



# Handling Heavy Weather

Presented by- Ralph Naranjo©

A photograph of a sailboat's deck and mast in heavy weather. A large white sail is visible, and the water is turbulent and blue. The text is overlaid on the image.

# ***Heavy Weather is a relative term***

***Skill of the crew***

***Seaworthiness of the vessel***

***The conditions at hand***

# BEAUFORT SCALE

BEAUFORT #	NAME	WIND SPEED (MPH)
0	calm	<1
1	light air	1-3
2	light breeze	4-7
3	gentle breeze	8-12
4	moderate breeze	13-18
5	fresh breeze	19-24



# Unfriendly side of the Beaufort Scale

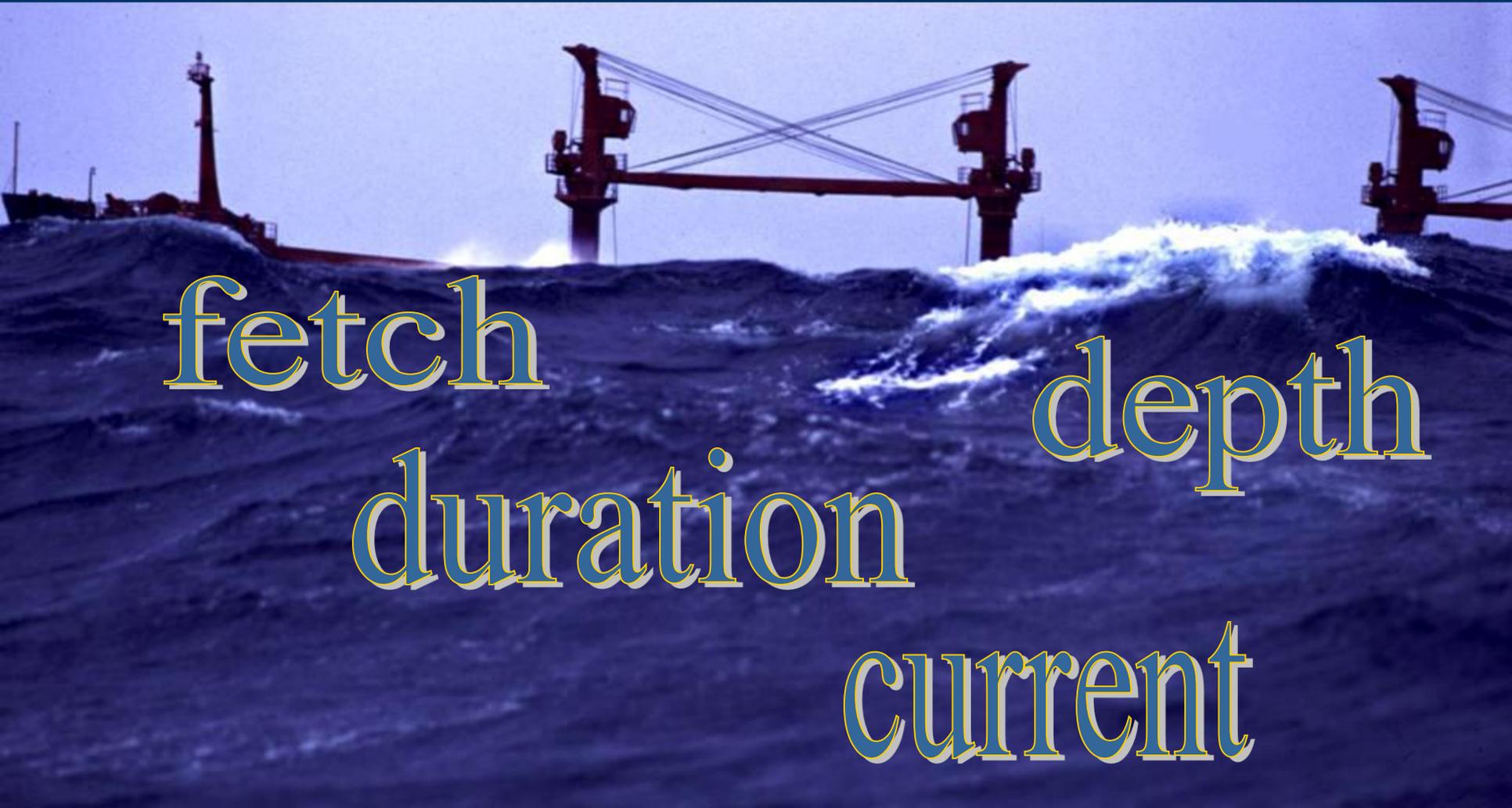
6	strong breeze	25-31	Reefing and head sail changes
7	moderate gale <i>or</i> near gale	32-38	Change to storm sails
8	fresh gale <i>or</i> gale	39-46	Heave to Run before Close reach
9	strong gale	47-54	↓
10	whole gale <i>or</i> storm	55-63	Tow a drogue Run under bare poles
11	storm <i>or</i> violent storm	64-72	↓
12	hurricane*	>72	

**pray**

w  
a  
v  
e  
  
d  
y  
n  
a  
m  
i  
c  
s



# Stay focused on the sea state



fetch

depth

duration

current

Bad weather moved safely offshore!



