

Sailing to NZ — includes weather term definitions

The following is what Chameleon considers before a passage.

Chameleon Does Not Set Off if:

1. A High over 1030 is in place at the start of the passage period.
2. A blocking or very slow moving High is just east of New Zealand.
3. A well developed Low is stationary or very slow moving at the latitude of and just east of New Zealand.
4. Forecasts indicate a polar dip in the isobars in the area of the Islands- especially if the 500 hPa progs forecast an upper trough for the area.
5. She might find herself sandwiched between any Low and High -especially a Low that forms to the north of her position.

Chameleon Doesn't Like It if:

1. She encounters a cold front below 30 degrees latitude. Much better to deal with it north of 30 degrees as its punch will be less.
2. She's too far west of the rhumb line as a new High establishes a strong SE wind flow. She hates headwinds.
3. She's too far east of the rhumb line as a cold front catches her near New Zealand with westerly quadrant winds. She still hates headwinds.

Chameleon Looks at the Gribbs out to about 10 days*, faxes and other wx products.

1. She tries to judge the speed of the Highs and Lows and especially takes note of any slow downs in the sequence.
2. She establishes the forecasted central pressures of the Highs and Lows and the tendencies.
3. She notes the forecast wind direction and speeds over the passage period.
4. She looks at Australia Faxes including 500hPa and surface analyses and progs.
5. She reads Bob McDavitt's Sunday weathergram.
6. She does a "what if" I'm slower or faster than anticipated. Where will she be in relation to the major features.

Chameleon PONDERS ON THESE:

1. Leaving the Islands on a strong stationary High means there might be a squash on one of its flanks depending on the High's location.
2. Leaving the Islands just as a front passes means that she may not make it to New Zealand before the next sequence takes place; thus she may encounter the next Low just as she's near New Zealand unless she goes like blazes.

3. It's always a good idea to arrive in New Zealand at or before the next Highs western flank approaches the country. That's because a front or trough follows.
4. We could consider leaving the Islands as the center of the current High is at the longitude of New Zealand. We'd possibly get the next trough at roughly 30 S.
5. On AVERAGE, a High centered at the longitude of Tasmania will be over NZ in about 4 days. A Low at that longitude will take 2.5 days.
6. Should she find herself between a developing Low to the north and a High to the south and only half way to New Zealand (this may be the worst scenario) she will consider a course change toward Norfolk Island where there may be shelter from the seas or possibly Minerva Reef if she's that far east**.
7. If leaving from Tonga a stop at Minerva will perhaps allow for more analysis and provide for a better passage.
8. A broad High could allow for a passage with no fronts at all.
9. Generalizations don't take into account that Highs and Lows come in all shapes and sizes, and grow or shrink, and move at varying speeds. This fact defeats many popular 'departure rules of thumb' that you will hear.
10. Go rhumb line or westing? One idea is a way point about 28 south and 173 east. Once there she has a better idea of the possibilities of SW winds further on. If too far west she may have to bash into easterly quadrant winds and sea.
11. Rhumb line, if feasible, at the early part of the passage could have merit as westing or easting can be implemented later when more info is obtained.
12. Successful passages become a function of our yachts speed, the speed of the weather systems, and the careful placement of one in relation to the other.
13. The longer she stays out there the more her odds deteriorate. She'll use her engine. (she's quite serious about this).
14. Don't agonize over the analysis as inevitably paralysis sets in.

So When Will Chameleon Leave?!!

She's in Fiji, Tonga or Vanuatu and reckons that it's going to take a week or so and knows the troughs or fronts crossing NZ are usually quicker than that. She doesn't want to make landfall during the arrival of a front or soon after as these fronts can be followed by nasty NW to SW winds- and even worse seas. (The admiral can confirm!). So she'll try to time her voyage so she'll encounter the front/trough with its wind shift at about 30S.. Her goal is to make landfall about 2-3 days after getting to 30S as the new High following the front will be over NZ or on the way out and the winds are turning northerly. If she's unlucky then she'll arrive at the same time as the next front, but "usually" the fronts that bring SW changes to Northland are more than 4 days apart.

