NORDISPLAN

RP-02

2012

TERRITORY OF NORFOLK ISLAND

NORDISPLAN

CYCLONE RESPONSE PLAN

(RP-02)

EMNI

Emergency Management Norfolk Island

DOCUMENT CONTROL

AUTHORISATION

This plan provides for the mobilisation and coordination of the Territory's resources to deal with an actual or potential cyclone.

This Cyclone Response Plan (RP-02) was endorsed by the Emergency Management Norfolk Island Committee

Date: 3 December 2012

This Cyclone Response Plan was approved by the Territory Controller of the Emergency Management Norfolk Island Committee:

Signed:

Mr Milton Bradley
Territory Controller EMNI

Date of Approval: 3 December 2012

VERSION CONTROL

A review of the Cyclone Response Plan shall be conducted annually and after any activation of the RP-02 by EMNIC.

Amendment No.	Amendment Summary	Author	Effective Date
01 / 2012	Final Draft	OIC & 2IC Police / CFCO	12/10/2012

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LIST OF ABBREVIATIONS

BoM	Bureau of Meteorology (Australian Government)
CCC	Crisis Coordination Centre (Attorney-General's Department)
CFCO	Chief Fire Control Officer
CRP (RP-02)	Cyclone Response Plan
EMA	Emergency Management Australia
EMG	Emergency Management Group (Norfolk Island)
EMLO	Emergency Management Australia Liaison Officer
EMNI	Emergency Management Norfolk Island
EMNIC	Emergency Management Norfolk Island Committee
ENSO	El Niño-Southern Oscillation
EOC	Emergency Operations Centre
FMS	Fiji Meteorological Service
FSA	Functional Service Area
FSC	Functional Service Coordinator
FSLO	Functional Service Liaison Officer
NI	Norfolk Island
NIA	Norfolk Island Administration
NIG	Norfolk Island Government
NIPF	Norfolk Island Police Force
NORDISPLAN	Norfolk Island Territory Disaster and Emergency Plan
OIC-NIPF	Officer-in-Charge, Norfolk Island Police Force
RP	Response Plan
RSMC NADI-TCC	Regional Specialised Meteorological Centre Nadi-Tropical Cyclone Centre
TCPA	Tropical Cyclone Public Advice
TCPW	Tropical Cyclone Public Warning

NORFOLK ISLAND CYCLONE RESPONSE PLAN

1. INTRODUCTION

This Cyclone Response Plan (RP-02) provides for the mobilisation and coordination of the Territory's resources to deal with an impending cyclone impact and was prepared by the Emergency Management Norfolk Island Committee pursuant to Section 8 of the Disaster and Emergency Management Act 2001 with input from Emergency Management Australia.

Norfolk Island (NI) is a self-governing Australian External Territory, located in the Pacific Ocean approximately 1,500km east of Brisbane approximately 1,100km north west of Auckland, New Zealand, and approximately 800km south-south-east of Noumea, New Caledonia, within the area bounded by the parallels 28 degrees 59 minutes and 29 degrees 9 minutes south latitude and the meridians 167 degrees 54 minutes and 168 degrees east longitude.

Norfolk Island is a volcanic outcrop approximately 5 x 8 kilometres with an area of 34.5 sq km. The Island lies in the South Pacific along the Norfolk Ridge, which extends from New Zealand to New Caledonia. It has no large-scale internal bodies of water and 32km of coastline. The island's highest point is Mount Bates, 319m above sea level, located in the northwest quadrant of the island. The majority of the terrain is rolling hills suitable for farming and other agricultural uses. The coastline consists of varying degrees of cliffs faces.

The Territory also includes the uninhabited islands of Phillip and Nepean (respectively 7km and 1km south of the main island). The climate is subtropical with mild temperatures of little seasonal variation. Norfolk Island has a population of approximately 1,800 residents with up to an additional 400 tourists at any one time.

2. AIM

The aim of this plan is to detail the prevention, preparedness, response and recovery arrangements in the event of a cyclone impacting on the Territory of Norfolk Island, in line with the requirements of the Norfolk Island Disaster and Emergency Plan (NORDISPLAN).

The Cyclone Response Plan provides for the mobilisation and co-ordination of the Territory's resources, both public and private, to deal with an impending Tropical Cyclone emergency.

3. OBJECTIVE

The risk of Tropical Cyclones upon Norfolk Island exists which requires Emergency Management Norfolk Island (EMNI) to have a Response Plan (RP) in place to cover such an identified threat.

Modern technology allows accurate monitoring of the track and intensity of Tropical Cyclones, however they remain, because by their nature, largely unpredictable in terms of path, speed and force. As a result, it is important that EMNI has a Cyclone Response Plan (RP-02) which can be implemented immediately **once** the threat of a Tropical Cyclone is identified.

RP-02 details the phases of preparedness necessary for the Emergency Management Norfolk Island Committee (EMNIC) to prepare Norfolk Island for the impact of a Tropical Cyclone. In addition, the plan considers all aspects of Tropical Cyclones, including damaging winds, rain and storm surges.

RP-02 also details the stages for alerting the community of Norfolk Island, as well as establishing the information that should be sent to the Australian Government Crisis Coordination Centre (CCC) in Canberra and other Australian Government agencies as required.

4. RESPONSIBLE OFFICER FOR THE CYCLONE RESPONSE PLAN

The responsible officer for RP-02 is the Controller.

5. ACTIVATION OF CYCLONE RESPONSE PLAN AND DECLARATIONS

Activation of this plan remains the responsibility of the Controller.

Declarations of a State of Disaster or a State of Emergency under Section 9 of the *Disaster & Emergency Management Act 2001* (NI) are made by the responsible Norfolk Island Government Minister, on the advice of the Controller, or, in the absence of the Controller the Deputy Controller or another member of the committee.

A declaration under subsection 9(1) must be made in writing in a manner and form determined by the Minister and must be published or announced in accordance with the NORDISPLAN.

A declaration under subsection 9(1) remains in force for 72 hours and may not be extended or renewed without a resolution of the Legislative Assembly.

Section 9(4)(a) of the *Disaster & Emergency Management Act 2001* (NI), allows for a declaration of disaster or emergency to be extended for the purpose of response operations under this Act and the Plan, and on the advice of the Controller for recovery operations under this Act and the Plan.

A schematic of the Declaration and decision making process can be found at Annexure 'A' - Declaration of Disasters and Emergencies'

A Tropical Cyclone Risk Assessment Matrix at Annexure 'B' has been developed as part of this Response Plan. The Tropical Cyclone Risk Assessment Matrix will assist in predicting and assessing cyclone impacts.

6. CYCLONE ALERT PHASES AND RESPONSE

The following is a detailed list of the alert phases of a cyclone and actions that will be implemented by EMNIC.