24-HOUR SURFACE FORECAST  
FROM: 00 UTC 03 MAY 2007  
VALID: 00 UTC 04 MAY 2007  
FCSTR: CLARK

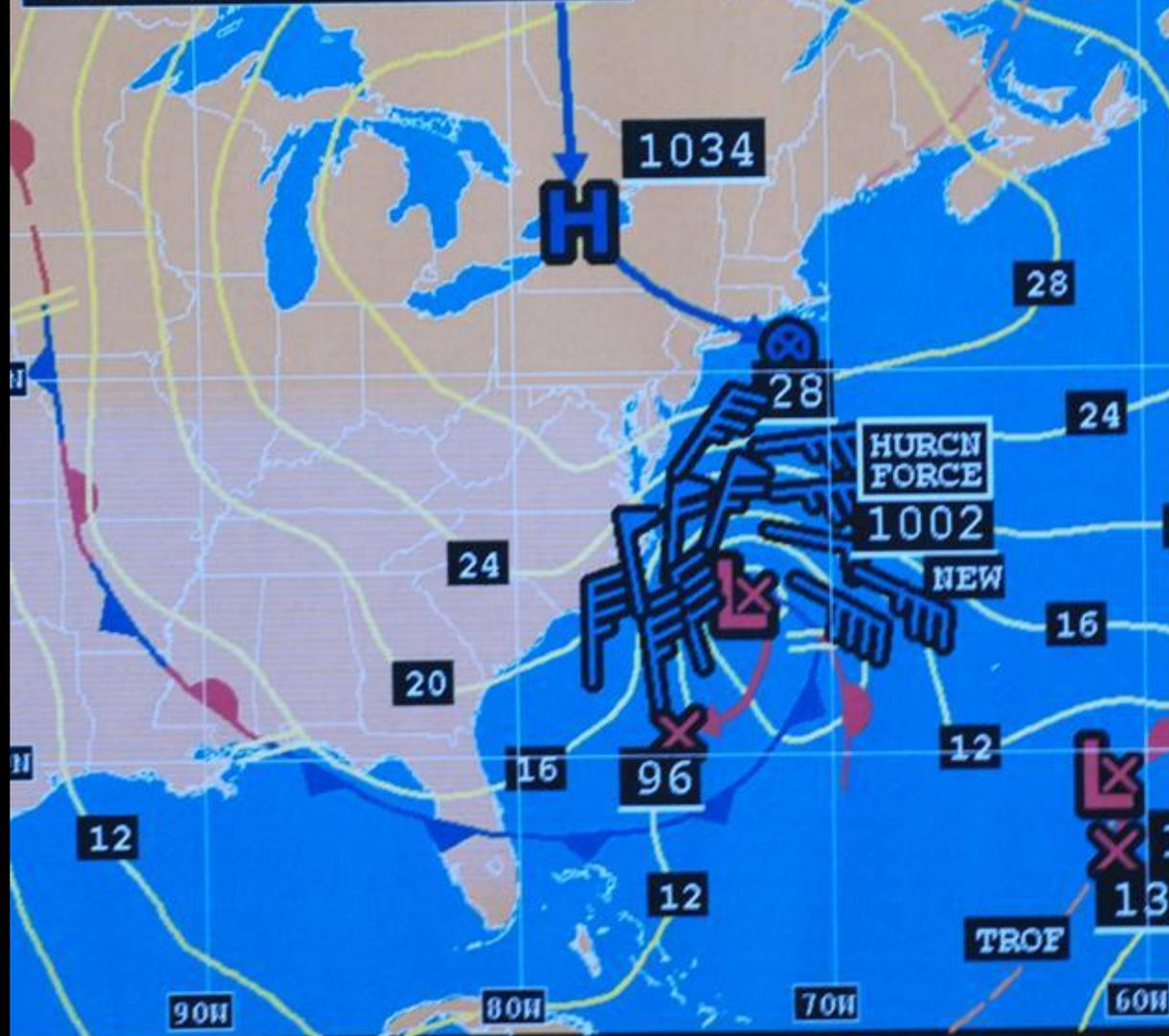


Forecast products up to May 04, 2007 continued to show a benign weather pattern for those heading north from Caribbean waters

NWS/NCEP - Ocean Prediction Center  
[www.opc.ncep.noaa.gov](http://www.opc.ncep.noaa.gov)



24-HOUR SURFACE FORECAST  
FROM: 00 UTC 06 MAY 2007  
VALID: 00 UTC 07 MAY 2007  
FCSTR: VUKITS



NWS/NCEP - Ocean Prediction Cent  
[www.opc.ncep.noaa.gov](http://www.opc.ncep.noaa.gov)

On May 06, 2007 the full extent of the developing storm was made clear. The waters from coastal Cape Hatteras to 70 degrees west longitude would be engulfed by storm force conditions

# THE CURRENT

RESCUE DRAMA

## In the clutches of a powerful storm

Coast Guard airlifts nine sailors from three boats in 100-knot winds and 50-foot seas off Cape Hatteras

By Douglas A. Campbell

SENIOR WRITER

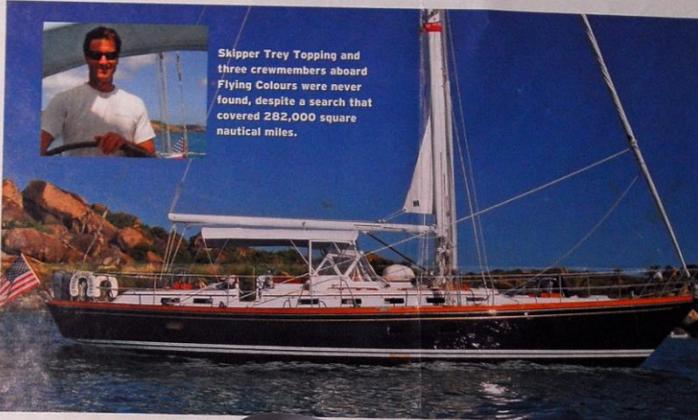
The forecasters and weather routers had this one nailed. Three days before a storm with hurricane-force winds hit off Cape Hatteras, N.C., May 7, the pros were warning boaters to steer away from that notorious neighborhood. But as a strong high-pressure system came on, only bore down on an entire hed low four yachts sailed directly into the meteorological cross hairs.

In the early dawn hours of that Monday morning, the fog rolled in. The winds gusted to 100 knots. The seas swelled chaotically, with breaking waves as tall as 50 feet. Electronic distress signals from three of the sailboats shot up to satellites above the fun and bounced back to the ground, sending Coast Guard C-130 aircraft and 16450 helicopters into the maw of a storm that would last 48 hours.

The boats were intermingled: two boats were sailed by a 77-year-old couple and their 25-year-old daughter, the other two crew of three professionals — were mentioned one eventually driven aground. A third boat — with an American, a Canadian and a British sailor aboard — according to a report in the Cape Cod Times — sank 225 miles out in the ocean, leaving its crew of three in a tattered, tiny life raft. All the sailors on these boats were, over the course of eight to eight hours, hunted out of the ocean by Coast Guard helicopter crew.

The fourth boat, an immaculate 54-footer owned by a company executive, gave off EPIRB signals over three hours when it disappeared, taking the professional, licensed captain and seasoned crewmember.

The apparent deaths of the rescues didn't help according to the Coast Guard. There was no "get caught," is a Florida-based charter skipper. Her



Skipper Trey Topping and three crewmembers aboard Flying Colours were never found, despite a search that covered 282,000 square nautical miles.

Coast Guard from off North Carolina Sunday, May 6. Seaker, the boat owned by... Mca, was... let... and south, buffered by high winds, the Dixons called in. Their anchor was dragging and Seaker was headed for Diamond Shoals. They asked to be rescued and gave their coordinates. At the same time, a third EPIRB was received, this one from the... er/sloop Illusion, ... R.I., by a... and



The National Hurricane Centers' wave buoys reported seas of up to 50 feet and winds of up to 100 knots directly from the Coast Guard by 4sailors.com as many reports have quoted... Edings Island, South Carolina. At the time of the initial EPIRB Flying Colours was southwest between St. Thomas and the mouth of the Chesapeake Bay. This may... The Coast Guard searched 282,000 square miles in the Atlantic... called off the active search on May 13th. The Coast Guard... information pertaining to the missing vessel, the... of any debris, or any sign of Flying Colours, a... Below are some graphical representations of the... images obtained from The National Hurricane Center.



# Sean Seamor



# Soundings

May 07, 2007

## DEATH'S DOOR



The crew of a 44-foot cutter narrowly survive a knockdown, a 360-degree roll and, ultimately, the loss of their boat in a fierce Atlantic storm

BY DOUGLAS A. CAMPBELL / SENIOR WRITER

**T**here was no conversation in the cabin of the 44-foot cutter boat *Seamaster II*, where the crew had retreated to take out the huge storm waves one upon another in 2007. A dingie had been deployed no more than 500 feet of land, and a nearby motor yacht was keeping the boat pointing downwind.

Outside, the ocean heaved, and mountains of water loomed 70 feet above the ocean levels, only *Seamaster II*'s crew occasionally huddled through the door, which had become backpacked again. Wind speeds were consistently reading about 70 knots. The 40-year-old boat sat at the chart table and let her crew through lanes, a horizon there was a gust of more than 80 knots.

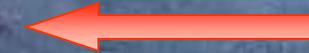
Ben Tye, 31, was sitting in the control station behind the seat table as port. Jean Pierre de Lard, 56, the skipper, a cousin of the Cuban-born and French who owned the cutter *Seamaster II*, was in one of the cabin's seats as starboard. He was pounding the post beam with lightning frequency. Tye, a re-

etired school teacher, remained at the sea station long enough to announce a high point of 85.5 knots. Then he went back to the 40th station to stop. His next would be downwind, the following near-death experience would be anything but.

