



# The Hakai Institute Oceanography program ([www.hakai.org](http://www.hakai.org))

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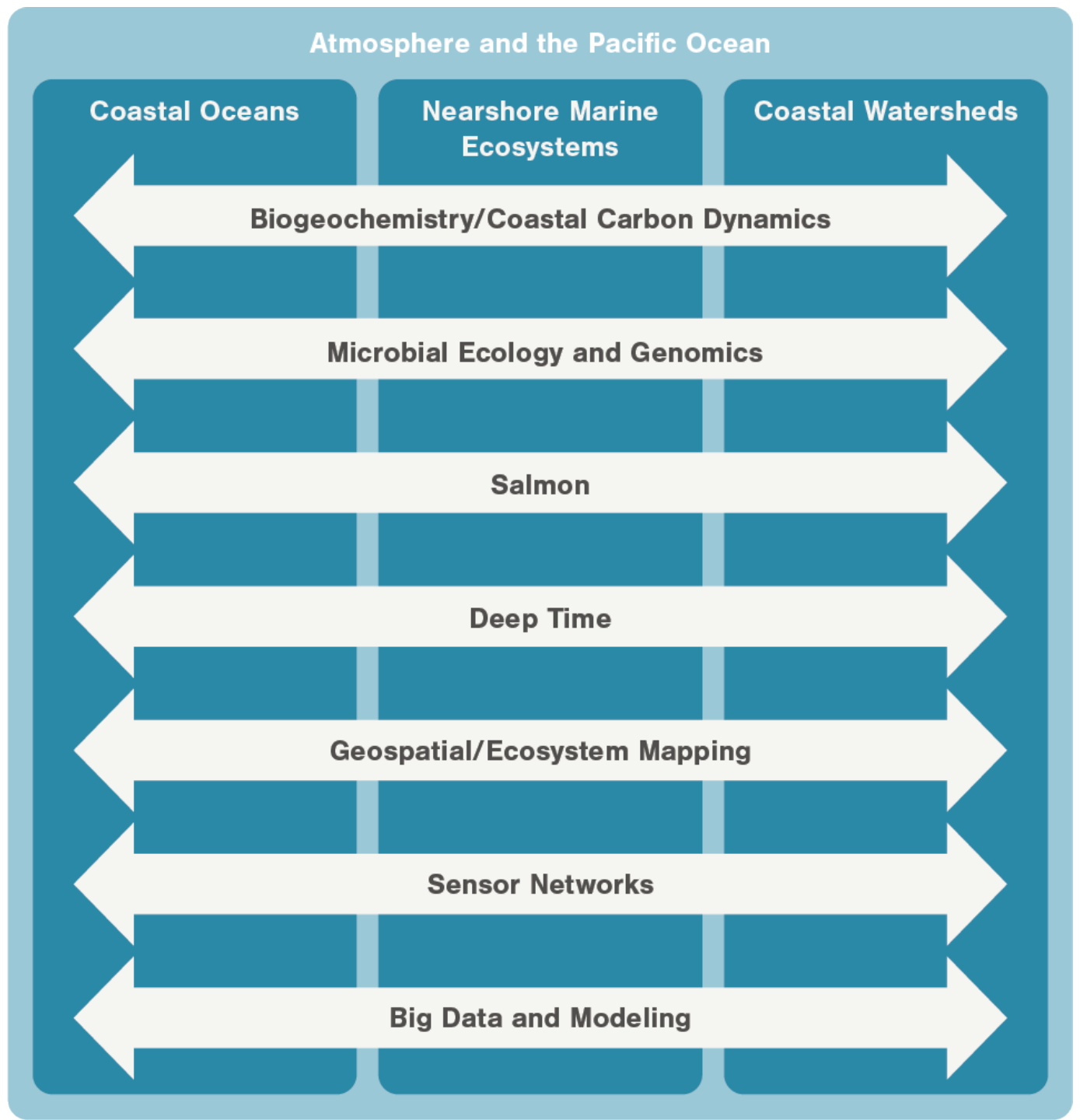
# Outline

- Introduction to the Hakai Institute
- Overview of Hakai programs
- Locations of the Hakai Institute Oceanography Program
- Types of oceanographic data collected
- Results – seasonal, interannual and spatial variation
- Summary

