

Forecasting and hindcasting wave conditions in Norwegian areas



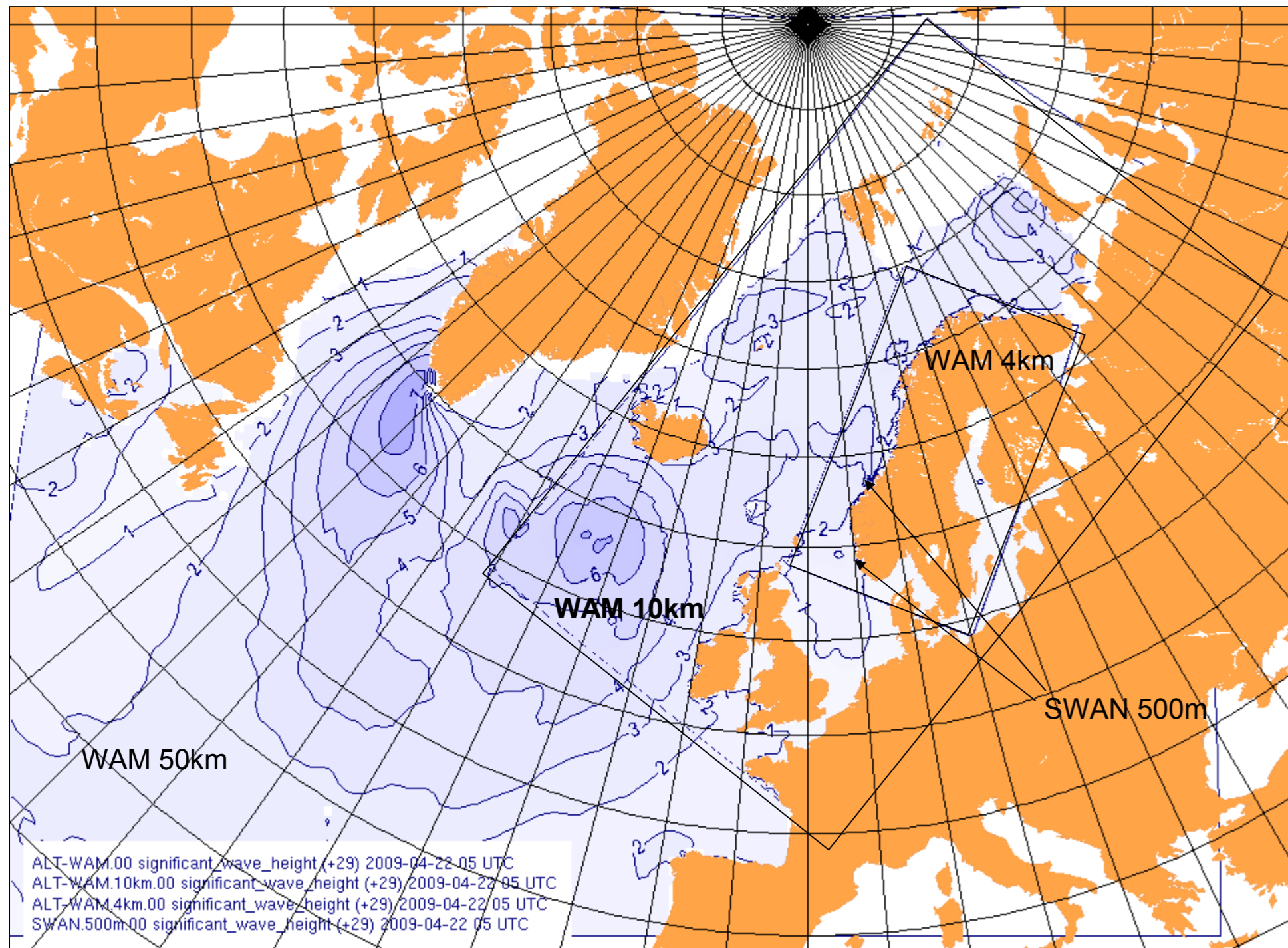
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Norwegian Meteorological Institute - met.no

11th Workshop for Wave Hindcasting and Forecasting Halifax, Canada, Oct 18-23, 2009

