

RDN Drinking Water & Watershed Protection Program

Technical Advisory Committee

April 13th, 2016



PRESENTATIONS

VIU Research Partnership Wetland Mapping Project Update	Nelson Lovestrom
Climate Change & Agricultural Water Requirements	Dr. Alan Gilchrist
New Groundwater Regulations – BC WSA	Pat Lapcevic
Water Day 2016 – Recap	Lauren Fegan
Region-wide Watering Restrictions Framework & Website	Julie Pisani
Nanoose Water Monitoring – Phase 2 Water Budget	Mark Bolton
Support for Stewardship Groups	Julie Pisani



DRINKING WATER
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PROTECTION

WETLAND MAPPING



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CLIMATE CHANGE & AGRICULTURAL WATER DEMAND

The Impact of Climate Change on Crop Water Requirements for Vancouver Island

Alan Gilchrist, Ph.D., P. Geo.

Department of Geography
Vancouver Island University



Introduction

- Agriculture on Vancouver Island is mainly along the east coast between Victoria and Campbell River
- Climate is historically cool & wet winters, warm and dry summers
- Natural vegetation is adapted to climate
- Agricultural crops typically require irrigation to supplement the natural supply of water, to prevent wilting of plants in summer.

Impact of Global Warming

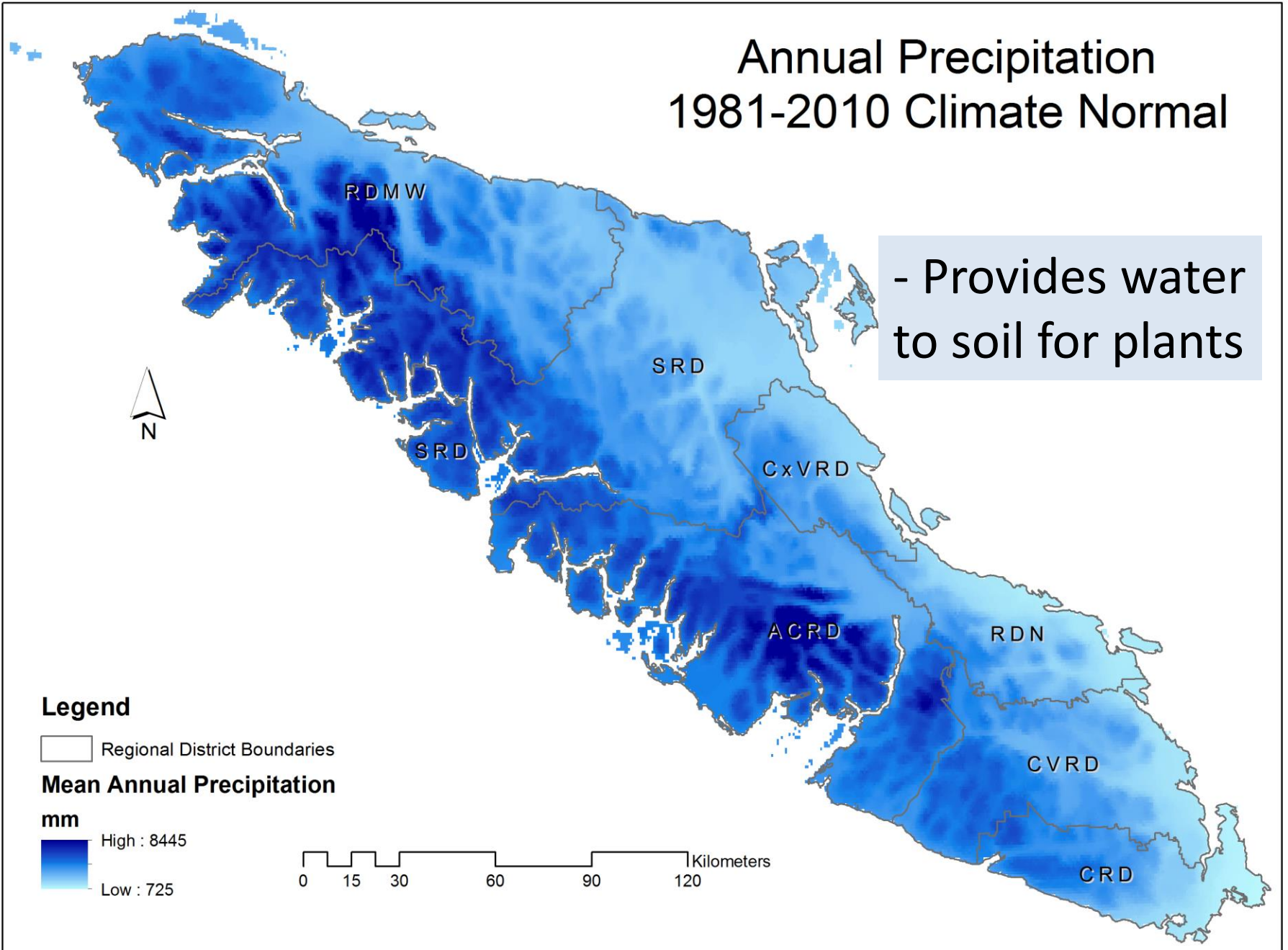
- Climate change - global warming – is due to human emissions of greenhouse gases
- Global Circulation Models predict:
 - General warming (summer & winter)
 - Slight increase in annual precipitation
 - More seasonal precipitation (less in summer, more in winter)
- This suggests there will be a future need for more crop irrigation, which is investigated by this research.

Model Formulation

- Calculated annual soil moisture balance due to precipitation, evapotranspiration and crop needs
- Used a simplified version of the BC Agriculture Water Demand Model
- Need data:
 - Soils texture
 - ClimateBC (historical and future climates)
 - Crops (assume “average crops” to show effect)
- Compared to BC Agriculture calculations.

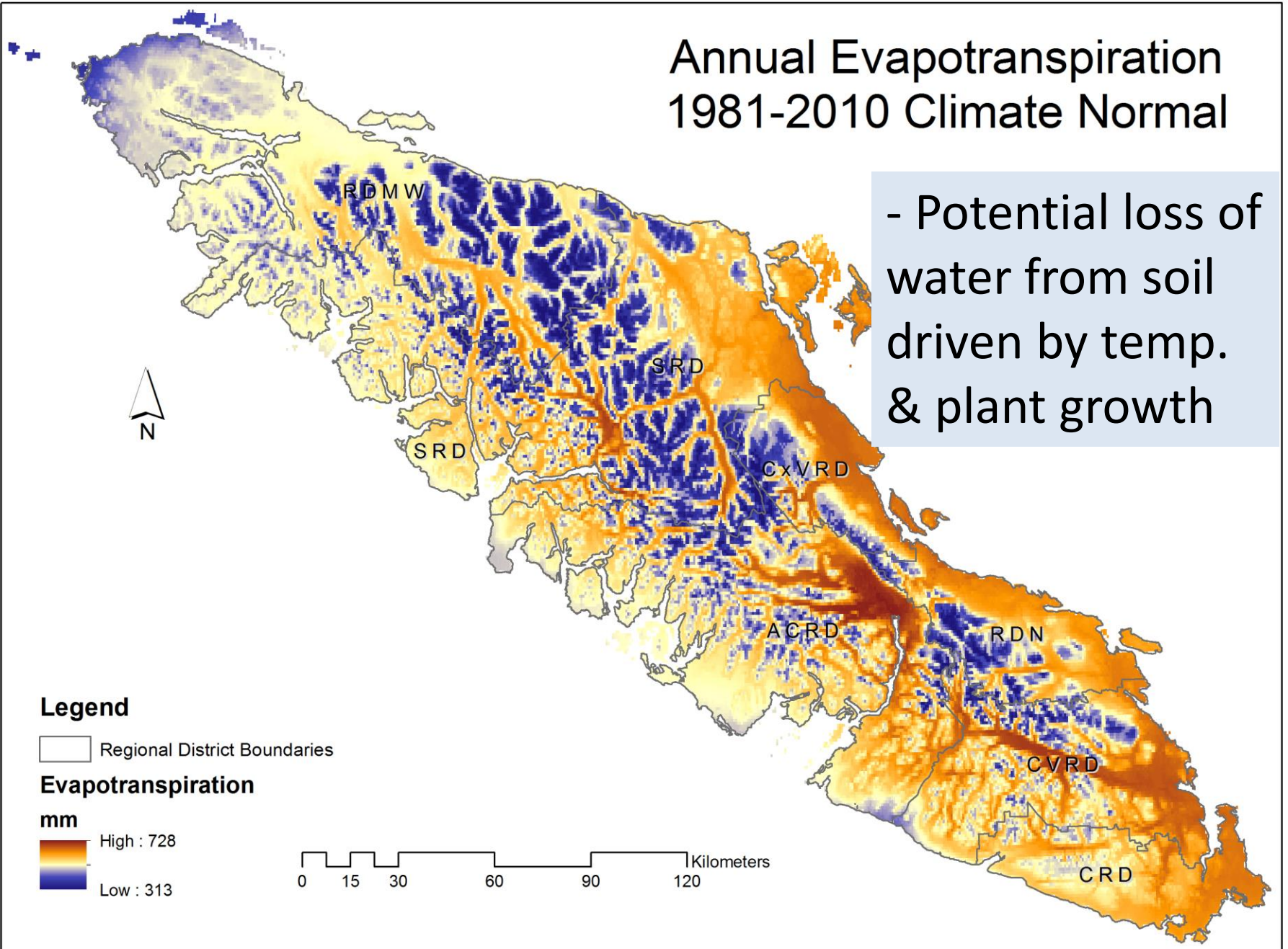
Annual Precipitation 1981-2010 Climate Normal

