

Weather, Navigation & Tactics

Vic Maui 2016
Tim O'Connell



Weather

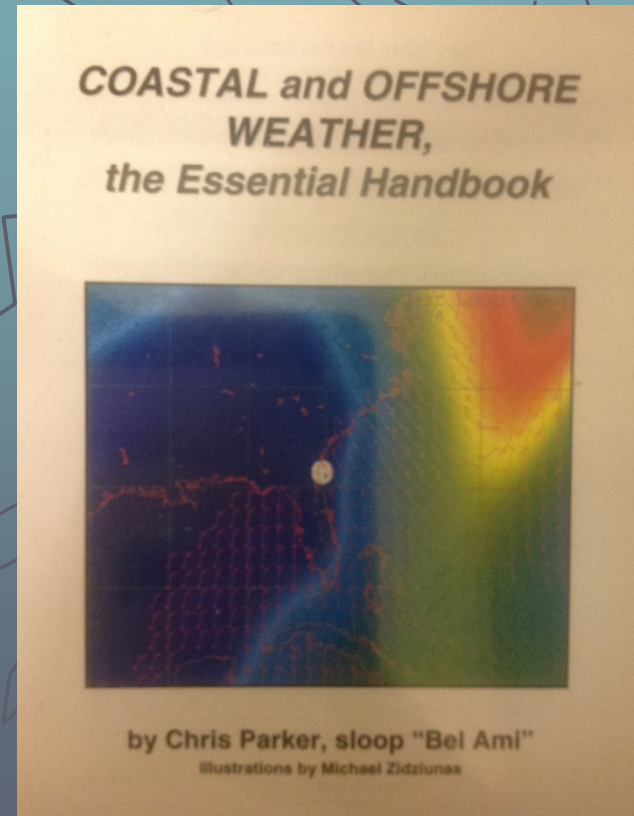
- ▶ Will there be weather?
 - Yes. The Nights will be dark, followed by periods of scattered light
- ▶ Will I get wet?
 - Yep. It's a good time for Gortex !!



Copyright © Tim O'Connell 2015

Study the Weather

- ▶ Coastal and Offshore Weather
The Essential Handbook
By Chris Parker



Where do I get Weather Data?

► Before the Race:

- Weather Services and Sources: e.g. Ocens, GMN, Predict Wind, Sailflow, USGRIB, SAILDOCS, NOAA, THEYR

► During the Race:

- Free GRIB sources via Email through SSB or Satphone.e.g. Saildocs (most popular source)
- Internet connection via Satphone e.g. direct download from Saildocs or NOAA
- Weather Fax

How Do I get Weather

▶ SSB or Satphone

- e.g. ICOM 806 + Pactor Modem + PC running Comms & Email Software Gateway (X-Gate) + Navigation Software with GRIB select capability

▶ Weather Fax

- E.g. Standalone Weatherfax Receiver, or PC/Tablet/iPad software connected via audio cable to SSB or SW Radio headphone jack.

Example Nav Station



Additional Useful Technology

Onboard WIFI



Beware of the brain frying radiowaves !!



Must Have Equipment a Barometer



Portable Short Wave Radio



Backup Navigation System

- ▶ INAVX on an iPad or iPhone, connected to the boat's NMEA 0183 network (Shipmodul NMEA2000 coming in 2016), can be a primary nav system, minus the weather routing function, or a remote instrument display with charting capability

Example iPad & Shipmodul Mux



Software with Grib Select with email interface

▶ PC Systems (some examples)

- Expedition
- MaxSea
- Oceans/GMN Weathernet
- Fugawi Marine 5

▶ Apple

- Fugawi MacENC

▶ IOS iPad/iPhone

- INAVX
- Weather 4D

Others using an Internet connection and direct download

- ▶ PC Systems (In addition to previous list)
 - UGRIB
- ▶ IOS iPad/iPhone
 - PocketGrib

GRIB Viewers

- ▶ All the previously listed navigation systems have GRIB viewing capability
- ▶ Once a GRIB file has been received, the following applications also display the files:
 - PC – Oceans/GMN Grib Explorer
 - IOS iPad Oceans/GMN Grib

Other Software

▶ Weather Fax Viewer

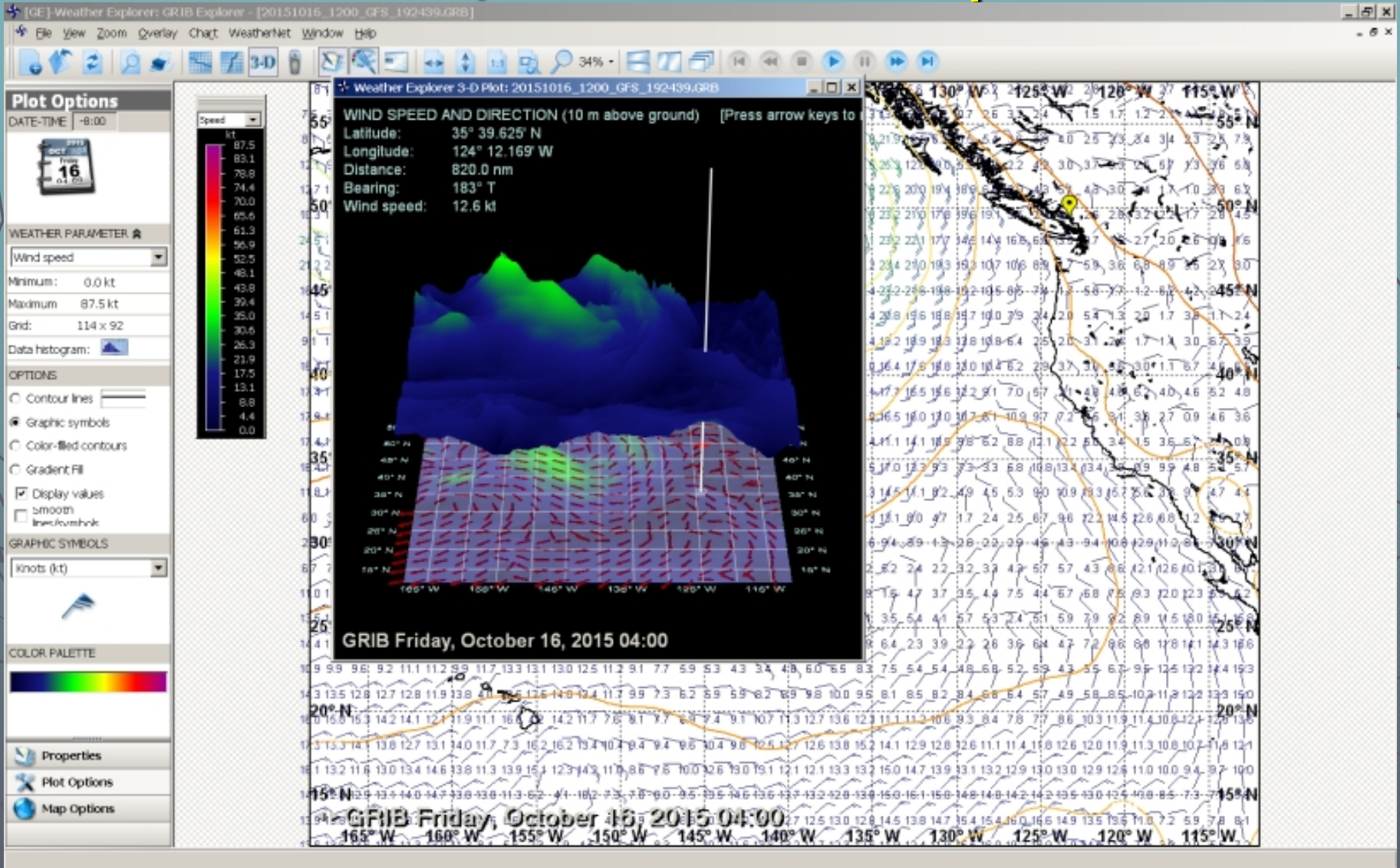
■ OCENS/GMN Metmapper

▶ This software imports a faxed image of a typical weather fax forecast, and displays it like a Grib Viewer. It can import a series of images and play them in animated manner

