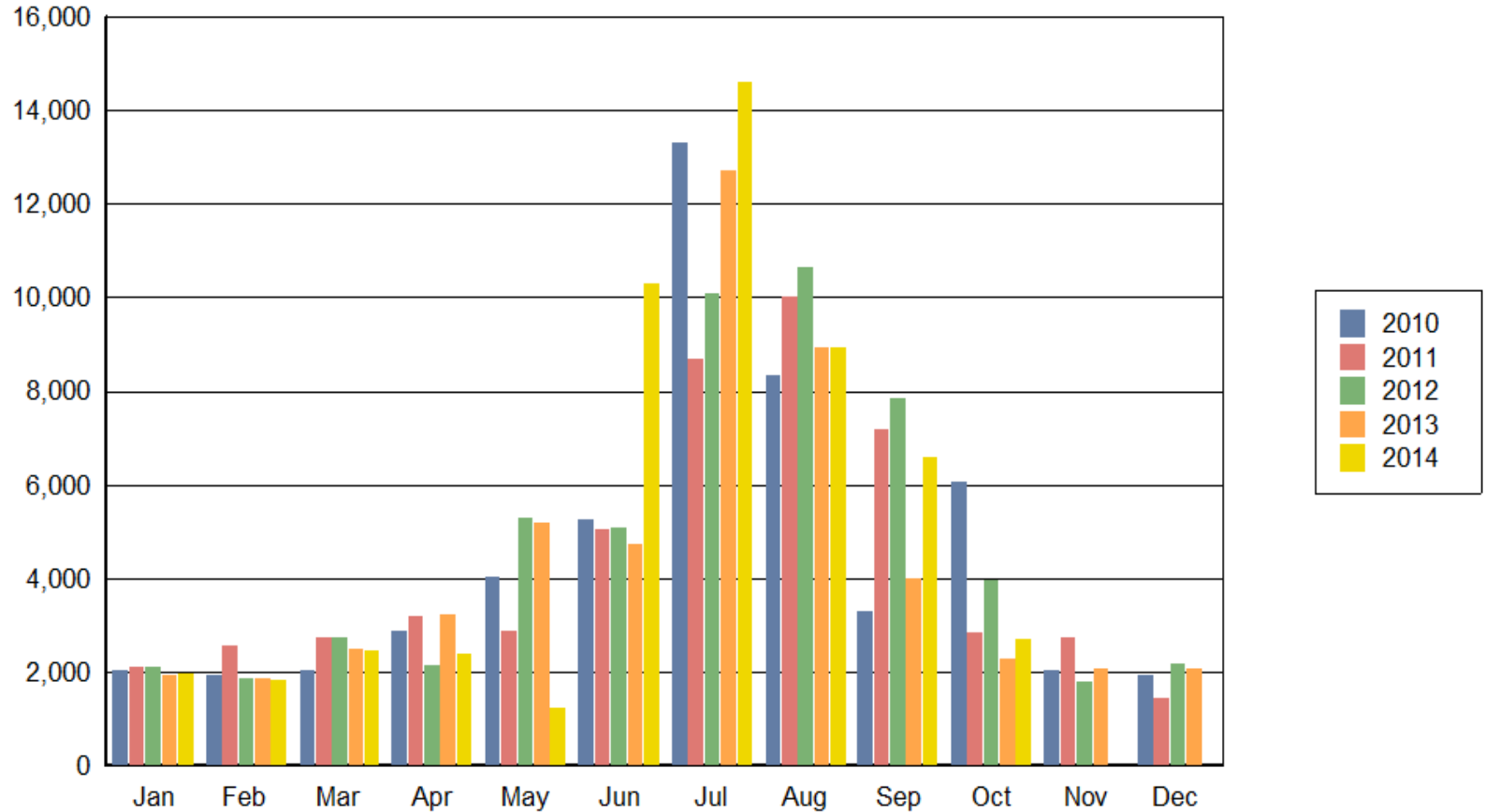
RDN Nanoose Bay Peninsula All water usage 2010 - 2014



cubic meters (m3)

