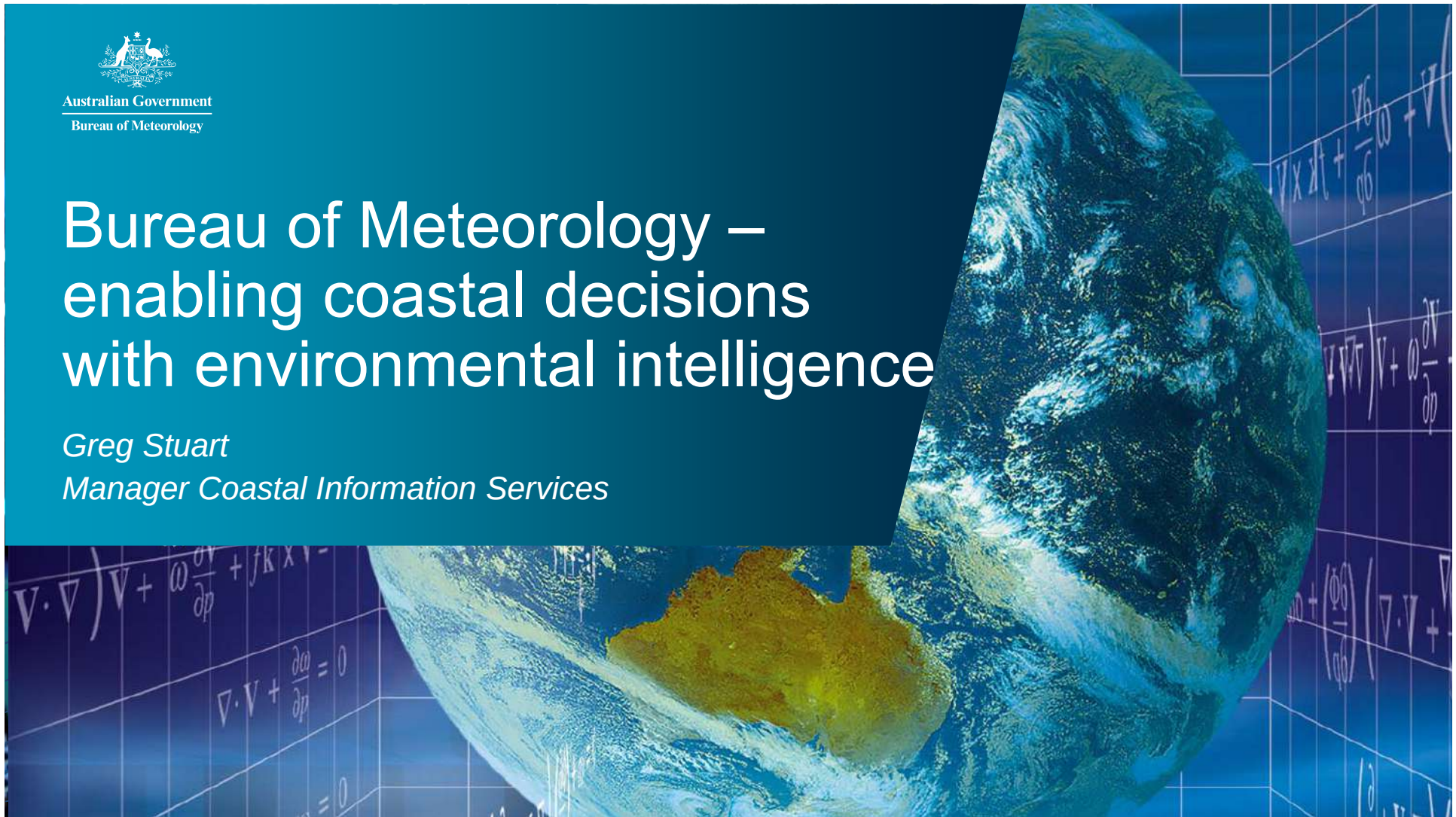




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Bureau of Meteorology – enabling coastal decisions with environmental intelligence

Greg Stuart
Manager Coastal Information Services



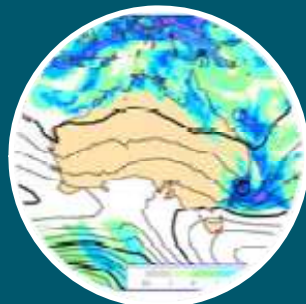


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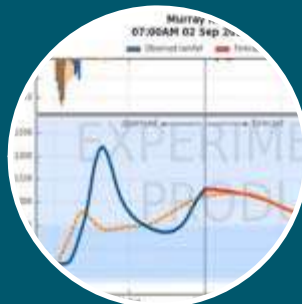
Why is the Bureau involved?



