MINUTES OF THE MEETING
STEERING COMMITTEE (SC)

Meeting Nº 68

Thursday, October 3, 2024

In person – Tabutinsac, New Brunswick 9:30 AM

Present:		
	Marc Dunn	Niskamoon Corporation
	Luc Duquette	Hydro-Québec
	Jean-Philippe Gilbert	Hydro-Québec
	Louie Kanatewat	Cree Nation of Chisasibi
	Mélanie Leblanc	Niskamoon Corporation
	Marie-Eve Lemieux	Hydro-Québec
	Geraldine Mark	Cree Nation of Wemindji
	Ernest Moses	Cree Nation of Waskaganish
	Mila Oser	Hydro-Québec
	Ernie Rabbitskin	Niskamoon Corporation
	Robbie Tapiatic	Cree Nation of Chisasibi
	John Lameboy	Cree Nation of Chisasibi
	Cassandra Weapenicappo	Cree Nation of Eastmain
Guest:	Zou Zou Kuzyk	University of Manitoba
	Mary O'Connor	University of British Colombia
	Frederic Letourneux	McGill University
	Billie Joe Fowler	Tabutinsac Watershed Association
	Samantha Robichaud	Esgenoôpetit Watershed Association
Absent:	James Bobbish	Cree Nation of Chisasibi
	Daniel Brosseau	Hydro-Québec
	Felix Boulanger	EMRWB
	Josée Lefebvre	Canadian Wildlife Service
	Graeme Morin	Cree Nation Government
	Roderick Pachano	Cree Nation of Chisasibi
	Stephanie Varty	Cree Trappers' Association

MEETING CHAIR AND SECRETARY

Luc Duquette (**Mr. Duquette**) chaired the meeting, and Mila Oser acted as the meeting secretary.

PROPOSED AGENDA

1. Approval of the Agenda
2. Approval of final reports from the River, Ocean, and TEK teams
3. Approval of the minute #66 from the previous meetings
4. Presentation on CHCRP Phase I Synthesis research (Zou Zou Kuzyk)
5. Presentation on 2024 fieldwork eelgrass update (Mary O'Connor)
6. Miscellaneous
7. Summary and Next Steps
8. Next Meeting

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1. Approval of the Agenda

The Chair reviewed the agenda, and no additional points were proposed. Thus, the agenda was approved as presented.

2. Approval of final reports from the River, Ocean, and TEK teams

- The final reports were approved except for the Cree Knowledge Final report that is partially approved until Julian Idrobo provides a copy of the Cree knowledge data.
  This will close phase 1 of the CHCRP.

Action: Finish a little video summarizing phase one of the CHCRP: needs be done by Zou Zou Kuzyk (Mrs. Kuzyk) and Melanie Leblanc (Mrs. Leblanc)

3. Approval of the minutes #66 from the previous meeting: Reviewed and Approved

- Minutes #58-#59 and #67 need to be reviewed and approved at next meeting

4. Presentation on CHCRP Phase I Synthesis research (Zou Zou Kuzyk)

Mrs. Kuzyk delivered a presentation titled "*CHCRP Phase I Synthesis research*" and a copy of the presentation and document is appended to these minutes for reference.

- The Report was finished about a year ago
- Over the past year, the core team took the 200 pages report and made a shorter report of 10 pages with the most important figures and writing it in a way that would be less scientific
- This synthesis paper is ready and will be sent to all involved **in the next week**
- The study was undertaken in the geographic region from Cape Jones to about Wemindji
- Mention of how the eelgrass was distributed and important in the early years before 1997

- Before 1980, in the winter, river flows were low during winter, including La Grande. With any river flow in winter, little areas of fresh water will form outside of the river mouth, within which eelgrass does not grow. With increase in winter river flow from La Grande, the size of the area of fresh water around the river mouth increased, and the area with no eelgrass increased.
- Stressors: global warming/extreme climate event/coastal development
  Controlling factors: light/sediments/temperature/salinity/nutrients
- Eelgrass sediment light (ESL) feedback loop:
  Mrs. Kuzyk spoke of the light conditions and how it affects the eelgrass, and the way that the sediments affect the light conditions when they get stirred up off the seabed; and the way that eelgrass helps prevent the sediments from getting stirred up off the bottom.
- Over time, there were few changes in eelgrass but small variations because from natural conditions (before Hydro Quebec). Then development started and there were several phases (pre 1975- 1990's). A difference between the pre crash period (pre 1998) vs. the late 1990s-2000s and today is that eelgrass has been affected by climate change and Hydro Quebec effects.
- Eelgrass changes; understanding the timeline, the project was trying to re construct the environmental changes, the start of Hydro QC, the eelgrass near the river mouth and how eelgrass suffered
- By the 1990s eelgrass changes had spread beyond the Chisasibi region
- CHCRP partnered with communities for the research activities: from 2017 to 2021
- The final paper tried to figure out how the different environmental changes have affected eelgrass and the factors that were affecting the eelgrass in the last 20 y.

Questions:

- Forest fires and their impacts, in the next few years: the fires and their debris could affect the light and the eelgrass what can we expect (Mr. Tapiatic):
  - Response from Mary O'Connor: no scale to give yet, no survey was made so no data is available. In this survey we went to the mouth of the river and how it could be affected by fire debris and the community said they were differences we are looking into it
- Large dense eelgrass beds that re still there the very few remaining, should we make a recommendation to protect them? We should make an effort to protect them and it should be part of the conversation
- Mr. Dunn asked where would we publish this report?:Mrs. O'Connor mentioned that it would be in "Nature Journal"

Mrs. O'Connor stated that this eelgrass story -such as this study- isn't uncommon but not yet researched much yet as coastal areas are thought to not be affected

Louie Kanatewat (**Mr. Kanatewat**) mentioned the Elders predictions: we will never see the eelgrass as it was back in the 70s. What are we going to do as it affects nature and geese as well?
Mrs. O'Connor and Mrs. Kuzyk responded that they were not sure yet. However, they said that the study benefited very much from the elders knowledge as no survey was made than so there was richness from them vs science

5. **Presentation on 2024 fieldwork eelgrass update**

Mrs. O'Connor delivered a presentation titled "*Preliminary Ecosystem Research*" and a copy of the presentation and document is appended to these minutes for reference.

Mrs. O'Connor mentioned where and how the survey was made

- Key concept; light condition
- Phase 2 of the CHCRP was developed after lots of community discussions from 2019 to 2022
- The phase 2 will be a 5-year program
- The Funds will be coming from 5 different organisations
- There will be three different projects in Phase 2
- Critical monitoring timing for the research is thought of

Question: timeline for restoration?

- First year will be a try out and critical and than we will see
  Other examples exist but not the same as in the location we are in now
  We will have to explain why some sights were chosen
  The sites will also be chosen to try and test different options
  Also we will need to look at people and capacity of these supporting the testing
  We are thinking of putting a dedicated team together for next summer perhaps, who will be on the ground

Mrs. O'Connor went through the different activities that happened this year – 2024

- They Visited 36 sites, some new, some repeat
- Some spots we were looking at were quite different but we don't know why yet
- We are having a hard time figuring out what made it so

Question:
Could we start the survey and compare areas that are good (Boatswain Bay) and than compare to areas that aren't as healthy
Mr. Gilbert said that they were aiming for that

- Certain sites showed really fast growth
- Flowering shoots were observed which is encouraging
- Light is an important factor in the Eeyou Istchee meadows
  many lots were sampled and will be analyzed by Xmas
  sensors were put in the water and recorded the light during summer 2021
  (These were important to say how light impacted growth)
  From site-to-site, differences were observed in local rivers melt, ice break up, open water
  6 sites were observed and measured for light and growth measurement
- 2024 observations: raw stages of data, more to be collected and analyzed

Question: when will you go back for studies ? Mrs. O'Connor answered that they will go back this winter

Action: A public announcement will be made re: grants. Likely UBC will do a press release and than Hydro Quebec will do a press release

6. **Miscellaneous**

N/A

7. **Summary and Next steps**

To do :

- Finalize/discuss the Cree Knowledge Final report
- Provide an update on the video
- Present an overview of the Wildlife Monitoring Alliance project and timeline
- Provide an update on the landscape change alliance project
- Presentation of Research paper by Paul del Georgio (TBC if he can make it at next meeting)
- Presentation on Tabusintac visit

8. **Next Meeting**

Following the exchange on the availability of each, it was agreed that the next meeting will be held on Friday, November 1, 2024, from 9 am to 12 pm online

ADJOURNMENT OF THE MEETING

Meeting was adjourned at 12:00 pm (noon)

The meeting secretary,

Mila Oser

The meeting chair,

Luc Duquette

Coastal Habitat Comprehensive Research Project

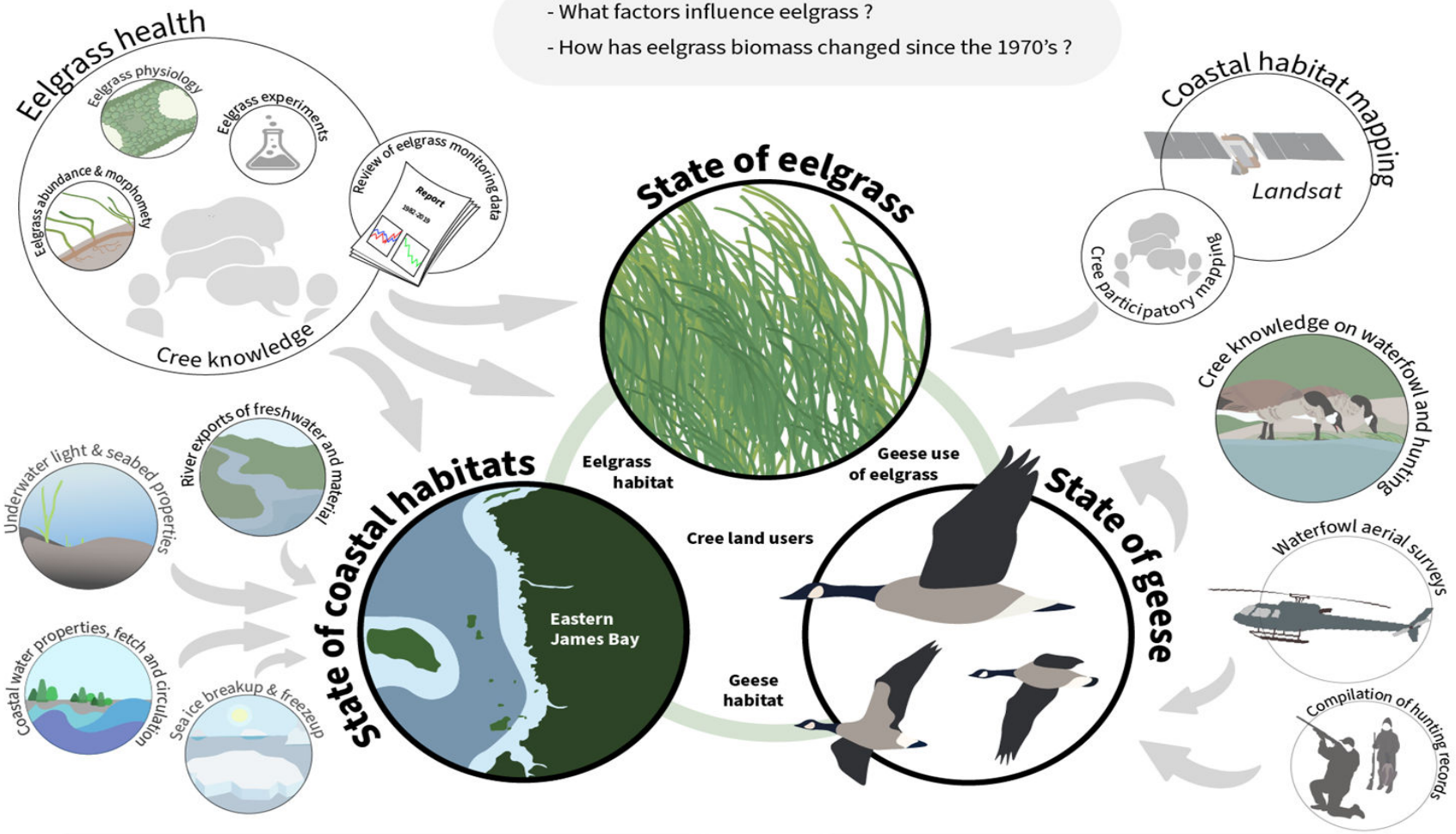
Presentation to the Steering Committee
Zou Zou Kuzyk, University of Manitoba
Tabusintac NB
October 3, 2024

EeyouCoastalHabitats

www.eeyoucoastalhabitat.ca

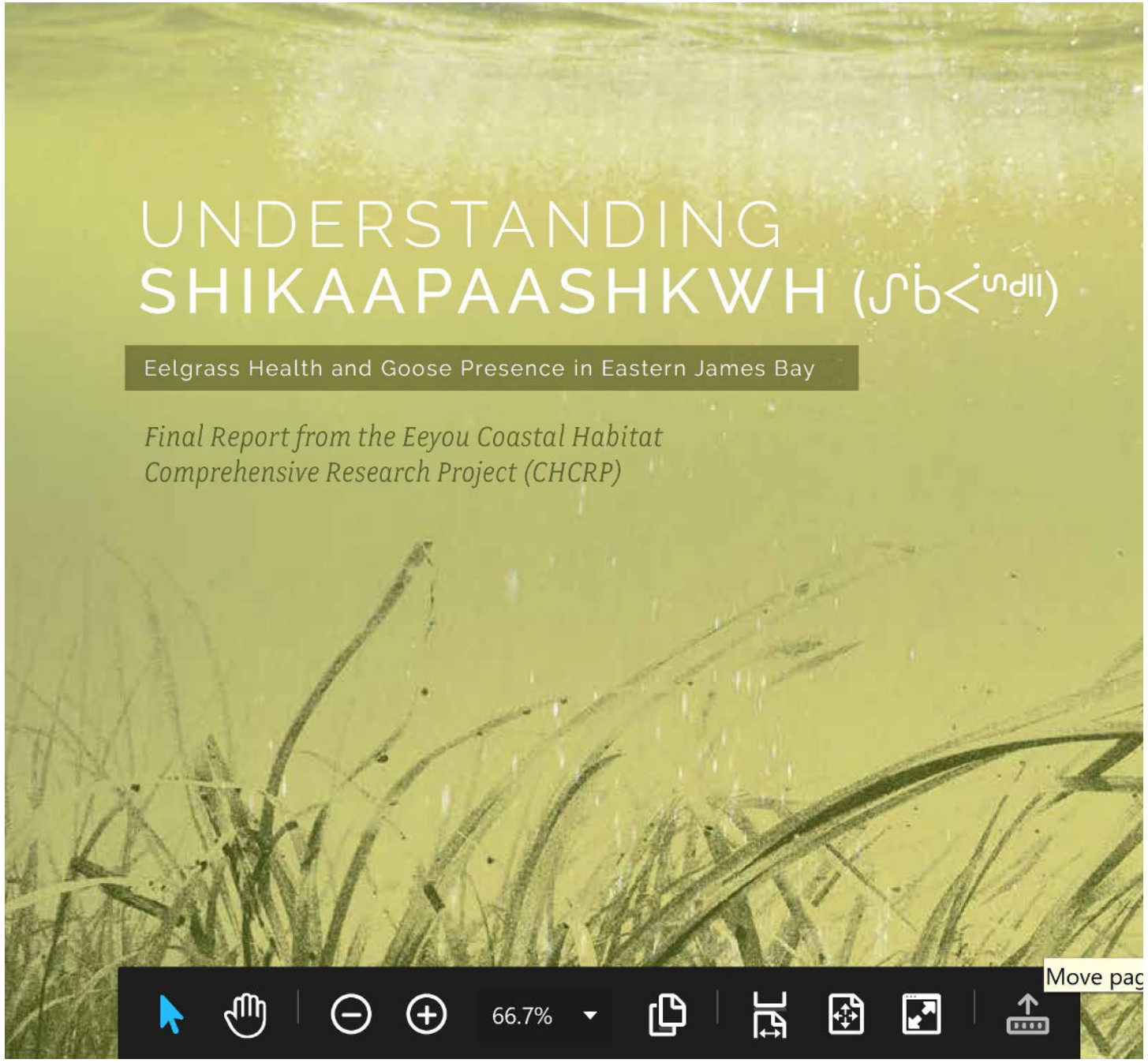
Knowledge integration to answer key research questions

- What factors influence eelgrass ?
- How has eelgrass biomass changed since the 1970's ?



