

HARDEN UP QUEENSLAND



ARCHIVE: Known Impacts of East Coast Lows, 1846 – 2009

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Date	Impact
19 Aug 1846	Vessel <i>Coolangatta</i> driven ashore at North Kirra Beach (just to the north of Tweed River) in easterly to northeasterly gale. Strong SW winds following day. Locality subsequently named after the vessel.
June July 1864	Tremendous gale off Queensland coast.
14-17 June 1869	Steamers unable to leave Brisbane due to tempestuous state of sea. Continuous rain in Brisbane; creeks swollen and communication with Gympie cut off; mail coach at the Durraboy Lagoon washed away and three horses drowned.
14-20 July 1876	Very heavy gales (14th), SS <i>City of Brisbane</i> attempted to enter Moreton bay without success. Another ship narrowly escaped shipwreck in the Bay. Exceedingly furious gales on the coast between Brisbane and Sydney (18th to 20 th). Heavy rain and floods (14 th) Myall Creek bridge at Dalby almost destroyed and part of the railway near Gowrie swept away. High seas on the coast with heavy gales. Several lives lost in different places also large numbers of stock and sheep. Disastrous floods and loss of life at Grafton.
3 June 1878	Unprecedented heavy gales very general on the southern coast.
15 May 1879	Very heavy gale along southeast coast of Qld with some casualties. Very heavy rain on the coast (9 th), Coffer Dam at the Brisbane dry docks destroyed. Three men drowned while attempting to cross the Thomson River.
24-27 Jun 1879	Thunderstorm 24th developed into cyclone 25th with much roof damage in Brisbane. Cyclone in Sth Qld 27th with great damage.
27 Aug 1879	Catholic Church at Charters Towers blown down (27 th). Very severe and unprecedented floods in parts of the colony (27 th) in Dalby many were forced to leave their houses. The Brisbane River was upwards of 8 feet above the high water mark. The floods reached their highest mark on the 30 th . The Victoria baths were washed down the Brisbane River; thirty tons of Yengarie sugar were destroyed at Bundaberg Wharf.
8-11 Oct 1888	Cyclone moving eastward across Coral Sea. SE gales and heavy Seas in SE Qld and north and central coasts of NSW. Very heavy rain on the coast.
17-19 Jul 1889	Cyclone near Rockhampton 17th, Brisbane 18th then moved east. Gales and heavy seas on north and Central coasts of NSW. Vessels lost Fraser Island to Coffs Harbour.
8 Jun 1891	Hurricane at Brisbane did considerable damage. Floods Brisbane and Gympie. Gales N NSW coast.
10-12 Jun 1893	Cyclone moved SE from Central Qld coast and then east. Gales and very heavy rain SE Qld coast and north coast NSW.
26 Jul 1897	The schooner <i>Heroine</i> , a wooden vessel of 122 tons and with 130 tons of coal on board was driven ashore at North Kirra near the mouth of Coolangatta Creek. On the 25 th the schooner was at anchor

	off Tweed Heads and on the morning of the 26 th heavy seas were breaking over her and staving in the hatches. The Captain had to slip her cables and the vessel was driven ashore. The captain and crew landed safely. Also on the 26 th the ketch <i>Candidate</i> was driven ashore at Byron Bay at the height of the gale. The captain and crew were landed by means of ropes.
23-24 Jun 1912	Very severe E to NE gales along sub tropical coast of Qld. Shipping delayed. Masters of vessels reported that night of 24th was the worst they had encountered.
15-16 Aug 1912	A depression off SE coast of Qld produced gales and high seas south of Sandy Cape.
24-25 Jun 1914	Cyclone off north coast. Gales between Mackay and Rockhampton.
21-23 Sep 1914	Cyclone on north coast. Gales east of Brisbane.
8-10 Oct 1914	Cyclone passing down off coast caused gales and torrential rains. Wrecked two ships off south coast.
23-28 Sep 1916	Cyclone passed from interior ESE out to sea producing very heavy rain and gales along southeast coast.
28 Jul 1919	Cyclone passed southwards between New Caledonia and Queensland. Ships driven on Barrier Reef southeast of Mackay.
22-24 July 1921	Cyclone from NE struck northern NSW coast causing gales and shipping disruptions before recurving to SE. Disastrous floods SE Qld and northern NSW. Goondiwindi, Warwick and Roma flooded. Several houses washed away and 2 men drowned at Texas. A man drowned at Inglewood. Heavy stock and crop losses and damage to roads and bridges.
2-6 Oct 1921	A cyclone passed southwards between New Caledonia and Qld producing severe gales.
18-23 Jun 1925	Cyclone crossed central coast at Port Clinton on 19th. Some damage to buildings at Yeppoon and Taranganba Station. It recurved over Gayndah and Double Island Point.
17-20 May 1926	Cyclone passed just east of Double Island Pt on 17th and moved SE to Norfolk Is while intensifying. SS <i>Wanganella</i> adrift for a week and <i>Eastern Moon</i> in similar difficulties. Local flooding in Burnett, Dawson and Balonne Rivers.
29-30 Nov 1927	Cyclone off Sandy Cape moving south. Heavy weather along south coast.
15-17 Jun 1929	Cyclone recurved to SE off Central Coast with gales reported. Local flooding Fitzroy R.
29-30 Jun 1929	Cyclone recurved to SE just to NE of Cape Moreton with gales and heavy rain. Much damage at Sandgate. Flooding in Pine and Nerang Rivers.
7 July 1931	Cyclone developed SE Qld and moved towards the SE. High winds Brisbane.
10-11 Jul 1933	Cyclone recurved over Broadsound and Rockhampton towards southeast. Floods Central Q.
1-2 Sep 1934	Cyclone passed to east of Brisbane. SS <i>Montoro</i> damaged.
7-10 July 1935	Cyclone recurved over Shoalwater Bay and moved towards SE. Gales. SS <i>Maheno</i> driven ashore. Heavy rain Central Q.
30 May 1941	Cyclone crossed coast near Town of 1770 and then moved back out to sea. Gales Central Coast 30th and 31st. Local heavy rain and hail.
14-16 Jun 1948	Complex cyclonic system moved from Double Island Pt to Coolangatta and then seawards. Gale