*Seamaster II* was caught in Tropical Storm Andrea May 6, 2007, off North Carolina in the next 12 hours, two other yachts or one with a professional crew of three, the other sailed by a 75-year-old couple and their 49-year-old daughter — would be abandoned in the storm. And the 44-foot yacht *Flying Colours* would, after its 1998 had transmitted two frantic signals, disappear without a trace with no professional crew of five.

Although the search for *Flying Colours* was futile, Coast Guard helicopter crews saved some sailors, including Tye. The end of the line, as they first reported in this powerful storm, which at its peak generated 120-knot winds and produced waves as high as 100 feet. Without exaggeration, the size of which

Illustration by [unreadable]



The Volvo Race fleet encounters worse weather rounding Cape Hatteras than when they rounded Cape Horn



# Inshore cruiser







**Inlets become untenable**

# Vessel attributes

- Stability
- Structural integrity
- Rudder
- Rig
- Rugged keel attachment





# • Tactics

Dictated by

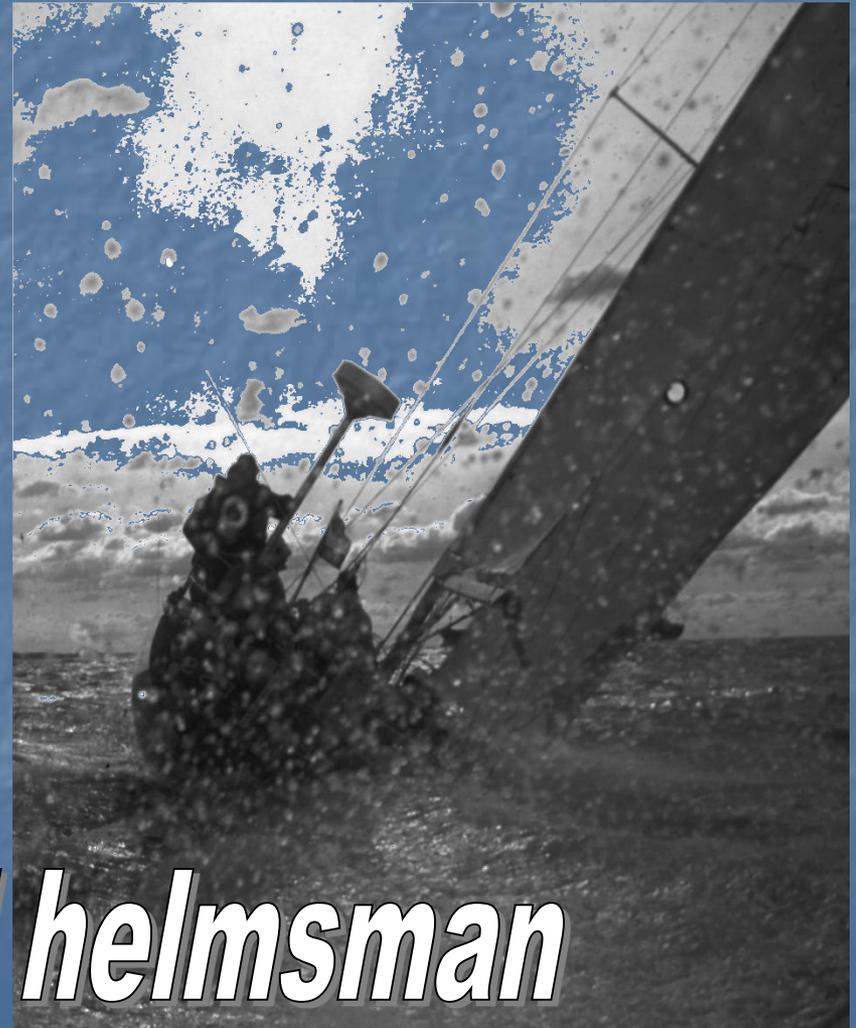
- the wind and sea
- your track and the storm's track
- crew skill
- vessel structure and stability