- Provides water
to soil for plants



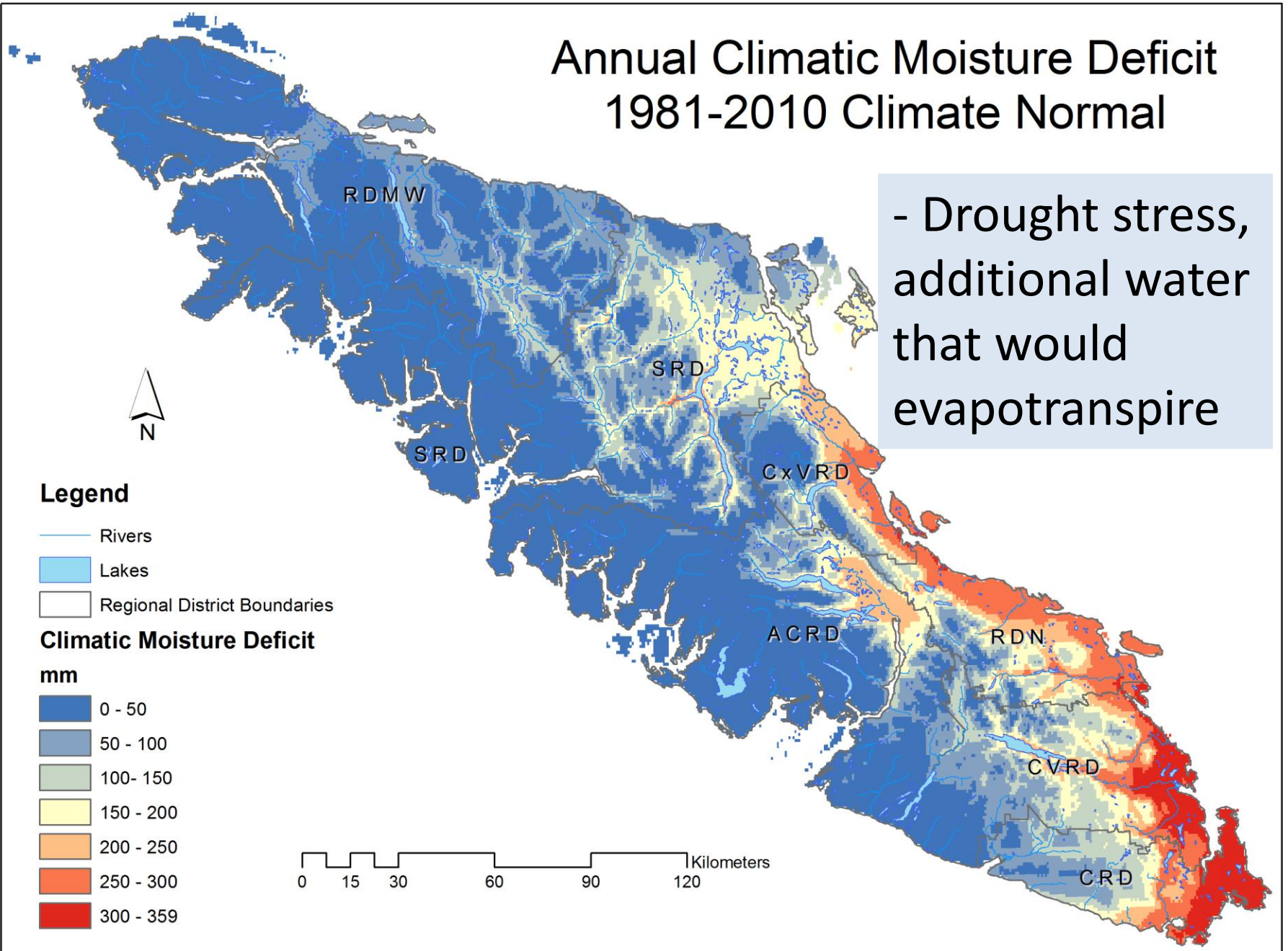
Annual Evapotranspiration 1981-2010 Climate Normal

- Potential loss of
water from soil
driven by temp.
& plant growth



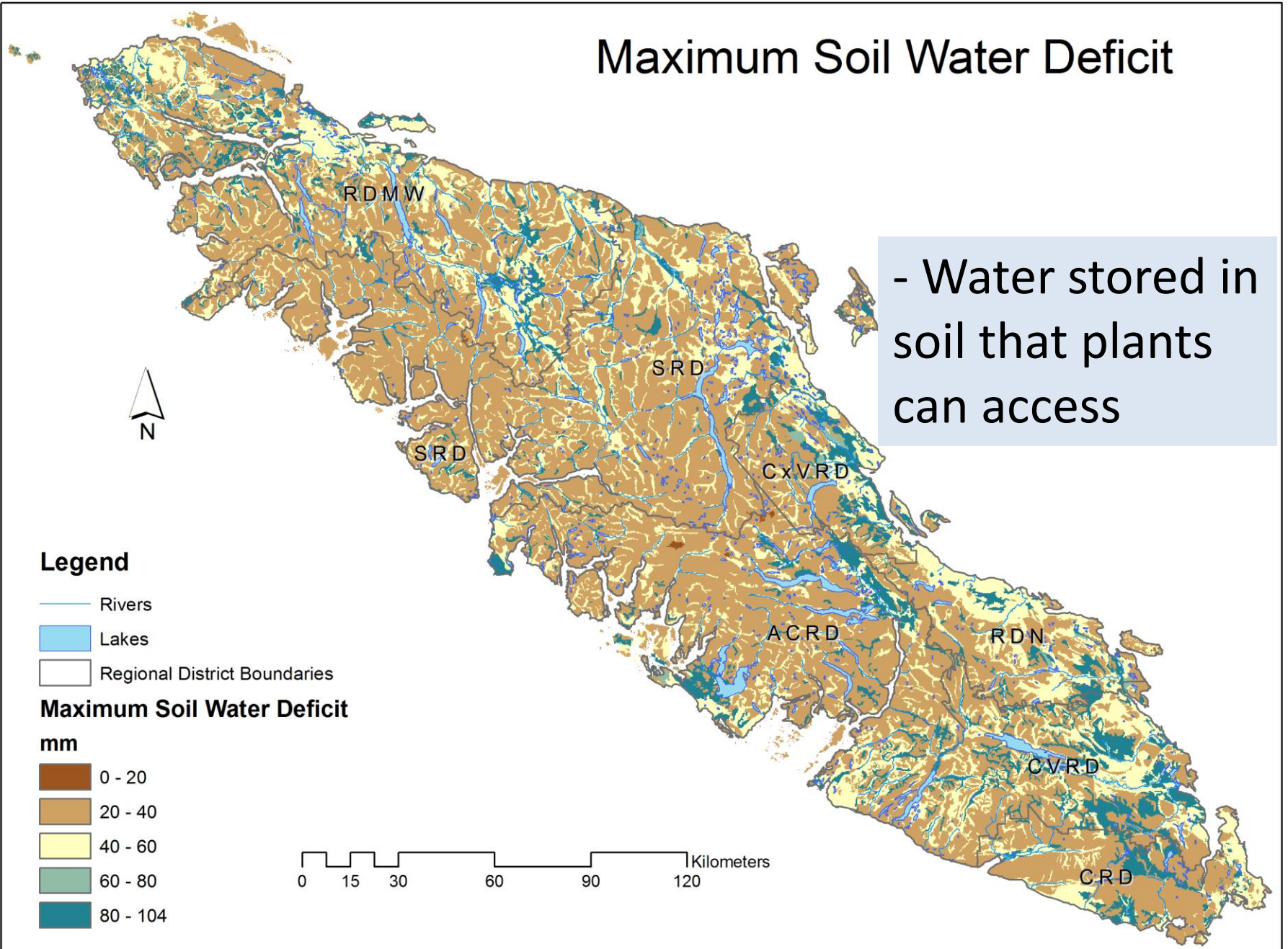
Annual Climatic Moisture Deficit 1981-2010 Climate Normal