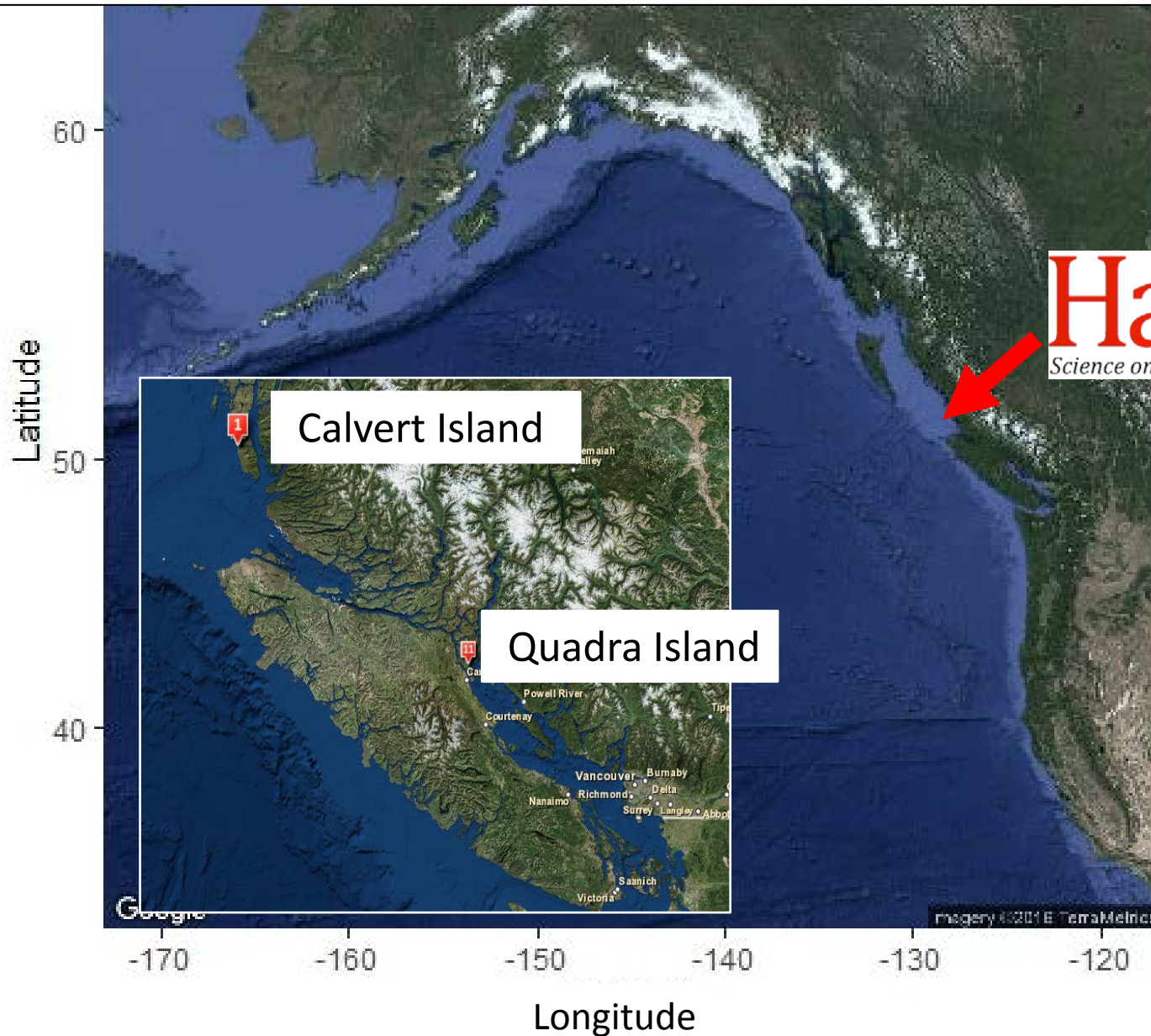
# The Hakai Institute ([www.hakai.org](http://www.hakai.org))

- The Hakai Institute is a scientific research institution that conducts long-term research at remote locations on the coastal margin of British Columbia, Canada
- The Hakai Institute is solely funded by the Tula Foundation which supports:
  - The Hakai Institute
  - Hakai Magazine
  - Tula Salud
- The Hakai Institute includes the following elements:
  - Two research stations
  - Dedicated scientific staff and equipment
  - A large network of affiliated collaborators at universities, government agencies, and with First Nations

