Visual Impact Assessment - Offshore Wind

The goal of visual impact assessment as it relates to offshore wind, is to determine whether the seascape and coastal landscape can absorb the visual change resulting from the installation of wind turbines and associated infrastructure, without significantly affecting scenic quality or viewer enjoyment.

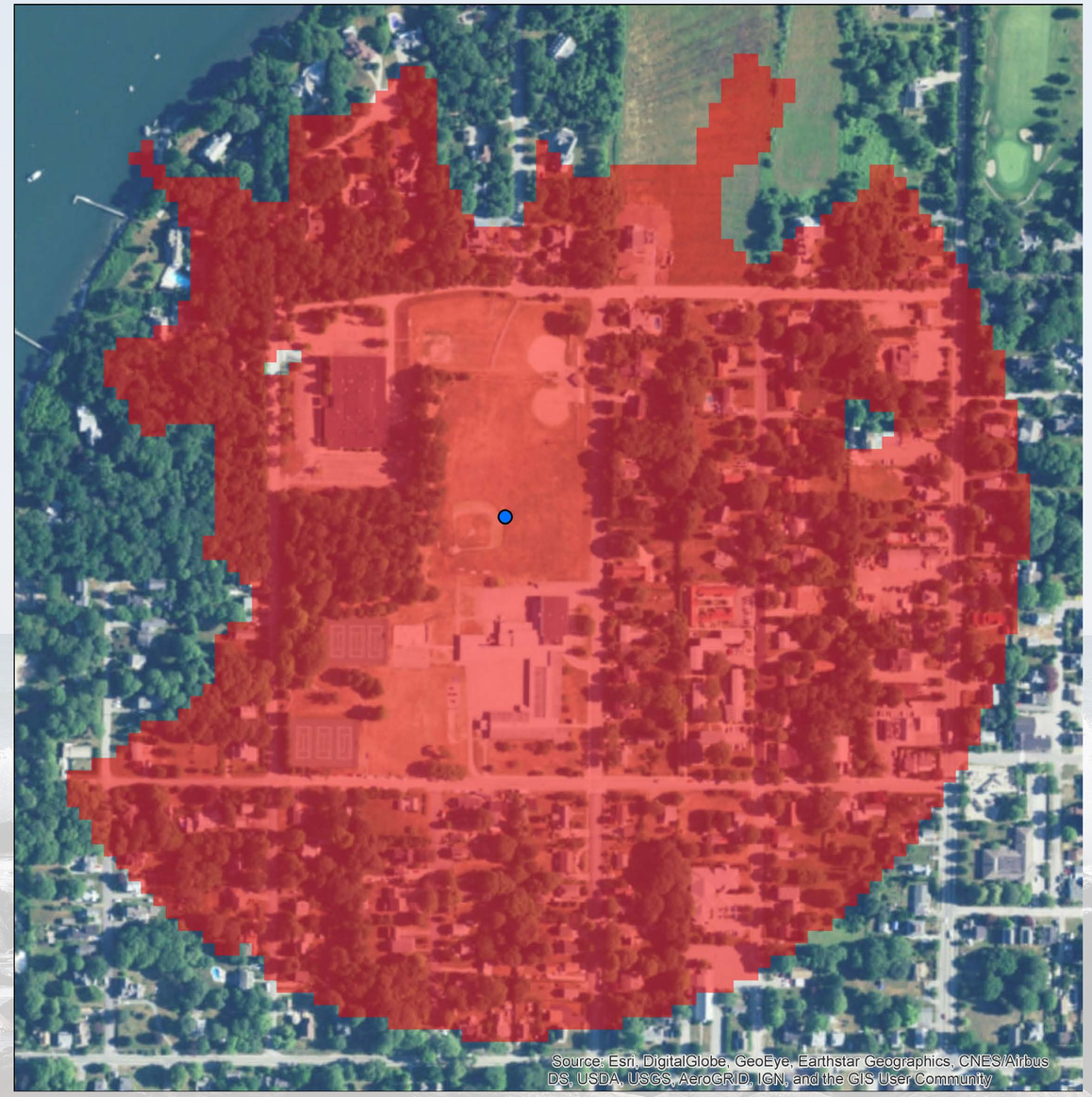
Visual Impact Assessment is not subjective (i.e. in the eye of the beholder). It is a detailed scientific process designed to apply values to aesthetic changes.

We will touch on the overall VIA process briefly, but the focus of this presentation will be on visualization techniques used in the overall analysis.

