



**BROOKLYN BRIDGE
SAIL CLUB**

FUNDAMENTALS OF SAILING



Course Comparison

Fundamentals of Sailing (FUN)

- Weekend course
- 18 hours
- US Sailing Curriculum
- BBSC Certification

Learn-to-Crew/Club Intro (LTC)

- Weekend course (FUN) + 2 Fleet Captain sails + 2 month club membership
- 26 hours
- US Sailing Curriculum
- BBSC Certification
- US Sailing Certification [when available]

Sample Outline

Day 1

- Sailing Concepts
- Getting Reading to Sail
- Break
- Sail Session #1
- Working Lunch
- Sail Session #2
- Debrief

Day 2

- Sail Session #3
- COB Recovery
- Working Lunch
- Sail Session #4
- Debrief
- Graduation

KNOWLEDGE SESSION #1

Boat Etiquette and Personal Preparation

- Accord captain/skipper with respect
- Ask permission to come aboard
- Cross over a boat ahead of the mast
- Non-marking shoes on deck
- Ask if you can bring beverages and snacks
- Ask permission to go below
- Leaving boat in better condition than you found it

Personal Protection

- Evaluate weather before arriving at dock
- Sun protection (SPF 15, hat, sunglasses)
- Wear layers (jacket over PFD)
- Hat vs hood
- Proper non-marking closed toe shoes
- Gloves