	force winds . Flooding on South Coast and Condamine.
15-26 Jun 1950	<p>On the 23rd a cyclone moved westward towards the Gold Coast and then turned slowly back out to sea and down the NSW coast. Wind over 50 knots in Moreton Bay and northern NSW where 10 to 15 m waves reported. Houses were unroofed at Cleveland, Southport and Coolangatta. 40 launches at Southport were damaged or destroyed. 24 hr rainfall totals to 368 mm (Springbrook). Extensive damage in SE Qld due to flooding and 2 lives were lost. Winds to hurricane force and waves to 15 metres off the NSW coast. For the 24 hours to 9am 24th Dorrigo recorded 636 mm of rain. Serious flooding in N NSW rivers and the Clarence River forced a new path to the sea. Grafton, Kempsey and Maitland badly affected with large scale evacuations (estimated 9000) and 4 lives lost. Navy ship <i>Fair Wind</i> lost with crew of 17. 648 ton freighter <i>Bangalow</i> driven ashore at Coffs Harbour. Tornado at Cudgen wrecked 4 homes and damaged others. At Grafton 3000 people were made homeless with 6 houses washed away. At Maitland 3200 were made homeless. Aerial surveys from Newcastle to Queensland revealed hundreds of blocks swept clear of homes. Millions of pounds (1950) damage to NSW train and tram tracks. Cronulla surf club collapsed into sea and extensive damage to other foreshore installations along the NSW coast. When rain cleared southward from the Maitland area westerly gales caused wave damage to submerged houses in an inland sea south and east of Maitland.</p> <p>The event began on the 15th/16th when a low developed east of Newcastle. Several houses and flats collapsed in the Sydney area by foundations being undermined by heavy rain. 300 families were evacuated in the Hunter Region. Similar evacuations in the Woy Woy Tuggerah area. Main roads out of Sydney were cut by landslides and flooded bridges. Five lives were lost. A second low developed near Ballina on the 19th and at Rathmines Met Office SE wind gusts to 61 knots were recorded.</p>
16 Nov 1950 12.5(17.5) C	Tropical low moved seawards near Brisbane and caused considerable structural damage with one life lost .
8-9 Jun 1951	Cyclone crossed coast Coffs Harbour and then moved over Darling Downs. Heavy rain.
29 Aug 1953	Cyclone made landfall at Rockhampton and then moved back out to sea. Gusts to 50 knots recorded at Rockhampton.
11-13 Jul 1954	Complex cyclonic system crossed coast near Bundaberg and then recurved towards SE. Winds to hurricane force left a trail of damage along the coast south from Bundaberg. Woman killed at Nambour Houses when shed was lifted by wind and hurled into her. House, shops, jetties and boats were badly damaged. 200 people were left homeless, hundreds of small craft were wrecked. Many houses unroofed including 50 at Caloundra. Hurricane force winds in Moreton Bay with widespread property and boat damage at Redcliffe, Sandgate and Wynnum. The Redcliffe jetty was badly damaged by large waves with most of the decking forced upwards and ripped off. The Dutch naval sloop <i>Snellius</i> reported waves to 21 metres off the South Coast.
8-12 Jun 1958	Large intense cyclone passed to east of south coast. Waves over 10m were reported off the South Coast out to a distance of 640 km. The schooner <i>Venturer</i> was wrecked near Lady Musgrave Is. Other ships sustained damage. Floods cut roads in SE Qld. There was severe beach erosion along the coast.
24-26 May 1960	Small deep low developed off the south coast on the 25 th north of a vigorous high in the Tasman Sea- 457 mm of rain fell in 3.5 hours at Cawarral (near Rockhampton)- Flash flood damage to crops and communications - Extensive sea damage to Gold Coast Beaches and interruptions to shipping.
5-7 Jun 1961	Deep complex low developed with centre east of Brisbane and another near Lord Howe Island. Gales and large seas along south coast with harbours closed.
6- 7 October 1961	1040 hPa high near Tasmania and an upper low forced a deep trough or small low to move off the Central Coast. A house was blown down at Rosedale. Heavy flooding in the Curtis. And heavy damage to roads. Crop and stock losses. 356 mm of rain was recorded in 9 hours at Wonbah (near Mt Perry.)

9-11 Jul 1962	<p>Cyclone developed NE of Fraser Island and moved past Gold Coast. 60 to 70 knot winds reported from Tweed Heads to Yamba in the 24 hours to 9am 11th. Local Flash floods Brisbane to Gold Coast. Fruit trees damaged buildings flattened Sunnybank. Small boats wrecked, buildings flattened, extensive beach erosion and roads damaged Gold Coast. Radio Mast wrecked Lytton. Widespread flooding Nerang, Albert and Logan Rivers.</p> <p>In NSW Small craft lost or damaged at North Coast harbours. Bad floods Murwillumbah, Lismore, Bellingen and Grafton with many evacuations and people drowned. At 1pm 9th 2 waterspouts came ashore at Port Macquarie and left a trail of destruction. 3 men were killed when a 2 story building they were building was wrecked. 30 houses were damaged. Largest 24 hr rain totals 265mm Springbrook and 227mm Lismore.</p>
7-8 May 1963	<p>Small cyclone developed near Tewantin and moved southeastwards out to sea. Gales brought down trees and power lines. Big tides and heavy rain caused severe local flooding at Redcliffe, Wynnum, the Sunshine Coast and the Gold Coast. There was waist deep water in Sutton St Redcliffe and other streets were under 5 feet of water. Families were evacuated at Lota. The Pacific Highway was cut by a landslide at Kirra. The Casino to Tenterfield road was washed away west of Casino leaving a 1000 feet sheer drop. Lismore had a major flood with water entering the city. Grafton then flooded with 700 families evacuated from their homes.</p>
25-28 June 1965	<p>Cyclone developed off Sunshine Coast and moved out to New Caledonia. Maximum average winds 44 knots at Double Island Point. Ship reported S'ly winds averaging 60 knots east of Fraser Island as cyclone intensified while moving seawards. Heavy to flood falls Mary R. Catchment and in Moreton. Maximum 24 hr registration 242 mm at Tewantin.</p>
18-21 Jul 1965	<p>Cyclone developed east of Brisbane, moved up to Fraser Island and then turned southwards over Brisbane, then down to Yamba and then seawards.</p> <p>Wind gusts to 60 knots recorded at the Bureau in Brisbane. There was much damage to small structures in the metropolitan area and 3 houses were unroofed. Trees were uprooted, plate glass windows smashed and telephone and power lines downed. Along the Bay many small craft were damaged. There was much crop damage in surrounding areas. Fallen trees and floods blocked roads. 24 hour rainfall rain totals in Brisbane were up to 236mm on the 20th. And 510 mm fell in 24 hrs at Springbrook. The upper trough associated with the development of the cyclone brought snow into the tropics for the first time on record. Scattered falls were reported on the 19th from the Central Highlands through the northern Warrego to the Darling Downs and Maranoa. Further north snow fell west of Mackay at Dalrymple Heights and Blue Mountain. Sleet was observed at Nebo and Clermont and on the 20th Thangool reported snow.</p>
9-13 Jun 1966	<p>Cyclone developed near Fraser Island and then moved south and passed to the east of Brisbane and the Gold Coast. Average winds to fifty knots along the S Qld coast. 24 hr rainfall totals:- 388mm Springbrook; 213mm Caboolture; 197mm Beenleigh and 163mm Brisbane Airport.</p>
8-13 Jun 1967	<p>Cyclone developed near Willis Is and moved down to Bundaberg on the 10th ,passed over Fraser Is and then moved into Moreton Bay on the 11th before moving over Gold Coast and then out to sea on the 13th. Cape Moreton reported gales from 9am 9th to 9am 11th with the strongest winds (gusts to 80 knots) at 6pm 10th. Very heavy rain 11th to 12th. Bureau in Brisbane recorded 282mm in 24 hours to 9am 12th. 140mm fell in the 3 hours to 10pm 11th. Springbrook recorded 621 mm in 24 hours to 9am 12th including 276mm in 6 hours to 3am 12th. A woman was killed when her car overturned into Mary R at Gympie. A youth was killed in an intersection crash in blinding rain at Clayfield. Two men were rescued from flooded vehicles at Doboy Ck and Wickham St in the Valley. Five hundred people were evacuated from flooded homes, fourteen people were rescued by boat. Fifteen cars were swept into Enoggera Creek and the occupants either escaped or were rescued. A car plunged into a washout at Chapel Hill. Hundreds of homes and shops in the Valley , Ashgrove, Moorooka, Hemmant, Breakfast Creek, Newstead, New Farm, Woolloongabba, Stones Corner, Greenslopes, Coorparoo, Fairfield, Annerley, Milton , Toowong , Newmarket, Windsor and Albion had water pouring through them. Three yachts were wrecked in Breakfast Creek by the floods. Caravans were washed away from the Newmarket Caravan Park. Landslides cut Brisbane rail services and there was much damage to roads and bridges.</p>

