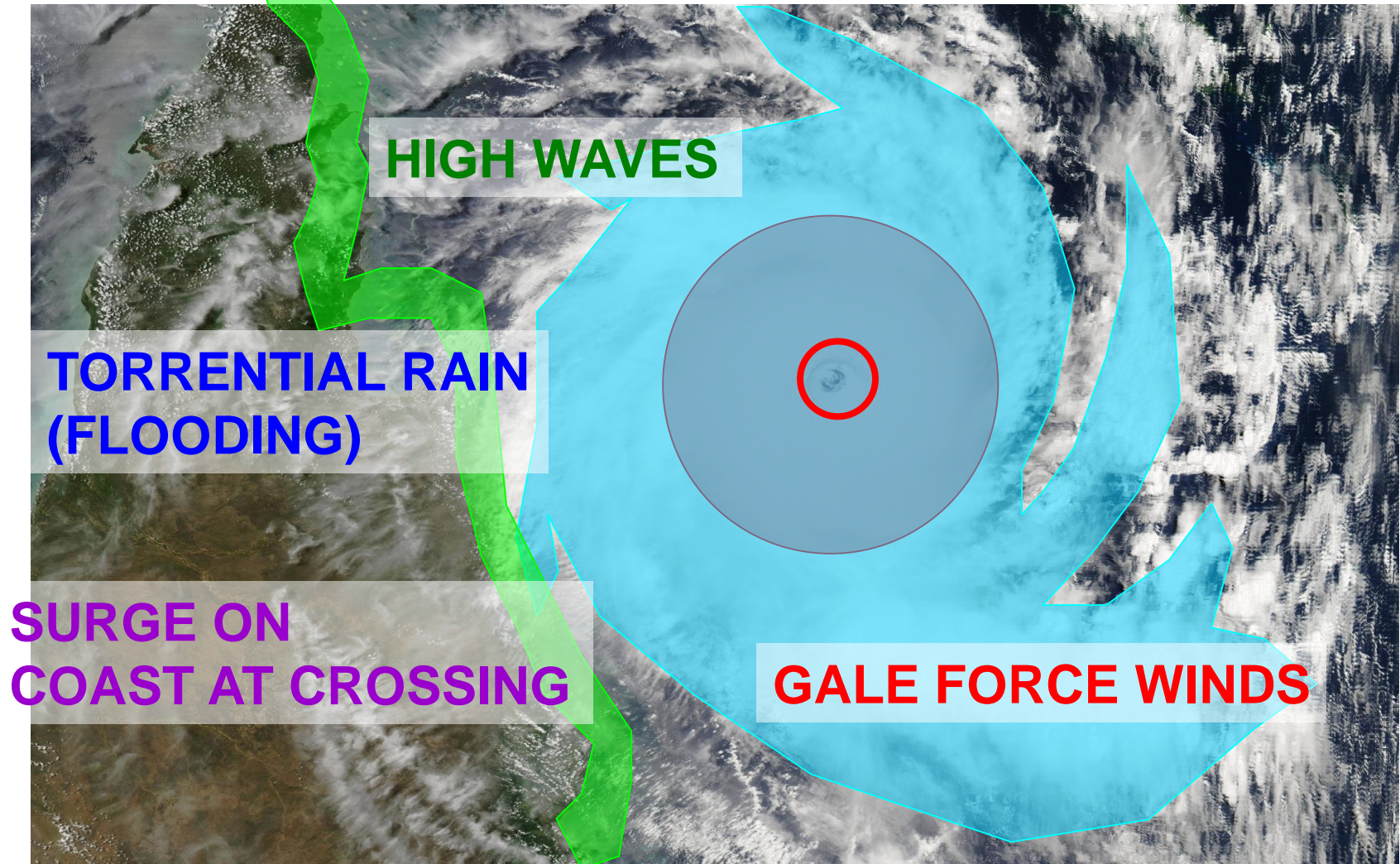


# Cyclone Hazards: wind



Australian Government

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Australian Government

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# Extremes

<http://wmo.asu.edu>

- most **deaths** in one event: **> 300,000 (storm surge)** (Bangladesh 1970)
- most **expensive**: **US\$81 billion** (Hurricane Katrina, USA 2005)
- highest recorded gust: **408 km/h** (TC Olivia, WA 1996)
- Lowest pressure: **879 hPa** (Typhoon Tip NW Pacific 1979)
- highest storm surge: **13 metres ?** (Bathurst Bay, Qld 1899)
- highest 24 hour rainfall: **1825 mm** (TC Denise, La Reunion 1966)
- ocean waves of **> 30 metres**



Photos: NOAA Photo Library





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# Category 1+





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# Category 3+ – TC Ingrid





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# Category 4?

