Offshore Winds as Represented in Reanalysis

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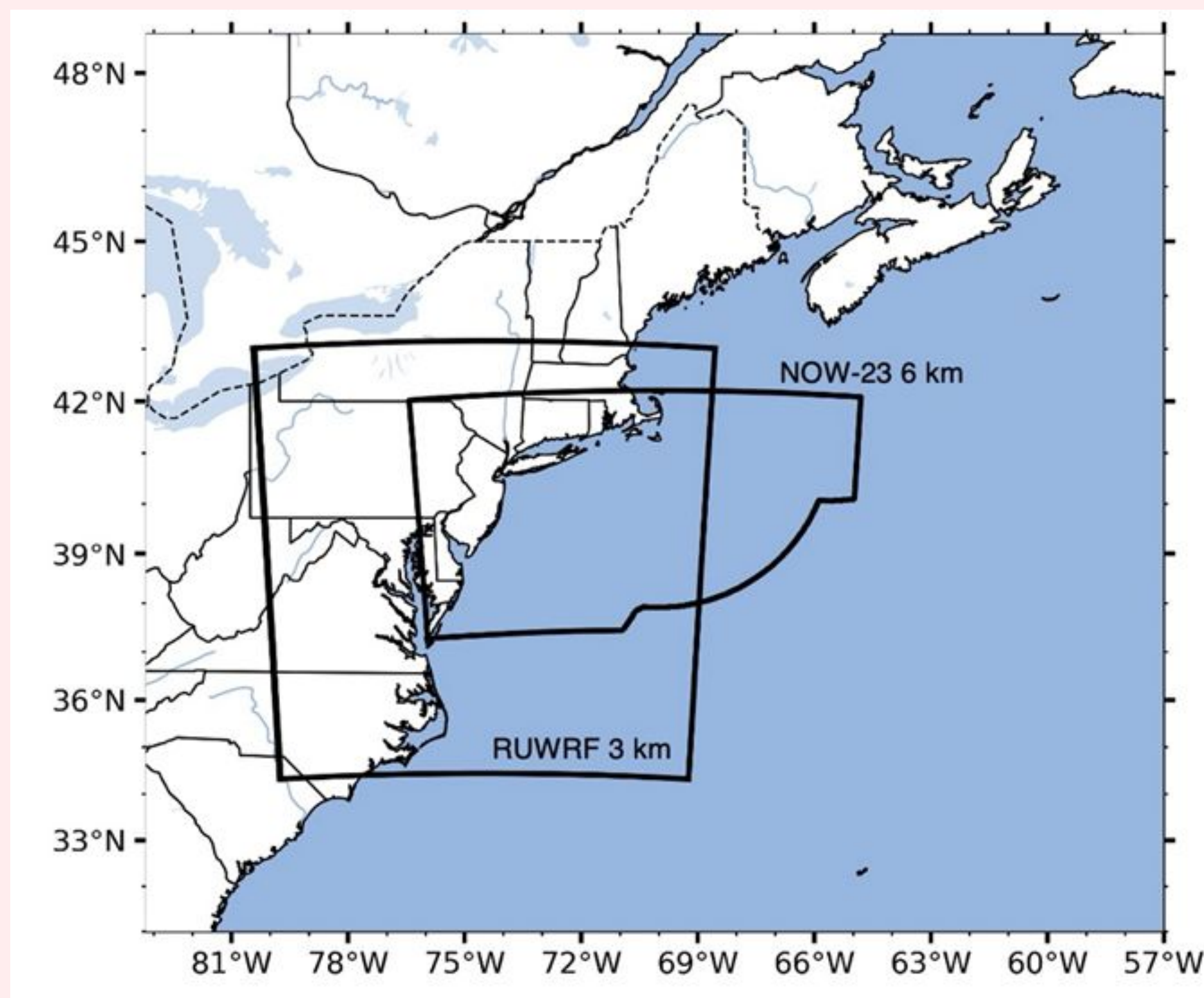
BACKGROUND

