



Apr 5th, 11:00 AM - 11:15 AM

Results from the Baynes Sound Environmental Intelligence Collaboration (BaSEIC)

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Evans, Wiley; Winterburn, Darlene; Pocock, Katie; Weekes, Carrie; and Hare, Alex, "Results from the Baynes Sound Environmental Intelligence Collaboration (BaSEIC)" (2018). *Salish Sea Ecosystem Conference*. 169. <https://cedar.wvu.edu/ssec/2018ssec/allsessions/169>

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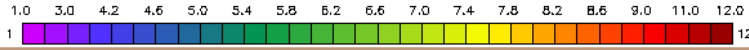
Results from the Baynes Sound Environmental Intelligence Collaborative (BaSEIC)

Wiley Evans¹, Darlene Winterburn², Katie Pocock¹, Carrie Weekes¹, Alex Hare¹

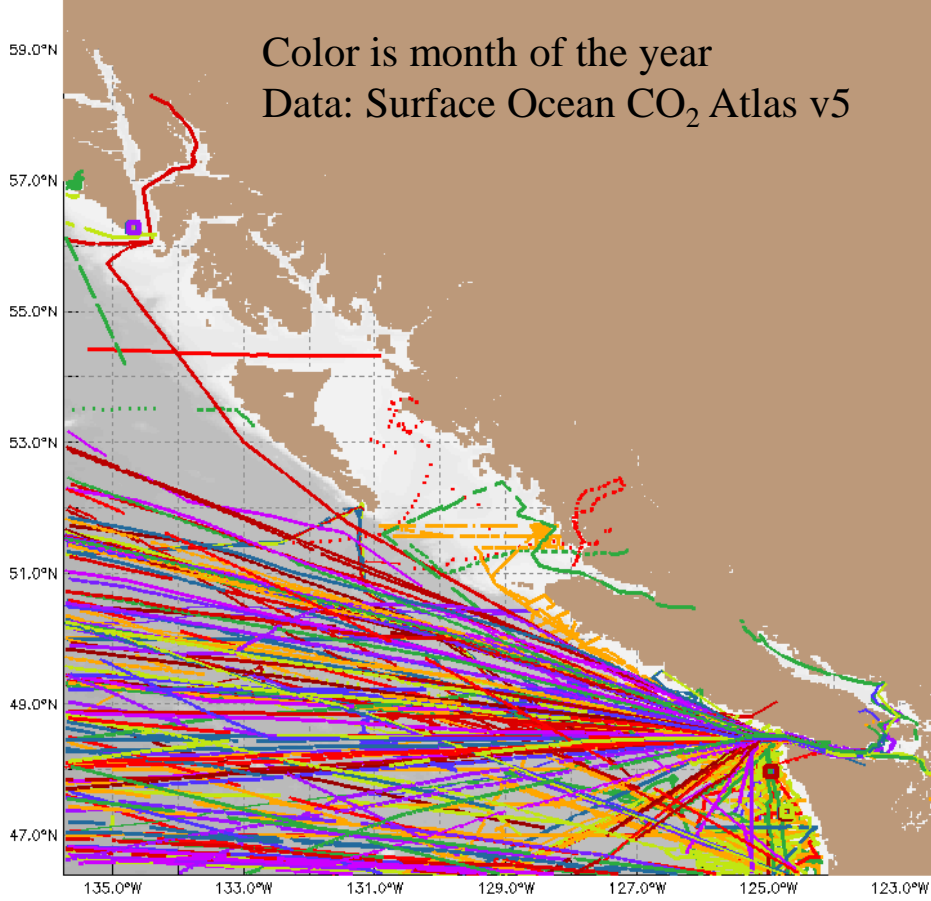
¹Hakai Institute, ²British Columbia Shellfish Growers Association
Salish Sea Ecosystem Conference, Seattle WA, April 5 2018



Data poor in regions where industry operates

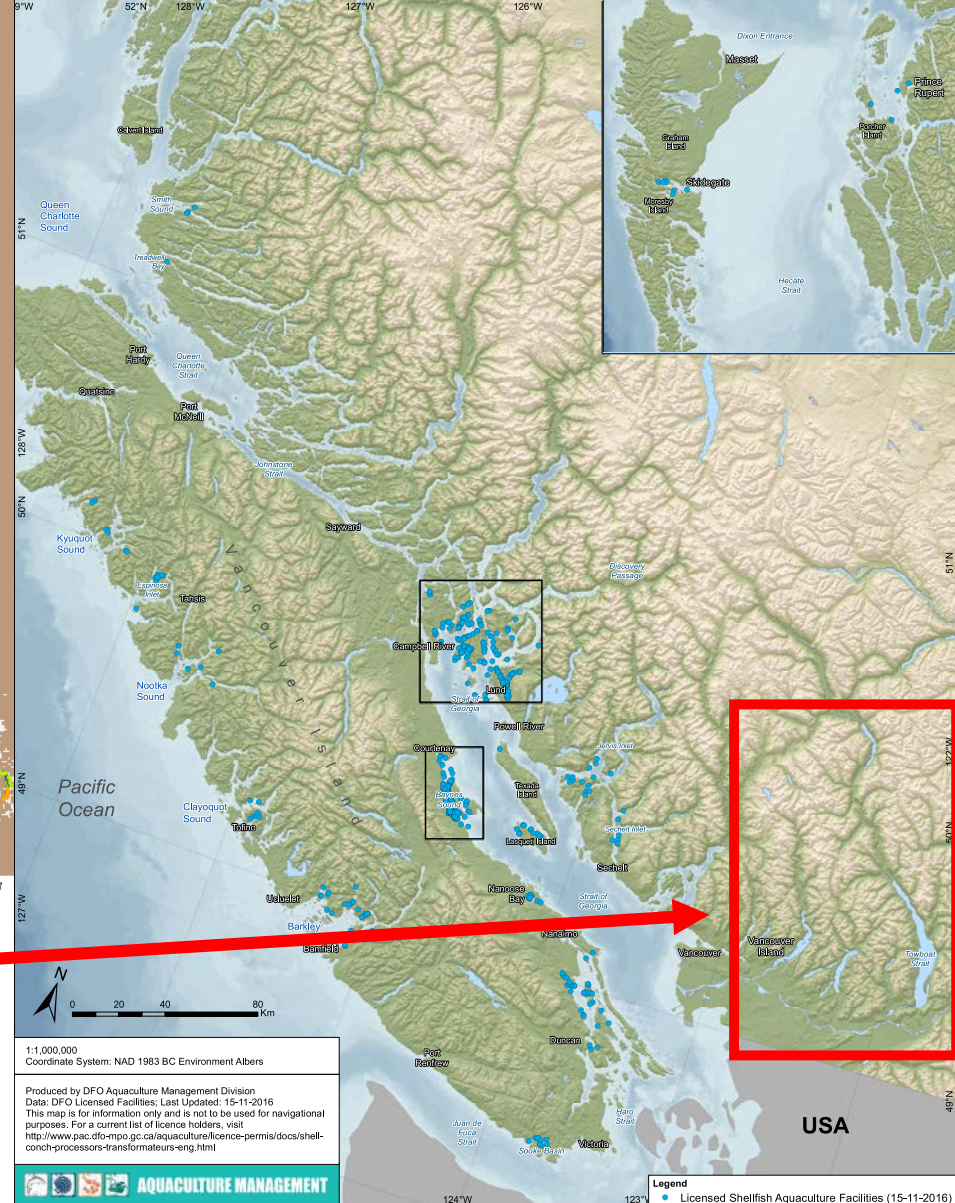


Color is month of the year
Data: Surface Ocean CO₂ Atlas v5



Baynes Sound:

40 km x 3.5 km; max depth 80 m
68% of total BC harvest in 2016
54% of total BC wholesale value (~57M/yr)





Salt Water pH

1165-02

7.7

7.8

7.9

8.0

8.1

8.2

8.3

8.4

LQM



The BCSGA Burke-o-Lator
Thank you to the Province of British Columbia Ministry of Agriculture



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Meet the Burke-o-Lator

A new instrument tracks ocean acidification in real time.