In order to allow for quick and decisive information to be passed to both the community and key stakeholders, the NORDISPLAN RP-02 has introduced a colour-coded alert system which will make it easier to identify both the phase and required action at that time. Full details of the alert phases, time frames and requirements can be found at Annexure 'C':- 'Tropical Cyclone Colour Coded Alert Phases & Action Plan'.

Between the months of November and April, which is the identified cyclone season, the coloured alert phase will be the 'Green Alert', issued by EMNIC. Any change to 'Green Alert' will be triggered by a cyclone developing in the South Pacific Ocean (West) region.

6.1 ALERT PHASES

6.1.1 Phase One (Green Alert): Emergency Management Australia (EMA) and Bureau of Meteorology (BoM) conduct a pre-season Tropical cyclone brief on the South Pacific Ocean (West) region to the EMNIC

- EMA, BoM and EMNIC liaise regarding forthcoming season.
- EMNIC meet and assess planning and preparedness.
- Territory Controller liaises with Emergency Management Group (EMG).
- EMNI remains at Green Alert

6.1.2 Phase Two (Green Alert): Tropical Cyclone detected and path tracks towards NI (72hrs +)

- BoM informs the Territory Controller of the predicted track
- EMNIC meet with EMG, discuss the situation and confirm actions
- EMNIC alert the CCC of developing cyclone and consider request for the deployment of an Emergency Management Australia Liaison Officer (EMLO)
- EMNIC to consider the activation of the NORDISPLAN (this is ongoing throughout the Phases)
- Consider whether Norfolk Island Emergency Operations Centre (EOC) is placed on standby for immediate activation
- Initial public advice issued
- EMNI Moves to Blue Alert (at 72 hours out)

6.1.3 Phase Three (Blue Alert): Tropical Cyclone impact (72hours)

- EMNIC to receive updates and begin action processes including identification of issues.
- Norfolk Island BoM brief EMNIC on situation
- Functional Service Coordinators (FSC) brief the committee on current status and activate sub plans as advised by the Controller
- EOC staff notified and staffing rosters developed
- Consider additional resources that may be required
- Liaise with CCC regarding the situation and possible assistance
- Sitrep developed and disseminated
- Updated public advice issued (public to be advised to begin preparations)
- Move to Yellow Alert (at 48 hours out)

6.1.4 Phase Four (Yellow Alert): Tropical Cyclone impact 48 hours

- EMNIC meet to update (as above)
- Norfolk Island BoM brief EMNIC on situation
- EOC Staff placed on standby.
- FSC's update the EMNIC on preparations
- Updated public advice issued (public to begin preparing homes for cyclone)
- Sitrep developed and frequency established (e.g. 0900 & 1700 each day)
- Move to Orange Alert (at 24 hours out)

6.1.5 Phase Five (Orange Alert): Tropical Cyclone impact 24 hours out

- EOC activated.
- EMNIC meet to update
- Norfolk Island BoM brief EMNIC on situation
- FSC's update the EMNIC on preparations
- First public warning issued (public to finalise home protections, personal plan and consider protection of life)
- Ensure Norfolk Island Administration (NIA) / Norfolk Island Government (NIG) preparations are finalised
- Move to Orange Alert (at 12 hours out)

6.1.6 Phase Six (Orange Alert): Tropical Cyclone impact 12 hours out

- EMNIC meet to update
- Norfolk Island BoM brief EMNIC on situation
- FSC's update the EMNIC on current status of their operations
- Second public warning issued (finalise shelter and personal protection)
- Contingency arrangements activated
- Norfolk Island Police Force (NIPF) commence/conduct patrols advising community of warnings and provisions of the Disaster & Emergency Management Act 2001
- Move to Red Alert (at 4 hours out)

6.1.7 Phase Seven (Red Alert): Tropical Cyclone impact 4 hours out (or prior to gale strength winds)

- EMNIC final pre-impact meeting, consider declarations,
- Norfolk Island BoM brief EMNIC on situation
- FSC's update the EMNIC on current status of their operations
- Final public warning issued (shelter)
- Norfolk Island Police Force (NIPF) conduct patrols to enforce warnings and provisions of the *Disaster and Emergency Management Act 2001* (if safe to do so).

- EOC remains activated and monitoring situation
- All shelter
- Move to Grey Alert

6.1.8 Phase Eight (Grey Alert): Post-impact

- Initial damage assessment undertaken,
- Assessment teams advise the EMNIC with a situation report
- EMNIC meet to be briefed on impact/damage
- EMNIC develop a cleanup/initial recovery action plan (as required)
- Review current hazards, threats and risks
- EMNIC prepare to issue all clear - move to white alert

6.1.9 Phase Nine (White Alert) Recovery

- Assess resources required for recovery
- If necessary compile requirements and assistance requests
- Advise Minister and Administrator of assistance requirements
- Advise the community of closures, hazards, health risks etc
- consider moving back to Green Alert

Once the threat of a cyclone has passed, whilst in the months of November through to April, EMNI will revert back to the Green Alert Stage

7. SUB PLANS

Sub Plans are established to assist the EMNIC to coordinate an effective response to a Tropical Cyclone. All Functional Service Areas (FSAs), within their respective Sub-Plans, develop response and contingency plans for Tropical Cyclones (along with specific response requirements for all identified hazards) The FSAs include:

Airport & Ports
Border Protection
EOC
Fire
Health
Media & Public Information
Police
Telecommunications Infrastructure
Transport & Resources, and
Welfare

8. BACKGROUND

Tropical Cyclone Season in Australia and surrounding areas extend from November to April. They have been described as *'the most devastating of natural disasters both because of the loss of human life they cause and the large economic losses they induce'* (American Meteorological Society, 1998).