# Hakai research axes



# BRITISH COLUMBIA COASTAL OBSERVATORIES





# Calvert Island Ecological Observatory

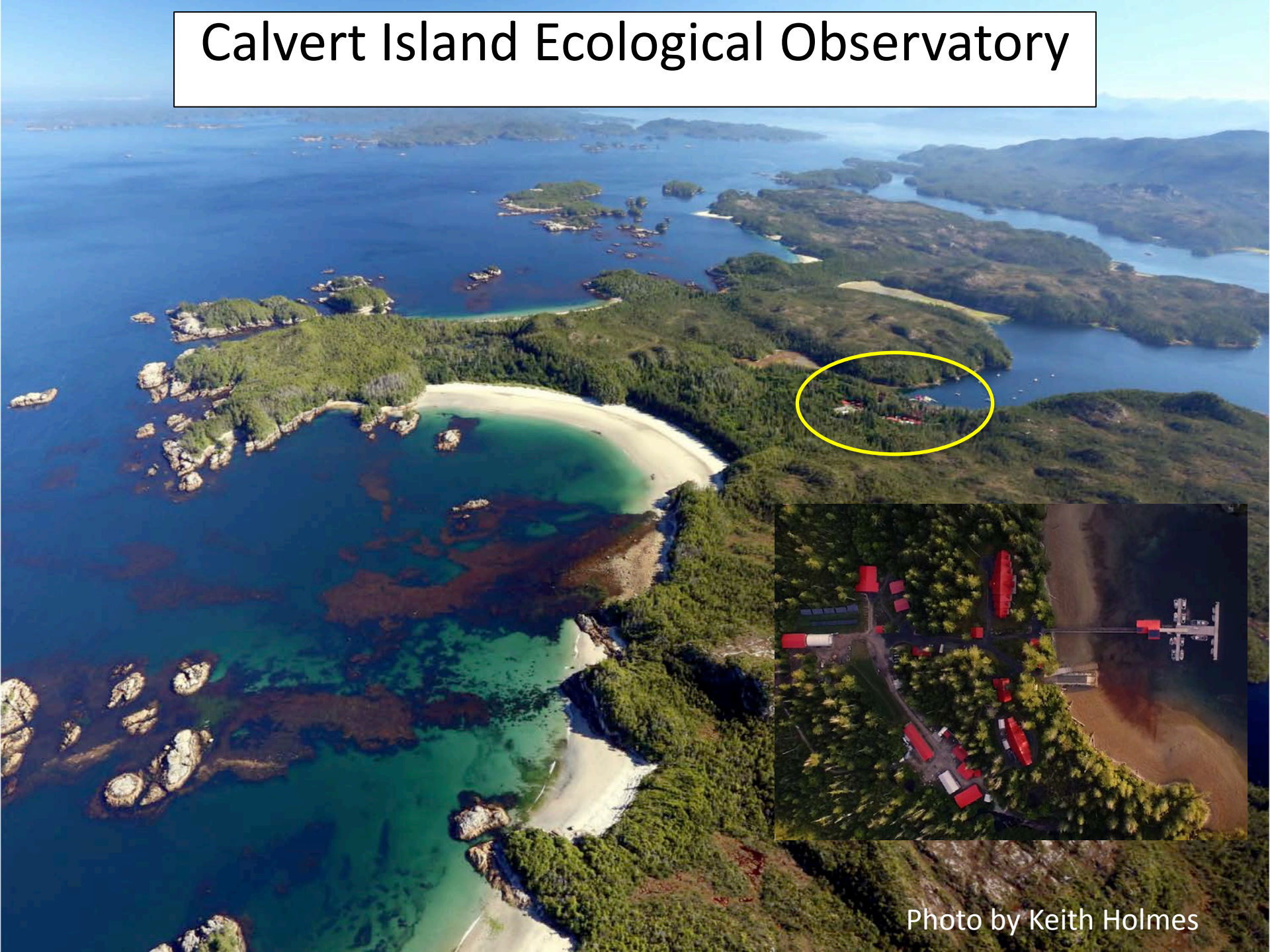
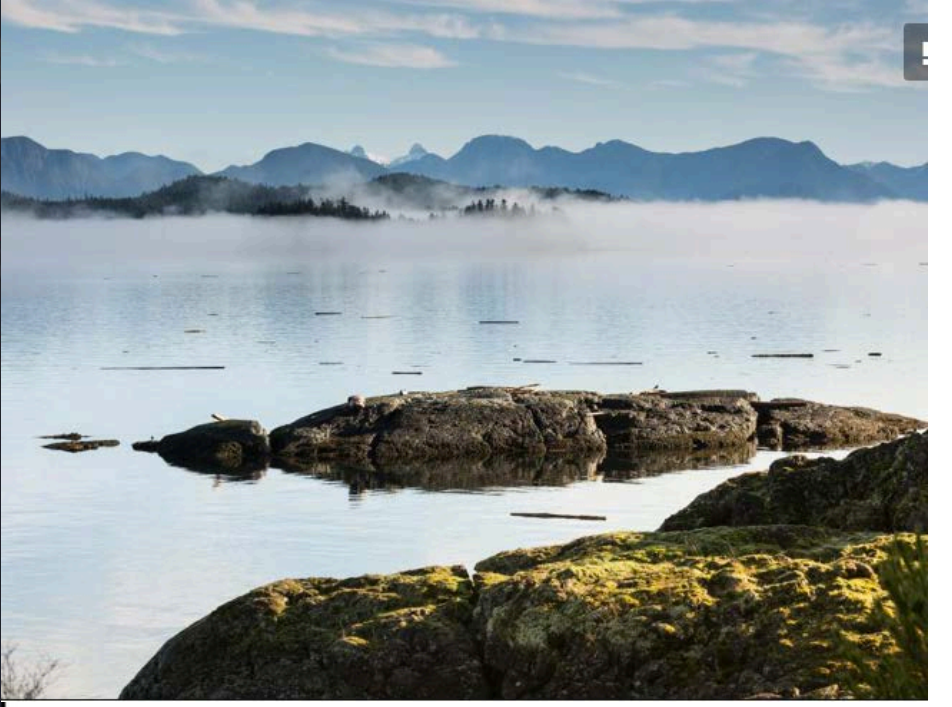


