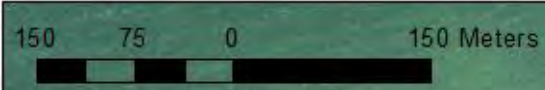


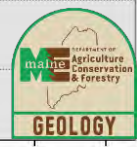
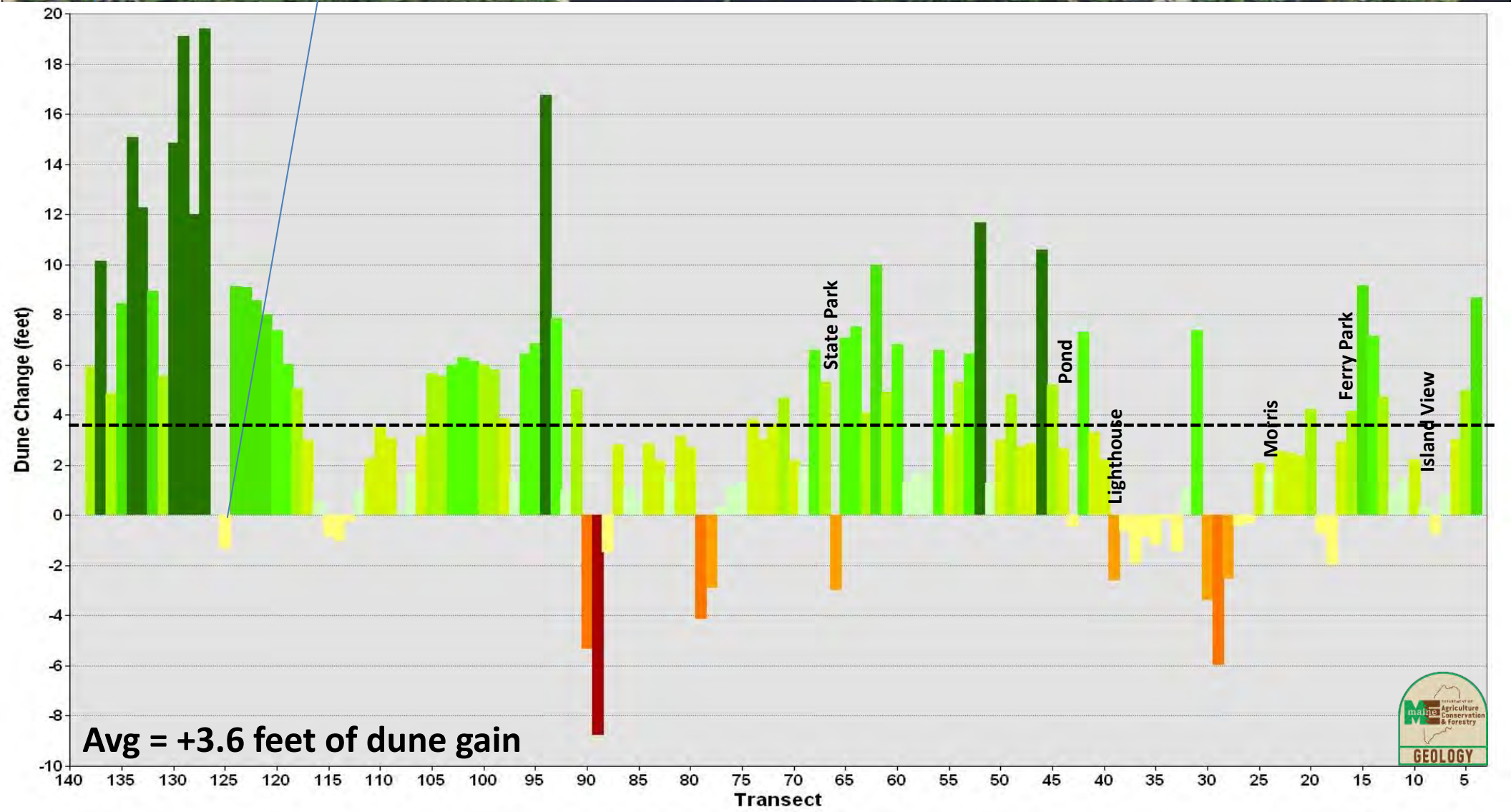
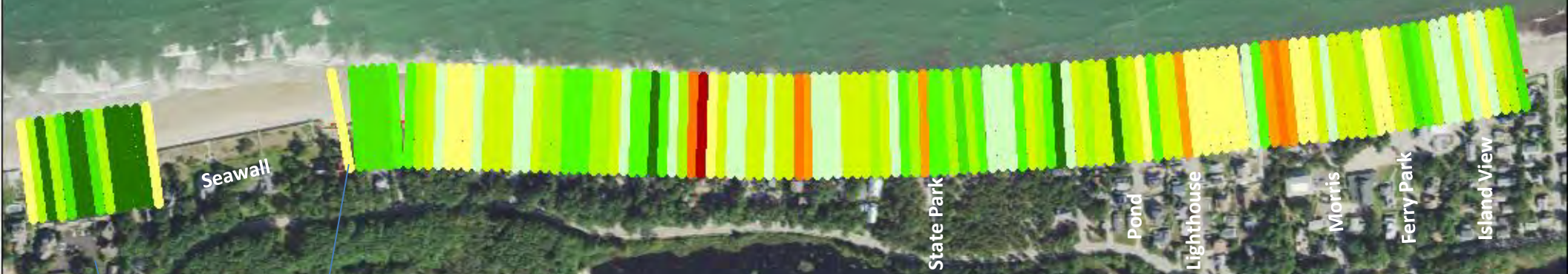
# Saco Shoreline Change Data March 2022 to March 2023

