



Englishman River Watershed Surface Water Quality

2011-2017
Data Trend
Analysis



REGIONAL
DISTRICT
OF NANAIMO

PROGRAM

SITES

ANALYSIS

NEXT
STEPS

Panel Presentation April 3 2019
Water Stewardship Symposium
by Julie Pisani for Regional District of Nanaimo

Drinking Water and Watershed Protection Action Plan



Report to the Board of the
Regional District of Nanaimo

by the Drinking Water-Watershed
Protection Stewardship Committee



October 2007



EDUCATION

SCIENCE

PLANNING

SCIENCE

Water resources inventory and monitoring

- Surface Water quality



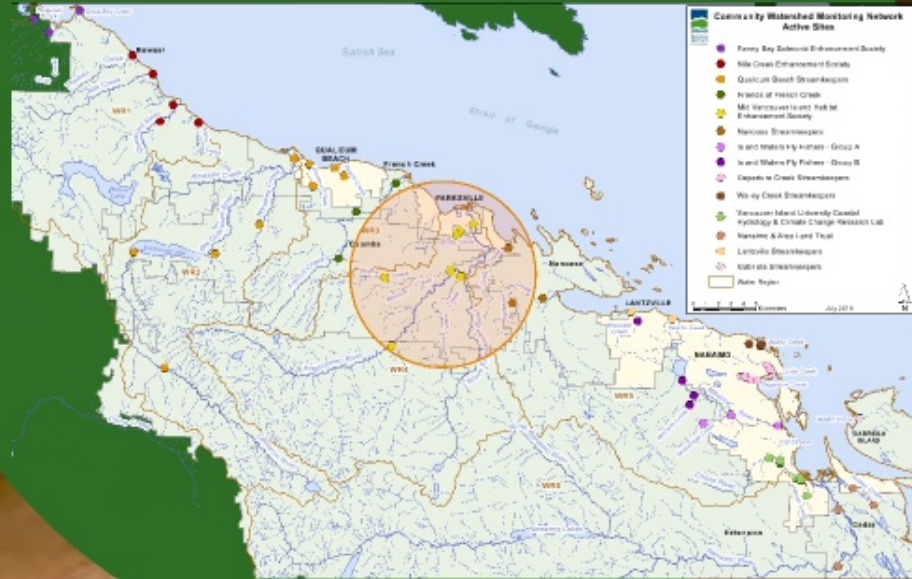
COMMUNITY
WATERSHED
MONITORING
NETWORK

COMMUNITY WATERSHED MONITORING NETWORK EST. 2011

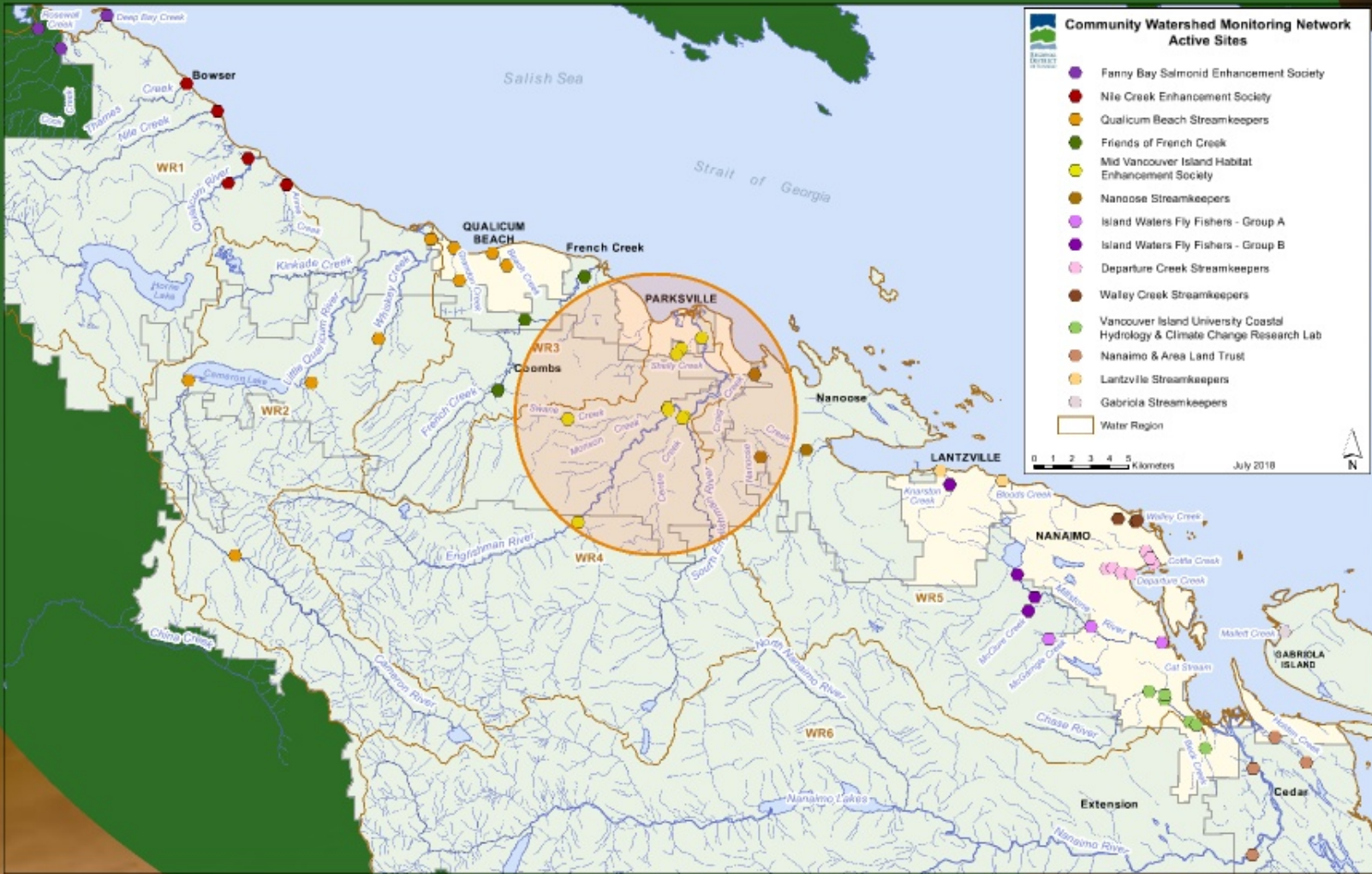
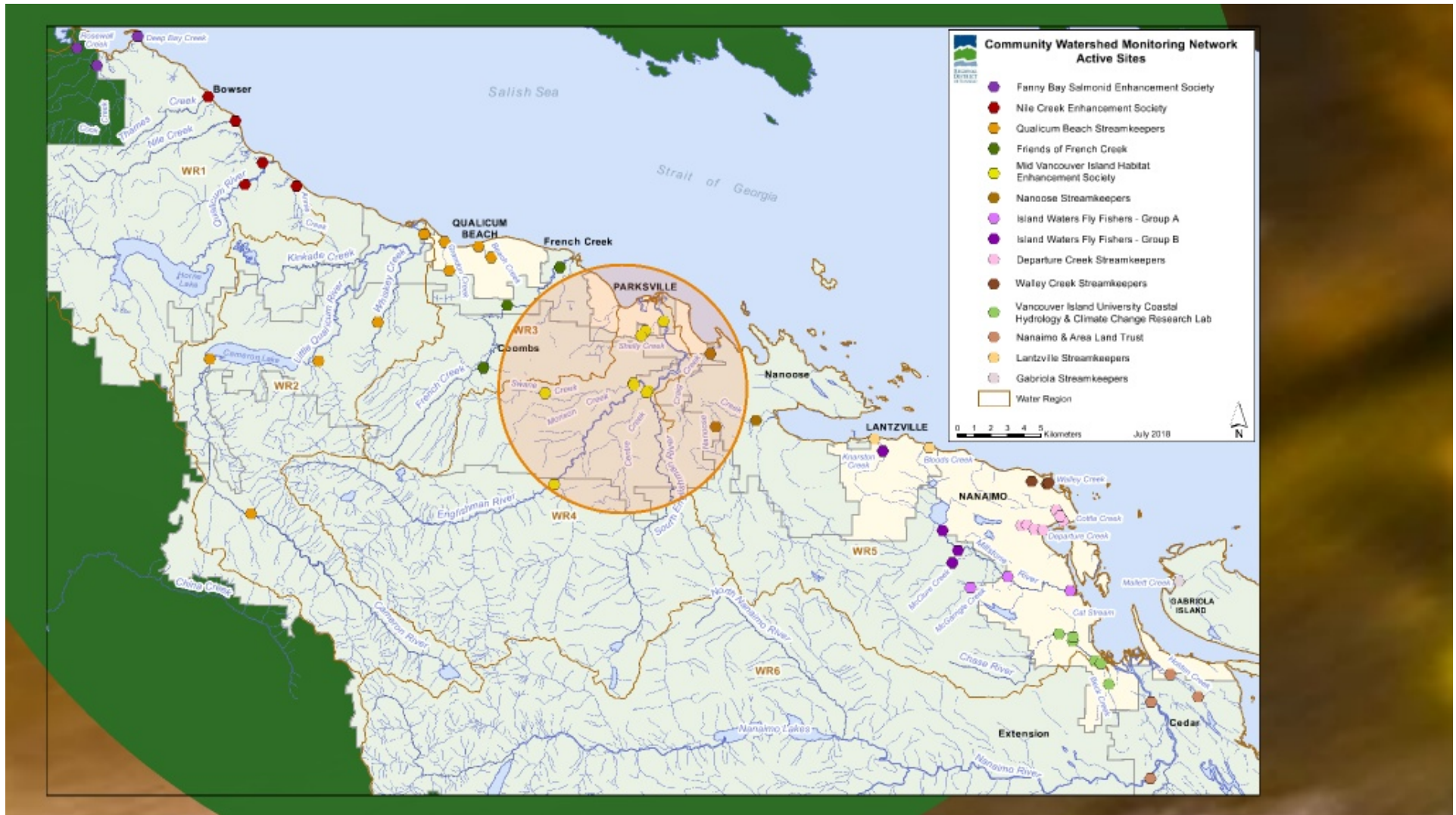
- Sample for **dissolved oxygen, temperature, conductivity, turbidity** during summer low flow & fall flush periods (total of 10 sample days)
- 62 active sites, **13 trained volunteer stewardship groups**
- Coordinated by RDN's Drinking Water & Watershed Protection Program; using **provincial protocols from Min. of Env**
- Land access provided by Mosaic Forest to upper watershed sites