Monthly Total Water Consumption

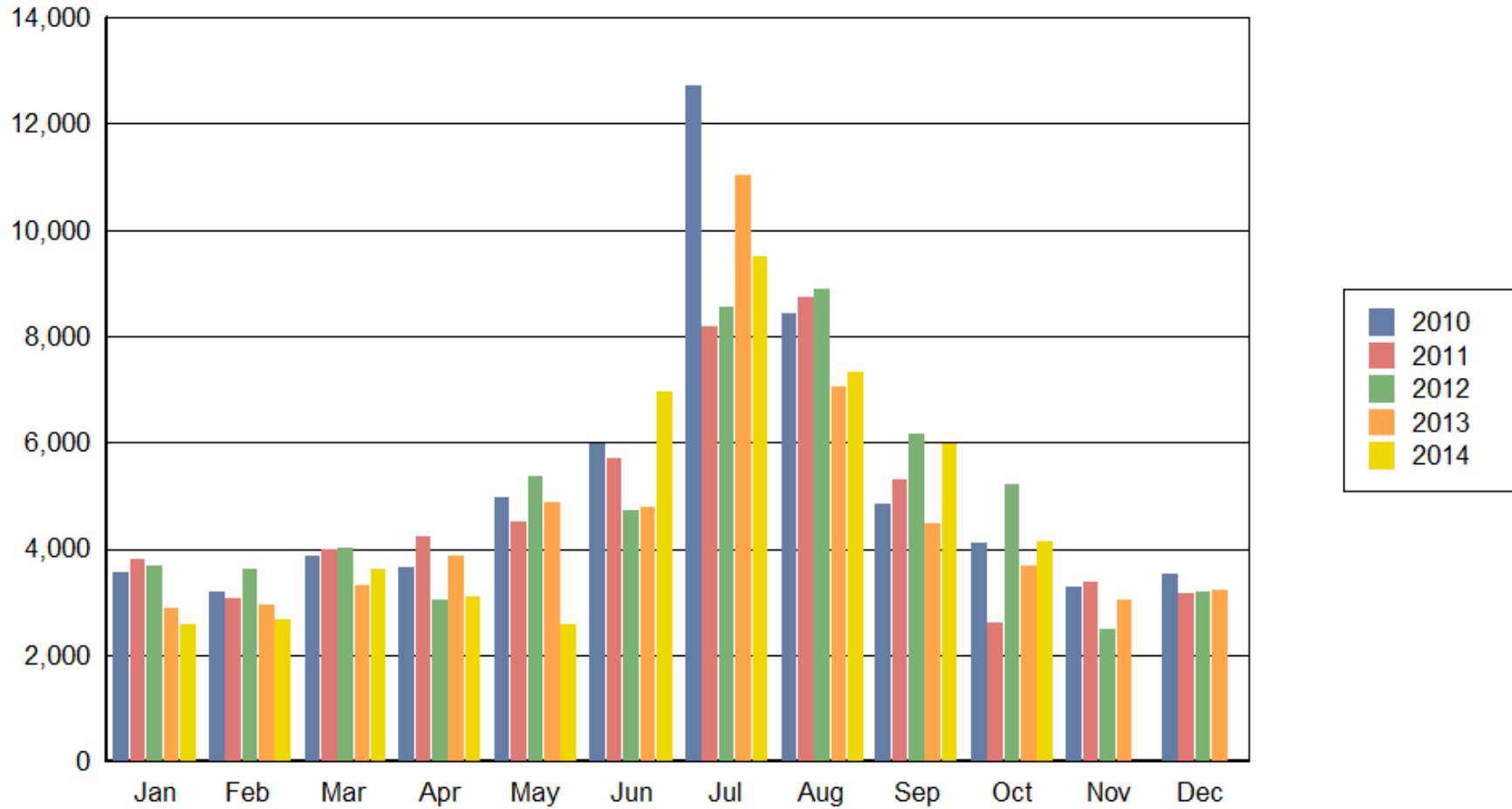
RDN Englishman River All water usage 2010 - 2014



cubic meters (m3)