	<p>On the Gold Coast water entered ground floors in Cavill Av. The worst hit areas were the canal estates west of Broadbeach where hundreds of houses were isolated. Fifty families were evacuated from homes on the Gold Coast. At Southport houses were washed away or undermined. Many boats were set adrift by the gales and were badly damaged. Huge seas added to the severe beach erosion left over from the summer cyclones.</p> <p>Over the border in NSW there were two deaths and 400 people were evacuated from their homes in Grafton. Sixty families were evacuated from homes in the Kyogle region.</p>
21-22 Jun 1967	Cyclone moved from Willis Island down to Fraser Island and then turned towards the SE and passed over Lord Howe Island. Average winds to 40 knots along the S Qld coast. Rainfall in Brisbane to 60mm produced minor flooding.
26-28 Jun 1967	Cyclone developed just to the east of Brisbane (26th) and moved slowly north to the east of Double Island Pt (27th) and then turned slowly towards the SE. Hurricane force winds were reported from Cape Moreton from 9am 26th to 3pm 27th. A man was killed when his car crashed into a creek at Nerang in bad weather on the night of the 26th. Some houses and buildings were unroofed at Burleigh and Surfers Paradise. At Mudgeeraba a building was blown off its stumps and wrecked. Boats were swept from their moorings. Two houses at Mermaid Beach were lost to the sea (26th). Large sections of the esplanade at Surfers was lost to the sea and lanes and streets collapsed at Palm Beach (26th). The swimming pool from the Beach Lodge resort was lost to the sea at Surfers. By the 28th the esplanade at Main Beach fell into the sea and 5 houses were wrecked at Nobby's and Palm Beach. Many houses were badly damaged by the sea along the Gold Coast however a volunteer army of 5000 people placed around 100,000 sandbags along the foreshore helping to prevent many houses being lost to the sea. Wreckage of the Prawn Trawler <i>Sydney J</i> was found at Tewantin with no trace of the owner skipper who was believed to have drowned.
5-8 Jul 1973	Cyclone developed east of Mackay (5th) and moved down just seawards of the Sunshine Coast by 7th. It then moved back up north to the east of Yeppoon. Four people drowned on the evening of the 8th. Two near Nambour when the car went into a creek and two near Yandina after their car became stranded. Average winds of 40 to 55 knots were reported along the South Coast from 8 am 5th until 10pm 8th. A ship reported average winds of 60 knots off Stradbroke Island at 3pm 6th while another ship reported winds of 74 knots off the Gold Coast at 3pm 7th. Trees and power line were brought down throughout southeast Qld causing widespread blackouts. Some houses were unroofed at Kingaroy and near Warwick. The South Nobby wave recording station on the Gold Coast reported significant wave heights to 5.2 metres and maximum wave heights to 8.7 metres. The 1600 ton cargo ship <i>Cherry Venture</i> was driven ashore 1.5 km south of Double Island Point on the afternoon of the 8th after foundering in "forty foot waves". Twenty four rainfall totals recorded 9am 8th included 384mm Nambour; 349mm Woodford; 340 Mapleton; 335mm Maleny and 328mm Springbrook(7 th). Many roads in southeast Qld were cut by floods and in Gympie 6 feet of water was over Mary St on the night of the 8th. The Mary R at Gympie peaked at 19.6 metres at 2am on the 9th with houses shops and factories under 2 m of water.
29-30 Jul 1979	Cyclone developed to the NE of Fraser Island moved down just to the east of Brisbane and then turned eastwards out to sea. Gales along the Gold Coast. The Brisbane wave recording station (7 km east of Point Lookout) recorded significant (peak) wave heights of 4.7m (8.7m) on 30 July.
6-9 May 1980	Cyclone developed near Fraser Island, moved east and then turned back and crossed the coast to the north of Brisbane. Average winds along the south coast to 45 knots. The Brisbane wave recording station recorded significant (peak) wave heights of 5.2m (8.1m) on 8 May. Six houses at Labrador (Gold Coast) were flooded by 1 metre of water (6th). Floods cut roads in Brisbane and power lines were brought down causing blackouts in some suburbs (6th). Vehicle swept off road by floods in the Gold Coast Hinterland though driver escaped injury (8th). Roads flooded in the Waterford Marsden area (9th).
21-22 May 1981	Major low pressure system developed near Mt Isa and moved down to NW NSW. Small secondary cyclone developed on the coast near Cairns and ran right down the east coast with gale force winds. Extensive sugar cane damage Cairns to Home Hill. 16 homes damaged at Darling Heights

	(Toowoomba). Two small yachts wrecked. Local flooding Rockhampton to Proserpine. Two boys drowned at Rockhampton and one near fatality at Proserpine when motor vehicles were washed off creek crossings. The Brisbane wave recording station recorded significant (peak) wave heights of 3.8m (5.2m) on 22 May.
3-5 Jun 1983	Small low formed northeast of Cape Moreton while major low developed near New Caledonia with a central pressure of 1000 hPa (4th) and north of a large 1040 hPa high. Storm force winds South Coast 3pm 3rd to 9 pm 4th with gusts to 70 knots at Cape Byron. The Brisbane wave recording station recorded significant (peak) wave heights of 5.3m (10.0m) on 8 May.
20-23 Jun 1983	A cyclone developed in the Coral sea and moved down through Hervey Bay across the Sunshine Coast and back out to sea. Maximum sustained winds of 60 knots were reported from a ship ENE of Noosa. Gusts to 56 knots were recorded at the Brisbane City Bureau (22nd). 350 mm of rain was recorded in the 24 hours to 9am 22nd at Nambour including 229mm in 4 hours. A boy was drowned at Pomona after being sucked into a flooded drain. A man was killed at Gatton when a tree fell on him. In Brisbane winds brought down trees and powerlines and landslides closed the Southeast freeway and Settlement Road. Brisbane creeks were flooded. On the Sunshine Coast many centres were isolated as floods and landslides cut roads, trees and power lines were down and 15 yachts were damaged at Mooloolaba . Eleven caravans were washed away and destroyed from raging floodwaters at Yandina Caravan Park. In Nambour shops were flooded including a Mercedes dealership where cars were washed away. Floodwaters inundated houses and shops in the lower parts of Mary Street Gympie. On the God Coast trees and power lines were blown down and tiles were lifted off roofs. A boat was sunk in one of the canals and may roads were cut by floods trees and landslides. There was widespread crop damage in SE Qld. Eleven houses were evacuated at Roma. Major flooding occurred at Dalby with 13 houses evacuated. There was severe beach erosion along the South Coast and the Brisbane wave recording station recorded significant (peak) wave heights of 5.1m (7.1m) on 22 Jun.
8-10 Jul 1985	A 1009 hPa low developed on the Sunshine Coast by 3pm 8th and moved south while intensifying to a 1001 hPa low over southern suburbs of Brisbane at 3am 9th. Maximum sustained winds NE/38 knots at Cape Moreton and ENE/50 knots with gusts to 65 knots at Cape Byron. Caloundra recorded 239 mm of rain in 24 hours. At 9am 9th low was 1001 hPa and just to the north of Yamba after which it deepened and moved to the SE. Lord Howe Is at 3pm 9th had 40 knot winds from ESE with gusts to 54 knots.
2/3 Sep 1985	A large low pressure area developed in the Tasman Sea with the main 990 hPa centre east of Sydney on the 2nd. It then moved SE and deepened below 988 hPa. On the 2nd westerly wind gusts uprooted trees ,damaged buildings and crops and blacked out 9000 homes in Brisbane. The maximum wind gust recorded in Brisbane was 97 km/hr (52 knots) at 11.12 am on the 2nd. Waves to 3 metre high were reported on Moreton Bay.
9-10 May 1987	Small low on the Gold Coast with large 1037 hPa high in the Tasman Sea. 345mm of rain in the 24 hr to 9am 10th at Springbrook with flash flooding on the Gold Coast. Road collapsed at Bundall. A woman was drowned when the motor cycle she was a pillion passenger ran into a metre of water at Nerang. A man was drowned when swept away by flood waters at Tallebudgera Caravan Park. A man was missing believed drowned by a flash flood on his Mullumbimby property. There was one other death(source Lucinda Coates). Many other people were rescued from flood waters and hundreds of houses were flooded. Three boats were sank at Southport.
4-7 Apr 1988	Small low moved out to sea from Sunshine Coast, then up to Fraser Is, back to Gympie , out to sea again and then back overland west of Brisbane. Springbrook rain 24 hrs:- to 9am 4th 228mm; to 9am 5th 246mm; to 9am 6th 302mm. 161 mm at Dayboro in 24 hr to 9am 6th causing flash floods. In SE Qld flooding closed schools, swept people off bridges, uprooted trees, caused landslides and closed roads and highways. Landslides blocked the Western Freeway and roads at Samford. People at Cecil Plains were isolated by floods for a week. Ipswich SES had more than 200 calls for help. 400 residents were stranded in their homes at Kholo. Sandbagging was required to save homes at Tarragindi and Logan.