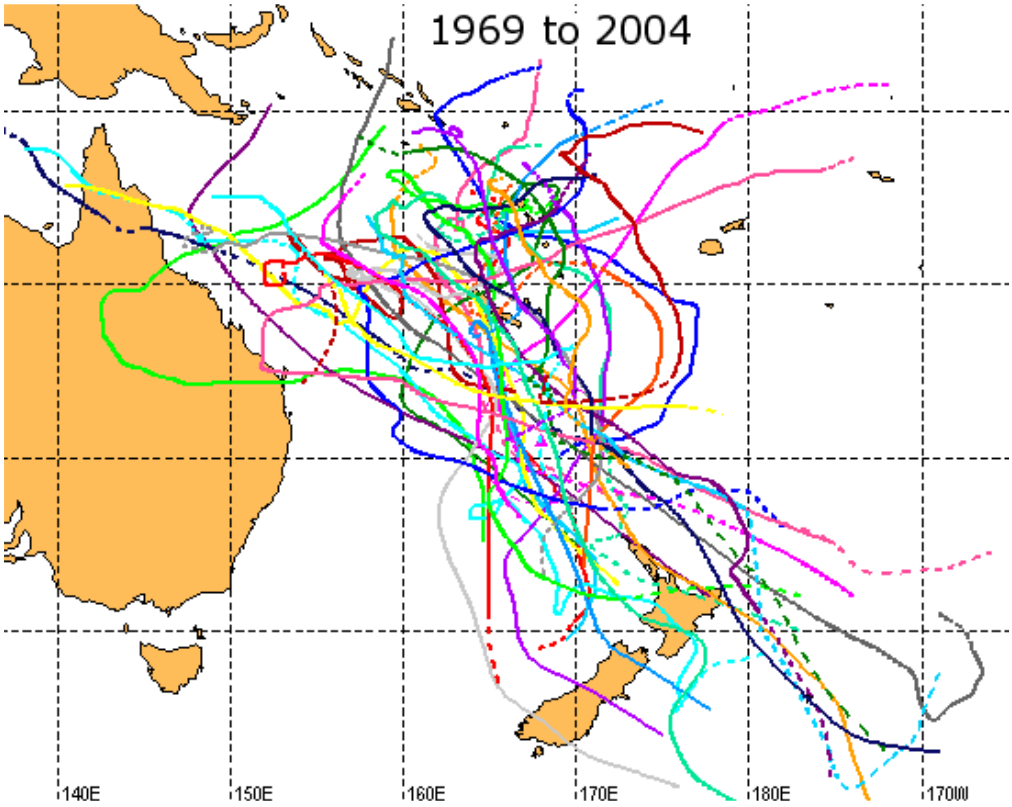
Tropical Cyclones are dangerous because they produce destructive winds, heavy rainfall with flooding and damaging storm surges that can cause inundation of low lying coastal areas.

Although cyclones are natural meteorological events, severe cyclones are predicted to increase in frequency as oceans warm under a changing climate (Nott & Hayne, 2001). These types of tropical storms are the most destructive form of natural damage within the southwest Pacific.

Tropical Cyclone Activity close to Norfolk Island

There has been significant historical evidence of the impact of Tropical Cyclones on Norfolk Island. *"Nothing but horror and desolation presented itself on every side which can only be equalled or conceived by those who have seen the dreadful effects of a Hurricane in the West Indies"* Philip Gidley King, Commandant, Norfolk Island 1789

The following image shows Tropical Cyclone tracks over the last 35 years (1969 - 2004). It highlights the need for vigilance and to ensure planning and preparedness remain a high priority for EMNIC.



Tropical Cyclones tracking near Norfolk Island 1969-2004

Tropical Cyclone Severity

The severity of a Tropical Cyclone is described in terms of categories ranging from 1 to 5. This categorisation relates to the zone of maximum winds. Using the severity scale, the EMNIC, key stakeholders and the wider Norfolk Island community will be able to assess the degree of cyclone threat and take appropriate action. Damage will vary depending on factors such as:

- Distance from the zone of maximum winds;
- The level of exposure at a particular location;
- Building standards;
- Vegetation type; and
- Resultant flooding.

It should be noted that the Tropical Cyclone category does not refer to the amount of flooding or storm tides. If a storm tide is expected, it will be mentioned separately in the cyclone warning. The following table shows the Tropical Cyclone Severity Categories, and the typical effects.

Category	Strongest Gust (km/h)	Typical Effects (indicative only)
1 (Tropical Cyclone)	**Less than 125** (Gales)	Negligible house damage. Damage to some crops, trees and caravans. Craft may drag moorings.
2 (Tropical Cyclone)	**125 – 164** (Destructive Winds)	Minor house damage. Significant damage to signs, trees and caravans. Heavy damage to some crops. Risk of power failure. Small craft may break moorings.
3 (Severe Tropical Cyclone e.g. Roma)	**165 – 224** (Very destructive Winds)	Some roofs and structural damage. Some caravans destroyed. Power failure likely.
4 (Severe Tropical Cyclone e.g. Tracy)	**225 – 279** (Very destructive Winds)	Significant roofing loss and structural damage. Many caravans destroyed and blown away. Dangerous airborne debris. Widespread power failures.
5 (Severe Tropical Cyclone e.g. Yasi)	**More than 280** (Very destructive Winds)	Extremely dangerous with widespread destruction. Extensive damage to homes and structures.

Table 1.1: Tropical Cyclone Severity Categories and Typical Effects[1]

Whilst they are a naturally forming meteorological incident that have caused destruction over a millennium, the frequency of severe storms has increased since the 1970s as ocean surface waters have warmed, feeding increases in the power that these storms generate. Current research predicts that '*The natural forces of tropical storms are expected to be enhanced as the climate changes, resulting in an increased frequency of severe cyclones*'[2].

Assessing impacts and ensuring necessary planning and preparation provides EMNI with an understanding of the vulnerability of Norfolk Island to such threats and hazards. It is critical that a Response Plan exists to respond to the effects of acute and chronic stressors which will occur with the effect and impact of Tropical Cyclones (e.g. potential loss of life, property damage, disrupted services and recovery efforts). This will assist to develop and enhance government and community resilience building management strategies and awareness through raising communications efforts[3] and overall preparedness.

Tropical Cyclones that represent a risk to Norfolk Island are formed during summer over pools of warm (>26.5°C) water in the Coral Sea and south-western Pacific. Once formed, Tropical Cyclones follow tracks within the latitudinal belt of 10 – 30°S, spanning most of the expanse of the area between North Eastern Australia to the East, and New Caledonia, Tonga and Fiji to the North. Based on historical data, an average of 1 to 3 cyclones threaten Norfolk Island every year, depending on the El Niño-Southern Oscillation phenomenon.

[1] Surviving Cyclones – Warnings, Preparedness and Safety – Australian Government (Emergency Management Australia and the Bureau of Meteorology, 2007
[2] Great Barrier Reef Marine Park Authority (GBRMPA) Cyclone Risk and Impact Assessment Plan April 2011
[3] Great Barrier Reef Marine Park Authority (GBRMPA) Cyclone Risk and Impact Assessment Plan April 2011

Size of Cyclones

The size of Tropical Cyclones is also an important factor, with the diameter of gales (i.e. including wind gusts) differing dramatically between systems. The following image shows the difference in size between Tropical Cyclone Tracy (that devastated Darwin in 1974) and Tropical Cyclone Kerry (2005).

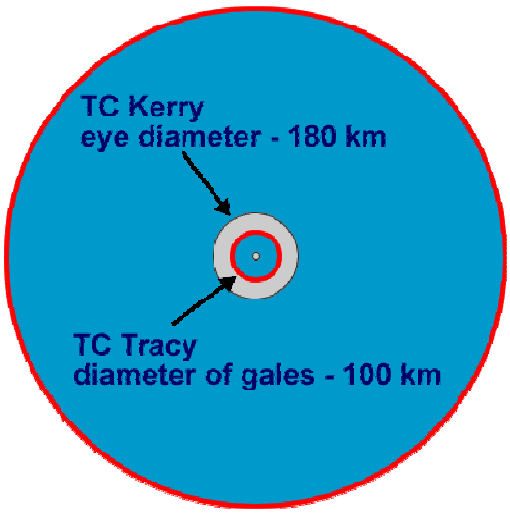


Fig 1.2: Differing size of Tropical Cyclones

To put this into perspective, the following shows the difference in size between Tropical Cyclone Yasi (which caused significant damage in far North Queensland) in 2011 and Hurricane Katrina in 2005, which caused devastation to the city of New Orleans and the wider states of Louisiana, Mississippi and Florida, which killed over 1800 people (roughly the population of Norfolk Island) and cost in excess of US$91 Billion in damage.

