May 1st, 1:30 PM - 3:00 PM

Oceanography of Cowichan Bay: A background view for early marine survival of Chinook and Coho salmon

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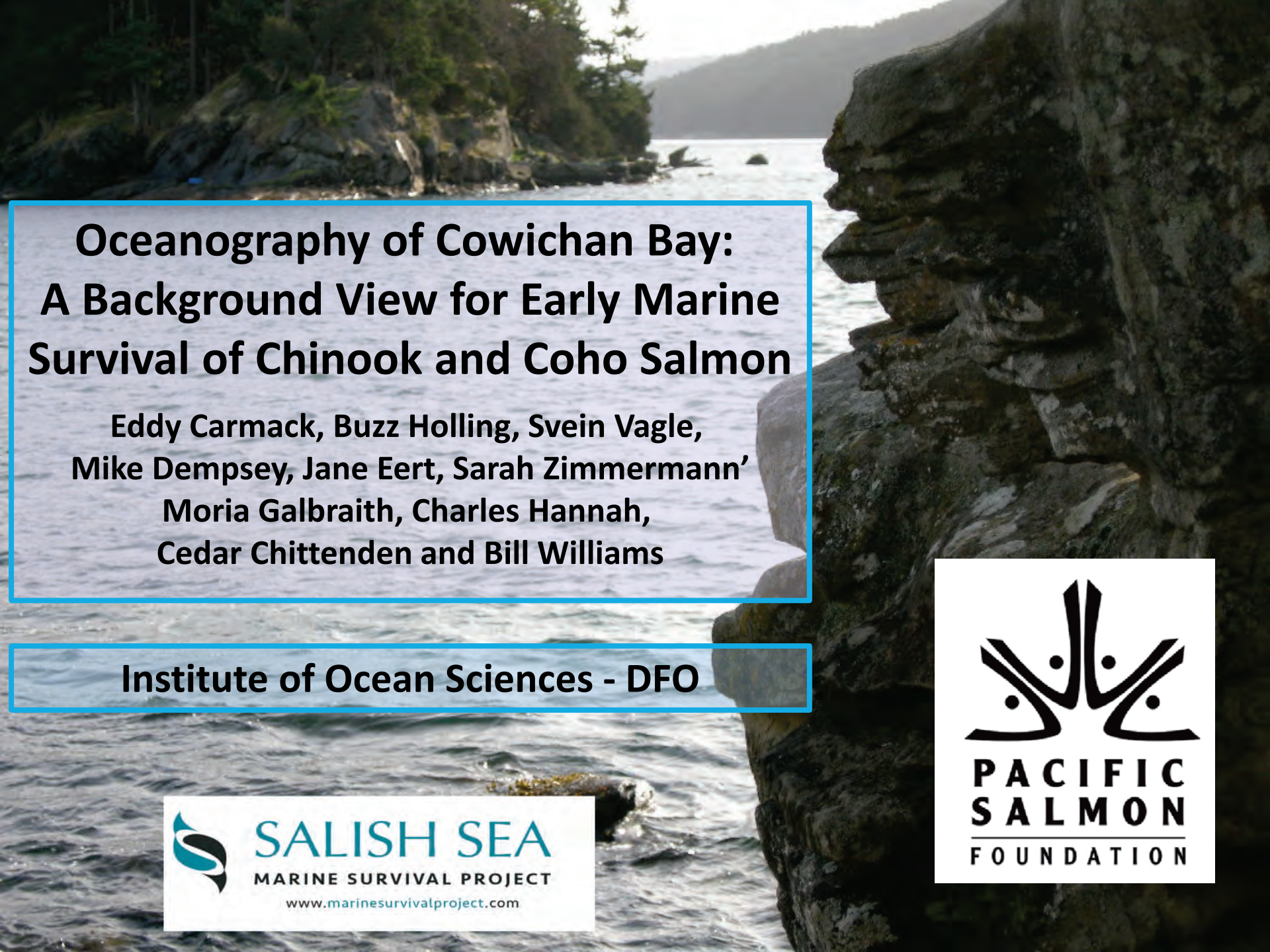

Oceanography of Cowichan Bay: A Background View for Early Marine Survival of Chinook and Coho Salmon

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Institute of Ocean Sciences - DFO

SALISH SEA
MARINE SURVIVAL PROJECT
www.marinesurvivalproject.com

PACIFIC SALMON FOUNDATION

Outline

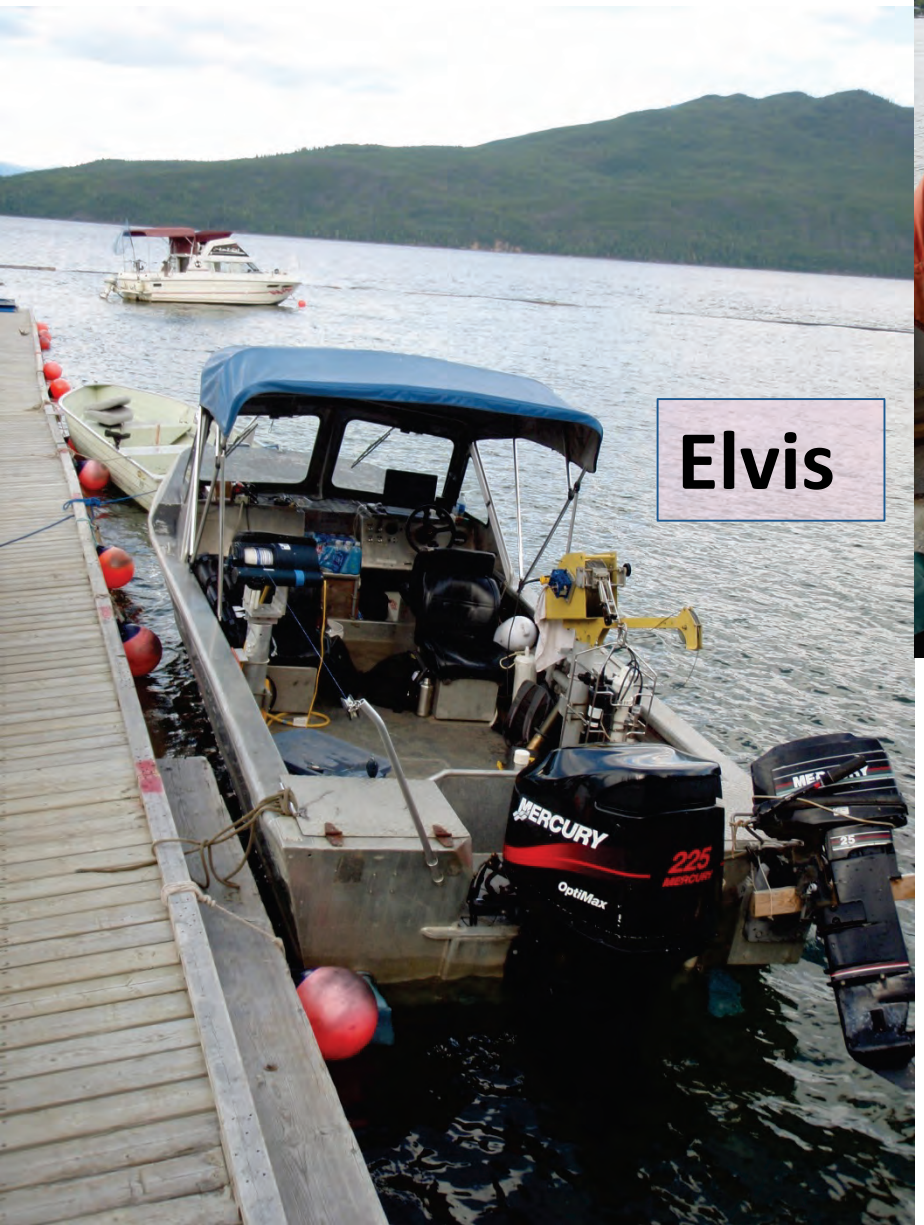
As a background for and ecosystem based assessment of Early Marine Survival of Chinook and Coho, a pilot study of a Cowichan Bay, a small sub-component of the Salish Sea system was launched in Spring and early Summer of 2013, and is now Continuing into 2014.

