

= 2002 ? 03 South Pacific cyclone season =

The 2002 ? 03 South Pacific cyclone season was the most active and longest tropical cyclone season since 1997 ? 98 , with ten tropical cyclones occurring within the South Pacific basin between 160 ° E and 120 ° W. The season started earlier than normal , with two systems developing before the official start of the season on November 1 , 2002 , while the final system dissipated on June 9 , 2003 , after the season had officially ended on April 30 . During the season , tropical cyclones were officially monitored by the Regional Specialized Meteorological Centre ( RSMC ) in Nadi , Fiji and the Tropical Cyclone Warning Centres in Brisbane , Australia and Wellington , New Zealand . The United States Armed Forces through the Joint Typhoon Warning Center ( JTWC ) , also monitored the basin and issued unofficial warnings for American interests . RSMC Nadi attaches a number and an F suffix to tropical disturbances that occur within the basin , while the JTWC designates significant tropical cyclones with a number and a P suffix . RSMC Nadi , TCWC Wellington and TCWC Brisbane all use the Australian Tropical Cyclone Intensity Scale and estimate windspeeds over a ten @-@ minute period , while the JTWC estimates sustained winds over a one @-@ minute period , which are subsequently compared to the Saffir ? Simpson Hurricane Scale ( SSHS ) .

The season began with Tropical Depression 17F on July 3 , several months prior to the official start of the season . In late December , the strongest cyclone of the season , Cyclone Zoe severely affected many islands in the South Pacific , particularly the island of Tikopia . Zoe remains the strongest cyclone recorded in the Southern Hemisphere . Shortly after , in mid @-@ January , Cyclone Ami struck Fiji as a Category 3 cyclone , where it caused US \$ 51 @.@ 2 million in damage . Cyclone Erica caused considerable damage to New Caledonia as a Category 4 cyclone , causing numerous power outages . The final storm of the season , Cyclone Gina , formed well outside the bounds of the conventional tropical cyclone season , existing entirely in the month of June and causing some damage to Tikopia . As a result of tropical cyclones in the 2002 ? 03 season , US \$ 67 @.@ 2 million in damages was caused , along with 20 fatalities .

= = Seasonal forecasts = =

During November 2002 , New Zealand 's National Institute of Water and Atmospheric Research predicted that there would be an eastwards shift in activity during the season , with more tropical cyclones than normal expected to the east of the date line , due to well established weak to moderate El Niño conditions . As a result , the island nations of Wallis and Futuna , Niue , Samoa , Tokelau , and the Southern Cook Islands were predicted to experience a higher than average number of tropical cyclones . The Solomon Islands , Fiji , Tuvalu , Tonga , French Polynesia , New Zealand and the Northern Cook Islands were predicted to experience an average number of tropical cyclones , while Southern Papua New Guinea , Vanuatu and New Caledonia were predicted to experience a reduced number of tropical cyclones . In January 2003 , NIWA issued an updated outlook , listing the Northern Cook Islands and French Polynesia as areas predicted to experience an above average number of tropical cyclones . In contrast , Vanuatu was predicted to experience below average cyclone activity . The Solomon Islands and Tonga were now predicted to experience a reduced number of tropical cyclones , with all other countries expected to face the same risk as the November outlook .

= = Seasonal summary = =

After three seasons of below average cyclone activity , the 2002 ? 03 season was slightly above average , featuring ten cyclones and seven severe tropical cyclones . One of the cyclones , Cyclone Erica , originated from the Australian region but later moved into the South Pacific , where it impacted New Caledonia . Throughout the season , a moderately warm El Niño ? Southern Oscillation ( ENSO ) generated a shift of cyclone activity away from Australia and towards the open waters of the southern Atlantic . As a result , the Southern Oscillation Index ( SOI ) between November 2002 and June 2003 was negative , averaging -7.2 . Sea surface temperatures ( SSTs )

in the Pacific were above average ; for most of the tropical regions , SSTs were above 29 ° C ( 84 ° C ) . At various times , Madden ? Julian oscillation ( MJO ) pulses increased convective activity and thus cyclone development in the basin . Five pulses of the MJO and Equatorial Rossby waves ( ER ) were responsible for most of the cyclone activity during the season . Cyclone Zoe , the strongest cyclone of the season , was the only cyclone with no connection to any identified MJO or ER wave . By April , an easterly trade wind anomaly took place , signifying the end of the El Niño pattern that had persisted for much of the year .

