Electronic Navigation Alternatives

"What electronic navigation tools should I be using to navigate with as I go further offshore?"

Or.. How to stay off the Rocks!

Sherry McCampbell
s/v Soggy Paws

Avanti, Beveridge Reef, Aug 2017

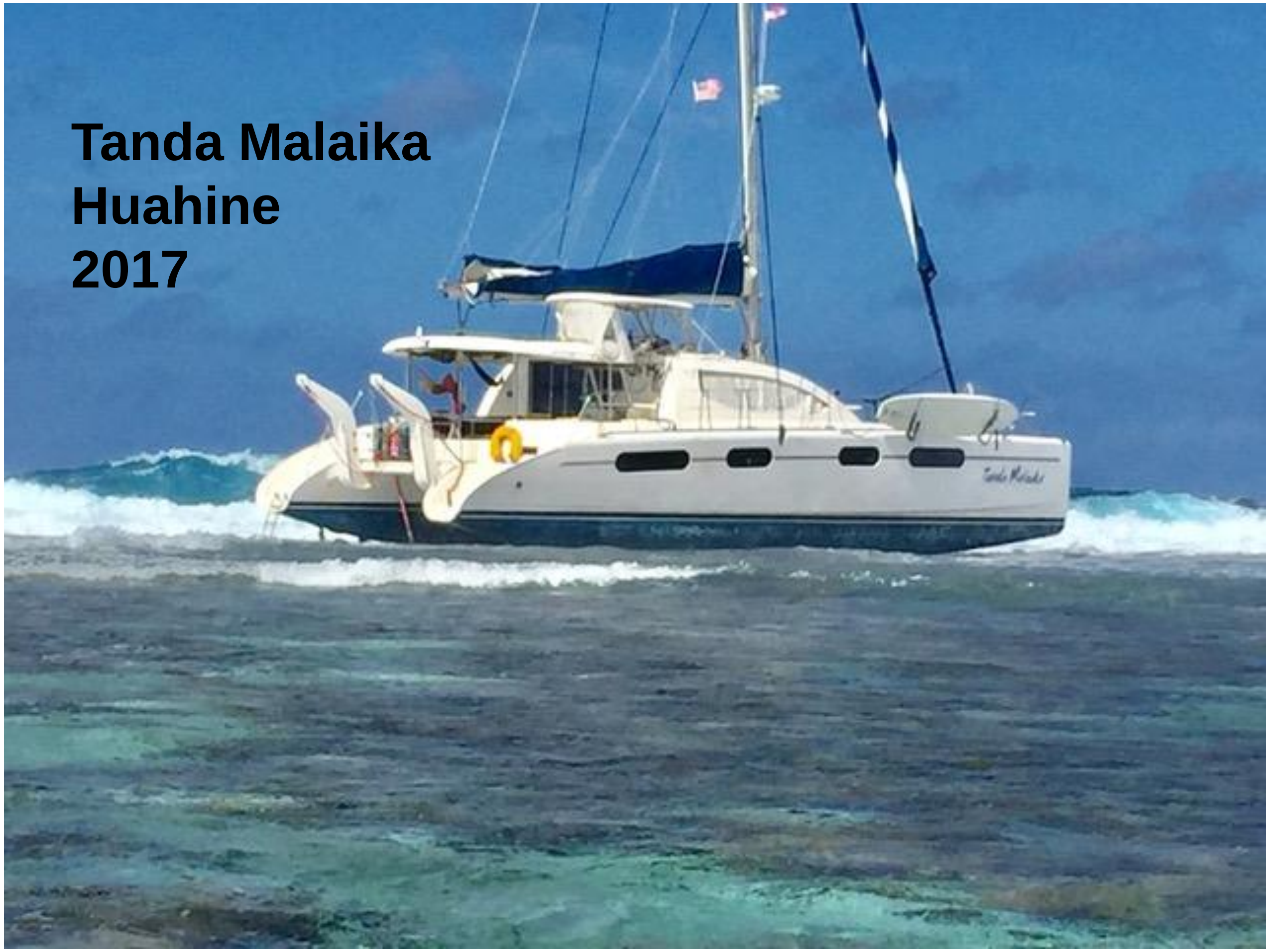
> “I had no idea the reef was there. I knew we’d hit something and were taking on water. We were ready to abandon ship.”

Robbie Cooper, s/v Avanti, Beveridge Reef, September 2017

Vestas Wind
Cargado Shoals
2014

VOLVO OCEAN RACE
ROUND THE WORLD
Vestas

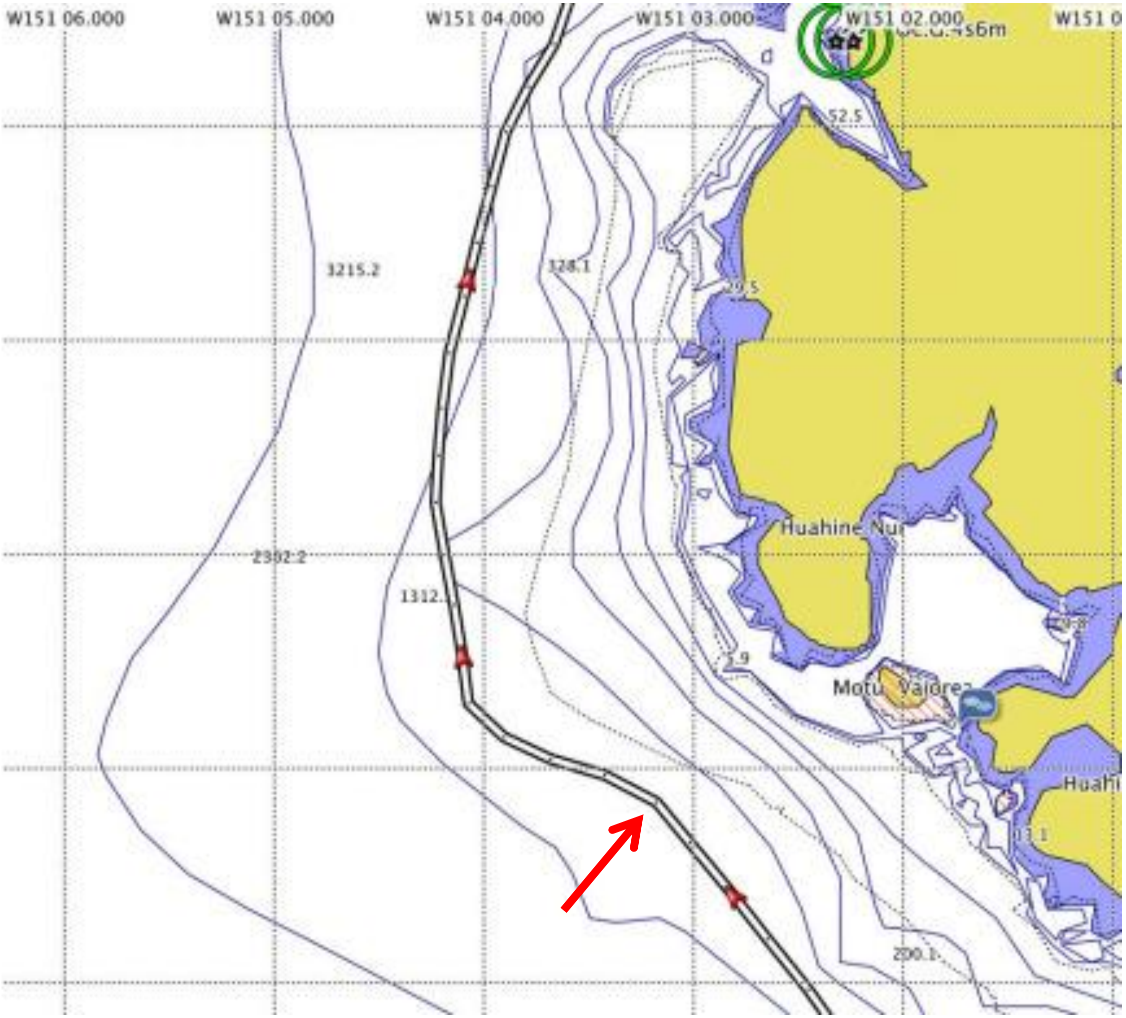
“Team Vestas Wind’s grounding on the Cargados Carajos Shoals comes down to a basic failure in overall passage planning, and an over-reliance on electronic navigation.”



Tanda Malaika
Huahine
2017

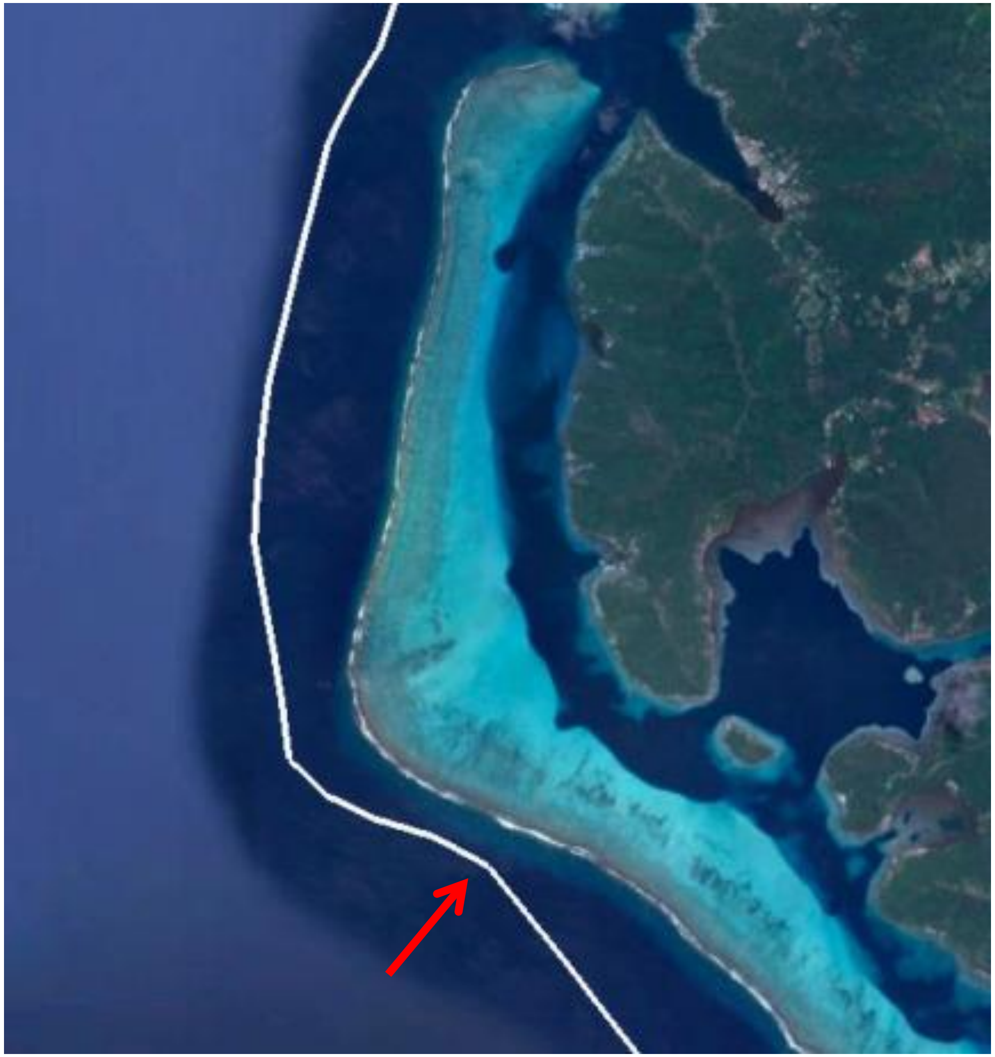
“When they asked us what happened and we told them that our chart did not show reef, they asked us if we had been using Navionics charts, and I said yes. He then shook his head and said that at least five boats end up on those reefs a year who were using Navionics charts.”

Moonshadow’s Close Call


W151 06.000
W151 05.000
W151 04.000
W151 03.000
W151 02.000
52.5
3215.2
328.1
29.5
2302.2
Huahine Nui
5.9
Motu Vaiorea
200.1

We had plotted a route that kept us outside the 300-foot depth contours

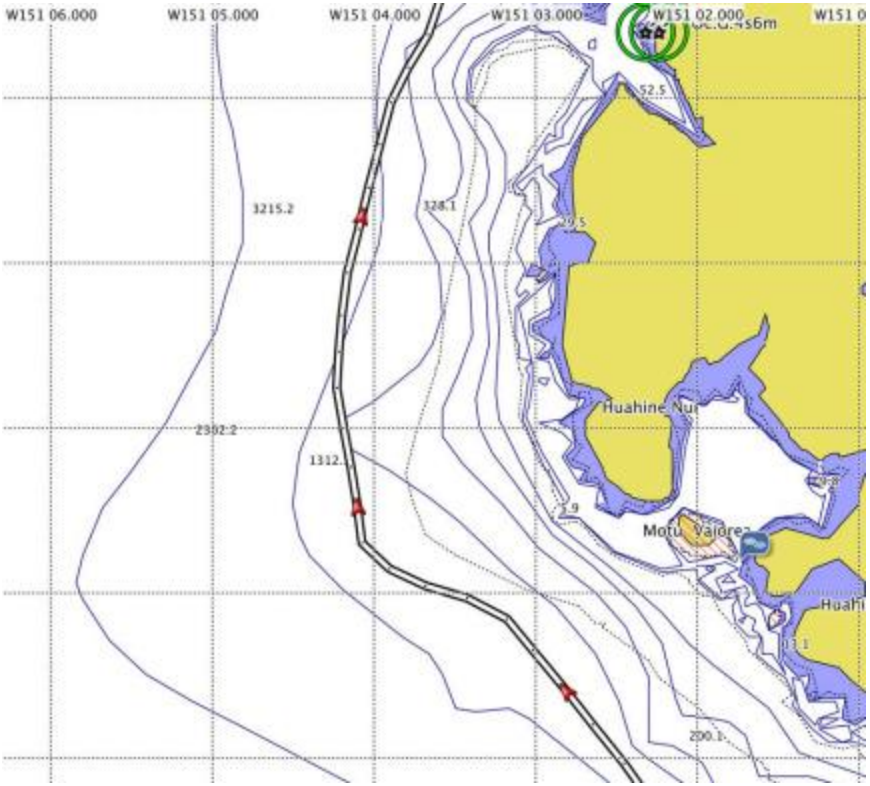
Moonshadow’s Close Call

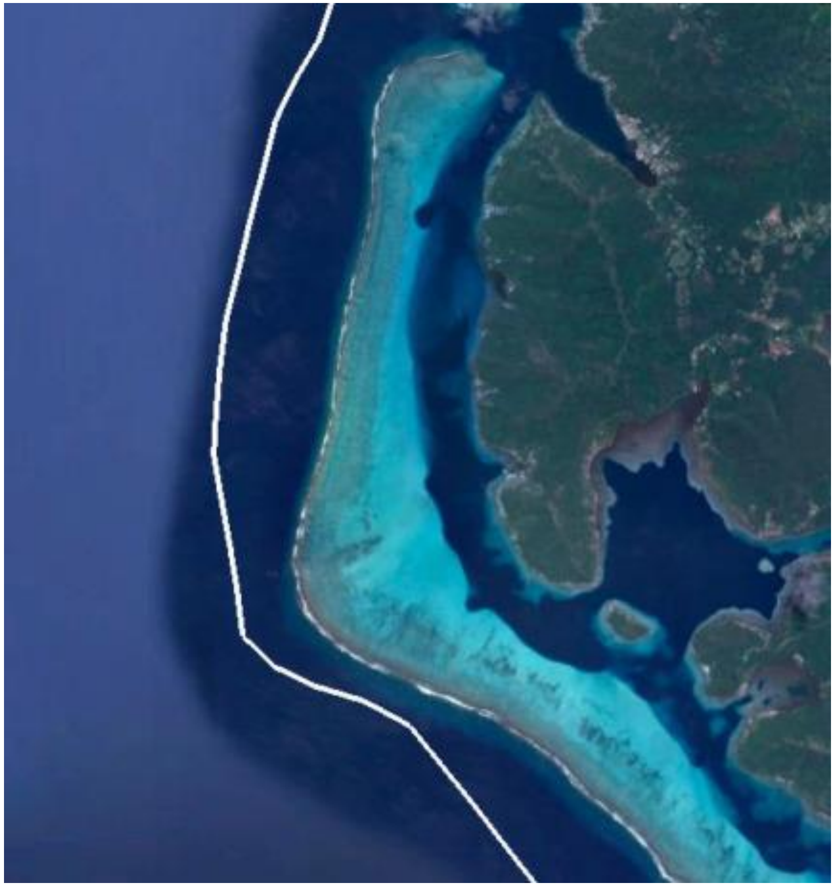


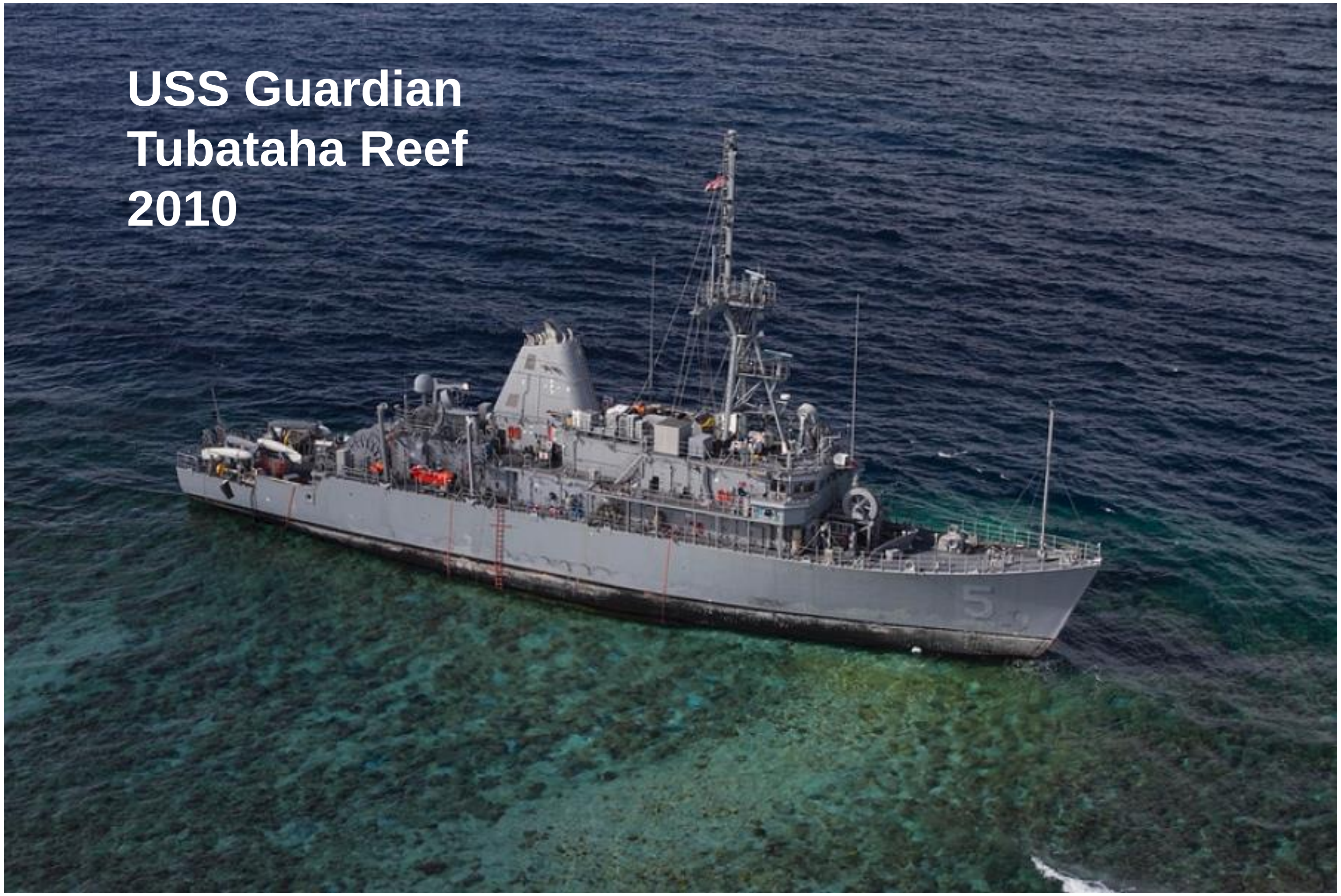
We looked up, and to our horror found that we were only about 900 feet from the surf!

