

Developing a Watershed-Based Fish Values Monitoring Protocol

Climate Change Adaptation Planning For Northwest Skeena Communities

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Presentation Overview

1. Background & context
2. Approach to monitoring (tiered approach)
3. Climate Change and watershed monitoring
4. What have we learned so far...
5. Where to from here (considerations & next steps)...

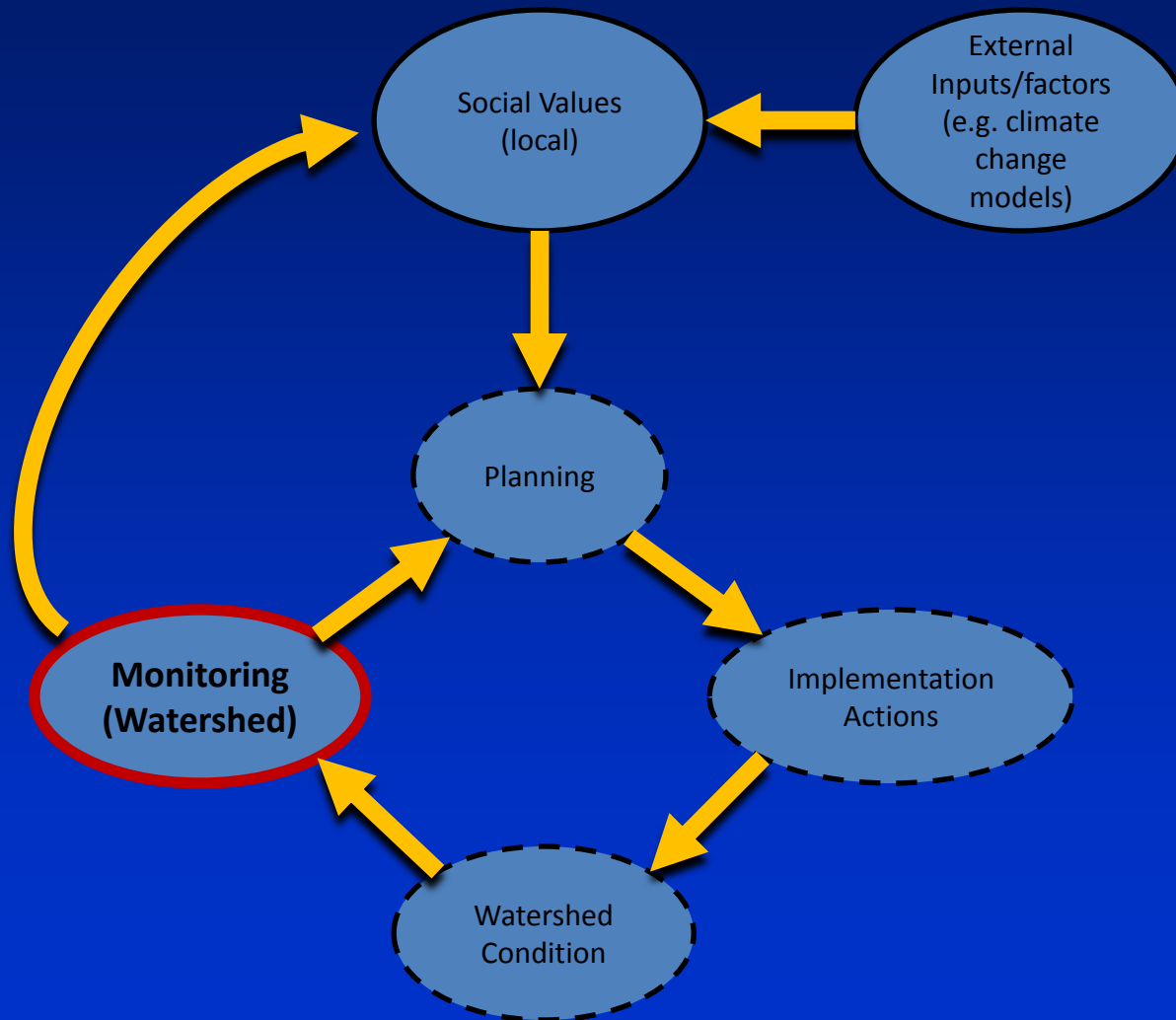
1. Introduction

So why monitor anyway?