April 28, 2016 By [Josh Silberg](#)



Ocean acidification, resulting from increased carbon dioxide in the atmosphere, is a growing threat to the world's oceans. Creatures that live in calcium carbonate homes like corals and shellfish are some of the most vulnerable. But to track ocean acidification requires more than merely dipping a piece of litmus paper in the sea. A tiny, seaside shed in British Columbia now houses one of the world's most innovative systems to measure this phenomenon. Meet the Burke-o-Lator.

"This is a really exciting piece of equipment. It's the first of its kind in Canada," says chemical oceanographer Wiley Evans, who leads ocean acidification research at the Hakai Institute.

Standing next to Wiley in the instrumentation hut—a shed only slightly larger than your average bathroom perched a dozen meters above the high tide line—is the inventor of the Burke-o-Lator, Oregon State University professor Burke Hales. A pioneer in the field of ocean carbon cycles, Hales has come to Hakai's Quadra Island Field Station to help install his namesake machine, part of a



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1d 7h

The world's largest jellyfish is a pulsating wondrous glob of tentacled glory. [#Nature](#) [#Video](#)
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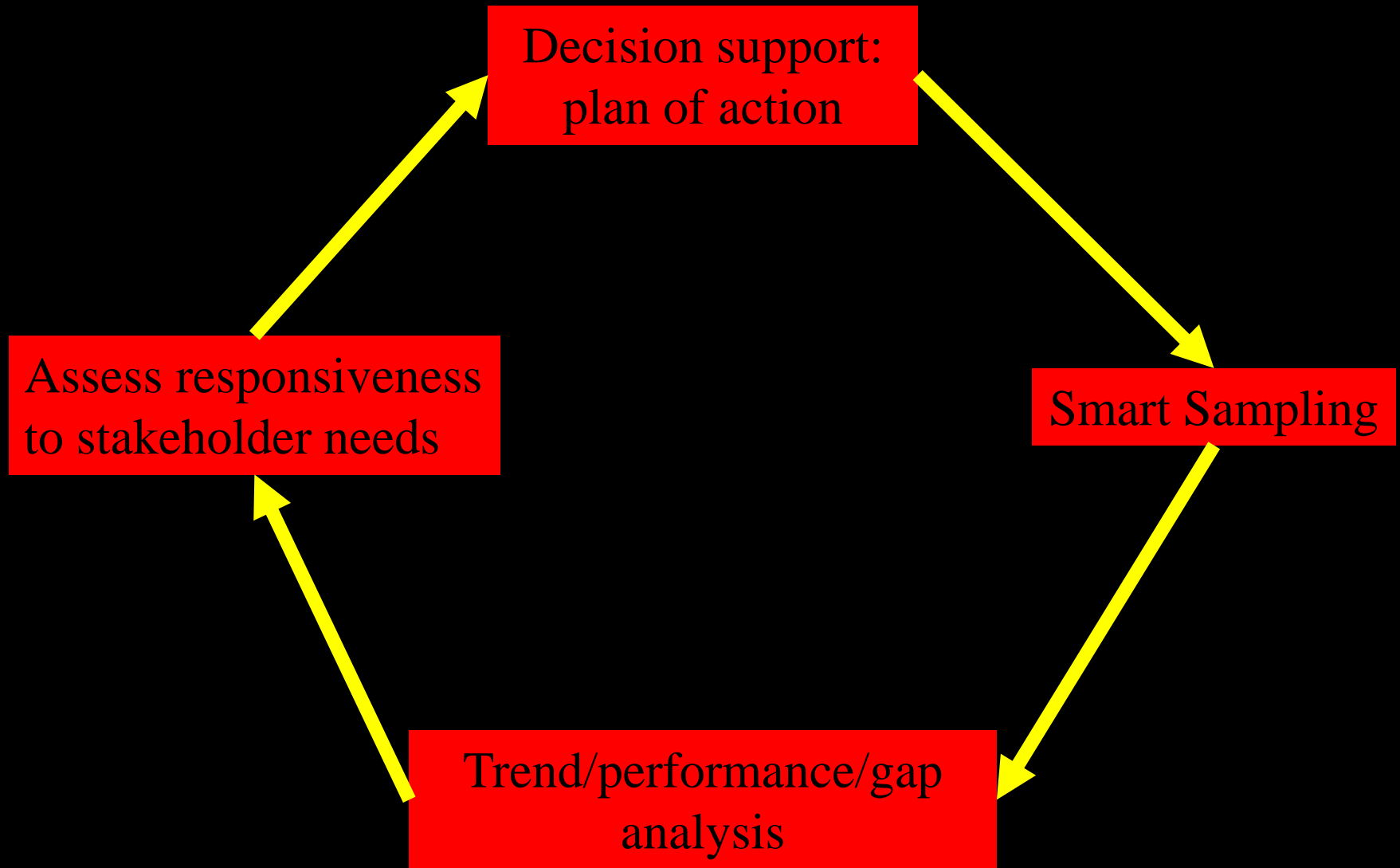


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2d 15h

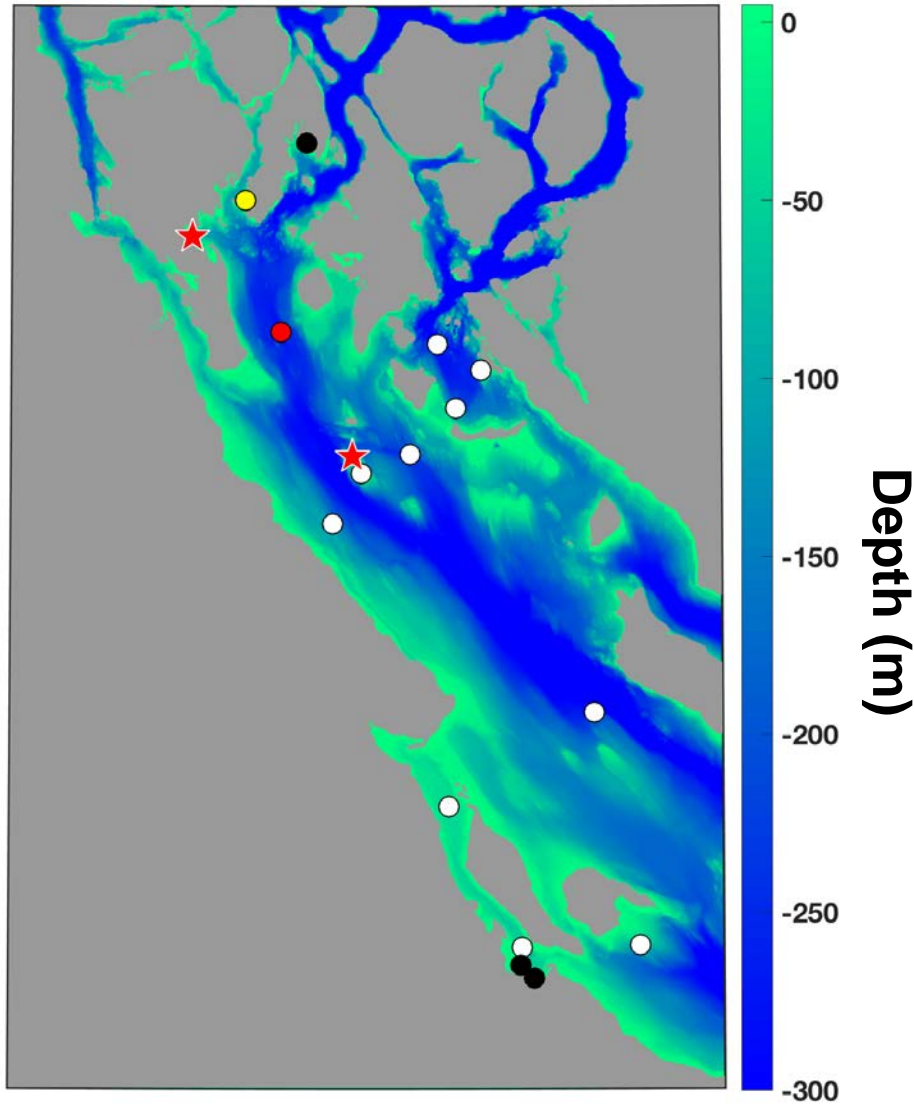
VISIT: www.hakai.org/blog

What do we mean by “Environmental Intelligence”?

