

HF radar observations of ocean currents, waves and winds in Australia

4th Meeting of The Global High Frequency Radar Network

Heraklion, Crete, Greece

22-23 September 2015

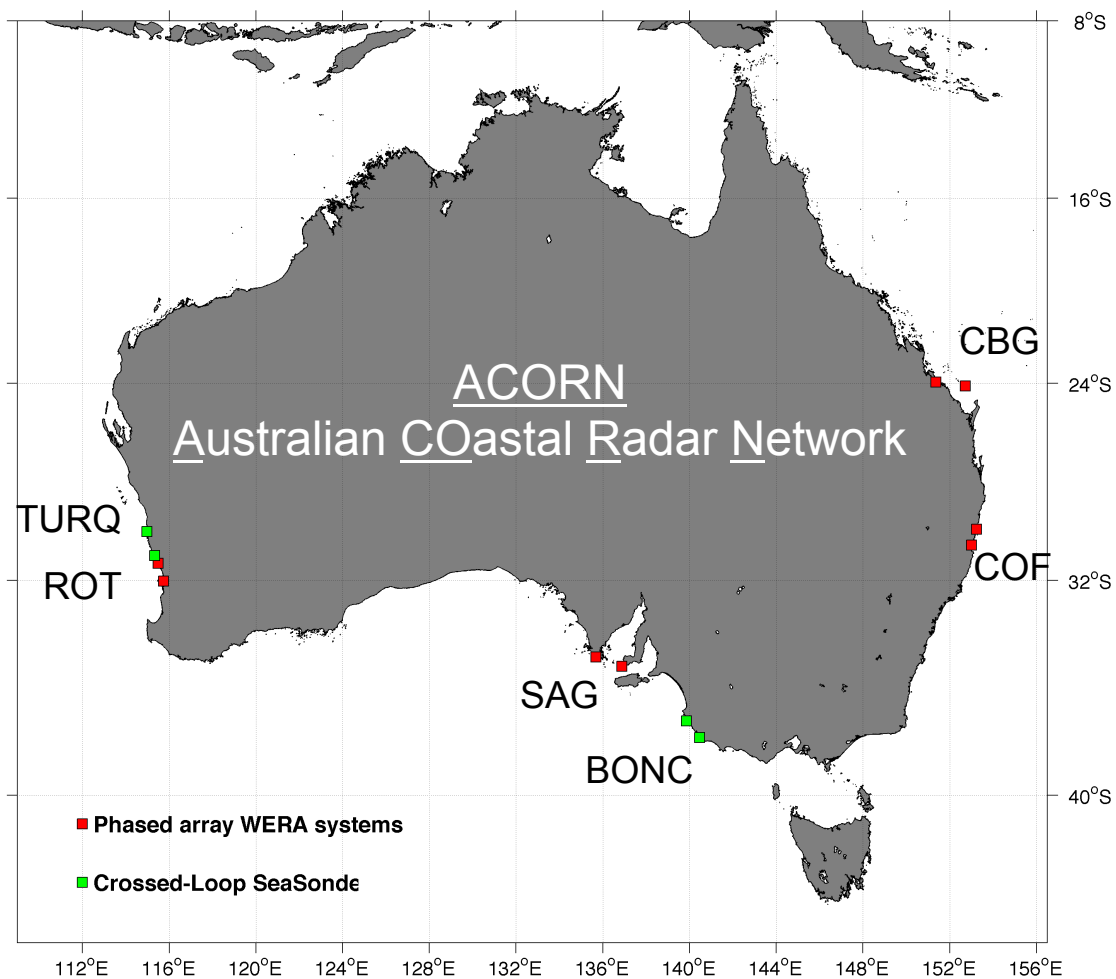
