SOUTH AND LOWER SOUTH SAN FRANCISCO BAY

Continuous SSC and Wave Monitoring

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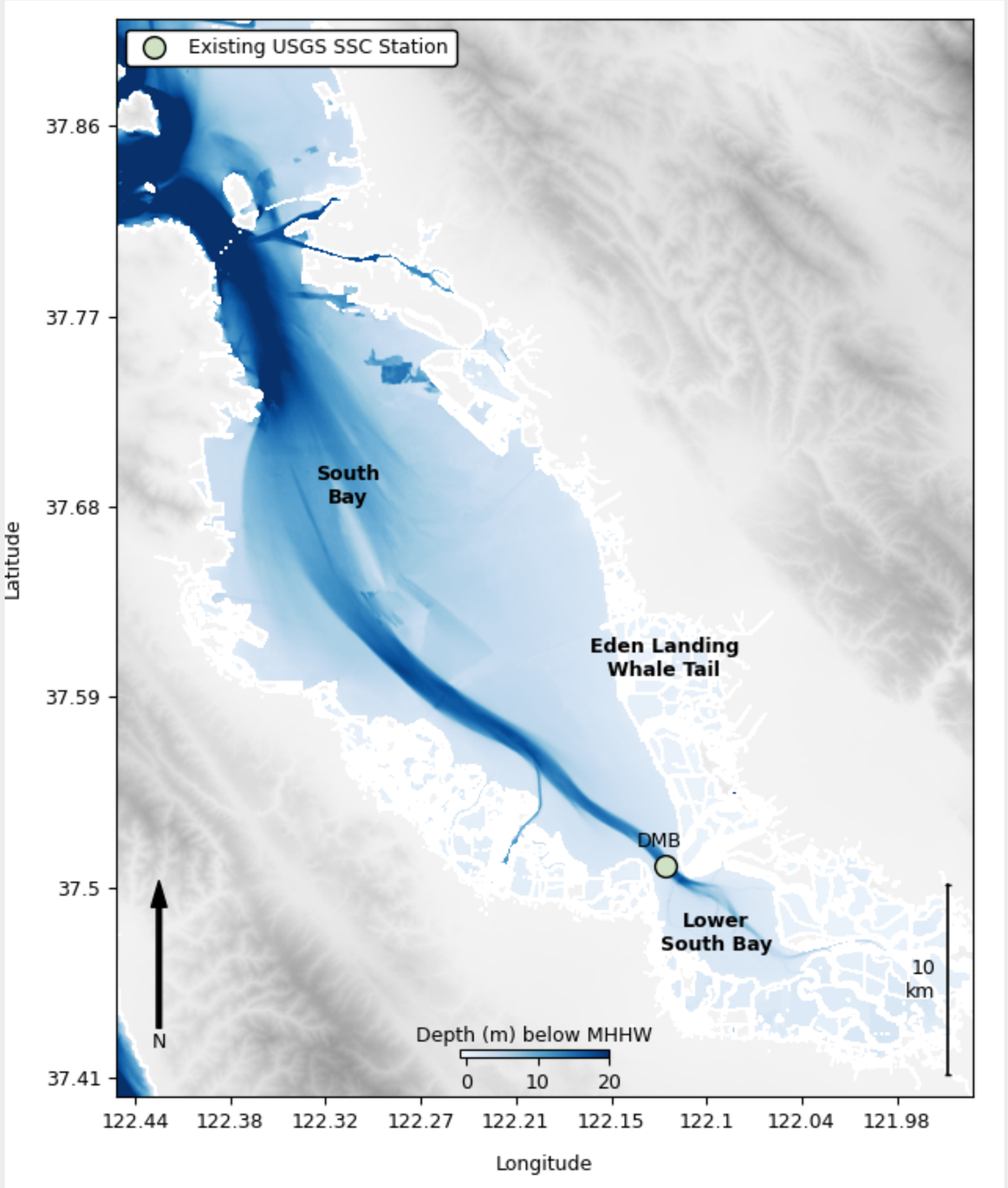
SFEI | SBSPRP | SSC | RMP

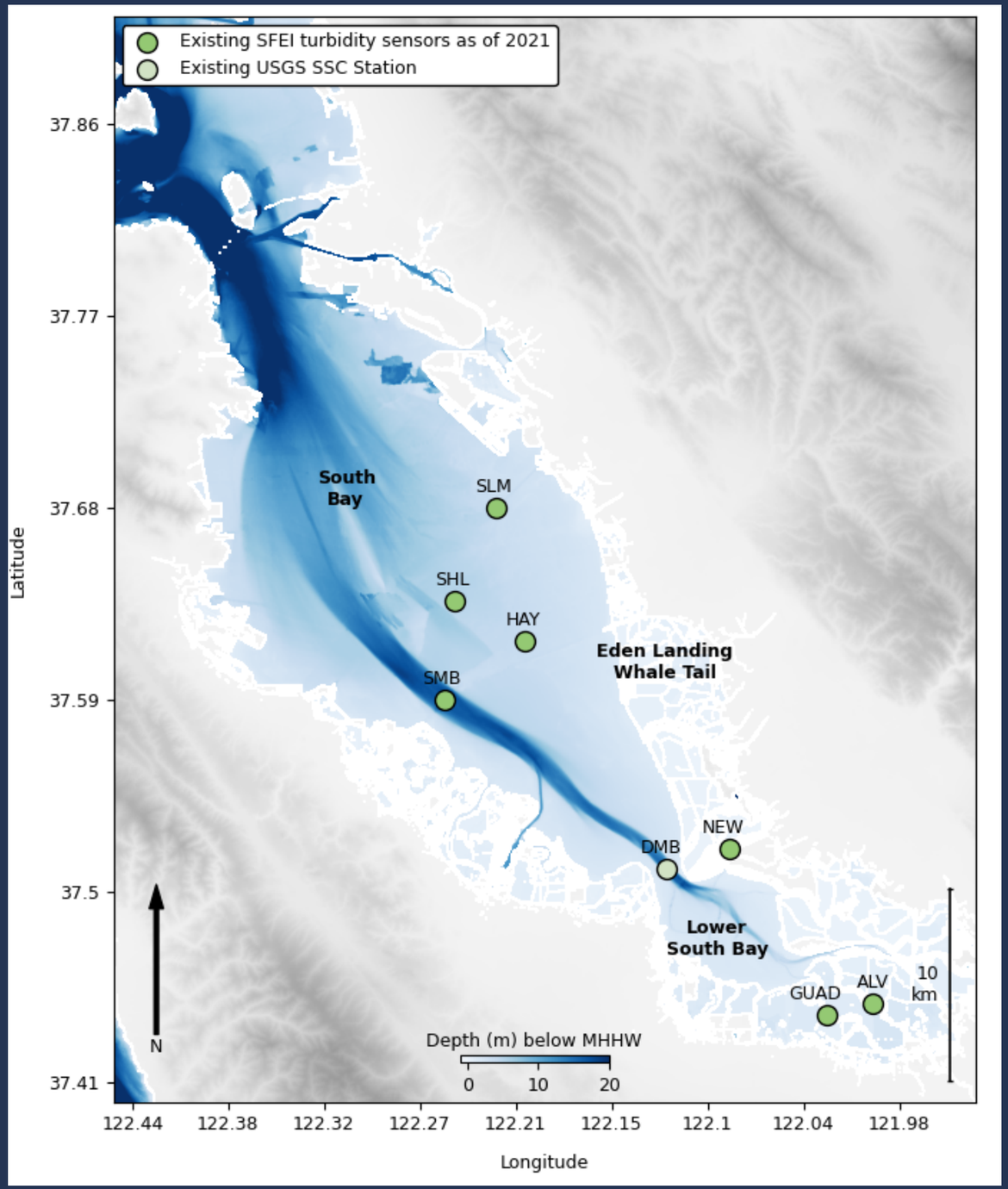
Motivation

This type of monitoring is sparse in the South and Lower South SF Bay ...

