

The TROPICAL REVOLVING STORM

Hurricane: May, June, July, August, Sept', Oct', Nov'

Typhoon: April, May, June, July, August, Sept', Oct', Nov, Dec'

Northern Indian Ocean Cyclones: March, April, May, June, July, August, Sept', Oct', Nov', Dec'

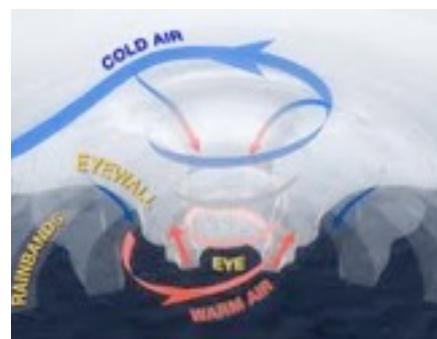
Southern Indian Ocean Cyclones: Nov', Dec', Jan', Feb', March, April



Hurricane Fran



Hurricane Ivan



Hurricane Down Drafts

Dynamics of the Tropical Revolving Storm

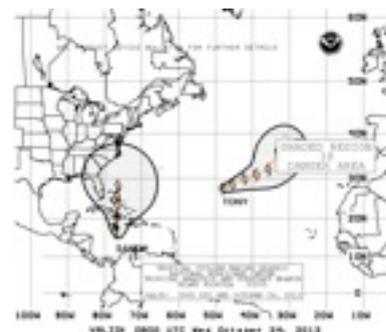
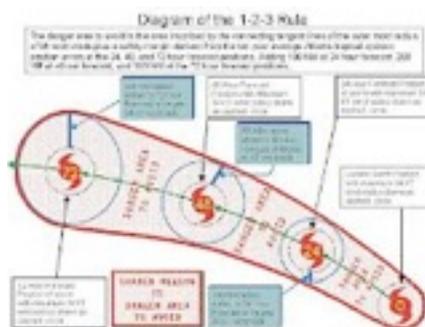
The most violent weather feature found at sea. The strong winds and massive waves are responsible for loss of life both on land and at sea each and every year. The prudent mariner arranges his passages to avoid both the time of year and the Tropics. Typically these storms originate on the Eastern side of the Ocean and grow in strength as they approach the western side. Whilst the main feature of the TRS is the high winds spinning about its centre, the storm also moves at considerable speed over the ground or sea. The storms will usually travel in WNW (Northern Hemisphere) and a WSW (Southern Hemisphere) direction, usually at around 10 Knots in its early stages and 13 to 17 after re-curve. Sometimes the storm may meander its course becoming erratic, at other times the storm will seem to move with certainty and determination. TRS offer re-curve turning there track away from the Equator and moving NE in the Northern Hemisphere and SE in the Southern Hemisphere.

Once the TRS reaches land the storm will generally break up, over land there are no longer any warm waters to feed the heat engine that is a Tropical Revolving Storm.

TRS Factoids;

- Form between 7° and 15° N & S
- Sea Temp' at least 26°C for Hurricane genesis
- Most common during Summer and Autumn
- Can't survive within 5° of the Equator
- Wind Speed must be equal to or exceed 64 Knots to be a TRS.
- Not one single month has ever avoided having a Hurricane in it.
- The South Atlantic has never recorded a Hurricane
- Are categorised on the Safir-Simpson Scale
- Learn the Mariners 123 Rule
- Avoid the 34 Knot zone
- Never cross the "T"

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Any vessel lying in the path of a TRS, especially of its centre, will be in serious trouble. If on the centre line the wind will remain fairly constant, whilst generally backing, in direction until the eye passes at this there will be a period of calm as the eye passes overhead. The wind will then fill in from the opposite direction. This will raise enormous seas with a confused and often breaking nature to them. This sudden and contrary change to the wind will put even a well secured vessel in danger.

WAVES The wave period in the tropics is quite constant around 6 to 8 seconds is quite normal. A change to 9 to 12 seconds is a good indicator that there is a tropical disturbance in the distance. A change of between 12 and 15 seconds is an even better indicator that there is a major tropical disturbance in the vicinity.

WIND Apply "Buys Ballot's Law", stand with the wind by your back and the center of the depression will be between 80° and 120° to your left in the Northern Hemisphere and to your right in the Southern Hemisphere. Ask if the wind is also backing?

AIR PRESSURE (Surface Pressure)
The Barometer should be monitored on a regular basis (hourly? 4 Hourly?), a graph will make any change from the norm' all the more obvious. In the tropics during the summer / autumn

pressure is around 1012 - 1020 Hp. Therefore anything below 1010 should be viewed with great caution, should the pressure continue to fall then must start to anticipate the worst.

CLOUDS A TRS is a LOW pressure system just like any other. As such the clouds will follow the same basic pattern that you are used to in your home waters. Initially (300-600 Miles) you will see high wispy Cirrus spreading out from the centre of the storm, as the storm gets closer the cloud base will lower and thicken into Cirrostratus then Altostratus and then heavy Cumulonimbus at a range of 200-400 Miles.

RISK ANALYSIS

34 KNOT Rule For vessels at sea avoiding the 34 knot wind field of a tropical cyclone is paramount. Any ship in the vicinity of a tropical cyclone should make every effort to remain clear of the maximum radius of analysed or forecast 34 knot winds associated with tropical cyclone. Knowing that the area of 34 knot winds around a TRS is rarely symmetrical but instead varies within semi-circles or quadrants is important. Understanding that each TRS has its own unique 34 knot wind field is an important factor to account for when attempting to remain clear of the dangerous area around the storm. The

American NHC (National Hurricane Center) forecast attempt to define the structure of the wind field and issue TCAs (Tropical Cyclone Advisories) to help when trying to determine the maximum radius of the 34 knot wind field. Winds of 34 knots are chosen as the critical value because as wind speed doubles, the force it generates is multiplied by a factor of 4. When 34 knots is reached the sea state development approaches critical levels that result in rapidly decreasing levels of maneuverability that in turn reduces the number of options available when considering course and speed needed to avoid the oncoming TRS.

MARINERS 1-2-3 RULE

The single most important aid in accounting for tropical cyclone forecast track error is the Mariners 1-2-3 Rule. This rule should be understood and used by all mariners when a active storm is found in the North Atlantic. The 1-2-3 Rule is derived from the latest 10 year average forecast errors associated with Tropical Revolving Storms in the North Atlantic

