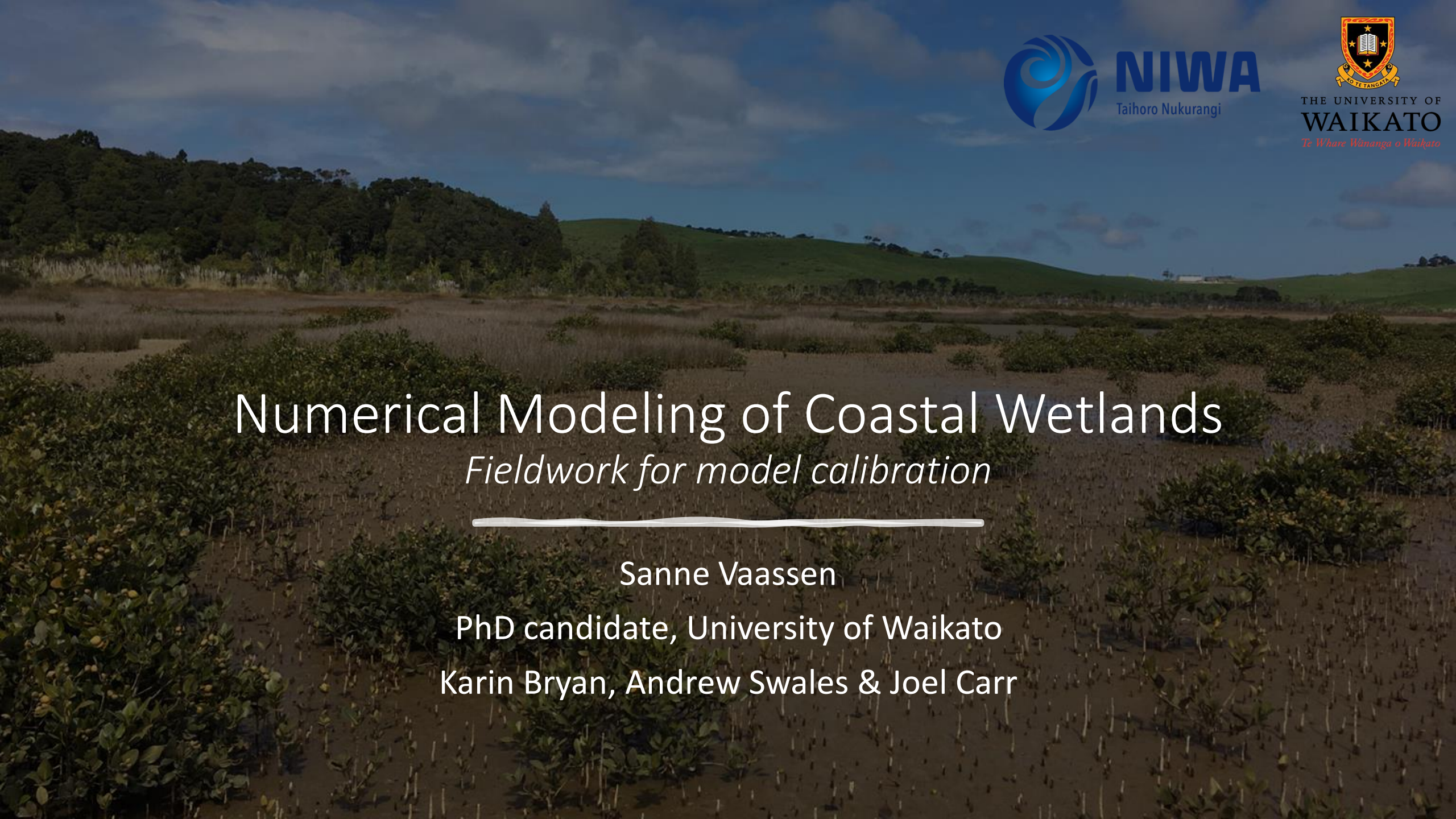


Numerical Modeling of Coastal Wetlands

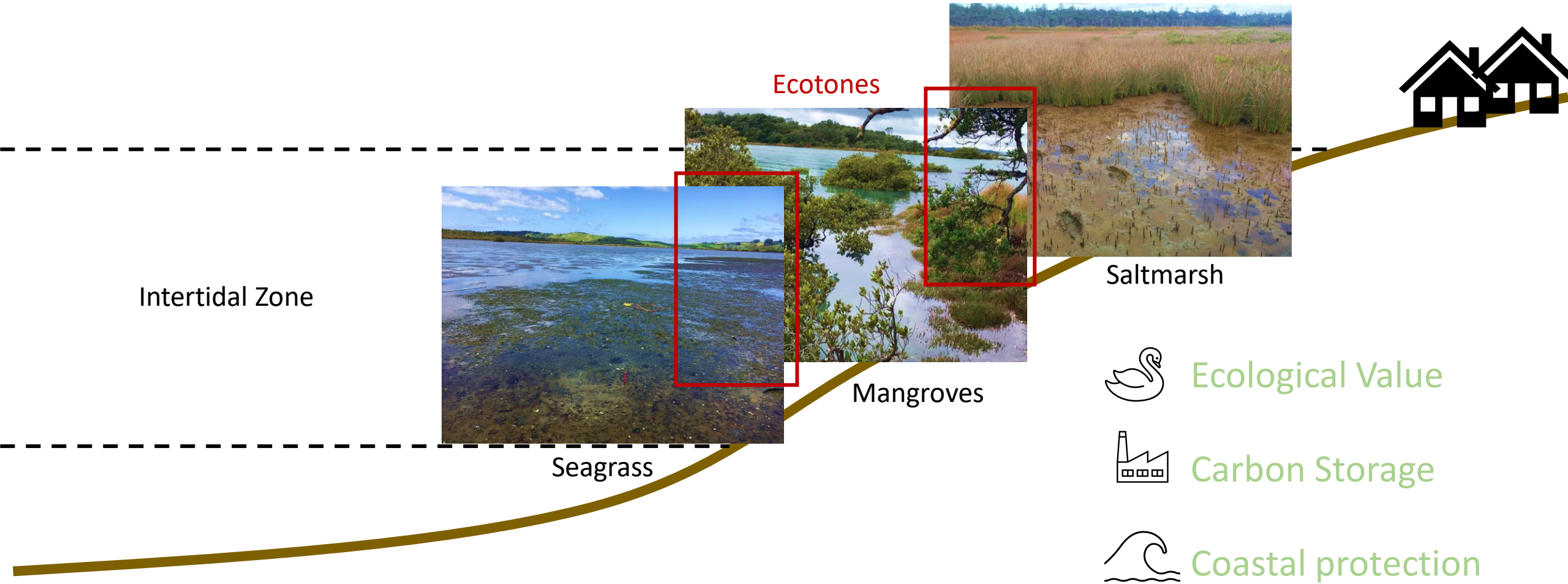
Fieldwork for model calibration

Sanne Vaassen

PhD candidate, University of Waikato

Karin Bryan, Andrew Swales & Joel Carr

1. Coastal Wetlands



Ecological Value

Carbon Storage

Coastal protection