Photo by Keith Holmes



# Hakai Institute - Quadra Island Facility



**Hakai**

Photos by Grant Callegari

# Oceanographic data from small boats

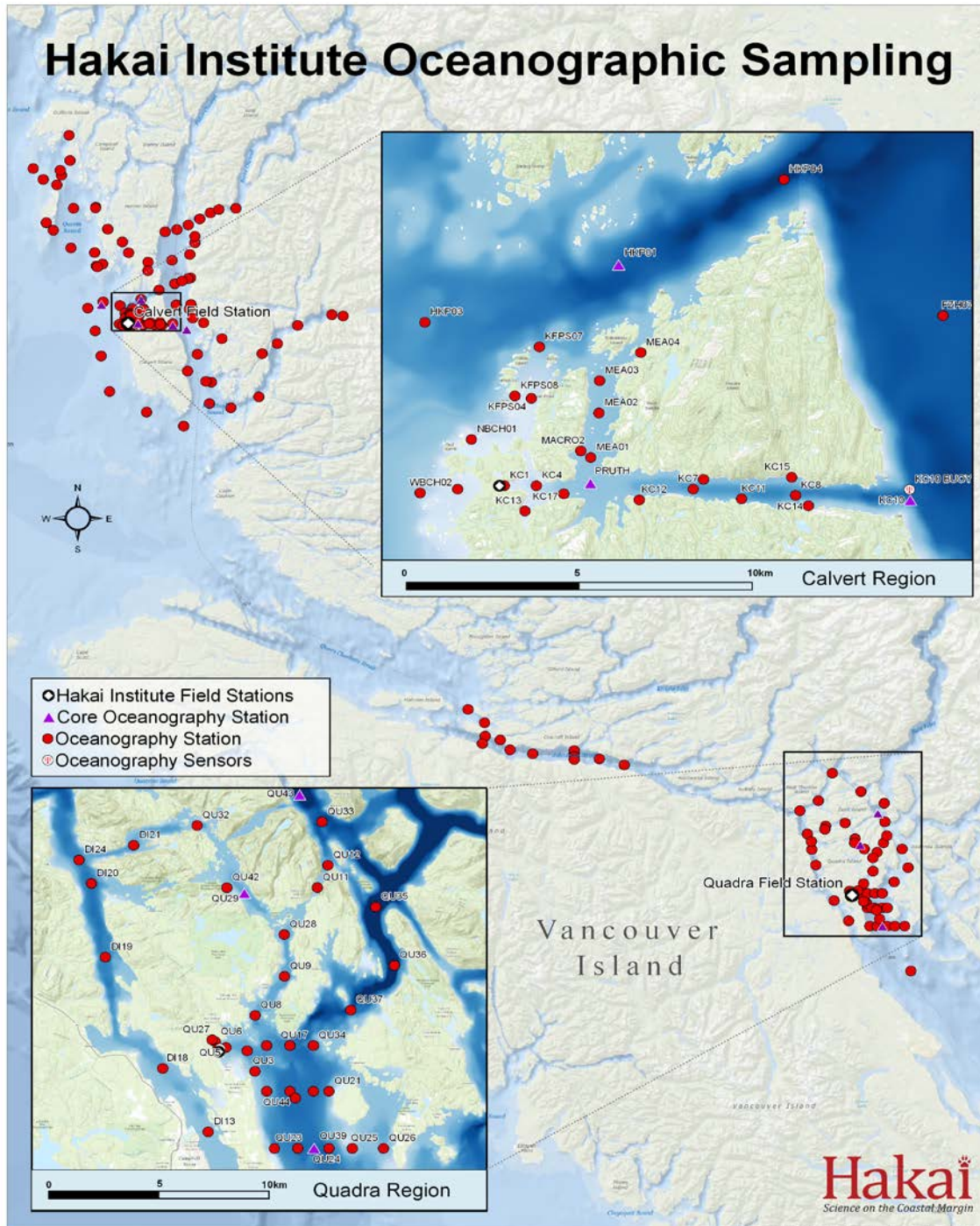


Photo credit  
Grant  
Callegari

- Since 2012, about 10,000 CTD profiles have been collected
- Hakai have 5 RBR CTDs and 2 Seabird 19+ CTDs
- Typical auxiliary sensors are fluorescence, dissolved oxygen, PAR, turbidity, and transmission (beam attenuation)
- Niskin bottles collect water to study nutrients, CO<sub>2</sub>, O<sub>2</sub>, POM, DOC, DIC, chlorophyll, phytoplankton, bacteria, and viruses
