A Weather Compendium for Cruisers -French Polynesia-

Sources of weather information for sailors cruising the waters of French Polynesia

Highlighting the incorporation of wave-state modelling into the GFS, and deprecation of the previously standalone Wave-Watch III model.
Source: HDDesktopWallpapers.in

Version 02 – 23 July 2021

IMPORTANT

Whilst all reasonable care has been taken in compiling the information in this document, there is no assurance regarding completeness or accuracy.
USE AT YOUR OWN RISK

Your corrections, questions, requests or suggestions for this weather compendium are welcome.
Please send to: svperigee [at] gmail [dot] com

From the author of the French Polynesia Compendiums - Sherry, Soggy Paws
Keeping these cruising guides up-to-date is impossible for me all by myself … we have cruised another 20,000 miles downwind, through many other islands and countries (dribbling more Compendia behind us). I'm still happy to edit in updates to keep the various French Polynesian Compendia alive, but to do so I need your help. Please take a few minutes out of your busy cruising schedule and send me an email with your updates.
Soggy Paws: sherry –at– svsoggypaws –dot– com
You can also contact us on Sailmail at WDI5677

The current home (and the most up to date) version of this document is:
http://svsoggypaws.com/files/#frpoly

Foreword

This stand-alone weather compendium was first released in April 2021, presenting a collation of sources of weather information available to recreational sailors navigating French Polynesian waters.

This document adopts the ethos of the other Soggy Paws cruising compendiums, and does not repeat published material readily available elsewhere. In addition, the intent is not to provide detailed explanations of the various weather phenomenon, but to focus on WHAT weather information is relevant, WHERE to get it and, importantly, HOW to do so.

Generic weather related content has been drawn from the other FP compendia, and has been rewritten to remove duplication & streamline content. Some additional material has been added to provide context for various weather products.

Author: David, svPerigee

Preface to the First Revision – July 2021

I received a small number of comments regarding the content and structure of the new FP WX Compendium, to the effect that it would be a good idea for this compendium to be more educative – that is, to provide expanded detail on the various climatic and meteorological influences, and how they work to influence the weather in French Polynesia. For example, what is the SPCZ *(South Pacific Convergence Zone)*, or where are the STR *(Sub-Tropical Ridge)* and SPH *(South Pacific High)*, and so on. This version incorporates these updates.

Information on the ENSO has been consolidated and condensed, with links newly provided for the MJO *(Madden Julian Oscillation)*.

Requests for more information regarding direct satellite *(ASCAT)* observations of the surface wind-field are noted, and held over to a later version.

As usual, if any corrections, questions, requests or suggestions, please do not hesitate to get in touch.

David, svPerigee, Cook's Bay, Mo'orea, July 2021

Ver	Date	Notes

02	23-Jul'21	Throughout this revision, changes of particular significance or interest are highlighted in blue.
		• Rewrite ENSO content, as per above.
		• Add new information on the MJO.
		• Incorporates changes to GFS and WW3 (now *GFS-Wave*) that were introduced 22-Mar'21, the main changes being:
		  ○ the data obtained when requesting the PRMSL parameter from GFS is no longer smoothed, and hence is now effectively the same as MLSP/MSLET, meaning that PRMSL (in GRIBs, for example) may now be more useful for determining the location and future disposition of TCs;
		  ○ the resolution of WW3 (now *GFS-Wave*) wave-state data is improved to a 0.25 degree grid (from 0.5˚), and with availability expanded to 16 days (up from 7-1/2 days);
		  ○ under-the-hood improvements: improved wave-current interaction in the WW3 (now *GFS-Wave*) models; wind data over land is no longer masked, thereby improving visibility of land effects on winds & waves.
		• Refined entries on the *Mara'amu (thanks Ryan from SC Kiapa Nui for the detail)*.
		• Corrected various errors, and updated the section on WX in FP *(thanks Christian from SV Pitufa for the detailed response).*
		• Updated entries for the *MeteoFrance* & the JRCC *(Joint Rescue Coordination Centre) (thanks Christine from Sugar Shack for the pointout).*
		• Updated the time for Gulf Harbor Radio, now 0515z, M-F *(thanks MetBob, and also for the stuff on MJO).*
		• Provided a link to the free pdf version of the Mariners Met Pack covering the SW Pacific.
		• Various editorials, correcting spelling & punctuation.
		• Corrected addressing errors in email quick-links.
		• Refined graphics for email quick-links.

01	12-Apr'21	Initial Issue

Table of Contents

Introduction

This document adopts the ethos of the other *Soggy Paws* compendiums, and does not repeat published material readily available elsewhere.

The intent is:

- to take a whole-of-French-Polynesia approach to the weather, reducing the repetition of generic material in each of the location-specific French Polynesian (FP) compendia; and
- NOT to provide detailed explanations of the various weather phenomenon (there is plenty of information available elsewhere for this – refer to Appendix A: Further Reading); but
- to focus on WHAT weather *information* is relevant, WHERE to get it and, importantly, HOW to do so.

Accordingly, the predominant weather phenomena in French Polynesia are introduced in the briefest possible terms, and described only to the extent necessary to assist sailors identify useful weather information and related products.

The main climatic characteristics associated with the island groups and archipelagos are also described only briefly, with a mind to what it means for the cruising sailor. Further detail on cruisers' own location-specific experiences with the weather can be found in the relevant compendia.

A feature of this compendium is a comprehensive listing of the main weather products available for French Polynesian waters. This listing incorporates e-mail links to make it easier to get weather information when offline (e.g. via satellite or HF/SSB), or in low-bandwidth environments (e.g. limited WiFi/mobile data connections). One-click icons (seen as a ✉ symbol) generate an e-mail request for the designated product.

Recognising that the ongoing rollout of 4G is providing faster internet at some locations in French Polynesia, URLs and hyperlinks are provided to facilitate direct access to a variety of online weather resources:

- Hyperlinks to online sources (seen as www) point to the file location or target web-page;
- NOAA Product Codes (for example, PLBZ08) link directly to the file on the NOAA server.

Acknowledgments

Many thanks to all earlier authors who contributed their time and effort to establish a solid foundation for this new edition, especially Chuck of *Jacaranda*, Sherry from *Soggy Paws*, Christine from *Sugar Shack*, *Tackless II*, and *Taitonga* who provided additional weather material in 2019.

Special thanks also to Christine of *Sugar Shack*, who provided detailed critical review of iterative drafts of the rewrite, and to Lenny for her support & unending patience during the drafting process of the rewrite.

Thanks to Lenny & Christine for assistance in proof-reading of this version.

Quick Tips

Voice of Experience

It is best to identify your preferred weather products, bookmark the relevant pages, and establish your own e-mail send-and-receive process, well before you leave areas of good internet. Once in French Polynesia, internet connections (especially in the outer islands) are often low-bandwidth and intermittent. Due to time-based dropouts, browser-based web-searching is either impossible or at best very time-consuming. Creating e-mail requests for the first time in an internet-challenged environment – correctly incorporating all required aspects of format and syntax – can be a somewhat error-prone and time-consuming affair. Avoid the frustration, and get it sorted before you leave.

A few salient points of interest for those more familiar with weather systems in the northern latitudes, or who might be sailing French Polynesian (FP) waters for the first time.

- Winter is June – August.
- Summer is December – February.
- The tropical cyclone season runs from 1 November to 30 April.
- When facing the winter sun (North), the sun rises to your right, moves from right to left across the sky, and sets to your left.
- FP is spread over ~20 degrees of latitude and, interestingly, encompasses three times zones: the Gambier, @ UTC -9HR; Marquesas, @ UTC -9.5HR; and the other FP islands, @ UTC -10HR.
- Throughout most of FP, the sun will be North of your position in winter, and in summer either South or, at the latitudes of the Gambier, roughly overhead.
- The wind moves clockwise around the centre of a Low-Pressure system (known in FP as a *Depression*, which is symbolised on MeteoFrance weather charts with a " **D** ").
- Apart from Tropical Cyclones (rare, but not unknown), influential low pressure systems generally pass to the south of French Polynesia, meaning that cold fronts / troughs generally extend up from the south and adverse winds come from the south – *when frontal activity is forecast, beware fetch to the south and the lee shore to your north*.
- The passage of cold-fronts or troughs results in a backing of the wind, typically from Southeast through North to West, then maybe even to the Southwest.
- French Polynesia measures wave heights in meters, temperature in degrees Celsius and atmospheric pressure in HectoPascals (hPa), which are numerically the same as millibars (mb).

Charting the weather

Coriolis forces are weaker in the tropics than in sub-tropical regions.

In the tropics, apart from Tropical Cyclones:

- the atmospheric pressure is relatively stable and pressure gradients are weak, with the diurnal variation generally no more than 2hPa; therefore
- the general rule-of-thumb applicable in the sub-tropics, that wind-strength is inversely proportional to the distance between isobars, does not apply.

Because of these factors, when charting the weather in tropical regions isobars are of uncertain use for indicating wind speed & direction. Therefore, some traditional *Mean Sea Level Pressure* (MSLP) charts are replaced with *streamline* charts to indicate the wind direction without referring to the pressure gradient. *Streamlines* directly indicate wind direction and infer the location of high and low pressure systems, and may be overlaid with wind barbs to indicate wind-speed, or other synoptic features such as ridges & troughs, convergence zones, or frontal features depicting the boundaries between different air masses.

File formats for weather graphics

Weather graphics and other facsimile-style text products are available in different file formats: typically, png, jpg, TIF or gif. Some graphics are provided in both TIF and gif formats. Some satellite images are available only in jpg format.

IMPORTANT

A graphic in 'TIF' format is typically one-third to one-fifth the size of the equivalent graphic in 'gif' format. When relying on slow or unstable internet/data connections, it is important to minimise download times; so, in these cases especially, it is preferable to use TIFs in e-mail file requests. Take care to note the correct capitalisation of filenames & suffixes where specified, e.g. all lower-case 'gif' versus all upper-case 'TIF'.

Most web-browsers will load a 'gif' file and display it directly on the page; requesting the same file in TIF or jpg format may result in the file not being displayed directly in the browser page, but being downloaded to the local drive for later viewing with another program or app.

Weather in French Polynesia

The weather in French Polynesia is influenced by:

- a succession of eastwards travelling high and low pressure systems passing generally well to the south of French Polynesia, that mainly come out of the area between Vanuatu and New Zealand;
- the *South Pacific Convergence Zone* (SPCZ), which provides steering and shaping influences on weather systems coming from the west;
- the strength, size and position of highs associated with the *Subtropical Ridge* (STR), which is a belt of high pressure situated at approximately 30˚S; the STR results from subsiding air and is associated with consistently warm, dry, calm & sunny conditions; also associated with the horse latitudes, the *STR* is the primary source of airflow driving the trade winds;
- the effects of the *South Pacific High*, which is a persistent large-scale region of high pressure centred near Easter Island (about 85˚W), with seasonal variations of the centre between 30˚S in the southern hemisphere winter and 35˚S during the summer.