Only one existing station with continuous SSC monitoring operated by USGS

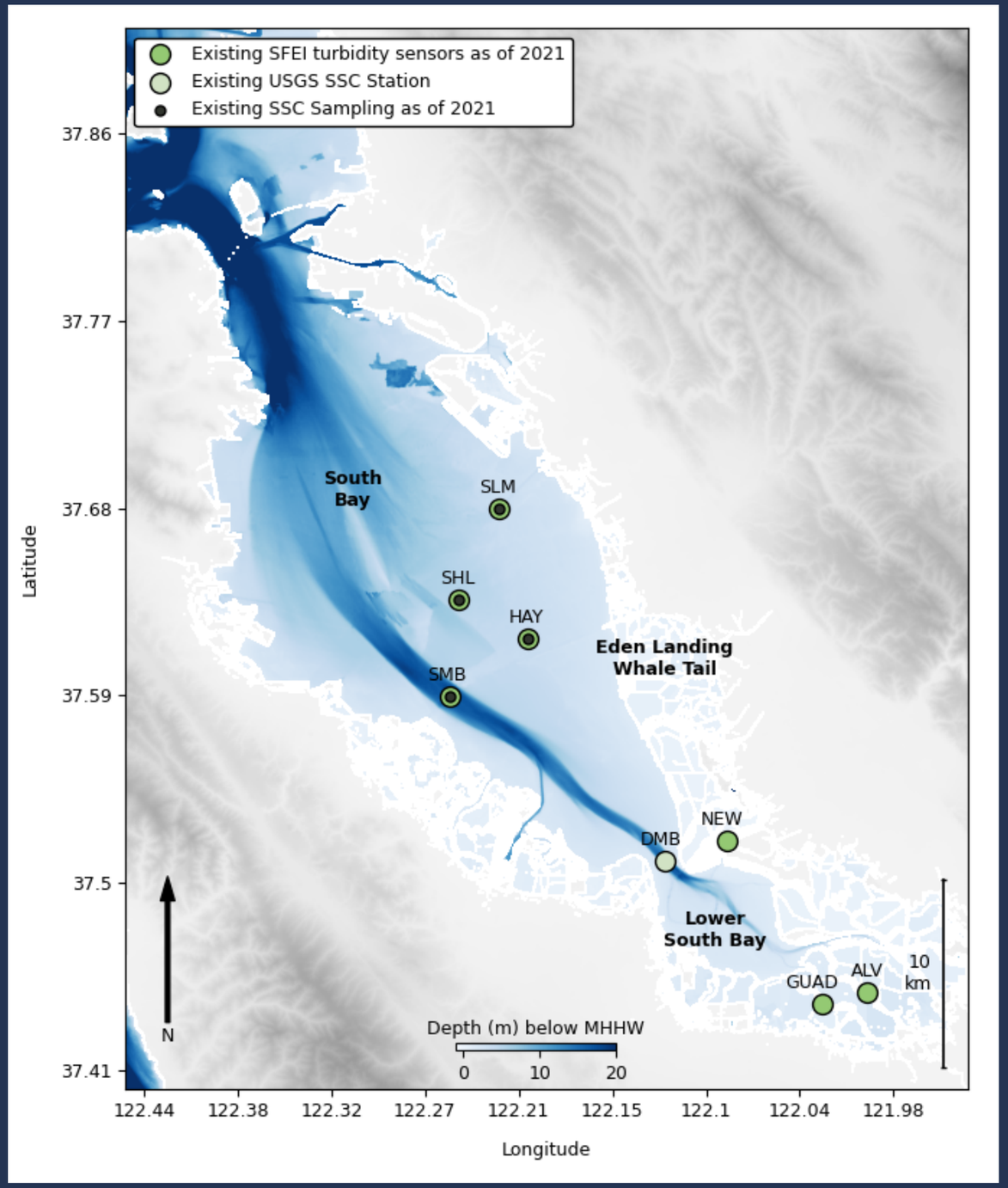
No wave monitoring station





Existing SFEI monitoring in 2021

Seven moored stations with high frequency (15 min.) turbidity sensors



Existing SFEI monitoring in 2021

Seven moored stations with high frequency (15 min.) turbidity sensors

Monthly SSC sampling at four South SF Bay moored stations

Motivation

Continuous water-column SSC measurements and high frequency wave monitoring are essential for:

01 Sediment transport model validation

02 Characterizing background conditions for empirical sediment studies

03 Characterizing light attenuation conditions for biogeochemical studies

04 Differentiating wave-resuspension verses inflow driven elevated-SSC events

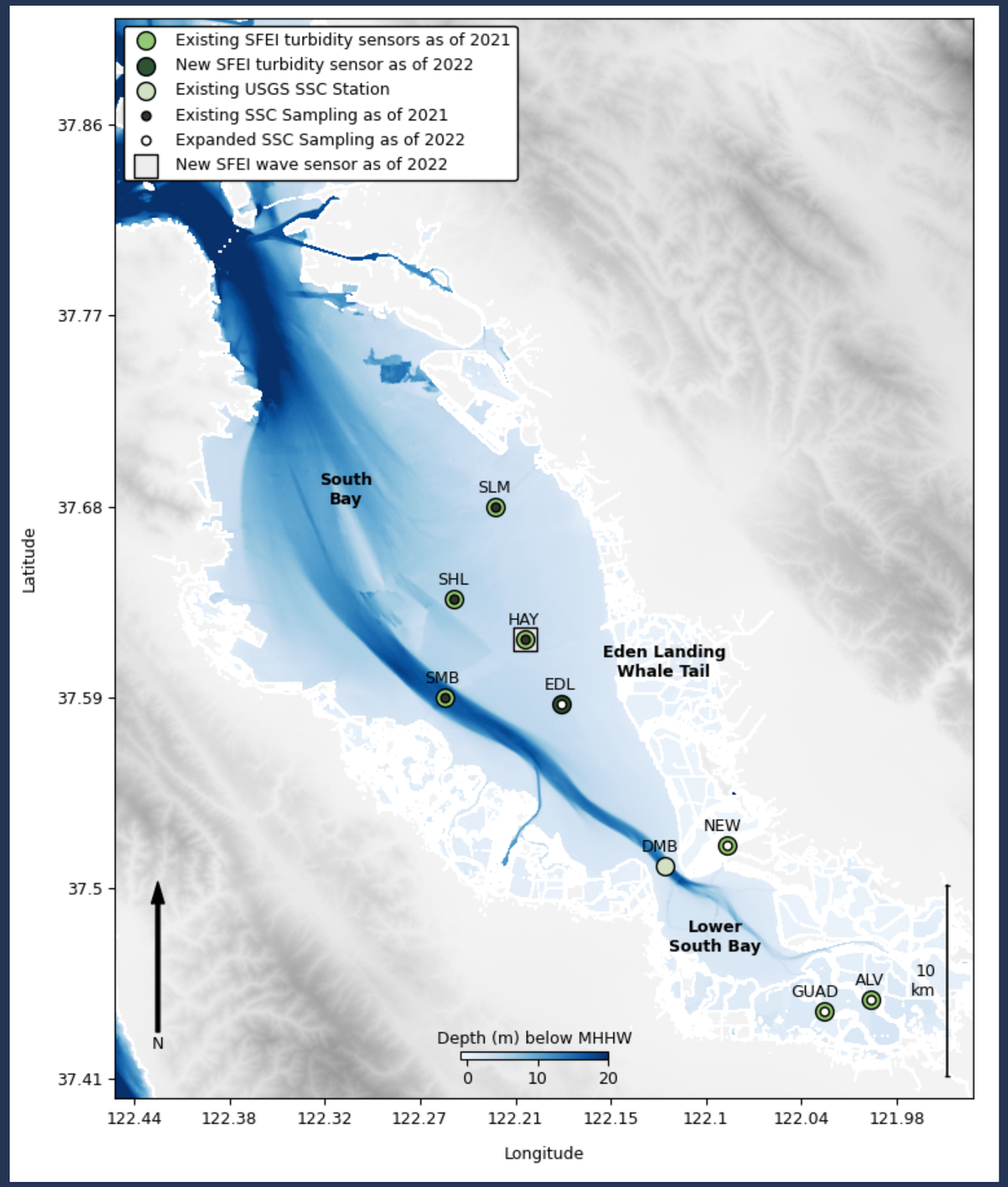
Project Objectives

Expand continuous SSC monitoring in the South and Lower South SF Bay from one station to nine stations

Deploy and maintain a high-frequency wave monitoring station on the eastern shoal of the South SF Bay