Visual Impact Assessment Process:

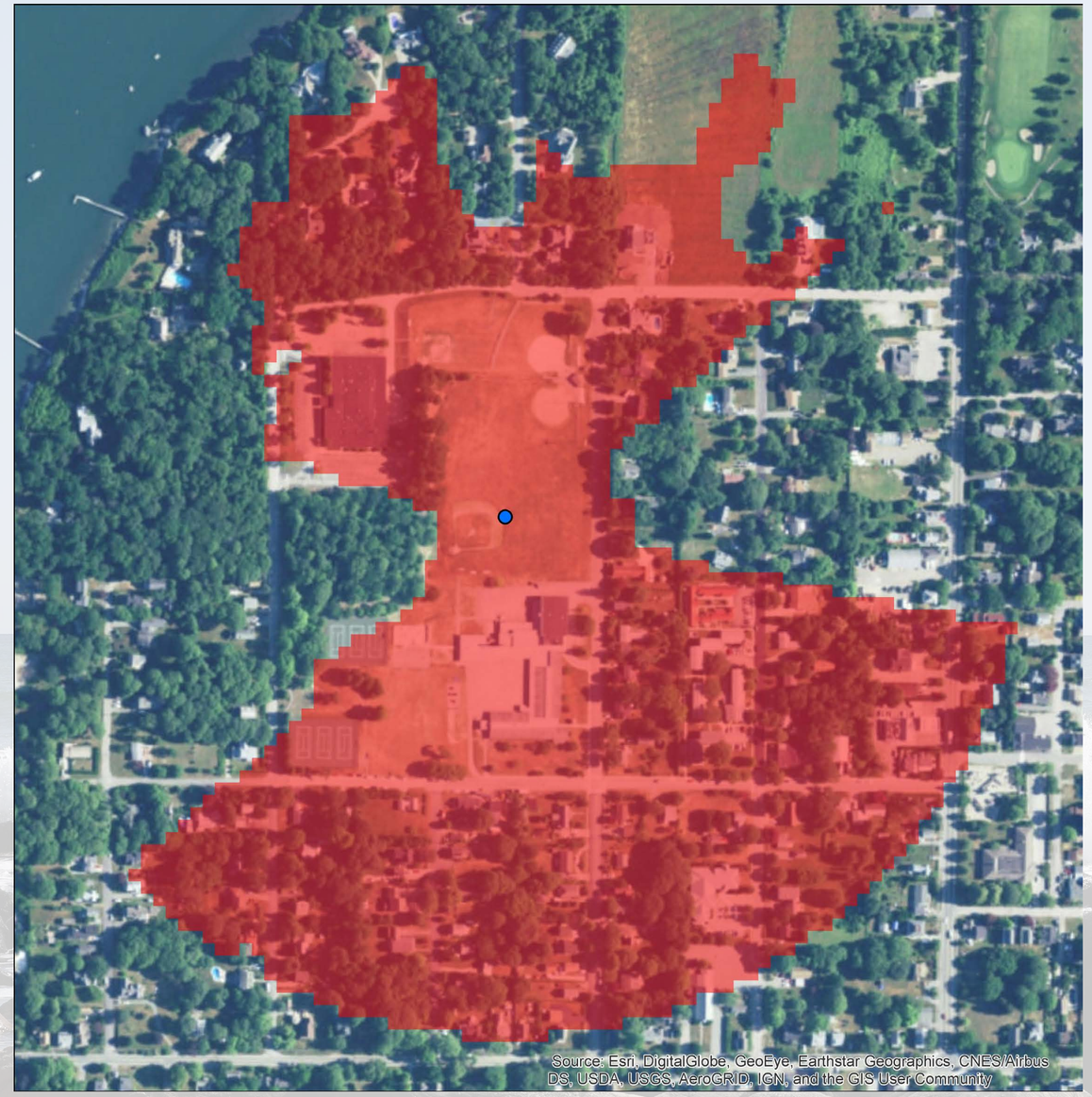
- **Establish the Area of Potential Effect (APE) through the use of viewshed analysis and distance models.**
- Determine the stakeholders, solicit input, and establish ongoing communication (throughout the entire process).
- Research and map visually sensitive resources in partnership with cultural resource experts and stakeholders (Section 106 Considerations).
- Identify Landscape Similarity Zones (LSZ).
- Identify potential Key Observation Points (KOP).
- **Field photography, survey, and videography.**
- **Line of sight cross sections and curvature of the earth models.**
- **Visual simulations.**
- Professional rating panel.
- Reporting, results, and mitigation.

Traditional Viewshed Analysis



- Viewshed analysis is the first step in determining the APE.
- Desktop analysis designed to establish potential baseline geographic visibility.
- Of 125 acres in the study area 97.6 acres may have potential visibility.
- 77.5% percent of the study area requires some level of further Investigation to determine actual visibility.