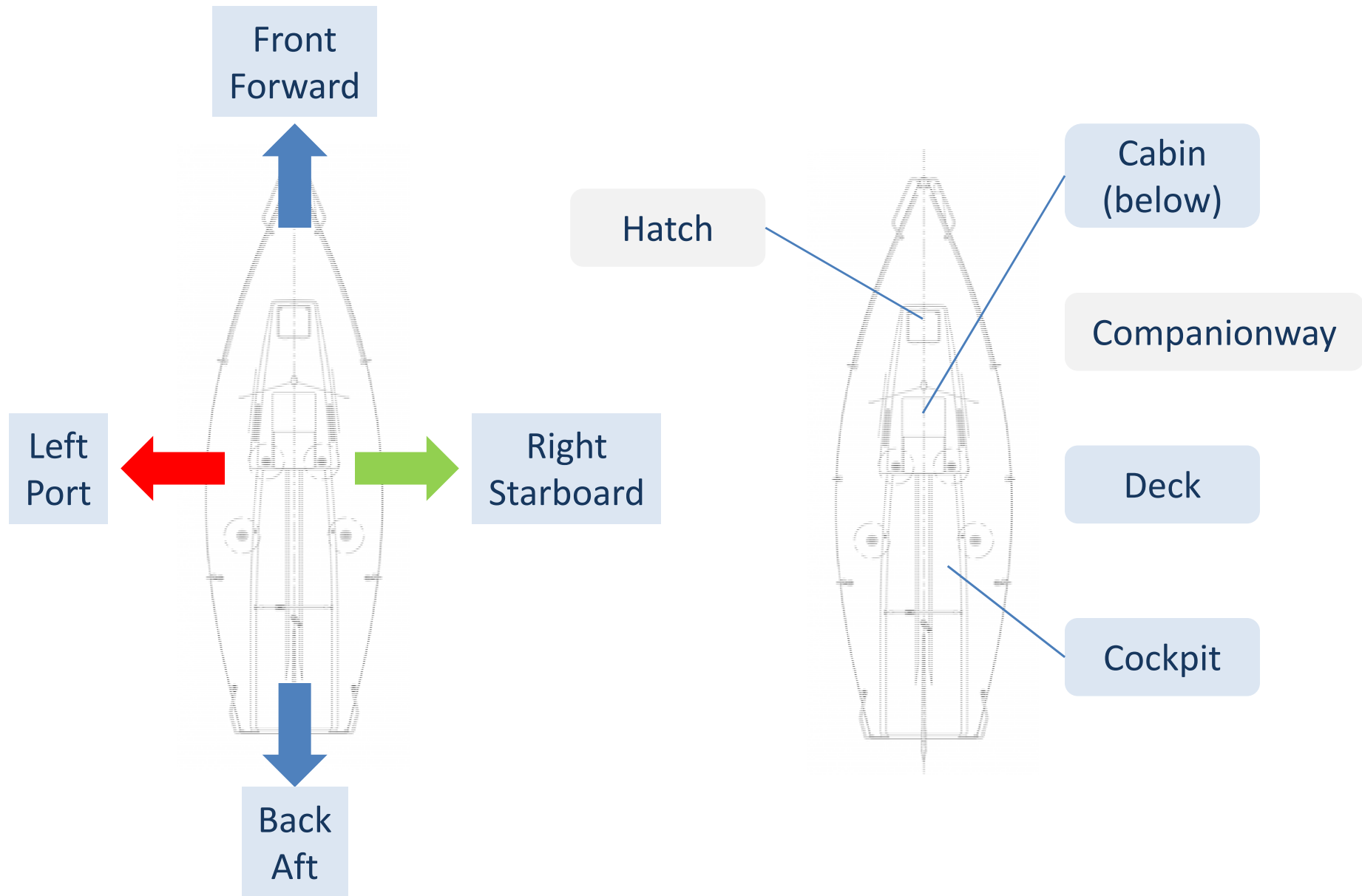
Stay Safe and Stay Healthy

- Stretching exercises – if you can
- Swimming ability
- Seasickness
- Hypothermia
 - Stay warm, easier to cool off than warm up
- Hyperthermia
 - Drink fluids
