Using HF radar for storm surge monitoring

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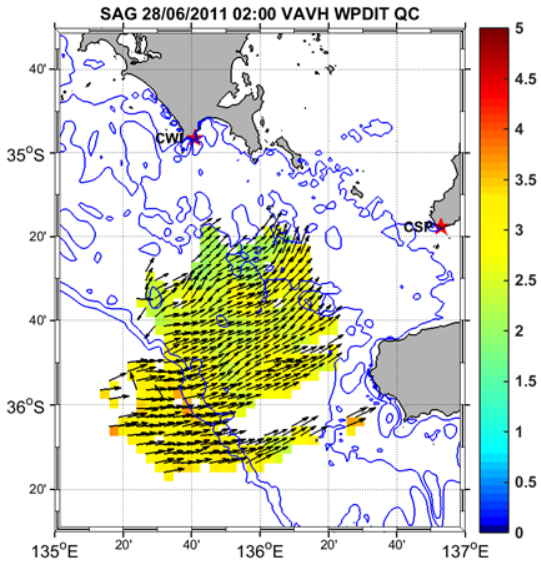
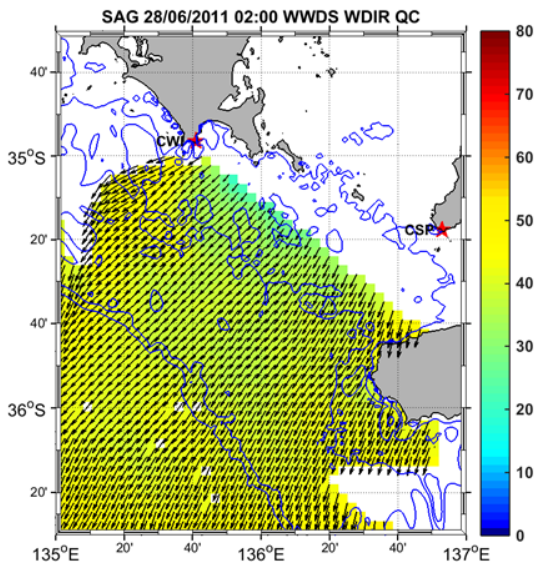
Wave data from South Australia