Had it been nighttime, we almost certainly would have ended up in that surf

Side-by-Side Comparison


W151 06.000
W151 05.000
W151 04.000
W151 03.000
W151 02.000
W151 0
52.5
3215.2
328.1
9.5
Huahine Nui
2392.2
1312.
3.9
Motu Vaiore
Huah
11.1
200.1



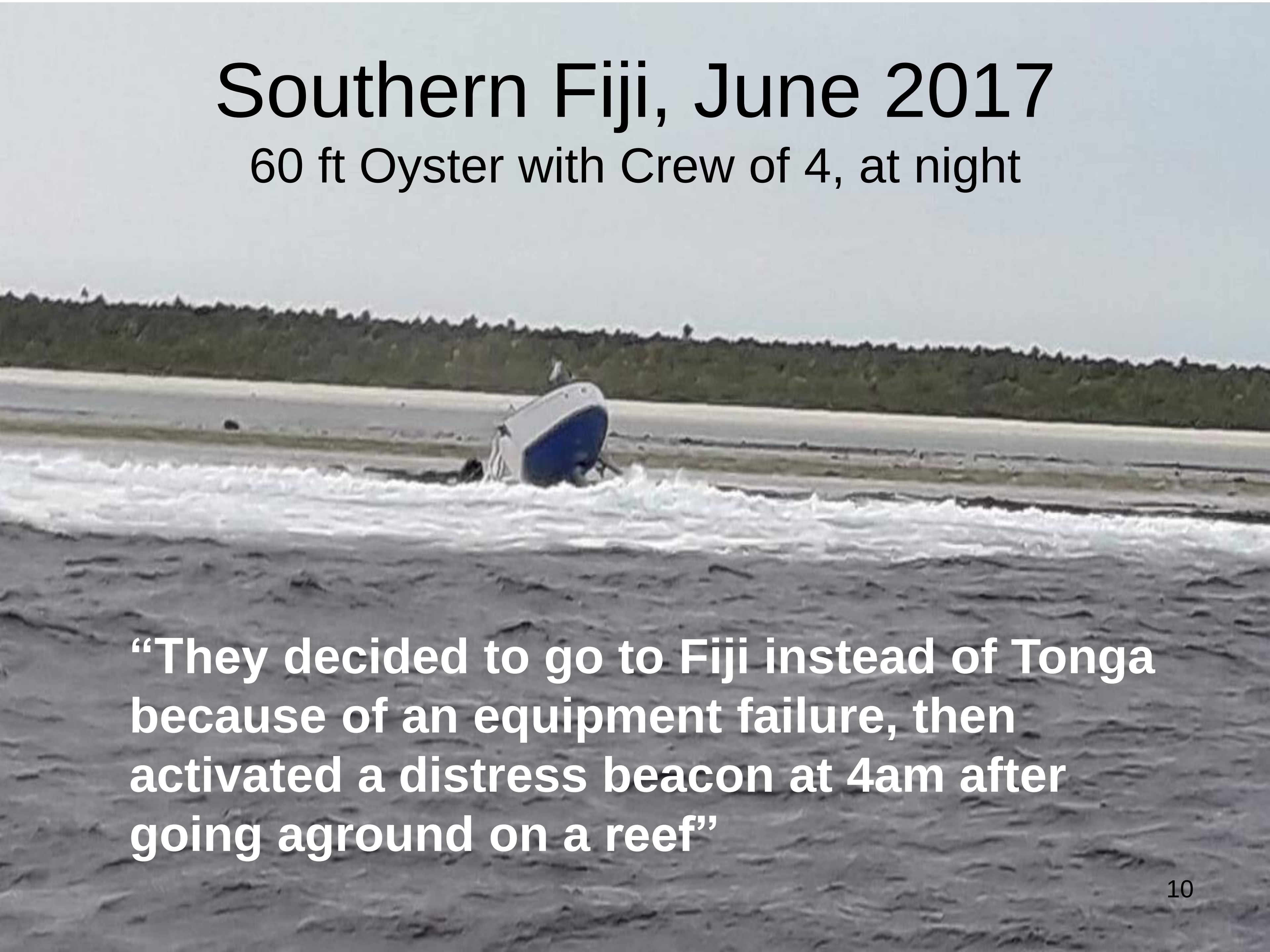

USS Guardian
Tubataha Reef
2010

The coastal scale electronic chart supplied to USS *Guardian* was flawed due to human error on the part of the NGA. This error **mis-located the Tubbataha Reef by 7.8 nautical miles** from its actual location. NGA was aware of this error in 2011 and updated a smaller scale electronic chart, but failed to publish a correction for the larger scale chart that the USS *Guardian* was using when she ran aground.

NW Australia, June 2016

Southern Fiji, June 2017

60 ft Oyster with Crew of 4, at night



"They decided to go to Fiji instead of Tonga because of an equipment failure, then activated a distress beacon at 4am after going aground on a reef"

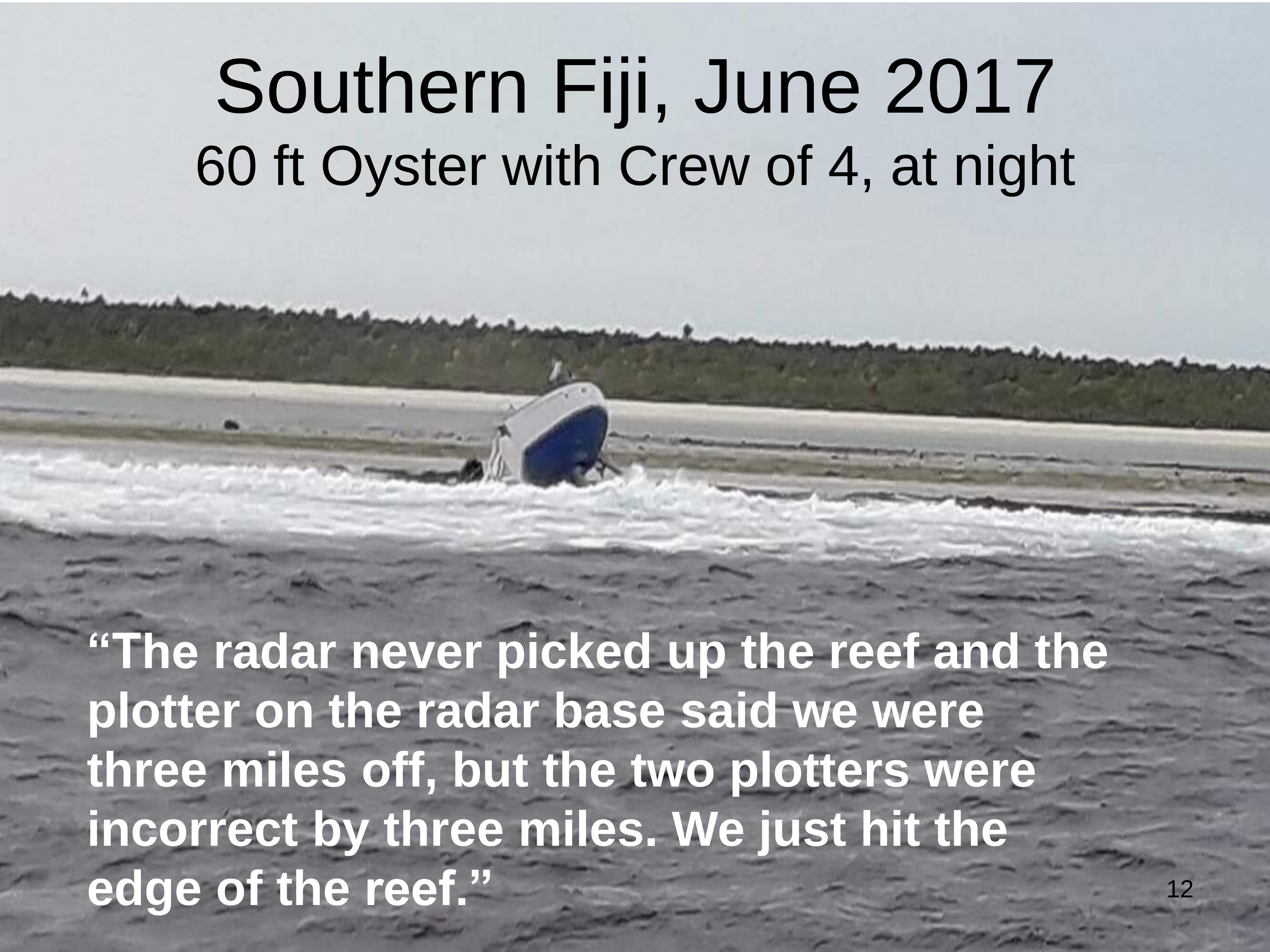
Southern Fiji, June 2017

60 ft Oyster with Crew of 4, at night

The Kiwi owner of the yacht says his nautical charts told him the reef was about 5km away - just before the boat hit it.

Southern Fiji, June 2017

60 ft Oyster with Crew of 4, at night



"The radar never picked up the reef and the plotter on the radar base said we were three miles off, but the two plotters were incorrect by three miles. We just hit the edge of the reef."

Topics

- Be suspicious of your charts
- Why not to use your iPad / Android tablet as your only navigation tool
- Why not to use your chartplotter as your only navigation tool
- Paper vs Raster vs Vector vs Satellite Charts
- Validating the accuracy for the next stop
- Navigating at night
- Introducing the power of GE2KAP
- Introducing the power of OpenCPN

Note: All tools and resources referenced in this presentation are linked on the reference pages at the end.

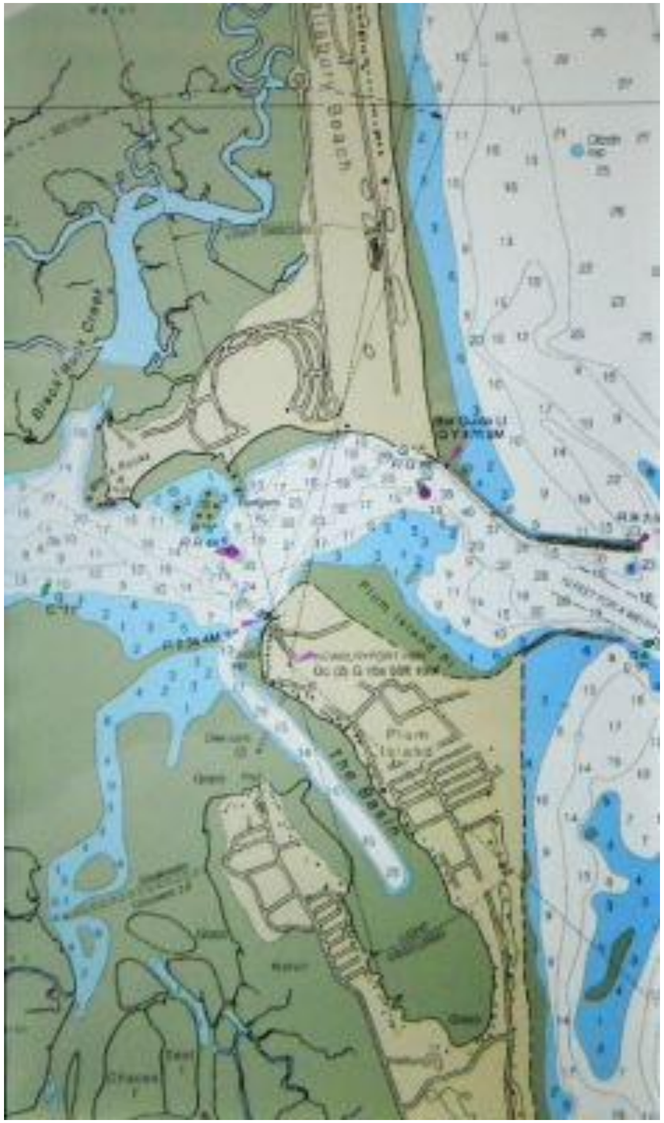
Paper Charts

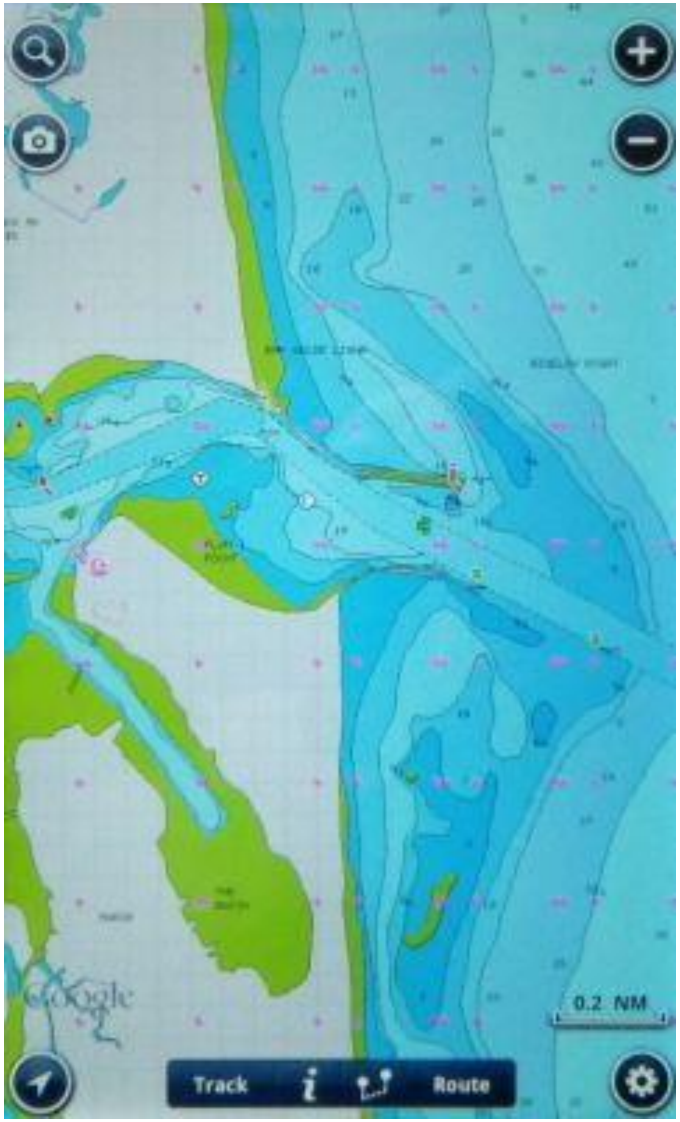
- Satisfyingly “there” feel
- Only as good as the survey they are based on
- A pain in the ass to keep updated
- Bulky, expensive, hard to acquire
- Hard to store large quantities
- They can blow away, they can get wet
- But islands don’t disappear!

Traditional Raster Charts

- Essentially a scanned paper chart
- All paper chart info is retained
- Easiest to adjust to using (if you are familiar with paper charts)
- Take up MUCH more electronic storage space (vs Vector charts)
  - 24 CD’s to cover the world, partially
- Everything zooms at the same rate

Raster vs Vector

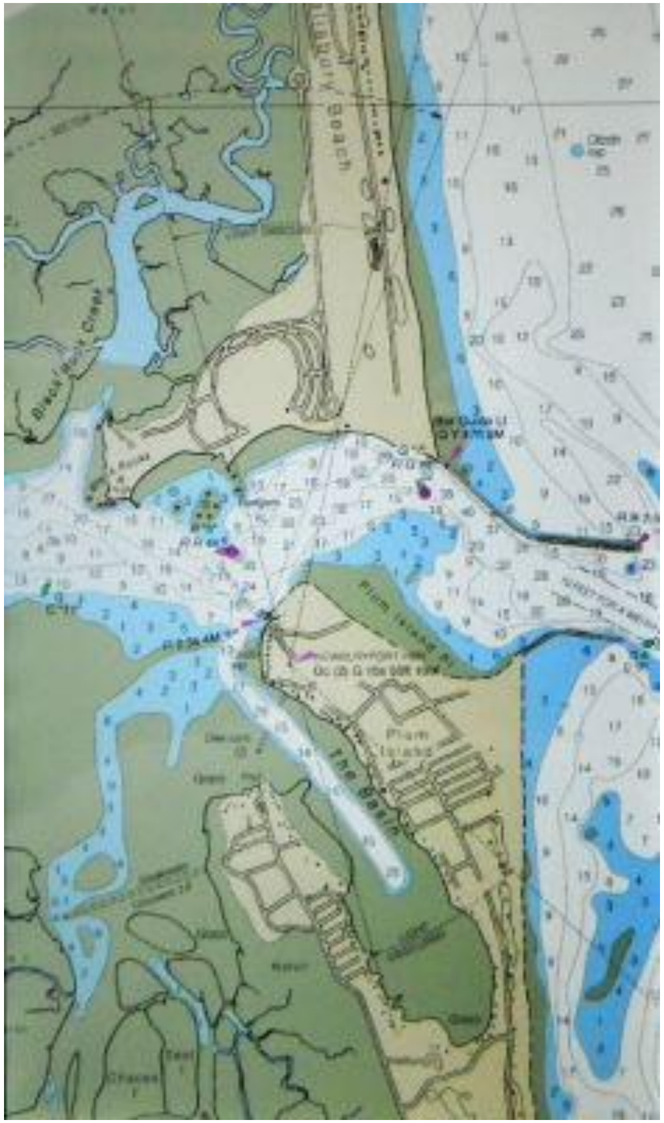


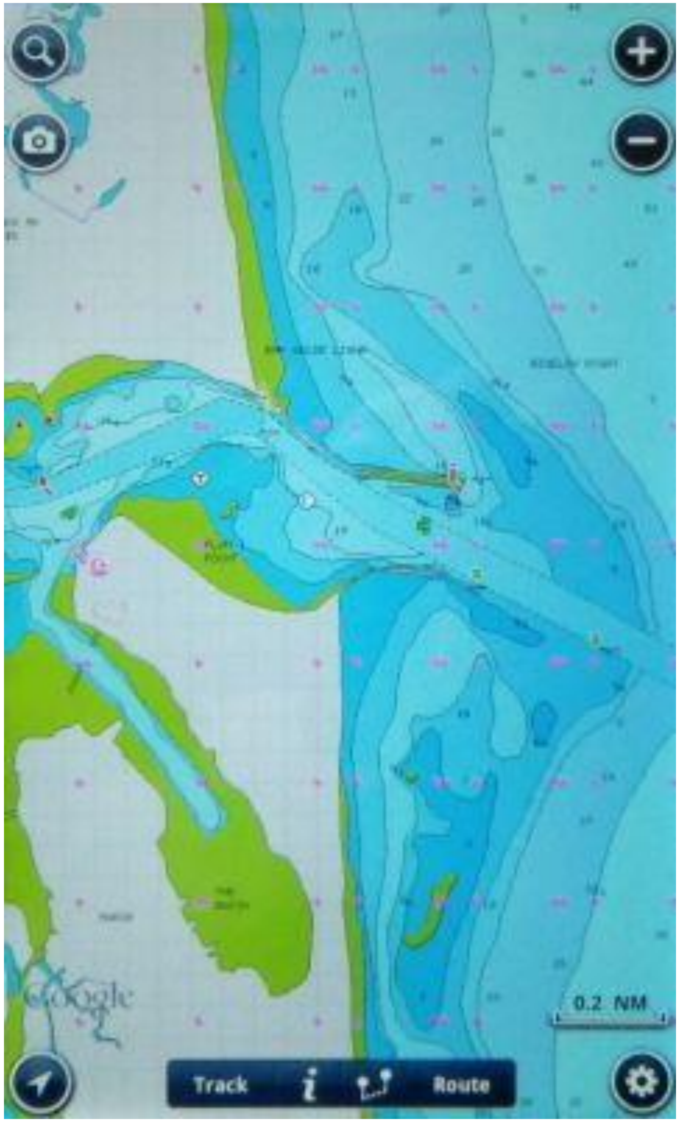

0.2 NM
Google
Track
Route

Vector Charts

- Vector charts have been drawn from paper charts by *someone*
- Are only as accurate as the underlying chart they were made from
- Take up SIGNIFICANTLY less space on electronic storage
  - The Whole World in one folder
- Contain lines, “objects”, and “data”

Raster vs Vector



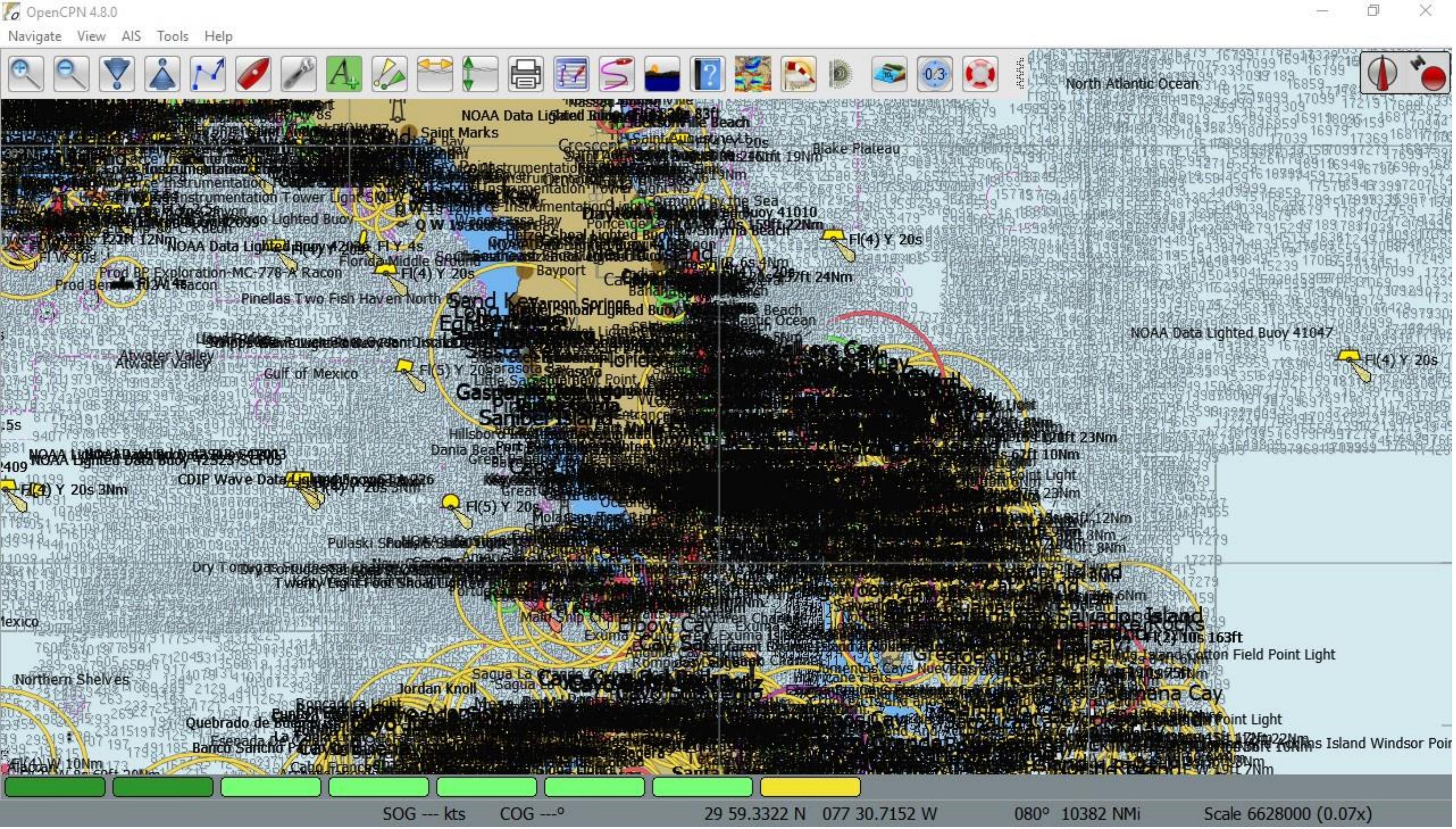

Google
0.2 NM
Track
Route

Vector Charts

- Most chart plotters are using vector charts
- Most tablet/phone apps are using vector charts
- Take a significantly smarter program to display and use
- Very powerful if used correctly
- Sometimes confusing to use and/or set up (flexibility = complexity)