- Drought stress,
additional water
that would
evapotranspire



Maximum Soil Water Deficit

- Water stored in soil that plants can access



Annual Crop Water Requirements 1981-2010 Climate Normal

- Min. irrigation
to maintain soil
moisture

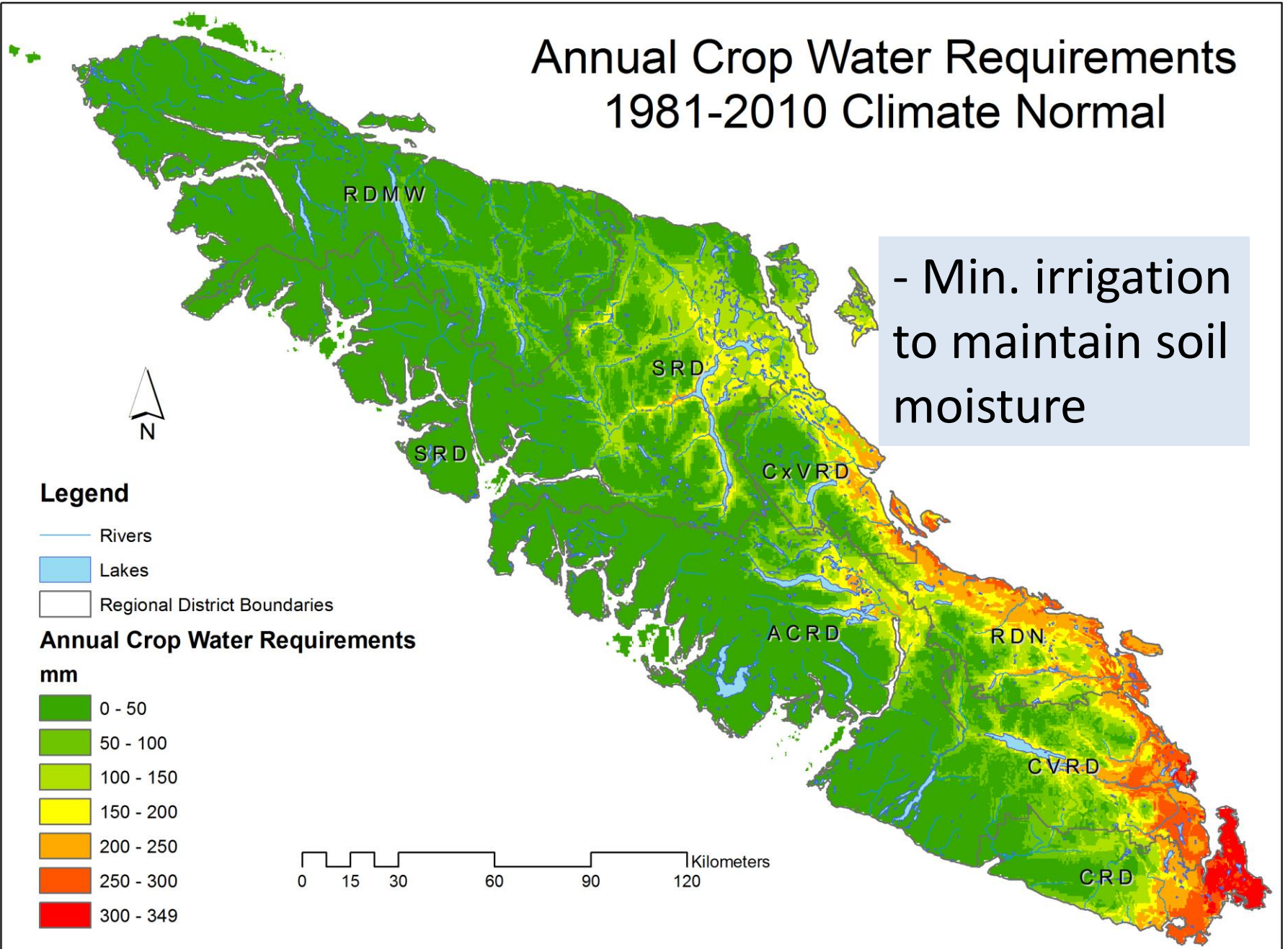
Legend

- Rivers
- Lakes
- Regional District Boundaries

Annual Crop Water Requirements mm

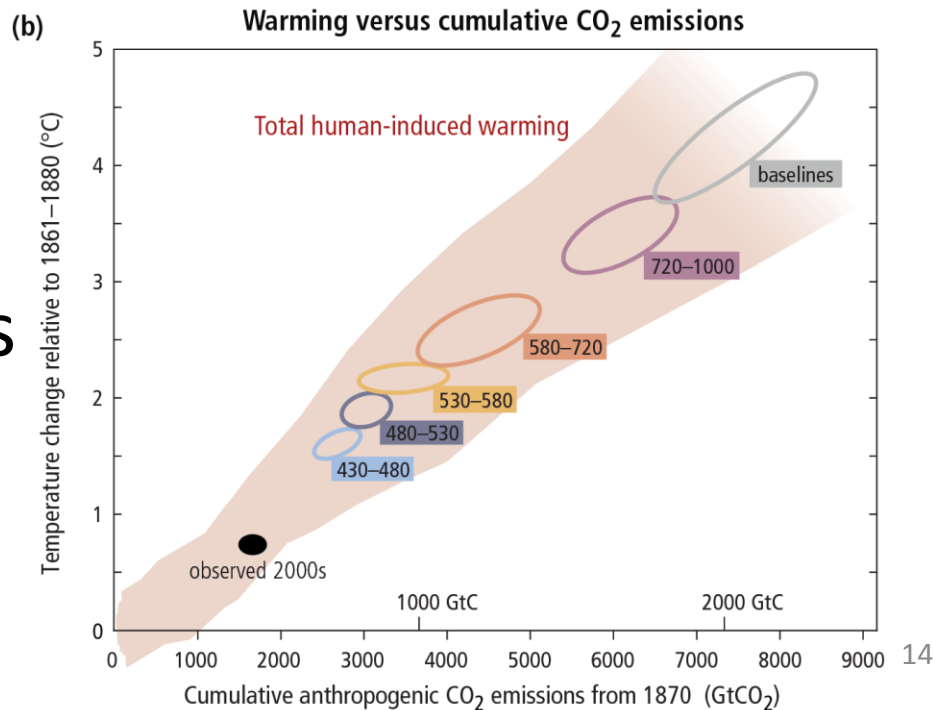
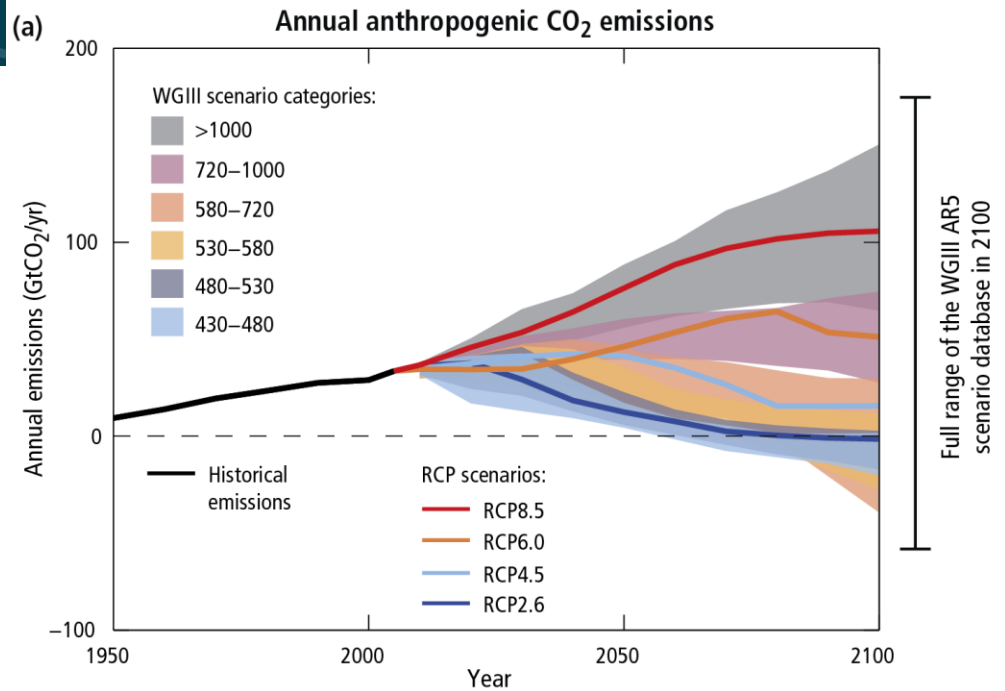
- 0 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- 200 - 250
- 250 - 300
- 300 - 349