1. Introduction

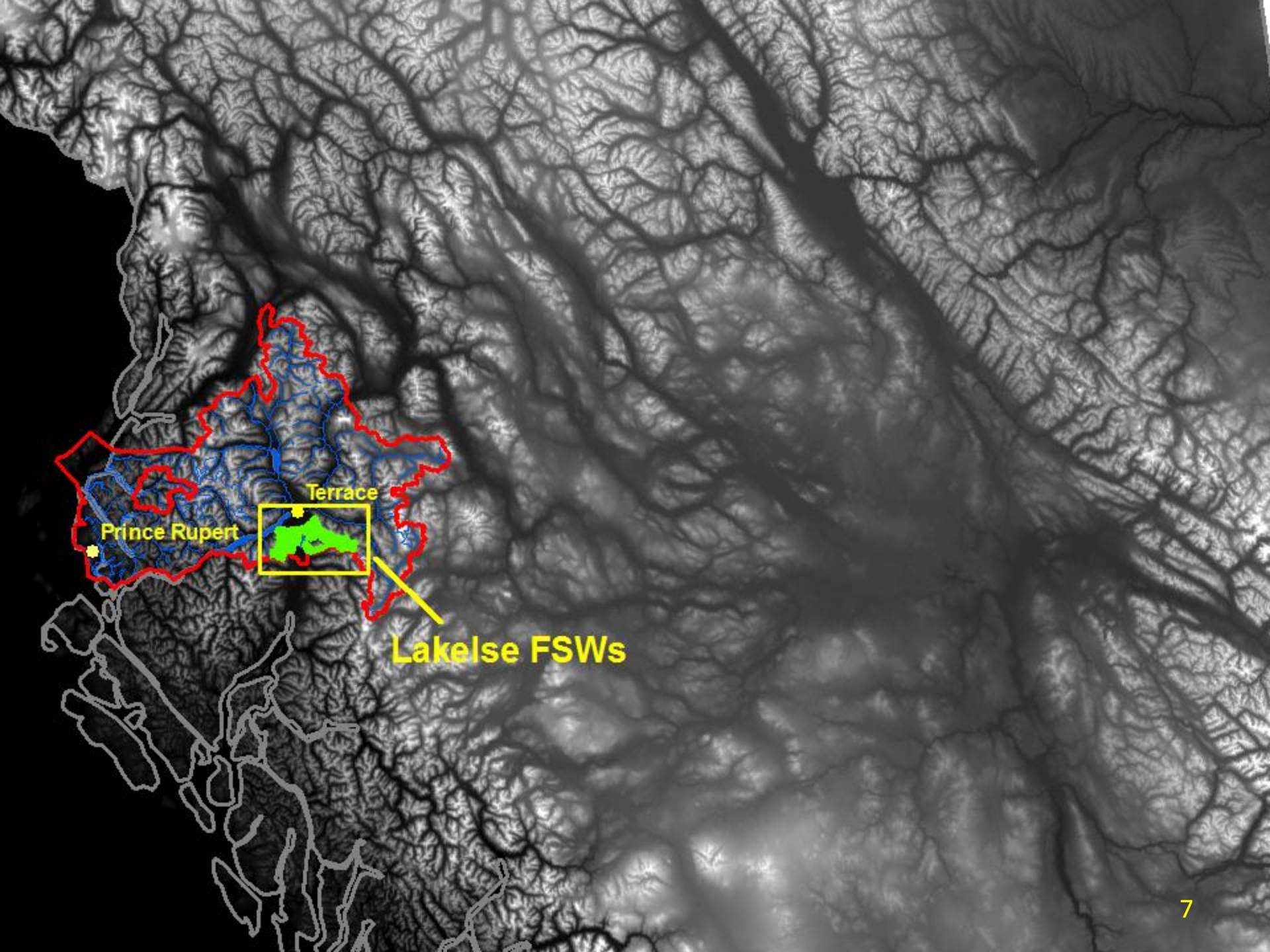
- What are the project goals?
 1. Determine the condition of a watershed (over baseline of “properly functioning”)
 2. Understand internal vs. external influences on condition (e.g. Climate change vs. human development within watershed)
 3. Design protocol to be as cost effective as possible (in order to make it “doable”)

