Oceanographic measurements in offshore wind farm 'alpha ventus'

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Overview

- Oceanographic devices and measurements in ,alpha ventus'
- Benefits
- Future plans



Oceanography and offshore industry



WHY?

- Ecological approach
- Economical approach
- Philosophical approach

HOW?

Experience

- Devices
- Infrastructure
- Cooperation
- Data



German Bight



Installed power

2015 >2GW

2020 **7.6GW**

2030 26GW



Oceanography at ,alpha ventus'

Current measurements

- ADCP AV0 (onl.)
- ADCP AV04 (aut.)
- ADCP AV07 (aut.)
- ADCP FIN01 (onl.)

Sea state (waves, water level)

- 2 Wave Rider buoys (FINO1 & Park)
- AWAC ADCPs
- RADAC AV0
- Radar gauge AV04 & AV07

Campaign and other BSH measurements

- Acoustic profiling
- CTD, oxygen, turbidity







Currents





Daily circulation pattern in German Bight

- Strong tidal currents
- Variable wind fields
- Seasonal variability













Currents



Current velocities during a few days at AV07



Currents



ADCP deployment measurement campaign in *alpha ventus*







German Bight

- Windsea W-NW
- Swell NW
- Seasonal variability
- Extreme waves







Sea state - Logistics





Secure boarding of offshore structures

Significant wave height < 1.3 m





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BSH Measurements





- Take existing stations
- Combine with alpha ventus data base
 - Deploy additional devices
 - Add data from other wind parks

 \rightarrow make it accessible to operators, scientists and modellers





Oceanographic measurements

- Direct input for operators and manufacturers for planning and building offshore structures
- Optimization of **logistics** during operation and maintenance
- Databank based Products (online data, forecasts)
- Quality controlled data
- Data support for sub-projects
- Extended data input for modelling



Project RAVEocean

- Direct input for operators and manufacturers for planning and building offshore structures
- Optimization of **logistics** during operation and maintenance
- Databank based Products (online data, forecasts)
- Quality controlled data
- Data support for sub-projects
- Extended data input for modelling
- Measurement service, Inspection

Thank you for sitting this through







BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE





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Things in need / to improve

- Delivery of high quality current and sea state/wave data/spectra
- Foundation of better wave and current prediction models
- Cooperation with other operators/wind parks
- Useful product development for logistics and maintenance
- On-site data support during operation (installation, inspection)