Over the course of the season , cyclones were active for a total of 40 days , and severe tropical cyclones were active for a total of 19 days , both above average . A total of five tropical disturbances formed during 2002 , of which two were cyclones . The first disturbance of the season , Tropical Depression 17F , along with another depression , 01F , formed well before the start of the cyclone season on July 3 and October 21 respectively . Cyclone Yolande was the first cyclone of the season , forming on November 29 , but did not impact any land masses . In December , two disturbances formed , Tropical Depression 03F and Cyclone Zoe . The latter was the season 's strongest cyclone and the strongest cyclone ever recorded in the Southern Hemisphere , affecting areas of the Solomon Islands .

In the first half of 2003 , thirteen disturbances formed , of which eight developed into tropical cyclones ; six intensified further and became severe tropical cyclones . January 2003 featured four disturbances and three cyclones . Cyclones Ami and Beni were both severe tropical cyclones , with the first extensively impacting Fiji . The month of February was less active compared to January ; only two disturbances formed , Cyclone Dovi and Tropical Disturbance 10F , although Dovi would become a Category 5 cyclone on the Australian cyclone scale . March was slightly more active than February ; the month featured three tropical depressions and two severe tropical cyclones , Cyclone Erica and Cyclone Eseta , although Erica originally formed west of 160 ° E. After an easterly wind anomaly arose in April , cyclone activity was suppressed during the month , totalling three tropical disturbances and one cyclone . In June , Cyclone Gina formed as a result of a strong ER wave and later became a severe tropical cyclone , well after the end of the season . Its dissipation on June 9 marked the end of the cyclone season .

= = Storms = =

= = = Tropical Cyclone Yolande = = =

Cyclone Yolande developed on November 29 from a broad area of thunderstorms embedded within a monsoonal trough , originating from a westerly wind burst associated with El Niño conditions ; the same area of disturbed weather would later generate Typhoon Pongsona on December 2 . At the time , the tropical depression was moving towards the southeast , but strong wind shear displaced the cyclone 's strongest winds and convection northeast of its circulation center . Convective activity fluctuated under strong diurnal temperature variation . After moving into an area of less wind shear , the system was able to organize and develop good outflow currents . This was reflected with a slight drop in minimum barometric pressure down to 995 mbar ( 29 @. @ 4 inHg ) . As a result , at 2255 UTC on December 4 , the depression attained cyclone status and was given the name Yolande , east of Tonga . After being named , Cyclone Yolande began to accelerate into an area of strong wind shear , and convection became increasingly displaced from the center of circulation . By 1200 UTC on December 5 , the convection was already sheared 160 km ( 100 mi ) from the northwest of the circulation center , and as such the cyclone was downgraded to depression status . By this time , Yolande had completed a transition into an extratropical cyclone , after interacting with a baroclinic zone to the southwest . Yolande 's extratropical remnants continued to track towards the southeast before dissipating entirely on December 11 , 2700 km ( 1700 mi ) to the southeast of Papeete , French Polynesia . As a result of remaining at sea , Yolande only caused minimal damage .

= = = Severe Tropical Cyclone Zoe = = =

Severe Tropical Cyclone Zoe was the most intense tropical cyclone in the Southern Hemisphere in recorded history , severely affecting areas of the Solomon Islands and Vanuatu . Cyclone Zoe developed from the South Pacific Convergence Zone ( SPCZ ) on January 23 , east of Tuvalu . Initially developing slowly as a tropical depression , the predecessor to Zoe moved toward the west @-@ southwest under the influence of a high pressure area . However , the storm entered an area of very favorable cyclone conditions . After reaching cyclone strength on December 25 , rapid intensification ensued . By the next day , Zoe had already strengthened to a severe tropical cyclone . On December 27 , Zoe attained wind speeds equivalent to Category 5 status on both the Australian and Saffir ? Simpson hurricane scales . An upper ? level trough of low pressure forced Zoe towards the southwest , moving into the vicinity of the Solomon Islands . The next day , Zoe intensified to a record low barometric pressure of 890 mbar ( 26 @.@ 28 inHg ) , with winds of 290 km / h ( 180 mph ) . However , conditions would deteriorate , and the cyclone would consequently weaken . By January 1 , the storm had already degenerated into an extratropical cyclone , and its remnants dissipated just three days later .