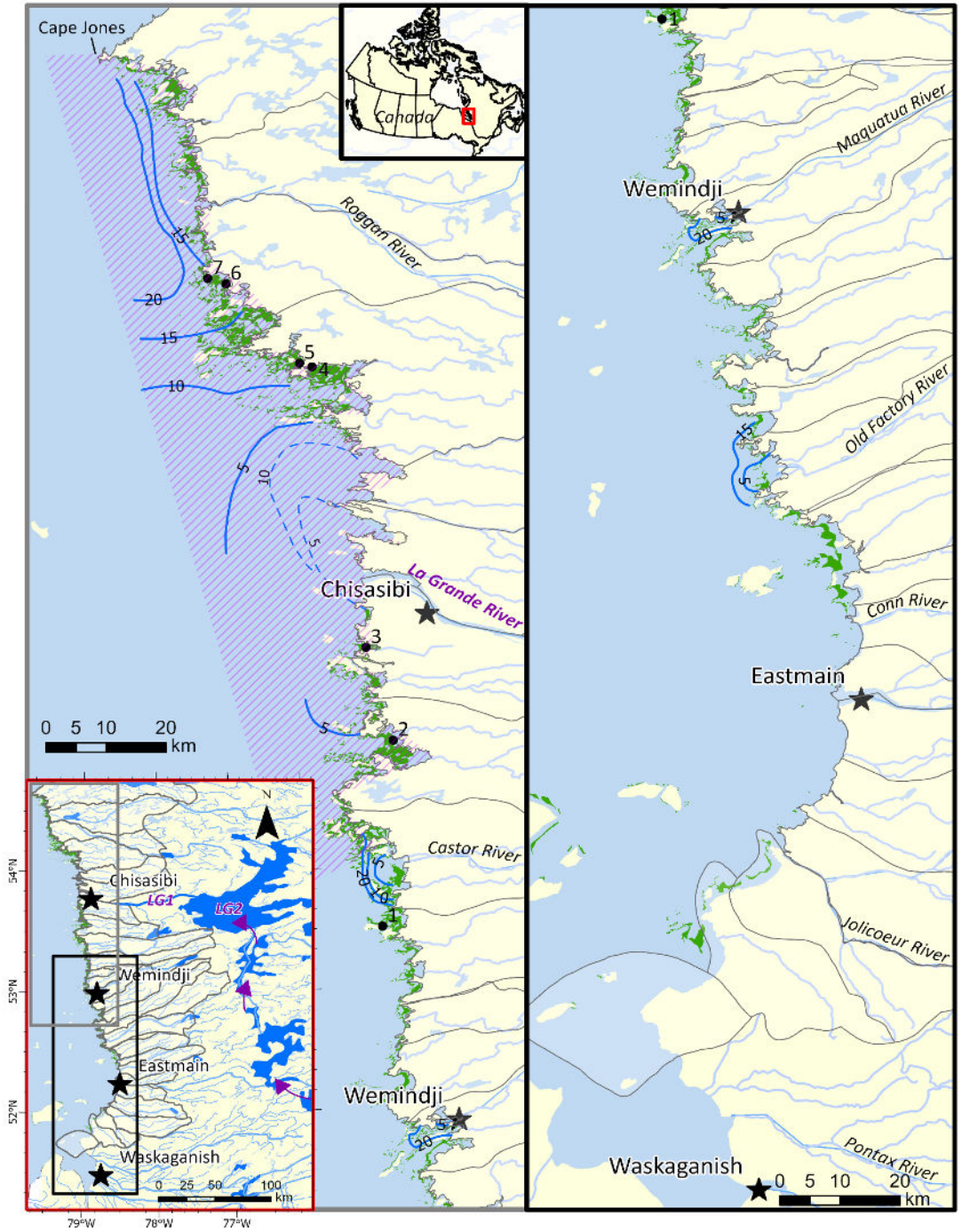
- What are the current water and sea bed conditions in EJB ?
- How have coastal conditions changed in the last decades ?
- What factors influence riverine exports ?
- Has regulated & unregulated river discharge changed since the 1970's ?

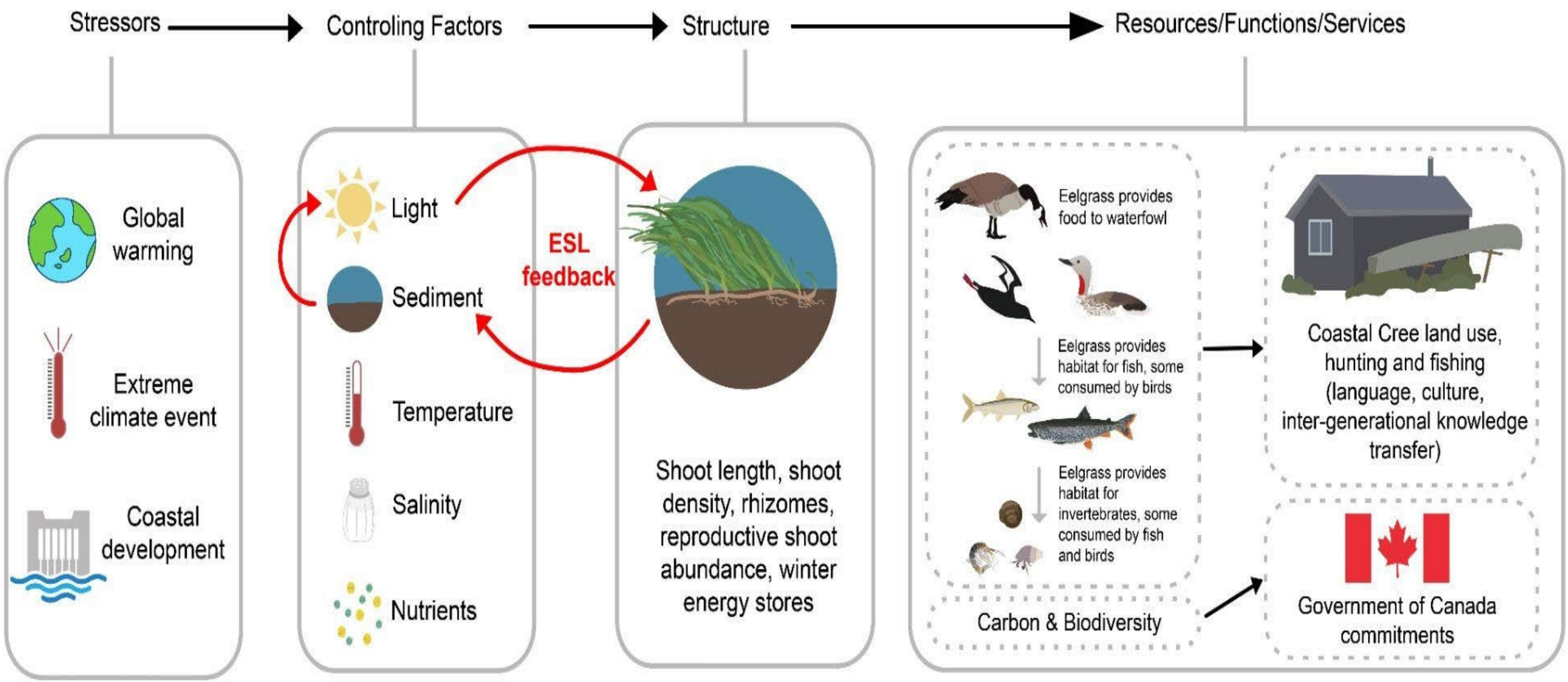
- What is the status of Canada geese populations harvested by Cree hunters ?
- What are the distribution and habitat use of Canada geese ?



Synthesis Paper for Scientific Audiences

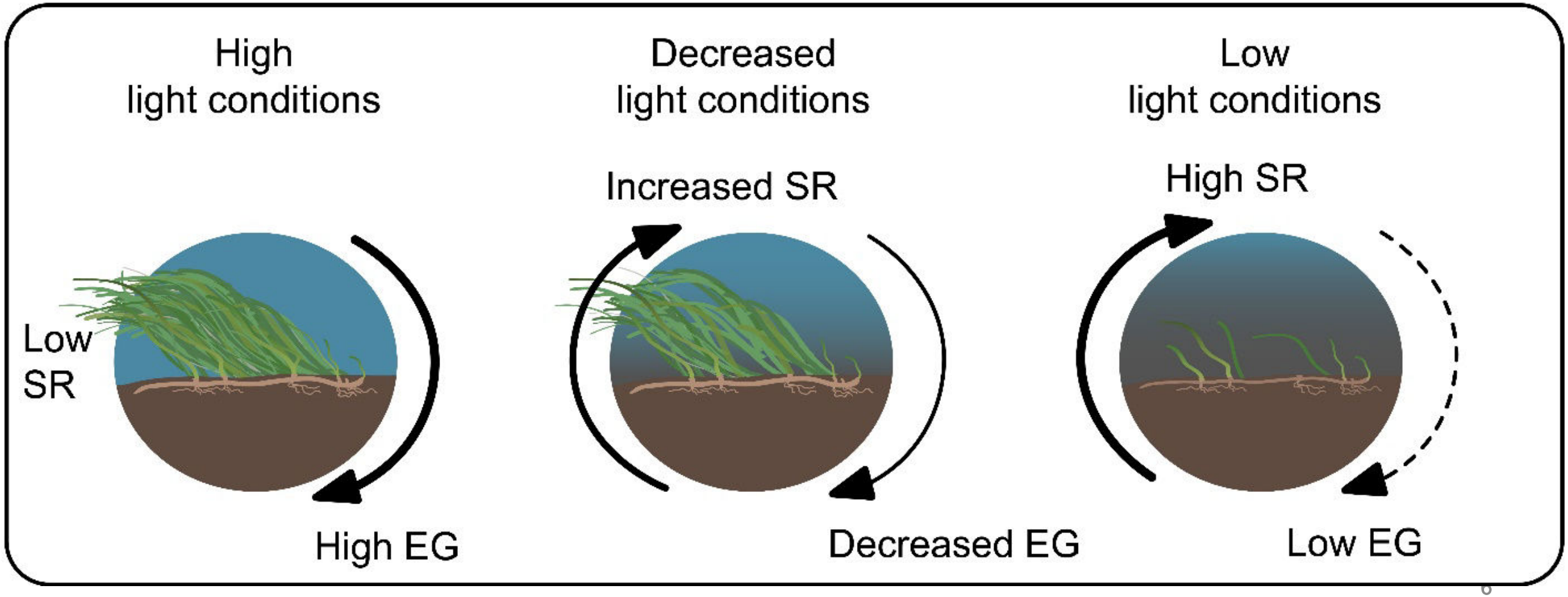
Losing *Shikaapaashkwh*

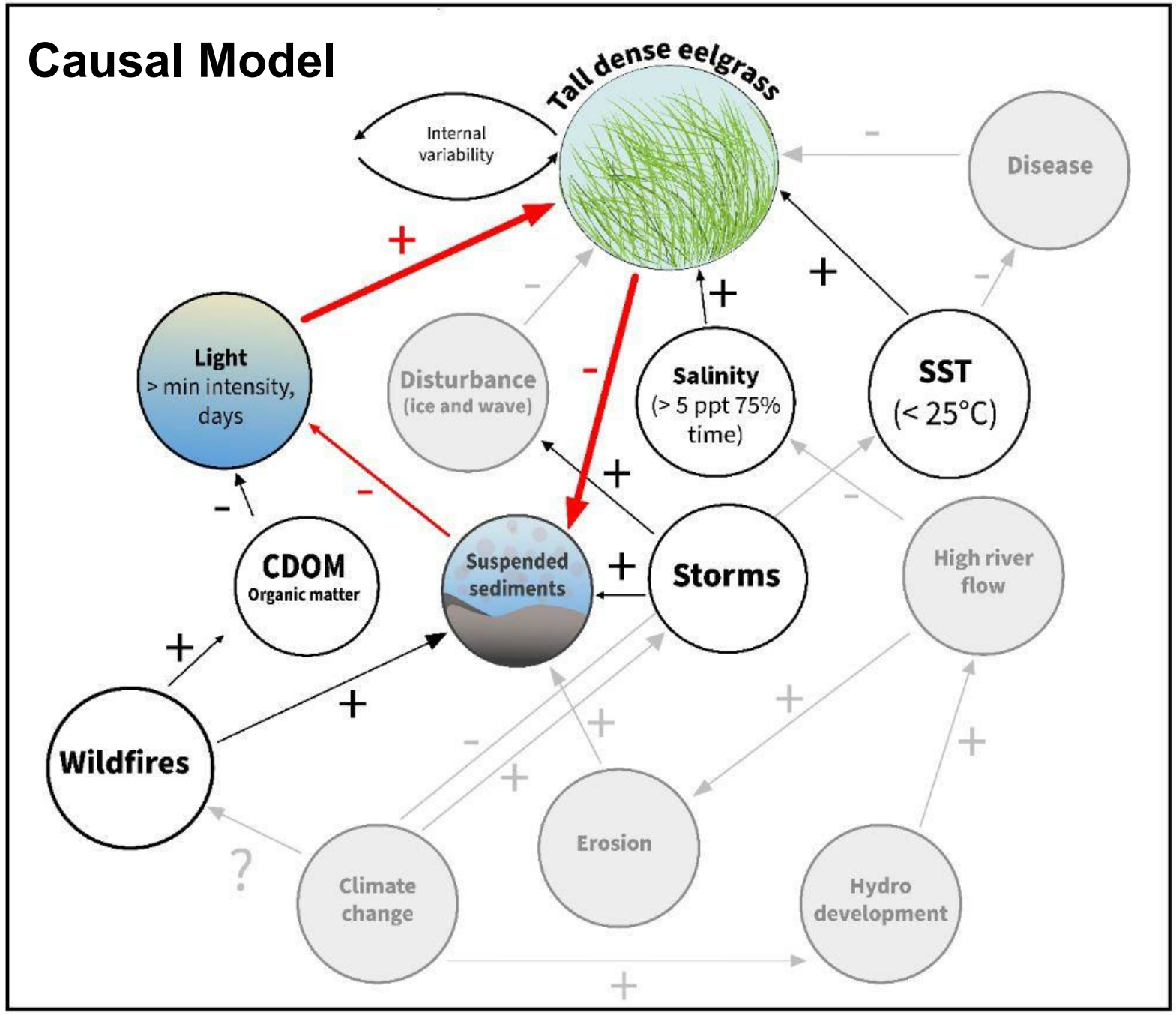

Cape Jones
Canada
Roggan River
Maquatua River
Wemindji
Old Factory River
La Grande River
Chisasibi
Conn River
Eastmain
Castor River
Jolicoeur River
Pontax River
Waskaganish
0 5 10 20 km
LG1
LG2
54°N
53°N
52°N
79°W
78°W
77°W
0 25 50 100 km


Stressors
Controling Factors
Structure
Resources/Functions/Services
Global warming
Extreme climate event
Coastal development
Light
Sediment
Temperature
Salinity
Nutrients
ESL feedback
Shoot length, shoot density, rhizomes, reproductive shoot abundance, winter energy stores
Eelgrass provides food to waterfowl
Eelgrass provides habitat for fish, some consumed by birds
Eelgrass provides habitat for invertebrates, some consumed by fish and birds
Carbon & Biodiversity
Coastal Cree land use, hunting and fishing (language, culture, inter-generational knowledge transfer)
Government of Canada commitments

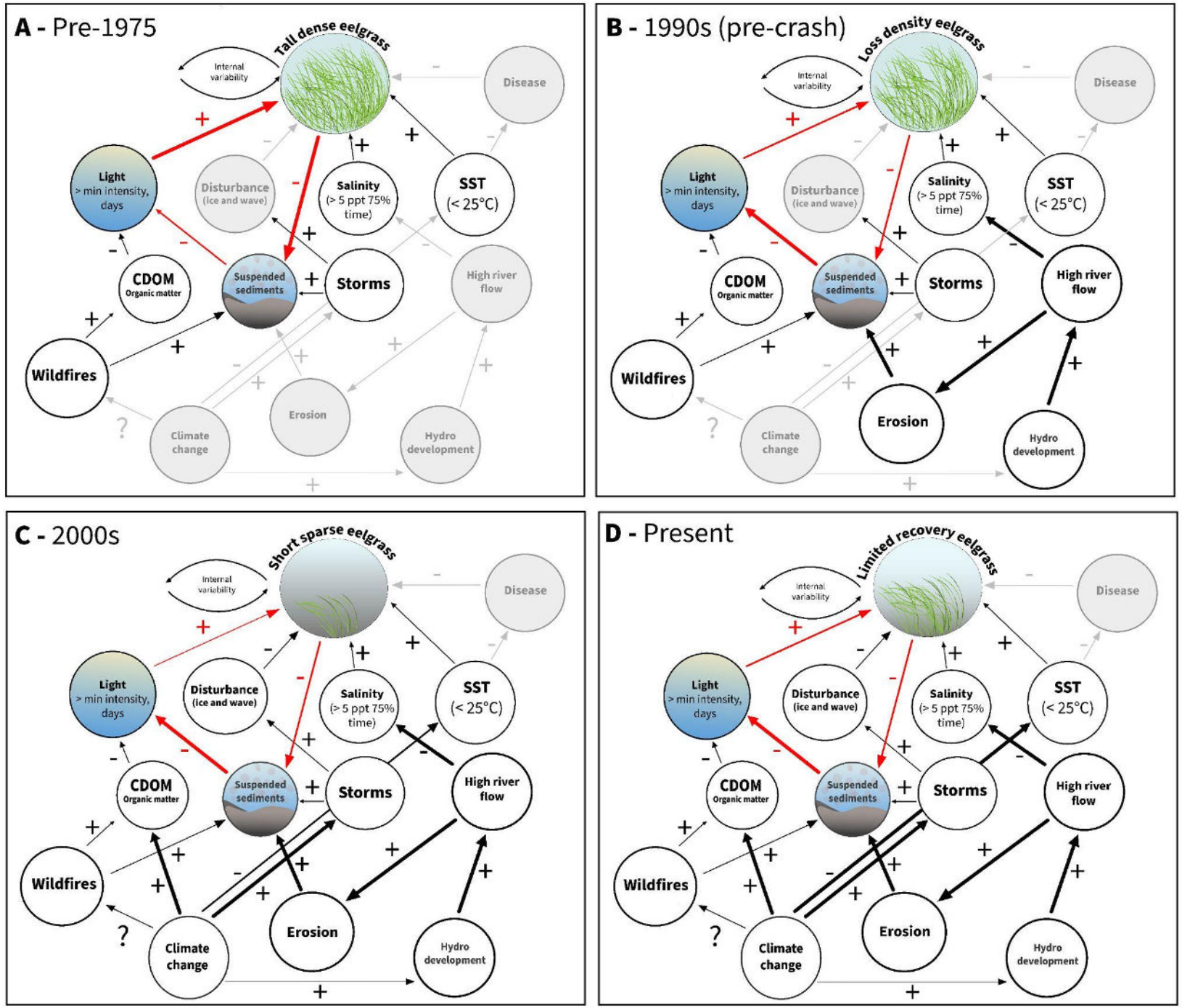
Eelgrass-sediment-light (ESL) feedback loop

