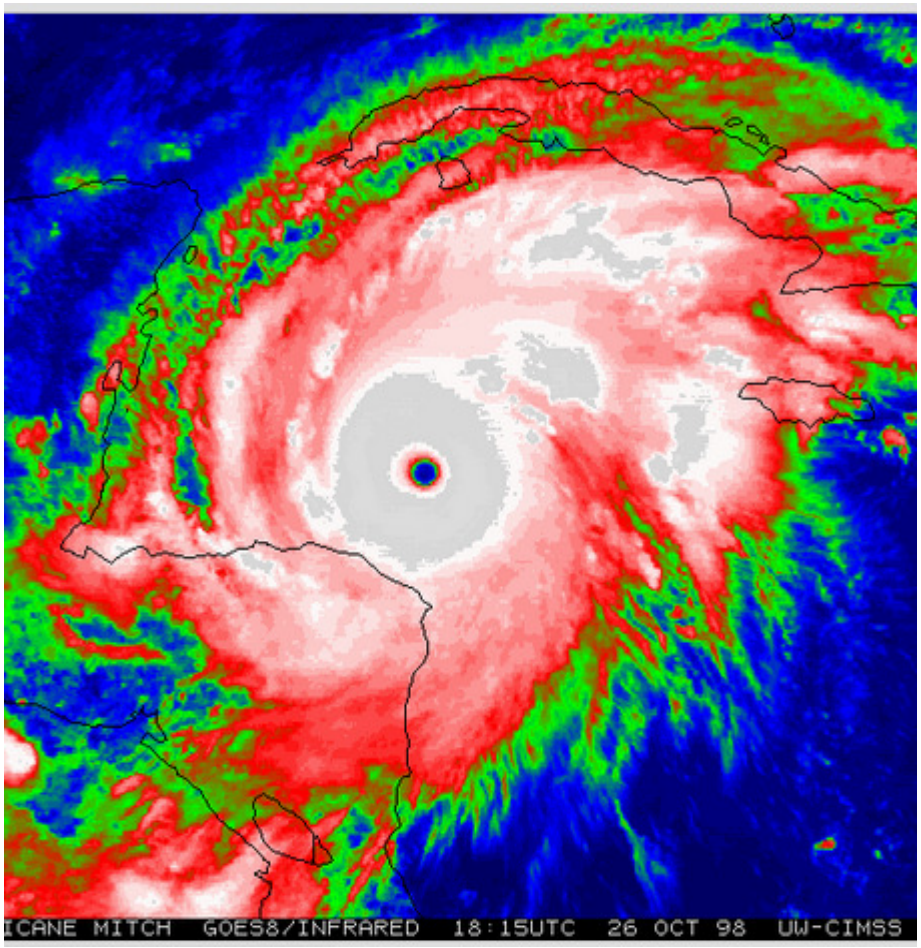
Surprise Cyclone Cyril

Presented at the SSCA Melbourne Gam
November 2012

ssca.org

http://svsoggypaws.com

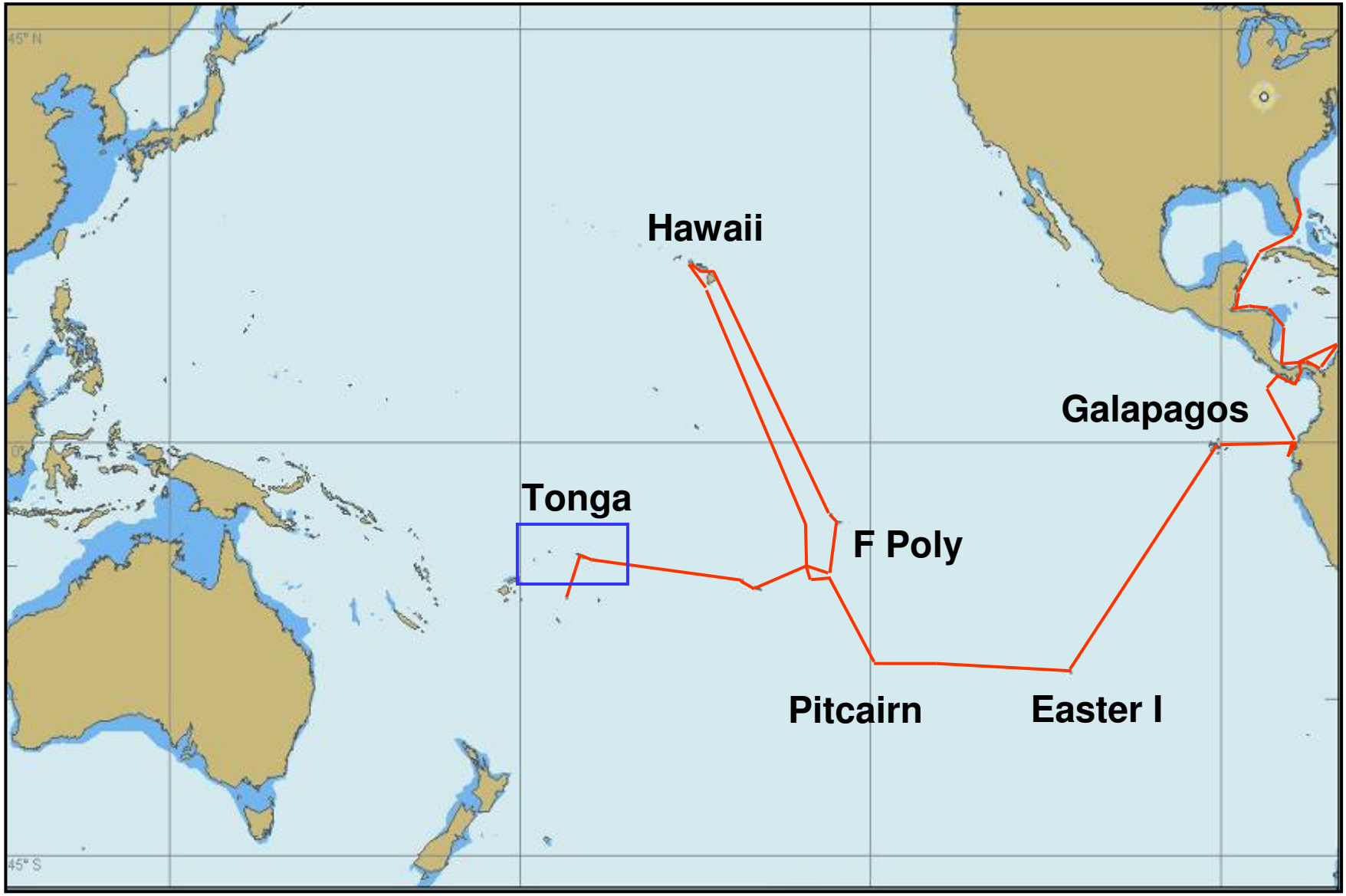
SURPRISE CYCLONE CYRIL

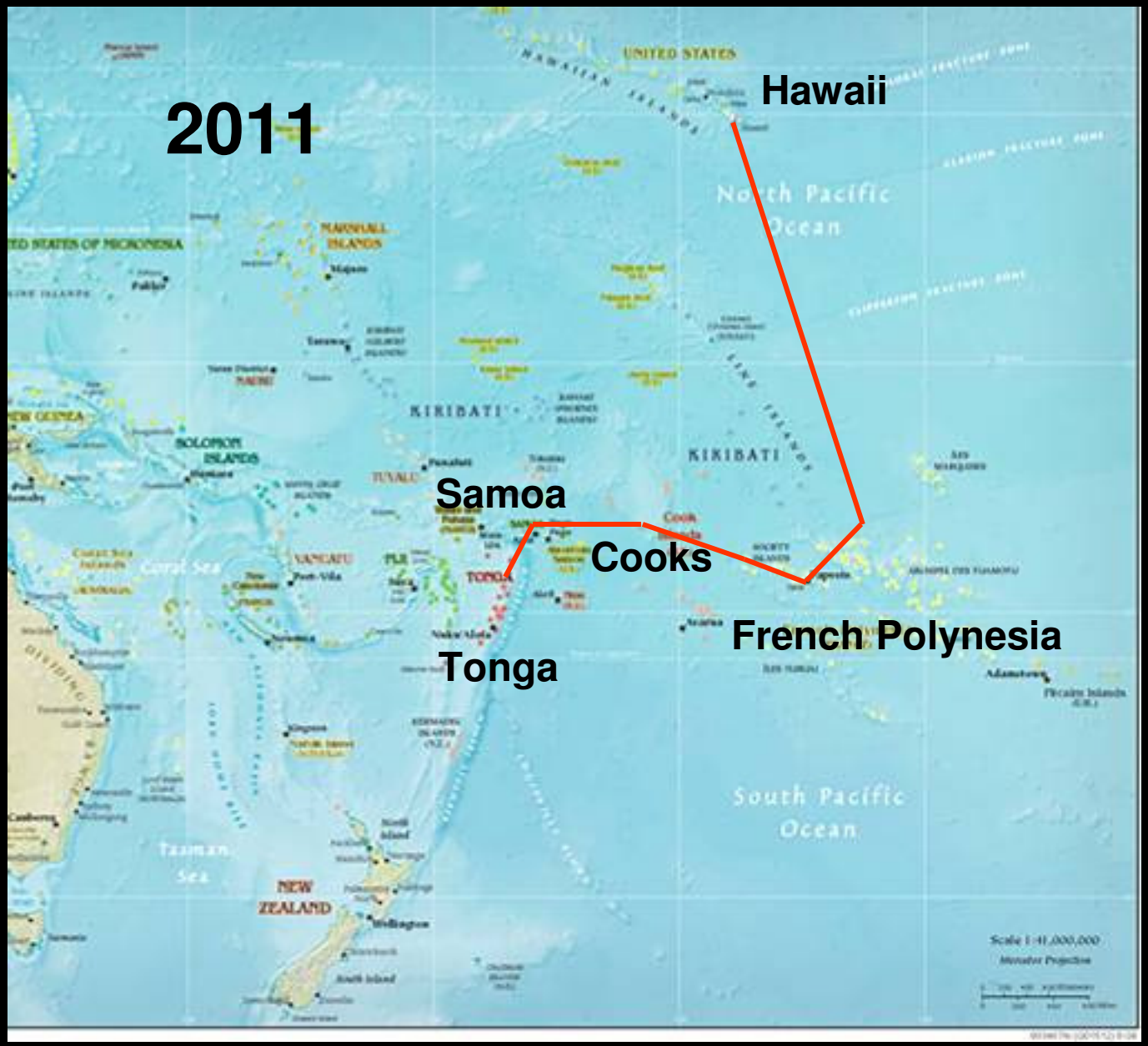


- Dave & Sherry McCampbell
- Storm Experience:
  - 16 years aboard
  - Ten hurricanes & one cyclone
  - Three 60 kt surprise storms at anchor
- This presentation at: SVSoggypaws.com