Traditional Viewshed Analysis



- Adding NLCD vegetation reduces the visible area.
- Of 125 acres in the study area 68.3 acres may have visibility.
- 54.3% percent of the study area requires some level of further Investigation to determine actual visibility.

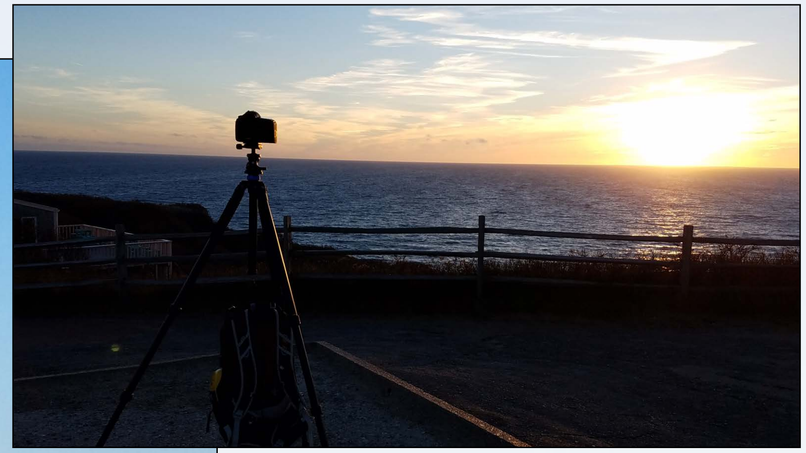
Advanced Viewshed Analysis

- Lidar has significantly increased the accuracy of viewshed analysis.
- Of 125 acres in the study area 11.5 acres may have visibility.
- 9.1% percent of the study area requires some level of further investigation to determine actual visibility.

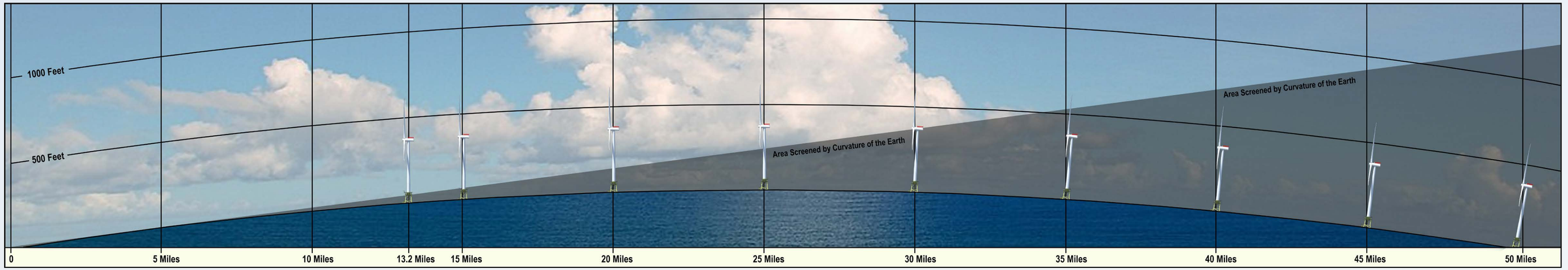
Advanced Viewshed Analysis

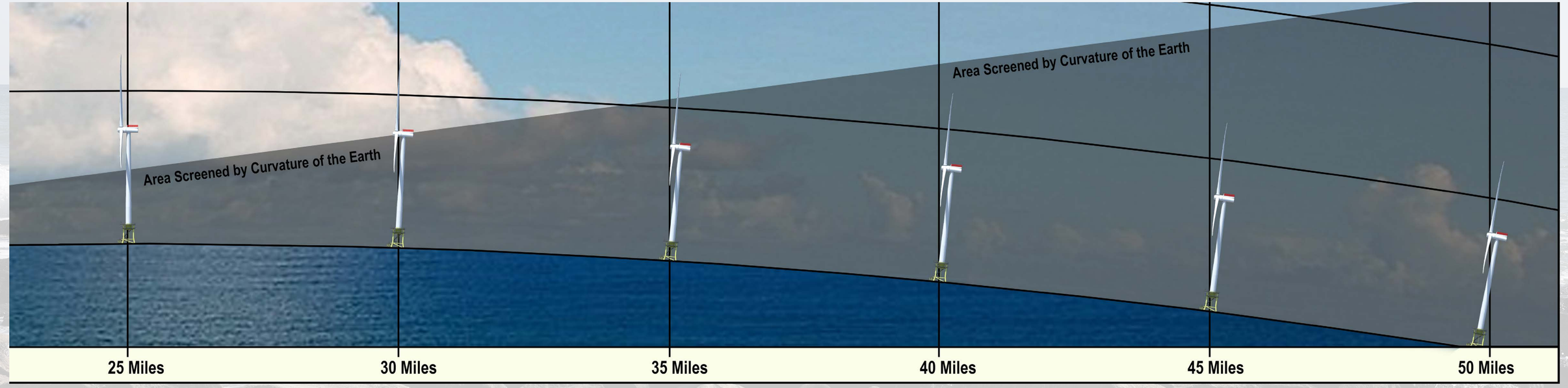
Field Verification - Cultural Significance, Historical Significance, Setting, and Sense of Place