Fig 1.3: Comparison between Category 5 storms - Cyclone Yasi and Hurricane Katrina

Consequences of Tropical Cyclones - High Winds and Flooding

The high winds of a tropical cyclone inflict widespread damage when such a storm leaves the ocean and crosses land. Aids to navigation may be blown out of position or destroyed. Norfolk Island has no harbour. However, craft in open water or close in, that may seek

shelter, often lifted by the storm surge, break moorings or drag anchor and are blown ashore and against obstructions.

Ashore, trees are blown over, houses are damaged, power lines are blown down, etc. The greatest damage usually occurs in the dangerous semicircle a short distance from the centre of a Tropical Cyclone, where the strongest winds occur. As the storm continues on across land, its fury subsides faster than it would if it had remained over water. This however, may be small comfort to a small island like Norfolk Island which is not large enough for this to occur.

Wind gusts, which are usually 30 to 50 percent higher than sustained winds, add significantly to the destructiveness of the tropical cyclone. Many tropical cyclones that reach hurricane intensity develop winds of more than 90 knots (167 km/h) sometime during their lives, but few develop winds of more than 130 knots (240 km/h).

Tropical cyclones have produced some of the world's heaviest rainfalls. While average amounts range from 6 to 10 inches (15.24 – 25.4 centimetres), totals near 100 inches (254cm) over a 4-day period have been observed. A 24-hour world record of 73.62 inches (187cm) fell at Reunion Island during a Tropical Cyclone in 1952.

Flooding is an extremely destructive by-product of the Tropical Cyclone's torrential rains. Whether an area will be flooded depends on the physical characteristics of the drainage basin, rate and accumulation of precipitation, and river stages at the time the rains begin. Previous experience shows that certain areas of Norfolk Island are prone to flooding.

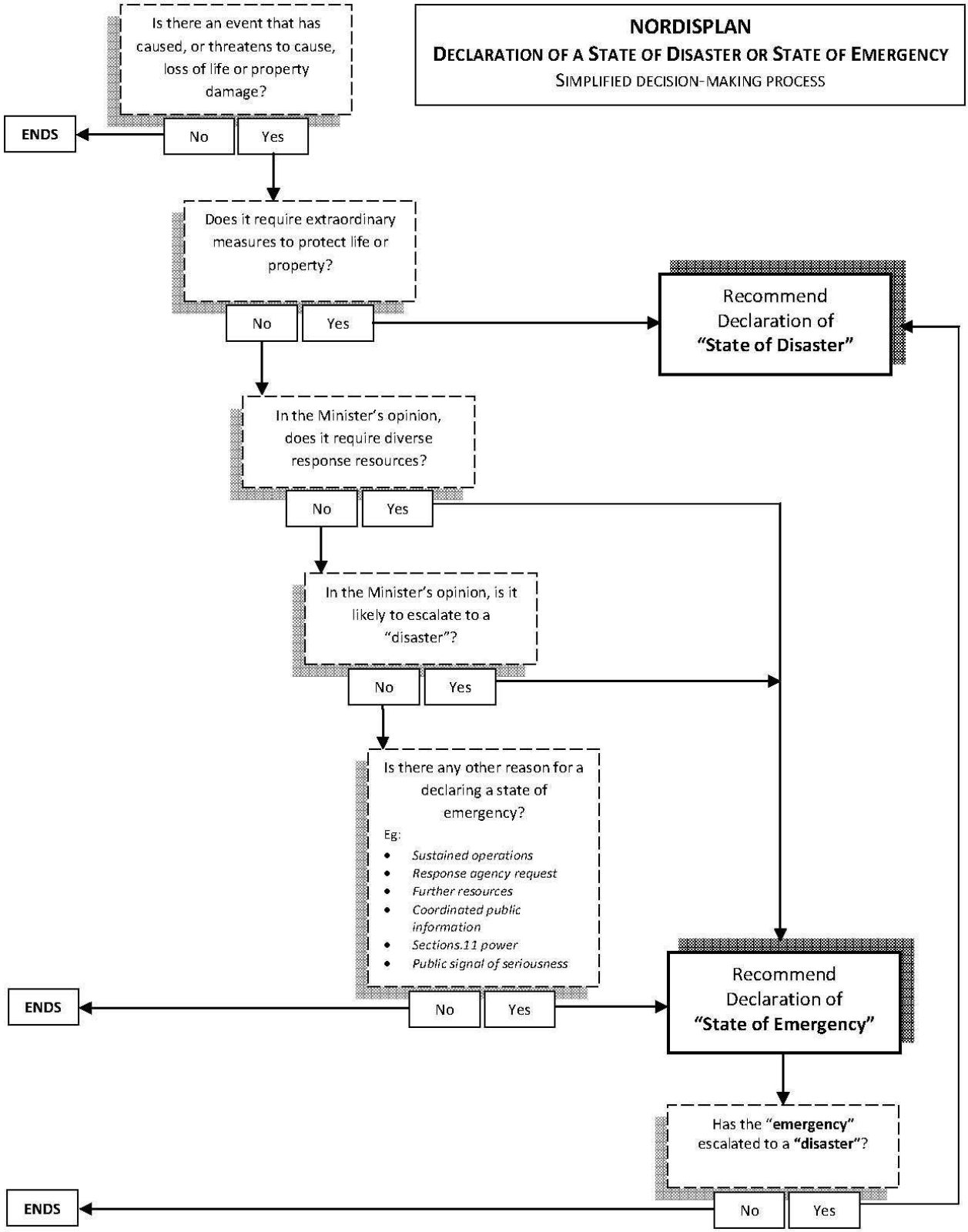
Storm Surge/Tide

Potentially, the most destructive phenomenon associated with Tropical Cyclones that make landfall is the storm surge. Storm surge is a *'raised dome of water about 60 to 80 km across and typically about 2 to 5 metres higher than the normal tide level'*[4]. Obviously, if the level of surge occurs at the same time as a high tide, then the area of inundation is going to be greater and therefore can be quite extensive, particularly in low-lying areas.