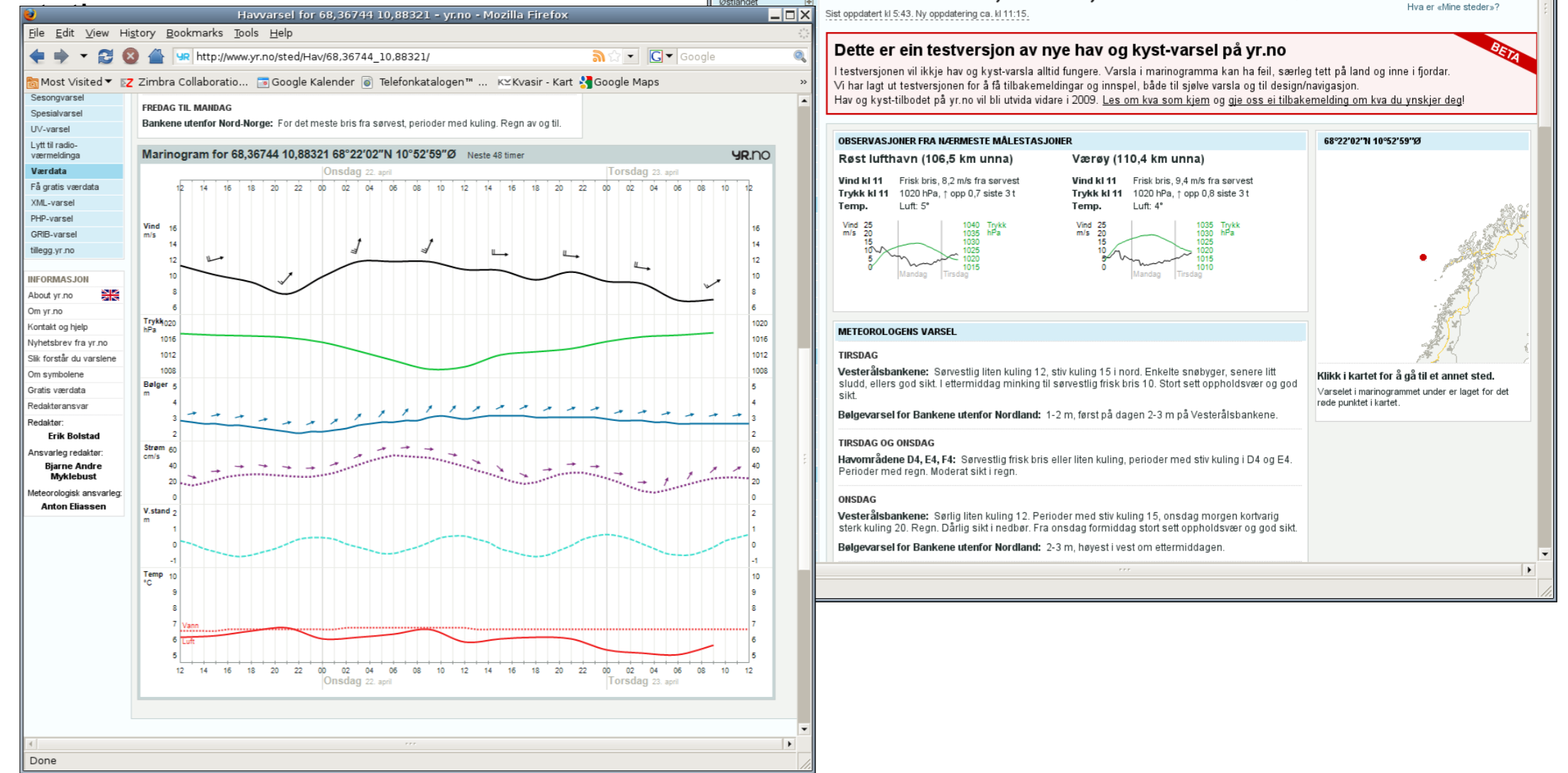
Also shown at WISE meeting Apr 26-30, 2009 Ensenada, Mexico