Field Verification



Curvature of the Earth





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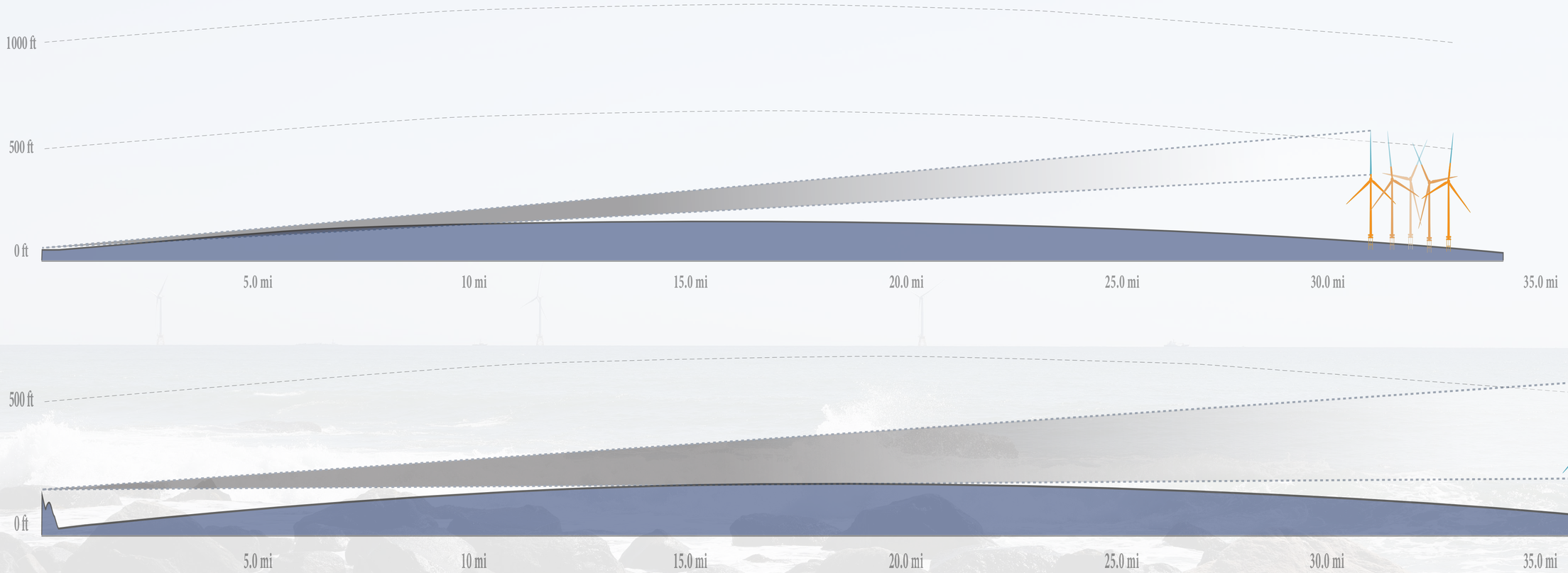

- Curvature of the earth becomes a major factor in screening wind turbines beyond 20 miles when viewing from beach level.
- Elevated views can extent the line of sight substantially.

- When viewing turbine at such distances, even on clear days, they are incredibly difficult to decipher on the horizon under most conditions.

- Exceptions do occur, but these events last for a couple of minutes during very specific atmospheric conditions.

- And at nighttime.


50 MM


500 MM


50 MM

What have we learned from the Block Island Wind Farm

- Verification of theoretical models dealing with curvature and atmospheric refraction.
- Excellent opportunity to gather public opinion.
- Beyond 20 miles, the Block Island Wind Farm becomes difficult to discern to the average viewer.
- Elevated views are have the highest probability of visibility.
- Turbine movement is difficult to discern over long distances.
- FAA signals are the most visible component from shore (nighttime).
- Coast Guard signals are of minimal visual concern due to earth curvature and diminishment over distance.
- Long distance viewing is impacted by slight atmospheric changes, waves, and background sky color.

Now What?

- Formal public surveys.
- Rating panel review.
- Increasing the realism of simulations.
- Atmospheric/visibility monitoring.

Thank You