

# PORT LOUIS MARINA

# HURRICANE PLAN

Valid 1<sup>st</sup> June 2021 – 30<sup>th</sup> November 2021

Camper & Nicholsons  
Port Louis Marina  
MB #9012  
Kirani James Boulevard  
St. George's  
Grenada  
West Indies

Version 1, dated 21<sup>st</sup> May 2021

## **INTRODUCTION**

### **The Hurricane Threat to Port Louis Marina**

The Marina's location in the south-eastern Caribbean has a hurricane risk. Though considered south of the "hurricane belt", the possibility of tropical storms and hurricanes does exist. Storms passing through the area, even a hundred miles away can affect the area with flooding and wind damage.

See **Annex A** for a detailed description of the categories and their effects.

For coastal areas, the effects of hurricanes include high wind, storm surge, waves, and flooding. Wind pressure and buffeting can affect all buildings within the marina and vessels berthed on the pontoon. Wind can also pick up unsecured items and throw them against structures and boats causing damage.

Hurricane pressure differences between the centre and its edges create storm surge flooding by lifting the surface of bodies of water. The intensity of wind, its duration in time, and distance over water which it blows (i.e., fetch) determine the size and frequency of waves. Flooding also results from excessive rain. Run-off can also produce mudslides.

In any coastal location, the impact of any of the above is a function of the intensity of the storm, its rate and direction of movement, and its proximity. Tropical cyclones have a counter clockwise circulation so their direction and speed of travel add velocity to wind to the right, forward quadrant of the storm. Thus for any location, wind may be greater or lesser depending on the observer's location relative to the hurricane eye.

The official hurricane season runs from 1<sup>st</sup> June to 30<sup>th</sup> November. The US Commerce Department's National Oceanic and Atmospheric Administration (NOAA) advised on 20<sup>th</sup> May 2021.

### ***Beginning with this year's hurricane season outlooks, NOAA's Climate Prediction Center***

NOAA's Climate Prediction Center is predicting another above-normal Atlantic hurricane season. Forecasters predict a 60% chance of an above-normal season, a 30% chance of a near-normal season, and a 10% chance of a below-normal season. However, experts do not anticipate the historic level of storm activity seen in 2020.

For 2021, a likely range of 13 to 20 named storms (winds of 39 mph or higher), of which 6 to 10 could become hurricanes (winds of 74 mph or higher), including 3 to 5 major hurricanes (category 3, 4 or 5; with winds of 111 mph or higher) is expected. NOAA provides these ranges with a 70% confidence. The Atlantic hurricane season extends from June 1 through November 30.

Last year's record-breaking season serves as a reminder to all residents in coastal regions or areas prone to inland flooding from rainfall to be prepared for the 2021 hurricane season.

## 2021 Tropical Cyclone Names

Ana	Henry	Odette
Bill	Ida	Peter
Claudette	Julian	Rose
Danny	Kate	Sam
Elsa	Larry	Teresa
Fred	Mindy	Victor
Grace	Nicholas	Wanda

### Port Louis Marina as a “Hurricane Hole”

The Marina sits just across from The Carenage in the St George’s harbour. High ground bounds the north, south and east sides. The hill at the Port Louis Development also acts as a buffer. On the west side is the entrance to the harbour facing the Caribbean Sea. Due to its convenient location and local knowledge of it being a “hurricane hole” there is a high probability that vessels will relocate to the Lagoon during the threat of tropical weather. Having additional boats anchored in the area will have an effect on Port Louis Marina as it prepares for a weather event. All boats in the marina will be advised of the threat of tropical weather. The berthing masters will visit each vessel very early on and verbally advise the vessel to make preparations. The owners/occupiers of boats at anchor in the lagoon will be invited to secure their vessels in the marina using our berths. By having these boats more securely in place they will pose less of a threat to vessels berthed at the marina.