Cyclone Zoe severely impacted the islands of the Solomon island chain , particularly the islands of Tikopia and Anuta . In Anuta , agricultural activities were disrupted . Various fruit trees and crops , especially in gardens on the island 's hills , were destroyed by high winds and heavy rain . In addition , communications with other islands were disrupted . The impact on Tikopia was much greater ; agricultural productivity on the island was said to have been wiped out . Fruit trees were estimated only to begin producing fruit again at least two years after Zoe 's impact . Topsoil was left dry by the cyclone , preventing any immediate replacement of lost crops .

= = = Severe Tropical Cyclone Ami = = =

Severe Tropical Cyclone Ami was one of the worst cyclones ever to affect Fiji . Cyclone Ami developed from a low @-@ pressure area east of Tuvalu on January 12 . The storm moved slowly towards the southwest early in its existence . Influenced by an upper @-@ level trough , Ami slowed down and began moving towards the south and then southeast . The cyclone attained severe tropical cyclone intensity on January 13 . Ami made its first landfall at Vanua Levu , before subsequently making another landfall on Taveuni . Ami reached peak intensity as an equivalent Category 3 cyclone on the Australian cyclone scale on January 14 . Accelerating to the southeast , the cyclone began to cross over cool sea surface temperatures and encountered wind shear . Ami transitioned into an extratropical cyclone the day after .

Cyclone Ami severely impacted parts of Fiji , mainly through flooding . Numerous landslides and power outages were caused by the heavy rains . The damage was particularly severe in Labasa , where the entire city was inundated . Sugar cane production decreased by 15 % , and other crops also suffered heavily . In Tonga , damage was not as severe , but two ships were grounded . Ami caused F \$ 104 @.@ 4 million ( US \$ 51 @.@ 2 million ) in damages and 14 deaths , primarily on Fiji . Following the deaths and damage , the name " Ami " was later retired .

= = = Severe Tropical Cyclone Beni = = =

Severe Tropical Cyclone Beni was an intense tropical cyclone that affected areas of the southern Pacific Ocean , particularly in New Caledonia . It developed from a tropical disturbance on January 20 south of the Solomon Islands , and at first moved slowly towards the west . On January 25 , the disturbance gained enough strength and organization to be named Beni . It quickly made a clockwise loop , maintaining its intensity , and later headed south . After fluctuating in intensity , Beni entered more conducive conditions and began to strengthen , this time heading southeast . Traveling between Vanuatu and New Caledonia , Beni reached its peak intensity as a Category 5 tropical cyclone on January 29 , the highest rating on the Australian cyclone scale , with winds of 235 km / h ( 146 mph ) . It only maintained this intensity for a short time before an increase in wind shear and less favorable conditions induced its weakening . After nearing Vanuatu , a strengthening

ridge forced Beni towards the southwest , away from Vanuatu . The cyclone made its closest approach to the island of New Caledonia on January 30 , but only as a marginal Category 1 cyclone . Continuing to weaken under strong wind shear , Beni was downgraded to a tropical depression the same day . After crossing New Caledonia , Beni exited the South Pacific basin and entered the Australian region .

During Beni 's existence , parts of the Solomon Islands , Vanuatu , and Queensland were affected by the storm . The cyclone caused flooding and a food shortage in the Solomon Islands . An estimated 2 @, @ 000 people were evacuated as a result . Rough seas and storm surge , as well as strong gusts , were the primary effects of Beni on Vanuatu and New Caledonia . New Caledonia was hit by power outages , and Vanuatu mainly suffered beach erosion .