0 15 30 60 90 120 Kilometers

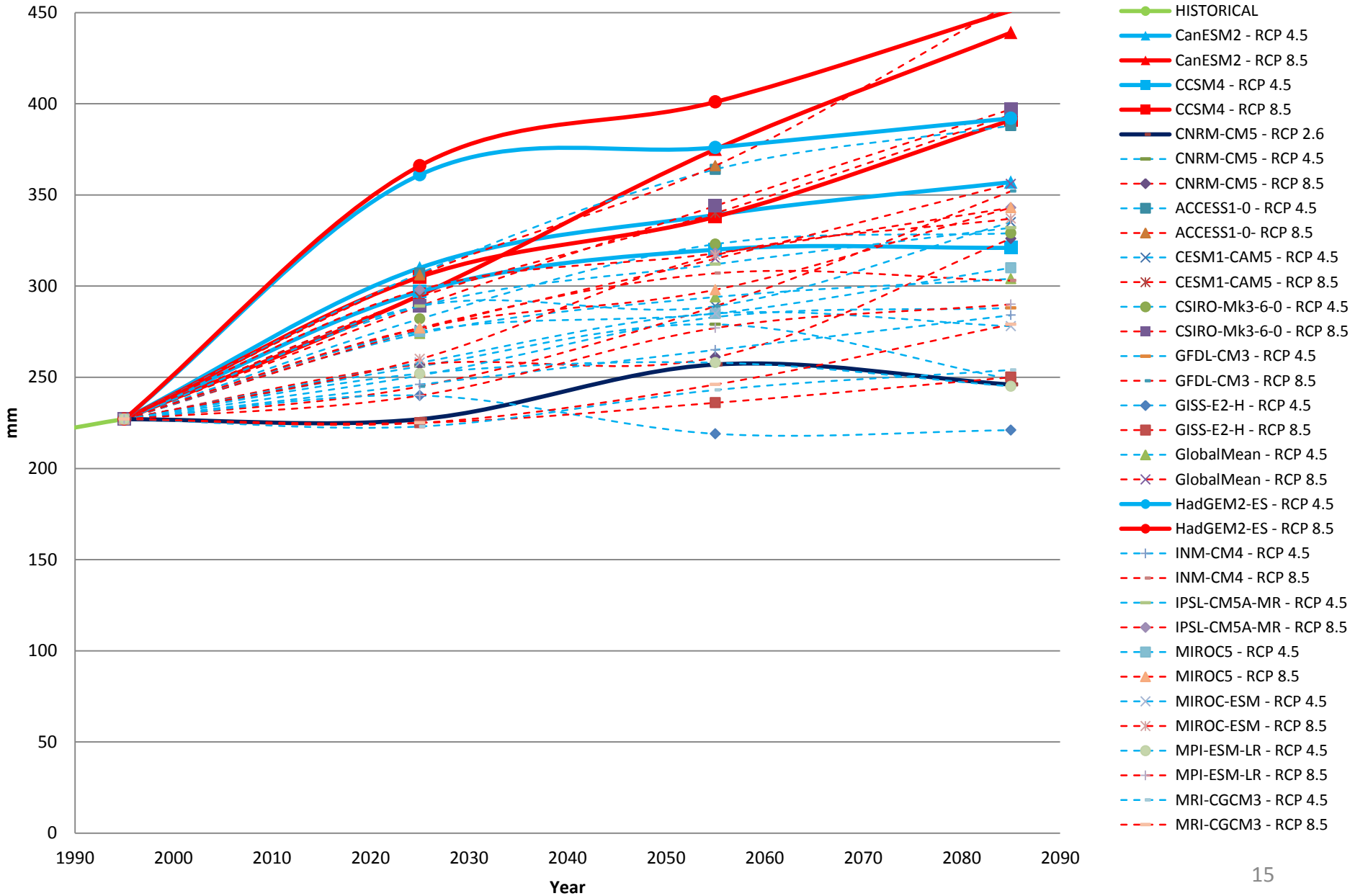


IPCC Fifth Assessment (2013) Global Warming Scenarios

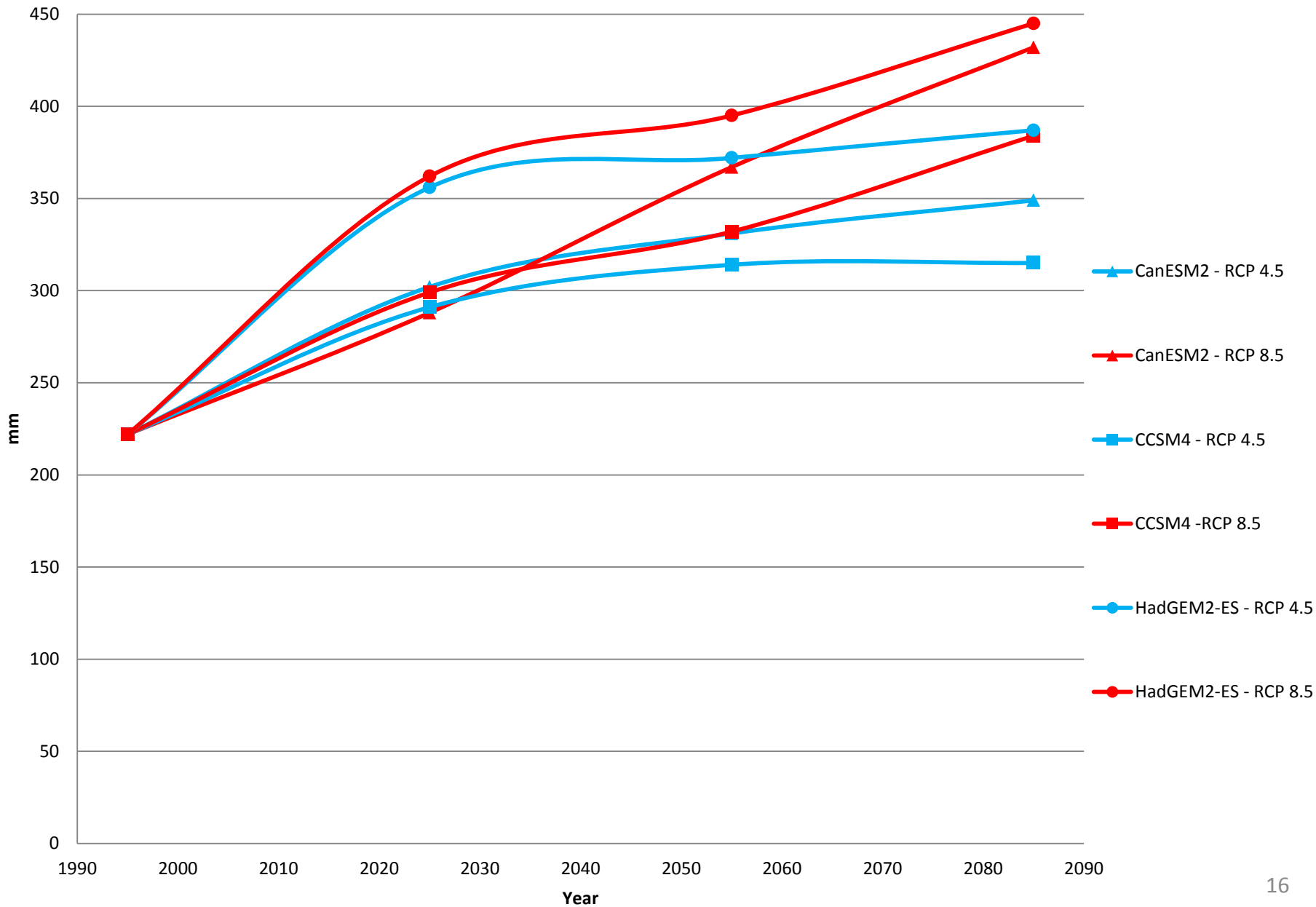
- RCP2.6 mitigation
- RCP4.5 stabilization
- RCP6.0 stabilization
- RCP8.5 high emissions