SR = sediment resuspension
EG = eelgrass growth

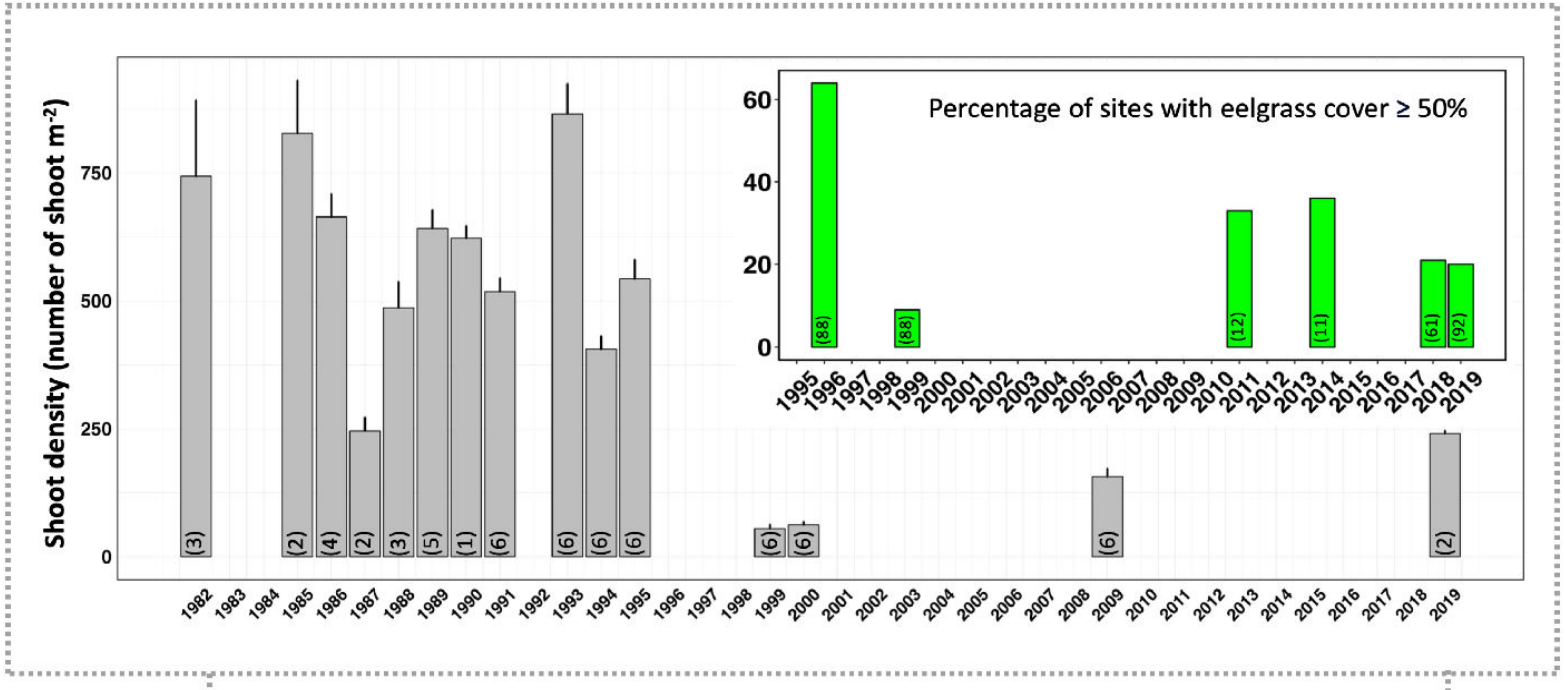




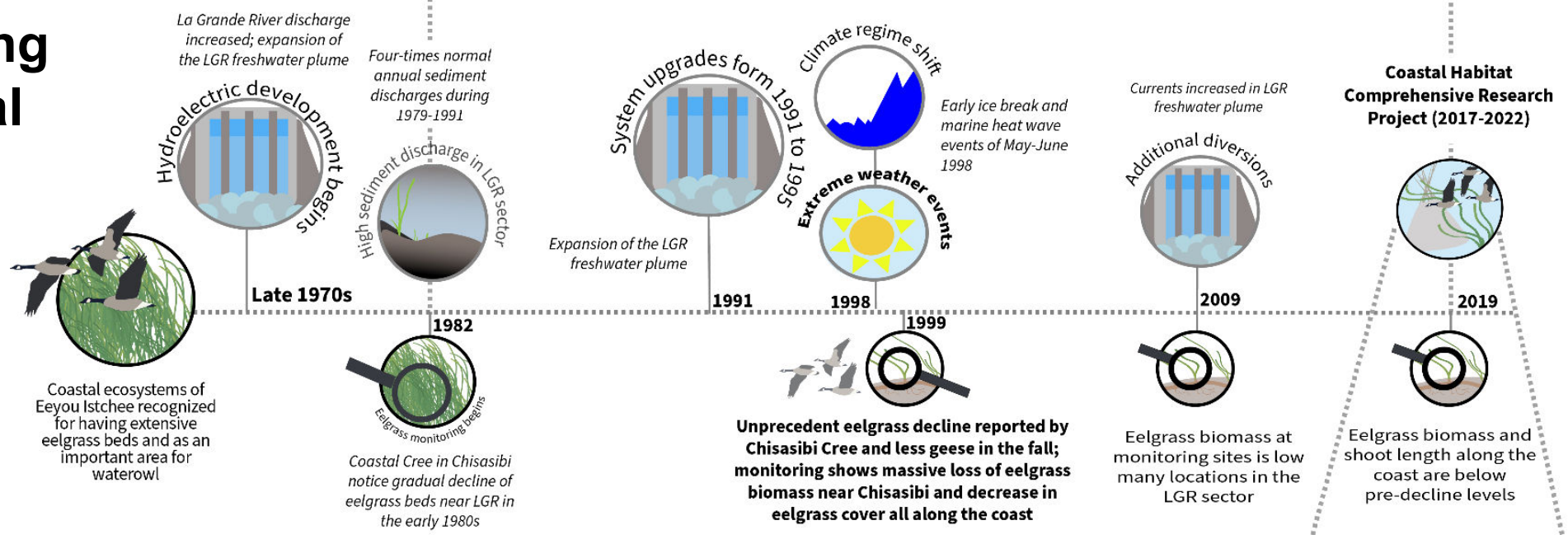
Direct and indirect effects of stressors and controlling environmental factors on eelgrass

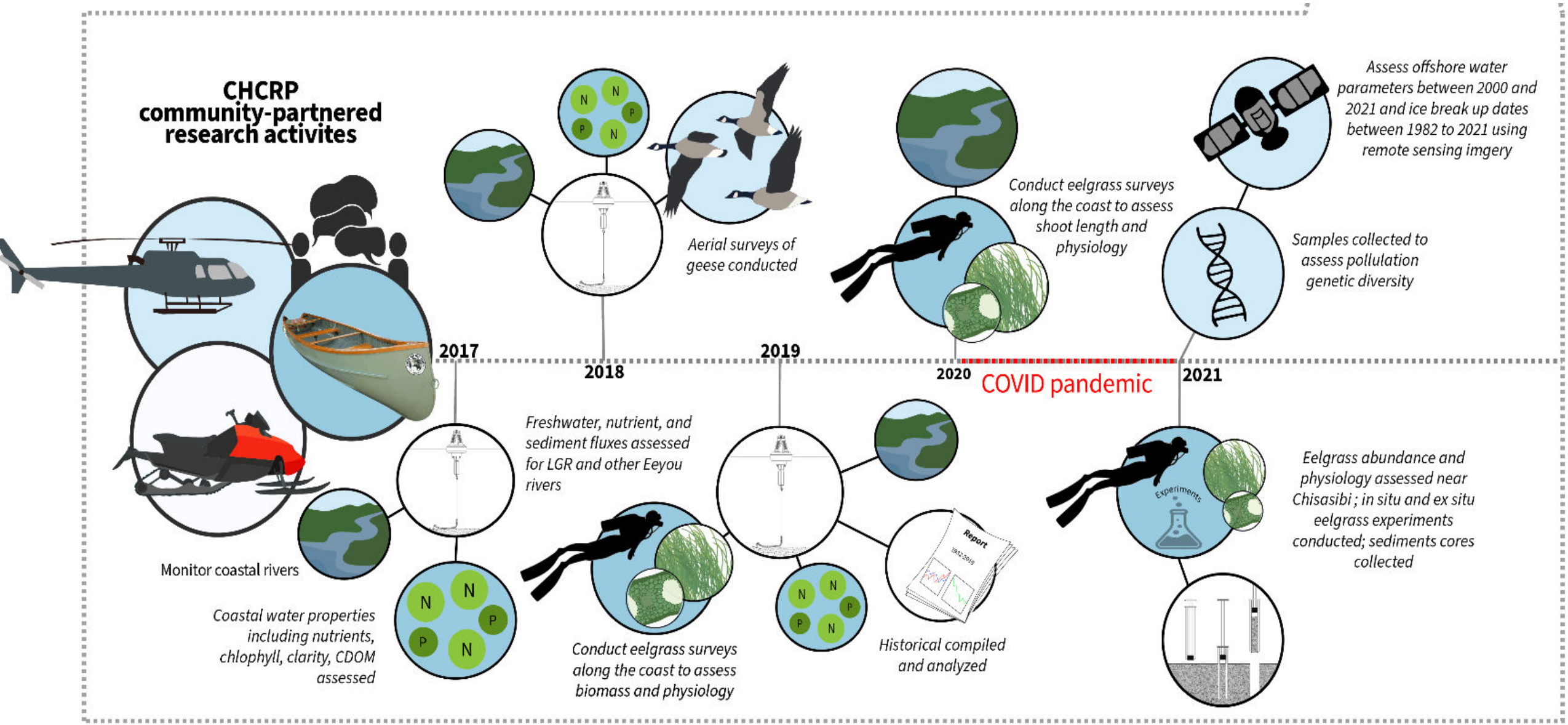

A - Pre-1975
Tall dense eelgrass
Internal variability
Disease
Light
> min intensity, days
Disturbance
(ice and wave)
Salinity
(> 5 ppt 75% time)
SST
(< 25°C)
CDOM
Organic matter
Suspended sediments
Storms
High river flow
Wildfires
Climate change
Erosion
Hydro development
B - 1990s (pre-crash)
Loss density eelgrass
Internal variability
Disease
Light
> min intensity, days
Disturbance
(ice and wave)
Salinity
(> 5 ppt 75% time)
SST
(< 25°C)
CDOM
Organic matter
Suspended sediments
Storms
High river flow
Wildfires
Climate change
Erosion
Hydro development
C - 2000s
Short sparse eelgrass
Internal variability
Disease
Light
> min intensity, days
Disturbance
(ice and wave)
Salinity
(> 5 ppt 75% time)
SST
(< 25°C)
CDOM
Organic matter
Suspended sediments
Storms
High river flow
Wildfires
Climate change
Erosion
Hydro development
D - Present
Limited recovery eelgrass
Internal variability
Disease
Light
> min intensity, days
Disturbance
(ice and wave)
Salinity
(> 5 ppt 75% time)
SST
(< 25°C)
CDOM
Organic matter
Suspended sediments
Storms
High river flow
Wildfires
Climate change
Erosion
Hydro development