Soggy Paws
1981 CSY 44

2007-2011 Overview



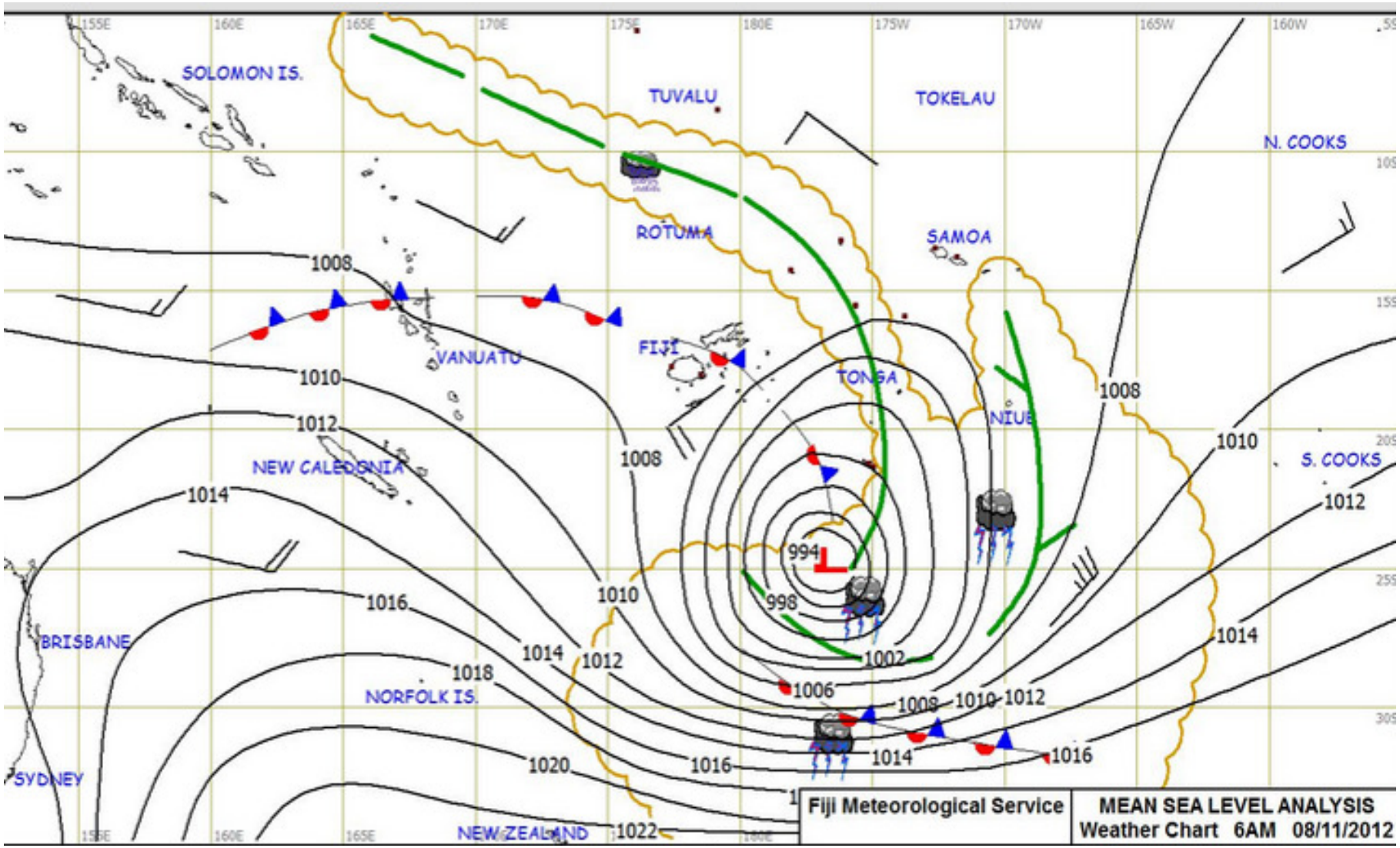

2011
Hawaii
Samoa
Cooks
French Polynesia
Tonga
North Pacific Ocean
South Pacific Ocean
UNITED STATES
KIRIBATI
SOLOMON ISLANDS
VANUATU
NEW ZEALAND
Coral Sea
Tasman Sea

Summer in Tonga

- Cyclone season Nov 1 – May 1
- Peak season Jan, Feb, Mar
- Mostly light winds, warm & humid
- Squally during SPCZ/MJO events
- Few cruisers - 8 boats 2011/2
  - Most depart for NZ or Australia ~1 Nov