1. Monitoring in context with the FFESC project





FFESC Study Area

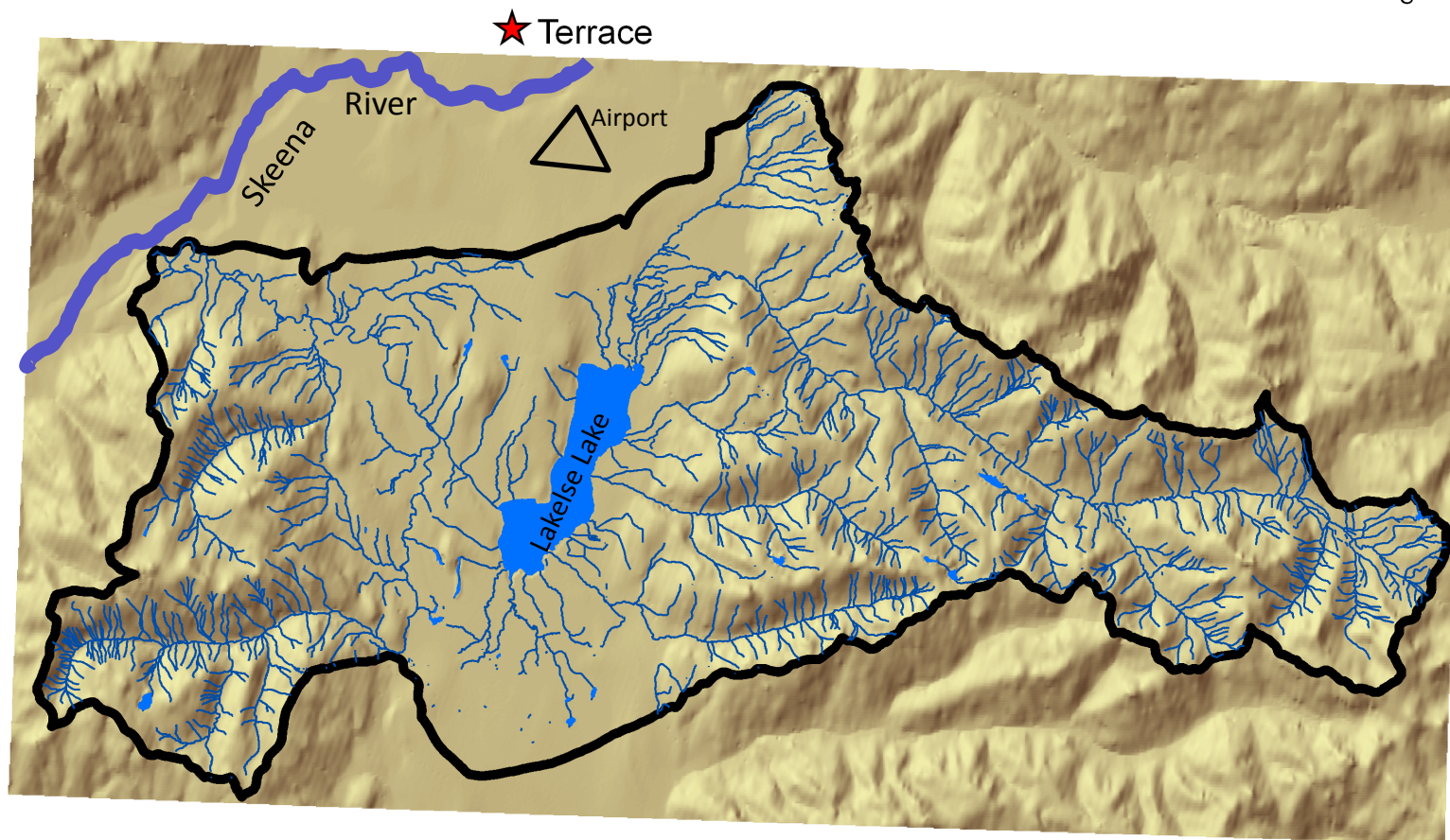


Prince Rupert

Terrace

Lakelse FSWs

Lakelse Drainage



0 2.5 5 10
Kilometers

2. Monitoring Approach

A *properly functioning* watershed...

- Can withstanding normal floods without experiencing:
 - accelerated erosion,
 - channel movement or
 - bank destabilization;
- Filter runoff and maintain water quality;
- Store and safely release water;
- Unimpeded aquatic habitat connectivity
 - natural stream network, and
 - between streams and adjacent riparian areas;
- Contain healthy riparian areas: with mature root network, and that provide a large woody debris supply;
- Provide stream side shade and maintain bank microclimates.

2. Monitoring Approach

- Two tiered approach
 - Tier I = GIS analysis
 - Tier II = field analysis

2. Monitoring Approach

Tier I = GIS data analysis

GIS Indicators:

- Sediment
 - # road stream-crossings
 - length of road on unstable terrain
 - *Landslides (mass wasting)*
- Riparian
 - proportion of stream network harvested
 - road length within 100m from stream
- Hydrology (peakflow) – % forest harvested

2. Monitoring Approach

Tier I = GIS data analysis

- Tier I -- Rolling it all up...

2. Monitoring

Tier II => Field Data Collection

FREP Field Protocols used...

- Riparian (Stream Channel) condition
- Water Quality
- Fish Passage
- *Mass wasting*
- *Wetland condition*

2. Monitoring -- Tier II

Training...



Data collection...



2. Tier II => Field Analysis

Are the following aspects of the watershed functioning properly?

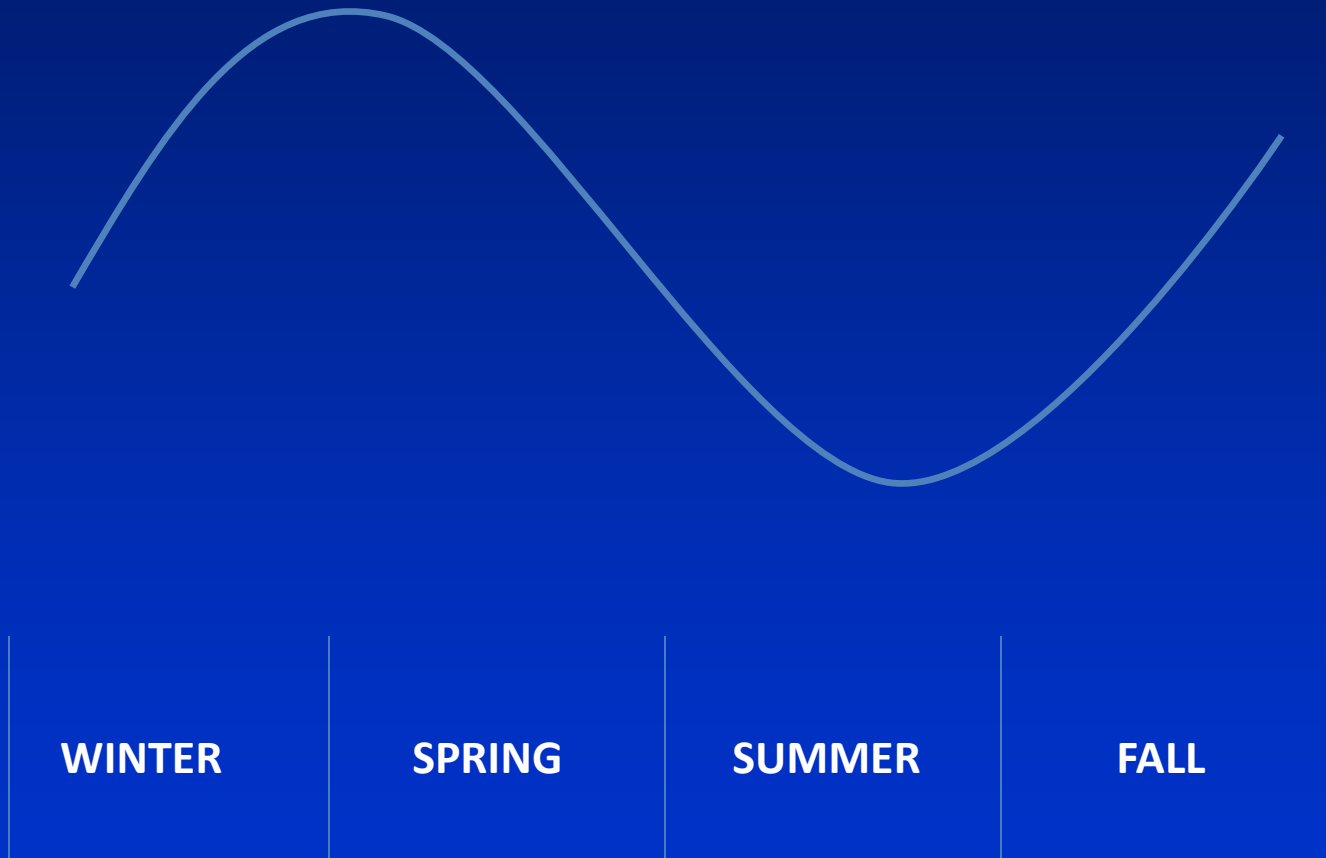
- Riparian = yes**
- Water Quality = yes**
- Fish Passage = yes**