The weather in the northern areas of French Polynesia is generally tropical or near sub-tropical in nature, being characterised by a *Wet* (or Rainy) *Season*. Because FP is spread over such a broad band of latitudes (7°S - 28°S), this results in different rainfall patterns between the various archipelagos. In general, in southern parts the Wet Season occurs from October to March, whilst in the Marquesas (closer to the equator), the Wet Season is from January to August.

Thunderstorms (TS) occur roughly 8 to 20 days annually, mostly from January through July.

Tropical Cyclones (TCs) are rare in French Polynesia, but not unknown, especially during *El Niño* events. The Cyclone Season in the Southern Hemisphere is officially from 01-November to 30-April. The effects of global warming make it increasingly appropriate to consider climatic influences well into May, if not beyond.

Closed circulation low-pressure zones (also known as *Depressions*, though not meaning here *Tropical Cyclones*), are infrequent within 20 degrees of the equator; accordingly, truly frontal weather is not a regular feature in the tropical weather patterns seen in much of northern French Polynesia. However, troughs and associated convergence zones from sub-tropical lows further south can influence the weather well to the north of 20°S. These non-frontal convergence zones are a regular feature in the weather patterns encountered in French Polynesia, mostly occurring without significant change of temperature or pressure but nevertheless often bringing periods of unsettled weather.

When a trough, front or convergence zone does pass through French Polynesian waters (more likely in summer, and during *El Niño* events), the predominant Southeast Trade Winds are affected beforehand by easing and backing to the NE ahead of the front/trough, then typically rapidly backing again to the NW-W-SW as the front/trough passes, and then backing slowly again through South before eventually re-establishing the normal SE-ly trade-wind pattern. The passage of a fontal or trough-based system is sometimes followed by a period of reinforced trade winds (aka *Mara'amu*).

Squash zones can occur to the north of eastwards moving high pressure systems, creating areas of higher windspeeds. Due to the seasonal northwards migration of these systems during the winter months, periods of higher wind affect French Polynesia more at this time of the year.

1 ENSO

The *El Niño Southern Oscillation* (ENSO) is a naturally occurring climatic fluctuation that arises in the coupled ocean-atmosphere system of the tropical Pacific, referring to a difference in *Mean Sea Level* (MSL) atmospheric pressure between the Pacific and Indian Oceans.

The total annual number and intensity of *Tropical Cyclones* (TCs) across the South Pacific is relatively constant and independent of the ENSO cycle. During the warm phase of ENSO, known as *El Niño*, the South Pacific cyclone season may run longer and later, with more cyclones distributed to the East of the dateline compared to other times in the ENSO cycle. Meaning that French Polynesia is more likely to be affected by TC activity during an *El Niño* event than at other times in the ENSO cycle.

- ENSO Diagnostics Discussion (NOAA: updated 10th-15th monthly): [www]
  Note: can subscribe to be email notifications advising when the monthly update is released.
- ENSO Landing page (BoM): [www]

2 MJO

The Madden–Julian Oscillation (MJO) is a global scale feature in the tropical atmosphere, characterised as an eastward moving 'pulse' of active convection near the equator which is first observed in the Indian Ocean, then moving across Indonesia/North Australia, eventually dying out over the Pacific Ocean. This pulse typically recurs every 30 to 60 days, taking around a week or two to cross an area. The increased convective activity results in greater cloud & rainfall, which can be factors in triggering and sustaining the formation of Tropical Cyclones (TCs), especially when *El Niño* conditions exist.

- MJO Landing page (BoM): [www]

3 Tropical Cyclones (TCs)

This section does not describe the characteristics of, or risks associated with, Tropical Cyclones (TCs), except to the extent necessary to assist obtaining information related to TCs in French Polynesian waters.

Tropical Revolving Storms are known variously as *Typhoons* (Asia), *Hurricanes* (US), or *Tropical Cyclones* (South Pacific). Whatever their name, these phenomena refer to the same thing, specifically a non-frontal, warm-core, low pressure system of synoptic scale, developing over tropical or subtropical waters with definite organised convection (thunderstorms), and a well-defined surface wind circulation.

The Cyclone Season in the Southern Hemisphere is officially considered to fall between 01-November and 30-April. The effects of climate change are imposing the need to consider the practical relevance of these start- and end-dates.

3.1 Historical Data

There are a variety of sources of historical data on *Tropical Cyclones* (TCs). The Australian *Bureau of Meteorology* (BoM) hosts the *Southern Hemisphere Tropical Cyclone Portal* containing data for prior cyclone seasons. The US *Joint Typhoon Warning Centre* (JTWC) provides a similar capability.

- BoM – SH TC Data Portal: [www]
- JTCW – Landing page: [www]
- Offline resources: the Climatology plug-in for OpenCPN provides a useful graphic showing the day-by-day evolution of TCs throughout the year. More details about the plug-in can be found online.

3.2 SSTs

A key environmental factor supporting the formation and growth of Tropical Cyclones are elevated *Sea Surface Temperatures* (SSTs); typically, SSTs above ~28°C are a warning sign.

Readily available sources of SST information are:

- Online:
  - SST Animation for the Tropical Pacific (NOAA) [www]
  - Trending SST anomalies (NOAA, .pdf) [www]
- RTOFS GRIB files containing the WTMP (or WATER_TEMP) parameter;
- SPOT Forecasts including the SEATMP parameter;

Examples (*Saildocs*)

```
send RTOFS:5S,25S,150W,115W|2,2|0,6..72|CURRENT,WTMP
send SPOT:17S,140W|5,3|PRMSL,WIND,SEATMP
```

3.3 TC Categories

The *Regional Specialised Meteorological Centre* (RSMC) Nadi publishes wave heights in meters, reports wind-speeds based on a **10-minute** average, and applies the criteria established by the Australian *Bureau of Meteorology* (BoM) for categorising *Tropical Revolving Storms* (TRS), which includes *Tropical Depressions* (TDs), and *Tropical Cyclones* (TCs) Category 1-5.

The wind-speeds (in knots) associated with the various TC categories in the western South Pacific, including nominal central pressure in hPa, and a rough equivalent on the US Hurricane scale, are:

SW-Pac TC	Sustained Winds	Gusts	Central Pressure	≈ US Category
Cat 1	34–47	49–67	995 – 986	N/A
Cat 2	48–63	68–89	985 – 971	none to mid-1
Cat 3	64–85	90–121	970 – 956	mid-1 to high-2
Cat 4	86–107	122–151	955 – 930	low-3 to low-4
Cat 5	>107	>151	<= 929	mid-4 and up

The JTWC, being a US agency, publishes wave heights in feet, reports wind speeds using the "maximum sustained winds based on a **1-minute** average", and uses criteria based on the *Saffin/Simpson Hurricane Intensity Scale* for classifying TRS (TD, TS (*Tropical Storm*), TC Cat 1 & 2, Intense TC Cat 3, Very Intense TC Cat 4 & 5). The table below provides a comparison between the US system and that used in the SW Pacific: Categories for US Hurricanes, Wind Speeds in knots, MSW = Maximum Sustained Wind, nominal central pressure in hPa, and a rough equivalent on the scale used in the SW-Pacific to categorise Tropical Cyclones.

US Hurricane	10-min avg MSW	Peak Gusts	Central Pressure	≈ SW-Pac TC Cat
Cat 1	56 - 72	79 - 101	>= 980	mid-2 to mid-3
Cat 2	73 - 84	102 - 118	979 - 965	mid to high-3
Cat 3	85 - 99	119 - 140	964 - 945	high-3 to mid-4
Cat 4	100 - 118	141 - 166	944 - 920	mid-4 to mid-5
Cat 5	>= 119	>= 167	<= 919	mid to high-5

3.4 TC Warnings from JTCW

Note that the official warning messages for TCs (*Tropical Cyclones*) in the Southwestern Pacific come from *RSMC* Nadi. *MeteoFrance* also issues TC bulletins for French Polynesia. However, is useful to also track the material being issued by *JTCW* Hawaii because of its accessibility, timeliness, detail & familiarity.

To obtain text or graphic latest *TC Warnings* issued by JTWC for a known system, place a *Saildocs* request for the following products.

Examples (*Saildocs*)

SEND https://www.metoc.navy.mil/jtwc/products/sh1521web.txt
SEND https://www.metoc.navy.mil/jtwc/products/sh1521.gif

These example product-requests refer to Storm #15 of Southern-Hemisphere Tropical Cyclone Year #2021 (November 2020 – April 2021). You will need to substitute the correct values for the storm of interest.

In return you will receive:

1. *a TEXT-based Tropical Cyclone **WARNING message**, detailing position & forecast track, wind strengths including wind quadrants & radii, with remarks including expanded prognostic discussion;*
2. *a **WARNING Graphic** [~150kb], representing the critical information detailed in the warning message, plus wave-height, the 34-knot wind danger area, and bearings/distances & CPAs to proximate population centres.*

The storm identifier can be obtained from NOAA's *Significant Tropical Weather Advisory* for the South Pacific Ocean. This product provides summary details of Tropical Disturbances & Cyclones South of the Equator, East of 135E through to the west coast of South America.