## Charley, Fl. impact of debris



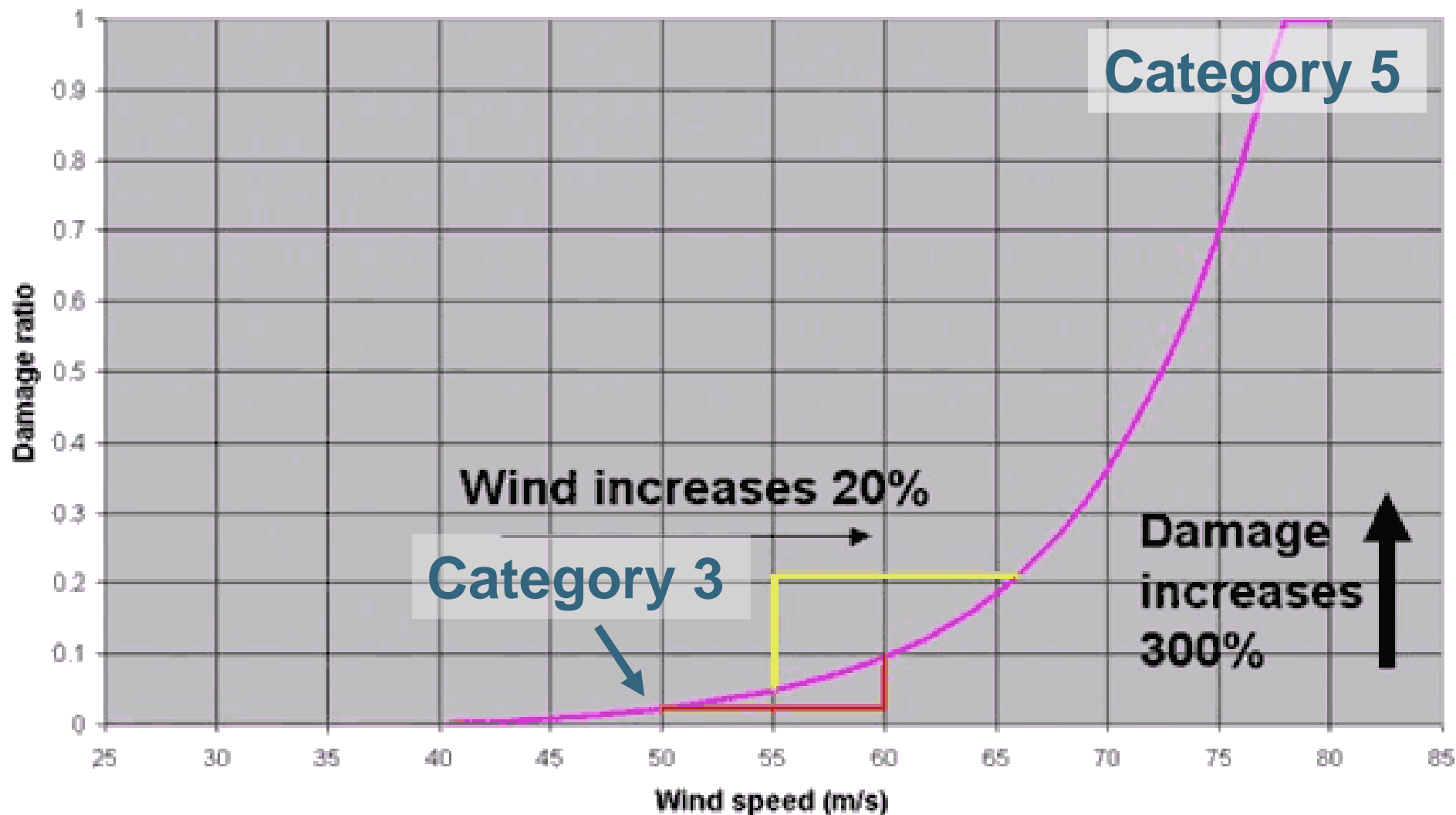


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# Winds Vs Wind damage