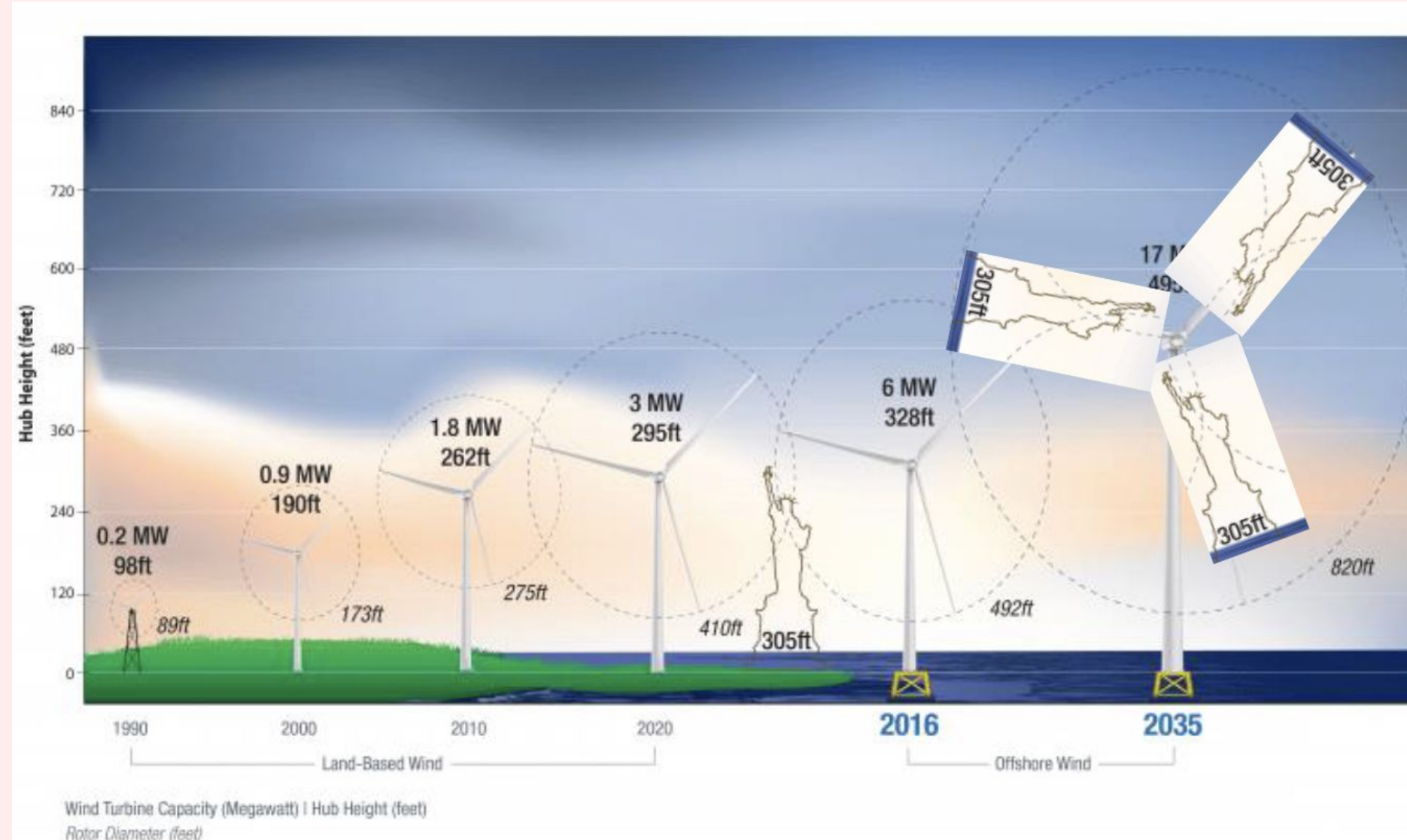**Figure 1:** Shows the are covered by the NOW-23 dataset.

Figure 2: Shows the goal wind turbine size for 2035.

- Wind goals from VA to MA, including an estimated 39 GW capacity in the MAB
- Importance of Accuracy: Accurate data on hub-height winds is crucial for optimizing turbine design, predicting energy output, and minimizing maintenance costs.