Create and iteratively update a public SSC and wave data repository

Advance SF Bay sediment planning and management



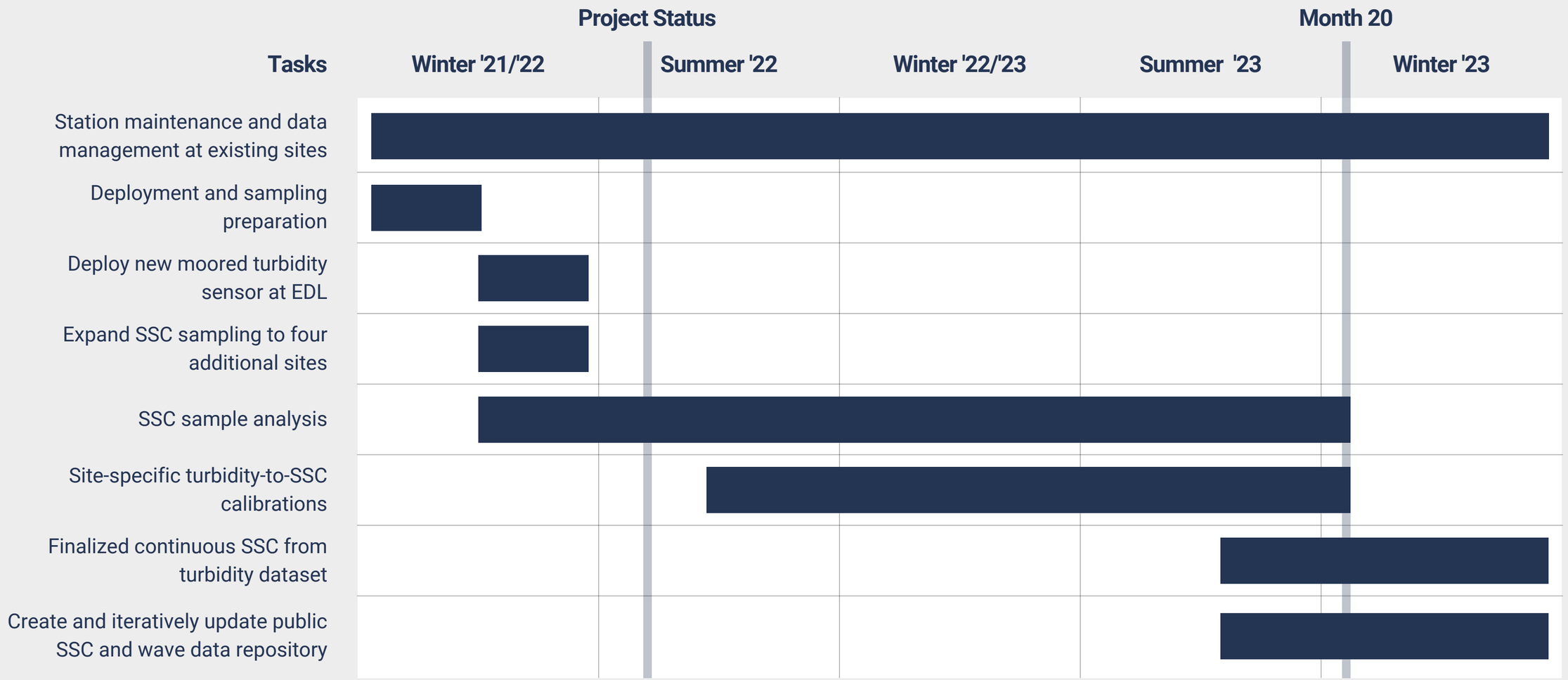
Expanded monitoring in 2022

01 Addition of one moored turbidity sensor (EDL) offshore of the Eden Landing Whale Tale area

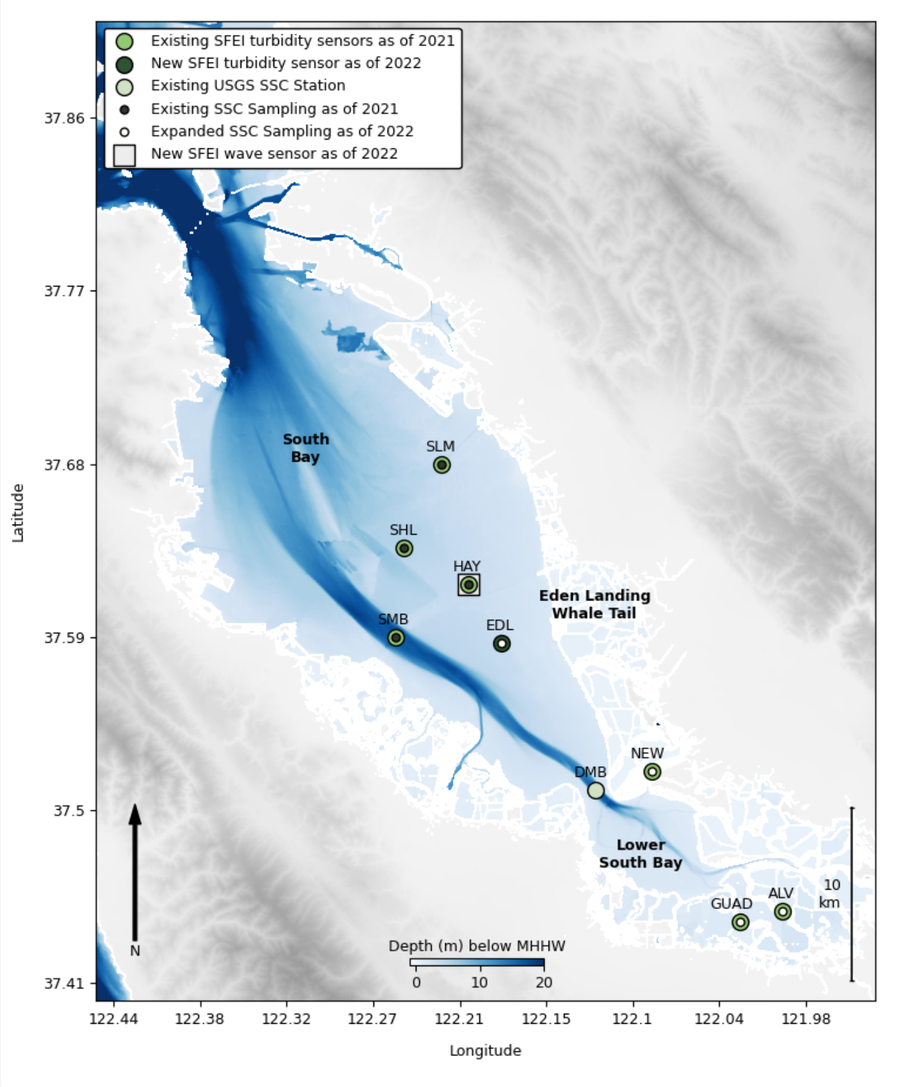
02 Expanded SSC sampling to three existing SFEI moored stations and the new EDL moored turbidity sensor

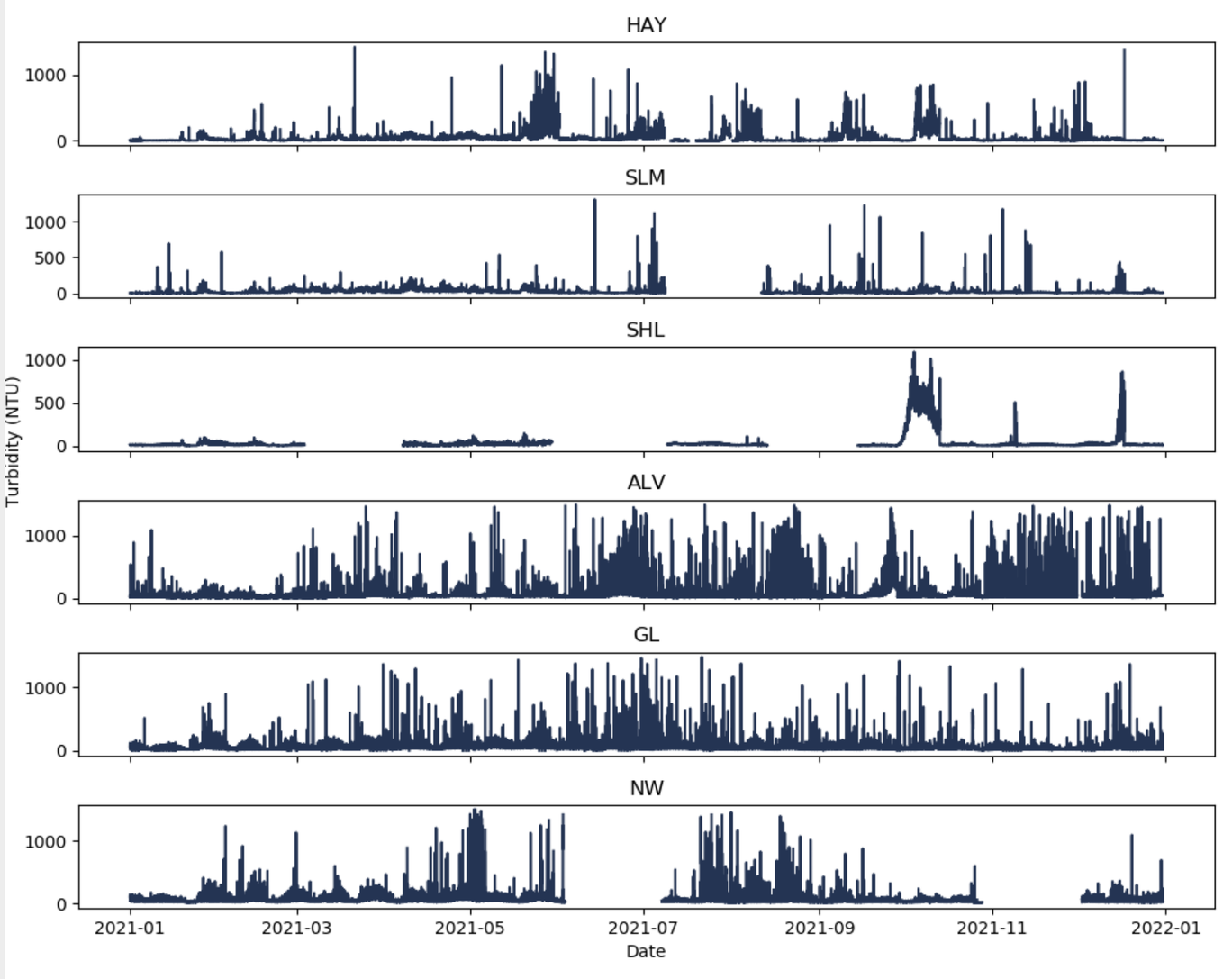
03 Addition of one high frequency wave sensor at the existing Hayward (HAY) SFEI moored turbidity station