Examples
Online: https://www.metoc.navy.mil/jtwc/products/abpwweb.txt
Saildocs: SEND abpw10.pgtw

3.5 Other TC Products

*Items listed below as a "landing page" have non-specific URLs, or for some other reason are less well suited for obtaining via email (e.g. via Saildocs request). Products with static URLs are better suited for obtaining via Saildocs email request. These are annotated with "**Saildocs**: SEND …"*

- Tropical weather outlook for French Polynesia (MeteoFrance): *issued every Tuesday during cyclone season*
  Saildocs: SEND https://meteo.pf/fr/point-hebdomadaire-saison-chaude
- 2-week Tropical Hazards Outlook (NOAA)
  Landing page: https://www.cpc.ncep.noaa.gov/products/precip/CWlink/ghazards/index.php
- 5-Day Tropical Cyclone Outlook EQ-25S 160E-120W (Nadi RSMC) *[in-browser pdf]*
  Landing page: https://www.met.gov.fj/index.php?page=3dayoutlook
- Marine Weather Bulletin EQ-25S 160E-120W (Fiji MetSVC)
  Saildocs: SEND http://www.met.gov.fj/aifs_prods/10140.txt
- Tropical Cyclone Potential Bulletin (MetSVC NZ)
  Landing page: https://www.metservice.com/warnings/tropical-cyclone-activity
- Tropical Disturbance Summary EQ-25S 160E-120W (Nadi RSMC)
  Saildocs: SEND https://www.met.gov.fj/aifs_prods/20036.txt
- Significant Tropical Weather Advisory S of EQ, E of 135E (NOAA)
  URL: https://www.metoc.navy.mil/jtwc/products/abpwweb.txt
  URL: https://tgftp.nws.noaa.gov/data/raw/ab/abpw10.pgtw..txt
  Saildocs: SEND abpw10.pgtw
- Tropical Cyclone Potential
  Landing page: http://www.ssd.noaa.gov/PS/TROP/TCFP/index.html
- Probability of Tropical Cyclone Formation, East Pacific Basin *(NOAA)*
  Landing page: https://www.ssd.noaa.gov/PS/TROP/TCFP/east_pacific.html

- Graphic: 48HR Probability of Tropical Cyclone Formation - East Pacific Basin *(NOAA: 10kb)*
  Saildocs: SEND https://www.ssd.noaa.gov/PS/TROP/TCFP/data/current/ep_rCUMP_048.gif
- Neat small colour graphic (<25kb) *showing the position and ID of any active TCs in the Pacific region, with past and forecast track & intensity*
  Saildocs: SEND http://www.tropicalstormrisk.com/tracker/dynamic/images/P.png
- Graphical weather warnings for FP *(MeteoFrance)*
  Landing page: https://meteo.pf/fr/vigilance-meteo
- Cyclone Alert Status for FP (*MeteoFrance)*
  Landing page: https://meteo.pf/fr/alerte-cyclone
- Cyclone activity report
  Landing page: tropic.ssec.wisc.edu
- Tropical Cyclone Bulletin (NZ MetSVC: 01 Nov – 30 Apr) - *provides graphic & text-based details of current cyclone activity, with possible cyclone development*
  Landing page: https://www.metservice.com/warnings/tropical-cyclone-activity
- Surface Pressure Charts SW Pacific: 5S-60S 160E-120W *(Low Bandwidth - NZ MetSVC)*
  Landing page: https://www.metservice.com/maps-radar/maps/southwest-pacific-low-bandwidth
- Interactive WX & Wave FCST Maps *(AUS BoM)*
  Landing page: http://www.bom.gov.au/australia/charts/viewer/index.shtml
- Tropical Storm Tracker – SW Pacific
  Landing page: https://www.tropicalstormrisk.com/tracker/dynamic/P.html
- Tropical Tidbits: *Global Tropical Cyclone & Disturbance Information provides various modelled track forecasts in graphic form for individual storms*
  Landing Page: https://www.tropicaltidbits.com/storminfo/
- Cyclocane: *Summary overview of Cyclones & Hurricanes*
  Landing page: https://www.cyclocane.com/tropical-storm-risk/

4 Winds

Sustained gale force winds are rare in French Polynesia, but may be arise from Tropical Cyclones. Gale force winds of lesser duration are more often generated by squalls and thunderstorms.

Land and sea breezes effect many islands and even some atolls. Sea breezes are most prevalent in the lee of the larger islands such as Tahiti & Mo'orea. Strong katabatic (downslope) winds can occur on mountainous islands.

Calms are less frequent south of about 20°S, where the direction is more variable with NE winds occurring December - March and NW to N winds not unknown from April through to November. Should the band of strong westerly winds from down south (e.g. the Roaring 40s) migrate further north than usual, then the southern islands are more likely to be affected.

4.1 Trade Winds

The *South Pacific High* generates a large-scale movement of air outwards and towards the *Inter-Tropical Convergence Zone* (ITCZ) – this mass movement of air is known as the *Trade Winds*, which are defined as steady and persistent winds which blow on the Equatorial side of the subtropical high pressure systems in both Hemispheres.

Wind speed: the *Trade Winds* generally decrease in strength as they get closer to the equator and, compared to other regions of the world, those experienced in French Polynesia generally remain relatively constant and steady at 8 to 12 knots throughout most of the year. That said, the strength, size and position of the *South Pacific High*, and the proximity of eastward moving highs embedded in the *Subtropical Ridge* (STR), can be responsible for reinforced trade winds (known colloquially as *Mara'amu*).

Direction: although the *Trade Winds* in French Polynesia are commonly referred to as the Southeast Trades and are of a generally South-Easterly nature, they are in fact quite variable due to the influence of eastbound high-pressure systems passing to the south of French Polynesia. Trade winds from the East and North-East are relatively common as a result.

Effect on the weather: as the trade winds move over tropical waters (that is, north of ~20° South), warming and evaporation results in increasingly moist and warm air which leads to build-up of cumulus clouds, frequent, sometimes heavy rain, and squalls & thunderstorms.

4.2 Mara'amu

The direct translation *(Tahitian)* of *Mara'amu* (aka, *Maramu* or *Maraamu*) is "Southeast Wind". Some locals also use the term *Mara'amu* to refer to the wind that blows between the islands of Taha'a and Bora Bora, and there have been *Va'a* (Polynesian surf ski) races across this body of water named after this. In colloquial usage, *Mara'amu* refers to stronger-than-normal trade winds that can blow for days or weeks at a time. These persistent stronger trade winds are also known as *Reinforced Trade Winds*.

By whatever name, these stronger trade winds can:

- occur when an additional boost to the windstream is provided by the *South Pacific High*, or by persistent high-pressure systems located in the *Sub-Tropical Ridge* (STR) relatively nearby to the south of French Polynesia;
- blow for several weeks at a time, but are generally of shorter duration;
- commonly exceed 25 knots, but are only rarely seen beyond gale force;
- occur as far north as 10 degrees South.

5 Squalls & Thunderstorms

Squalls and thunderstorms:

- are a fact of life in French Polynesia, resulting from of the vast volume of air in the trade-winds being warmed as it travels over the tropical ocean, picking up energy and water vapour as it goes;
- are driven by convective forces and rising air; the greater the lifting force, the stronger and faster the updrafts, and the greater potential for squalls & thunderstorms of increasing severity.

To aid in assessing the likelihood and severity of squalls & thunderstorms, the GFS atmospheric model includes two indicators of atmospheric instability. These parameters are: *Convective Available Potential Energy* (CAPE) and *LiFTed IndeX* (LFTX). To obtain the values for CAPE and LFTX, include these parameters in an e-mail request to *Saildocs* for either a plain-text SPOT forecast or a GFS *GRIB* file.

Examples

```
send SPOT:17S,140W|5,3|PRMSL,WIND,CAPE
send GFS:16S,18S,139W,141W|0.5,0.5|0,3,..72|PRESS,WIND,CAPE
```

Here is a brief summary of what the CAPE/LFTX values mean.

CAPE

Value (kJ/kg)	Atmospheric Instability
<1,000	Weak
1,000 - 2,500	Moderate
2,500 - 4,000	Strong
>4,000	Extreme

LFTX

Value (°C)	Atmospheric Conditions	Thunderstorm Risk
0 or above	Stable	Unlikely
-1 - -3	Slightly unstable	Possible
-4 - -5	Unstable	Probable
-6 - -7	Highly unstable	Severe thunderstorms possible
Below -7	Extremely unstable	Violent thunderstorms possible

Location-specific notes

6 Marquesas

Some of the Marquesas island group lies to the north of the official cyclone belt, so this may be an option for sitting out the Cyclone Season November through April. Even though not often directly affected by winds >64 knots, the Marquesas do get severe gales and torrential rains on the periphery of Tropical Cyclones.

Apart from that, gales are rare and thunderstorms are infrequent.

Rain is highly variable, between 90 to more than 250 days annually (read below about microclimates generated by island topography).

The trade-winds prevail, being mostly easterlies; being closer to the equator, the lowest average speeds are about 12 knots, seen in July and August.

The high Marquesan Islands obstruct the flow of the trade-winds, creating acceleration zones and turbulent air; this effect is particularly noticeable when travelling between nearby islands that are situated roughly across the wind-line.

Some islands are large enough to create their own weather-systems (*micro-climates*), creating localised areas of wet and dry.

Other on-island effects occur when the terrain concentrates and funnels wind down valleys into otherwise protected anchorages, creating shifty gusting conditions – basically, the wind you get in otherwise secluded bays can be completely different (and more violent) than that in the free windstream at sea. When the trade winds are quieter, land and sea breezes exist on the sheltered sides of the islands.

7 Tuamotus

Generally hot, although May through October are slightly cooler than the rest of the year. Most rain falls in the warmer months.

Tropical Cyclones are rare, but historical records highlight that the islands of this archipelago can be at risk, particularly during El Niño events.

The prevailing winds throughout the year are the Southeast Trades, 10-15 knots. In the eastern part of the Tuamotus group, E to ENE winds are most usually prevalent, while in the western part most come from the E to ESE. Reinforced trade winds that can exceed 25 knots and extend for 2 weeks or more at a time, are generally the result of strong and persistent high-pressure systems nearby to the south of French Polynesia adding energy to the trade-wind airstream.

Occasionally low pressure systems or, more likely, associated troughs or cold fronts pass through the Tuamotus, resulting in sometimes squally weather and temporary reversal of the trades to become winds from the Westerly quadrant. This can happen at any time when cold fronts or troughs are being shovelled eastwards across to the French Polynesian region from their subtropical breeding ground north of New Zealand. This is more likely when the whole East-West band of South Pacific weather systems is moved north of its average position, most usually in winter-time, including the bridging months either side.

Hint: GRIB files can be notoriously bad at detailing the rapid wind-shifts that can accompany the passage of a trough or a cold front; always study the big picture to see what are the main forces and weather systems at play, and be especially cautious if there is any element of southerly wind on forecast.

General Tuamotus Weather Conditions April-July

The prevailing wind in the Tuamotus when most cruisers are there is ESE and SE, with average wind speeds are 10-15 kts. However, averages don't tell the whole story.

The weather that controls conditions in the Tuamotus comes from New Zealand, and from the South Pacific Convergence Zone. Fronts and troughs and lows blast out of NZ and then stall out over French Polynesia. The SPCZ, surprisingly, often extends all the way into the Tuamotus (see the Fiji Nadi Fleet picture for this).

It's very difficult to predict what any given weather system will do, and the GRIB files almost always predict light and variable winds when a front passes. But at least once each season, it seems that cruising boats in the Tuamotus get surprised by a vicious frontal passage.

The one bad storm we experienced in the Tuamotus; the winds were forecast in the GRIB files to back from SE-E-NE-N-NW-W. Our Northern Hemisphere brains told us to protect ourselves from the north on the frontal passage, and we did that. So, we tucked up in a place with protection from N and W. We figured that we would have plenty of time to move to a location the following day that had better protection from the south, if we needed to.

But the wind only stayed N and W for a few hours, and by the middle of the night, was blowing 25 knots from S — a direction that we were totally exposed across 15 miles of lagoon. In squalls we clocked 40 knots gusts.

As we were getting battered by 6' waves coming across the lagoon, on a lee shore, we finally dug into our 'Weather' folder, and read Jim Corenman's sage advice in Latitude 38 from 1998, which said "the northerly sector winds will usually be light and of short duration, so if you can't get 360-degree protection, make sure you are protected from the south, as that is where all the strong winds will come from." *Soggy Paws*

8 Societies

Tropical Cyclones are rare, but historical records highlight that the Society Islands can be at risk, particularly during El Niño events.