- Zooplankton tows collect data to measure biomass, isotopes and fatty acids



# Hakai Institute Oceanographic Sampling

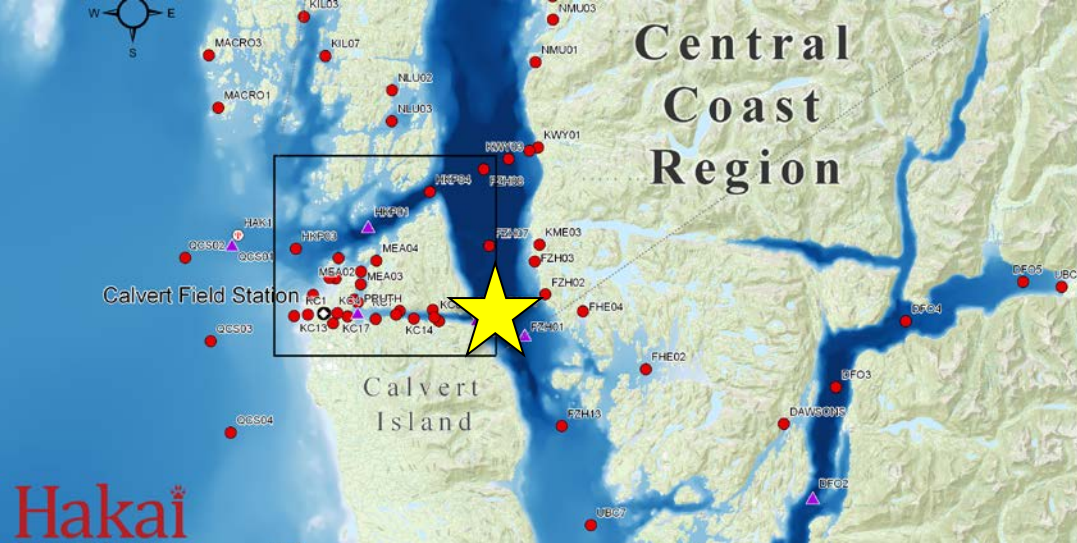


- Discovery Islands data collection started 2014 and all stations are sampled year-round
- Johnstone Strait data collection started 2015 and stations are sampled April to July
- Calvert Island data collection started 2012 and stations sampled daily March to October and every 3-6 weeks through winter