# Heavy weather alternatives

*sailing to windward*

- Reef and beat
- Reduce and flatten sails
- Storm sails
- Heave to

***skilled helmsman***

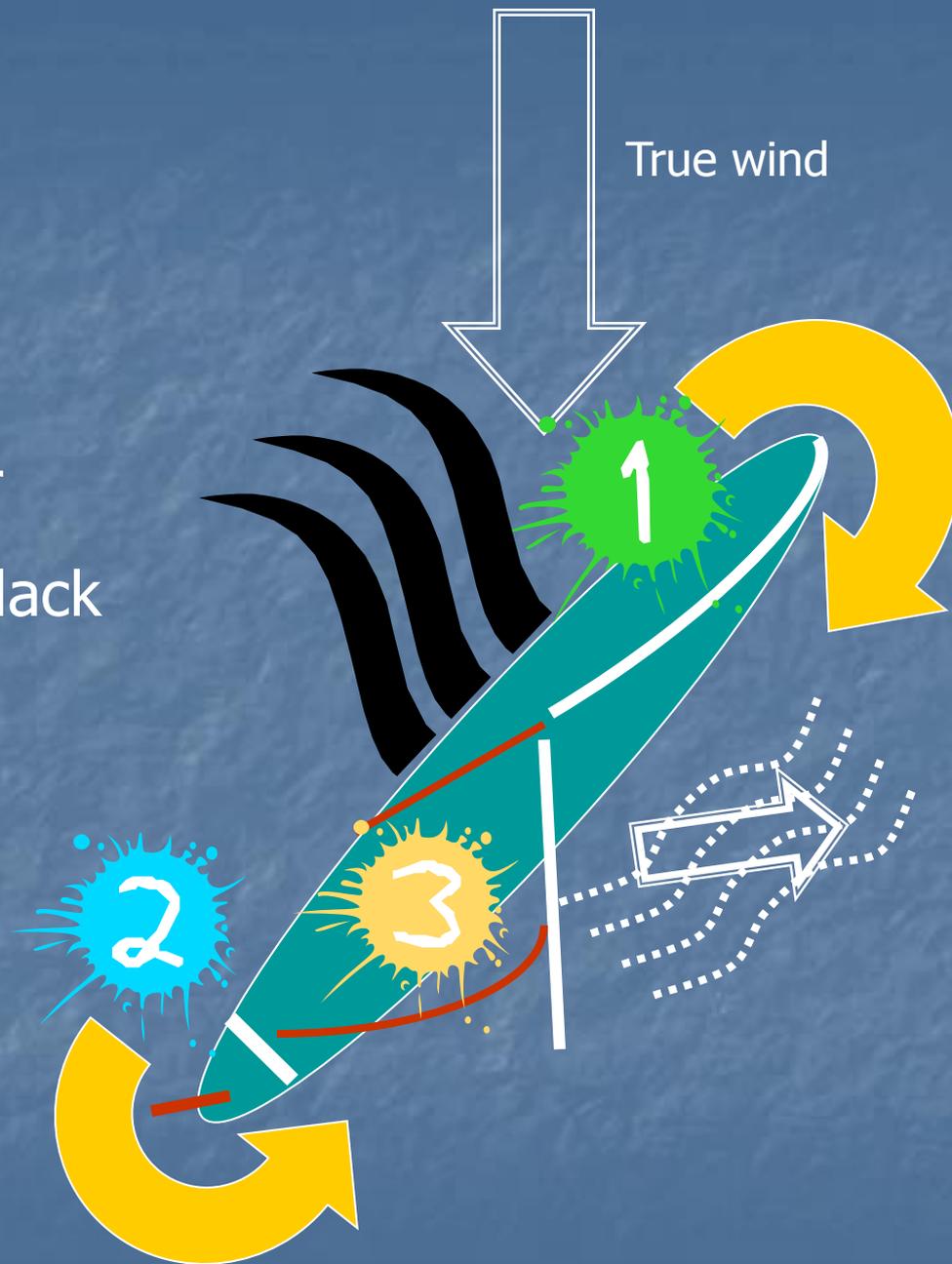


# Climbing wave faces



# Heave to

- Tack
- Jib backed
- Rudder over
- Mainsheet slack

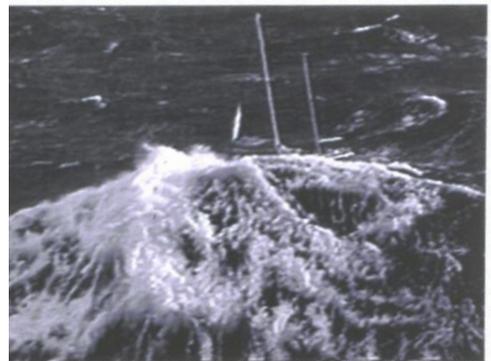
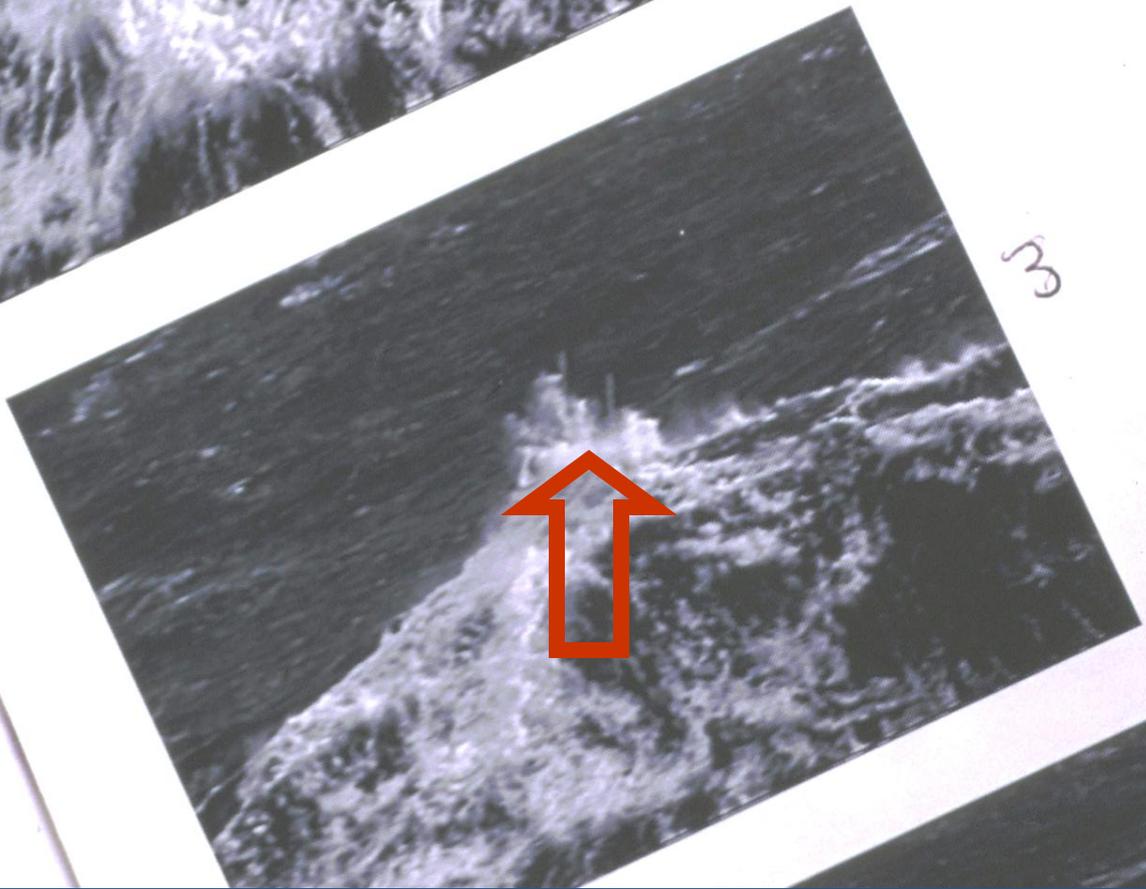
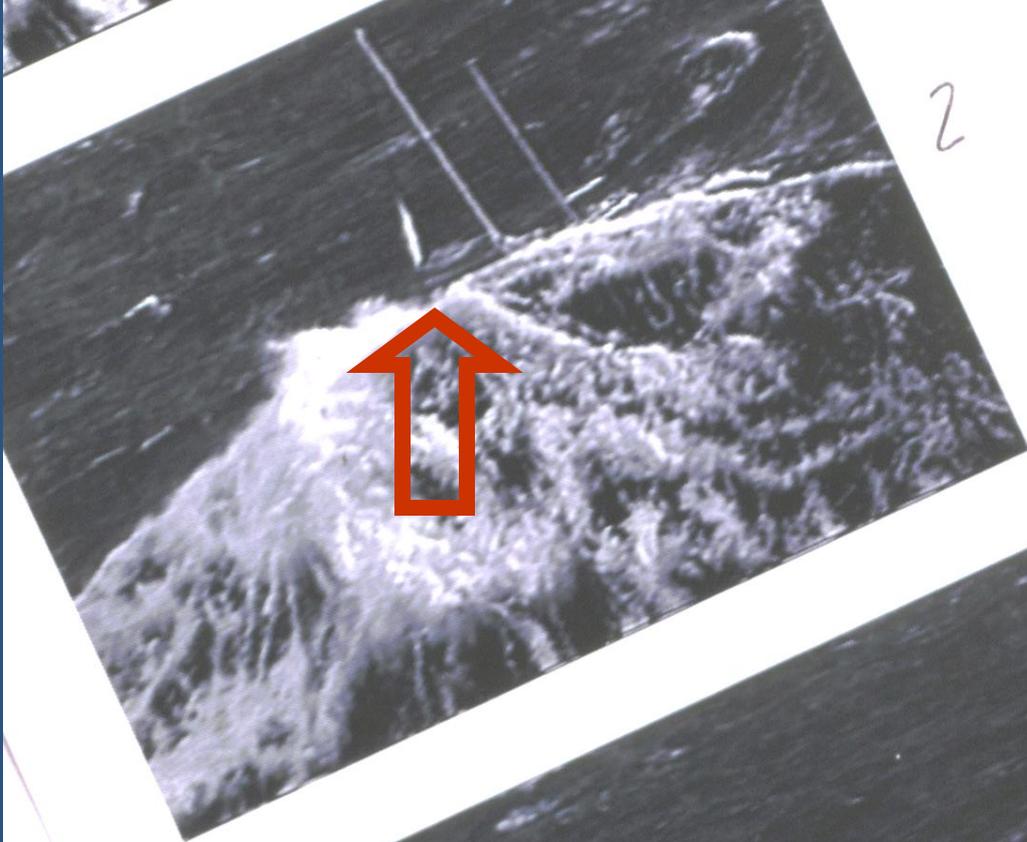