Simone Cosoli

Leader, Australian Coastal Ocean Radar Network

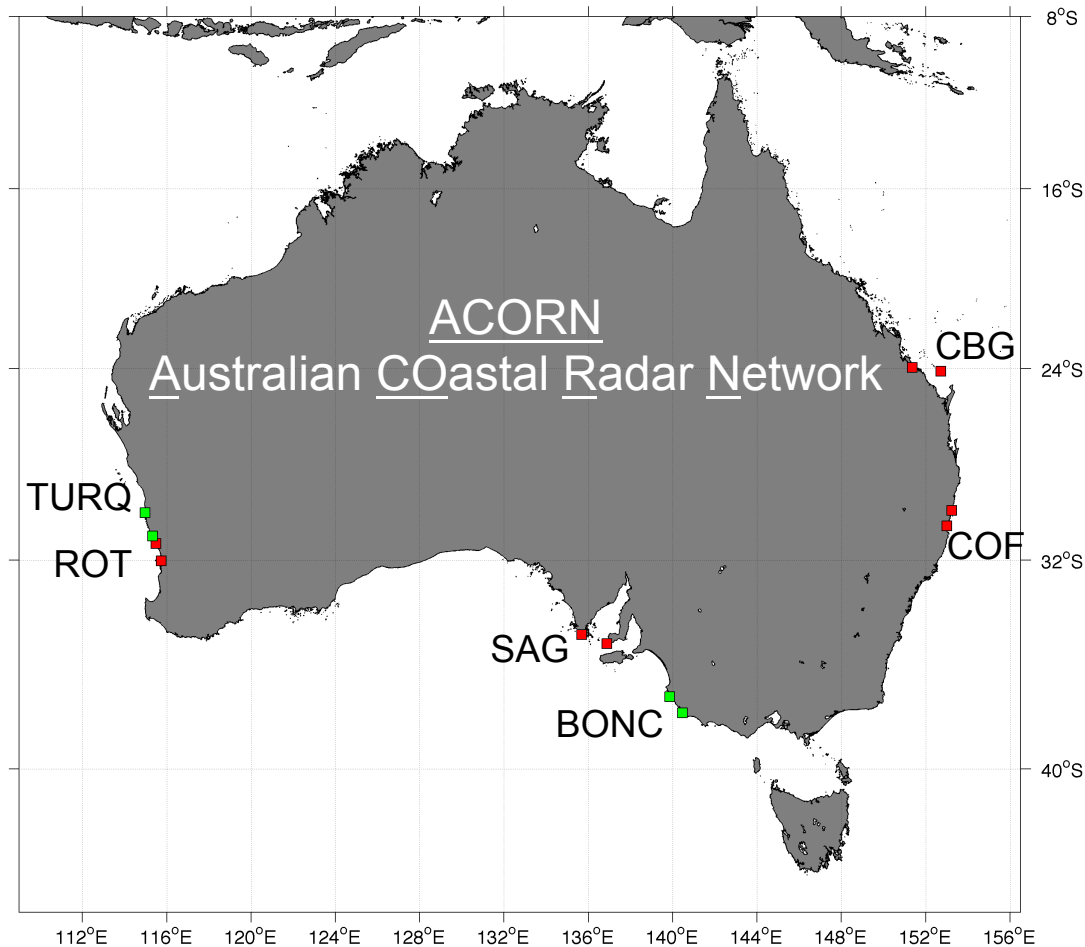
School of Civil, Environmental and Mining Engineering & UWA Oceans Institute

