

Tropical South Pacific weather resources

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For those cruising the tropical south Pacific and trying to make decisions based on the weather, the number of different weather and climate resources available can seem daunting. I hope these notes will help make some sense of it all.

I've spent the last 2 years in the region (including two cyclone seasons) and have had the opportunity to consider most sources of information. In the end, for me, it is the diversity of weather information that helps make better decisions. I try to make sure I choose and compare information from across the field of uncertainty. In this way I can get an idea of the likelihood of a forecast being correct.

It is human nature to want to know exactly what will happen, and dockside chatter is commonly about people pinning their colours to a particular scenario. But it is worth remembering that nothing is as certain as it seems when it comes to forecasting the weather. Whilst a single model forecast could confidently show a feature headed off in a particular direction, it is entirely possible that in reality the particular direction was determined on a very marginal basis over the other alternatives.

In these notes I describe the sources I use on a regular basis to build a picture of what is happening and how it might play out. These sources primarily cover my immediate area of interest in the western tropical south pacific, however many of them have global coverage too.

For convenience the weather source links are all summarised in a table at the end of these notes.

Climatic analysis and forecasts

There are two climatic conditions it is worth tracking regularly:

- Madden Julian Oscillation (MJO); and
- the Southern Oscillation (SO).

These provide good indicators of general conditions in the South Pacific.

Following these two phenomena on regular basis helps to build up a picture of the type of weather to expect on a weekly, monthly and seasonal basis.

I keep regular watch on the MJO, especially during cyclone season. The location of the MJO 'pulse' provides a very good indication of the amount of convection (and likelihood of cyclone formation). The 'phase' diagram is particularly useful for locating the pulse around the globe.

The Australian Bureau of Meteorology (BOM) links below provide good explanations of MJO and SO. I find the NOAA sites better for keeping tabs on the two conditions.

1. NOAA Global Tropics Hazards and Benefits Outlook
<http://www.cpc.ncep.noaa.gov/products/precip/CWlink/ghazards/index.php>
2. NOAA Madden Julian Oscillation (MJO) status and forecasts
<http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/mjo.shtml>
3. NOAA MJO weekly discussion
www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/mjoupdate.pdf
4. BOM (Australia Bureau Of Meteorology) MJO monitoring
<http://www.bom.gov.au/climate/mjo/>
5. NOAA Southern Oscillation Index (SOI) status and forecasts
<http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/enso.shtml>
6. NOAA SOI weekly discussion
www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf
7. BOM (Australia Bureau Of Meteorology) ENSO Wrap-Up
<http://www.bom.gov.au/climate/enso/>

Satellite Imagery

I find satellite imagery to be one of the most useful tools for understanding weather in tropical regions. From a passage making perspective it is especially useful for locating fronts or convergence features such as the Inter Tropical Convergence Zone (ITCZ) and South Pacific Convergence Zone (SPCZ).

If I have the internet bandwidth I watch the animations to see what's developing and where its headed. If I am at sea or in a remote location I use weatherfax to download individual images from Honolulu (NWS) 4 times a day.

Infra-Red (IR) images provide good 24hr coverage and show the colder (high) cloud tops as whiter. The visible image is only useful during daylight hours, but usually gives a clearer picture of what clouds at different levels are doing. Once you get familiar with interpreting them, I find the visible images sometimes give a better indication of where low level features might be centred.

1. NOAA Southern Hemisphere Sectors (images and animations)
<http://www.goes.noaa.gov/sohemi/>
(use the images and loops under the MTSAT East column)

2. Honolulu NWS radiofax charts for the Central, Southeast and North Pacific
<http://weather.noaa.gov/fax/hawaii.shtml#SAT>

Modelled weather forecasts

I use results from two different global weather models for short and medium range forecasts:

- Global Forecasting System (GFS) model run by the US National Weather Service
- ECMWF model (European model)

The GFS model is the basis for most commonly downloaded GRIB files as well as many of internet based surface wind forecasts including Passageweather, Windguru and Metvuw. It's important to recognise that these are not independent weather forecasts, and therefore comparison does not provide any indication of confidence or uncertainty. I have heard many people say they've compared two of these internet forecasts and found them to match perfectly so it must be a very confident forecast... but it's just a case of them both using the same source data.