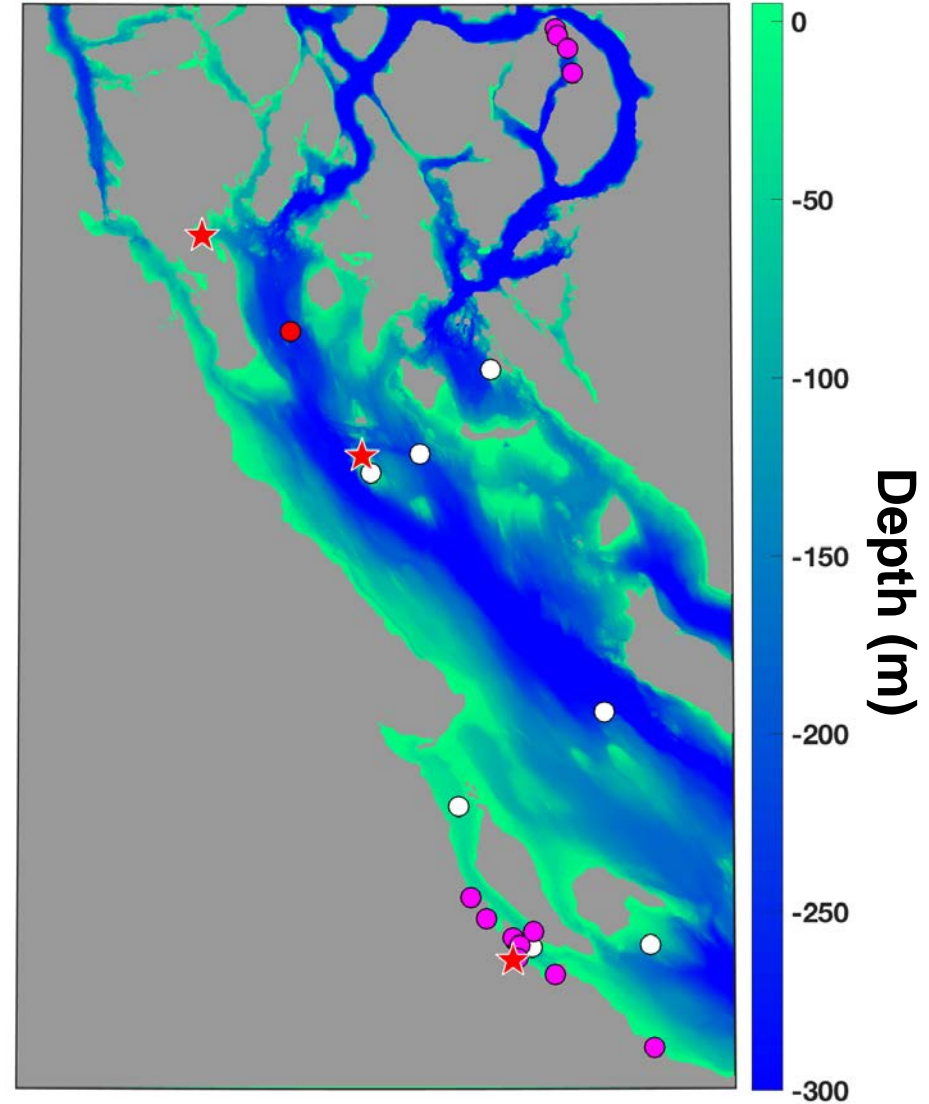


*Measurement sites in northern Salish Sea &
Baynes Sound*

2016

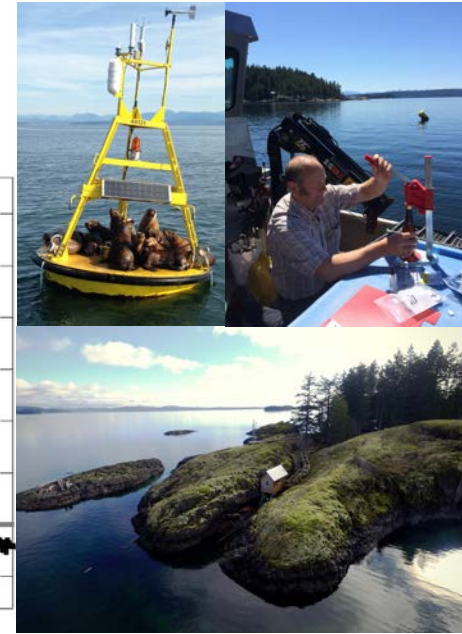
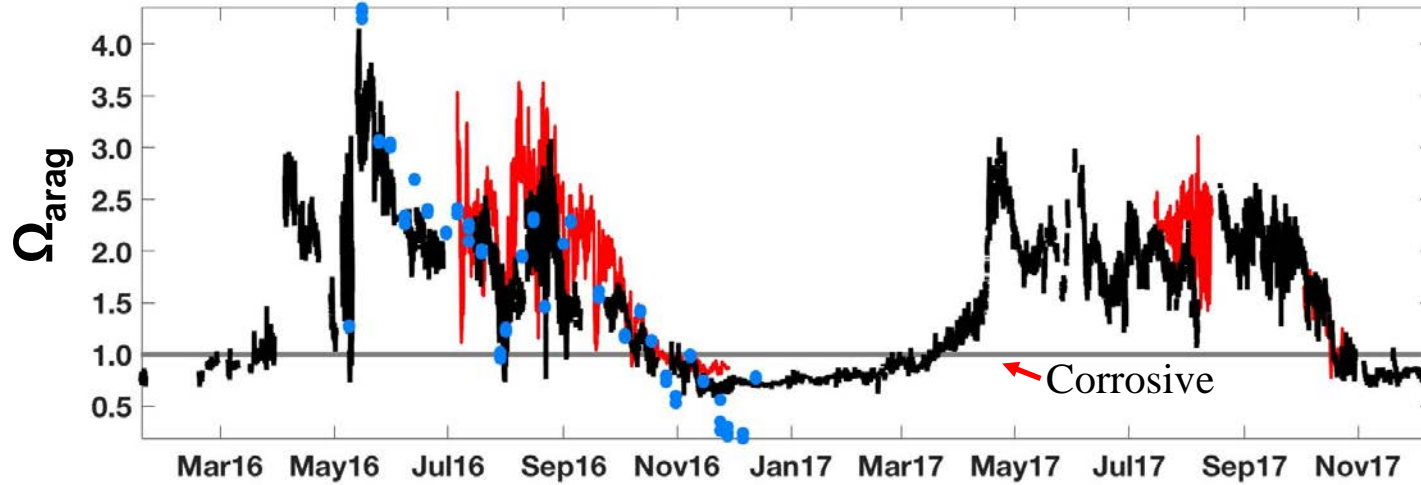