Effect of Cyclone on Cascade Pier (either, Eseta – 1988, Dovi 1988 or Delilah – 1989)

[4]Surviving Cyclones – Warnings, Preparedness and Safety – Australian Government (Emergency Management Australia and the Bureau of Meteorology, 2007

ANNEXURE A: DECLARATION OF DISASTERS AND EMERGENCIES



ANNEXURE B: CYCLONE RISK ASSESSMENT MATRIX

EMNI

TC Name: Date: Time: ____:____hrs

#	Risk Event	Description	Likelihood 1-5			Consequence 1-5			Risk		Action / Comment
1	Best case Scenario		Almost certain Likely Possible Unlikely Rare	5 4 3 2 1	❑ ❑ ❑ ❑ ❑	Severe Major Moderate Minor Negligible	5 4 3 2 1	❑ ❑ ❑ ❑ ❑	**Low:** **Medium:** **High:** **Extreme:**	❑ ❑ ❑ ❑	
2	Worst case Scenario		Almost certain Likely Possible Unlikely Rare	5 4 3 2 1	❑ ❑ ❑ ❑ ❑	Severe Major Moderate Minor Negligible	5 4 3 2 1	❑ ❑ ❑ ❑ ❑	**Low:** **Medium:** **High:** **Extreme:**	❑ ❑ ❑ ❑	
3	Most likely scenario		Almost certain Likely Possible Unlikely Rare	5 4 3 2 1	❑ ❑ ❑ ❑ ❑	Severe Major Moderate Minor Negligible	5 4 3 2 1	❑ ❑ ❑ ❑ ❑	**Low:** **Medium:** **High:** **Extreme:**	❑ ❑ ❑ ❑	

Emergency Controller

Chairman,

EMNI Executive Committee

Risk Matrix Key

Likelihood							
	Almost certain	5	High	High	Extreme	Extreme	Extreme
	Likely	4	Medium	High	High	Extreme	Extreme
	Possible	3	Low	Medium	High	Extreme	Extreme
	Unlikely	2	Low	Low	Medium	High	Extreme
	Rare	1	Low	Low	Medium	High	High
			1	2	3	4	5
			Negligible	Minor	Moderate	Major	Severe
			Consequence				

ANNEXURE C: CYCLONE RESPONSE COLOUR CODED ALERT PHASES

Alert Phase	Cyclone Activity	Time-Frame	BoM Advice	EMNIC Response	Community Requirements	Public Advice & Warnings
Green Alert (Phase One)	Cyclone Season commences	November to April	Tropical Cyclone Outlook *(3 Day outlook every 24 hours)*	• EMA, BoM and EMNIC liaise regarding forthcoming season. • EMNIC meet and assess planning and preparedness. • Territory Controller liaises with EMG. EMNI remains at Green Alert. • EMNI remains at Green Alert.	• Organise your emergency kit including first aid kit, essential medications, torch, portable radio, spare batteries, food and water. • Develop a family cyclone plan.	*We are now in the Cyclone Season and will remain at GREEN ALERT until April. It is time to start preparing for the cyclone season.*
Green Alert (Phase Two)	Cyclone developing & path tracks towards NI	72hrs+	BoM informs of detection and predicted track	• BoM informs the Territory Controller of the predicted track • EMNIC meet with EMG, discuss the situation and confirm actions • EMNIC alert the CCC of developing cyclone and consider request for the deployment of an EMLO • EMNIC to consider the activation of the NORDISPLAN (this is ongoing throughout the Phases) • Consider whether NI EOC is placed on standby for immediate activation • Initial public advice issued • EMNI Moves to Blue Alert (at 72 hours out)	• Keep up to date with the cyclone development through radio, television or internet. • Secure or remove loose material and rubbish from around your home or work. • Develop a family cyclone plan and start making preparations if you have not done so.	*We have been notified of a cyclone developing and tracking towards Norfolk Island. We remain at GREEN ALERT at this stage.*
Blue Alert (Phase Three)	Cyclone forming and tracking	72 hours out	Tropical Cyclone Information Bulletins (*Every 6 hours*)	• EMNIC to receive updates and begin action processes including identification of issues. • Norfolk Island BoM brief EMNIC on situation • FSCs brief the committee on current status and activate sub plans as advised by the Controller • EOC staff notified and staffing rosters developed • Consider additional resources that may be required • Liaise with CCC regarding the situation and possible assistance • Sitrep developed and disseminated • Updated public advice issued (public to be advised to begin preparations) • Move to Yellow Alert (at 48 hours out)	• Keep up to date with the cyclone development through radio, television or internet. • Begin preparing your home • Fill suitable water containers including bath tubs • Top up your car's fuel tank, chainsaws and normal fuel containers • Ensure you have fresh batteries for your radio. • Make sure you have adequate supplies of prescribed medicine. • Stock up on non perishable/tinned food items if required. • Ensure your neighbours are aware of the issued warning. • Secure or remove loose material and rubbish from around your home or work. • Consider relocating people with special needs including people who are pregnant, elderly or have disabilities. • Identify the strongest part of your house or the closest welfare centre. • Identify a safe place for your pet/s. • Ensure you have adequate tie down materials or anchor points for loose items. • Organise a gas barbeque or portable stove to use outside in a dry, ventilated area, if electricity is cut.	*A BLUE ALERT has been issued in relation to a tropical cyclone, you need to start preparing for possible impact.*

Alert Phase	Cyclone Activity	Time-Frame	BoM Advice	EMNIC Response	Community Requirements	Public Advice & Warnings
Yellow Alert (Phase Four)	Cyclone Tracking	48 – 24 hours out	Cyclone Watch *(Every 6 hours to every 3 hours)*	• EMNIC meet to update (as above) • Norfolk Island BoM brief EMNIC on situation • EOC Staff placed on standby. • FSC's update the EMNIC on preparations • Updated public advice issued (public to begin preparing homes for cyclone) • Sitrep developed and frequency established (eg. 0900 & 1700 each day) • Move to Orange Alert (at 24 hours out)	• Keep up to date with the cyclone development through radio, television or internet. • Know where your family and pets are located. Consider sheltering pets early. • Secure boats, trailers, garden sheds, rainwater tanks and LPG bottles to tie down points. • Store or secure other loose items like outdoor furniture that is likely to be thrown about by destructive winds	*A YELLOW ALERT has been issued, you need to finalise preparations and plans for the tropical cyclone*
Orange Alert (Phase Five)	Cyclone Tracking	24 hours out	Cyclone Warning *(Every 3 hours – to every hour)*	• EOC activated. • EMNIC meet to update • Norfolk Island BoM brief EMNIC on situation • FSC's update the EMNIC on preparations • First public warning issued (public to finalise home protections, personal plan and consider protection of life) • Ensure NIA / NIG preparations are finalised • Move to Orange Alert (at 12 hours out)	• Keep up to date with the cyclone development through radio, television or internet. • Fuel your vehicles and park it in a sheltered area with the handbrake on and in park or first gear. • Ensure your emergency kit is complete and fill emergency containers with water. • Make sure your neighbours have received this warning. If you are ready and they need help, give them a hand. • Fasten all cyclone screens. Board up or heavily tape exposed windows. Close curtains and lock doors. • Pack a relocation kit, including warm clothes. Place valuables, important papers and photos in waterproof bags to be taken with your emergency kit. Prepare to move quickly to the strongest part of your house or relocate to the nearest welfare centre if required. • If you live in a low-lying coastal area and the cyclone is likely to create a storm surge, you may be advised to relocate if required • Ensure your children are home. • Gather tools that will be needed for emergency repairs. e.g. hammer, nails, rope, tarpaulins and chainsaws • If you live in a low-lying coastal area and the cyclone is likely to create a storm surge, you may be advised to relocate if required • Prepare the safest part of your house (usually the bathroom) and place emergency stores there. • Account for and lock up your pets.	*An ORANGE ALERT has now been issued, you need to implement your tropical cyclone plans.*