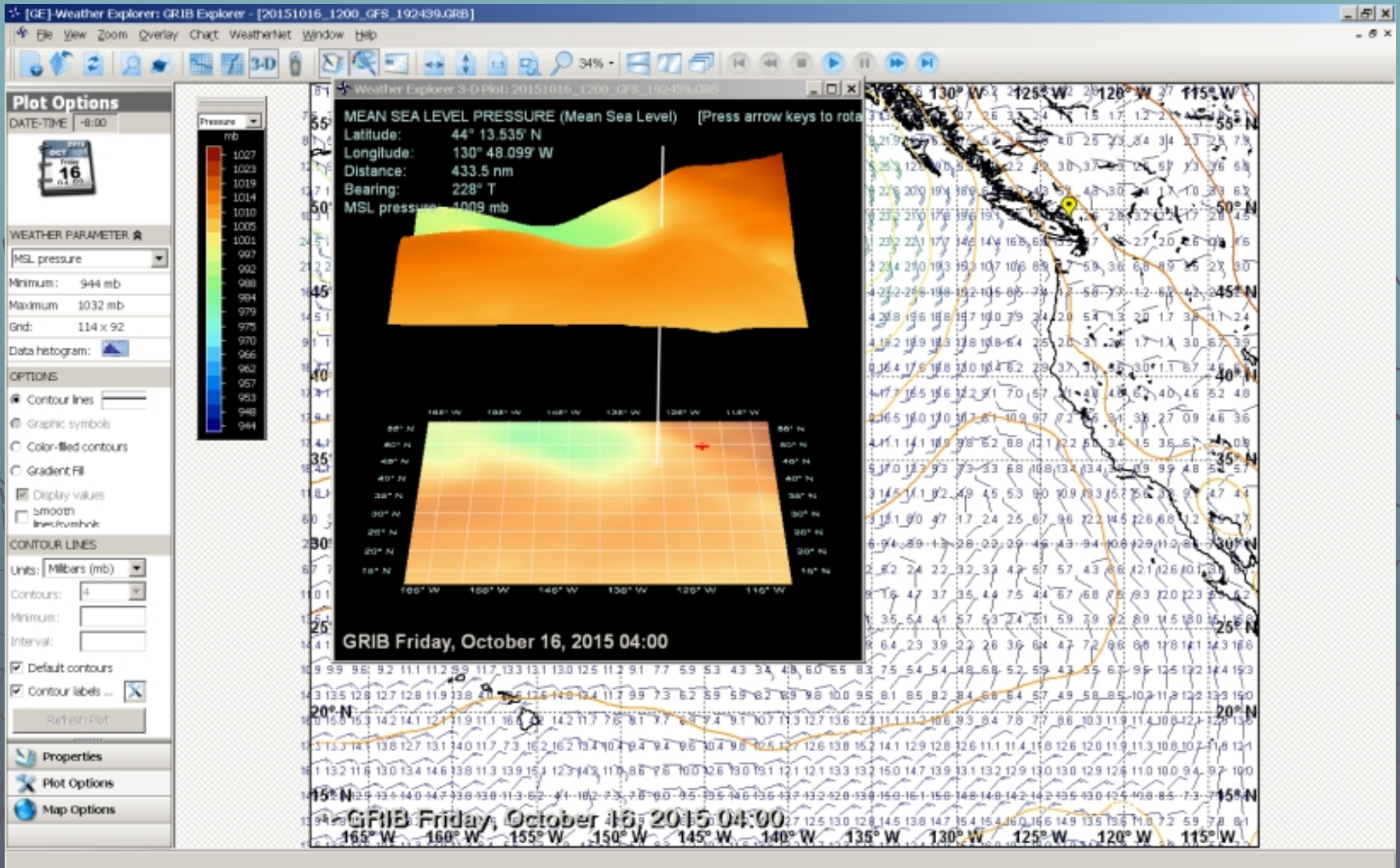
■ IOS – iPad – HF Fax

▶ By connecting your Mic port to the speaker output jack of your SSB or SW Radio, this App translates the incoming sound into a Fax image.