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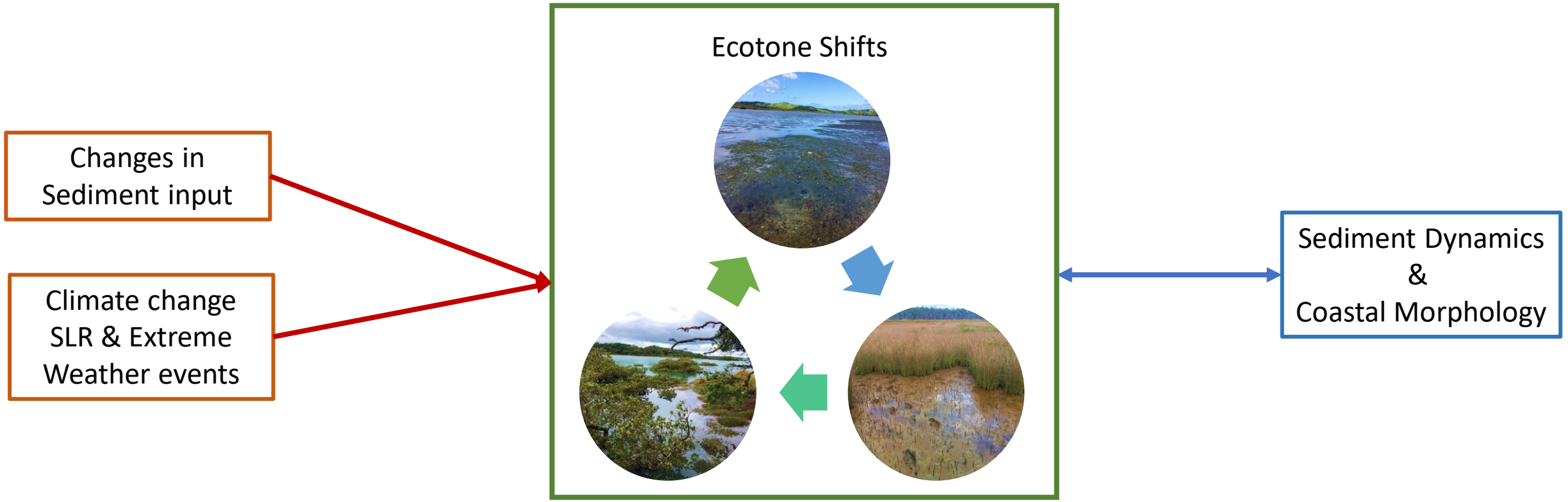
2. Research Goals



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2 Research Goals numerical modeling

Vegetation Model

Delft3D
Morphodynamic Model

Currents and velocities
Sediment displacement
(erosion / sedimentation)

Colonization
Competition
Abiotic effects (increased drag)