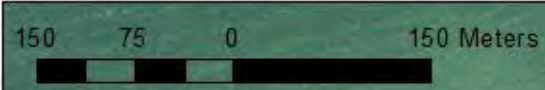


Peter Slovinsky, Marine Geologist  
Maine Geological Survey

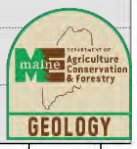
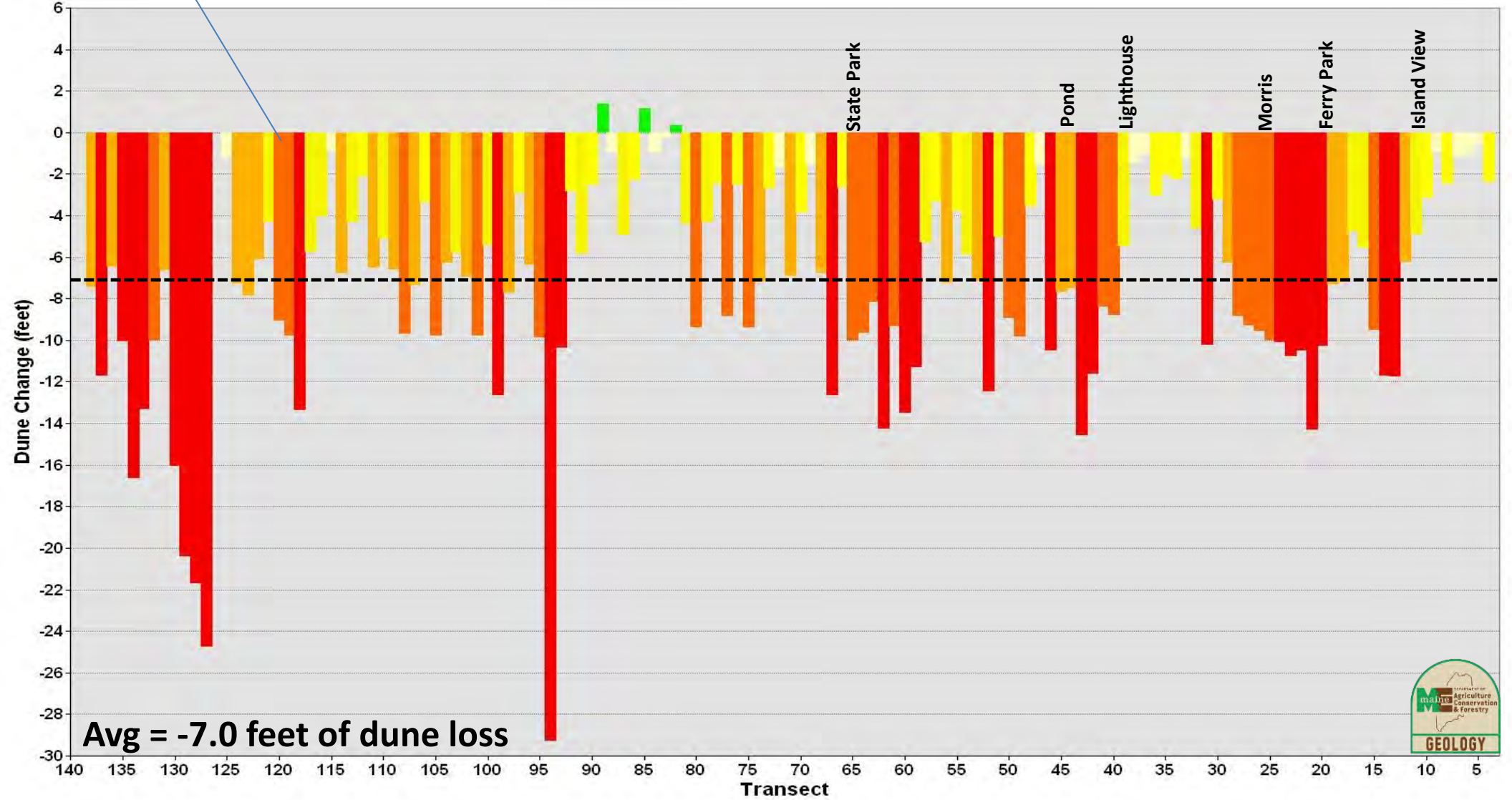
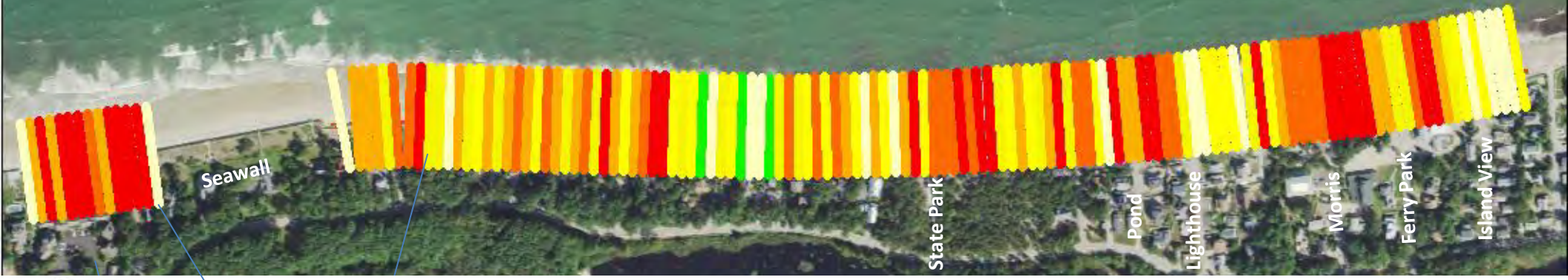


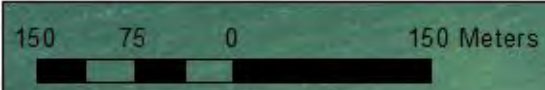
# Dune Changes (March 2022 to June 2022)