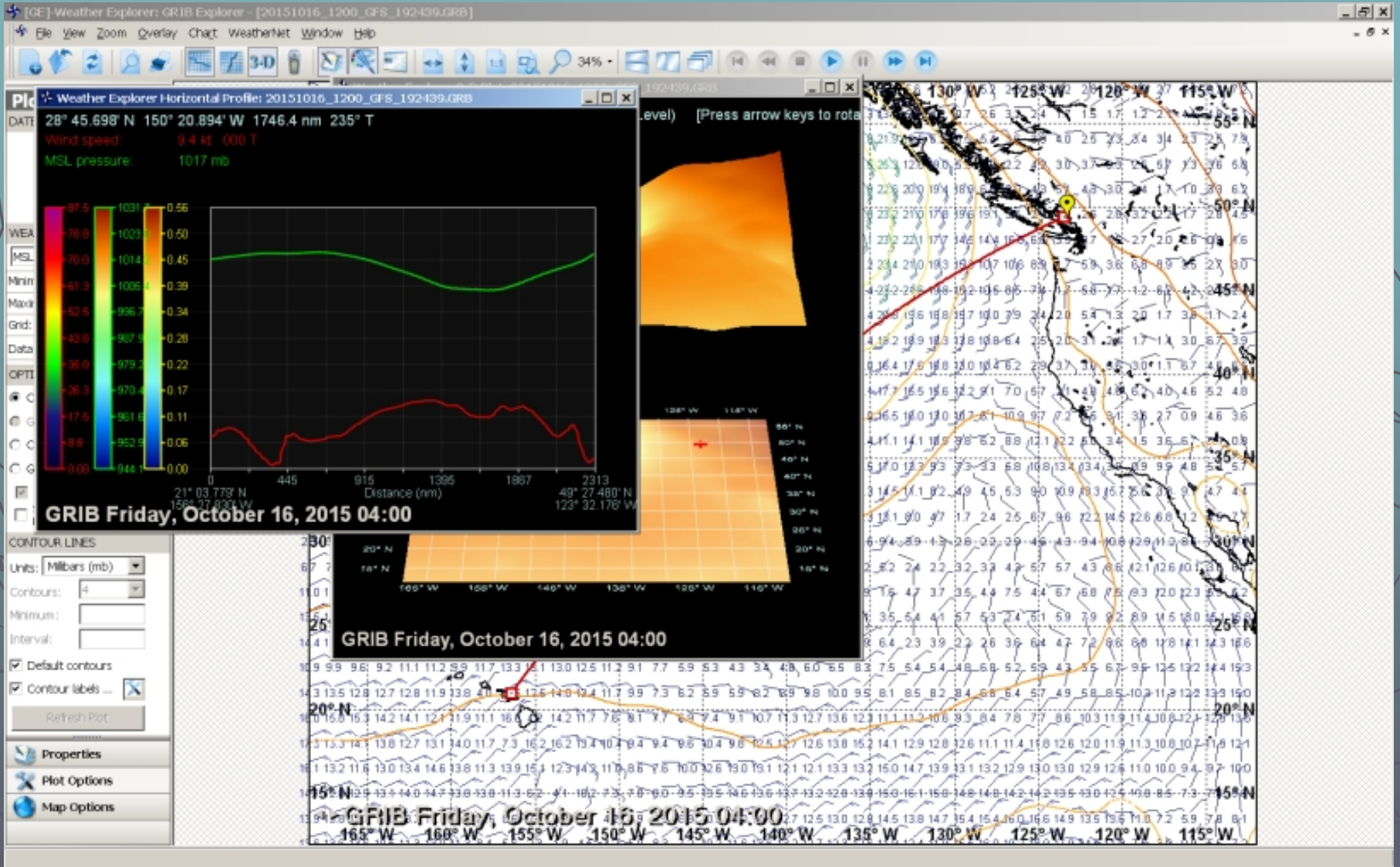
Oceans/GMN Grib Explorer



Cont.....



Cont.....



NAVIGATION Essentials

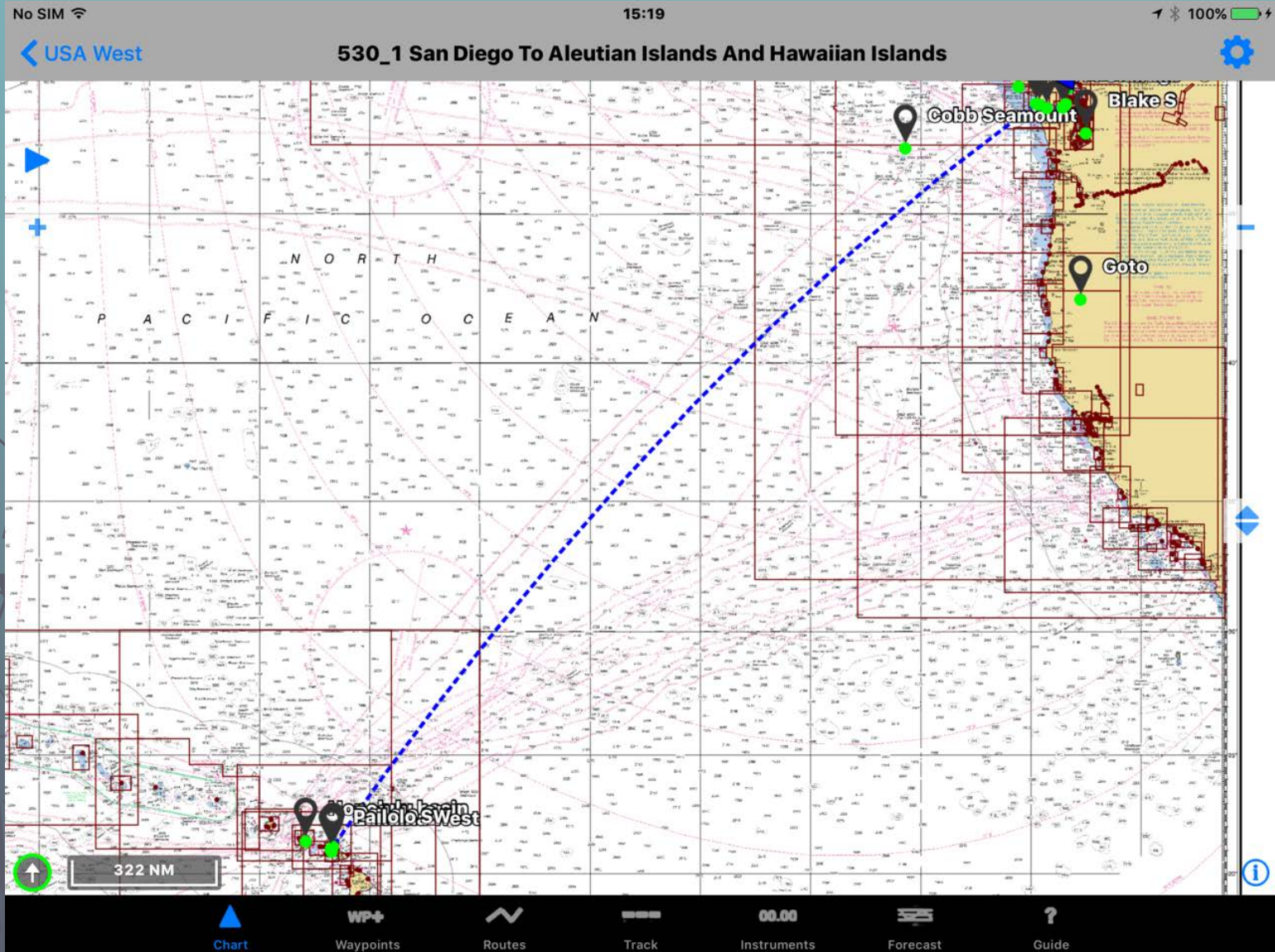
▶ Charting Software

- Preferably with Weather Routing
- ACCURATE POLARS
- GRIBS
 - ▶ Pressure
 - ▶ Surface Wind (10 metres off surface)
 - ▶ Precipitation
 - ▶ Tidal Currents
 - ▶ Ocean Currents
- Calibrated Instruments and Barometer

Cont....

- ▶ Train a backup navigator
- ▶ Change of watch briefing
- ▶ Identify situations when Navigator needs to be notified of changes in conditions
- ▶ **MAINTAIN A PAPER LOG**
 - Update every hour

The Rhumb Line



Summary of RL Legs

No SIM 15:18 100%

< Routes Distance: 2,316 NM

VicMaui 2016

+ Edit Distance	Scroll To	Goto	
Brochie Ledge			
Race Psg	209° Mag, 8.68 NM		
VM Clallum	252° Mag, 37.58 NM		
VM Neah Bay	279° Mag, 52.31 NM		
Duntze Rock	268° Mag, 58.30 NM		
Pailolo Ch	218° Mag, 2,300 NM		
Pailolo SW	211° Mag, 2,309 NM		
Lahaina West	143° Mag, 2,316 NM		

Sample Log

1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18	19	
1	Logbook																	
2																		
3	Boat	Hinckley 42 "Sparky"			Skip			W Cap										
4	Race	Marion Bermuda			Nav			Helm										
5																		
6	Date	Time	Pos. Lat	Pos. Long	Log	Dist from last Log	Hdg M	COG from last Log	Baro	Sea Temp C	APP Wind Speed	True Wind Angle	True Wind Dir	Boat Speed	Ave Boat Speed	SOG	Depth	Comments
7	Jun/17	13:00	41 39.045N	070 42.926W	1133.90		259M		1015	20C	33kn	50	175T	6.70		6.7kn	30ft	Protest at start RRS 10. Not filed
8	Jun/17	15:06	41 32.092N	070 51.263W	1157.40	23.5	239M	227M	1014	20C	21kn	50	175T	5.90	11.2kn	6.1kn	52ft	
9	Jun/17	16:06	41 26.991N	070 52.662W	1162.90	5.5	241M	242M	1014	18C	22kn	50	177T	5.00kn	5.5kn	4.9kn	63ft	
10	Jun/17	19:04	41 21.048N	071 01.277W	1173.60	10.7	155M	221M	1014	16C	18kn	50	191T	5.6kn	3.6kn	4.5kn	96ft	Jammed genoa halyard-60 mins to clear-Rob bruised
11	Jun/18	0:46	41 10.609N	070 45.358W	1195.30	21.7	144M	147M	1012	15C	18kn	60	190T	5.0kn	3.8kn	4.7kn	107ft	Storm jib in lieu of headsail. Halyards twisted in dark
12	Jun/18	2:30	Recharging for 1 hr at 1000RPM															
13	Jun/18	2:33	41 07.767N	070 41.184W	1199.00	3.7	169M	148M	1012	15C	6kn	60	215T	3.0kn	2.1kn	2.5kn	123ft	Very slow! No wind left over waves. Thunder storms

Weather Routing - Polars

C-Map - Expedition

Charts Marks Sail Start Weather Optimal Tools Playback Window State Style ?