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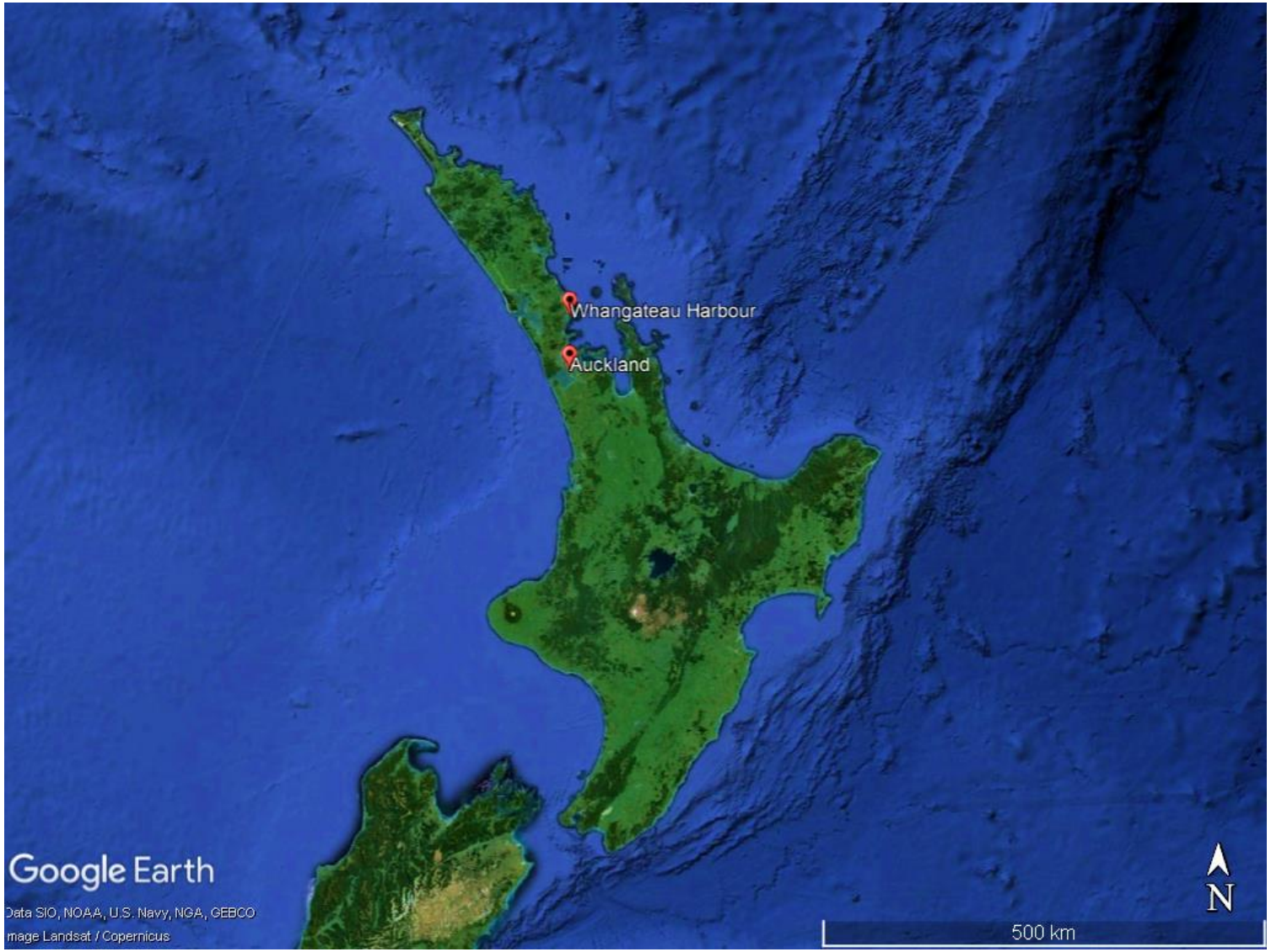
3. Study Site: Whangateau Harbour



