

WERA Wave Mapping



“WERA-Wave-Map”

provides gridded wave data:

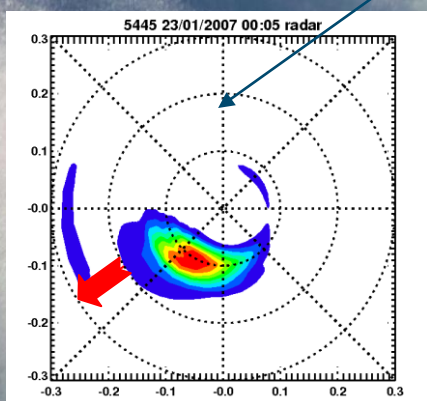
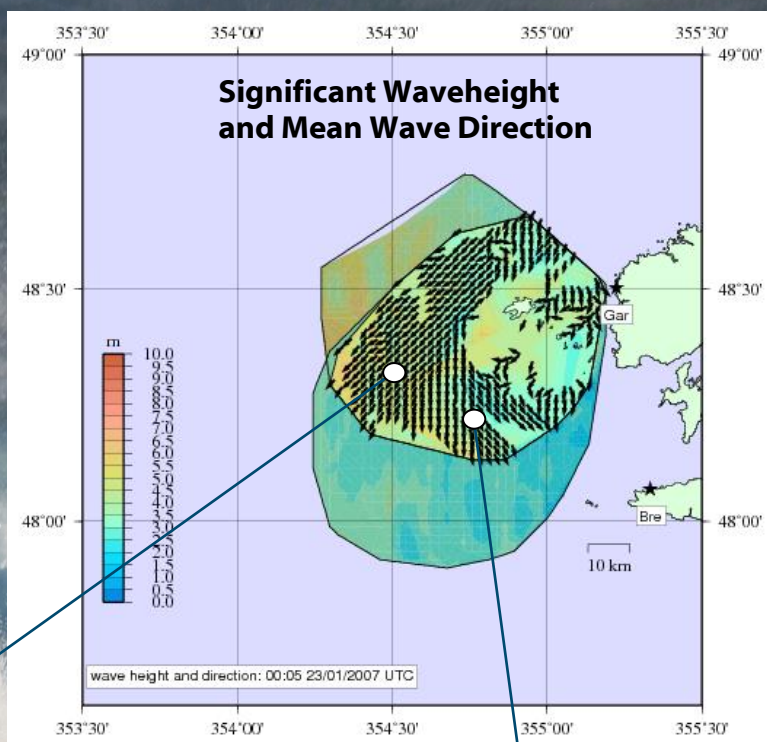
- Significant Waveheight
- Mean Wave Direction
- Time-series for individual grid cells

Optional:

Full Directional Wave Spectra and derived parameters for selected locations with

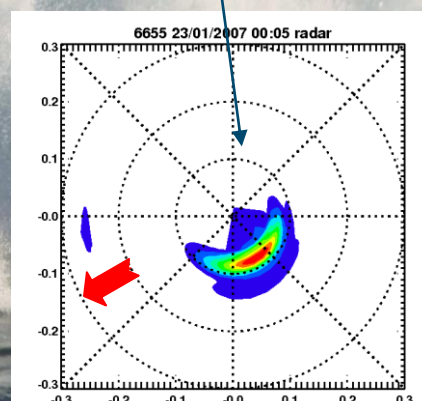
WERA-Synthetic Wave Buoy

or for all locations with the **WERA-SV-Wave-Grid** package powered by **Seaview Sensing Ltd.**



Wave Energy is aligned with the wind

“Synthetic-Wave-Buoy”
Provides Directional Wave Spectra and wind direction from selected user-defined locations



Waves are not aligned with the wind

Wave measurements with WERA in Brittany, France (courtesy of SHOM)

Always a wavelength ahead !



WERA provides accurate and reliable data as required for wave monitoring networks

Array type WERA Systems

Provide significant waveheight and mean wave direction within area of overlapping signals from two stations, see figure on the right. This software package is included in the standard WERA oceanographic tool box.

Time series are provided by the optional WERA data viewer.

The range in azimuth depends on the number of antennas, 60° can be achieved with 8 antennas and 100° with 16 antennas.

Additional Wave processing packages

The **WERA Synthetic-Wave-Buoy** software package provides at selected, user-defined locations directional wave spectra and time series of derived parameters such as significant waveheight, peak period, peak direction as well as wind direction, see figures on front page.