Observe



Analyse



Forecast



Inform



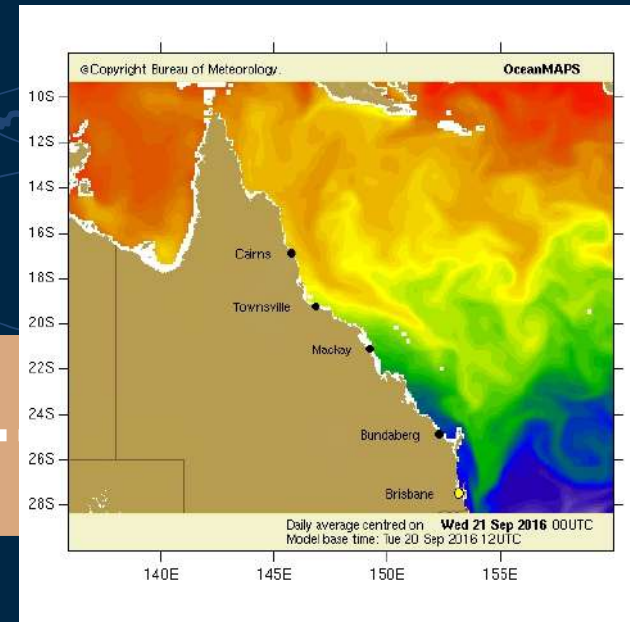
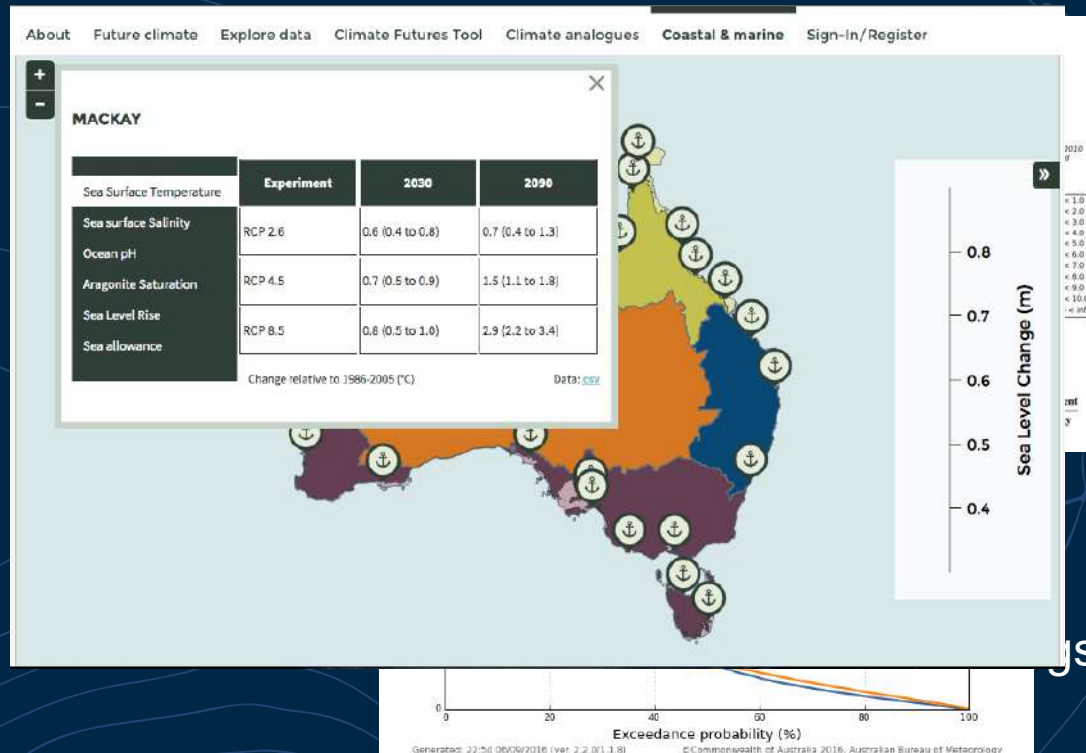
Warn