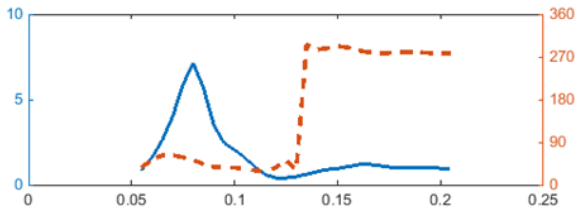
Hs and peak direction

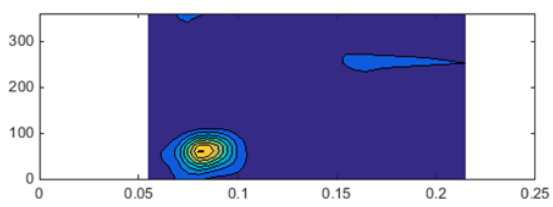


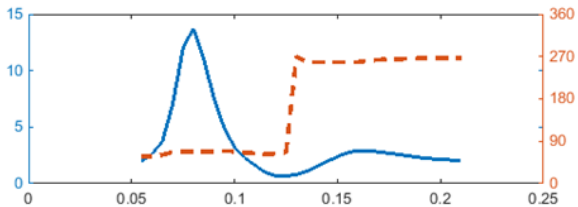


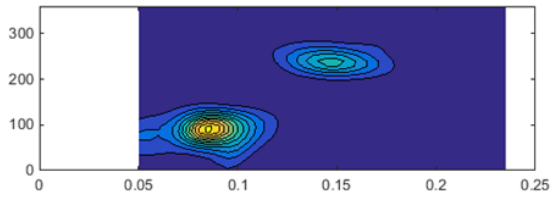
Shortwave (wind) direction and spread

$E(f)$, $\theta_{mean}(f)$



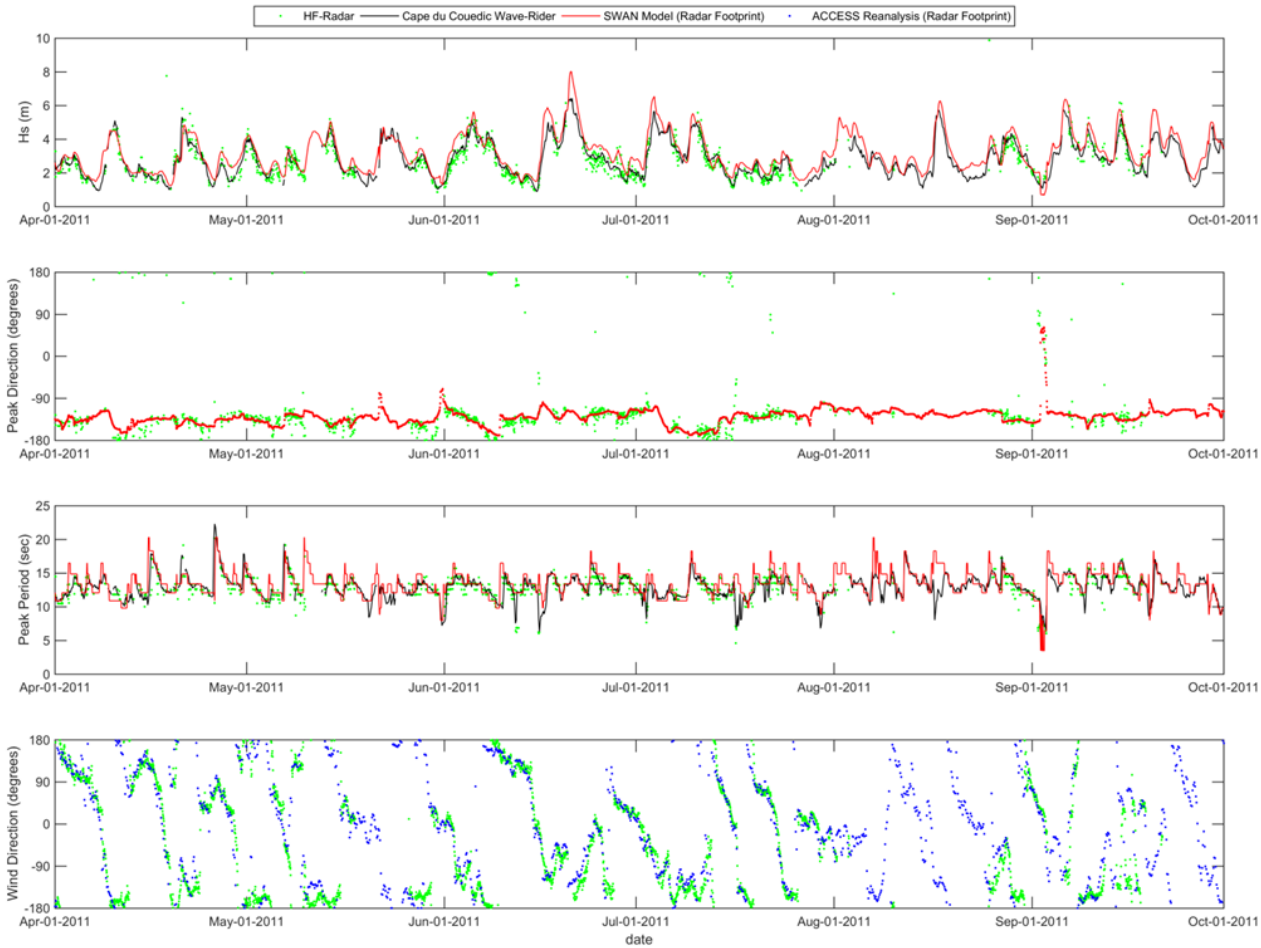






Directional spectra

Analysis and figure supplied by Charles James, SARDI, SA



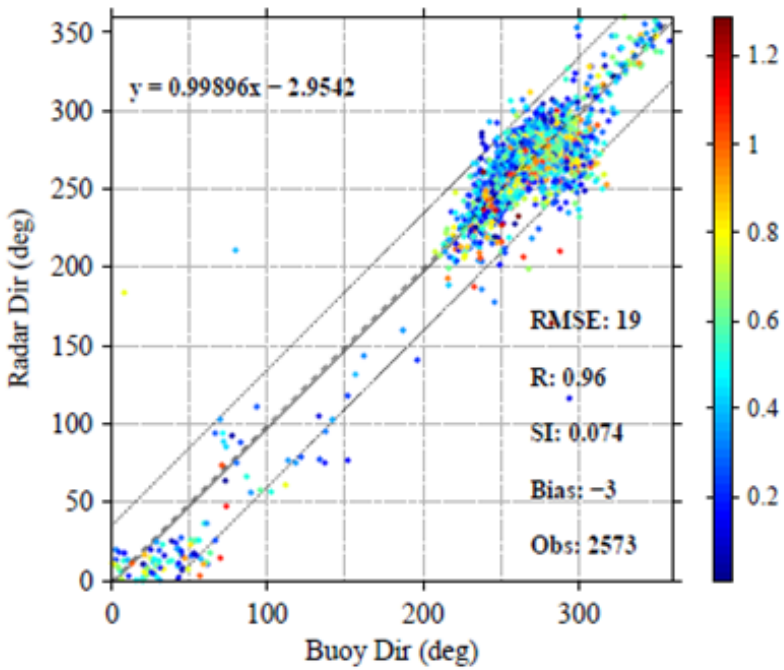
- Radar
- Wavebuoy
- SWAN wave model
- ACCESS (Met) model reanalysis from BoM

Wave validations at Wavehub

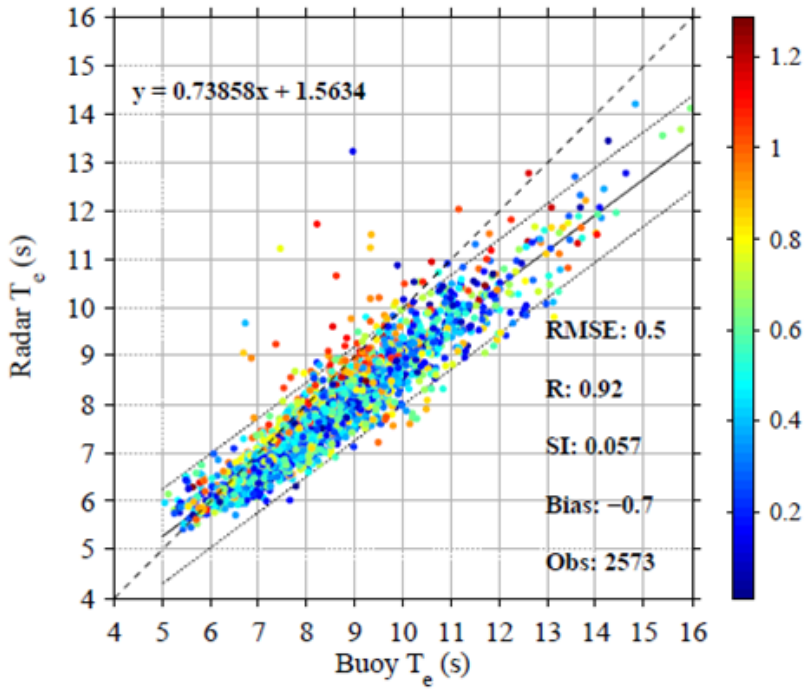
kindly provided by Daniel Conley, University of Plymouth.

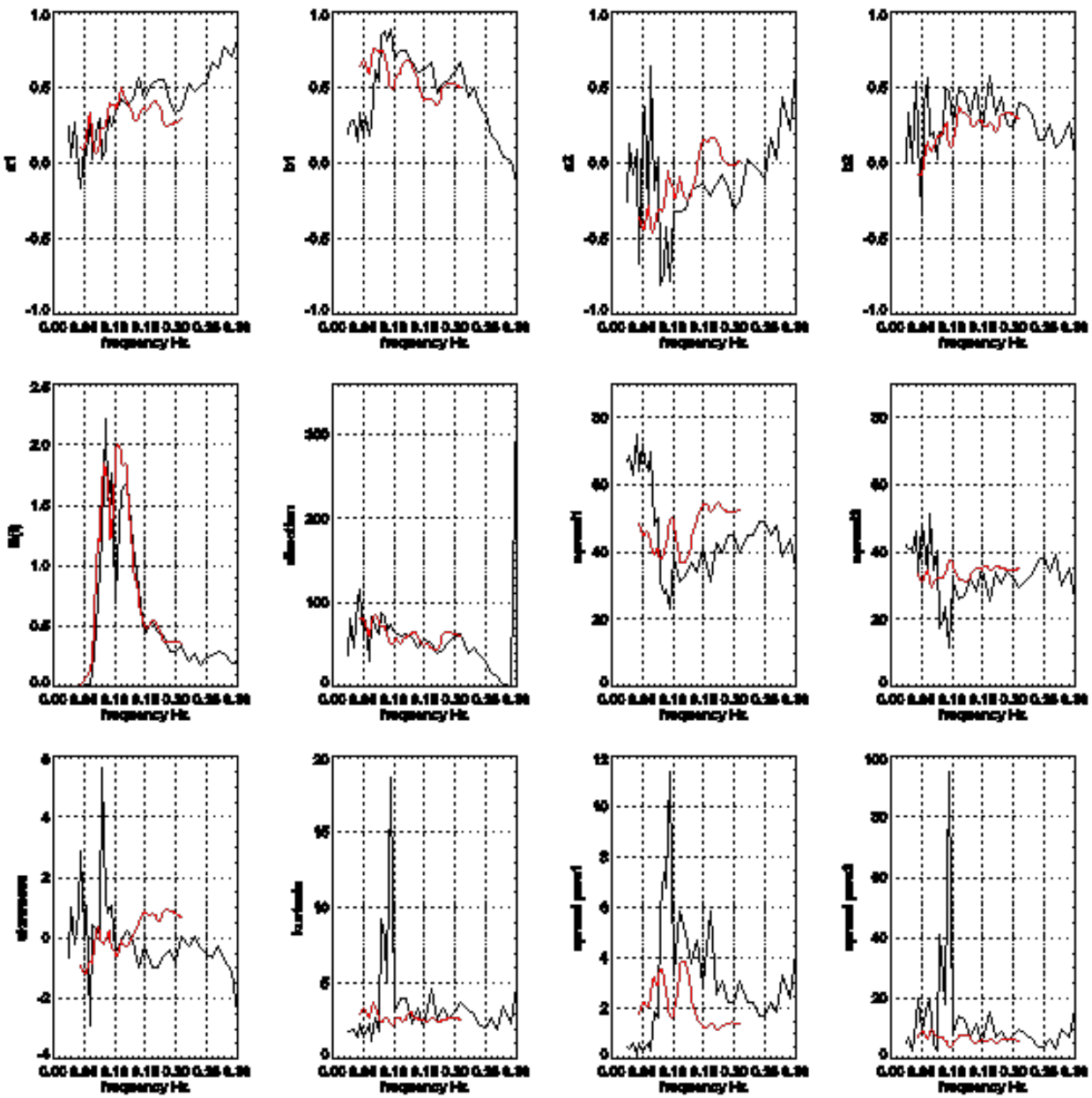
Colour-coding is current speed.

Mean direction



Energy Period, Te





The first five

Radar

Buoy

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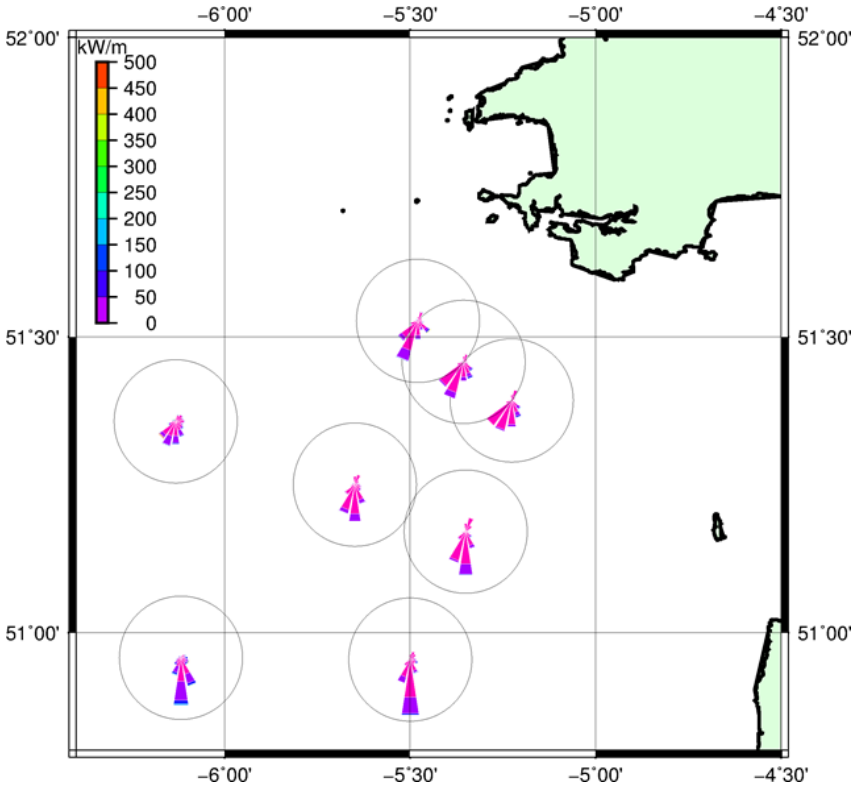
SEAVIEW SENSING

Directional distribution of wave power during Feb 2005 in Celtic Sea.