METHODS & DATA

- Reanalysis Data: 20-year dataset developed by the National Renewable Energy Lab (NREL) called NOW-23
- The focus is on assessing long-term wind trends at the 160m level to examine how wind patterns in turbine areas vary.
- Limits: There are significant uncertainties in measuring and modeling hub-height winds due to limited observations, especially at long-term climate scales
- Findings are expected to offer insights into boundary layer dynamics, enabling more accurate forecasting
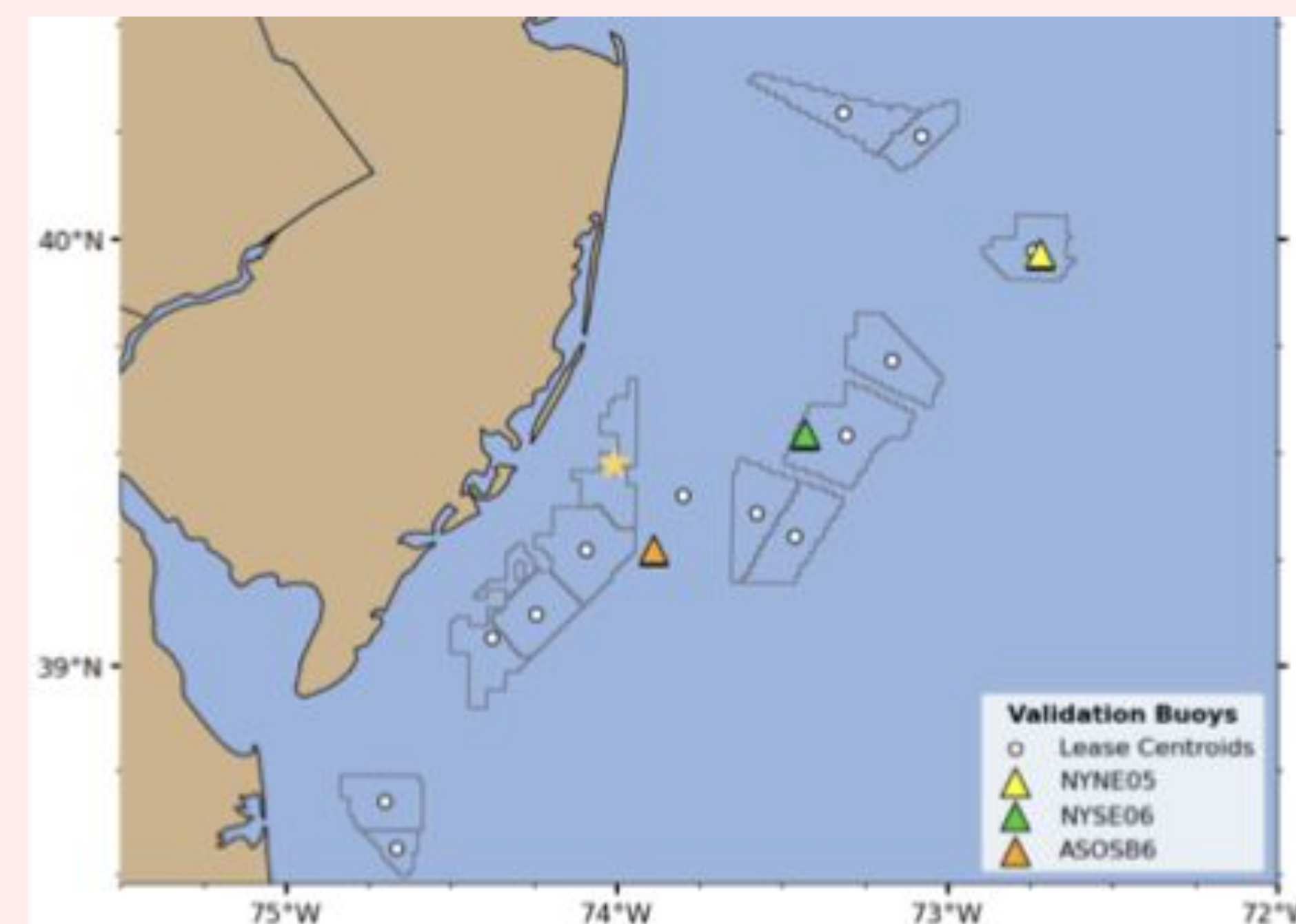

Figure 3: Shows the lease area under analysis.