- In emergencies, stay with the boat

Fundamentals

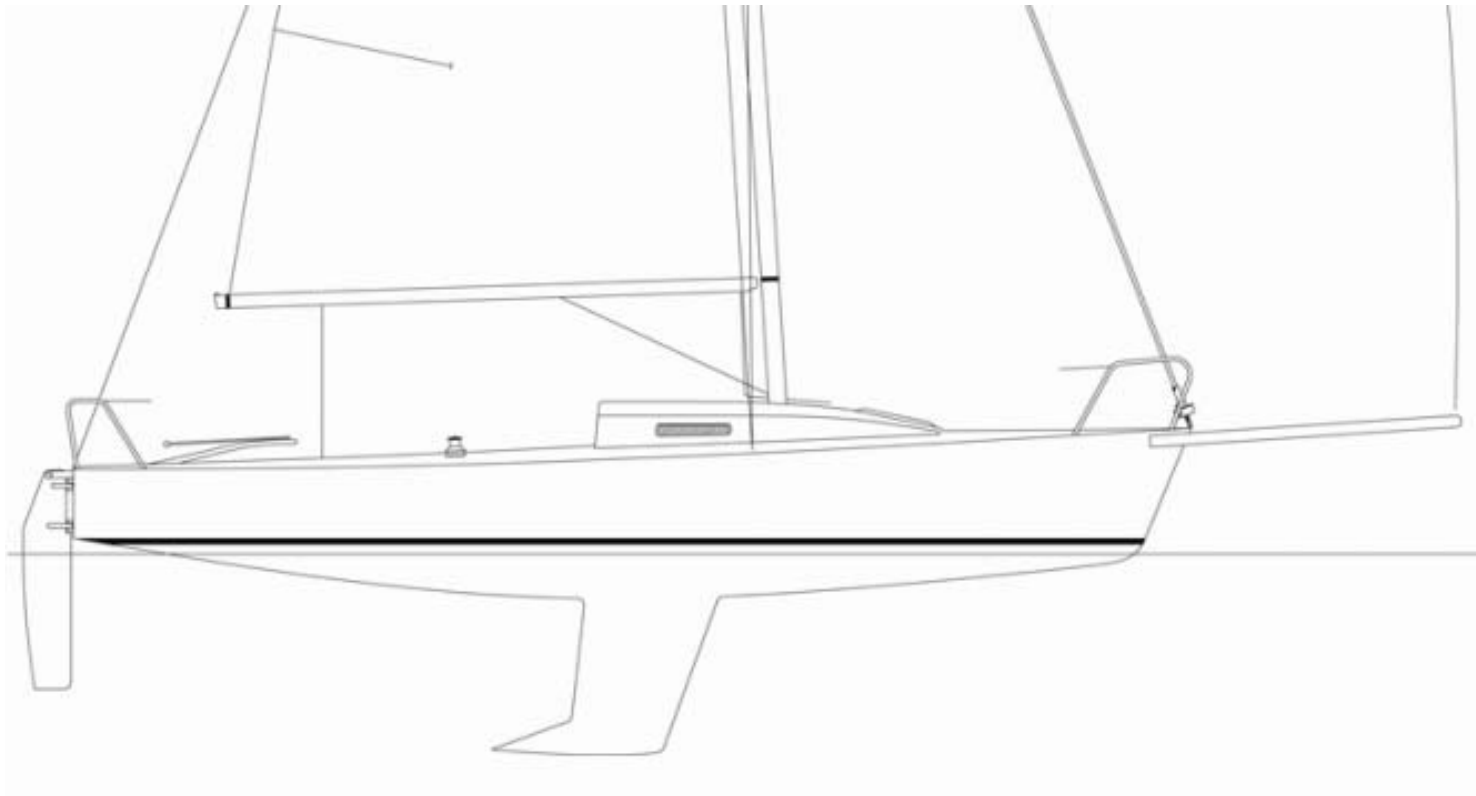
- Parts of the boat
- Steering
- Rigging
- Sails
- Sail controls
- Sailing concepts
- Basic sailboat design
- Boat dynamic