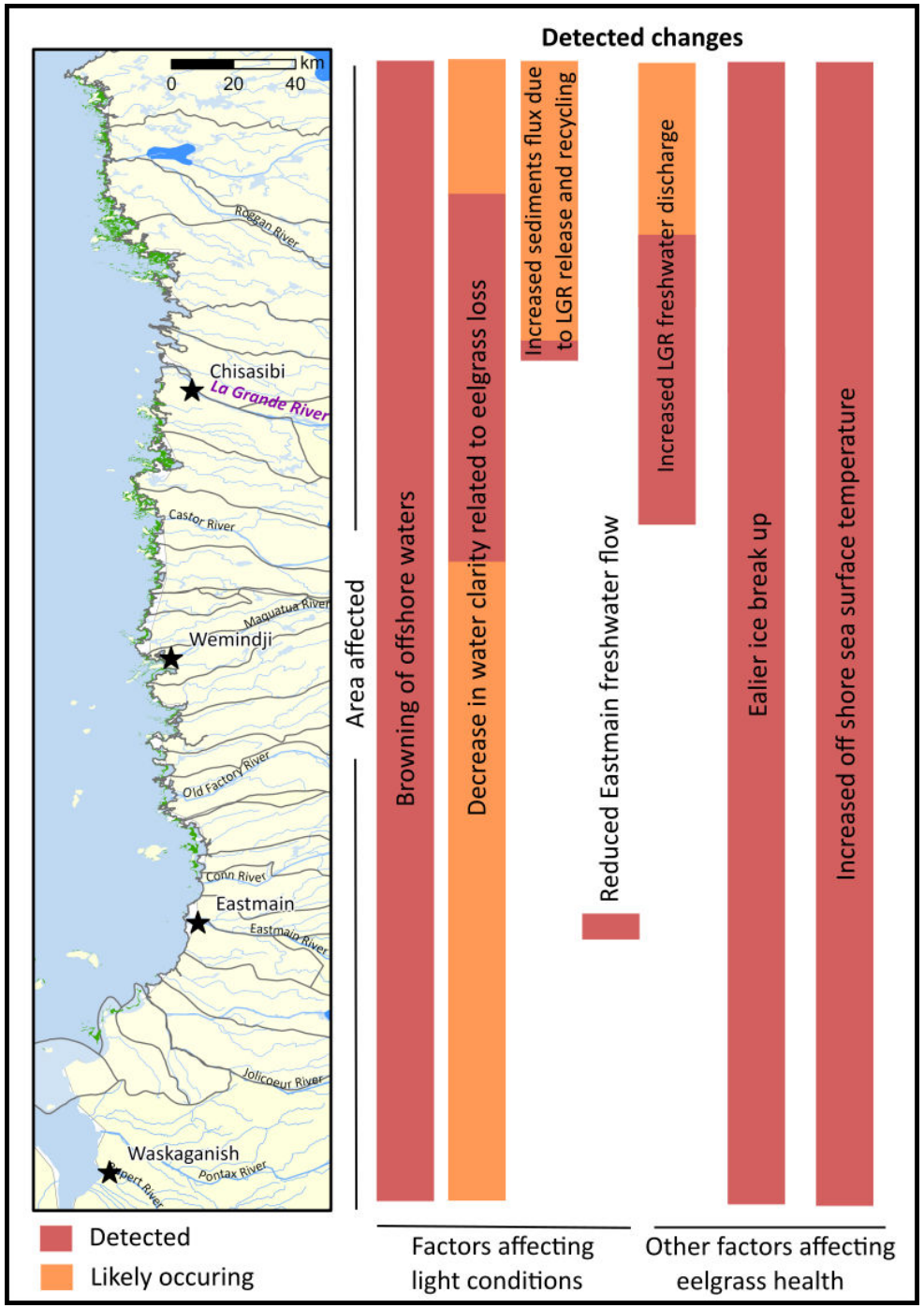
Eelgrass change



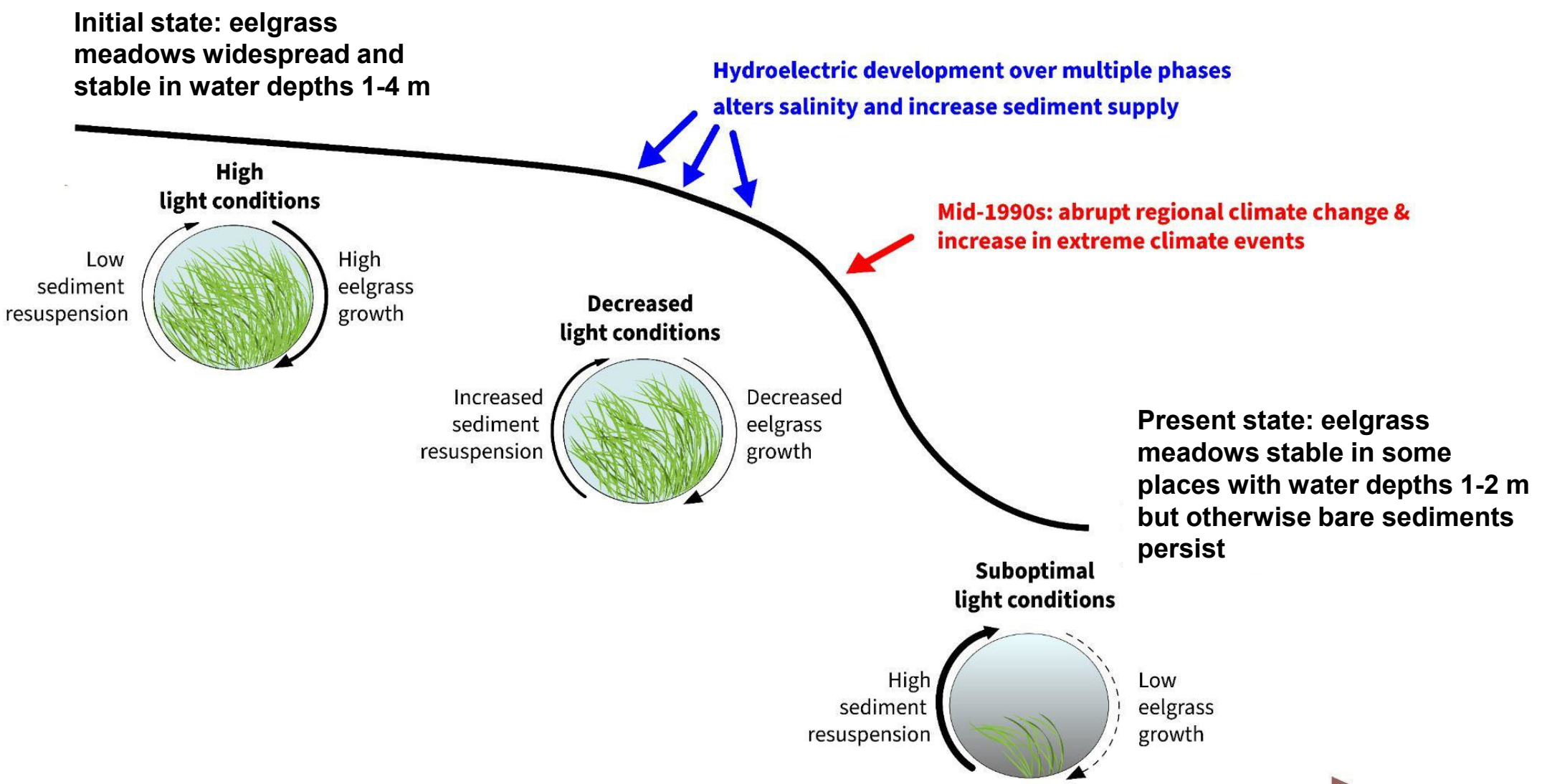
Reconstructing environmental change



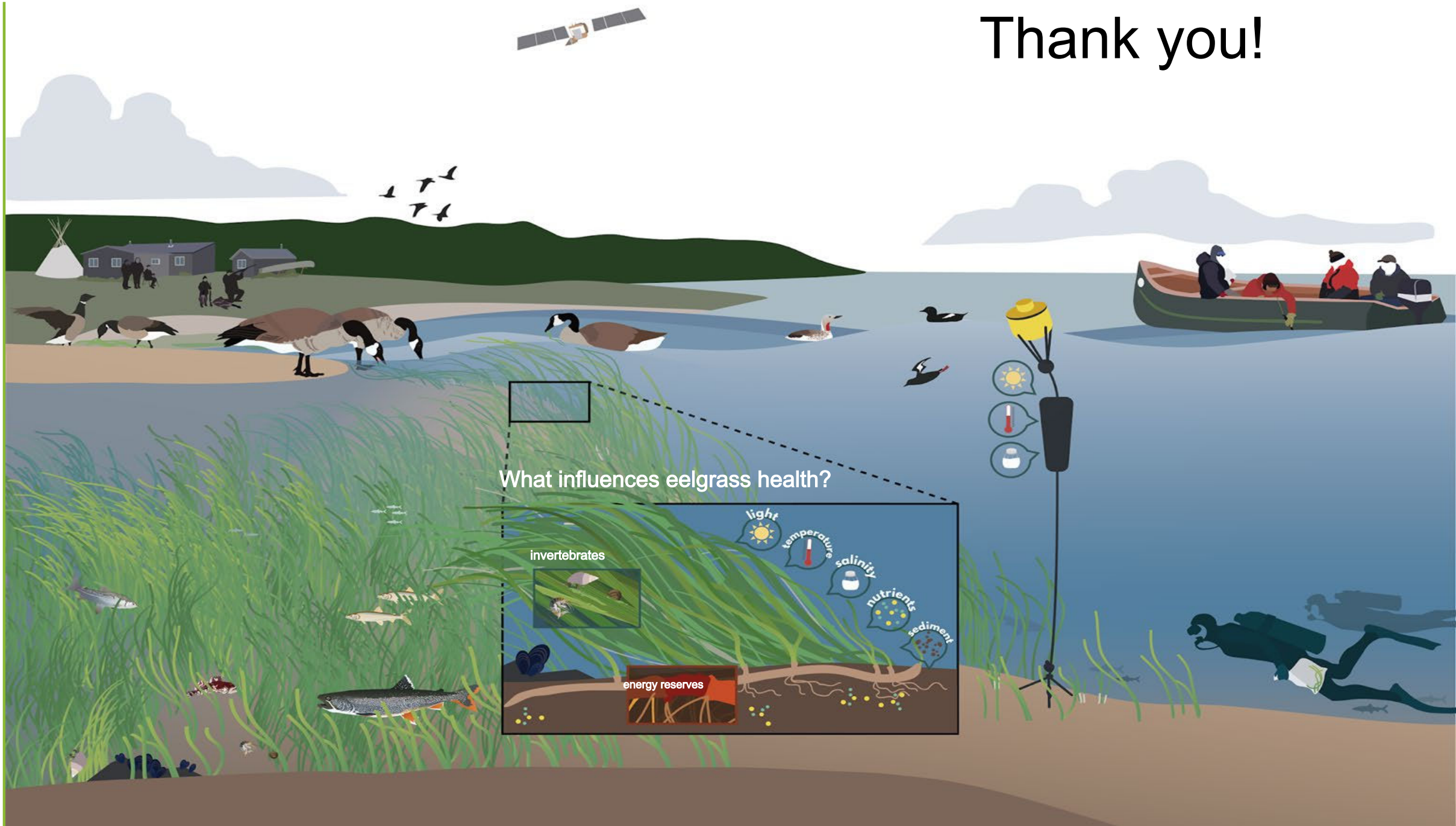

CHCRP
community-partnered
research activites
2017
2018
2019
2020
COVID pandemic
2021
Monitor coastal rivers
Coastal water properties including nutrients, chlophyll, clarity, CDOM assessed
Aerial surveys of geese conducted
Freshwater, nutrient, and sediment fluxes assessed for LGR and other Eeyou rivers
Conduct eelgrass surveys along the coast to assess biomass and physiology
Historical compiled and analyzed
Conduct eelgrass surveys along the coast to assess shoot length and physiology
Assess offshore water parameters between 2000 and 2021 and ice break up dates between 1982 to 2021 using remote sensing imgery
Samples collected to assess pollulation genetic diversity
Eelgrass abundance and physiology assessed near Chisasibi ; in situ and ex situ eelgrass experiments conducted; sediments cores collected
Experiments
Report


Detected changes
km
0
20
40
Roggan River
Chisasibi
La Grande River
Castor River
Maquatua River
Wemindji
Old Factory River
Conn River
Eastmain
Eastmain River
Jolicoeur River
Waskaganish
Pontax River
Area affected
Browning of offshore waters
Decrease in water clarity related to eelgrass loss
Increased sediments flux due to LGR release and recycling
Reduced Eastmain freshwater flow
Increased LGR freshwater discharge
Ealier ice break up
Increased off shore sea surface temperature
Detected
Likely occuring
Factors affecting light conditions
Other factors affecting eelgrass health

Conceptual model of the role of local and regional drivers plus ESL feedbacks in shifting the eelgrass ecosystem



Thank you!


What influences eelgrass health?
invertebrates
light
temperature
salinity
nutrients
sediment
energy reserves

Part 2 of Presentation to SC

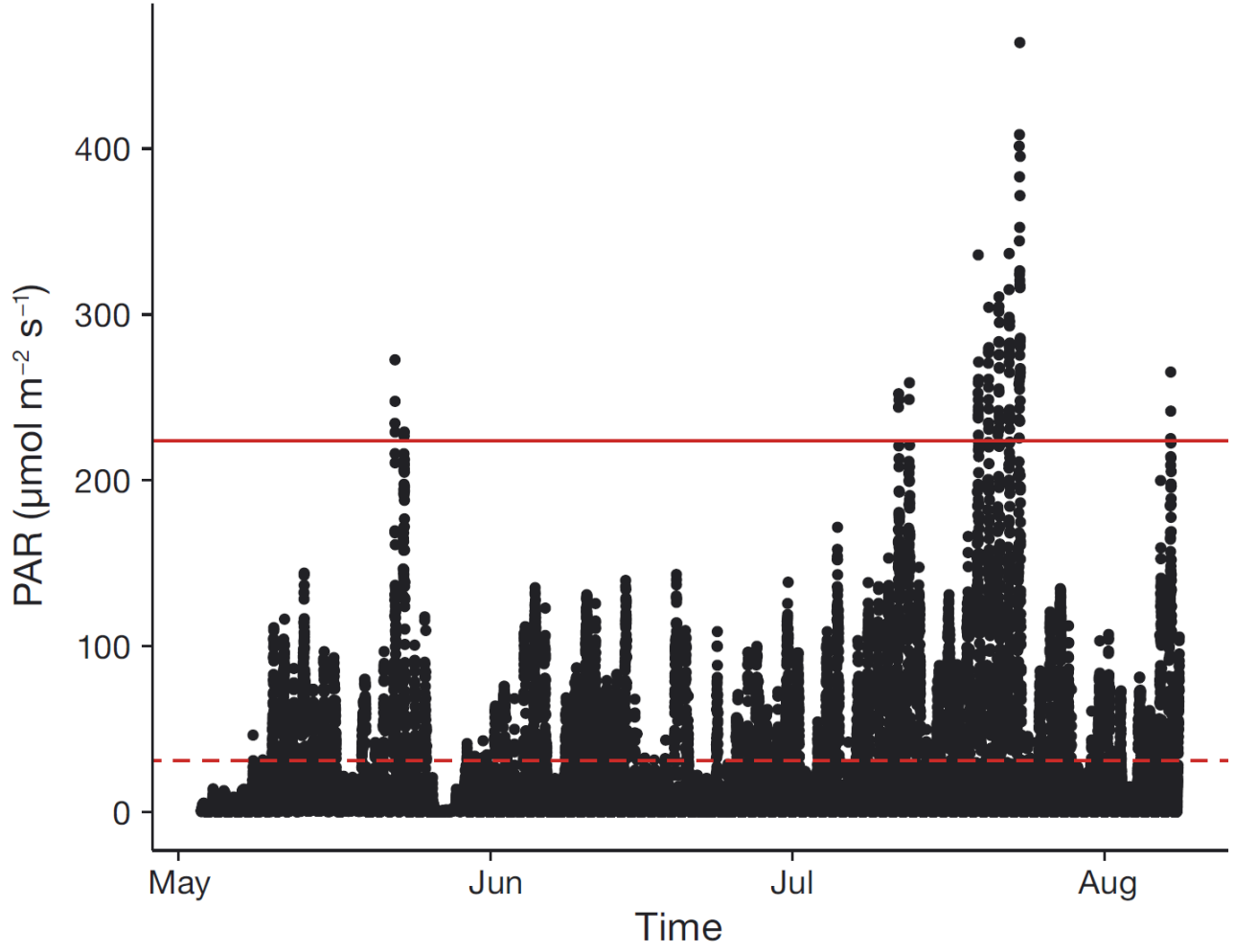
Update on University of Manitoba Activities during Summer 2024

Introduction

- Light is an important factor affected the health of Eeyou Istchee eelgrass meadows
  - Eelgrass need a lot of light to grow compared to algae
  - In Eeyou Istchee, the growing season is short because there is a long period of ice cover

During summer 2021, observations of light (PAR) from a mooring at CH34 were compared with **estimated light requirements** of eelgrass (determined from experiments)

Results showed that PAR was suboptimal during that part of the growing season

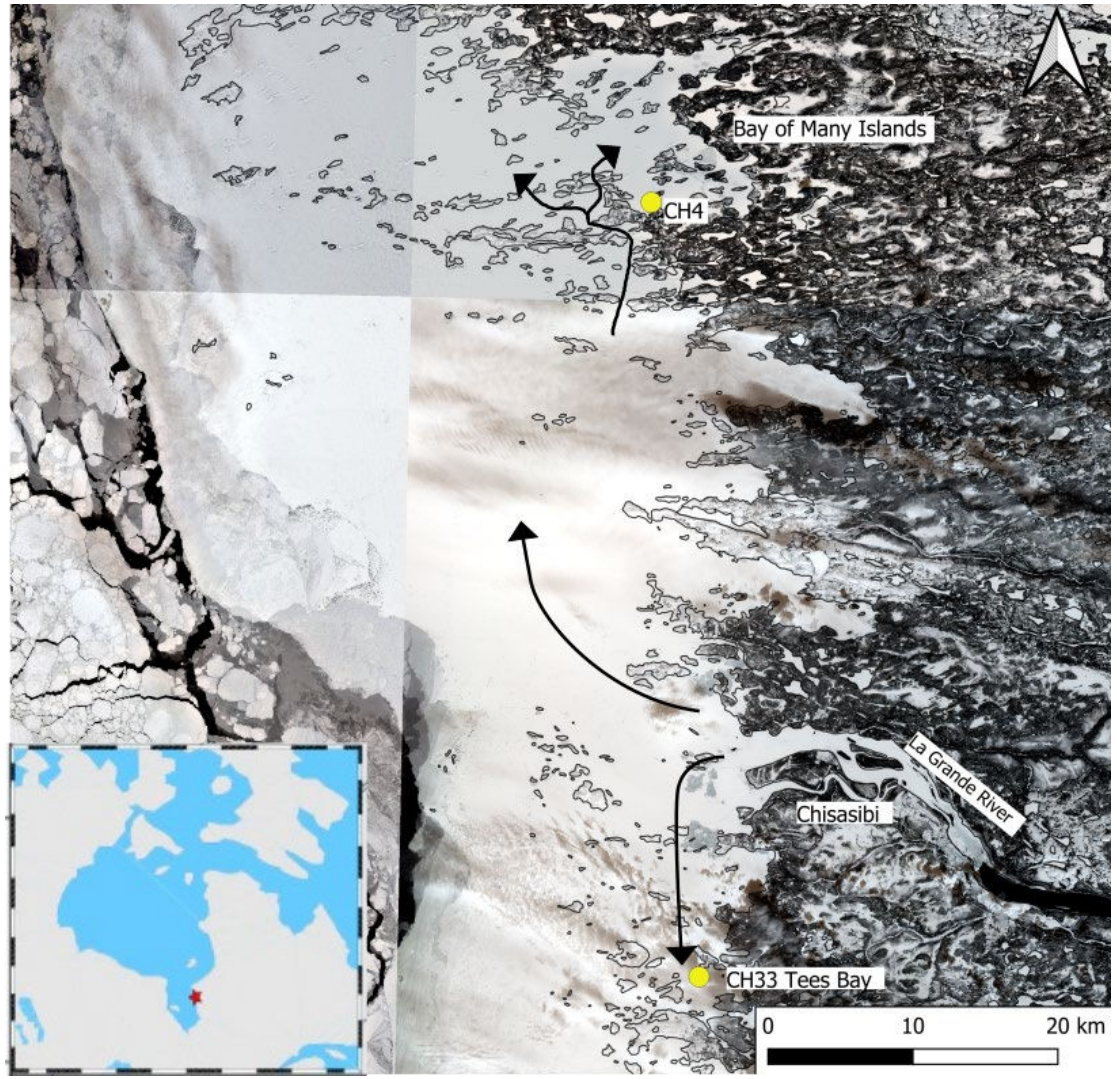


Saturating irradiance (allowing maximum growth) 224 umol m-2 s-1

Compensation point (allowing some growth) ~31 umol m-2 s-1

Davis et al., 2024

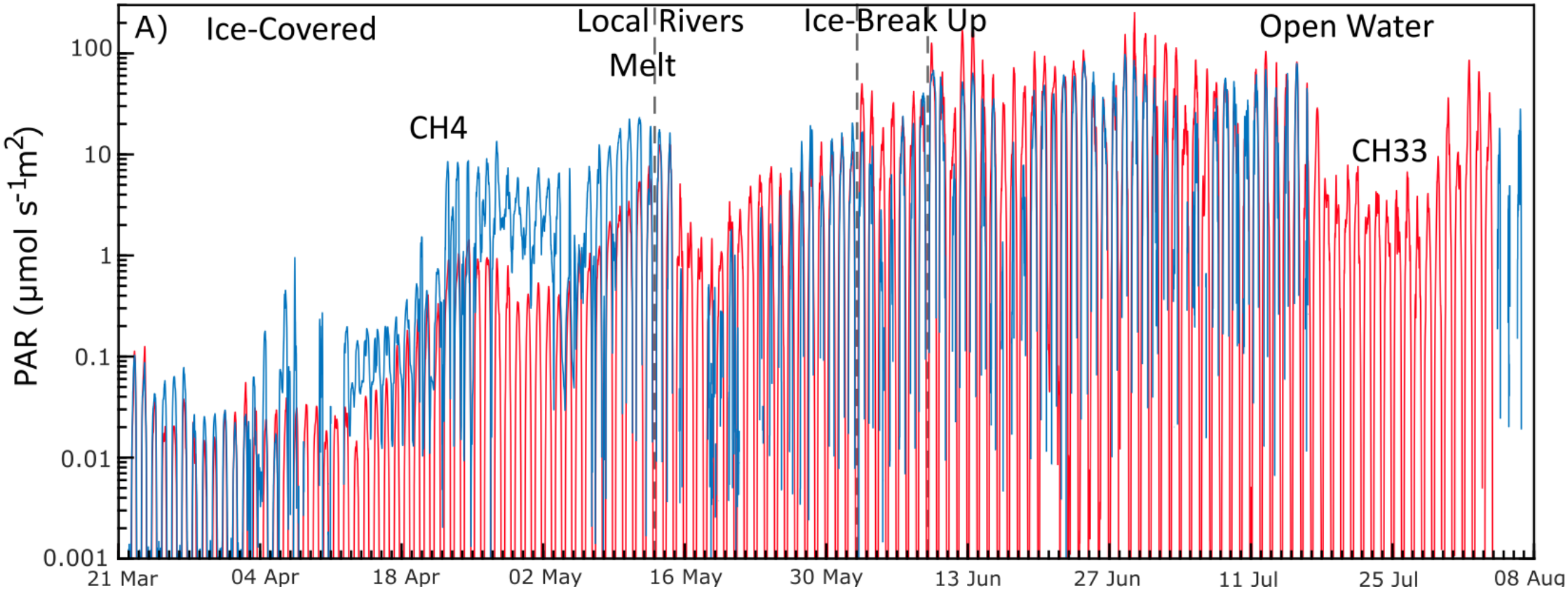
Previous work: factors affecting underwater light



- Moorings were deployed from March to August 2019 at CH4 and CH33, north and south of the La Grande River

2019 Observations, CH4 and CH33

Near eelgrass beds; mean water depths of 4.5 - 4.6 m



Peck et al., in prep.