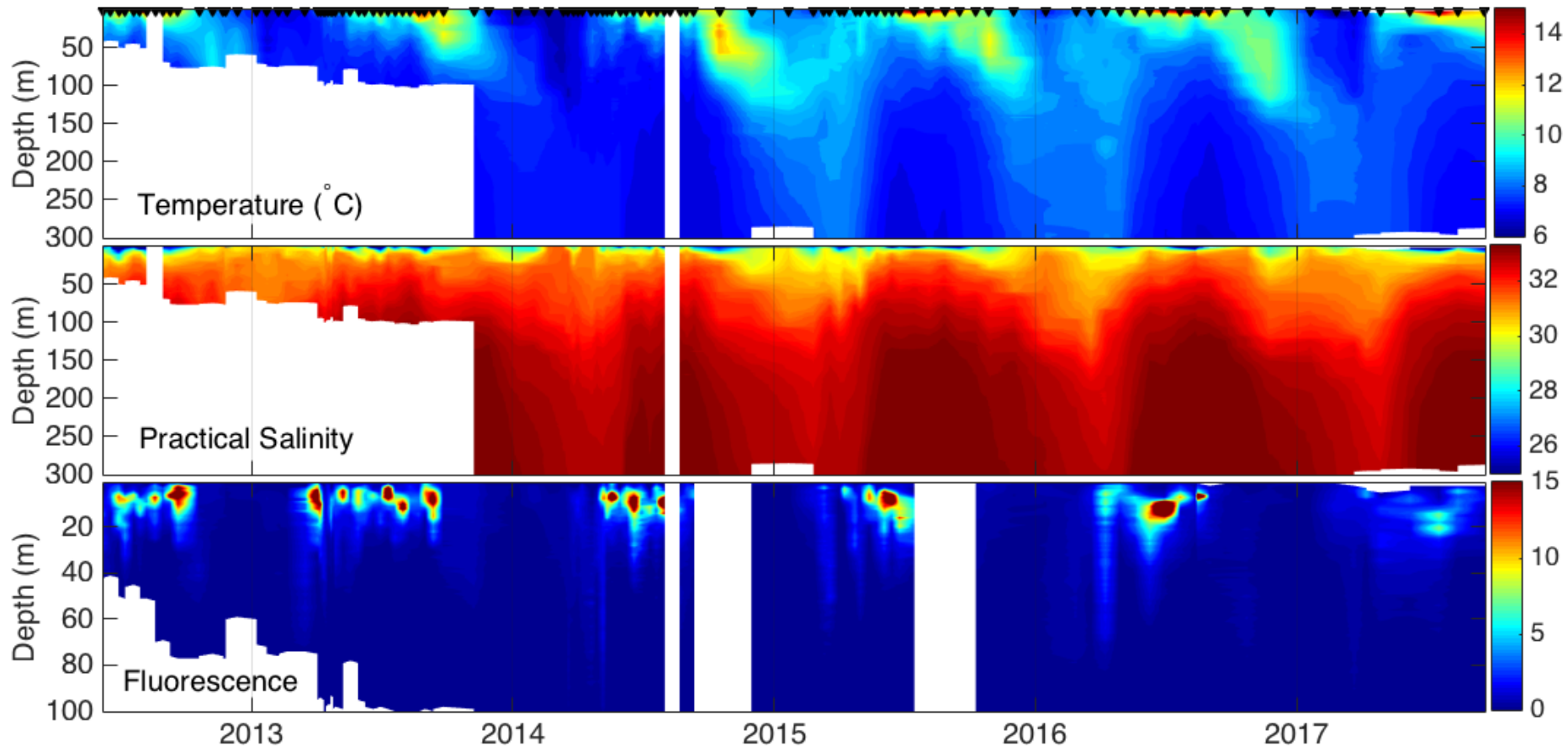
# Hakai marine sensor array

## ([www.data.hakai.org](http://www.data.hakai.org))

- About 40-50 temperature TidBits deployed at 5 m below the low tide zone in Calvert Island area
- MapCO<sub>2</sub> mooring about to be deployed in Fitz Hugh Sound, east of Calvert Island
- Bellingham to Ketchikan ferry has been instrumented with a throughflow system that includes CO<sub>2</sub> measurements
- Cabled observatory (Limpet) off Quadra Island measures temperature, conductivity, oxygen and fluorescence
- About 20 atmospheric weather stations throughout study regions