Boat Orientation

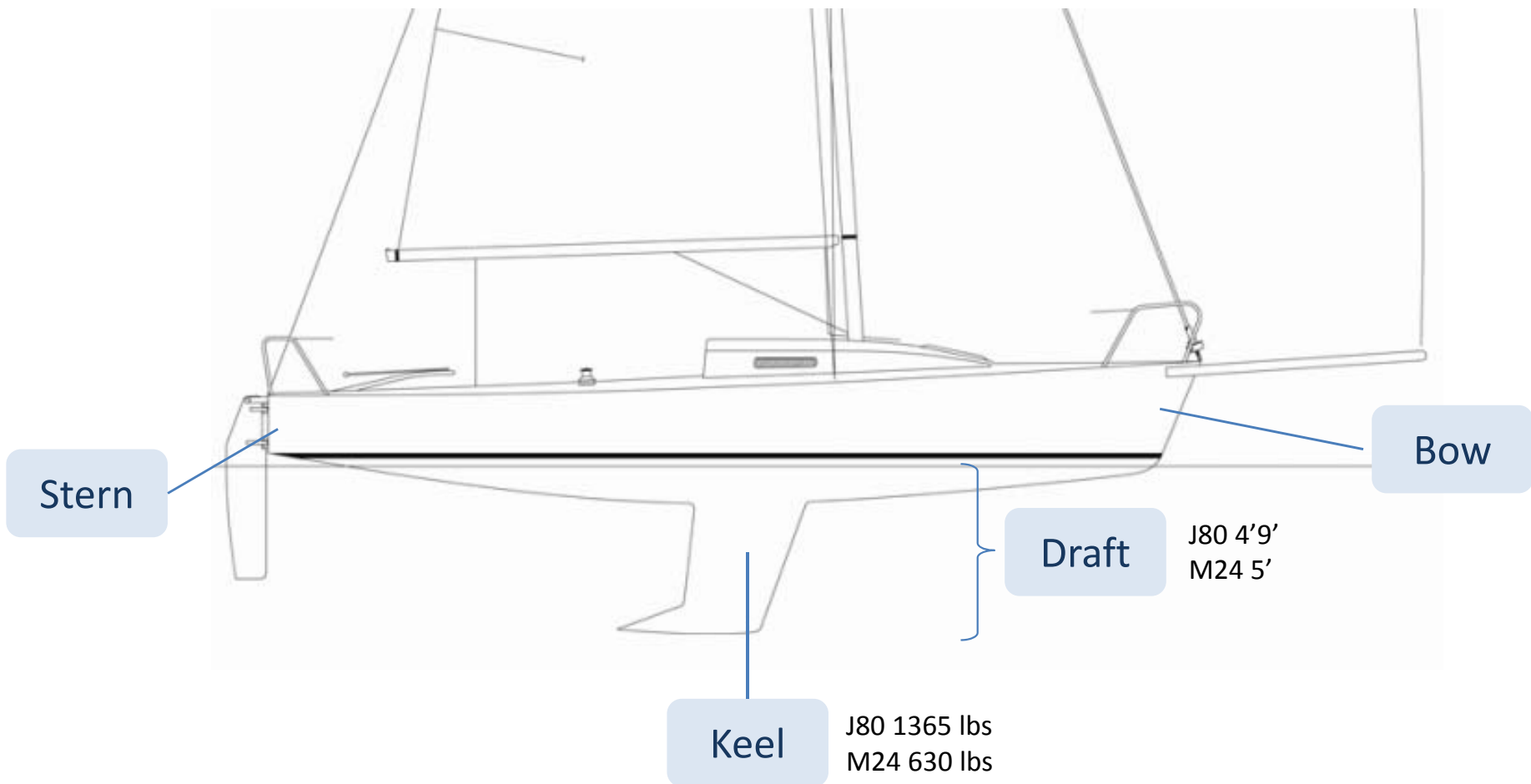


Parts of the Boat

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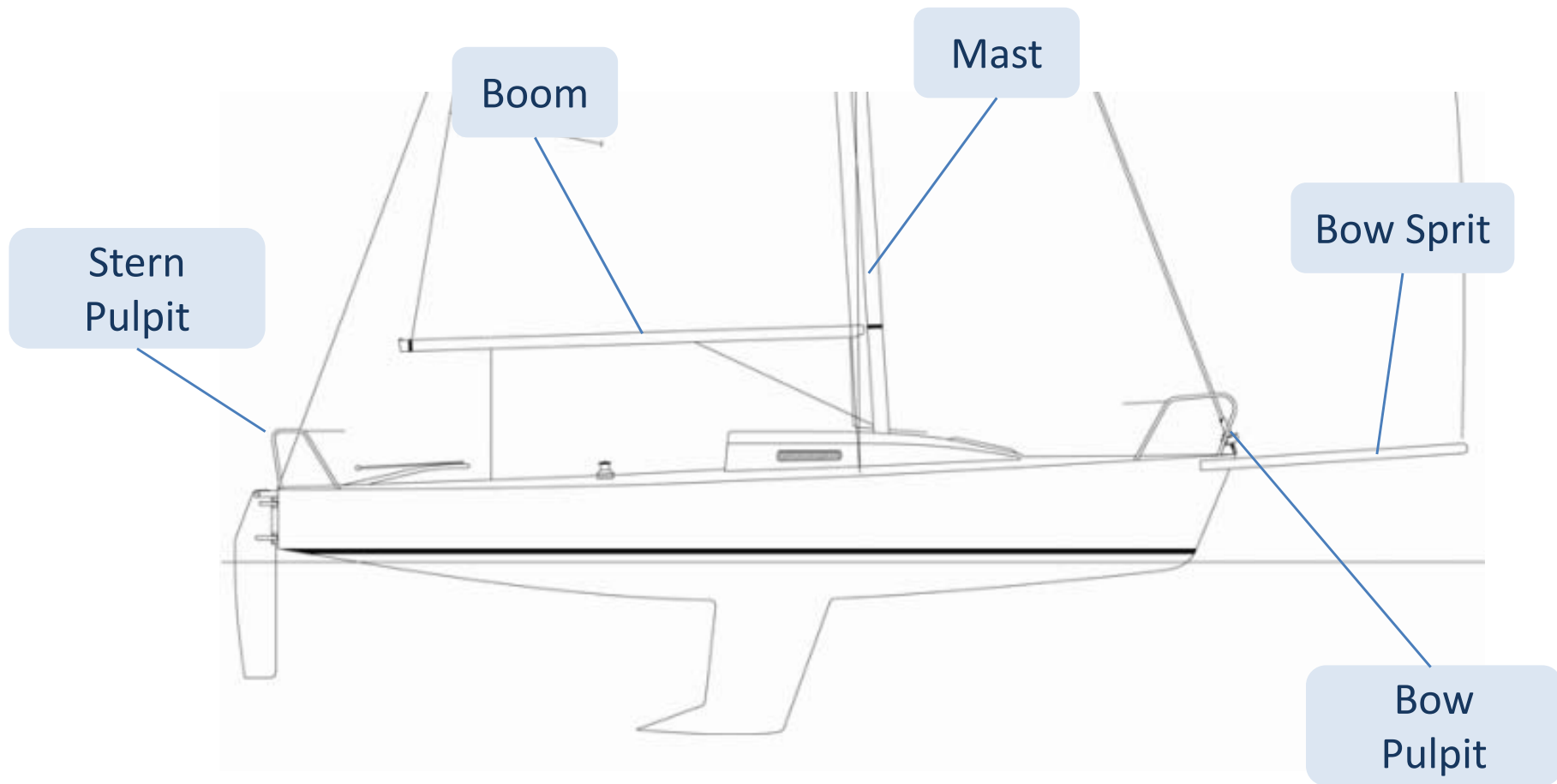