	The Crop damage in the Lockyer Valley and Darling Downs reached 20 million (1988\$). Floods also cut roads and isolated communities in NE NSW. Gold Coast wave recording station recorded significant wave heights to 4.28 m on 5 Apr.
10-11 Apr 1988	Small low developed SE of Fraser Island and moved onto Sunshine Coast. 24 hr rainfalls :- Springbrook 215mm to 9am 11th and 337mm to 9am 12th; Cooroy 239mm to 9am 11th; Eumundi 203mm to 9am 11th Gales were reported from Double Is Pt to Yamba. Wind gust to 50 knots at the Gold Coast uprooted trees, flipped small craft, and ripped bigger boats from their moorings. SES repaired roofs, cleared trees from houses and sandbagged houses on Gold Coast. Crop damage expected to reach 100 \$million in SE Qld from the series of lows. Communities continued to be isolated by floods in SE Qld. Huge seas on Gold Coast with 1 metre waves on Broadwater. Brisbane wave recording station recorded significant wave heights to 4.1 m on 11 Apr.
14-16 Sep 1988	A low developed 100 km east of Cape Moreton and then moved slowly out to sea. Gales affected the Gold and Sunshine Coasts and the N Coast of NSW. Large swells hit the Gold Coast and N NSW. Brisbane wave recording station recorded significant wave heights to 4.62m on 15 Sept.
14-18 Dec 1988	A tropical low developed near Willis Island and initially moved towards the SSE before turning S and then SW before crossing the coast south of Gladstone. Gales were reported from near the low and along the Sunshine Coast. Central Business area of Gladstone badly flooded. One metre of water swept through shops in Goondoon St on the 18th. There were four deaths from road accidents over southeast Queensland in bad weather on the 18th. Brisbane wave recording station recorded significant wave heights to 4.98m on 18 Dec.
24-26 Apr 1989	Tropical low developed near Yeppoon 24th moved down the coast over the Sunshine Coast on the evening of the 25th and east of the Gold Coast on the morning of the 26th. Gale to storm force winds on the Sunshine Coast with 15 houses suffering roof damage and 5 houses damaged by falling trees. One person was drowned at a creek crossing on the Gold Coast and another was electrocuted on the Sunshine Coast. Heavy rains caused widespread flooding. At the high tide early on the 26th some roads in Brisbane were under a metre of water. There was a 0.5m storm surge recorded on the Brisbane tide gauge. Landslides blocked city streets , walls collapsed and power lines were brought down. Flooding occurred at Gympie and several houses on the Sunshine coast were flooded. Large seas caused severe beach erosion along the Sunshine and Gold Coasts. The Brisbane wave recording station recorded significant wave heights to 6.11 m on 25 April.
21 -22 Feb 1992	Monsoon low crossed the coast near Rockhampton as it formed a secondary centre near Maryborough. Very heavy flood rains SE Qld . A motorist lost his life when he attempted to cross a barricaded crossing on the Stanley River. 225 homes were inundated by depths up to 800 mm in the Maroochy system. There was a flash flood component to this flooding. 30 to 40 houses and 110 business premises were flooded at Gympie. There was flash flooding at Bundaberg and on the Cherwell River near Howard where 60 houses and Caravans were inundated and around 20 people evacuated. 732mm in 24h at Tewantin.
14-16 Feb 1995	Low developed off the central coast and deepened to 997 hPa early on the 15th before making landfall on the Sunshine Coast. Winds to storm force south of the centre. Flash floods occurred at Hervey Bay though fortunately at low tide. The Brisbane wave recording station recorded significant wave heights to 6.42 m on the 15th..
14-17 Feb 1996	A tropical low developed near New Caledonia and moved past Brisbane and brought storm force southerly winds to waters off the Gold Coast. A storm surge brought some flooding up the Brisbane River at Newstead. A storm surge Of 0.59m was measured at The Gold Coast Seaway. The luxury vessel <i>Queen Elizabeth II</i> , travelling from Brisbane to Sydney, was battered by average winds of 26 ms ⁻¹ and very short and very steep 10 metre waves just off the northern New South Wales coastal town of Yamba around 1900 UTC 15 February 1996 resulting in injuries to passengers. The Brisbane wave recording station recorded significant wave heights to 6.19 m on the 15th.

