THE UNIVERSITY OF MAINE

PhOG School of Marine Sciences University of Maine

ADVANCED STRUCTURES & composites center

DeepC LiDAR™

Offshore Wind Resource Assessment Buoy

First floating LiDAR buoy validated in the US providing bankable wind speed data at hub height, metocean data, and ecological monitoring services

High quality, low-cost offshore wind resource data:

- 1/10th the cost of traditional meteorological tower for wind resource assessments
- Deployable in virtually any water depth
- Capable of providing bankable wind speed data up to 200 m above sea-level
- Fully-integrated metocean sensor package provides wave and current data
- Optional ecological monitoring sensor package for permitting efforts developed with the Biodiversity Research Institute

Technical Overview:

LiDAR:
- **Windcube® Offshore, measures wind speed at 40 m - 200 m heights**
- **GLGH Stage 3 acceptance for use in formal wind resource assessment campaigns**

Other Sensor Packages:
- **Metocean: wave, wind, and current**
- **Ecological: acoustic, bird, bat, and fish**

Hull Type and Construction:
- **Aluminum, 3 m discus buoy, fully seal welded with main central hatch for all data and power control electronics**

Telemetry:
- **GOES, CDMA/GSM, IRIDIUM**

Mooring:
- **Shallow water: chain with gravity anchor**
- **Deep water: chain/wire/chain with gravity anchor**

Power:
- **System is autonomous, deployable for 1 year without regular maintenance**

Partially Funded By:

U.S. DEPARTMENT OF ENERGY

mti Maine Technology Institute

For more information, contact: Dr. Anthony Viselli, Manager, Offshore Model Testing and Structural Design
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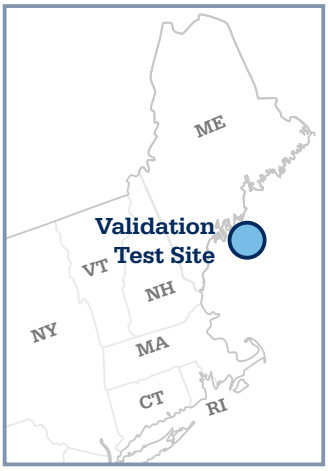
Successful 6-month Validation of DeepCLiDAR in the Northeast US



Sample DeepCLiDAR Wind Measurement Performance Against Carbon Trust Roadmap Key Performance Indicators		
	Definition / Rationale	Acceptance Criteria
X_{mws}	Mean Wind Speed - Slope Tested for two speed ranges: a) >0.0 m/s b) 4.0 to 16.0 m/s	Best Practice: 0.98 – 1.02 Results: a) 0.998 – 1.008 b) 0.998 – 1.013 Passed for both speed ranges
R^2_{mws}	Mean Wind Speed – Coefficient of Determination Tested for two speed ranges: a) >0.0 m/s b) 4.0 to 16.0 m/s	Best Practice: ≥98% Results: a) 0.988 – 0.994 b) 0.988 – 0.994 Passed
M_{mwd}	Mean Wind Direction - Slope Tested for two speed ranges a) >0.0 m/s b) 4.0 to 16.0 m/s	Best Practice: 0.97 – 1.03 Results: a) 0.985 – 0.989 b) 0.985 – 0.987 Passed

Easily Deployable

AWS Truepower™
Where science delivers performance.

Validation Testing Conclusions

"Based upon the results of this test, and cumulative results of the two previous phases, AWST concludes that the DeepCLiDAR meets the Carbon Trust's acceptance criteria, and is capable of accurately measuring wind speeds and directions across the range of meteorological and ocean conditions observed during the campaigns.

Having successfully completed these validation exercises, the DeepCLiDAR has demonstrated a "Pre-commercial" level of maturity. Sufficient performance data are now available to assess the system's uncertainty when operating in similar environmental conditions.

AWST considers this system valid for use in an offshore wind resource and design condition assessment campaign in similar metocean conditions."

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