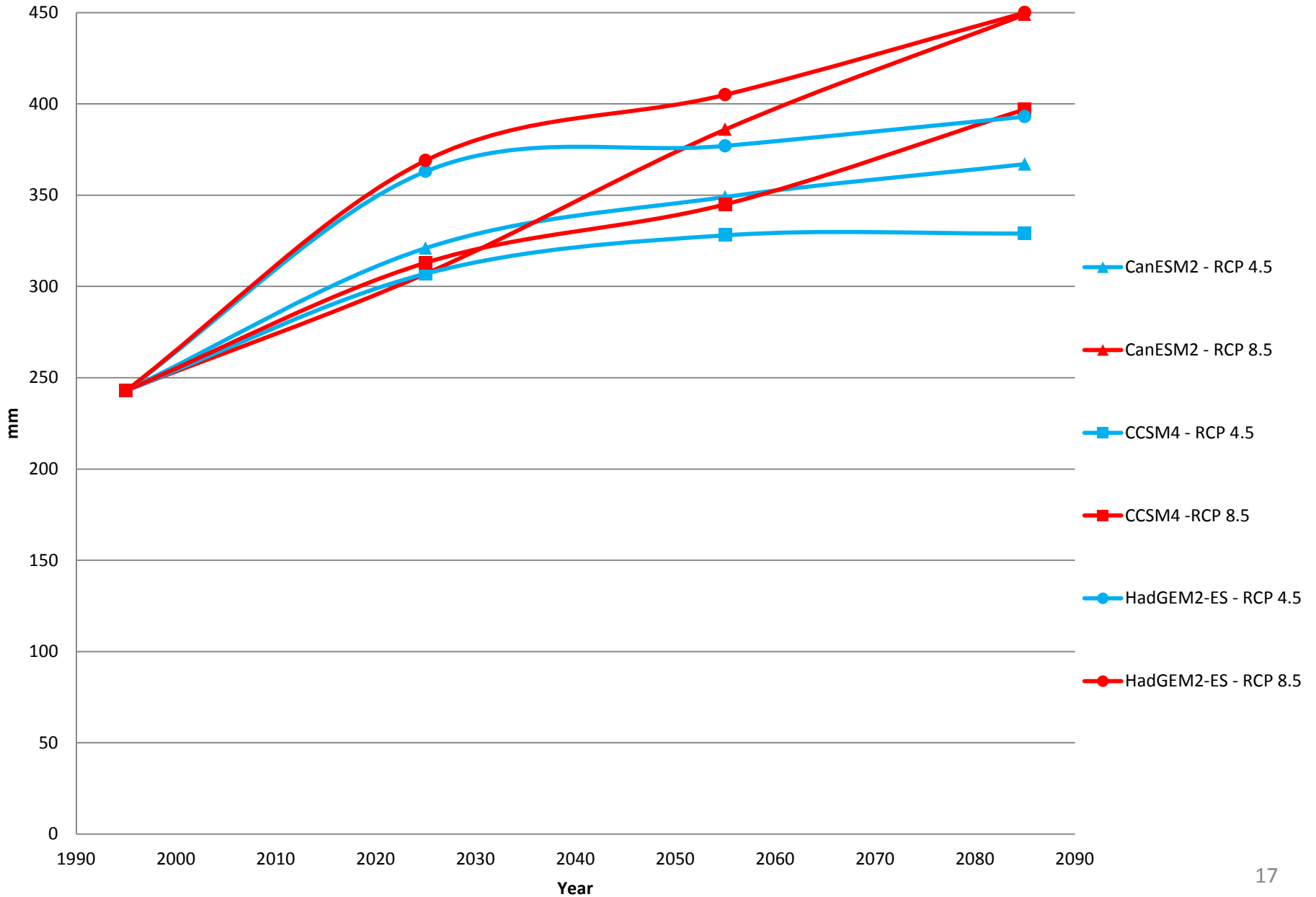
Nanaimo Airport - Annual Crop Water Requirements (AR5 Models)



RDN - Annual Crop Water Requirements for ALR



CVRD - Annual Crop Water Requirements for ALR



Summary & Conclusions

- Annual crop water requirements will likely increase in future in all areas, requiring more irrigation & water resources
- The amount of increase will depend upon future climate change
- The increase will be highest along the east coast
- Within any region (e.g. Regional District) there will be some variability across ALR lands.



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NEW GROUNDWATER REGULATIONS



Ministry of Forests, Lands and Natural Resource Operations



The New *Water Sustainability Act*:

What Now?

Pat Lapcevic, M.Sc. P.Geol.

Water Protection, West Coast Natural Resource Region

RDN Drinking Water and Watershed Protection
Technical Committee

April 13th 2016



Background:

- *Bill 18 - Water Sustainability Act* received Royal Assent on May 29, 2014
- Priority regulations brought Act into force on February 29, 2016
- Most provisions of *Water Act* and associated regulations carried over to *Water Sustainability Act* – but also new provisions





Existing Groundwater users

- Three years to apply and have historical use recognized (2016-2019)
- Application fee exemption in year one of 3-year period
- May continue to use water until
 - the end of the application period, or
 - a decision is made on the application
- Obligated to pay rental from day one
- If user doesn't apply within 3-year period, will be considered a new user and date of application will be used as precedence date!





Groundwater Licensing Issues

Date of first use:

- The date from which groundwater has been used regularly and beneficially on an ongoing basis for a water use purpose.

Quantity and Purpose:

- Evidence of beneficial use of water and the purpose.

Terms and Conditions:

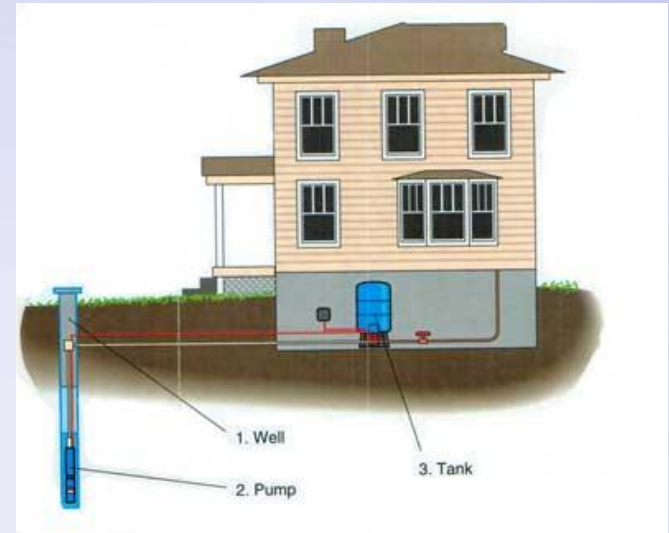
- Decision to grant a licence may include conditions for water use





Domestic use


- Drinking water
- Food preparation
- Sanitation
- Fire prevention
- Water for pets and household animals or poultry
- Irrigating a garden adjoining the dwelling





Ministry of Forests, Lands and Natural Resource Operations

Registering your domestic well (use)

 **Well Registration Form**

To register your well, please complete the following information. The information provided will be added to the Provincial WELLS Database, which is accessible free of charge to the public at <http://a100.gov.bc.ca/pub/wells/public/>.

Owner Information

Owner Name: _____

Mailing Address: _____ Town _____ Prov. _____ Postal Code _____

Email Address: _____ Phone No.: _____

Well Location Information

If the address of the well location is the same as above, please check []

Address: _____ Town _____

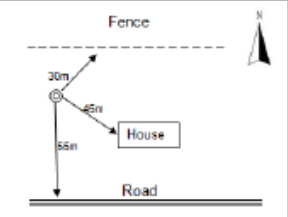
Legal description (available from the property tax assessment notice):

Lot: _____	Block: _____	Range: _____
Plan: _____	Section: _____	Land District: _____
District Lot: _____	Township: _____	PID: _____

Description of well location on the property _____

Please provide or attach a sketch or picture of where the well is located on your property relative to the road and any other structures.

Example Sketch



- 1 -

GPS Coordinates of the Well

Coordinates for the well can be determined by using a GPS unit or by using a mapping application such as Google Earth.

Latitude (e.g. 49.20184°): _____

Longitude (e.g. 122.58376°): _____

OR

UTM Zone (NAD83): _____ UTM Easting: _____ UTM Northing: _____

Source of coordinates (check one): GPS [] Google Earth [] Other (please specify) [_____]

Well Information

If the well construction report is available, please attach to this form. Attached Not Available

Well Identification Plate Number (steel plate attached to some wells): _____

Description of where on the well the plate is attached (usually attached to the well casing or well cap): _____

Date well drilled (YYYY/MM/DD): _____ Is this the Exact date or an approximate date?

Drilling Company: _____

Method of Drilling: Drilled Excavated or Dug

Water Use: private domestic water supply system* irrigation commercial or industrial
 Geothermal (Open Loop or Closed Loop) Other (please specify) _____

* Please note that wells that are for the purpose of supplying a water supply system are required to complete a Schedule 2 Report Form, which can be obtained from the email provided below.

