MaPP

ENVIRONMENTAL STEWARDSHIP INITIATIVE ESI

Community-Based Monitoring to Support Cumulative Effects Assessment in Coastal British Columbia

PICES Annual Meeting| Victoria, BC | October 24, 2019

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BRITISH COLUMBIA · Kitselas First Nation · KITSUMKALUM INDIAN BAND

ACKNOWLEDGEMENTS

Maya Paul – *North Coast-Skeena First Nations Stewardship Society, North Coast CE Program Manager*

Quinton Ball – *Kitsumkalum First Nation*

James Herbert – *Gitxaała First Nation, NC CE Food Security/Access to Resources Value Lead*

Janine Pittman – *Gitga'at First Nation*

Carmen Tattersfield – *Kitselas First Nation*

Cindy Barwell – *Kitselas First Nation*

Anna Usborne *– Metlakatla First Nation*

Maria Faria – *Ministry of Energy, Mines and Petroleum Resources*

Heather Johnston – *Ministry of Energy, Mines and Petroleum Resources*

Melissa Lucchetta – *Ministry of Forests, Lands and Natural Resource Operations and Rural Development*

Kim Lutz - *Ministry of Forests, Lands, and Natural Resource Operations and Rural Development*

James Prsala – *Ministry of Energy, Mines and Petroleum Resources*

Nicole Wallace – *NC CE Estuary/Salmon Value Lead*

Melissa Meneghetti *– NC CE Data Management Coordinator*

Chris Apps *– Kitselas First Nation*

Rina Gemeindhart *– Kitsumkalum First Nation*

Chris Picard *– Gitga'at First Nation*

Bruce Watkinson *– Gitxaała First Nation*

Ross Wilson – *Metlakatla First Nation*

Mark Graham *– Ministry of Energy, Mines and Petroleum Resources*

Charlie Short - *Ministry of Forests, Lands, and Natural Resource Operations and Rural Development*

Kristin Worsley *- Ministry of Forests, Lands, and Natural Resource Operations and Rural Development*

Robert Grodecki – *North Coast-Skeena First Nations Stewardship Society*

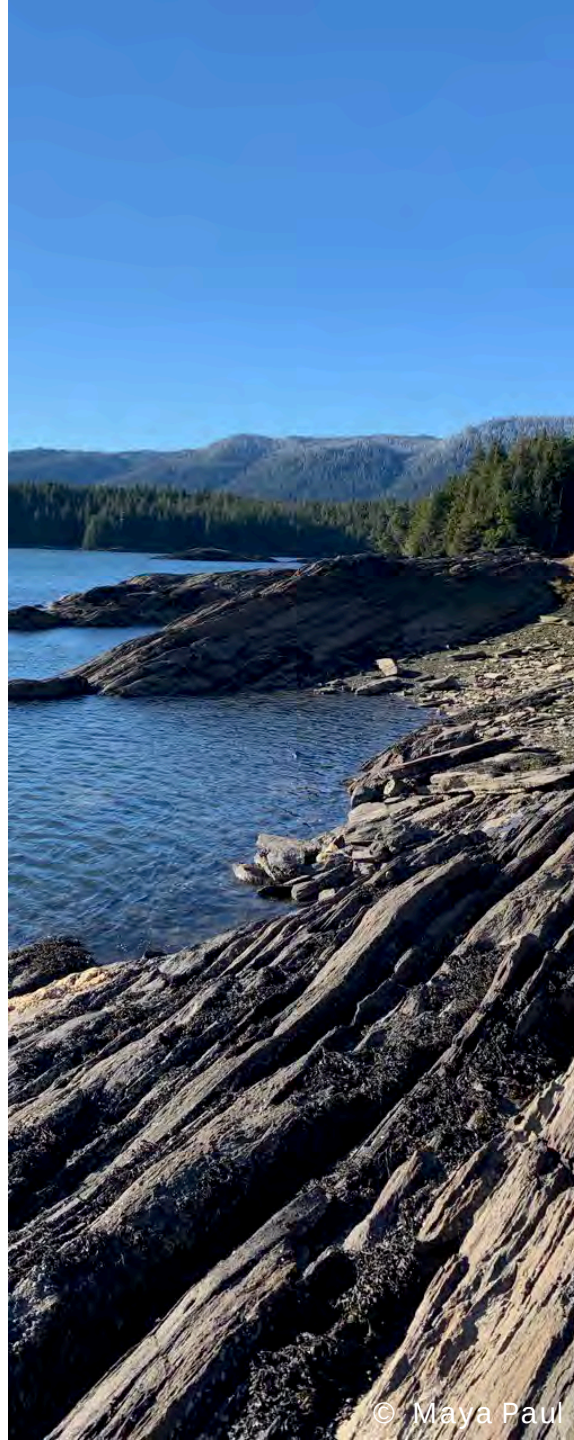
Karen Topelko *- Ministry of Forests, Lands, and Natural Resource Operations and Rural Development*