Project timeline & deliverables

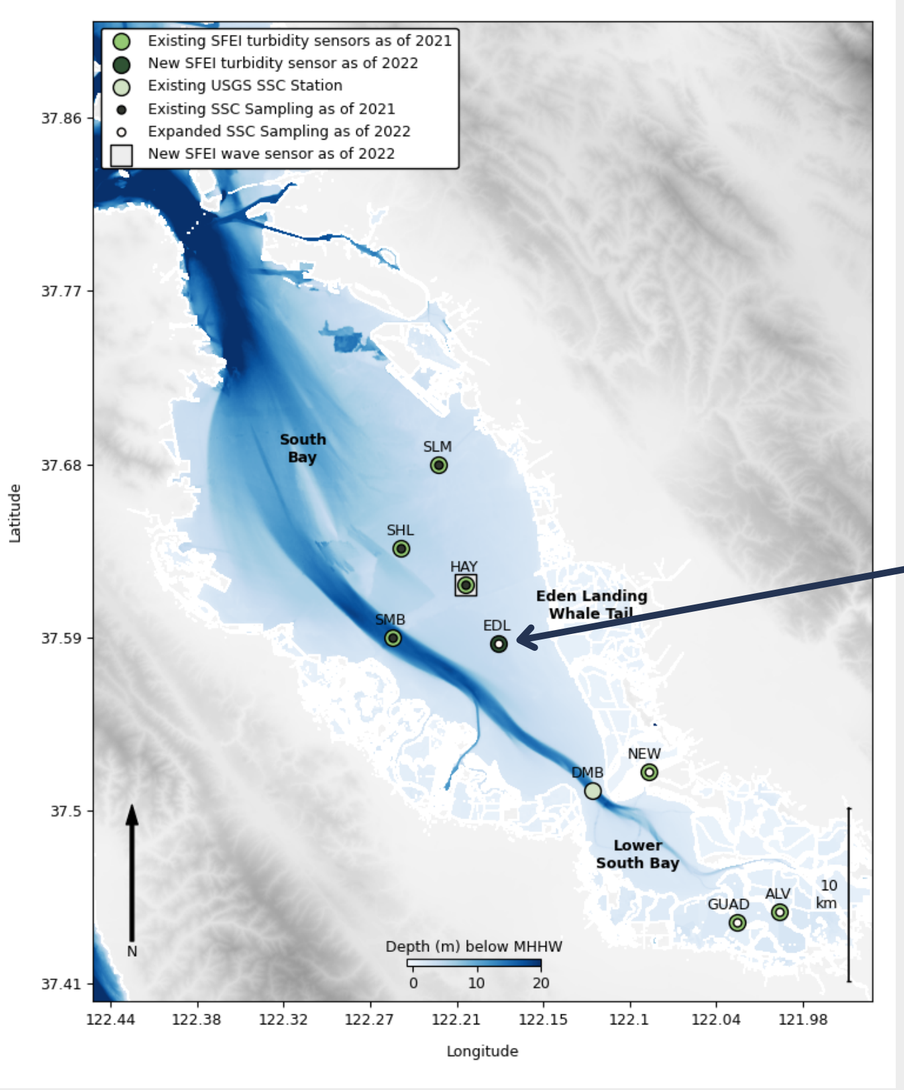


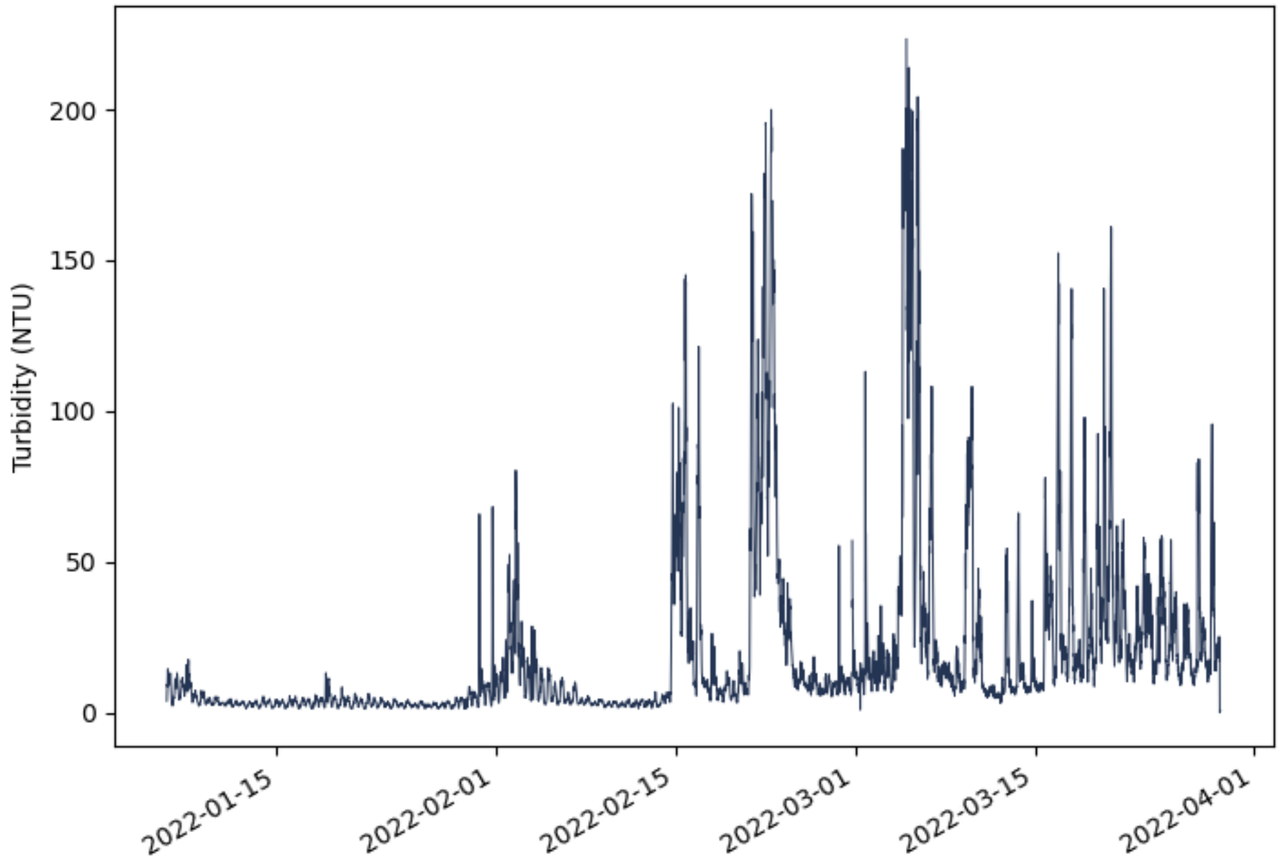
Turbidity across stations and seasons



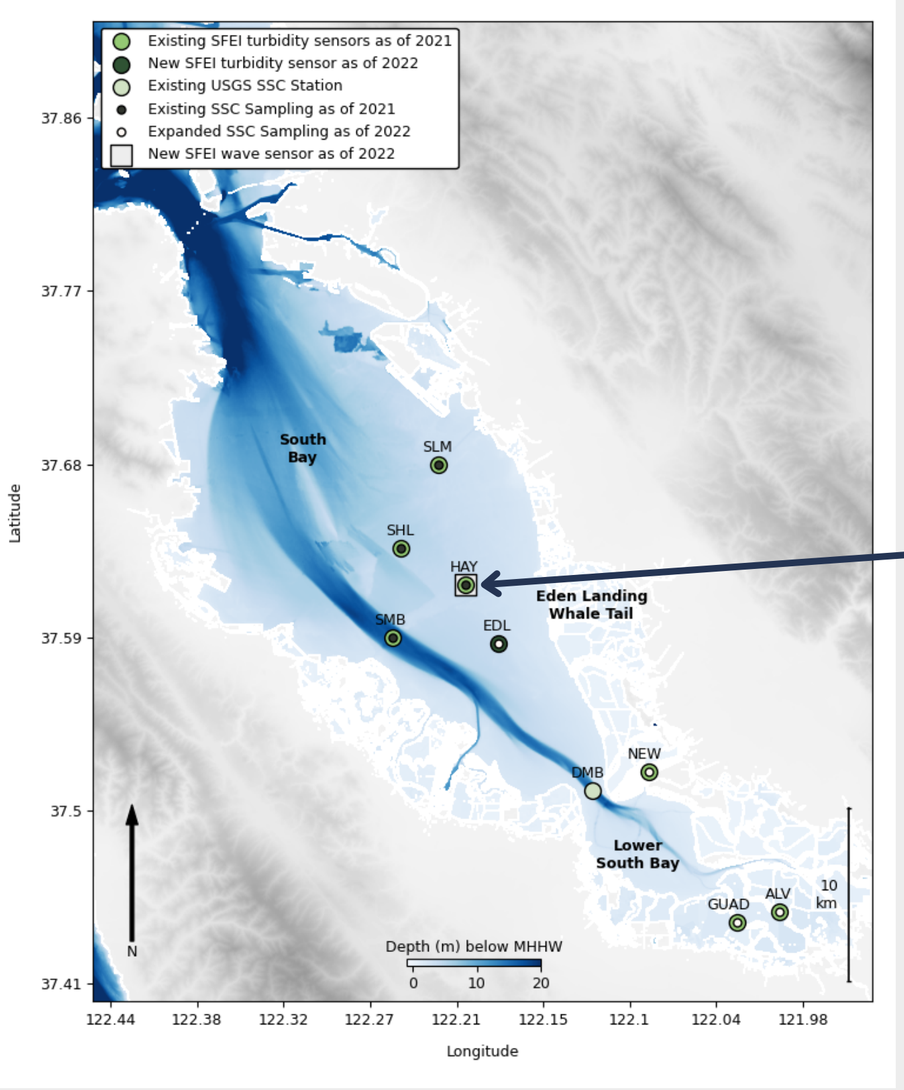


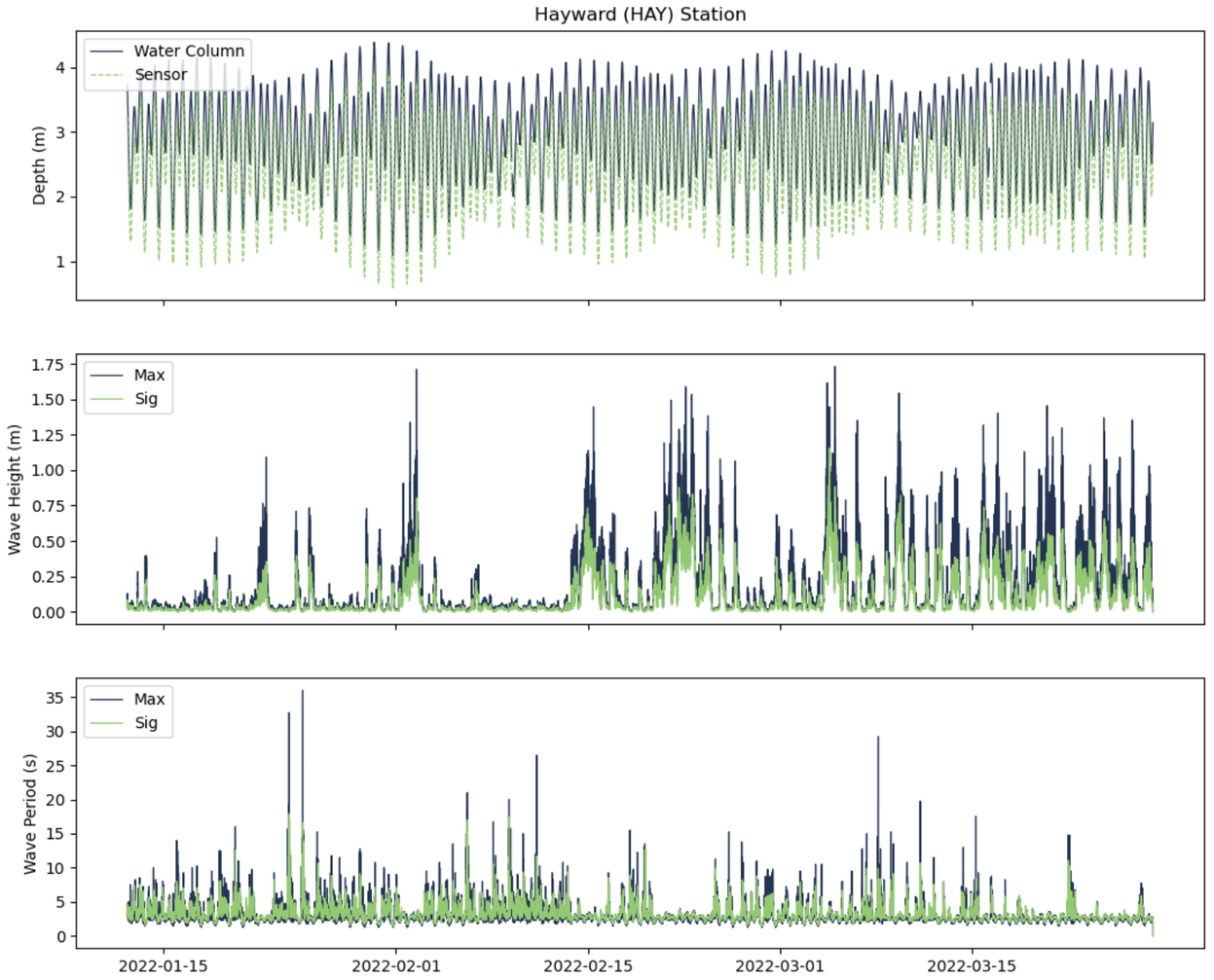
Newly available turbidity data



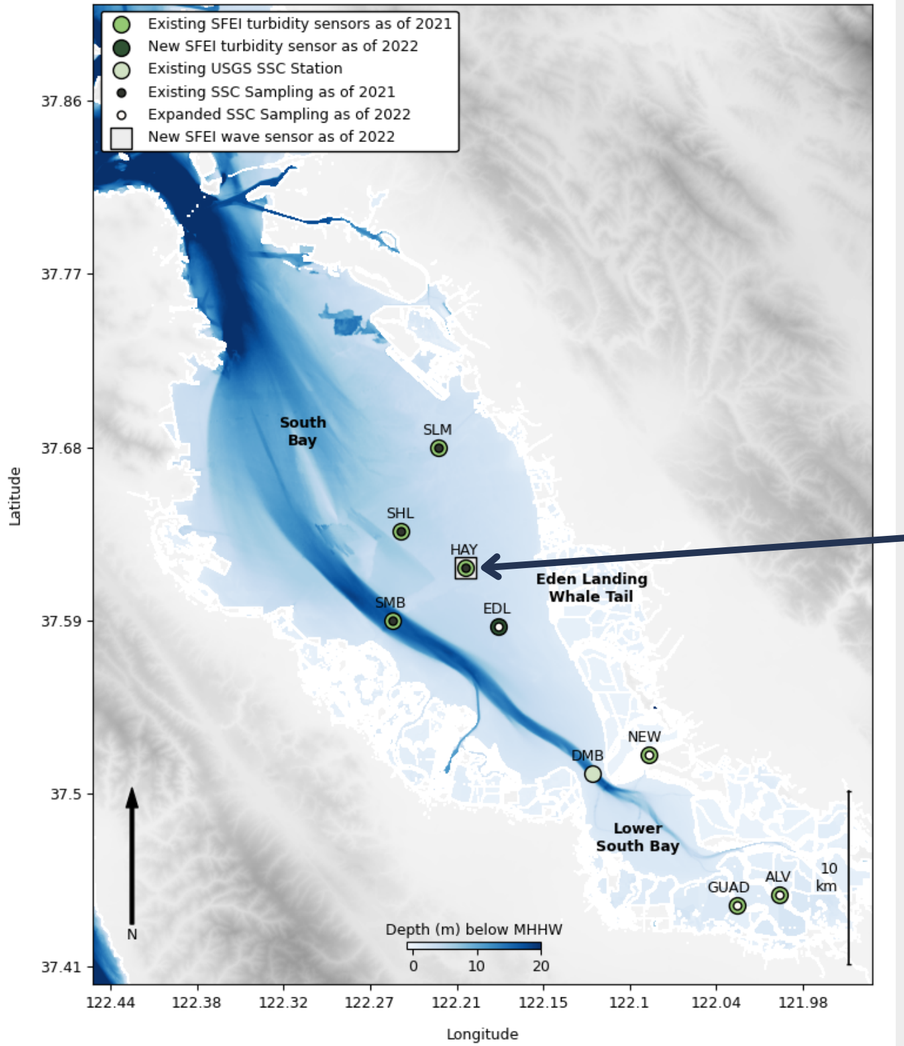


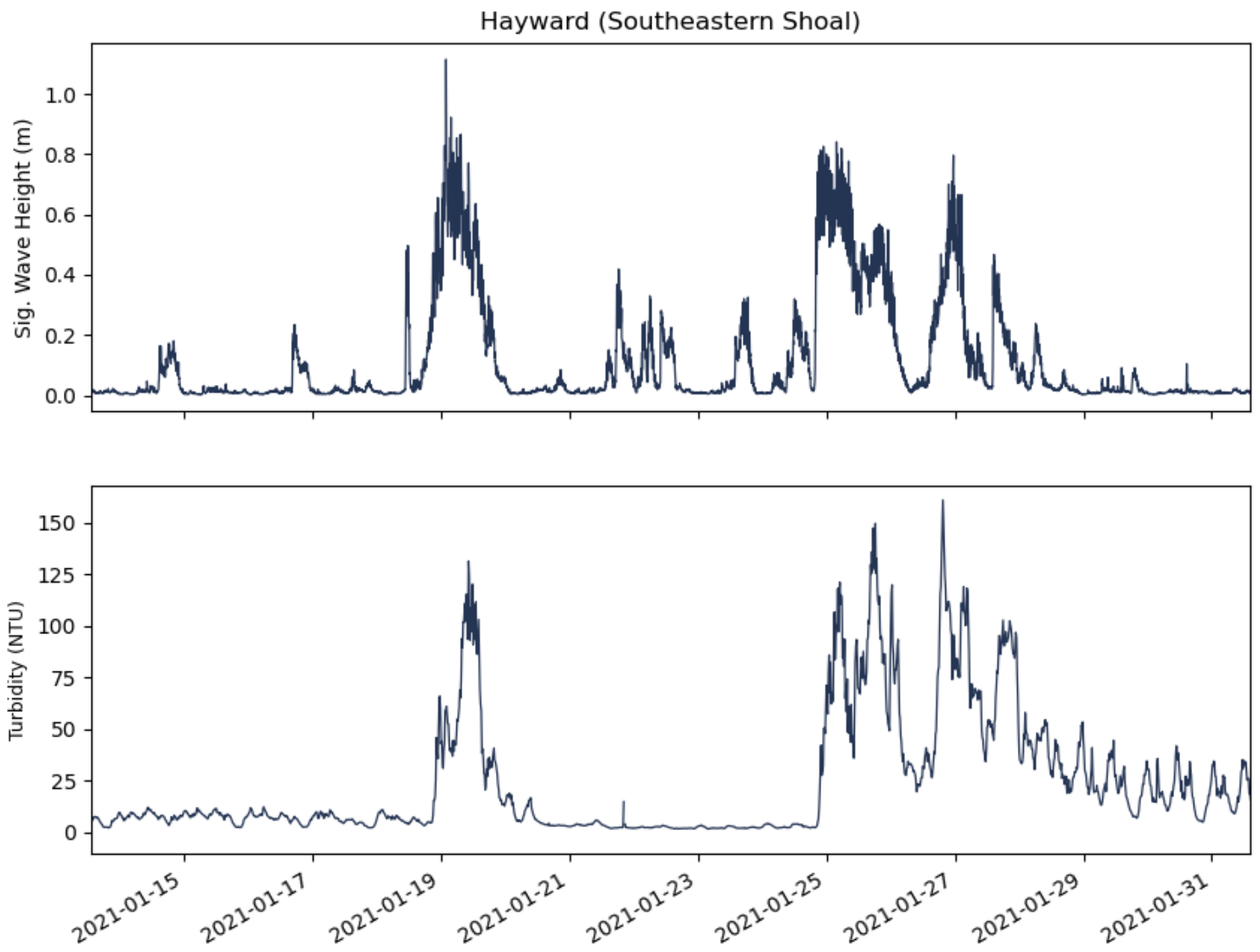
Newly available wave data





Wave resuspension vs. inflow of SSC