SURFACE WATER QUALITY MONITORING SITES

MID VANCOUVER ISLAND HABITAT ENHANCEMENT SOCIETY



CITIZEN SCIENTISTS / DEDICATED STEWARDSHIP VOLUNTEERS



MVIHES

CWMN Program

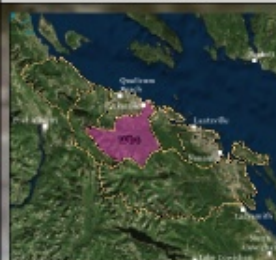
Surface Water Quality Trend Analysis

Water Region: Engishman River (2074)

LEGEND

- ▲ Sampling Sites
- Highway
- Water Region of Basin
- Water Region Boundary
- Lakes and Rivers
- Land Cover Class
- Agroforest
- Forest
- Impervious
- Permeable
- Residential
- Water
- Wetland

Mapsheet Index

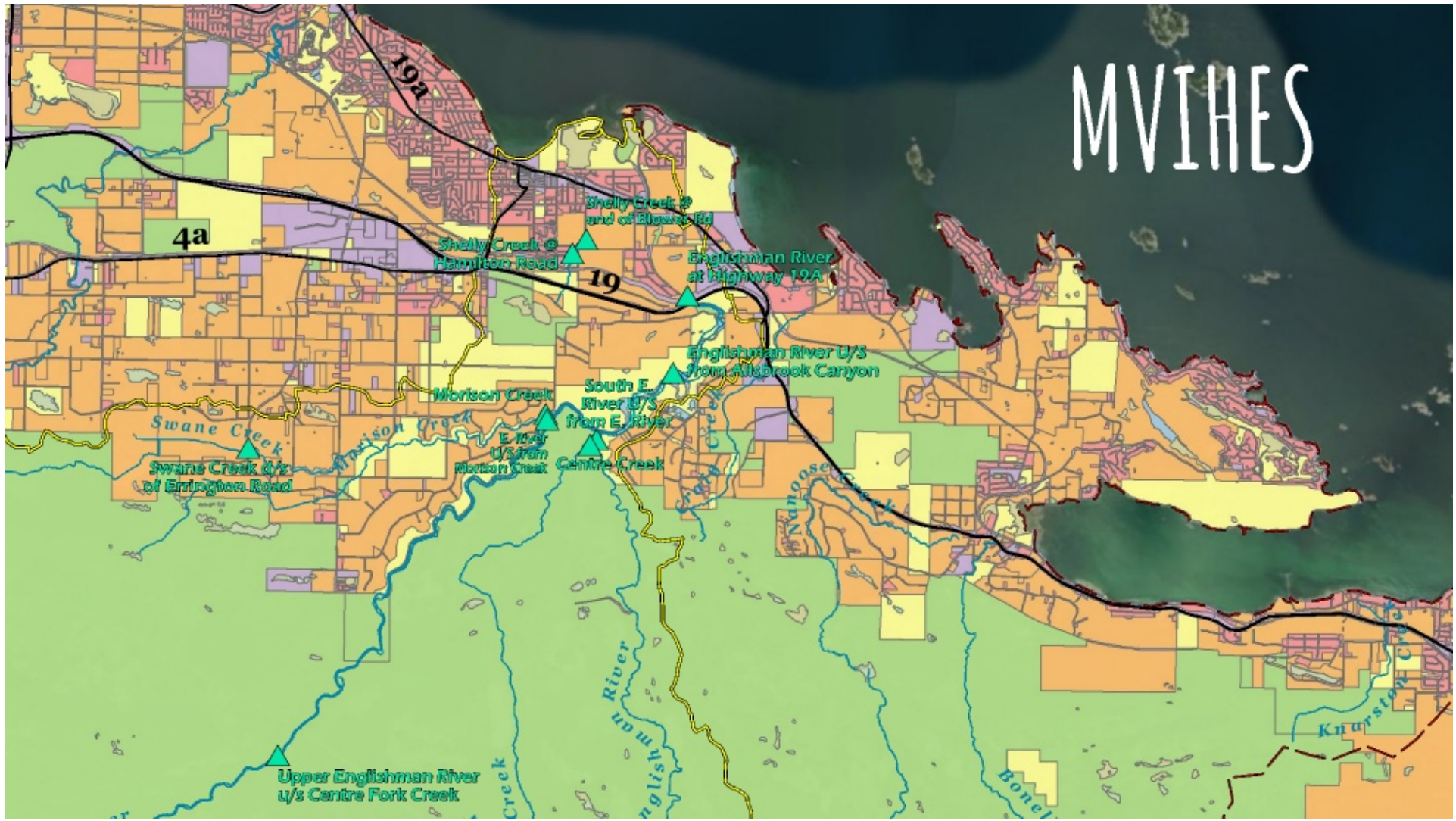