Polars Sail chart Sail list Tests Event list Set event Race schedules Edit boats Bsp+twa as targets Edit database Notes Add Save Clear Save as Import

HO 1700 Thu 15 Oct 48 26 00 N

Polars

Nav Perf Start Heel Pol5 Pol6 Pol7 Pol8

	Twa0	Bs...	Twa1	Bs...	Twa2	Bsp2	Twa3	Bsp3	Twa4	Bsp4	Twa5	B
4	0	0	47.5	4.59	60	5.51	90	6.3	120	5.63	137	4.
6	0	0	46	6.36	60	7.6	90	8.46	120	7.99	139.1	6.
8	0	0	43.2	7.25	60	8.66	90	9.56	120	9.43	141.8	8.
10	0	0	41.5	7.74	60	9.18	90	10.19	120	10.31	147	8.
12	0	0	41	8.06	60	9.47	90	10.66	120	11.03	151.1	9.
14	0	0	40.4	8.21	60	9.69	90	11.18	120	11.7	150.5	10.
16	0	0	40.1	8.31	60	9.86	90	11.58	120	12.49	146.5	11.
18	0	0	40.1	8.39	60	9.99	90	11.95	120	13.6	145.5	11.
20	0	0	40.4	8.44	60	10.09	90	12.31	120	14.49	146.8	11.
25	0	0	41.9	8.5	60	10.21	90	13.1	120	16.57	150.8	11.
30	0	0	44.5	8.5	60	10.16	90	13.65	120	18.66	154.5	21.
35	0	0	49.2	8.36	60	9.96	90	13.95	120	20.49	157.2	21.

100 %

C:\Documents and Settings\All Users\Application Data\Expedition\Polars\TP52.txt

OK Cancel

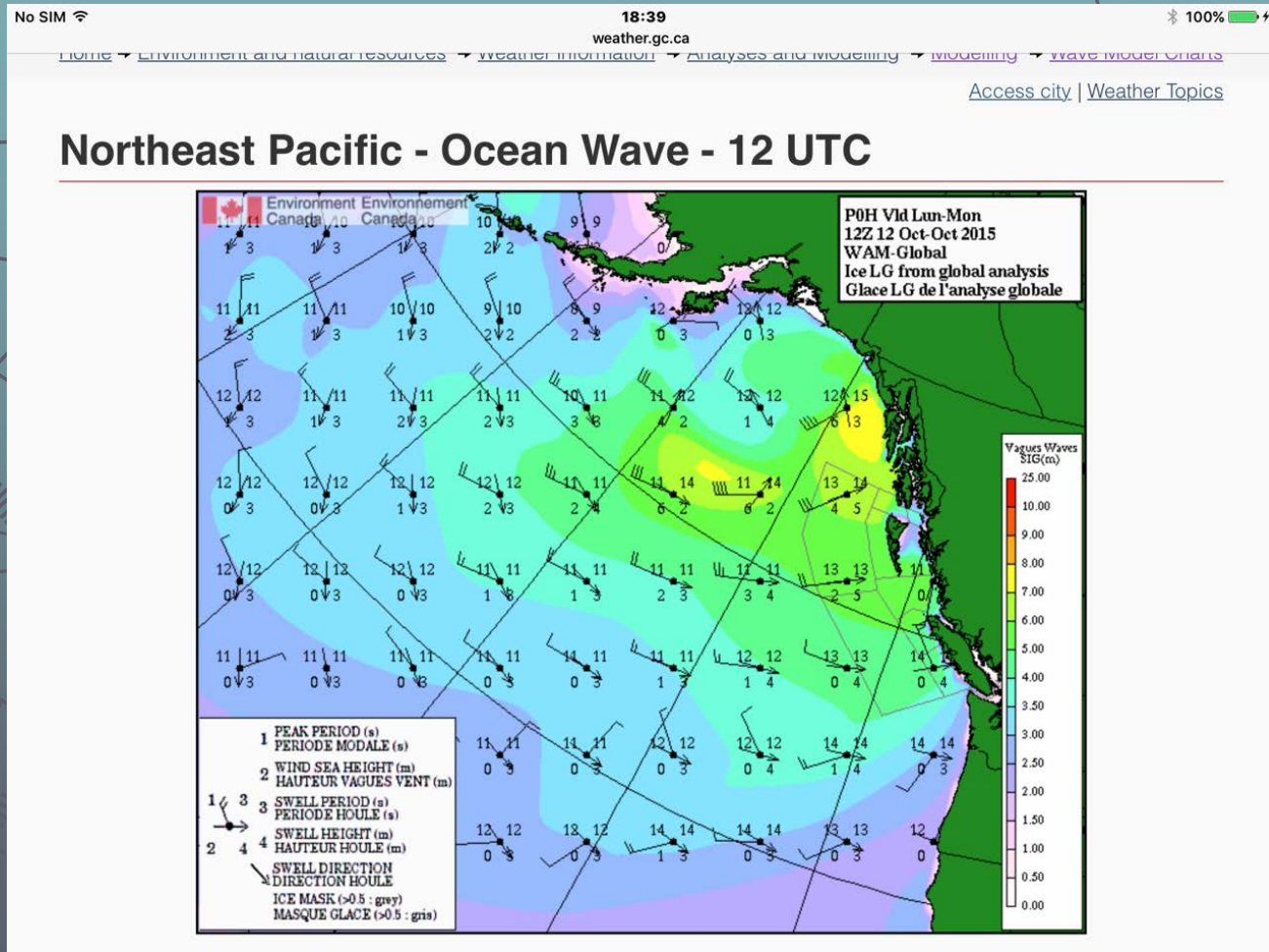
1x 1:36452 Level E/0 | 48 26.184n 124 45.260w | var16.64*e | WGS84 | Metres | NO POSITION FIX | Duntze Rock | VicMaui2016

Boat tracking

Boat	Brg	Rng	MkBrg	MkRng	2m COG	SOG	VMC	5m COG	SOG	VMC	10m COG	SOG	VMC
0													
Boat 1													
Boat 2													
Boat 3													