What is good on these weather sites is how they display the data. I find some of the images very useful for visualising conditions. Probably the most beautiful illustration is the "earth wind map"
<http://earth.nullschool.net/>

ECMWF is a very good performing weather model. In fact, research shows it to be better than GFS in many circumstances. Unfortunately the Europeans have chosen not to make the model output easily available in GRIB or any detailed format. So the publically available forecasts are generally limited to regional synoptics.

I find it a great shame that ECMWF (and the UKmet) choose not to make details of their model forecasts available. It could provide a real improvement to our weather forecasting, especially in cyclone prone areas such as the South Pacific.

Another source used by sailors in the region is the Predictwind service. This is a pre-pay online service which gives access to a range of global and detailed forecasts.

Predictwind uses their own proprietary model to produce two forecasts for users to compare.

The forecasts are outputs from different runs of the same model. The two forecasts differ because two largely independent sets of input data are used for each model run. The two forecasts therefore represent differences in the input data rather than differences in the forecasting process.

I have found the Predictwind model to be very good a forecasting detailed local conditions, especially where interaction with land is likely. I have not had the opportunity to properly evaluate it for the more extreme tropical events in our region.

Understanding the uncertainty in the model forecasts

In order to get a picture of uncertainty I try to assess the variability between the models and between successive model runs. The first thing I do is compare 7 days of forecasts between the GFS and the ECMWF.

Then, if I see a particular event in a forecast (a developing low for example) I will compare its development and progress as each successive model run becomes available (4 times a day for GFS and 2 times a day for ECMWF).

Through practice it is possible to build a pretty good picture of how confident the models are. However it must be remembered they are just computer models and the output is only intended to help build a picture of what the weather might do. They all need interpretation.

Accessing and viewing weather model forecasts

I find it best to always view my GRIB files on the same package and at the same scale for consistency. I generally use Viewfax, a freeware grib viewer. It's very simple.

When I have bandwidth I use Viewfax to specify, download and view the GRIB file. When I am out of range I specify the GRIB file in an email to Saildocs and then open it in viewfax.

There are many other options, some of which use routing algorithms. Open CPN is used by many to display and analyse their GRIB files. Expedition LT is another favourite.

Here are some of the sites I use for viewing various weather model forecasts:

1. ECMWF European model for selected regions
http://www.ecmwf.int/en/forecasts/charts/medium/mean-sea-level-pressure-wind-speed-850-hpa-and-geopotential-500-hpa?area=Australia&step=0&relative_archive_date=2014042912¶meter=Wind%20850%20and%20mslp
(use the 'step' drop down menu to choose forecast days, use the 'forecast base time' drop down to compare different model runs)
2. ECMWF and GFS comparison
<http://www.wunderground.com/wundermap/?lat=13.60000&lon=-49.30000&zoom=4&type=hyb&units=english&rad=0&wxsn=0&svr=0&cams=0&sat=0&riv=0&mm=1&mm.mdl=ECMWF&mm.type=SURPRE&mm.hour=180&mm.opa=100&mm.clk=0&hur=0&fire=0&tor=0&ndfd=0&pix=0&dir=0&ads=0&dd=0&tfk=0&ski=0&stormreports=0>
(use the menu on the right to scroll to 'model data' and use the settings button to change model)
3. Windguru provides a good way of looking at 'spot' forecasts from the GFS model
<http://www.windguru.cz/int/index.php?sc=207053>
4. Metvuw provides nice clear images showing surface wind and rain. I have never received confirmation, but I believe that this uses GFS

<http://www.metvuw.com/ows/>

5. Weather Online Expert Charts provide good comparisons of various different models
<http://www.weatheronline.co.uk/cgi-bin/expertcharts?LANG=en&MENU=0000000000&CONT=sepa&MODELL=gfs&MODELLTYP=1&BASE=-&VAR=prec&HH=3&ARCHIV=0&PANEL=0&ZOOM=0&PERIOD=>
6. Predictwind provides two forecasts based on the same model using different sets of input data
<http://www.predictwind.com/>

Other synoptic chart analyses and forecasts

I also like to look at analyses and short term (1 to 3 day) forecast synoptics which have been produced under the supervision of skilled forecasters.

