What We Can Learn from Sailing Accidents to Benefit Sailors

Sally Lindsay Honey, Chair,
Safety at Sea Committee

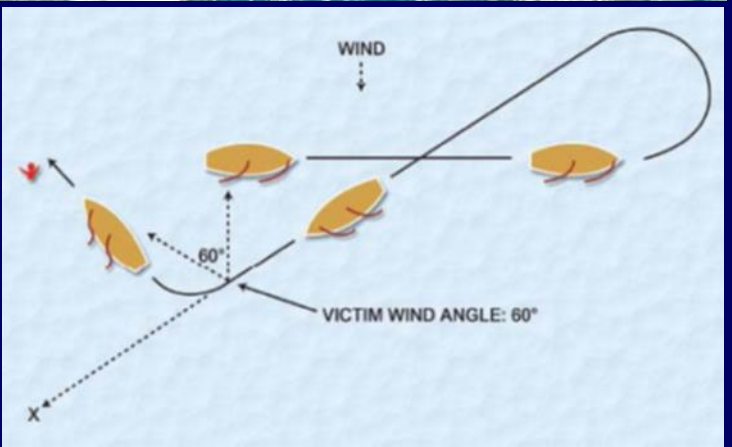
Chuck Hawley, Past Chair,
Safety at Sea Committee

Sailing Incidents

What happened in 6 incidents? How they have changed sailing.

Lessons Learned Incorporated into:

- Equipment Requirements
- Vessel Limitations
- Training
- Crew Expertise



3 Incidents, 7 souls

- Low Speed Chase, Sydney 38
  - Safe Water Depths
  - April 14, 2012: 5 crew lost
- Imedi, TP 52
  - Boat Control near COB
  - July 21, 2018: 1 crew lost
- Morpheus, Moore 24
  - COB Recovery Equipment
  - March 13, 2019: 1 crew lost
- ALL: Inadequate Flotation

Farallones Race
San Francisco
April 14, 2012

A normal lively sailing day -

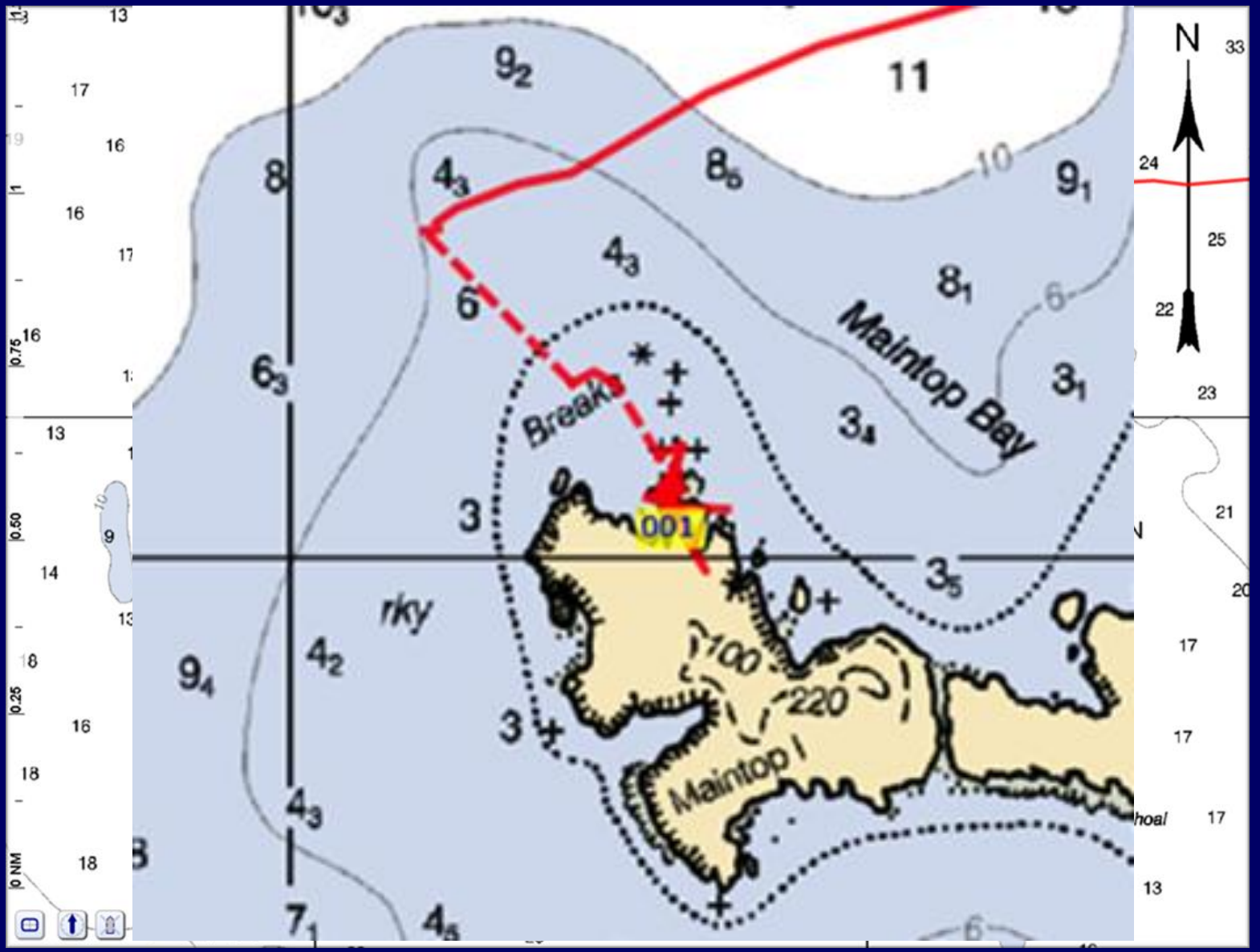
- turned tragic:

Breaking wave

Lee Shore

5 of 8 crew lost

Failure of seamanship in negotiating shoal waters on a lee shore



Lost At Sea -

Alan Cahill

Alexis Busch

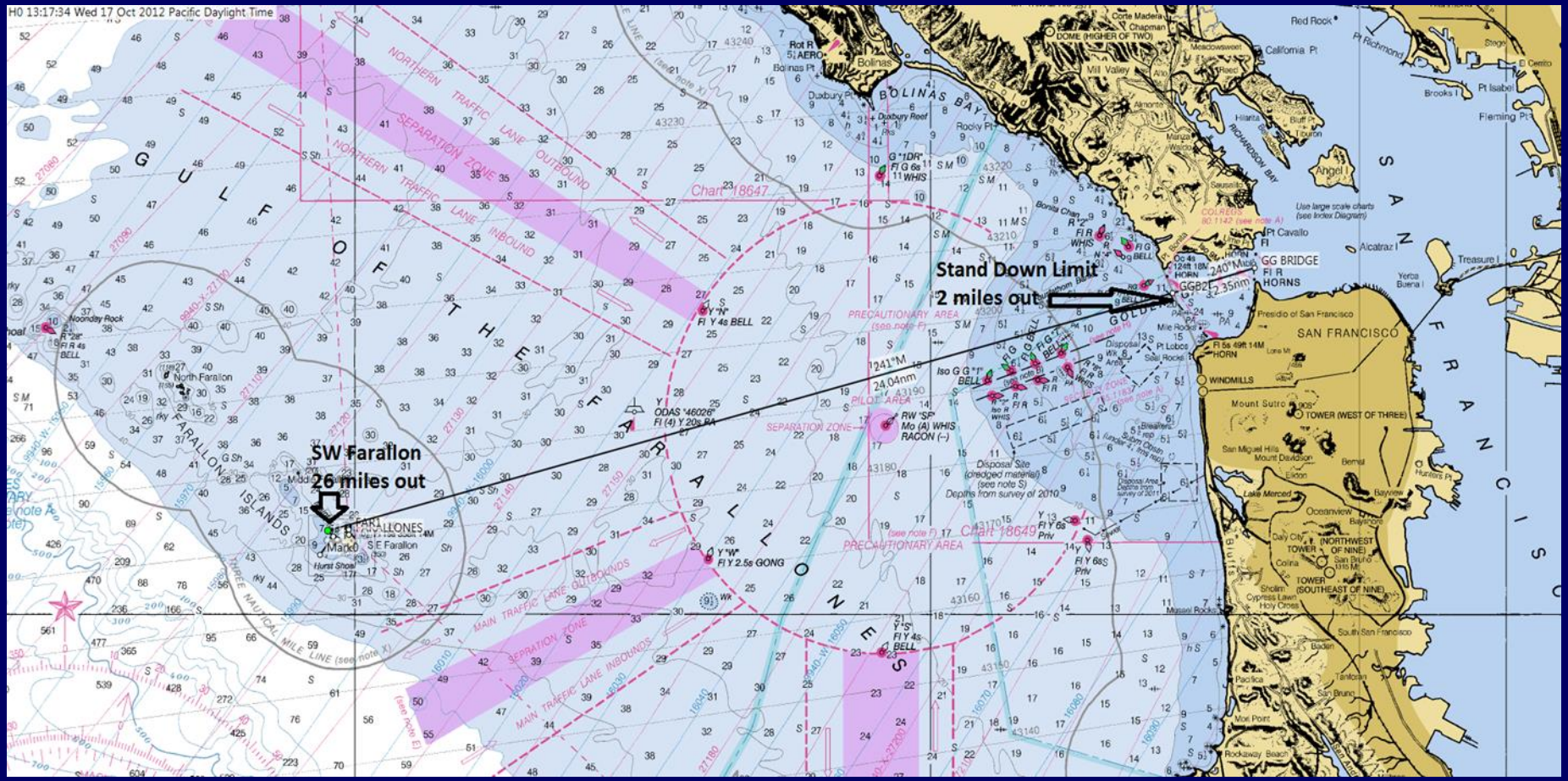
Marc Kasanin

Jordan Fromm

Elmer Morrissey

No tethers: 5 of 7 in the water were lost; one on boat survived.
Survivors wore life jackets that met US Sailing 5.0.1
Compromised buoyancy in surf/aerated water

12 days later: USCG Capt. Stowe called for Stand Down in Gulf of the Farallones



Restricts offshore races to line from Mt. Bonita to Land's End

"San Francisco offshore sailboat racing organizations need to review racing safety protocols and seek improvement"

USCG asked US Sailing to Investigate:

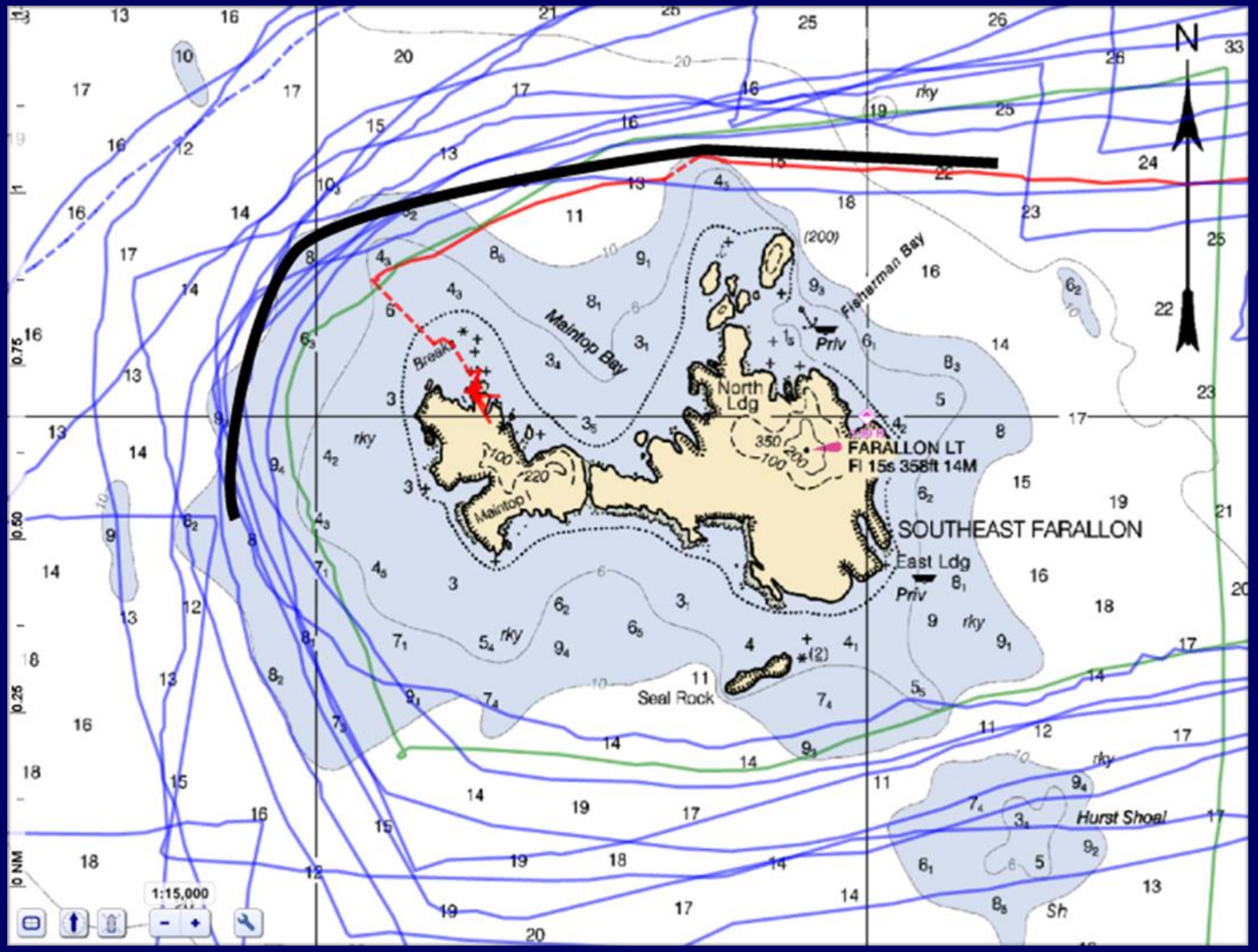
1. **Failure of seamanship** in negotiating shoal waters on a lee shore was the only direct cause

2. **Inadequate personal safety gear** in use for offshore conditions, could have saved lives

3. **Limited VHF communication infrastructure** hampering race committee-to-race boat communications

4. **Race management protocol flaws** created uncertainty surrounding search and rescue efforts

Only Prevention: more conservative course



Recommendations from LSC Tragedy

1. Annual Training to improve seamanship, specifically on breaking wave development.
2. Require personal flotation to meet USS prescription 5.0.1, training in jackline rigging and use, spot inspections to ensure MER compliance.
3. Improve VHF communication infrastructure
4. Improve race management accountability of boats and crew on the race course.