Other Useful Data

► Environment Canada Wave Heights

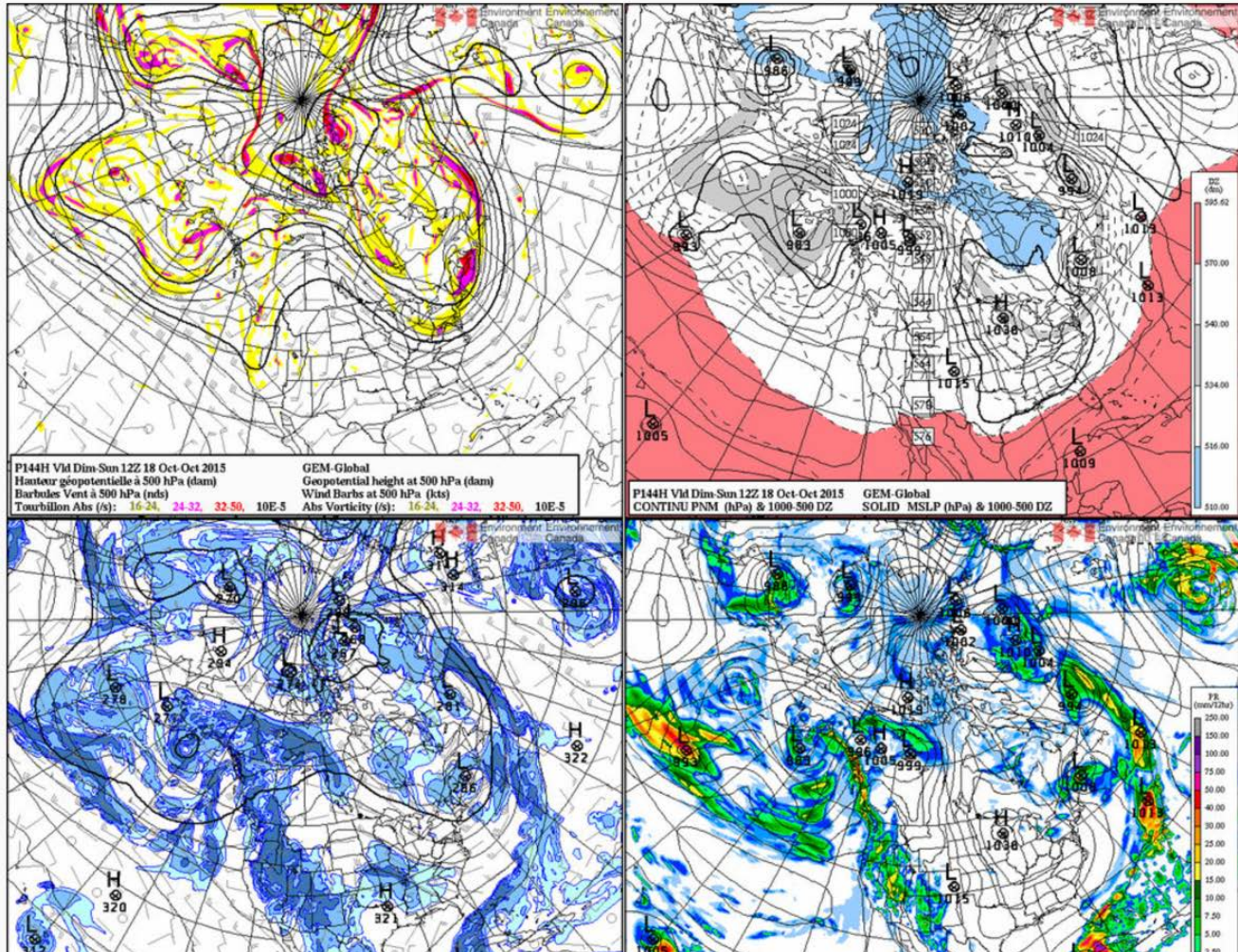


Forecast Models

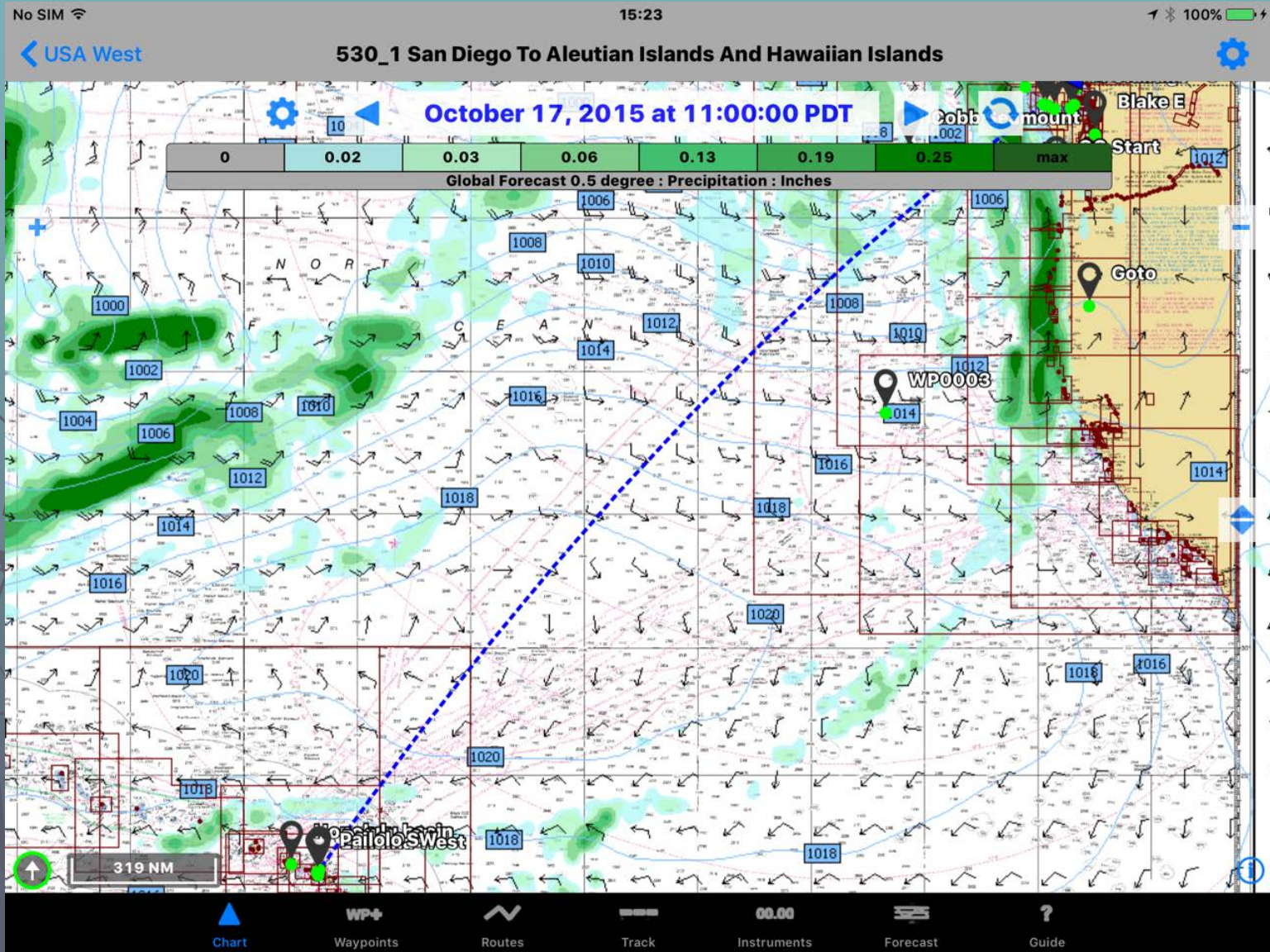
No SIM

18:50
weather.gc.ca

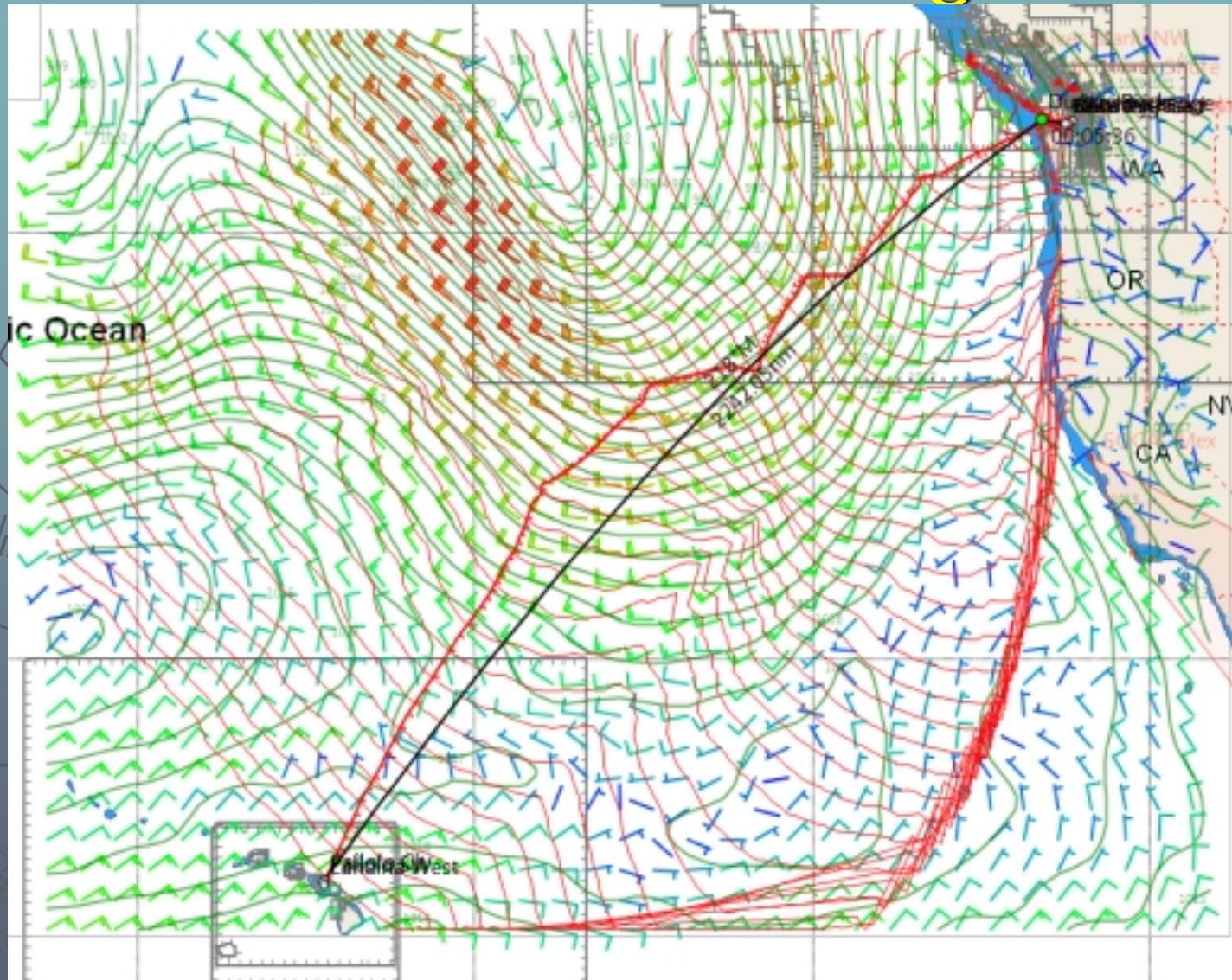
100%



Theyr Weather in INAVX



Weather Routing



Grib Parameters

- ▶ On the morning of the start, load up with long term data and do all the heavy downloads via land based hot spots before leaving the dock.
 - Get 7 Day .25 degree resolution Wind, Pressure, Precipitation, Waves.
- ▶ After Day 1, download only as much ocean area as you will need to see for next 36 hrs.
- ▶ Compare each day with the original 7 Day to check for stability in weather systems.