2024 field season

- Objective was to collect more observations of PAR at eelgrass beds

Moorings were placed at 6 sites

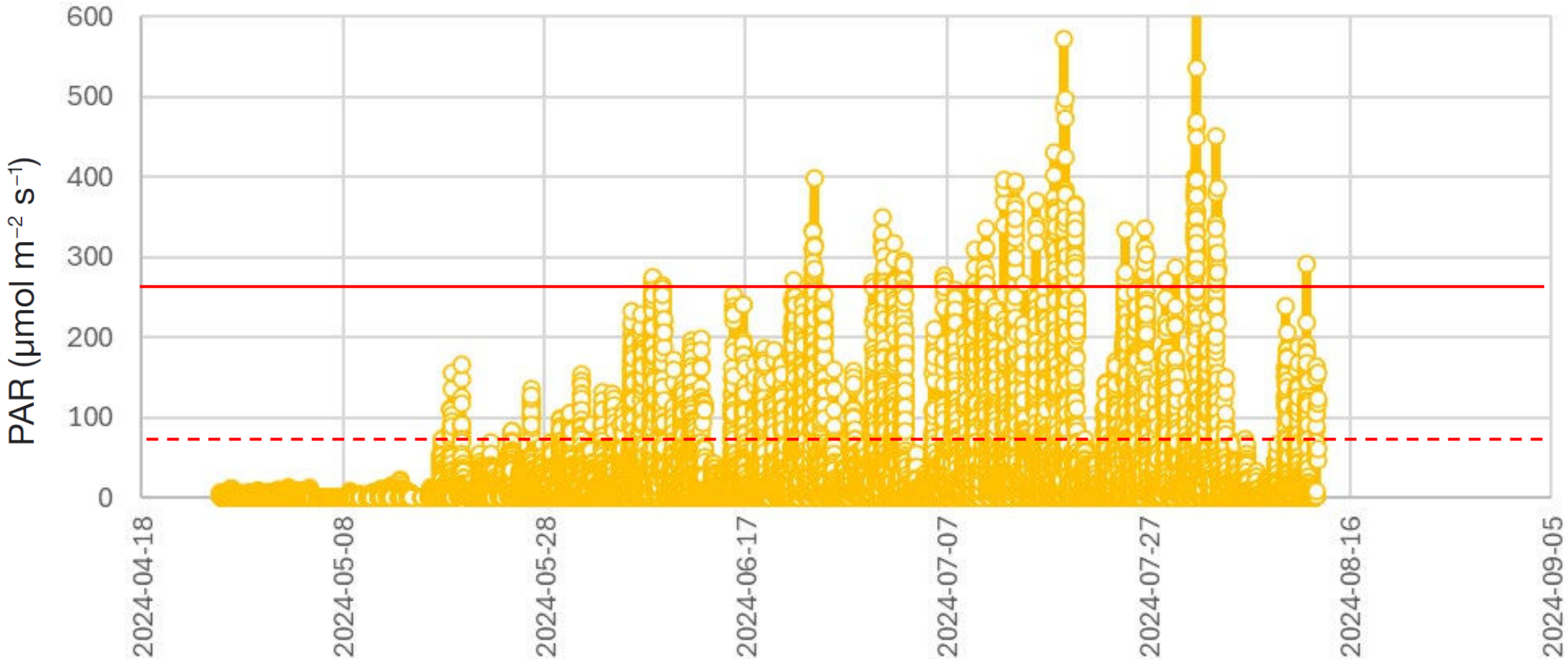
CTtur sensor (salinity, temperature, turbidity)

PAR sensor cabled to a wiper and data logger (yellow)

Pressure sensor and logger (yellow)

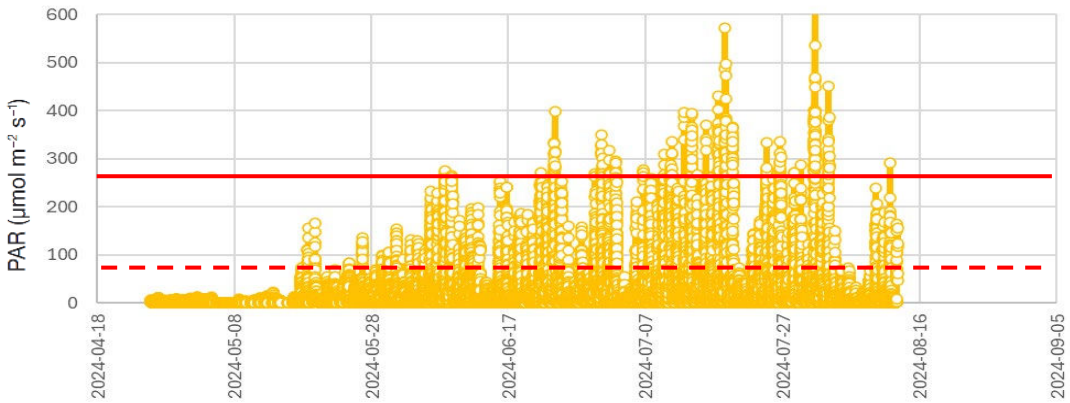
2024 Observations

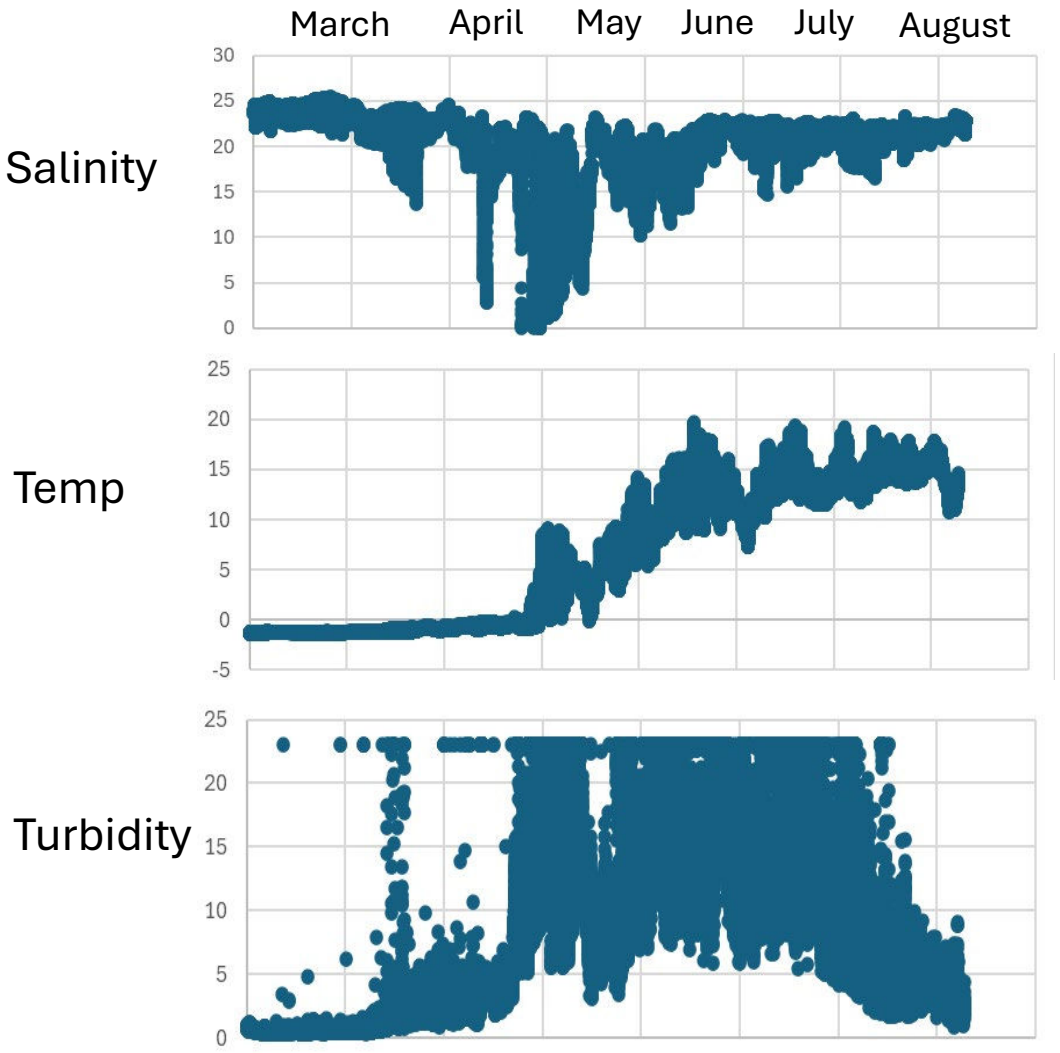
CH34, bottom depth ~1.7 m

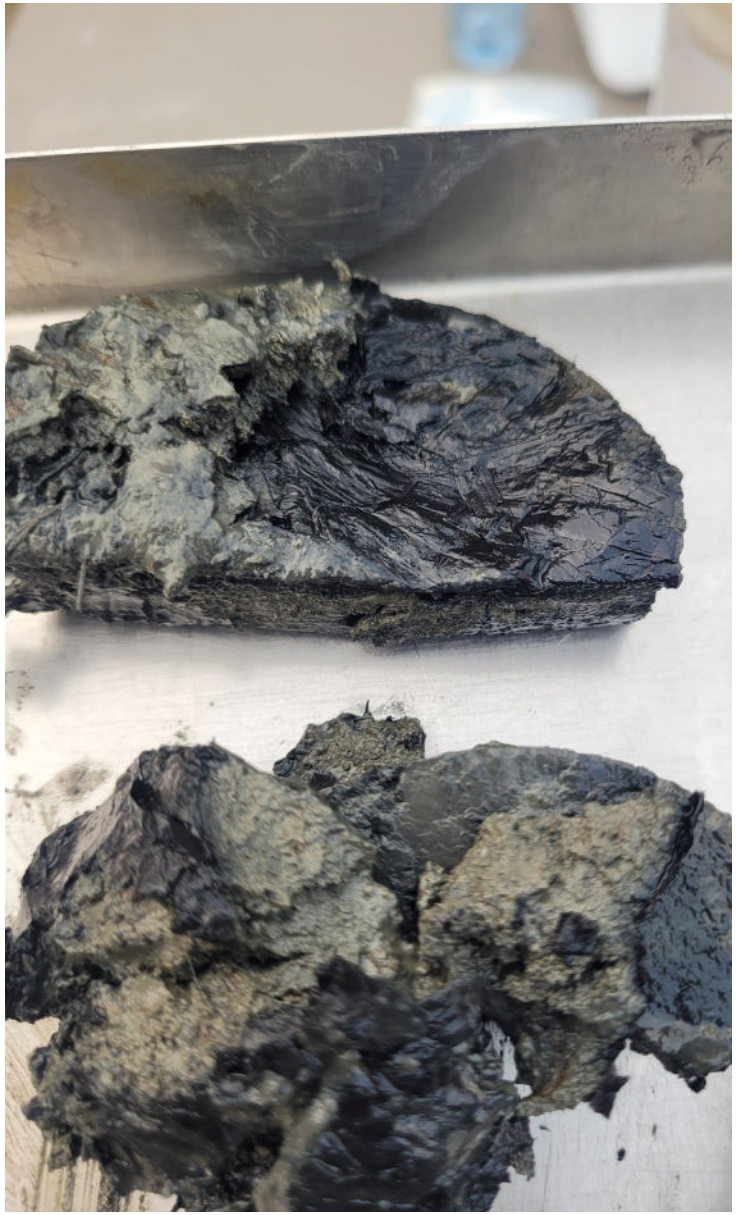


2024 Observations

CH34, bottom depth ~1.7 m







Presentation to Steering Committee
Tabusintac, NB

October 3 2024

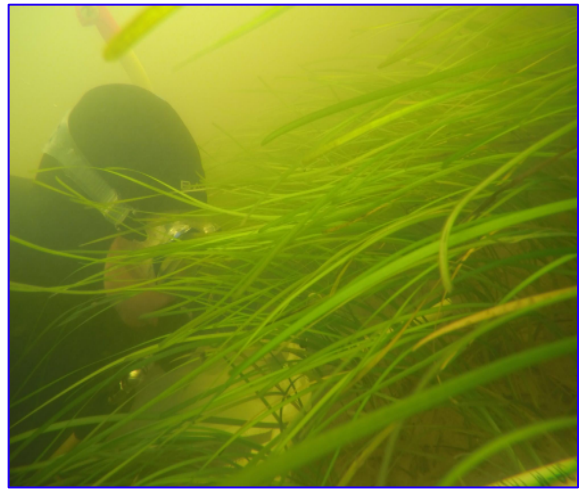
PRESENTING CHCRP PHASE II **PRELIMINARY** ECOSYSTEM RESEARCH PROGRAM

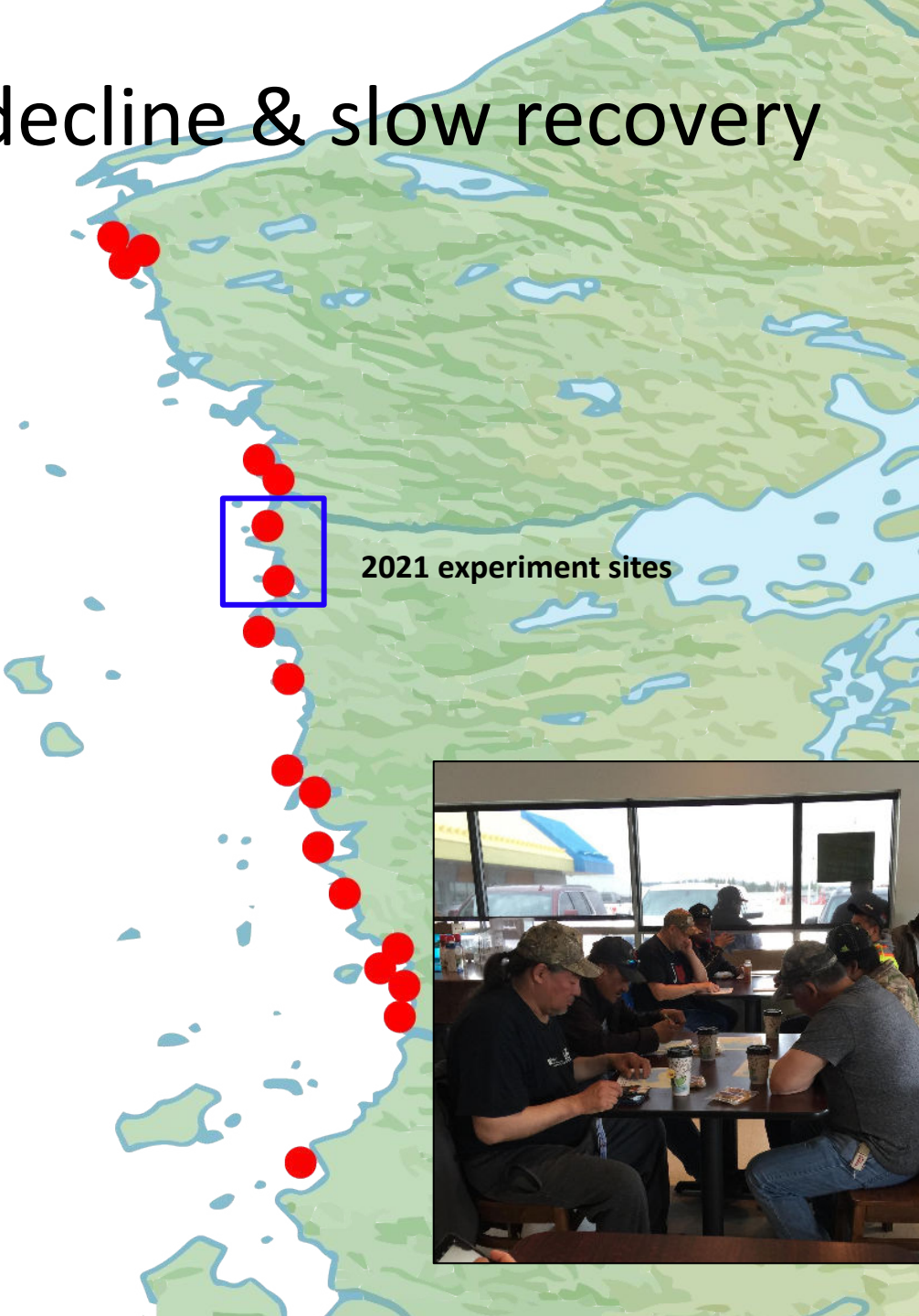



Mary O'Connor, Fanny Noisette, Zou Zou Kuzyk, Jens Ehn, Simon Bélanger, Caroline Fink-Mercier, Nicole Knight