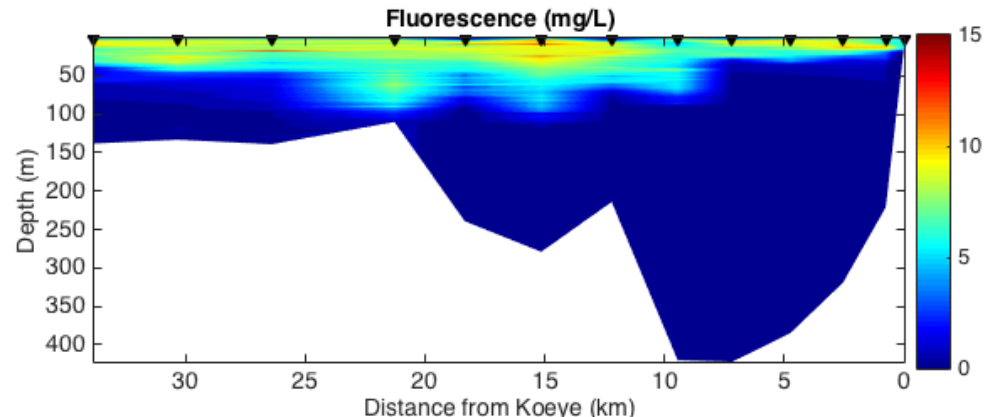
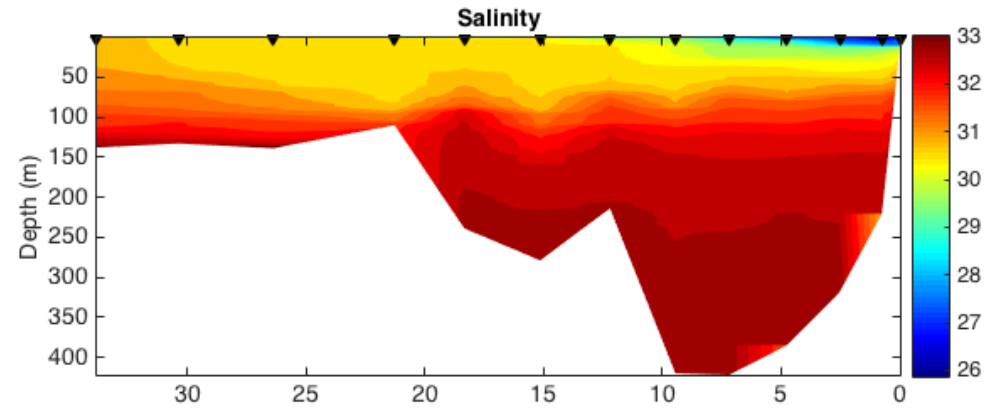
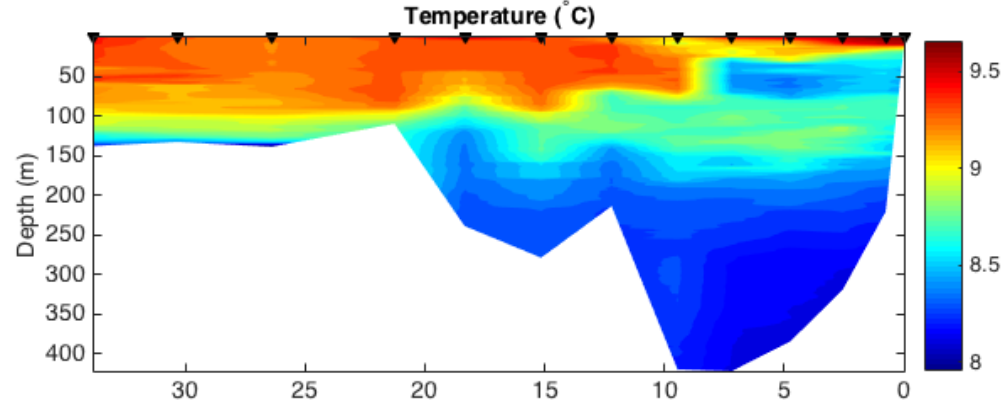
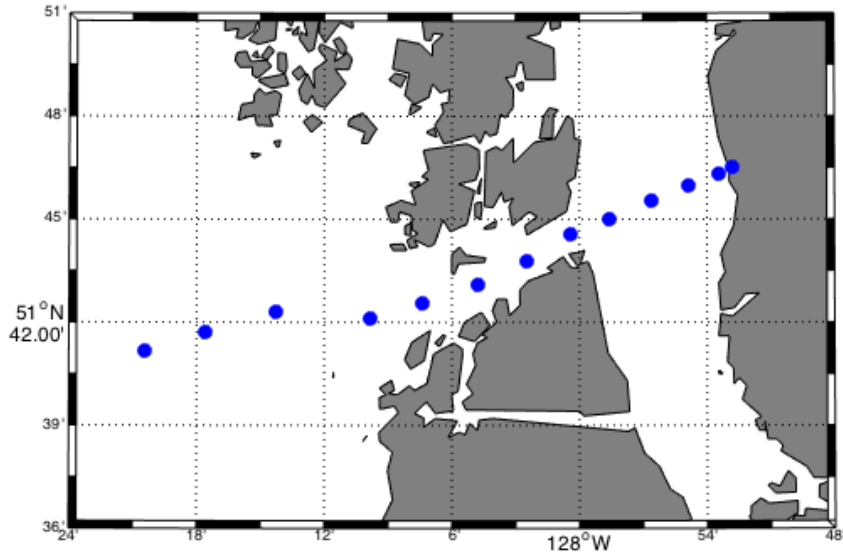