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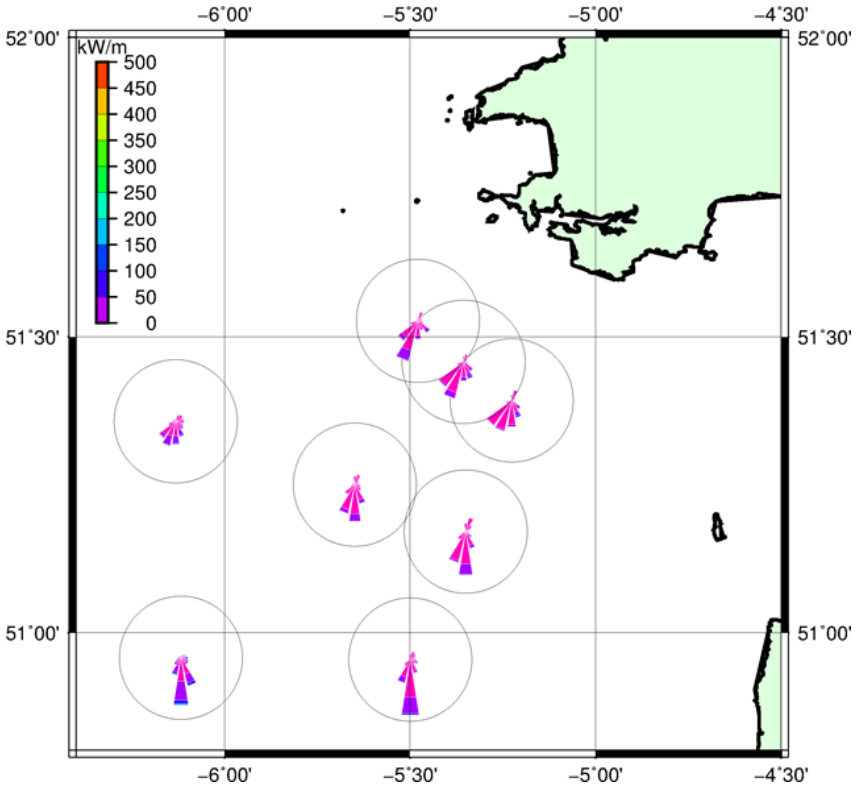

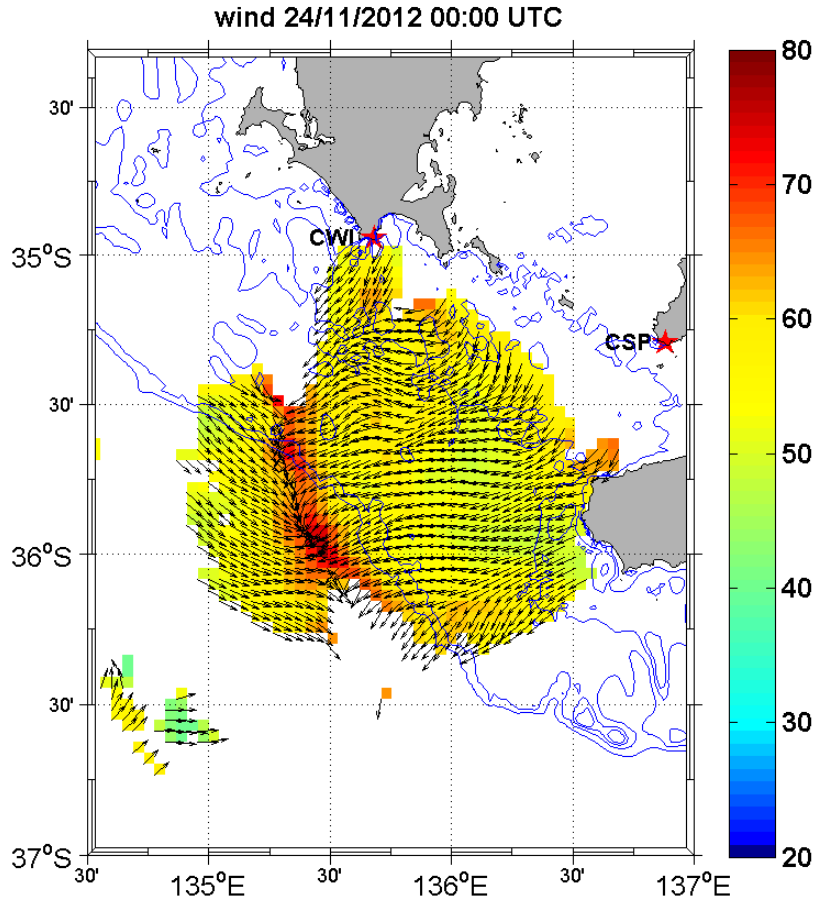

Weather front seen in radar wind direction and spreading map.

The following has been extracted from a report in the Guardian, Thurs Oct 28, 2004.

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Coastline lashed by huge waves

Storms pounded Britain last night

An Irish Ferries vessel arrived at Pembroke dock in West Wales at about 2:30pm but the captain decided conditions were too risky to dock.

The Met Office said the winds were expected to peak last night and were not remarkable, but, combined with high seas, they were a potential danger.

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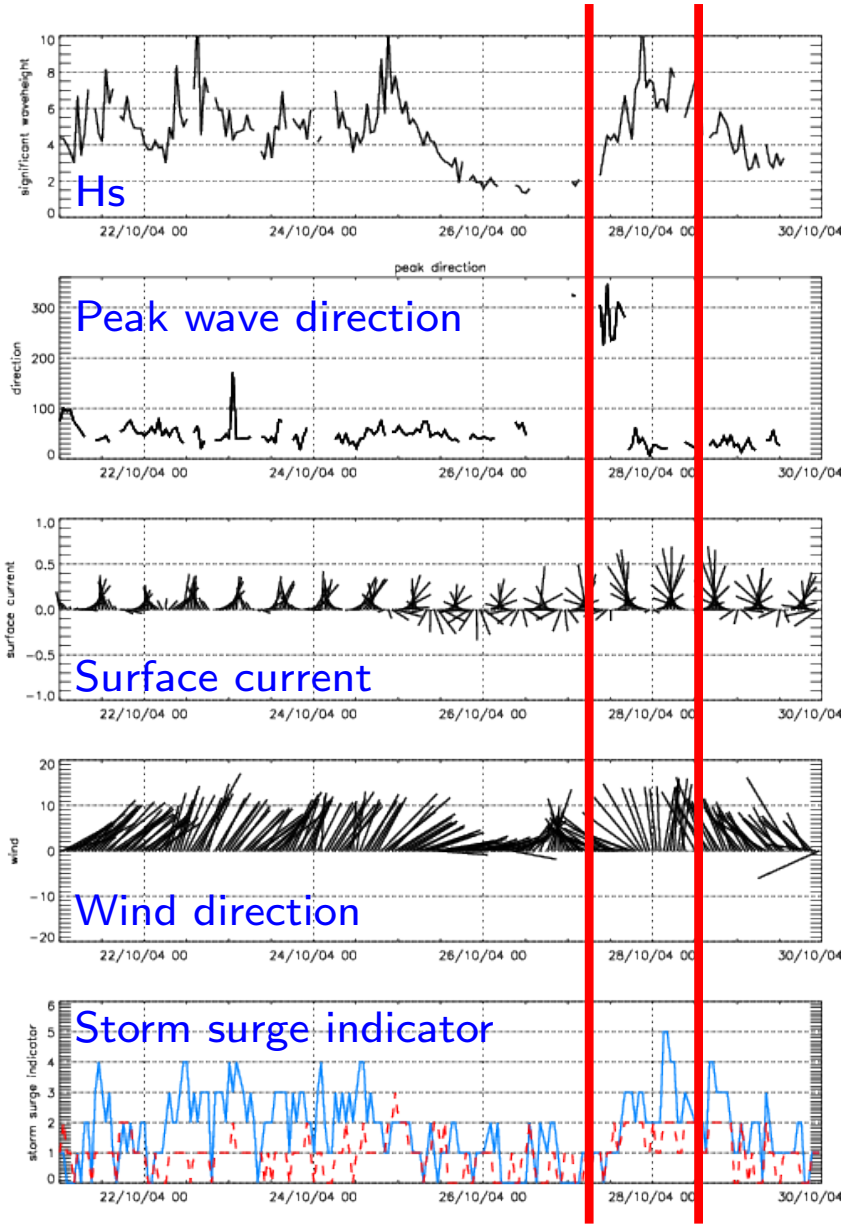
At this time a Pisces HF radar (Neptune Radar Ltd) was monitoring the Celtic Sea in a project funded by Met Office and EA.