The University of Western Australia - 35, Stirling Highway, Crawley, WA 6009

AUSTRALIA



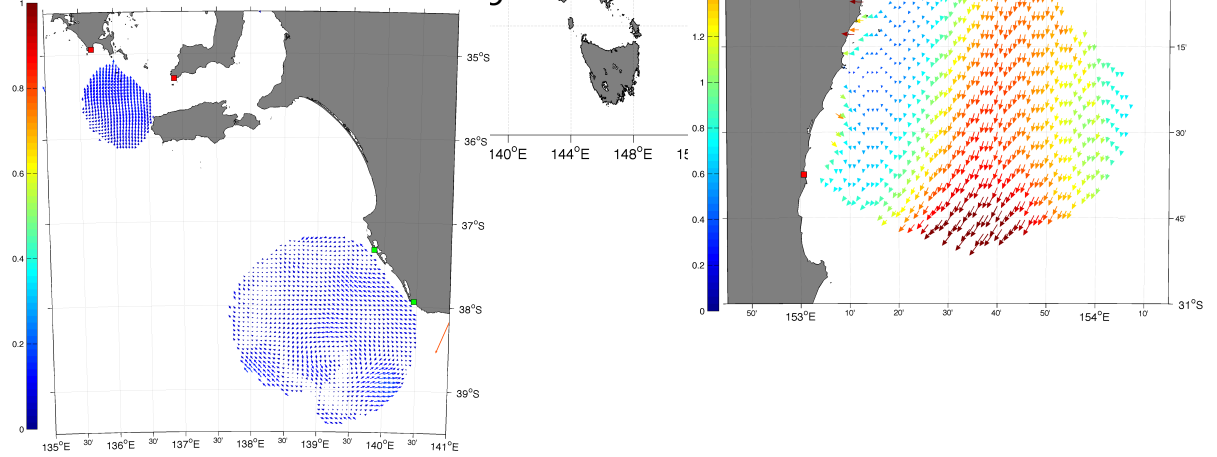
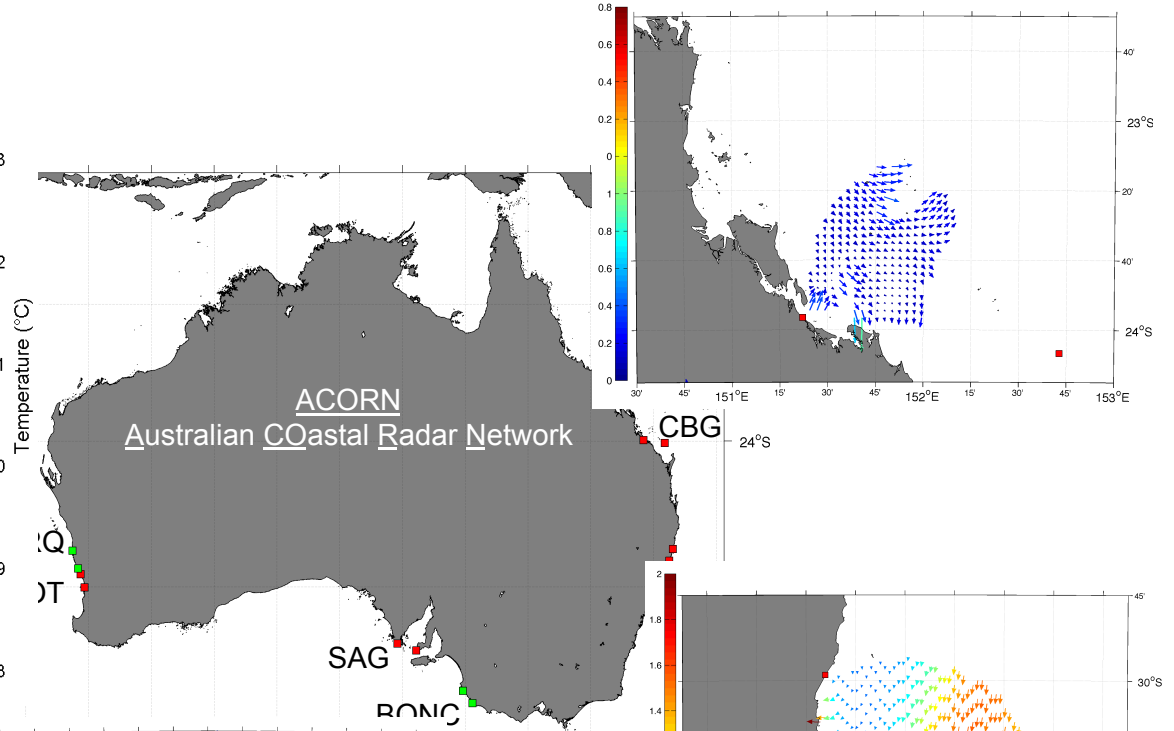
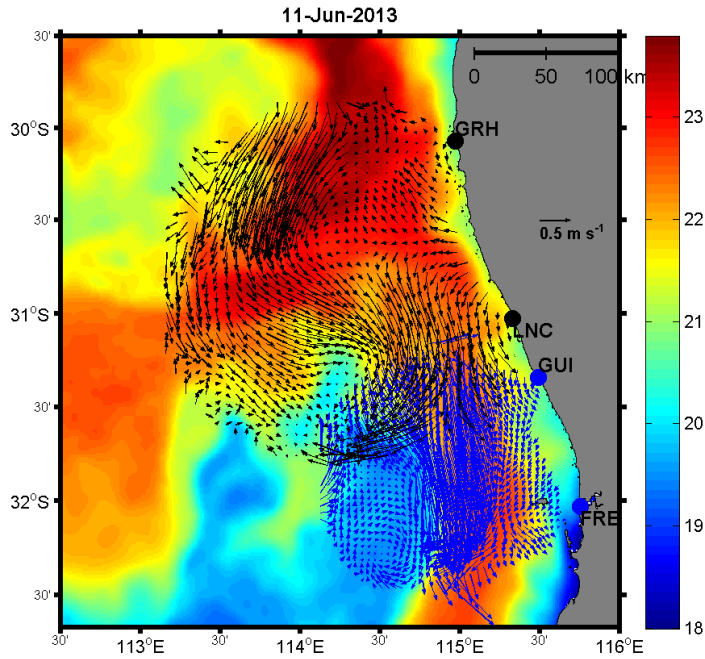
Map showing ACORN radars
WERA and SeaSonde sites