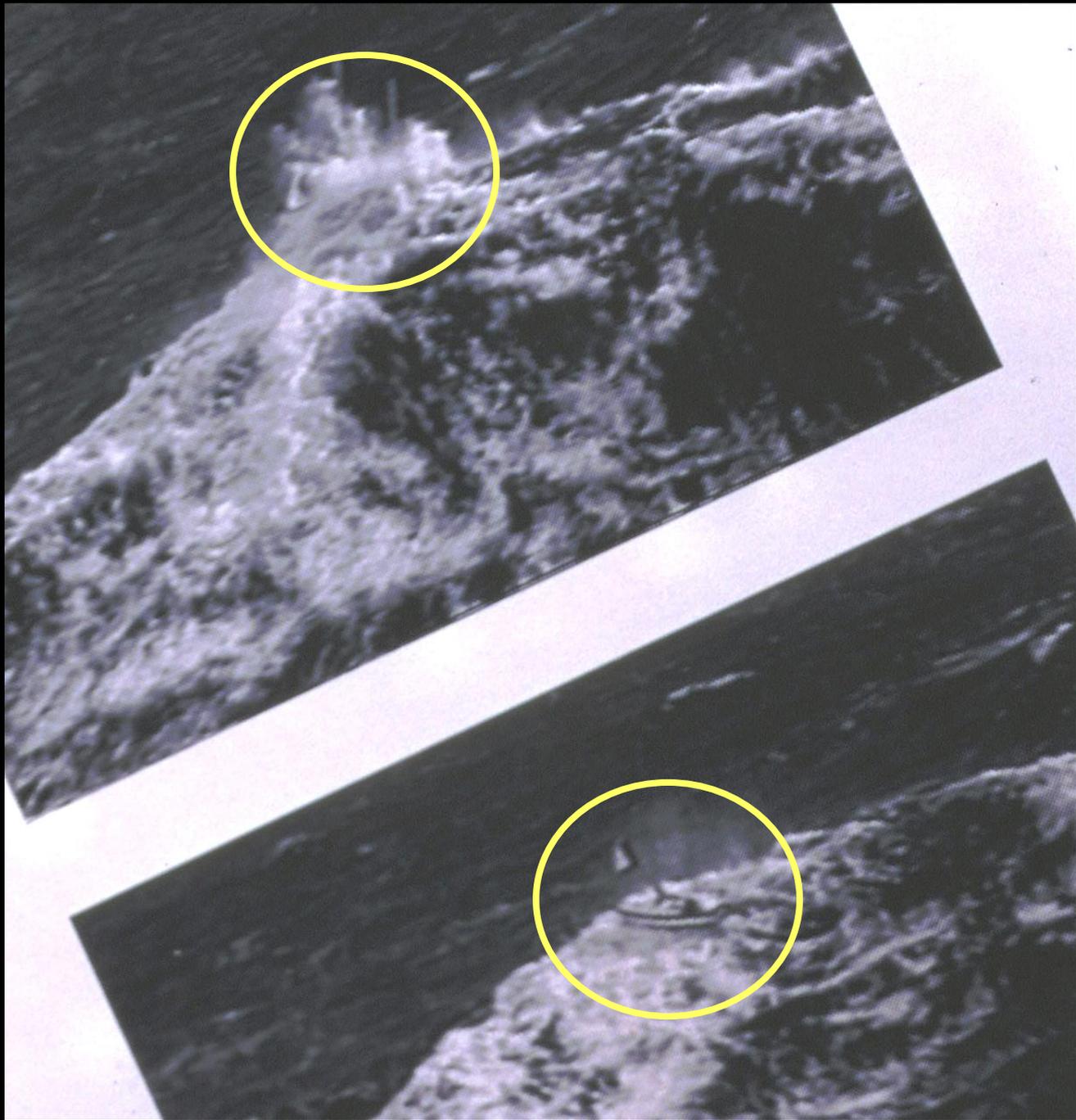
# Off-the-wind alternatives

- Run before
- Bare pole
- Tow drogue
- Sea anchor
- Lie a hull

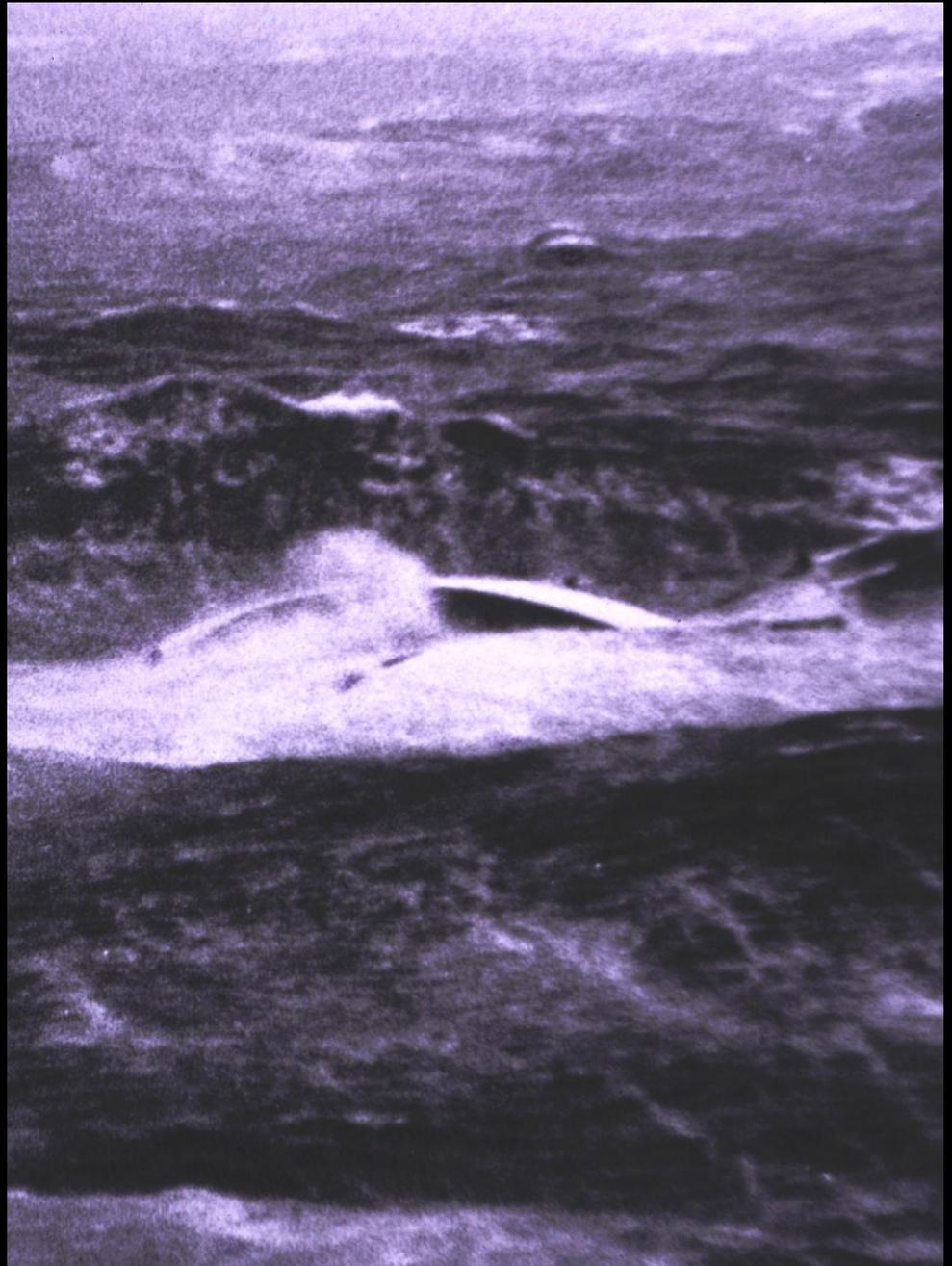
*appropriate gear*







Schooner *Spellbound*  
founders in Cape  
Hatteras Storm

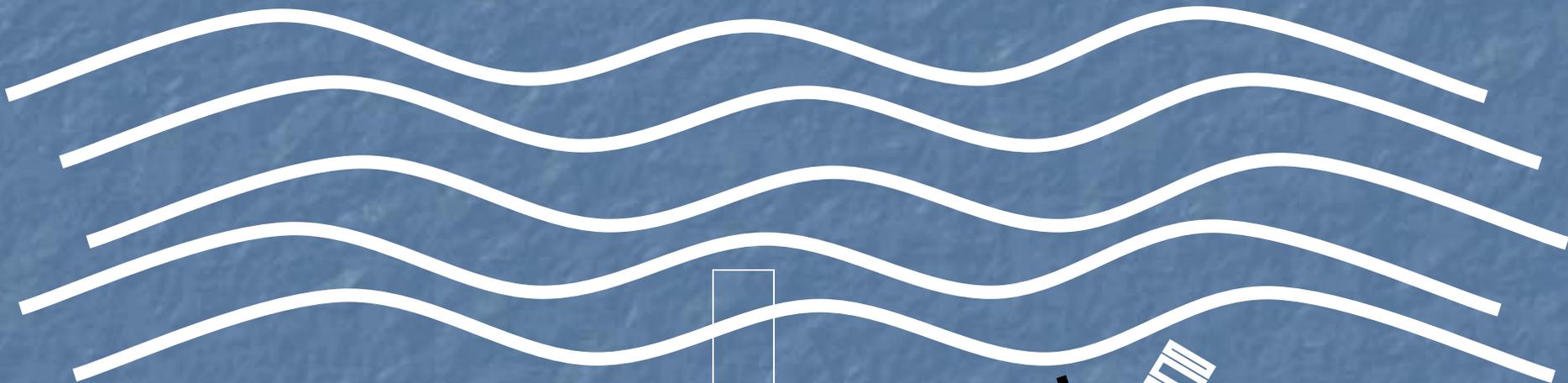


# Wind and sea geometry

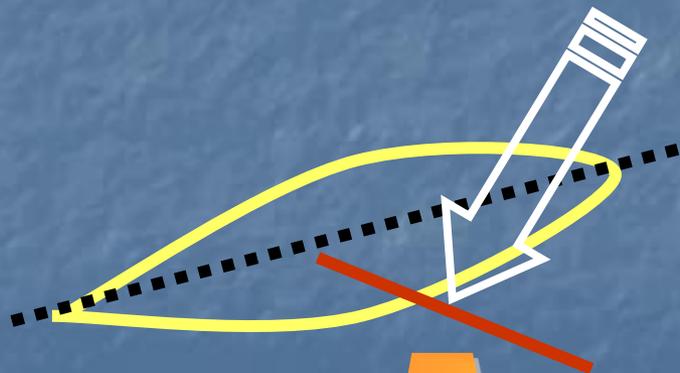
- Note the wind and swell offset angle
- Avoid being beam on to largest seas
- Plot location of WX system and movement
- Sail away from worst part of storm
- Establish if weather is worsening or improving