1-5 May 1996	<p>Low developed east of Townsville and intensified as it moved down to waters just off Brisbane. Wind, sea and flood damage SE Qld - 3 drowned in small craft and in rivers. Boy swept down drain-1 traffic accident death - 16 houses were damaged by wind at Tamborine and there was wind damage on the Gold Coast. Landslides blocked roads and fallen trees brought down power lines. The maximum wind gust of 65 knots was recorded at Cape Moreton AWS. Storm tides flooded the Sandgate foreshore at Flinders Parade. The Gold Coast Seaway was 0.51m above the predicted high tide on the 2nd which was 0.18 m above HAT.</p> <p>The Brisbane wave recording station recorded significant wave heights to 6.9 m on the 2nd.</p>
4-5 Feb 1999	<p>A low developed east of Fraser Island and moved south. Hpeak and Hsig on the Southport wave rider buoy on the 4th were 6.7 m and 3.5 m. Two men were lost when a 8.1 m fishing boat was wrecked by a large wave on Breaksea Spit north Fraser Island early on th 6th.</p>
8-10 February 1999	<p>Small low developed near Double Island Point. In the lead up rains a girl drowned at Samford on the 6th. A man and a woman in a Campervan swept into creek at Kennilworth when bank collapsed on afternoon of the 8th. The man drowned. On the 8th at the Sunshine Coast flooding and landslips closed dozens of roads. Wind blew power lines down causing blackouts and several houses had roof damage. SES sandbagged homes against flash flooding in Nambour, Palmwoods, Coolum, Mudjimba and Pacific Paradise. Landslides affected the Obi Range Road between Mapleton and Kennilworth, Jimna Creek Road, Cedar Pocket Road and Tin Can Bay Road. Kilcoy was Isolated by floodwaters. At Brookfield a schoolgirl was rescued from Mogill Creek. In the Valley a landslide closed off Ivory Street. The road to Bribie Island was cut. SES volunteers attended wind and flood damage operations in the Laidley and Gatton area. Fallen trees cut several roads. Double Island Point automatic weather station (AWS) recorded a gust of 63 knots at 0047 UTC 8th, while the AWS at Cape Moreton registered a gust of 56 knots at 0119 UTC 8th. A peak wave height of 8 metres was measured on the waverider buoy off Main Beach Southport at 1300 UTC 8th.</p> <p>On the 9th top 24 hour rainfall totals to 9am were Maleny 404 mm, Mary Cairncross 370mm Nambour 332 mm. In Brisbane Strathpine recorded 182 mm. A boy was drowned when he was swept into a stormwater drain at Palmwoods. Another boy was rescued after being swept from a park in Nambour. A man was drowned when he was swept over a weir while boogie-boarding in the Caboolture and a man was trapped by the rapidly rising South Pine River at Albany Creek and drowned. North of Brisbane 160 roads were cut with the Bruce Highway being the worse affected with the road cut in several key locations. 17,800 houses were without power in southeast Queensland. A man drowned in a creek on the Gold Coast.</p> <p>On the 10th the body of a man was found in a creek just outside Conondale. The Mary River at Gympie peaked at 21.95 metres (The highest level this century). 150 business and 20 houses were inundated.</p>
20 May 1999	<p>A disturbed area formed well off the Queensland coast during the third week of May. The storm had significant impact on the Australian coast between 25S and 32S although its closest approach was about 400 nm off the coast. There were two helicopter rescues to stricken yachts just off Brisbane and two more near Port Macquarie. Swells with wave heights to 10 m were reported. Numerous ships reported winds well above gale force, and there were a couple reporting winds in excess of 50 kts: ELMQ 23/0600Z 150/50 kts near 26.3 S, 159.6 E ---- 23/1200Z 140/54 kts near 26.3 S, 154.0 E. The storm passed about 50 nm east of Lord Howe Island around 1200 UTC on 24 May. That station reported peak winds of 230/41 kts with a gust to 57 kts at 24/1355 UTC. However the anemometer is obstructed for SW winds. An anemometer on runway 10 recorded a maximum gust of 81 knots from the SW during the afternoon of the 24th. The mean wind was 62 knots. Boats in the Lagoon with anemometers recorded gusts to 85 knots and some of these boats were washed ashore. Three lodges were damaged and one was unroofed. There was widespread tree damage. 24 hour rainfall to 9am 25th at Lord Howe was 150.0mm.</p> <p>Secretary Island (located in the southwest of South Island) experienced gusts to 78 knots as the storm brushed by New Zealand. Invercargill reported 60-kt winds at 2100 m and 84 knots at 3050 m. Finally, as the system moved rapidly south-southeastward on 26 May, it passed over a drifting buoy near 52.5 S, 169.0 E which reported a minimum pressure of 975.2 hPa at 1249 UTC.</p>
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	<p>tides were a half a metre below the highest levels.</p>
18-19 January 2001.	<p>A mid to upper level trough developed forming an upper low east of Brisbane by 1200 UTC 18 January 2001. Severe thunderstorms preceded this in Northern NSW and SE Queensland. Casino in NSW was badly damaged and as the storms moved towards Queensland the Evans Head automatic weather station recorded a 73 knot gust.</p> <p>Around 1300 UTC 17th, severe storms damaged many houses in the southern suburbs of Brisbane and adjacent rural areas. Around 1730 UTC 17th (3.30am local) hail between golfball and tennis ball size hit the northern suburbs of Brisbane. A third wave of severe storms hit Brisbane and the Gold Coast around 2130 UTC 17th (7.30 am) causing damage to many houses. A broad open sea level low then developed east of Brisbane with maximum 10 minute average winds of 130/48 knots recorded at Cape Moreton at 1234 UTC 19th. Pressure rises along the coast south of the low as a high moved into the Tasman Sea contributed to the development of the gales. The gales caused damage to moored marine craft and brought down power lines causing blackouts. Severe thunderstorms developed just south of Townsville around 0800 UTC 19th under a marked upper divergent area north of the upper trough. This caused major damage from wind and lightning in an area not known for severe thunderstorms and broke an Australian lightning record (2500 strikes in an hour).</p>
31 January- 2 February 2001.	<p>Another mid to upper level trough began forming over NSW on 31 January 2001 forming an upper low just to the west of Brisbane by 1200 UTC 1 February 2001. The sea level reflection was a 1001 hPa low near Rockhampton. This low was complex extending a trough down to the Brisbane area as a large strengthening sea level high moved into the Tasman Sea producing an intense pressure gradient over Southern Queensland and Northern New South Wales. Winds reached storm force on the open coast near Brisbane with Cape Moreton recording easterly storm force winds between 1553 UTC and 1900 UTC 1 February 2001 with the maximum 10 minute average wind 080/51 knots. The gales extended well inland into the Tablelands where Toowoomba recorded 10 minute winds to 38 knots at 1739 UTC 1st. Tenterfield on the Tablelands just south of the Queensland border, sustained widespread wind damage. On the exposed coast the winds brought down many trees in elevated areas and power blackouts were widespread. Seas rapidly developed with peak wave heights reaching just over 10 metres on wave rider buoys near Brisbane. Rainfall was very heavy with 24 hour rainfall totals in Southeast Queensland as an example:- Springbrook 384.8mm, Mount Glorious 341mm and Natural Bridge 320 mm. There was flooding in southeast Queensland however this was reduced by a prolonged dry period leading up to this event, however over the border in NSW there was major flooding in the Lismore area with many people were evacuated. In southeast Queensland, there were several near escapes when people drove into flooded stream crossings and their vehicles were swept away. However in all cases the drivers managed to scramble to safety. One man was drowned when he dived into a flooded river just north of Brisbane.</p>
8 March 2001	<p>A low pressure system developed in the sub-tropics off the east coast of Australia and made landfall on the Northern New South Wales coast. At landfall 10 minute average winds speeds exceeding 50 knots (26ms^{-1}) accompanied the low making it equivalent to a category 2 tropical cyclone. Late in its life the low displayed some characteristics that are reminiscent of tropical cyclones. The low moved northwest while deepening and by 2300 UTC 5 March 2001 was east of Brisbane. A large high in the Tasman Sea then moved east towards New Zealand weakening the pressure gradient and winds along the coast south of Brisbane. However the low continued to slowly deepen. Severe weather and ocean gale warnings were being issued for the Southeast Coast of Queensland where large swells, wind and big tides caused beach erosion and salt water inundation.</p> <p>On 7 March 2001 the low slowed its movement towards the coast and rainbands, which were circulating around the western flank of the low, broke away from the circulation and moved onto</p>

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Queensland. There was serious beach erosion at Noosa and Maroochydore on the Sunshine coast on the Gold Coast there was a 0.45m storm surge on the Gold Coast with scarping on the northern beaches from between 0.5 and 1.5 m.

New South Wales. The most extensive wind damage occurred along the coastal region between Evans Head and Brooms Head (under rainbands separate and some distance from the eye of the storm). There was much less damage near the eye of the storm which passed between Byron Bay and Ballina. At Evans Head AWS the strongest wind of 170/54 knots (28ms^{-1}) with gusts to 75 knots (39 ms^{-1}) was recorded at 0615 UTC 8 March 2001. Evans Head AWS is located near the northern boundary of the Bundjalung National Park, which extends southwards almost down to Iluka. Extensive tree damage was reported in the Park. The most extensive structural damage was reported from the town of Yamba where around 100 buildings were damaged. Around 100 houses were also unroofed at Iluka just over the river from Yamba. In the Tweed, four houses suffered some roof damage.