Storm event shown here: Hs>6m, onshore winds combined with spring tide peaking at 4-5am 28th Oct.

Crude storm surge indicator for S Wales and N Devon obtained by adding 1 for each of the followiing:

- wind direction onshore
- current direction onshore
- wave direction onshore
- waveheight $>$ 4m
- current speed $>$ 0.5 m/s

Some options for refining a storm surge indicator

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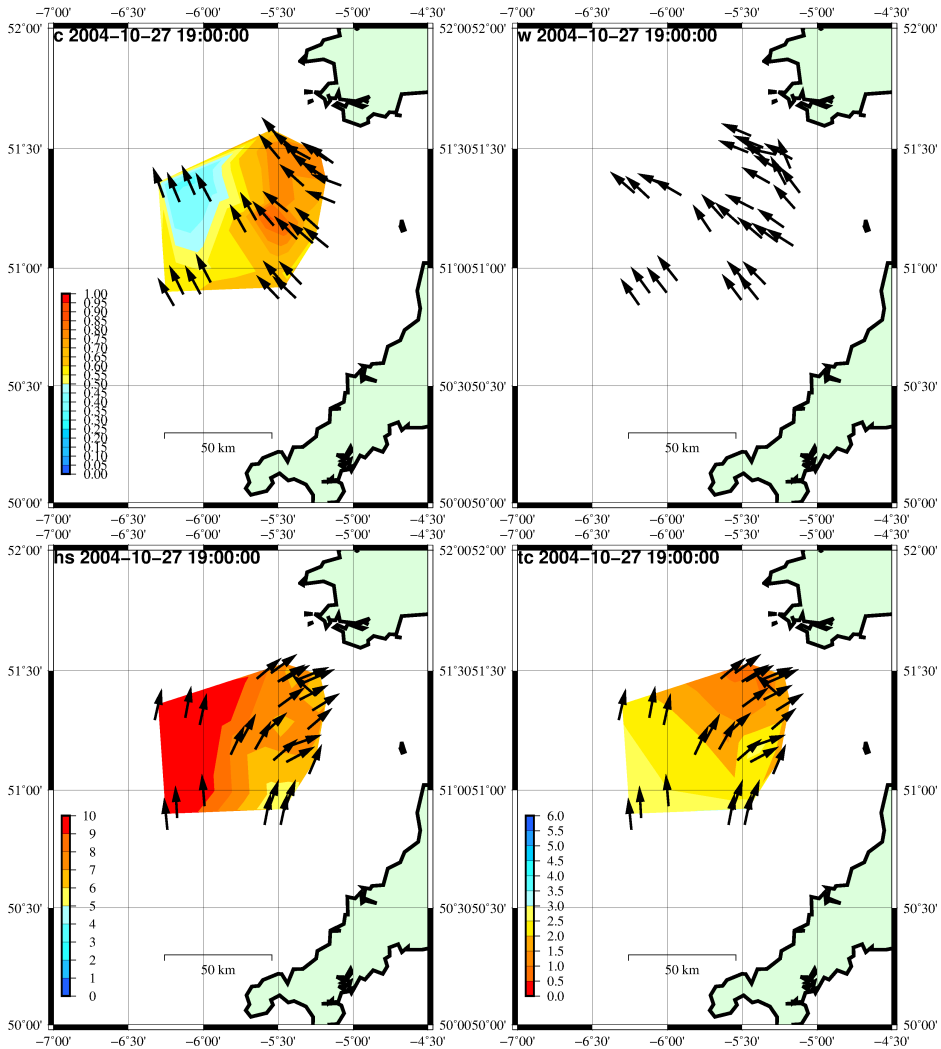
27-10-2004 19:00