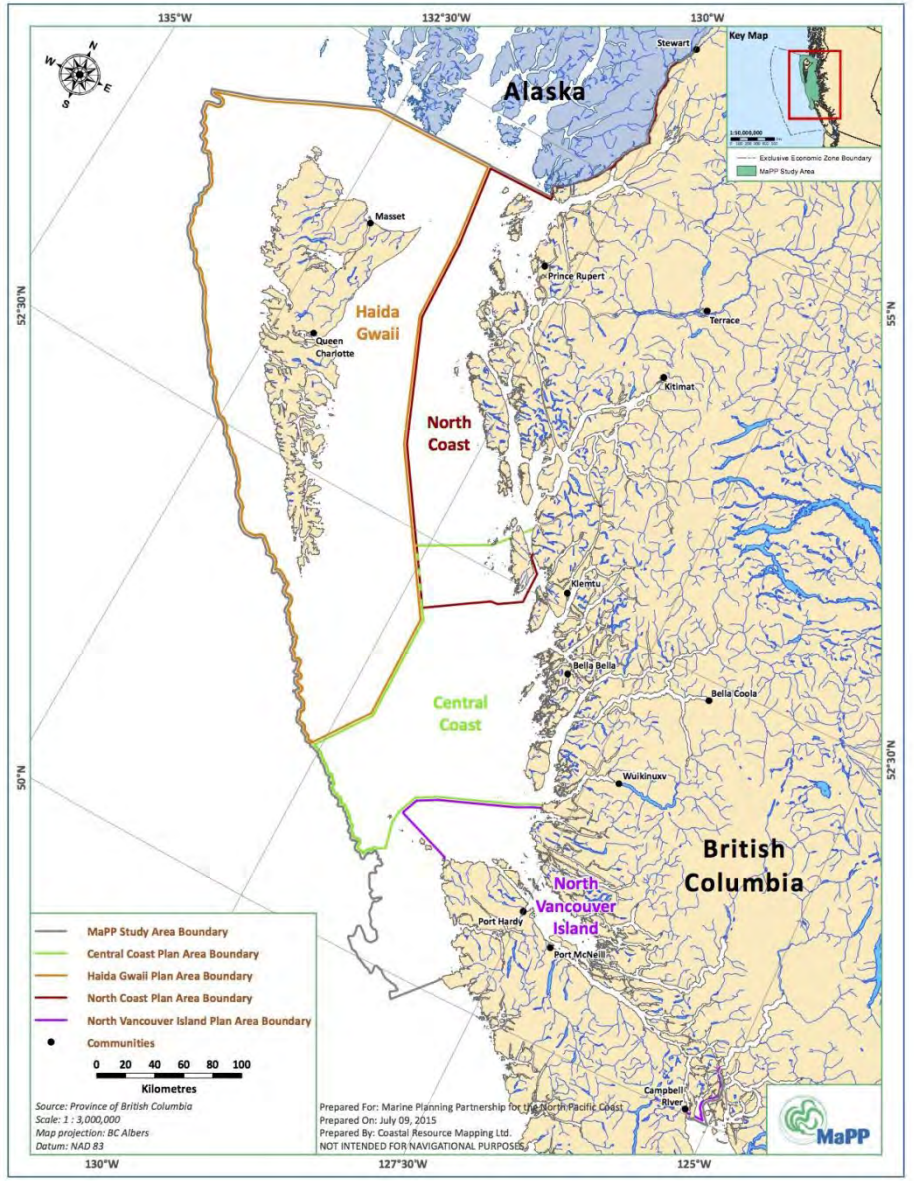
Romney McPhie *– Marine Plan Partnership (MaPP)*

Other folks that have supported the various aspects of this project:

Mark Biagi, Brennan Hutchison, Sarah Duggan, Jessica Hawryshyn, Ethan Griesbach, Steve Kachanowski

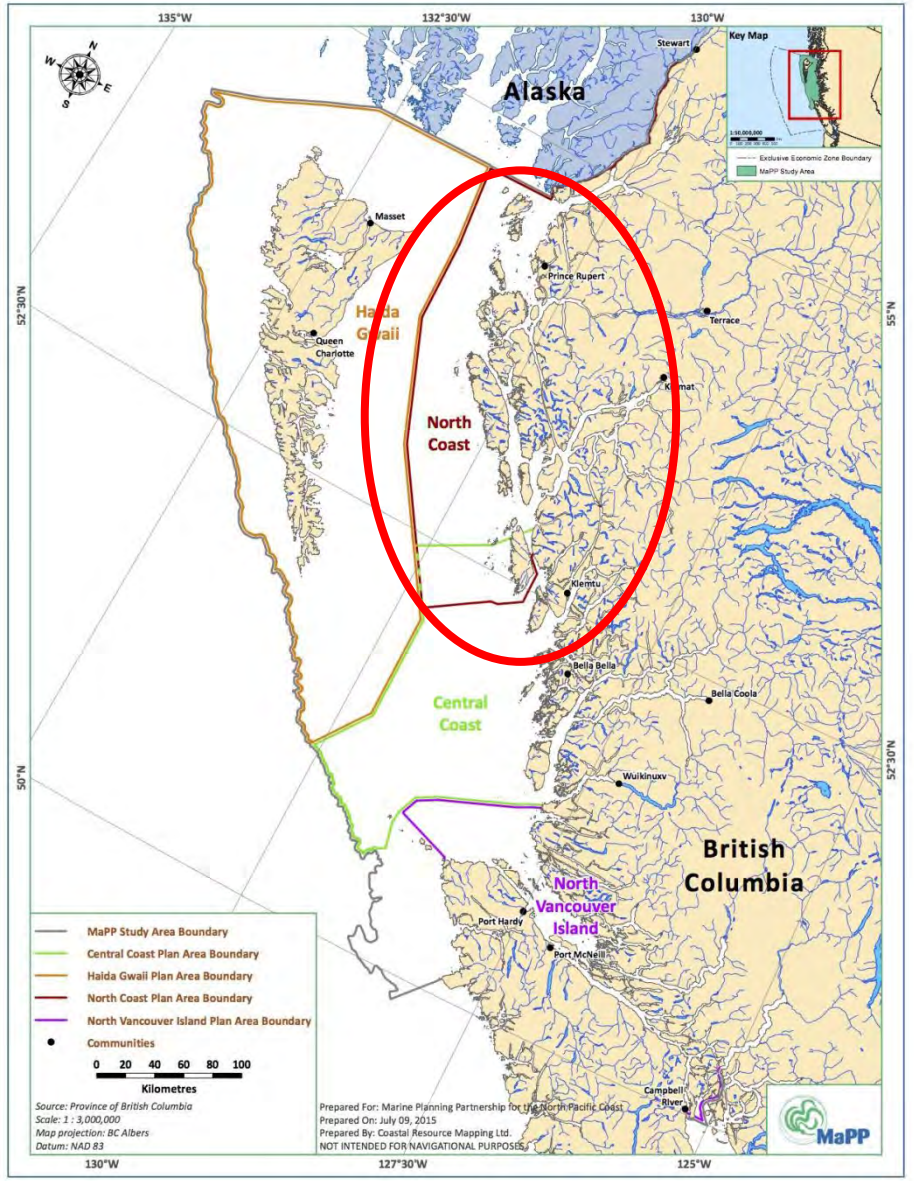
MaPP Subregional Leads and Co-Leads





Marine Plan Partnership:

- Collaboration between Provincial Government and 17 First Nations
- 4 Subregional marine plans, supported by a Regional Action Framework
- Goals:
  - Protect marine environment;
  - Promote sustainable economic development;
  - Support coastal community well-being



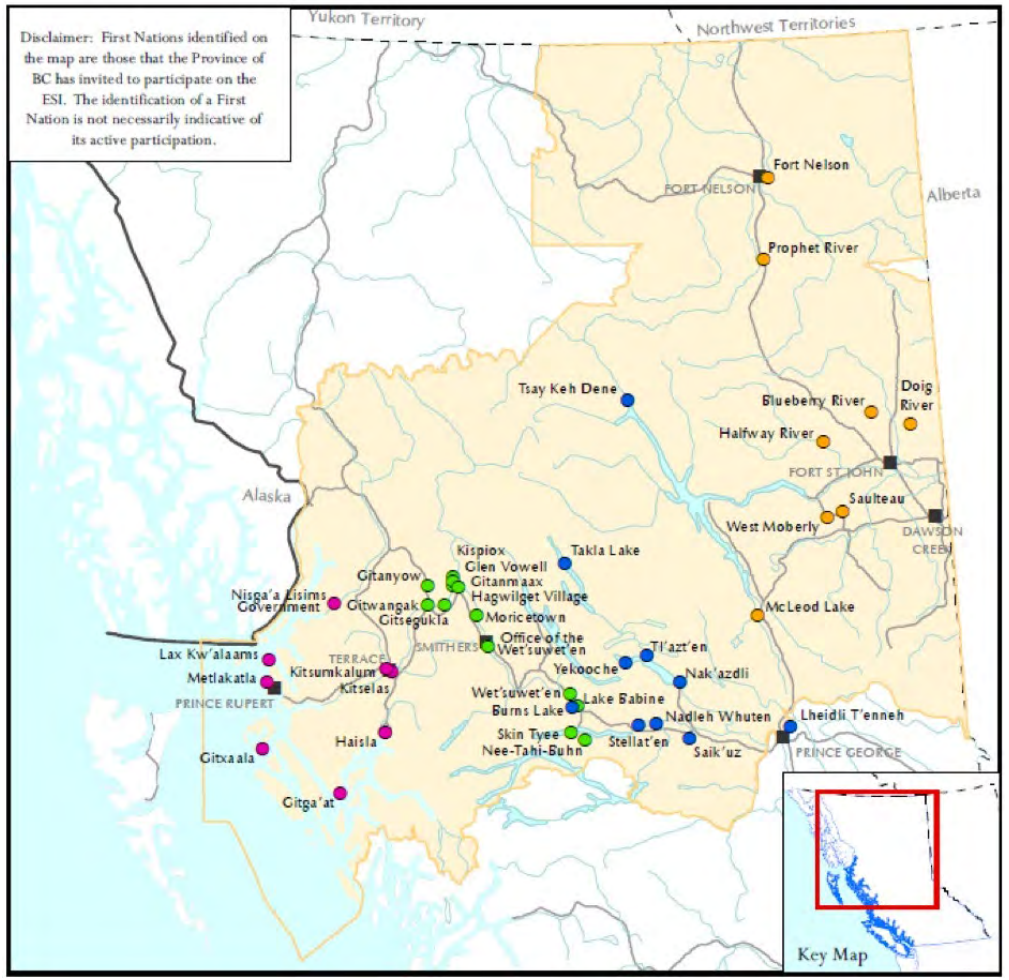
North Coast Subregion:

- Six First Nations (Gitga'at, Gitxaała, Haisla, Kitselas, Kitsumkalum, & Metlakatla) worked with Province of BC to develop the NC Marine Plan (2015) with Cumulative Effects being a key priority
- Management direction for Cumulative Effects:
  - Strengthen or create new relationships to facilitate CE assessment;
  - Determine core coastal and marine values;
  - Collaboratively identify management objectives for ecological, social and cultural values;
  - Utilise results to support decision making.

ENVIRONMENTAL STEWARDSHIP INITIATIVE **ESI**

Environmental Stewardship Initiative:

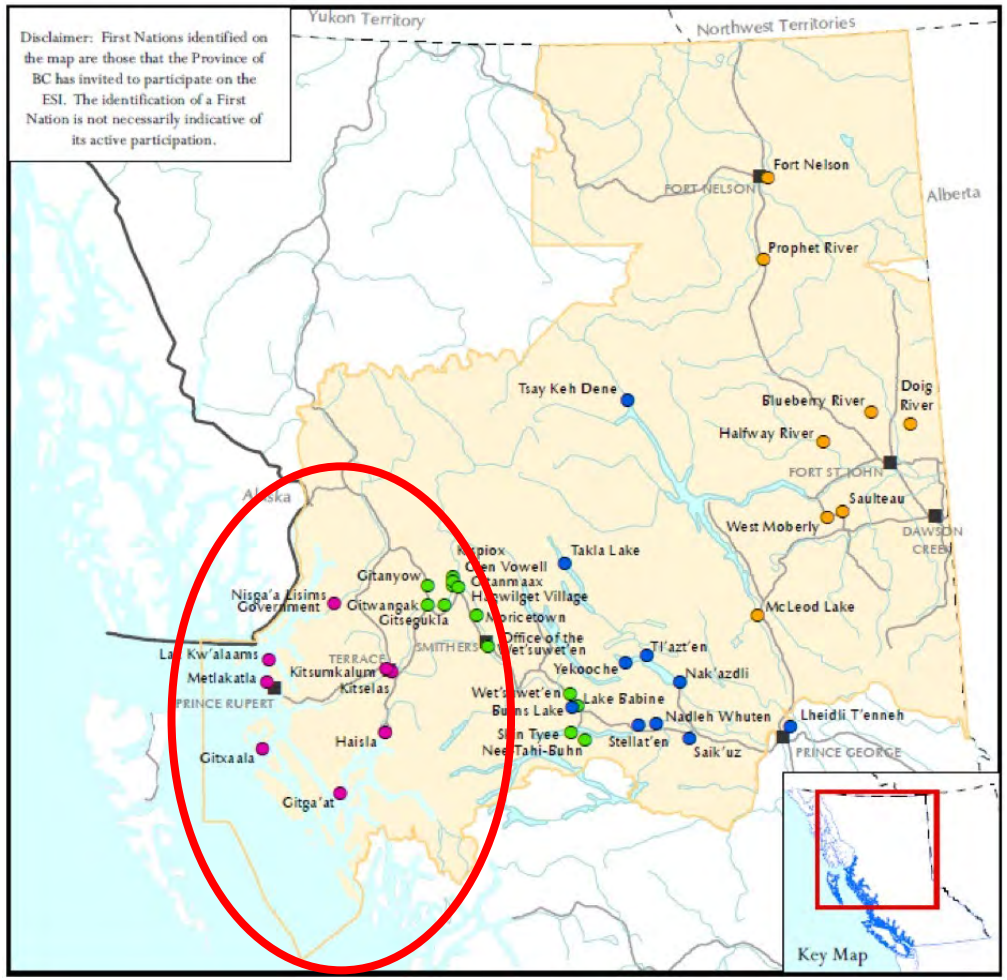
- ESI was created to collaboratively address First Nation environmental concerns that arise during the regulatory process for natural resource developments
- The Province allocated $30 million for co-designed projects that First Nations communities will have a direct role in implementing and managing
- There are 30 First Nations in Northern BC participating in ESI who are organized into 4 regions: Northeast; Omineca; Skeena; and North Coast
- Scope:
  - Ecosystem Assessment and Monitoring
  - Ecosystem Restoration and Enhancement
  - Ecosystem Research and Knowledge Exchange
  - Stewardship Education and Training



ENVIRONMENTAL STEWARDSHIP INITIATIVE ESI

North Coast ESI Projects

- The North Coast Regional Stewardship Forum (RSF) has developed 2 Projects that support both on the ground ecosystem restoration projects and longer- term environmental monitoring and assessment within the traditional territories of participating North Coast Nations:
    - **North Coast Cumulative Effects Project** with the Kitselas, Kitsumkalum, Gitga'at, Gitxaała and Metlakatla First Nations and the Province of BC
    - **North Coast Ecosystem Restoration Project** with the Kitselas, Kitsumkalum, Gitga'at, Gitxaała, Metlakatla and Haisla First Nations and the Province of BC



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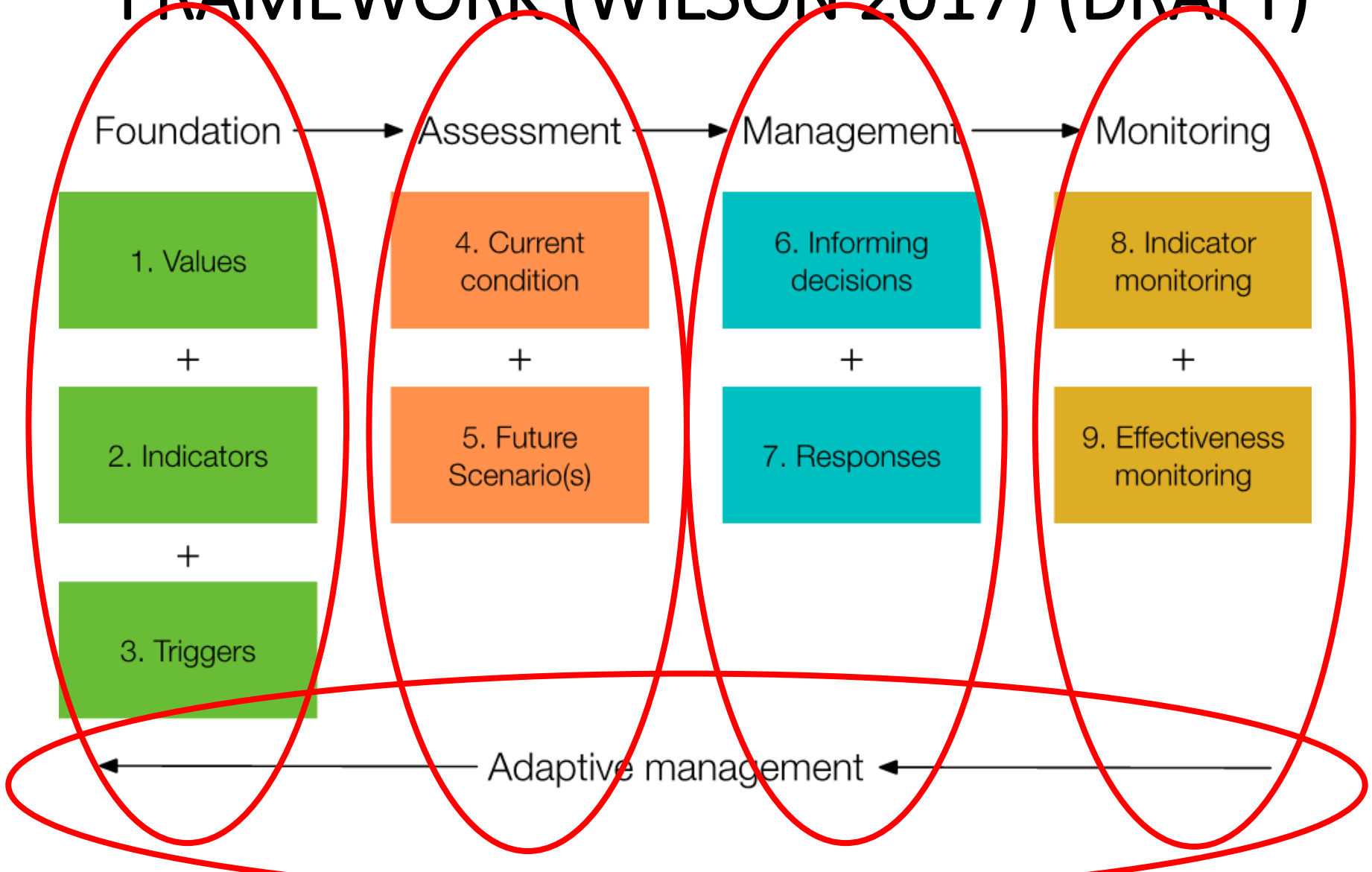
- A wide range of economic activities occur: commercial fisheries including processing, logging, port activities, recreational fishing and tourism.
- Currently subject to development pressure from numerous small to large scale industrial activities
- Proposed projects are assessed project by project, not in a sufficient way to assess cumulative effects.