= = = Tropical Cyclone Cilla = = =

Cyclone Cilla affected several islands in the South Pacific . The cyclone developed from a monsoon trough on January 26 northwest of Fiji , and initially moved to the east in conditions unfavourable for cyclones . After wind shear lessened , Cilla reached its peak intensity on January 28 , attaining maximum winds of 75 km / h ( 45 mph ) sustained over 10 minutes . After slightly weakening , Cilla was able to intensify again to match this intensity on January 29 . Strong vertical wind shear conditions then returned , and Cilla transitioned into an extratropical cyclone .

Cilla dropped heavy rainfall over islands along its path . As a depression the storm dropped rain over Fiji , which had already been effected by Cyclone Ami just two weeks earlier . Damage in Tonga was mostly limited to vegetation and fruit trees ; damage to infrastructure was relatively minor . Rain also fell on American Samoa , although no damage was reported . After the season , the name " Cilla " was retired .

= = = Severe Tropical Cyclone Dovi = = =

Cyclone Dovi developed on February 5 from an area of circulation within the SPCZ near the northern Cook Islands . Dovi therefore saw favourable conditions throughout much of its existence . Due to a mid ? level ridge to the east , the cyclone progressed on a southward track . Dovi eventually steered to the southwest , and continued to intensify steadily after fluctuating due to diurnal temperature variations , becoming a Category 1 equivalent on the Saffir ? Simpson hurricane scale on February 8 . An anticyclone positioned to the west of the system moved closer to Dovi , providing an improved environment . After developing an eye later that day , Dovi attained its maximum wind speeds of 205 km / h ( 125 mph ) sustained over 10 minutes . The cyclone then again steered towards the south , encountering high wind shear and cooler sea surface temperatures . As a result , Dovi quickly weakened as its convection was displaced . While its outflow in its western and southern quadrants remained favorable , elsewhere outflow was deteriorating . On February 10 , Dovi 's minimum barometric pressure was 980 mbar ( 28 @. @ 94 inHg ) as it moved south ? southeast at 11 km / h ( 7 mph ) . The weakening Dovi became an extratropical cyclone on February 11 . The remnants continued drifting southwest ; the Meteorological Service of New Zealand in Wellington stopped issuing information on it on February 13 .

Despite its close proximity to islands along its path , Dovi caused only minimal damage . Oceanic swells and storm surge were felt in some coastal areas . Strong winds were reported in the southern Cook Islands and Niue . Damage to banana plantations on Palmerston Island was reported , but Dovi caused no fatalities .

= = = Severe Tropical Cyclone Eseta = = =

Cyclone Eseta developed on March 10 from an area of disturbed weather that originated in the vicinity of Vanuatu . At the time the cyclone was in very favourable conditions , in an area with warm sea ? surface temperatures , low wind shear , and with development enhanced by an MJO pulse

traversing the area at the time . After convection began to wrap around the center of circulation , the low ? pressure area was named Eseta . The Joint Typhoon Warning Center ( JTWC ) began issuing warnings on Eseta at 1200 UTC on March 10 ; Eseta had a minimum pressure of 995 mbar ( 29 @.@ 39 inHg ) at the time . As the cyclone was on the western periphery of a mid ? level ridge , it moved in a south ? southeastwardly direction , initially at 13 km / h ( 8 mph ) . It then intensified quickly , and the next day developed a ragged eye . As it began to curve around the mid ? level ridge , its forward speed increased to 21 km / h ( 13 mph ) . Favorable conditions continued on March 12 , and Eseta underwent rapid intensification , with its barometric pressure falling 40 mbar ( 1 @.@ 2 inHg ) to a minimum of 930 mbar ( 27 @.@ 46 inHg ) . Wind speeds increased to 185 km / h ( 115 mph ) sustained for 10 minutes . However , the cyclone only maintained this intensity for 12 hours before entering an area of strong vertical wind shear . It continued to accelerate in forward speed , but shower activity became elongated and the eye dissipated . The next day , Eseta had a forward speed of 55 km / h ( 35 mph ) . As a result , the cyclone lost tropical characteristics on March 14 . The JTWC issued its last warning on Eseta at 0000 UTC on March 4 as it became extratropical . Eseta was absorbed by a front the next day .