The **WERA-SV-Wave-Grid** package provides directional wave spectra at all grid cells within the overlapping radar ranges and time series of derived parameters. This software package (provided in association with Seaview Sensing Ltd.) is available as real-time or offline version.

Integration into Data Management Systems

The WERA-Data-Viewer displays the actual data and allows easy access to time series. Export of data in various formats is available for maps, data and time series.

Technical specification

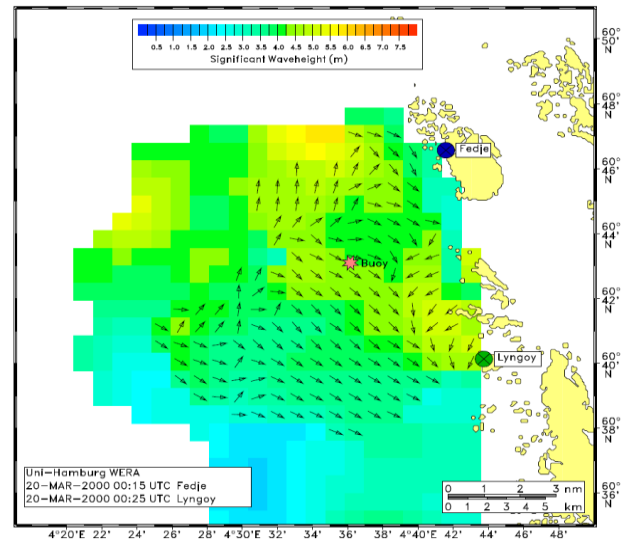
Range: 10 – 150 km (50 – 5 MHz)
 Spatial Resolution: 300 – 3000 m (typical 3% of range)
 Temporal Resolution: 15 – 60 min

Accuracy (compared with WaveRider buoy):
 Significant Waveheight: scatter index 15 % rms 36 cm
 Mean Wave Direction: rms 23°
 Mean Wave Period: scatter index 8 % rms 0.85 sec

The limits of accurate wave measurements depend on the operating frequency (range) of the WERA system.

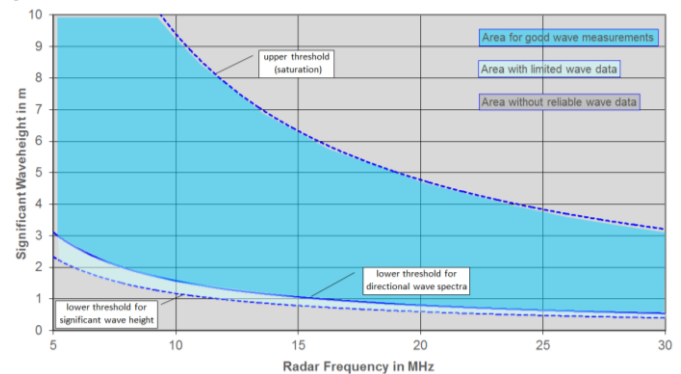
Applications of Wave Data

- Planning Offshore installations
- Information for Operational Services of Offshore Installations
- Harbour Authorities and Vessel Traffic Services can provide more reliable data and forecasts
- Meteorological and Oceanographic Research



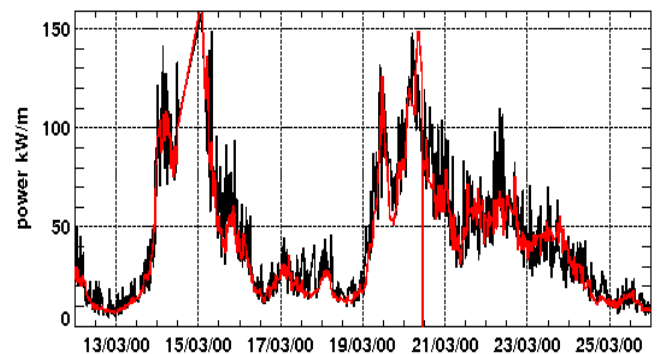
Wave field measured with 27 MHz WERA system at Norwegian coast near Bergen using the standard WERA tool box

Limits for Wave Measurements



The upper measurement limit and lower threshold are increasing with longer ranges (lower radar frequencies).

Time Series of Wave Power



Comparison between radar (black) and buoy (red).
 Correlation coefficient = 0.91, rms difference = 13.2kW/m
 Data are kindly provided by Seaview Sensing Ltd.