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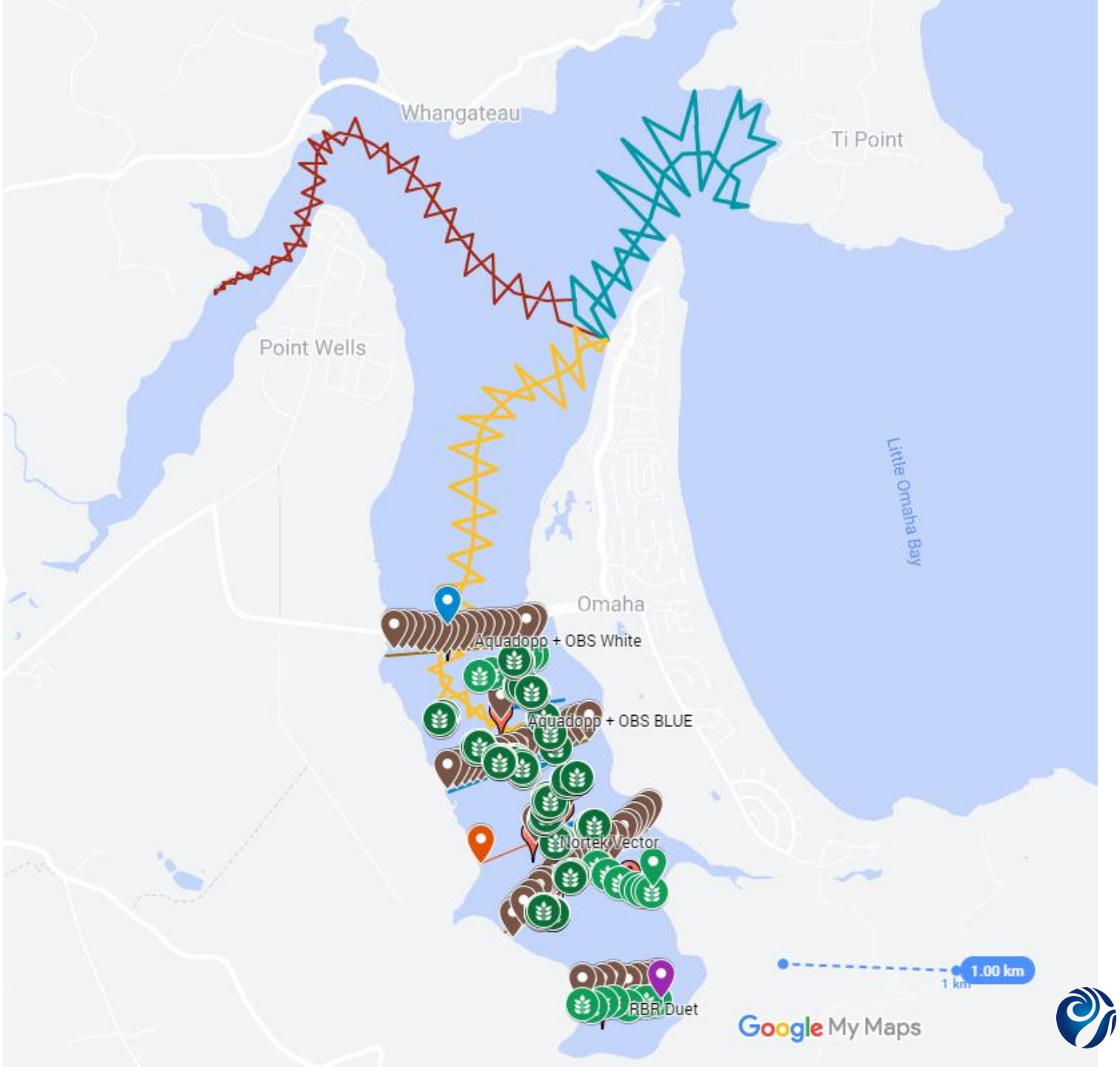
4. Fieldwork

12 Oct till 02 Nov 2023
Spring/Neap tide



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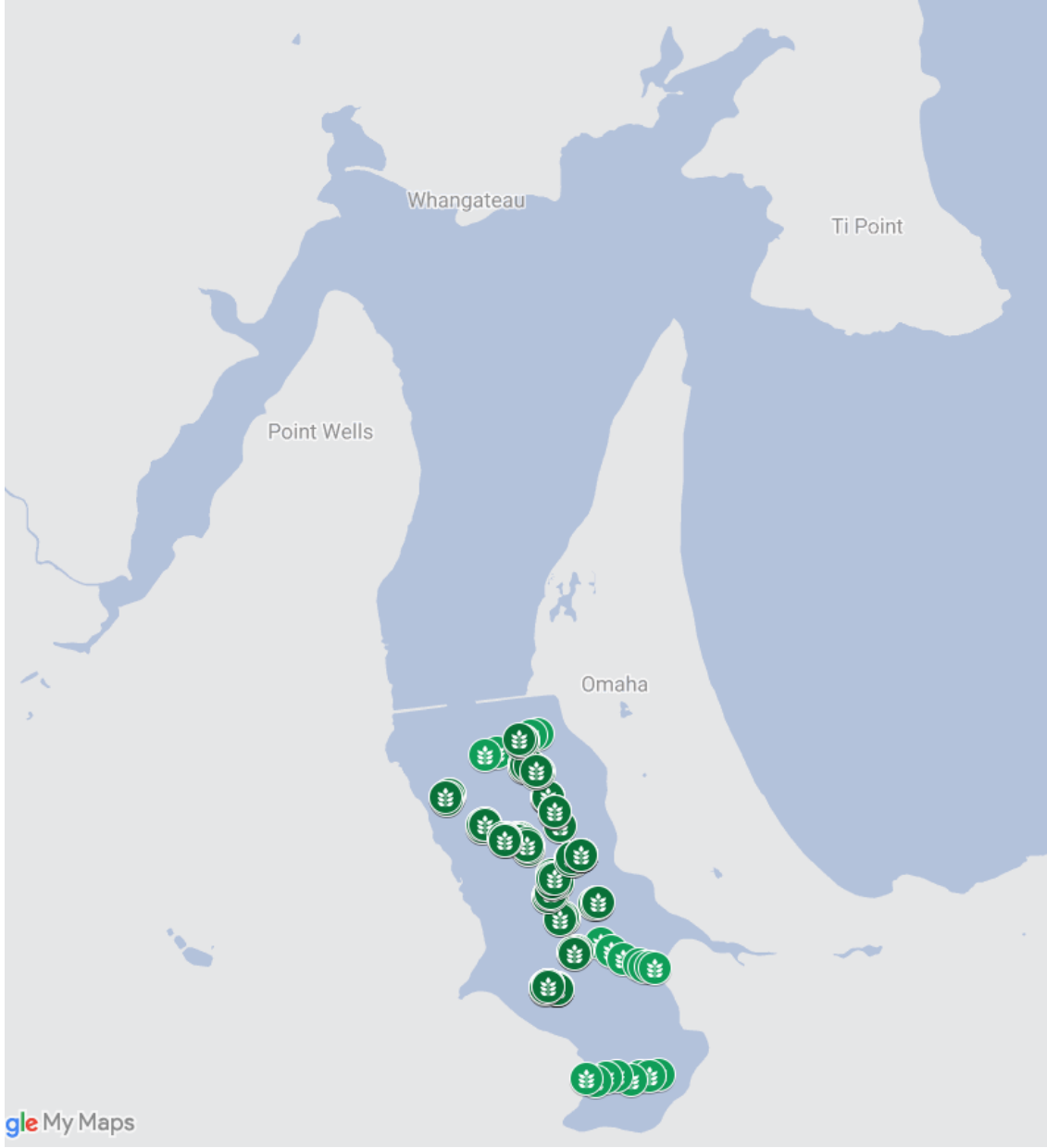
4 Fieldwork data collection