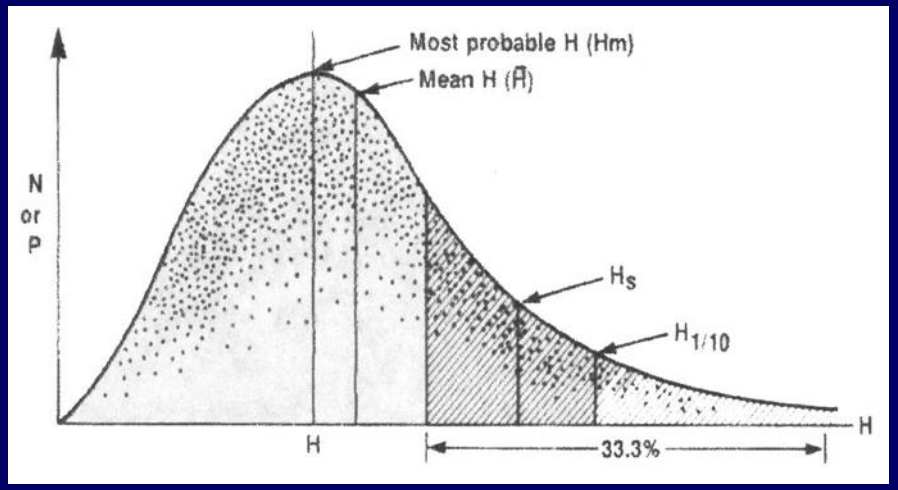
Safe Water Depths:

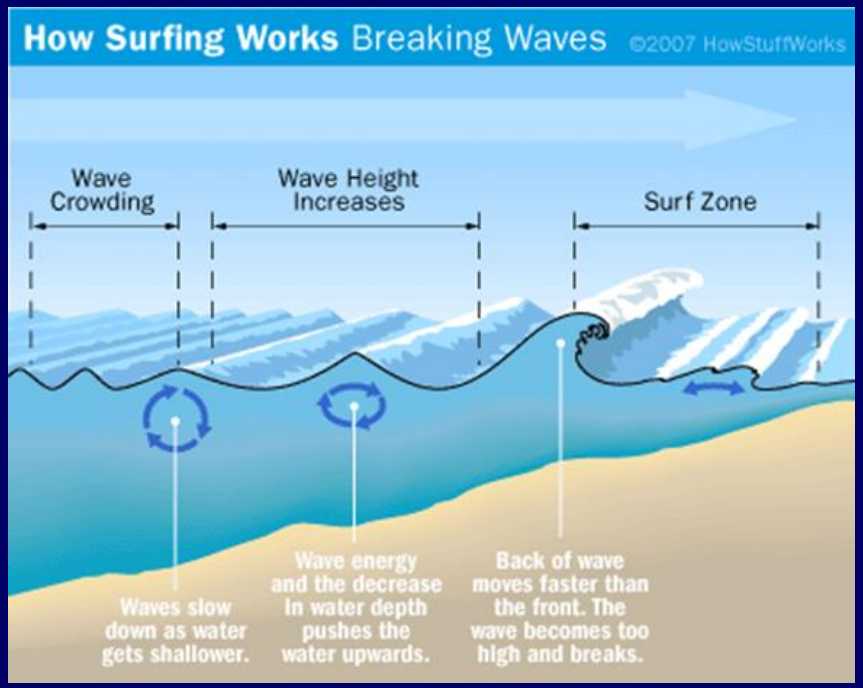
Significant Wave Height/SWH =

average of largest 1/3 of all waves.

Forecast: wind waves 7’ on 15’ swell

Maximum: 30 feet, 2-3 per hour = 25’





Calculate minimum depth from maximum forecast swell and wind-wave heights: 3 ways

Easiest: 2.5x the sum of maximum forecast swell and wind-wave heights

For April 14th forecast: 1) 43’, 2) 55’, and 3) 45-60’

Inadequate personal safety gear for offshore conditions

- Racers required to “have” lifejackets to meet US SAILING 5.0.1, but only wear “adequate” flotation
- Category 2 requirements not met by two crew
- Of crew in water, those wearing 5.0.1 life jackets survived, none had thigh straps
- Jacklines deployed per requirement, not used

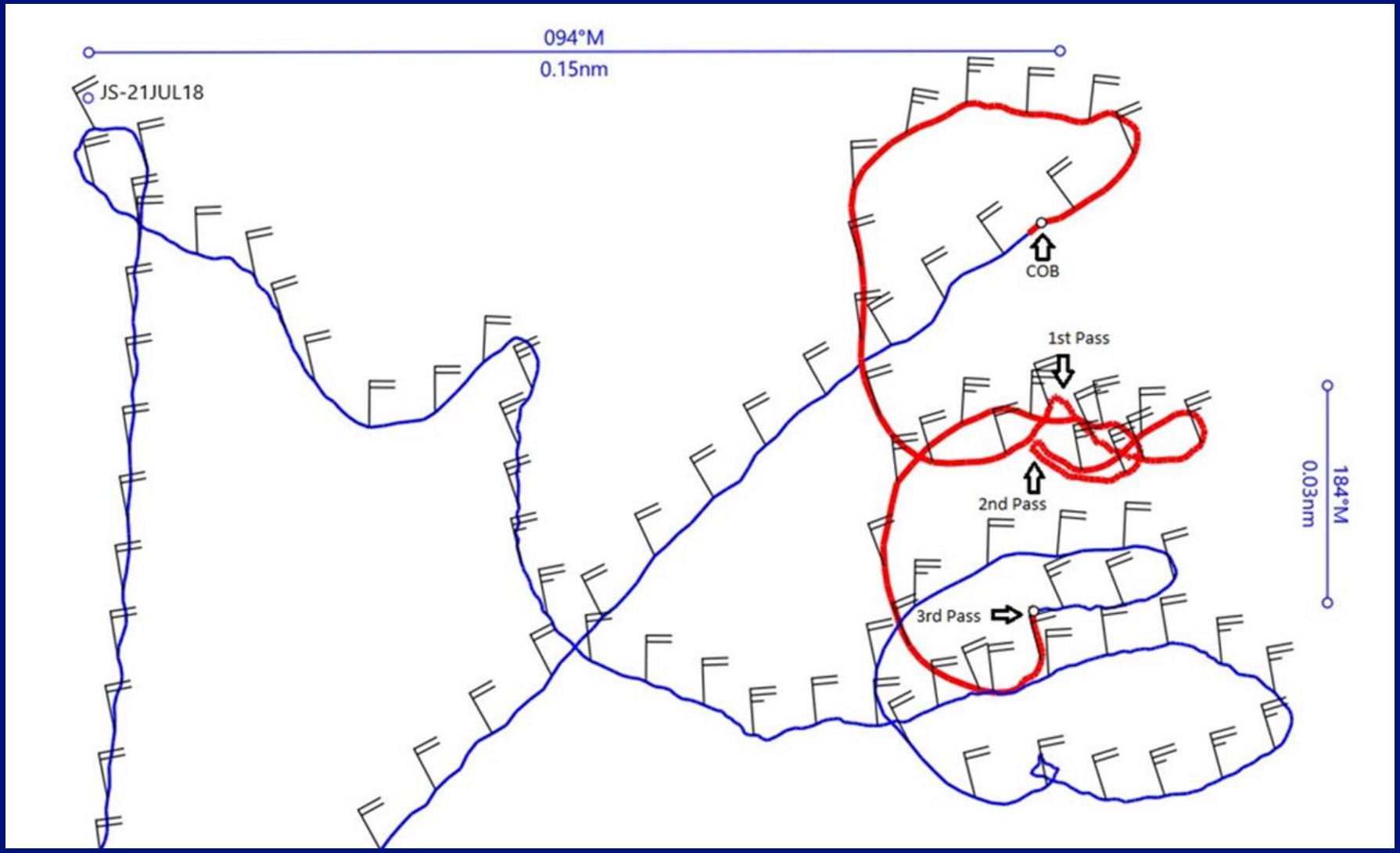
Direct Results – NorCal ORC

- Seamanship – Skippers' meetings: local conditions
  - More variety of Safety at Sea course formats: ½ day, full day, 2 day
- Safety gear – SERs created, consistent among all OAs, inspections required

Imedi, TP 52, Chicago- Mackinac Race, 21 July 2018, Jon Santarelli/COB lost

Wide open cockpit: no jack lines near vang control

Imedi recovery attempts



Jon Santarelli was fit, conscious, swimming. Why did he drown?

CO2 cartridge not pierced until recovered 1 week later

Life Jacket Maintenance & Understanding:

- Cursory pre-inspection of 10+ year old life jackets
- Crew not familiar with boat-supplied life jackets
- No attempt by PIW to manually/orally inflate life jacket

Other Issues:

2. Obligatory COB Practice:

   inside breakwater,
   under power

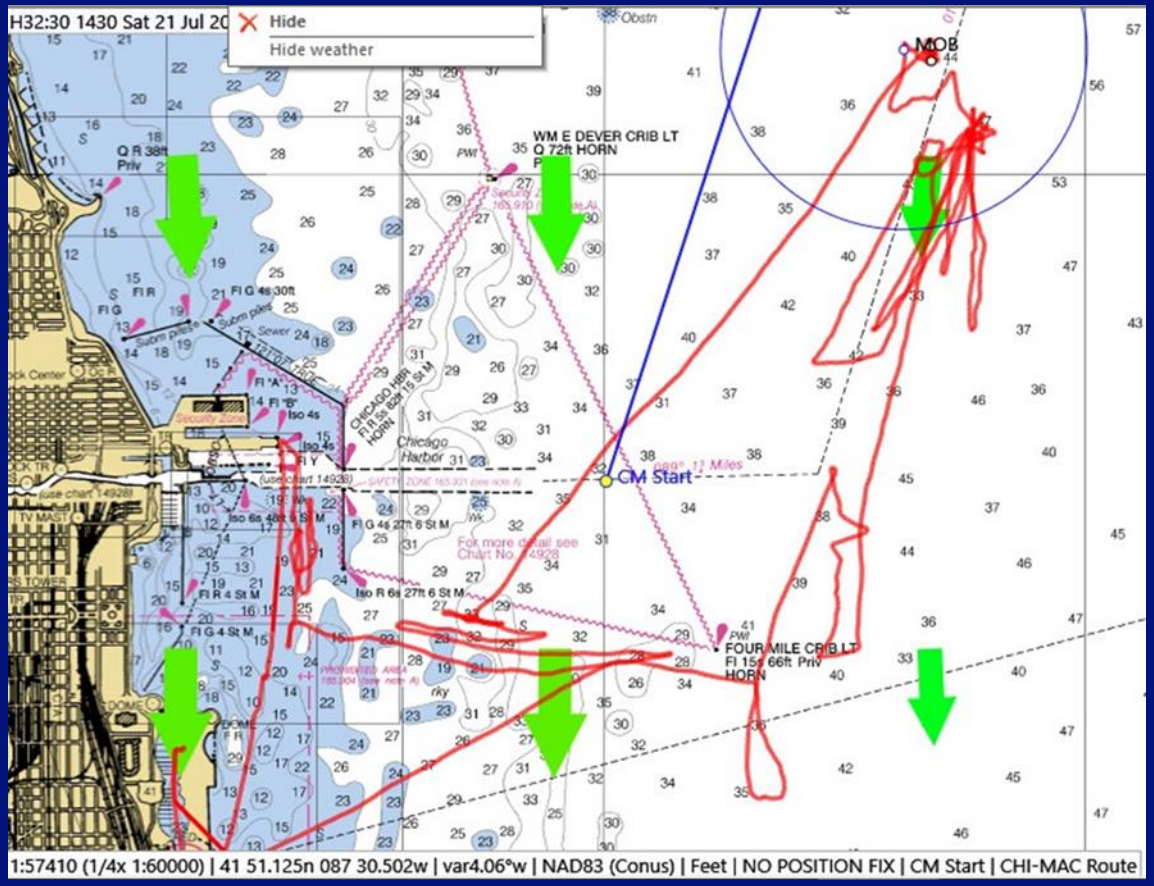
3. Command Structure:

   poorly defined

4. Unused Equipment:

   LifeSling,

   MOM



Lessons Learned

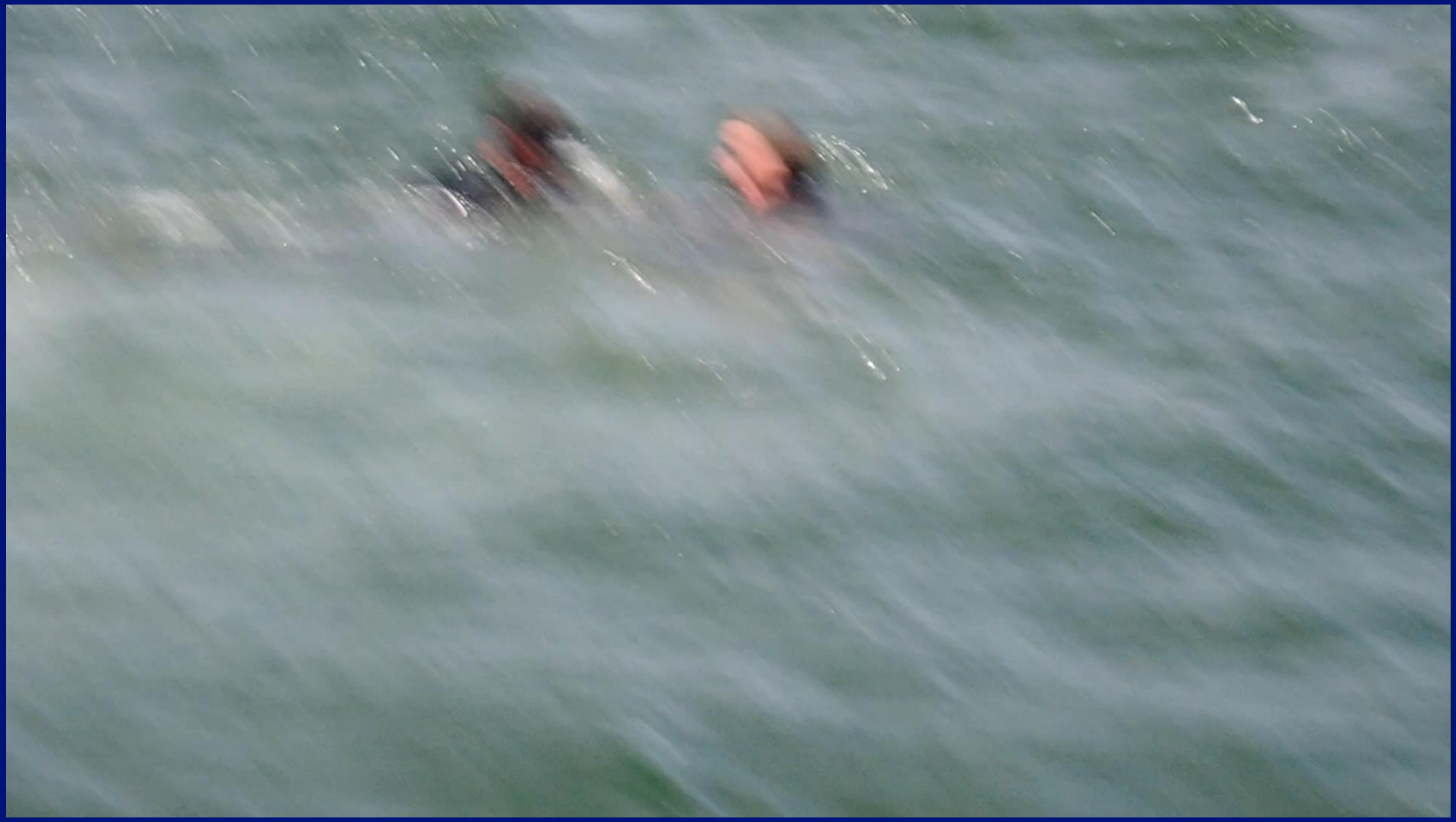
1. Comprehensive Dock Talk: command structure, crew roles, procedures
2. Establish/communicate COB procedures
3. Safety gear: Inspect, fit, instruct prior to use
4. Practice in expected conditions
5. As PIW: act immediately
6. Enhanced training needed for inflatable lifejackets

Safe COB Recovery in seaway:

Alternative Possibilities:

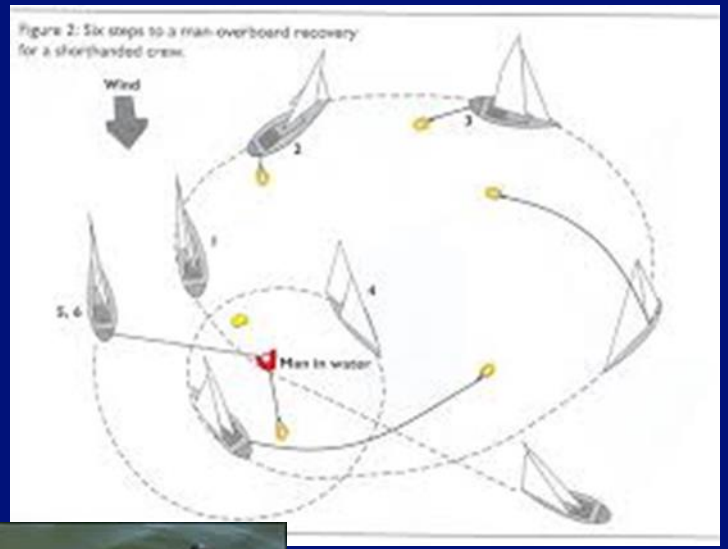
- Swimmer of the watch (Professional crews)
- Lower crew on halyard (Adequately fit crew)
- Modified LifeSling 1:2 retrieval

Flat bottom, fin keel



Safe COB Recovery in Seaway:

1. Push MOB button
2. Slow boat, Lower headsail
3. Sail by COB – Ensure adequate flotation, don't stop
4. Dowse main, motor back
5. Drag LifeSling around COB
6. Stop boat, drift
7. Hook spinnaker halyard to tow line outside lifelines, do not disconnect.
8. Hoist COB on 1:2 purchase up and over lifelines



Morpheus, Moore 24
Monterey Bay Wednesday Evening Race, March 13, 2019 – COB drowned

Windy conditions, but not unusual for Monterey Bay

Recovery Attempts, Morpheus crew:

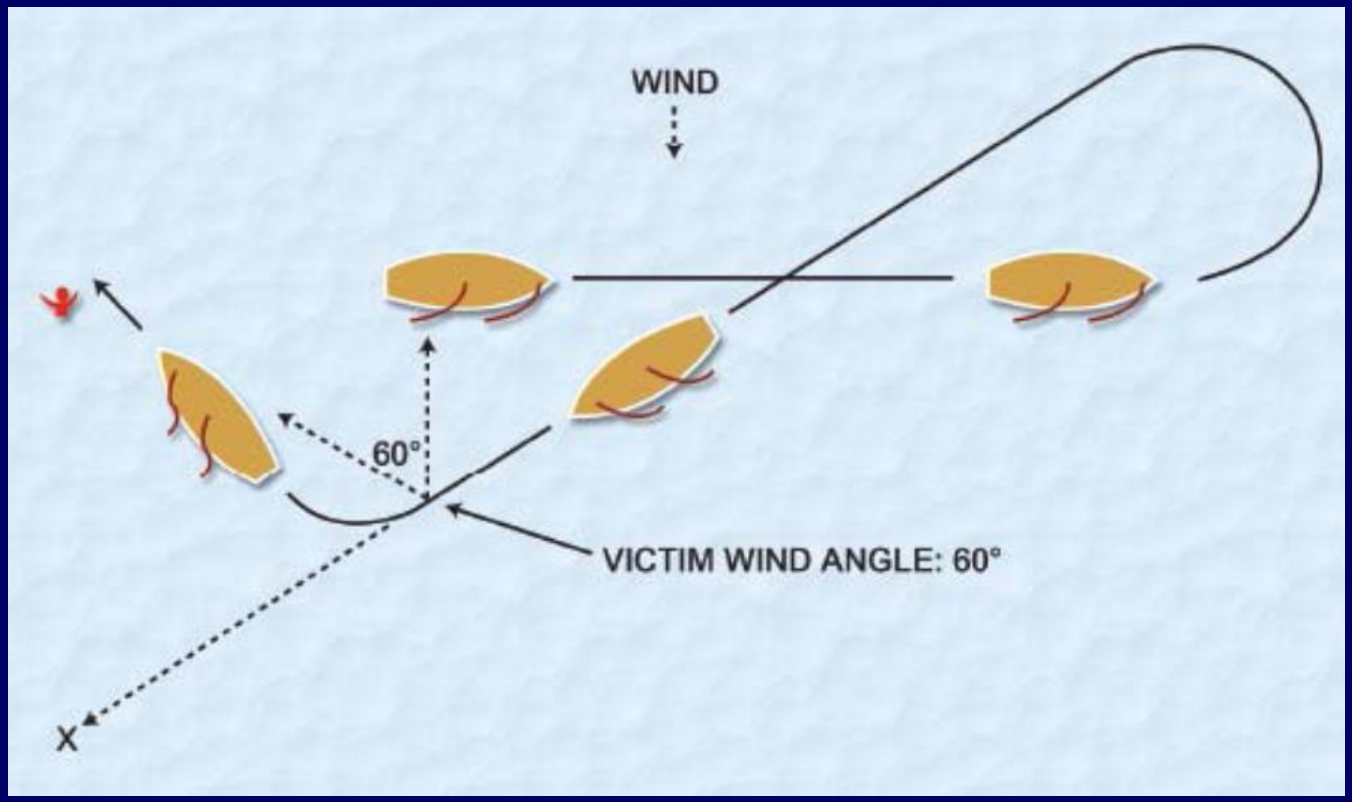
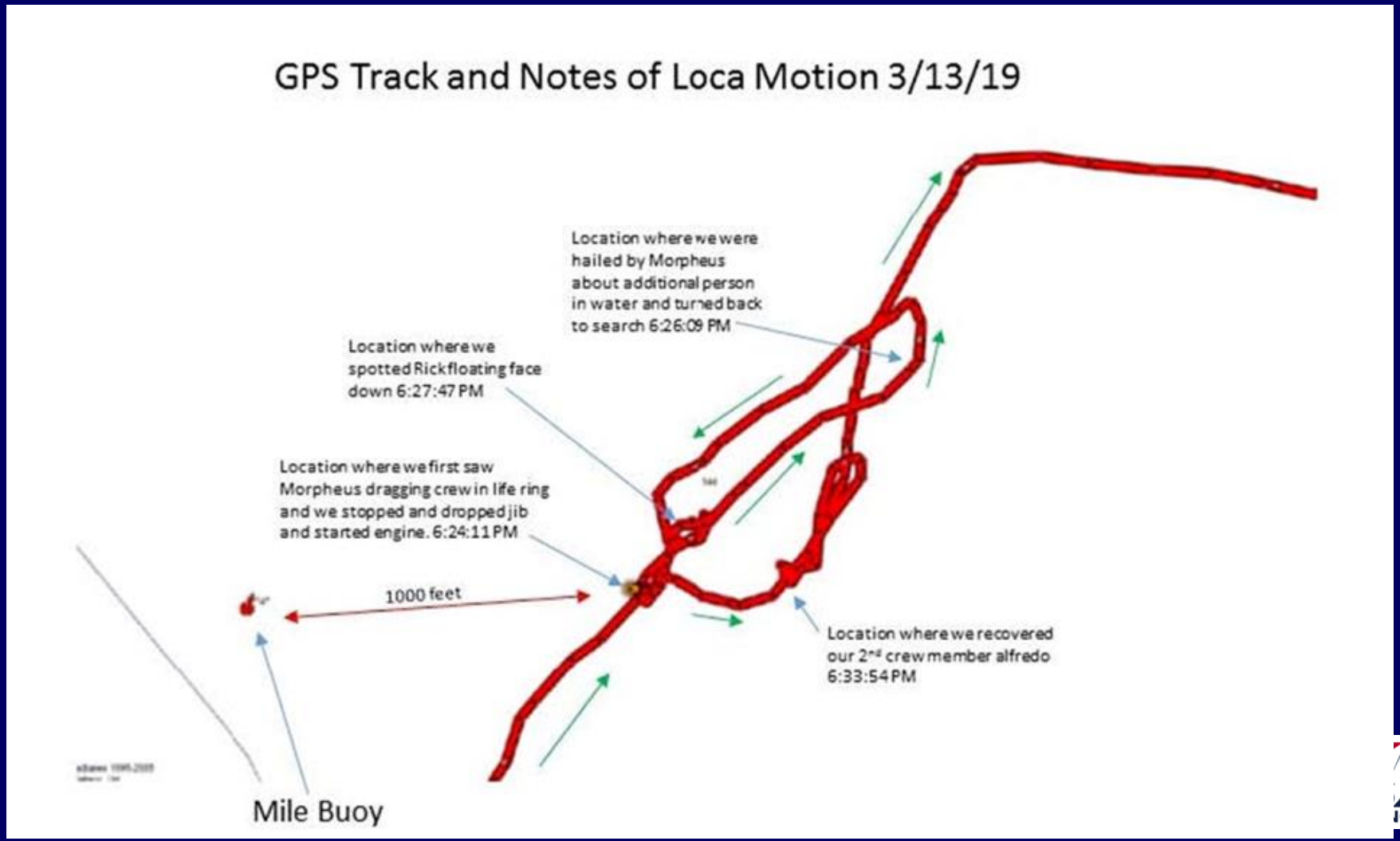


Figure 8, twice. Lost grip: “Hurry”

Threw line, upwind, Dale falls in

Recovery Attempt, Loca Motion, Express 37



Lessons Learned

Stay attached to boat

Consider use of lifelines

Cause of death: drowning due to inadequate flotation

Use of Lifesling could have provided flotation

Crisis stress > additional people in water

Cold water acts quickly

Inflatable Lifejackets

Still the best option

- Integrate harness, tether

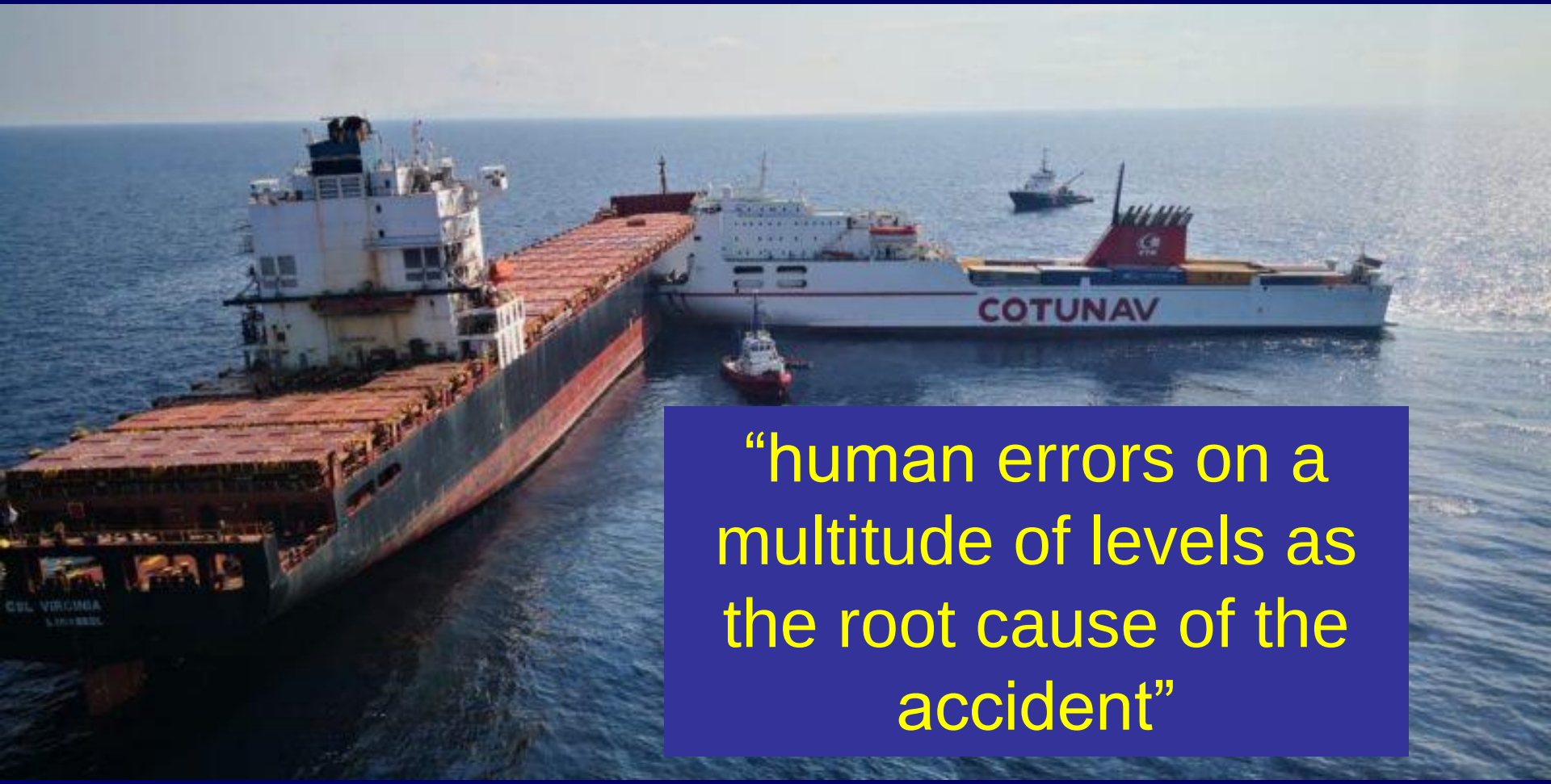
Must be understood, maintained, checked

Must be adjusted to fit

US Sailing to survey inflatable lifejacket failures

New clinics specific to life jacket wear & care

It’s not just sailboats or recreational boaters...