Alert Phase	Cyclone Activity	Time-Frame	BoM Advice	EMNIC Response	Community Requirements	Public Advice & Warnings
Orange Alert (Phase Six)	Cyclone Tracking	12 hours out	Cyclone Warning *(Every 3 hours – to every hour)*	• EMNIC meet to update • Norfolk Island BoM brief EMNIC on situation • FSC's update the EMNIC on current status of their operations • Second public warning issued (finalise shelter and personal protection) • Contingency arrangements activated • NIPF commence/conduct patrols advising community of warnings and provisions of the Disaster & Emergency Management Act 2001 • Move to Red Alert (at 4 hours out)	• Completed Orange Alert (Phase Five) recommendations. • Make a final check of your preparations	
Red Alert (Phase Seven)	Cyclone Imminent	6 hours out	Cyclone Warning *(Every hour)*	• EMNIC final pre-impact meeting, consider declarations, • Norfolk Island BoM brief EMNIC on situation • FSC's update the EMNIC on current status of their operations • Final public warning issued (shelter) • NIPF conduct patrols to enforce warnings and provisions of the Disaster & Emergency Management Act 2001 (if safe to do so). • EOC remains activated and monitoring situation • All shelter • Move to Grey Alert	• Keep listening to your portable radio for information on the cyclone's progress. • Disconnect electrical appliances and turn off gas supply valves. • Ensure that pets and animals are safely sheltered. • Go immediately to the strongest, safest part of your house or the building you are in (i.e. internal hallway, bathroom or toilet) or to the closest welfare centre. • Keep your emergency kit with you. • Take your relocation kit with you if you have been advised to relocate. • Stay away from doors and windows, and keep them closed and locked. • Stay inside until the White Alert - ALL CLEAR is given by authorities. • Do not make unnecessary demands on the emergency services. • Beware of the calm "eye" of the cyclone and do not go outside until you are advised to do so.	*A RED ALERT has now been issued. You must activate your cyclone plan. Listen to the radio for further updates*
Grey Alert (Phase Eight)	Cyclone has passed, but damage not assessed	Post Impact		• Initial damage assessment undertaken, • Assessment teams advise the EMNIC with a situation report • EMNIC meet to be briefed on impact/damage • EMNIC develop a cleanup/initial recovery action plan (as required) • Review current hazards, threats and risks • EMNIC prepare to issue all clear - move to white alert	• Keep listening to your portable radio for information on the cyclone's progress. • Stay inside until the white Alert - ALL CLEAR is given by authorities • If you need to go outside, be careful because power lines could be down and there may be fallen trees, broken water and sewage lines, loose roof sheeting and other material. • Report any damage or injuries to the appropriate agency or to the EMNI • Do not touch wet switches, and beware of fallen power lines, treat them as if they are live. • Do not drink water that could be contaminated. • Stay at your shelter; resist the urge to go sightseeing.	*A GREY ALERT has now been issued in relation to the tropical cyclone. Please listen to the radio for further updates*

Alert Phase	Cyclone Activity	Time-Frame	BoM Advice	EMNIC Response	Community Requirements	Public Advice & Warnings
White Alert (Phase Nine)	Cyclone is no longer a threat	Recovery		• Assess resources required for recovery • If necessary compile requirements and assistance requests • Advise Minister and Administrator of assistance requirements • Advise the community of closures, hazards, health risks etc • consider moving back to Green Alert	• Keep listening to your portable radio for information on the cyclone's progress. • Listen for information and follow advice from authorities. • If you need to go outside, be careful because power lines could be down and there may be fallen trees, broken water and sewage lines, loose roof sheeting and other material.	*A WHITE ALERT has been given, the cyclone danger has passed but take care.* *Issue hazards and areas/structures to remain clear of as they may be closed to the public and there may be dangers.*
Green Alert (Phase One)	Cyclone season continues	Daily 3-day outlook	Tropical Cyclone Outlook *(3 Day outlook every 24 hours)*	• EMNIC meet and re-assess planning and preparedness. • Territory Controller liaises with EMG. EMNI remains at Green Alert. • EMNI remains at Green Alert.	• Re-organise your emergency kit including first aid kit, essential medications, torch, portable radio, spare batteries, food and water. • Review family cyclone plan.	*We are back at GREEN ALERT. We need to remain vigilant and prepared through the rest of the cyclone season.*

ANNEXURE D: CYCLONE ALERT SYSTEM AND INFORMATION ADVICE ISSUED BY BOM

TO BE UPDATED WITH BoM INFORMATION WHEN AVAILABLE

Both Australia and New Zealand have joint responsibility for monitoring tropical cyclones in the South Pacific Ocean (West). However, only the Australian Bureau of Meteorology (BoM) provides tropical cyclone advice and warning products for Norfolk Island. More detailed information is included in advices as the level of threat increases. The following table details these BoM products:

Advice Product	Time Frame	Information
Tropical Cyclone Outlook	3 Day outlook produced every day	Issued daily by the Tropical Cyclone Warning Centre[5]. It presents a 3-day outlook on possible tropical cyclone development in the region and surrounding oceans.
Tropical Cyclone Information Bulletins	Every 6 hours	Issued if a Tropical Cyclone forms but is more than 48 hours from effecting the coastline or island communities or won't effect the coastline at all. It contains the cyclone's name, current location and forecast movements.
A Cyclone Watch	Every 6 hours to every 3 hours	Issued when a cyclone is expected to effect the coastline within 48 hours. These are broadcast on local media every 6 hours or every 3 hours as the threat becomes more serious. Contains cyclone's location, intensity, severity category and movement.
A Cyclone Warning	Every 3 hours – to every hour	Issued when a cyclone threat is imminent and landfall is expected within 24 hours. These are broadcast every 3 hours or every hour when a cyclone is close to the coast. In addition to information contained in the Watch Advice, contains expected maximum wind gusts, forecast rainfall, flooding and abnormal high tides.

Table 1.2: Tropical Cyclone Advice Products – Australian Bureau of Meteorology

Early Tropical Cyclone Advice

As stated earlier, whilst Norfolk Island nominally sits within New Zealand area of responsibility it operationally relies on much of its early information from Fiji (to the North) and Australia. Early Tropical Cyclone Advice uses a combination of indicators and tools.