2017

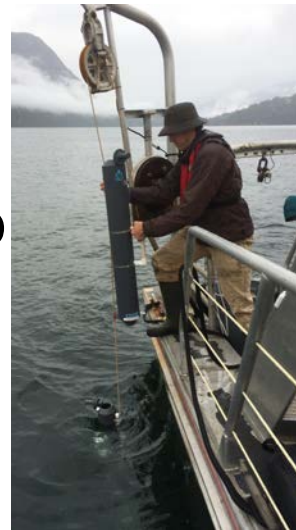
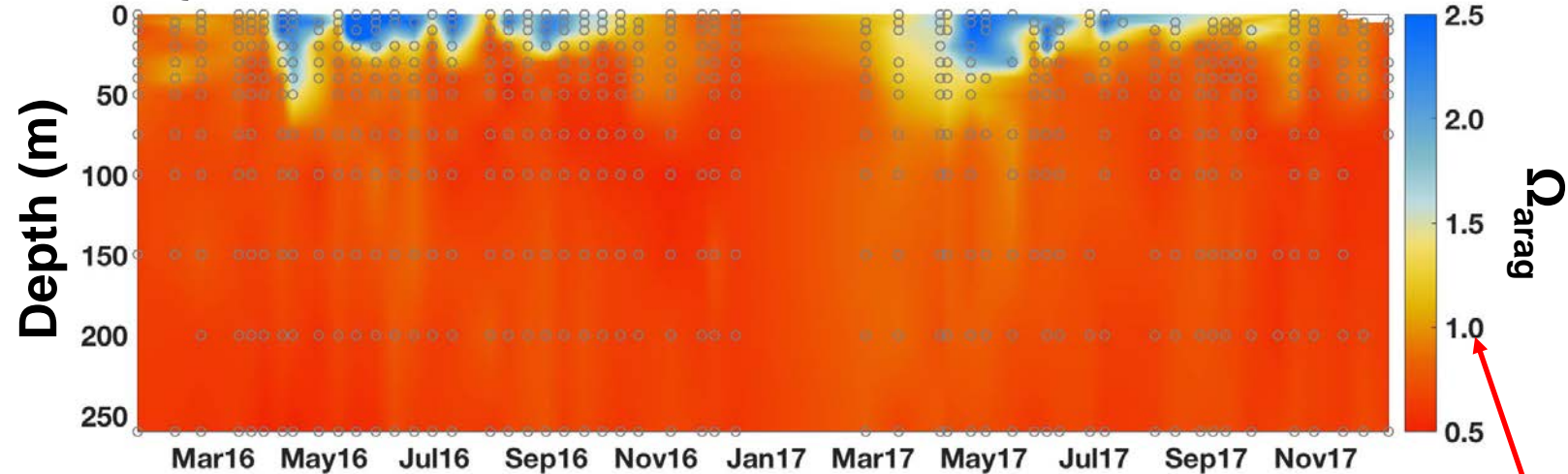


Large and coherent seasonal cycle:

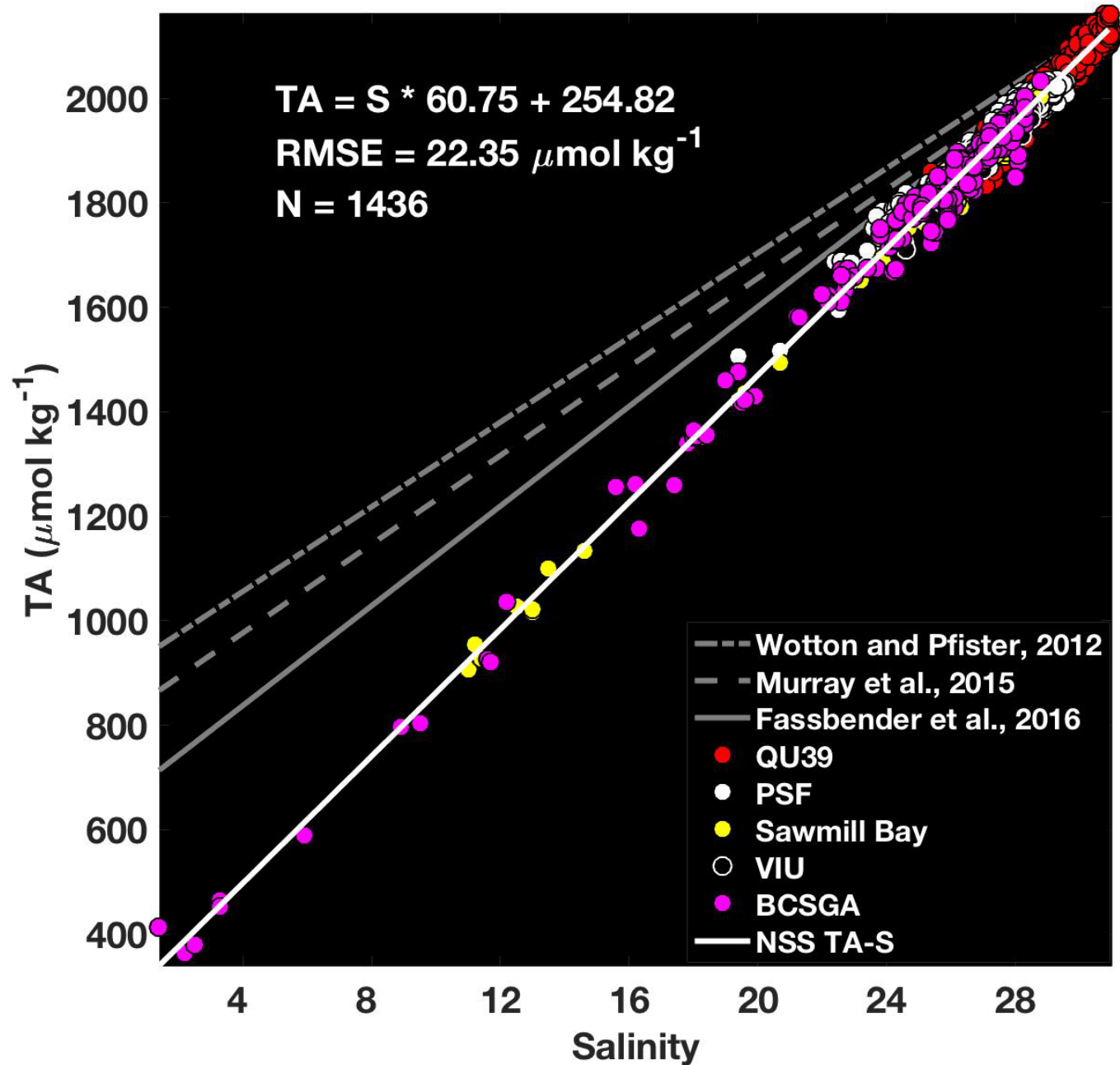
Quadra Island Field Station (QIFS), Sentry Shoal, Sawmill Bay Shellfish