The Societies enjoy prevailing Easterly trade-winds throughout the year, with variations roughly equally from the NE and the SE; strongest being 11 to 12 knots in the winter months. Because of terrain effects, the winds experienced on Bora-Bora and Papeete are quite variable on the N and W coasts, with speeds reduced to an average of 5 knots with a high percentage of calms.

Rainy season, November through to March, is hot & humid; the driest months are July & August. Thunderstorms are more frequent January through to March.

Best in June through to September when is it is cooler and drier, with pleasant breezy weather.

9 Australs

From December through to April these islands can be in the path of the depressions and cyclones that move down from the north west guided by the *South Pacific Convergence Zone* (SPCZ). Starting in May, depressions start moving past to the south, but are close enough to be sending swell and strong winds north.

Temperatures are still low during November or December, before the Cyclone Season becomes established, noting that climate-change is making the seasons less predictable.

10 Gambier

The Gambier have a low likelihood of cyclones, especially during cooler ENSO cycles, so it may be possible to visit starting December/January while temperatures are still comfortable.

Daily temperatures range between 29° and 20°C during summer; 26° to 16°C in winter.

Sources of Weather Information

Terms & Definitions

- GMDSS – Global Maritime Distress and Safety System
- WMO – World Meteorological Organisation
- MeteoFrance – the French meteorological service provider, issues a range of weather products for French Polynesian waters.

French Polynesia falls within GDMSS METAREA XIV (fourteen), as defined by the WMO and agreed by international convention.

GDMSS Metarea XIV Landing Page: [www]

New Zealand holds overall responsibility for METAREA XIV, meaning preparing and disseminating *Marine Safety Information* (MSI) including meteorological information such as *High Seas Forecasts* and *Warnings* (Gale/Storm Warnings, Tropical Disturbance Advisories & Tropical Cyclone Warnings). Within METAREA XIV, Fiji is responsible for preparing and issuing meteorological information for the area north of 25 degrees South.

11 Fiji Meteorological Service

The *Fiji Meteorological Service* (FMS) provides forecast & warning services for international shipping in the Tropical SW Pacific and, in addition, functions as the *Regional Specialised Meteorological Centre* (RSMC) for French Polynesian waters.

Products issued by Fiji that:

- are related to Tropical Cyclones are listed under the section-heading "Tropical Cyclones";
- may be of more general interest to sailors in French Polynesian waters:
  - Tropical Disturbance Summary: [www]
  - Marine Weather Bulletin: [www] ✉
  - Fleet Code: ✉

12 MeteoFrance

MeteoFrance provides a range of French-language weather information for French Polynesian waters, including synoptic charts, text-forecasts, weather warnings, marine bulletins & satellite images.

Contact details:

- MeteoFrance online: Landing Page [www]
- Tel: +689 40 80 33 00
- email: contact.polynesie-francaise@meteo.fr

Products of interest to mariners in French Polynesian waters are detailed in the Product Listing.

13 JTWC

The US *Joint Typhoon Warning Centre* (JTWC) publishes various weather products of interest, including:

- A Significant Tropical Weather Advisory [www]; and
- other products related specifically to *Tropical Cyclones* (TC), such as *Tropical Cyclone Formation Alerts* (TCFAs) and *Tropical Cyclone Warnings*, both of which are issued in text & graphic formats.

JTCW online: Landing Page [www]

TC products issued by JTCW that relate to French Polynesian waters are listed under the section-heading "Tropical Cyclones".

Other products of interest are detailed in the Product Listing.

14 Local Voice Broadcasts

Unless otherwise annotated, all times are local Tahiti time (UTC-10).

Coast Radio Station Mahina Radio (FJA) broadcasts every day:

- Leeward Islands - CH26 | Windward Islands - VHF CH 27
  - Warnings @ 0800 & 2040
  - Forecasts for the next 24 hours @ 1100, 1200, 2040, 2100
- HF/SSB
  - 0845, 1100, 1200, 1430, 1630, 2000 – 8,803kHz
  - 0803, 0833, 1803, 1833, 2100 – 2,182kHz and then 2,620kHz

RFO

- AM: 738kHz | FM: 89.0 & 91.8MHz
- 0555, 0657, 0757, 1030, 1755

Radio Polynesia 1

- AM: 738kHz | FM: polynesie.la1ere.fr/les-frequences-radio.html
- Mo-Fr: 0510, 1826 | Sa-Su: 0610, 1826

JRCC Papeete

Note: the prior MRCC (Maritime Rescue Coordination Centre) has been merged with the ARCC (Aviation RCC) to become the JRCC (Joint RCC)

- VHF 16 *(Society Islands only)*
- HF 8,291kHz | MF 2,182kHz
- Emergency: +689 40 54 16 16, also when using a mobile with a French Polynesian SIM, dial 16
- Routine/Inquiries: +689 40 54 16 15
- Email: contact@jrcc.pf
- Online: http://www.jrcc.pf

15 Gulf Harbour Radio

Gulf Harbour Radio from New Zealand gives location-specific weather via HF/SSB. This is a free service (donations accepted), but you need to register with them first.

- 0515z (UTC), Monday to Friday (2021: May 11 - 25 November)
- Frequency: 8,752kHz; Normal alternates: 8,779 & 8,297kHz
- Alternate frequencies for long-range use: 12,353 kHz & 12,365kHz
- e-mail: weather@ghradio.co.nz

Gulf Harbour Radio also "live streams" their daily HF/SSB weather broadcast for the western Pacific (Mo-Fr, May-Dec only); find the livestream link on their website.

> *We have heard excellent comments about their weather reporting. Usually they do not cover FP but I assume that is because many people here do not know about them. They do give weather for the area between Bora Bora and Tonga and further west.* *Jacaranda*

> *David is a retired professional weather forecaster formerly working for NWS Hawaii, having cruised the South Pacific for years on sv Chameleon but now retired from cruising. They operate GHR 1 May – 25 Nov (cruising season in W Pacific), and are not so focussed on weather forecasting for people in eastern FP. I have used Gulf Harbor Radio myself, it is an excellent resource specifically for cruisers.Sherry, Soggy Paws*

16 HF Radio Facsimile

Times and frequencies for weather products covering French Polynesia are provided against the specific product listings (below).

Unless otherwise indicated, times are UTC *(with no Daylight Savings Time).*

- Gambier UTC -9HR
- Marquesas UTC -9.5HR
- Other French Polynesian Islands UTC -10HR

-/continued next page

When using a SSB radio in USB mode to receive RFAX broadcasts, select a carrier frequency 1.9kHz below the listed frequency.

Full broadcast schedules: NOAA: HNL KVM70 [www]
NZ Met Service: ZKLF [www]

KVM70 HNL FREQUENCIES **HN (Hours of Night): 0519-1556z (UTC) 9,982.5 & 11,090kHz**
OT (Other Times): 1719-0356z (UTC) 11,090 & 16,135kHz

GOES IR SATELLITE IMAGE - SW PACIFIC: 05N-40S, 165E-130W
VT06 @ **0649z** | VT18 @ 1849z

SIGNIFICANT CLOUD FEATURES: 50N-30S, 160E-110W
VT03 @ **0524z** | VT15 @ 1724z

MSL CHARTS
STREAMLINE ANALYSIS: 30N-30S, 130E-110W
VT00 @ **0555z** | VT06 @ **1154z** | VT12 @ 1755z | VT18 @ 2354z
MSLP FORECASTs: 50N-30S, 130E-110W
+24H VT00 @ **0701z** | VT12 @ 1901z
+48H VT00 @ **0714z** | VT12 @ 1914z
+72H VT00 @ **0727z** | VT12 @ 1927z

SEA STATE CHARTS: 30N-30S, 130E-110W
ANALYSIS
VT00 @ **0740z** | VT12 @ 1940z
FORECASTs
+24H VT00 @ **0753z** & **1141z** | VT12 @ 1953z & 2341z
+48H VT00 @ **1102z** | VT12 @ 2302z
+72H VT00 @ **1115z** | VT12 @ 2315z

NZ Weather Fax - ZKLF

Because the NZ HF radio-fax service relies on a single transmitter, the same product is broadcast sequentially on different frequencies within the same UTC hour.

How to use this section

1. Refer to the first table below, under the relevant Island group, to ascertain the local hour in which the MSLP chart of interest will be broadcast;
2. Ascertain a suitable frequency for the time of day and expected propagation conditions *(5MHz is the usual 'Go-To' FREQ in the morning; 16MHz in the afternoon)*;
3. Refer to the second table below to ascertain the 'past the hour' timing with respect to the chosen broadcast frequency.

MSLP Charts SW Pacific	UTC	SOCs, TUAs, Austr. (UTC -10HR)	Marquesas (UTC -9.5HR)	Gambier (UTC -9HR)
Analysis	0400z, 1000z 1600z, 2200z	6pm, midnight 6am, midday	6:30pm, 00:30am 6:30am, 12:30pm	7pm, 1am 7am, 1pm
Forecast +36H	0000z, 1200z	2pm, 2am	2:30pm, 2:30am	3pm, 3am
+48H	0100z, 1300z	3pm, 3am	3:30pm, 3:30am	4pm, 4am
+72H	0200z, 1400z	4pm, 4am	4:30pm, 4:30am	5pm, 5am

Frequency	*Timing (HRs UTC)*
3,247.4kHz HN (hours of night)	HH+45m
5,807.0kHz	HH+00m
9,459.0kHz	HH+15m
13,550.5kHz	HH+30m
16,340.1kHz HJ (hours of day)	HH+45m

17 Messaging APPs

Recent initiatives are using messaging apps such as *WhatsApp* to distribute focussed information; messages get through on tenuous mobile phone connections in situations where e-mail is difficult and on-line browsing impossible.

There is a growing tendency to move to open-source apps such as *SIGNAL*, as these are more flexible than locked-down proprietary solutions. Use of technology in this way is rapidly evolving, but is not yet always reliable. Automated functions do not always work as intended resulting in either junk-messages, or no messages at all.

Franz & Ilona of *ZwerfCat* have made a special contribution to support French Polynesian cruising community by establishing several special-interest messaging groups. Some groups are manual, relying on individuals with good online access to sort through and redistribute information of interest. Some are tech-assisted, obtaining information from specific weather sites and resending it automatically. Value-add is provided where automated functions provide translated content (e.g. local weather forecasts in English, drawn from French-language sites).