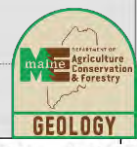
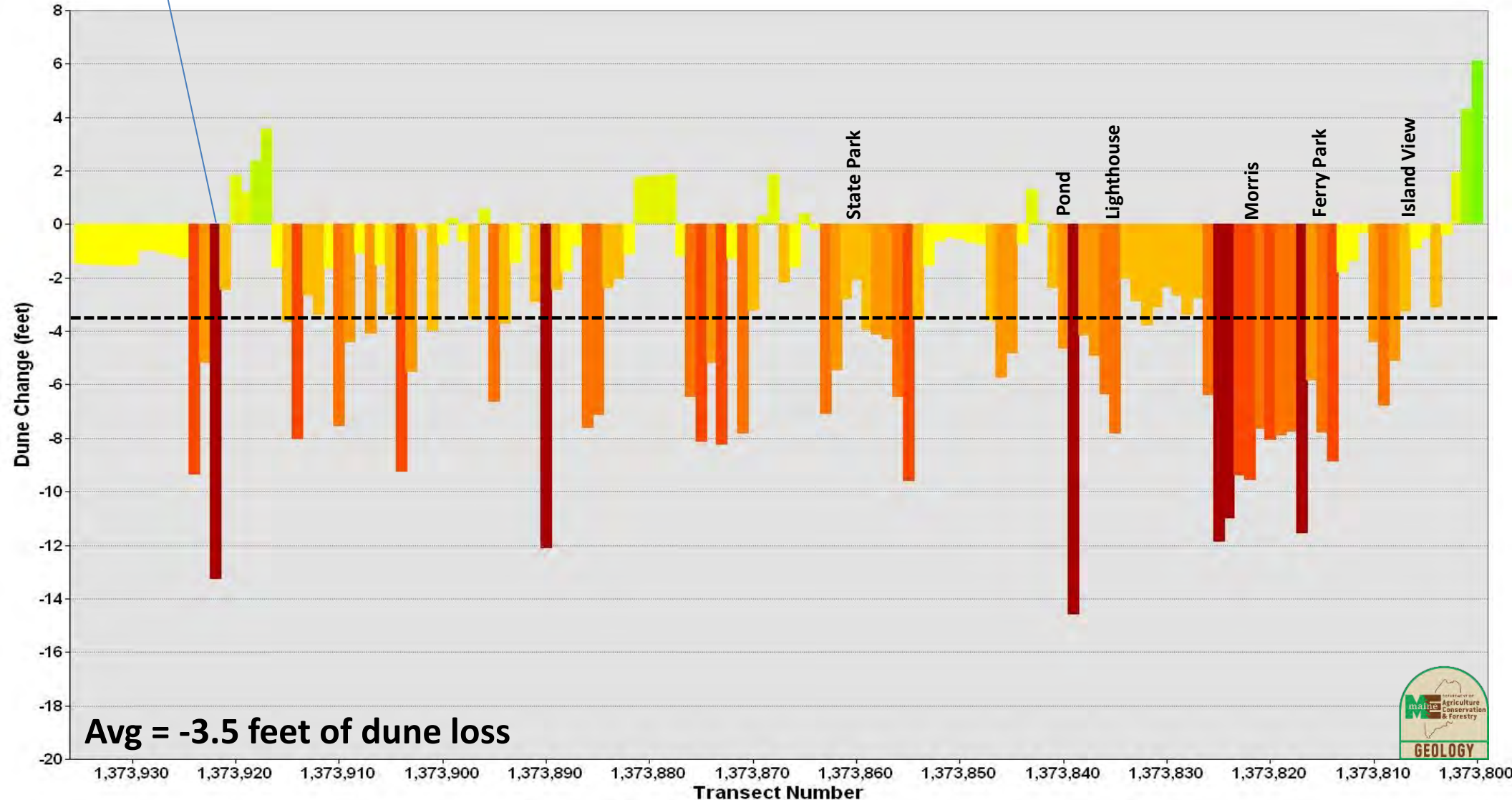