### PURPOSE OF THE PLAN

The purpose of the plan is to provide an organised and effective response to the continuing risk of hurricanes to Port Louis Marina (hereafter “the Marina”) facilities and boats docked at the marina.

See the **Glossary** for terms used in this plan and in hurricane weather forecasts.

The Marina requires that all persons on the marina take early and appropriate action to limit the impact of hurricanes. Such actions may prevent any loss of life or injury and will certainly better protect boats and property

### OBJECTIVES OF THE PLAN

The objectives of this plan are to:

- Prevent any risk to the lives, health, or safety of all residents, workers, or visitors at the Marina both during and after a hurricane.
- Minimize the risk to the Marina facilities and boats docked at the marina.

The overriding principle behind these objectives is ***property is replaceable; people are not.*** Property can be protected with prudent actions before each hurricane and with adequate insurance. During and after a hurricane, only the minimum number of personnel designated by the Marina Management will be allowed into the Marina and its facilities.

### INSTIGATION OF THE PLAN

The activities in this plan are keyed to forecasts from various weather services including National Weather Service and the National Hurricane Centre. The Marina will commence executing its plan

for a hurricane when the probability is 50 percent or higher that the centre of a named storm or hurricane will pass within 75 miles of Grenada within 72 hours. It may also instigate the plan earlier or if particular forecasts warrant it. Information about hurricane probabilities is available at: [www.nhc.noaa.gov](http://www.nhc.noaa.gov)

## **RESPONSIBILITIES**

This applies to all persons on the marina, including but not limited to, boat owners, berth owners, boat charterers, crew, tenants, building occupiers etc. Every effort will be made to distribute this plan to all persons but it shall be their responsibility to ensure they have the current version of this plan and for distributing it within their own organisations. The Marina will keep a copy of this plan in the Marina Office. Alternatively an electronic version can be obtained by sending an e-mail request to: [reservations@cnportlouismarina.com](mailto:reservations@cnportlouismarina.com)

All persons shall comply with directions from public authorities before, during, and after a hurricane with respect to evacuation, movement about the area and other public safety measures.

It is also imperative that individuals and businesses prepare their own Hurricane Plan. The Grenada Chamber of Industry and Commerce issue an information document and the 2010 version can be found at **Annex B**.

## **CAMPER & NICHOLSONS PORT LOUIS MARINA, HURRICANE MANAGEMENT TEAM**

The management team consists of the following personnel:

Lisa Scipio-Green	Office & HR Manager
Francis Ashton	Maintenance Supervisor
Gina Hector	Accountant Supervisor
Joel R. Grey	Senior Berthing Master

The hurricane management team will take all available steps to achieve the objectives of this plan. Actions / Preparations in the event of a Hurricane are detailed at **Annex C**.

The hurricane management team will also comply with direction from public authorities. Thus, the hurricane management team may not be immediately available just before, during or after a hurricane. In the case of the management team being absent from the marina, the security of property, i.e., the Marina, facilities and boats rests with preparations taken before a hurricane.

When the hurricane management team is present at the Marina during or immediately after a hurricane, they will control who is present at the Marina. Persons wishing to be on the Marina during and immediately after a hurricane must get verbal permission from a member of the hurricane management team. It is believed such control is in the best interests of all persons.

Camper & Nicholsons Grenada Services Ltd assumes **NO** responsibility to prepare boats and tenant buildings for a hurricane. This is the sole responsibility of owners, occupiers etc who may make these preparations personally or arrange to have the work done for them. It is also the responsibility of these persons to ensure they hold the appropriate insurance for these types of event. **The owner is to ensure that the vessel insurance covers salvage and wreck removal costs, as well as cover to remain in Grenada during the hurricane season and cover for named storms or hurricanes.**

Boats should always be secured with sufficient numbers of dock lines of adequate strength and length to remain secure for all conditions of flooding up to six feet above mean low water. Dock lines shall include appropriate chafing and shock absorbing gear as required. ***All vessels of length greater than 20.0 metres are advised to leave the marina in the event of a hurricane being forecast.***

## **The Saffir-Simpson Hurricane Scale**

The Saffir-Simpson Hurricane Scale is a 1-5 rating based on the hurricane's present intensity. This is used to give an estimate of the potential property damage and flooding expected along the coast from a hurricane landfall. Wind speed is the determining factor in the scale, as storm surge values are highly dependent on the slope of the continental shelf in the landfall region. Note that all winds are using the U.S. 1-minute average.