A quick look at the maths shows a distance of 600-700 miles from say Fiji to the magical 28 to 30 degrees south. So she looks at the Grib with the view to encounter the trough 4 to 5 days after departure assuming 6 knots (if your yacht is slower or faster adjust the timing accordingly). When Chameleon's now at 28-30S with only 2-3

days to Opuia the Grib will be ever more accurate plus the NZ 30, 48, and 72hr progs enter the fray to help confirm the heralding of the new High and her glorious arrival to the Bay of Islands replete with welcoming spinner dolphins.

Of course if the models and forecasting are all wet then the scenario will be altered somewhat. And once again the Admiral will be hunting for the onboard meteorologist who will be attempting to blend into the good ship Chameleon.

*Gribs: It is useful to go out about 5-10 days when planning a passage. You need a good sized area to be able to see what is coming but you need to adjust the settings so that the file is not too big. We use Lat 12-39S and Long 129E-168W. Go to Options and chose wind and PRMSL and a grid of 3x3. The grid default setting is 2x2 but this gives too big a file. For the suggested lat and long ranges a 3x3 for 5 days is about 5900 bytes so very doable on a daily basis. We go out to 10 days when passage planning.

** Explosive cyclogenesis can occur when very warm, moist air from the tropics is drawn into a forming Low. Huge amounts of heat are released as this air condenses. As the warm air continues to rise it distorts the upper wind pattern even more, which increases divergence, which increases upward movement, and so on.

The following is for yachties who have limited knowledge of meteorology but who may appreciate a few hints to make sense of it. It is not meant to give advice (nor is the above) but rather food for thought. I have collaborated with Bob McDavitt (New Zealand Met Service) on this effort and further suggest that you purchase his book "Mariners Met Pack" for a more detailed view of South Pacific weather. The following focuses on the tropics and sub-tropics.

CHAMELEON'S HINTS AND DEFINITIONS for interpreting weather information

1. Surface Trough. A line or band of showers maybe squally. Temperature similar on both sides. Usually found between two Highs. Isobars are shaped like a tongue, with no kinks like one would see if the trough was a cold front.
2. Trade Wind Surge. Sometimes the trades slow down in an area where just to the east or southeast they were strong. This will cause clouds and showers.
3. Convergence zone. Non frontal (no temperature change) but rain and gusty winds. An area where winds of different directions and speeds merge together. Found on equatorial side of the trade winds. Isobars more or less straight lines. Streamlines merge smoothly.
4. Stationary front in the tropics. Rain and showers. Definite wind shift and marked temperature difference across front. Typically it's the tail end of a cold front. The parent Low has moved on and leaves behind the stationary front which exists in the boundary between the surface trades and the upper flow or westerlies. This feature is about 2000 meters up in a sort of "no mans land" which is why it doesn't move much, and tends to lie along isobars.
5. Instability Line. A band of unstable air that may develop into thunderstorms.