Regional Location of Study Area



WATERSHED
LAND USE

MVIHES



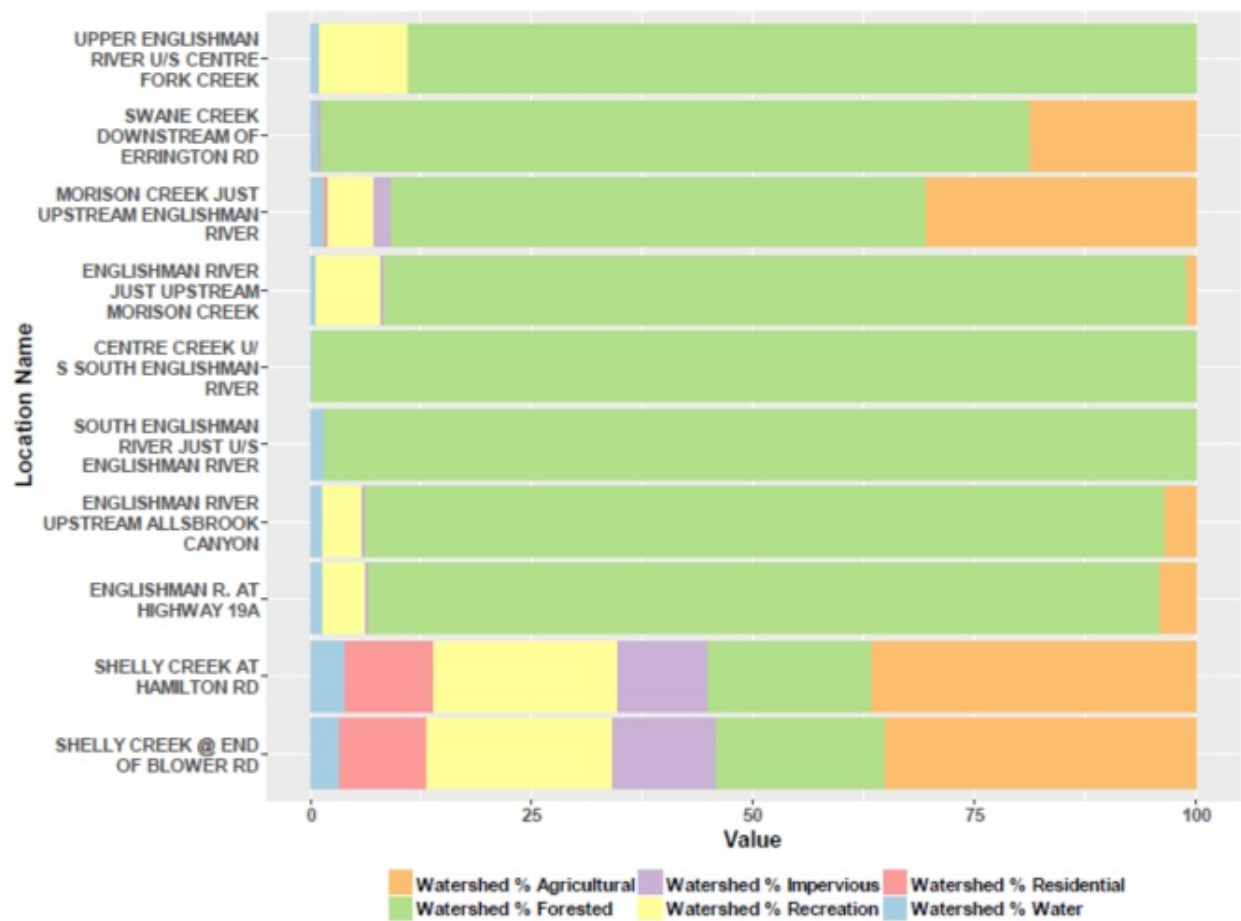


Figure 3-4: Percent land use composition for CWMN site watersheds of Water Region 4 (Englishman River).

Report available at
rdn.bc.ca/dwwpreports

Surface Water Quality Trend Analysis for
Regional District of Nanaimo Community Watershed
Monitoring Network Data (2011-2017)



ANALYSIS

ENGLISHMAN
RIVER
WATERSHED



Prepared For:
Regional District of Nanaimo

Prepared By:
Ecoscape Environmental Consultants Ltd.
July 2018

CHANGES
OVER TIME?