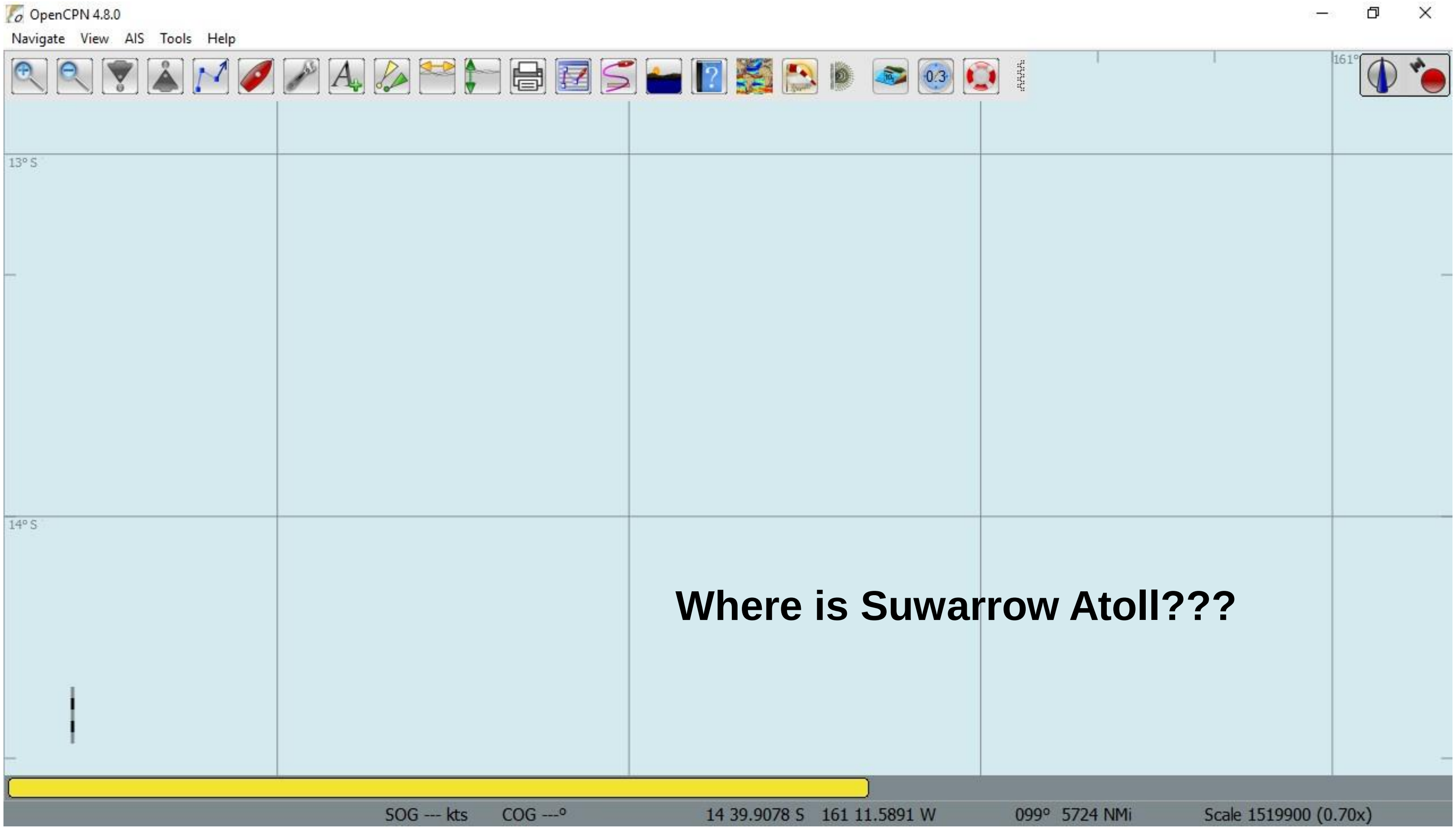
Too Much Detail!

(this is configurable)


OpenCPN 4.8.0
Navigate
View
AIS
Tools
Help
North Atlantic Ocean
NOAA Data Lighted Buoy 41047
Fl(4) Y 20s
Blake Plateau
Gulf of Mexico
Atwater Valley
Pinellas Two Fish Haven North
Bayport
Saint Marks
Northern Shelves
Jordan Knoll
Cotton Field Point Light
Samana Cay
SOG --- kts
COG ---°
29 59.3322 N
077 30.7152 W
080°
10382 NMi
Scale 6628000 (0.07x)

Problems with Vector Charts

The Disappearing Island – Chart Zooms

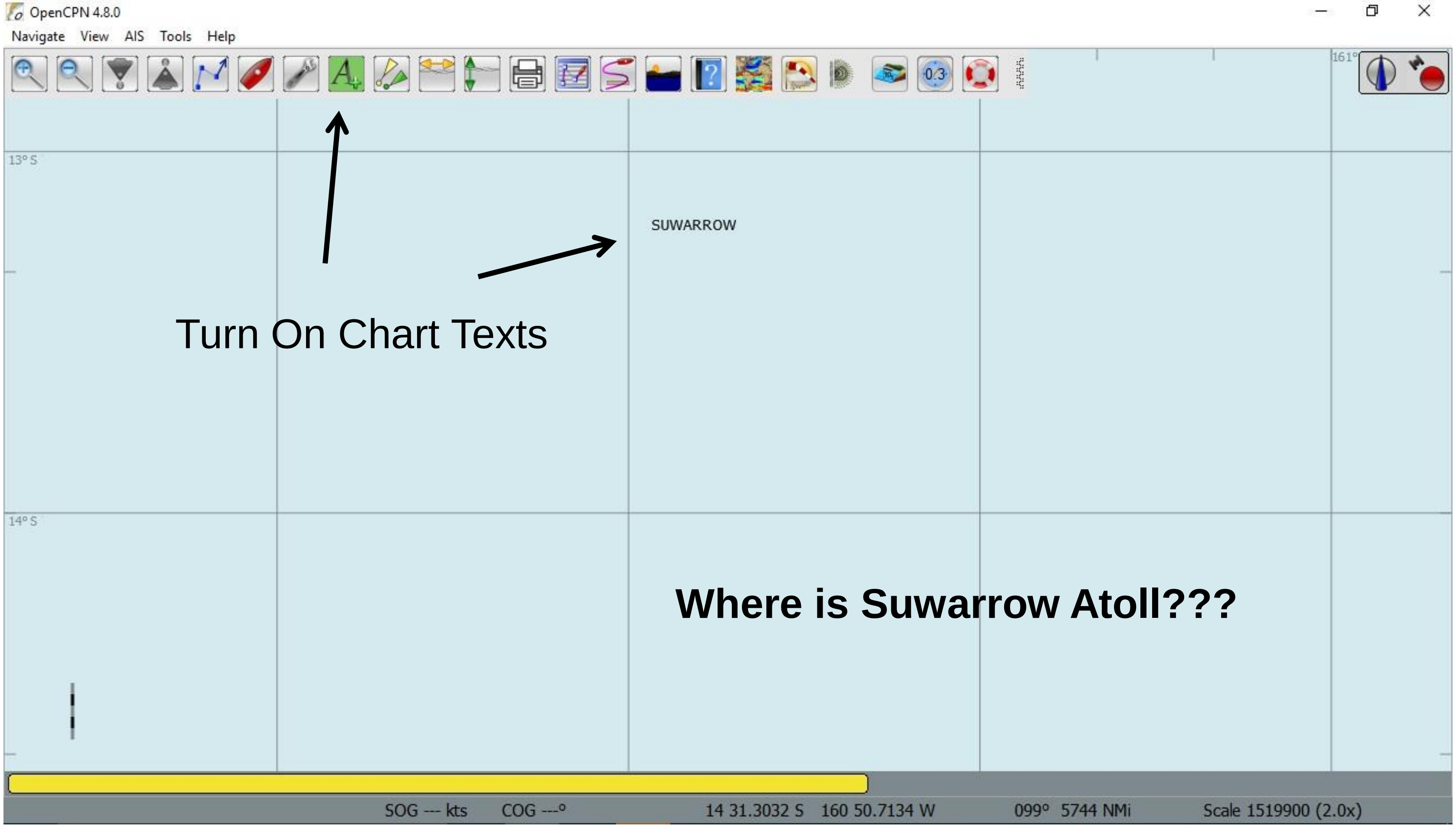

OpenCPN 4.8.0
Navigate
View
AIS
Tools
Help
0.3
13° S
14° S
161°

Where is Suwarrow Atoll???

SOG --- kts COG ---° 14 39.9078 S 161 11.5891 W 099° 5724 NMi Scale 1519900 (0.70x)

Problems with Vector Charts

The Disappearing Island – Chart Zooms

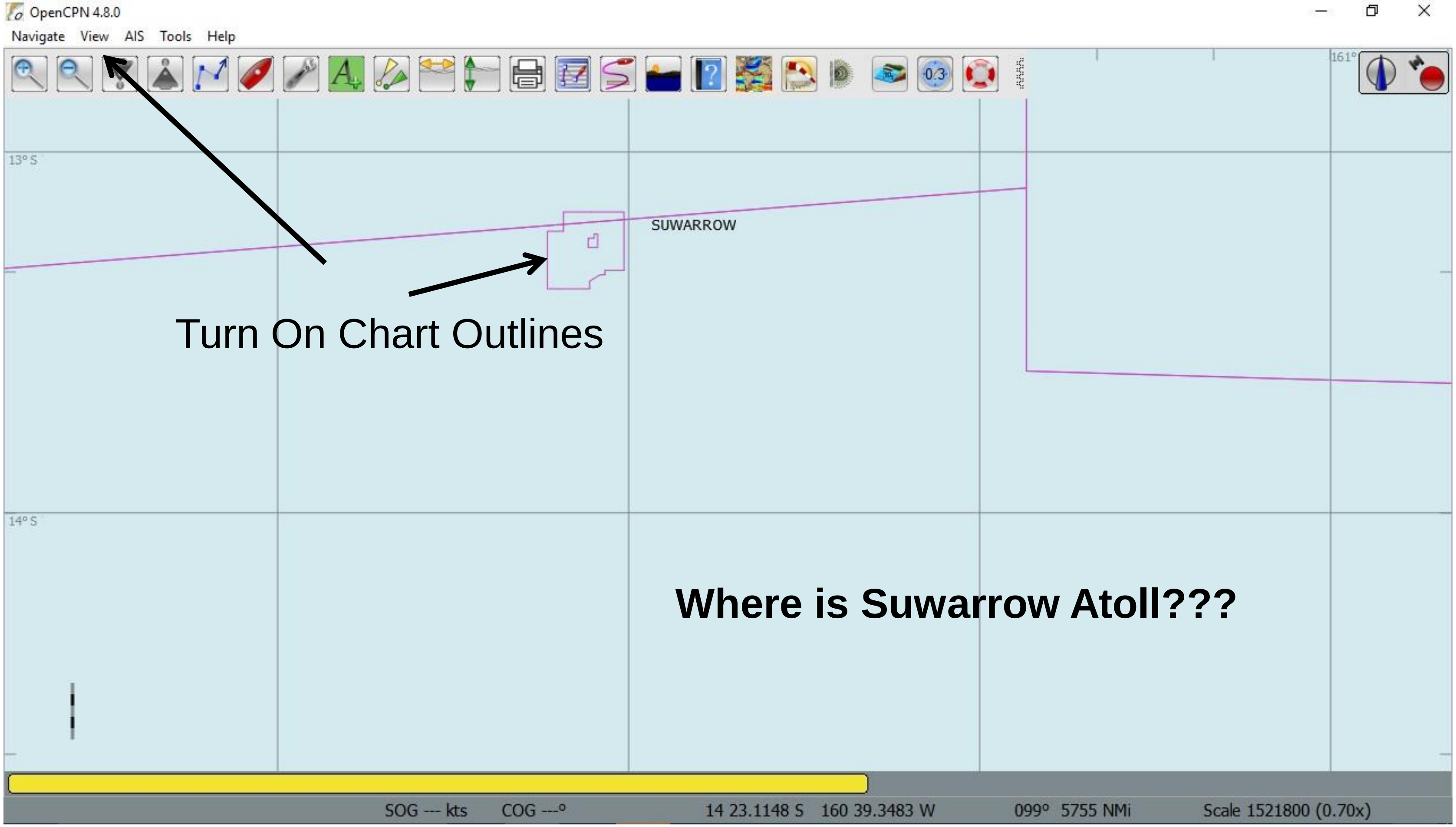

OpenCPN 4.8.0
Navigate View AIS Tools Help
161°
13° S
SUWARROW
14° S
SOG --- kts COG ---° 14 31.3032 S 160 50.7134 W 099° 5744 NMi Scale 1519900 (2.0x)

Turn On Chart Texts

Where is Suwarrow Atoll???

Problems with Vector Charts

The Disappearing Island – Chart Zooms

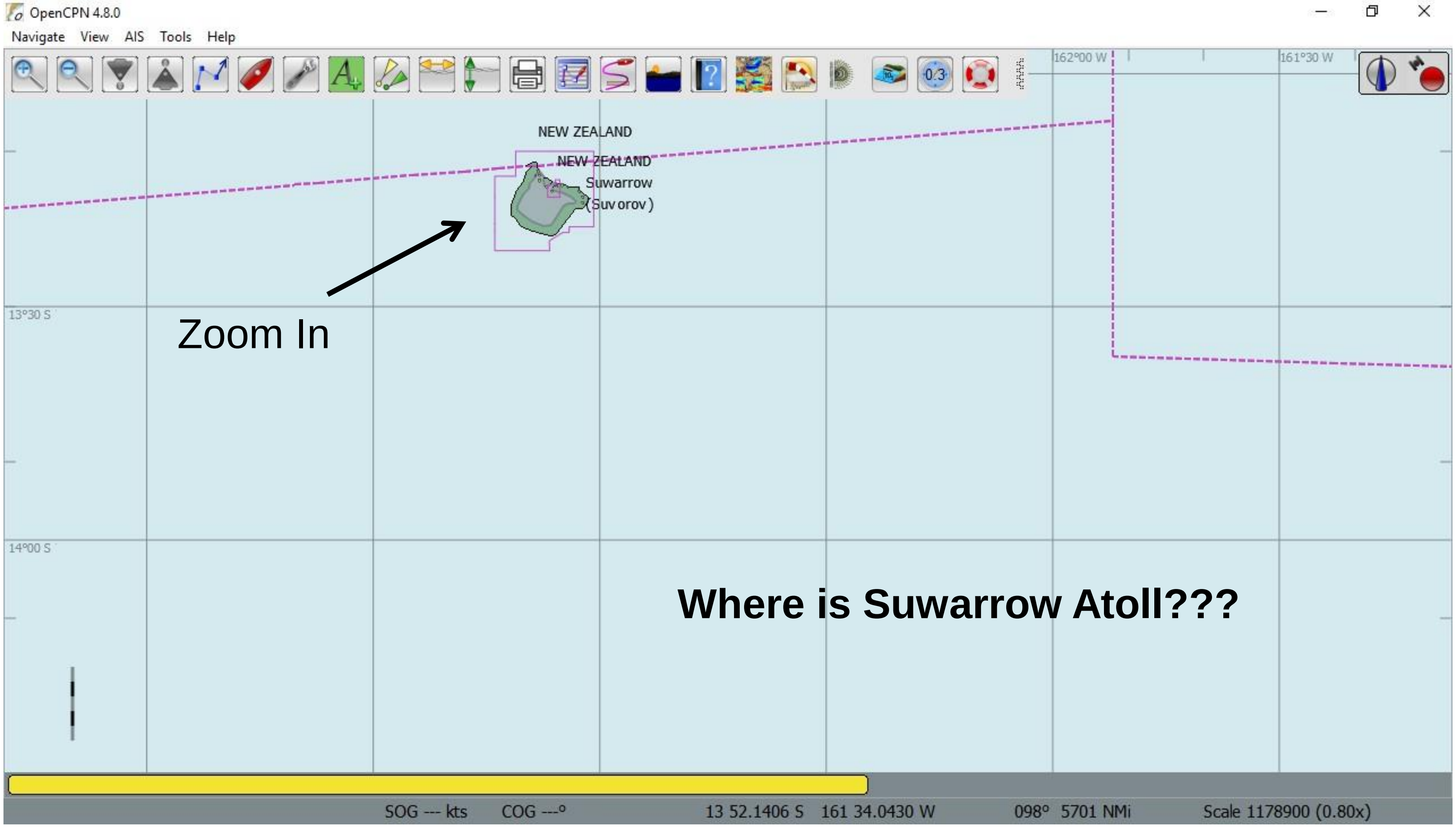

OpenCPN 4.8.0
Navigate
View
AIS
Tools
Help
13° S
14° S
161°
SUWARROW
SOG --- kts
COG ---°
14 23.1148 S
160 39.3483 W
099°
5755 NMi
Scale 1521800 (0.70x)

Turn On Chart Outlines

Where is Suwarrow Atoll???

Problems with Vector Charts

The Disappearing Island – Chart Zooms



OpenCPN 4.8.0
Navigate View AIS Tools Help
162°00 W
161°30 W
NEW ZEALAND
NEW ZEALAND
Suwarrow
(Suv orov)
13°30 S
14°00 S
Zoom In

SOG --- kts COG ---° 13 52.1406 S 161 34.0430 W 098° 5701 NMi Scale 1178900 (0.80x)

Where is Suwarrow Atoll???

Chart Zooms / Avanti Wreck

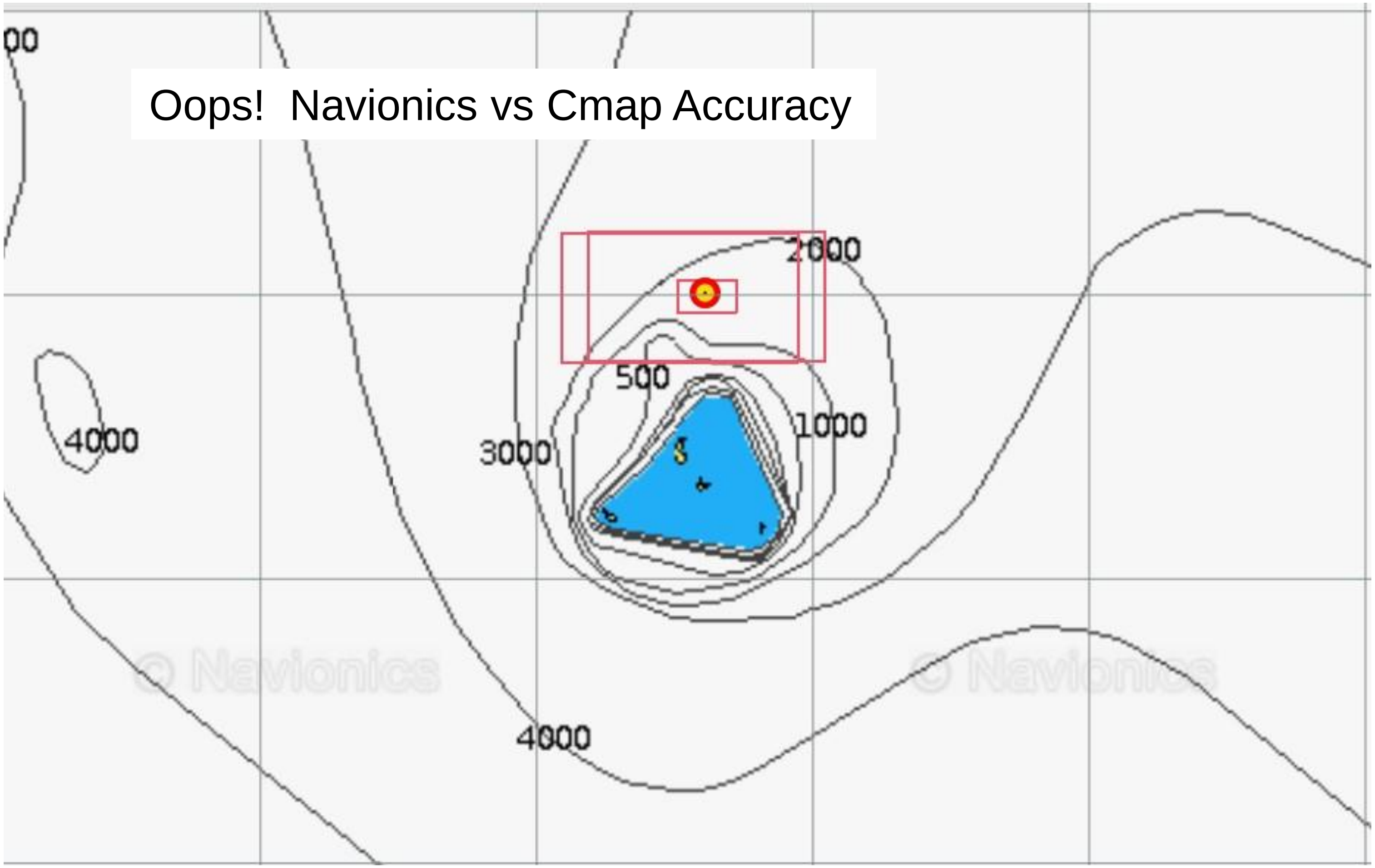
From sv Golden Glow on Noonsite

“Beveridge Reef appears on our Furuno Chart, but only when it’s zoomed in to a map size of 35 nm across the screen (at 40 nm size it’s NOT visible).

Navionics and iNavx apps DO show Beverage Reef, but our Earthmate (Garmin) app, the map for our delorme explorer device, does NOT show the reef.”