The operational suite for wave forecasting at met.no



Products available at yr.no

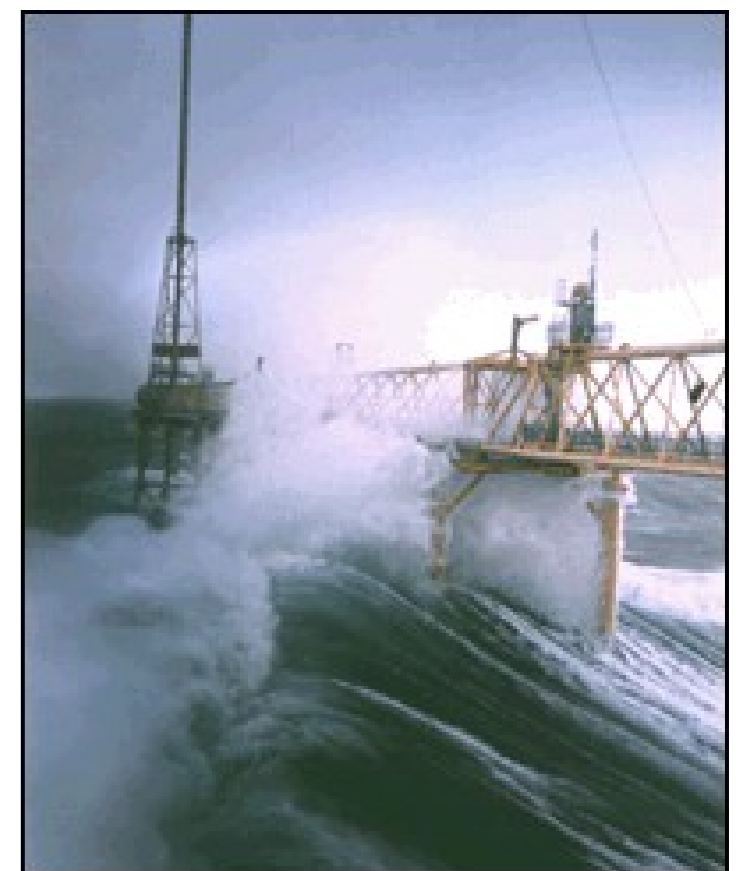
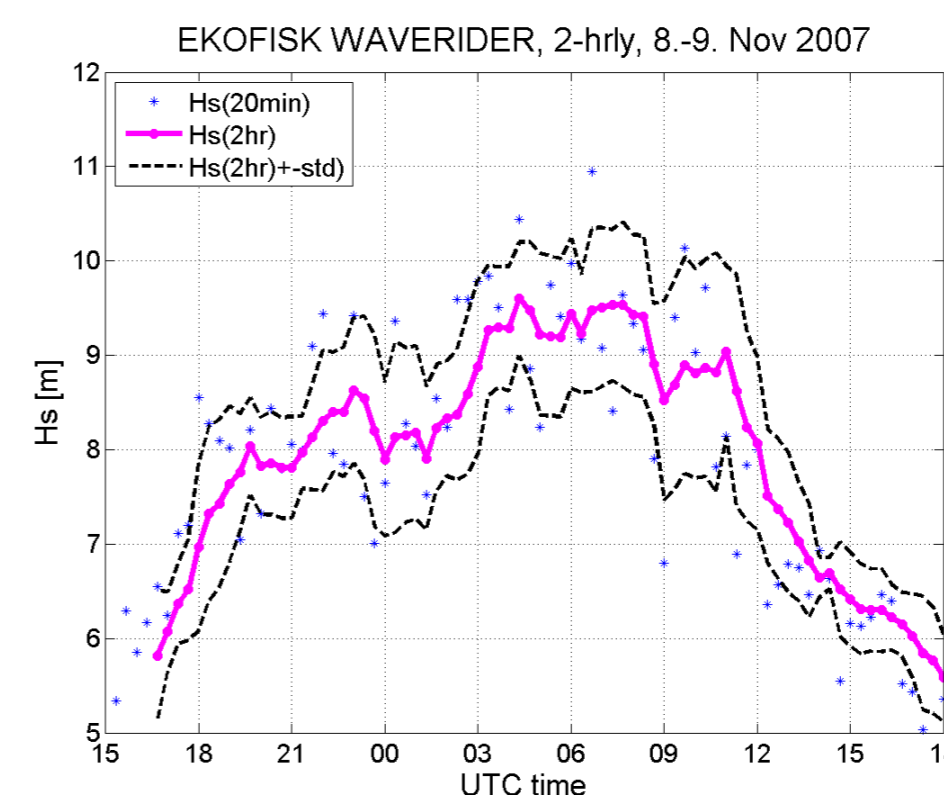
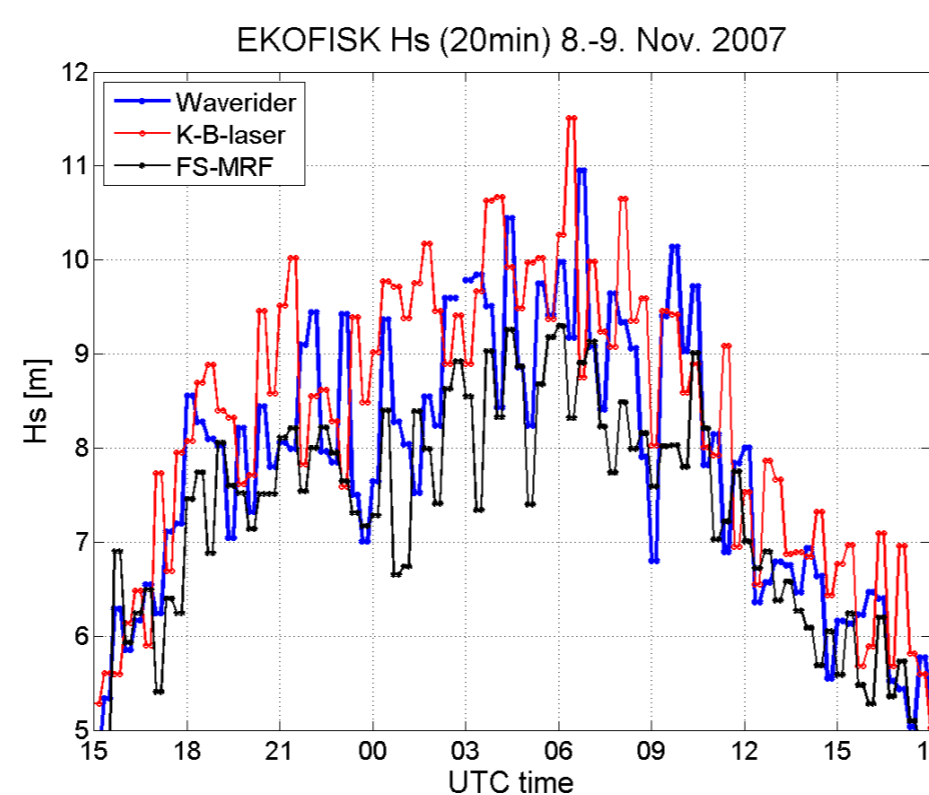
Click at any point offshore and get a.o. forecasts of standard parameters and observations from the closest



