



National Aeronautics and
Space Administration



Wind Event Warning System

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March 29, 2024

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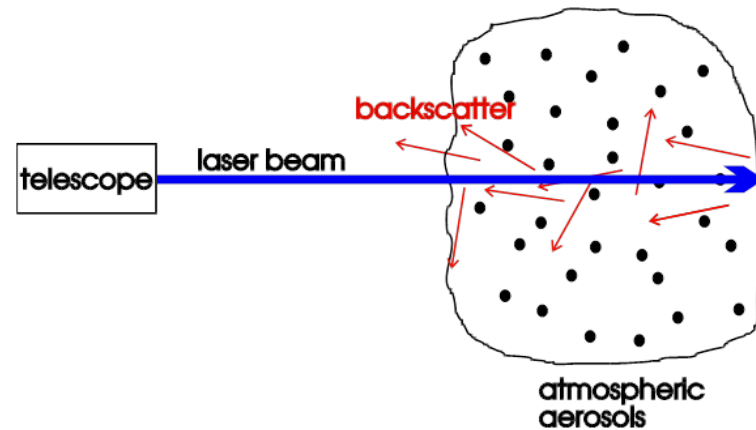
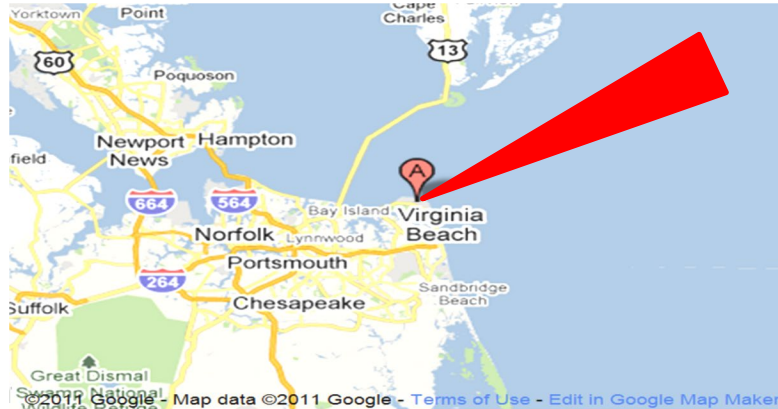


- Lidar concept to give a predictive capability for oncoming hazardous wind events.
- Warning time of 10-30 minutes can be possible to take protective action against strong wind gusts, shear, storm fronts, etc.
- Also, prediction can be made for wind farm power output change to help balance the power grid.
- Cost benefit:
 - avoiding catastrophic damage to turbines
 - optimizing electrical grid power supply





Example Wind Lidar Experiment for Virginia Offshore Wind



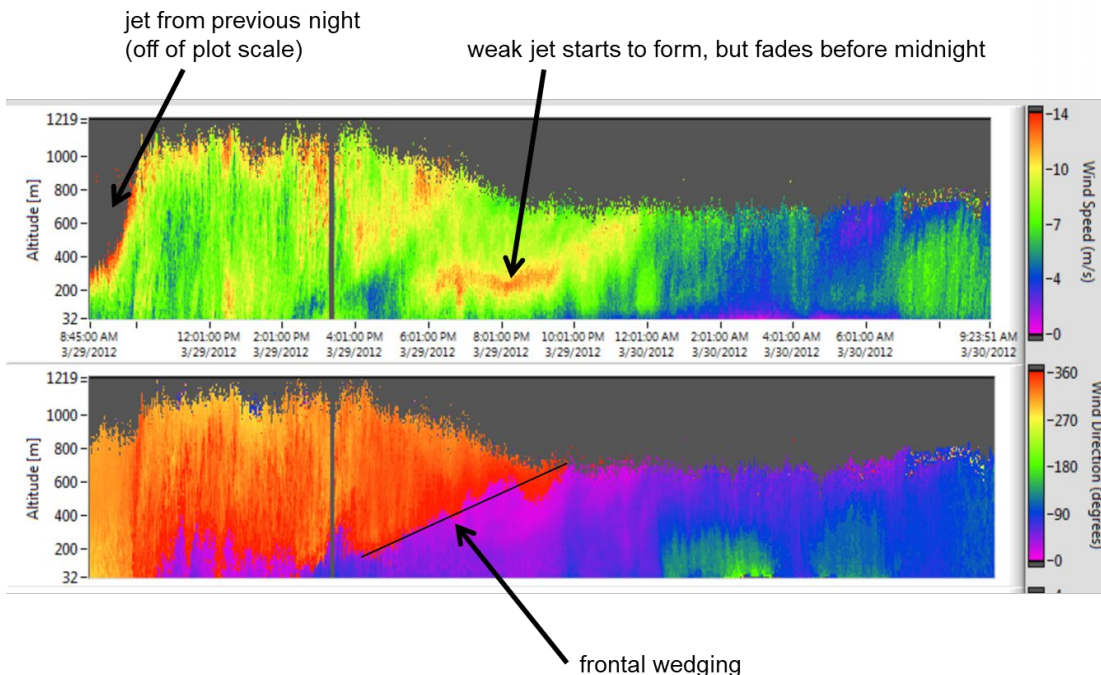
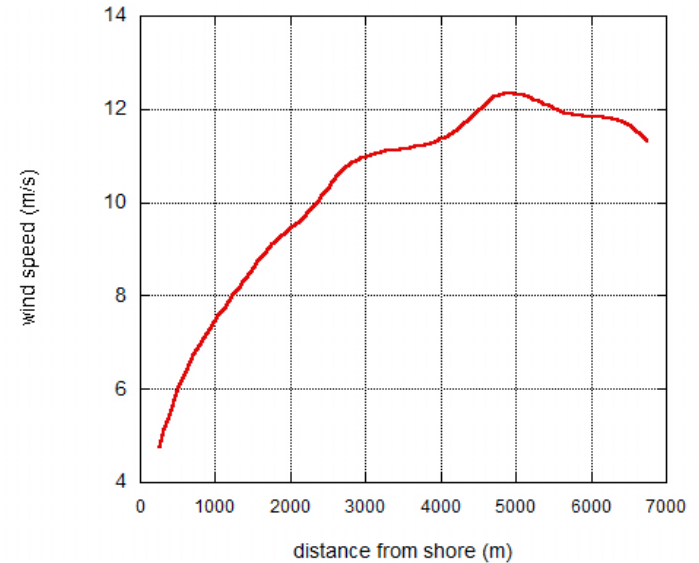
wind lidar measures Doppler shift from motion of aerosols



lidar position at Fort Story

Data examples are on following slide.

- Prior experiments were aimed simple measurement of wind speed and direction.
- Predictive capability for wind events became apparent and formed the WEWS patent concept.
- Initial licensing discussions indicated that instrument cost was likely prohibitive for many applications.
- Recent years have re-designed the lidar instrument for significantly lower cost, based on using fiber lasers.



Data Simulation of Wind Event Warning