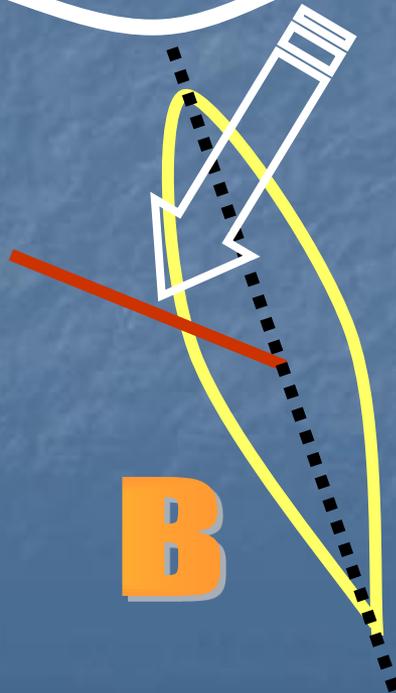
# wind/wave offset



Wave energy



**A**



**B**

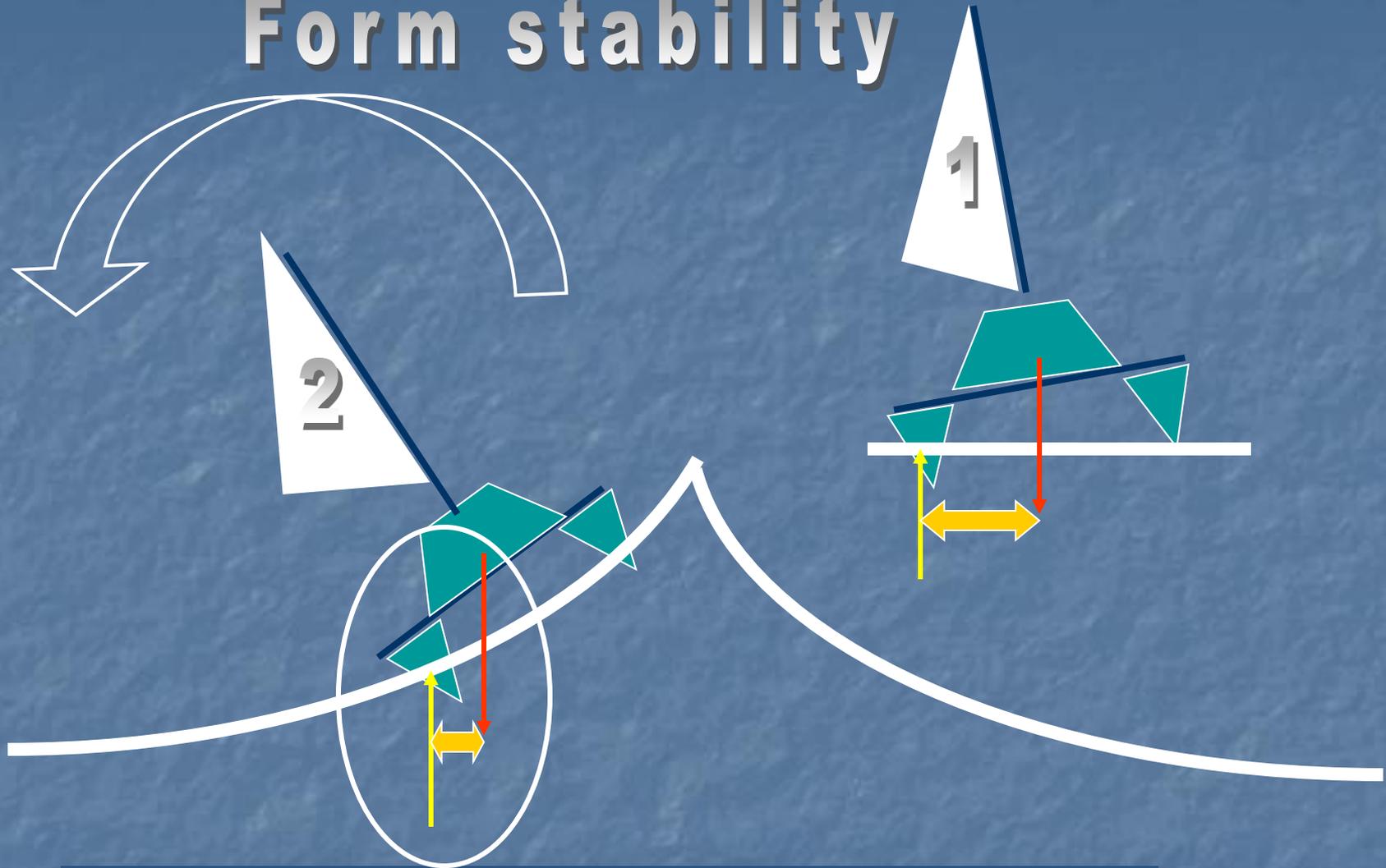
# Multihull stability

*wind pressure  
and  
seaway implication*





# Form stability



Center of gravity —————

Center of buoyancy —————

Southerly Buster

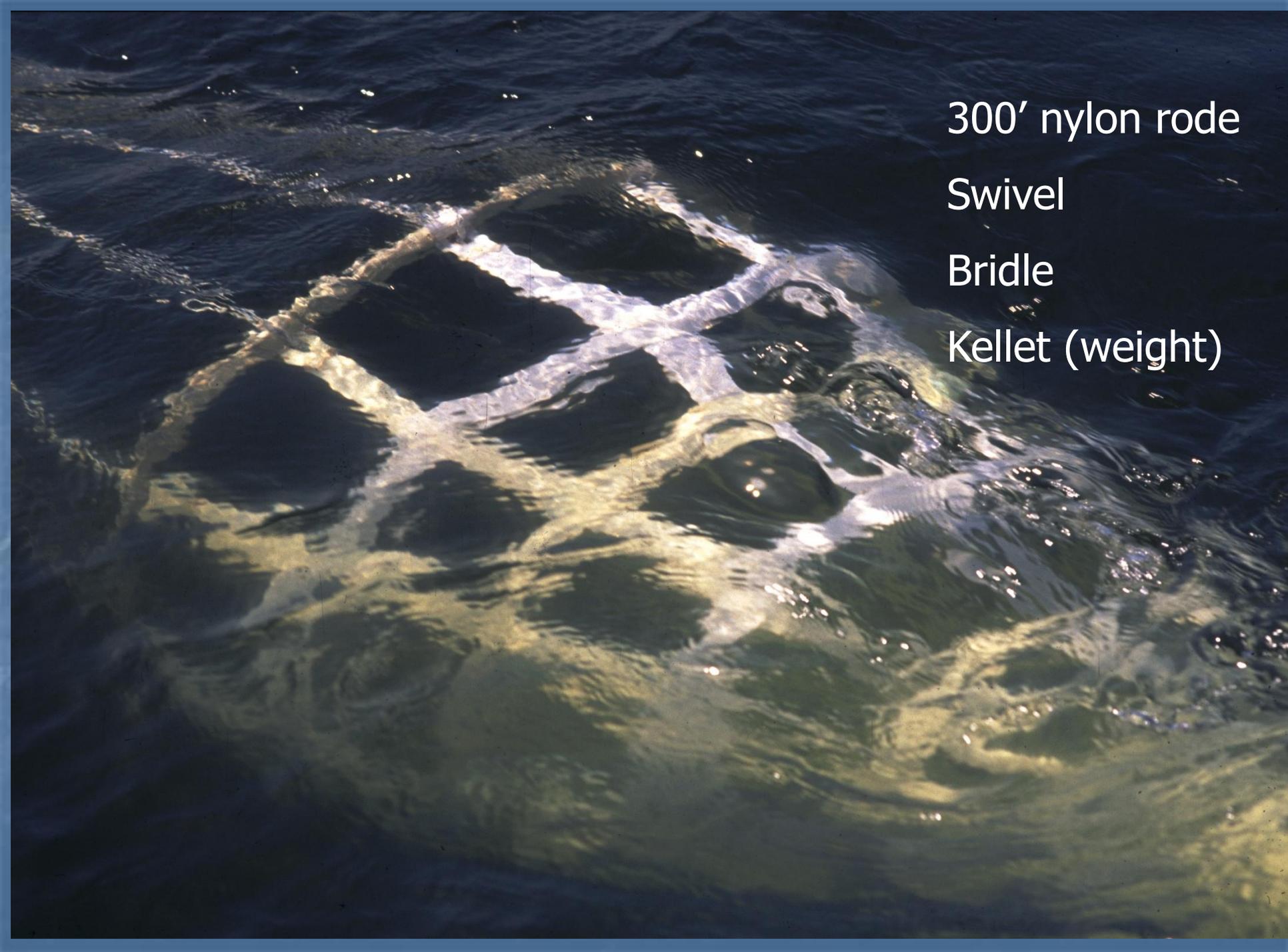
Black Nor'easter

Micro Burst

Bomb

# Tow to slow

- Warp
- Drogue
- Sea anchor

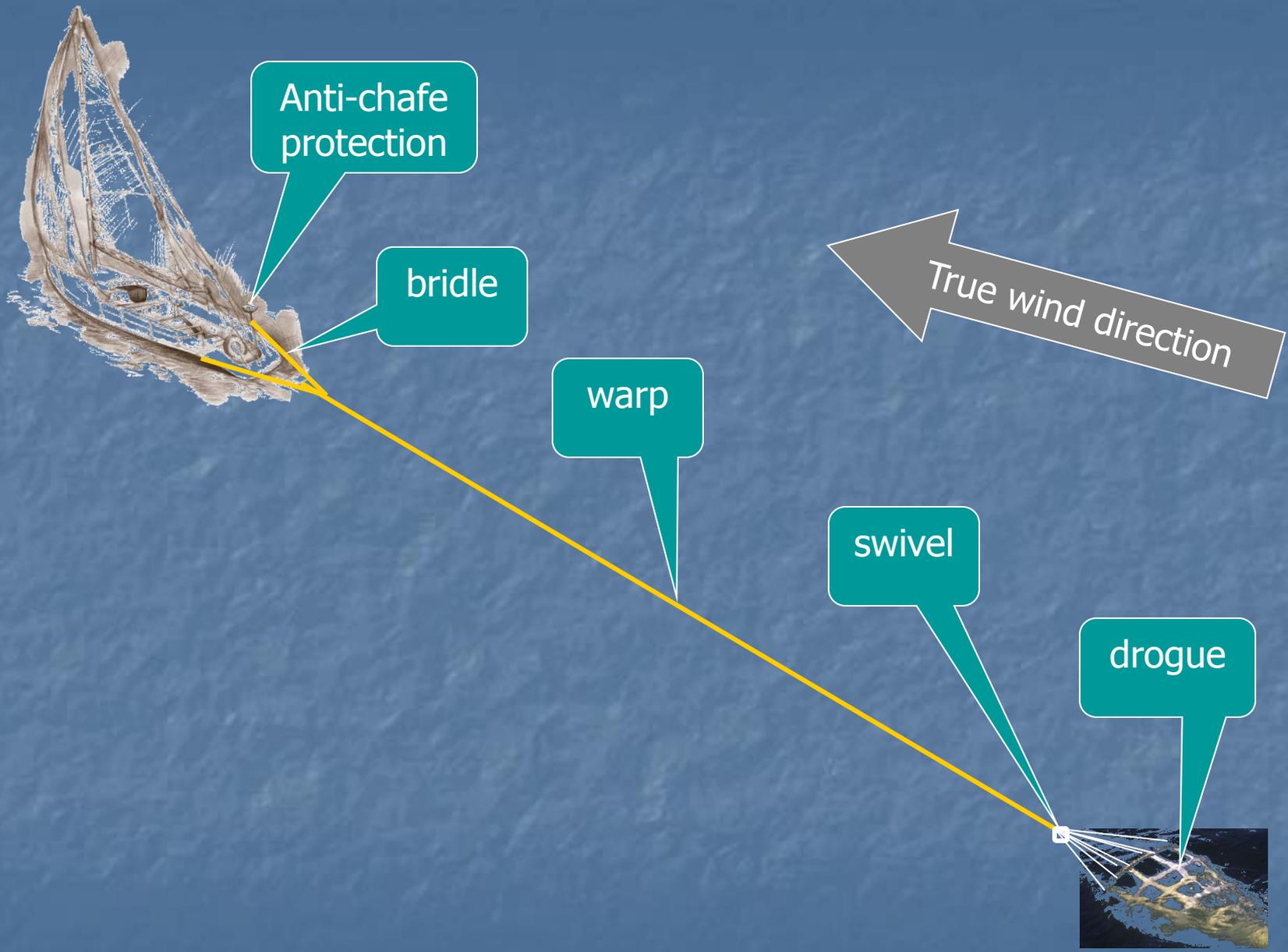
An aerial photograph showing a complex arrangement of fishing gear in the dark blue ocean. The gear consists of several interconnected rectangular panels, likely made of nylon, forming a large, irregular shape. The panels are connected by a network of lines, creating a web-like structure. The water around the gear is slightly disturbed, showing some white foam and ripples. The overall scene is captured from a high angle, looking down at the gear.