Monthly Total Water Consumption

RDN French Creek All water usage 2010 - 2014



cubic meters (m3)

Resources

Utility: CITY OF PARKSVILLE

Board Hydrometric Locations

RESOURCE is designed to be a... provides a familiar look at... water resource performance... Comparison utility: Please Select

Metrics

Water Usage (m³)

Bar Graph | Pie Chart

Category	Oct 2013	Oct 2014
Commercial	~20,000	~25,000
Residential	~45,000	~60,000

Category	YTD 2013	YTD 2014
Commercial	~20,000	~30,000
Residential	~50,000	~70,000

Consumption (Litres/person)

Month	2013	2014
October	5,073	7,141
Comparison	0	0

Year-to-date

Category	2013	2014
You	67,755	83,933
Comparison	0	0

Water Storage (%)

0% | 0%

Please Select | Please Select

History of Water Levels

No data exists | No well selected

Monthly Comparative Metrics:

- Utility Water Usage – this year and last year + YTD
- Comparison with other Utility in the Region
- Water Storage % (surface water)
- Groundwater Levels
- Precipitation – this month this year and last year + YTD
- Temperature – Today's Temp vs. avg / max/ min for the month
- Evapotranspiration - current vs average
- Drought Level
- Snowpack



Non-comparative Metrics

Precipitation (mm)

Temperature (°C)

26.6°C -1.8°C
MAX TEMP MIN TEMP
AVERAGE TEMP: 9.5°C

11.4°C 2.0°C
MAX TEMP MIN TEMP
NOV-22-2014

Source: Environment Canada
Location: Quilicum Airport

Evapotranspiration (mm)

Snowpack

Data not available

Drought Level

1. Normal
2. Dry
3. Very Dry
4. Extremely Dry
5. Loss of Community Supply

Program Action 5:
Water Use Management
Program Action 2:
Water Resources
Inventory & Monitoring

A blue hexagonal shape with a white shadow underneath, containing the text "Water Use Reporting Centre" in white. The hexagon is tilted slightly to the right.


Water Use Reporting Centre

- New development: the BC WURC will have capacity to house / display hydrometric data (non- WSC sites included) thanks to Okanagan BWB
- The Province of BC (MOE and MFLNRO) has expressed interest in exploring BC WURC as a provincial reporting tool to fit within the new Water Sustainability Act.

UPDATES



Program Action 1:
*Public Awareness
and Involvement*



Team
WaterSmart
Education and
Awareness

- School Field Trips
- Rebate Programs
- Irrigation Check-up Stats
- Graphical Water Billing Feedback

UPDATES



School Watershed Field Trips

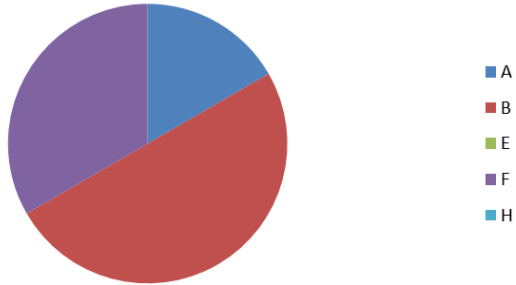
- “The pre-trip activities package was excellent. Students were well-prepared for the experience. Student response to the experience was very positive overall. THANK YOU!” – Mrs. Creighton, Departure Bay School, Gr. 4