4-7 July 2001

A severe low pressure system brought heavy seas onto the Queensland and New South Wales coastlines. The low originally formed to the south of Noumea, New Caledonia, equatorward of a large blocking high pressure system over New Zealand as an upper-level trough crossed the Tasman Sea.

Computer UK analysis around the time of peak intensity (1200 UTC 4 July 2001) showed a cyclonic circulation up to 500 hPa and strongest in the 850 to 700 hPa layer. Above 400 hPa the system was an open trough. Scatterometer winds from satellite data at 0615 UTC 4 July 2001, revealed a low with gales almost completely surrounding it and with a huge area of gale to storm-force winds on the poleward side. The low tracked to the east of Norfolk Island where the lowest MSLP of 990.3 hPa occurred at 1500 UTC on the 4 July 2001. At Norfolk the maximum 10-min mean wind recorded was 100/43 knots, gusting to 63 knots and occurred at 0230 UTC. 4 July 2001 and the mean sea level pressure at that time was 1001.3 hPa. Balloon flight wind calculations from Norfolk indicated winds to hurricane force a short distance above the surface.

Heavy swells affected the Australian coastline. The most exposed wave rider buoy (just east of Brisbane) recorded a peak wave height of 7.9 metres. The peak wave period was 15.9 seconds--a long period swell. The long period swells produce a larger breaking wave height than shorter period swells do. The 11-metre cruiser "Just Cruising" was found wrecked on Spitfire Bank near the entrance to Moreton Bay and just southwest of Cape Moreton. The boat had been flipped over by the large breakers on 6 July 2001 and the crew of four were never found. A yacht was wrecked by large waves on a sandbar near Fraser Island and the lone yachtsman was never found. Also, a woman was reported missing after being swept off her dinghy on the 7th July near Jumpinpin Bar (which separates North and South Stradbroke Islands) halfway between Brisbane and the Gold Coast. Farther east, a French yachtsman was found drowned near his stricken yacht in the Norfolk Island area.

In New South Wales 2 rock fisherman were swept to their deaths, one at Twofold Bay and the other near Cronulla.

14-17 Feb 1996

A tropical low developed near New Caledonia and moved past Brisbane and brought storm force southerly winds to waters off the Gold Coast. A storm surge brought some flooding up the Brisbane River at Newstead. A storm surge of 0.59m was measured at The Gold Coast Seaway. The luxury vessel *Queen Elizabeth II*, travelling from Brisbane to Sydney, was battered by average winds of 26 ms^{-1} and very short and very steep 10 metre waves just off the northern New South Wales coastal town of Yamba around 1900 UTC 15 February 1996 resulting in injuries to passengers. The Brisbane wave recording station recorded significant wave heights to **6.19 m** on the 15th.

1-5 May 1996	<p>Low developed east of Townsville and intensified as it moved down to waters just off Brisbane. Wind, sea and flood damage SE Qld - 3 drowned in small craft and in rivers. Boy swept down drain-1 traffic accident death - 16 houses were damaged by wind at Tamborine and there was wind damage on the Gold Coast. Landslides blocked roads and fallen trees brought down power lines. The maximum wind gust of 65 knots was recorded at Cape Moreton AWS. Storm tides flooded the Sandgate foreshore at Flinders Parade. The Gold Coast Seaway was 0.51m above the predicted high tide on the 2nd, which was 0.18 m above HAT.</p> <p>The Brisbane wave recording station recorded significant wave heights to 6.9 m on the 2nd.</p>
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8 March 2001	<p>A low pressure system developed in the sub-tropics off the east coast of Australia and made landfall on the Northern New South Wales coast. At landfall 10 minute average winds speeds exceeding 50 knots (26ms^{-1}) accompanied the low making it equivalent to a category 2 tropical cyclone. Late in its life the low displayed some characteristics that are reminiscent of tropical cyclones. The low moved northwest while deepening and by 2300 UTC 5 March 2001 was east of Brisbane. A large high in the Tasman Sea then moved east towards New Zealand weakening the pressure gradient and winds along the coast south of Brisbane. However the low continued to slowly deepen. Severe weather and ocean gale warnings were being issued for the Southeast Coast of Queensland where large swells, wind and big tides caused beach erosion and salt water inundation.</p> <p>On 7 March 2001 the low slowed its movement towards the coast and rainbands, which were circulating around the western flank of the low, broke away from the circulation and moved onto the coast and the low weakened.</p> <p>On 8 March 2001 the low began to accelerate and intensify again as it moved south-westward into the New South Wales.</p>

	<p>Impacts</p> <p>Queensland. There was serious beach erosion at Noosa and Maroochydore on the Sunshine coast on the Gold Coast there was a 0.45m storm surge on the Gold Coast with scarping on the northern beaches from between 0.5 and 1.5 m.</p> <p>New South Wales. The most extensive wind damage occurred along the coastal region between Evans Head and Brooms Head (under rainbands separate and some distance from the eye of the storm). There was much less damage near the eye of the storm which passed between Byron Bay and Ballina. At Evans Head AWS the strongest wind of 170/54 knots (28ms^{-1}) with gusts to 75 knots (39 ms^{-1}) was recorded at 0615 UTC 8 March 2001. Evans Head AWS is located near the northern boundary of the Bundjalung National Park, which extends southwards almost down to Iluka. Extensive tree damage was reported in the Park. The most extensive structural damage was reported from the town of Yamba where around 100 buildings were damaged. Around 100 houses were also unroofed at Iluka just over the river from Yamba. In the Tweed, four houses suffered some roof damage.</p>
4-7 July 2001	<p>A severe low pressure system brought heavy seas onto the Queensland and New South Wales coastlines. The low originally formed to the south of Noumea, New Caledonia, equatorward of a large blocking high pressure system over New Zealand as an upper-level trough crossed the Tasman Sea.</p> <p>Computer UK analysis around the time of peak intensity (1200 UTC 4 July 2001) showed a cyclonic circulation up to 500 hPa and strongest in the 850 to 700 hPa layer. Above 400 hPa the system was an open trough. Scatterometer winds from satellite data at 0615 UTC 4 July 2001, revealed a low with gales almost completely surrounding it and with a huge area of gale to storm-force winds on the poleward side. The low tracked to the east of Norfolk Island where the lowest MSLP of 990.3 hPa occurred at 1500 UTC on the 4 July 2001. At Norfolk the maximum 10-min mean wind recorded was 100/43 knots, gusting to 63 knots and occurred at 0230 UTC. 4 July 2001 and the mean sea level pressure at that time was 1001.3 hPa. Balloon flight wind calculations from Norfolk indicated winds to hurricane force a short distance above the surface.</p> <p>Heavy swells affected the Australian coastline. The most exposed wave rider buoy (just east of Brisbane) recorded a peak wave height of 7.9 metres. The peak wave period was 15.9 seconds—a long period swell. The long period swells produce a larger breaking wave height than shorter period swells do. The 11-metre cruiser "Just Cruising" was found wrecked on Spitfire Bank near the entrance to Moreton Bay and just southwest of Cape Moreton. The boat had been flipped over by the large breakers on 6 July 2001 and the crew of four were never found. A yacht was wrecked by large waves on a sandbar near Fraser Island and the lone yachtsman was never found. Also, a woman was reported missing after being swept off her dinghy on the 7th July near Jumpinpin Bar (which separates North and South Stradbroke Islands) halfway between Brisbane and the Gold Coast. Farther east, a French yachtsman was found drowned near his stricken yacht in the Norfolk Island area.</p> <p>In New South Wales 2 rock fisherman were swept to their deaths, one at Twofold Bay and the other near Cronulla.</p>
2-4 June 2002	<p>A low in the middle atmosphere developed overland in southeast Queensland by 2 June 2002. At the surface a large high moved across southeast Australia while a trough developed to the east of the upper low generating gale force winds along the south coast of Queensland. The trough developed east of Bowen between Marion Reef and Frederick Reef and because of the large high over southeast Australia it had the same effect as a deep east coast low. The gales extended northwards up to the Capricorn Coast by 4 June 2002. The low level onshore flow and the upper low combined to produce areas of very heavy rain.</p> <p>On Tuesday 4 June 2002 torrential rain and flash flooding occurred in the Yeppoon area with falls between 80mm and 100mm of rain in the 24 hours to 2300 UTC 3 June 2002. Very heavy rain (with thunder) began falling at about 2230 UTC and continued until 0030 UTC 4 June 2002. Reports of</p>