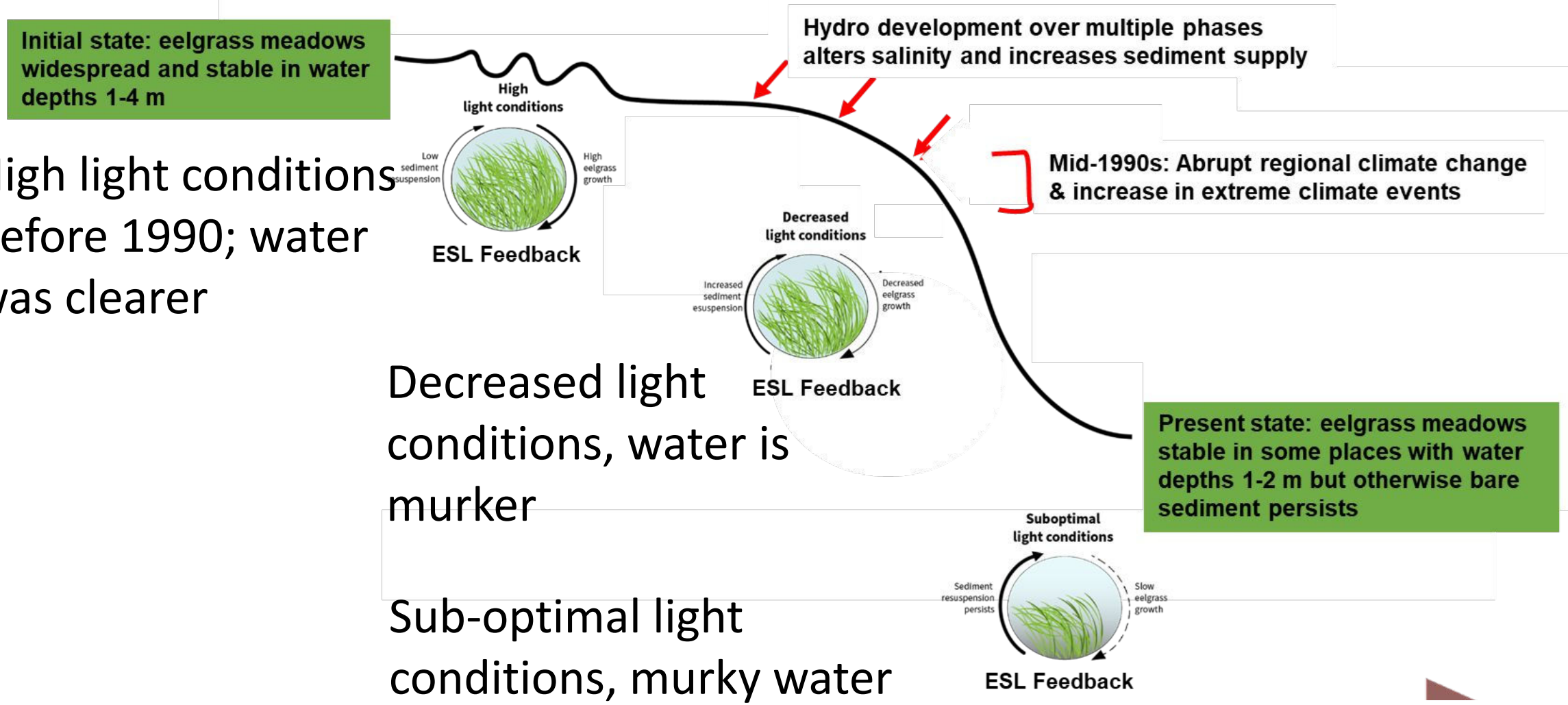
Phase I: Eelgrass condition, causes of decline & slow recovery

- 124 sites (2019, 2020, 2021) - eelgrass team
- > 700 sites (2017-2021) - ocean team
- We did experiments to test for effects of light and nutrient changes
- We measured eelgrass and biodiversity





Phase 1: eelgrass persists but is not recovered

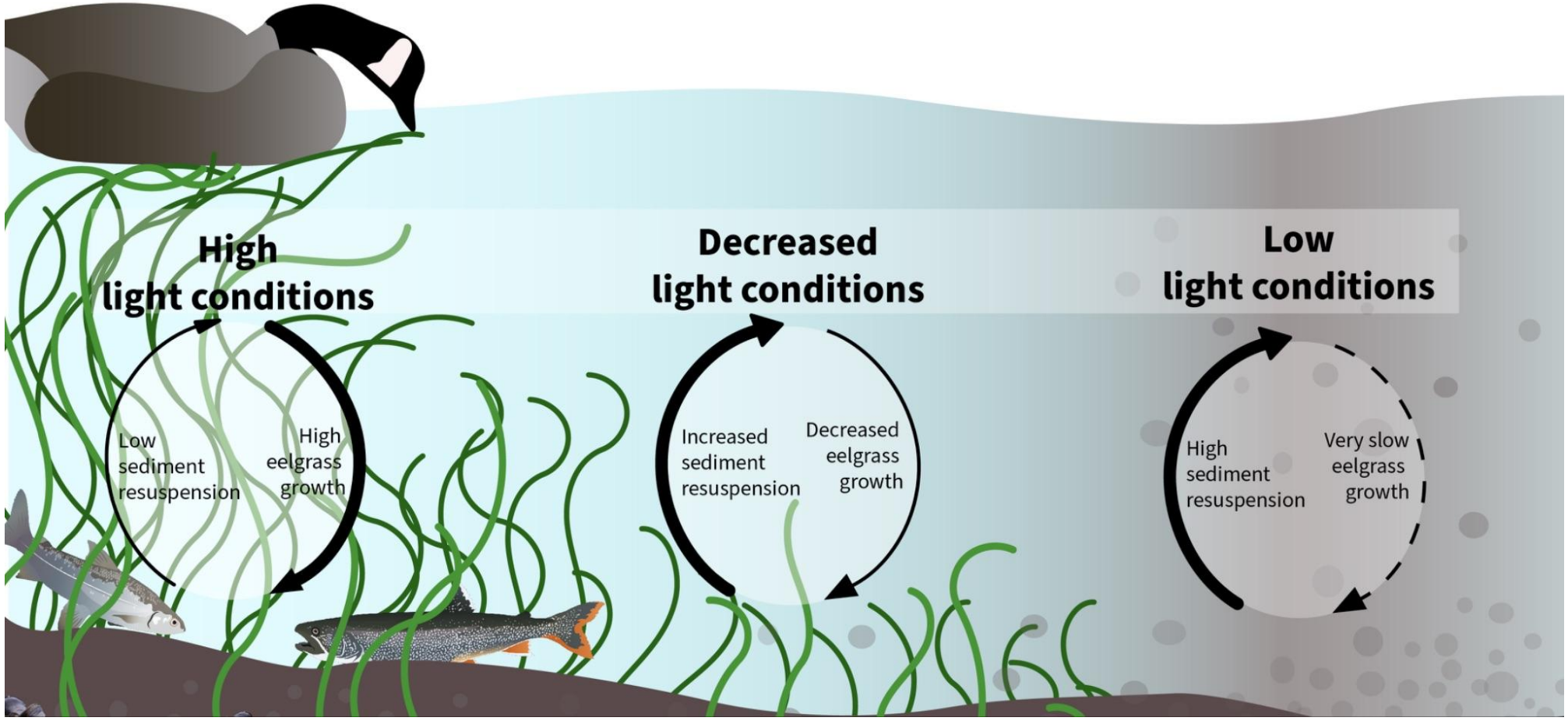


High light conditions before 1990; water was clearer

Decreased light conditions, water is murker

Sub-optimal light conditions, murky water

Key Concept: Eelgrass - Sediment - Light feedback



Phase II is in response to community priorities

Phase II is in response to community priorities

1. How are coastal ecosystems changing?
2. How is this change can be effectively monitored?
3. Can eelgrass be restored?
4. How is the river changing ?

CHCRP Phase II: A 5-year program

Spring 2025-Fall 2029

Summer 2024 is an inter-rim trip to connect with communities and check on eelgrass

Jointly funded through a collaborative grant:

NSERC CRSNG

ISKAMOON CORPORATION

Hydro Québec

Canada

EEYOU MARINE REGION WILDLIFE BOARD
CONSEIL DE GESTION DES RESSOURCES FAUNIQUES DE LA RÉGION MARINE D'EEYOU

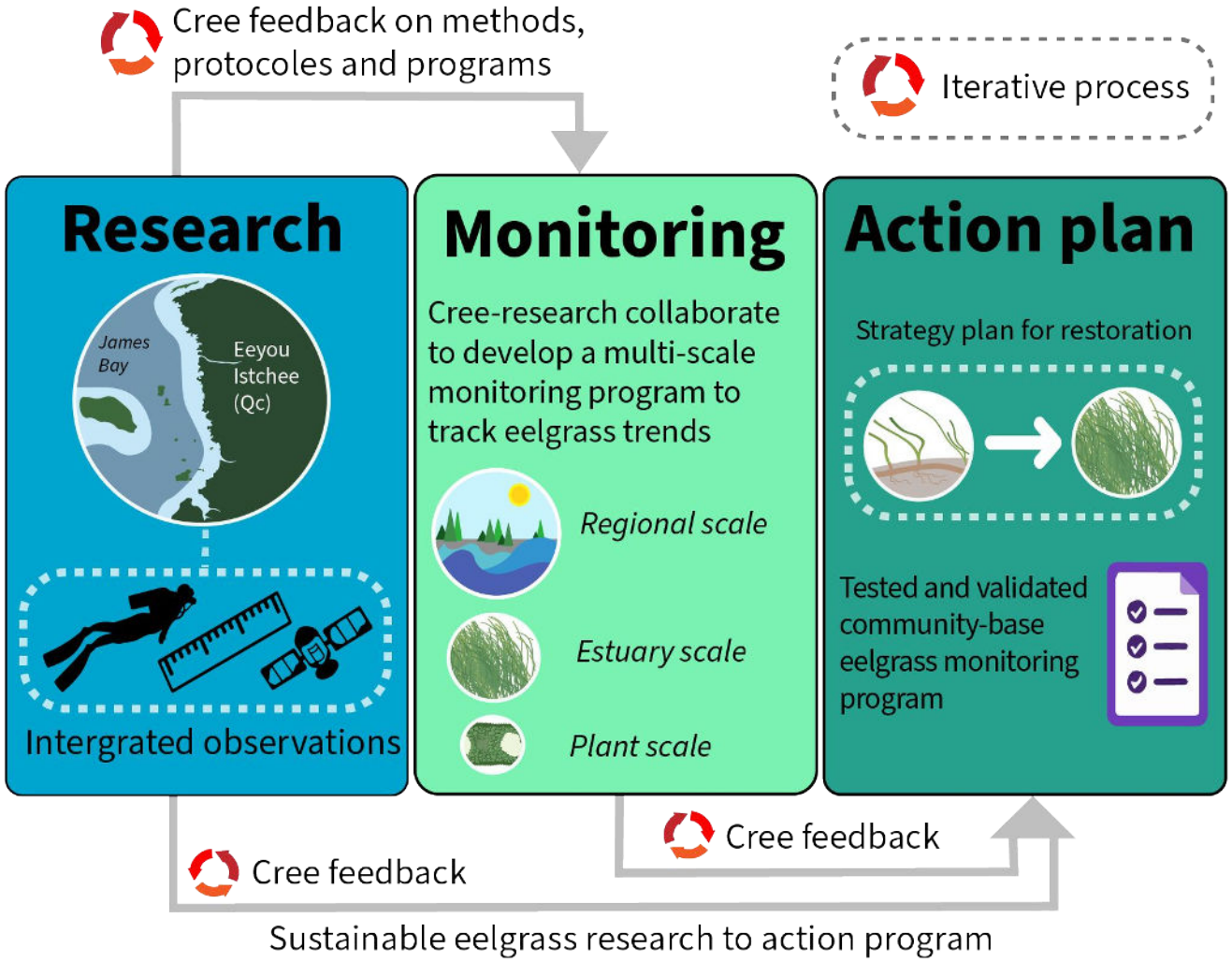
Federal Research Grant

Major $$ Contributor

Grant is currently under review

We are one of three projects in CHCRP Phase II

Coastal Ecosystems Project Goals



Coastal Ecosystems Project Team

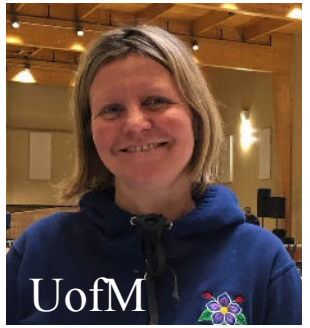
Collaborators:
Murray Humphries,
Ally Menzies,
Paul del Giorgio

co-PI

Mary O'Connor

Jens Ehn

Zou Zou Kuzyk



Fanny Noisette

Simon Bélanger

Partners (current)

Melanie Leblanc (Niskamoon)

Eeyou Marine Region Wildlife Board
Parks Canada
CEGRIM
Hydro Québec

Project coordinator

Caroline Fink-Mercier

Post-doc fellow

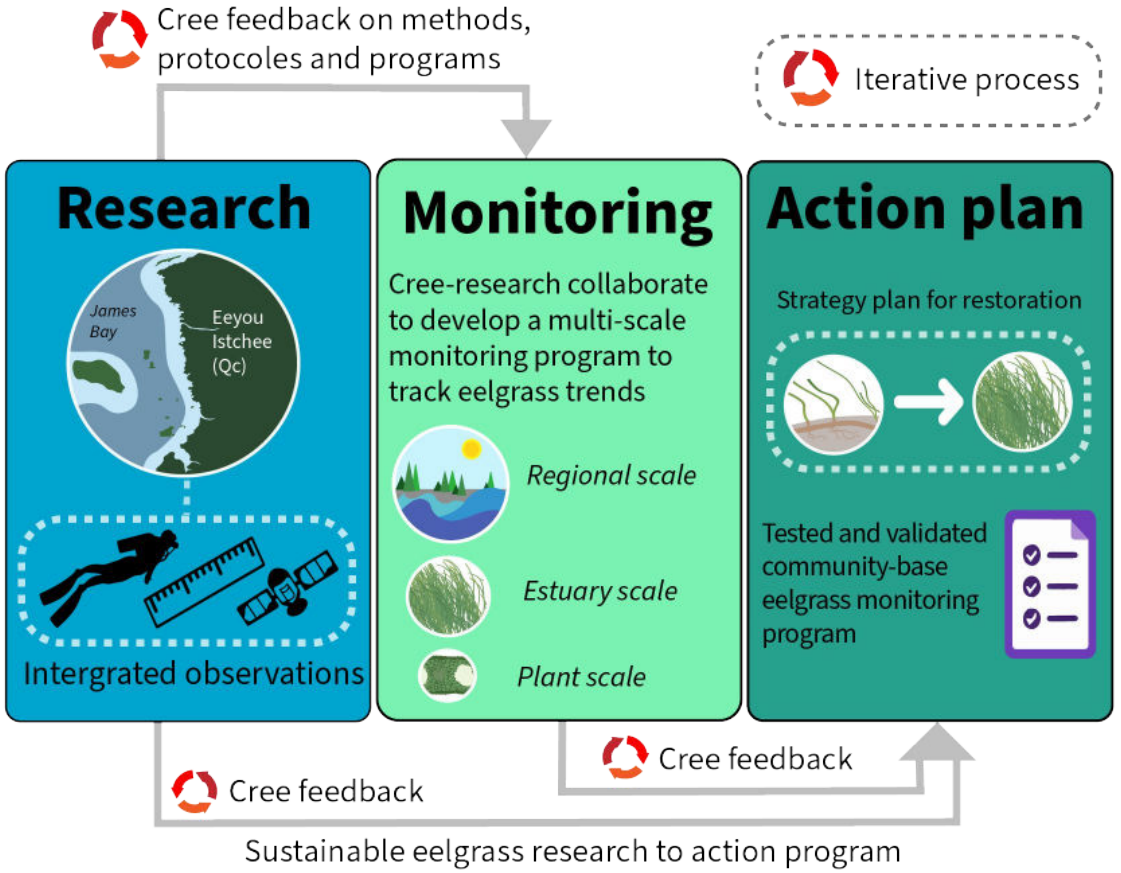
Nicole Knight

Coastal Ecosystems Project: Goals

1: To understand how the ocean, river plume, and ice environment affects eelgrass health (current and future).

2. To identify opportunities to enhance recovery and restoration.

3: To support the development of a sustainable Cree-led eelgrass ecosystem monitoring and early action program

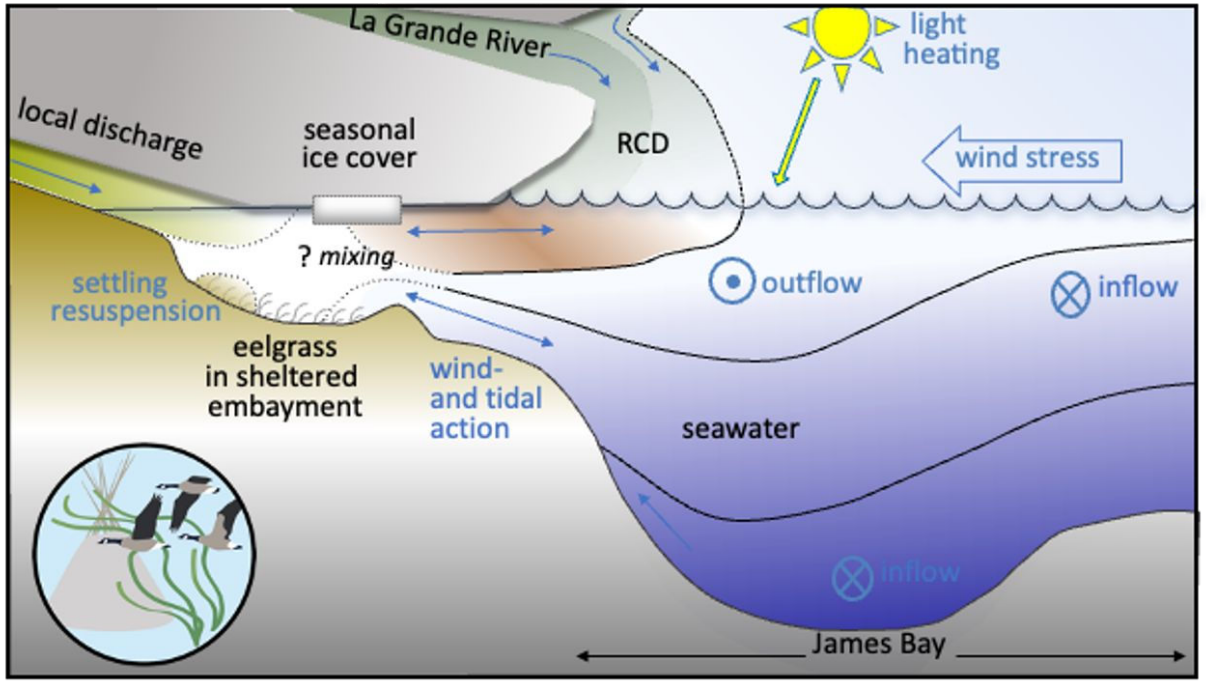


Coastal Ecosystems Project: Goals

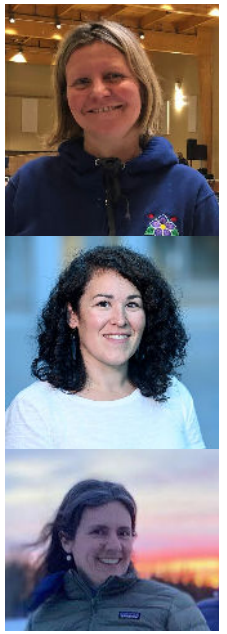
1: To understand how the ocean, river plume, and ice environment affects eelgrass health (current and future).