- ▶ If systems are rapidly moving, INVEST in another download for a wider area and more days in the forecast.

Armed with all this, what's next?

- ▶ SAIL FAST all the time BUT sail where the Navigator/tactician says so.
- ▶ Sailing hot is fun and fast, but after an hour of being 5 degrees higher and hotter on a screaming reach, you might as well start late in Victoria !!!
- ▶ Plot where your competitors are

TACTICS

▶ GENERALLY:

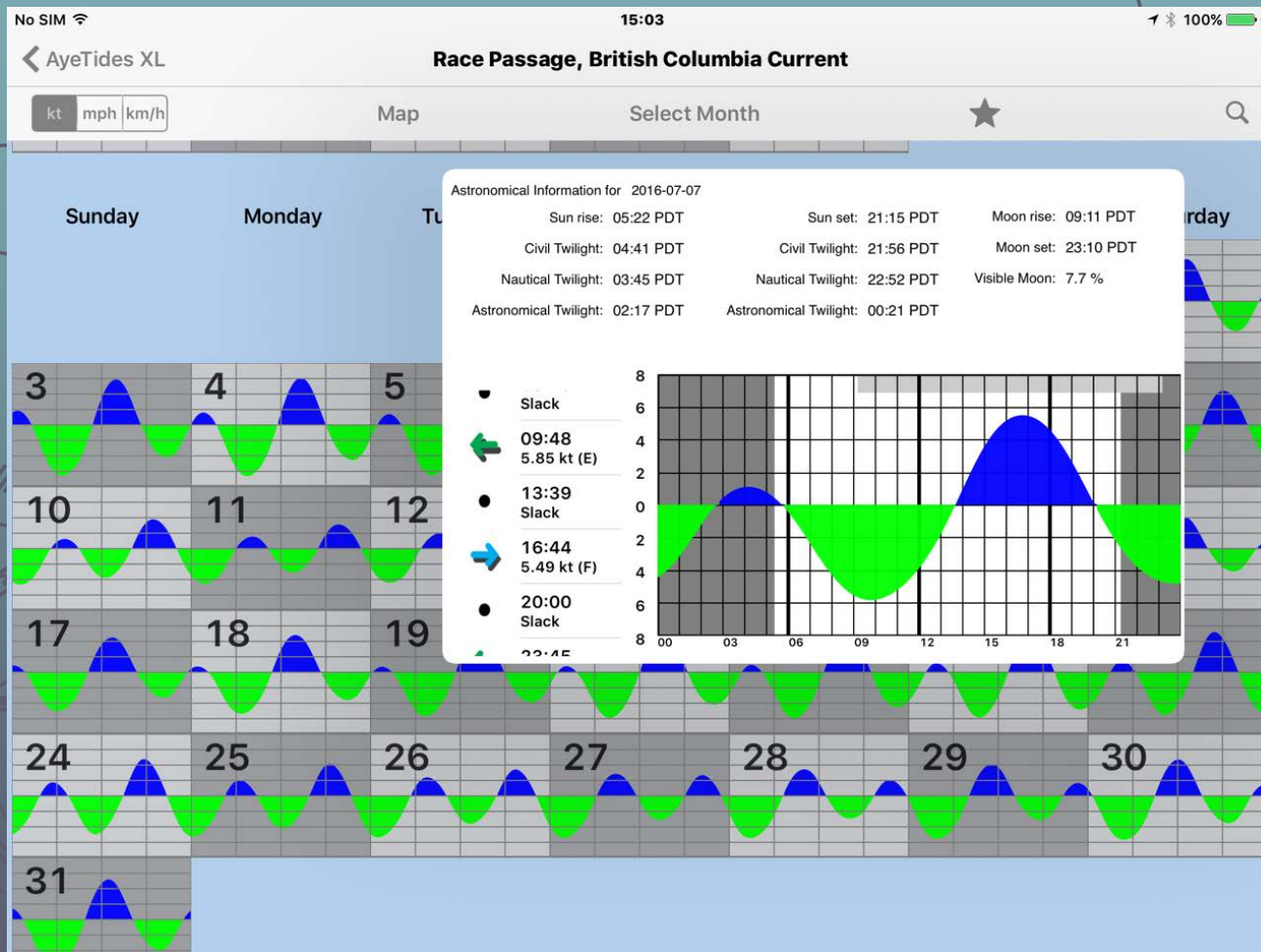
- Break up the race into "legs" e.g.
 - ▶ Leg 1. Start to Duntze Rock
 - ▶ Leg 2. Duntze to approx 38*N
 - ▶ Leg 3. 38*N to the turn around the High
 - ▶ Leg 4. The turn to Orig Rhumb Line
 - ▶ Leg 5. The gybe to Pailolo Channel
 - ▶ Leg 6. Pailolo to Finish