300' nylon rode

Swivel

Bridle

Kellet (weight)





[www.WindInMySails.com](http://www.WindInMySails.com)

*Sophisticated Lady*

10

# When a seagoing becomes survival

- Waves rather than wind dominate
- Harness use is imperative (PFD)
- Steer to minimize boat damage
- Anticipate knock downs (gear stowage)
- Short watches (helmsman and wave watcher)
- Communicate position and situation

# Man overboard prevention



# Clear side decks



- Inboard handholds
- Effective nonskid

# Boat agility



offshore



inshore



**A harness and lifejacket shall be worn when on deck**

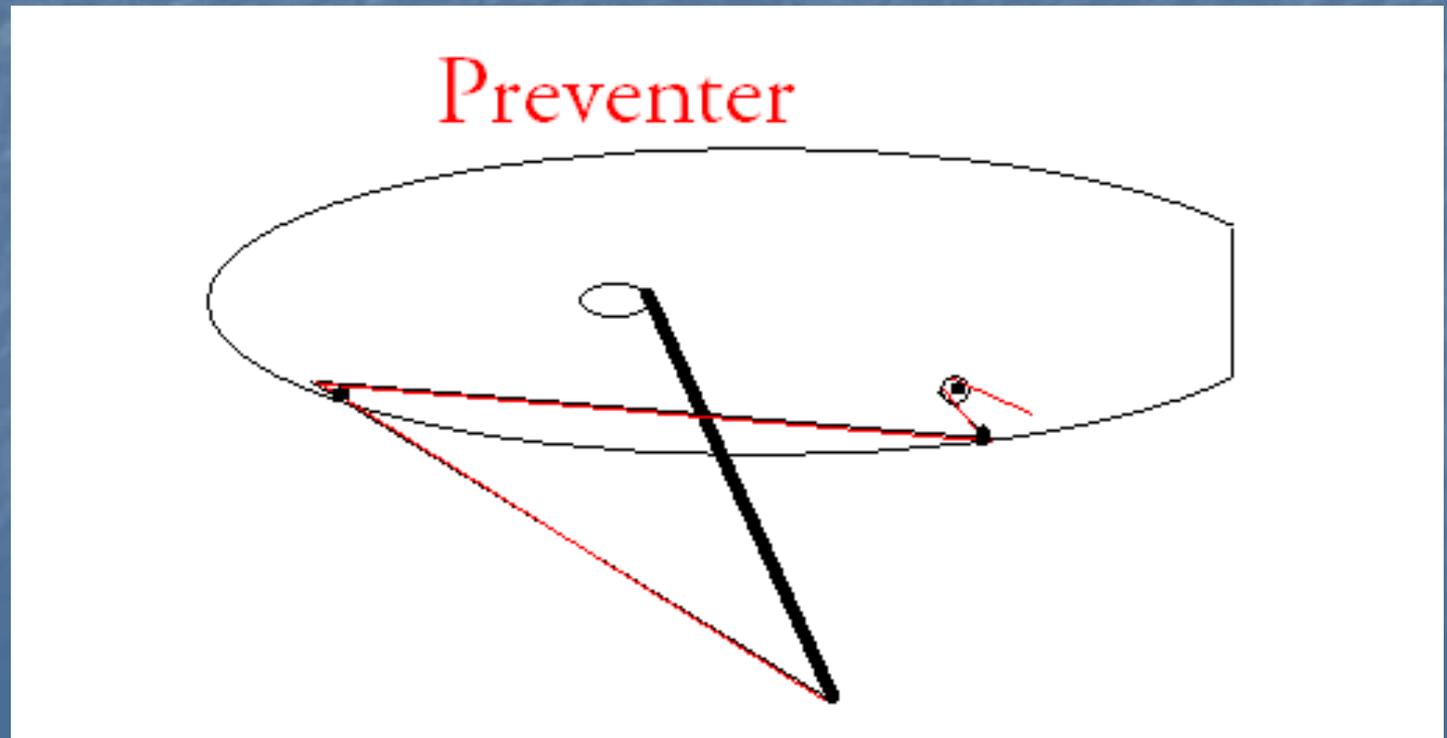
- a) between the hours of sunset and sunrise
- b) when alone on deck
- c) when reefed
- d) when the true wind speed is 25 knots or above
- e) when the visibility is less than 1 nautical mile

# Preventer

A close-up photograph of a sailboat's boom and mast area. A large white sail is partially visible, and a red rope is attached to the boom. A person in a blue jacket and orange life vest is standing on the deck in the background, working with the rigging. The word 'Preventer' is overlaid in red text.

# End boom preventer

- must handle full mainsheet load
- Eased from a winch

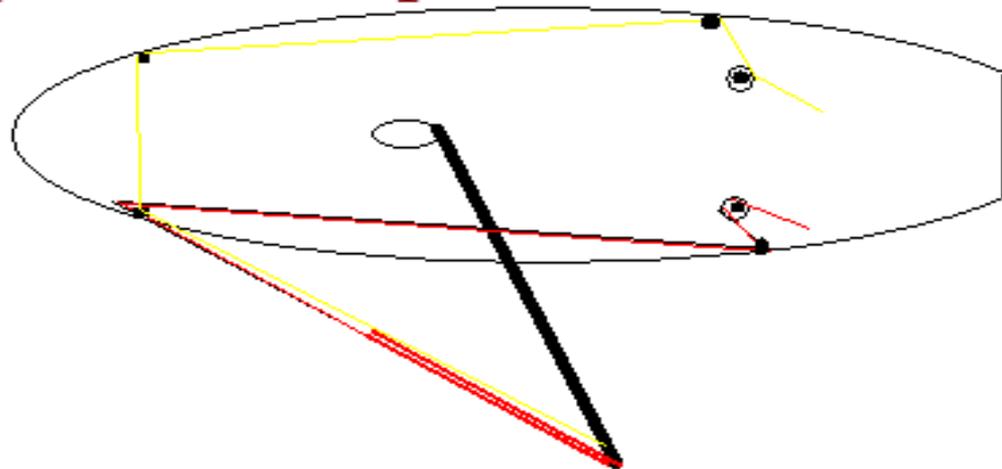


# Shortage of leeward winch

- Rig additional snatch blocks to windward

—Boom pennant 

preventer option 2





THE OFFICIAL PROGRAM OF THE US SAILING SAFETY AT SEA SEMINARS

# SAFETY AT SEA



Steve Callahan takes part in a Cruising World liferaft review.



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THE RACING  
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*the end*

*a Naranjo Photo presentation*