# Dune Changes (June 2022 to March 2023)



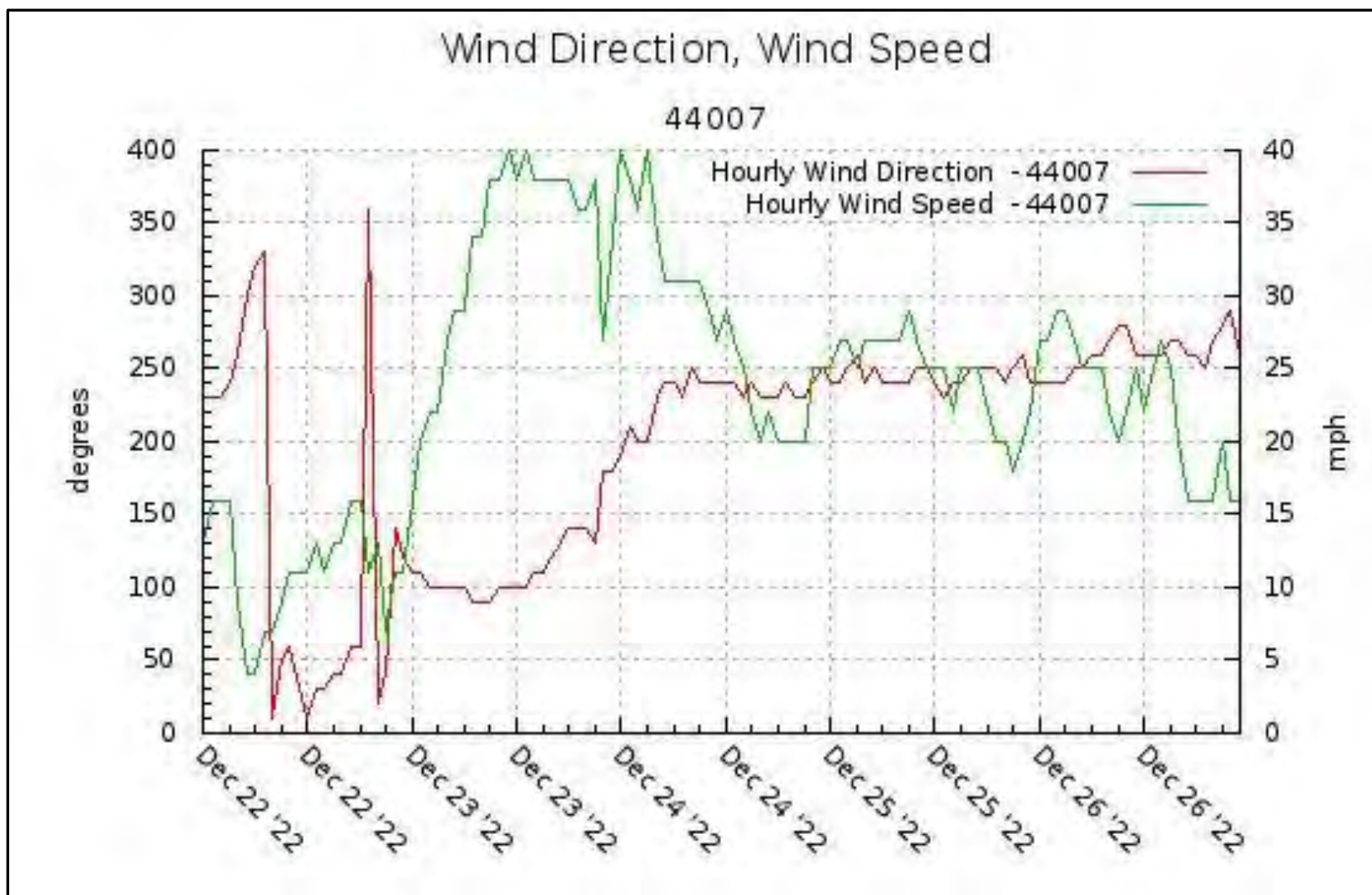


# Dune Changes (March 2022 to March 2023)

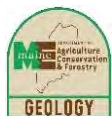


## Winter Storm Elliott (December 23, 2022)

On December 23, 2022, a very strong southeaster storm, dubbed Winter Storm Elliott, pounded the Maine coastline with strong southeast winds and large waves on top of a high astronomical tide. Average hourly windspeeds reached 40 miles per hour, with directions from the southeast (around 100-150 degrees) through December 24<sup>th</sup>, when winds shifted to the west and stayed strong, exceeding 20 miles per hour through December 26<sup>th</sup>.