wind strength, duration, structure exposure & design





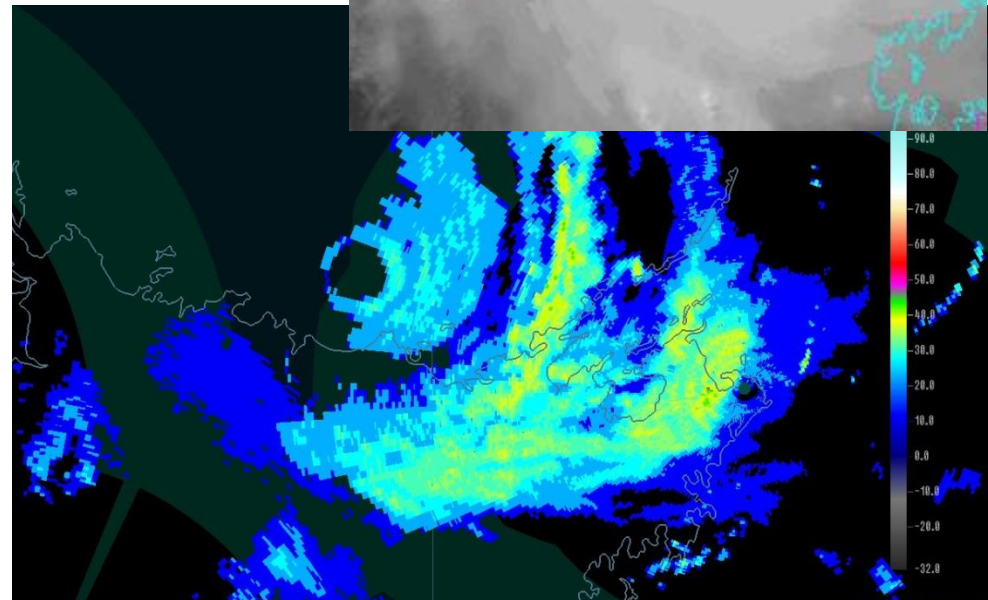
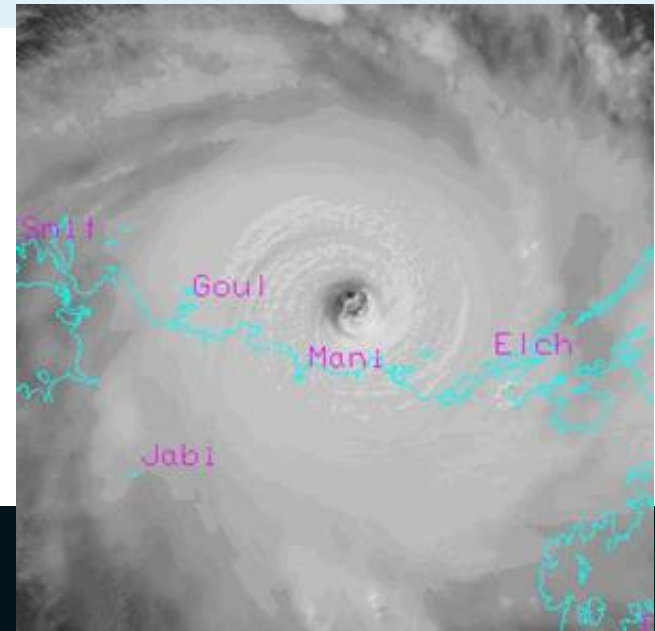
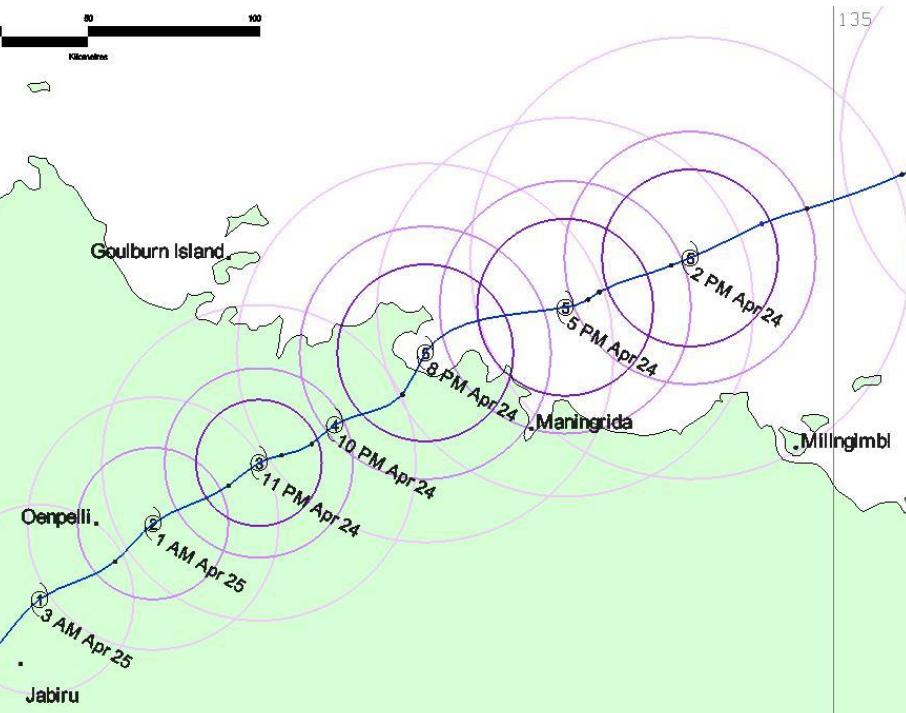