The Disappearing Island

Also Misplaced

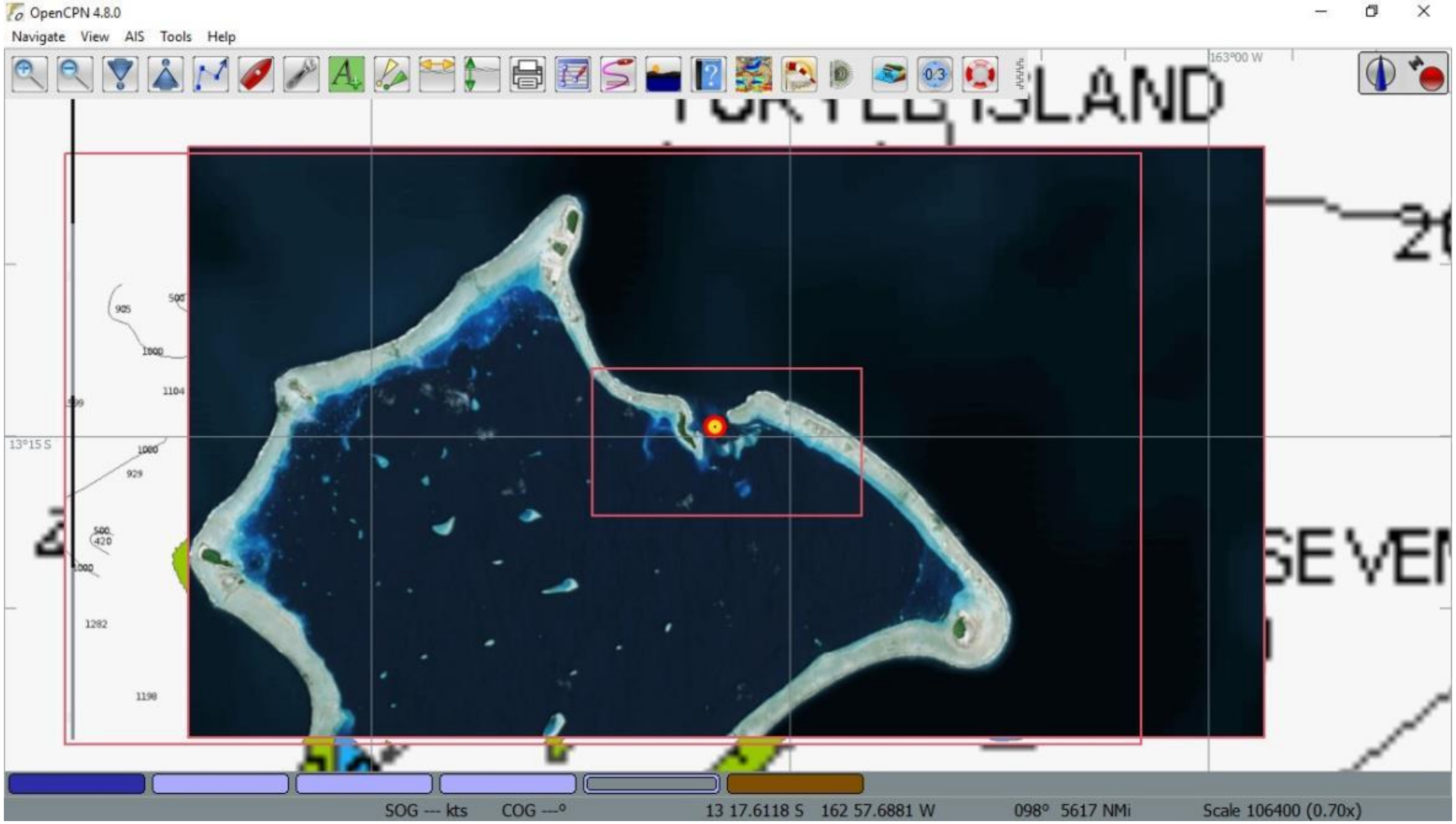

00
2000
500
1000
4000
3000
4000
© Navionics
© Navionics

Oops! Navionics vs Cmap Accuracy

Where is Suwarrow Atoll???

The Disappearing Island

Misplaced

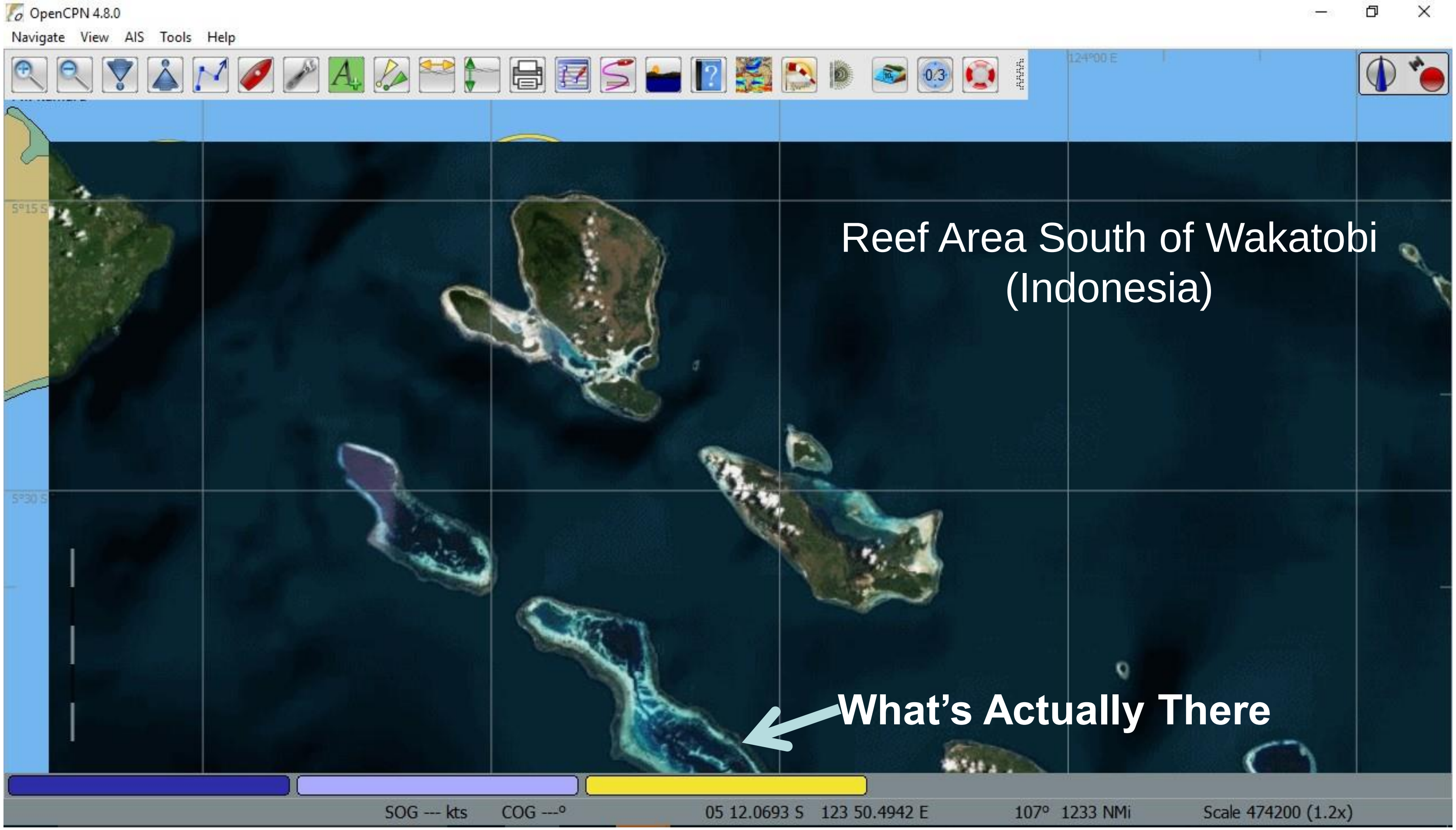

OpenCPN 4.8.0
Navigate
View
AIS
Tools
Help
0.3
163°00 W
TURTLE ISLAND
SEVEN
13°15 S
905
500
1000
1104
999
1000
929
500
420
1000
1282
1198

SOG --- kts COG ---° 13 17.6118 S 162 57.6881 W 098° 5617 NMi Scale 106400 (0.70x)

Where is Suwarrow Atoll???

The Disappearing Reef

Chart Versions


OpenCPN 4.8.0
Navigate View AIS Tools Help
124°00 E
5°15 S
5°30 S

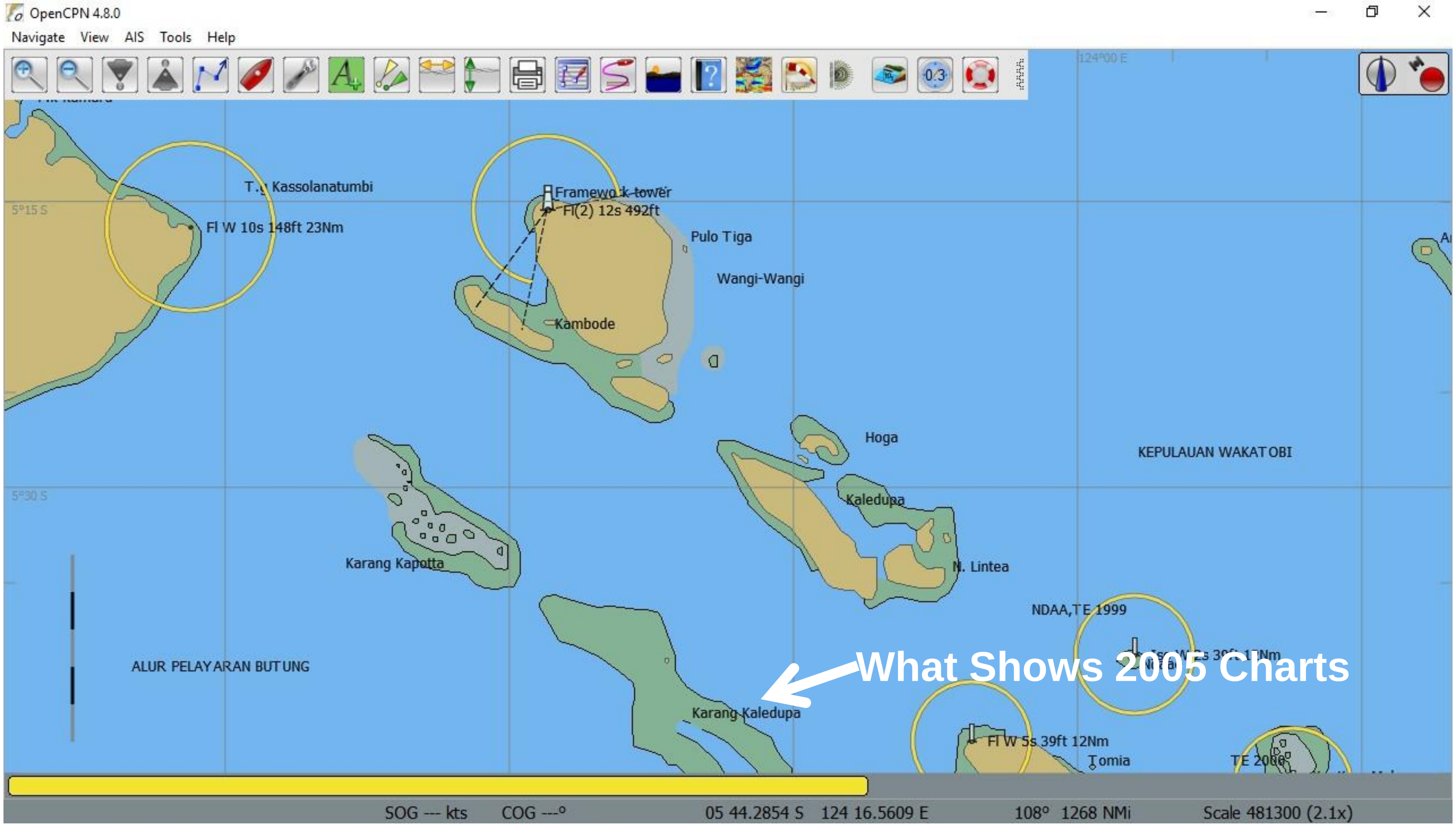
```
SOG --- kts    COG ---°    05 12.0693 S   123 50.4942 E    107°  1233 NMi    Scale 474200 (1.2x)
```

Reef Area South of Wakatobi (Indonesia)

What's Actually There

The Disappearing Reef

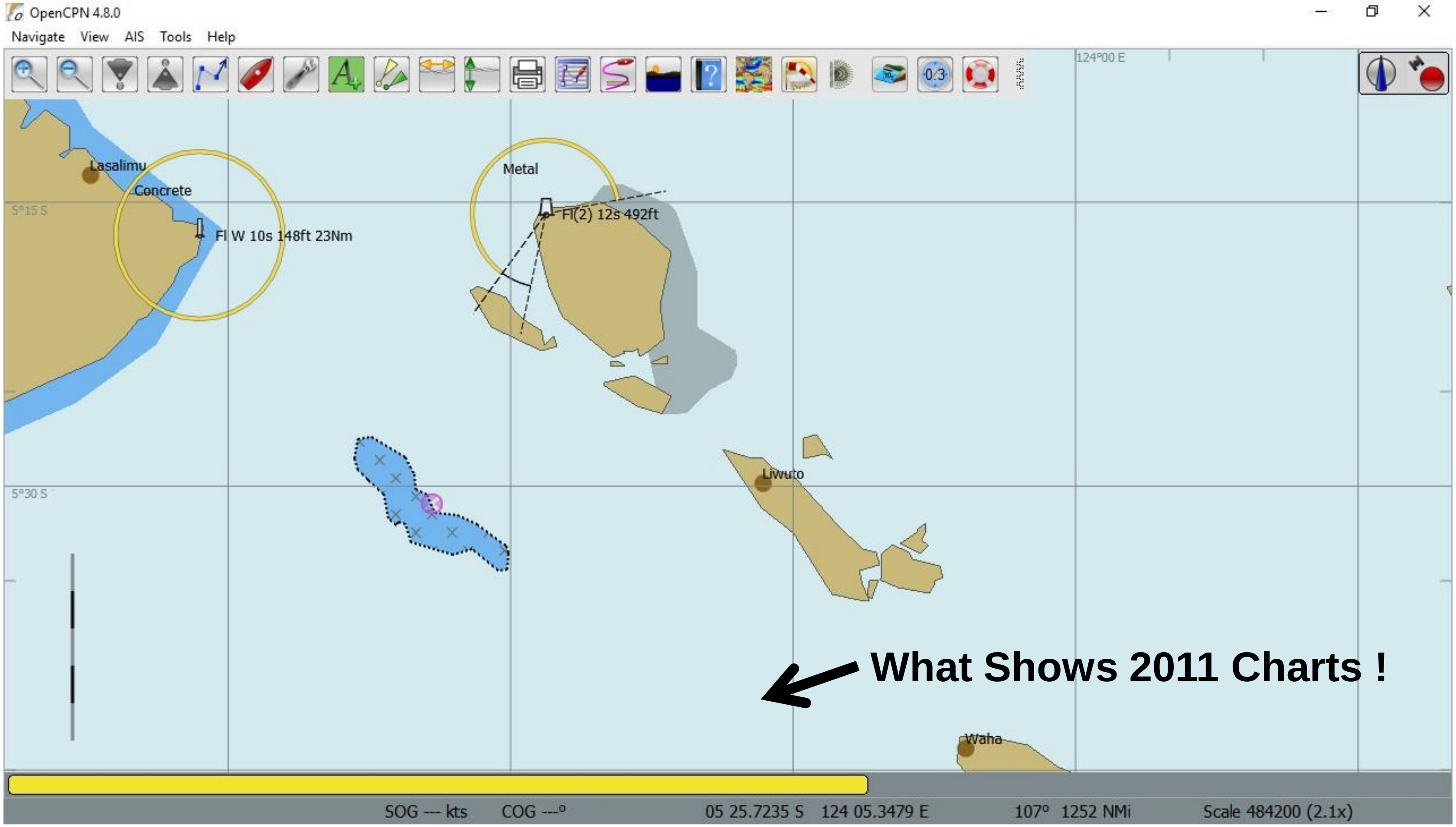
Chart Versions


OpenCPN 4.8.0
Navigate View AIS Tools Help
124°00 E
5°15 S
5°30 S
T. Kassolanatumbi
Fl W 10s 148ft 23Nm
Framework tower
Fl(2) 12s 492ft
Pulo Tiga
Wangi-Wangi
Kambode
Hoga
Kaledupa
N. Lintea
KEPULAUAN WAKATOBI
Karang Kapotta
ALUR PELAYARAN BUTUNG
NDAA,TE 1999
Karang Kaledupa
Fl W 5s 39ft 12Nm
Tomia
TE 2006
SOG --- kts COG ---°
05 44.2854 S 124 16.5609 E
108° 1268 NMi
Scale 481300 (2.1x)

What Shows 2005 Charts

The Disappearing Reef

Chart Versions

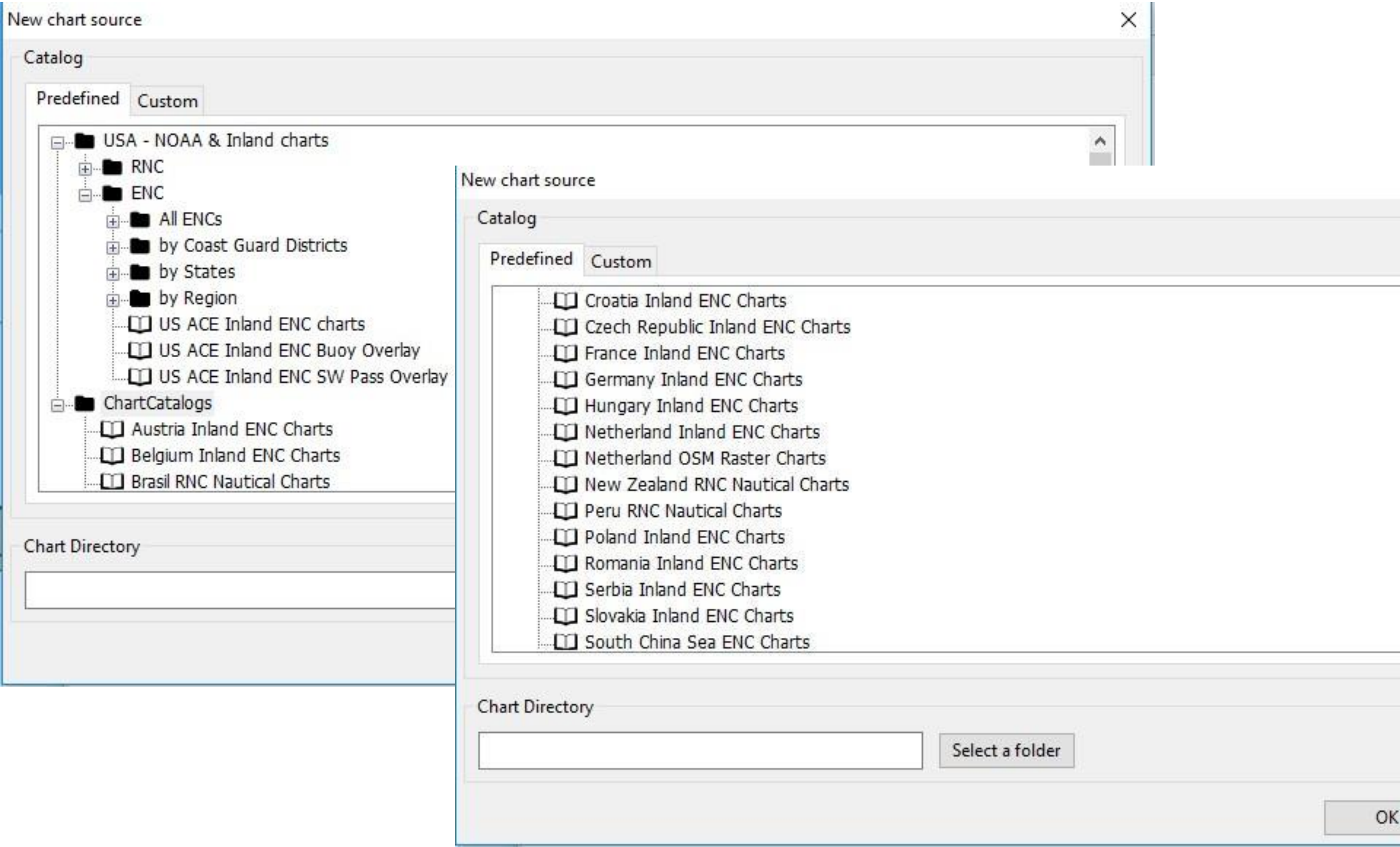

OpenCPN 4.8.0
Navigate View AIS Tools Help
124°00 E
Lasalimu
Concrete
5°15 S
Fl W 10s 148ft 23Nm
Metal
Fl(2) 12s 492ft
Liwuto
5°30 S
Waha
SOG --- kts
COG ---°
05 25.7235 S
124 05.3479 E
107°
1252 NMi
Scale 484200 (2.1x)

What Shows 2011 Charts !