Information from environmental data and models to inform decisions



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Timescales are important



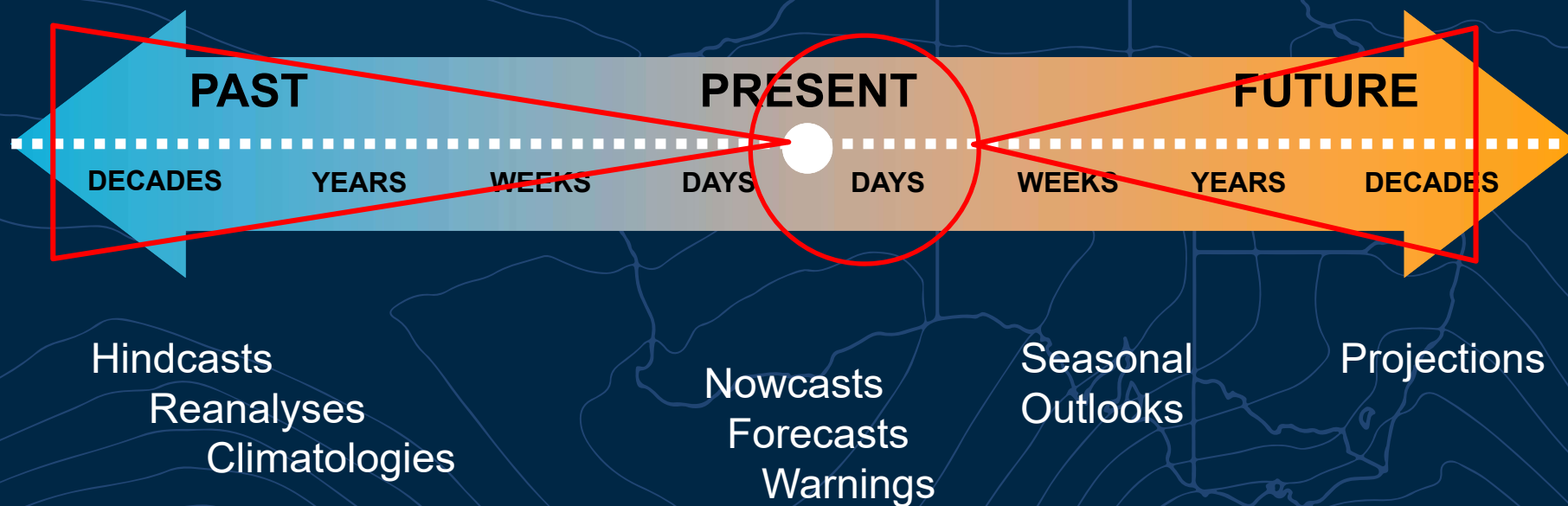
Seasonal
Outlooks

Projections



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Timescales are important

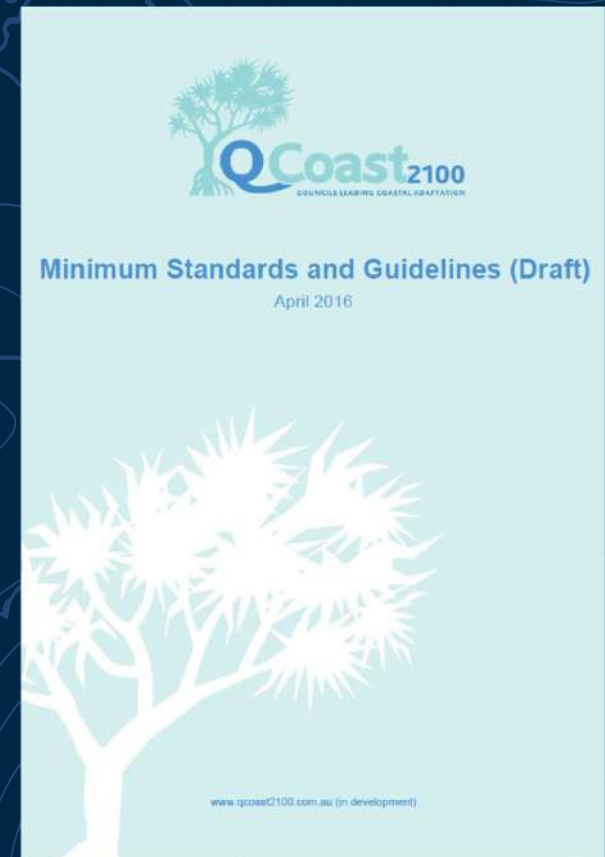




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Phases of a CHAS

Phase	Description
1	Engagement plan
2	Scope hazards
3	Identify exposed areas
4	Identify exposed assets
5	Risk assessment
6	Identify options
7	Socio-economic assessment
8	Implement and review

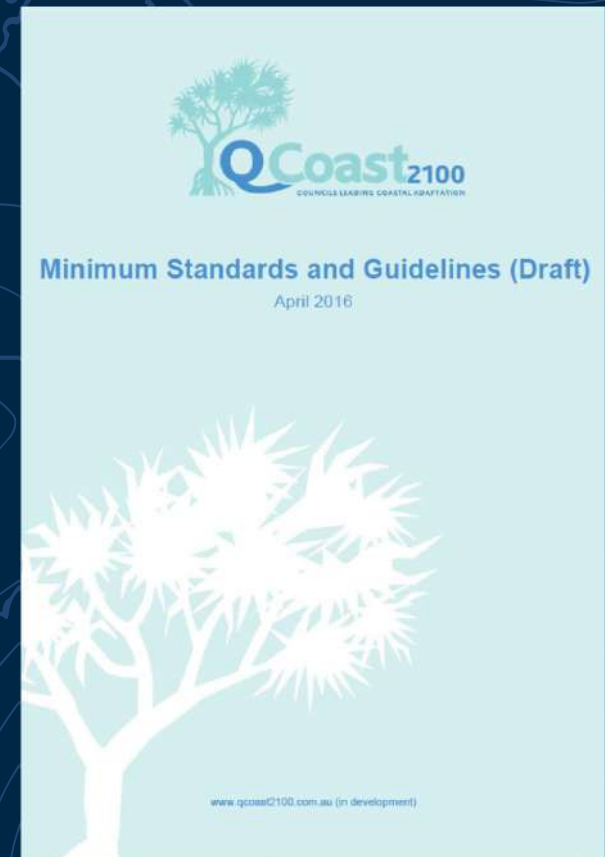




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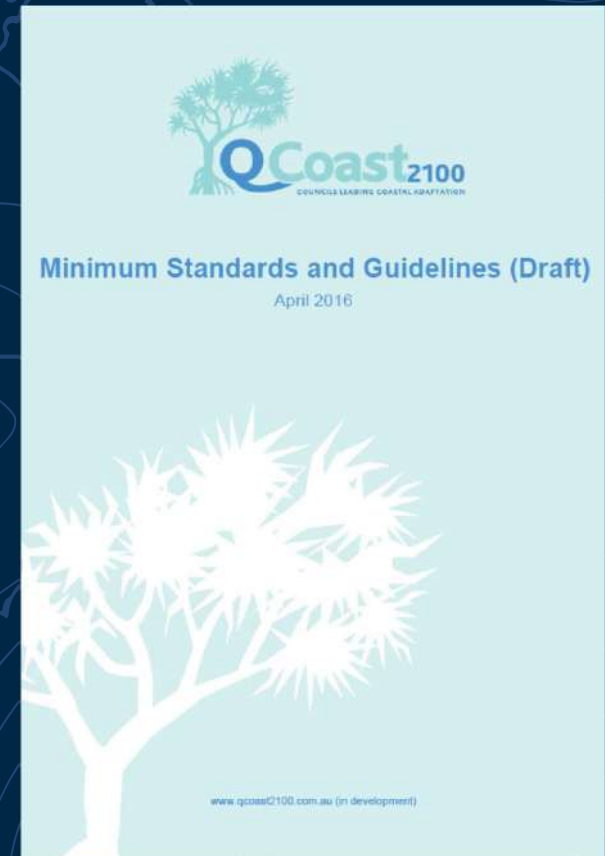