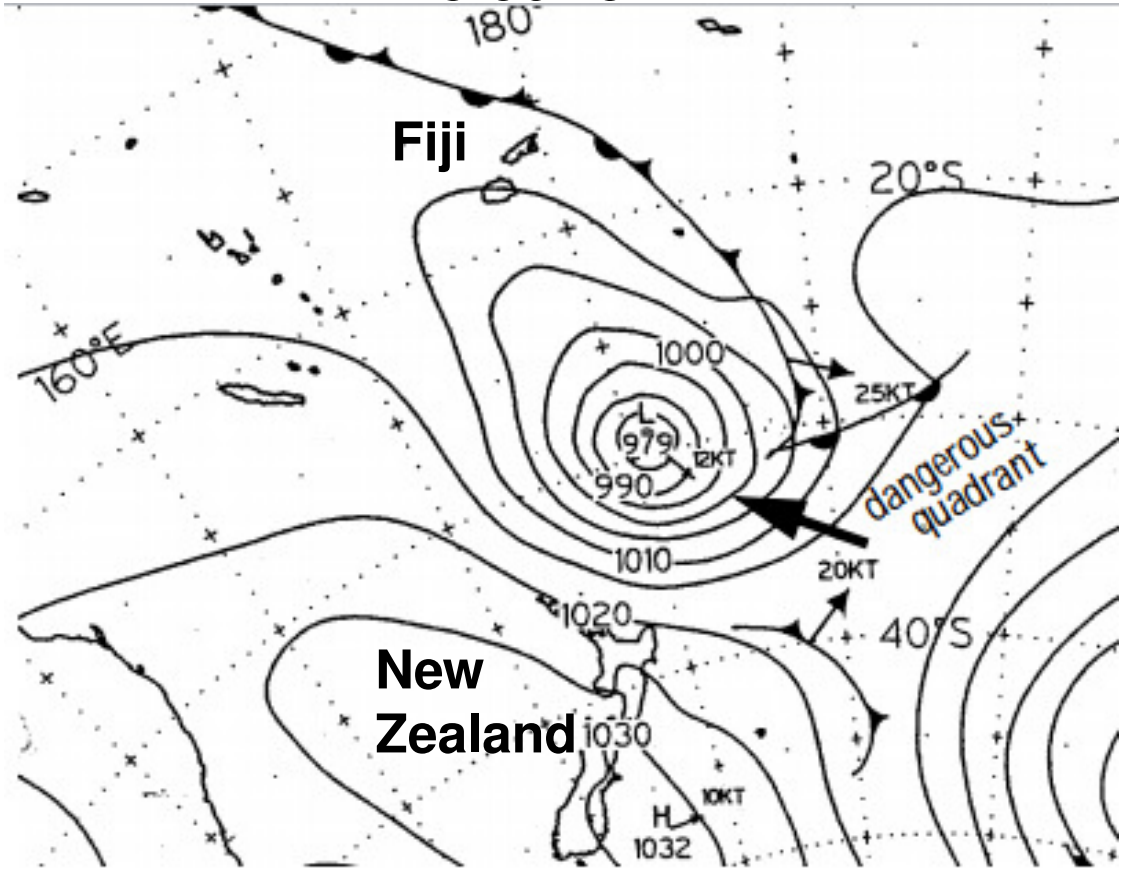
Why Not Go to New Zealand

8 Nov 2012



1994 Queen's Birthday Storm

5 June



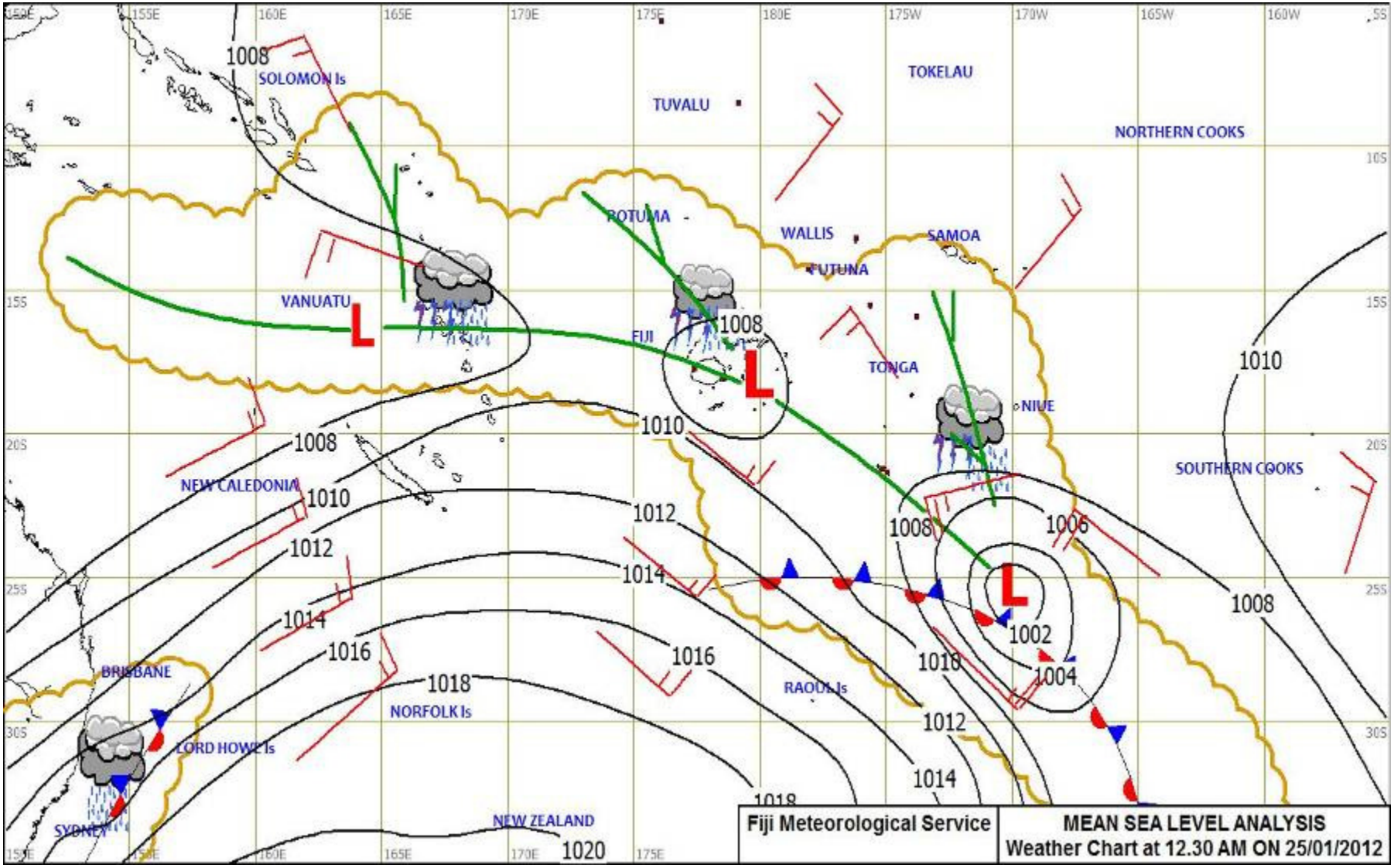
June 5, and the low between New Zealand and the Fiji Islands has deepened to 979mb. It is still squashed against the high to the south, which in turn is still held in place by the stationary depression to the east.

Winds in the dangerous quadrant are estimated at hurricane force. If caught in that part of the storm one should be on port tack, close-hauled. If on the track, or to the west, the wind should be on the port quarter, broad-

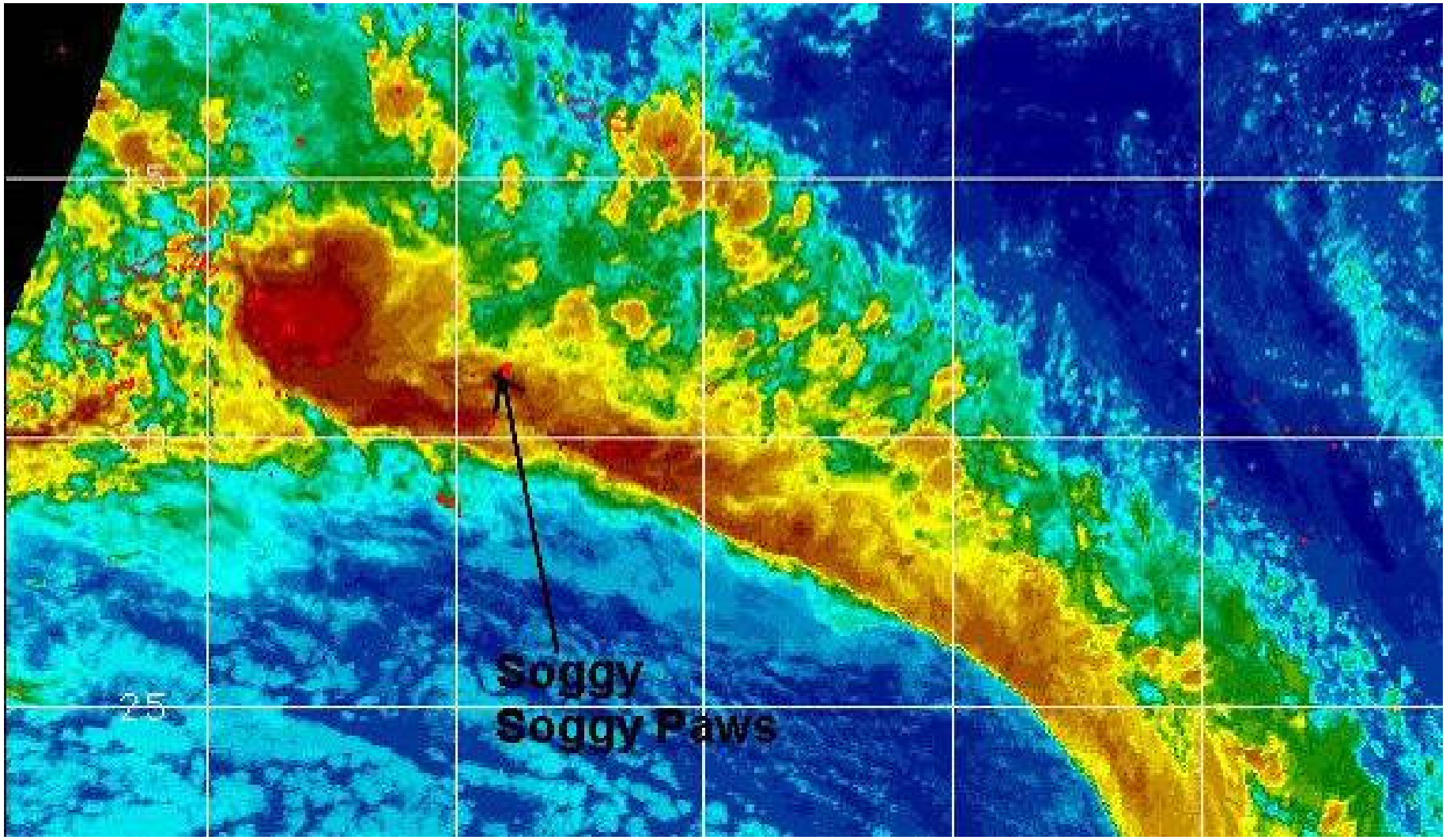
Cyclone Season Plan

- Remain in Vavau, Tonga
- Fly to USA Nov – Dec
- Soggy Paws on cyclone mooring-
  - watched by Ark mooring field owners (ex cruisers) at Tapana Isl
  - Deploy anchor to west if cyclone threatens
- Cruise Vava'u Jan-Feb-Mar
  - < 6 hours to mooring in Vavau
- Visit Ha'apai April, sail to Fiji in May