### **Category One Hurricane**

#### **Winds 74-95 mph (64-82 knots or 119-153 km/hr).**

Storm surge generally 4-5 ft above normal. No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Some damage to poorly constructed signs. Also some coastal road flooding and minor pier damage.

### **Category Two Hurricane**

#### **Winds 96-110 mph (83-95 knots or 154-177 km/hr).**

Storm surge generally 6-8 feet above normal. Some roofing material, door, and window damage of buildings. Considerable damage to shrubbery and trees with some trees blown down. Considerable damage to mobile homes, poorly constructed signs, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of the hurricane centre. Small craft in unprotected anchorages break moorings.

### **Category Three Hurricane**

#### **Winds 111-129 mph (96-112 knots or 178-208 km/hr).**

Storm surge generally 9-12 ft above normal. Some structural damage to small residences and utility buildings with a minor amount of curtain wall failures. Damage to shrubbery and trees with foliage blown off trees and large trees blown down. Mobile homes and poorly constructed signs are destroyed. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the hurricane centre. Flooding near the coast destroys smaller structures with larger structures damaged by battering of floating debris. Terrain continuously lower than 5 ft above mean sea level may be flooded inland 8 miles (13 km) or more. Evacuation of low-lying residences within several blocks of the shoreline may be required.

### **Category Four Hurricane**

#### **Winds 130-156 mph (113-136 knots or 209-251 km/hr).**

Storm surge generally 13-18 ft above normal. More extensive curtain wall failures with some complete roof structure failures on small residences. Shrubs, trees, and all signs are blown down. Complete destruction of mobile homes. Extensive damage to doors and windows. Low-lying escape routes may be cut by rising water 3-5 hours before arrival of the hurricane centre. Major damage to lower floors of structures near the shore. Terrain lower than 10 ft above sea level may be flooded requiring massive evacuation of residential areas as far inland as 6 miles (10 km).

### **Category Five Hurricane**

**Winds greater than 157 mph (137 kt or 252 km/hr).**

Storm surge generally greater than 18 ft above normal. Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. All shrubs, trees, and signs blown down. Complete destruction of mobile homes. Severe and extensive window and door damage. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the hurricane centre. Major damage to lower floors of all structures located less than 15 ft above sea level and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5-10 miles (8-16 km) of the shoreline may be required.

**Annex B**

**Issued by Grenada Chamber of Industry and Commerce:**



**HURRICANE PREPAREDNESS**

Hurricanes are Tropical cyclones with winds that exceed 74 mph.

<u>Category</u>	<u>Sustained Wind</u>	<u>Level of Damage</u>
● Category 1	74-95mph	Low
● Category 2	96-110mph	Moderate
● Category 3	111-129mph	Extensive
● Category 4	130-156mph	Extreme
● Category 5	+ 157mph	Catastrophic

The seasonal activity is expected to fall within these ranges in 70% of seasons with similar climate conditions and uncertainties to those expected this year. These ranges do not represent the total possible ranges of activity seen in past similar years. The predicted ranges for 2020 are centered above the 1981-2010 seasonal averages of 12 named storms, 6 hurricanes, and 3 major hurricanes. Most of the predicted activity is likely to occur during the peak months (August-October, ASO) of the hurricane season.