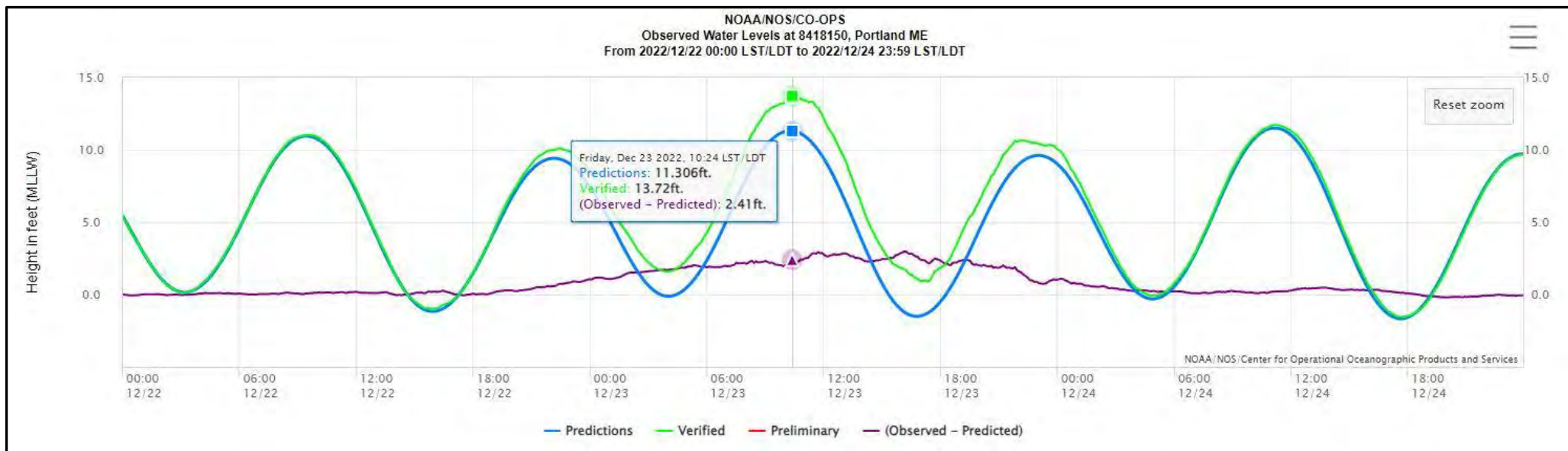
Wind speed (green) and direction (red) measured at NDBC Buoy 44007. Courtesy of NERACOOS.



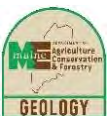


## Winter Storm Elliott (December 23, 2022)

At the [Portland, ME tide gauge](#), the overall storm tide (predicted tide plus surge) reached 13.72 feet around 10:24 am on December 23<sup>rd</sup> (Figure 3). This was due to approximately 2.4 feet of storm surge on top of a high predicted tide (11.3 feet). According to the National Weather Service's [Advanced Hydrologic Prediction Service](#), this is the fourth highest water level recorded in Portland since 1912.



The predicted tide (blue line) and storm surge (purple line) resulted in the overall storm tide (green line) reaching 13.72 feet at the Portland, ME tide gauge during Winter Storm Elliott. Data courtesy of NOAA CO-OPs.