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# Severe TC Monica Coastal crossing

- 8.30 pm 24/4/2006
- 37km west of Maningrida
- 350 km/h wind-gusts
- estimated 915 hPa





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# Damage to vegetation where Monica's eye crossed the coast





A map of Fiji showing various islands and locations. A red circle highlights the area around Suva and Nadi. A blue arrow points from the top left towards the bottom right, passing over the map. The locations labeled on the map include Labasa, Taveuni, Koro, Viwa, Nadi, Suva, Gau, Lakeba, Moela, Kadavu, and Ono-I-lau. Time zones are indicated as 00:00 8/1 and 12:00 8/1.



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# Forecasting winds

## Track, intensity, size, uncertainty

- Point specific forecast:
- Onset of gales?
- How strong will the winds and when?
- When will they ease?
- What is the chance they will get to cat 3?

## Extent for watch/warning purposes



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# Forecasting winds

## Key Messages on Hurricane Joaquin

### Thursday Morning, October 1, 2015



NHC tweet  
uncertainty

- Preparations to protect life and property in the central Bahamas should be complete.** The slow motion of Joaquin during the next 24 to 36 hours will bring a prolonged period of hurricane force winds, storm surge, and very heavy rainfall to those islands.
- Confidence in the details of the forecast after 72 hours remains low, as there have been some large changes in the model guidance overnight.** The range of possible outcomes is still large, and the possibility of a hurricane landfall in the Carolinas still cannot be ruled out.
- Efforts continue to provide the forecast models with as much data as possible.** The NOAA G-IV jet flew the first in a series of missions in the storm environment last night, and these missions will continue today. The National Weather Service also continues to launch extra balloon soundings.
- Because landfall, if it occurs, is still more than three days away, it's too early to talk about specific wind, rain, or surge impacts from Joaquin in the United States.** Regardless of Joaquin's track, strong onshore winds will create minor to moderate coastal flooding along the coasts of the mid-Atlantic and northeastern states through the weekend.
- A hurricane watch for a portion of the U.S. coast could be required as early as tonight.**
- Many portions of the eastern U.S. are currently experiencing heavy rains and gusty winds associated with a frontal system.** These heavy rains are likely to continue for the next few days, even if the center of Joaquin stays offshore. The resulting inland flood potential could complicate preparations for Joaquin should it head toward the coast, and even more substantial inland flooding is possible if Joaquin later passes near or over these same areas.



National Hurricane Center: [www.hurricanes.gov](http://www.hurricanes.gov)