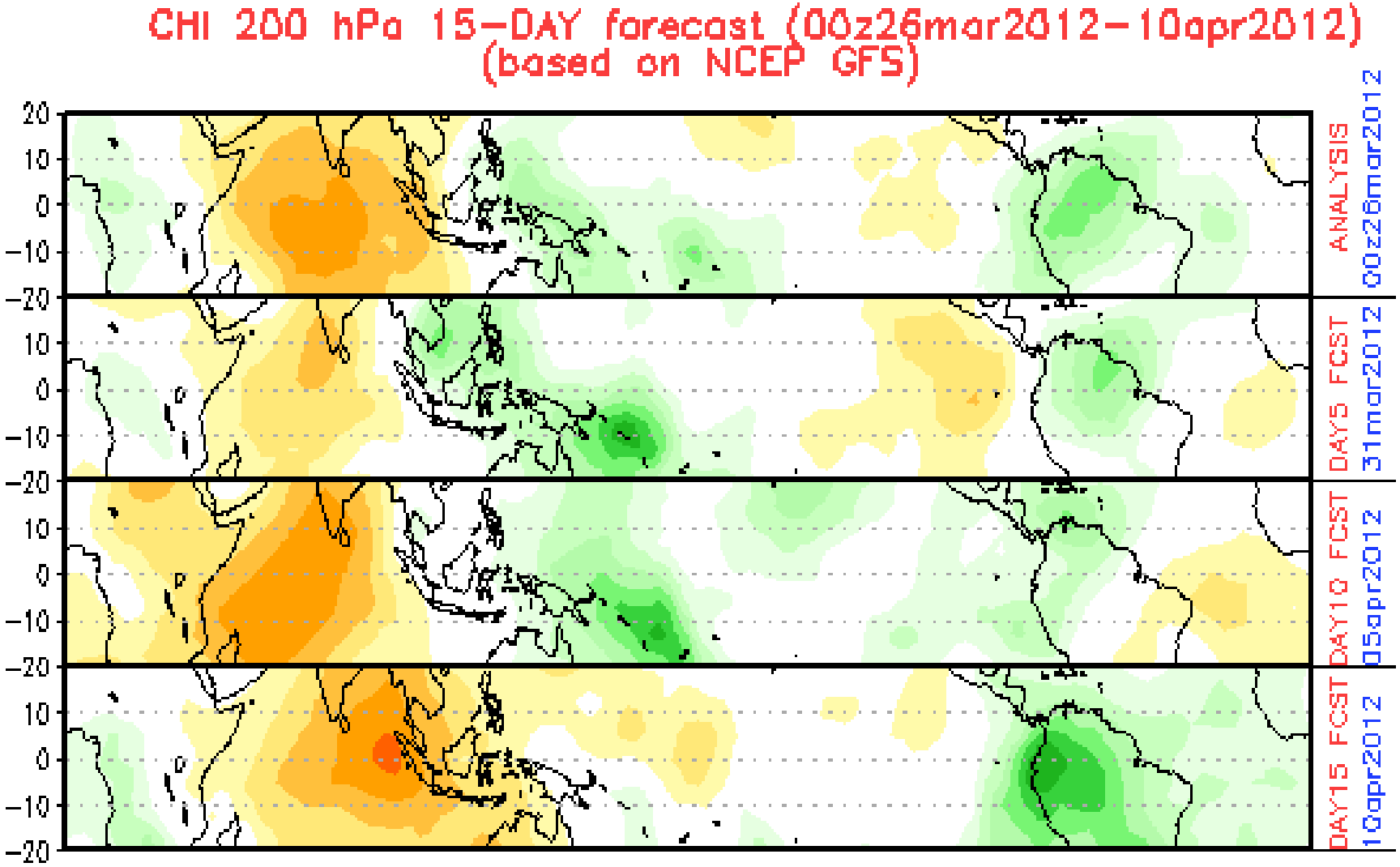
SPCZ Over SW Pacific

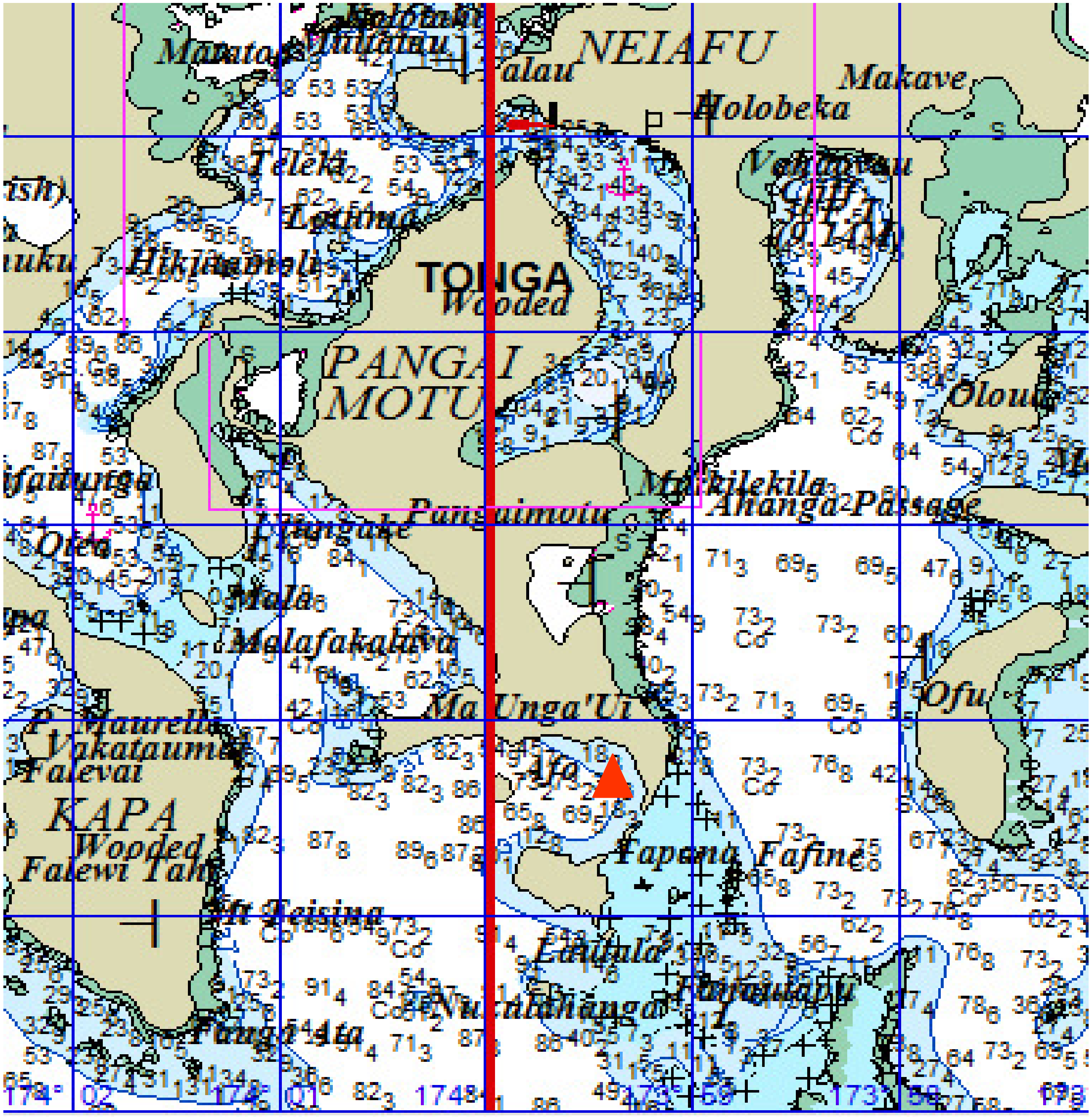


SPCZ Enhanced Sat Pic

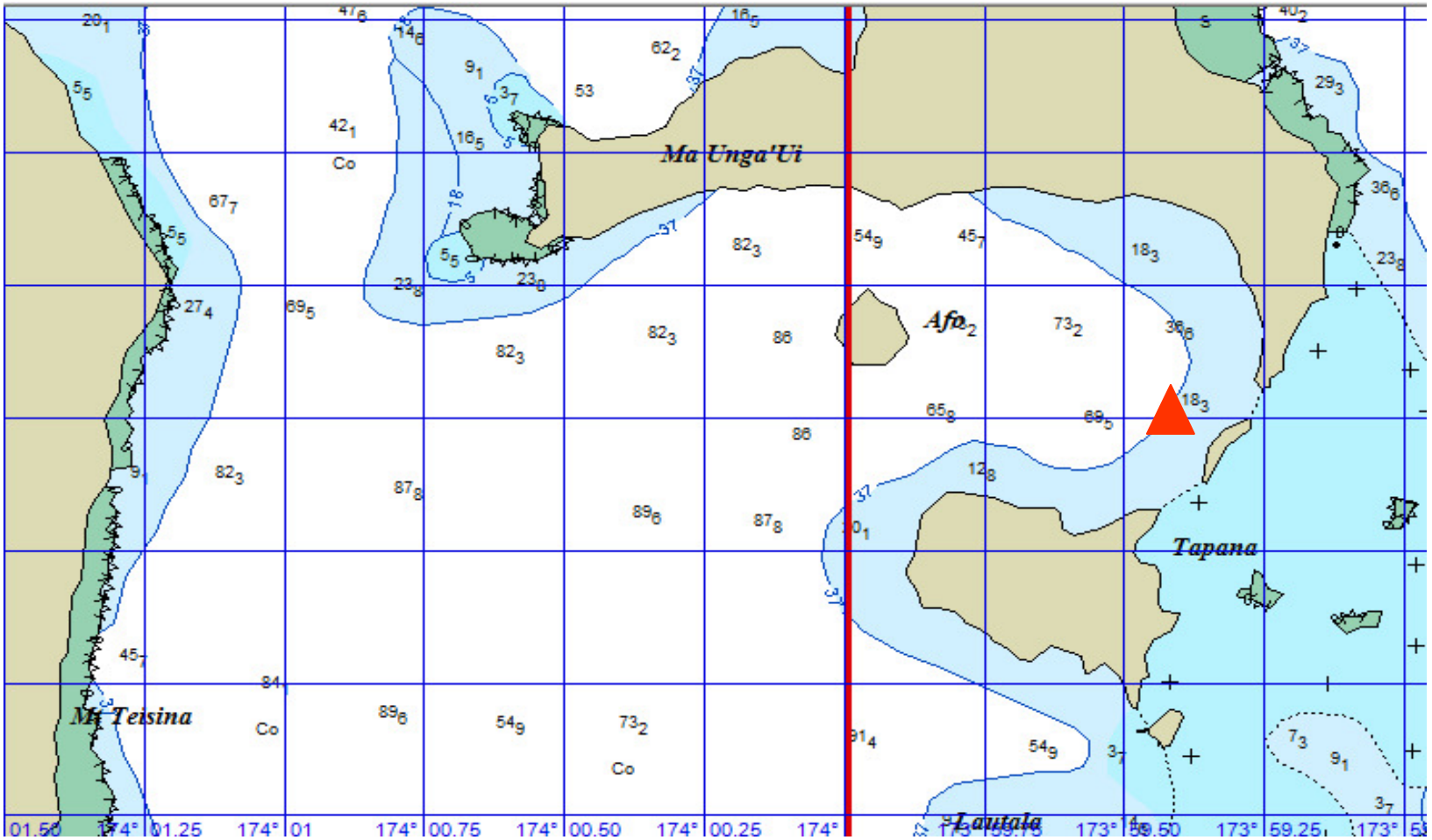


Madden-Julian Oscillation Event