FREQUENT
EXCEEDENCES?

STATISTICAL
PREDICTORS?

ANALYSIS OF REGIONAL DATA 2011 - 2017

STATISTICAL MODELLING REVEALED THAT LAND USE TYPES ASSOCIATED WITH HUMAN DISTURBANCE WERE IMPORTANT PREDICTORS OF WATER QUALITY.

Watersheds **<60% forested** associated with changes in turbidity and conductivity

Watersheds with **>20% agricultural use** associated with higher turbidity and lower dissolved oxygen

Watersheds with **paved road densities >0.002m/m²** associated with increased conductivity, higher water temperatures

RESULTS



@ SITES IN ENGLISHMAN RIVER WATER REGION

Changes over time were observed in:

Englishman River @ HWY 19A
- turbidity: increasing trend between 2011-2017

Englishman River u/s of Morison
- dissolved oxygen: decreasing trend between 2011-2017

Land use thresholds were exceeded in these watersheds:

Morison Creek

> 20% agri

Shelly Creek

<60% forested,

>0.002 m/m₂ paved road density

Indicates greater risk for water quality issues.

RESULTS

Were data results within guidelines or were there frequent exceedences?

TURBIDITY

Summer < 2 NTU
Fall < 5 NTU

DISSOLVED OXYGEN

30 day avg. minimum 8 mg/L
Instantaneous minimum 5 mg/L



= above
guideline

Swane Creek

Shelly Creek

RESULTS

Were data results within guidelines or were there frequent exceedences?

TEMPERATURE

<17 degrees C
(coho rearing guideline)

Swane Creek
Morison Creek
Shelly Creek
Englishman u/s Morison
Centre Creek
S. Englishman
Englishman @ Hwy 19A



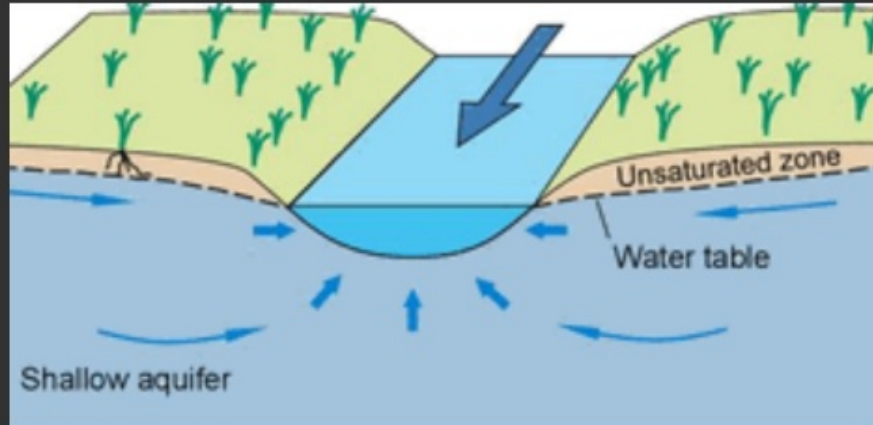
= close to
guideline



RESULTS

CONDUCTIVITY

No guidelines



Higher conductivity values; suggesting groundwater influence

Shelly Creek
Centre Creek
Swane Creek

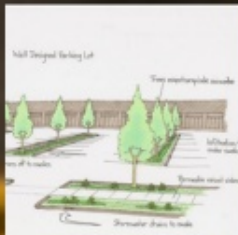
RECOMMENDATIONS

Sample for **additional parameters** to learn more about the source of water quality issues:
Swane Creek

Phosphorus - proxy for agricultural run-off

Support improving **streamside vegetation** i.e. particularly needed on Shelly Creek

Support use of **rain gardens & bioswales** to slow and filter stormwater before it enters the creeks particularly Shelly Creek



THANK YOU!



REGIONAL
DISTRICT
OF NANAIMO

Drinking Water & Watershed
Protection

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