- Vegetation Surveys (seagrass, saltmarsh, mangroves, ecotones)



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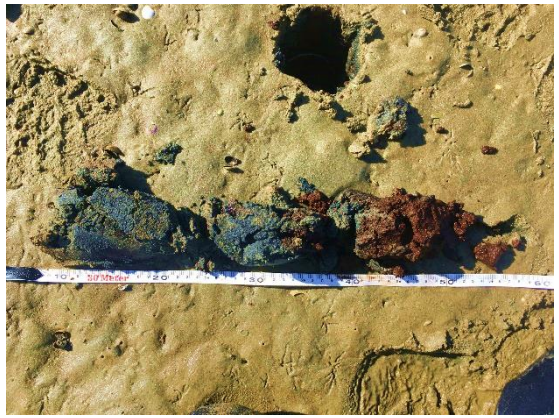
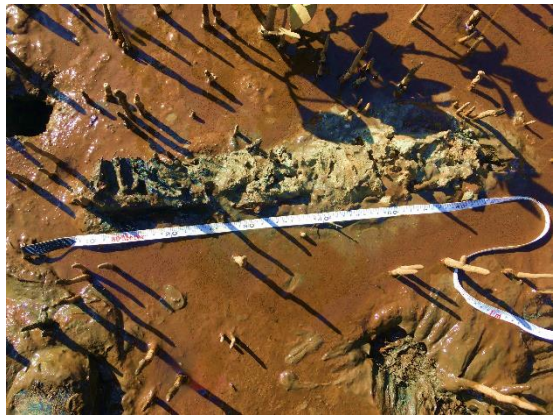
4 Fieldwork data collection

