

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 overwhelming. I hope these notes will help make some sense of it all.

I have cruised the region for 5 years (including 4 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 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 longer term 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.

Useful links at this 'macro' level:

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 clearly show the colder (high) cloud tops. 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. Visible images can also give a better location of the centre of a circulating weather feature.

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. BOM (Australia Bureau Of Meteorology) Satellite Viewer
<http://satview.bom.gov.au/>
3. Honolulu NWS radiofax charts for the Central, Southeast and North Pacific
<https://tgftp.nws.noaa.gov/fax/hawaii/latest.shtml>

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)

These are two independent forecasting models and therefore provide well informed, but different, views of what might happen. If they are aligned then there is high confidence. If they are very different then there is high uncertainty.

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. They are all derived from the same model output and therefore comparison does not provide any indication of confidence or uncertainty. I have heard many people say they've compared different 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, some research shows it to be better than GFS in many circumstances. Unfortunately the model output is not easily available in GRIB or any detailed format.

Several web based forecasting resources such as Predictwind and Windy.com have made the ECMWF forecasts available through their various platforms. These resources provide really good graphical interfaces for comparing the GFS and ECMWF forecasts.

Predictwind also uses their own proprietary model to produce two additional forecasts for users to compare. It is understood that these two additional forecasts (PWG and PWC) are produced by running the same model with two independent sets of initialisation data. The two forecasts would therefore represent differences in the input data rather than differences in the forecasting process.

I have found the Predictwind PWC and PWG forecasts to be good at forecasting detailed local conditions where interaction with land is likely (in the lee of Viti Levu for example). I would however not rely on these forecasts for anticipating 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 GRIB 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 and easy to use.

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 is another favourite.

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

1. ECMWF European model for selected regions
[https://www.ecmwf.int/en/forecasts/charts/catalogue/medium-mslp-wind850?facets=Range,Medium%20\(15%20days\)%3BType,Forecasts&time=2019011312,0,2019011312&projection=classical_equatorial_pacific](https://www.ecmwf.int/en/forecasts/charts/catalogue/medium-mslp-wind850?facets=Range,Medium%20(15%20days)%3BType,Forecasts&time=2019011312,0,2019011312&projection=classical_equatorial_pacific)
2. Windy.com ECMWF and GFS comparison
<https://www.windy.com/?-18.125,178.450,5>
(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 (this feature is also available on Windy.com for both GFS and ECMWF)
<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 a wider range of different weather 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 has both GFS and ECMWF forecasts... and provides two other useful forecasts
<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. These represent forecasts based on expert interpretation – not just the output of a computer model.

1. NOAA weatherfax charts can be downloaded using SSB and weatherfax, or
<https://tgftp.nws.noaa.gov/fax/hawaii/latest.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/index.php?page=maps>
4. Australian Bureau of Meteorology (BOM) weather charts
<http://www.bom.gov.au/australia/charts/?ref=ftt>

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/AFDPO>

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.metoc.navy.mil/jtwc/jtwc.html>
2. Cooperative Institute for Meteorological Satellite Studies, University of Wisconsin
<http://tropic.ssec.wisc.edu/>
(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>
(for Beachcomber Island in Fiji)

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

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](#)

[BOM Satellite Viewer](#)

Short and medium term model forecasts

[ECMWF surface pressure forecasts](#)

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

[Windy.com 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](#)