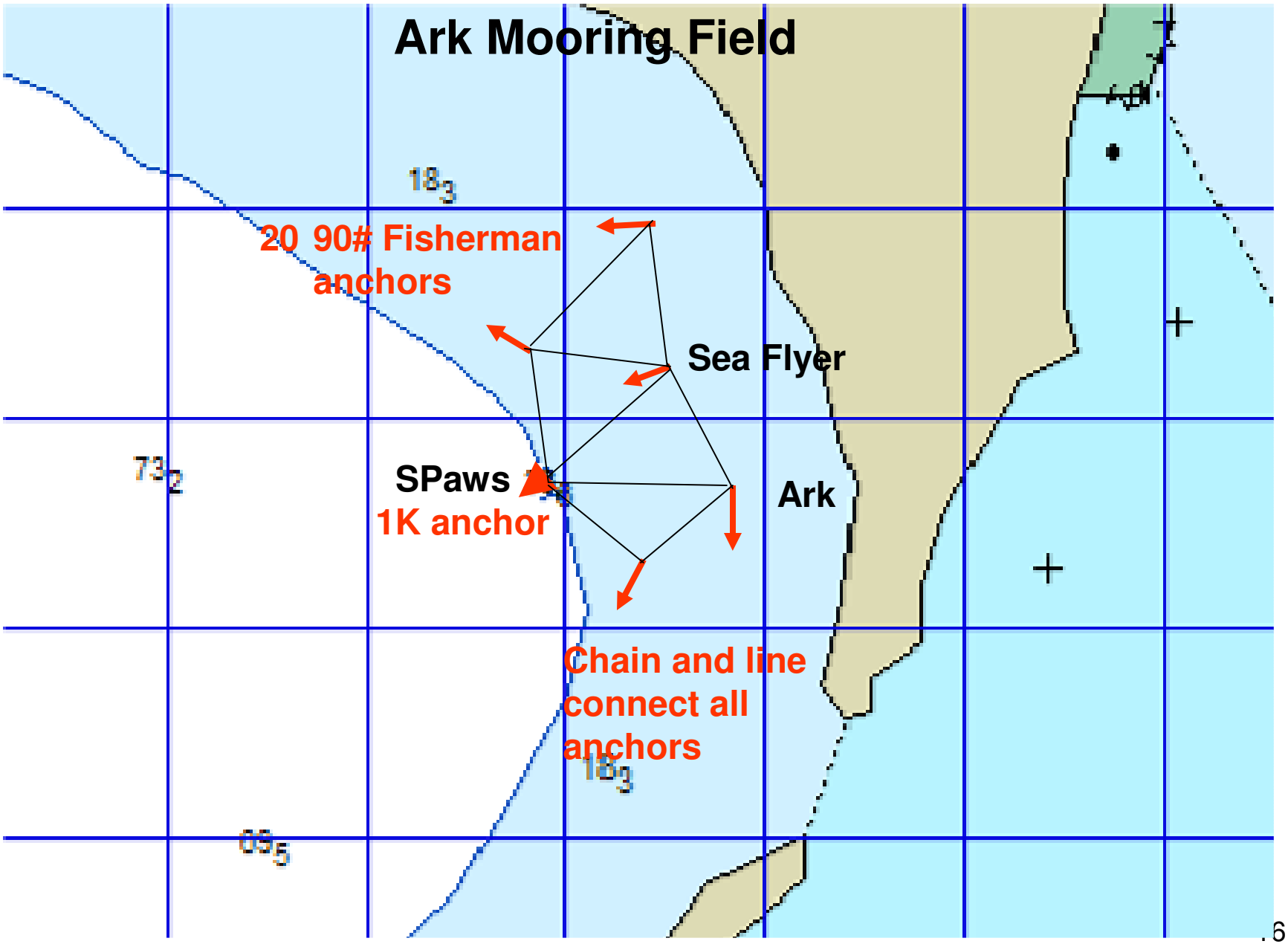



NEIAFU
Makave
Holobeka
TONGA
Wooded
PANGAI
MOTU
Pangaimotu
Ahanga Passage
Mala
Malafakalava
Ofu
Afa
Fafine
KAPA
Wooded
Falevai
174° 02
174° 01
173° 59
173° 58