By the **Start of Hurricane Season** *you should:*

➤ **Have a family Disaster Plan**

**“Preventing the loss of life and minimizing the damage to property from hurricanes are responsibilities that are shared by all.”** One of the ways you can prepare for and mitigate against disaster is by planning with your family. How many of us have family disaster plan? Your family Disaster plan should be based on your vulnerability to the Hurricane Hazards. ***You should keep a written plan and share your plan with other friends or family.***

## **FAMILY DISASTER PLAN**

- Discuss the type of hazards that could affect your family. Know your home's vulnerability to storm surge, flooding and wind.
- Locate a safe room or the safest areas in your home for each hurricane hazard. In certain circumstances the safest areas may not be your home but within your community.
- Determine escape routes from your home and places to meet.
- Have an out-of-community person as a contact, so all your family members have a single point of contact.
- Make a plan now for what to do with your pets if you need to evacuate. Remember pets are not allowed in shelters
- Post emergency telephone numbers by your phones and make sure your children know how and when to call these numbers.
- Check your insurance coverage
- Stock non-perishable emergency supplies and a Disaster Supply Kit.
- Use a **battery operated radio**. **Remember to replace its battery every 6 months.**
- Take First Aid, CPR and disaster preparedness classes.
- Plan for evacuation

Remember Disaster prevention includes both being prepared as well as reducing damage (mitigation)

### ➤ **Have a place to go**

One of the most important decisions you will have to make is "**Should I Evacuate?**"

**If you are asked to evacuate, you should do so without delay.** That means that you should identify a place to go.

***If your family hurricane preparedness plan includes evacuation to a safer place then it is important to consider the following points:***

- ✚ If ordered to evacuate, do not wait or delay your departure.
  - ✚ Select an evacuation destination that is nearest to your home, or at least minimize the distance over which you must travel in order to reach your intended shelter location.
  - ✚ If possible, make arrangements to stay with the friend or relative who resides closest to your home and who will not have to evacuate. Discuss with your intended host the details of your family evacuation plan well before the beginning of the hurricane season.
  - ✚ **If you are unable to stay with friends or family, then as a last resort go to a shelter.** Remember, shelters are not designed for comfort. Bring your disaster supply kit and food and water supplies with you to the shelter.
  - ✚ Make sure that you fill up your car with gas, before you leave.
  - ✚ Ensure your cell phone/phones are fully charge and carry them with you
- **Assemble your Disaster Supply Kit**

There are certain items you need to have regardless of where you ride out a hurricane. The disaster supply kit is a useful tool when you evacuate as well as making you as safe as possible in your home. These items are often scattered around your home and simply need to be brought together into one location. In certain circumstances you may need to go to a store to purchase an item to supplement your kit.

### **DISASTER SUPPLY KIT**

- ✓ **Water** - at least 1 gallon daily per person for 3 to 7 days
- ✓ **Food** - at least enough for 3 to 7 days — non-perishable packaged or canned food / beverages
  - foods for infants or the elderly
  - non-electric can opener
  - matches
  - Disposable Eating Utensils
- ✓ **Blankets / Sleeping Bags / Pillows**
- ✓ **Clothing** – at least one complete change of clothing and foot wear per person
  - rain gear/ sturdy shoes or work boots/gloves
- ✓ **First Aid Kit / Medicines / Prescription Drugs**
- ✓ **Special Items** - for babies and the elderly
- ✓ **Toiletries (Toilet Paper, soap, disinfectant, sanitary napkins etc.)**
- ✓ **Household chlorine Bleach**
- ✓ **Flashlight / Extra Batteries**
- ✓ **Radio** - Battery operated
- ✓ **Mobile Phones** - Fully charged cell phone with extra battery
- ✓ **Cash (with some small bills) and Credit Cards** - Banks and ATMs may not be available for extended periods
- ✓ **Keys**
- ✓ **Toys, Books and Games**
- ✓ **Vehicle fuel tanks filled**
- ✓ **Pet care items**
  - Proper identification/immunization records/medications
  - Ample supply of food and water
  - A carrier or cage
  - Muzzle and leash
- ✓ **Important documents** - in a waterproof container or watertight re-sealable plastic bag
  - identification cards
  - passport
  - insurance
  - medical records
  - bank account numbers
  - Birth, marriage and death certificates etc.