Observations - Importance of quality and understanding variability



Observations of Hs from three different sensors at Ekofisk during the Andrea storm 09.11.2007 and the effect of using two-hourly average on Waverider data (maximum decreases from 11 to 9.5m).



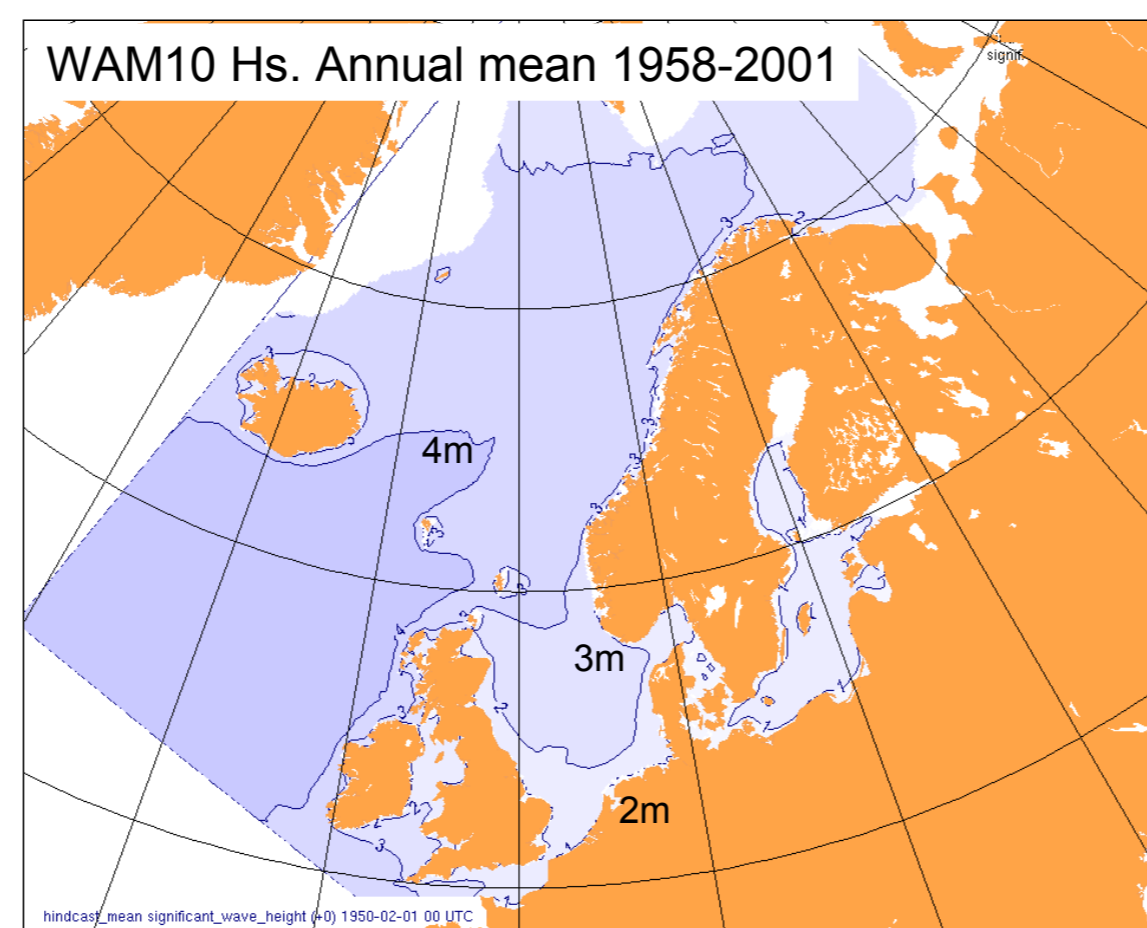
Ekofisk 29.01.2000
Sea spray on laser instrument.