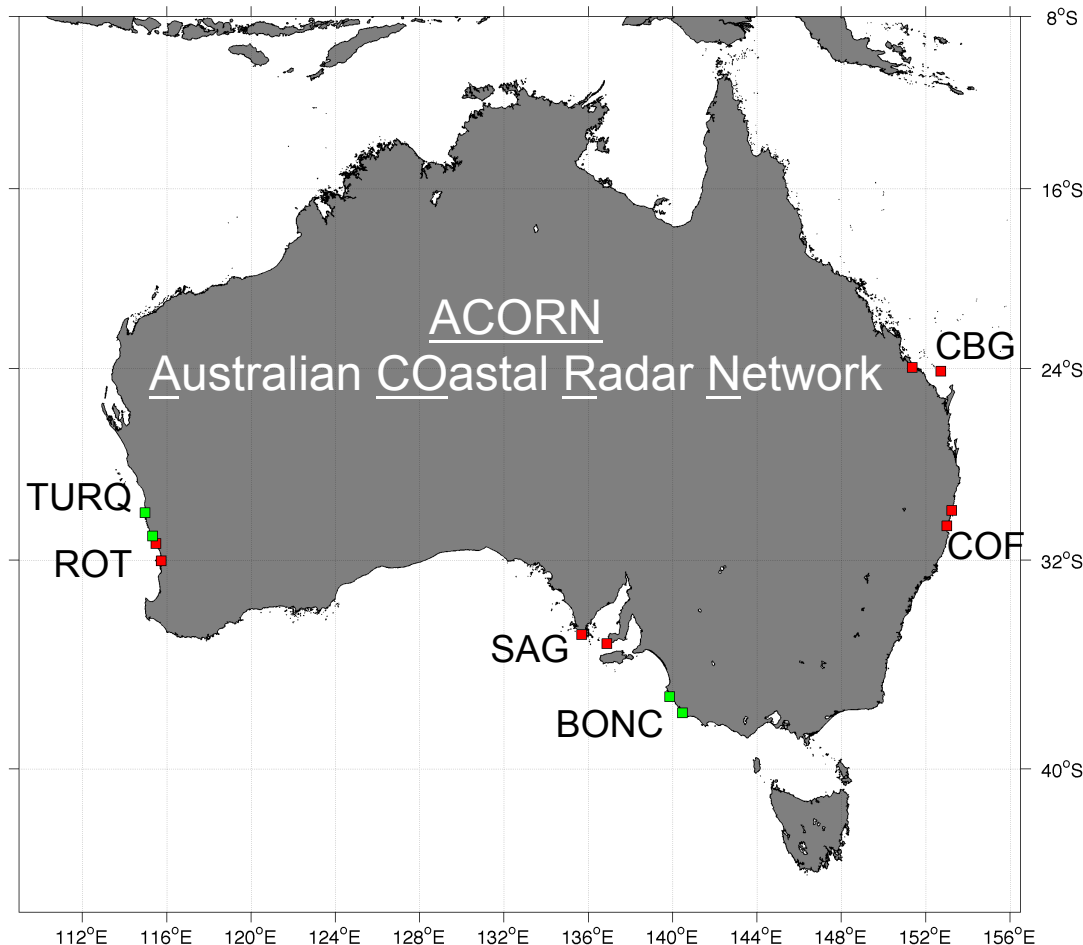


Map showing ACORN radars
WERA and SeaSonde sites

Main Issues

- Site Selection and Approvals
- Radar choice
- Frequency Management and Frequency Changes
- Transition from JCU to UWA