Parts of the Boat: Hull



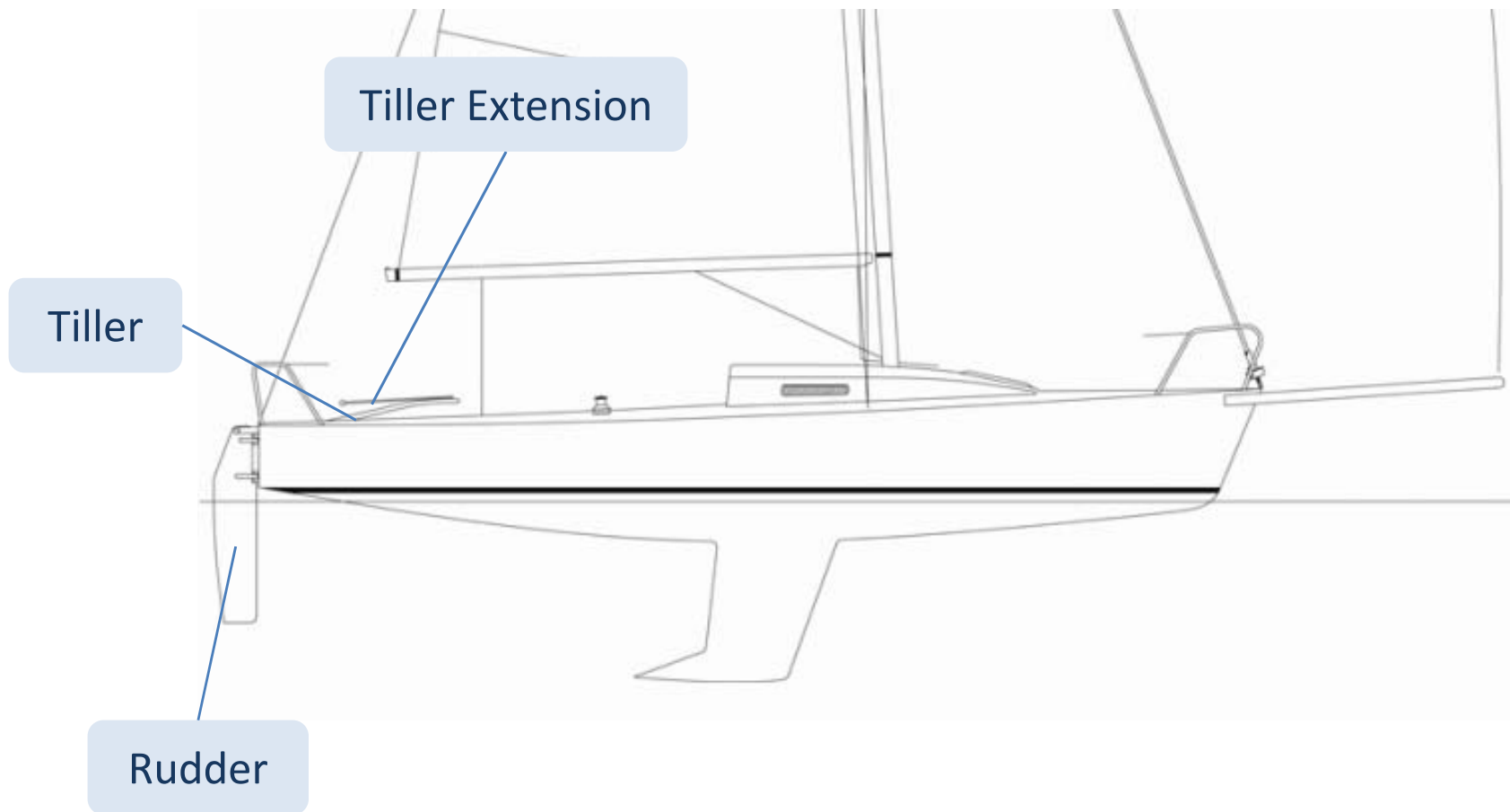
Parts of the Boat: Rig/Spars

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Parts of the Boat: Steering

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Steering

- Wheel
 - Turn in the direction you want to go
 - Same as a car
- Tiller
 - Turn in the opposite direction you want to go
- Return tiller or wheel to NEUTRAL position