CUMULATIVE EFFECTS ASSESSMENT FRAMEWORK (WILSON 2017) (DRAFT)



FOUNDATION: Identifying Values

- 33 initial common values identified through *multiple phases of engagement;*
- 4 initial values are being advanced:
    - Aquatic Habitat: Estuaries
    - First Nations Access to Resources
    - Food security
    - Pacific Salmon
- Broad Objectives e.g., Aquatic Habitat: Estuaries value

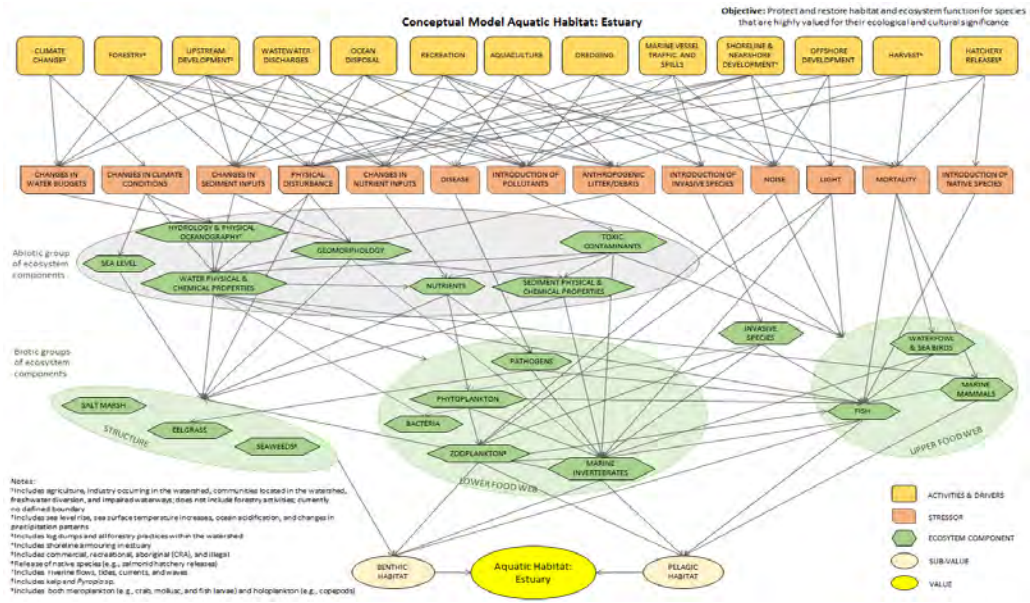
    "Protect and restore habitats and ecosystem function for species that are highly valued for their ecological and cultural significance"

	Common North Coast First Nations Cumulative Effects Values: December 7th 2016	
1	Herring - including eggs, spawn on kelp	Species
2	Salmon (all species)	
3	Halibut (and other groundfish)	
4	Bivalves - including butter clams, cockles, mussels	
5	Eelgrass	
6	Marine vegetation (seaweed and kelp)	
7	Dungeness crabs	
8	Eulachon	
9	Abalone	
10	Terrestrial mammals (moose, deer, bear)	
11	Seabirds	
12	Marine mammals	
13	Marine and Freshwater quality	Environment
15	Aquatic habitat - intertidal, subtidal, pelagic, benthic, estuarine, freshwater, wetland and riparian areas, coastal and inland old growth forests, glass sponge reefs	
16	Marine safety and navigability - wake, access	
17	Marine sediments	
18	Qualitative experience	
19	Acoustics (underwater noise, noise pollution)	
20	Human health and health services (including crime)	
21	Access to resources	SocioEconomic
22	Food security (preferred places/time/means) Where/what you want and quality and amount	
23	Commercial fisheries and marine based economy	
24	Indigenous trade	
25	Cultural identity (including cultural recognition)	
26	Knowledge transmission	
27	Resource management authority	
28	Community infrastructure/services	
29	Employment and Training (including education)	
30	Economic access	
31	Integrated knowledge (including cultural recognition)	
32	Housing	
33	Traditional governance systems (including relationships)	

*Numbers do not indicate ranking of importance/priority.

FOUNDATION: Identifying Indicators

- Conceptual models of system drafted
- Indicators Selected (criteria-based)
  - E.g., Aquatic Habitats: Estuary
    - State indicators (EOVs, EBVs)
      - Abiotic (e.g., Turbidity; SST; SSS; Nitrate Concentrations; Sediment contaminants)
      - Biotic (e.g., Native eelgrass extent; Native fish diversity; Benthic Invertebrate Meiofauna and Macrofauna)
    - Pressure indicators (e.g., Shoreline Area Disturbed; Permitted waste discharge)



MONITORING: Community-Based Field Programs

- **ESI**: Skeena Estuary Ecological state indicator monitoring program

- **NC MaPP**: North Coast Water quality monitoring strategy

- **MaPP Region**: Regional Kelp Monitoring Program (with Hakai Institute)