Well depth (ft): _____ Well Diameter (in): _____

Casing Stick up (in): _____ Static Water Level (ft): _____

Approximate Well Yield (USGPM): _____ Pumping Rate (USGPM): _____

Send Completed Forms To

Mailing Address: _____ Email: _____

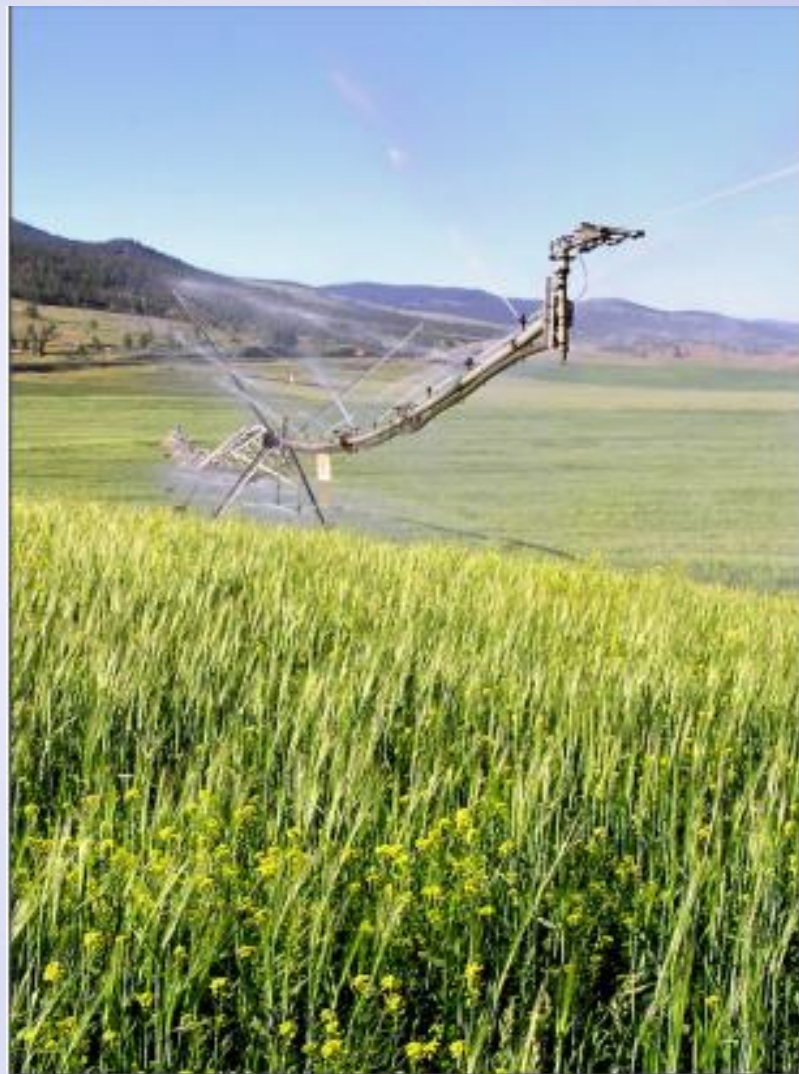
Ground Water Data Specialist
 Ministry of Environment
 PO Box 9362 Stn. Prov. Govt
 Victoria BC V8W 9M2

GroundWater@gov.bc.ca



Non-domestic use

- conservation
- industrial
- irrigation
- land improvement
- mining
- oil & gas
- power production
- storage
- waterworks





Ministry of Forests, Lands and Natural Resource Operations



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- [Ministry of Health](#)
- [B.C. Health Authorities](#)
- [Ministry of Agriculture and Lands](#)
- [Environment Canada](#)
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Ministry of Forests, Lands and Natural Resource Operations

Water Licences and Approvals

All water in British Columbia is owned by the Crown on behalf of the residents of the province. Authority to divert and use surface water is obtained by a licence or approval in accordance with the statutory requirements of the *Water Act* and the *Water Protection Act*.

In British Columbia, simply having access to surface water within or adjacent to property does not authorize a right to divert, use or store water.

Steps Taken in Processing your Water Licence Application:

1. Water licence applications are submitted electronically (on-line) via Virtual FrontCounterBC.
2. Once the application meets completeness criteria for acceptance the application is checked to identify potential impacts which include: **existing** licence holders or earlier applicants, **minimum** in-stream flow requirements, **landowners** or crown land tenure holders, other agencies, and the interests of First Nations.
3. Once notification of potentially affected licensees or other interests have been completed and comments or objections received, a technical assessment of the application is performed by Water Stewardship staff to determine if there is sufficient water available in the source to issue a new water licence.
4. The Regional Water Manager or the Comptroller of Water Rights reviews the assessment of the application considering potential impacts and the availability of water and will either grant a water licence or refuse the application.
5. All Applications have a right of appeal to the [Environmental Appeal Board](#) from a decision of a Regional Water Manager or the Comptroller of Water Rights.

 2014
 From Paper To Electronic
 Applications for Water Licence Authorizations are now on-line.

Electronic Water Application

For information or assistance with applications for water authorizations, please contact the [FrontCounterBC office](#) in your area.



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- [BC Online](#)
- [Discovery Tool](#)
- [Minerals Title Online\(MTO\)](#)
- [Integrated Land and Resource Registry](#)
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FrontCounterBC

Guide

Water Licence Application

[Start your Water Licence Application](#)

- | | |
|---|---|
| 1. Overview | 5. Consulting First Nations |
| 2. Costs and Responsibilities | 6. Links |
| 3. What you need to apply | 7. Tips for a successful application |
| 4. What happens after you apply | 8. Start your Water Licence Application |

Overview

This application is to apply for a water licence under the *Water Act*, which if granted, permits you to: divert, use or store surface water from a stream, and to construct works. A stream includes a natural watercourse or source of water supply and a lake, river, creek, spring, ravine, swamp and gulch.

A water licence specifies the source, the purpose, the volume and the works associated with the water use as well as where the water can be used. Water use may be restricted to certain times of the year.

You can apply for a variety of purposes on an application. A [list of all water use purposes](#) is available.

You may also be required to apply for a Permit over Crown Land if your works cross or flood Crown land.

[Next](#) 
[Costs and Responsibilities](#)



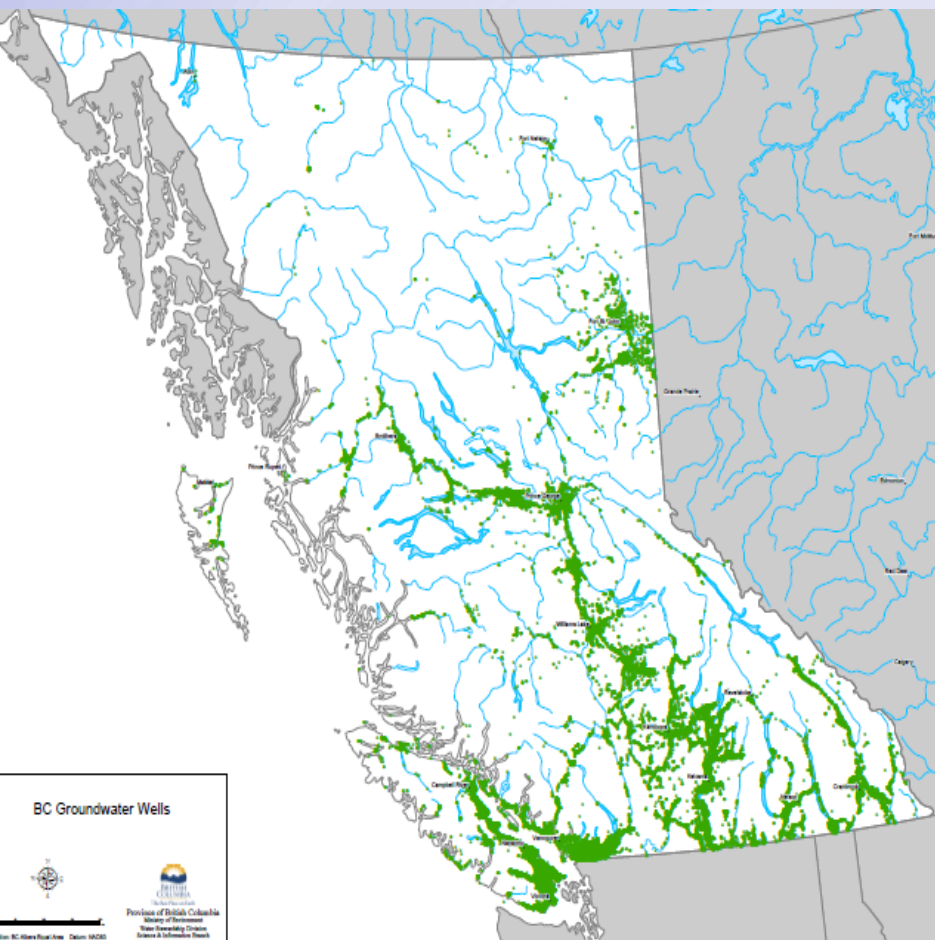
Groundwater Protection Regulation: New Water Supply Well Setback

- Purpose is to minimize risk of excessive well interference
- The owner of an existing water supply well can drill one additional well within 15m of the existing well
- If not feasible, professional can recommend a closer setback; alternative specification must be accepted by the engineer before well is drilled





Mandatory submission of well construction and decommission reports



- Submission format: currently paper and electronic, but moving toward **electronic only** submission
- Information requirements include:
 - Owner and driller details
 - Well location
 - Dates of work
 - Lithology
 - Well depth and diameter
 - Construction details
 - Well yield
 - Well class and use



Ministry of Forests, Lands and Natural Resource Operations

Artesian flow must be stopped or brought under control (WSA s. 52, 53)

Responsible parties:

- Driller at time of construction
- Well owner or land owner for existing well

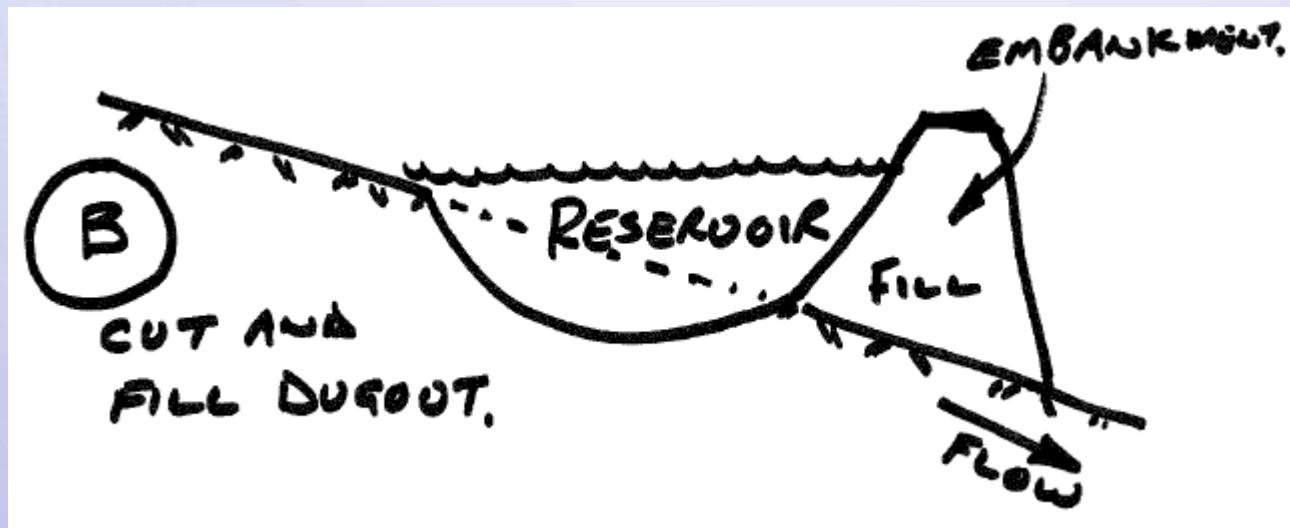
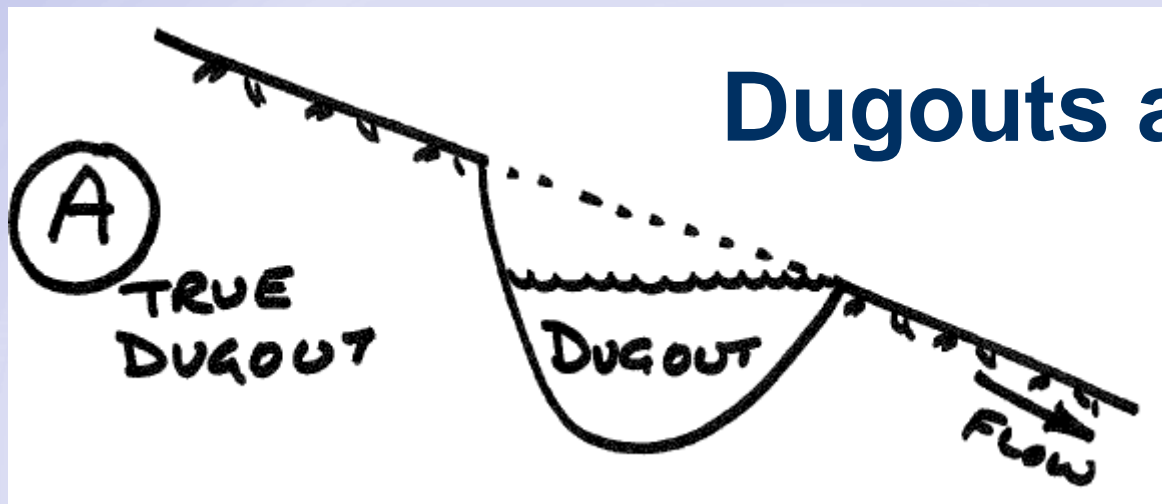
“Under control” means:

- Clear of sediment
- Entirely conveyed through casing (if applicable)
- Can be turned off indefinitely
- Does not pose a threat to property, public safety or the environment





Dugouts and Dams





Summary

- WSA and regulations in force!
- More regulations will come into effect in years to come.
- Encourage existing groundwater users to submit their applications.
- For more information contact:

FrontCounterBC @ 1-877-855-3222 or
<http://www.frontcounterbc.gov.bc.ca/>

Thanks!



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WATER DAY EVENTS 2016



Water Day



Nanaimo
March 20 10am - 5pm
Bowen Park Complex
500 Bowen Rd

Qualicum Beach
April 3 10am - 5pm
Qualicum Commons
744 Primrose Ave
(formerly Qualicum Beach Elementary)

LIVE at
Nanaimo
Water Day



LIVE at
Qualicum
Water Day



FREE COMMUNITY EVENTS

Interactive Booths • Workshops • Speakers
Kids Activities • Artists • Food Concession • Live Music

CELEBRATE WATER!



- **Overview:**
 - Team WaterSmart annual spring workshops
 - Two festival style events: Nanaimo & Qualicum Beach
 - Events well attended & covered by local media
- **Community Support:**
 - *City of Nanaimo, Town of Qualicum Beach, Mount Arrowsmith Biosphere Region, RDN Recreation & Parks, Island Radio, CHLY, stewardship organizations*



Brought to you in partnership with:

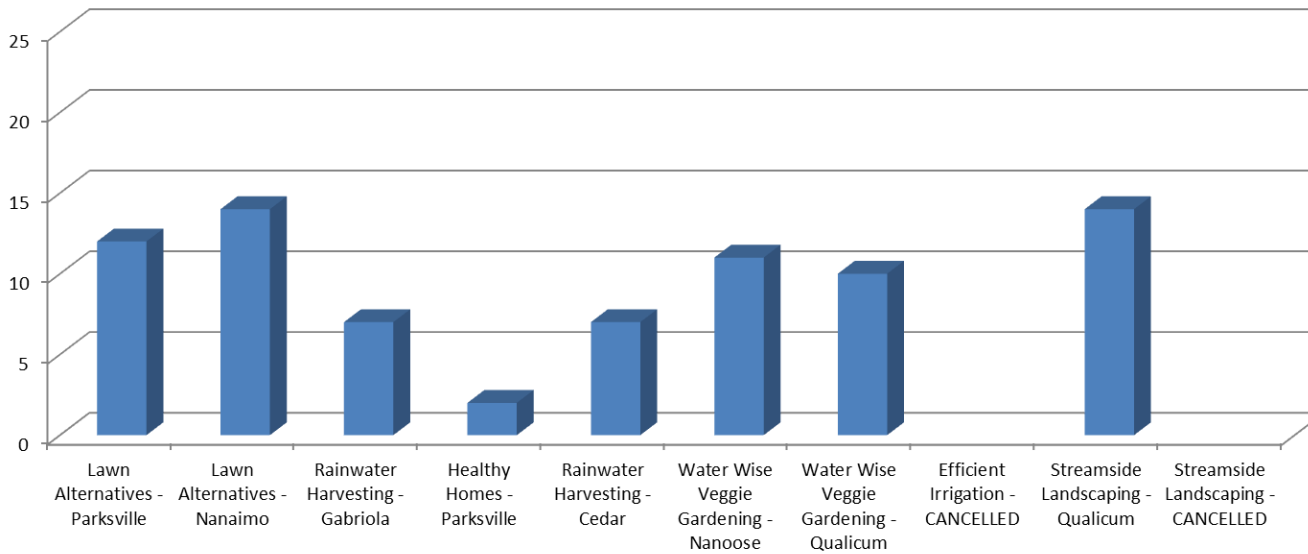


TWS Workshops



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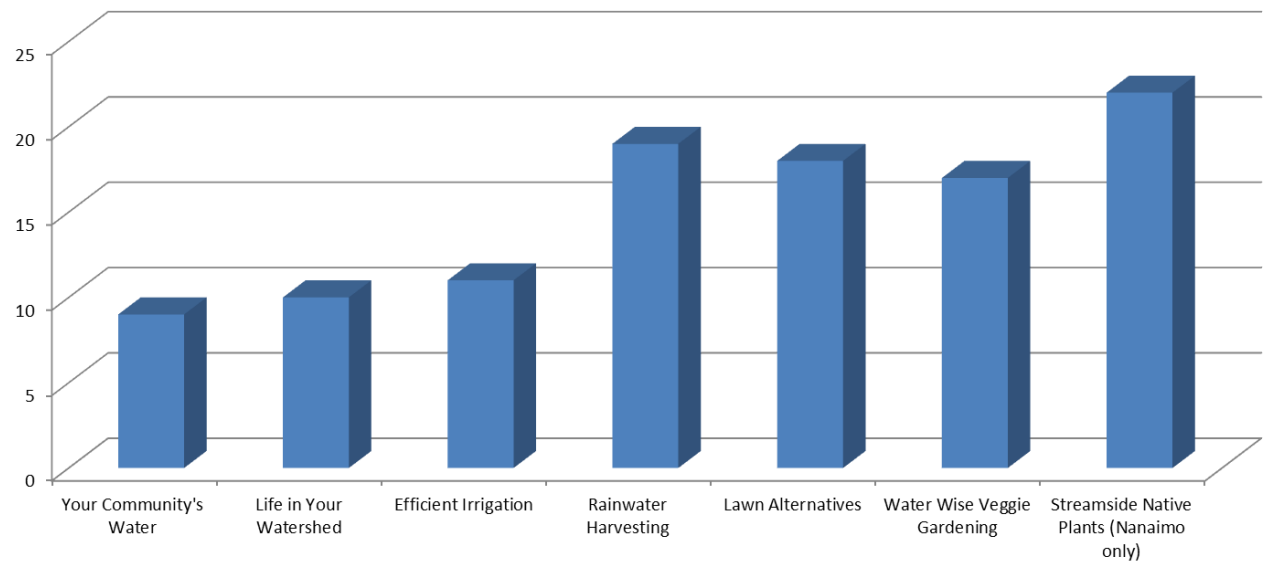
2015 Workshops Participants (All Workshops)



- **2015:**
- 10 workshops scheduled
- 2 cancelled
- 77 participants

- **2016:**
- 13 workshops / speakers
- 170 participants

2016 Workshops Participants (Qualicum Only unless indicated)



Water Day Annual Events



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- **For 2017:**
 - Tentative Dates: March 18 or 19 and 25 or 26
 - Locations, venues & save the date invites this June
 - Updates from 2016 event
- **Feedback from attendees, vendors & presenters compiled:**
 - *Shorter event*
 - *More advertising*
 - *More booths / values included*



Comments & Feedback

- TAC ideas & comments for Water Day 2017?
- Additional values to include?