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Phase 2: Scoping coastal hazards

- First pass coastal hazard (semi-quantitative)
- Identify and assess existing data
- Note gaps that need to be filled

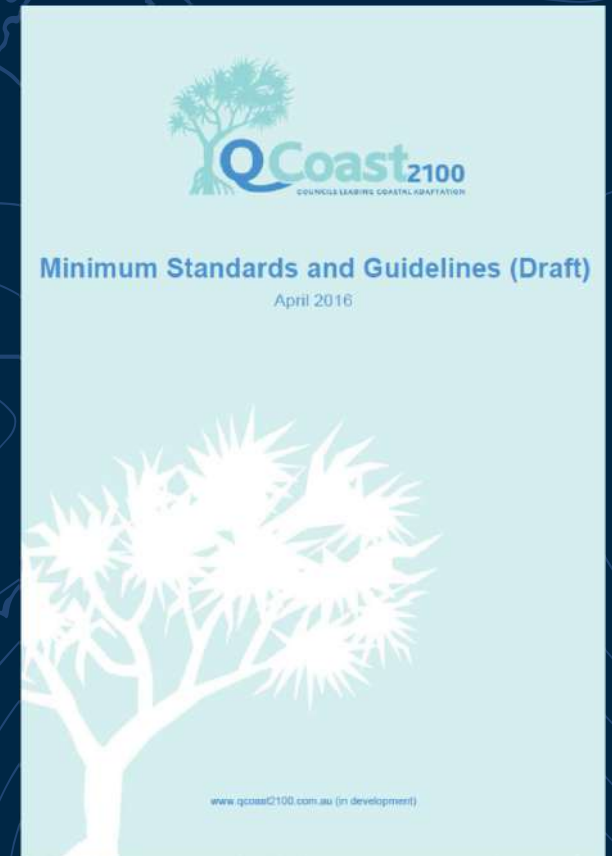




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Useful data for a CHAS

- Rainfall
- Temperature (air and sea)
- Wind
- Waves
- Tides
- Ocean currents
- Tropical Cyclones
- Storm surges
- Tsunamis
- River flood heights
- River flow volumes
- Groundwater levels
- Soil moisture
- Water storages
- Water quality
- Sediments
- Beach profiles
- Short and long term erosion
- Dune conditions
- Infrastructure





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Useful data held by the Bureau

- Rainfall
- Temperature (air and sea)
- Wind
- Waves
- Tides
- Ocean currents
- Tropical Cyclones
- Storm surges
- Tsunamis
- River flood heights
- River flow volumes
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- Sediments
- Beach profiles
- Short and long term erosion
- Dune conditions
- Infrastructure



Minimum Standards and Guidelines (Draft)
April 2016



www.qcoast2100.com.au (in development)



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How can you access the data?

On-line

The image displays three overlapping screenshots of the Bureau of Meteorology website, illustrating various ways to access data online.

- Left Screenshot: Seasonal Streamflow Forecasts**
This page shows the "Seasonal Streamflow Forecasts" for August-October 2016. It includes a map of Australia with streamflow data points and a table of forecasts for various locations. The page is titled "Seasonal Streamflow Forecasts" and "About".
- Middle Screenshot: Marine & Ocean**
This page is titled "Marine & Ocean" and features a "Warnings" section with a "Marine Wind Warning Summary for New South Wales". It also includes a "Forecasts" section with links to "Marine forecast wind and wave maps for Sydney waters", "Local & coastal waters forecasts via desktop map", and "Marine forecast wind and wave maps".
- Right Screenshot: Ocean maps and data**
This page is titled "Ocean maps and data" and provides information on "Ocean observations underpin marine weather forecasting and detection of global climate change". It includes a "Recent and historical sea temperature analysis" section with links to "Daily SST maps for Australia and Australian coastal regions", "Weekly averages of SST for the Pacific and Indian oceans", "Weekly SST anomalies for the Pacific Ocean", and "Global maps showing daily, weekly and monthly SST means and anomalies, and differences from recent monthly mean SSTs".



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How can you access the data?

On-line Download

The screenshot displays two overlapping browser windows from the Australian Government Bureau of Meteorology website.

The background window is the 'Catalog' page at <http://ereftds.bom.gov.au>. It features a 'Dataset' list on the left with links to various data types, including 'Raw data', 'Processed data', and 'Derived data'. The list includes links for 'Raw data', 'Processed data', and 'Derived data' for various parameters like 'Rainfall', 'Temperature', 'Wind', 'Humidity', 'Cloud', 'Sunshine', 'UV', 'Air Quality', 'Marine', and 'Agriculture'.

The foreground window is the 'Climate Data Online' page at <http://www.bom.gov.au>. It provides a search interface for climate data. The 'Select using Text' tab is active, showing a search for 'Daily rainfall'. The 'Date about' dropdown is set to 'Rainfall'. The 'Type of data' dropdown is set to 'Observations'. The 'Daily rainfall' section shows a search for 'Daily rainfall' with a 'Find' button. The 'Get the data' section shows a search for 'Daily rainfall' with a 'Get Data' button.