What are the features of the present day environmental regime that may be good or bad for eelgrass?

- ice patterns
- sediments
- fresh water
- storms
- light in the water



Coastal Ecosystems Project: Goals

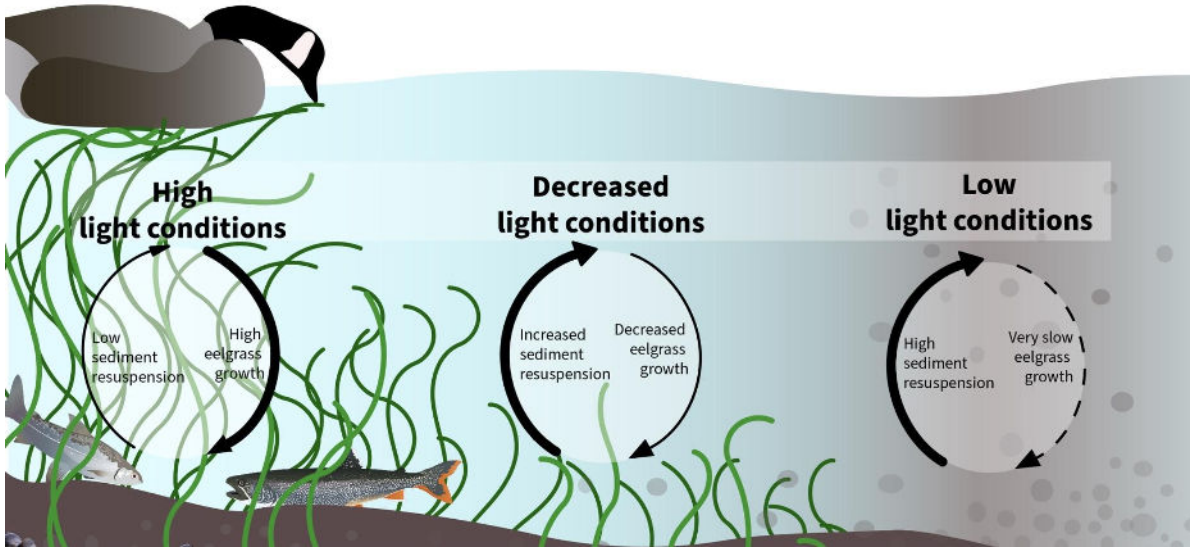


2. To identify opportunities to enhance recovery and restoration.

Where might eelgrass recover?

Where might restoration be possible?

- eelgrass monitoring
- closer study of eelgrass growth year-round
- experiments (trying things!)



Coastal Ecosystems Project: Goals

3: To support the development of a sustainable Cree-led eelgrass ecosystem monitoring and early action program

Collaborate and consult
- avoid competing efforts!
- flexible protocols that produce good data

Training
- field work, including SCUBA
- data processing
- monitoring methods
- using instruments

Develop the full monitoring process
- observations (easy in the field!)
- data processing and reporting

Timeline

5 years

Every year:

- meet with land users and communities
- share progress
- discuss plans and priorities
- develop protocols
- visit eelgrass sites in all four communities

Most years:

- observe eelgrass and environment in spring, summer, fall and winter

Meeting with land users in Wemindji - June 30 2024

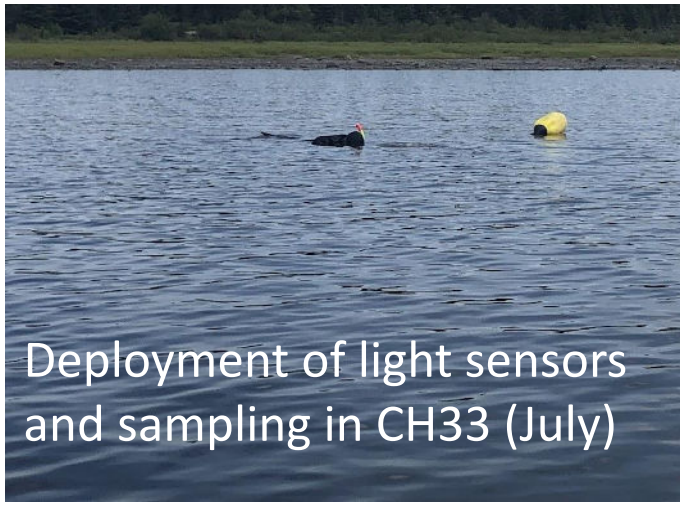
This Year (2024)

We developed the plans and process

We submitted the grant!

We visited all four communities

We started the process of tracking eelgrass at a few sites (March - August)



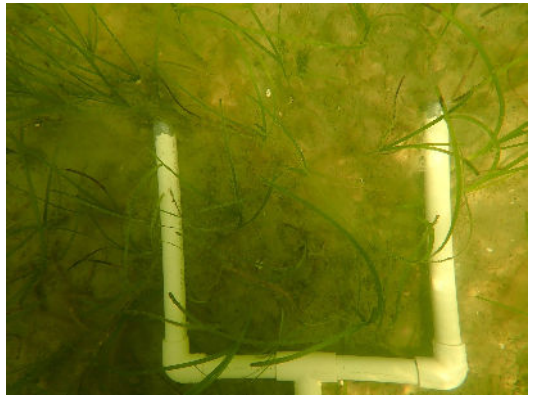
Deployment of light sensors and sampling in CH33 (July)