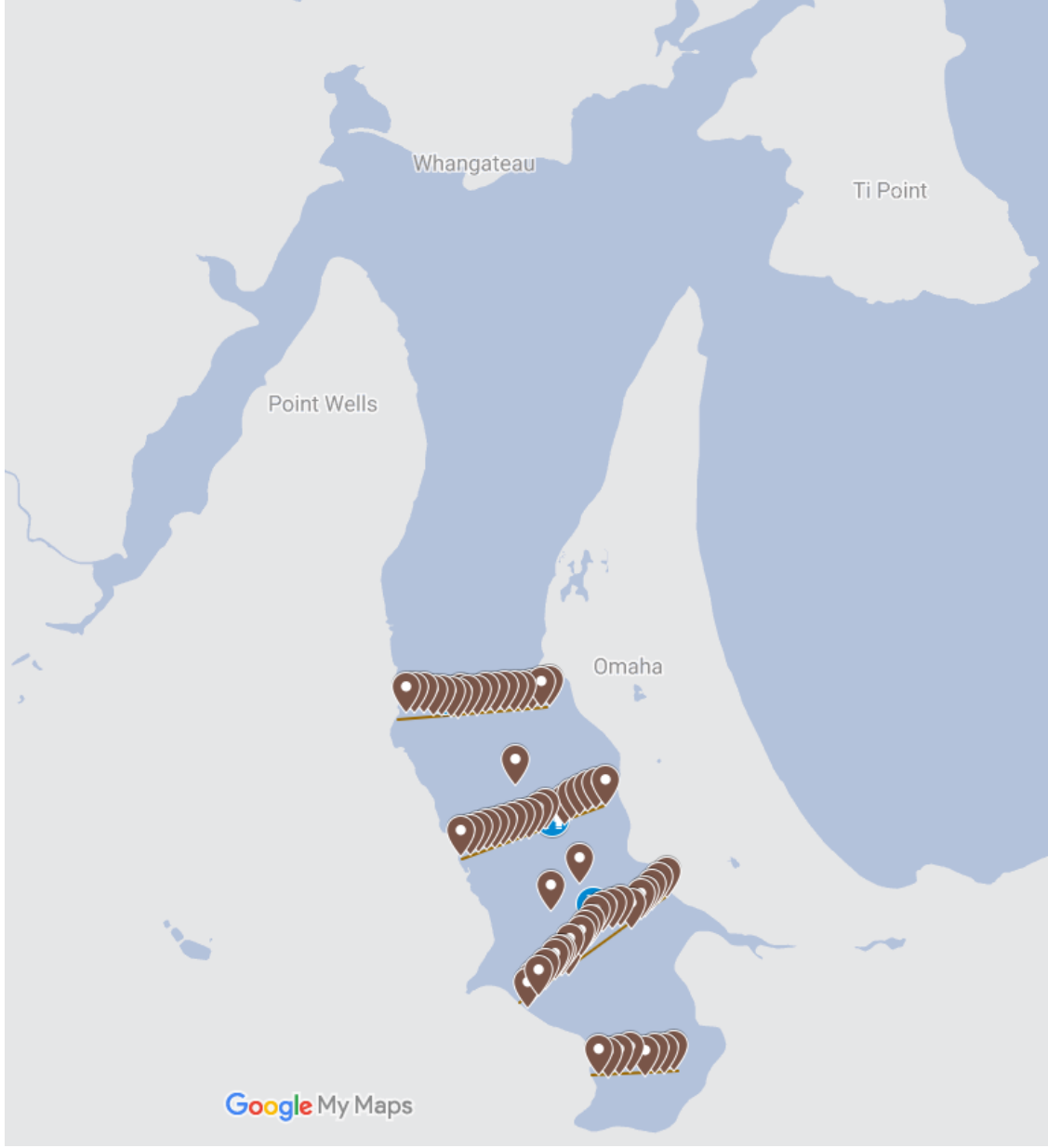
- Sediment Sampling

Sandflat



Mangrove





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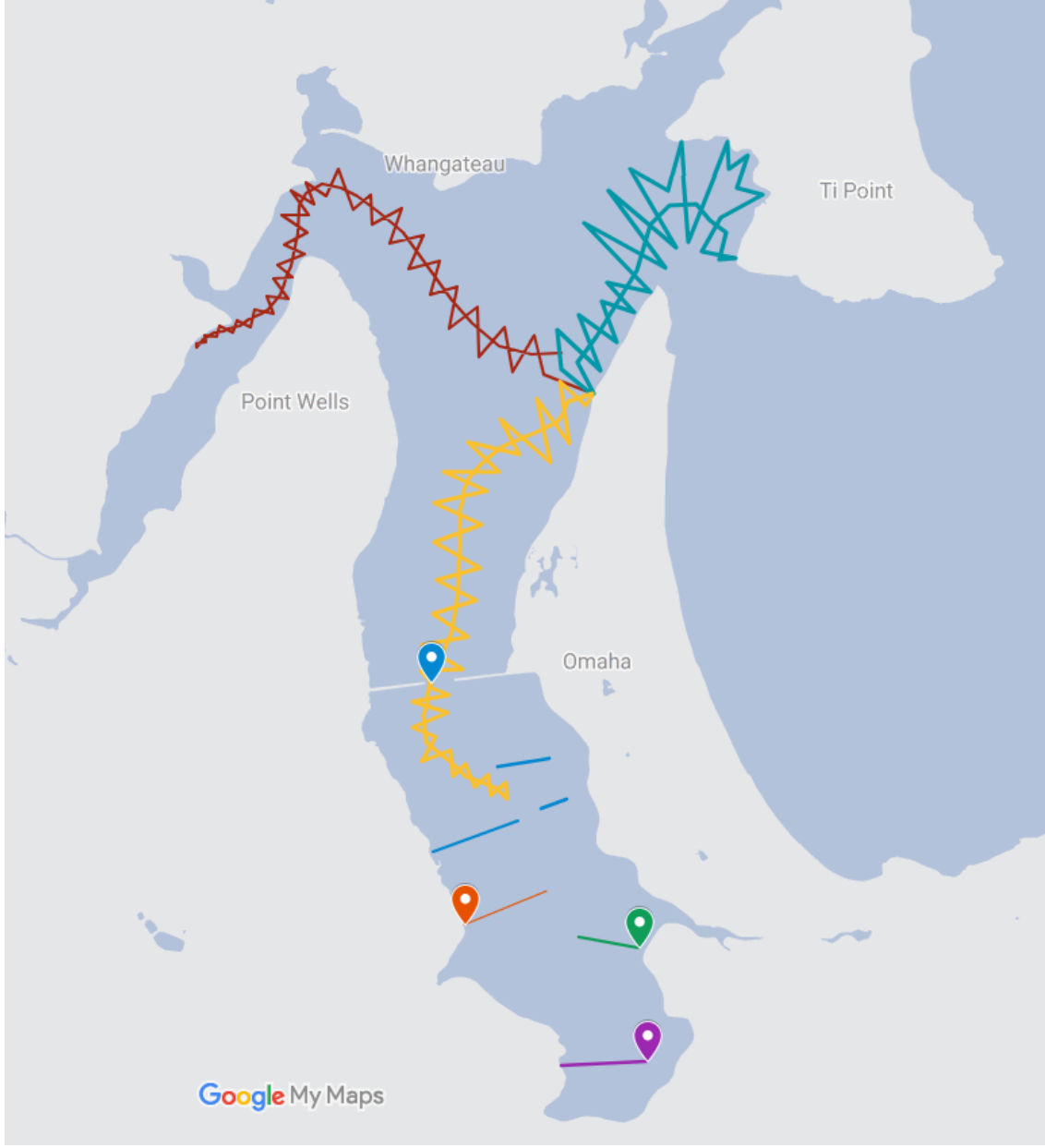
4 Fieldwork data collection