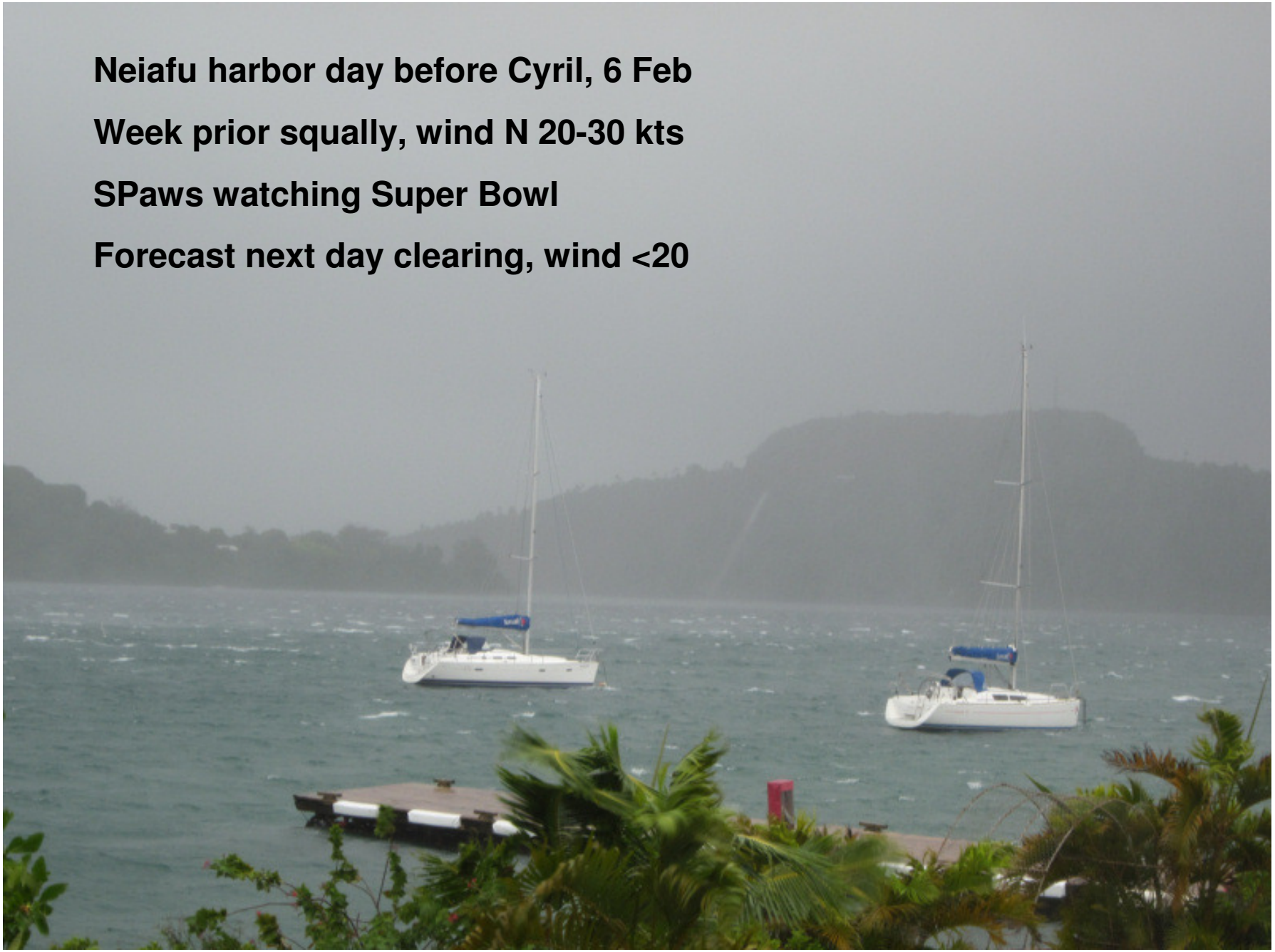
Tapana Bay, Vavau, Tonga



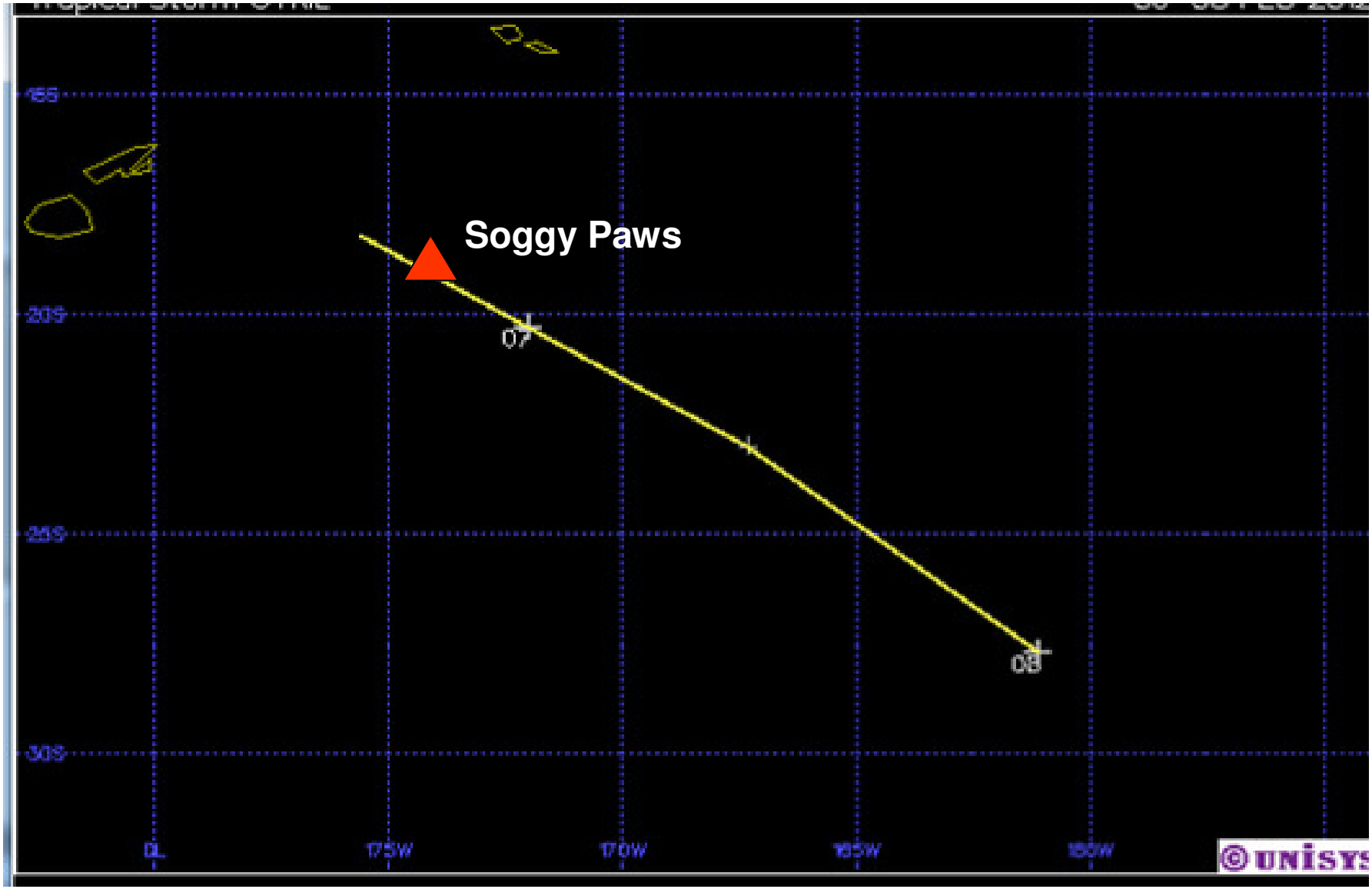
Tapana Bay, Vavau, Tonga


Ark Mooring Field
20 90# Fisherman anchors
Sea Flyer
SPaws
1K anchor
Ark
Chain and line connect all anchors

SPaws Storm Mooring Rig

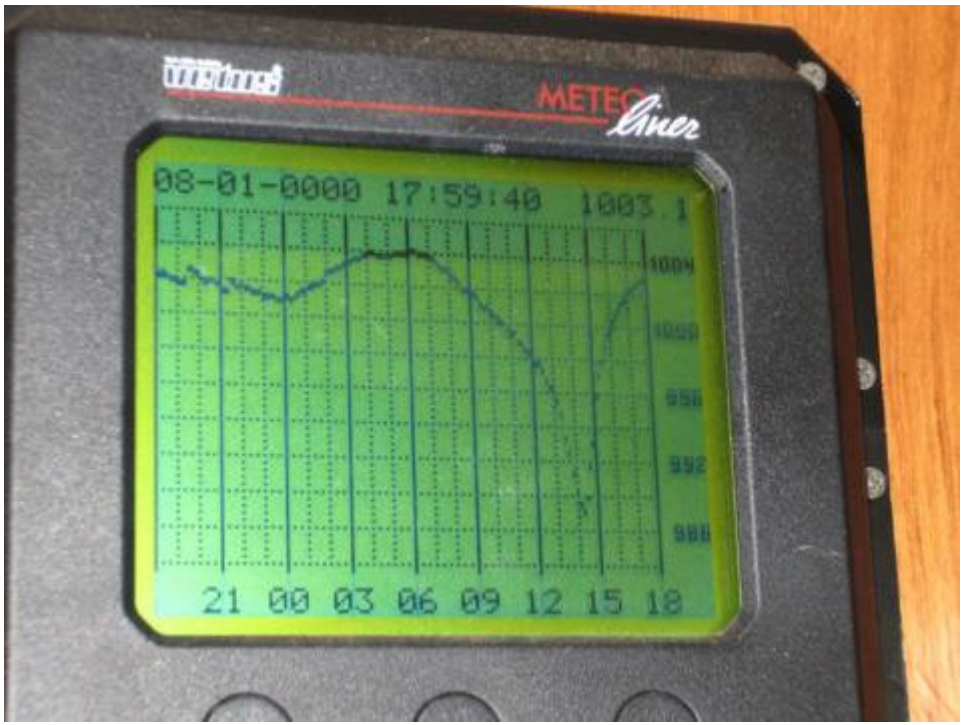

Neiafu harbor day before Cyril, 6 Feb
Week prior squally, wind N 20-30 kts
SPaws watching Super Bowl
Forecast next day clearing, wind <20

TCyclone Cyril 6-8 Feb 12



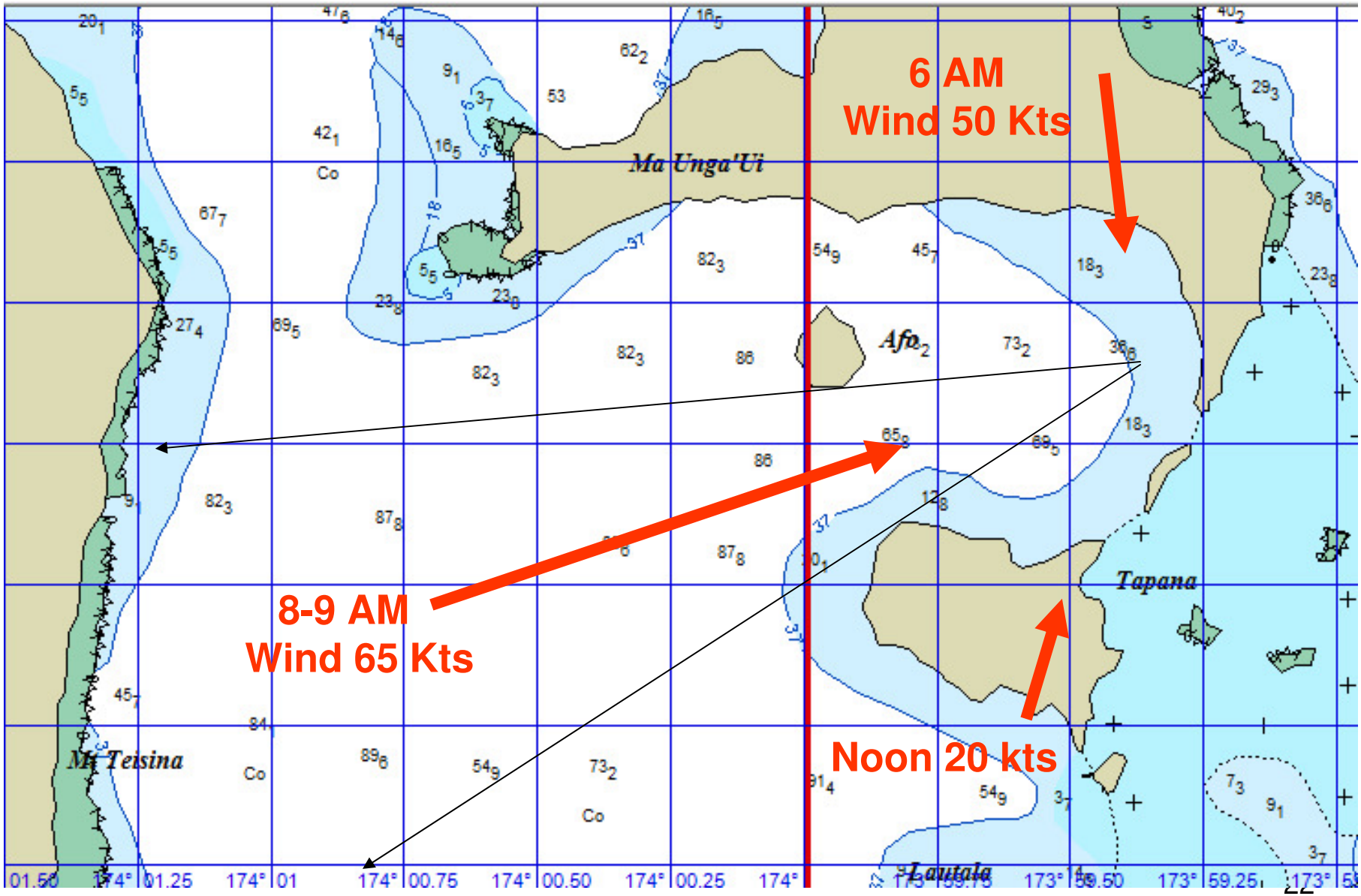
Surprise Cyclone Cyril

February 6, 2012



Barometer Drops to 989mb in 7 hrs!