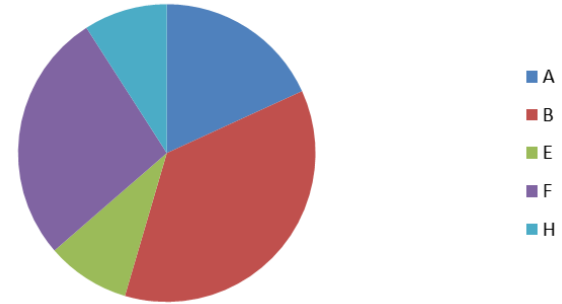
Rural Water Quality Stewardship Program 2014

surface seal redone (6 total)
\$1800 rebate dollars



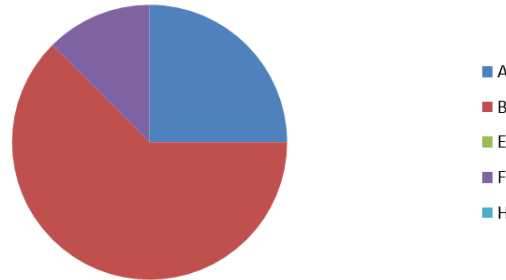
BEFORE

cap replaced (11 total)
\$550 rebate dollars



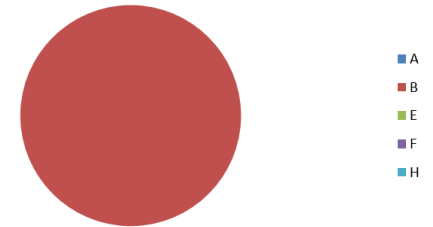
AFTER

stick-up redone (8 total)