The Hindcast Wind and Wave project

The new hindcast database is a three-hourly set of atmospheric data, e.g., wind, air pressure, air temperature, humidity and precipitation as well as wave parameters for all grid points (10km resolution)

2-D wave spectra are stored for selected grid points. The new archive covers the ERA40 period, September 1957 – August 2002.

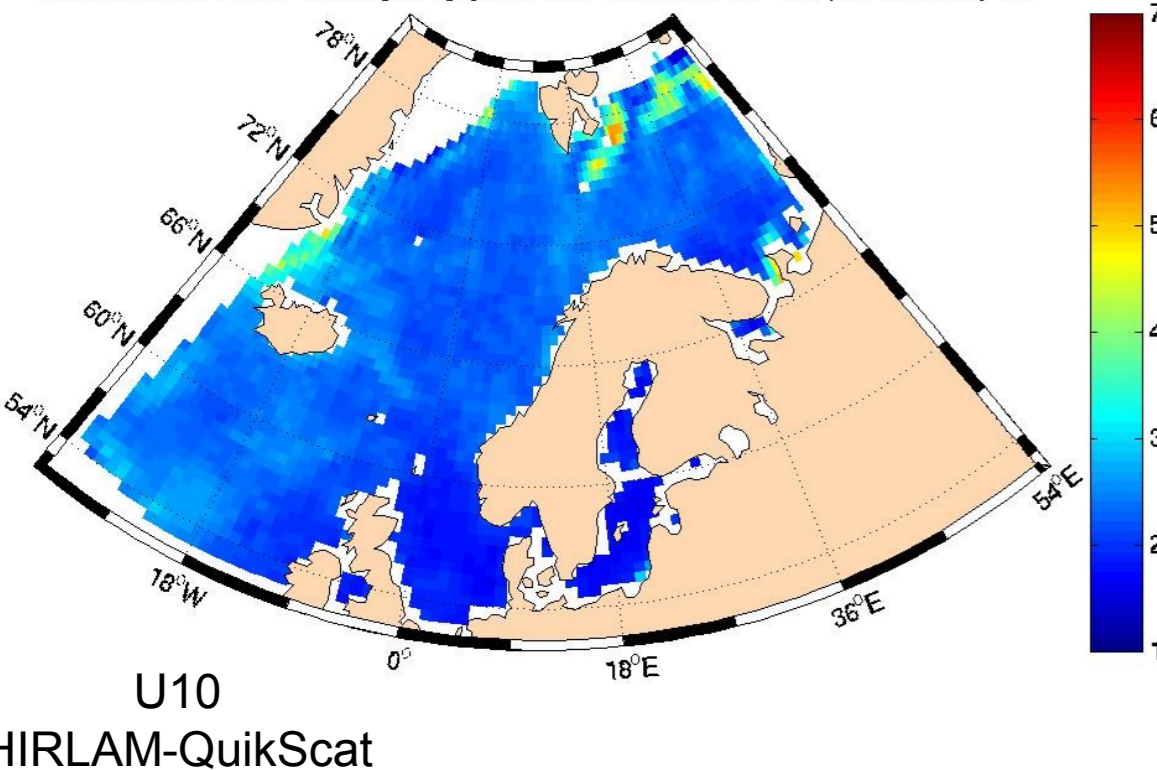
The project will be supplemented with ECMWF forecasts as forcing data for the time after 2002.