- At 6 am we got the first 50 kt gust
- By 8 am 60 kts+ and 90-degree wind shift
- 5-6’ Seas in the anchorage
- Soggy Paws drags “cyclone mooring”
- Noon--wx back to normal @15-20 kts


6 AM
Wind 50 Kts
8-9 AM
Wind 65 Kts
Noon 20 kts
Ma Unga'Ui
Afo
Tapana
Mt Teisina
Lautala
Co
01.50
01.25
01
00.75
00.50
00.25
174°
173°
59.50
59.25


Soggy Paws from Sea Flyer

Soggy Paws from Sea Flyer


Shango


Sea Flyer from Soggy Paws

During TC Cyril 08-1000

- Dinghy flopping on davits aft
- Mooring dragging about two boat lengths
- Engine started
- Wind backs almost 90 degrees, N--W
- Sea Flyer's mooring line caught between SPaws rudder & skeg, unable to motor clear
- Sea Flyer's bow crashing into SPaws stern quarter causing heavy damage
- Dave enters water w/MSF to assess Sea Flyer's mooring line situation

During TC Cyril 08-1000

- Strong wind/waves prevent moving boats
- SPaws' dinghy, Monitor, and stern platform ripped off
- Sea Flyer 1" mooring line chafed through in ~ 10 mins on SPaws rudder post heel plate
- Sea Flyer's 2nd mooring line holds
- Sherry able to motor clear and continues motoring for next 2 hours to remain clear
- Dave boards Sea Flyer


SOGG AWS
MARATHON, FL

After Cyril from Sea Flyer

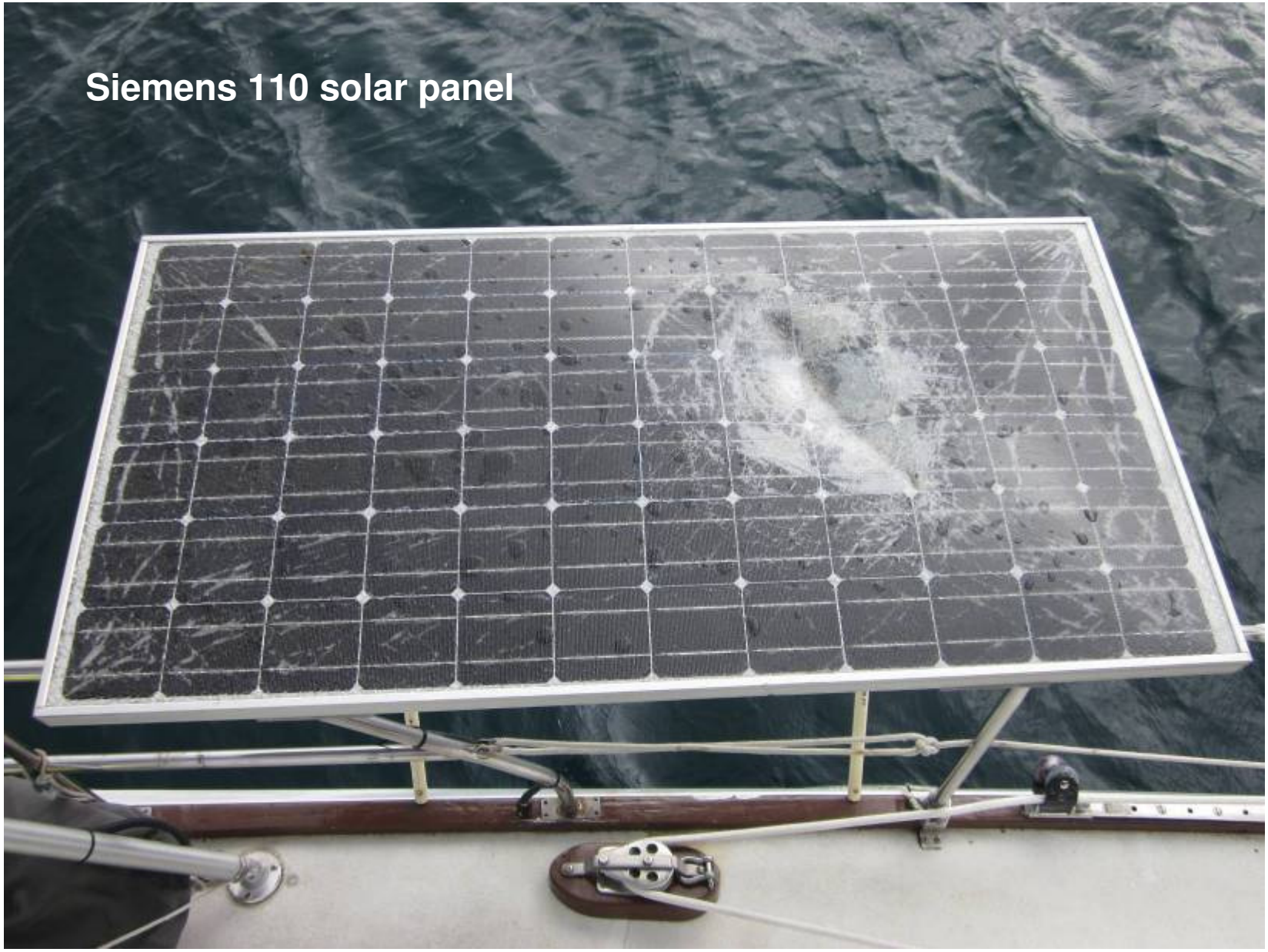
Damage Assessment

- 110 watt solar panel mounted on port quarter smashed
- 175 watt solar panel on arch bent and glass shattered
- Bent/broken stern pulpit/stanchions on port quarter
- Extensive fiberglass damage on port quarter.
- Port hole in the affected area destroyed
- Aluminum swim platform on the stern ripped off and bent
- Monitor self-steering vane ripped off, mounts bent
- Arch post bent/holed
- Dinghy ripped off davits-recovered with two holes in pontoons
- 5 HP Nissan outboard motor ripped off the dinghy and sunk
- Dinghy gas tank plastic cap broken off
- "Soggy Paws" name and hailing port on stern (decal) damaged
- Interior oak trim damaged

Ruined Porthole

Port Quarter

Stern, Monitor, Swim Platform


Siemens 110 solar panel

New Cyclone Season Plans

- Collect the pieces/parts
- Seal fiberglass hole w/ garbage bag
- Order repair materials from NZ-2 mos lead
- Move to Neiafu town moorings
  - Stronger moorings
  - Dock space, hardware stores & welder
  - Internet & better social life
- Work on repairs during the week, cruise on the weekends
- Dive 1 day each week