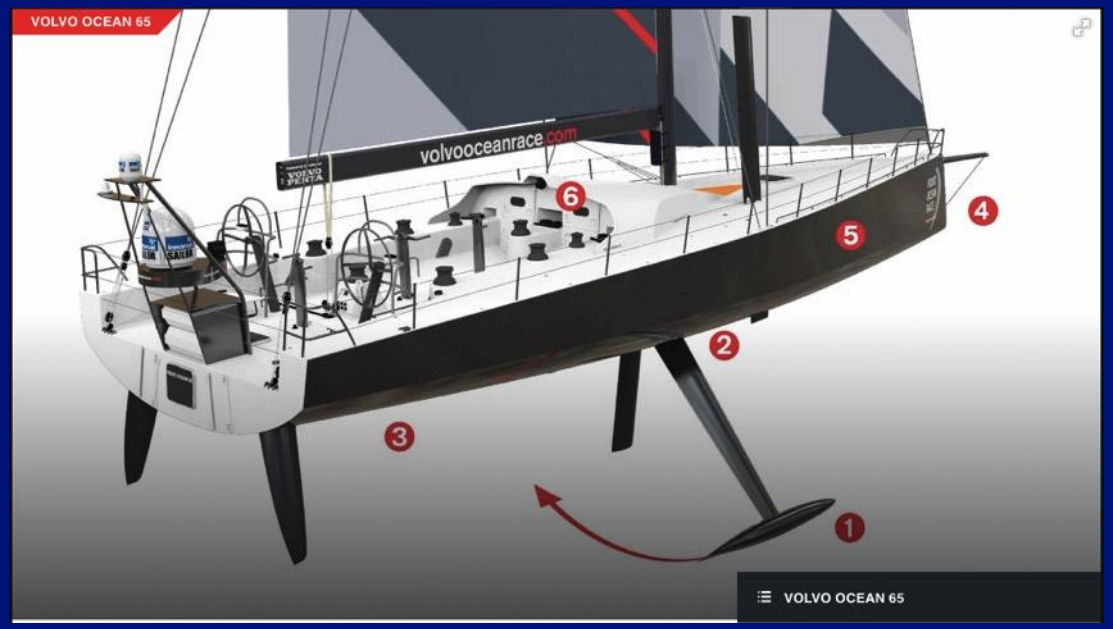
“human errors on a multitude of levels as the root cause of the accident”

“the watch officer onboard the Tunisian ro-ro Ulysse was alone on the bridge and was on his phone”

Vestas Wind
Volvo Ocean Race
November 29, 2014

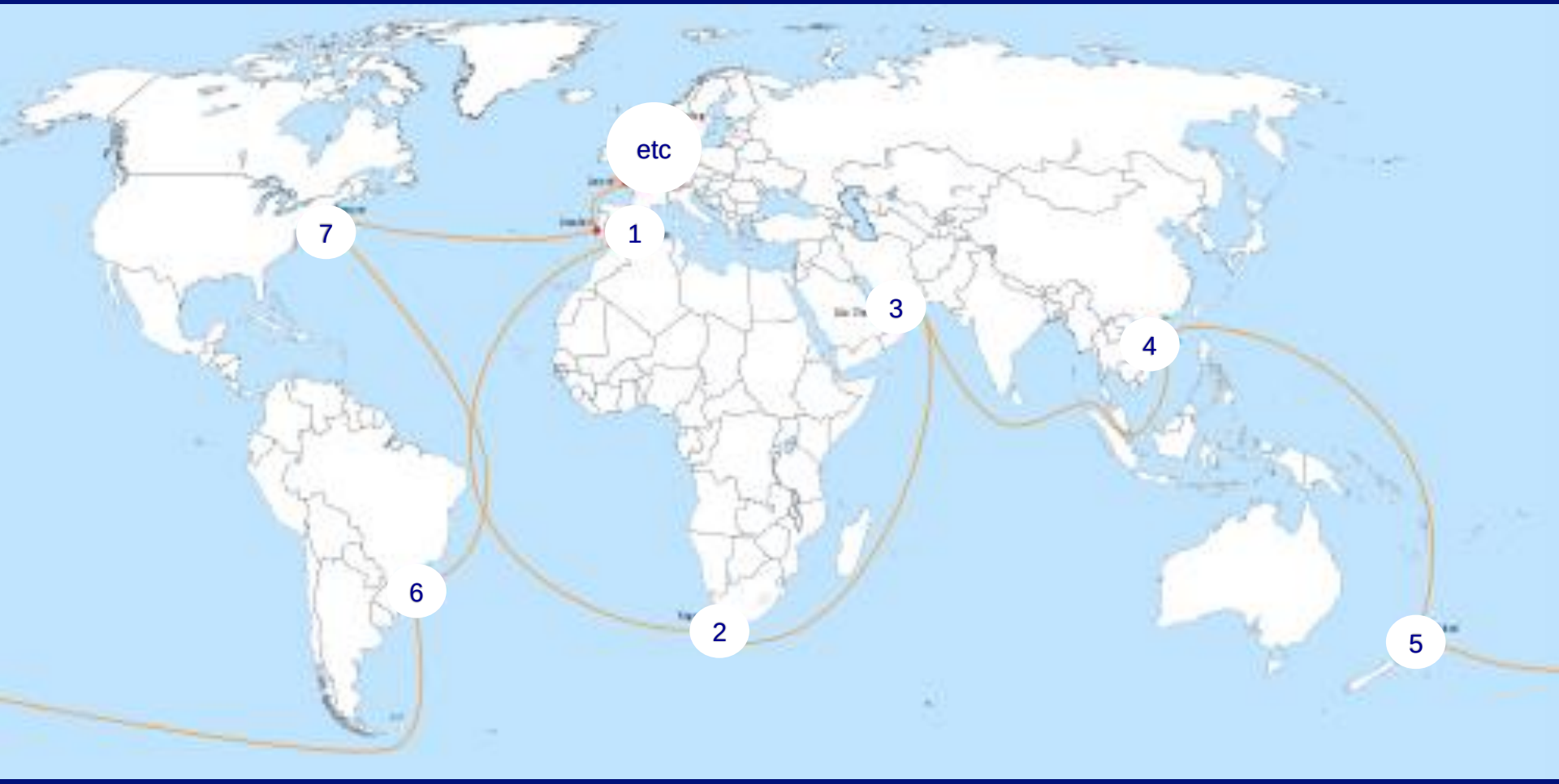
Volvo Ocean Race 2014-2015

- 10 Leg, 39,000 mile race
- 8 crew plus a media professional
- 65’ one-design boats
- Hazardous courses



25 degree angle of heel, lots of sails, small radar, constant sail trimming...

New Route for 2013-2014 Race



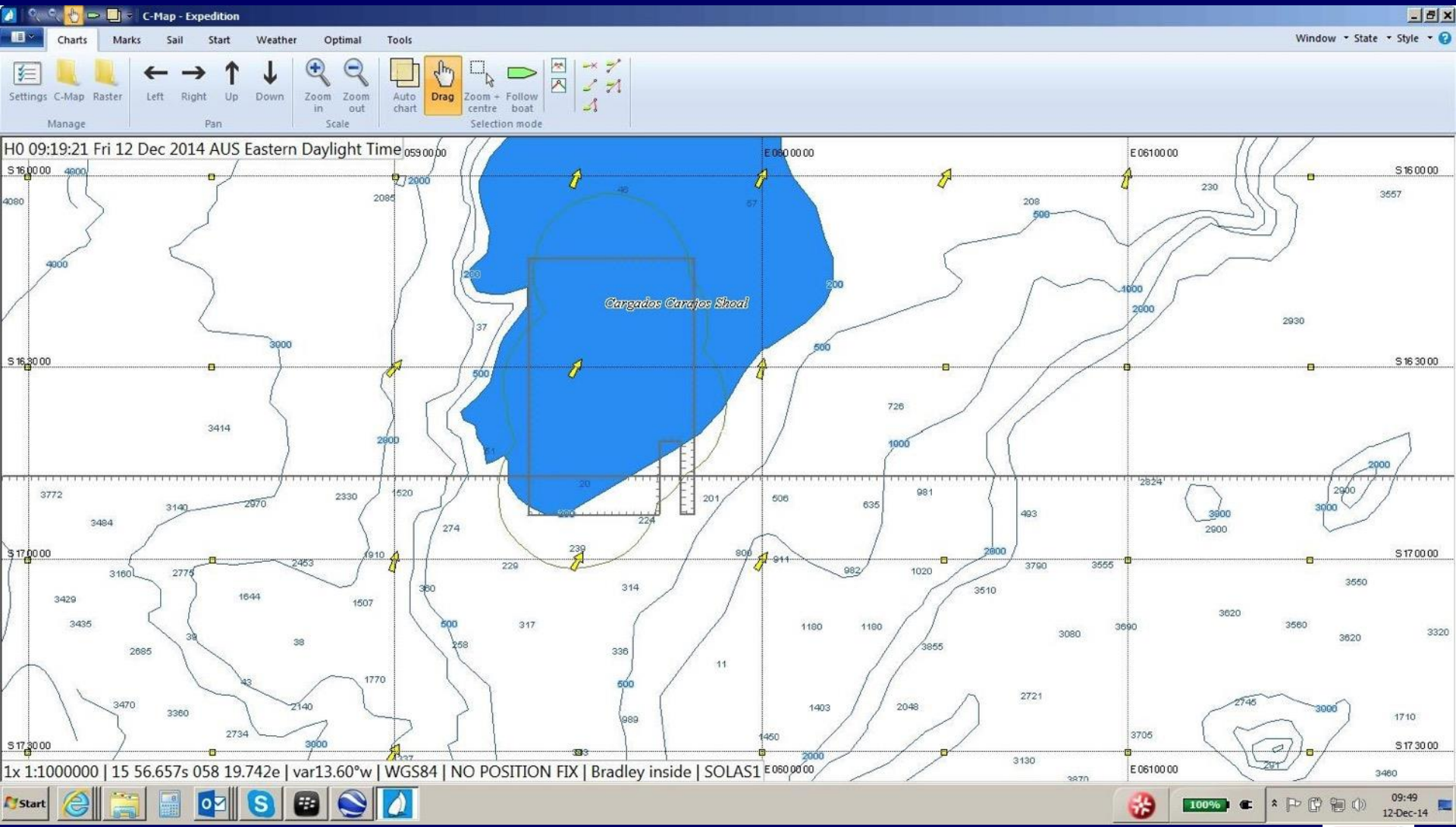

12/1969
N
Saint-Denis
Reunion
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
Image IBCAO
Google earth


Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2020 Maxar Technologies
Google Earth
Imagery Date: 12/13/2015 16°37'16.81" S 59°47'53.27" E elev -130 ft eye alt 51.66 mi

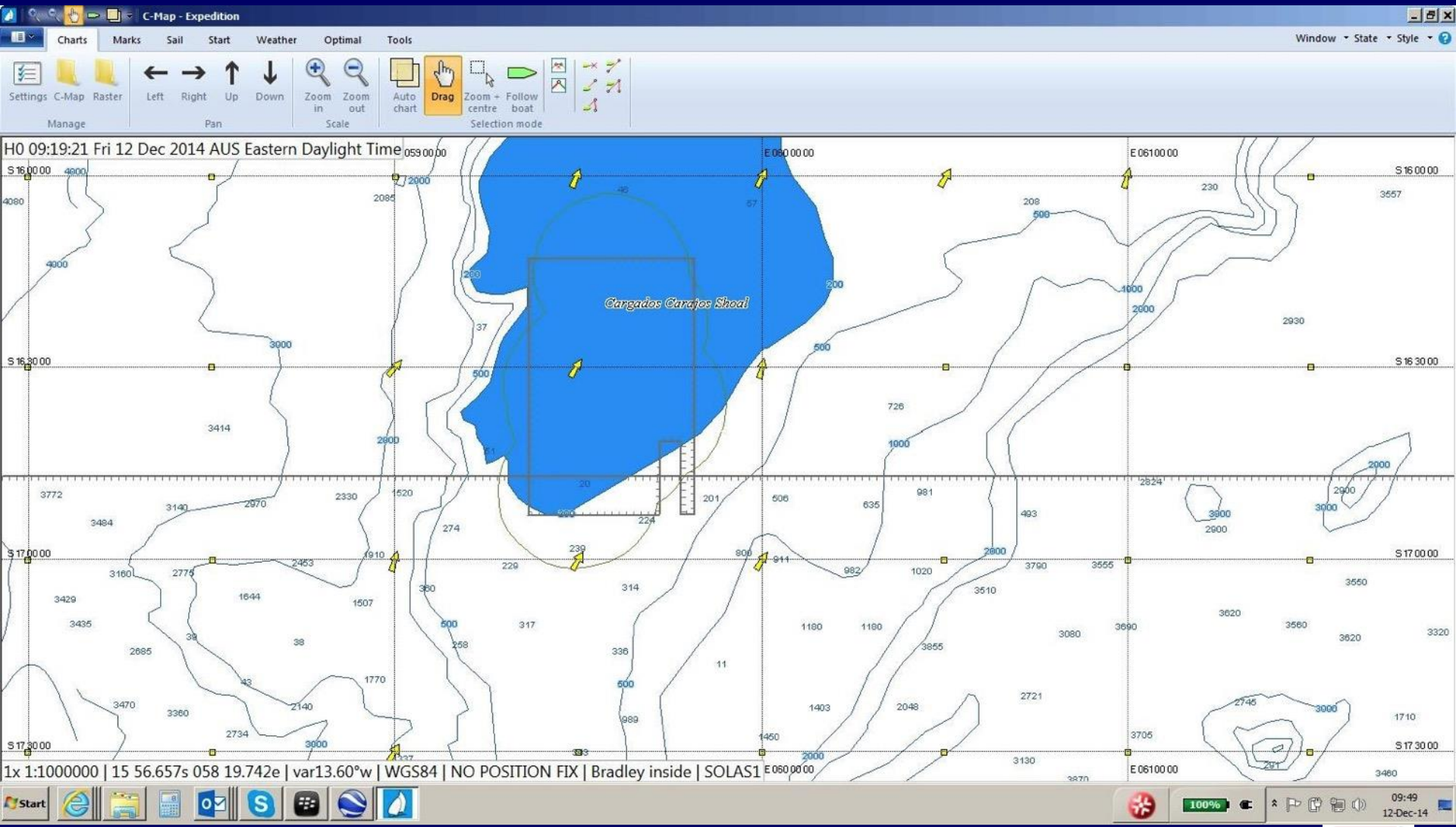

Wormley Seamount
12°W(4'E)
Nazareth
Bank
SOUTH EQUATORI
(about 0·5 kn. s
Albatross I(3)
Co. S.Sh
Île Raphael
Perle I
Coco I
Cargados Carajos Shoals
Alix Seamount

C-MAP Chart of Same Area

How could you determine if there might be land there?