\$1600 rebate dollars



BEFORE

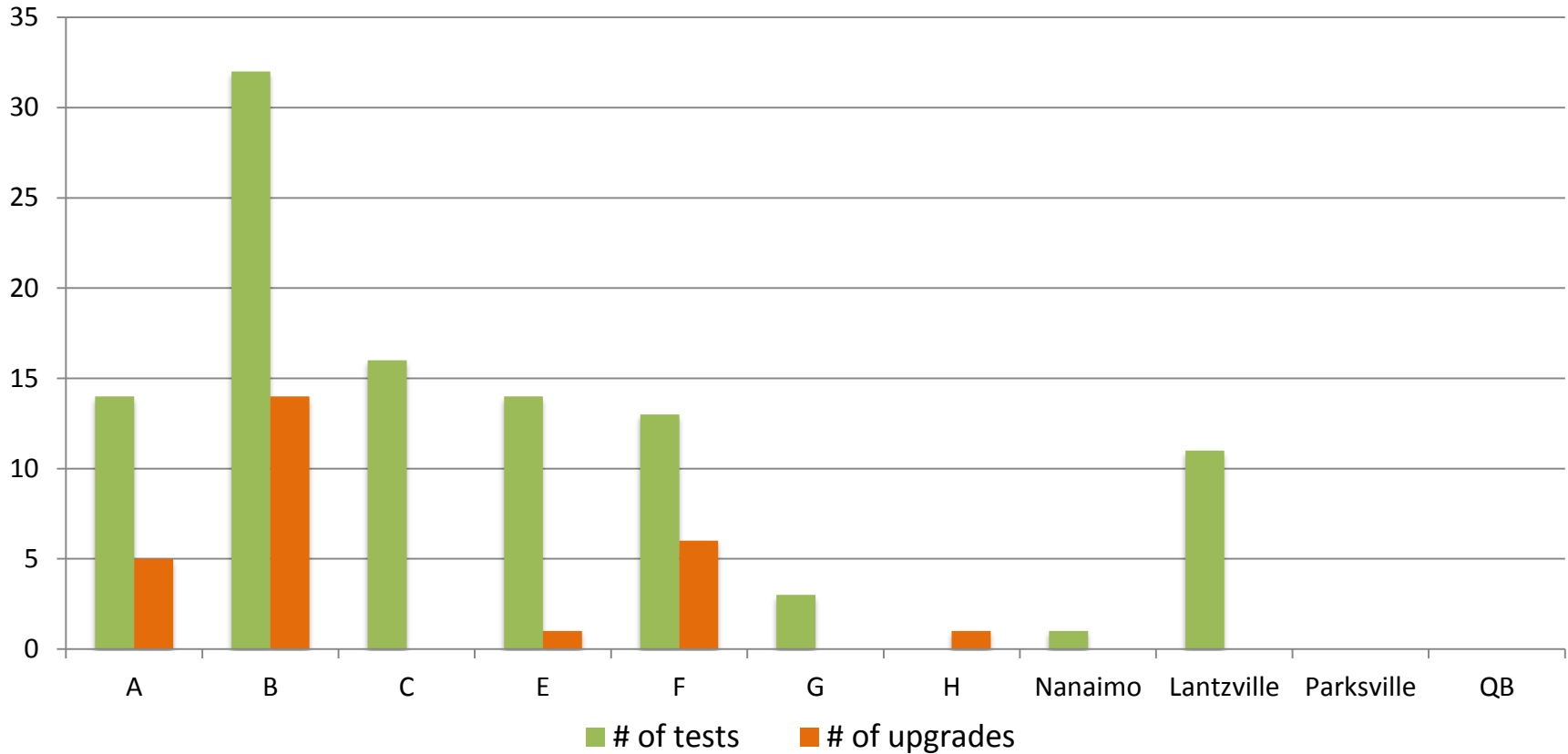
well closure (1)
\$500 rebate dollars



AFTER

Rural Water Quality Stewardship Program 2014

Rural Water Quality Stewardship Program Rebates by Type & Area



Rural Water Quality Stewardship Program 2014



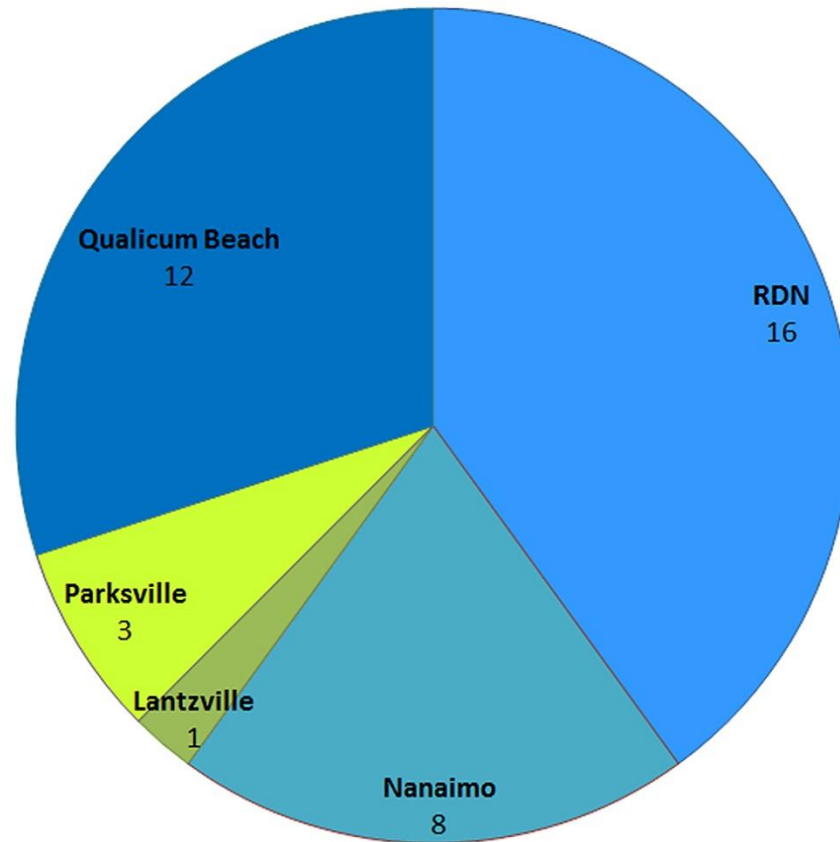