3. Climate Change and watershed monitoring

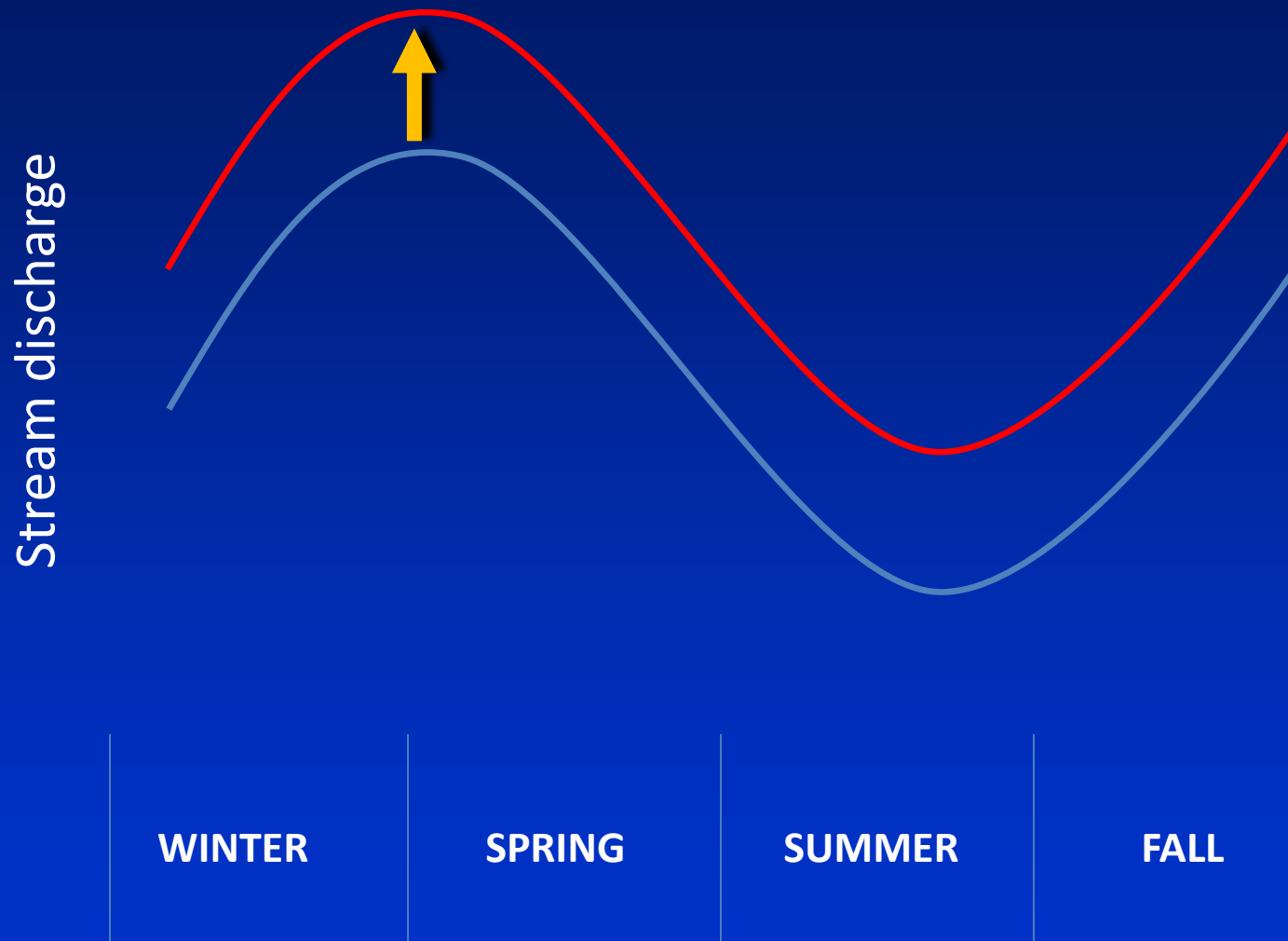
Climate Change: what can we expect?