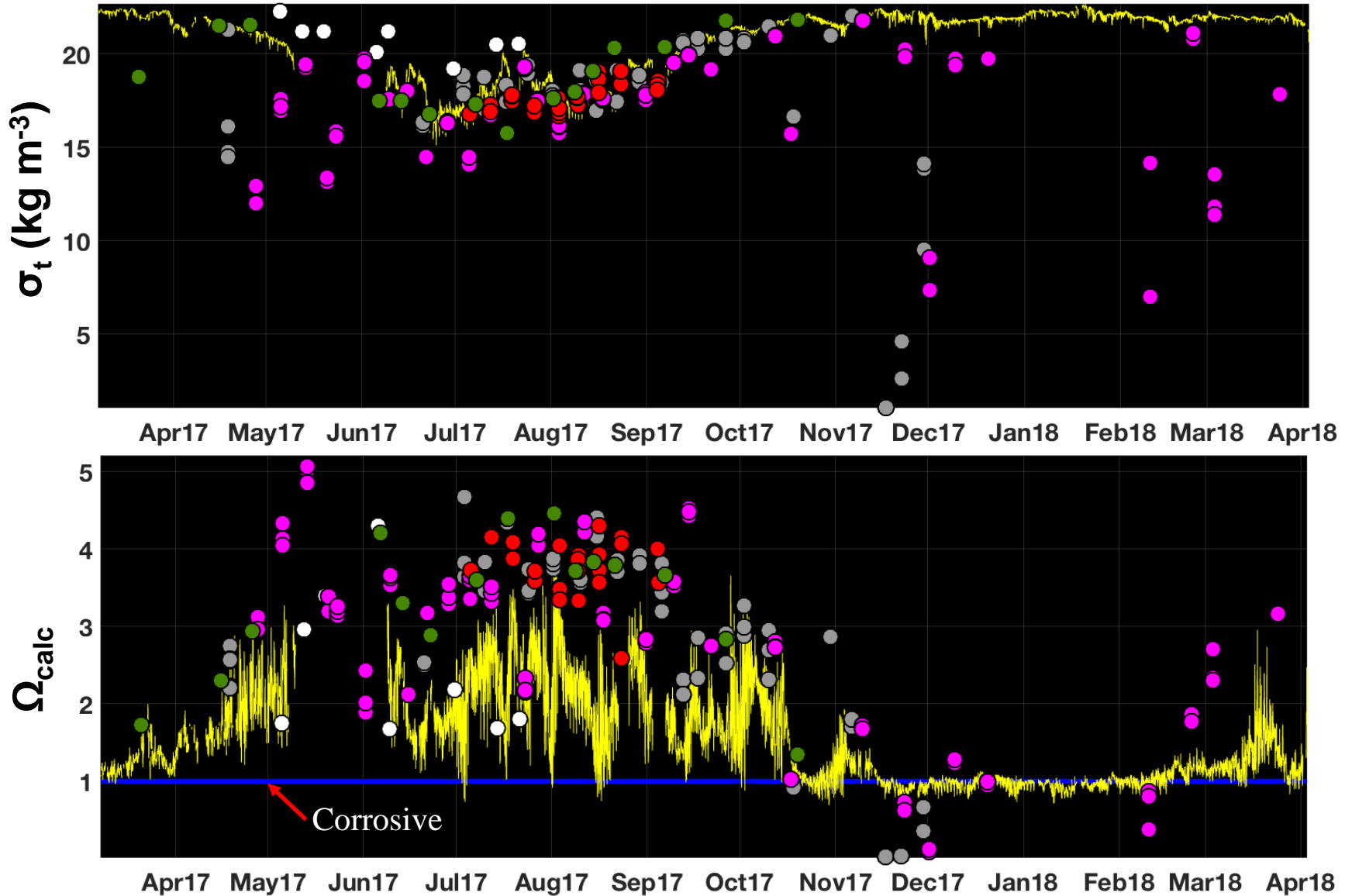
QU39



Robust northern Salish Sea TA-S relationship:

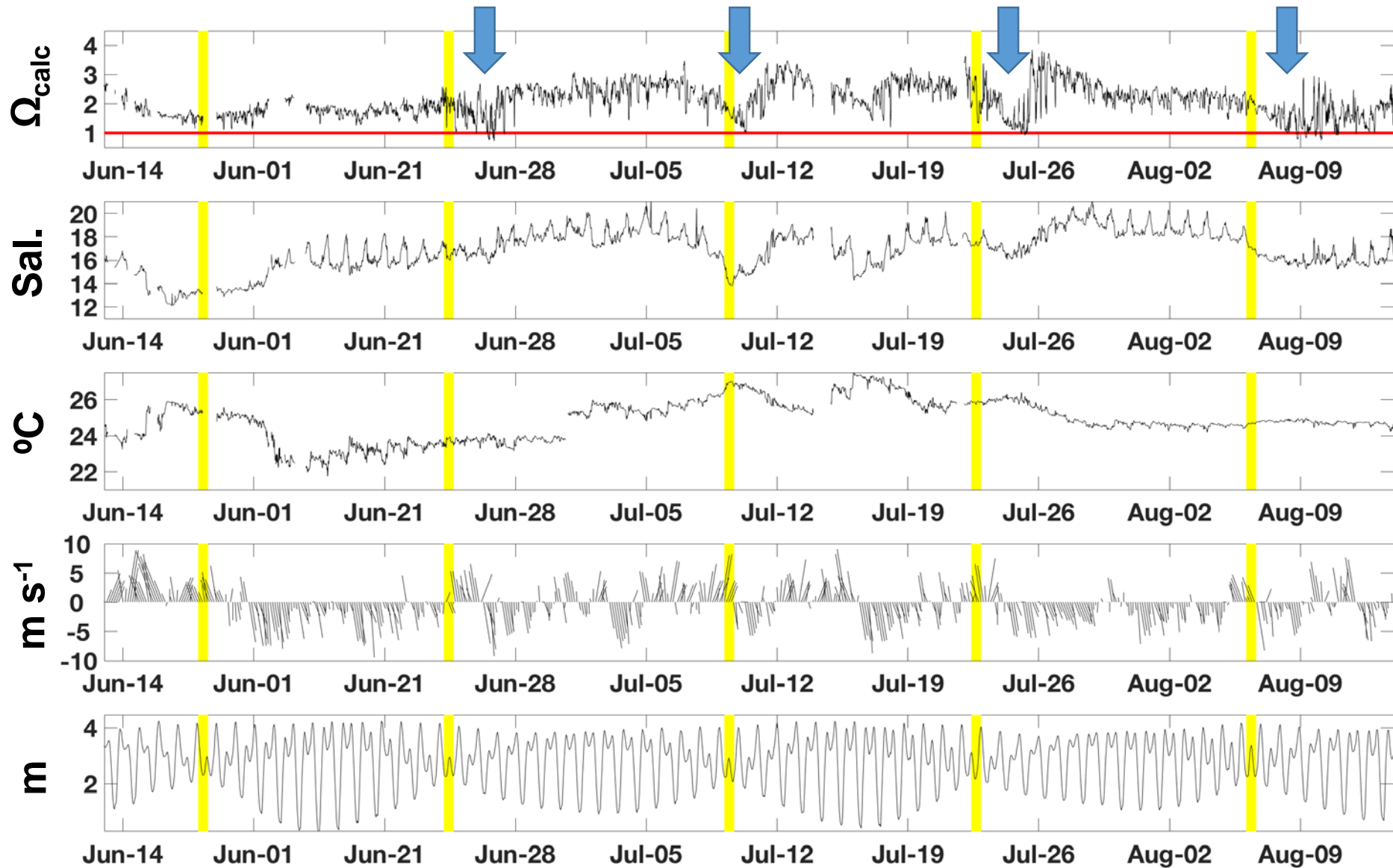


Near Surface Data: March 7, 2017 – April 2, 2018



Seasonal cycle punctuated by large short-term variability
Seasonally dependent offsets between surface and 8 m data