6. Shear line. A narrow zone across which wind direction and or speed changes rapidly. Also another name for #4.
7. Cold front in the tropics. At times a very long and developed cold front penetrates the tropics. The wind will shift and come from a westerly quadrant.
8. To get a feel for where the Lows and Highs are and their movement- Face the wind, the Low is to your left at 8:00 and the High is to your right at 2:00.
9. Any High over 1030 hPa usually has gale force winds on its perimeter.
10. Between a strong High and a Low there will be a vigorous squash zone.
11. A polar dip in the isobars. Be wary as this can lead to the formation of a Low. This is partly because as the winds turn toward the equator they slow down and the air stream converges which causes showery convection or worse.
12. A Blocking High. This is a High that is generally broad, slow moving or stationary. Strong Highs are usually slow moving. The average High moves about 6 degrees of longitude per day and is located along about 30 south during cruising season.
13. A Blocking High often has a Low forming on its equatorial side.
14. A Blocking High can also be coincidental with a Low forming on its eastern and western flanks. Each slightly to the south of the Highs center. If the blocking High gets stronger so do the flanking Lows.
15. An intense slow moving High may intensify a convergence zone or surface Low to its north.
16. A Low moving eastward becomes blocked by a Blocking High. The Low can do a loop; shunt southward; stretch and split; or sit there and create a nasty squash zone between it and the High.
17. Be leery of the back end of a strong High. This is the westward side. An unpleasant trough or even a Low may form there. This happens because the flow is usually stronger than the flow to its north creating what is called cyclonic shear, or the tendency to spool up into a Low pressure area.
18. If your weather fax shows a High to the south with one or more troughs on its eastern side moving northward, beware. This is indicative of very cold air moving toward the tropics which will create unstable conditions as cold air undercuts warm air which is a recipe for squally weather.
19. Sometimes during the winter cruising season a tropical disturbance may form and local forecasting doesn't pick it up right away. If you experience extensive low level clouds with wide spread rain, heavy at times, with the wind rotating in direction then take note. If this is finally shown on the weather fax you will note at least one circular isobar. These events can disappear fairly quickly or develop into a more intense Low and generally move in a southeasterly direction. Wind can be 30 to 40 knots in squalls and make a normally safe anchorage a lee shore.
20. If you happen on satellite pictures a very young Low is just a bulge of clouds; a maturing Low looks like an apostrophe; a mature Low looks like a spiral whirl.
21. Be cautious of the "weather window" between two Highs because if a Low forms on the western side of a departing High the resulting squash zone will be accentuated.

22. Wind Flow. Isobars are hard to interpret in the tropics. If you are within 5 degrees of the equator the wind could flow perpendicular to isobars because of the lack of coriolis force. For wind direction its best to use streamlines. Hawaii and Australian faxes show streamlines. The streamline drawn is the actual wind direction.
23. Winds in the trades are not uniform as the isobars would imply. Your yacht may experience 12 to 15 knots and your mate a mile away can have 25 knots.
24. Faxes from New Zealand don't offer a prognosis past 72 hours. Only the surface analysis and the 30 hour prog show fronts and troughs. The 48 and 72 hour show only the general features. Don't rely on NZ to show much detail north of 25 south. Often some island forecasts are merely what will happen today. These met offices are often budget constrained and don't have the resources for extensive forecasting. Australia offers 500 hPa progs for those that can interpret them but these don't go out past 48 hours. Fiji Met is responsible for weather north of 25 south. (The French in Polynesia and New Caledonia). Fiji fleet code is informative, but often fraught with errors so use it with prudence.
25. Isobars. In data sparse areas computer drawn maps smooth out the isobars. Remember the actual pressure gradients are non-linear, thus the trades are 'banded' with areas of stronger wind near areas of lighter wind. See # 23.
26. Isobars around Land. Winds don't follow isobars very well near any coastline, and tropical islands with afternoon showers can draw in breezes that blow counter to the trades especially on their western sides.
27. Grib Files. If you have a computer, SSB, and Sailmail, Winlink, or the like you can download the Grib Files. These have done wonders in providing the yachtie with quite decent wind speed and direction, and isobar information, for ten days or longer. They are most accurate for up to 5 days and data after that should be taken as a general idea; but still useful for planning. The data is from a computer model (usually GFS, ECMWF or UKMET) and is not modified or interpreted by a meteorologist, but never the less can be surprisingly accurate, but be aware that wind speed and direction is not very good near land, and fronts and troughs are averaged out over a wider area than they really take; thus these features appear much broader than they actually are. Wind speeds don't take into account gusts. If the 'grib' says 15 knots, view it as 10-20, with gusts to 22 (50% greater than the stated wind). Very small intense features may not be picked up at all. Some people are critical of the Grib files because their conditions are different from the model, but this may be because of land effect or their inability to interpret where the troughs are, which takes some practice. And in many cases the model is indeed incorrect. But just remember that model output is just an idea based on incomplete input, using equations of the atmosphere which are not perfect, and it takes more than a model to make a proper forecast. However, I firmly believe that they contribute to a safer passage.

Questions, comments to Dave at Gulf Harbour Radio

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