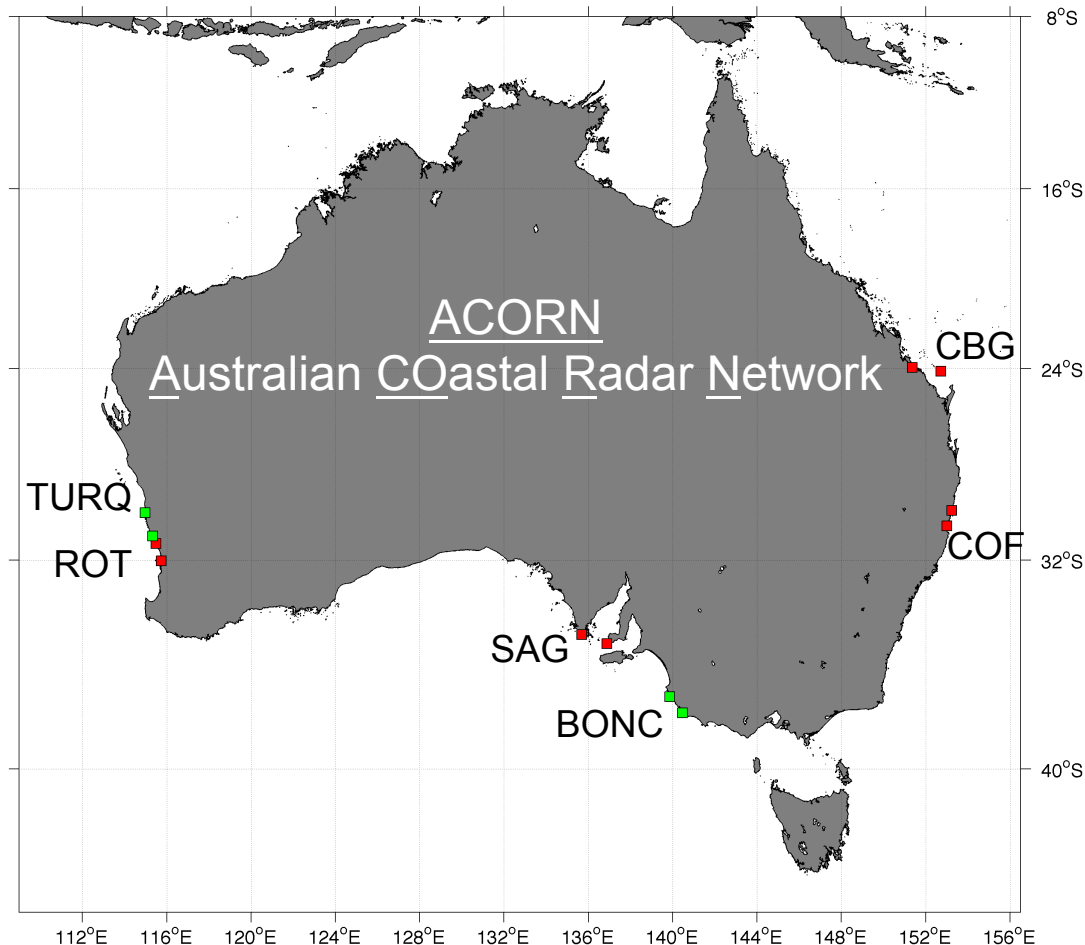




Map showing ACORN radars
WERA and SeaSonde sites

ACORN operations, monitoring and maintenance

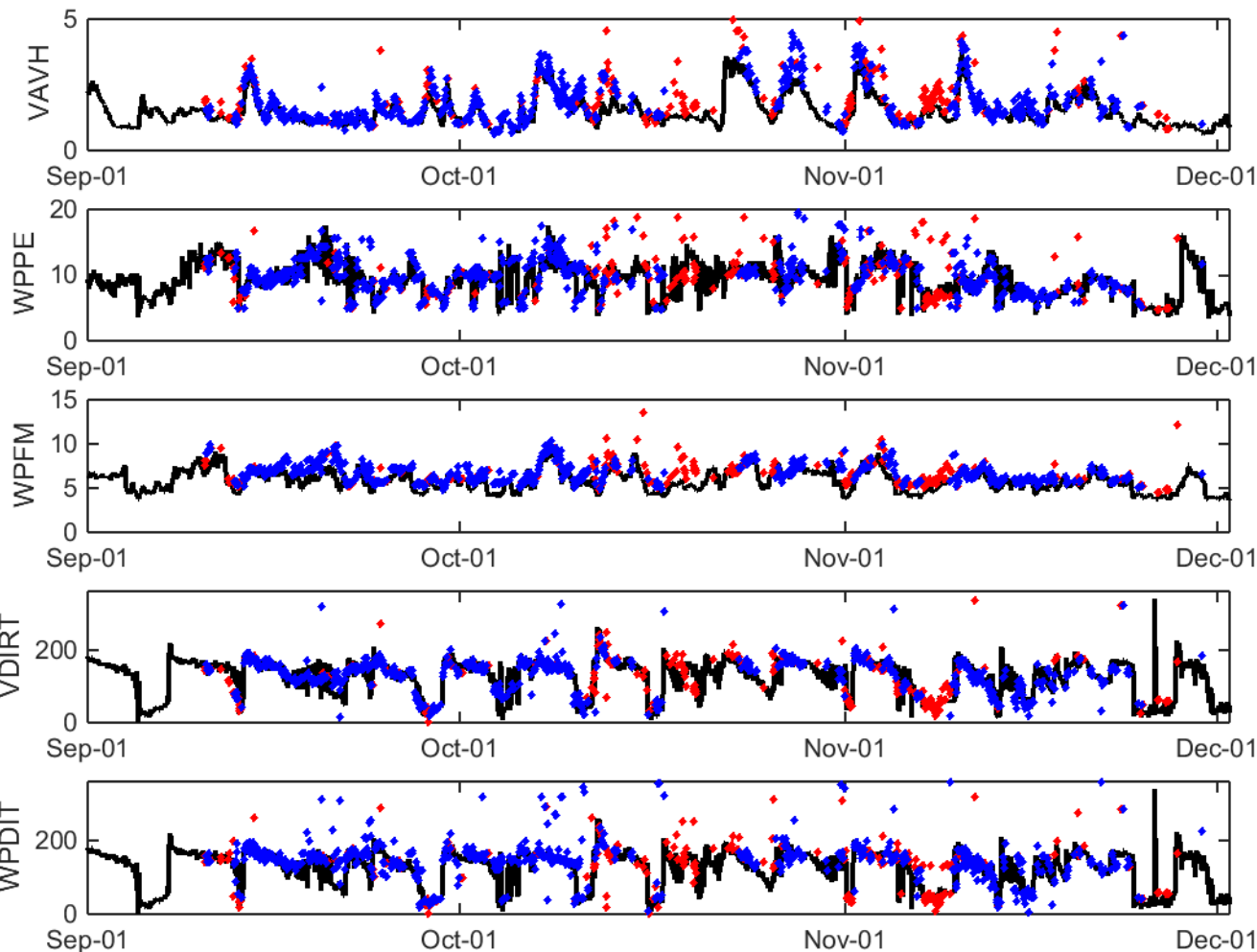
- Automatic email warning and reports on changes in status of stations and computer systems
- Web-based database of incidents and actions
- Daily monitoring of all sites using manufacturers and ACORN-developed web interfaces
- Site caretakers – very important for remote sites
- 3-4 monthly site visits for routine maintenance and calibration and data download
- Trouble-shooting visits as needed (resources dependent)



Map showing ACORN radars
WERA and SeaSonde sites

ACORN challenges

- Implementation of QAQC procedures for SeaSonde / WERA
- SNR-based level-0 (spectra to radials) for SeaSonde
- Swarm analysis – spatial and temporal correlation level-0 (spectra to radials and waves) for WERAs