Parts of the Boat: Rigging

Standing Rigging

- Forestay
- Backstay
- Sidestay/Shrouds

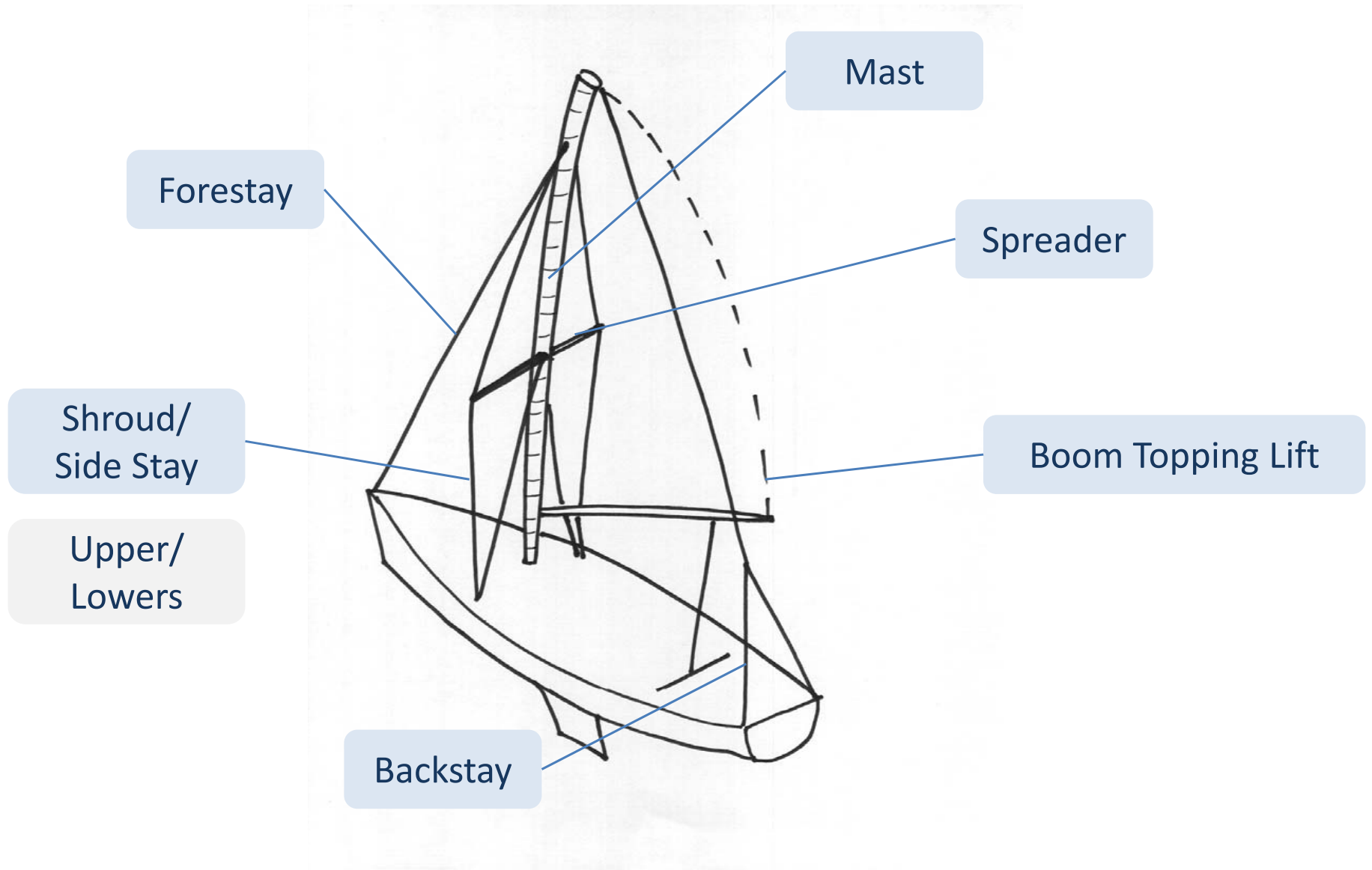
Running Rigging

- Lines not ropes