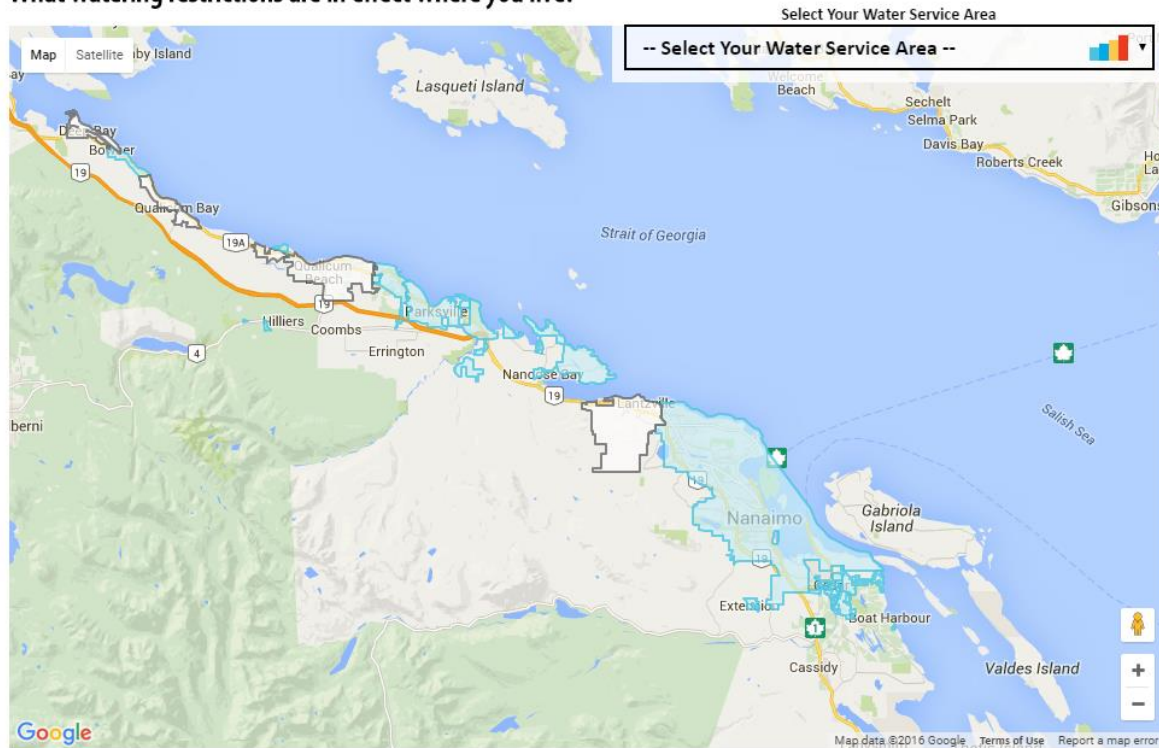


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REGION-WIDE WATERING RESTRICTIONS FRAMEWORK

Interactive Map

What watering restrictions are in effect where you live?



www.teamwatersmart.ca

Note: Private wells are not subject to municipal watering restrictions, but conservation is encouraged because water is a shared resource.

[Water Efficiency Tips](#)

[Frequently Asked Questions](#)

[Printable Restrictions Chart](#)



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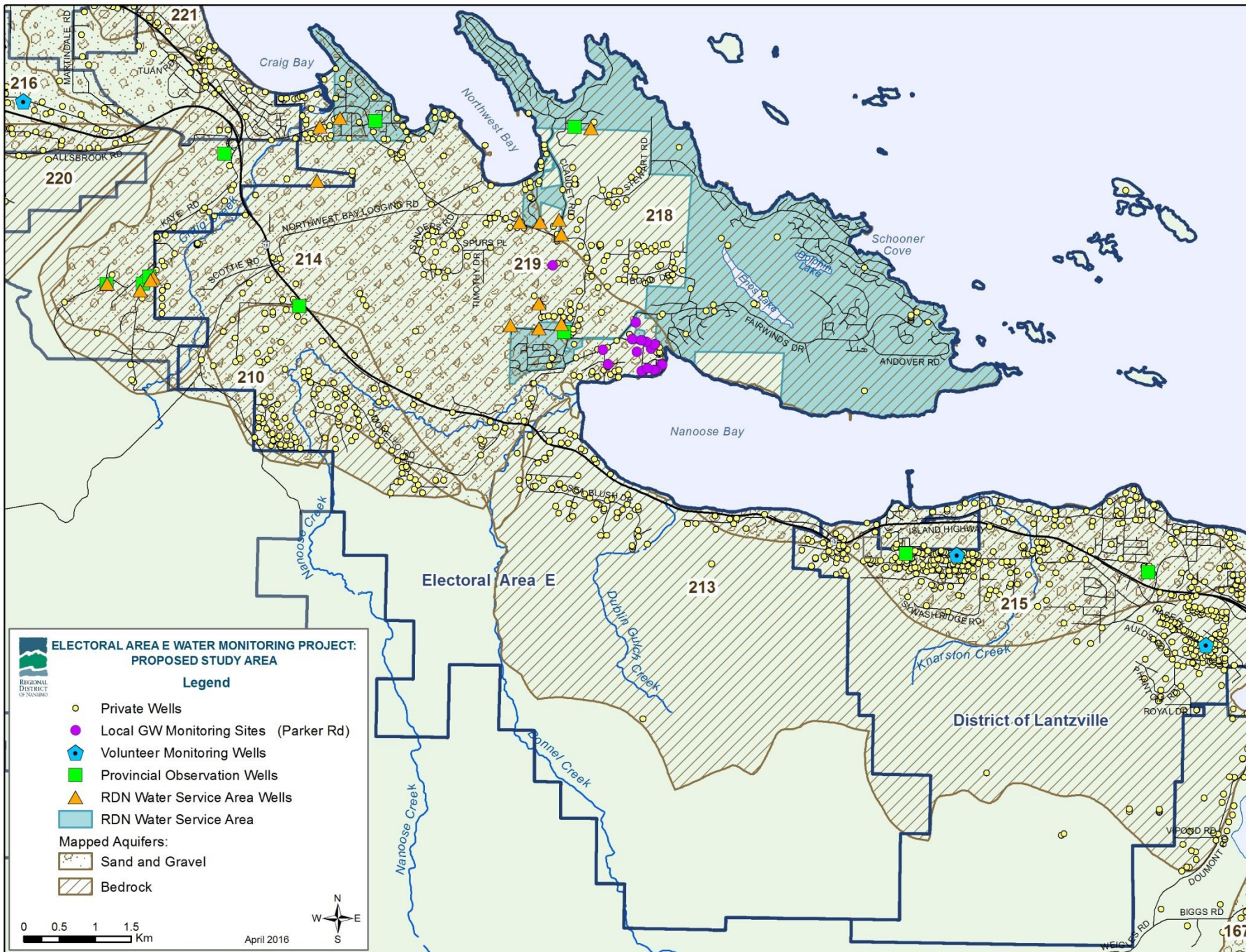
NANOOSE (AREA E) WATER MONITORING

Background

- Build on the Phase 1 Water Budget Project
- Objective: to identify sources of uncertainty and work collaboratively with partners to develop a monitoring program that will support detailed analysis & water budget models to assess supply and demand
- Ultimately provide the technical basis to guide land use decisions in the area, and support the development of a Water Sustainability Plan

Key Questions

- What is the groundwater & surface water availability in the aquifers and streams in Nanoose?
- Under what conditions can water demands (for communities and ecosystems) be met over the long term with the buildout of the area?



Project Plan Thus Far...

- Review existing data and studies for Area E
- Draft goals & scope for water sustainability
- Consult the public on proposed goals & scope
- Incorporate public feedback into monitoring plan
- Implement expanded monitoring in key areas
- Data will be used to estimate / model the water dynamics

We want your input - help steer the scope



SUPPORT FOR STEWARDSHIP PROJECTS



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PARTNER UPDATES