- Bathymetry Survey
  - Boat and Fishfinder
  - RTK



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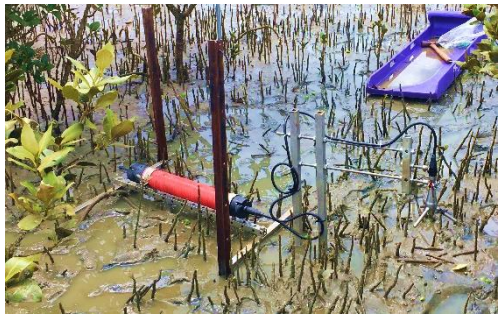
4 Fieldwork instruments

- Water level
- Flow velocity
- Flow Direction
- OBS [AQD] Sediment Concentration

Nortek Aquadopp

Nortek Vector



RBR Duet

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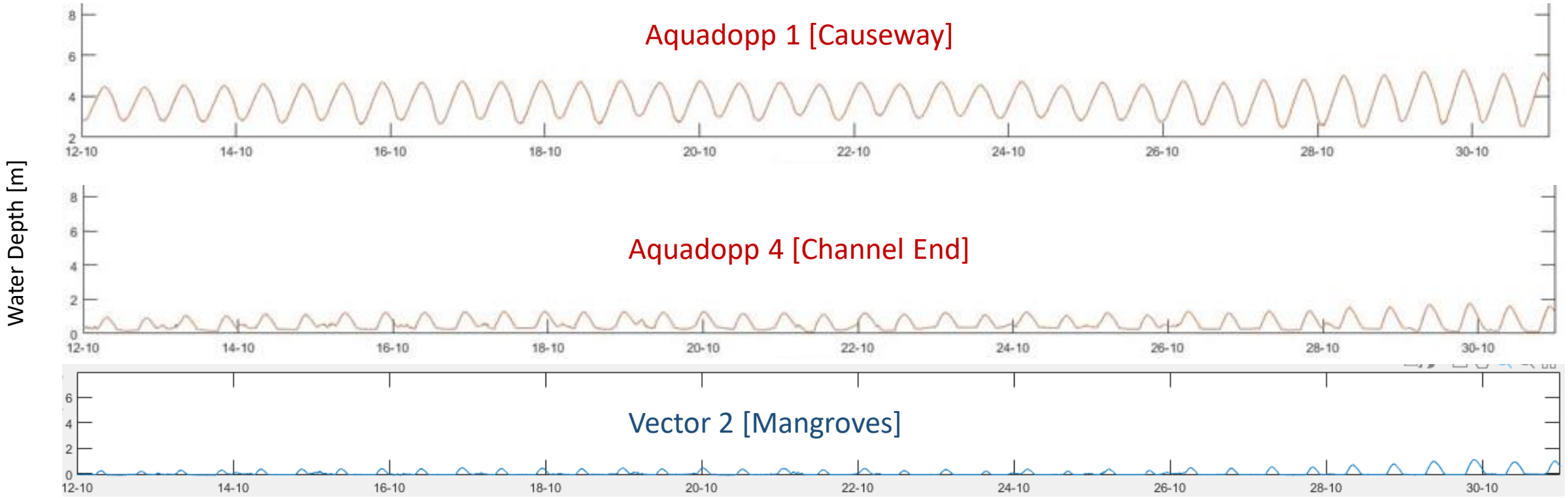
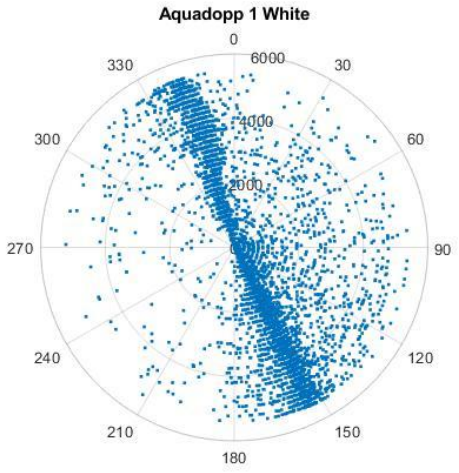
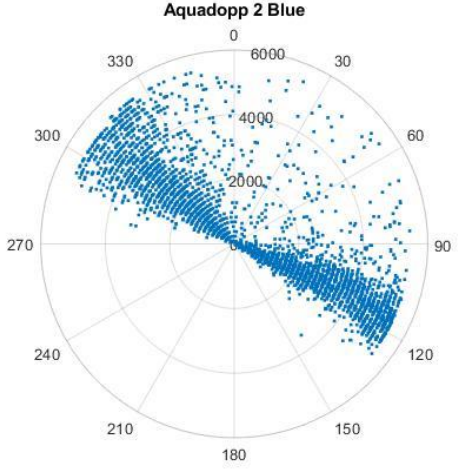
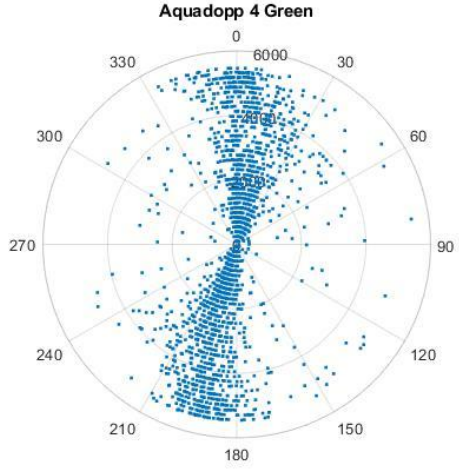
5. Instrument Output water levels