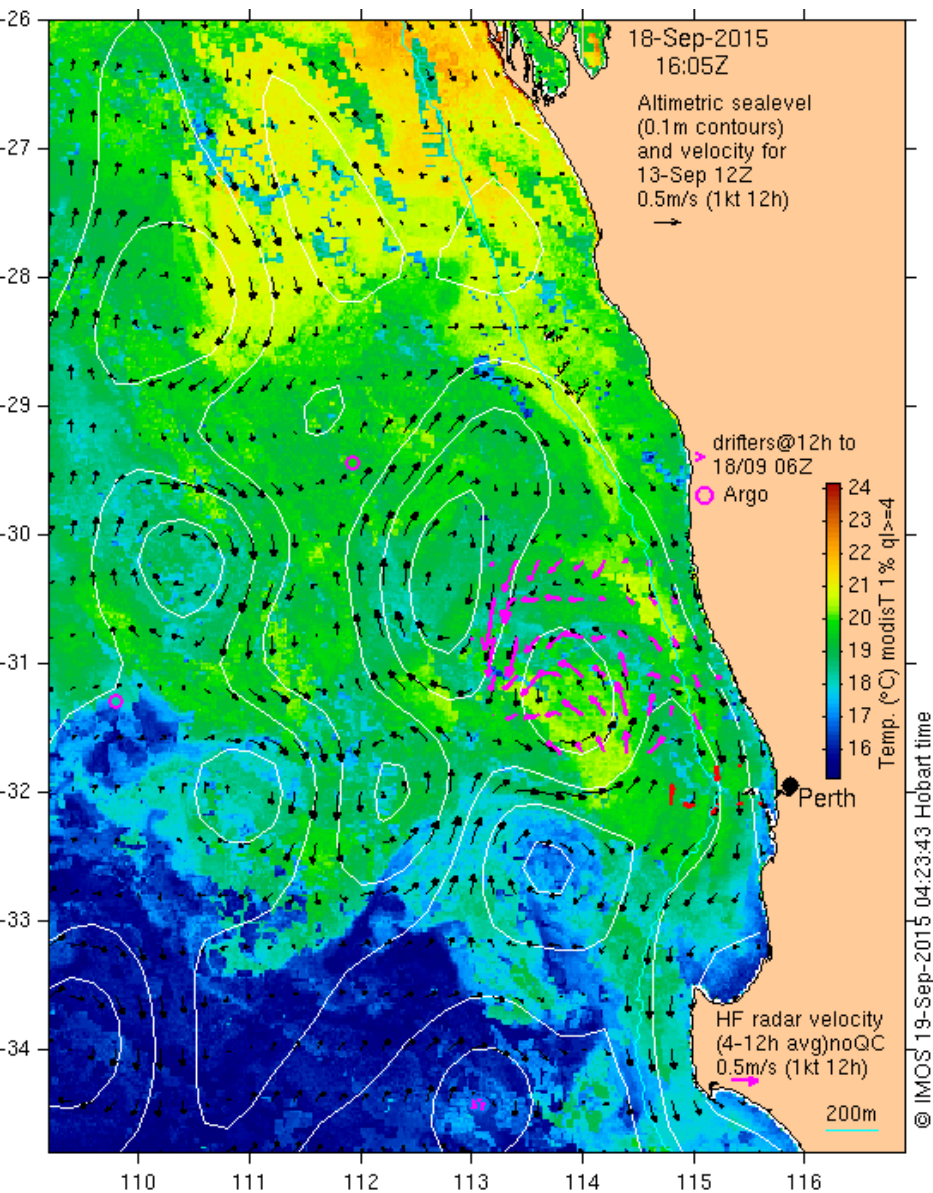
Time series of wave parameters from WERA radars at COF – Coffs Harbor. From top to bottom,

1 significant waveheight; 2, peak and mean period; 3, mean and peak direction.

Blue dots are the radar measurements with flag 1, red with flag 0; black line, buoy measurements (courtesy Lucy Wyatt)

ACORN wave:

- Analyses with 1-hour averaged Doppler spectra to reduce signal variance and improve separation of 1st-2nd order Bragg region
- Analyses performed with SeaView software provide significant waveheight, mean and peak period and direction – and wind direction
- Validation with buoy data led to improvement in the wave processing software