The footer of the website includes a 'WARNINGS' section with links to 'Tropical Cyclones', 'Tsunami Warning Centre', 'Agriculture - Water and the Land', 'Marine & Ocean', 'W & Sea Protection', and 'Rainfall & River Conditions'. It also includes a 'MetLive' section with links to 'Rainfall Forecast', 'Seasonal Outlook', 'Climate Variability & Change', 'Climate Data Online', 'Seasonal Streamflow Forecasts', and 'Water Storage'. The footer also includes links to 'Facebook', 'YouTube', 'RSS', 'Google+', and 'Web'.



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How can you access the data?

On-line
Download
Data request

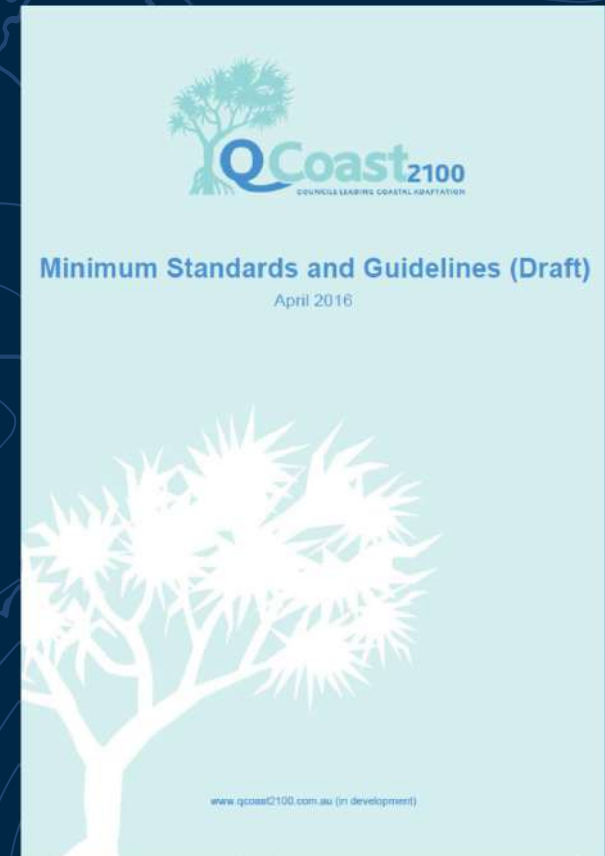
climdata@bom.gov.au
tides@bom.gov.au



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Phase 3: Identify exposed areas

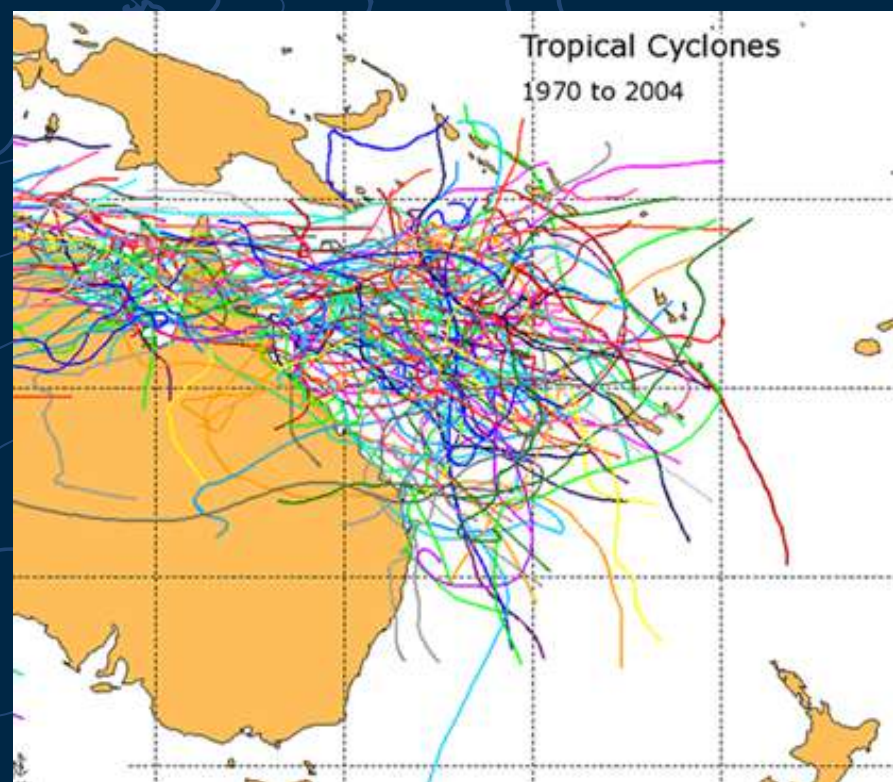
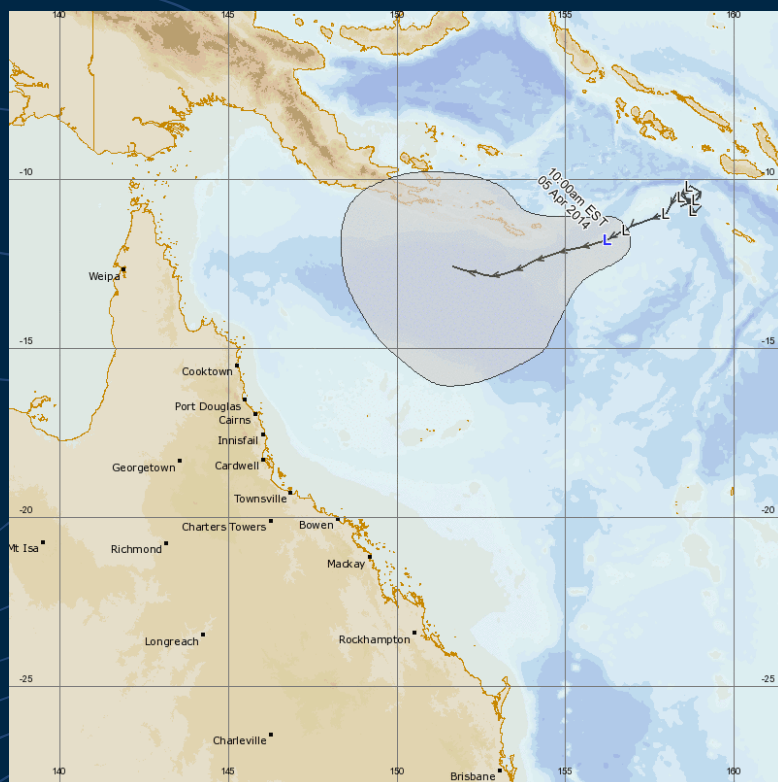
- Calculate erosion prone areas
- Calculate storm tide inundation prone areas
- Consider a range of climate change scenarios