The "*FP Weather Information*" group on SIGNAL sends out tailored versions of various marine weather bulletins issued for French Polynesia. As a contemporary example of automated 'push' technology, this initiative shows great promise in helping users keep abreast of weather forecasts with minimal effort. Here is the joining link: [www]

> *We were enthusiastic early adopters of SIGNAL groups, but have on occasion found them to be unreliable. Like all technology, it is great when it works, but troublesome when it doesn't. We had a TSUNAMI warning, but updates came late, or not at all – tracking down what was going on with the technology could have become a distraction when time was of the essence.*
> *Even though these messaging apps are very convenient, and add another welcome arrow to the quiver of weather sources and distribution channels, I recommend caution at this time against becoming sole-source reliant on these message groups for weather forecasts or warnings.* *David, svPerigee, July 2021*

18 Weather APPs

These apps utilise the *File Transfer Protoco*l (FTP) to download GRIB data and, in some cases, other weather information direct when online. This is quick and easy where internet is available.

- iNavX [www]
- LuckGrib [www]
- PocketGrib [www]
- SailGrib [www]
- Weather4D [www]
- Weathertrack [www]
- XyGrib [www]

For use offline, some of these apps:

- have the built-in ability to create a *Saildocs* e-mail request for sending via satellite or HF data;
- are certified for direct interface with the *IridiumGO!*, or other satellite data management device, (such as the RedPort) and can therefore use the satellite data connection to do a direct download of GRIB data using FTP (which, when it works, can be somewhat quicker than email, and can avoid the multi-step processes required when getting GRIB files by e-mail).

For further detail on GRIB viewers, refer to [www].

19 Online Browser access

Weather sites of interest:

- earth.nullschool.net – visuals for windstream [www] & ocean currents [www]
- FastSeas.com
- PredictWind.com – GFS & ECMWF
- Weathertrack.us
- Windguru.cz
- Windytv.com – GFS & ECMWF

Further reading: [www]

20 NOAA Online

NOAA (the US *National Oceanic and Atmospheric Administration*) provides a variety of weather products that are useful for sailors navigating French Polynesian waters. The main products of interest are detailed under the section-heading "Tropical Cyclones", or in the Product Listing below. A full list of NOAA weather products for the Pacific basin is available online.

The actual products themselves may be found in the following directories:

ftp://tgftp.nws.noaa.gov/fax
https://tgftp.nws.noaa.gov/fax/

To access these products online, add the [filename] to the end of the directory URL.

Example

Online: https://tgftp.nws.noaa.gov/pub/fax/PJFB10.gif
Note the use of the (lower-case) 'gif' file format for online access.
Hint: the URL derived above provides the means to obtain this product via e-mail request to Saildocs.

To obtain these products via e-mail, use the full URL.

Example (*Saildocs*)

SEND https://tgftp.nws.noaa.gov/pub/fax/PJFB10.TIF
Note the use of the (upper-case) TIF file format for e-mail requests; doing so obtains a file that is smaller (beneficial for e-mail via slow or intermittent data connections). Some popular products may be available from Saildocs by referring to the product code only without needing to use the full URL (e.g. SEND PJFB10.TIF).

21 NOAA e-mail service

NOAA provides the means to obtain their products via e-mail directly from the NOAA servers.

Send an e-mail:

To: NWS.FTPMail.OPS@noaa.gov
Subject: Put anything you like - *but suggest do not leave blank*
Body: Example

```
open
cd fax
get PLBZ08.TIF
get PZZZ93.TIF
quit
```

Obtain the product names from the Product Listing in this document, or NOAA's online listing of products for the Pacific basin.

22 Saildocs

Using specially formatted e-mail requests you can receive graphic, text or digital weather products, including graphical synoptic charts, GRIB files, Synoptic Charts via Fleet Code, SPOT & other text-based forecasts, and satellite images. If you know the static web-address (URL) of a particular weather product or web-page you can also request these by referring to the URL.

Weather products covering French Polynesian waters are detailed in the product listing below. Separate sections provide additional detail on how to obtain SPOT forecasts, GRIB files and weather products relating to Tropical Cyclones. Some listings include an e-mail hyperlink (seen as a ✉ symbol); clicking on this symbol will open the default e-mail program and create an e-mail requesting the selected product. In some cases, the e-mail link will create a request for multiple products.

Cut-and-pasting the address and body of the e-mail to your preferred e-mail program will enable you to receive the requested product/s by whatever means available – satellite, HF/SSB, or WiFi; the e-mail request can be tailored to specific requirements.

- When manually coding a request for obtaining weather graphics by e-mail, where possible request graphic files coded in the 'TIF' format, as these are 20-33% of the size of comparable graphics in 'gif' format.
- Some files provided by the US/NOAA can be requested directly from *Saildocs* without needing to refer to the location in the NOAA file-store; refer to the NOAA product code directly (e.g. send PBFA11.TIF). In some cases, this will result in a file-size reduced by up to 50%.
- The NOAA product codes, *Saildocs* IDs and URLs of the main weather products covering French Polynesia are listed against their respective entry in the Product Listing section (below).
- For other weather products that are available online or issued by other agencies, request the URL of the specific page or file.

Send an e-mail:

```
To:         query@saildocs.com
Subject:    Put anything you like - but suggest do not leave blank
Body:       send [URL or Saildocs/NOAA product ID]
    Example
     send PBFA11.TIF
     send nadi.sopac
     send https://www.met.gov.fj/aifs_prods/20036.txt
     send https://www.metoc.navy.mil/jtwc/=
     products/abpwweb.txt
     Note 1: you can request multiple products in a single e-mail.
     Note 2: use a separate line for each requested product.
     Note 3: for long lines (>80-characters) use "=" to insert a manual
             line break, followed by a carriage-return.
```

23 Professional Service Providers & Weather Routers

Various individuals and organisations provide weather and routing services, generally on a fee-for-service basis. The main ones known to specialise in the South Pacific region are listed below.

MetBob

Bob McDavitt, from Auckland New Zealand, publishes a weekly "Weathergram" which discusses the weather in the South Pacific. Bob also provides bespoke weather advice and routing solutions.

Weathergram online: Graphics | No Graphics | *Saildocs*: subscribe nz.wgrm

✉ | www | facebook | SMS: +64 27 776 2212

Ken McKinley

USA-based Ken McKinley at Locus Weather does weather routing all over the world. Soggy Paws used him for the Easter Island to Pitcairn and Gambier legs of their trip. [www]

YiT *(Yacht-In-Transit)*

New Zealand based *Yacht-In-Transit* ceased operations at the end of 2020.

24 Other References

Pitufa, crewed by Christian & Birgit, is an Austrian boat which has been cruising in FP for 7 years. Christian maintains online webpages that embed:

- current forecasts and charts. [www]
- browser-based wind atlas information. [www]

New Zealand MetServices: although not an official provider for weather products for French Polynesian waters, NZ MetSVCs provides a useful online resource via its surface analysis & near-term forecast; although this cannot be requested by e-mail, it accommodates low-bandwidth online access by using small charts (~16kb in PNG format). [www]

Product Listing

The following section lists a diverse range of weather products relevant to navigation in French Polynesian waters, including:

- Text-based material, such as Maritime Weather Forecasts, Bulletins, Warnings, Advisories, Alerts & Summaries, SPOT forecasts, and Metbob's Weathergram;
- Graphic products, such as Satellite Images, Fleet Codes, MSL & Sea-state Charts;
- GRIB files detailing Atmospheric, Wave & Ocean Current data.

Supplementary background information is provided on the various numerical weather prediction models (e.g. GFS), including detail on accompanying weather parameters.

Brief instructions, supplemented by focussed examples, are provided to enable readers to place DIY e-mail requests for their own tailored weather products.

Hyperlinks to online sources (seen as www) point to the file location or target web-page.

NOAA Product Codes (for example, PLBZ08) link directly to the file on the NOAA server.

One-click icons (seen as a ✉ symbol) generate an e-mail request for the designated product.

25 Text Bulletins

SW-PAC Tropical Disturbance Summary: EQ-25S, 160E-120W		
NADI RSMC	www	✉
S-PAC Significant Tropical Weather Advisory:		
S of EQ, 135E -> W Coast of S.America - NOAA	www	✉
SW-PAC Marine WX Bulletin: EQ-25S, 160E-120W		
FIJI MET SVC	www	✉
Alternate (NOAA)	www	✉
SW-PAC High Seas Forecast (HSF): EQ-25S, 160E-120W		
NOAA	www www	✉
Alternate, with small colour graphic	www	
FP Area forecast (Meteo-France, online in FR; EN via e-mail by svSarana)	www	✉
FP Short-range forecast (Meteo-France, online in FR; EN via e-mail by svSarana)	www	✉
FP Long-range forecast (Meteo-France, online in FR; EN via e-mail by svSarana)	www	✉
Single e-mail request for the 3x FP forecasts in English		✉

26 SPOT Forecasts by e-mail

SPOT forecasts are requested for specified coordinates, with data derived from the gridded marine database (GRIBs). Data is returned as a small text-only e-mail (size ~2kb) for the following default parameters:

- 10m Wind Speed & Direction (WIND), with GUSTs
- Atmospheric Pressure at Mean Sea Level (PRMSL)
- Significant Wave Height (HTSGW – significant wave height, meaning the average of the trough-to-crest heights of the largest 1/3 of wind waves and swell combined)
- Direction & Period of the Primary Waves (DIRPW & PERPW)

-/continued next page

Atmospheric and sea-state data is extracted from the GFS model, which (since March 2021) incorporates the prior WW3 (Wave Watch III) model.

Send an e-mail:
To: query@saildocs.com
Subject: Put anything you like - *but suggest do not leave blank*
Body: send spot:DD.dS,DDD.dW|DAYS,INTERVAL

Insert a space between the "send" and the "spot" request, but no spaces thereafter.
Latitude and Longitude are separated by a "," (comma); enter as decimal or whole degrees (or in DD-mmS,DDD-mmW format, degrees-wholeminutes separated by a dash) followed by N/S & E/W.
Use the "|" (vertical bar) symbol to separate the elements of the request.
Days & Interval are optional; if omitted the default is 5,6 (5-day forecast at 6-hourly intervals), otherwise enter as whole numbers separated by a comma.

Example
send spot:17.8S,140.8W
Returns a SPOT forecast for 17°48'S 140°48'W, with values for the default parameters (WIND [SPD, DIR & GUSTs], PRESS, WAVES [HGT, DIR & PER]), default duration and interval (forecast out to 5-days at 6-hourly intervals).
A text-only e-mail is returned containing the data in mono-spaced table layout; download size about 2kb.

Example
send spot:17-52.8S,140-47.3W|7,3
Returns a SPOT forecast for 17°53'S 140°47'W, with values for the default parameters provided out to 7-days at 3-hourly intervals.

More comprehensive requests can be made by specifying additional parameters.