PRELIMINARY RESULTS

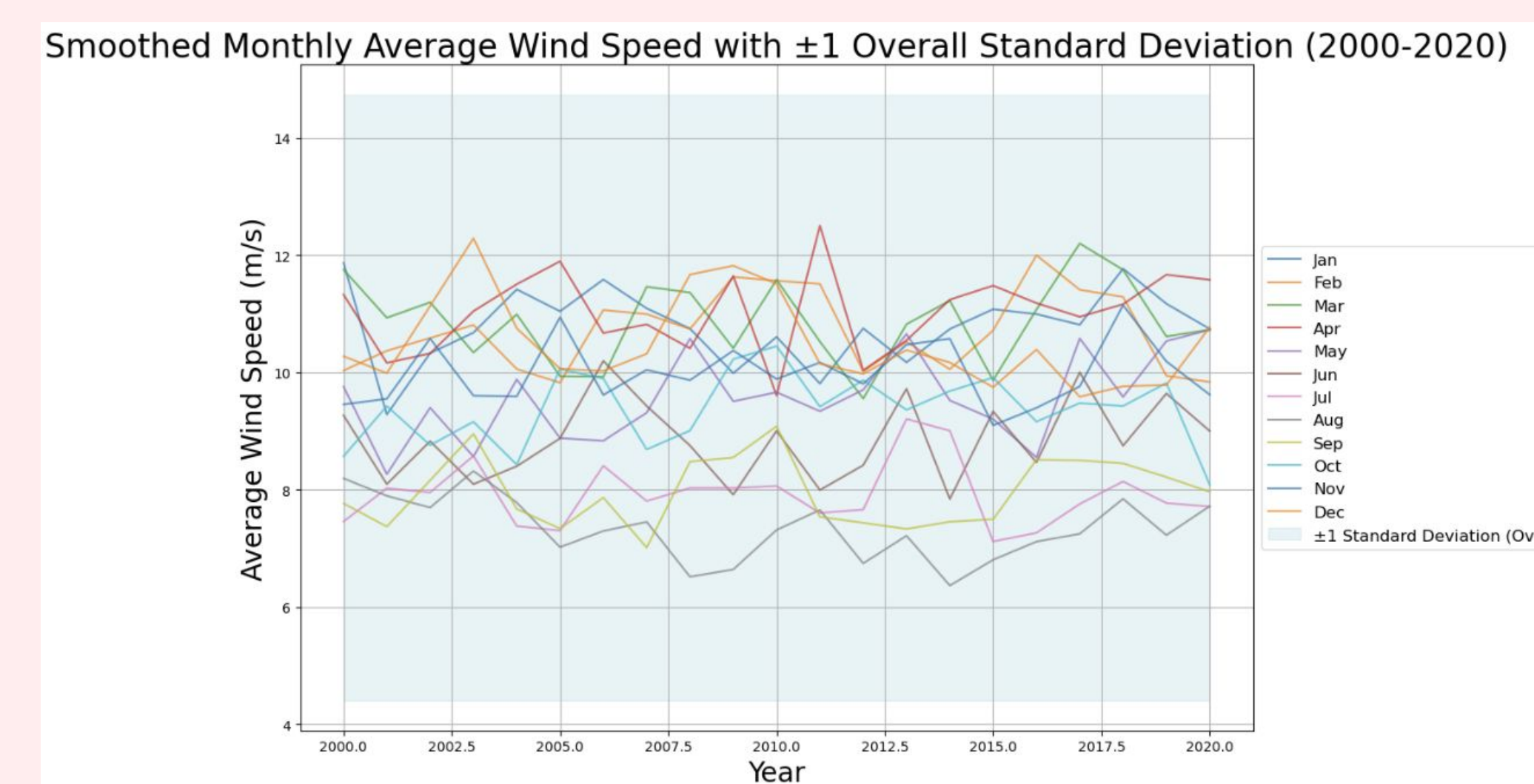### Average Wind Speed for Each Month

Figure 4: Shows the smoothed monthly average wind speed from 2000-2020 with the standard deviation.