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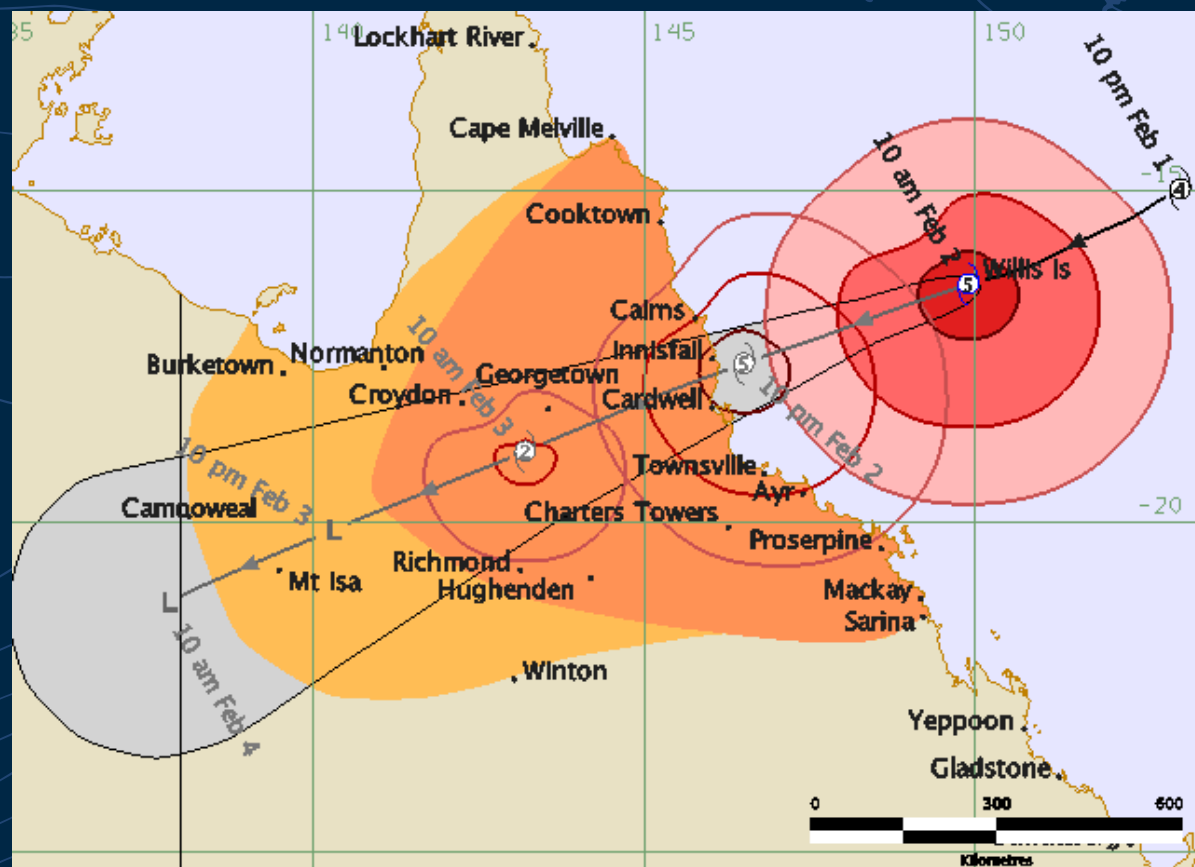
Tropical Cyclone information