Example
send spot:17-53S,140-47W|7,3|=
PRMSL,WIND,GUST,AIRTMP,CLOUDS,RH,RAIN,CAPE,WAVES
These parameters are selected from a subset of those available for the GFS atmospheric model, with the WAVES parameter polling data derived from the "GFS-Wave" component of the GFS (formerly the WW3 wave-state model).
Note the use of the "=" (equals sign) to manually insert a carriage-return. In addition to improving readability, this minimises problems with Saildocs decoding requests that extend beyond 80-characters (where some e-mail programs insert a line-break).

To **subscribe**, use the same format and change the "send" to "sub". The default subscription is 14 days; to change this add a space and "days=DD" ("days=30" for a 30-day subscription; "days=0" for an indefinite subscription).

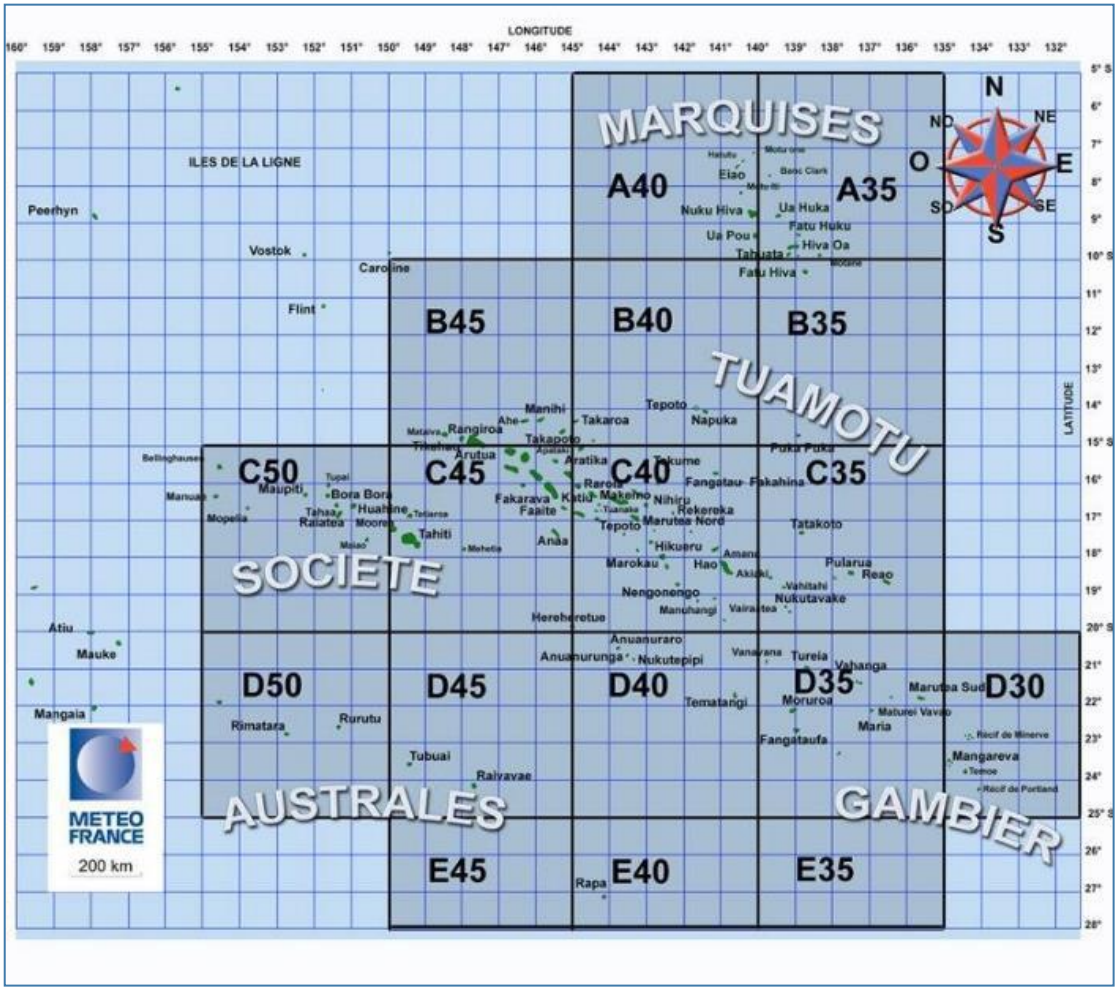
Example
sub spot:17.8S,140.8W|4,3 days=30
By default, the subscription spot forecast will be sent daily shortly after 0000z (UTC).

To specify a different daily time, add a space and then "time=HH:mm".

Example
sub spot:17.8S,140.8W|4,3 days=30 time=12:00

Cancellation instructions are included with each subscription message.

27 Marine Bulletins from MeteoFrance



Forecast Areas for Marine Bulletins

Each zone is identified with an alpha-numeric code (e.g. A35) - the coded identifier has inherent meaning:

- the letters describe latitude: 'A' is 5 to 10 degrees South, 'B' is 10-15 degrees, 'C' is 15-20 degrees, and so on;
- the numerals describe longitude: '35' is 135-140 degrees West, '40' is 140-145, and so on.

These Marine Bulletins are available:

- Online, MeteoFrance in French [www]
- Via e-mail request for Marine Bulletins machine-translated to English ✉

Other information available on-line:

- Cyclone Alerts [www]
- Weather warnings [www]
- Sea-state (waves) [www]
- Sea-state (swell) [www]

28 Satellite Images

Unfortunately, URLs for satellite photos provided by MeteoFance are coded with a time-based token, so obtaining these images using an e-mail request to Saildocs may result in an outdated image being forwarded.

South Pacific: EQ-45S 160E-120W MeteoFrance *[70kb]*.....www

French Polynesia: 06S-30S 160W-128W MeteoFrance *[75kb]* .....www

SW-PAC Infrared: 05N-40S 165E-130W *[60kb + RFAX HNL]*
VT00z ✉ | VT06z ✉ | VT12z ✉ | VT18z ✉ .....Latest evps11 ✉

GOES-West, Band 13: EQ-30S 170E-130W *[115kb]*.....www

SW-PAC Water Vapour: EQ-50S 160E-120W *[280kb]*.....www

Central Pacific Infrared (B&W): 40N-50S 110E-120W *[300kb]*.....www

SW-PAC Infrared: EQ-50S 160E-120W *[335kb]* .....www

29 Surface Charts

ISOFRONT Graphics – MeteoFance

Landing Page: www Forecast Charts ..... +36H www ✉
..... +60H www ✉

NOAA Charts

Symbols & Test Chart *[125kb]* .....PLBZ08 ✉

MSL Streamline Analysis: 30N-30S 130E-110W *[40kb + RFAX HNL]*
VT00z PWFA90 ✉ | VT06z PWFA91 ✉
VT12z PWFA92 ✉ | VT18z PWFA93 ✉ .....Latest colour PWFA11 ✉
..... Loop (last 3 analysis) www

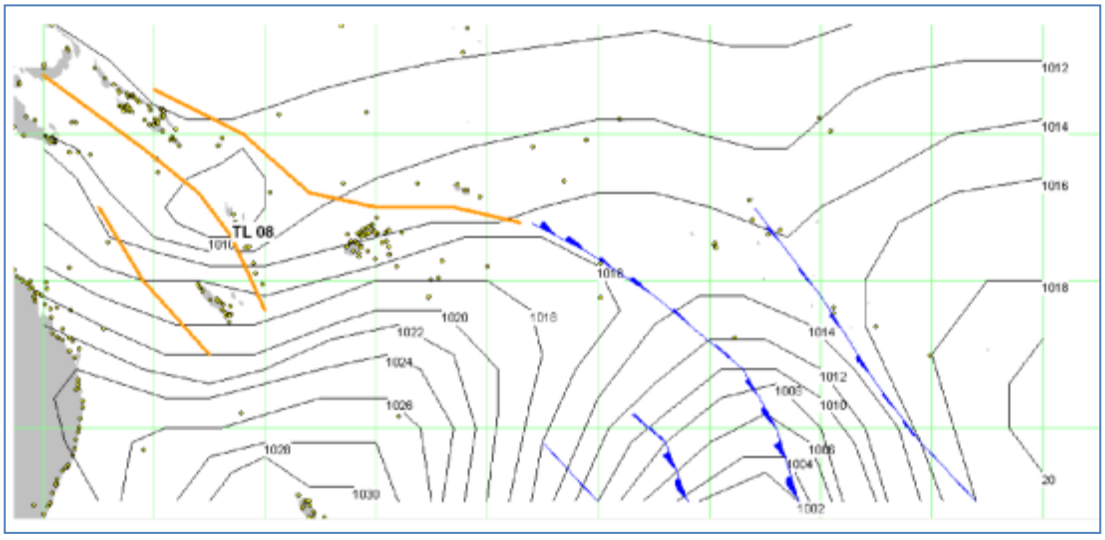
MSLP Forecasts: 50N-30S 130E-110W *[30kb + RFAX HNL]*
+24H VT00z PYFE87 ✉ | VT12z PYFE88 ✉..... Latest colour PYFE11 ✉
+48H VT00z PYFI87 ✉ | VT12z PYFI88 ✉..... Latest colour PYFI11 ✉
+72H VT00z PYFK87 ✉ | VT12z PYFK88 ✉..... Latest colour PYFK11 ✉

Sea State Charts: 30N-30S 130E-110W *[25kb + RFAX HNL]*
Analysis VT00z PJFB89 ✉ | VT12z PJFD89 ✉.....Latest PJFB10 ✉
Forecasts +24H VT00z PWFE82 ✉ | VT12z PWFE84 ✉.....Latest PWFE11 ✉
+48H VT00z PJFI89 ✉ | VT12z PJFI91 ✉.....Latest PJFI10 ✉
+72H VT00z PJFK89 ✉ | VT12z PJFK91 ✉.....Latest PJFK10 ✉

30 Fleet Code Charts

International Analysis Code (IAC), aka FLEET CODE, are synoptic charts encoded in blocks of five-numeral groups. Designed originally for dissemination by Morse Code, these code-groups can be decoded and hand-drawn. In contemporary use, the FLEET CODE text blocks are available online or via e-mail for loading into dedicated fleet-code viewer (such as PhysPlot), or for viewing in OpenCPN using a plug-in (which is now incorporated in contemporary versions, otherwise obtainable by download).

A surface analysis chart for the South Pacific (NZ-120W, EQ-35S) is published in Fleet Code format by the *Fiji Meteorological Service* (FMS) [www], or via *Saildocs* e-mail request: send fleet.nadi ✉



Example of FLEET CODE graphic

31 MetBob's Weathergram

Bob produces a free "Weathergram", published weekly on Sundays, which provides a big-picture explanation of what's going on throughout the South Pacific, along with more detailed information on various routes and locations of interest to recreational sailors.

Subscribe direct with MetBob: bob@metbob.com

Saildocs: subscribe nz.wgrm

Weathergram online: Graphics | No Graphics

32 GRIB files

GRIB stands for "GRidded Information in Binary". GRIB files contain data derived from various Atmospheric, Wave-State or Ocean Current models.