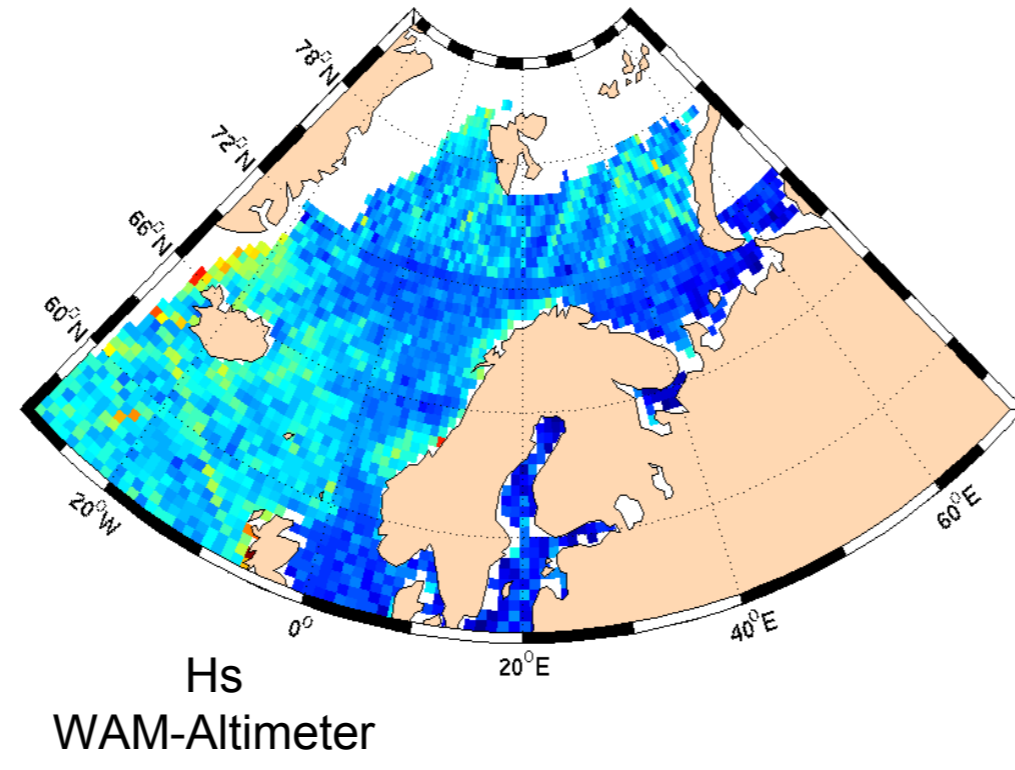
Verification against satellite wind and waves (below) and observations (example from Ekofisk).

	N	Mean	St.dev	Mean abs. difference	RMS difference	Corr. coefficient	P90	P95	P99
Obs.	28642	2.12	1.25				3.8	4.5	6.1
Model	28642	2.11	1.31	0.25	0.35	0.97	3.9	4.7	6.3