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Storm surge service



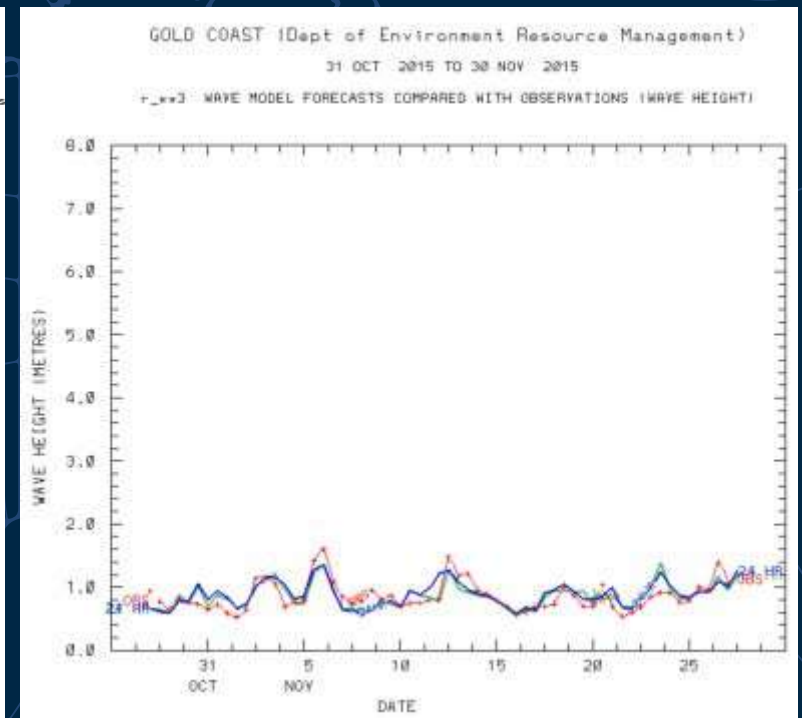
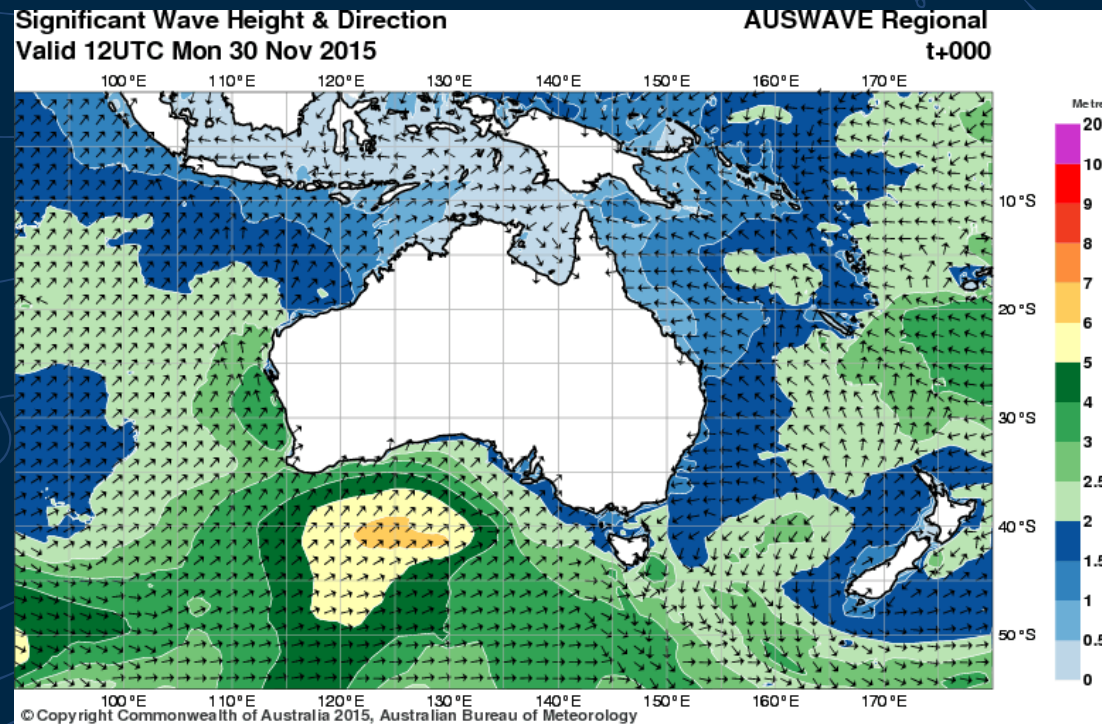
Dangerous
storm tide
possible



Colours
consistent
with Qld
evacuation
zones

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AUSWAVE



WAVEWATCH III, 0.1° resolution, ACCESS-R forcing, 4 runs per day to +72 hours

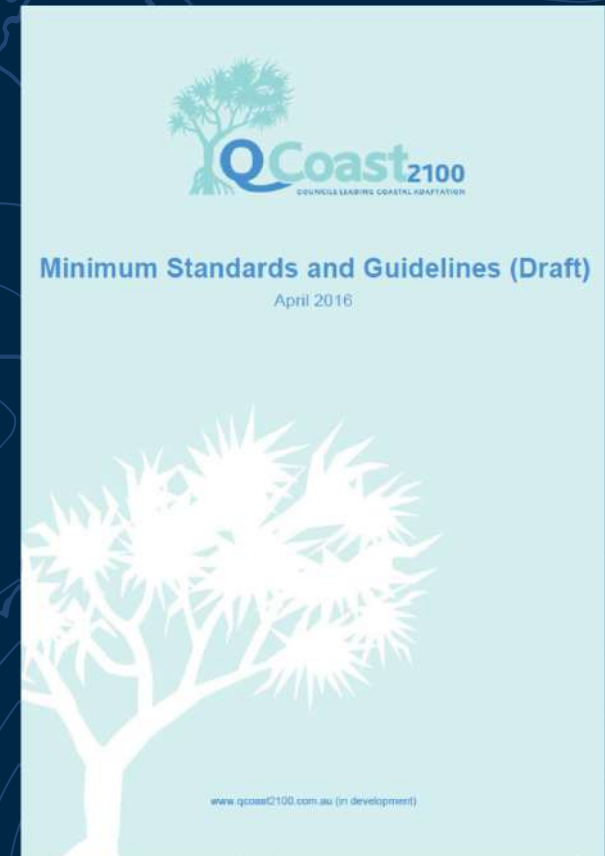
<http://www.bom.gov.au/nwp/doc/auswave/data.shtml>, <http://www.bom.gov.au/australia/charts/bulletins/apob97.pdf>