## Hurricane Warning System

**Advisory:** Issued at regular intervals when a tropical storm or hurricane is first detected in the area.

**Hurricane Watch:** Issued within **36 hours** when the hurricane poses a threat but actual strike is not certain.

**Hurricane Warning:** Issued when the country can be affected by hurricane conditions within **24 hours**.

### Know What to Do When a Hurricane **WATCH** Is Issued

- Listen to the radio or TV stations for updates.
- Prepare to bring inside any lawn furniture, outdoor decorations or ornaments, trash cans, hanging plants, and anything else that can be picked up by the wind.
- Prepare to cover all windows of your home. If shutters have not been installed, use plywood. *Note:* Tape does not prevent windows from breaking.
- Fill your car's gas tank.
- Check on emergency supplies (food, water, first aid kit, batteries, flashlights etc.)
- Fill containers with water

### Know What to Do When a Hurricane **WARNING** Is Issued

- Listen to the radio for hurricane updates
- Complete preparation activities
- Evacuate immediately if told to do so
- If you are not advised to evacuate, stay indoors, away from windows.
- Batten down windows and glass doors
- Pack all valuable documents in plastic and store in a safe place
- Switch off main electrical switch and gas cylinder.

### During the Hurricane

- Stay calm and provide assurance to the young and the elderly
- Do not go outside during the passage of the hurricane eye. Be aware that the calm "eye" is deceptive; the storm is not over. The worst part of the storm will happen once the eye passes over and the winds blow from the opposite direction. Trees, shrubs, buildings, and other objects damaged by the first winds can be broken or destroyed by the second winds.
- If you are away from home in stay in a safe location and remain there until the hurricane is over

### Know What to Do After a Hurricane Is Over

- Keep listening to the radio or TV stations for instructions.
- If you evacuated, return home when local officials tell you it is safe to do so.
- Inspect your home for damage.
- Use flashlights in the dark; do not use candles.
- Seek medical assistance for injured persons; report missing persons
- Do not touch loose or dangling wire; report these to the nearest utility office
- Do not attempt to cross flooded areas
- Do not go sightseeing in affected areas
- Purify water before usage

**Actions in the Event of a Hurricane**

**NB – All check list are suggestions and should not be viewed as a full definitive list**

**Stage 1 – General Preparations**

Weather Monitoring

The weather is monitored everyday by the marina office via NOAA and other websites so they are generally aware of tropical systems many days prior to them approaching the Caribbean. This enables the team to forewarn appropriate persons and take appropriate action themselves.

Marina Preparations

The Marina team will attempt to ensure all boat owners, crew, building tenants etc are given as much notice as possible of an approaching tropical system. They will ensure that the marina is checked for loose materials, etc and secure as much marina equipment as possible. Where possible they will assist with the preparations of other persons but this cannot be guaranteed and should not be assumed. ***Each person is to take responsibility for preparation of their boat, building etc***

Boat Preparations

It is the responsibility of the boat owners/Captain/charterer/management company etc to ensure the boat is prepared. The marina accepts no liability. If the boat is to be left unattended it is strongly recommended that the boat is put under a Guardianship contract to ensure that checks, preparations etc are carried out in good time. Such checks/preparations should include but are not limited to:

- Remove all sails.
- Remove all canvas, for example covers, dodgers, sail covers etc.
- Remove as many deck items as possible.
- Lower and/or secure boom – protect against damage to deck.
- Ensure suitable numbers and types of lines, fenders etc are in use. Where possible ensure spares are available, including the anchor.
- Anti-chaffing system on lines.
- Shock Absorbing system on lines.
- Boat should be able to move under its' own propulsion. The marina cannot guarantee to be able to move vessels.
- Vessels that are to be left unattended should ensure the Guardianship company are aware of all preparations completed and any others that should be carried out prior to a storm.
- General good condition of the vessel – engine etc serviced, fire fighting and life saving equipment in working order and accessible, cockpit drains clear.
- Vessels must be left in a condition that that they can be moved. The Marina accepts no liability for damage to a boat if circumstances dictate it needs to be moved.
- ***The owner is to ensure that the vessel insurance covers salvage and wreck removal costs, as well as cover to remain in Grenada during the hurricane season and cover for named storms or hurricanes.***

Tenant Preparations

It is the responsibility off tenants/building occupiers to ensure their building is prepared. The marina accepts no liability.

- Ensure all loose items can be secured or if not, remove from site to a secure area.
- Ensure equipment available to fully secure building.

- Ensure Marina staff have contact numbers.

## **Stage 2 – Preparations in the event of Named Storm/Hurricane Warning being Issued**

### Marina Preparations

Buildings – The marina team will carry out the following actions in the buildings they occupy:

- Secure All Shutters.
- Back-up server data.
- Bag all PCs etc and move to solid building.
- Bag as much archive data as possible and move to solid building.
- On departing, ensure buildings are locked.

### Pontoons

- The pontoons will be checked and all loose items such as bins, removed.
- While walking the docks any persons seen will be reminded of impending storm etc.
- Where possible boats will be advised to berth on the East side of the marina.
- Where possible boats will be berthed as far apart as is possible and if space allows, one boat between finger berths.

### Utilities

- All water and electricity supplies will, as far as possible, be isolated.

### Boat Preparations

- Ensure additional lines are in place.
- Secure lines to the strongest part of the boat.
- Use all available mooring cleats on pontoons.
- Where available, use additional lines to secure to the moorings between berths.
- Ensure ALL loose items are removed and stored below including running rigging where possible. If not, this should be well lashed.
- All hatches, ports etc are closed and locked.
- Where possible block off all vents.
- Dinghies to be deflated and where possible, stored below or lashed inverted to the deck.
- Photograph vessel after preparations are complete – useful record following a hurricane.
- NO-ONE is to remain on board the vessel during a Storm or Hurricane. The marina can provide details of local shelters.

### Tenant Preparations

- Ensure all utilities are switched off.
- Ensure all doors & windows are secured.
- Photograph building to provide evidence to insurance company if required.

### General

The local authorities are likely to insist that the marina be evacuated. All persons are to comply with instructions given by local authorities and this includes when it is safe to return.

After the event the marina staff will where possible inform persons when it has been advised that it is safe to return and provide assistance in clearing up.

The marina staff will as soon as it is possible and safe to do so, re-open the marina office to provide a central point of communication.

## **Glossary**

**Advisory** Official information issued by tropical cyclone warning centres describing all tropical cyclone watches and warnings in effect along with details concerning tropical cyclone locations, intensity and movement and precautions that should be taken. Advisories are also issued to describe: tropical cyclones before issuance of watches and warnings and subtropical cyclones.

**Best Track** A subjectively smoothed path, versus a precise and very erratic fix-to-fix path, used to represent tropical cyclone movement. It is based on an assessment of all available data.

**Centre** The vertical axis or core of a tropical cyclone. It is usually determined by cloud vorticity patterns, wind, and/or pressure distributions.

**Centre/Vortex Fix** The location of the centre of a tropical or subtropical cyclone obtained by reconnaissance aircraft penetration, satellite, radar, or synoptic data.

**Central North Pacific Basin** The region north of the Equator between 140W and the International Dateline. The Central Pacific Hurricane Centre (CPHC) in Honolulu, HI is responsible for tracking tropical cyclones in this region.

**Cyclone** An atmospheric closed circulation rotating counter-clockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere

**Eastern North Pacific Basin** The region north of the Equator east of 140W. The National Hurricane Centre in Miami, FL is responsible for tracking tropical cyclones in this region.