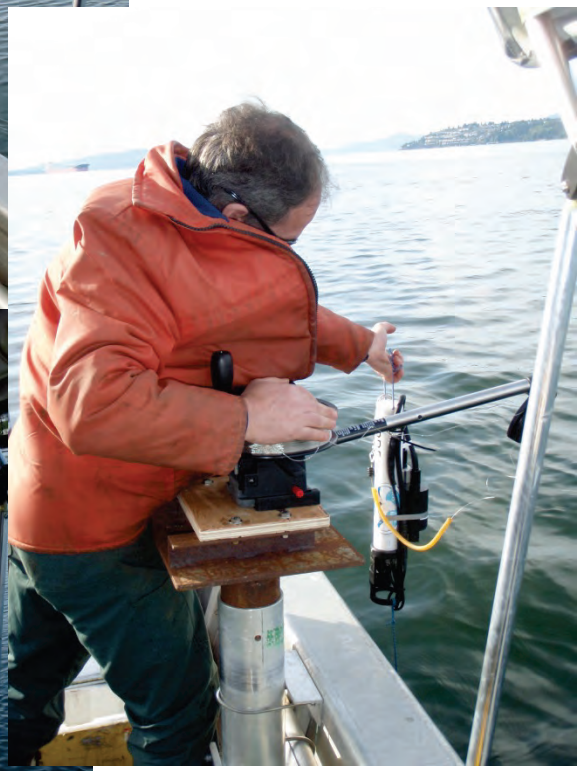
A repeat sampling grid was established in the bay and the surrounding waters, and sampled at weekly intervals for Temperature, salinity, chlorophyll fluorescence, , nutrients and zooplankton; oceanographic measurements were carried out concurrently with fisheries assessments.

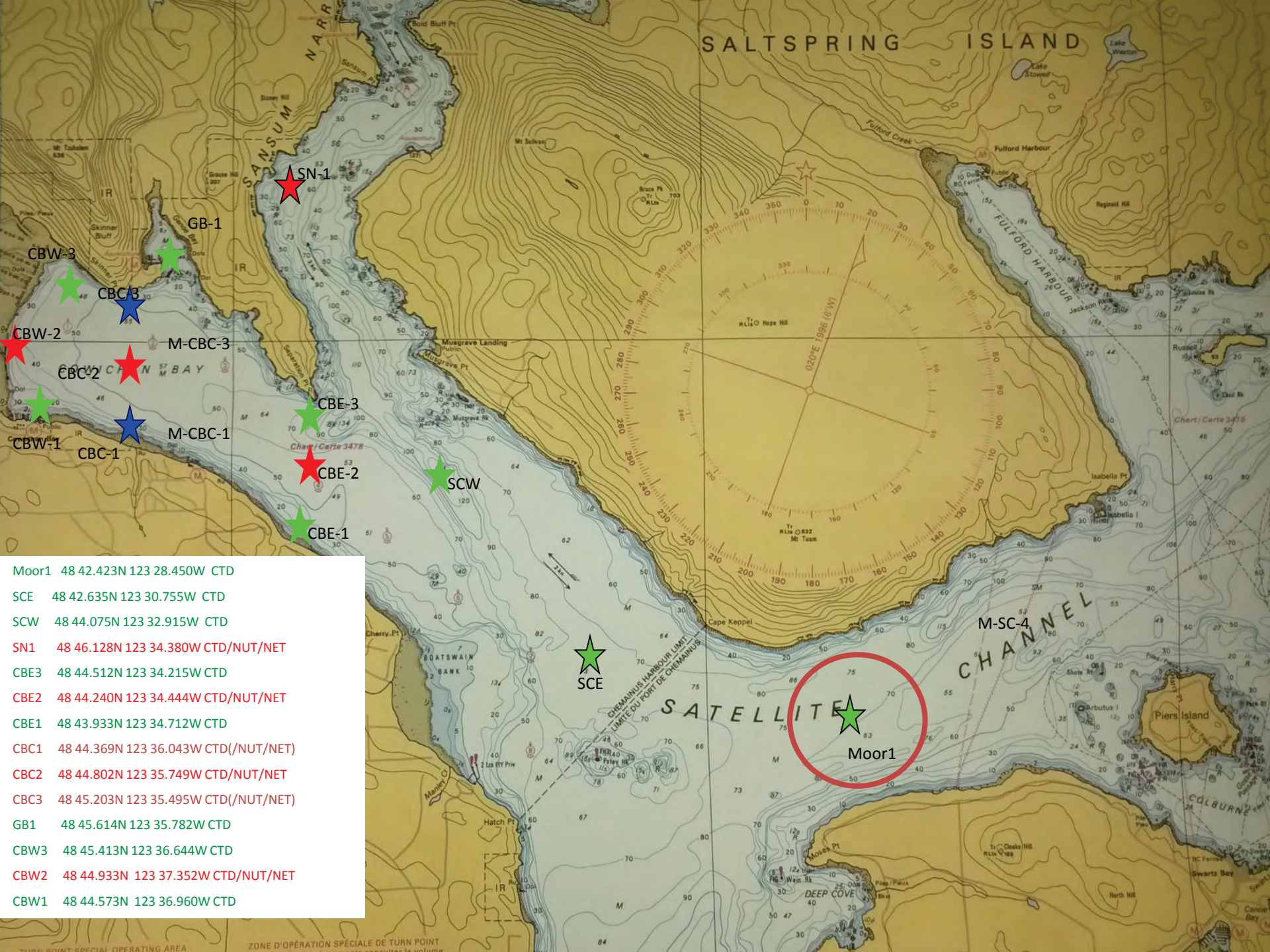
A longer section was carried out at monthly intervals to connect Cowichan Bay with the Salish Sea.