Firstly, the BoM provides an El Niño-Southern Oscillation (ENSO) Report, based on the seasonal outlook of cyclone activity during the high risk summer season. This report is issued in October / November pending the commencement of the cyclone season.

On average, almost twice as many cyclones are formed in La Niña (wet cold phase) as opposed to El Niño (dry warm phase) years. Secondly, sets of tools are combined to enable the short-term risk forecasting and near-real time monitoring of tropical lows and cyclones once formed. These include mapping of points of origin (cyclogenesis), observed and predicted eye pressure (a proxy for maximum wind speeds), and storm path, size and speed of movement (a proxy for residence time over the land formations).

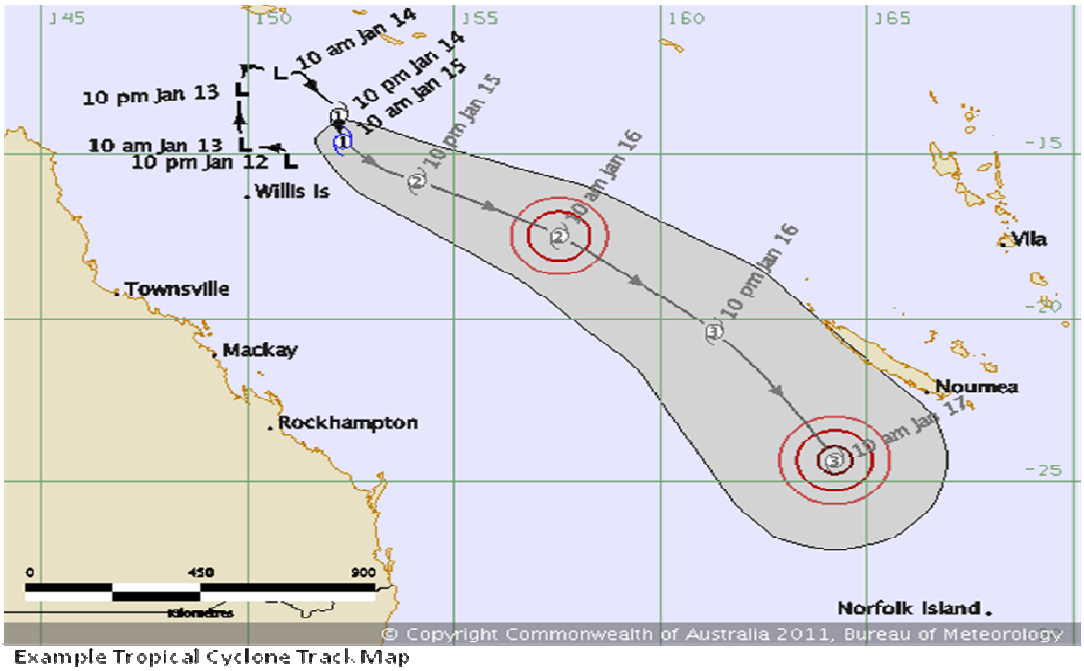
In addition to the services of the BoM, cyclones generating to the North of Norfolk Island are monitored and reported on, in the first instance, by the Fiji Meteorological Service (FMS) and specifically the Regional Specialised Meteorological Centre Nadi-Tropical Cyclone Centre (RSMC Nadi-TCC). The responsibility of the RSMC Nadi-TCC extends to 25 degrees South Latitude.

[5] Norfolk Island comes under the Sydney Regional Office of the Bureau of Meteorology, but the Brisbane Tropical Cyclone Warning Centre

The reliance on early advice, including predicted tracking, speed, intensity etc of any Tropical Cyclone is a critical component in the planning and preparation phases ahead of any alert.

Tropical Cyclone Forecast Track Map

When a tropical cyclone is detected, the BoM will issue a cyclone track map (impending cyclone) for the region that will include the predicted path of the tropical cyclone based on known weather formulas. The tropical cyclone track map will also include predicted cyclone strengths and the time for each stage up to 48 hours ahead.



Example Tropical Cyclone Track Map

Tropical Cyclone Public Advice

Once a Tropical Cyclone has formed, the BoM will issue a Tropical Cyclone Public Advice where there are strong indications that winds above gale force will affect Norfolk Island within 72 hours of issue

IDQ20064
Australian Government Bureau of Meteorology
Queensland

Top Priority for Immediate Broadcast
NORFOLK ISLAND TROPICAL CYCLONE ADVICE

Reissue of
METSERVICE NZ CYCLONE ADVICE FOR NORFOLK ISLAND BULLETIN NO: 02

ISSUED AT 0336 UTC ON 19-JAN-2008

A CYCLONE WATCH IS IN FORCE FOR NORFOLK ISLAND
TROPICAL CYCLONE FUNA WAS CENTRED NEAR 20.9S 174.8E 1110KM AWAY FROM NORFOLK AT 190000 UTC
FUNA IS CURRENTLY MOVING SOUTHEAST AT 10 KNOTS BUT IS EXPECTED TO CURVE TOWARDS THE SOUTHWEST AND ACCELERATE. IT NOW LOOKS LIKELY THAT THE CYCLONE WILL PASS JUST EAST OF NORFOLK ISLAND SUNDAY EVENING.

FORECAST UNTIL 06AM LOCAL TIME ON MONDAY MORNING
SOUTHEASTERLIES BECOMING STRONG SUNDAY AFTERNOON, TURNING SOUTHERLY IN THE EVENING AND POSSIBLY REACHING GALE FORCE FOR A TIME. EXPECT HIGH SWELLS.

THE NEXT ADVICE FOR NORFOLK ISLAND WILL BE ISSUED AROUND
191000 UTC

This warning is also available through TV and Radio broadcasts, the Bureau's website at www.bom.gov.au or call 1300 659 218. The Bureau and State Emergency Service would appreciate this warning being broadcast regularly.

Norfolk Island Time = UTC + 11hrs 30min
Australian Eastern Daylight Time = UTC + 11hrs
Australian Eastern Standard Time = UTC + 10hrs

Figure 1.1: Sample of a Bureau of Meteorology Tropical Cyclone Advice Products - Tropical Cyclone Advice for Norfolk Island Bulletin re TC Funa (2008)

The message will contain details of the Tropical Cyclone, including its name and location, as well as information regarding its intensity, severity category and movement. Surge and Tide information is also included. The Advice also details the time it was issued and the time of the next advice.

Cyclone watch messages are renewed every six hours.