Some Sources of Vector Charts

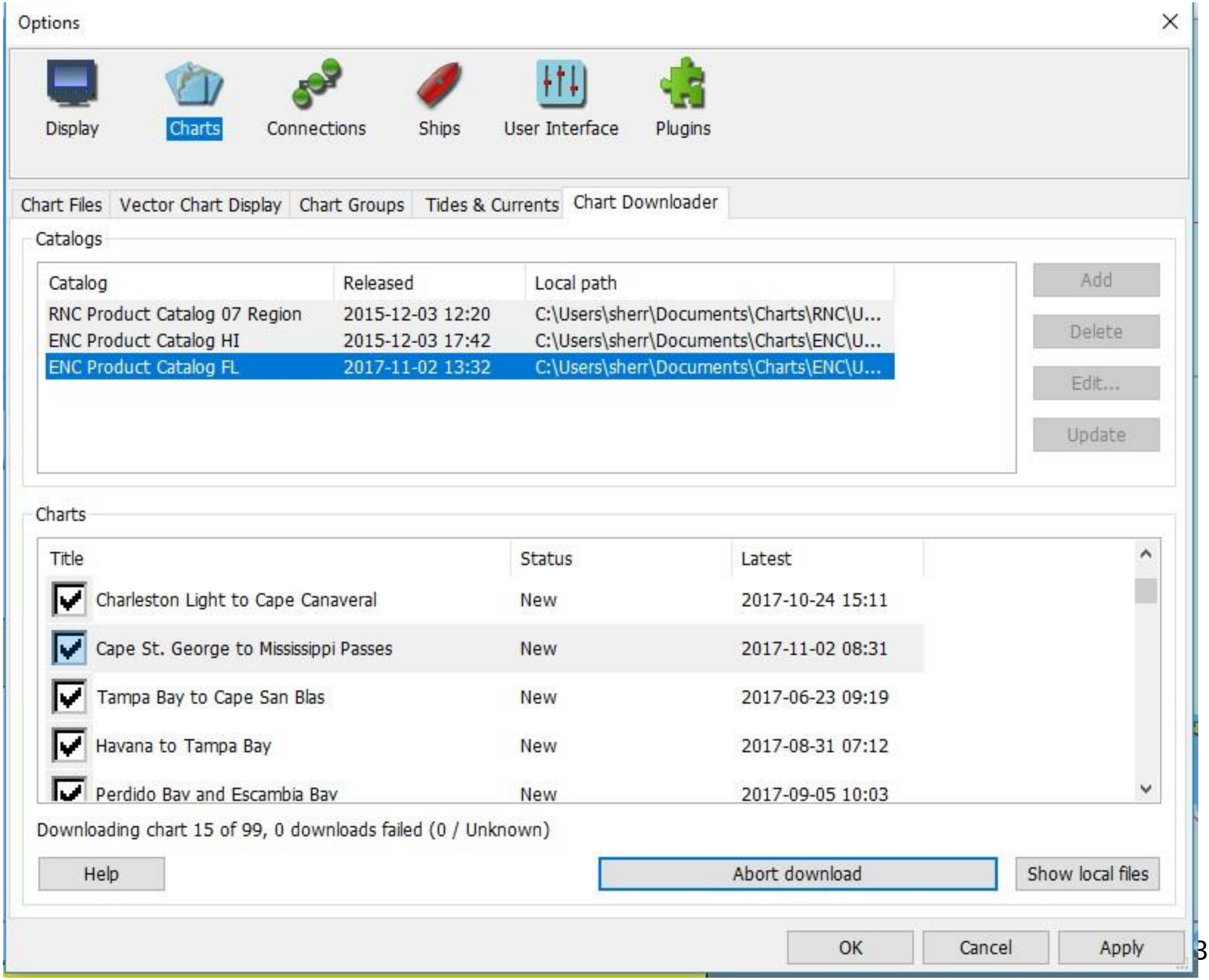
- Your local country’s chart purveyor
  - Sometimes free, sometimes not
- CM93 v2 (stopped updating in 2010/2011)
- CM93 v3 Cmap / Time Zero (Furuno)
- Garmin ($250-$350 per region)
- Navionics
- Raymarine
- Other Cruisers
- The Apple Store!

OpenCPN Chart Downloader


New chart source
Catalog
Predefined
Custom
Chart Directory
Select a folder
OK

- USA - NOAA & Inland charts
  - RNC
  - ENC
    - All ENCs
    - by Coast Guard Districts
    - by States
    - by Region
    - US ACE Inland ENC charts
    - US ACE Inland ENC Buoy Overlay
    - US ACE Inland ENC SW Pass Overlay
- ChartCatalogs
  - Austria Inland ENC Charts
  - Belgium Inland ENC Charts
  - Brasil RNC Nautical Charts

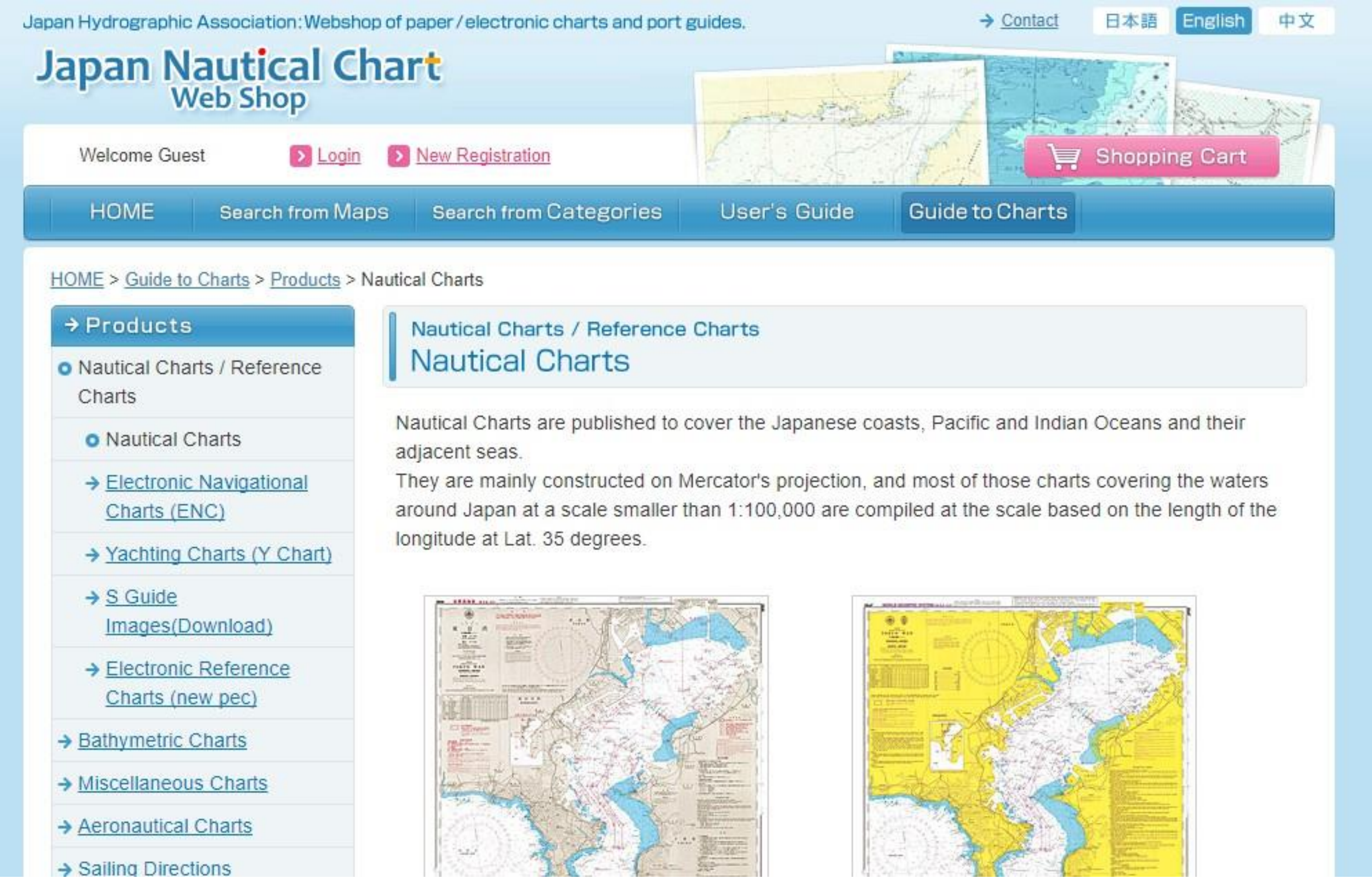
- Croatia Inland ENC Charts
- Czech Republic Inland ENC Charts
- France Inland ENC Charts
- Germany Inland ENC Charts
- Hungary Inland ENC Charts
- Netherland Inland ENC Charts
- Netherland OSM Raster Charts
- New Zealand RNC Nautical Charts
- Peru RNC Nautical Charts
- Poland Inland ENC Charts
- Romania Inland ENC Charts
- Serbia Inland ENC Charts
- Slovakia Inland ENC Charts
- South China Sea ENC Charts


Options
Display
Charts
Connections
Ships
User Interface
Plugins
Chart Files
Vector Chart Display
Chart Groups
Tides & Currents
Chart Downloader
Catalogs
Add
Delete
Edit...
Update
Charts
Help
Abort download
Show local files
OK
Cancel
Apply

Catalog	Released	Local path
RNC Product Catalog 07 Region	2015-12-03 12:20	C:\Users\sherr\Documents\Charts\RNC\U...
ENC Product Catalog HI	2015-12-03 17:42	C:\Users\sherr\Documents\Charts\ENC\U...
ENC Product Catalog FL	2017-11-02 13:32	C:\Users\sherr\Documents\Charts\ENC\U...

Title	Status	Latest
☑ Charleston Light to Cape Canaveral	New	2017-10-24 15:11
☑ Cape St. George to Mississippi Passes	New	2017-11-02 08:31
☑ Tampa Bay to Cape San Blas	New	2017-06-23 09:19
☑ Havana to Tampa Bay	New	2017-08-31 07:12
☑ Perdido Bay and Escambia Bay	New	2017-09-05 10:03

Downloading chart 15 of 99, 0 downloads failed (0 / Unknown)


Japan Hydrographic Association: Webshop of paper / electronic charts and port guides.
Contact
日本語
English
中文
Japan Nautical Chart Web Shop
Welcome Guest
Login
New Registration
Shopping Cart
HOME
Search from Maps
Search from Categories
User's Guide
Guide to Charts
HOME > Guide to Charts > Products > Nautical Charts
Products
Nautical Charts / Reference Charts
Nautical Charts
Electronic Navigational Charts (ENC)
Yachting Charts (Y Chart)
S Guide Images(Download)
Electronic Reference Charts (new pec)
Bathymetric Charts
Miscellaneous Charts
Aeronautical Charts
Sailing Directions

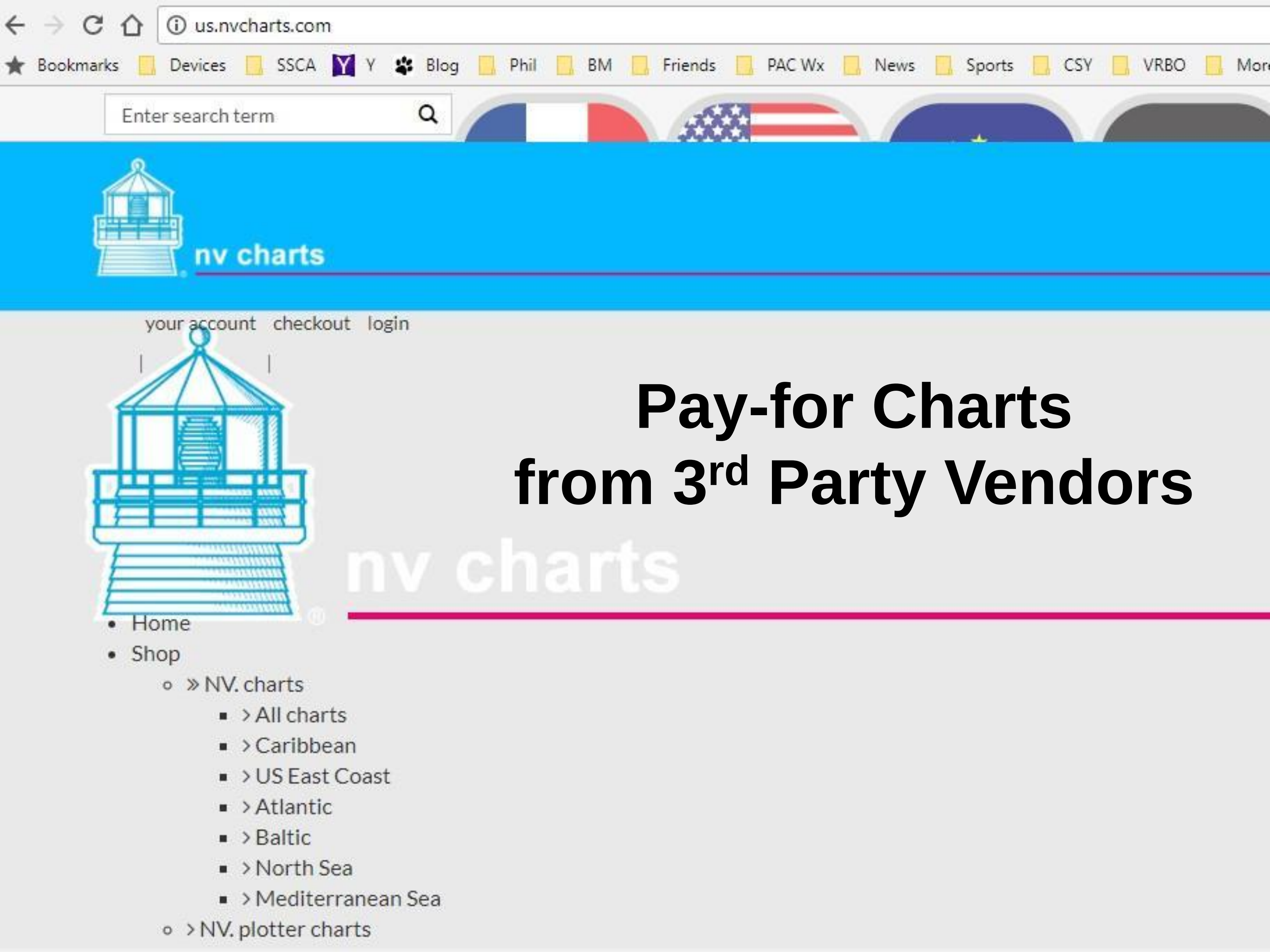
Nautical Charts / Reference Charts

Nautical Charts

Nautical Charts are published to cover the Japanese coasts, Pacific and Indian Oceans and their adjacent seas.
They are mainly constructed on Mercator's projection, and most of those charts covering the waters around Japan at a scale smaller than 1:100,000 are compiled at the scale based on the length of the longitude at Lat. 35 degrees.

Example of Japan’s Chart Purchase Page

Pay-for Charts
from 3rd Party Vendors


us.nvcharts.com
Bookmarks
Devices
SSCA
Y
Blog
Phil
BM
Friends
PAC Wx
News
Sports
CSY
VRBO
Mor
Enter search term
nv charts

your account | checkout | login

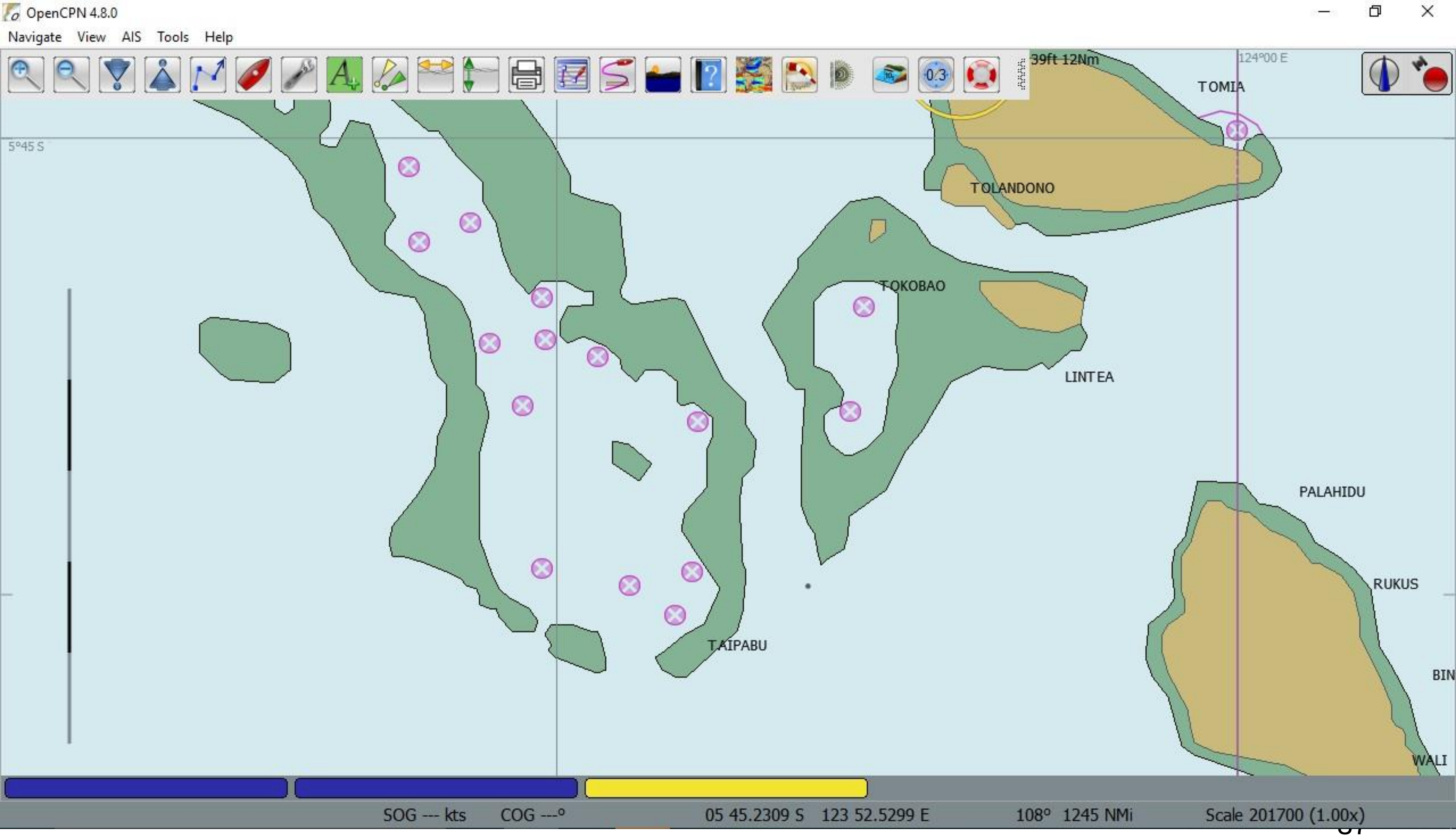
nv charts

- Home
- Shop
  - » NV. charts
    - › All charts
    - › Caribbean
    - › US East Coast
    - › Atlantic
    - › Baltic
    - › North Sea
    - › Mediterranean Sea
  - › NV. plotter charts

Using Satellite “Charts”

- GoogleEarth (Windows only)
- SAS Planet (Windows only)
- Ovital Maps (Tablet only)
- OpenCPN & GE2KAP Charts (Windows, Linux, Apple Mac, Android (tablet & phone), sorry, not iPad or iPhone
- Some chartplotter chart sets
  - Garmin G2 Vision (poor resolution)

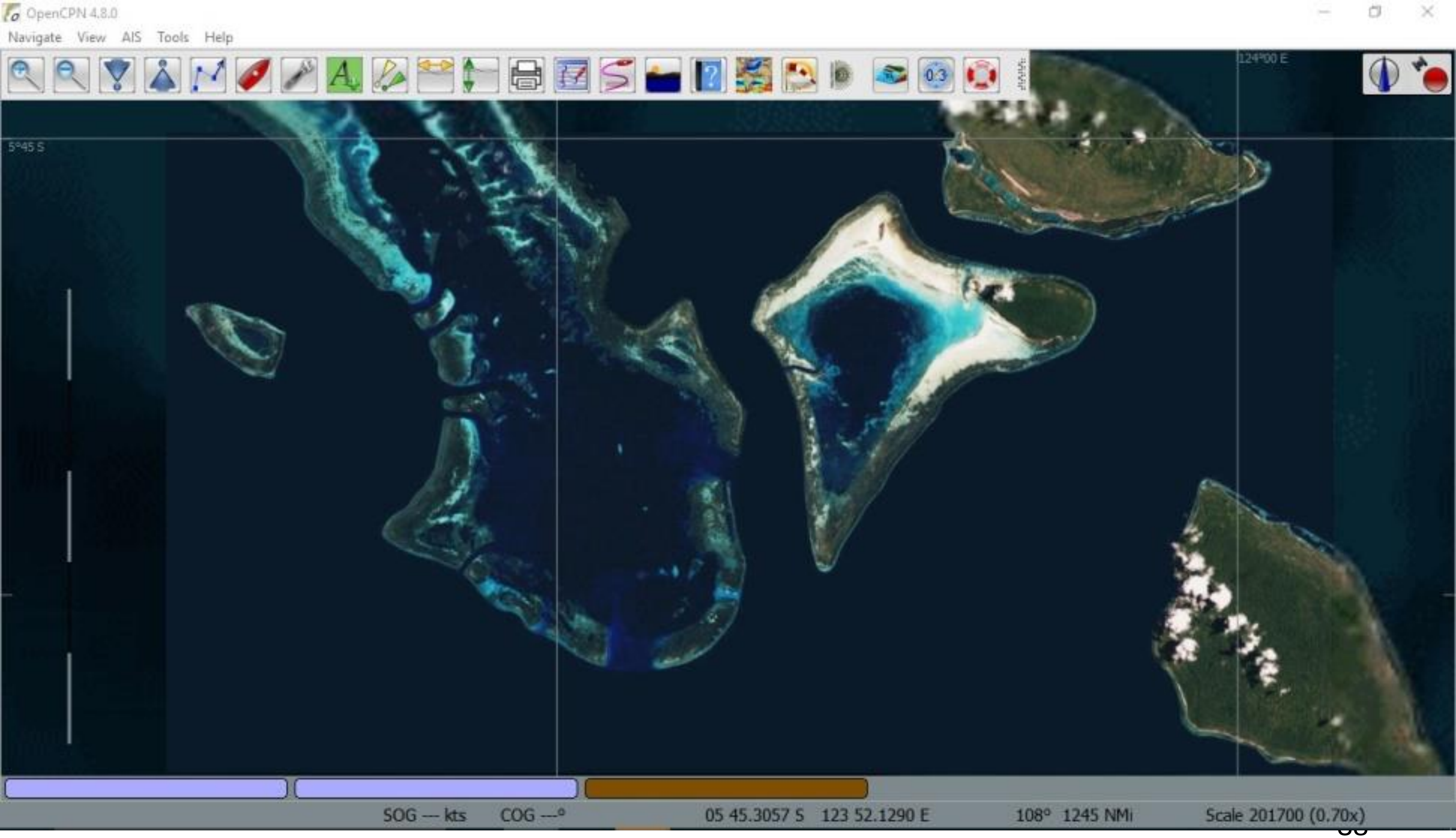
Which Would You Choose?