Tzouhalem
Cowichan R.
R1
R2
R3
2a
Genoa Bay
14
Koksilah R.
7
itchard Rd
A
Cowichan Bay
10
Image © 2013 DigitalGlobe
© 2013 Google
Glen Rd
Google
Map
Photo

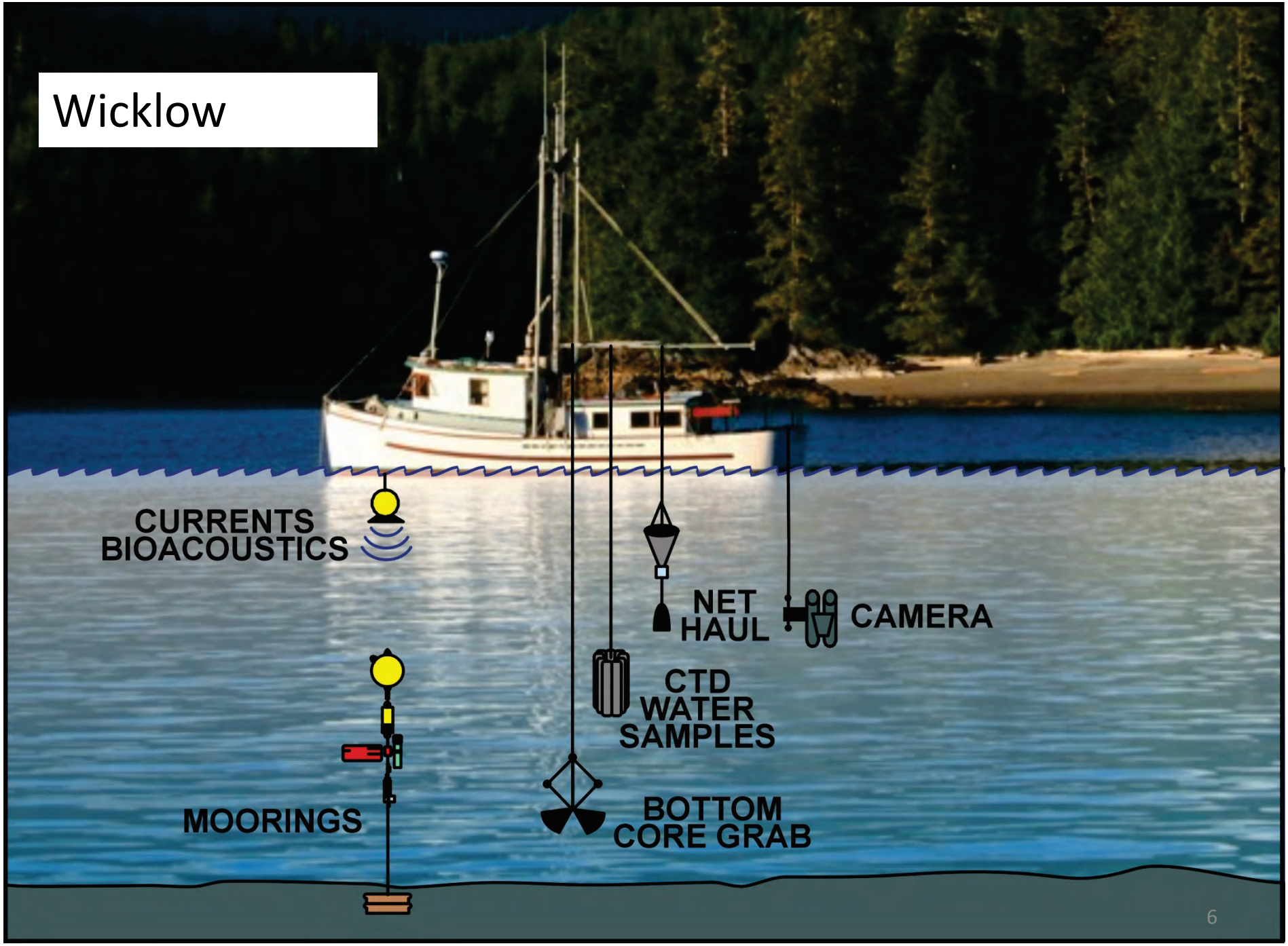
Sampling vessels:



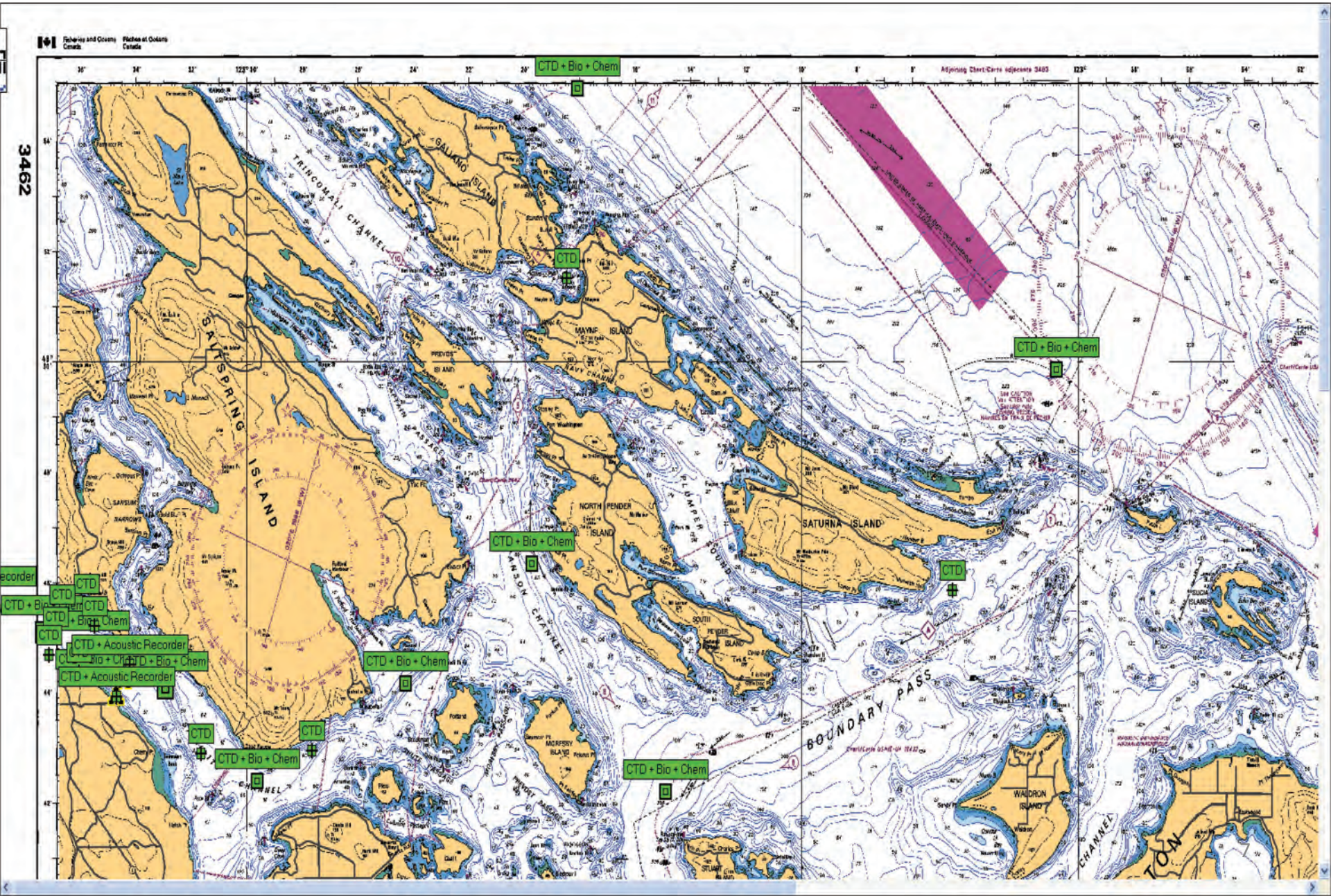




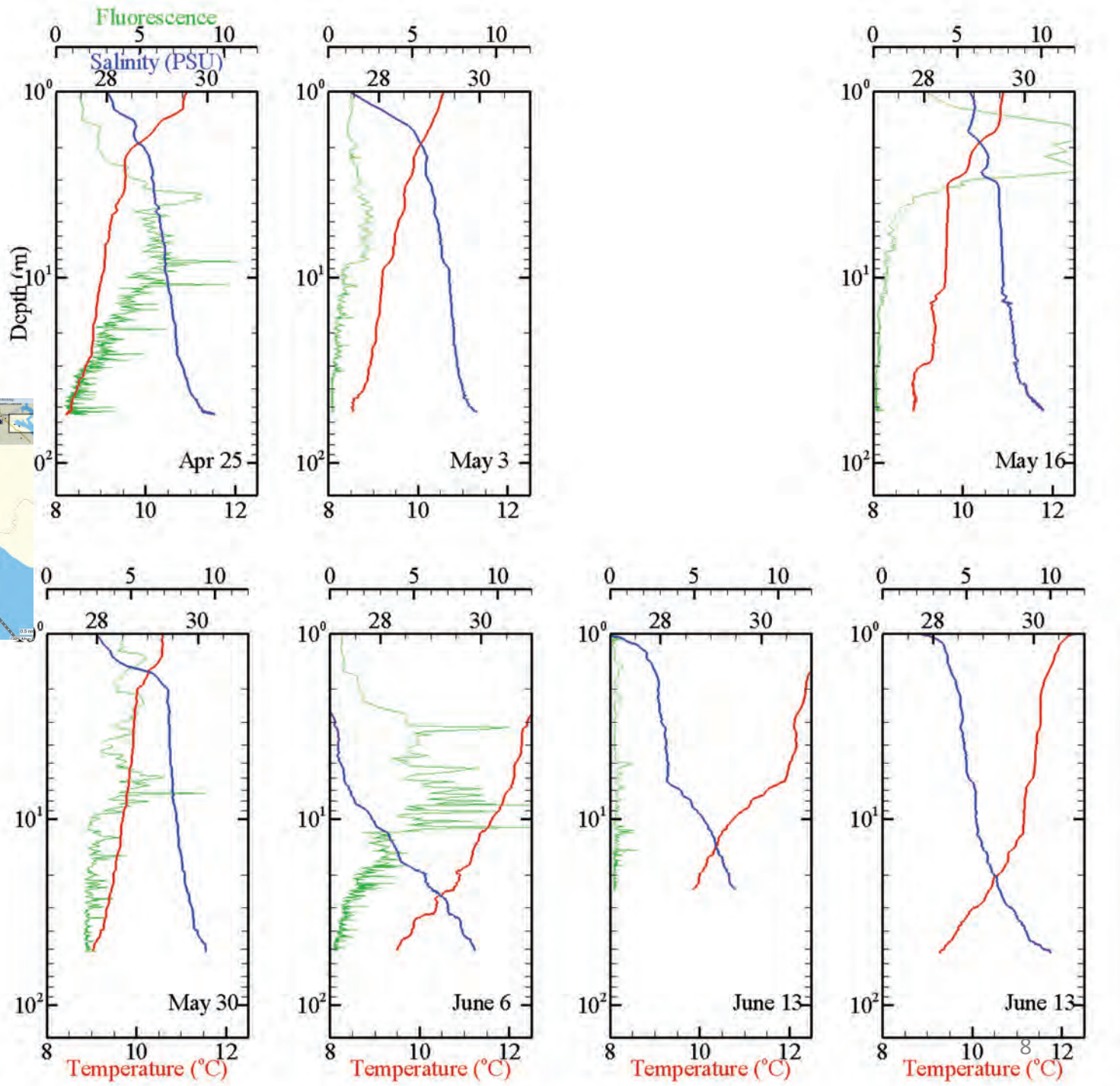
Moor1	48 42.423N	123 28.450W CTD
SCE	48 42.635N	123 30.755W CTD
SCW	48 44.075N	123 32.915W CTD
SN1	48 46.128N	123 34.380W CTD/NUT/NET
CBE3	48 44.512N	123 34.215W CTD
CBE2	48 44.240N	123 34.444W CTD/NUT/NET
CBE1	48 43.933N	123 34.712W CTD
CBC1	48 44.369N	123 36.043W CTD(/NUT/NET)
CBC2	48 44.802N	123 35.749W CTD/NUT/NET
CBC3	48 45.203N	123 35.495W CTD(/NUT/NET)
GB1	48 45.614N	123 35.782W CTD
CBW3	48 45.413N	123 36.644W CTD
CBW2	48 44.933N	123 37.352W CTD/NUT/NET
CBW1	48 44.573N	123 36.960W CTD