Although Eseta was well offshore of any islands in the Pacific , rains and wind caused some damage . Western regions of Fiji reported heavy rain and flooding as the cyclone passed to its south . As a weakening cyclone , Eseta passed over the Tongan island of Eua , destroying fruit trees and kava crops . No deaths were reported due to Eseta .

= = = Severe Tropical Cyclone Erica = = =

Severe Tropical Cyclone Erica was a powerful cyclone considered the worst to affect New Caledonia since Cyclone Beti . It developed from a monsoonal trough on March 4 just off Queensland in the Australian cyclone region . Once it entered the South Pacific cyclone region on March 12 , Erica steadily intensified in a favourable environment , reaching peak intensity on March 13 as a Category 5 equivalent on the Saffir ? Simpson Hurricane Scale . On that day Erica paralleled the coast of New Caledonia , before making landfall on the southern end of the island at L 'Île @-@ des @-@ Pins . At the same time the cyclone entered an area with strong wind shear and thus began to weaken . After passing the island , an extratropical transition began , weakening the cyclone as it moved southeast . On March 15 , Erica completed its transition into an extratropical cyclone and fully dissipated the next day .

Cyclone Erica severely impacted the island nation of New Caledonia , causing intense winds and heavy rain . An estimated 892 families were affected by the cyclone on the island , and two people were killed . As many as 60 % of people on the west coast lost power . On March 17 only seventeen of the sixty @-@ six secondary schools on the island were functioning . After the storm it was feared that the existing dengue fever epidemic on the island would spread . Erica caused US \$ 15 million in damages , primarily on New Caledonia .

= = = Tropical Cyclone Fili = = =

Cyclone Fili formed on April 13 from an area of convection northeast of Fiji . As marginal windshear abated , the disturbance began to organise , and cyclonic rotation was noted . A tropical upper tropospheric trough to the southwest helped enhance upper ? level divergence in the system . RSMC Nadi began issuing warnings at 0000 UTC on April 14 . Despite forecasts that Fili would merge with an extratropical cyclone , overnight convective organisation improved . Dvorak satellite estimates gave a rating of 3 @.@ 0 , implying winds of 85 km / h ( 55 mph ) . The JTWC issued their only warning on Fili at 0600 UTC on April 14 . RSMC Nadi named the storm Fili at 1800 UTC on the same day , east ? southeast of Tongatapu . At the time , Fili was travelling southeast at 35 km / h ( 20 mph ) . During the day a nearby upper ? level trough helped accelerate Fili southeast and then southward . However , Fili quickly lost tropical characteristics under intense wind shear , becoming an extratropical cyclone the next day and merging with a cold front by 1200 UTC on March 15 . No damage was reported as a result of Fili due to its distance from land masses .

### == Severe Tropical Cyclone Gina ==

A westward @-@ moving tropical disturbance persisted northeast of Vanuatu , with persistent convection extending toward the Solomon Islands . On June 4 , both the JTWC and RSMC Nadi classified the system as a tropical depression . With a ridge to the south , it moved to the west @-@ southwest , quickly intensifying into Tropical Storm Gina by June 5 about 970 km ( 600 mi ) east @-@ southeast of Honiara . By 0000 UTC on June 7 , the JTWC upgraded Gina to the equivalent of a minimal hurricane , after an eye became evident on satellite images . Interaction with the nearby remnants of Tropical Cyclone Epi caused convection to decrease . On June 7 , FMS reported that Gina attained peak intensity as a low @-@ end Category 3 tropical cyclone on the Australian intensity scale , with winds of 140 km / h ( 90 mph ) . The JTWC recorded winds of 170 km / h ( 105 mph ) . A compact cyclone with a well @-@ defined eye , Gina encountered stronger wind shear and cooler waters . After turning southeast and then east @-@ southeast in response to a rapidly approaching trough , Gina quickly deteriorated as the convection became displaced from the centre . By June 9 , the centre became uncertain as Gina stalled to the west @-@ northwest of Port Vila . Winds diminished below gale force the next day .