> *GRIB files seem to be generally accurate except when cold fronts from NZ run into stalled troughs or convergence zones which sometimes lurk over the Tuamotus. Then no one - not the French, Fiji, or NOAA - does a very good job of predicting what the wind will do in any given location.* *Jacaranda*

Further reading:

- Offline: send a (blank) e-mail to: gribmodels@saildocs.com ✉
- Online: [Mail-a-Sail] | [Windy]

GRIB files from the main models of interest for French Polynesia waters are available from *Saildocs* via e-mail upon request:

- Atmospheric: European ECMWF & US GFS
- Waves: US GFS-Wave
- Ocean Current: RTOFS

-/continued next page

Send an e-mail:

```
To:        query@saildocs.com
Subject:   Put anything you like - but suggest do not leave blank
Body:      Use the request format detailed in the GFS examples below
```

Note: Data from other models (such as the Arome Polynésie or Arpège Global models from Meteo-France) may be obtained by subscription but, as specialist products, they are not covered in this overview.

OCEAN current data from the OSCAR model is available in GRIB format by e-mail request to svSARANA. Details are provided below under the section heading "*Ocean Data*".

32.1 Atmospheric Models

ECMWF

Data from the *European Centre for Medium–range Weather Forecasts* model, (ECMWF, aka *"the European Model"*) is normally available only by (expensive) paid subscription. However, in order to fulfil obligations to the WMO to freely provide 'essential' data, a small set of parameters are available without cost. These are:

- Height of the 500hPa pressure surface (HTG500);
- Temperature & Wind at the 850hPa pressure surface (TMP850, WIND850); and the
- Atmospheric pressure at MSL (MSLP).

If parameters are omitted, the default is MSLP,HTG500.

Use request code: ECMWF. Send the request to *Saildocs* and use the same request format as detailed in the GFS examples below.

GFS

The GFS *(Global Forecast System)* is a global numerical weather prediction computer model run by the US NOAA's NCEP *(National Centres for Environmental Prediction)*.

Note: The GFS was upgraded on 22-Mar'21, extending the model top from the upper stratosphere (~55 km height) to the mesopause (~80 km height), and increasing the number of vertical layers to 127.
Another major aspect of this upgrade being that the previously standalone Wave Watch III (WW3) wave model was merged into the GFS. Meaning that, now that wave data is part of GFS, you can download sea level pressure, wind and detailed wave state in the same file download.
Also of importance for those interested in using ***GRIB data to monitor the location and forecast positions of Tropical Cyclones****, the PRMSL parameter is now no longer smoothed (previously, the resolution of PRMSL data was about 80nm).*

The GFS model is run every six-hours starting at 00z (UTC), with the outputs becoming available within 6 hours after the run commences. Modelling outputs provide data points for every hour out to 120HRS (5D), thence 3-hourly (0300, 0600, …) out to 240HRS (10D), thence 12-hourly (1200 & 2400) out to 384HRS (16D). Horizontal resolution of output data is 27.8km (15.0nm, 0.25°) out to 7 days, thereafter 70km (44nm, ~0.75°) out to 16 days.

GFS data available via Saildocs is:

- 3-hourly out to 192 hours (8D), thence 6-hourly out to 240 hours (10D), thence 12-hourly out to 384 hours (16D);
- resolution: 0.25° out to 120 hours (5D), thence 0.5° out to 240 hours (10D), thence 1.0° out to 384 hours (16D).

-/continued next page

Send an e-mail:

To: query@saildocs.com
Subject: Put anything you like - *but suggest do not leave blank*
Body: see format & examples below

Format

send [model]:[lat1,lat2,long1,long2]|[grid spacing]|[VTs]|[parameters]

Insert a space between the "send" and the model identifier (e.g. GFS or ECMWF); no spaces thereafter, except in specified cases.
Insert a ":" (colon) after the model identifier, then start (without space) with the coordinates.
Latitude and Longitude are separated by a "," (comma); enter as decimal or whole degrees followed by N/S E/W.
Use the "|" (vertical bar) symbol to separate any following elements of the request.
Enter grid-spacing in decimal or whole degrees; if omitted the default is "2,2" (2x2 degrees).
"VTs" represent a comma-separated list of Valid-Times in whole hours; if omitted the default is "24,48,72".
Enter parameters as a comma-separated list; if omitted the default is pressure and wind.

Example

send gfs:10S,30S,170W,120W

This is the default request format, and the equivalent of:
send gfs:10S,30S,170W,120W|2,2|24,48,72|PRESS,WIND
This will return the GFS data for the defined area, with data-points every 2x2 degrees; 24-hourly intervals out to 72 hours.
Parameters: Wind speed & direction at 10m, raw (unsmoothed) atmospheric pressure at Mean Sea Level (MSL).
Filesize: ~5kb
For long request-strings (extending beyond 80-characters per line), manually break the line to ensure that SailDocs can process the request. Do this by inserting a "=" (equals) character at the end of the line, followed by a hard return ("carriage return" or paragraph mark "¶", not a linefeed), and continuing the next line as before (ensuring no spaces or other hidden characters at the end or beginning of any line).

Example

send gfs:10S,30S,170W,120W|1,1|6,12,=
18,24,36,48,72,96|PRESS,WIND
Filesize: ~45kb

A shortcut is available to abbreviate the validity-times.

Example

send gfs:10S,30S,170W,120W|1,1|6,12..96|PRESS,WIND
This means +6 and +12 hours, and then repeat the same 6-hourly interval out to 96 hours.

To **subscribe** to this GRIB file, use the same format but change the "send" to "sub". The default subscription is 14 days. To change this, add a space after the parameters and then "days=DD" ("days=30" for a 30-day subscription; "days=0" for an indefinite subscription).

Example

sub gfs:10S,30S,170W,120W|1,1|6,12..96|PRESS,WIND days=30
The requested subscription product will be sent daily shortly after 06z (UTC).

To specify a different daily time, add a space after the parameters and then "time=HH:mm".

Example

sub gfs:10S,30S,170W,120W|1,1|6,12..96|PRESS,WIND days=30 time=12:00

Cancellation instructions are included with each subscription message.

Selected parameters for GFS GRIB file (& text-based SPOT forecast) requests to Saildocs

```
HGT500  - Height of the 500hPa pressure surface
TMP500  - Temperature at the 500hPa pressure surface
WIND500 - Wind velocity at the 500hPa pressure surface
ABSV    - Absolute vorticity at the 500hPa pressure surface
---
CAPE - Convective Available Potential Energy
LFTX - LiFTed IndeX
```
CAPE and LFTX are both indicators of atmospheric instability and thereto the likelihood of Thunderstorms (TS) – refer to §5 for further information.

```
---
CLOUDS - % of total cloud cover
HGT    - height of the cloud ceiling (not yet decoded by Saildocs)
RH     - Relative Humidity at 2m above the surface (%)
RAIN   - Precipitation rate in mm/hr
APCP   - Accumulated precipitation over 6 hours (mm)
---
PRMSL - with effect from 22-Mar'21, PRMSL data from GFS is no longer smoothed,
          and hence is now effectively the same as MSLET
          (Shuell Sea Level Pressure)
---
WIND - Wind speed & direction at 10 meters above the surface
GUST - at 10 meters above the surface
---
AIRTMP - air temperature 2 meters above the surface
SEATMP - surface sea temperature
---
The WAVES parameter can be added to a GFS GRIB request; this will return
significant wave height derived from the GFS-Waves (previously WW3) model
(additional details of the GFS-Waves model are provided below).
```

Example scripts

Super Wide Area - SW Pacific [~45kb]:
MSL Pressure & 10m Wind,
2 degree grid, 12-hourly for 5 days

```
send GFS:5S,35S,175W,120W|1,1|0,12..120|PRMSL,WIND
```

Wide Area - French Polynesia [~50kb]:
MSL Pressure, 10m Wind & Gusts, Accumulated Precipitation, CAPE
1 degree grid, 12-hourly for 5 days

```
send GFS:8S,25S,155W,135W|1,1|0,12..120|PRMSL,WIND,GUST,APCP,CAPE
```

Island sub-Group - general [~55kb]:
MSL Pressure, 10m Wind & Gusts, 2m Temperature, Accumulated Precipitation, CAPE & WAVES
1/2 degree grid, 6-hourly for 5 days

```
send GFS:14S,18.5S,148.5W,140W|0.5,0.5|0,6..120|=
PRMSL,WIND,GUST,AIRTEMP,APCP,CAPE,WAVES
```

Local area – detailed [~55kb]:
MSL Pressure, 10m Wind & Gusts, Accumulated Precipitation,
2m Temperature, CAPE & WAVES
1/4 degree grid, 3-hourly for 3 days

```
send GFS:17S,19S,139W,142W|0.25,0.25|0,3..72|=
PRMSL,WIND,GUST,APCP,AIRTEMP,CAPE,WAVES
```

32.2 Wave Data

Wave state data comes from NOAA's FNMOC *(Fleet Numerical Meteorology and Oceanography Centre)*.

With effect from 22-Mar'21, the previously standalone *Wave Watch III* (WW3) global wave model was updated and merged into the *Global Forecast System* (GFS). Now called *GFS-Wave*, the resolution and forecast times of wave data are newly aligned to that of the GFS atmospheric model (see above).

Note 1: The pre-existing Wave Watch III model has been deprecated, and GRIB requests using the WW3 request ID will return only a limited set of data (wind at 10m, significant height of combined wind & swell, and primary wave direction). Because wave data is now an integrated component of the GFS, you can ***download wave state data using the GFS request ID****, which may also include the normal GFS atmospheric parameters such as wind velocity & sea level pressure. Simply add your detailed wave data request (e.g. HTSGW,DIRPW,PERPW) to a normal GFS request.*

Note 2: other changes of interest include:

- *improving the resolution of wave data to 0.25˚ (previously 0.5˚);*
- *extending the forecast horizon for wave data out to 384 hours (16 days, previously 10 days);*
- *including additional parameters such as the Mean Period & Direction of Combined Wind Waves & Swell;*
- *the direction & period components for the primary wave parameter are determined from either of the wind-wave or swell, depending on which one is more important;*
- *providing a third swell partition (significant height, direction & period: SWELL:3, SWDIR:3, SWPER:3); however, this creates compatibility issues for Grib1 coding, so Saildocs currently provides only the primary swell as SWELL, SWDIR & SWPER.*

Some of these changes have not yet flowed through to the GRIB data provided by some other providers.

Note 3: Further info from Saildocs relating to the transition from WW3 to GFS-Wave is reflected in a Mar'21 update to the "Available Saildocs Grib Data" document, which is available by sending a [blank] email to gribmodels@saildocs.com.