Big blue area showing depths less than 200m



Territorial sea boundaries

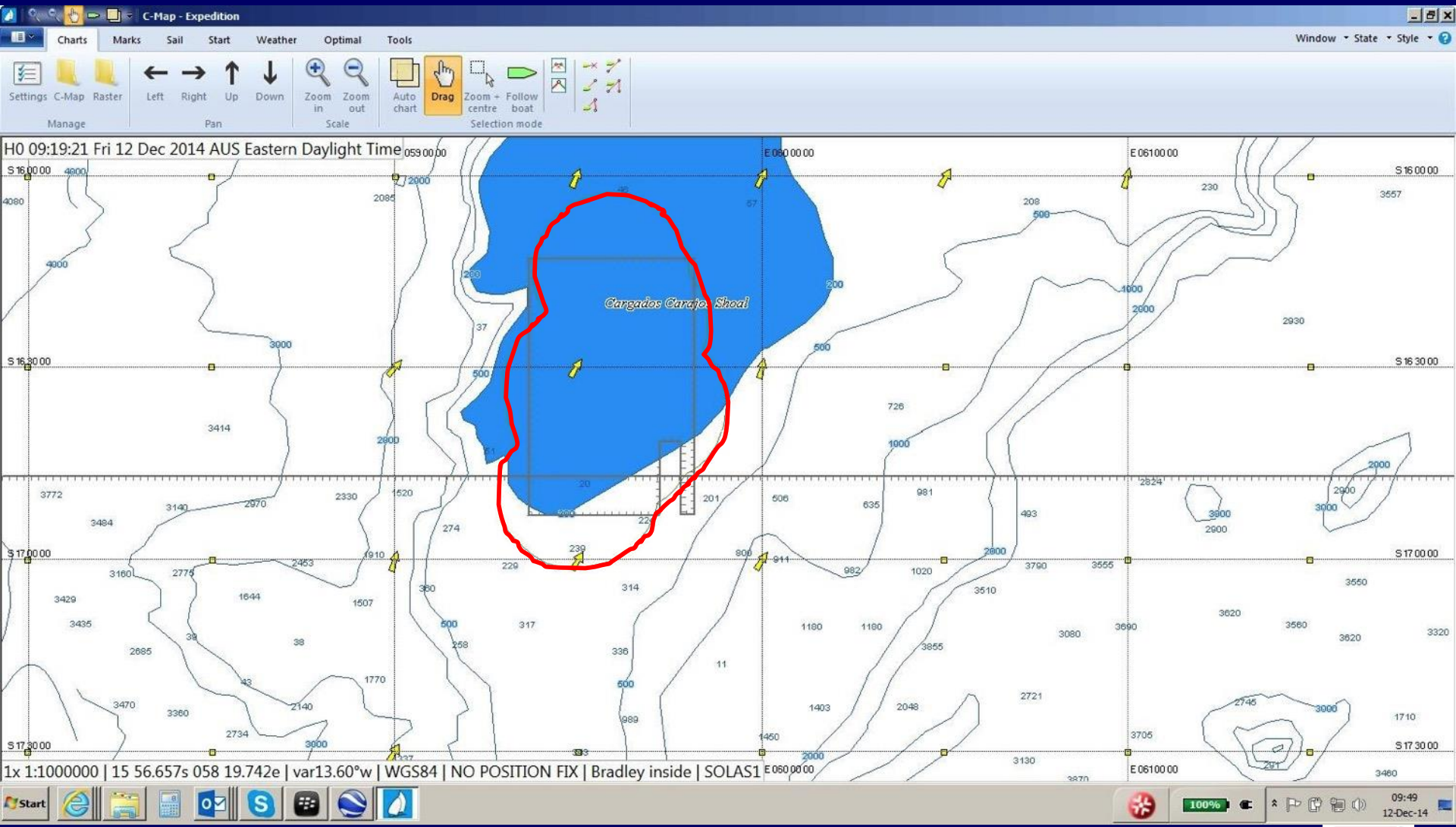
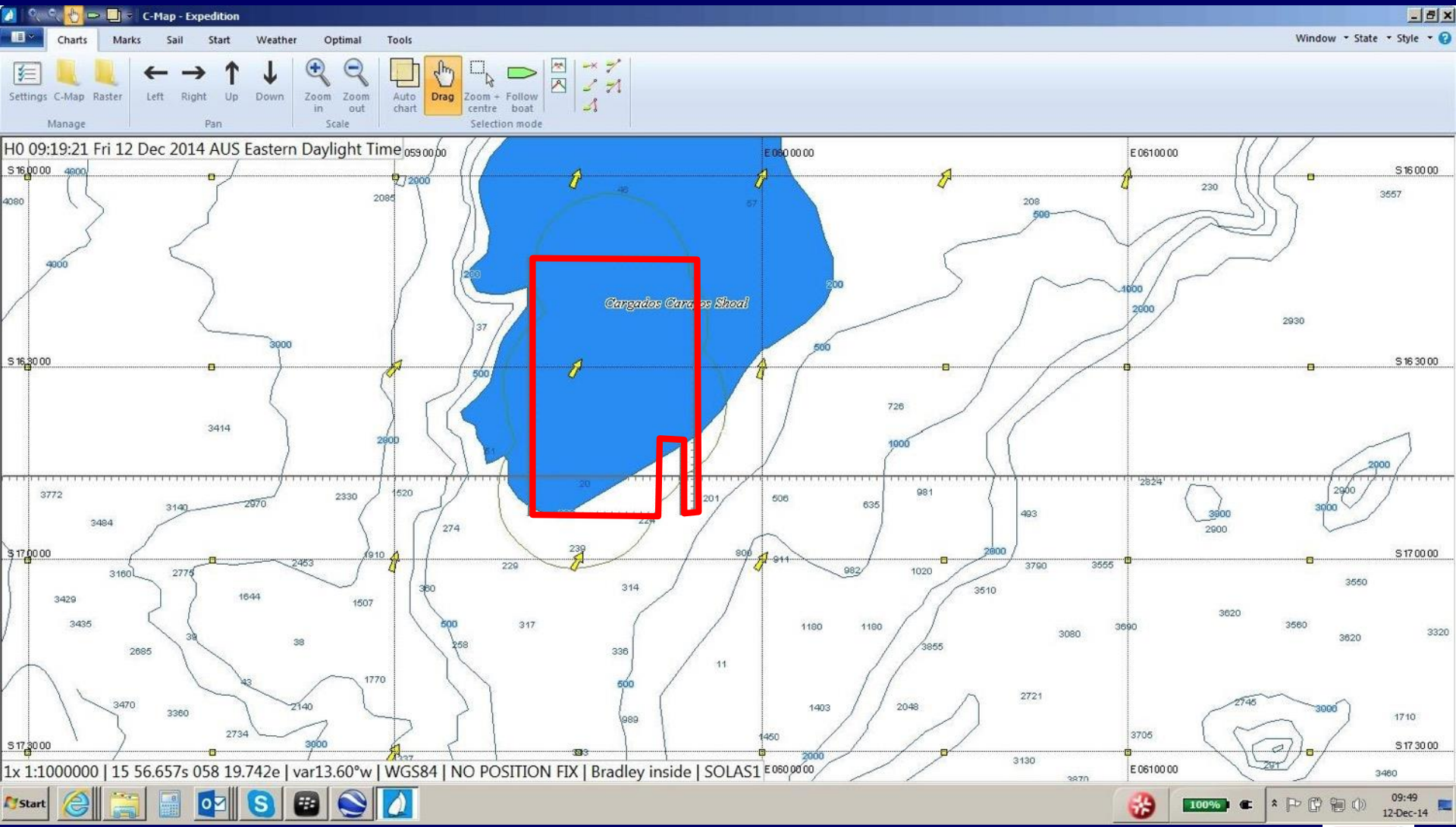
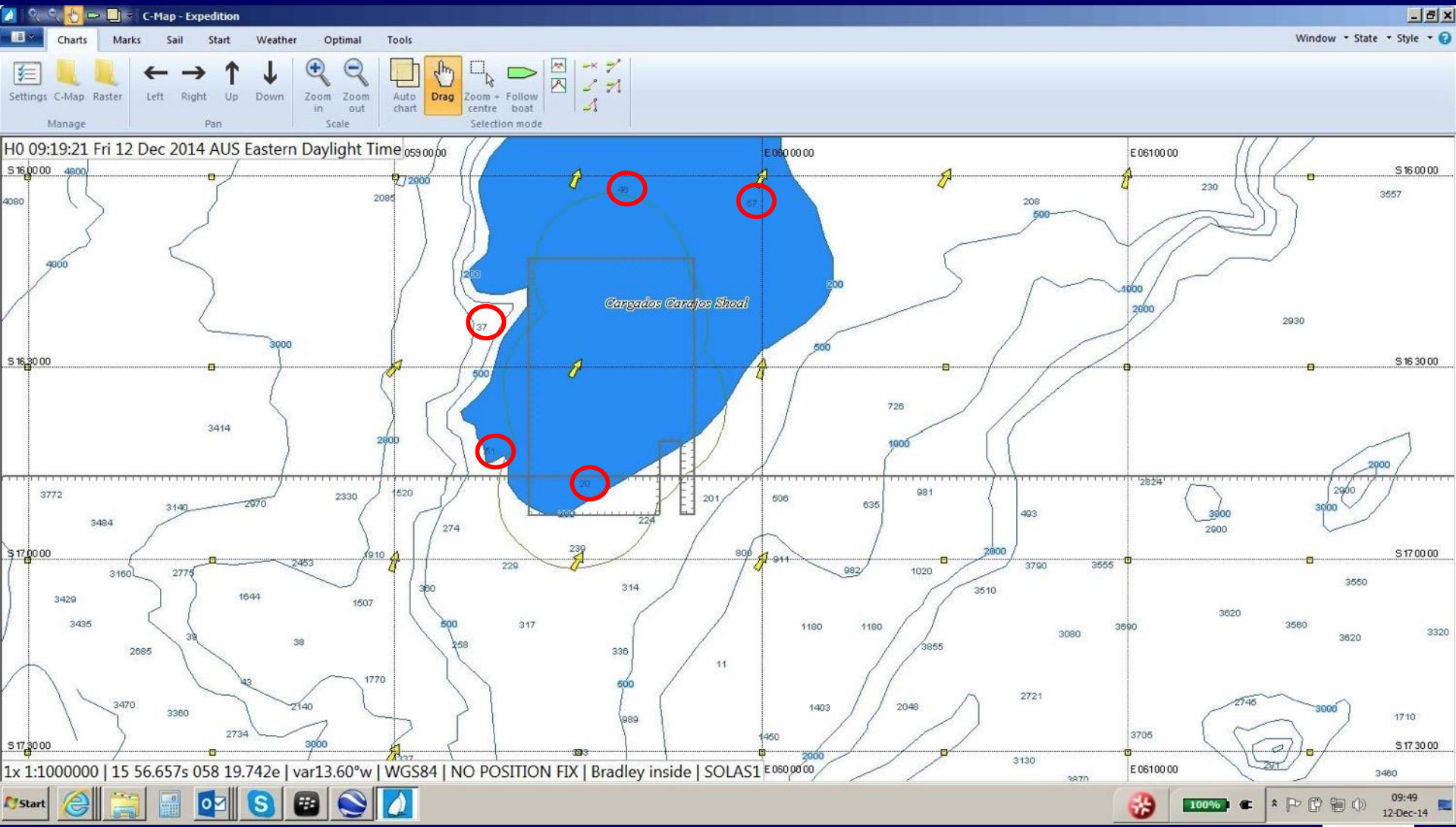


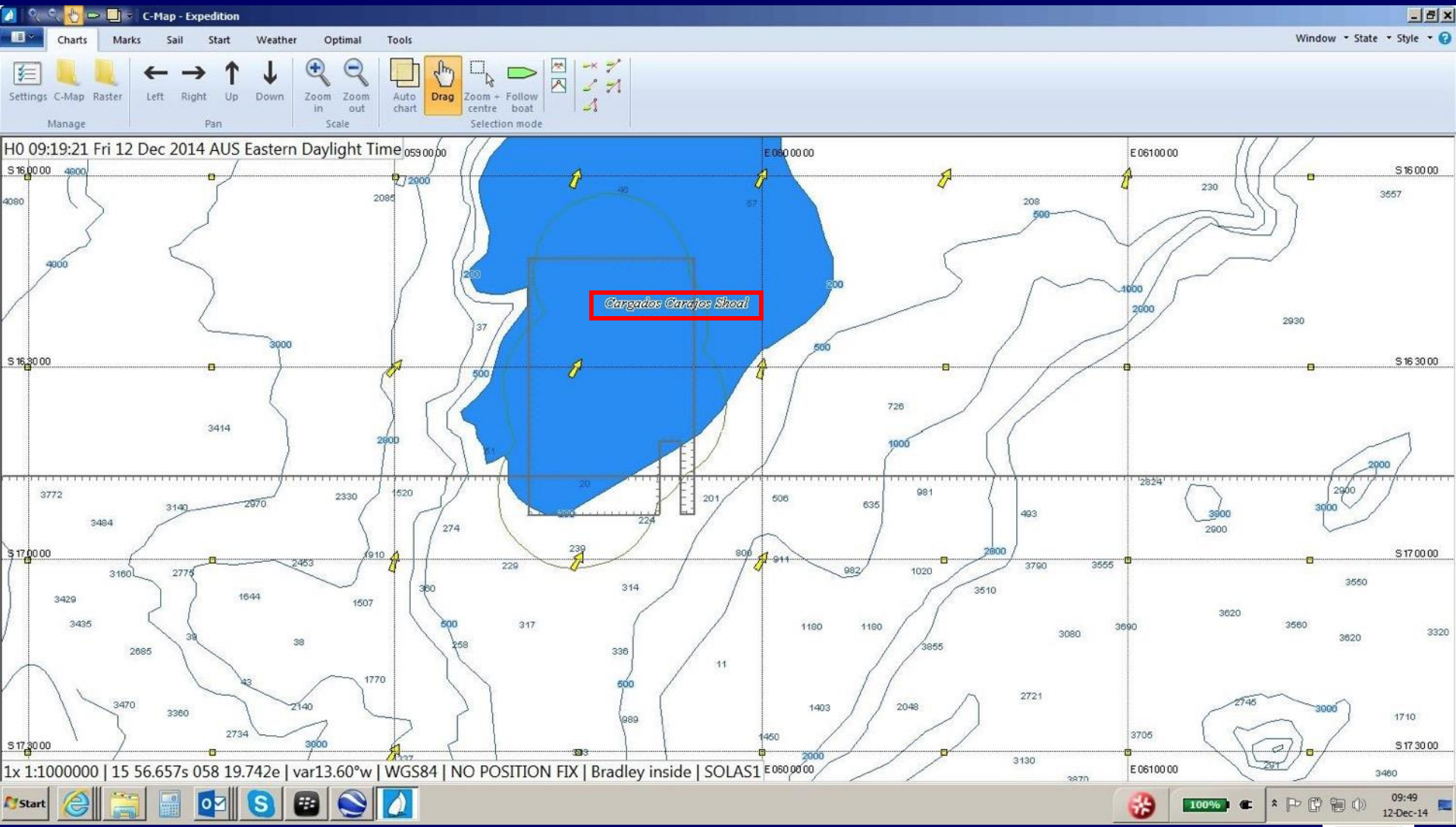
Chart “bounds”



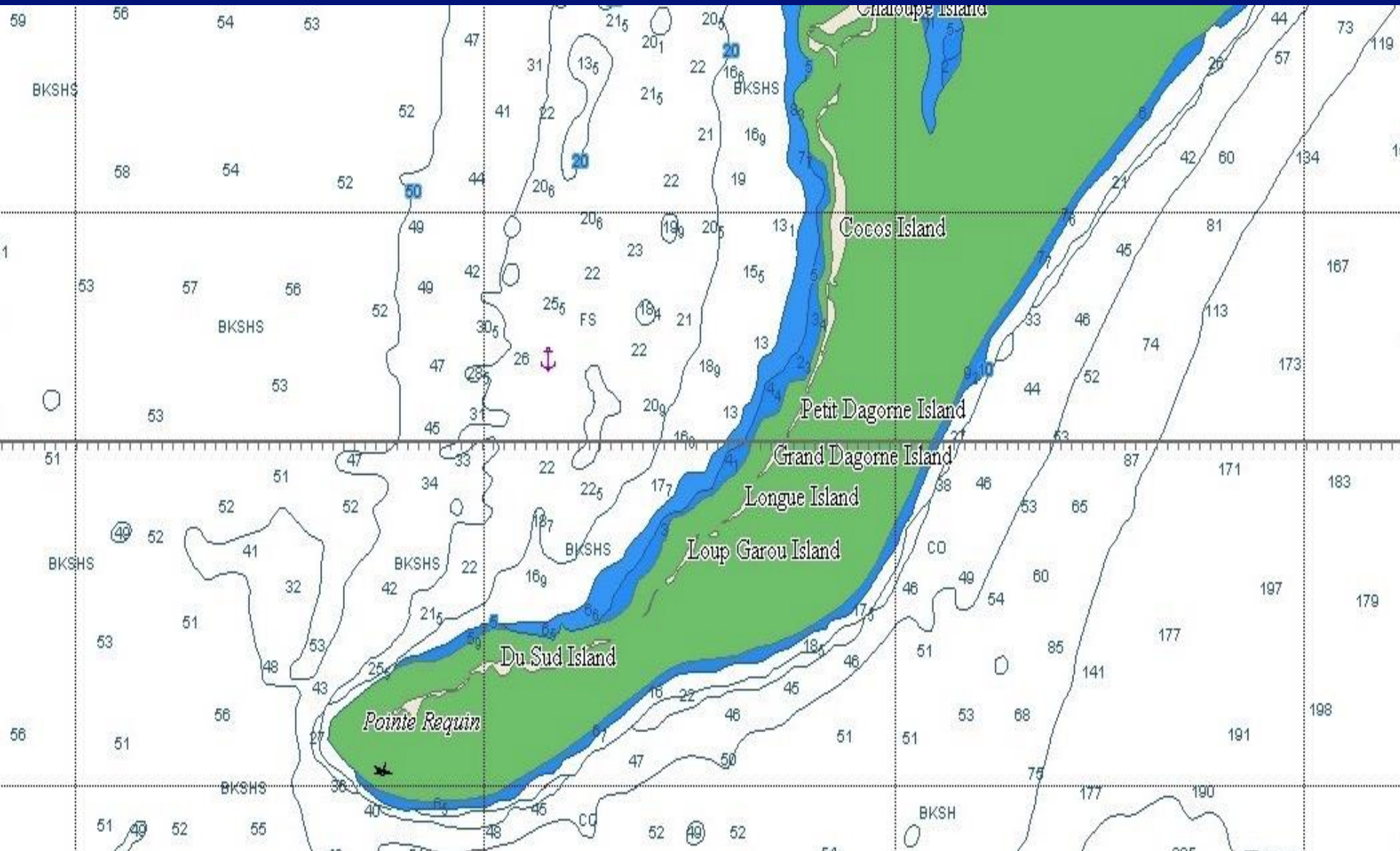
Spot Soundings



A name of a physical feature with “shoal” in it



C-MAP Chart, zoomed in




VOLVO
OCEAN
RACE
Vestas

Lessons Learned:

- Exclusion zone changed ~ 36h before race start
- Navigator and skipper did not zoom in on C-Map charts; were completely unaware of the danger
- Conditions they encountered matched what they had imagined and warned the crew about
- Did not use radar or depth sounder because there was no perceived need.
- C-Map charts were not effective at alerting the crew to the danger of the reef

The Loss of Clipper Ventures 24

Information and Images from

MAIB Accident Report

“Report on the investigation of the grounding and loss of the UK registered yacht CV24 at Cape Peninsula, South Africa, on 31 October, 2017

ACCIDENT REPORT

MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

Report on the investigation of the

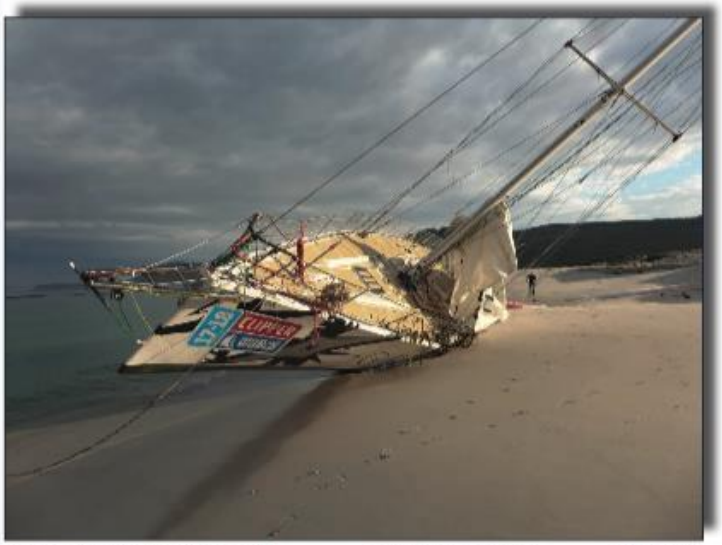
grounding and loss

of the UK registered yacht

CV24

at Cape Peninsula, South Africa,

on 31 October 2017

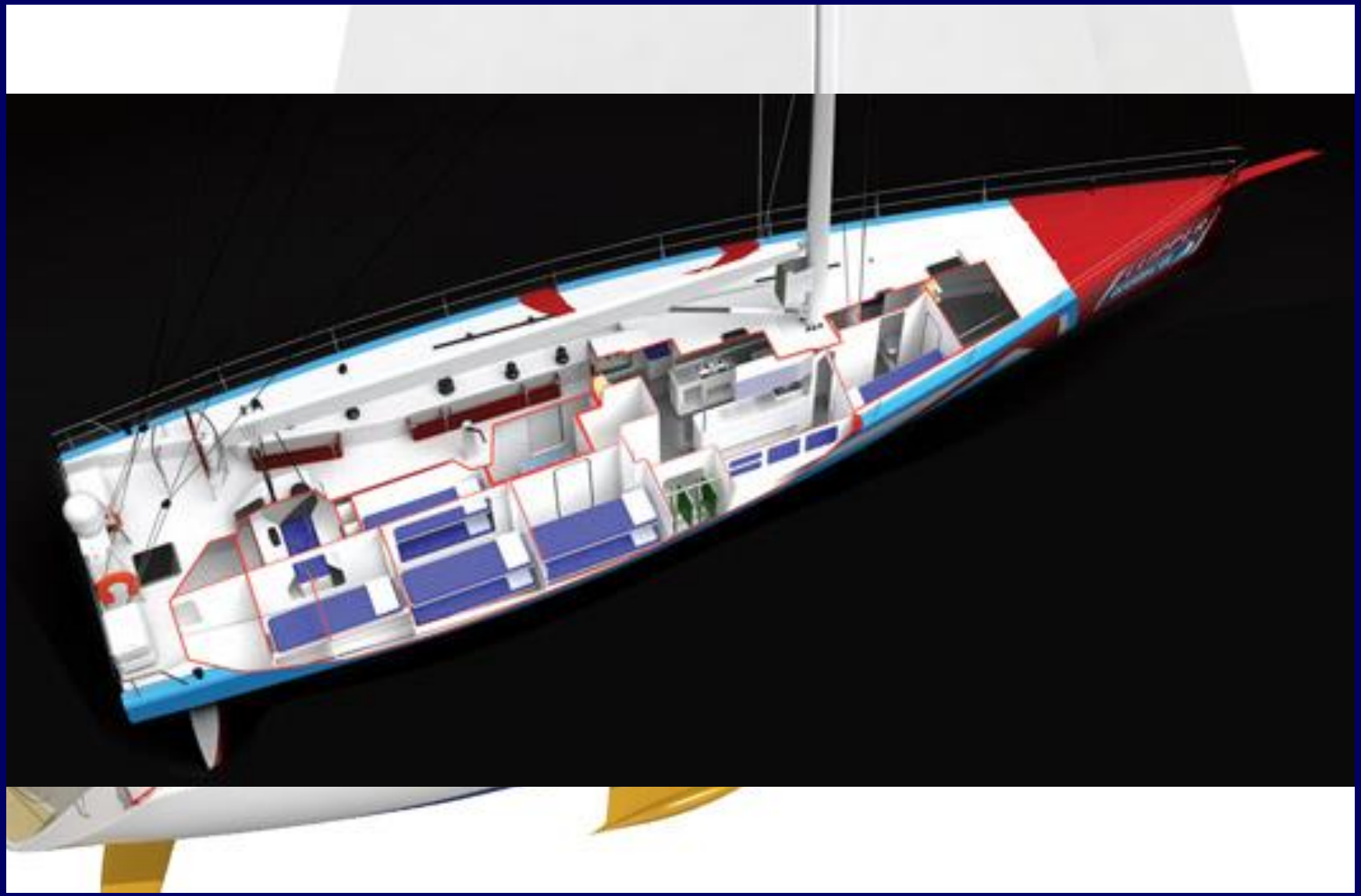


VERY SERIOUS MARINE CASUALTY REPORT NO 12/2018 JUNE 2018

US SAILING

Clipper Round the World Race

- Pay-to-sail race around the world on 12 identical 70 foot sloops
- One professional captain on each yacht
- Extensive training program prior to the event
- Sailors can sign up for one or more legs or the entire race
- Course is similar to Volvo Ocean Race with about 12 legs; passes through Panama Canal



The Race Course

Previous Incidents

Groundings

- Loss of CV4, Indonesia, 1/2010

Crew overboard, successful, 3/2014

Gybe causing trauma, fatal, 2015

Crew overboard fatal, 11/2017

Crew overboard, fatal, 12/2017

Mandatory reporting to Head of Training

- Successful MOB recovery
- Crash or accidental gybes
- 25 months: 107 reported incidents

Aground in Brazil during 2015-2016 Race

Derry~Londonderry~Doire MOB

3/31/2014

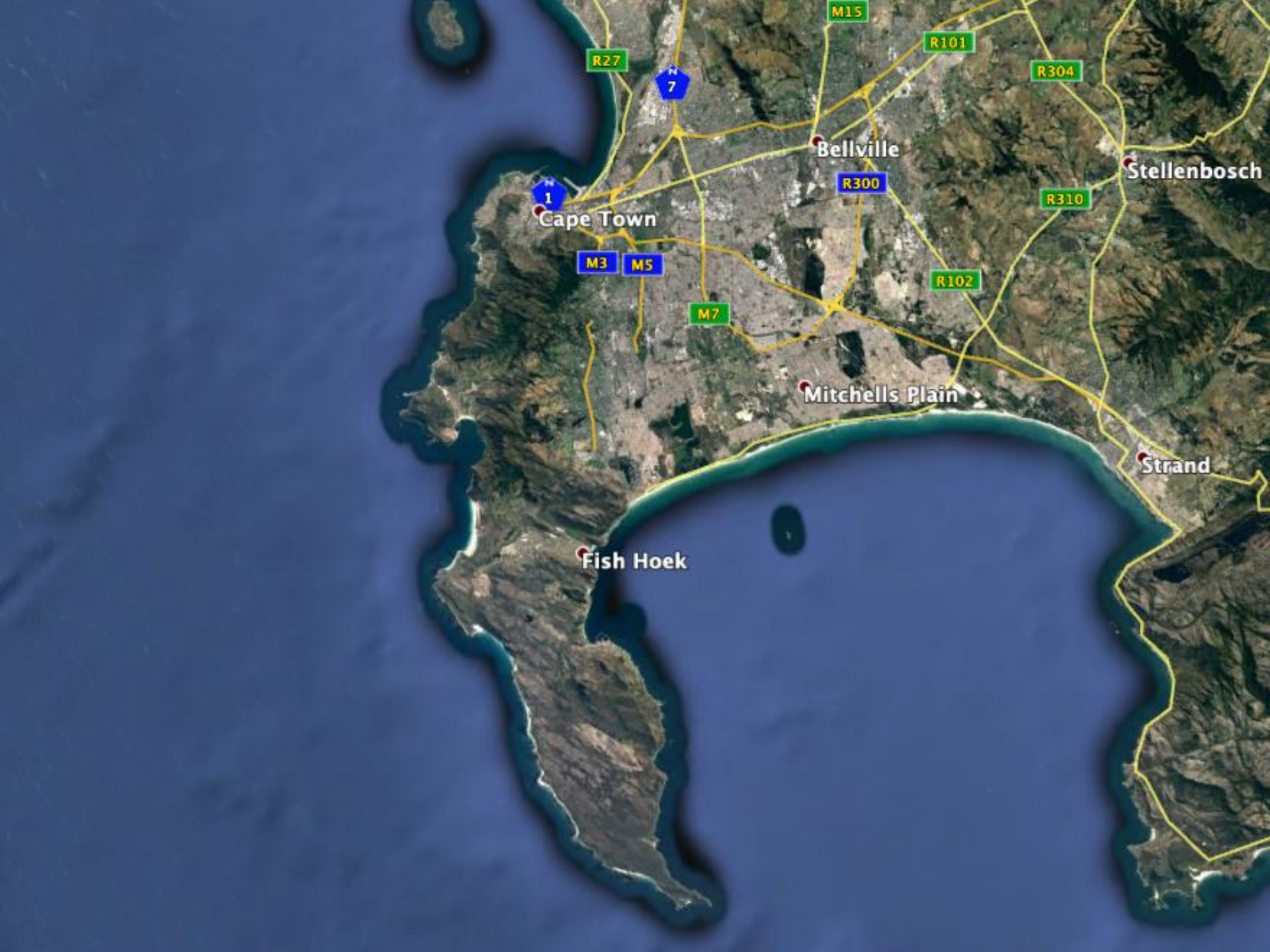
Timeline

23:43 UTC	Man Overboard, initiated MOB procedure
00:55 UTC	Crewmember sighted
01:13 UTC	Crewmember recovered

90 minutes in the water.

Crew made full recovery.

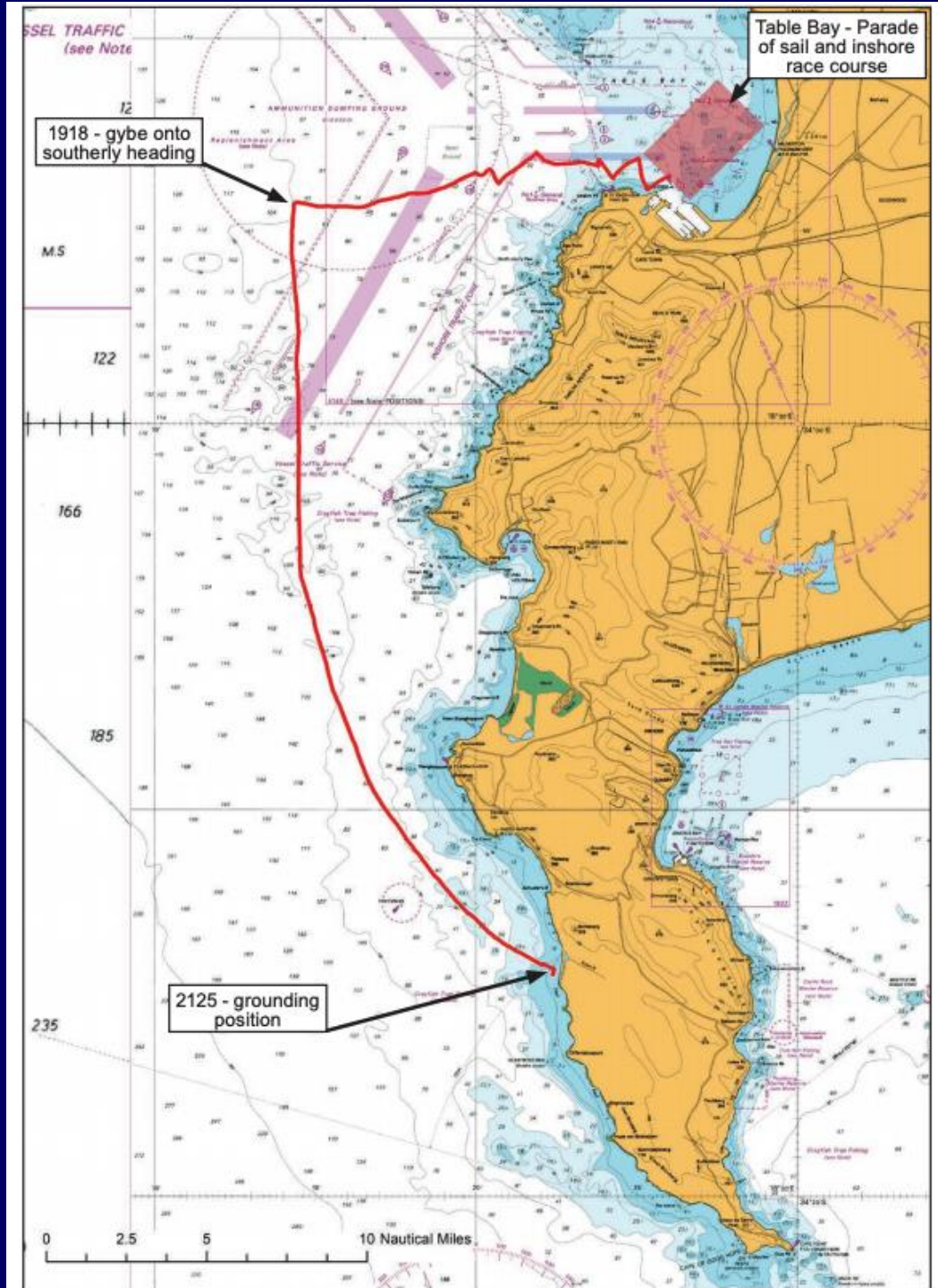

Cork
discoverireland.com


M15
R101
R27
N7
R304
Bellville
Stellenbosch
R300
N1
R310
Cape Town
M3
M5
R102
M7
Mitchells Plain
Strand
Fish Hoek