1. NOAA weatherfax charts can be downloaded using SSB and weatherfax, or
<http://weather.noaa.gov/fax/hawaii.shtml>
2. New Zealand Metservice forecast synoptics
<http://www.metservice.com/maps-radar/maps/southwest-pacific-low-bandwidth>
3. Fiji Meteorological Service surface analysis
http://www.met.gov.fj/weather_maps.php
4. Australian Bureau of Meteorology (BOM) weather charts
<http://www.bom.gov.au/australia/charts/?ref=fr>

Text discussions and analyses

I find these very useful for low bandwidth downloads. Some of them also provide good interpretation by experienced weather forecasters. One of the most useful weather discussions for the region is of course Bob McDavitt's 'Weathergram'. Bob produces a new Weathergram every Sunday night. It should not be missed. He also offers weather services to assist passage making.

1. Fiji Met Service weather bulletin
http://www.met.gov.fj/aifs_prods/10140.txt
2. Weather discussion from Guam for Micronesia
<http://www.prh.noaa.gov/data/GUM/AFDPQ>

3. Bob McDavitt's regular Sunday night Weathergram
<http://weathergram.blogspot.com/>

Additional cyclone monitoring

All the official local and regional sources should be monitored for advisories. I also track several other sources of forecast and information to make sure I am fully in the picture and able to make decisions I am happy with. These include:

1. Joint Typhoon Warning Centre for various text and graphic products on current threats
<http://www.usno.navy.mil/JTWC/>
2. Cooperative Institute for Meteorological Satellite Studies, University of Wisconsin
<http://tropic.ssec.wisc.edu/>
(there is some really useful pages which help you to understand the steering forces which a cyclone is subject to)

Swell forecasts

Many anchorages or passes are affected by swell conditions, particularly if there has been a big storm in temperate latitudes. There are plenty of good surfer web sites. Look at the wave period and wave height forecasts. Wave period over about 12 seconds starts to produce long swell conditions which can build up in shallower water.

1. Magic Seaweed is one of many good sites
<http://magicseaweed.com/Pacific-Ocean-Islands-Surf-Chart/58/?chartType=PERPW>
2. Windguru gives swell and wave forecast data in easy to read tabular form
<http://www.windguru.cz/int/index.php?sc=207053>

Summary of links for weather and climate in the western South Pacific

[View this table online](#)

Climate analyses and forecasts

[NOAA Global Tropical Hazards](#)

[BOM MJO monitoring](#)

[NOAA MJO status and forecasts](#)

[BOM ENSO Wrap-up](#)

[NOAA MJO weekly discussion](#)

[NOAA SOI status and forecasts](#)

[NOAA SOI weekly discussion](#)

Satellite Imagery

[NOAA MTSAT animations](#)

[NOAA Honolulu Weatherfax charts](#)

Short and medium term model forecasts

[ECMWF surface pressure forecasts](#)

[Windguru \(GFS model\)](#)

[Wunderground ECMWF and GFS comparison](#)

[Metvuw \(GFS model?\)](#)

[Weather Online expert charts \(GFS, ECMWF etc\)](#)

[Predictwind](#)

Synoptic analyses and forecasts

[NOAA Honolulu Weatherfax charts](#)

[New Zealand Met Service](#)

[Fiji Met surface analysis](#)

[Australia BOM](#)

Text weather discussions

[Fiji Met bulletin](#)

[NOAA Guam \(Micronesia only\)](#)

[Bob McDavitt weekly Weathergram](#)

Additional cyclone monitoring

[Joint Typhoon Warning Centre](#)

[CIMSS \(University of Wisconsin\)](#)

Swell conditions and forecasts

[Windguru](#)

[Magicseaweed](#)