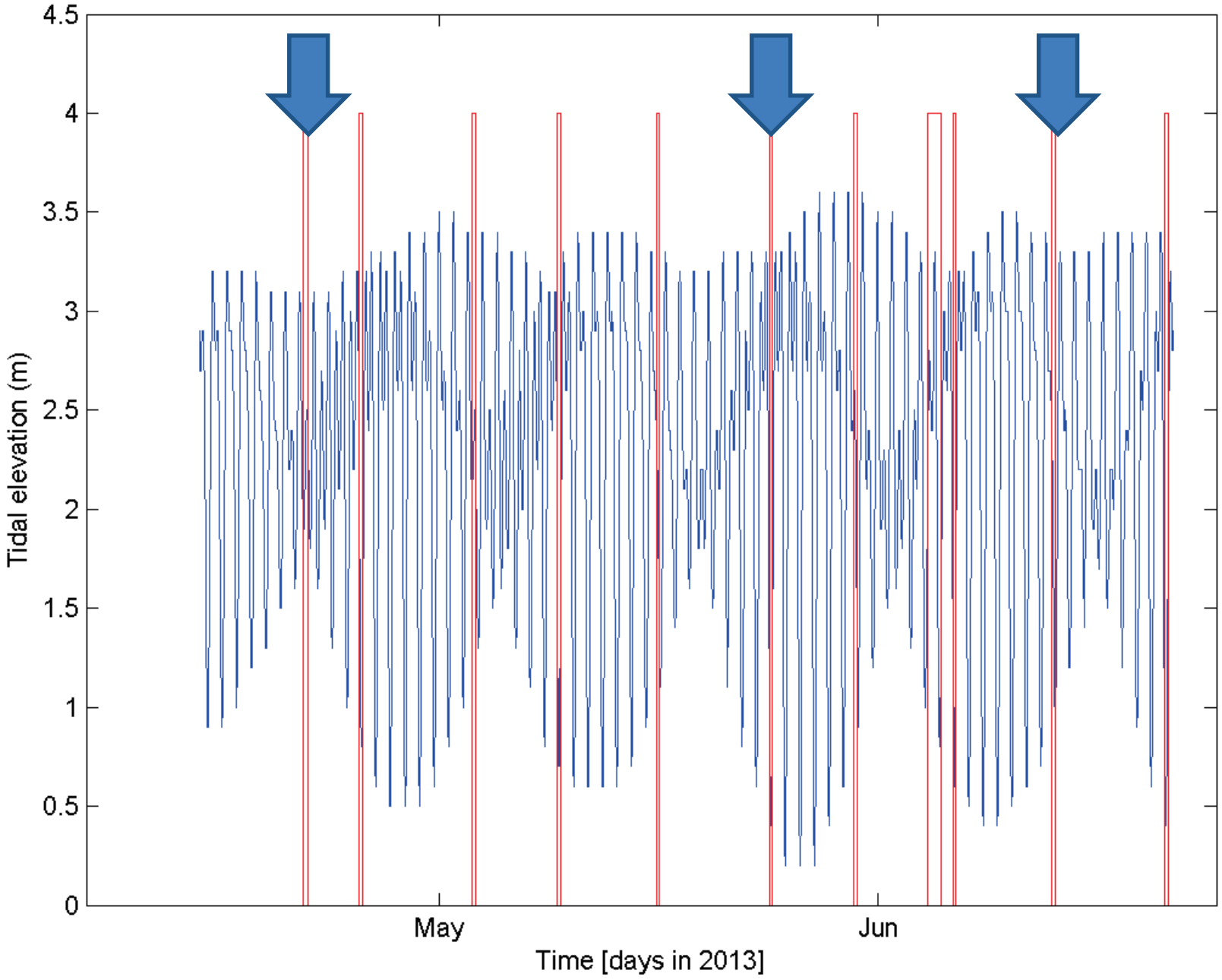

Wicklow
CURRENTS
BIOACOUSTICS
NET
HAUL
CAMERA
CTD
WATER
SAMPLES
MOORINGS
BOTTOM
CORE GRAB

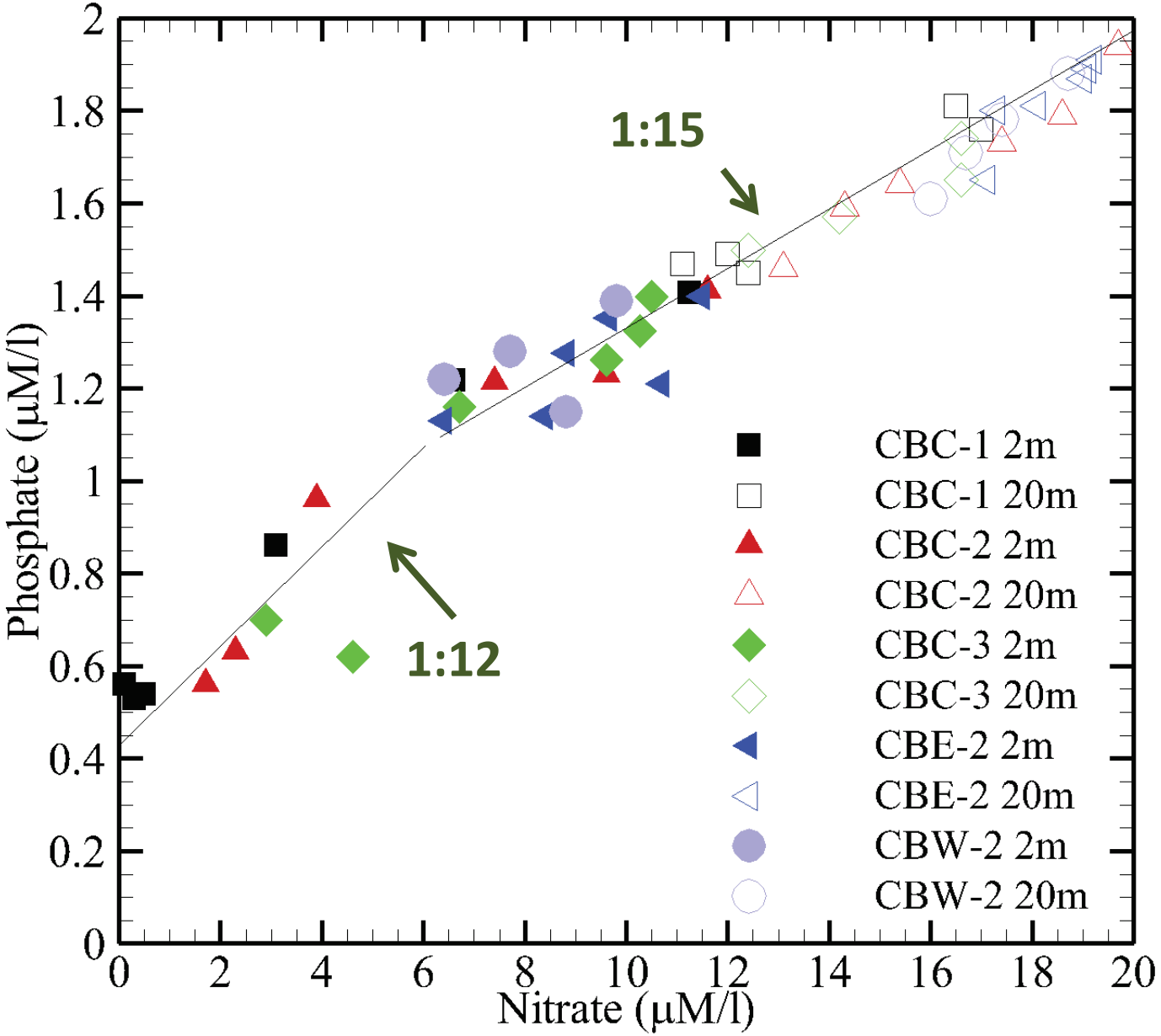