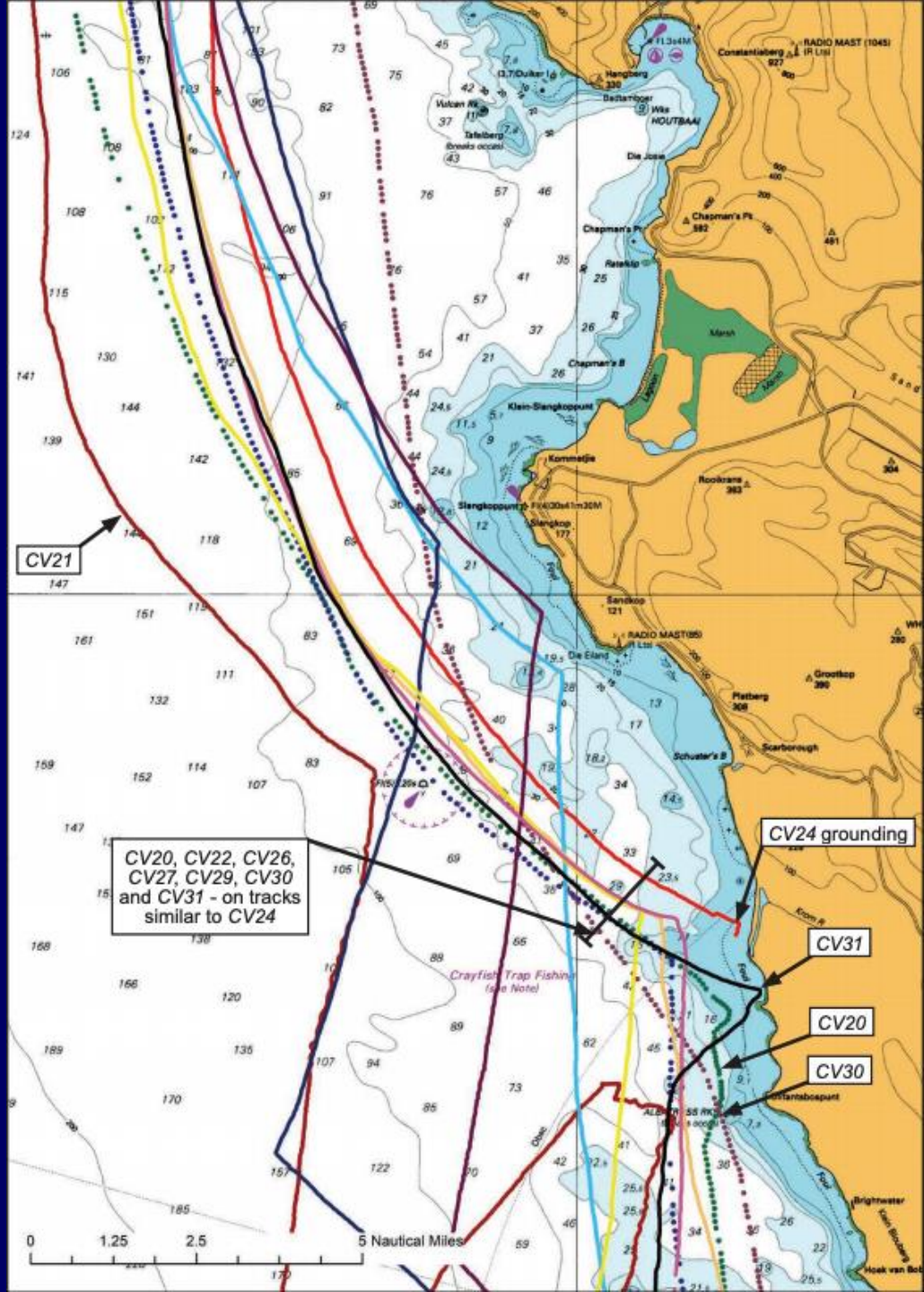
Path of CV24 from the start of Leg 3, along Cape Peninsula

Winds initially out of the NE; began to back as fleet went south.

Breeze freshened from the north, then NNW



Paths of vessels along Cape Peninsula




COG
Standard Wind Functions
SOG
VMG


Garmin GPS
Map plotter
Timezero
display
KEEP
CALM
CARRY
ON
VHF radio/intercom
to helm station


2121 - broach
2123 - gybe
2125 - grounding
0
0.05
0.1
0.2 Nautical Miles

Lessons Learned

1. Loss of situational awareness was the proximate cause of the grounding, i.e. navigation was ignored so that the gybe could be safely carried out.

2. A lack of a passage plan made it more difficult to determine that the vessel was off-course

3. Navigational training was not part of their comprehensive training program.

4. Key navigational information was either not displayed or not available on deck.

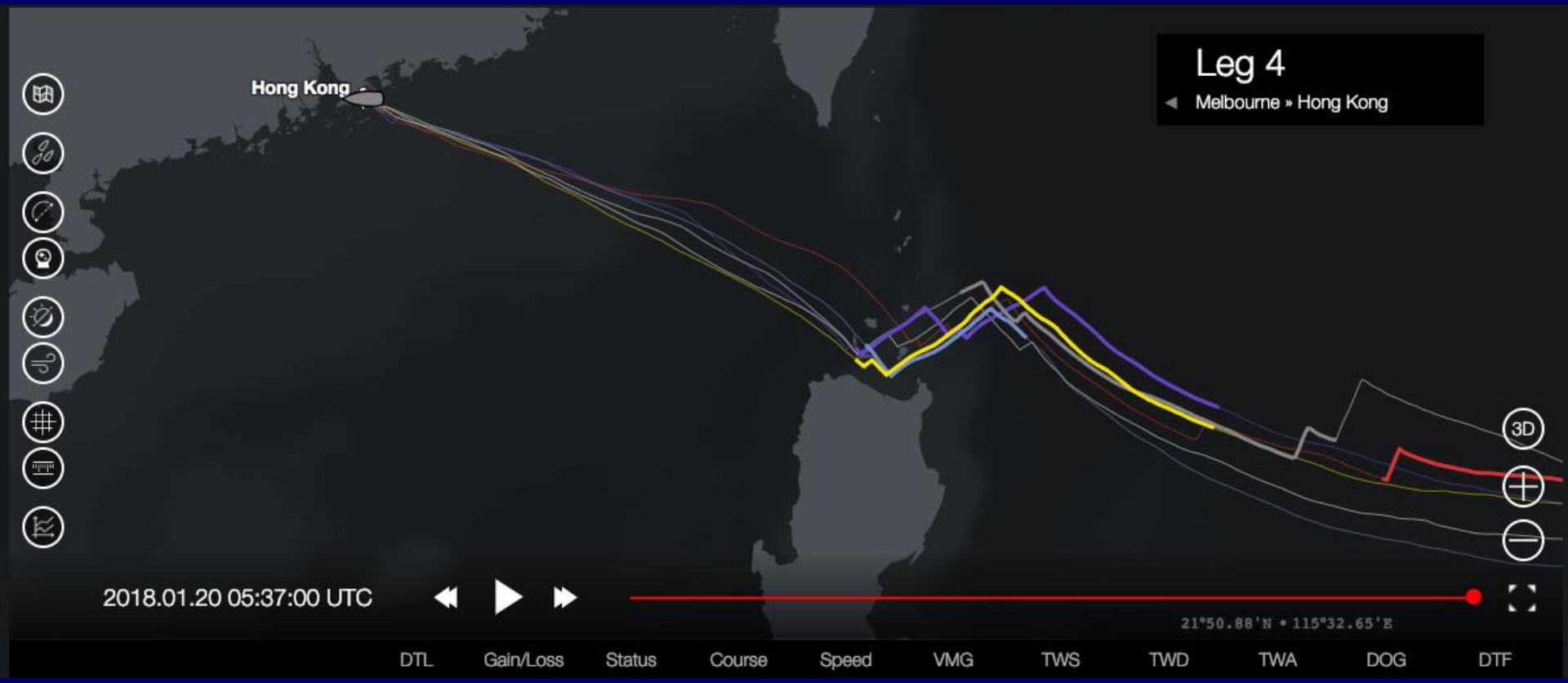
2017-2018 Volvo Ocean Race
Collision on Leg 4

- Fleet was headed from Melbourne to Hong Kong
- TWA of 150, 21kts of boat speed
- Encountered a mass of coastal fishing boats
- Collision between V11 and one of the boats on her port bow about 30 miles from the finish
- The captain of the fishing boat was killed in the collision
- Vestas 11th Hour Racing stayed on site and helped rescue the fishermen after the collision

US SAILING


Finish
Philippines
Papua New Guinea
Solomon Islands
Sydney
Melbourne

Philippines to Port



Trends in Long Distance Offshore Racing

Boats are faster with fewer sailors

Routes cross the equator more frequently

Fleets sail in congested waters: Qingdao, Hong Kong, Gibraltar, Brazil, Strait of Malacca

Sponsorship drives the route choices

Fishing Vessel Activity by AIS, Sept 2017

Fishing activity near Qingdao (beige boats are fishing vessels)

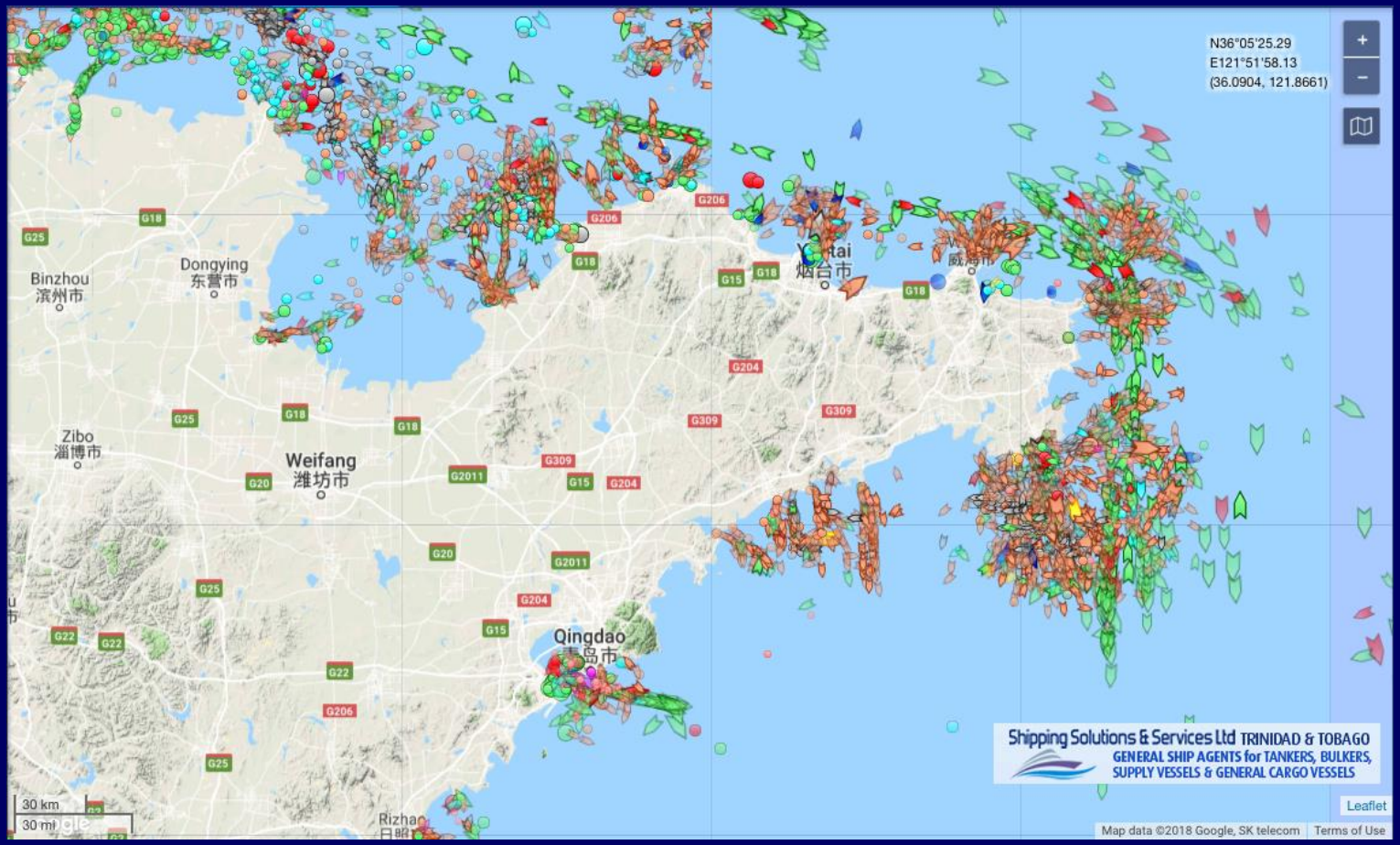


Image courtesy of MarineTraffic

Heel + spray + jibs on the water = tough watchkeeping.

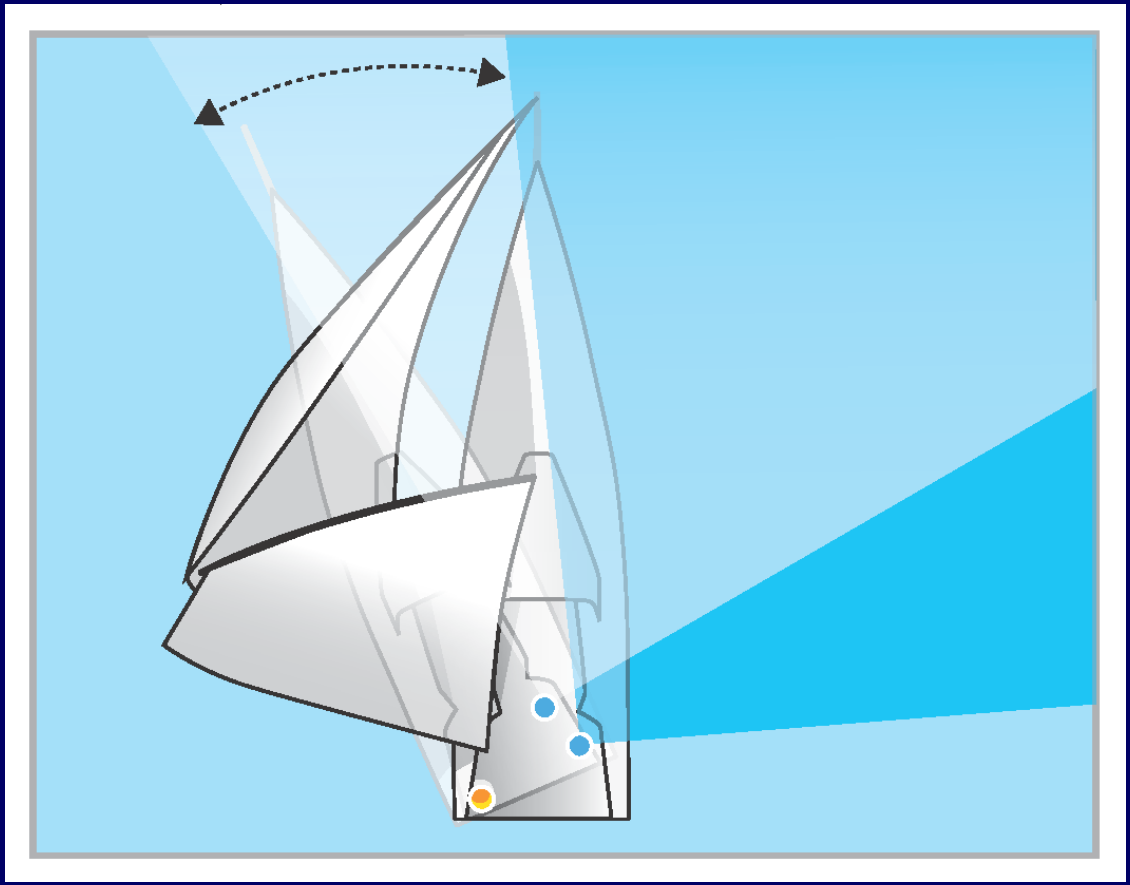
Photo credit: Ainhoa Sanchez, Volvo Ocean Race