Photos: Jolene Brown

MONITORING: Field Programs

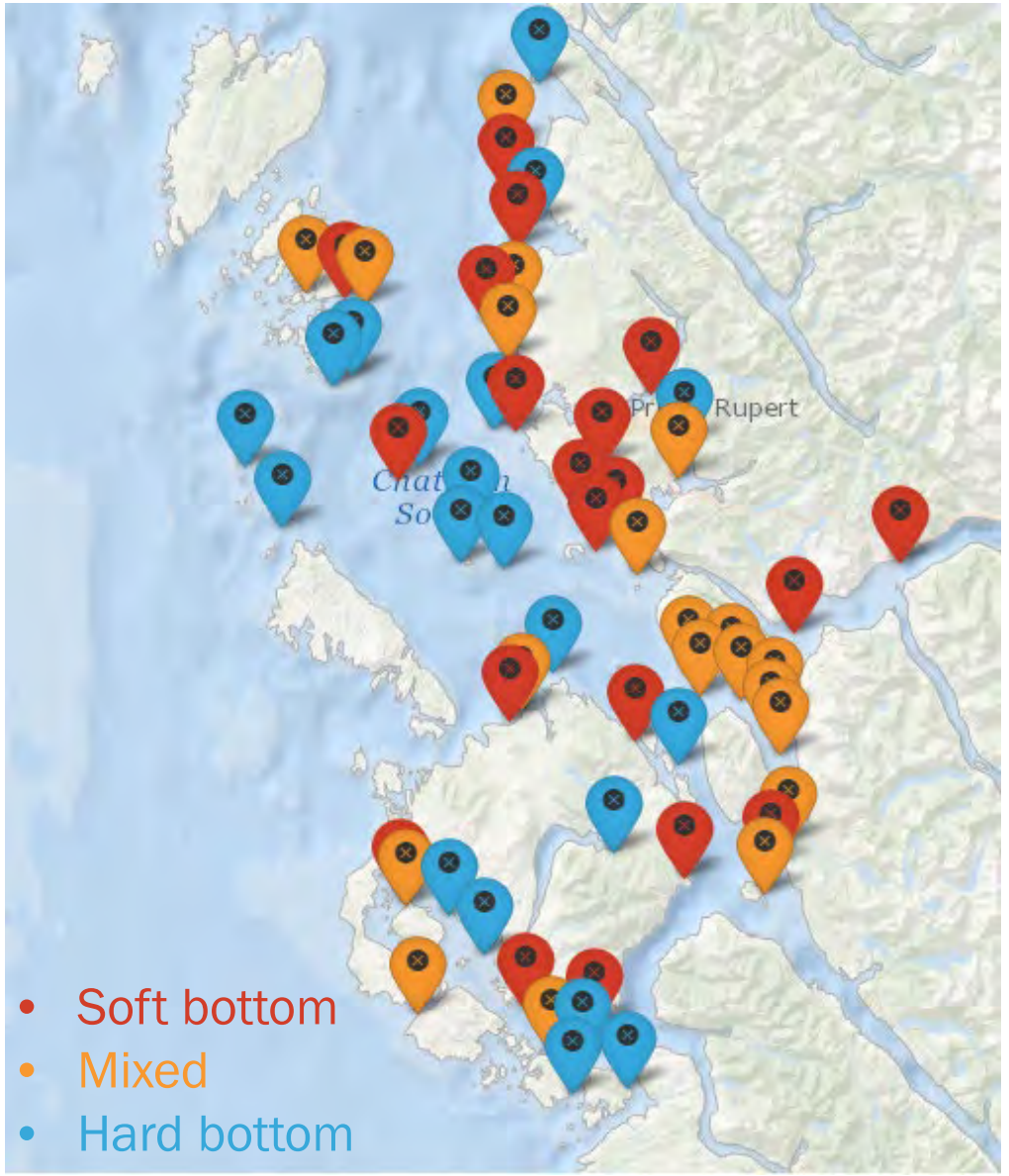
- **ESI Skeena Estuary Ecological state indicator monitoring program**
  - Annual - Summer 2017, 2018, 2019
  - Soft-sediment habitats (vegetated and unvegetated)
    - **Biotic State Variables:**
      - Eelgrass extent and condition
      - Fish community indices and biodiversity
      - Benthic Invertebrates (Clams) abundance & diversity
      - Meiofauna – diversity and abundance indices
    - **Abiotic State Variables:**
      - Sediment quality (sediment contaminants)
      - Water quality (water contaminants, nutrients)
      - Water physical properties (SST, SSS, Turbidity)