Sampling Stations II

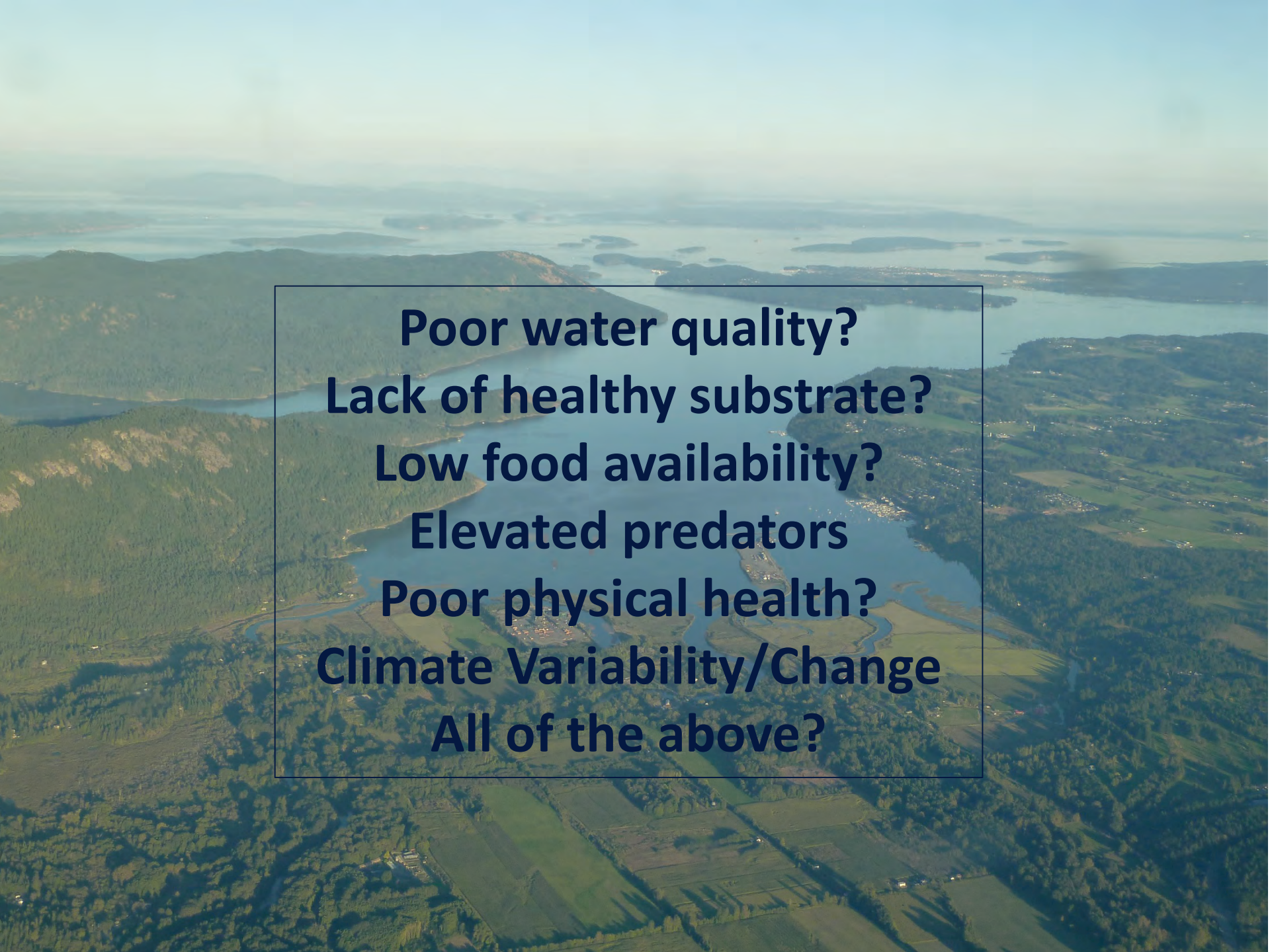


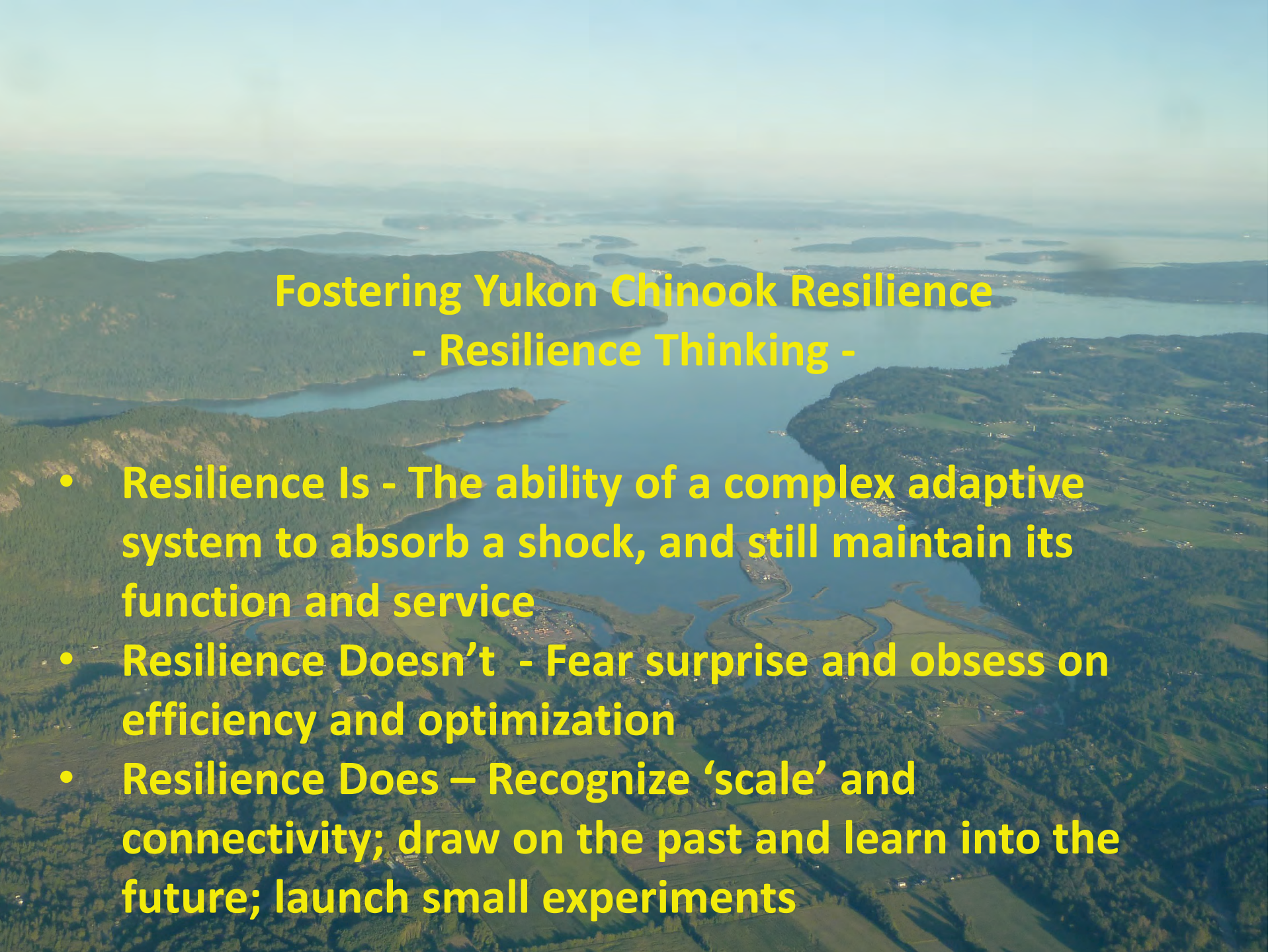
CBC-2


Fluorescence
Salinity (PSU)
Depth (m)
Apr 25
May 3
May 16
May 30
June 6
June 13
June 13
Temperature (°C)


4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Tidal elevation (m)
May
Jun
Time [days in 2013]