Risk Factors

1. Limited visibility from the sailboat
2. Limited visibility of the sailboat from surrounding vessels
3. Local fleets unaware of the vessels' arrival or speed
4. AIS in near universal use, but may be on nets or skiffs
5. Fishing vessels are lit, but not with IRPCAS lights

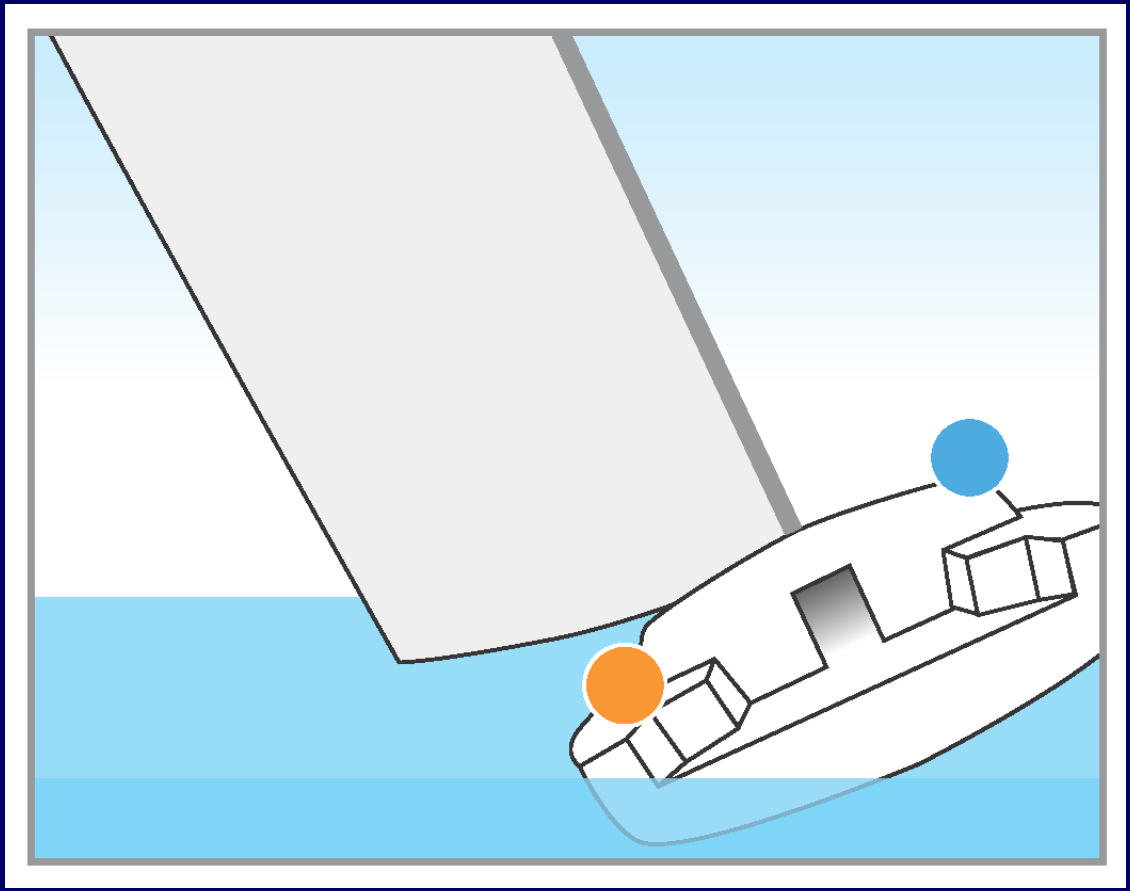
Dipping the Bow

Helmsmen would bear off 10-20 degrees periodically to allow them to see beyond/behind the luff of the headsail



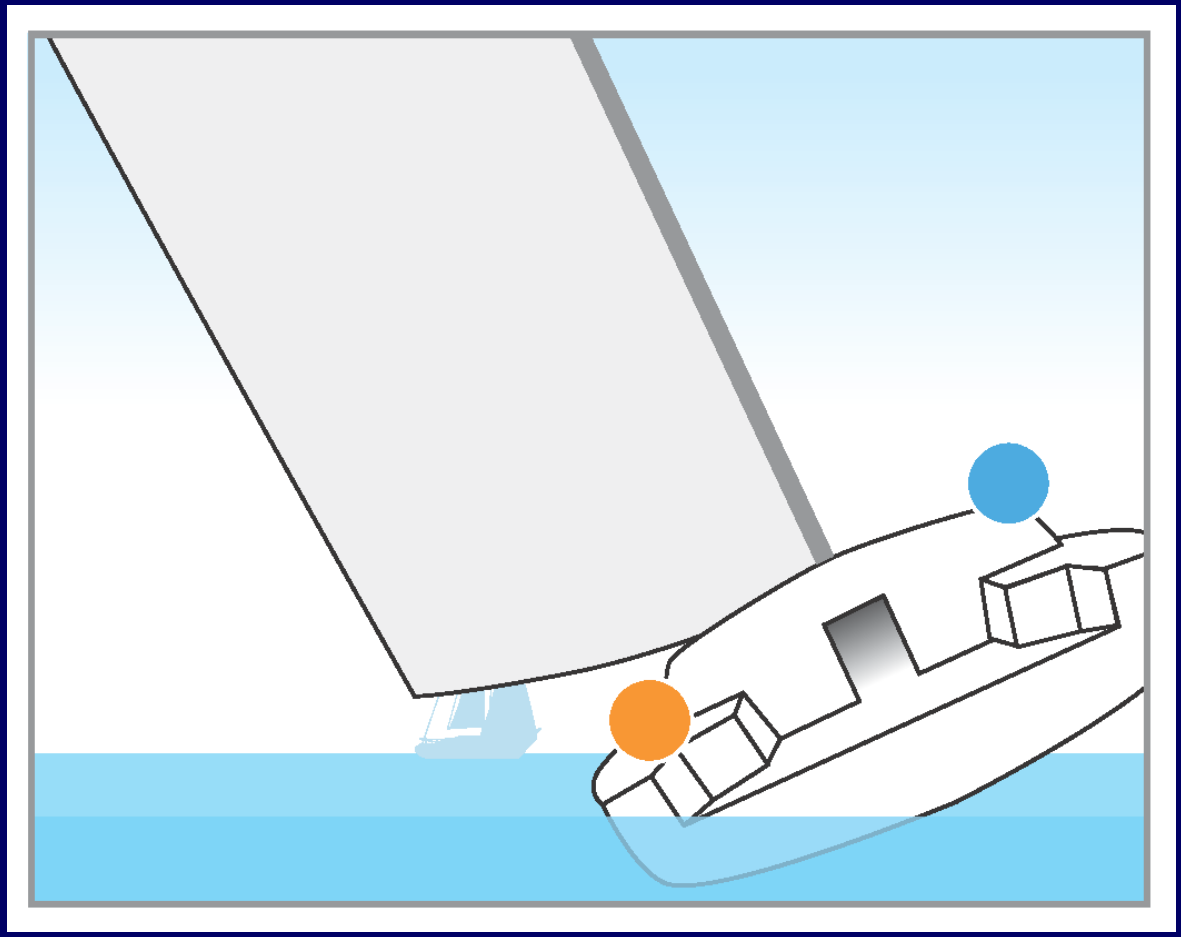
Crew to Leeward

Watch captains position a grinder or an extra crewmember to leeward to wait for an opportunity to view what is under the sail



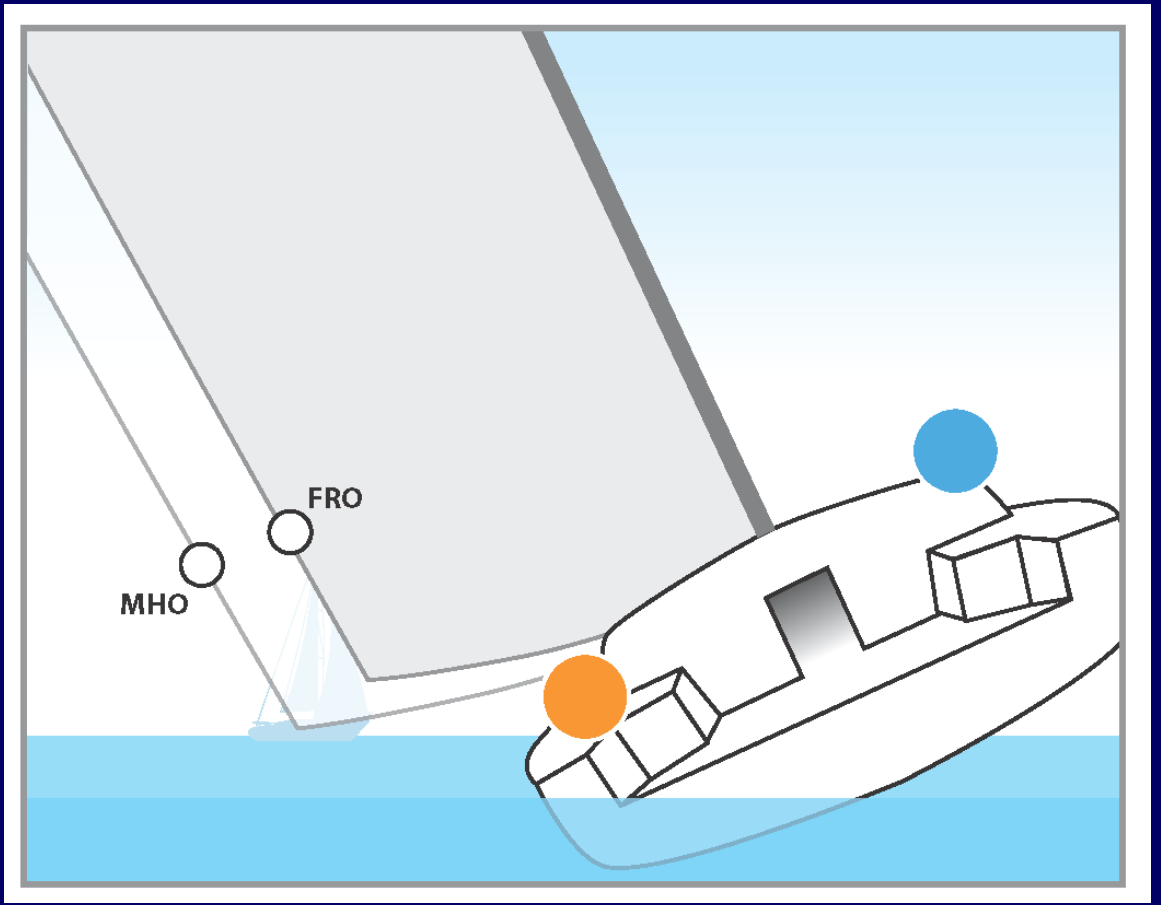
Timing is everything

Crews to leeward in the cockpit would have to wait for the sailboat to be on a crest to get the best view



Less overlap = more visibility

Crews indicated that the A3 and MHO, due to their overlap, presented the greatest visibility issues. Shorter LP sails, like the FRO, were easier to see around.



Navigation light conundrum

Up to 20m, vessels can use a combined nav light at the masthead for sailing

Above 20m, separate sidelights and a sternlight

Cannot be used under power, necessitating additional lights

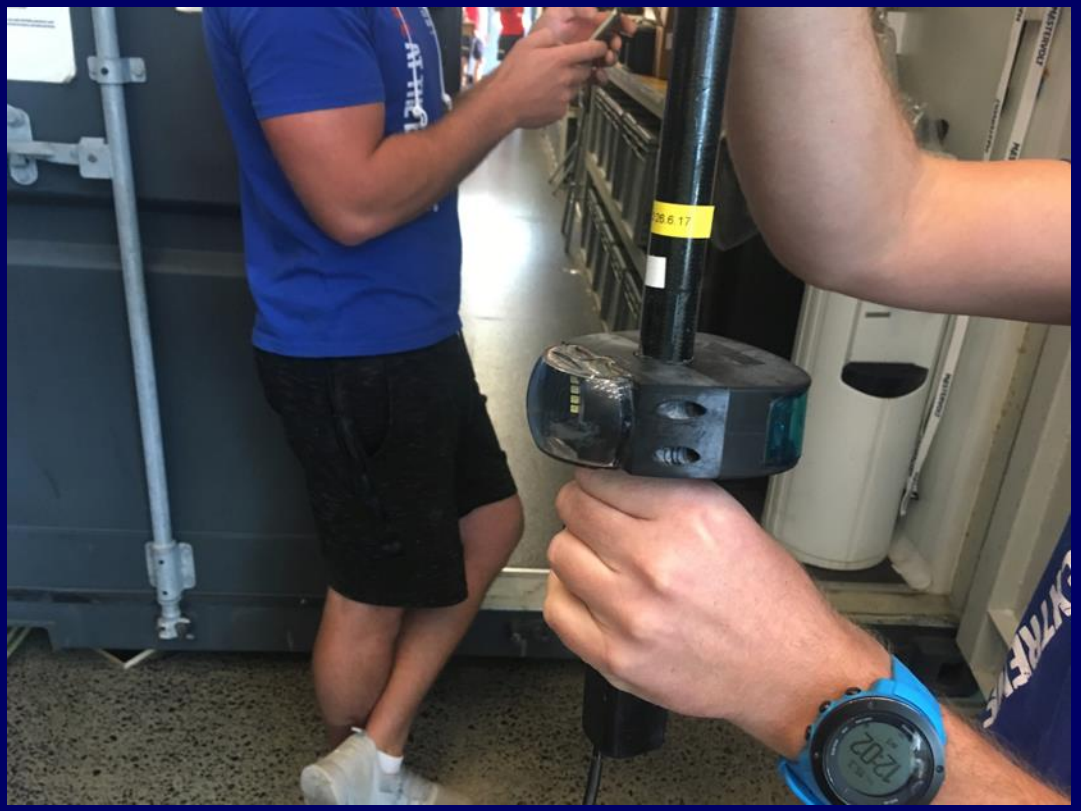
Lights at the sheerline are blocked by sails

Lights on the prod are frequently underwater

VO 65 solution

Three LED modules, mounted to the carbon wind sensor mast

Not blocked by anything but the Windex and VHF antenna



Making the sailboats easier to see

Both deck-levels lights and masthead lights have advantages

1. Use both, especially in harbors or areas that are backlit by city lights
2. Add a blinking light to the tricolor light to bring attention to it
3. Illuminate the head of the mainsail with uplights on the uppermost spreader, without blinding the crew or skipper

Current “tricolor” light

Current “tricolor” light with “uplight”

Prod-mounted and“tricolor” lights

Sheerline and “tricolor” lights

Blinking and “tricolor” lights

Actions Taken

Extensive investigation into causes of the collision.

VO65s fitted with much better radar for anti-collision.

Better AIS antenna installations.

World Sailing letter to IMO explaining the problem and requesting clarification of COLREGS.

IT IS TIME FOR THE

SOCIAL MEDIA MINUTE

Please take 60-seconds and post one takeaway, picture or thought from this session on a social media platform of your choice and tag

@USSailing @(presenter)

#SailingLeadership

Your Opinion Matters

Please open the **Sailing Leadership Forum app** and complete the **session survey** found in the **menu bar.**

Thank you for attending this session