3. Stream Flows

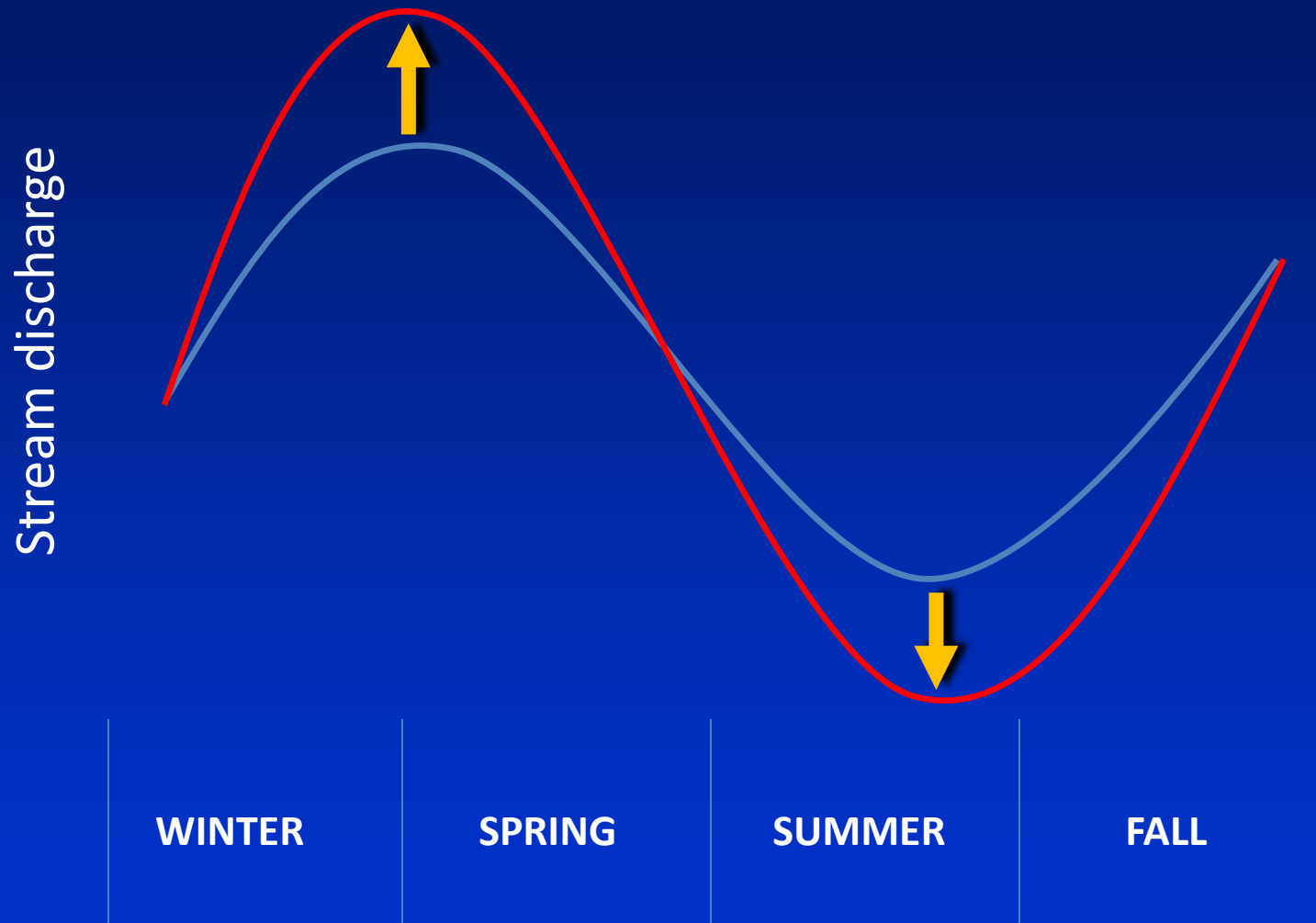
Stream discharge



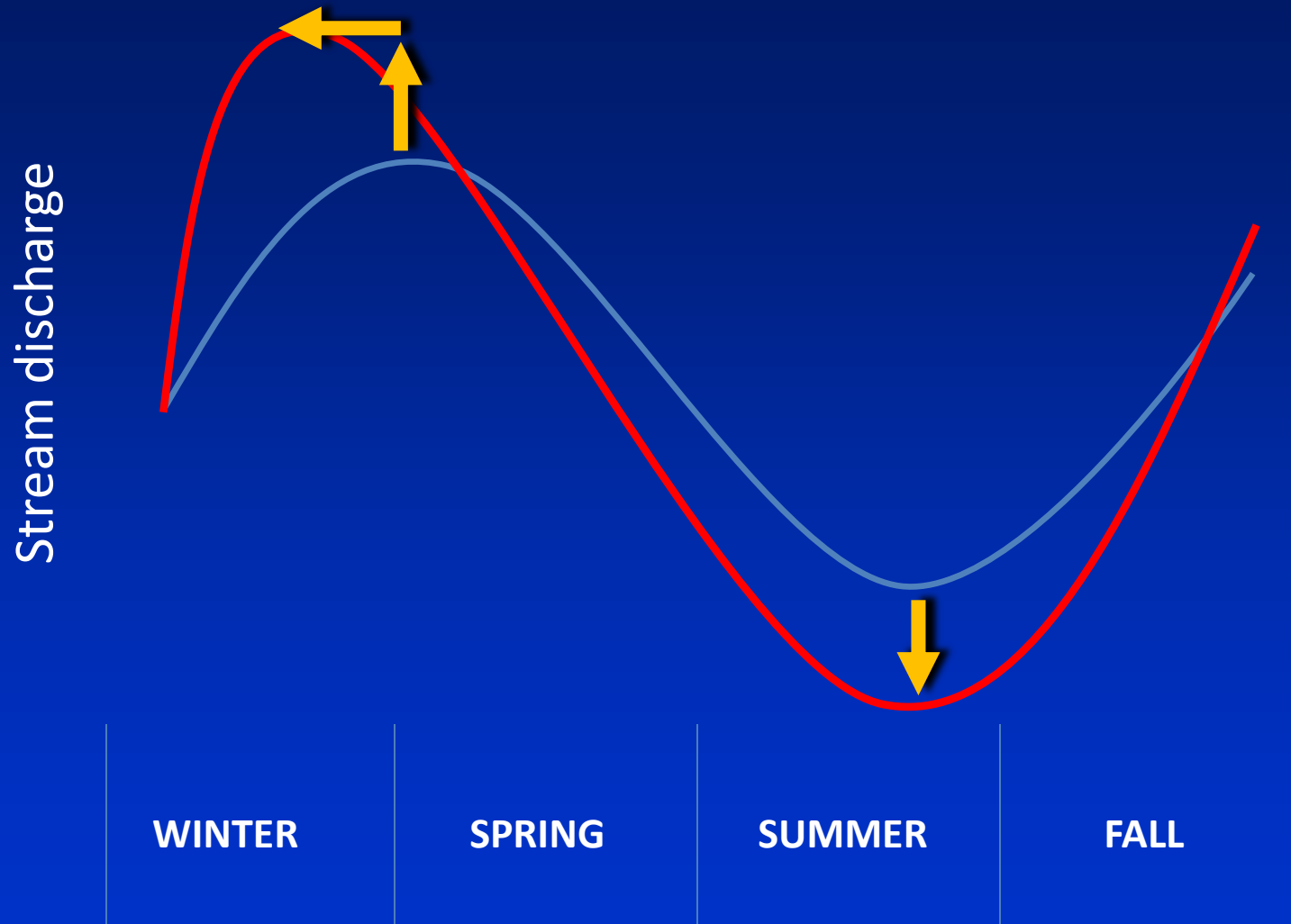
3. Stream Flows



3. Stream Flows