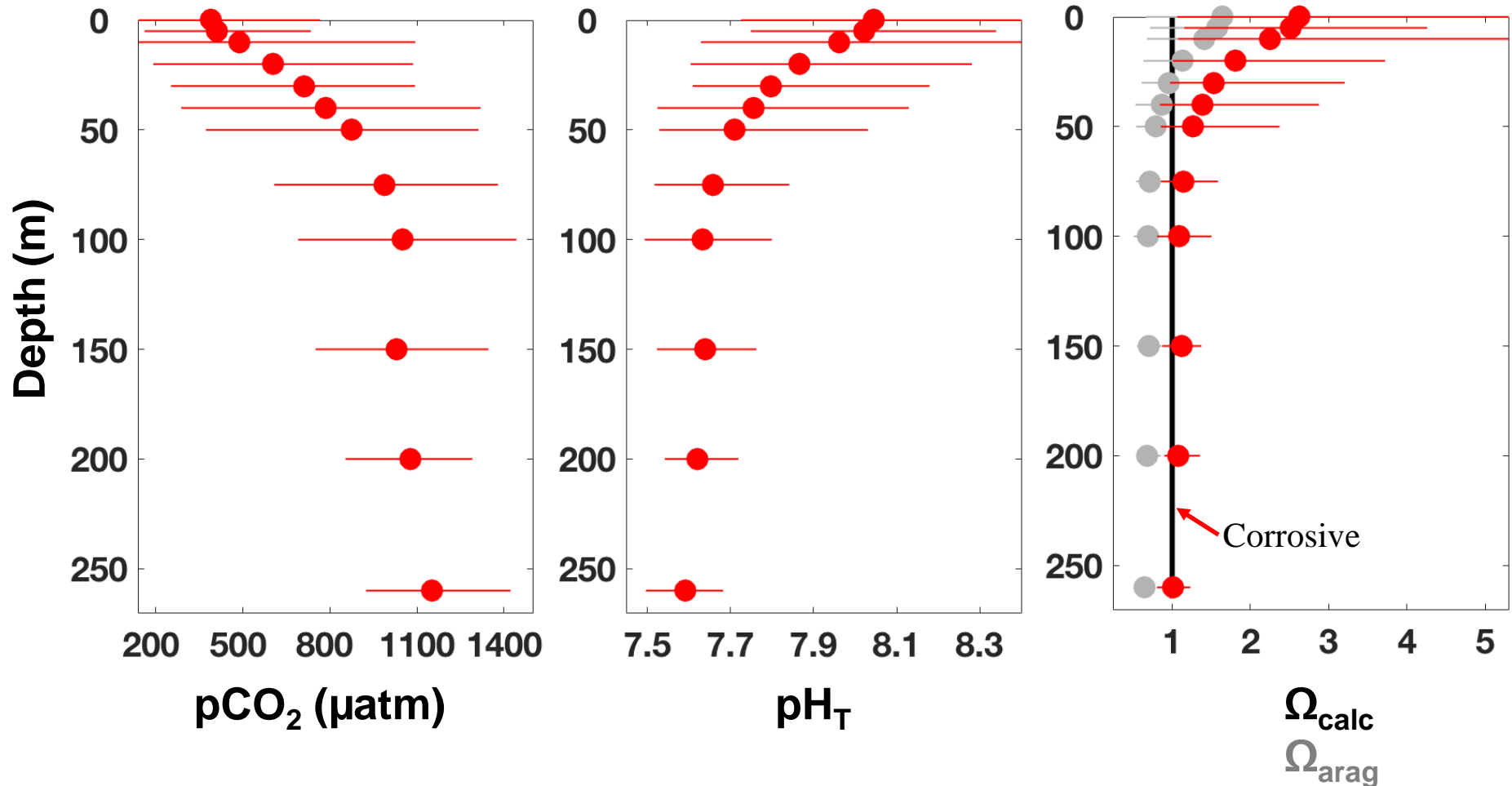
2017 Summer FBO Continuous Data



Calcite undersaturation events lag the neap tide

Is calcite undersaturation “normal” for the Northern Salish Sea?

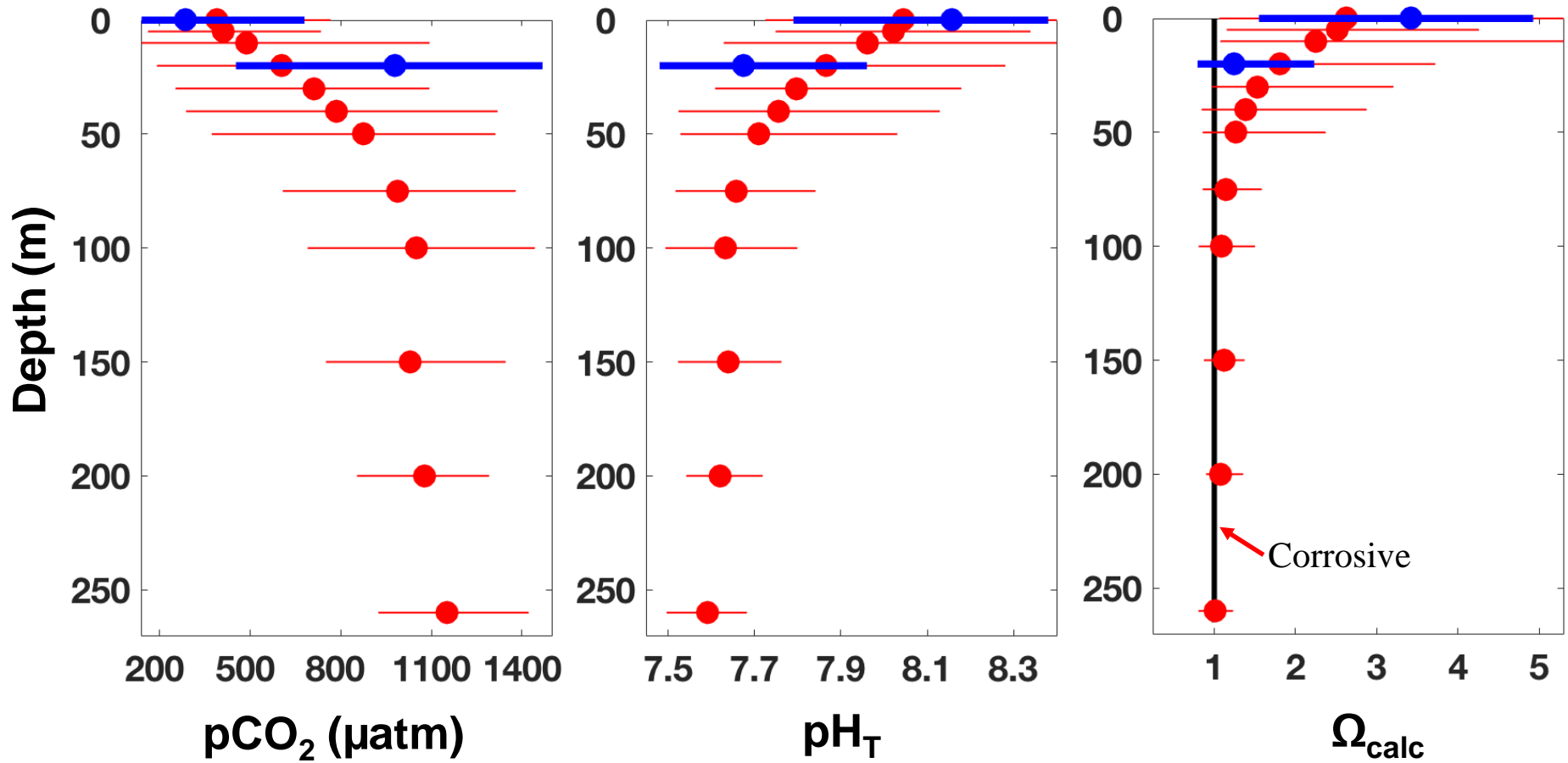
QU39 is our baseline



dots = mean; bars = range

Is calcite undersaturation “normal” for the Northern Salish Sea?