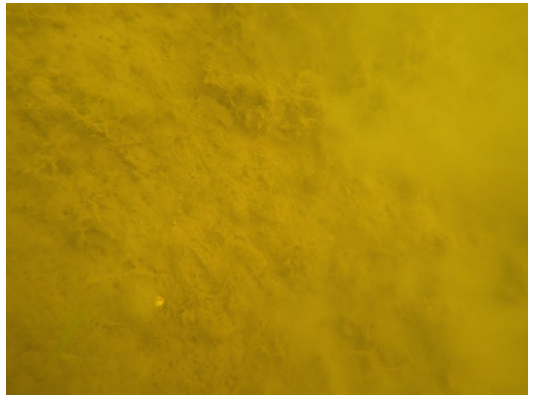
Tagging eelgrass to follow its growth

We visited 36 sites, most were repeat visits but some were new

CH03

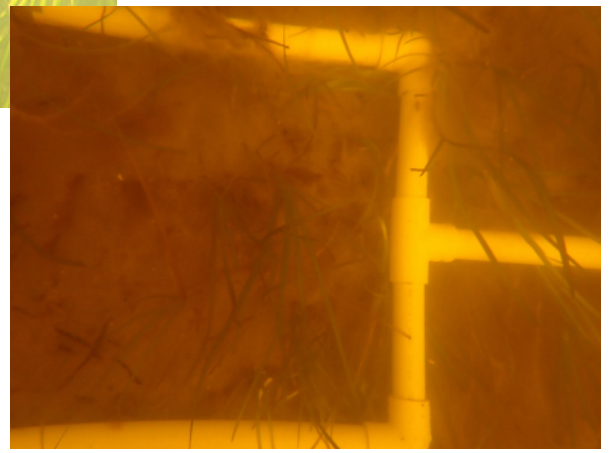
VC10



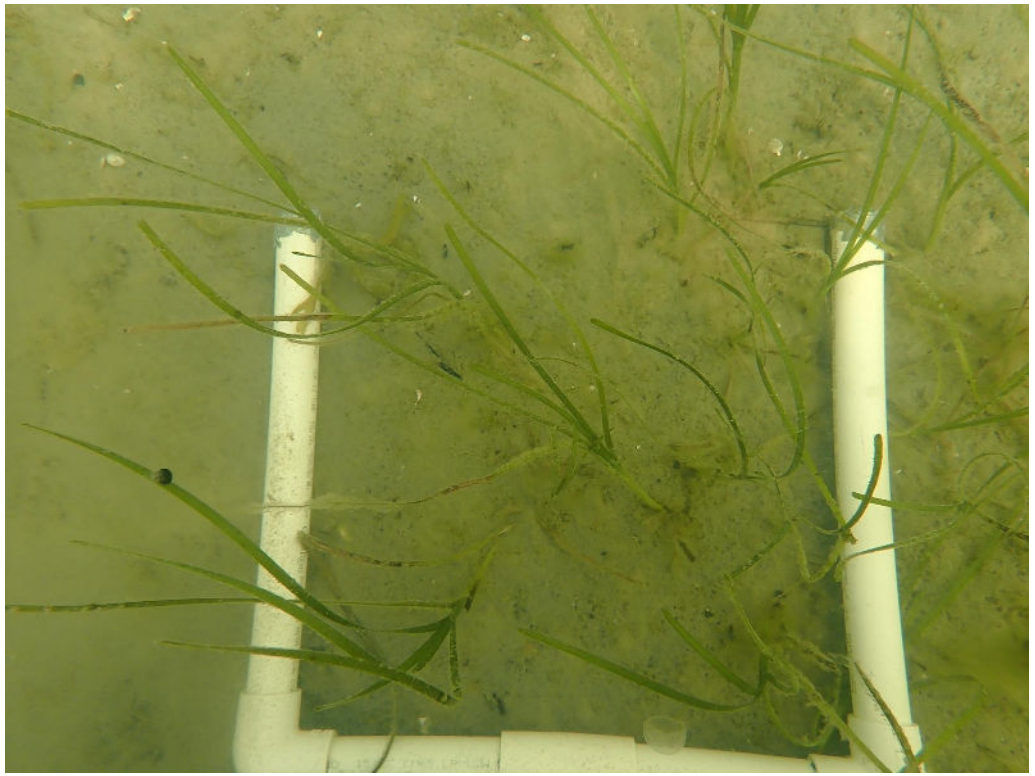


CH34

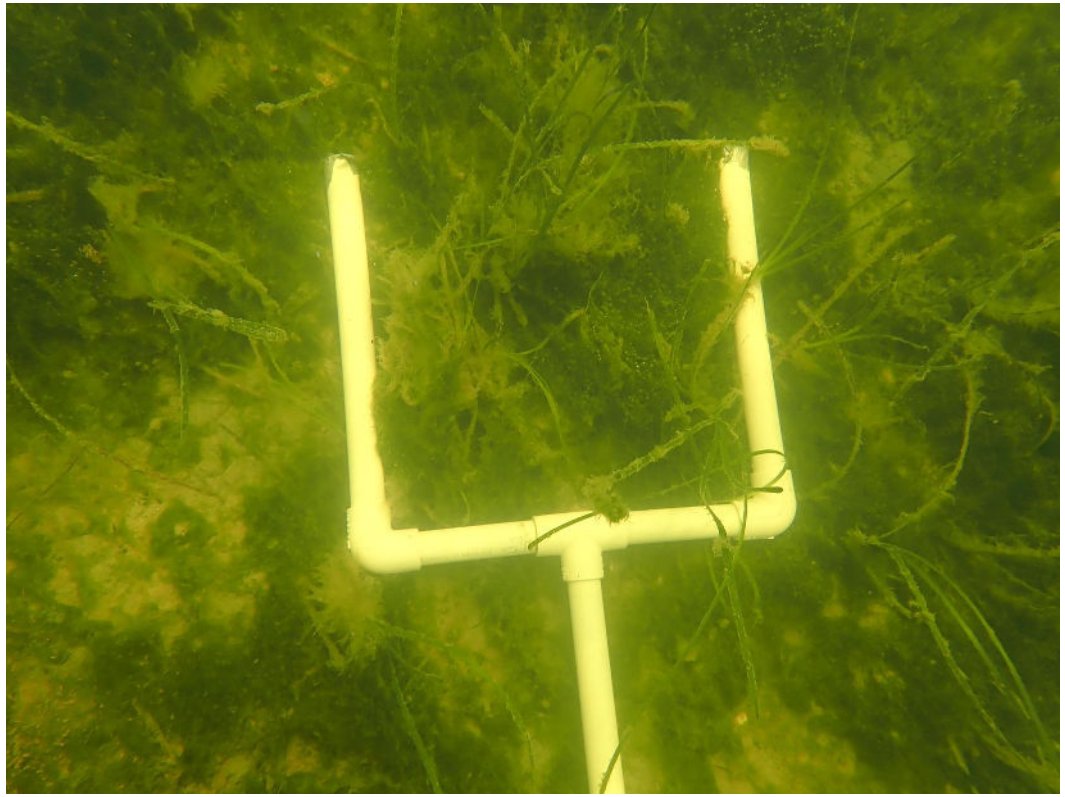
VC32



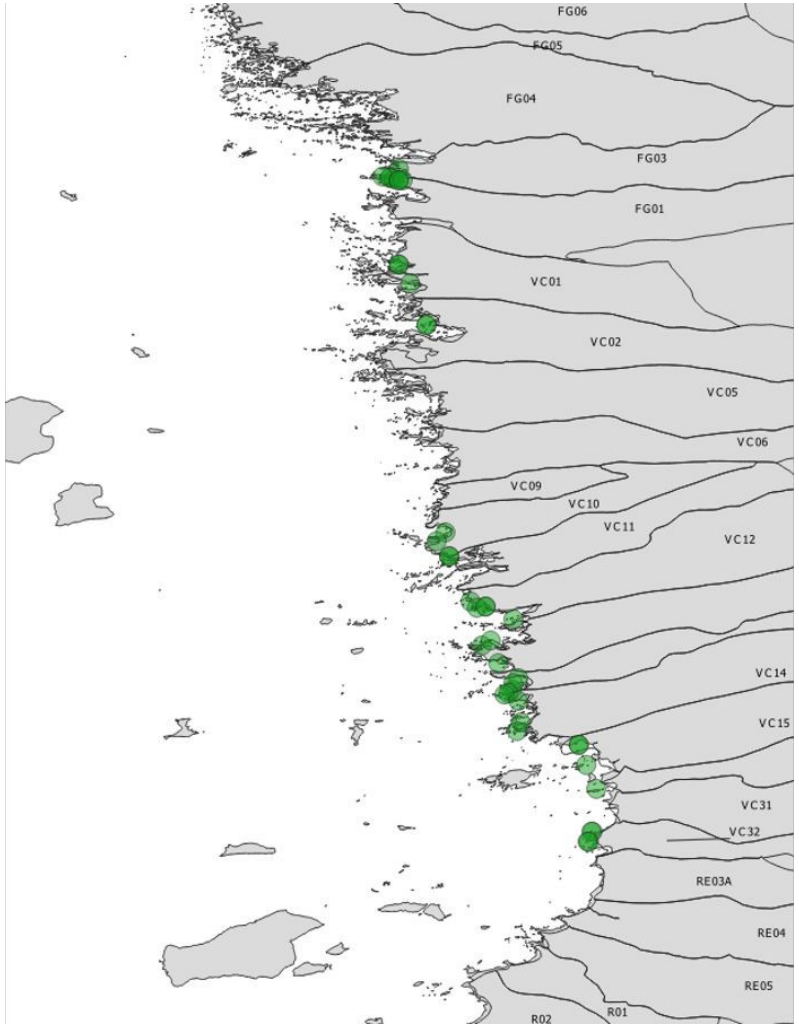
VC 10 - same exact area, two views



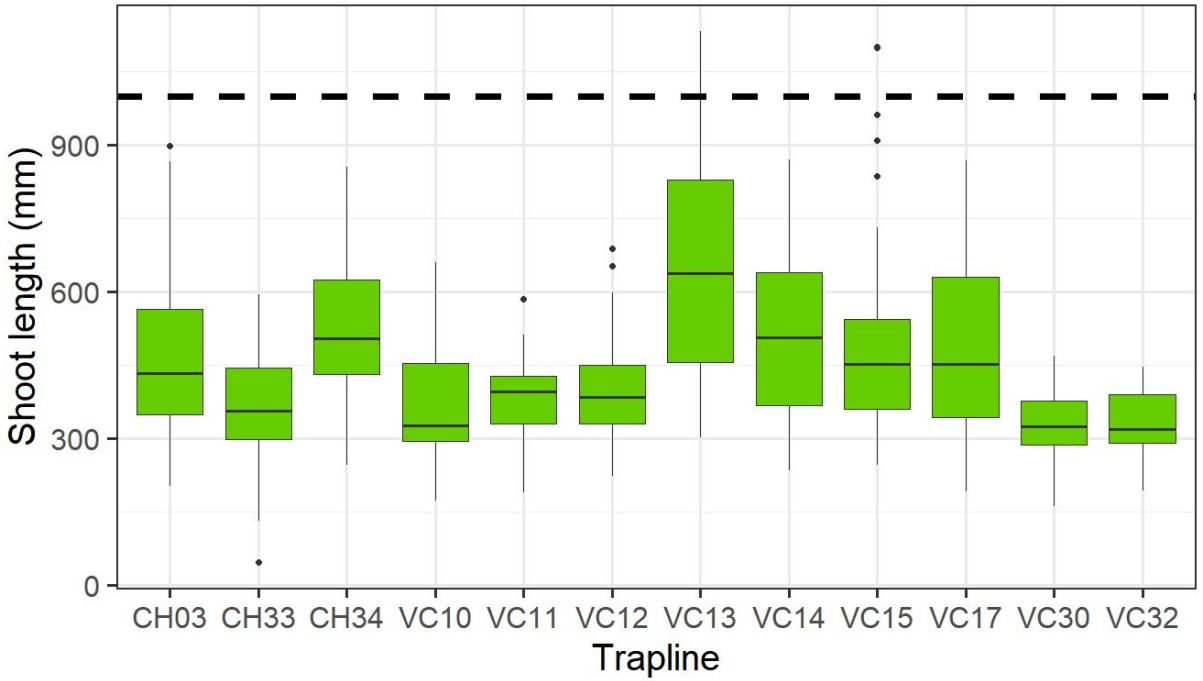
VC 10 - same area, two views



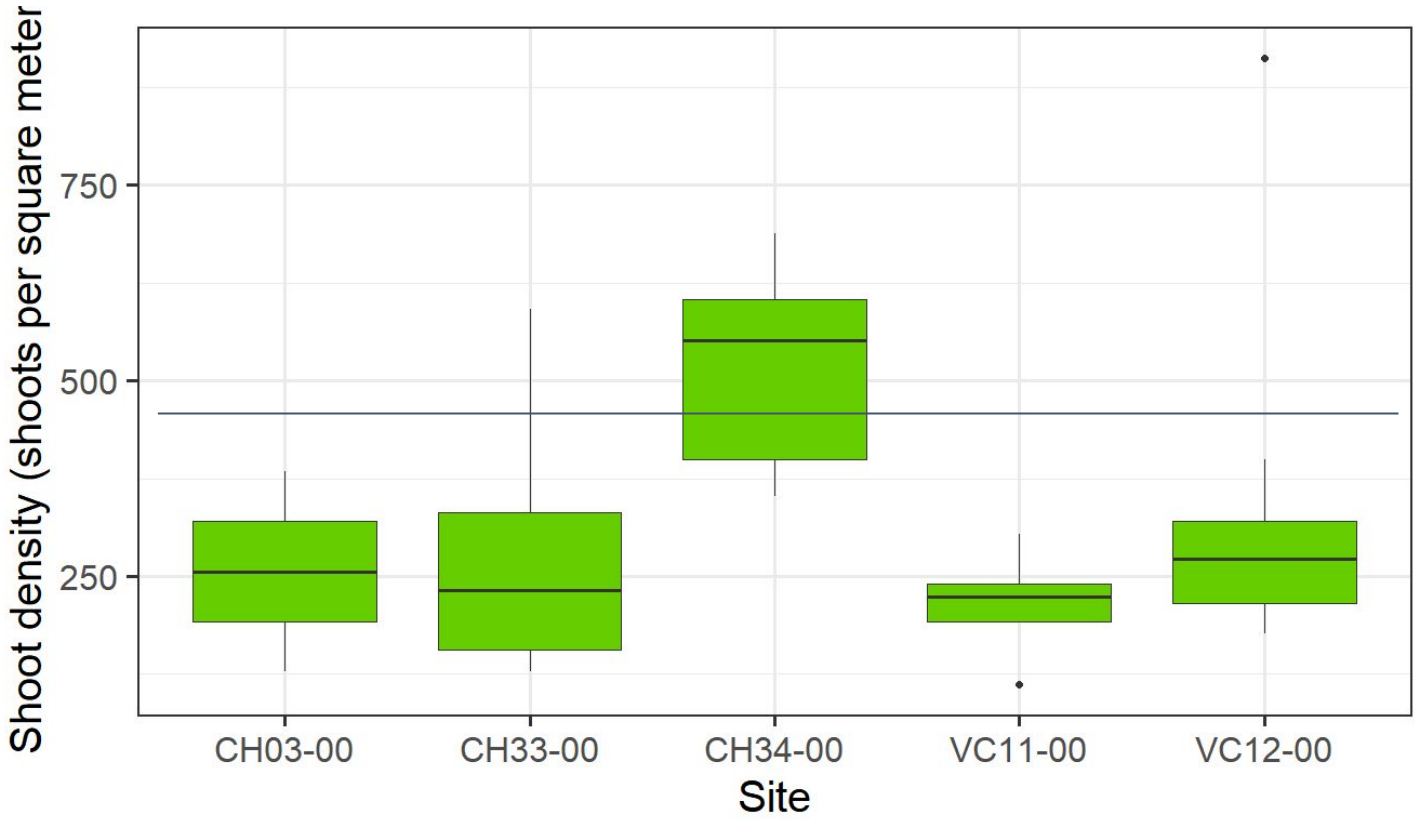
We visited 36 sites, most were repeat visits but some were new

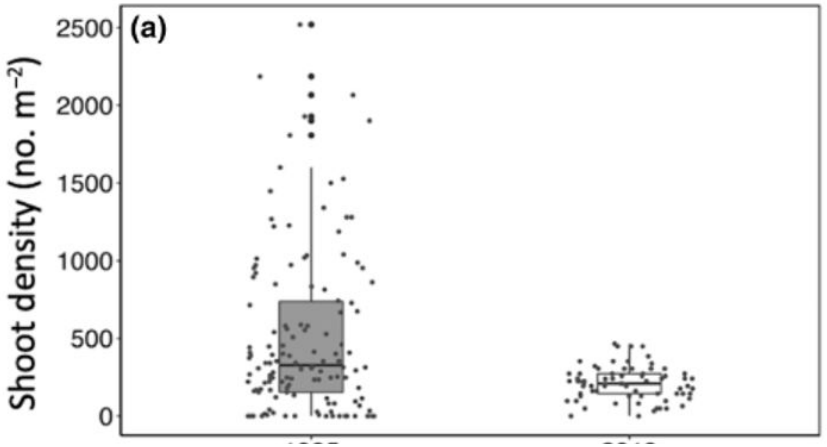


We measured 569 shoots
We measured growth at five sites
We had moorings at 6 sites



Shoot Density

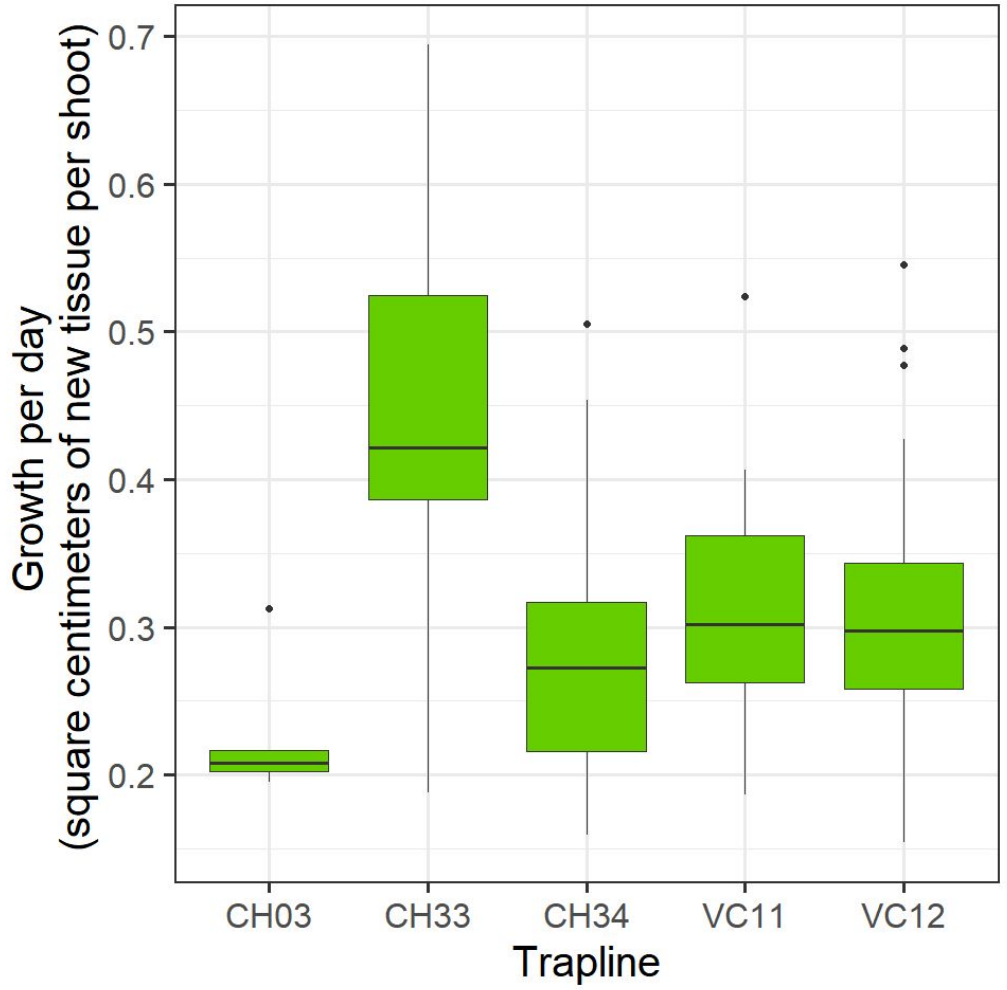




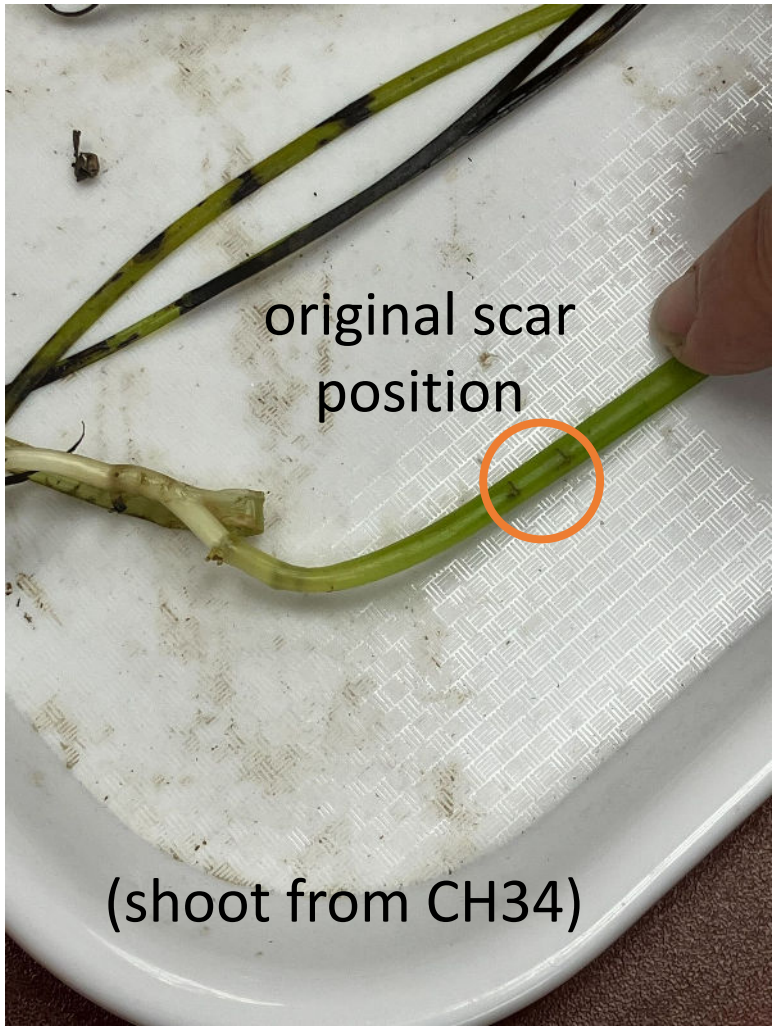
1995 2019

Leblanc et al 2022

We measured shoot growth

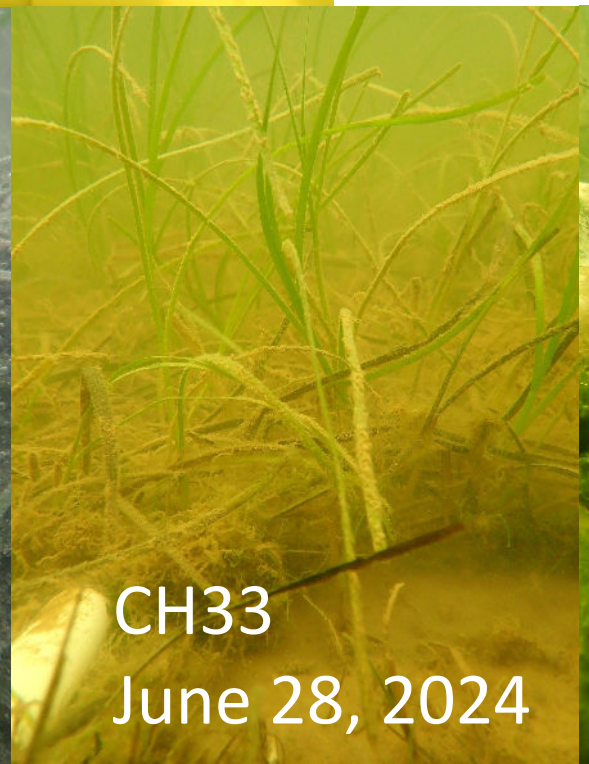


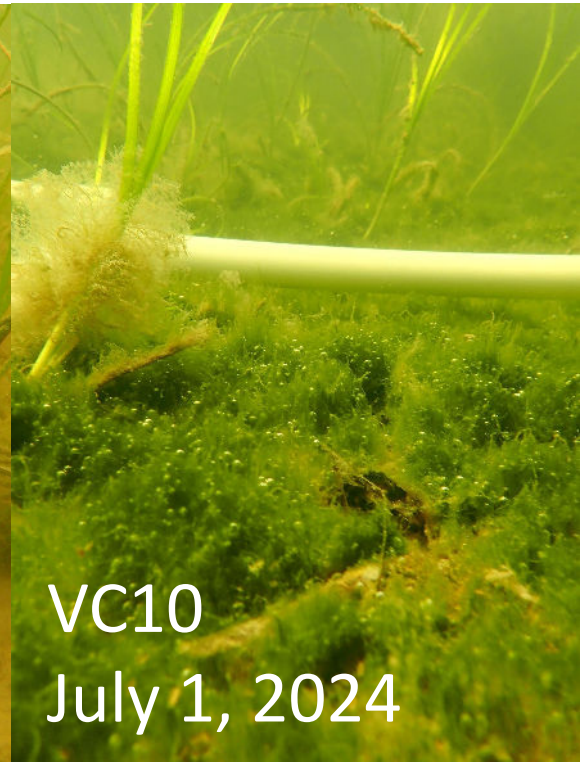
This summer: growth measurements



We observed flowering shoots at all 5 dive sites

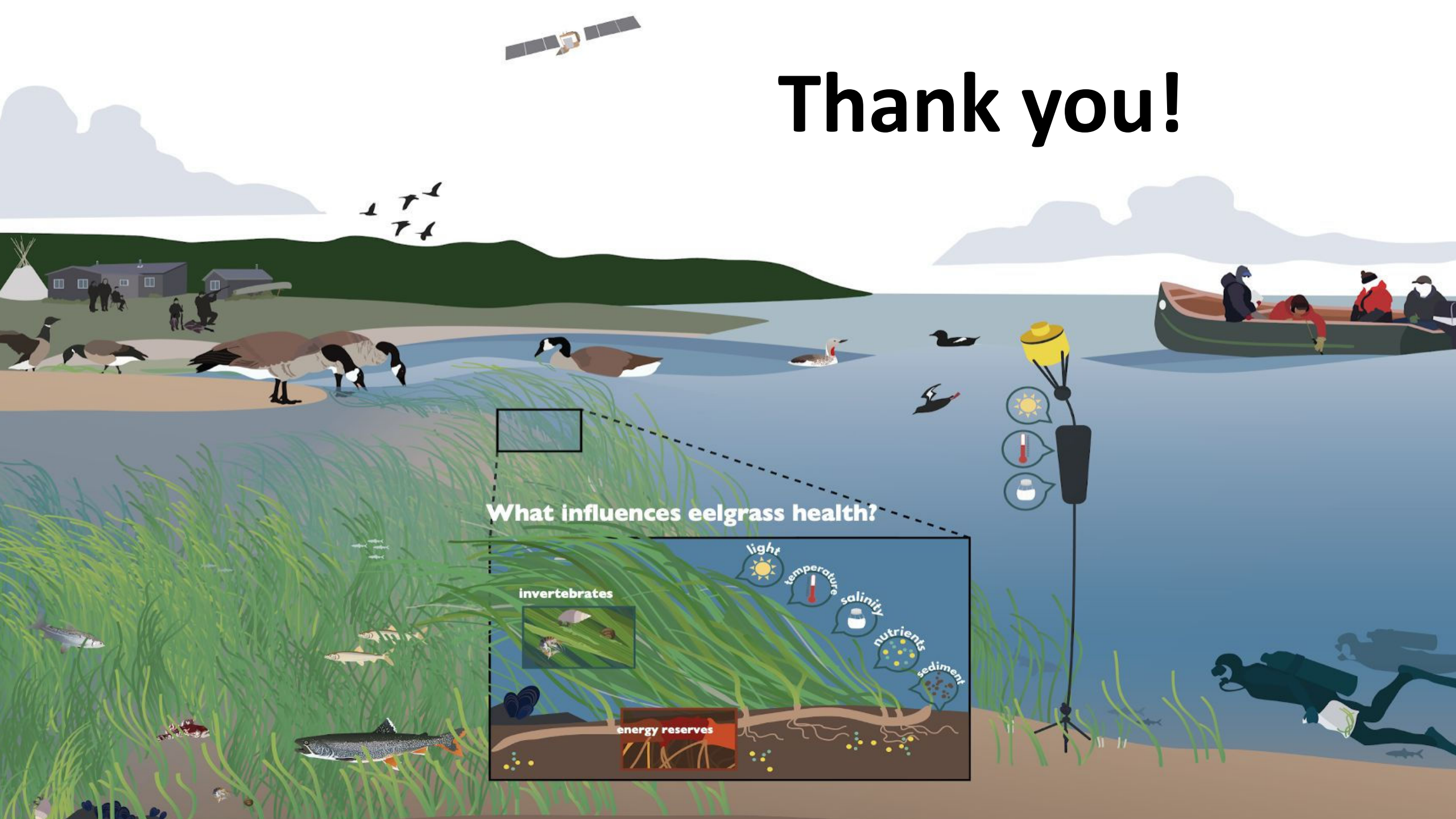
We have seen many algal mats that may be affecting eelgrass growth





We will identify which species are in the algal mats using DNA

Thank you!


What influences eelgrass health?
light
temperature
salinity
nutrients
sediment
invertebrates
energy reserves