Surface current

Significant waveheight and peak direction



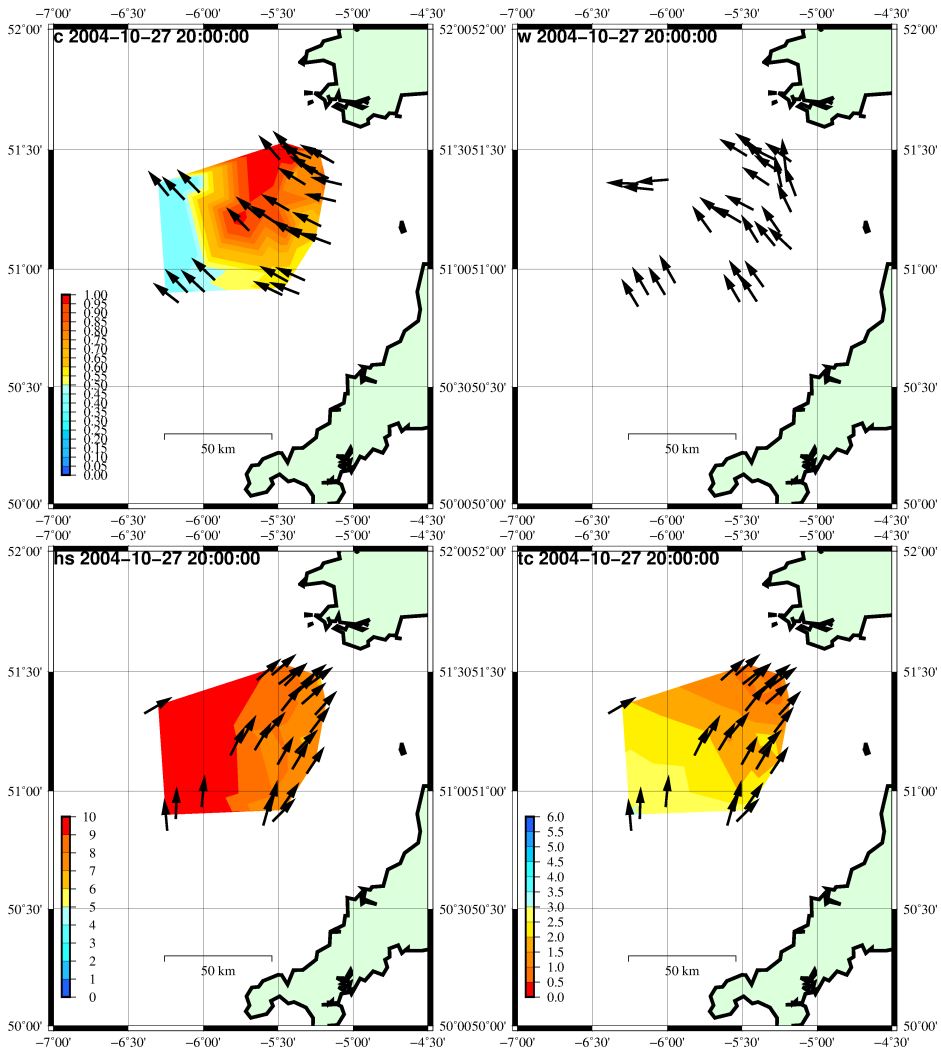
Wind direction

Time (hrs) for wave energy to reach coast assuming no change in peak direction

27-10-2004 20:00

Surface current

Significant waveheight and peak direction



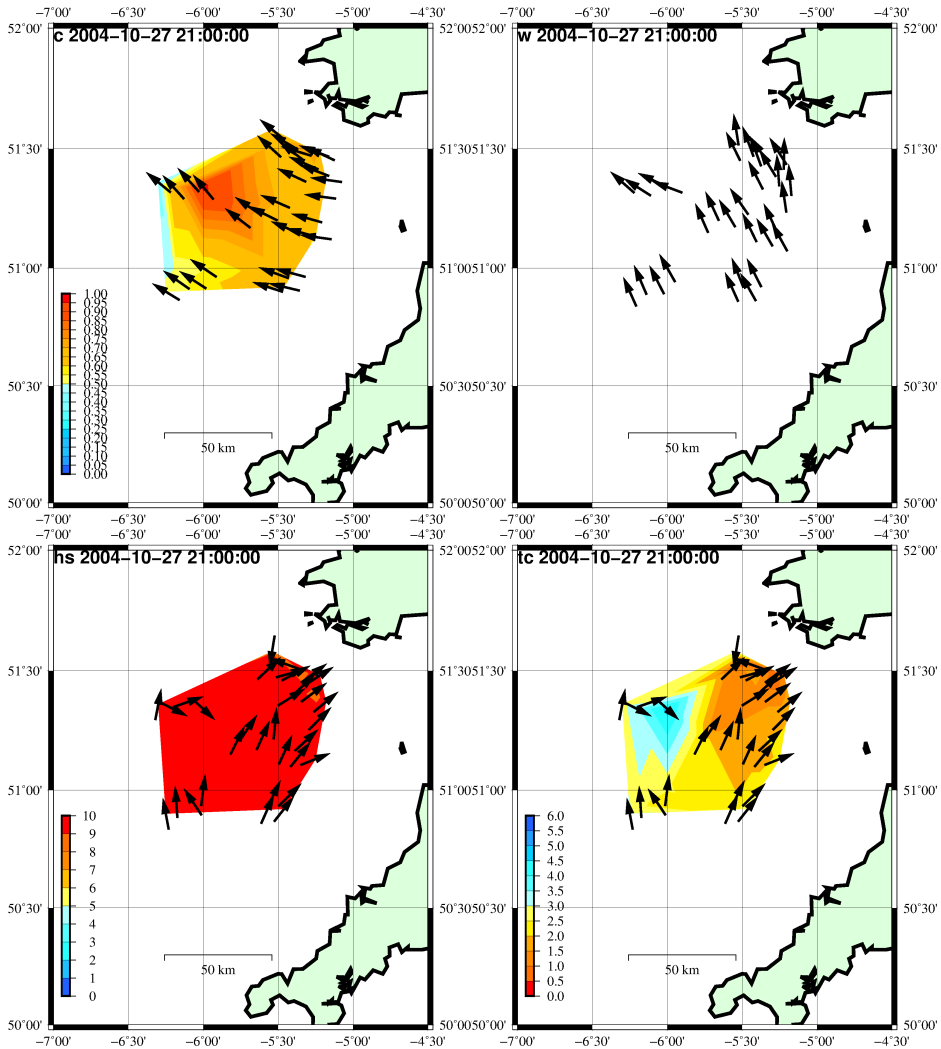
Wind direction

Time (hrs) for wave energy to reach coast assuming no change in peak direction

27-10-2004 21:00

Surface current

Significant waveheight and peak direction



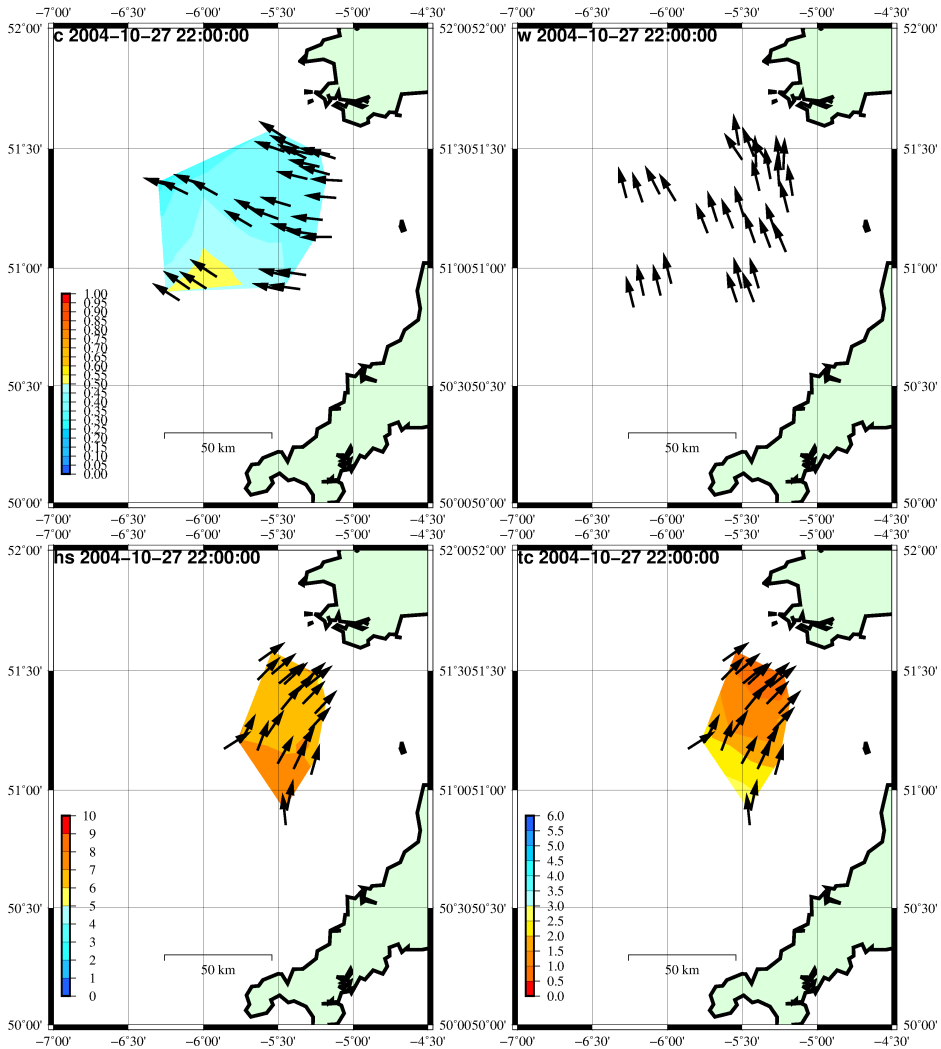
Wind direction

Time (hrs) for wave energy to reach coast assuming no change in peak direction