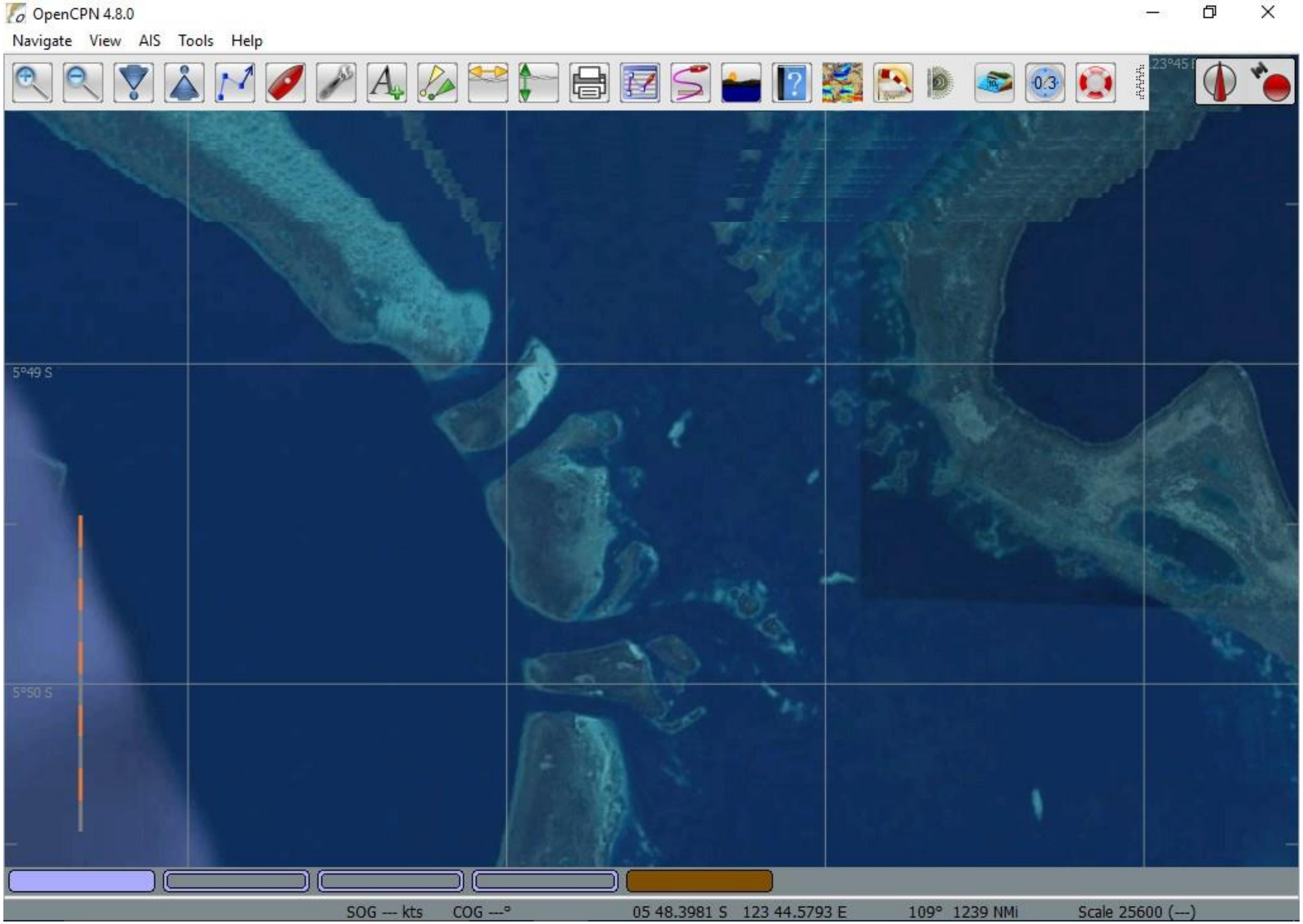
OpenCPN 4.8.0
Navigate View AIS Tools Help
39ft 12Nm
124°00 E
5°45 S
TOMIA
TOLANDONO
TOKOBAO
LINTEA
PALAHIDU
RUKUS
BIN
WALI
TAIPABU
0.3

SOG --- kts COG ---° 05 45.2309 S 123 52.5299 E 108° 1245 NMi Scale 201700 (1.00x)

Which Would You Choose?

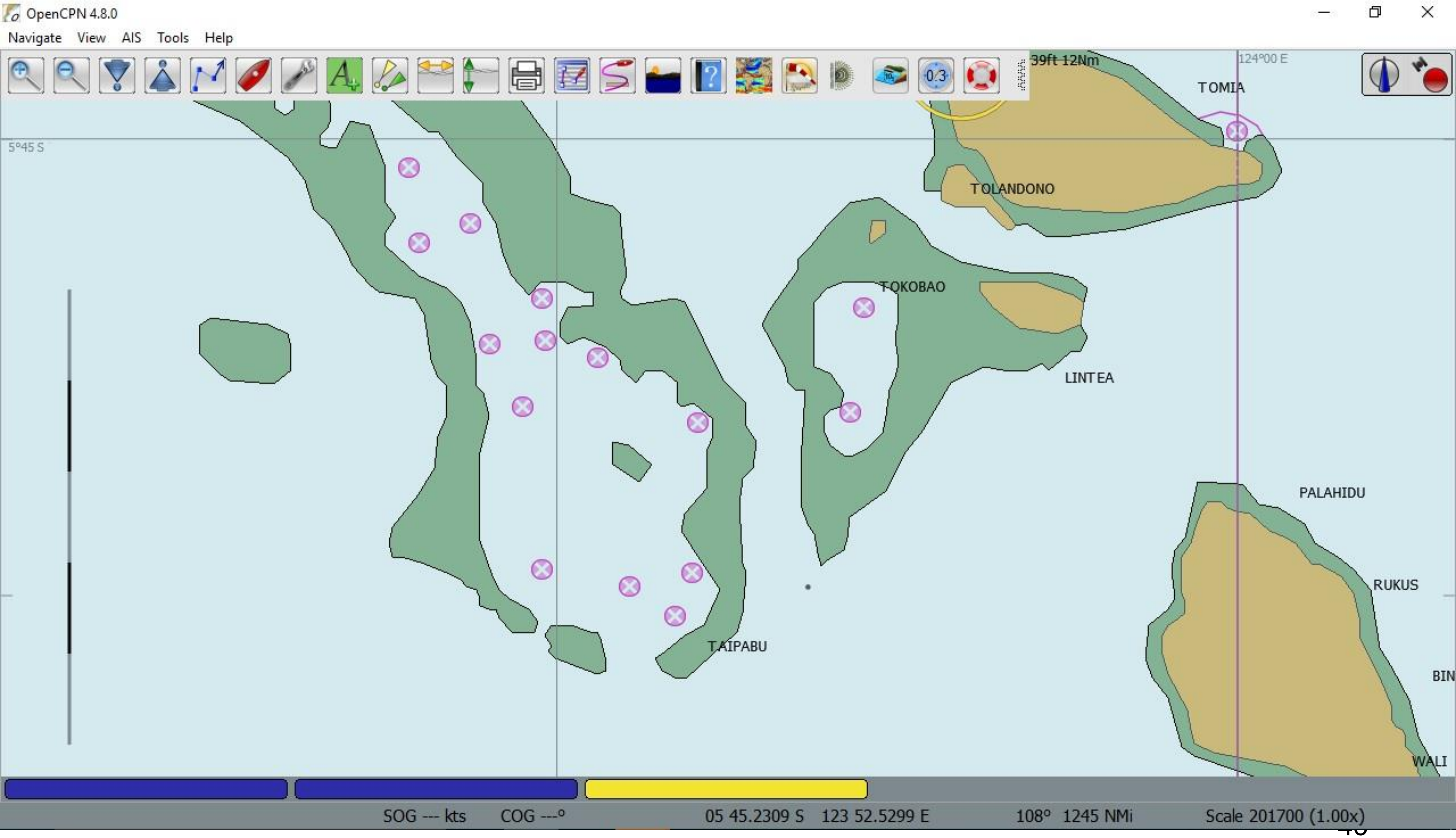

OpenCPN 4.8.0
Navigate
View
AIS
Tools
Help
124°00 E
5°45 S
0.3
SOG --- kts
COG ---°
05 45.3057 S
123 52.1290 E
108°
1245 NMi
Scale 201700 (0.70x)

Which Would You Choose?


OpenCPN 4.8.0
Navigate
View
AIS
Tools
Help
123°45
5°49 S
5°50 S

SOG --- kts   COG ---°   05 48.3981 S   123 44.5793 E   109°   1239 NMi   Scale 25600 (---)

Which Would You Choose?


OpenCPN 4.8.0
Navigate
View
AIS
Tools
Help
39ft 12Nm
124°00 E
5°45 S
TOMIA
TOLANDONO
TOKOBAO
LINTEA
PALAHIDU
RUKUS
BIN
WALI
TAIPABU

SOG --- kts COG ---° 05 45.2309 S 123 52.5299 E 108° 1245 NMi Scale 201700 (1.00x)

Problems Using Satellite Programs Directly

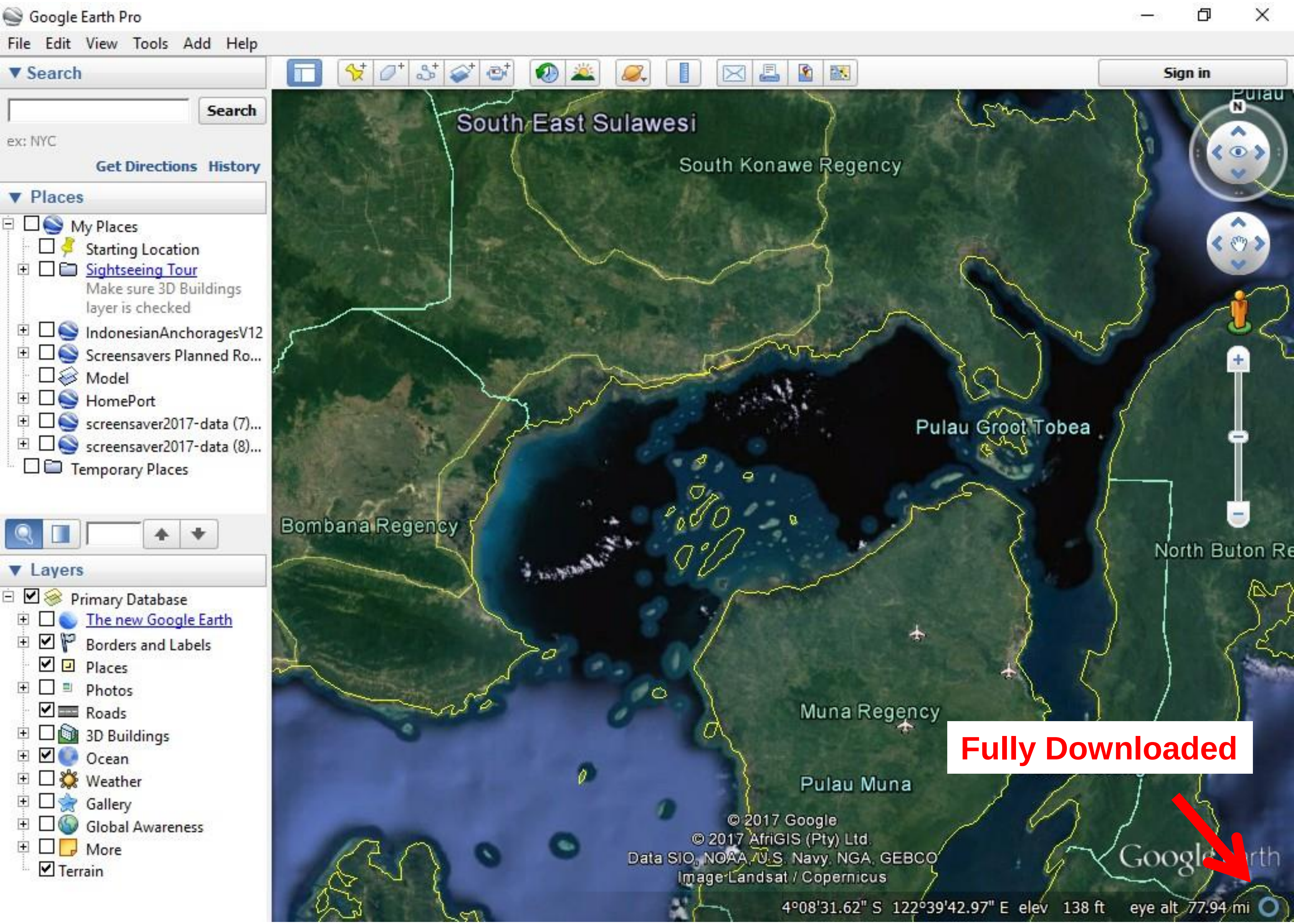
- GoogleEarth
  - ~~No direct GPS connection~~
  - You are not in control of the chart-saving
  - Not made for navigation
  - Integrating other navigation information
  - You MUST download
- SASPlanet
  - Can control what is saved
  - Possible to populate from other’s saved data
  - Not as user friendly
- Is chart there or not???

Benefits of Using Pre-Made Satellite KAP Charts

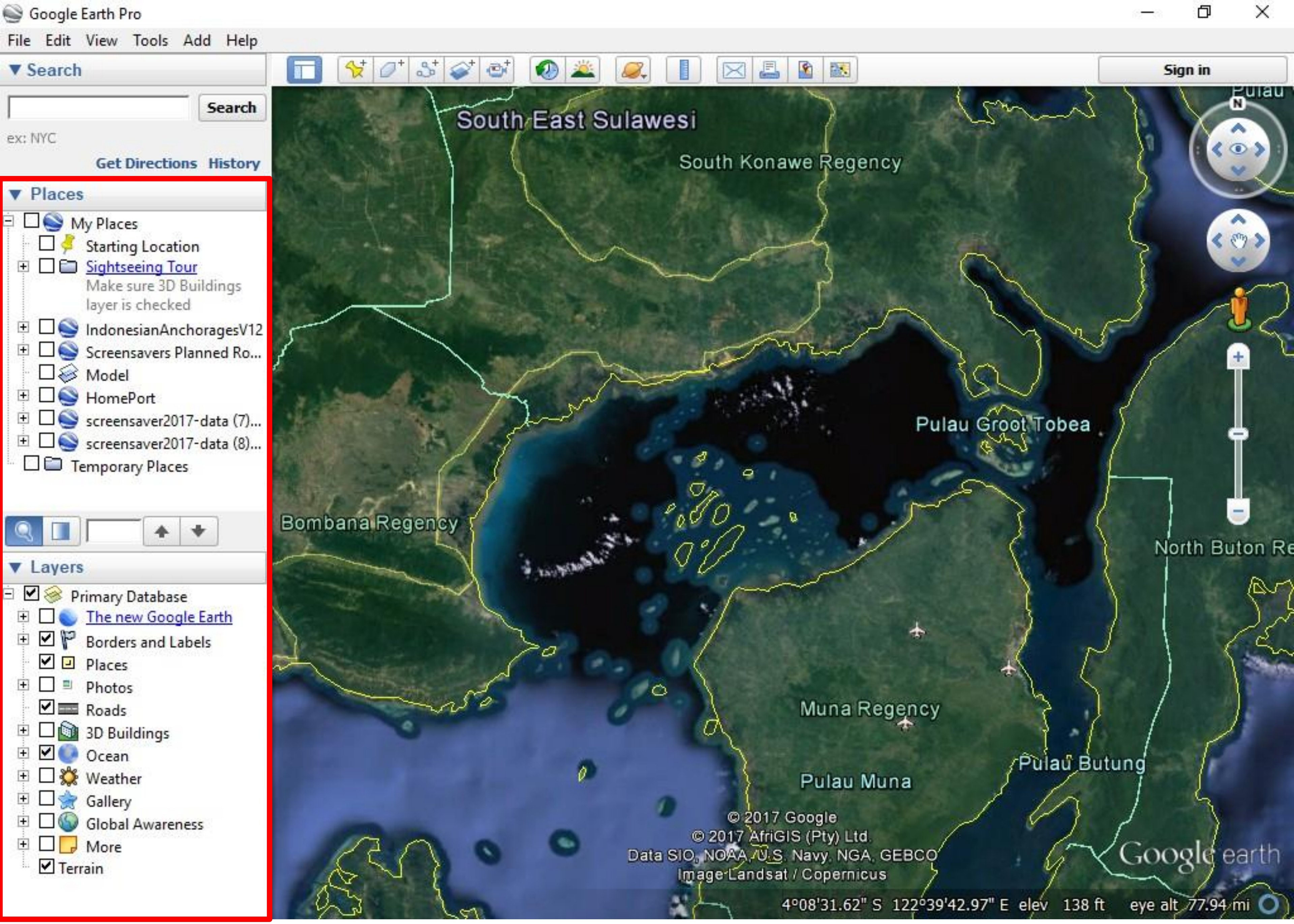
- You know absolutely what you have charted
- You can share your charts with others
- You know who made it and how well it is done

Steps to make a Chart from GoogleEarth

- Install GE2KAP & GoogleEarth (and/or SASPlanet)
- Locate area you want to chart
  - Zoom in, position
  - Make sure it is fully downloaded
  - Turn Layers On and Off
  - Get rid of toolbars (View /


Google Earth Pro
File Edit View Tools Add Help
Search
Search
ex: NYC
Get Directions History
Places
My Places
Starting Location
Sightseeing Tour
Make sure 3D Buildings layer is checked
IndonesianAnchoragesV12
Screensavers Planned Ro...
Model
HomePort
screensaver2017-data (7)...
screensaver2017-data (8)...
Temporary Places
Layers
Primary Database
The new Google Earth
Borders and Labels
Places
Photos
Roads
3D Buildings
Ocean
Weather
Gallery
Global Awareness
More
Terrain
Sign in
South East Sulawesi
South Konawe Regency
Pulau Groot Tobea
Bombana Regency
North Buton Re
Muna Regency
Pulau Muna
© 2017 Google
© 2017 AfriGIS (Pty) Ltd.
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
Google Earth
4°08'31.62" S 122°39'42.97" E elev 138 ft eye alt 77.94 mi

Fully Downloaded



Google Earth Pro
File Edit View Tools Add Help
Search
Search
ex: NYC
Get Directions History
Sign in
South East Sulawesi
South Konawe Regency
Bombana Regency
Pulau Groot Tobea
North Buton Re
Muna Regency
Pulau Muna
Pulau Butung
Pulau
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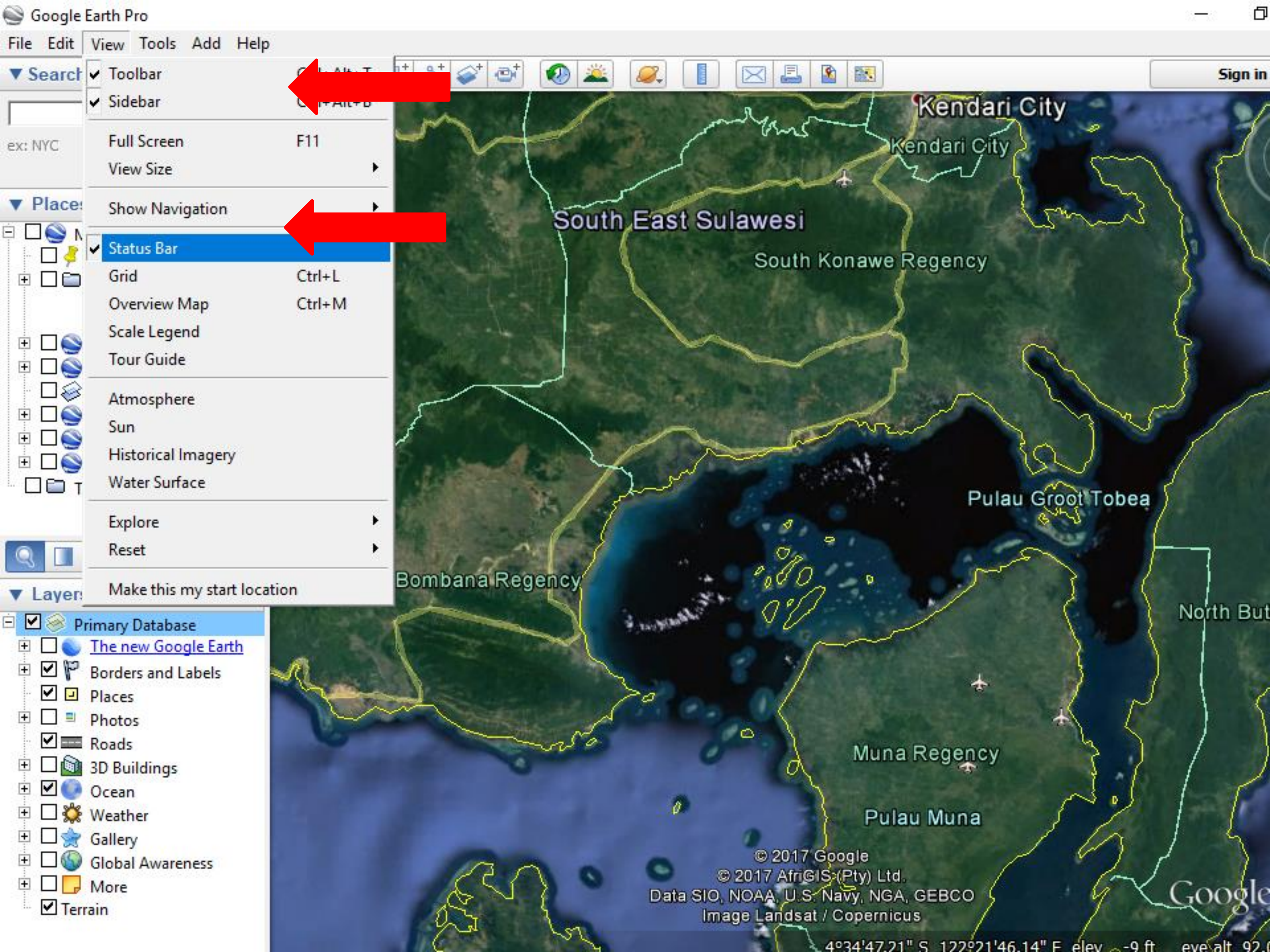
Image Landsat / Copernicus
Google earth
4°08'31.62" S 122°39'42.97" E elev 138 ft eye alt 77.94 mi

Places

- ☐ My Places
  - ☐ Starting Location
  - ☐ Sightseeing Tour
    Make sure 3D Buildings layer is checked
  - ☐ IndonesianAnchoragesV12
  - ☐ Screensavers Planned Ro...
  - ☐ Model
  - ☐ HomePort
  - ☐ screensaver2017-data (7)...
  - ☐ screensaver2017-data (8)...
- ☐ Temporary Places