Photos: Jolene Brown

MONITORING: Site Selection

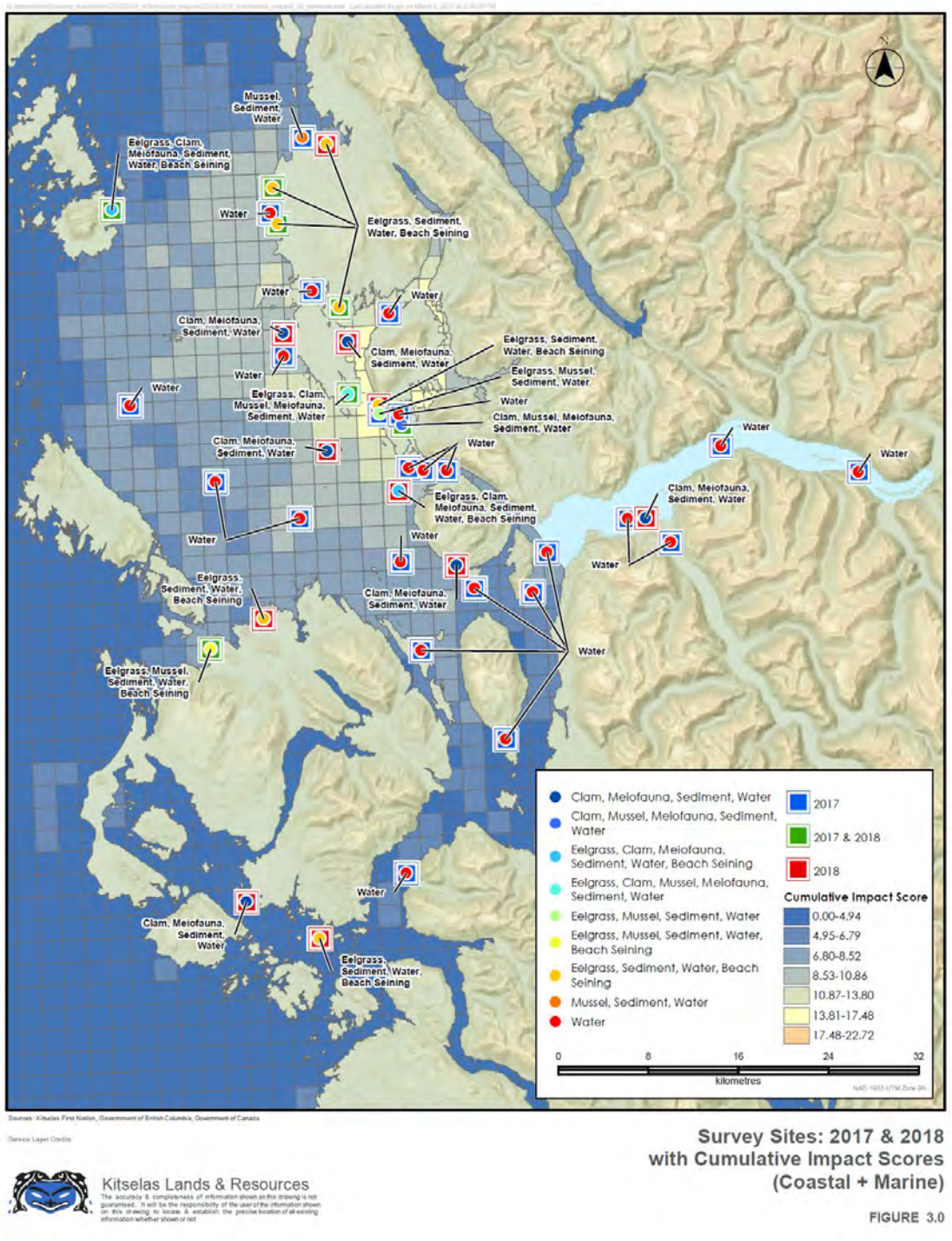
Marine Master Sampling Design - Ecofish

- Supports random selection of sampling locations to enable large scale inferences to be drawn from monitoring data.
- Statistically robust – Balanced Accepted Sampling
- Can integrate “legacy” sites & targeted monitoring based on First Nation and community feedback
- Stratified based on a number of factors (e.g., habitat type)



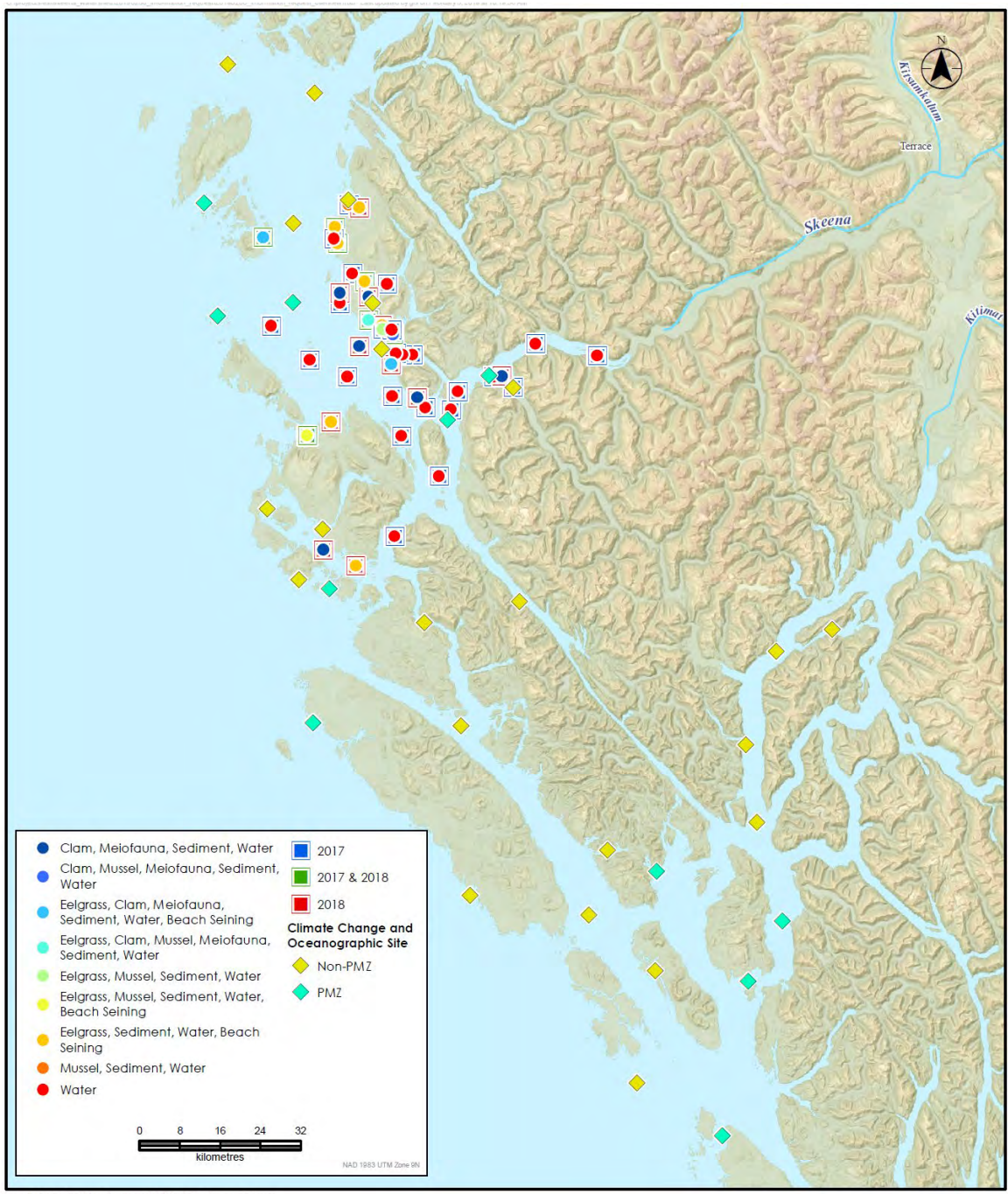
MONITORING: Site Selection

- Marine Master Sampling Design
- Stratified by Cumulative Effects scores developed for British Columbia (Clarke-Murray et al 2019)
  - Tool selects sites and gives options of both high disturbance (e.g. near Prince Rupert) and low disturbance (remote sites) which will allow us to compare data between categories
  - Make Inference across cumulative pressures index