27-10-2004 22:00

Surface current

Significant waveheight and peak direction



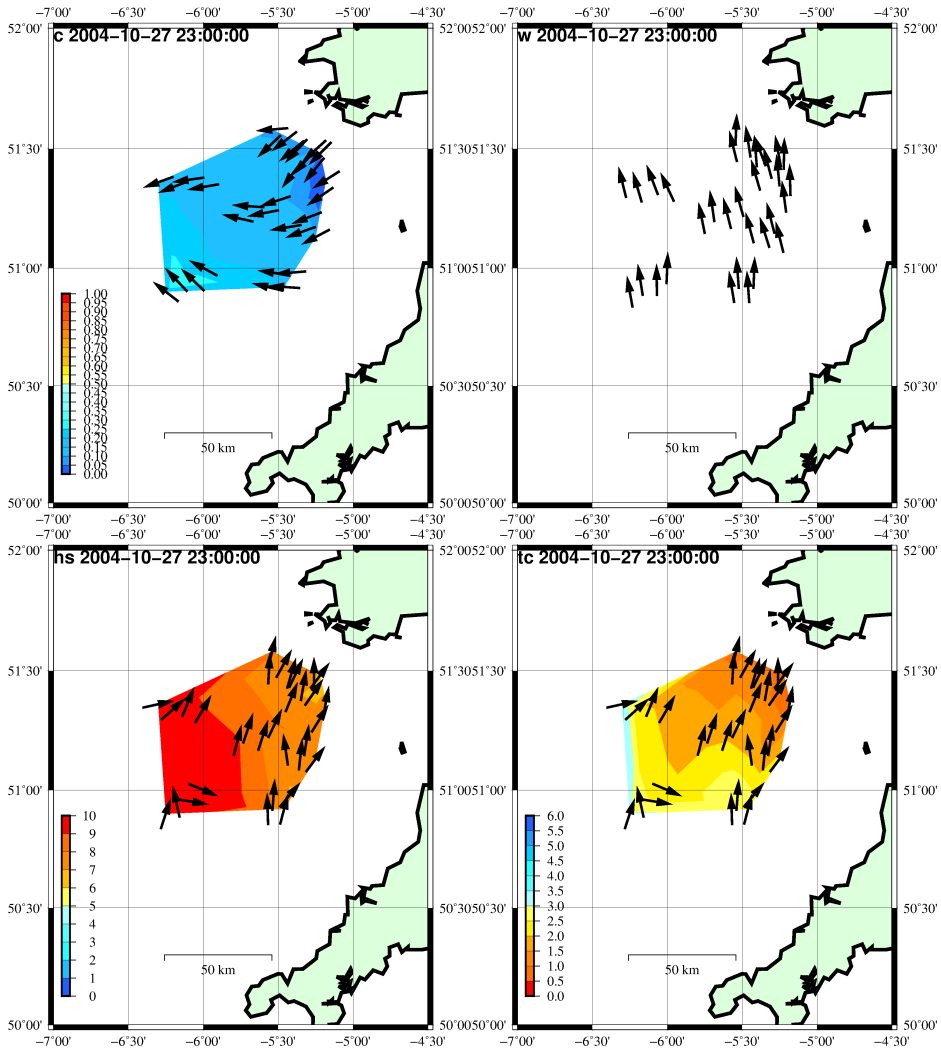
Wind direction

Time (hrs) for wave energy to reach coast assuming no change in peak direction

27-10-2004 23:00

Surface current

Significant waveheight and peak direction



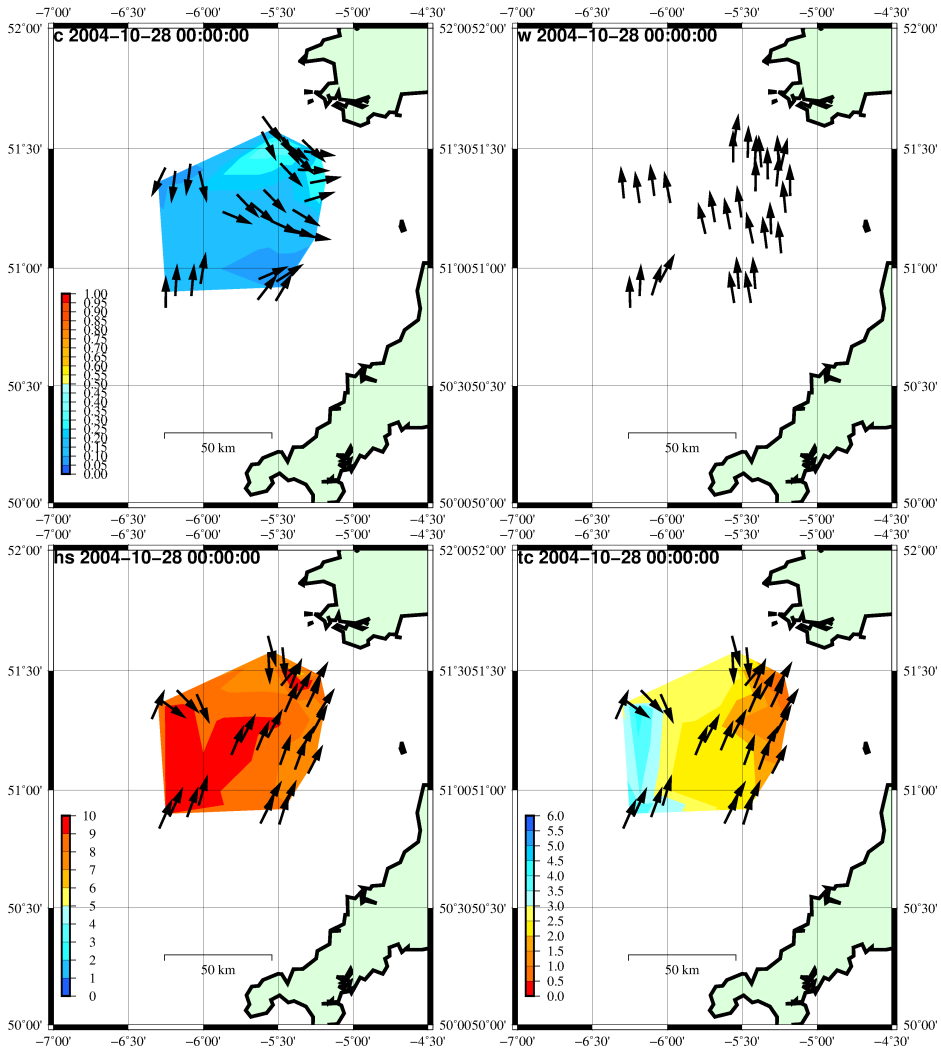
Wind direction

Time (hrs) for wave energy to reach coast assuming no change in peak direction

28-10-2004 00:00

Surface current

Significant waveheight and peak direction



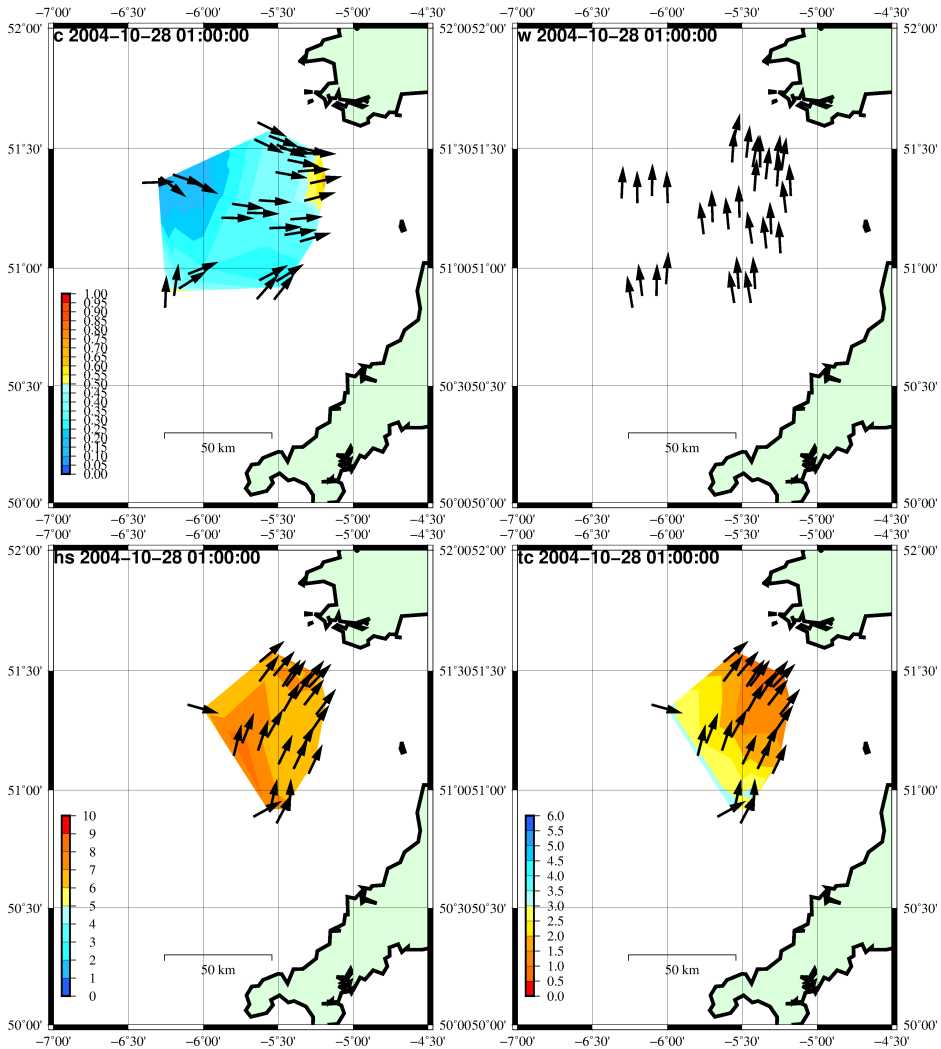
Wind direction

Time (hrs) for wave energy to reach coast assuming no change in peak direction