ACORN future scientific challenges

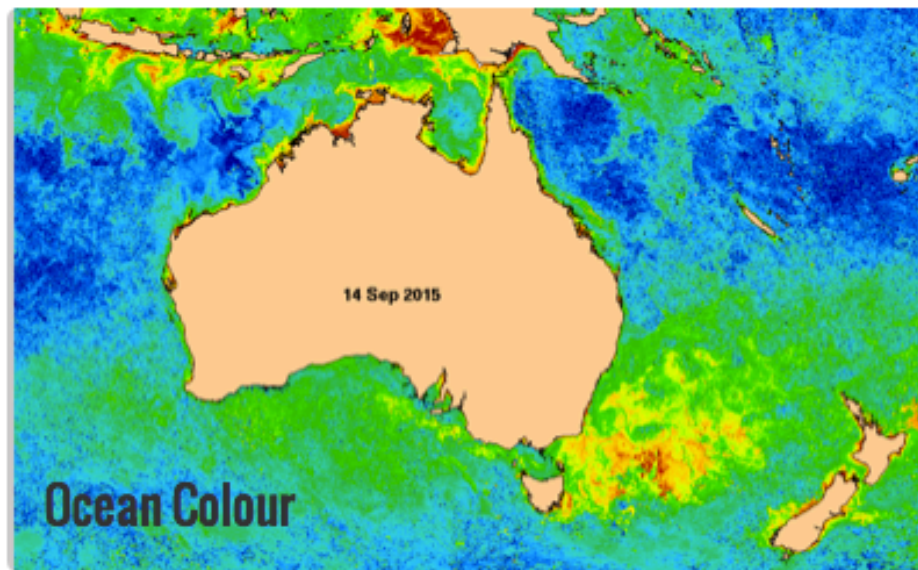
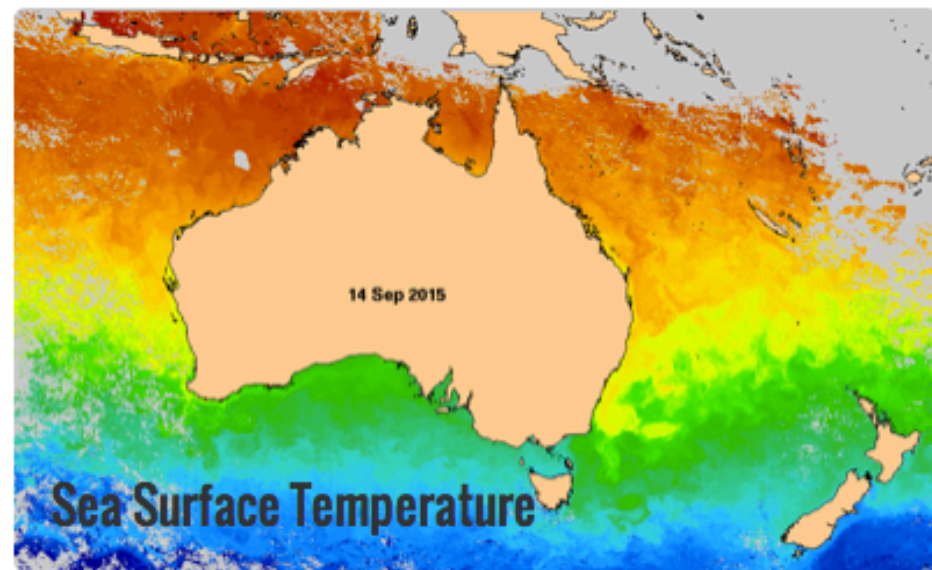
- Improve data visibility and data quality: data available at the IMOS portals:

<https://imos.aodn.org.au/imos123/>

<http://oceancurrent.imos.org.au/>

- Implementation of the real-time 4D-VAR data assimilation into ROMS – tests are being made in offline mode

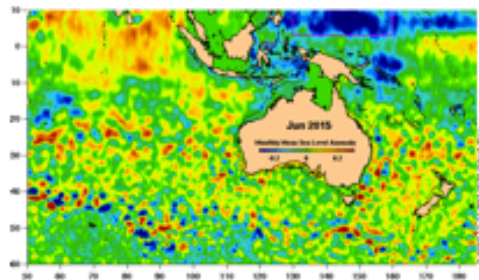
Map showing SST imagery, geostrophic currents, radar data and floats / drifters



Ocean News

Sea level in the western equatorial Pacific drops dramatically

15 July, 2015



The month-average of sea level north of New Guinea has dropped to levels not seen since the 'super El Niño' of 1997/1998. An El Niño event occurs when sea surface temperatures in the central and eastern Pacific become sufficiently warm that the atmospheric circulation shifts resulting in weaker equatorial trade winds. Low sea levels north of New Guinea (a result of weak equatorial trade winds) are strongly correlated with Nino3.4, the El Niño index that relates best to Australian climate. [\[more\]](#)

[Animations](#)

[Google Earth View](#)

[Argo](#)

[Current Meters](#)

[Gliders](#)

<http://oceancurrent.imos.org.au/>

Thank you for your attention

For more information:

<http://imos.org.au/acorn.html>

IMOS is a national collaborative research infrastructure, supported by Australian Government. It is led by University of Tasmania in partnership with the Australian marine and climate science community.