Gina struck the island of Tikopia that had already sustained catastrophic damage from Cyclone Zoe less than two months previously . The storm brought high winds and torrential rains that triggered landslides . Dozens of homes were damaged and many areas newly re @-@ planted after Cyclone Zoe were devastated again . The impacts of Gina reportedly set back recovery efforts by nearly six months . A total of 112 newly built houses and 128 newly built kitchens were severely damaged , and another 37 homes sustained minor damage . The newly planted winter crop was lost due to sea spray , and 143 bags of rice , given as relief supplies after Cyclone Zoe , were lost . Following the storm , additional relief supplies and food were rushed to residents to ensure their safety . These consisted of local foods , sago and mesh wiring , worth \$ 14 @, @ 400 . A ship carrying five people became stranded in the Coral Sea during the storm when their engine failed on June 7 . A mayday signal was put out by the captain but rough seas produced by the storm hampered rescue efforts . The five were safely rescued later that day , but two more people were discovered to be missing .

### == Other systems ==

During the opening days of the tropical cyclone year 2002 @-@ 03 , a westerly wind burst occurred and lead to the formation of Typhoon Chataan and Tropical Depression 17F . The system was first noted as a tropical depression during July 3 , while it was located about 800 km ( 495 mi ) to the northwest of Honiara in the Solomon Islands of Guadalcanal . Over the next couple of days the system moved westwards before it was last noted during July 5 . During October 21 , Tropical Disturbance 01F developed about 410 km ( 250 mi ) to the northwest of Port Vila , Vanuatu . It moved southeast and developed into a poorly organised tropical depression . It remained disorganized and accelerated towards the southeast , and was last noted by RSMC Nadi at 1800 UTC on October 22 . On December 10 , RSMC Nadi reported that Tropical Disturbance 03F had developed within a trough of low pressure , about 635 km ( 395 mi ) to the northeast of Pago @-@ Pago on the American Samoan island of Tutuila . The depression drifted towards the south , and was classified as a tropical depression the next day . Further development of the depression was prevented by dry air wrapping into the system and vertical windshear displacing convection . The depression was no longer monitored by RSMC Nadi on December 15 after it had become sheared , but it was briefly referred to as a " weak tropical depression " on December 19 and 20 .

On January 30 , the poorly organised Tropical Disturbance 08F developed within a convergence zone about 325 km ( 200 mi ) to the northeast of Apia on the Samoan island of Upolu . Over the next few days the system remained weak and poorly organized , and was classified as a tropical depression during February 5 . The depression then moved westwards , before dissipating on February 9 . Tropical Disturbance 10F developed on February 15 , about 170 km ( 105 mi ) to the north of the Fijian Dependency of Rotuma Island . The system was poorly defined and disorganised

, while convection surrounding the system was mostly confined to the southern and eastern flanks of the low level circulation . Over the next few days the disturbance remained weak and was last noted during February 21 , while nestled within the Solomon Islands . On March 6 , Tropical Depression 11F developed under an upper trough of low pressure about 220 km ( 140 mi ) to the northeast of Nadi , Fiji . Convection surrounding the depression was displaced to the north of the low level circulation center . The depression remained weak over the next couple of days , and was last noted during March 8 . A fairly disorganized tropical disturbance developed during April 6 , within a monsoonal convergence zone , about 236 km ( 145 mi ) to the northeast of Port Vila , Vanuatu . It was initially located within an area of weak vertical windshear , but was expected to move into an area of stronger vertical windshear over the following 24 hours and gradually become extratropical . During the next day , as the disturbance moved southwards , it was assigned the designation 14F , before it was dropped by RSMC Nadi during April 8 , as convection surrounding the system became sheared and displaced . On April 13 , Tropical Disturbance 15F developed within a monsoon trough , about 355 km ( 220 mi ) to the southeast of Apia , Samoa . The system moved towards the south , with convection surrounding it poorly organised , and displaced to the north of the depression 's low level circulation centre . The depression was then last noted , during the next day as Tropical Depression 16F developed into Tropical Cyclone Fili .

= = Seasonal effects = =