Layers

- ☑ Primary Database
  - ☐ The new Google Earth
  - ☑ Borders and Labels
  - ☑ Places
  - ☐ Photos
  - ☑ Roads
  - ☐ 3D Buildings
  - ☑ Ocean
  - ☐ Weather
  - ☐ Gallery
  - ☐ Global Awareness
  - ☐ More
  - ☑ Terrain


Google Earth Pro
File
Edit
View
Tools
Add
Help
Search
ex: NYC
Places
Layers
✓ Toolbar Ctrl+Alt+T
✓ Sidebar Ctrl+Alt+B
Full Screen F11
View Size
Show Navigation
✓ Status Bar
Grid Ctrl+L
Overview Map Ctrl+M
Scale Legend
Tour Guide
Atmosphere
Sun
Historical Imagery
Water Surface
Explore
Reset
Make this my start location
Sign in
☑ Primary Database
☐ The new Google Earth
☑ Borders and Labels
☑ Places
☐ Photos
☑ Roads
☐ 3D Buildings
☑ Ocean
☐ Weather
☐ Gallery
☐ Global Awareness
☐ More
☑ Terrain
Kendari City
Kendari City
South East Sulawesi
South Konawe Regency
Pulau Groot Tobea
Bombana Regency
North But
Muna Regency
Pulau Muna
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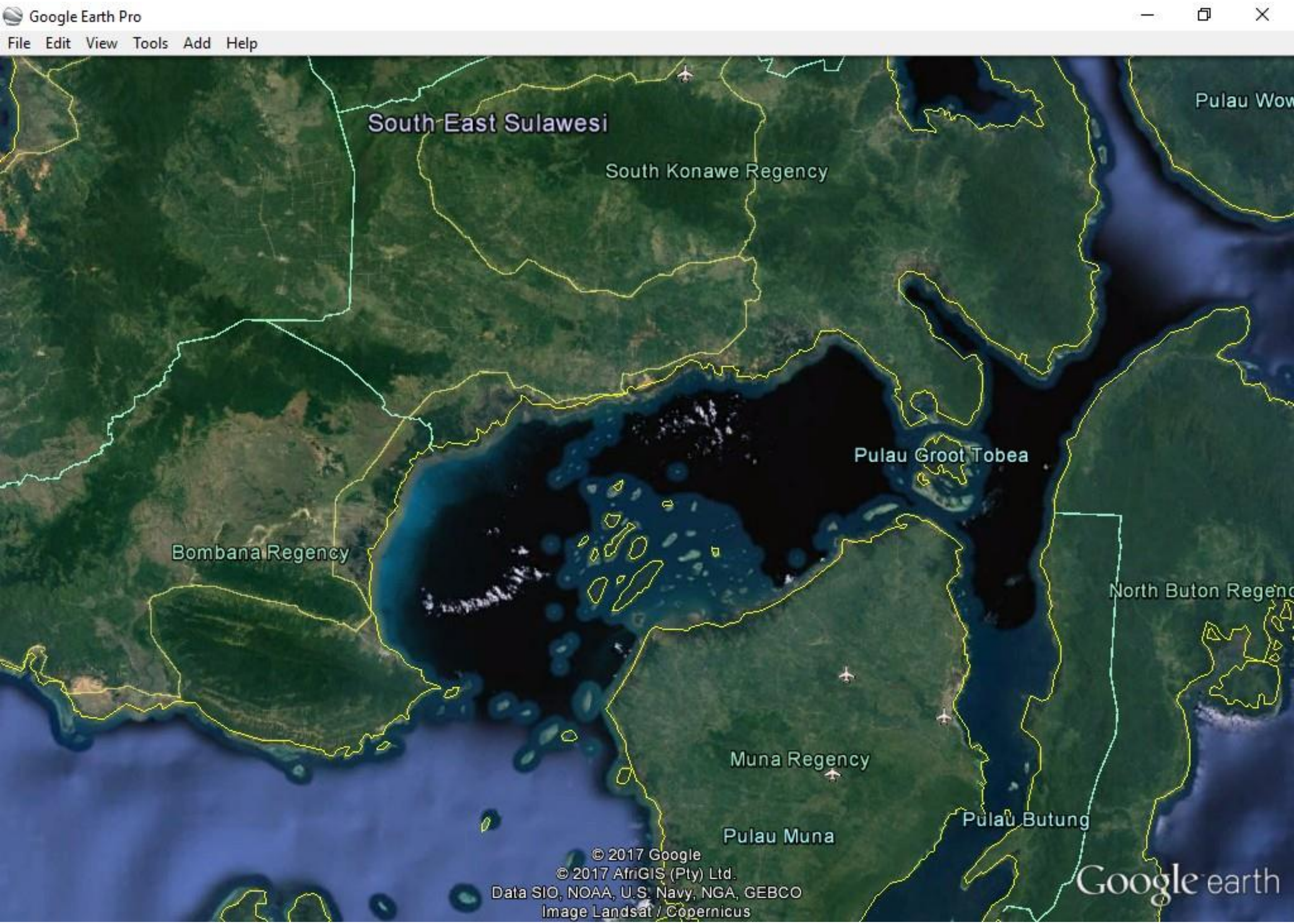
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
Google
4°34'47.21" S 122°21'46.14" E elev -9 ft eye alt 92



Google Earth Pro
File
Edit
View
Tools
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Help
South East Sulawesi
South Konawe Regency
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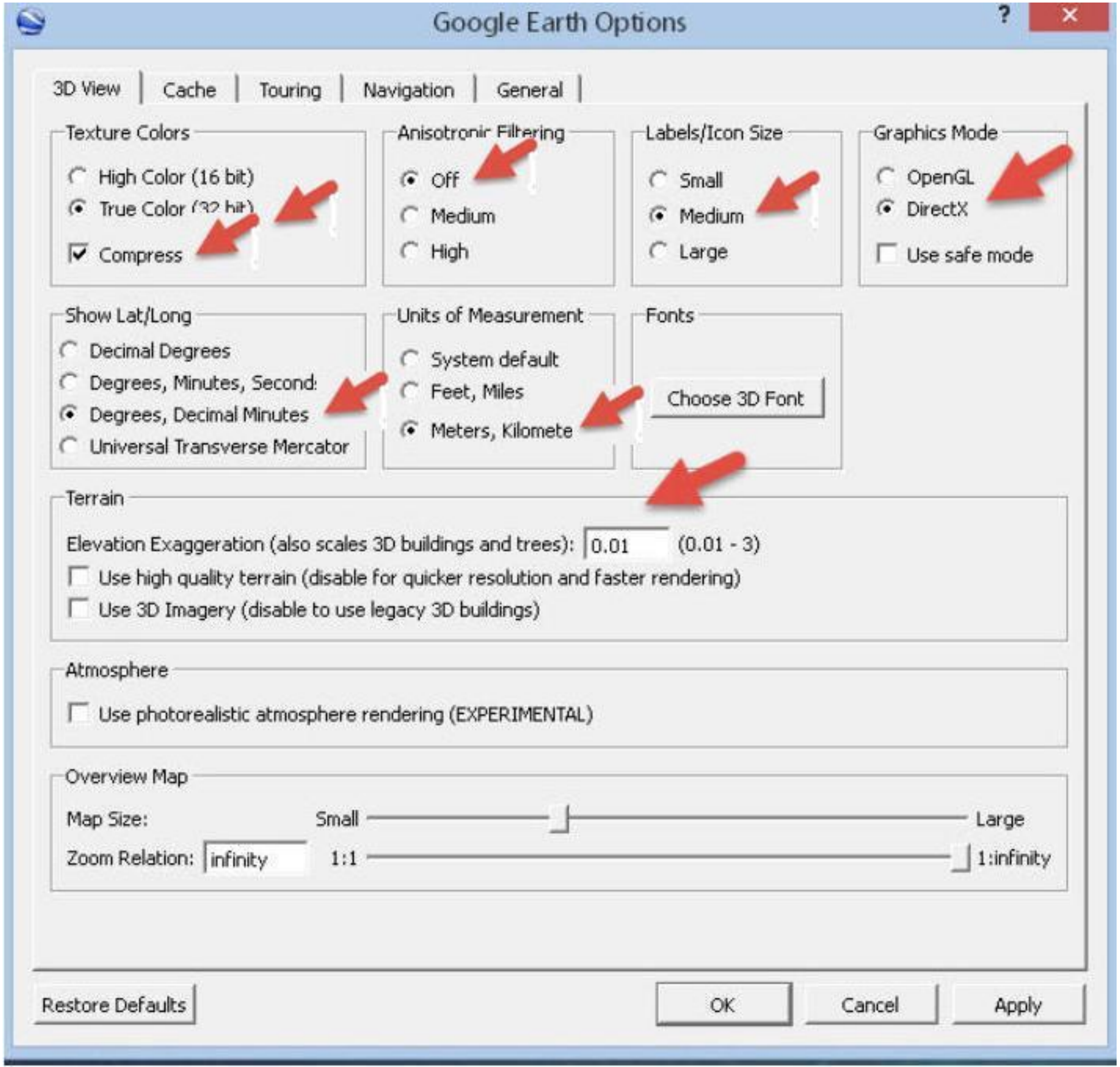
Image Landsat / Copernicus
Google earth

A Few Quick Settings Changes


Google Earth Options
?
×
3D View
Cache
Touring
Navigation
General

Texture Colors
- ○ High Color (16 bit)
- ● True Color (32 bit)
- ☑ Compress

Anisotropic Filtering
- ● Off
- ○ Medium
- ○ High

Labels/Icon Size
- ○ Small
- ● Medium
- ○ Large

Graphics Mode
- ○ OpenGL
- ● DirectX
- ☐ Use safe mode

Show Lat/Long
- ○ Decimal Degrees
- ○ Degrees, Minutes, Second
- ● Degrees, Decimal Minutes
- ○ Universal Transverse Mercator

Units of Measurement
- ○ System default
- ○ Feet, Miles
- ● Meters, Kilomete

Fonts
Choose 3D Font

Terrain

Elevation Exaggeration (also scales 3D buildings and trees): 0.01 (0.01 - 3)
- ☐ Use high quality terrain (disable for quicker resolution and faster rendering)
- ☐ Use 3D Imagery (disable to use legacy 3D buildings)

Atmosphere
- ☐ Use photorealistic atmosphere rendering (EXPERIMENTAL)

Overview Map

Map Size: Small — Large

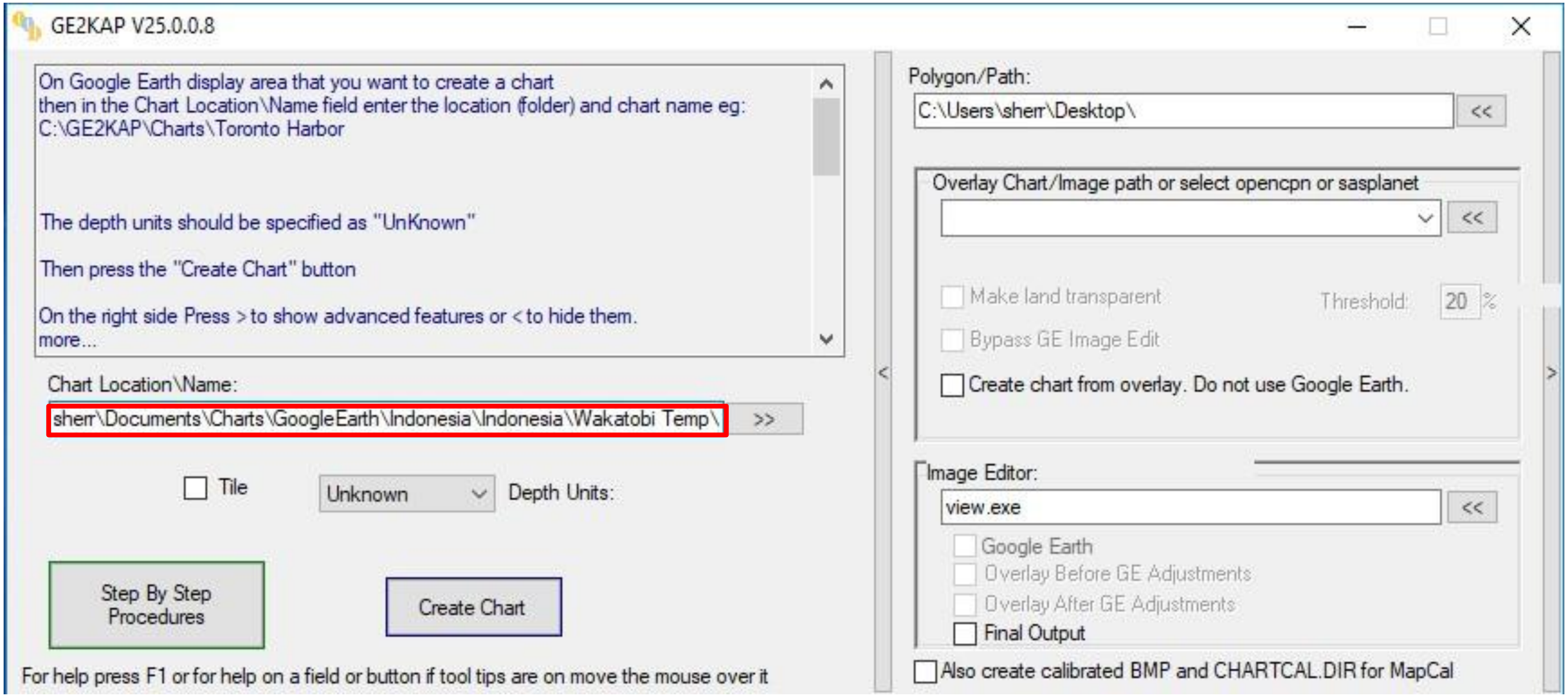
Zoom Relation: infinity 1:1 — 1:infinity

Restore Defaults
OK
Cancel
Apply

Steps to make a Chart from GoogleEarth/SAS Planet

- Open GE2KAP
- Select folder to save chart
- Name chart-to-be
- Click a button -> Creates a .kap file (raster chart file)
- Tell your chart program to load it

GE2Kap is Simple!



On Google Earth display area that you want to create a chart
then in the Chart Location\Name field enter the location (folder) and chart name eg:
C:\GE2KAP\Charts\Toronto Harbor

The depth units should be specified as "UnKnown"

Then press the "Create Chart" button

On the right side Press > to show advanced features or < to hide them.
more...

Chart Location\Name: sherr\Documents\Charts\GoogleEarth\Indonesia\Indonesia\Wakatobi Temp\

☐ Tile

Depth Units: Unknown

For help press F1 or for help on a field or button if tool tips are on move the mouse over it

Polygon/Path: C:\Users\sherr\Desktop\

Overlay Chart/Image path or select opencpn or sasplanet

☐ Make land transparent

Threshold: 20 %

☐ Bypass GE Image Edit

☐ Create chart from overlay. Do not use Google Earth.

Image Editor: view.exe

☐ Google Earth

☐ Overlay Before GE Adjustments

☐ Overlay After GE Adjustments

☐ Final Output

☐ Also create calibrated BMP and CHARTCAL.DIR for MapCal

Specify Path (to save chart) & filename, and click “Create Chart”

Advanced GE2KAP Features

- Make multiple charts along a course, or within a circle--great for coastlines or rivers
- Adjust screen capture on GoogleEarth to cut off the bottom stuff
- Merge multiple small charts into one big chart
- Overlay chart on OpenCPN (blended chart)

- Alternative to GE2KAP: www.venturefarther.com

GoogleEarth vs SAS Planet

- GoogleEarth
  - Easier to use (less flexibility)
  - Updates may cause problems
  - Limited to JUST Google imagery
  - Infinite / specific altitude settings
  - Many layers and overlay capabilities

GoogleEarth vs SAS Planet

- SAS Planet
  - High flexibility
  - Multiple imagery sources
  - User interface is quirky
  - Tiled area charts have dot in the middle (a GE2KAP quirk)
  - No longer being updated?
- You should check both when making charts, for best imagery

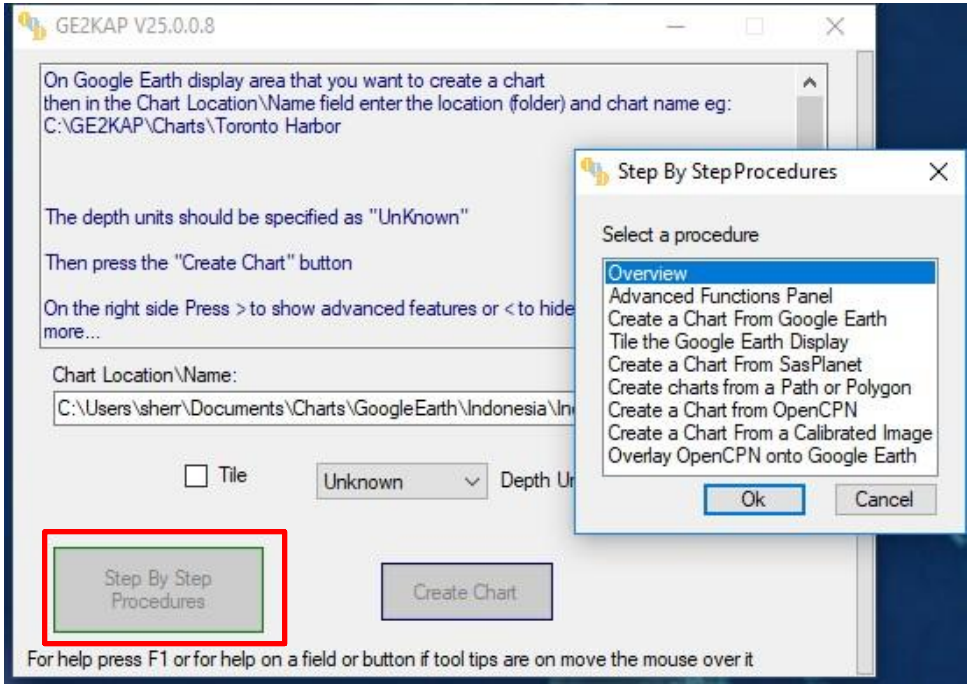
Downloading & Installing GoogleEarth & SASPlanet

- Use GoogleEarth Pro version from GE2KAP site (newer GE version blocks GE2KAP api)

- Use SASPlanet version from Valhalla site (pre-configured for GE2KAP settings)

GE2Kap & OpenCPN Tutorials

- Terry (Valhalla)
- Sherry (Soggy Paws)
- Embedded in GE2Kap



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more...

Chart Location\Name:
C:\Users\sherr\Documents\Charts\GoogleEarth\Indonesia\In

☐ Tile

Unknown

Depth Ur

For help press F1 or for help on a field or button if tool tips are on move the mouse over it

Select a procedure

- Overview
- Advanced Functions Panel
- Create a Chart From Google Earth
- Tile the Google Earth Display
- Create a Chart From SasPlanet
- Create charts from a Path or Polygon
- Create a Chart from OpenCPN
- Create a Chart From a Calibrated Image
- Overlay OpenCPN onto Google Earth

Sources of Pre-Made GoogleEarth Charts

- Mike on Zen Again (world?)
- Terry on Valhalla (SE Asia & W Pac)
- Sherry on Soggy Paws (Fr Poly to SE Asia)
- Jon on Ocelot (SE Asia) (bring hard drive)
- Rally Groups (Puddle Jumpers)
- Other Cruisers' hard drive swap

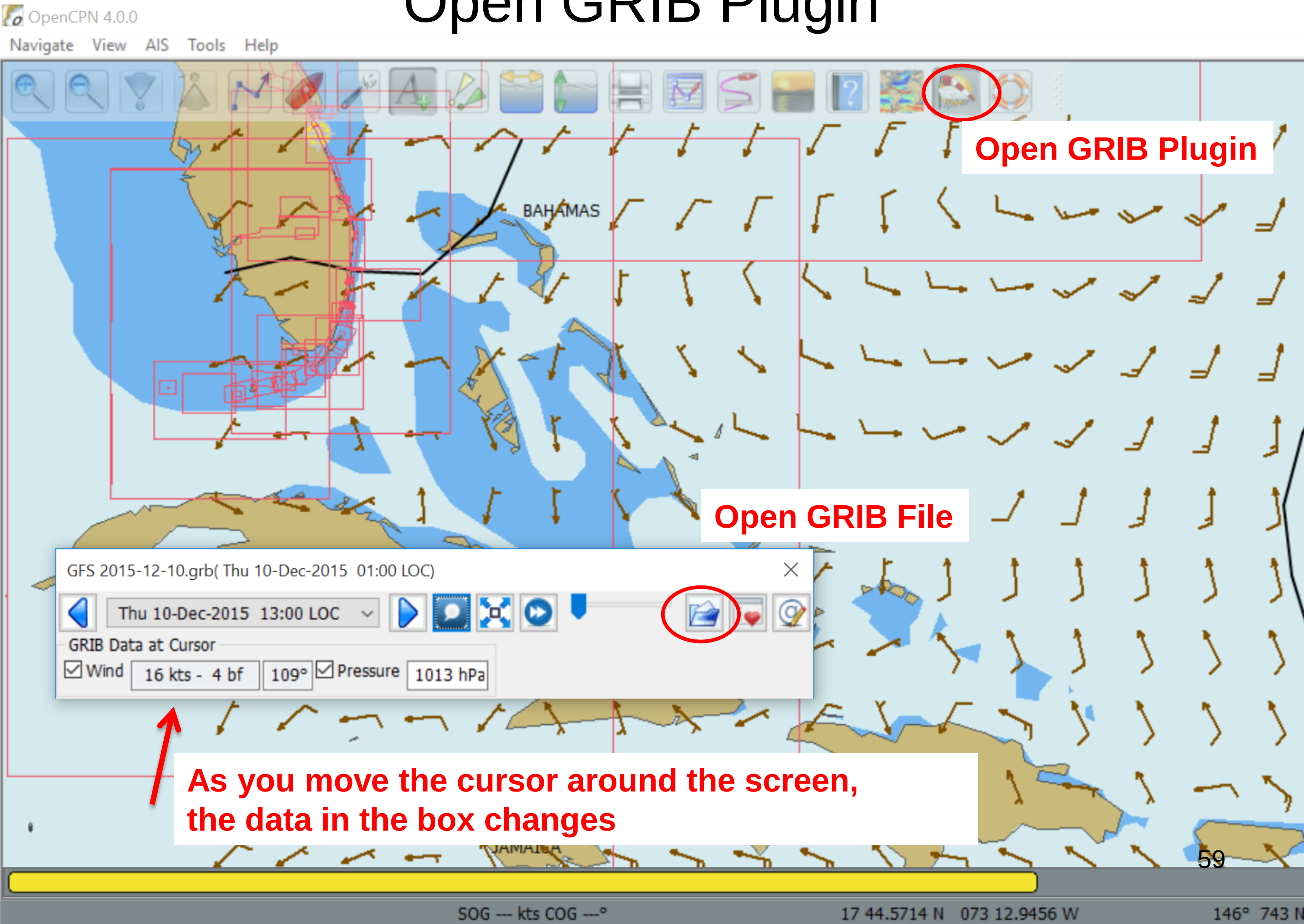
Choosing a Charting Program

- Are you held captive??
- Chartplotters = captive, expensive, ruggedized
- Time Zero (ex Nobeltec) = captive, expensive
- Most tablet apps = captive, cheap
- OpenCPN = OPEN!, free!

