Cyclones

Cyclones have played a major role in the history of the Gold Coast. In February 1928, huge seas developed off the south coast causing serious floods where five people drowned. A severe gale hit Coolangatta and Tweed Heads, badly damaging buildings and uprooting trees.¹ Many cyclones have since caused damage to the southeast Queensland coast; see History of Gold Coast Storms information sheet.

What are cyclones?
Cyclones are low pressure systems that form off the coast over warm tropical waters. In their centre, cyclones can carry gale force winds of 63km/h or greater with gusts in excess of 90km/h. In the Southern Hemisphere, they have well-defined clockwise wind circulations that can extend hundreds of kilometres from the cyclone centre.

How are they formed?
Cyclones form when there is a combination of warm tropical water (above 26.5°C), high relative humidity and increased precipitation. This ultimately drives atmospheric energy to form a cyclone and once formed they can persist for many days and follow unpredictable paths. When cyclones travel across land or colder oceans, they usually dissipate as driving forces decrease.

Although the majority of extreme cyclones affect tropical areas, they can extend with the same severity to the whole east Australian coastline, between southern Queensland and Tasmania. These systems mainly develop between autumn and spring, and can intensify very rapidly. The most significant cyclone, Tropical Cyclone Glenda, hit the Gold Coast coastline in June 1967. Three consecutive storms generated gale force winds, huge waves (up to 16 metres) and widespread flooding. This resulted in major flooding and extensive erosion of Gold Coast’s beaches.
To find out how you can prepare for a cyclone, visit goldcoastcity.com.au/disaster

This information was sourced from the Australian Bureau of Meteorology: bom.gov.au/cyclone

Cyclone severity

The severity of a cyclone is described in terms of categories ranging from 1 to 5, related to the zone of maximum winds.

<table>
<thead>
<tr>
<th>Category</th>
<th>Maximum wind speed (km/h)</th>
<th>Typical effects (indicative only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt; 125</td>
<td>Negligible house damage. Damage to some crops, trees and caravans. May drag vessel moorings.</td>
</tr>
<tr>
<td>2</td>
<td>125 - 169</td>
<td>Minor house damage. Significant damage to signs, trees and caravans. Risk of power failure.</td>
</tr>
<tr>
<td>3</td>
<td>170 - 224</td>
<td>Some roof and structural damage. Some caravans destroyed. Power failure likely.</td>
</tr>
<tr>
<td>4</td>
<td>225 - 279</td>
<td>Some roofing loss and structural damage. Many caravans destroyed and blown away. Dangerous airborne debris. Widespread failures.</td>
</tr>
<tr>
<td>5</td>
<td>&gt; 280</td>
<td>Extremely dangerous with widespread destruction.</td>
</tr>
</tbody>
</table>

Why haven’t we seen the severity of the 1967 cyclone in most recent years?

Gold Coast’s cyclonic events correlate with the Interdecadal Pacific Oscillation (IPO). The IPO is the Pacific Ocean’s climate variability index that indicates changes in global oceanic patterns, including sea level rise and high energy events with a cycle of 15–30 years. During stormy periods the IPO is negative and in calmer, drier periods it is positive. The longest period of negative IPO has been from the late 1950s–90s, and in the most recent years the IPO has been positive, which is why the Gold Coast has not seen the extent of severe cyclones similar to the 1960s and 1970s.

Changes in the IPO index and sea level from 1880–2000. Can you see the negative IPO between the late 1940s and 1970s? (Source: Peter Helman)

Cyclones + climate change =

There is evidence to suggest the east coast of Australia will experience more frequent low pressure systems, including cyclones, as a result from oceanic circulation changes. Changes in the climate can affect ocean circulation patterns, and at a regional scale, sea surface temperatures may warm. This means the Gold Coast may experience more erosion and flooding events, as a result from an increase in the number and intensity of cyclones.

What is GCCC doing to mitigate against/adapt to cyclones?

- Protection strategies for beaches
- Improving storm water drainage
- Investment in coastal community education

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Discover more of our city’s coast at www.goldcoastcity.com.au/coast. This information is proudly produced in partnership with the Griffith Centre for Coastal Management’s CoastEd program. For more information, visit www.griffith.edu.au/coastal-management.