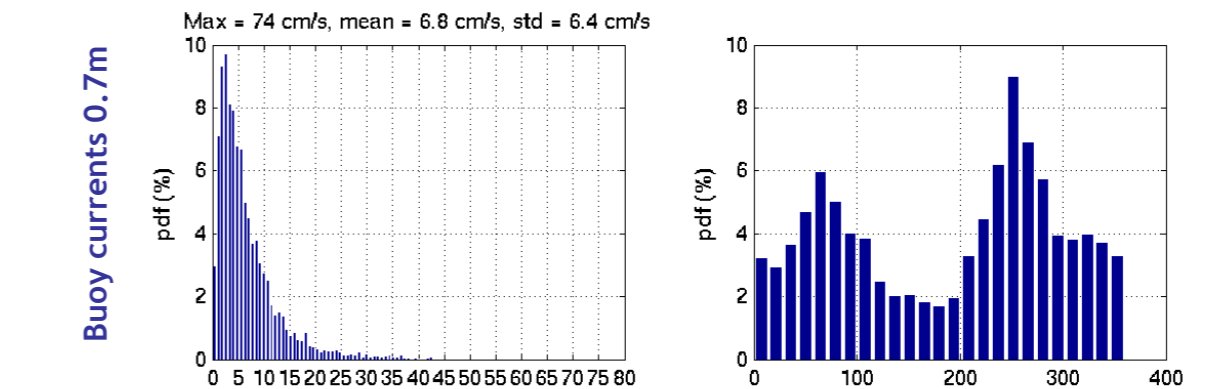
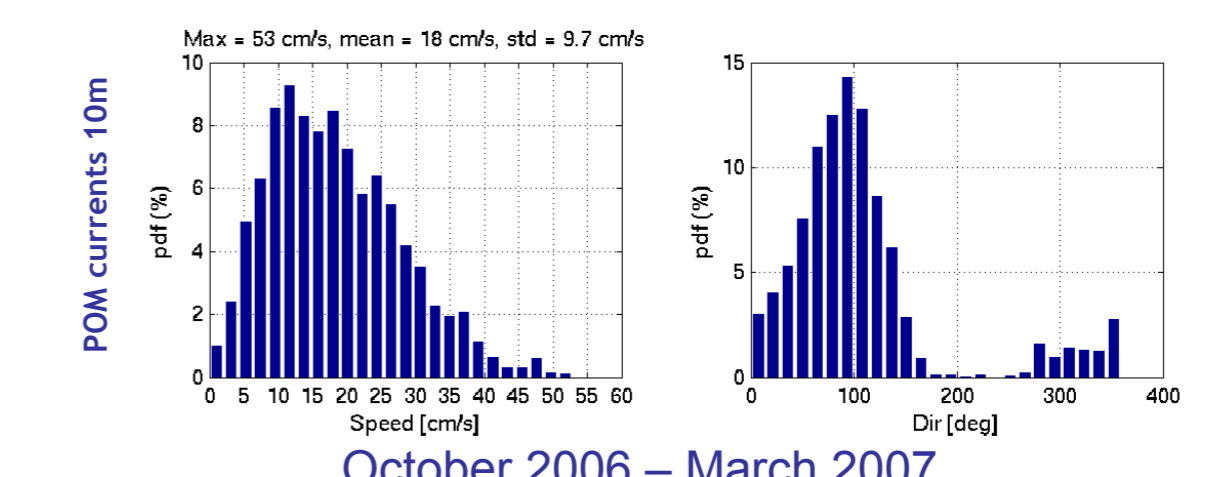
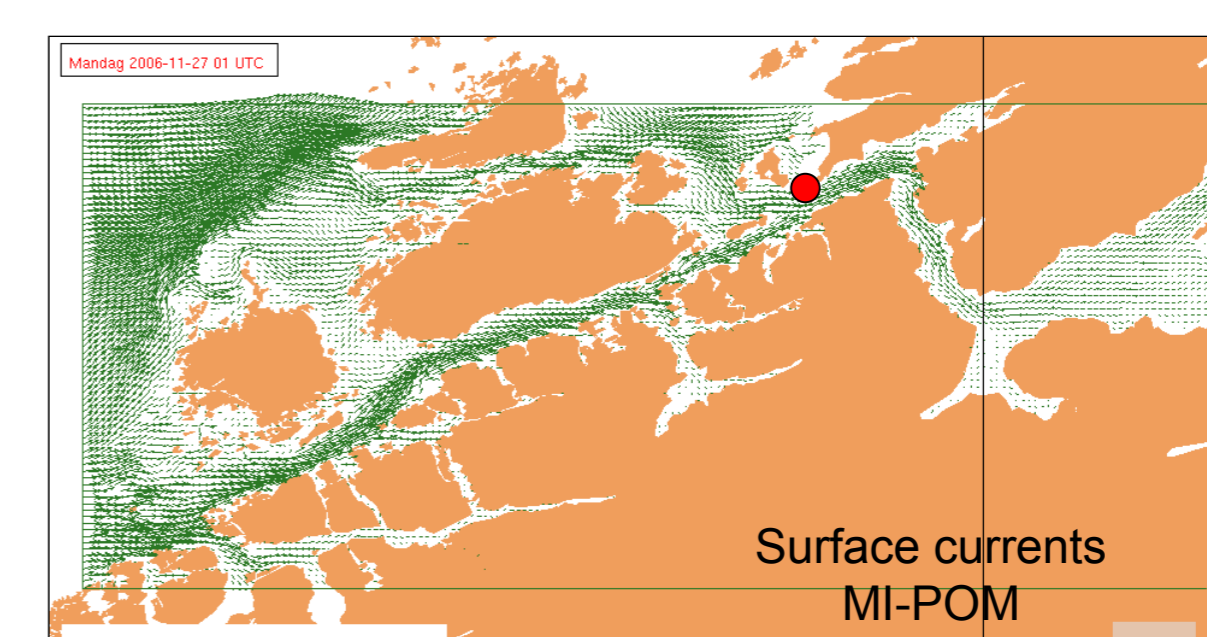
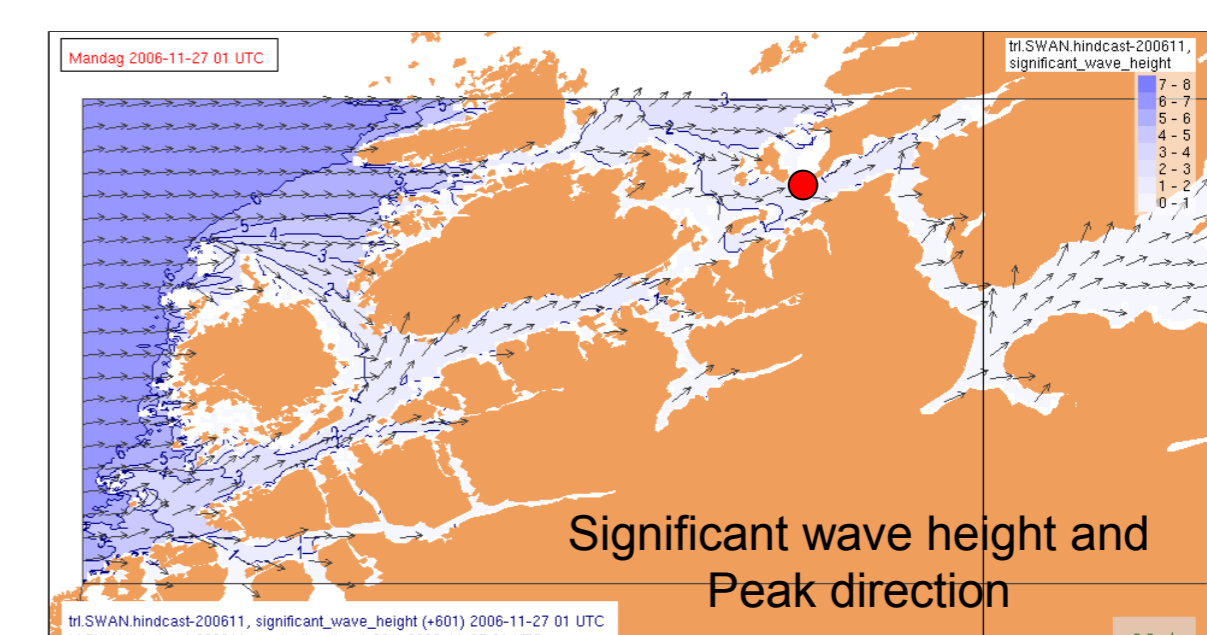
RMS error HIRLAM - Qscat [ms⁻¹], years 1999-2002 DJF, N_s=300 per 1x0.5 deg cell



RMS error WAM - All sat H_s [m], years 2000-2001, N_s=300 per 1x0.5 deg cell



Wave-current interaction with SWAN500m



The ship lane to Trondheim (mid-Norway) has complicated topography and wave-current interactions are significant.

The study covers the period Oct.2006 – Mar.2007 and is a collaboration with the Norwegian Coastal Authorities for improved operational forecast.

Modelling and observing currents - a challenge!

The buoy location (at ●) was perhaps not optimal...?

References

Reistad, M., Ø. Breivik and H. Haakenstad: A High-Resolution Hindcast Study for the North Sea, the Norwegian Sea & the Barents Sea. Proc. 10th int. workshop on wave hindcasting and forecasting and coastal hazard symposium, North Shore, Oahu, Hawaii, 2007.

Acknowledgements

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