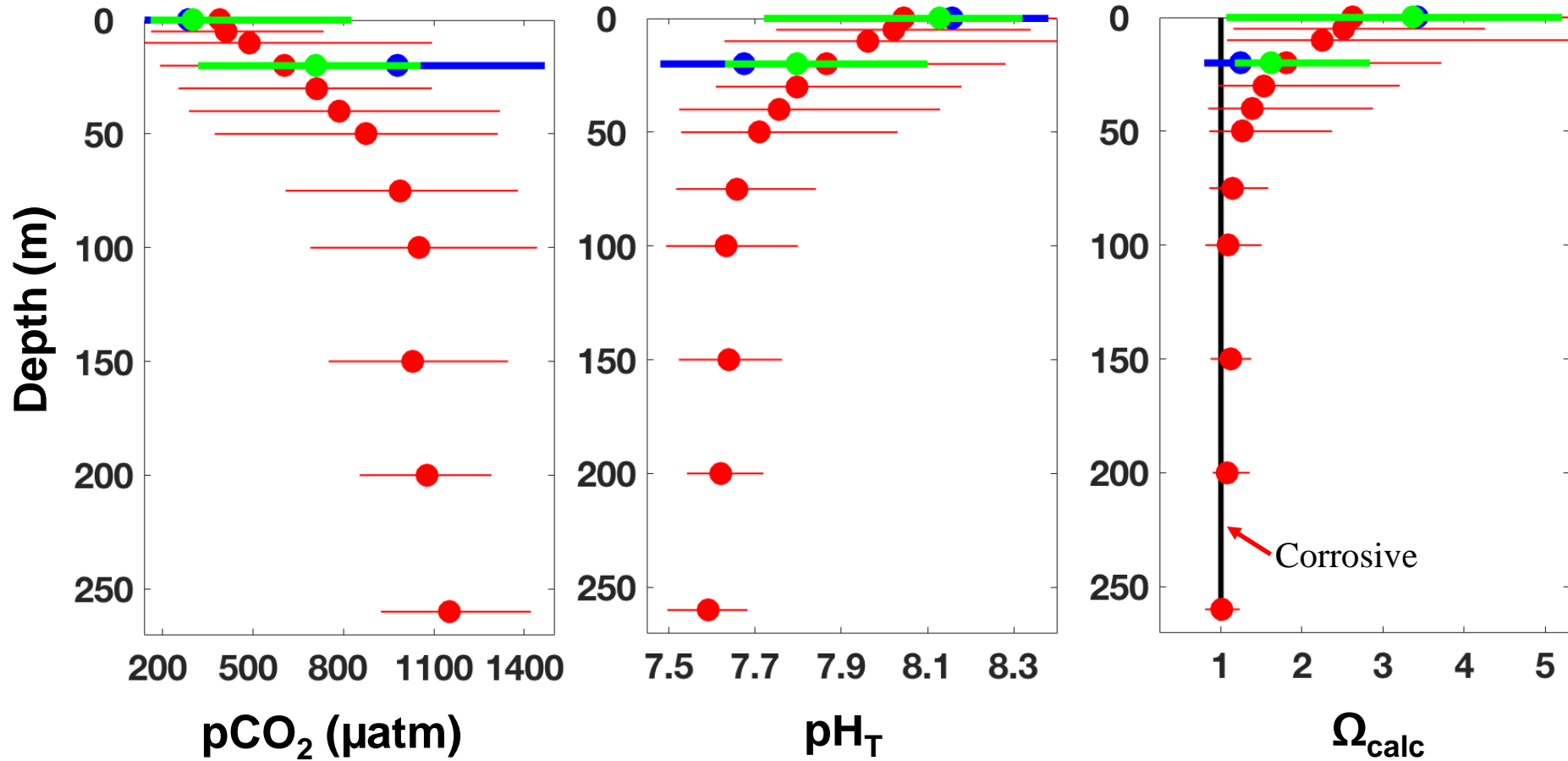
Add in northern BS PSF station



dots = mean; bars = range
2016 & 2017 PSF data

Is calcite undersaturation “normal” for the Northern Salish Sea?

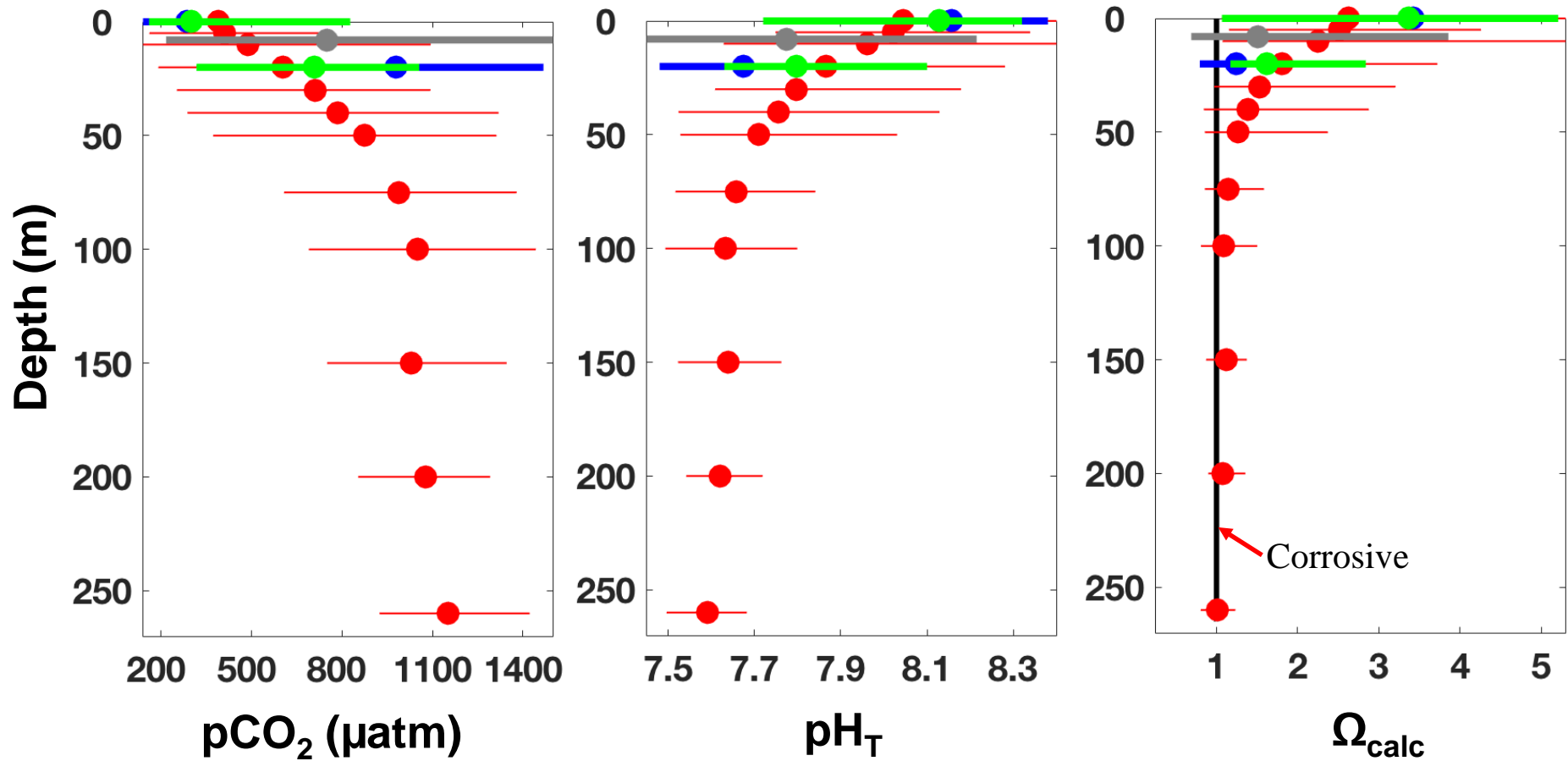
Add in southern BS PSF station



dots = mean; bars = range
2016 & 2017 PSF data

Is calcite undersaturation “normal” for the Northern Salish Sea?