3. Stream Flows



Normal Flow Levels



Very Low Flow Levels



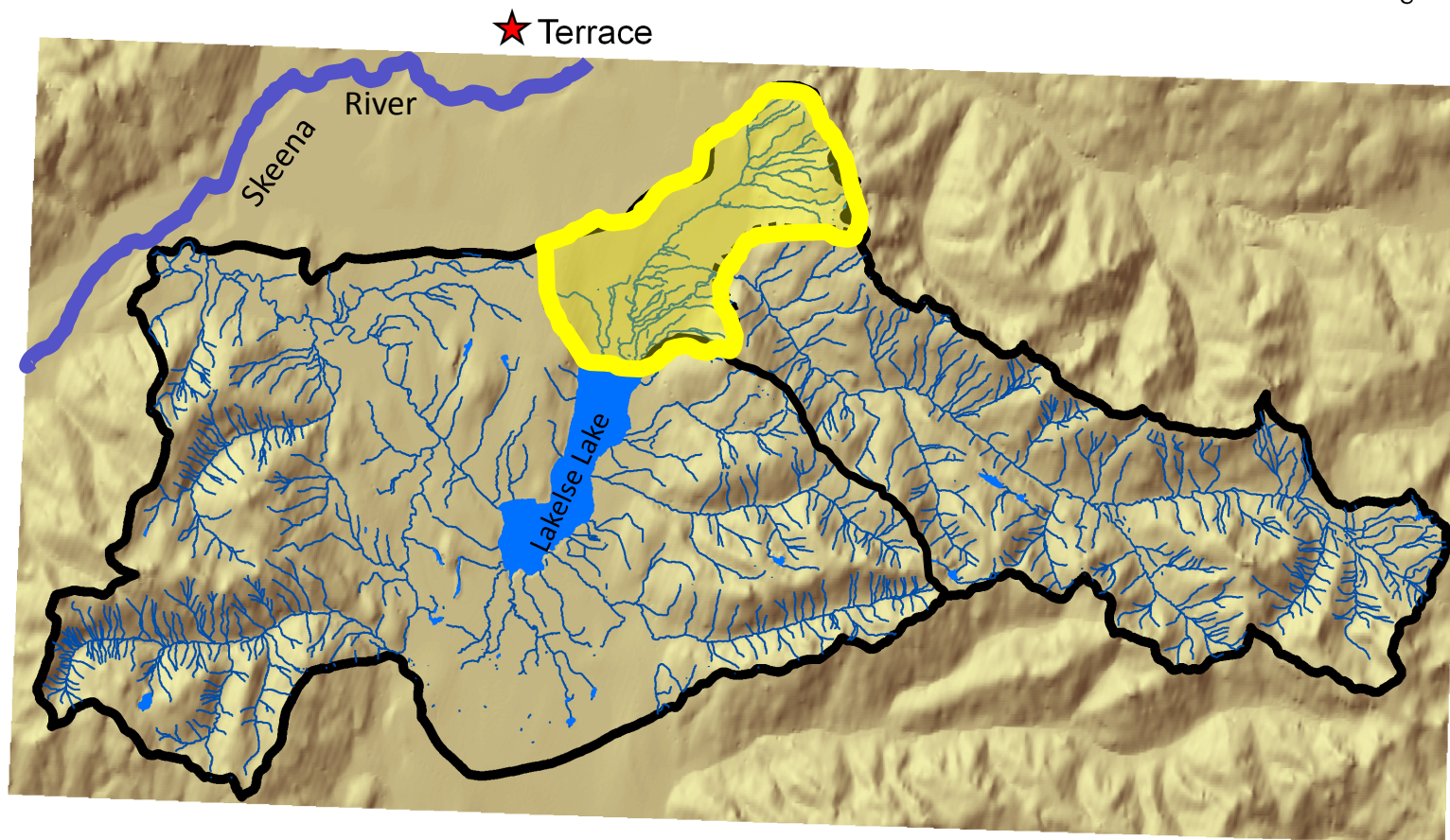
3. Climate Change and watershed monitoring