	<p>amounts in that 2 hour period ranged from 120mm to 320mm. The heaviest areas seemed to be around Kinka Beach (halfway between Yeppoon and Emu Park, Emu Park itself, and at Zilzie just south of Emu Park).</p> <p>Some of the reports received were Kinka Beach, 359mm in total, 70mm of it before 2100 UTC. Another Kinka Beach resident reported 322mm total, 102mm before 2300 UTC and 220mm after 2300 UTC, while a report from a resident 1 km inland from Kinka Beach indicated 305mm in total and 75mm before 2300 UTC. At Barlows Hill, just north of Yeppoon 150mm was recorded in 90 minutes and at Kemp Beach 330mm was recorded in total, with 240mm after 2300 UTC. Emu Park reported 290mm in the 7 hours to 0500 UTC 4 June 2002. Zilzie recorded 380mm in total, 320mm after 2100 UTC. The Keppel Sands Coastguard, 245mm up to 0200UTC.</p> <p>There was one report of 446mm at Kinka Beach for the whole event. A number of houses were inundated by stormwater at Emu Park and motor vehicles were abandoned.</p> <p>Gales generated large seas and near Lady Musgrave Island 5 yachtsmen were rescued off two yachts, <i>Banshee</i> and <i>Moonfleet</i>. Both yachts were destroyed by the seas. Rundle Island automatic weather station (AWS) reported gales from 1700UTC 3 June 2002 to 0900UTC 4 June 2002. The strongest 10 minute average wind recorded at the AWS was 45 knots. The strongest 10 minute average wind recorded at Double Island Point AWS was 39 knots, Lady Elliot Island AWS 35 knots, Frederick Reef 38 knots, Gannet Cay AWS 41 knots and Cape Moreton AWS 45 knots.</p>
26 June 2003	<p>At 1600 UTC on 24 June a LOW was centred about 150 nm east-northeast of Townsville. The system moved generally southeastward fairly quickly and by 0600 UTC on the 26th had reached a position approximately 325 nm east-southeast of Brisbane and sustained winds to 53 knots (the lowest MSL pressure there was 991.5hPa) were recorded at Lord Howe Island as the storm passed just to the west of that station on the 26th. Another interesting feature of this storm system was a small trough system which circulated around the parent LOW. This small cyclonic eddy moved inland into northeastern New South Wales and southeastern Queensland where it caused localized severe wind damage and brought torrential rain.</p> <p>The heaviest 24h rainfall to 2300UTC 25 June was Ballina Airport, NSW 190 mm. The heaviest 24h rainfall to 2300UTC 26 June was Byron Bay, NS 176 mm.</p> <p>Six fishermen from the 25-metre, 80-ton vessel "Tan Sula" were rescued 32 nm east of Cape Byron on the northern NSW coast on 27 June by being winched onto two helicopters from Brisbane and Lismore. Seas on the Gold Coast of Queensland were large with significant wave heights to 4.3 m at the Brisbane wave rider buoy on 26 June. In NSW significant heights reached 5.5 m on the 27th at Coffs Harbour. Surfers were injured by the large waves and there were six major rescues off the NSW coast by lifeguards.</p> <p>Rivers overflowed in northern NSW causing flooding around Murwillumbah, Mullumbimby and Byron Bay. Police rescued a 14-year old boy at Stokers Siding, 50 km from Byron Bay, who tried to save a calf from rising waters and became trapped in a tree. A fire brigade helped to evacuate children from two schools in the Brunswick region because buses were unable to cross the flooded roads. The large waves made river entrances in northern NSW and southern Queensland virtually impassable.</p> <p>The small trough system circulating around the larger LOW caused localized severe wind damage on the southern Gold Coast. Trees were brought down and a dozen homes were damaged by fallen trees, which also caused power outages. The Coolangatta AWS recorded 10-min avg winds to 34 kts for a brief period of less than 30 minutes.</p>
Hybrid low 5 March 2004	<p>Very large long-period waves were generated by the storm. Waves with significant wave heights of 7.1m and maximum heights 14.3m were recorded on the the buoy off Stradbroke Island around 05/0700 UTC, coming from the east-northeast. The peak height measured on the Tweed Buoy was just over 14 m and this occurred at 1700 UTC on 6 March, when the significant wave height was between 5 and 6 metres. The wave periods were almost 13 seconds and approached from the east-northeast. Even in Moreton Bay a maximum wave height of over 3.5 metres was measured around 1500 UTC on 5 March. The worst effect from storm surge appears to have been in association with the Friday night's high tide at Currumbin on the Gold Coast when cars were floating around the car park. This was not a big tide (0.74 m below the Highest Astronomical Tide--HAT) and</p>