Key Considerations

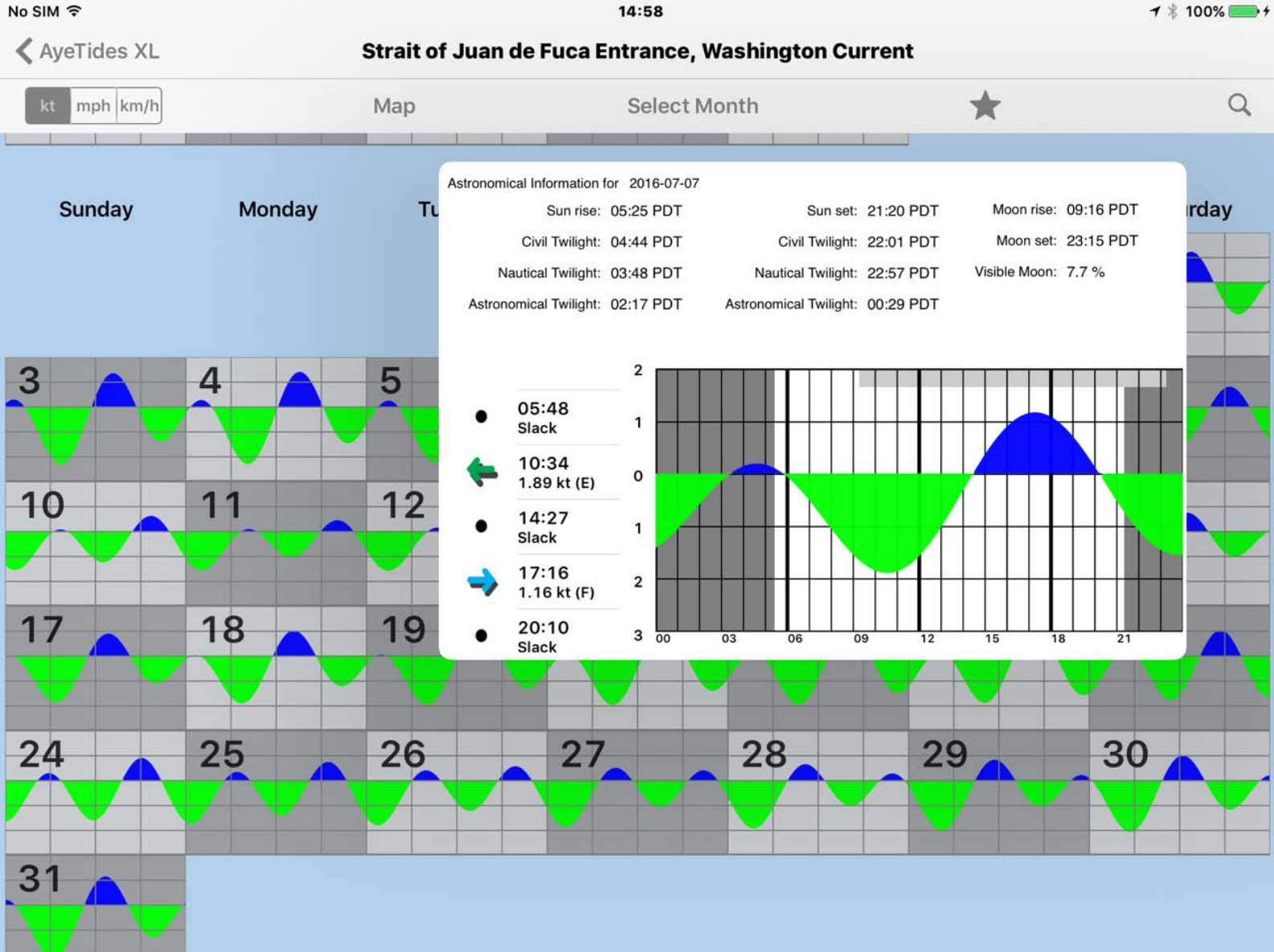
- ▶ Leg 1. It is essential to get out of Juan De Fuca a.s.a.p. Boats that have rounded ahead, have probably popped a chute and are stretching out their lead.
 - Adopt Swiftsure winning approaches.
- ▶ Sail the rhumb line for a day to get crew into the groove (unless conditions favour another course)