Climate Change Indicators

- Snow pack and ice field (GIS)
- Stream temperature (Field)
- Hydrology modeling as a management filter (e.g. Moore et al. *In press*) (GIS)
- *Stream hydrometric data (requires expanded network of hydrometric stations?)*

4. What have we learned so far...

Lakelse Drainage



0 2.5 5 10
Kilometers

Sockeye & Lower Williams Creek

EVALSTATUS

- Not Eval (Red dot)
- Sampled (Yellow dot)

0 0.3 0.6 0.9 1.2 Kilometers

Lower Williams Creek

EVALSTATUS

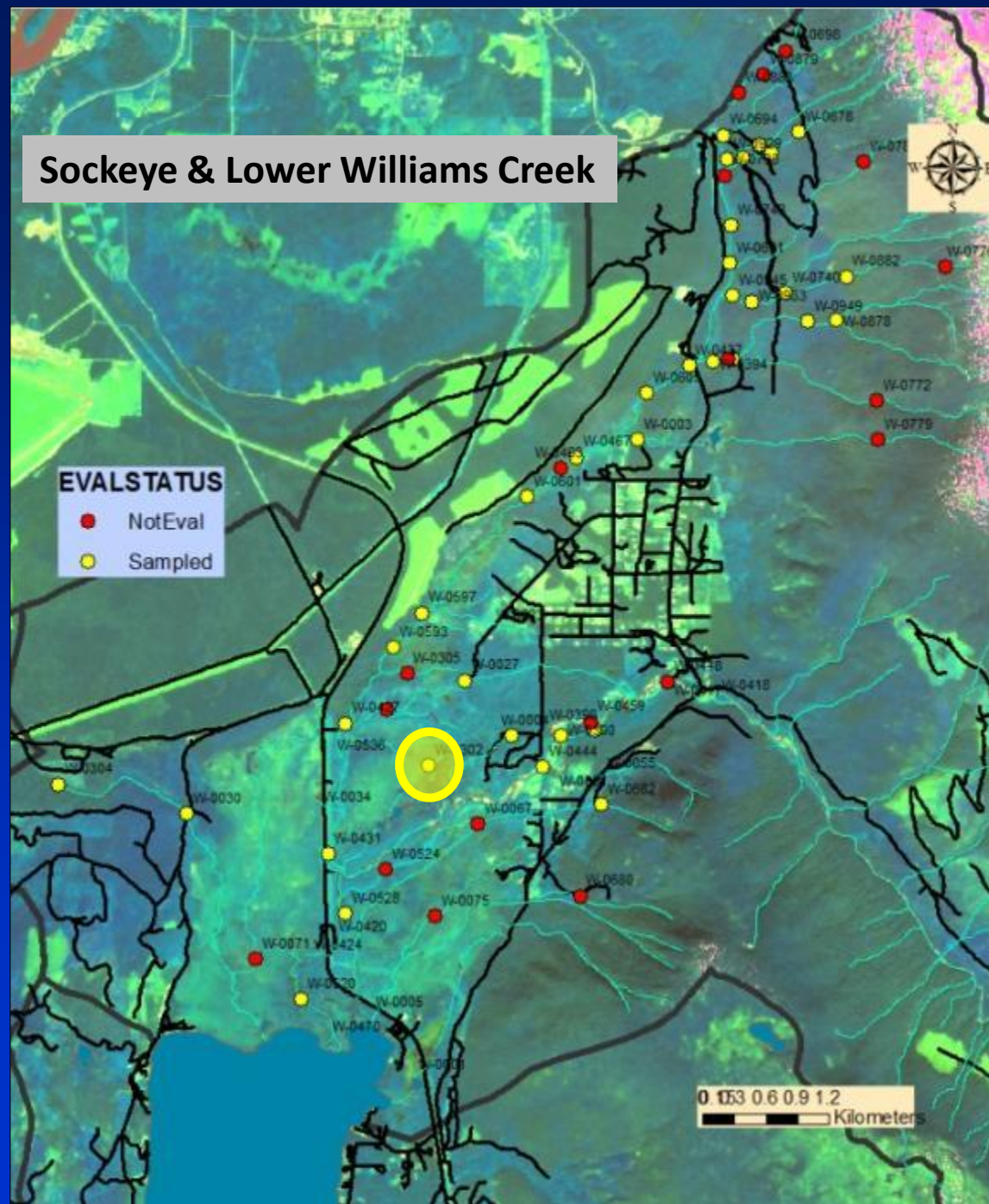
- NotEval
- Sampled

0 0.3 0.6 0.9 1.2 Kilometers

The map displays the Lower Williams Creek area with a color-coded background representing different land use or vegetation types. Black lines indicate the creek's network and various roads. Sampling locations are marked with yellow dots, many of which are circled in yellow. Some locations are labeled with codes like W-0001, W-0002, W-0003, W-0004, W-0005, W-0006, W-0007, W-0008, W-0009, W-0010, W-0011, W-0012, W-0013, W-0014, W-0015, W-0016, W-0017, W-0018, W-0019, W-0020, W-0021, W-0022, W-0023, W-0024, W-0025, W-0026, W-0027, W-0028, W-0029, W-0030, W-0031, W-0032, W-0033, W-0034, W-0035, W-0036, W-0037, W-0038, W-0039, W-0040, W-0041, W-0042, W-0043, W-0044, W-0045, W-0046, W-0047, W-0048, W-0049, W-0050, W-0051, W-0052, W-0053, W-0054, W-0055, W-0056, W-0057, W-0058, W-0059, W-0060, W-0061, W-0062, W-0063, W-0064, W-0065, W-0066, W-0067, W-0068, W-0069, W-0070, W-0071, W-0072, W-0073, W-0074, W-0075, W-0076, W-0077, W-0078, W-0079, W-0080, W-0081, W-0082, W-0083, W-0084, W-0085, W-0086, W-0087, W-0088, W-0089, W-0090, W-0091, W-0092, W-0093, W-0094, W-0095, W-0096, W-0097, W-0098, W-0099, W-0100. A legend in the top left corner indicates that red dots represent 'NotEval' and yellow dots represent 'Sampled'. A scale bar in the bottom right corner shows distances from 0 to 1.2 kilometers. A north arrow is located in the top right corner.