28-10-2004 01:00

Surface current

Significant waveheight and peak direction



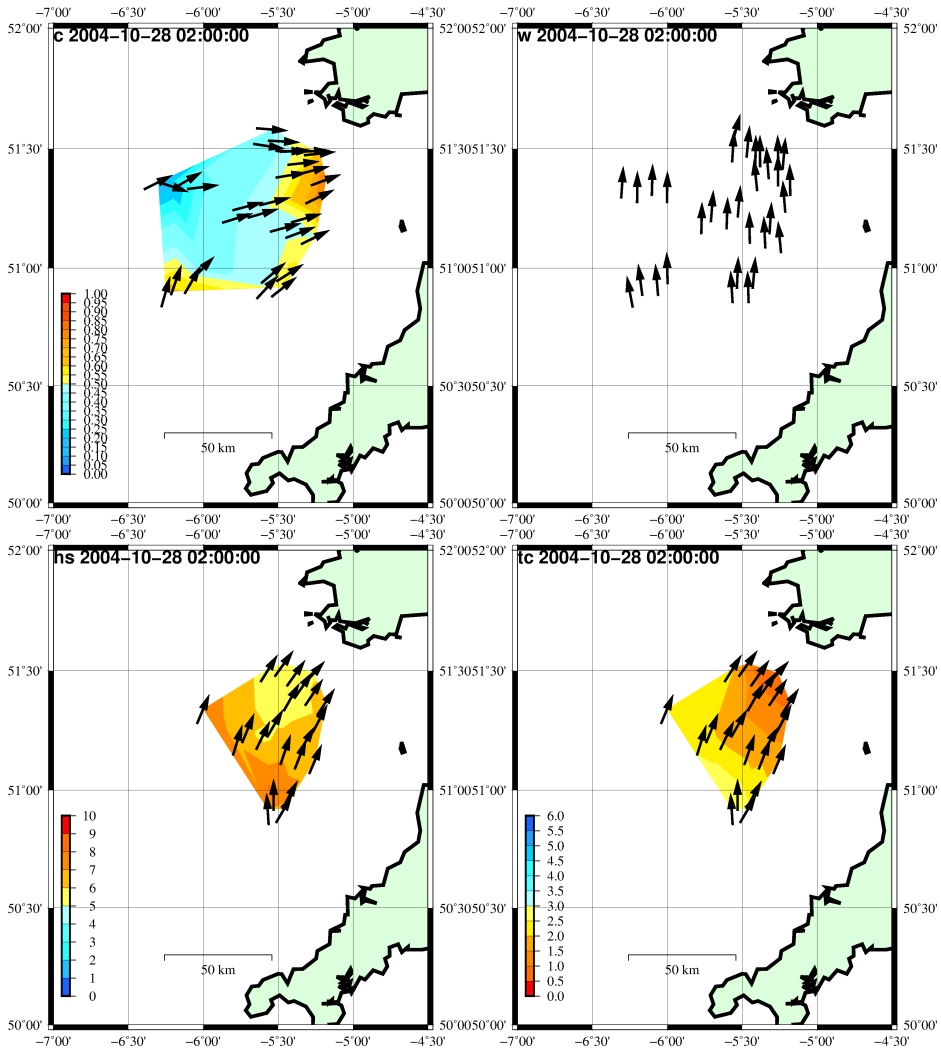
Wind direction

Time (hrs) for wave energy to reach coast assuming no change in peak direction

28-10-2004 02:00

Surface current

Significant waveheight and peak direction



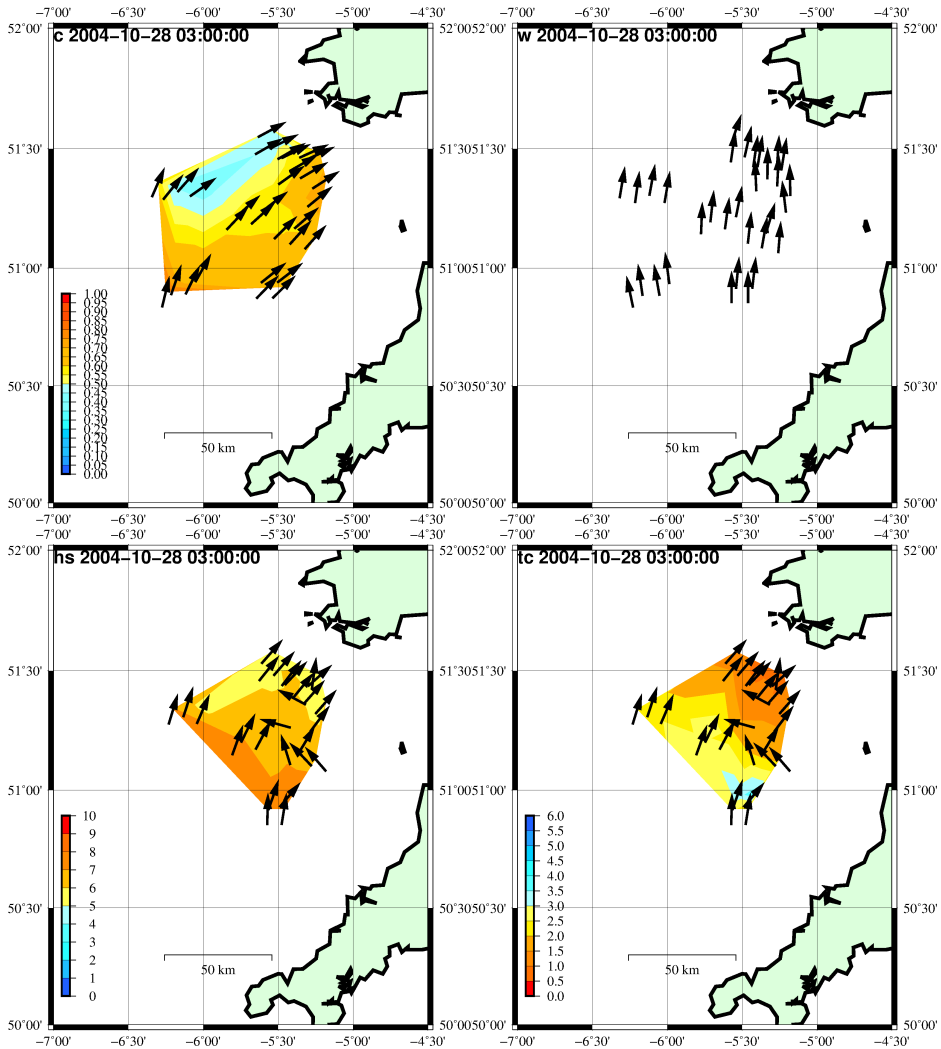
Wind direction

Time (hrs) for wave energy to reach coast assuming no change in peak direction

28-10-2004 03:00

Surface current

Significant waveheight and peak direction



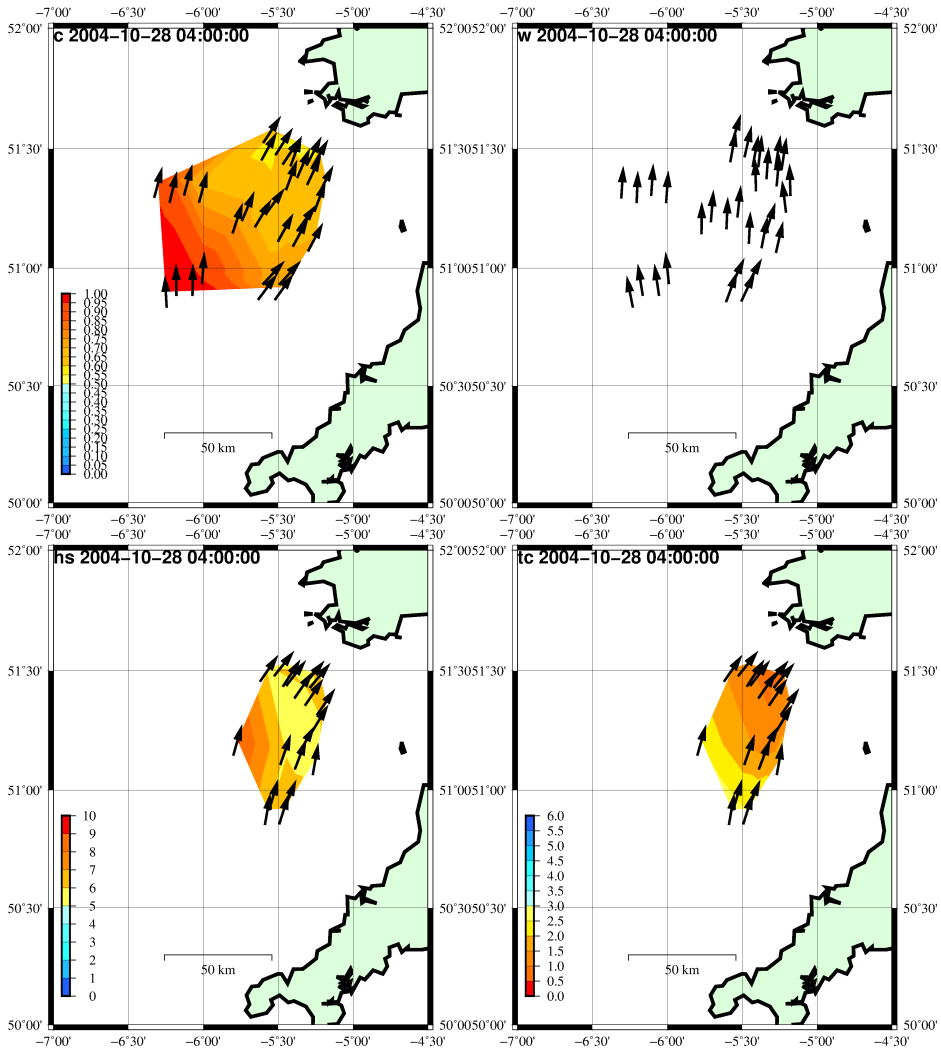
Wind direction

Time (hrs) for wave energy to reach coast assuming no change in peak direction