**Eye** The relatively calm centre of the tropical cyclone that is more than one half surrounded by wall cloud.

**Eye Wall/Wall Cloud** An organized band of cumuliform clouds immediately surrounding the centre of a tropical cyclone. Eye wall and wall cloud are used synonymously.

**Explosive Deepening** A decrease in the minimum sea-level pressure of a tropical cyclone of 2.5 mb/hr for at least 12 hours or 5 mb/hr for at least six hours.

**Extratropical** A term used in advisories and tropical summaries to indicate that a cyclone has lost its "tropical" characteristics. The term implies both poleward displacement of the cyclone and the conversion of the cyclone's primary energy source from the release of latent heat of condensation to baroclinic (the temperature contrast between warm and cold air masses) processes. It is important to note that cyclones can become extratropical and still retain winds of hurricane or tropical storm force.

**Fujiwhara Effect** A binary interaction where tropical cyclones within a certain distance (300-750 nm depending on the sizes of the cyclones) of each other begin to rotate about a common midpoint.

**Gale Warning** A warning of 1-minute sustained surface winds in the range 34 kt (39 mph or 63 km/hr) to 47 kt (54 mph or 87 km/hr) inclusive, either predicted or occurring not directly associated with tropical cyclones.

**High Wind Warning** A high wind warning is defined as 1-minute average surface winds of 35 kt (40 mph or 64 km/hr) or greater lasting for 1 hour or longer, or winds gusting to 50 kt (58 mph or 93 km/hr) or greater regardless of duration that are either expected or observed over land.

**Hurricane/Typhoon** A warm-core tropical cyclone in which the maximum sustained surface wind (using the U.S. 1-minute average) is 64 kt (74 mph or 119 km/hr) or more. The term hurricane is used for Northern Hemisphere cyclones east of the International Dateline to the Greenwich Meridian. The term typhoon is used for Pacific cyclones north of the Equator west of the International Dateline.

**Hurricane Local Statement** A public release prepared by local National Weather Service offices

in or near a threatened area giving specific details for its county/parish warning area on (1) weather conditions, (2) evacuation decisions made by local officials, and (3) other precautions necessary to protect life and property.

**Hurricane Season** The portion of the year having a relatively high incidence of hurricanes. The hurricane season in the Atlantic, Caribbean, and Gulf of Mexico runs from June 1 to November 30. The hurricane season in the Eastern Pacific basin runs from May 15 to November 30. The hurricane season in the Central Pacific basin runs from June 1 to November 30.

**Hurricane Warning** A warning that sustained winds 64 kt (74 mph or 119 km/hr) or higher associated with a hurricane are expected in a specified coastal area in 24 hours or less. A hurricane warning can remain in effect when dangerously high water or a combination of dangerously high water and exceptionally high waves continue, even though winds may be less than hurricane force.

**Hurricane Watch** An announcement of specific coastal areas that a hurricane or an incipient hurricane condition poses a possible threat, generally within 36 hours.

**Post-storm Report** A report issued by a local National Weather Service office summarizing the impact of a tropical cyclone on its forecast area. These reports include information on observed winds, pressures, storm surges, rainfall, tornadoes, damage, and casualties.

**Preliminary Report** A report summarizing the life history and effects of an Atlantic or eastern Pacific tropical cyclone. It contains a summary of the cyclone life cycle and pertinent meteorological data, including the post-analysis best track (six-hourly positions and intensities) and other meteorological statistics. It also contains a description of damage and casualties the system produced, as well as information on forecasts and warnings associated with the cyclone. NHC writes a preliminary report on every tropical cyclone in its area of responsibility.

**Present Movement** The best estimate of the movement of the centre of a tropical cyclone at a given time and given position. This estimate does not reflect the short-period, small-scale oscillations of the cyclone centre.

**Probability of Tropical Cyclone Conditions** The probability, in percent, that the cyclone centre will pass within 50 miles to the right or 75 miles to the left of the listed location within the indicated time period when looking at the coast in the direction of the cyclone's movement.