Wave state parameters are:

```
WAVES – significant wave height & direction
HTSGW - height of significant waves
WVHGT - wind-wave height
WVDIR - wind-wave direction
WVPER - wind-wave period
DIRPW - direction of primary wave
PERPW - period of primary wave
DIRSW - direction of secondary wave
PERSW - period of secondary wave
```

Note: Height of significant waves = the average of the heights of the largest 1/3 of wind waves and swell combined.

32.3 Ocean data

Two popular models for oceanic current and other data are OSCAR & RTOFS.

OSCAR: *(Ocean Surface Current Analysis Realtime)* is an *analysis* of ocean current on a global scale, with a focus on the tropical Pacific. It is produced by US/NASA, derived from scatterometer and altitude satellite observations over a 5-day period; resolution 0.33 degrees. The analysis is run and updated every 5 days. Use the code "OSCAR"; the forecast-time field is not used; the default (and only) parameter is surface current (CURRENT or UOGRD,VOGRD).

To obtain OSCAR, send an e-mail ✉

```
To:         query (at) svsarana (dot) com
Subject:    whatever you like – perhaps 'OSCAR from svSARANA'
Body:       OSCAR:5S,25S,150W,115W
            Note: lat-long is N to S, W to E.  Returned filesize is ~50kb
```

RTOFS: *(Real-Time Ocean Forecast System)* is a global forecast of oceanic current produced by the US NOAA. Model resolution is 0.08 (1/12) degree; 3-hourly intervals out to 72 hours (3 days); thereafter 6-hourly intervals out to 192 hours (8 days).

Parameters are CURRENT (or CUR or UOGRD,VOGRD), WTMP (or WATER_TEMP), DSL_M (sea-level deviation), SALTY (salinity), Ice concentration (ICEC or ICE) and thickness (ICETK). If omitted, the default is CURRENT.

Examples (*Saildocs*)

```
send RTOFS:5S,25S,150W,115W
  this returns a 2-day current forecast, 0.3DEG grid; filesize ~40kb
send RTOFS:5S,25S,150W,115W|1,1|0,6..192
  this returns an 6-hourly 8-day forecast of current, 1DEG grid; filesize ~160kb
send RTOFS:5S,25S,150W,115W|2,2|0,6..72|CURRENT,WTMP
  this returns a 6-hourly 3-day forecast of current & SfcTMP, 2DEG grid; filesize ~15kb
```

-=-

Appendix A – Further Reading

1. Download “Weather Information for French Polynesia” with all the services and files Jacaranda used while cruising in French Polynesia:
   www.jacarandajourney.com/fpweather
2. Bob McDavitt’s “Mariner’s Met Pack for the Southwest Pacific” ISBN 1-877197-08-04 published by Captain Teach Press, Auckland, NZ. Though Bob is located in NZ and his weather focus is mainly the western portion of the South Pacific, his instruction manual covers a lot of useful information for the South Pacific in general.
   Buy: Waypoint Books, Bluewater Books; or e-mail Bob: bob@metbob.com
   Free online (pdf): [www]
3. Jim Corenmans “Letters from the South Pacific” originally published in the late 1990’s in Latitude 38 Magazine. Download from here:
   http://svsoggypaws.com/files/JimCorenman-SouthPacificLetters.pdf
4. David Sapiane’s Weather for the Yachtsmen. Downloaded from the Gulf Harbor Radio Site:
   http://ghradio.co.nz
5. The Hacking Family has a great circumnavigation website, and their South Pacific weather page is here:
   http://hackingfamily.com/Cruise_Info/Pacific/SPacific_Weather.htm
6. Bruce Balan from s/v Migration wrote a great article in the Feb 2011 Latitude 38 entitled "Fair Weather Sailor - Pacific Weather Simplified" You can find the article here:
   http://svsoggypaws.com/files/Migrations-PacWxSimplified.pdf
7. Christian from s/v Pitufa wrote a short summary of the South Pacific weather explaining the SPCZ and other phenomena for Cruising World June/July 2019. This can be found at:
   https://www.cruisingworld.com/pacific-weather-routing.

Appendix B – French Weather Terms

*It is highly recommended that cruisers heading for French-speaking locations purchase French for Cruisers **before** they leave!!*

	....est stable	....is stable
	....remonte	....is rising
	...baisse./...chute	...is dropping/....is falling
	A … heures Temps Universal (TU)	At … Universal Time
	a la fin	at the end
	ailleurs	elsewhere
	Avez-vous la (prevision) meteo?	Do you have the weather forecast?
les	alizes	trade winds
l'	amelioration	improvement
l'	anticyclone(A)	high (H)
	au debut	at the beginning
l'	averse	showers
l'	avis	warning
les	bancs de brouillards cotiers	coastal fog banks
le	barometre	barometer
	bientot	soon
la	brise de mer	sea breeze
la	brise de terre	land breeze
la	brouillard	fog
la	bruine	drizzle
la	brume	fog
le	Bulletin cote	coastal forecast
le	Bulletin grand large	high seas forecast
le	Bulletin large	offshore forecast
le	bulletin meteo	weather report
le	Bulletin meteorologique Special (BMS)	Special Weather Bulletin
la	carte meteo (-rologique)	weather map
	ce soir	this evening
	centre	center
	cet apres-midi	this afternoon
	cette nuit	tonight
le	ciel	sky
	clair	clear
	couvert	overcast
le	creux	trough
le	CROSS	CROSS (broadcasts weather)
le	cyclone tropical	tropical cyclone
	dans le nord	in the North
	dans le quadrant sud-est	in the southeastern quadrant
	dans un rayon de 20 mn autour du	within a 20 nm radius of
	degage	clear
le	degre	degree
le	deplacement	movement
la	depression (D)	low (L)
	devenant	becoming
le	diametre de l'oeil	diameter of the eye
la	dorsale	ridge
l'	echelle de Beaufort (B)	Beaufort scale
	eclaircie	sunny period
les	eclairs	lightning
	en cours	in progress
	en journee	during the day
	ensoleille	sunny
	epars	scattered

	est	East
	et au sud du 21 nord	and South of 21 North
la	force	force
la	foudre	lightning that strikes something
	fraichissant	freshening
	front chaud	warm front
	front froid	cold front
le	grain	squall
la	grele	hail
les	hectopascals (hPa)	HectoPascals
	heure locale	local time
l'	humidite relative	relative humidity
	Il fait un temps de chien	The weather is awful.
	Il pleut	It is raining
	Il y a une alerte cyclonique	There is a hurricane warning
	isole	isolated
	La mer est agitee	moderate Force 4 1.25 – 2.5 m
	La mer est belle	smooth Force 2 0.1 – 0.5 m
	La mer est calme	Calm – glassy Force 0 0 m
	La mer est enorme	phenomenal Force 9 >14 m
	La mer est forte	rough Force 5 2.5 – 4 m
	La mer est grosse	high Force 7 6 – 9 m
	La mer est peu agitee	slight Force 3 – 5 0.5 – 1.25 m
	La mer est ridee	Calm – rippled Force 1 0 - 0.1 m
	La mer est tresse grosse	very high Force 8 9 – 14 m
	La mer esttres forte	very rough Force 6 4 – 6 m
	la nuit	at night
	le long du 20 ouest	Along 20 west
	Le vent va fraichir.	The wind is supposed to increase.
la	ligne de grains	squall line
	localement	locally
	matin	morning
les	millibars	millibars
	modere	moderate
	mollissant	moderating
la	neige	snow
les	noeuds (nd) nuh	knots (kts)
	nord	North
	Nord-est	Northeast
	Nort-ouest	Northwest
les	nuages	clouds
	nuageux	cloudy
	occasionnel	occasional
	On attend une gross houle d'ouest vendredi.	There is supposed to be a large swell from the west on Friday.
	On s'attend a avoire des grains.	We're supposed to get squalls.
	On va avoir du mauvais temps.	We're going to have bad weather.
l'	onde tropicale	tropical wave
l'	orage	thunderstorm
	orageux	stormy
	ouest	West
	parfois	sometimes
la	perturbation	disturbance
la	pluie	rain
	plus tard	later
la	position	position
la	position prevue	forecast position
la	pression atmospherique	atmospheric pressure
la	prevision metro or just (metro)	weather forecast
	prevu	forecast

	prochain	next		
	Quel beau temps!	What nice weather!		
la	rafale	gust		
	revenant	backing		
	s'attenuant	dissipating		
	s'attenuant	dissipating		
	s'etendant jusqu'a 180 mn	extending up to 180 ns		
	s'orientant	turning to		
	se comblant	filling		
	se decalant vers	moving forward		
	se dissipant	dissipating		
	se dreusant	deepening		
	se renforcant ...lentement	strengthening ...slowly		
le	secteur	sector		
la	service de meteo	weather service, met office		
la	situation general	synopsis		
	stationaire	stationary		
	sud	South		
	Sud-est	Southeast		
	Sud-ouest	Southwest		
	suivant	following		
	sur l'extreme nord-est	in the extreme Northeast		
la	temperature	temperature		
la	tempete	storm		
la	tempete tropicale	tropical storm		
	temporaire	temporarily		
le	temps	weather		
le	temps a grains	squally weather		
la	tendance ulterieure	outlook		
le	thalweg	trough		
le	tonnerre	thunder		
la	trajectoire du cyclons	the track of the cyclone		
la	trombe	waterspout		
	valable a partir du	valid beginning		
	valable jusqu'au	valid until		
	variable	variable		
	variable depressionaire	variable in depression		
	venant	becoming		
le	vent	wind		
	vent - fort coup de vent	strong gale	Force 9	41 – 47 kts
	vent - bonne brise	fresh breeze	Force 5	17 – 21 kts
	vent - calme	calm	Force 0	0 – 1 kts
	vent - coup de vent	gale	Force 8	34 – 40 kts
	vent - grand frais	near gale	Force 7	28 – 33 kts
	vent - jolie brise	moderate breeze	Force 4	11 – 16 kts
	vent - legere brise	light breeze	Force 2	4 – 6 kts
	vent - ouragan	cyclone	Force 12	>64 kts
	vent - petite brise	gentle breeze	Force 3	7 – 10 kts
	vent - tempete	storm	Force 10	48 – 55 kts
	vent - tres legere brise	light air	Force 1	1 – 3 kts
	vent - vent fraise	strong breeze	Force 6	22 – 27 kts
	vent - violente tempete	violent storm	Force 11	56 – 63 kts
	vent assez fort	fairly strong wind	Force 6	22 – 27 kts
	vent dominant	prevailing wind		
	virant	veering		
	visibilite	visibility		
	visibilite mauvaise	poor visibility		
	visibilite bonne	good visibility		
	visibilite entre 2 et 5 milles marins	Between 2 & 5 nm		
	visibilite inferieure de 2 milles marins	less than 2 nm		

	visibilite superieure a 5 milles marins	greater than 5 nm
la	vitesse	speed
la	zoine de hautes pressions	high pressure area
la	zone	zone
la	zone de basses pressions	low pressure area