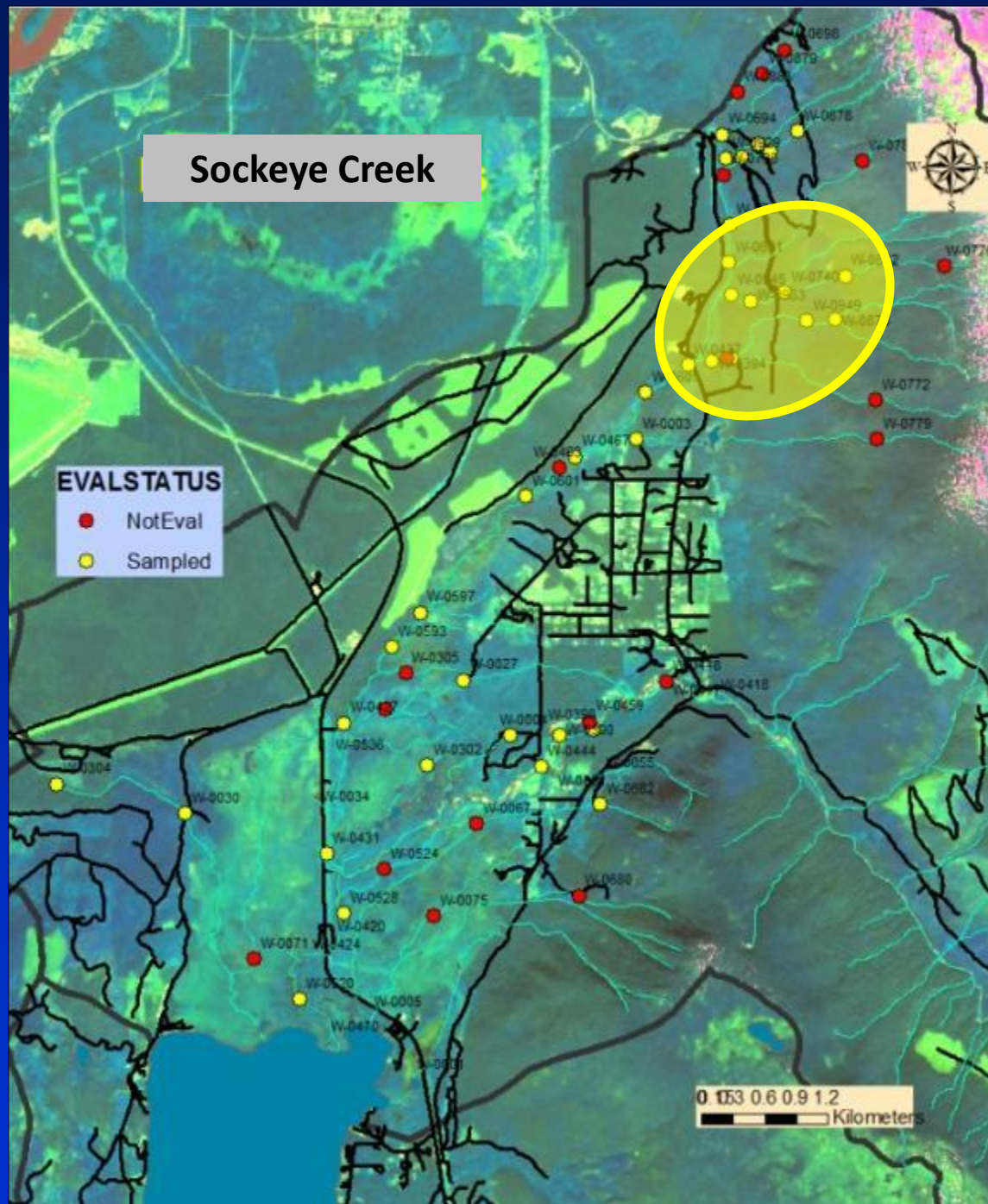


Sockeye & Lower Williams Creek





Sockeye Creek





5. Where to from here (considerations & next steps)...

Management considerations under climate change in watersheds with high values...

Manage to prevent Cumulative Effects

5. Where to from here (considerations & next steps)...

Management considerations under climate change in watersheds with high values...

- Road building standards
 1. Drainage structures (more with greater capacity)
 2. Design techniques that minimize sediment and mass wasting
 3. Road maintenance & deactivation
- Recovery timing vs. harvest cycle
 1. Increased riparian protection (stream length and width)
 2. Partial cutting and commercial thinning

5. Where to from here (recommendations & next steps)...

- Where we're "at" (project status)
- Expansion of the study

Tier II Training & Monitoring Participants

- DFO 9
- FLNRO 8
- LWS 1*
- MOE 1
- NWCC 2
- KSRD 1*
- UNBC 1
- Consulting (direct) 3*
- Consulting (indirect) 4*
- Total participants 29

*includes volunteer time

Questions?



Sponsoring Agencies