The following message is typical of that which is likely to be broadcast ahead of a Cyclone:

> *When the cyclone comes, it is strongly advised that you stay in a safe place, listen to the radio and abide by the instructions issued by the media. But move early; remember that most injuries and fatalities in cyclones result from people being hit by flying debris while outside in high winds. Outside movement becomes both difficult and dangerous once wind gusts exceed 85km/h and external activities should cease once gusts exceed 100km/h.*
>
> *If you feel your house/shelter is not safe, see if you can shelter in a neighbour's house or move to the community evacuation centre as advised by the radio. Check to see that your neighbours, in particular those who are elderly, have disabilities, or are living alone, are safe.*
>
> *The following emergency service phone number should only be used in an emergency during or after a cyclone. In a life threatening emergency call 000.*

When more definitive information is known, then a message similar to the following will be released:

PRIORITY

NORFOLK ISLAND TROPICAL CYCLONE ADVICE NUMBER 5

A Cyclone WARNING has been declared for Norfolk Island.

At 5:30 pm NFT Severe Tropical Cyclone (INSERT NAME), Category 3 was estimated to be 1460 kilometres northwest of Norfolk Island and 890 kilometres west northwest of Noumea and moving southeast at 44 kilometres per hour.

SEVERE TROPICAL CYCLONE (INSERT NAME), CATEGORY 3, is expected to maintain a similar intensity over the next 18 hours, but then begin to weaken as it passes near Norfolk Island. Presently, the cyclone is forecast to pass to the southwest of the Island overnight Monday. The cyclone is then expected to continue moving southeast to lie approximately 400km southeast of Norfolk Island by midday Tuesday.

Northeast winds are expected to rise to GALE force Monday night, reaching DESTRUCTIVE force for a brief time overnight Monday and early Tuesday. Peak wind gusts to 150km/hr are expected. Northwest winds should ease below gale by late Tuesday morning.

A period of HEAVY RAIN is expected with the passage of the cyclone, with a chance of torrential downpours.

Details of Severe Tropical Cyclone (INSERT NAME) at 5:30 pm NFT:

.Centre located near..... 24.0 degrees South 162.7 degrees East .Location accuracy..... within 35 kilometres .Recent movement..... towards the southeast at 44 kilometres per hour .Wind gusts near centre... 220 kilometres per hour .Severity category..... 3 .Central pressure..... 957 hectoPascals

People on Norfolk Island should immediately commence or continue preparations, especially securing boats and property using available daylight hours.

- For cyclone preparedness and safety advice, visit the Norfolk Island Administration website (http://www.info.gov.nf/Emergency_Management)

- For emergency assistance call the Emergency Management Norfolk Island (EMNI) on +6723 999 for assistance with storm damage, rising flood water, fallen trees on buildings or roof damage.

The next advice will be issued by 9:30 pm NFT Sunday 16 January.

This warning is also available through TV and Radio broadcasts, the Bureau's website at www.bom.gov.au or call (+61) 1300 659 218. The Bureau and Norfolk Island Emergency Services would appreciate this warning being broadcast regularly.

This advice is for land-based communities, marine warnings will be issued from New Zealand.

Norfolk Island Time = UTC + 11hrs 30min which is Australian Eastern Daylight Time = UTC + 11hrs (Australian Eastern Standard Time = UTC + 10hrs)

ANNEXURE E: NOTES FOR NORFOLK ISLAND COMMUNITY AND VISITOR ACTION STATEMENT

 # (i) Watch

The Community and Visitors to Norfolk Island should consider what action they need to take if the cyclone threat increases.

- Information is available from Emergency Management Norfolk Island (+6723 999) or the Norfolk Island Police Force (+6723 22222)

- For cyclone preparedness and safety advice, visit the - For cyclone preparedness and safety advice, visit the Norfolk Island Administration website at: (http://www.info.gov.nf/Emergency_Management)

- For emergency assistance call the Emergency Management Norfolk Island on +6723 999 (for assistance with storm damage, rising flood water, fallen trees on buildings or roof damage).

 # (ii) Warning Zone – Category 1 only

The Community and Visitors to Norfolk Island should take precautions and listen to the next advice at XXX am/pm.

- Information is available from Emergency Management Norfolk Island (+6723 999) or the Norfolk Island Police Force (+6723 22222)

- For cyclone preparedness and safety advice, visit the - For cyclone preparedness and safety advice, visit the Norfolk Island Administration website at: (http://www.info.gov.nf/Emergency_Management)

- For emergency assistance call the Emergency Management Norfolk Island on +6723 999 (for assistance with storm damage, rising flood water, fallen trees on buildings or roof damage).

 # (iii) Warning Zone – Category 1 nearing or making landfall

The Community and Visitors to Norfolk Island should remain inside until the cyclone has passed and listen to the next advice at XXX am/pm.

- Information is available from Emergency Management Norfolk Island (+6723 999) or the Norfolk Island Police Force (+6723 22222)

- For cyclone preparedness and safety advice, visit the - For cyclone preparedness and safety advice, visit the Norfolk Island Administration website at: (http://www.info.gov.nf/Emergency_Management)

- For emergency assistance call the Emergency Management Norfolk Island on +6723 999 (for assistance with storm damage, rising flood water, fallen trees on buildings or roof damage).

 # (iv) Warning Zone – Category 2-5 (without the Standard Emergency Warning Siren - SEWS)

The Community and Visitors to Norfolk Island should immediately commence or continue preparations, especially securing boats and property, using daylight hours before nightfall.

- Information is available from Emergency Management Norfolk Island (+6723 999) or the Norfolk Island Police Force (+6723 22222)

- For cyclone preparedness and safety advice, visit the - For cyclone preparedness and safety advice, visit the Norfolk Island Administration website at: (http://www.info.gov.nf/Emergency_Management)

- For emergency assistance call the Emergency Management Norfolk Island on +6723 999 (for assistance with storm damage, rising flood water, fallen trees on buildings or roof damage).

 # (v) Warning Zone – Category 2-5 (with the SEWS)

The Community and Visitors to Norfolk Island should complete preparations quickly and be prepared to shelter in a safe place. boats and outside property should be secured using daylight hours before nightfall

- For cyclone preparedness and safety advice, visit the - For cyclone preparedness and safety advice, visit the Norfolk Island Administration website at: (http://www.info.gov.nf/Emergency_Management)

NOTES FOR EMNI ALERT

Messages to be added when Norfolk Island is under threat.

 # R1: Gales within 24-48 hours. Cyclone Watch

The Territory Controller advises the community under Watch that now is the time to put together your emergency kit, clear your yards and balconies, and commence home shelter preparations.

 # R2: Gales within 12-24 hours. Cyclone Warning

The Territory Controller advises the community and visitors than now is the time to make final preparations to your home shelter or identify which public emergency shelter to use.

 # R3: Gales within 6-12 hours. Cyclone Warning

The Territory Controller advises the community and visitors that PUBLIC SHELTERS ARE NOW OPEN.

 # R2: Gales within 0-6 hours. Cyclone Warning

The Territory Controller advises the community and visitors to TAKE SHELTER NOW.

REPEATING: the community and visitors are advised to TAKE SHELTER NOW.