# Looking south near Eagle Ave March 2022

Dry berm with cusps





# Looking south near Eagle Ave March 2023



**Sloped and flat berm**

# Looking north near Eagle Ave March 2022



Note high sand levels

# Looking north near Eagle Ave March 2023



**Note exposed geotube , lower sand levels  
and scarped but slightly wider dune**

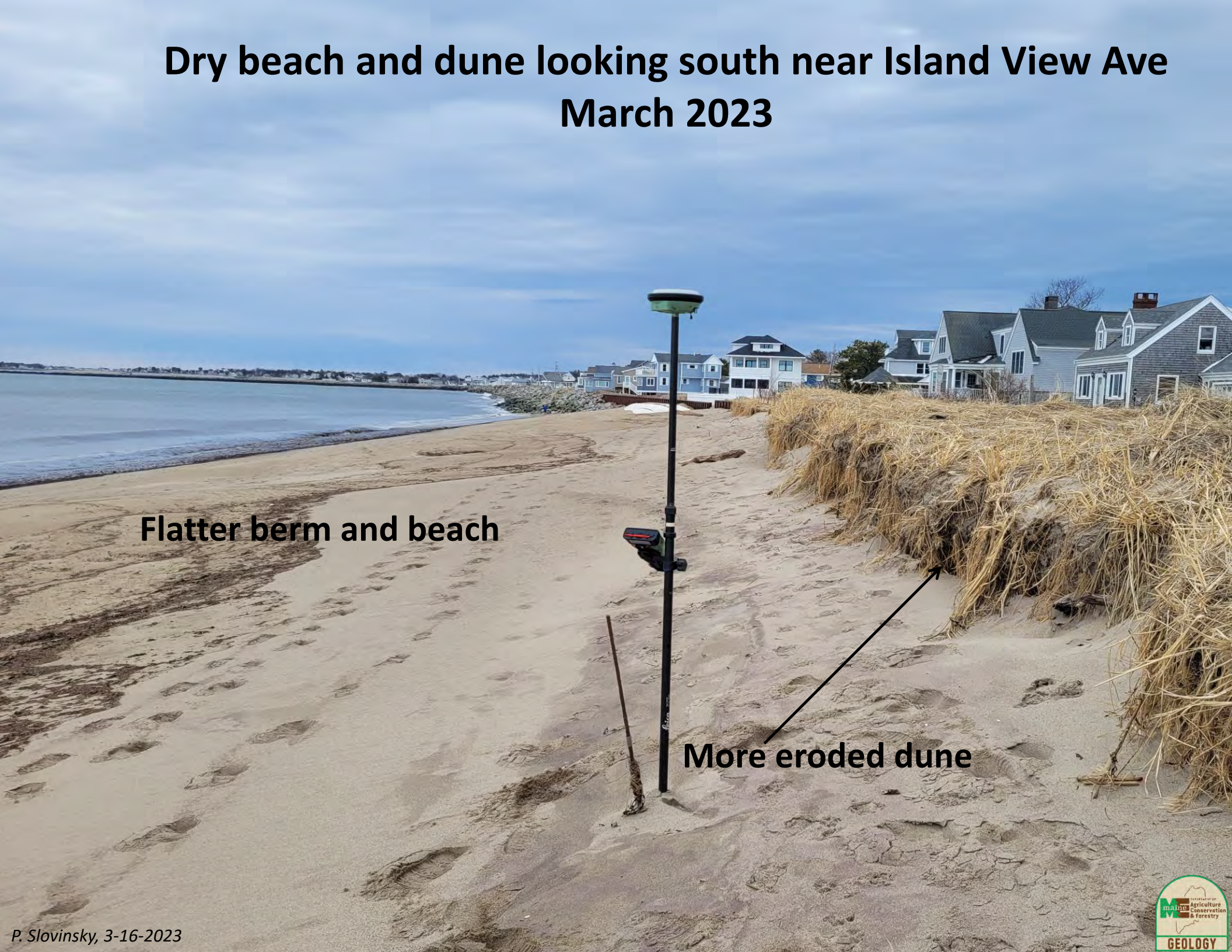
# Dry beach and dune looking south near Island View Ave March 2022

Flat berm and wide beach

Eroded dune



# Dry beach and dune looking south near Island View Ave March 2023



Flatter berm and beach

More eroded dune

# Ferry Beach Park Association Restored Dune March 2022



# Ferry Beach Park Association Restored Dune March 2023



# Looking south from the State Park March 2022





# Looking south from the State Park March 2023



# Looking north at the State Park March 2023



# Dune erosion just north of the State Park



March 2022



March 2023

# Area of dune erosion north of State Park March 2022



# Area of dune erosion north of State Park March 2023



# Area of dune erosion (north of State Park) March 2022



# Area of dune erosion (north of State Park) March 2023



# Area of dune erosion (south of seawall) March 2022





# Area of dune erosion (south of seawall) March 2023



March 2022



March 2023