**Rapid Deepening** A decrease in the minimum sea-level pressure of a tropical cyclone of 1.75 mb/hr or 42 mb for 24 hours.

**Relocated** A term used in an advisory to indicate that a vector drawn from the preceding advisory position to the latest known position is not necessarily a reasonable representation of the cyclone's movement.

**Storm Surge** An abnormal rise in sea level accompanying a hurricane or other intense storm, and whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the cyclone. Storm surge is usually estimated by subtracting the normal or astronomic high tide from the observed storm tide.

**Storm Tide** The actual level of seawater resulting from the astronomic tide combined with the storm surge.

**Storm Warning** A warning of 1-minute sustained surface winds of 48 kt (55 mph or 88 km/hr) or greater, either predicted or occurring, not directly associated with tropical cyclones.

**Subtropical Cyclone** A low pressure system that develops over subtropical waters that initially has a non-tropical circulation but in which some elements of tropical cyclone cloud structure are present. Subtropical cyclones can evolve into tropical cyclones. Subtropical cyclones are generally of two types:

An upper level cold low with circulation extending to the surface and maximum sustained winds generally occurring at a radius of about 100 miles or more from the pressure centre.

A mesoscale cyclone originating in or near a frontolyzing zone of horizontal wind shear, with radius of maximum sustained winds generally less than 30 miles. The entire circulation sometimes encompasses an area initially no more than 100 miles in diameter

These generally short-lived, marine cyclones may vary in structure from cold to warm core.

**Subtropical Depression** A subtropical cyclone in which the maximum sustained surface wind speed (using the U.S. 1-minute average) is 33 kt (38 mph or 62 km/hr) or less.

**Subtropical Storm** A subtropical cyclone in which the maximum sustained surface wind speed (using the U.S. 1-minute average) is 34 kt (39 mph or 63 km/hr) or more.

**Synoptic Track** Weather reconnaissance mission flown to provide vital meteorological information in data sparse ocean areas as a supplement to existing surface, radar, and satellite data. Synoptic flights better define the upper and aid in the prediction of tropical cyclone development and movement.

**Tropical Cyclone** A warm-core, non-frontal low-pressure system of synoptic scale that develops over tropical or subtropical waters and has a definite organized surface circulation.

**Tropical Cyclone Plan of the Day** A coordinated mission plan that tasks operational weather reconnaissance requirements during the next 1100 to 1100 UTC day or as required, describes reconnaissance flights committed to satisfy both operational and research requirements, and identifies possible reconnaissance requirements for the succeeding 24-hour period.

**Tropical Depression** A tropical cyclone in which the maximum sustained surface wind speed (using the U.S. 1-minute average) is 33 kt (38 mph or 62 km/hr) or less.

**Tropical Disturbance** A discrete tropical weather system of apparently organized convection—generally 100 to 300 nmi in diameter---originating in the tropics or subtropics, having a non-frontal migratory character, and maintaining its identity for 24 hours or more. It may or may not be associated with a detectable perturbation of the wind field.

**Tropical Storm** A tropical cyclone in which the maximum sustained surface wind speed (using the U.S. 1-minute average) ranges from 34 kt (39 mph or 63 km/hr) to 63 kt (73 mph or 118 km/hr).

**Tropical Storm Warning** A warning for tropical storm conditions including sustained winds within the range of 34 to 63 kt (39 to 73 mph or 63 to 118 km/hr) that are expected in a specified coastal area within 24 hours or less.

**Tropical Storm Watch** An announcement that a tropical storm poses or tropical storm conditions pose a threat to coastal areas generally within 36 hours. A tropical storm watch should normally not be issued if the system is forecast to attain hurricane strength.

**Tropical Wave** A trough or cyclonic curvature maximum in the trade-wind easterlies. The wave may reach maximum amplitude in the lower middle troposphere.