	<p>therefore the wave effects appear to have added over a metre to the tide. Northeasterly gales in Moreton Bay early on Saturday raised the level of the Bay 0.7 metres. Cape strongest winds were at 05/0500 UTC-- 30/56 knots (10-min mean) and peak gust 67 knots.</p> <p>Twenty-four hour rainfall totals from 04/2300 to 05/2300 UTC reached 284.0 mm. Up to 106,000 customers lost power during the passage of the subtropical storm through the greater Brisbane Metropolitan area, the Sunshine Coast, and the Gold Coast with tree and associated minor structural damage reported throughout the area and extending into northern New South Wales. There were 3 fatalities associated with this event. A man is missing in the flooded Mary River near Gympie, a 10-year-old boy who was drowned after being swept away from his family when they tried to cross a creek in the Tweed River catchment; and an elderly woman drowned in a creek near Nambucca Heads (South of Coffs Harbour). Two people were rescued from a 4WD in a flooded creek on the northern Gold Coast. Five people were rescued from the top of their car in a flooded stream near Caboolture north of Brisbane. At Bundamba near Ipswich two girls fell into strong rapids and were rescued by Police. At Murphy's Creek near Toowoomba fire-fighters rescued a stranded motorist. Five people were rescued after they were swept into the sea by the run up from large waves. In Moreton Bay a French yachtsman was rescued after an air and sea search.</p> <p>The State Emergency Services (SES) says its crews were called out to about 200 jobs across the Brisbane area, 80 on the Gold Coast and 70 on the Sunshine Coast. Most were minor roof damage and sandbagging requests. Police say there were many trees and power lines down across Brisbane, the Gold Coast, the Sunshine Coast, Ipswich and Toowoomba. On the Gold Coast, police say some cars became bogged in flooded roadways, although there are no reports of any injuries. The Warrego highway at Cunningham's Gap, west of Brisbane, was closed due to rockslides. Four metres of roadway were washed away on Sydney Street at Brassall in Ipswich as a bus passed over it.</p>
29/30 June 2005	<p>During the morning of 30 June 2005 (local time) the heaviest rainfall occurred in this event as a trough system had developed just inland from the coast in Northern New South Wales and extended up to a small low centre just to the north of Brisbane. The flow onto the coast was warm and very moist with dewpoints reaching nineteen or twenty degrees Celsius. This was also the period of the strongest winds with gale force northeast winds indicated and this was consistent with the largest waves on the wave rider buoys (significant wave heights reaching 5 metres) around 2300UTC 29 June 2005. There was widespread severe flooding along the whole Gold Coast strip with hourly rainfall totals up to 145mm and 12 hour rainfall totals to 503mm. There were three deaths with a young couple swept off a bridge in their vehicle and a man drowned at Byron Bay about 55km south of Tweed Heads. Insured costs 78,900,000 (AUD 2005). 3000 people affected- 3142 people evacuated.</p>
3-5 March 2006	<p>By 0800UTC 2 March a large area of strong to gale force winds had developed in the onshore flow off the southern Queensland coast. This occurred as a low pressure system formed ENE of Rockhampton and a large high moved into the Tasman Sea. By 2000UTC 2 March the low had deepened and moved down to the east of Fraser Island while high pressures were maintained over northern New South Wales. Wave heights began to increase during Friday the 3 March on the south Queensland buoys and at this stage more rapidly on the Sunshine Coast than on the buoys further south. Twenty fours hours later at 2000UTC 3 March the low did not noticeably deepen but moved closer towards the higher pressure, which was maintained at 1018 hPa over the period at Coffs Harbour. As a result an intense pressure gradient with gale to storm force onshore winds had developed off the south Queensland Coast. Later that evening at 0800UTC 4 March the quikscat data indicated gale force winds extending out at least 400km east of the coast.</p> <p>The maximum wind averaged over 10minutes was from Cape Moreton 53knots at 1430UTC 3 March 2006. Wind damage affected many areas of Southeast Queensland. A Counter Disaster and Rescue Service spokeswoman said volunteers had been "flat out" as trees crushed houses and cars. A nursing home at Kirra was evacuated when a tree fell on a unit. No residents were injured. In Brisbane, residents of a unit block in Wooloowin and a house in Chermside were lucky to escape when trees fell on their properties. Traffic accidents kept police busy and one vehicle crashed into a house at St Lucia. Energex staff were braced for action as blackouts hit about 100,000 homes and businesses from Friday morning to Sunday afternoon. At Mt Tamborine and Bonogin boggy grounds</p>

	<p>hampered restoration efforts and in Beaudesert trees and branches continued to damage wires. In Moreton Bay on Sunday 5 March boats were damaged and ripped from their moorings. One of these yachts was found later in the week at Noosa Heads.</p> <p>The second highest significant wave height since 1976 was recorded at the EPA's Brisbane wave recording station on Saturday (4 March). Significant wave heights up to 7.2m were recorded by an EPA wave monitoring buoy located 10km southeast of Point Lookout, North Stradbroke Island while individual waves up to 15.0m (and possibly 16.7m) were also recorded. Significant wave heights of 5.4m, 5.3m and 5.5m were also recorded respectively at the Sunshine Coast, Gold Coast and Tweed Heads wave recorders. These waves were the second, fifth and third highest wave events at these sites."</p> <p>A significant storm surge occurred with stormwater outlets blocked by surging waves and this caused localised flooding of low lying coastal areas such as Flat Rock Creek and Marine Parade Kirra. The mayor of Redcliffe said there was a significant storm surge in Moreton Bay though following the first Severe Weather Warning sand bagging was carried out and this prevented large-scale erosion.</p>
21-25 August 2007	<p>The initial development of a low pressure centre occurred over the period from the 20 to 21 August 2007. A large high pressure ridge which built up along the NSW coast nudged the low centre up towards Fraser Island which brought gale to storm force wind to areas along the coast between the border and Fraser Island. The maximum wind gust reported was 67 knots from Cape Moreton at 1318 UTC 21 August or 1118pm 21st local time. The main affect of these winds was to bring trees down causing power blackouts to 34,000 houses and damaging houses and cars. A new low centre east of Fraser Island by 1100 UTC 23 August with a very strong pressure gradient along the coast to the south. This was around the time that the extreme rainfall began about the Northern Sunshine Coast. Rainfall rates reached 313mm in 6hrs and 527mm in 12 hours along the Northern Sunshine Coast.</p> <p>Large waves impacted on the Southeast Coast with an Indonesian Naval "Tall Ship" being driven ashore at Rainbow Beach. An experienced surfer was badly injured with serious spinal injuries at Kirra on 25 August when dumped by a large wave after high energy swell arrived.</p>
2 June 2008	<p>Wild seas and flooding in Southeast Queensland early on 2 June 2008 were associated with a weather phenomenon called an East Coast Low. On the Sunshine Coast after six people were rescued from floodwaters. Up to 140 mm of rain fell in some parts of the coast in just three hours. Two teenage girls who were stuck in a tree near Cooroy, west of Noosa, are safe and well after been rescued about an hour ago. Earlier, four people were pulled to safety from the top of their car. The rain has also been kept SES volunteers busy across Brisbane, with 40 home owners needing help. Among the worst-hit areas were the bayside suburbs of Manly and Balmoral, where 15 homes were damaged by leaking roofs. Large seas caused erosion on the Gold Coast. L:a</p>
13-15 Feb 2009	<p>A low over southern inland Queensland developed a secondary centre on the coast near Rockhampton on 13 February. By 14 February the coastal low was near Cape Moreton and moved past the Gold Coast that night before intensifying and moving out to sea off the Northern NSW coast. Significant wave heights reached 4 metres on the Brisbane Buoy and just over 6 metres on the Byron Buoy.</p>
30 March- 3 April 2009	<p>A low developed out to sea from the Sunshine Coast on 30 March before moving down the coast just offshore from Yamba on 31 March. The low then moved back north to be just east of Fraser Island on the 2nd April. Significant wave heights reached just over 4 metres on the Tweed buoy late on the 30 April before easing and then increased again to reach 4.8 metres on 2 April when the Gold Coast buoy reached 5 metres significant wave height.</p>
East Coast Low 19-23 May 2009	<p>19 -2 3 May 2009</p> <p>This east coast low produced the worst beach erosion on the Gold Coast since May 1996.</p> <p>As the low developed flood rains affected the Brisbane region. The low became complex with several transient centres. On 20 May gales developed on the Gold Coast and a man was killed at Surfers Paradise in his office as flying debris crashed through his office window. By 6am 21 May a small low developed north of Byron Bay where mean winds to 62knots were reported.</p>

Significant wave heights readings from the Brisbane Buoy (off the Northern tip of North Stradbroke Island) increased during the 20 May and reached 5 metres around 3pm EST. The Gold Coast Buoy reached 5 metres later at 10pm while there were some problems with the Tweed buoy. NSW buoys at, Byron Bay, Coffs Harbour and Crowdy Heads all reached 5 metres earlier in the day.

During the day on 21 May the low moved south and the pressure gradient increased east of the NSW coast and this was when some of the largest waves were recorded. The Tweed buoy reached 6.2metres significant wave height at 8am 21 May while the buoy at Byron reached 7.4 metres later at 6pm. The Gold Coast buoy failed to report over this period.

Over the 24 hour period up to 10am 23 May 2009 the low had weakened by 10am 22 May but quickly reformed out to sea and then a small centre moved towards the Gold Coast where it stalled. Quikscat observations at 6am 23 May 2009 indicated a very extensive area of gales off the coast. The Buoy at Coffs recorded its peak significant wave height of 6.4metres around 10am 23rd while Crowdy reached 6.1metres at 7am. A redevelopment of waves occurred off the Gold Coast with the Buoy there recording a significant wave height of 6.2metres at 4am 23 May.