MONITORING: Site Selection

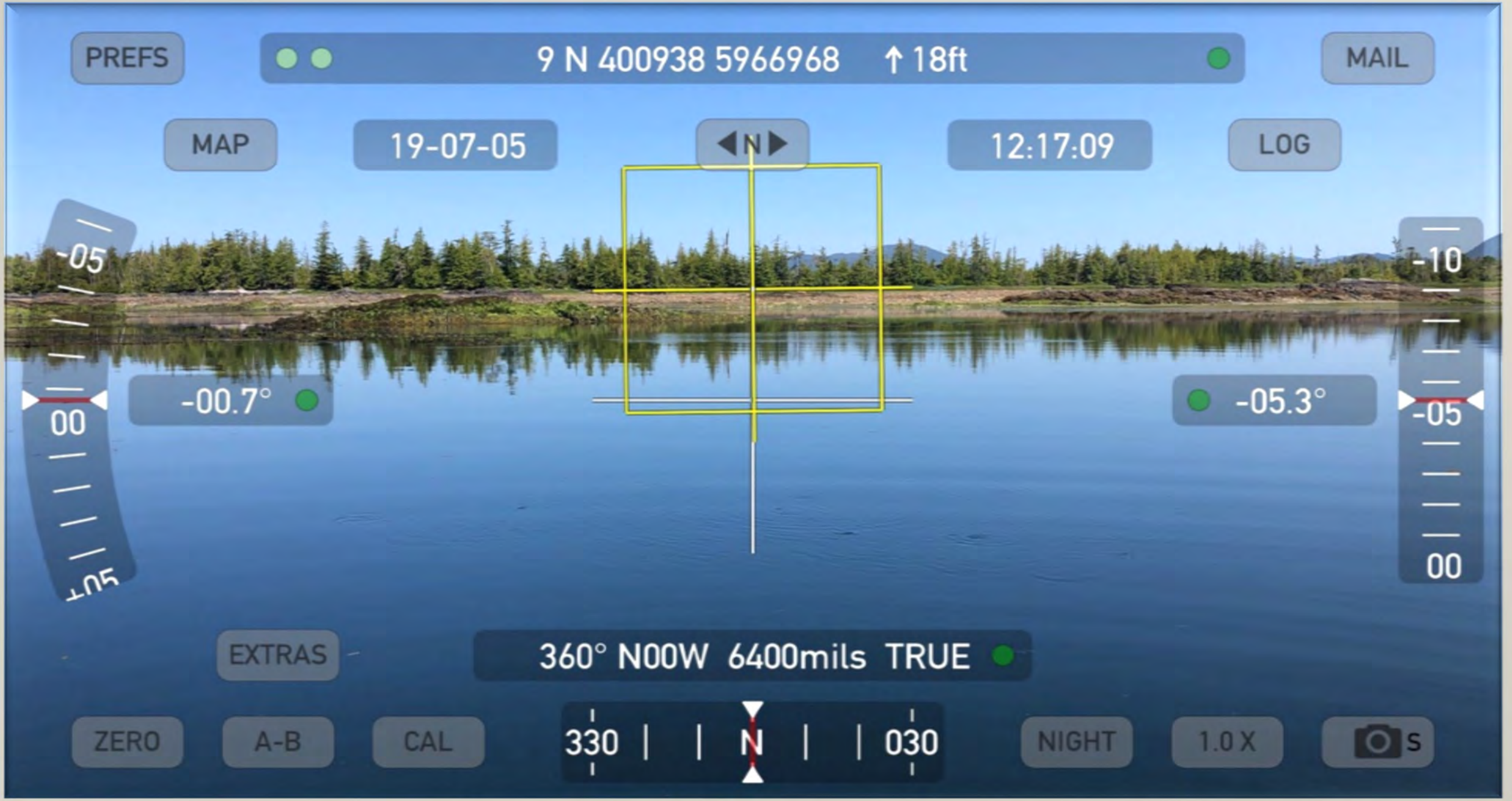
- In 2019 we completed 20 sites with 16 sites repeated from selected 2017-18 and 4 new sites selected using the site selection tool
- Mix of repeated sites with a few new ones added each year.
- Some sites are huge and will take years to complete.
- Others are small and can be alternated with similar sites nearby as selection tool selects sites close together



Survey Sites: 2017 & 2018 with Climate Change and Oceanographic Sites

MONITORING: Field Work

- In 2019 we were able to complete 18 sites in 10 days with 2 boats 12 technicians, and 1 contractor in comparison to 3 boats 18 technicians, 6 contractors in 2018
- As our sites are remote they are all accessed by boat which is a significant costs
- Relied in previous years on external contractors to lead the process and have moved towards having our First Nations Technicians lead most of the work.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LESSONS LEARNED

- Linking field monitoring to CE Assessment is iterative
- Logistical challenges of field work for monitoring nearshore EOV/EBVs e.g., low tides are a hot commodity
- Always have backup plans to prepare for missing crew/boat, weather, and equipment breakdowns
- Crew run the program on their own but up front investment in training is key
- Anticipate turnover of staff and look to securing stable funding
- Capacity building, monitoring are expensive – experience improves efficiencies
- Data management/systems are key to discuss and start developing early

THANK YOU