Add in Fanny Bay continuous data



Broad ranges with tendency toward higher pCO₂ / lower pH & Ω

What we've learned:

(1) Evidence points to Baynes Sound as a region with high respiratory CO₂

*summertime neap tide related corrosive events

*wintertime corrosivity

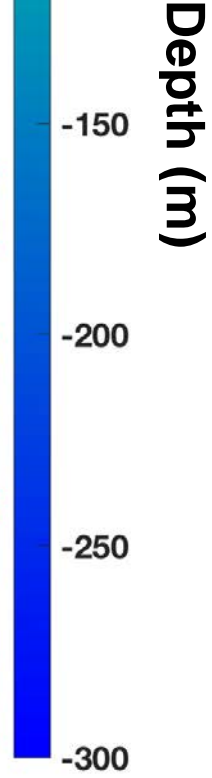
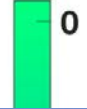
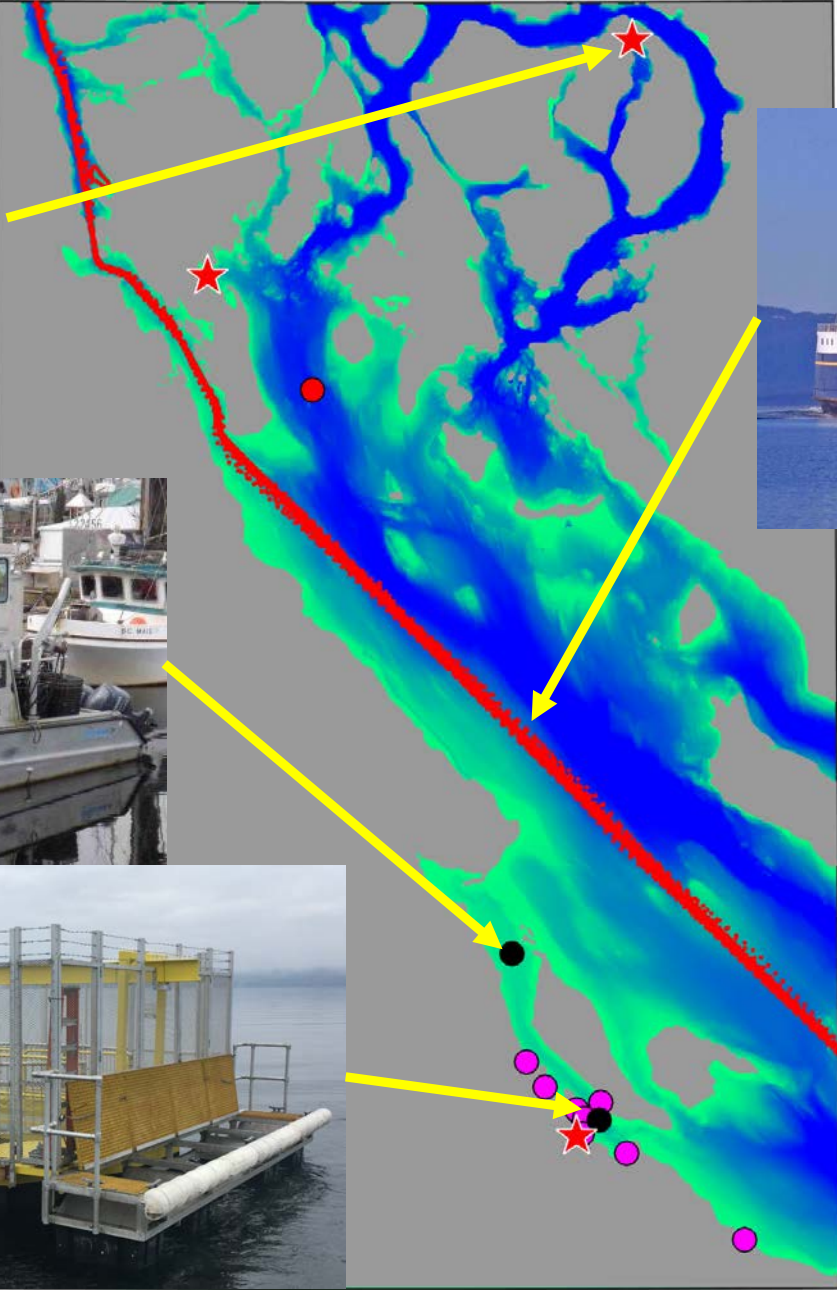
*average conditions more corrosive than in main basin

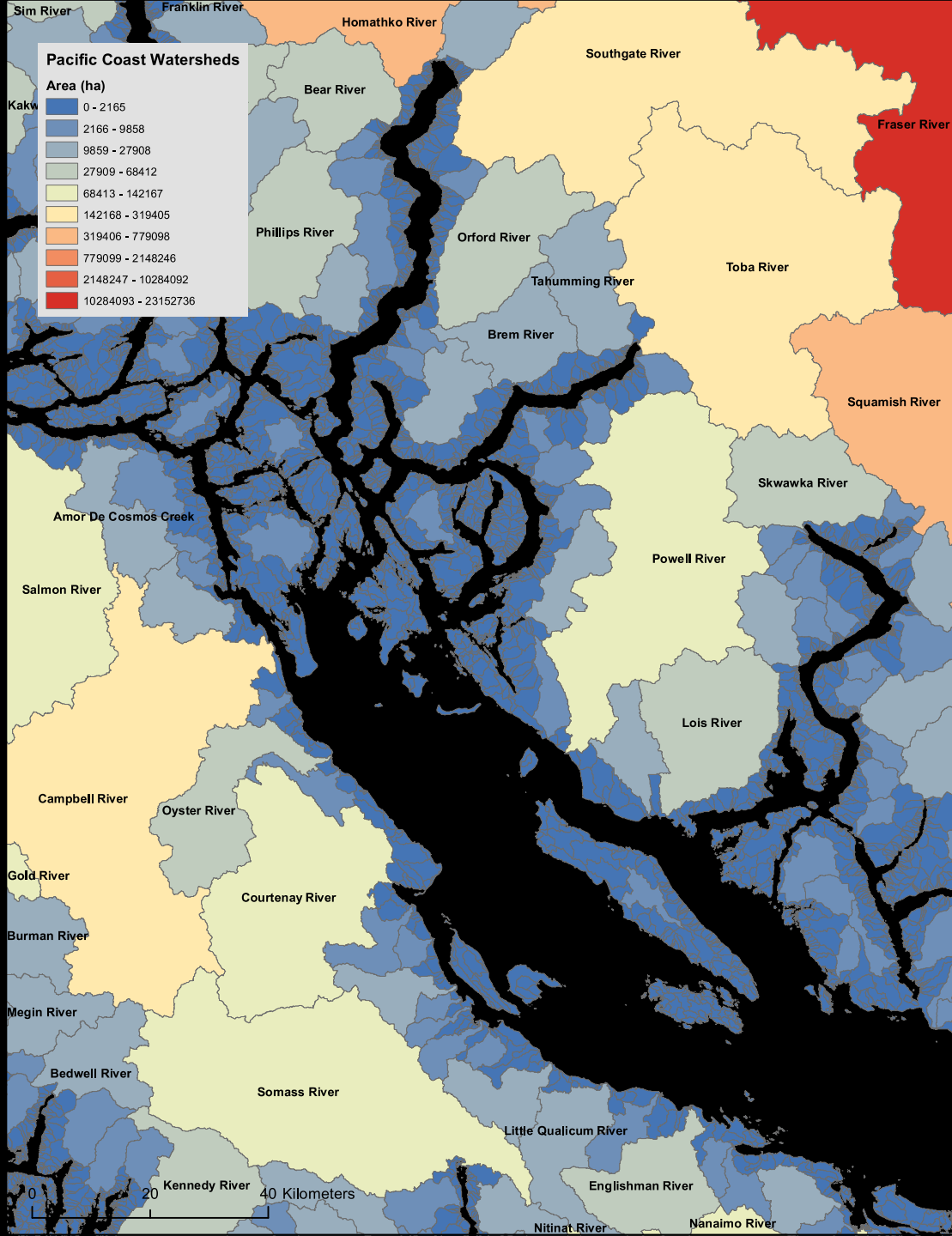
*Implications are tendency toward higher Revelle Factors;
more sensitive to anthropogenic CO₂ invasion*

(2) North/south difference in corrosivity with conditions magnified in the north where exchange is presumed to be more restricted

Acknowledgement: Fanny Bay Oysters, Mac's Oysters, Sawmill Bay Shellfish, Island Scallops, VIU Deep Bay Field Station, Kieran Cox, Pacific Salmon Foundation Citizen Science Program, BC Shellfish Grower's Association, Province of British Columbia, Tula Foundation

2018





Map from
Ian Giesbrecht,
Hakai Institute