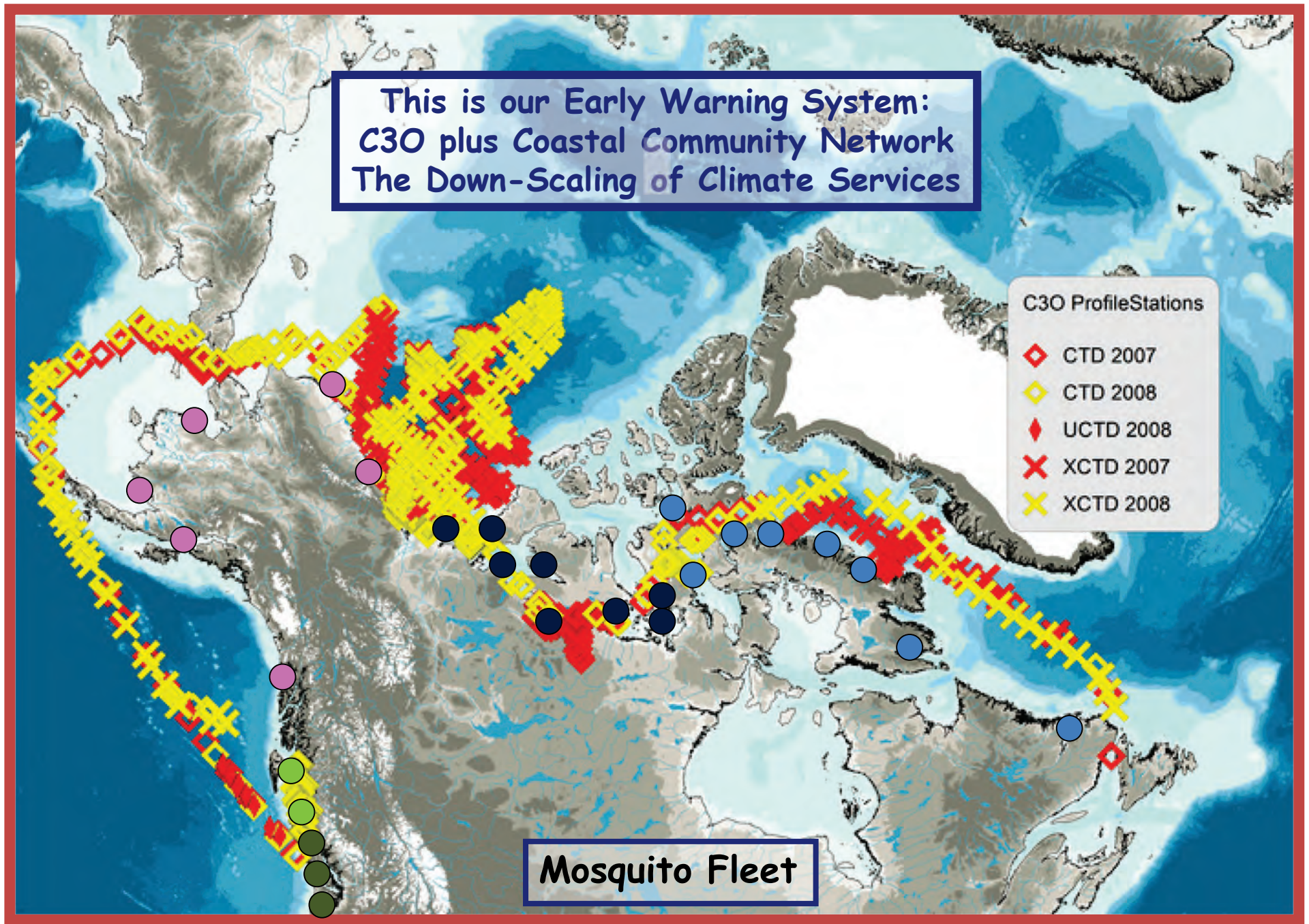

1:15
1:12
Phosphate (µM/l)
Nitrate (µM/l)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0
2
4
6
8
10
12
14
16
18
20
CBC-1 2m
CBC-1 20m
CBC-2 2m
CBC-2 20m
CBC-3 2m
CBC-3 20m
CBE-2 2m
CBE-2 20m
CBW-2 2m
CBW-2 20m


Poor water quality?
Lack of healthy substrate?
Low food availability?
Elevated predators
Poor physical health?
Climate Variability/Change
All of the above?



Fostering Yukon Chinook Resilience
- Resilience Thinking -

- Resilience Is - The ability of a complex adaptive system to absorb a shock, and still maintain its function and service
- Resilience Doesn't - Fear surprise and obsess on efficiency and optimization
- Resilience Does – Recognize 'scale' and connectivity; draw on the past and learn into the future; launch small experiments


This is our Early Warning System:
C3O plus Coastal Community Network
The Down-Scaling of Climate Services
C3O ProfileStations
CTD 2007
CTD 2008
UCTD 2008
XCTD 2007
XCTD 2008
Mosquito Fleet

SUMMARY

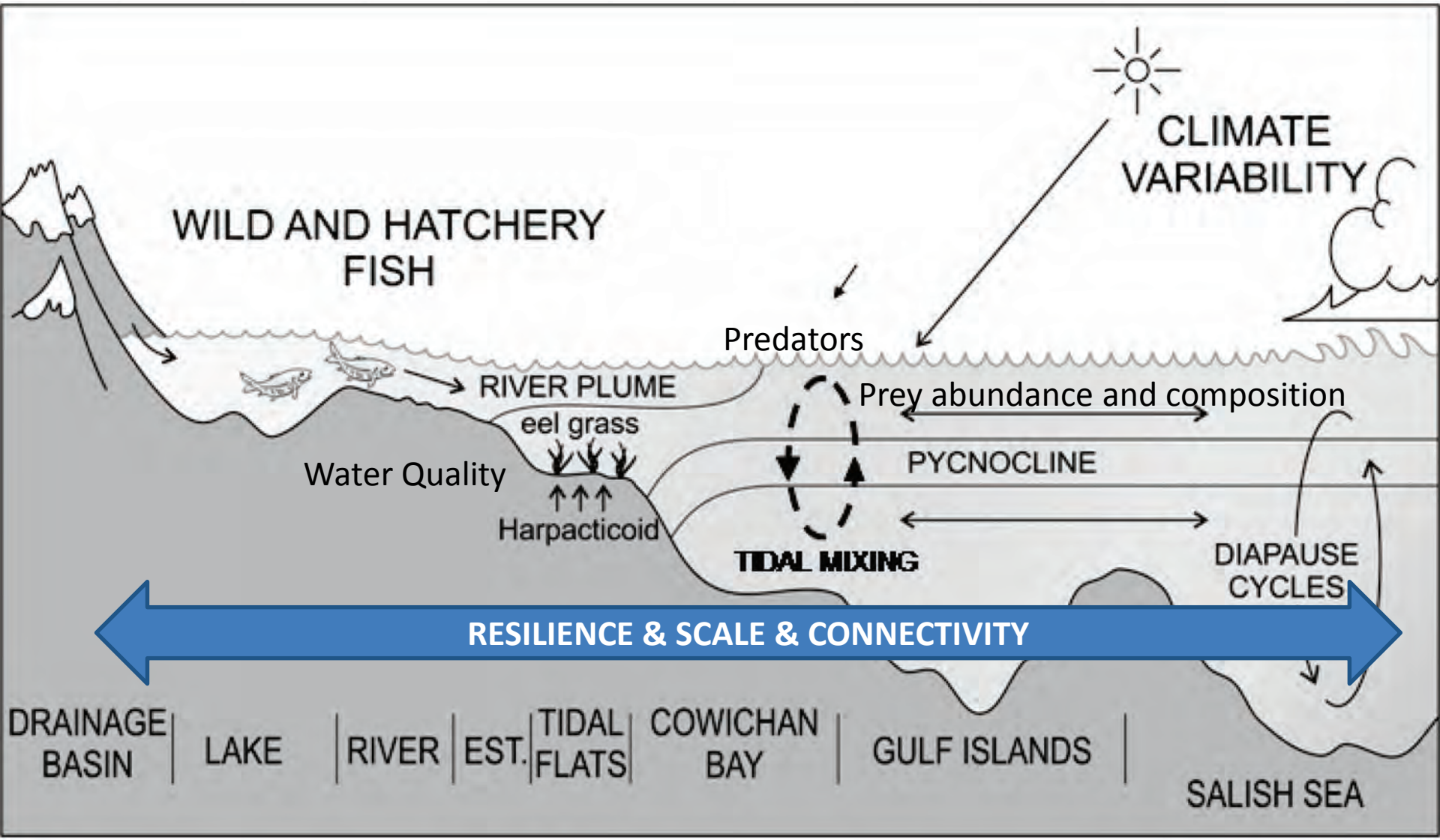


Figure – Schematic of the oceanography of Cowichan Bay in relation to climate variability and connectivity to the watershed, lake, river, estuary Gulf Islands and Strait of Georgia.