Race Passage Current for early start

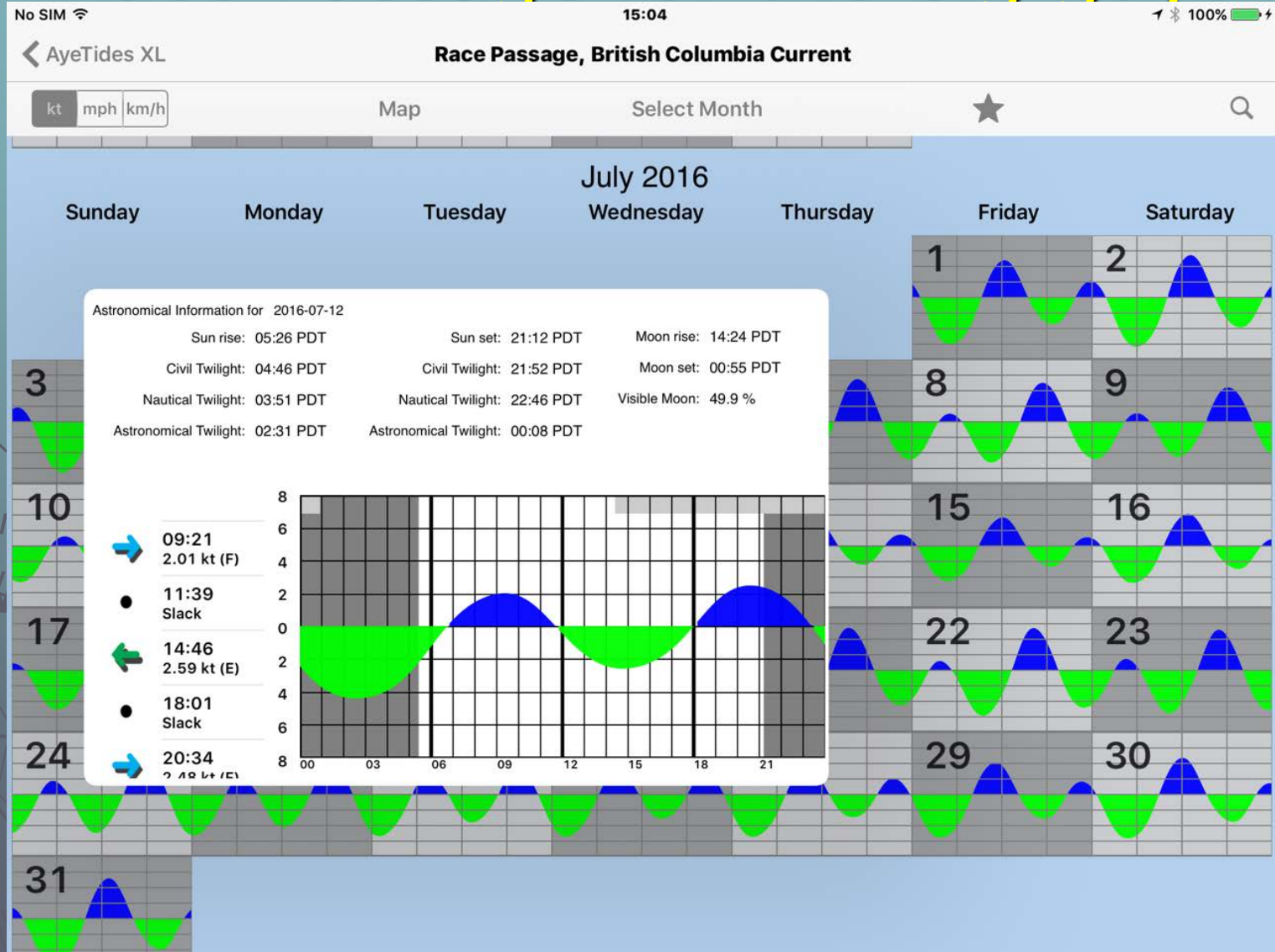
- Aye Tides on an iPad is an excellent set of Tide and Current Tables and integrated with INAVX



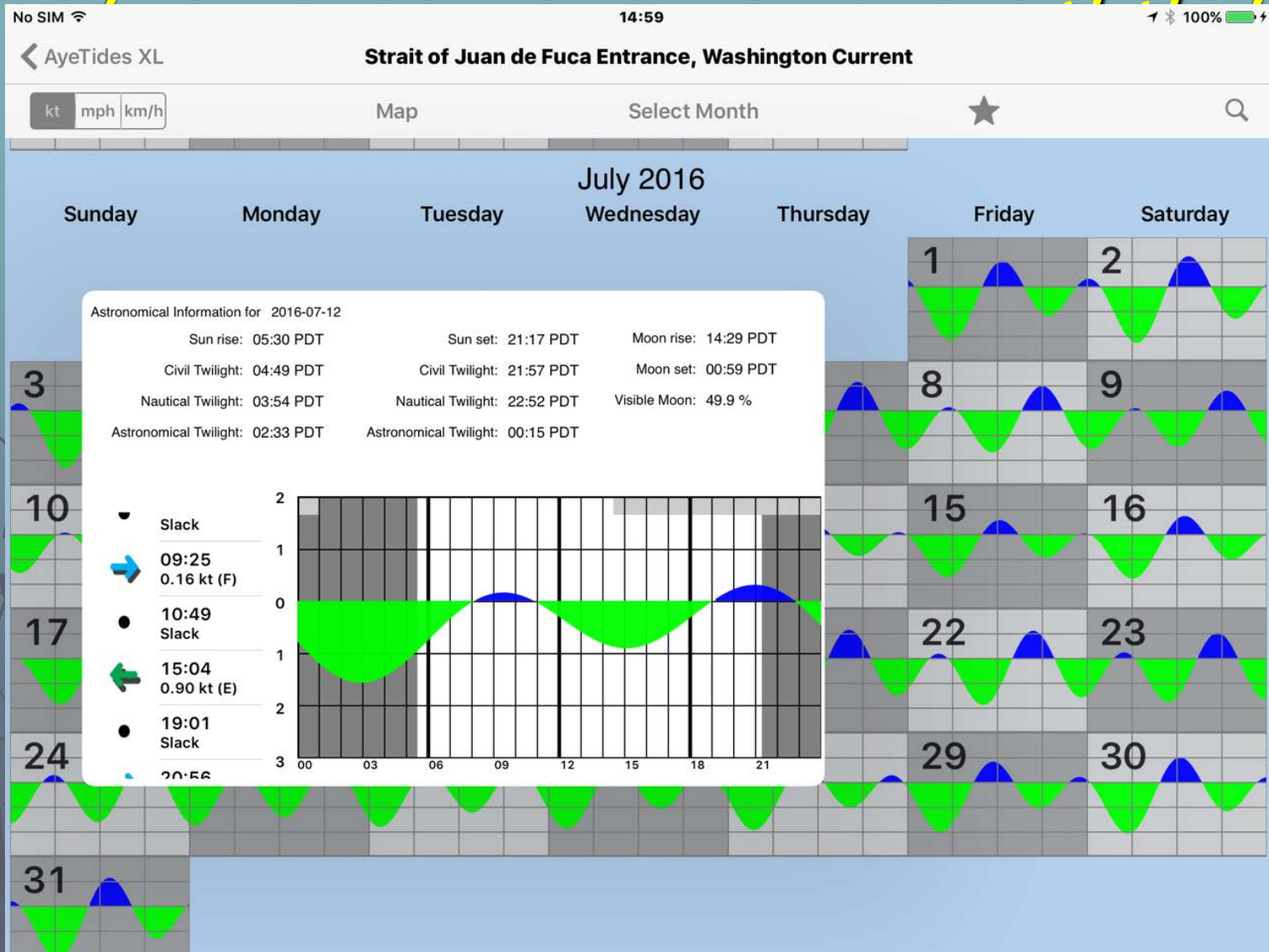
West Juan De Fuca for early starters



Race Passage for the big guys



Day One Current for the big guys



Key Considerations

- ▶ Where should we turn the corner of the high ??
 - It has often been the case that inside 3mb's of the highest pressure "islands" winds drop off, and the wind angle gybing away from the high, once you have gone in to close, is awful in terms of VMC to Maui.
 - Outside of 3mb's you are more likely to see more than 10 kn.
 - These are sweeping generalizations that don't take into account slope of the pressure gradient etc... But check out the grib's yourself to get a sense of that dividing "sanity" line

Key Considerations...

- ▶ On your approach into Pailolo Channel, there's a big windshadow west along the west side of Maui
- ▶ In fact, wind comes over the island from the East, and curves back in the backeddy.
- ▶ Approach roughly half way between Maui and Molokai to stay in less fickle wind directions and don't be too tempted to turn to the finish line too soon.

Have Fun Be Safe



Copyright © Tim O'Connell 2015