Rainwater Harvesting Incentive Program 2014



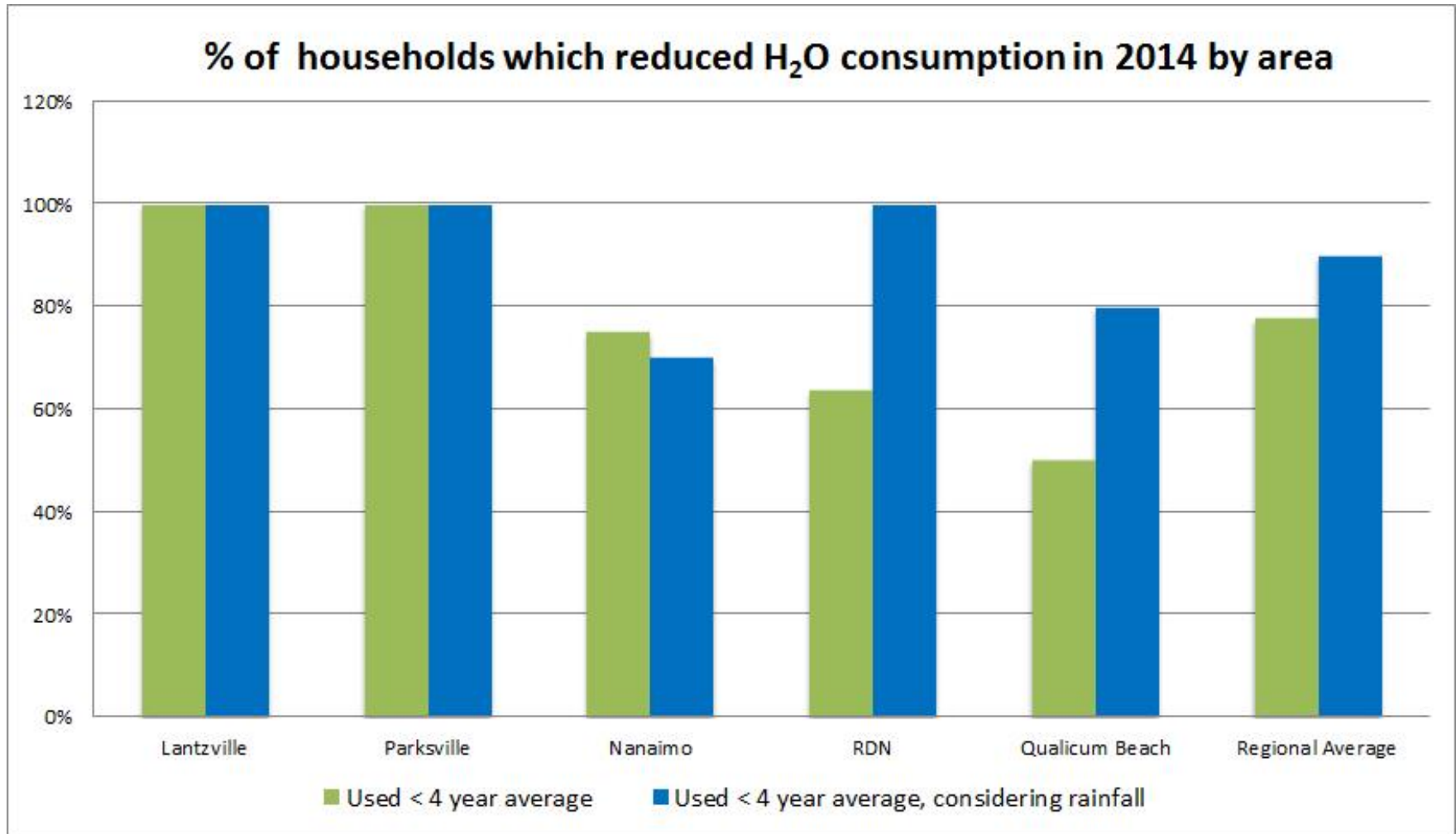
Residential Irrigation Check-ups

2013 Check-Ups by Area



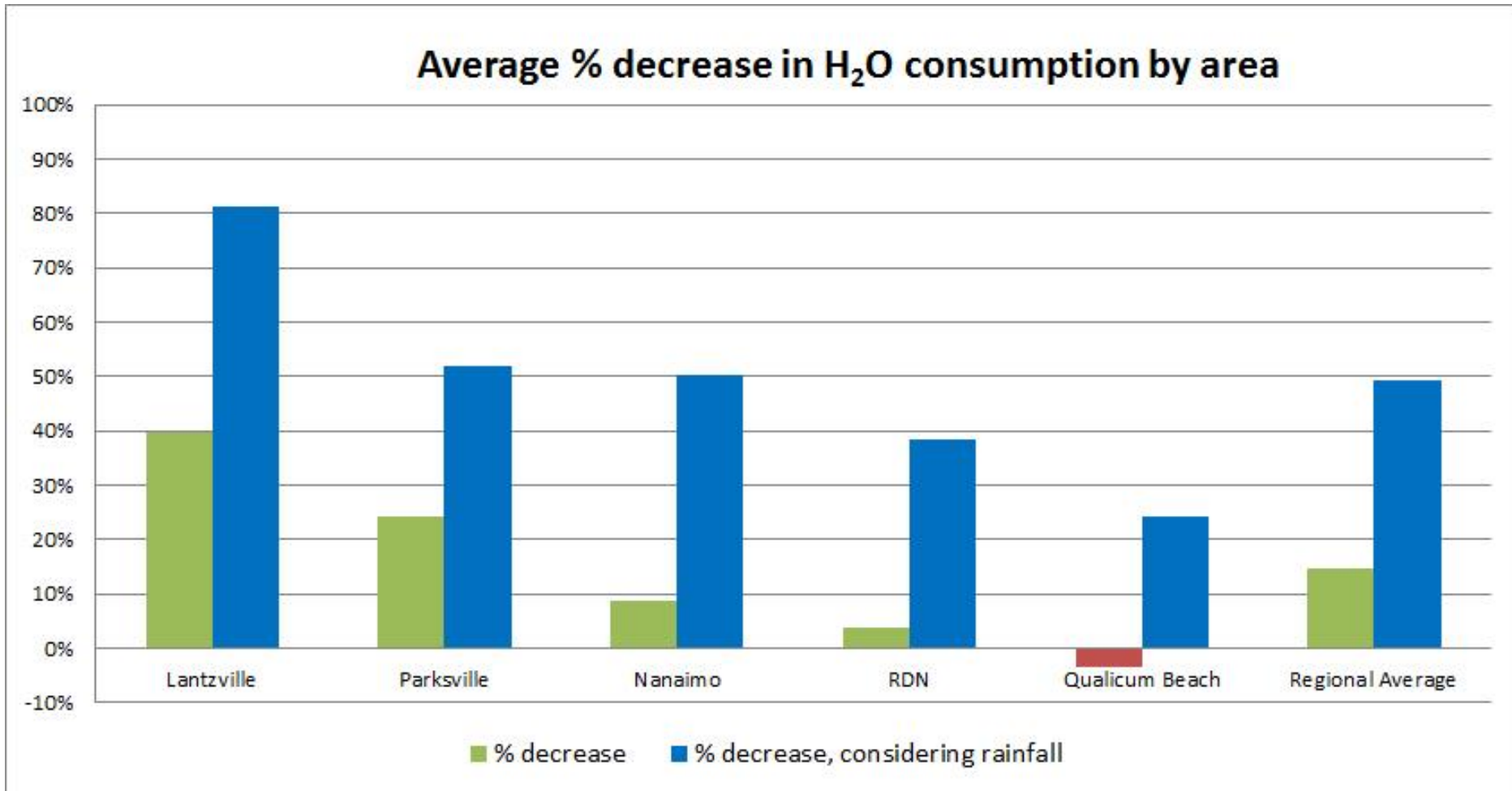
UPDATES

Residential Irrigation Check-ups (2013)



UPDATES

Residential Irrigation Check-ups (2013)



UPDATES

Graphical Water Billing Reports

Your Water Score

Dear RESIDENT household:
Your water consumption at 000 STREET ST for the Summer of 2014 was 1.00 cubic meters (264.17 gallons) per day. The following report summarizes your water usage for the last billing period based on actual water meter readings.