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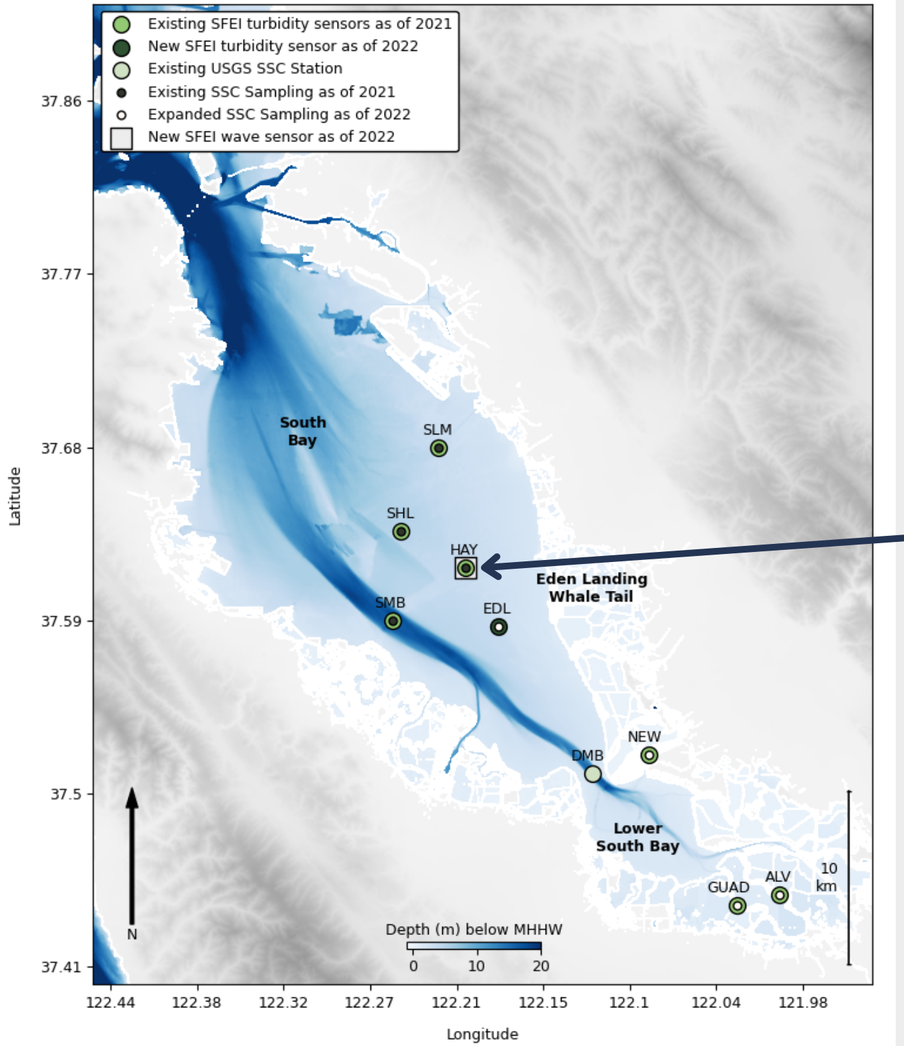

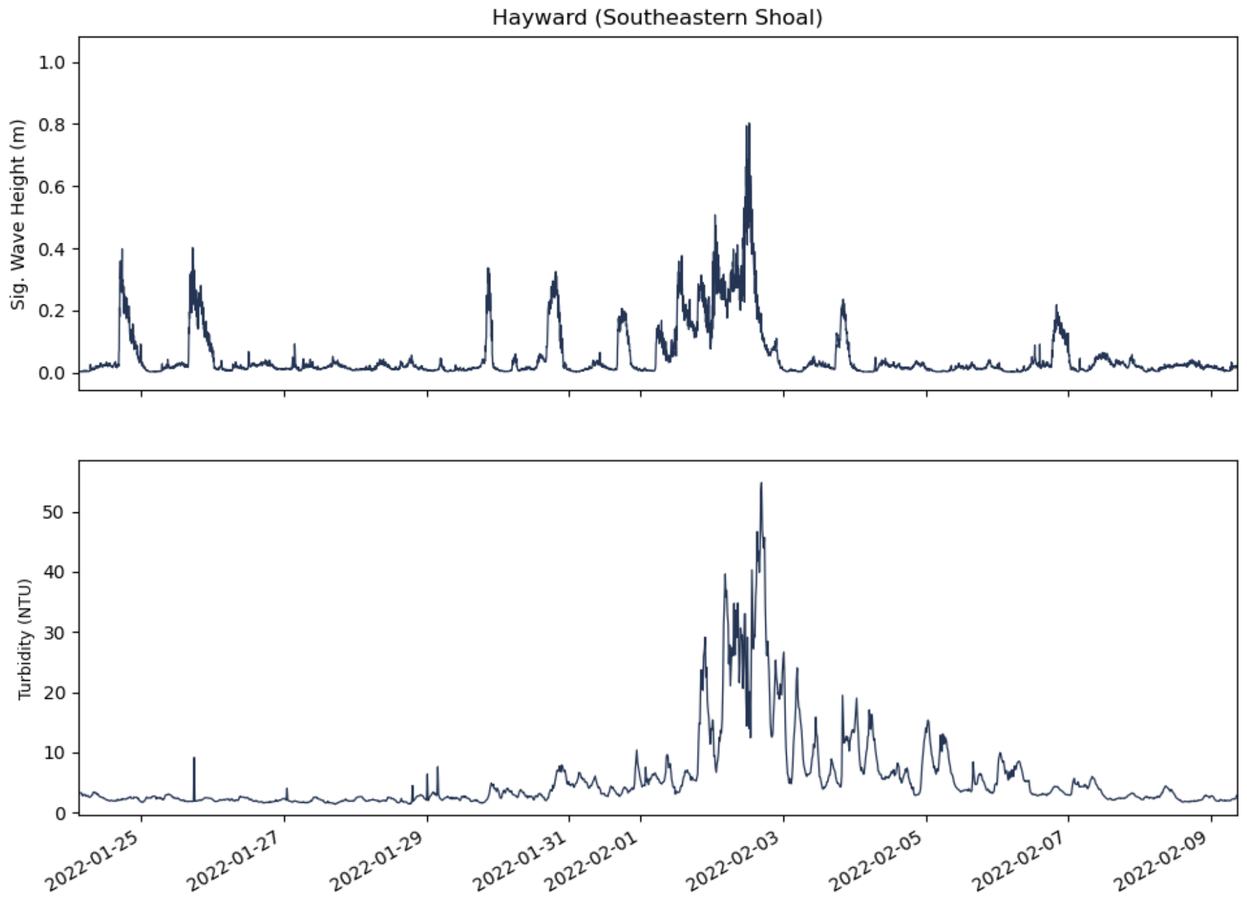

Next Steps

01 Continue to maintain moored turbidity stations and manage data

02 Obtain SSC results from monthly discrete samples

03 Plot regressions between turbidity and discrete SSC data sets

04 Create initial site-specific turbidity-to-SSC calibrations and iterate as more data becomes available

Application

The large-scale marsh and wetland restoration projects ringing the South and Lower South SF Bay depend on sediment exchange dynamics with the open bay.

The concentration of suspended sediment in shallow bay waters influences sediment transport and accretion onto marsh restoration sites.

Wave energy in shallow bay waters adjacent to marshes can resuspend sediment, increasing SSC and sediment transport to marshes.

Sediment accretion on marsh restoration sites can counter marsh flooding due to sea level rise.

Acknowledgments

Derek Roberts, SFEI

Donna Ball, SBSPRP & SFEI

Melissa Foley, SFEI

Kristin Art, SFEI

USGS-Biogeochemistry Group

USGS-Marine Facilities

Funding

South Bay Salt Pond Restoration Project
Restoring the Wild Heart of the South Bay

Coastal Conservancy

SFEI

RMP
REGIONAL MONITORING PROGRAM FOR WATER QUALITY IN SAN FRANCISCO BAY
sfei.org/rmp

SOUTH AND LOWER SOUTH SAN FRANCISCO BAY
SEDIMENT MONITORING PROJECT

Thank you!

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