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Phase 5: Assess your risks

- Advice on **probability** of extreme events
- **Consistent** approach across the state





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Bureau of Meteorology

Recent developments



Supercomputing capacity in the Bureau

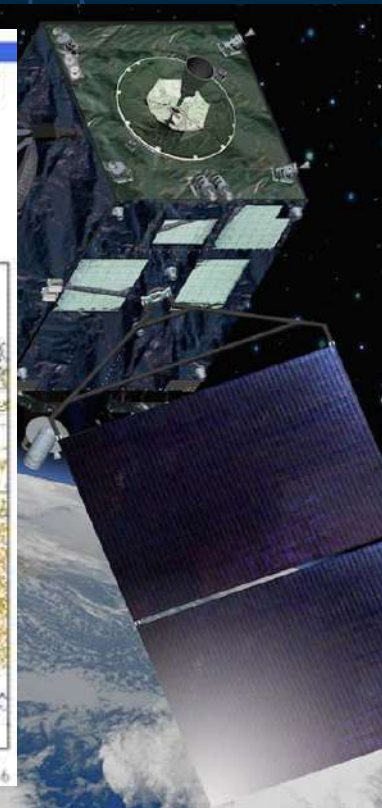
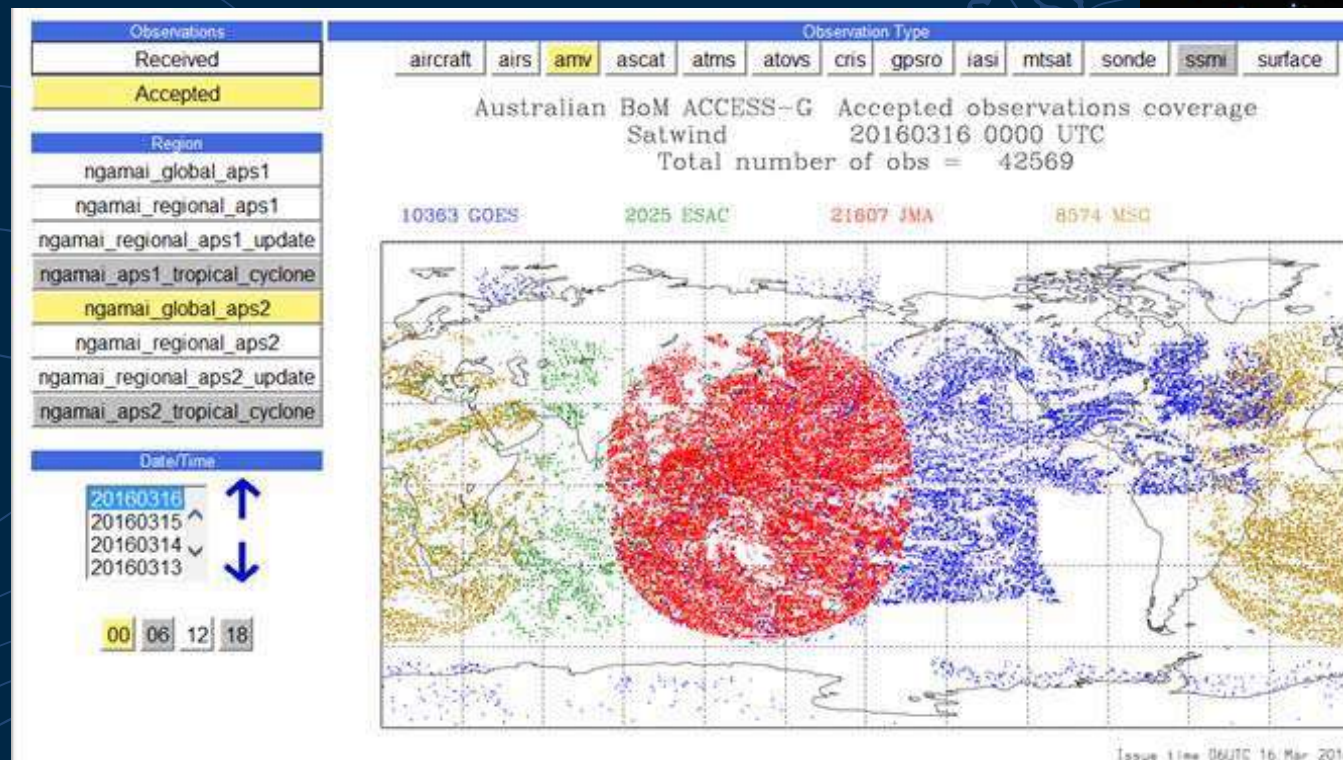


- Current system: **Ngamai, 2013:** 104 teraflops
- New system: **Australis, 2016:** 1660 teraflops
- Future system: **Australis+, 2019:** over 5000 teraflops



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New met satellite : Himawari-8 (from JMA)





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Thank you

g.stuart@bom.gov.au