[October 10, 2014]

Account Number: 0000000
Service Address: 000 STREET ST

Please turn over the page to view your home water consumption report for 000 STREET ST. This report expands upon the information presented in your household's recently received water bill. Seeking to reduce your consumption? Visit www.teamwatersmart.ca to find out how!

HOW YOU'RE DOING:



Skillful Saver



Room for Improvement



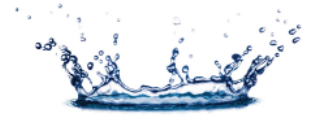
Take Action

HOW YOU COMPARE:



CHALLENGE YOURSELF! REDUCE YOUR HOUSEHOLD CONSUMPTION EACH YEAR

SURFSIDE RESIDENT
000 STREET ST
City, BC
CANADA
A1A1A1



Water Home WATER CONSUMPTION Report

frequently asked Questions

1. Are these consumption statistics specific to my water service area?

Consumption statistics are calculated from actual meter read information and are specific to your RDN water service area. Therefore, the statistics featured in this report describe consumption for the Surfside Water Service Area only.

2. How is the figure for daily consumption in efficient households calculated?

This figure is the average daily consumption of "Skillful Savers" in your service area. These households consume 0.7 cubic meters of water or less per day.

3. How is the average daily consumption of households calculated?

Daily consumption is calculated by dividing the water consumption for your entire water system by the number of meters read. This number is then divided by 123 days for the summer billing period.

Why 123 days? Billing periods may fluctuate in length by a couple of days from year to year, and meter reads for larger water systems may have to take place over a number of days. A standard billing period figure allows for consistency when comparing average consumption from year to year.

4. How was I sorted into one of the three consumer categories?

Consumer categories are linked to the 2014 RDN Water Systems Rate Structure. See below for consumption ranges in each category:

- 0.7 cubic meters per day or less — Skillful Saver
- 0.71 to 2.1 cubic meters per day — Room for Improvement
- 2.11 cubic meters per day and up — Take Action

Please see your recently received water bill for more information about the 2014 RDN Water Systems Rate Structure.

5. Can I keep track of my household water consumption myself, instead of waiting for a bill or report to arrive in the mail?

Yes you can! Find your water meter (located in a box in the ground near the property line), and write down the digits shown on the meter dials. These dials show cumulative water usage in cubic meters (1 cubic meter = 220 imperial gallons). By subtracting the reading from your last water bill from the new reading, you can figure out the volume of water used since the last meter reading (in cubic meters). Then you can calculate the average volume of water used per day by dividing the volume of water used by the number of days since the last meter reading.

6. My household water consumption was higher than I expected. How can I check if I have a leak?

The best method to determine if there is a leak on your property is to turn off all sources of water in the house and garden, and then locate the water meter. Check the dial on the meter for movement. If no movement is observed, record the present reading and wait 30 minutes, then read the meter again. If the meter shows movement or has shown consumption in 30 minutes, something is leaking, and you will need to search around your property to find the leak.

7. I have a question not addressed in this FAQ. Who can I contact for more information?

Water conservation and WaterSmart tips:
Team WaterSmart, 250-390-6560 or teamwatersmart@rdn.bc.ca

Water consumption:
Water and Utility Services Department, 250-390-6560

Try these WaterSmart solutions . . .



Xeriscape your garden



Choose efficient appliances



Irrigate only when necessary

Visit www.teamwatersmart.ca for more WaterSmart solutions

Turn over the page for more information about this Home Water Consumption Report.



**WATERSHED PARTNERSHIPS
SESSION at Nanoose First Nation
and the Englishman River**

Sept. 26, 2014

Other updates, comments from
committee members?



*Thank You! ...for your feedback and guidance as we
work together for our water*