# Along Seaside Ave (March 2022)



**Berm**

**Restored dune area**

# Along Seaside Ave (March 2023)



**Berm**

**Restored dune area**

# Take Home Points

- **From March to June 2022**, the dunes along the shoreline recovered nicely, with dune growth averaging close to +4 feet along the shoreline. Dune restoration efforts were evident, especially north of the seawall along Seaside Ave. There were some small pockets of erosion, between Morris and Lighthouse Avenues.
- **From June 2022 to March 2023**, storm impacts from Winter Storm Elliott were evident, with the majority of dunes showing relatively substantial erosion, with an average of -7 feet. Overwash at the Park penetrated over 100 feet, and was 30-50 feet in many areas. Erosion was worst between Island View and the State Park, and even more pronounced north and south of the seawall. End effect erosion was especially evident north of the seawall.

# Take Home Points

- **From March 2022 to March 2023**, the dunes showed a **net loss of about -3.5 feet along the shoreline**, with the most pronounced loss along the dunes between Ferry Park Ave and Morris Ave, at the State Park, and from the State Park north to the seawall.
- There was growth of the dune at the southern end of the area, near Eagle Avenue, likely due to remaining sand at the geotubes. Beyond this, it is **difficult to state that any benefits of the beach nourishment conducted in 2018 are still evident.**
- Similar to March 2022 to June 2022, we do expect significant dune recovery to occur by summer 2023.