Benefits of OpenCPN

- Free, free, free
- Runs on almost everything (exc iPad ☹)
- Supports many chart formats
- Great for sharing tracks and waypoints (gpx)
- Permits adjustment to CM93 v2 Charts
- Good website and extensive help
- Many, many plug-ins to add functionality

Open GRIB Plugin


OpenCPN 4.0.0
Navigate View AIS Tools Help
BAHAMAS
JAMAICA

GFS 2015-12-10.grb(Thu 10-Dec-2015 01:00 LOC)

Thu 10-Dec-2015 13:00 LOC

GRIB Data at Cursor

☑ Wind 16 kts - 4 bf 109° ☑ Pressure 1013 hPa

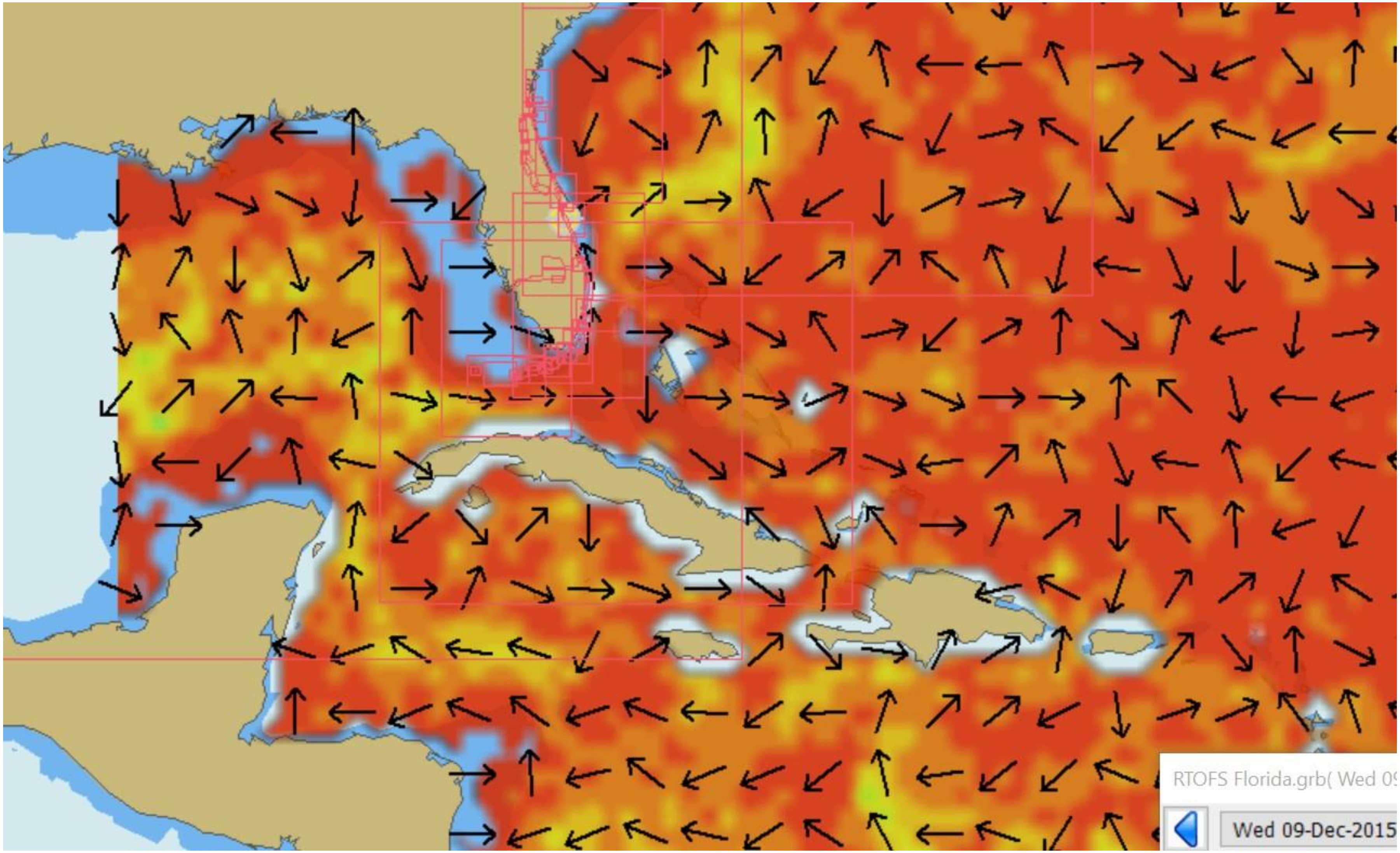
SOG --- kts COG ---° 17 44.5714 N 073 12.9456 W 146° 743 N

Open GRIB Plugin

Open GRIB File

As you move the cursor around the screen, the data in the box changes

RTOFS (Grib File) Display


RTOFS Florida.grb(Wed 0
Wed 09-Dec-2015

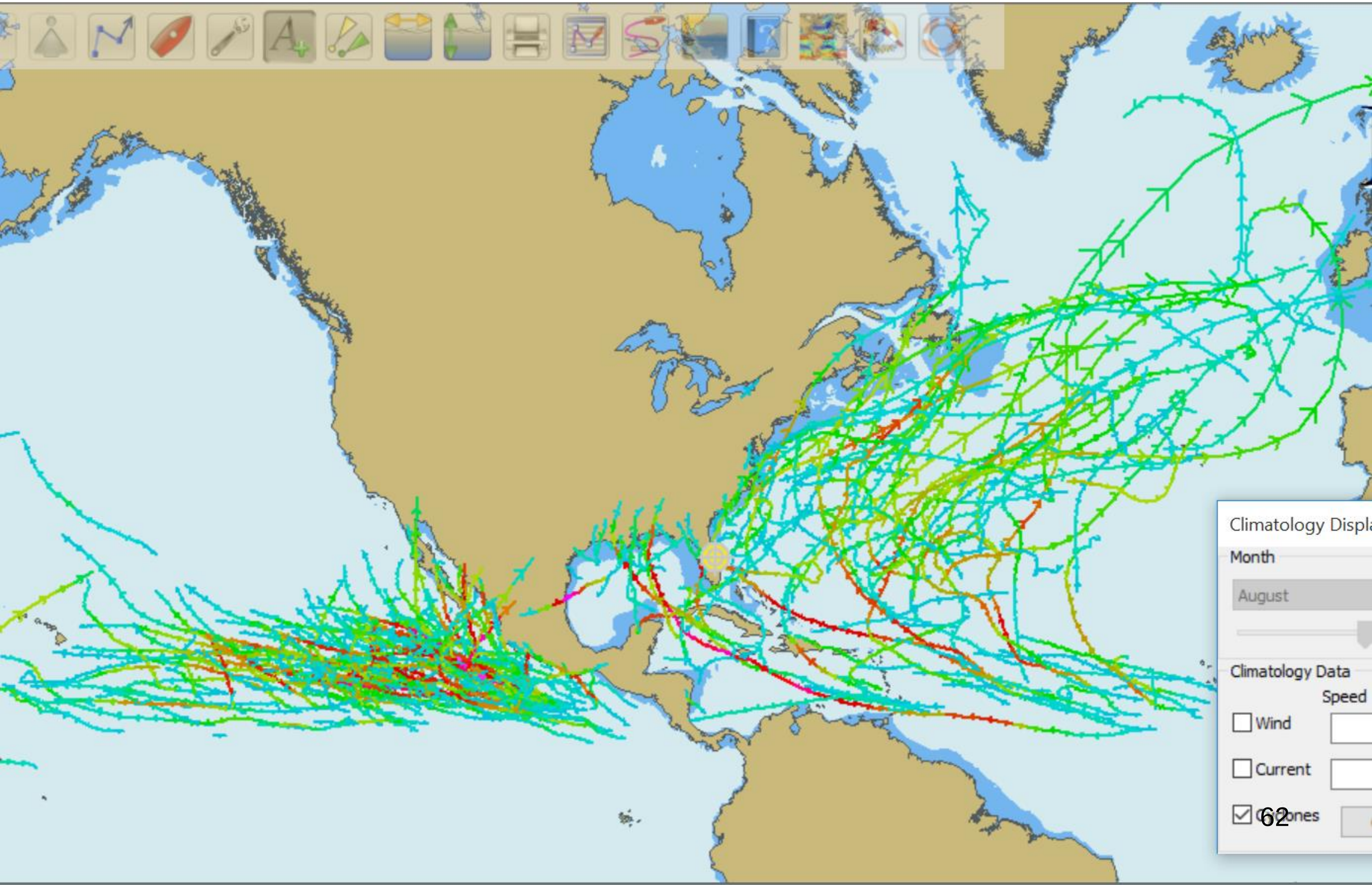
RTOFS = Grib file for current data

Climatology Plugin

- Pilot charts overlaid on your chart
- Updated with fairly recent data
- Wind, currents, and tropical storm tracks
- Traditional wind rose display, or wind barbs

“Climatology data is generally averaged since the 1980's depending on data type and sources available (for example, Wind data is averaged 6 hr data since 1987)”

Where is a Safe Place to Be In August?



Climatology Displa

Month

August

Climatology Data

Speed

☐ Wind

☐ Current

☑ Cyclones

More OpenCPN Plugins

- Radar overlay (Garmin & Navico)
- Weather Routing
- Create your Polar file
- Voyage Data Recorder
- Stowage Manager
- Logbook Function
- NMEA Instrument Display
- Squidio – Alternative to Active Captain

Rugged Laptops for OpenCPN

10 inch screen, $425
13 inch screen, $450
Free shipping

1.2 ghz processor
80 gb HDD
2 gb RAM
External GPS antenna
12 volt power supply
Linux OS
Pre-loaded w/ OpenCPN & some charts

Accuracy of the GPS

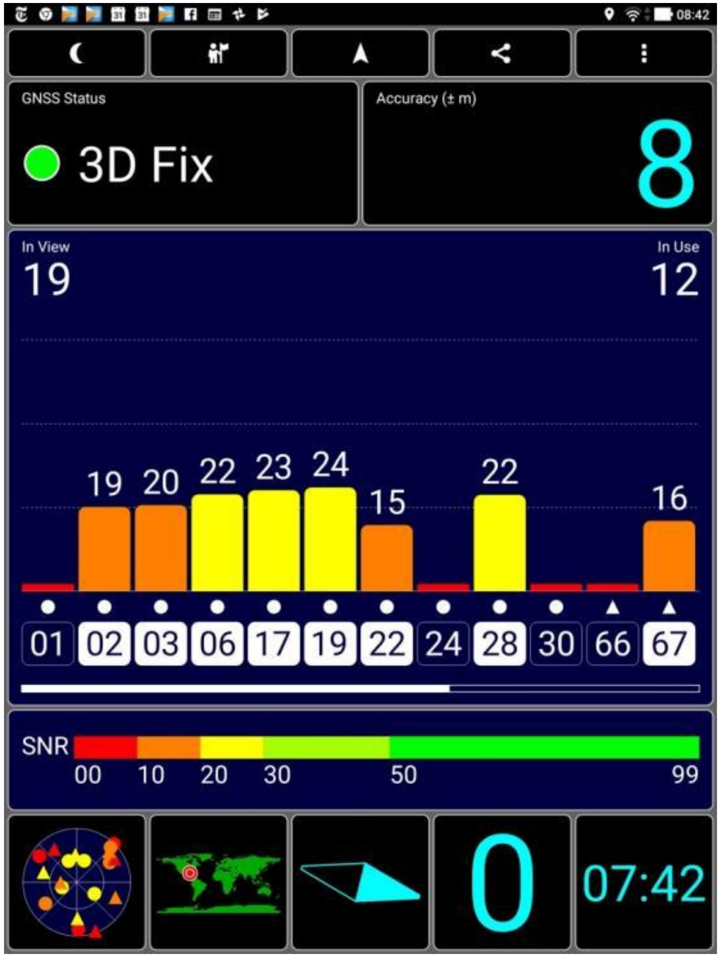
- Does your tablet HAVE a GPS? (older wifi-only, maybe not)
  - Recommended: Bad Elf Bluetooth GPS
- Backup/easy USB GPS for laptops
  - GlobalSat BU-353-**S4** USB GPS Receiver
    - Windows 7, 8, 10
    - Linux
    - Rasberry Pi
    - $27 on Amazon, with Prime

Accuracy of the GPS

- Understand the limitation of your GPS
- Time to acquire fix varies widely
  - How many receivers it has (8,12,48 channels)
  - How long since last use
  - How far away from last use
  - Signals blocked (cabin, trees, buidlings)
  - Newer devices can perform significantly better

Android program “GPS Test”

Inside building
Marginal SNR
Not many sats



GNSS Status: 3D Fix

Accuracy (± m): 8

In View: 19

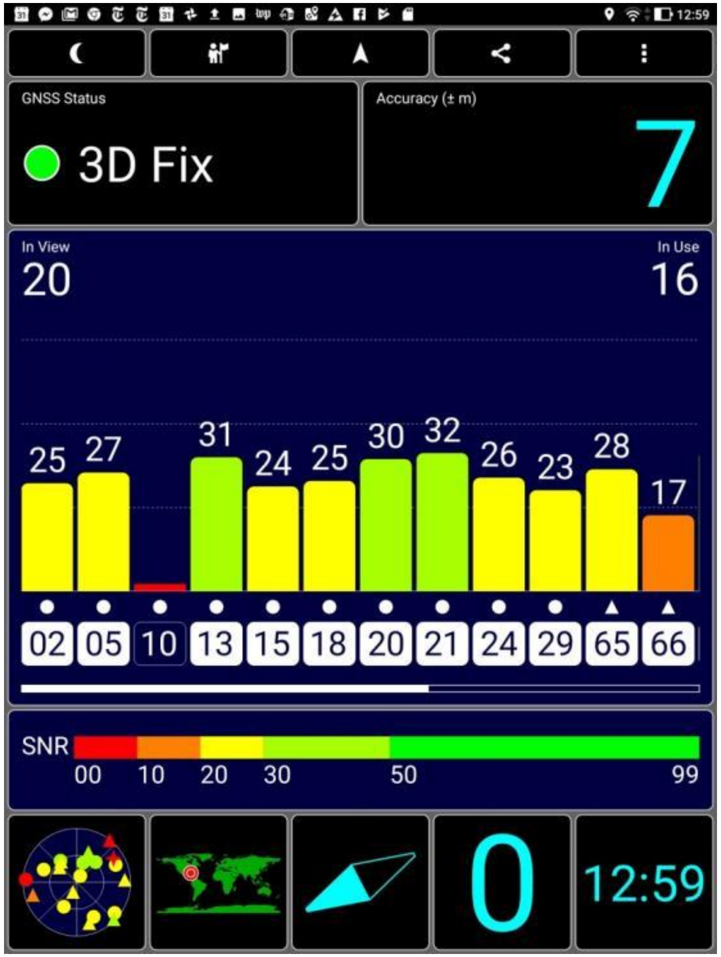
In Use: 12

08:42
19
20
22
23
24
15
22
16
01
02
03
06
17
19
22
24
28
30
66
67
SNR
00
10
20
30
50
99
0
07:42

METERS!

Android program "GPS Test"

Outside buildings
OK SNR
More sats



GNSS Status
3D Fix

Accuracy (± m)
7

In View
20

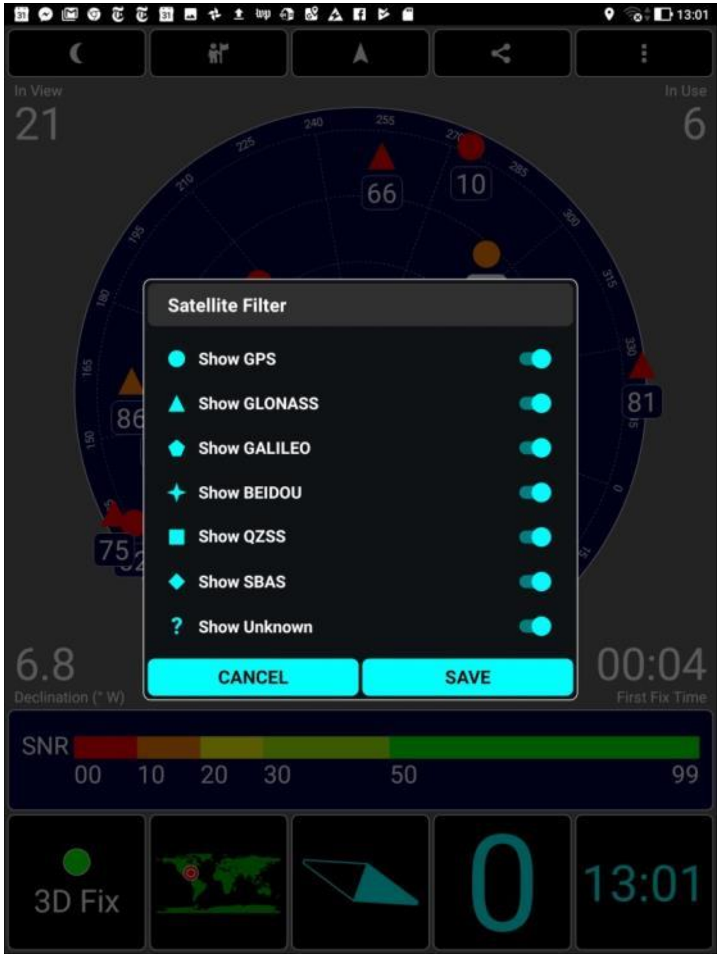
In Use
16

12:59
25
27
31
24
25
30
32
26
23
28
17
02
05
10
13
15
18
20
21
24
29
65
66
SNR
00
10
20
30
50
99
0
12:59

METERS!

Android program “GPS Test”

What Satellites
to Display



Satellite Filter

- Show GPS ●
- Show GLONASS ●
- Show GALILEO ●
- Show BEIDOU ●
- Show QZSS ●
- Show SBAS ●
- Show Unknown ●

13:01
In View
21
In Use
6
66
10
86
81
75
6.8
Declination (° W)
CANCEL
SAVE
00:04
First Fix Time
SNR
00
10
20
30
50
99
3D Fix
0
13:01

Entering a new Area? How to Check Your Chart

- Accuracy
  - Plot a known set of waypoints
  - GPX / Friend you trust / Satellite / Guidebook
- Detail
  - Check vs other sources
- Plot route and check at low level
- If you change your route, check your NEW route at low level

Entering a new Area?
What Charts to Use?

- ASK “what are the best charts for…”
- Make sure you validate
  - Chartplotter, tablet, or computer
  - What “generation” of chart
- Ask people who “go places”
- Harbor charts for busy ports are almost always accurate everywhere
- The further off the beaten path, the more likely the charts will be inaccurate

If You’re Stuck Navigating Unfamiliar areas at Night

- Consider: Heave to and enter in daylight
- If you must go in…
  - Prior prep makes this option much safer
    - Satellite (GE) charts
    - Trusted tracks and waypoints
  - Check and double-check
  - Charts, waypoints, routes, depths
  - Use other validation methods (radar, depth sounder)
  - Mark I eyeballs! Spotlight at night

The Bottom Line

- Know the true accuracy of your GPS device
- Plot a detailed route and examine for anomalies
- If your route changes, examine it again
- Don’t sail around reefs at night
- Use all the tools available
  - Paper charts
  - Electronic charts from several sources
  - GoogleEarth & other satellite charts
  - Other cruiser’s tracks and waypoints
  - Cruising guides

The Bottom Line

- Double check your waypoints

- One caution about “Electronic charts from several sources (make sure they are different sources)”
  - The Grib File / Weather Forecast analogy

The End
www.SVSoggyPaws.com

Questions?

Sources of Charting Tools/Info

- Terry (Valhalla) Charts, Waypoints, Guides, etc
  http://yachtvalhalla.net/navigation/terrystopics.htm
- Paul's GE2Kap Program
  http://www.gdayii.ca/
- OpenCPN
  https://opencpn.org/
- Ovital Maps (iPad / Android)
  http://www.ovital.com/en/
- Zen Again (Lots of Charts!)
  http://yachtzenagain.blogspot.com/2015/04/googleearth-kap-library-for-opencpn-and.html

Sources of Charting Tools/Info

- Soggy Paws' Website
  http://svsoggypaws.com/GECharts/index.htm Charts
  http://svsoggypaws.com/Presentations.htm OpenCPN
- Garmin's iPad Product (BlueChart)
  - Apple Store (Not currently available on Android ☹)
- Navionics Apps (iPad & Android)
  - Apple Store & Google Play
- USB GPS for Laptops Amazon Link
- Ruggedized PC's equipped with OpenCPN & GPS
  Gary Rogers **captgary40@gmail.com** or text at 239-633-5714
- Navigating with SAS Planet Directly
  http://outchasingstars.com/2017/07/15/using-sas-planet-navigate-uncharted-reefs/

Other Background Information

- https://www.thoughtco.com/raster-vs-vector-charts-2915534
- https://www.nauticalcharts.noaa.gov/csdl/seamlessraster.html