5. Instrument Output flow directions







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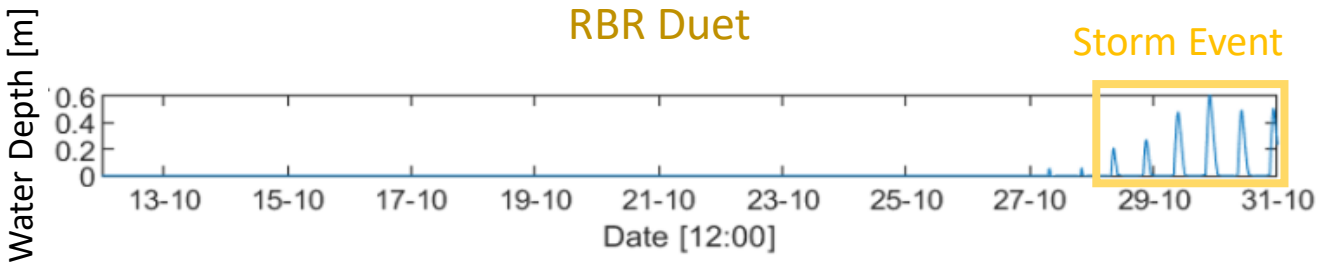
6. Storm Event

- Last 3 days of deployment
- Seedling dispersion → Ecotone shifts



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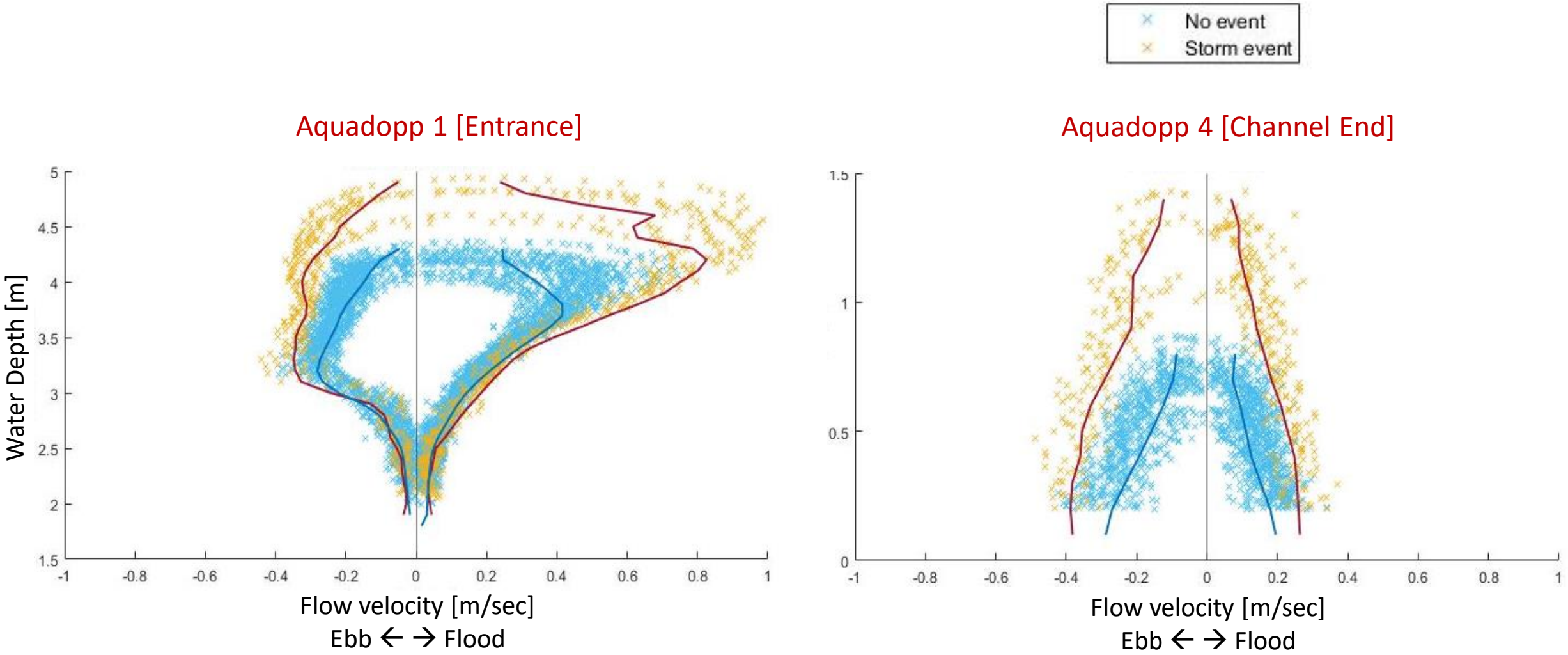
6. Storm Event



Conclusions

- Data Collection
  - Expand understanding of processes in Whangateau Harbour
  - Valuable for model calibration and validation
- Learn about storm events

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Acknowledgements

- Future Coasts Aotearoa ~ Funding
- Ngāti Manuhiri ~ Access to fieldsite
- Auckland Regional Council ~ Data provision

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NGATI MANUHIRI
SETTLEMENT TRUST

Auckland Council
Te Kaunihera o Tāmaki Makaurau

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