# Temporal variability Calvert Island



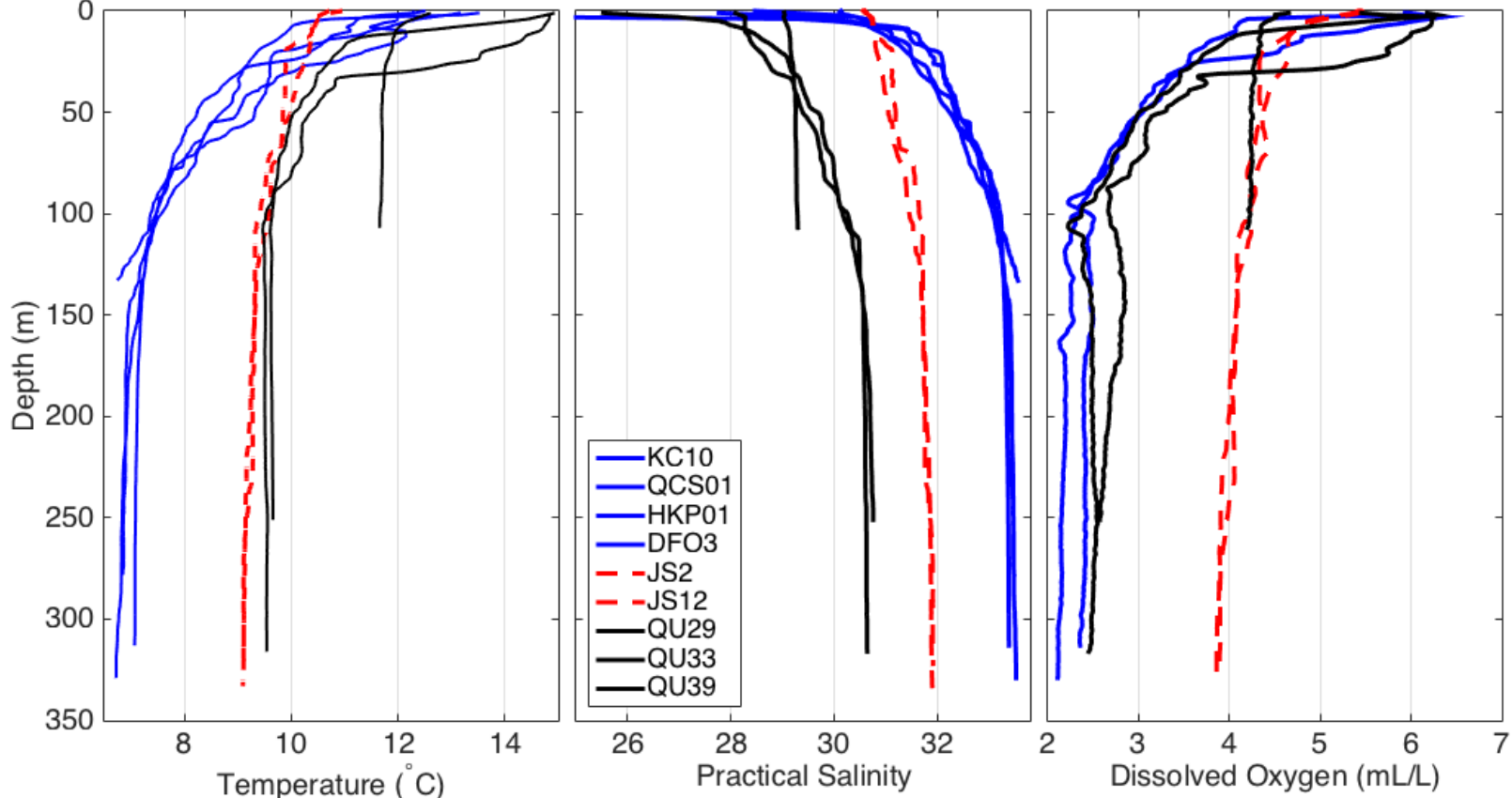
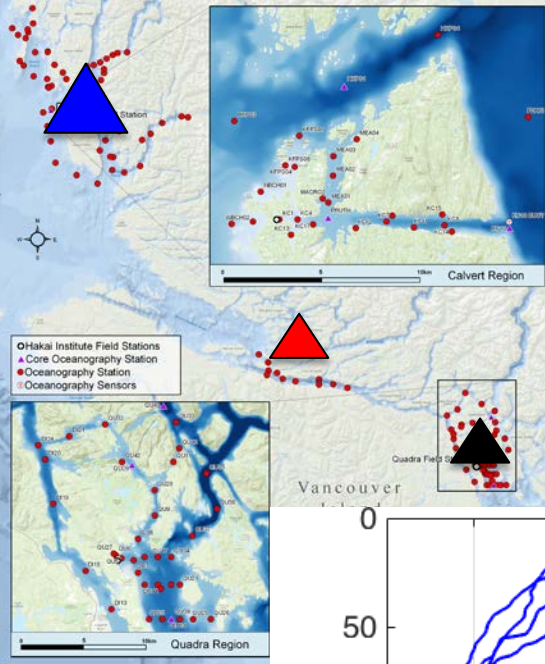


# Spatial variability Calvert Island



# Comparison of properties summer 2016

Hakai Institute Oceanographic Sampling



# Summary

- The Hakai Institute began collecting oceanographic data on British Columbia's central coast in 2012
  - To date about 10,000 CTD profiles have been collected
- Frequent (daily to monthly) biological, chemical and physical data are collected year-round from small boats
- These data can resolve the seasonal cycle, interdecadal variability, and submesoscale (~ 5 km) processes
- The Hakai Institute are interested in collaboration, particularly on research projects that examine the coastal margins of the North Pacific

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