Swim platform repair
MERCURY


Monitor work


Stern rail work

Monitor , swim platform & stern rail repaired

Dinghy repair-2 patches


Outboard motor flush/repair

Carl at work from his dinghy


Carl at work

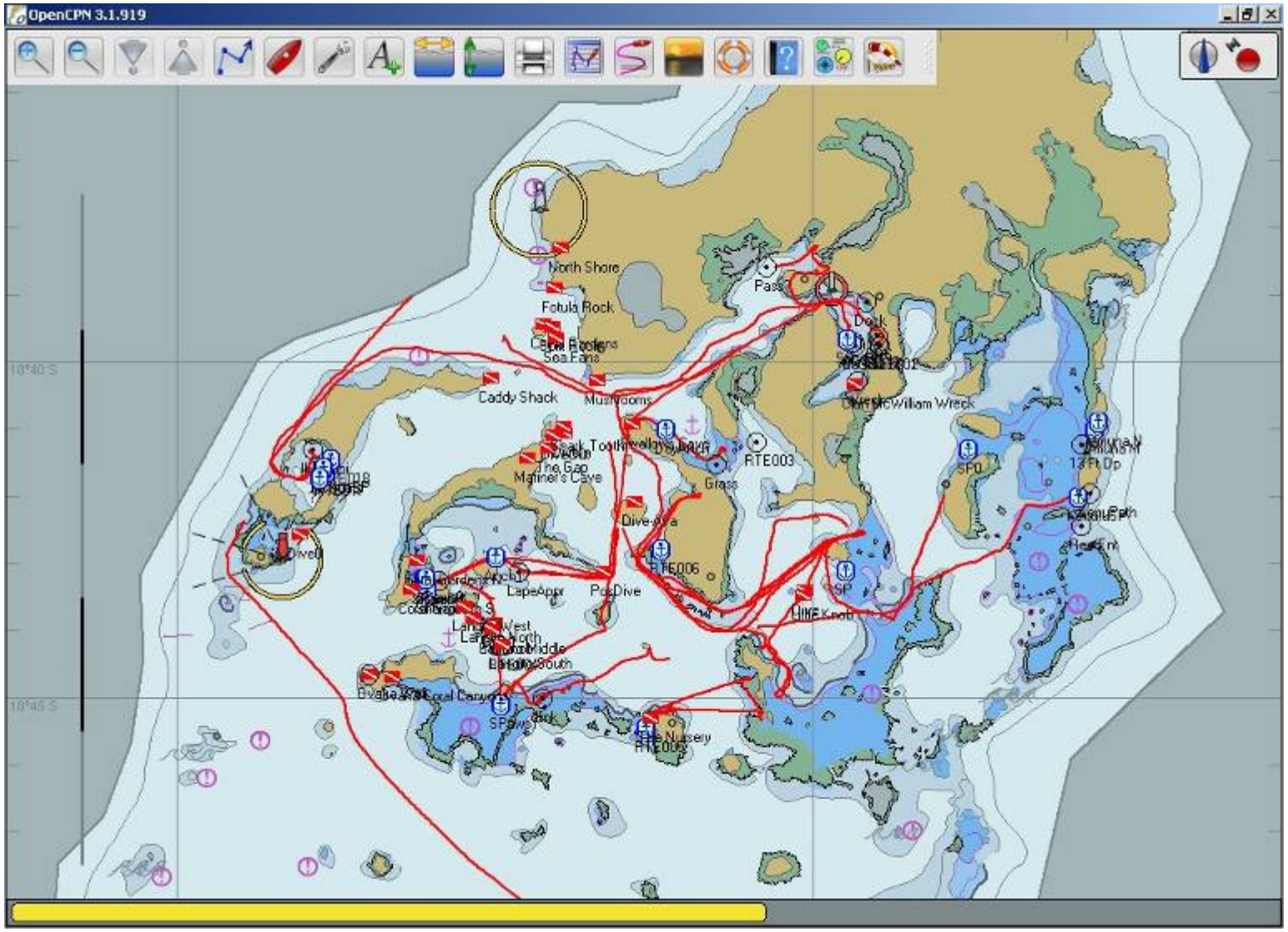
Plywood shell in place


Fiberglass work done


Awlgrip Primer on


Seaworthy Again!
May 5, 2012

Why Stay in Tonga during Cyclone Season

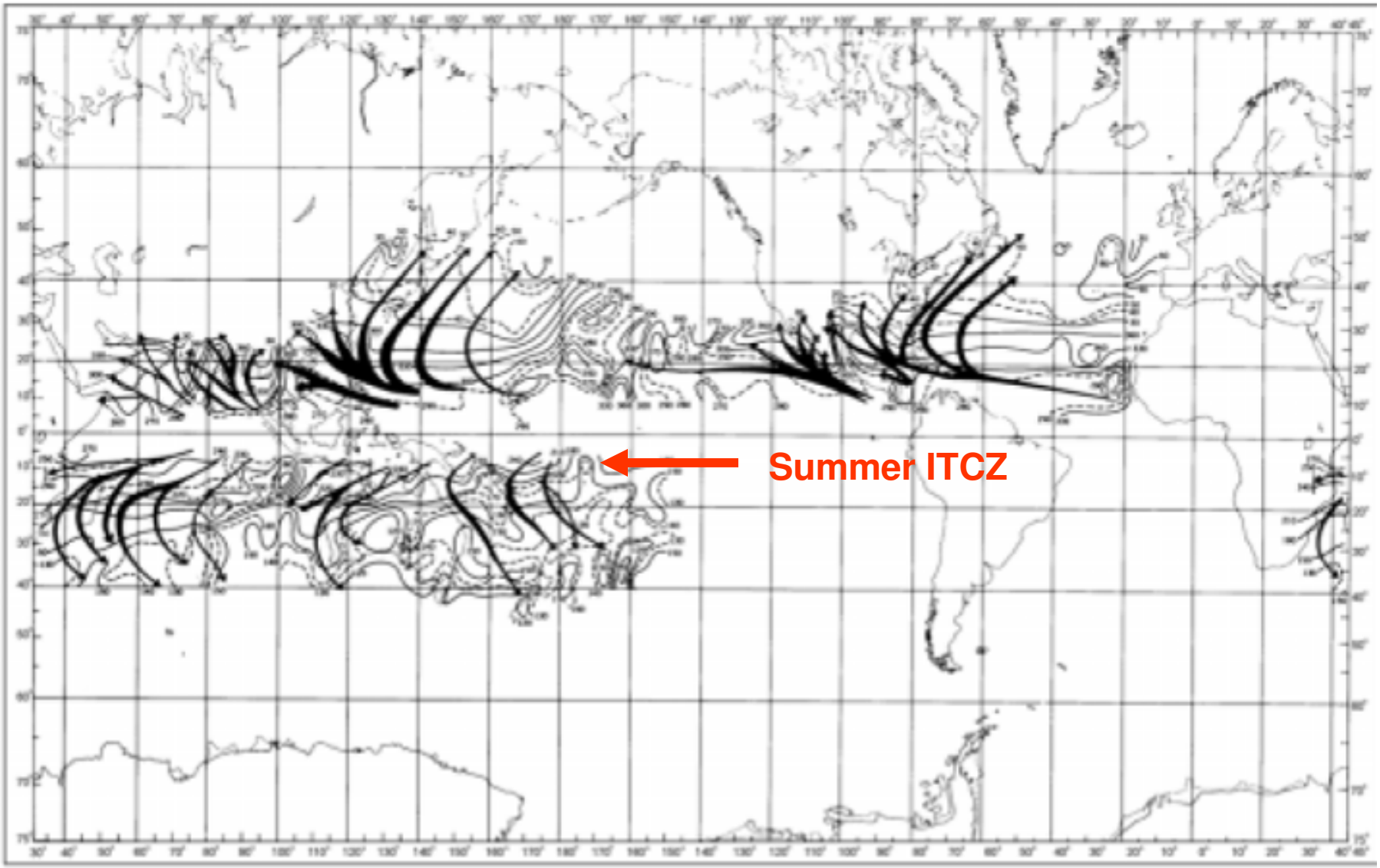



Great Cruising Grounds

Lessons Learned

- When MJO and SPCZ in area watch out!
- Don’t trust Grib Files for accurate wind predictions for fronts, depressions, troughs
- 2 nm fetch too much in 65 kt TCyclone
- Don’t trust owners’ opinion re strength of their moorings
- 1000# stockless ship’s anchor not enough to hold 40K# boat in 65 knots
- Ensure quick disconnect capability when on a mooring

World Tropical Storm Paths



CSY Wind Load Graph

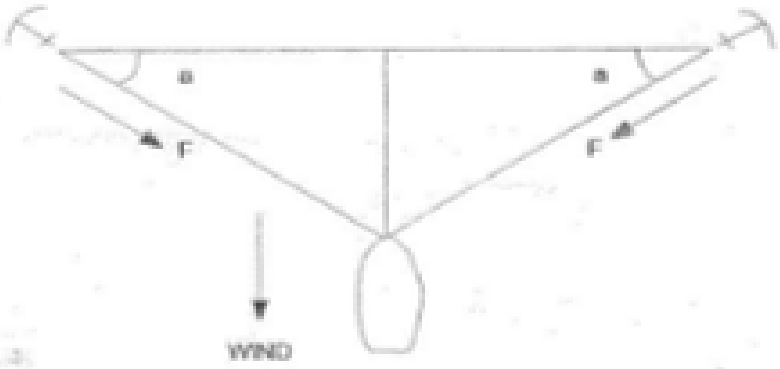
Assumptions: CSY 44 with Wind Resistance (WR) of 243 sq. ft.

Wind Pressure WP = Cd x P/2 x V**2 x WR
Cd = Coefficient of vessel drag...assume 1.1
P = Air density...assume .0034
V = wind velocity
Thus, WP = V**2 x .454-(lbs)
Wind pressure is the force on a single anchor (assuming no significant current)

	SINGLE	TWO ANCHORS ACROSS THE WIND					
V	WP	F with a=	F with a=	F with a=	F with a=	F with a=	F with a=
		10	20	30	45	60	75
10	45	131	66	45	32	26	24
20	182	523	266	182	129	105	94
30	409	1176	598	409	289	236	212
40	727	2093	1063	727	514	420	376
50	1136	3271	1661	1136	803	656	588
60	1636	4710	2391	1636	1157	944	847
70	2227	6411	3255	2227	1574	1286	1153
80	2908	8374	4251	2908	2056	1679	1505
90	3681	10598	5381	3681	2603	2125	1906
100	4544	13084	6643	4544	3213	2623	2352
110	5498	15832	8038	5498	3886	3174	2846
120	6543	18841	9566	6543	4627	3778	3387
130	7679	22112	11226	7679	5430	4434	3975

However, if the boat is anchored in Bahamian moor style, with the wind perpendicular to the (imaginary) line between the two anchors, then the force on each anchor is:

F = WP / (2sin a) If a=0, F is infinite (assuming no rode stretch)



- Straight line wind pressure only
- Must add yaw, pitch & shock
- Calder calcs say at least double!

Mooring Strengths

Vineyard Haven, Pull Test Results		
Mooring Type	Bottom Condition	Breakout Force
350-lb. Mushroom	5 ft. deep in mud	2,000 lb.
500-lb. Mushroom	in sand bottom	1,700 lb.
3,000-lb. Concrete USCG block	set in mud	2,100 lb.
6,000 lb. cement block	on sand bottom	3,200 lb.
8/10 Helix	soft clay mud	**20,800+ lb.**

Mooring Type	Helix	Dor-Mor anchor 650 lbs	mushroom 500 lbs	single block 2k lbs	double block 8k lbs
Resisting Force (lbs.)	12,000	4,500	1,200	800	4,000
Water Depth	20	18	15	14	35
Scope	4:1	3:1	3.5:1	3:1	3:1

More here…

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The End