28-10-2004 04:00

Surface current

Significant waveheight and peak direction



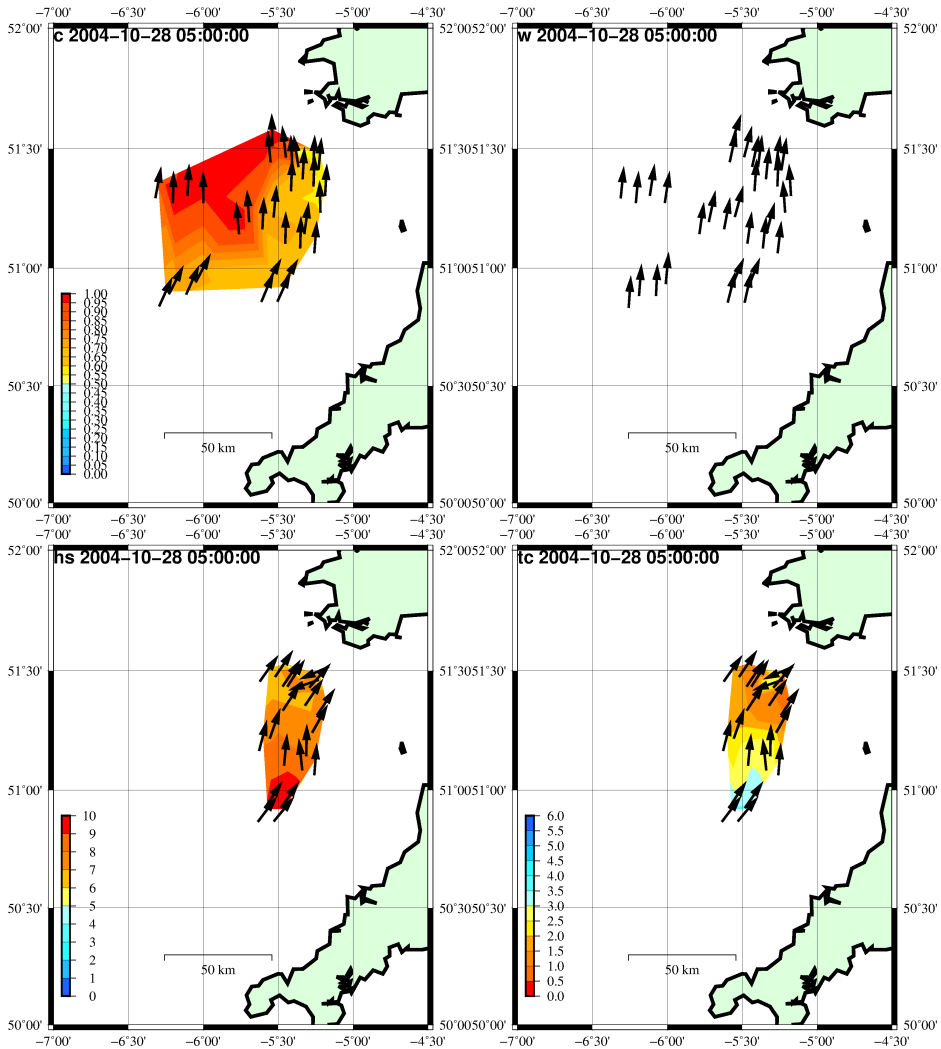
Wind direction

Time (hrs) for wave energy to reach coast assuming no change in peak direction

28-10-2004 05:00

Surface current

Significant waveheight and peak direction



Wind direction

Time (hrs) for wave energy to reach coast assuming no change in peak direction

28-10-2004 06:00

Surface current

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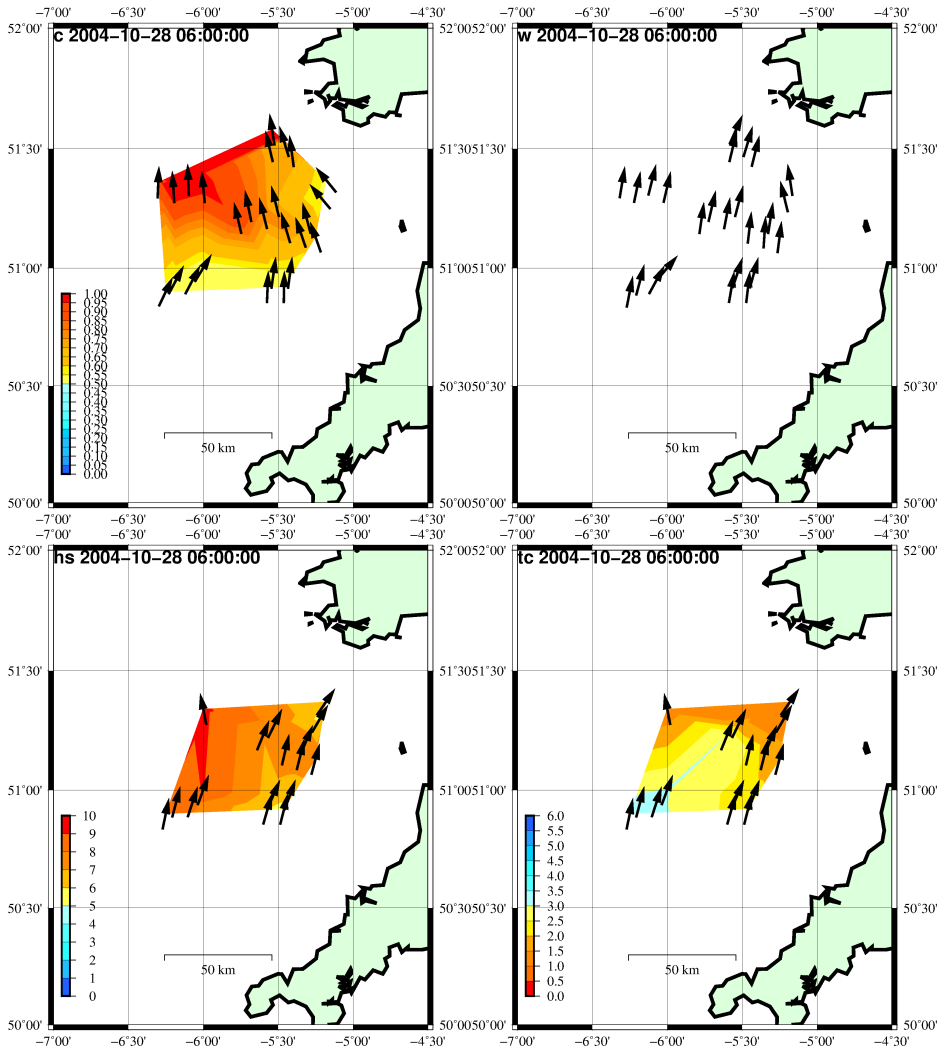

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SEAVIEW SENSING

THE END