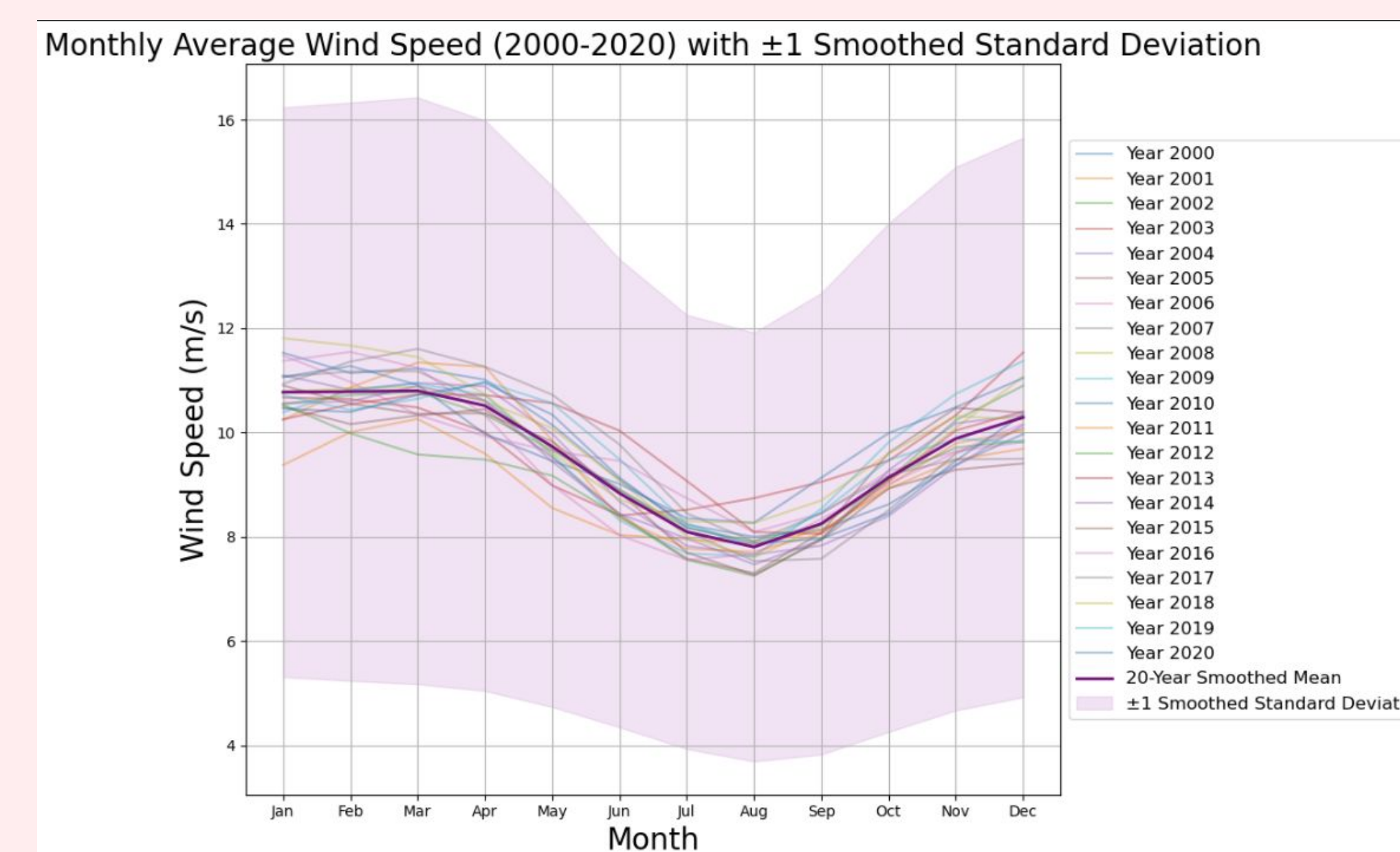### Monthly Average Wind Speed (2000-2020)

Figure 5: Shows the average wind speed from 2000-2020 across all months.

CONCLUSIONS

- Further research is being done to analyze the power output given by the turbines at the observed wind speeds.
- The analysis of wind speed variability over the 20-year period provides critical insights that can be leveraged to refine predictive models for energy production. This allows for more efficient energy planning and contributes to the strategic integration of offshore wind energy into the regional power grid.
- The examination of long-term wind trends offers valuable data for understanding the impacts of climate variability on wind energy potential.

ACKNOWLEDGEMENTS

REFERENCES