- Halyards
- Sheets

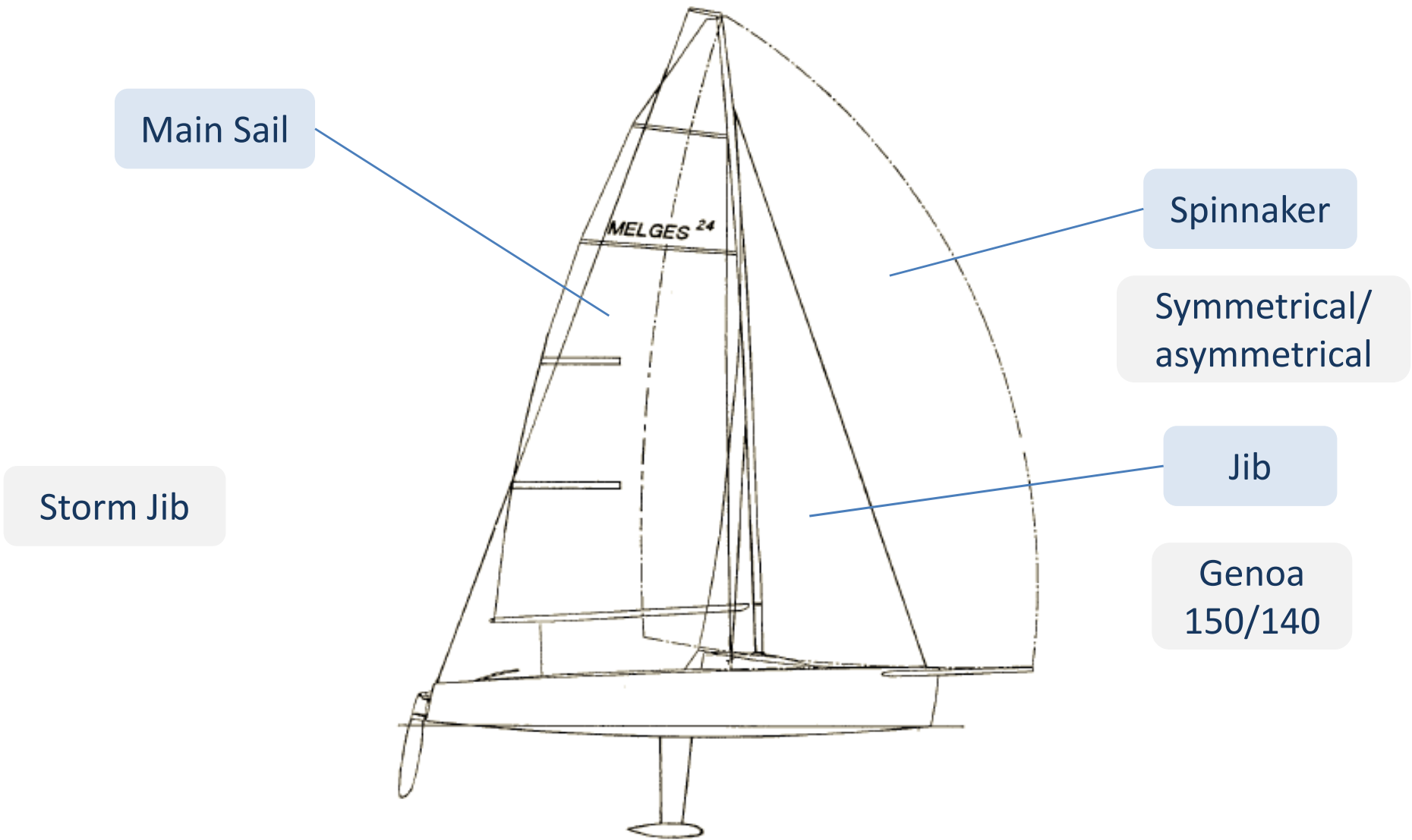


Parts of the Boat: Standing Rigging

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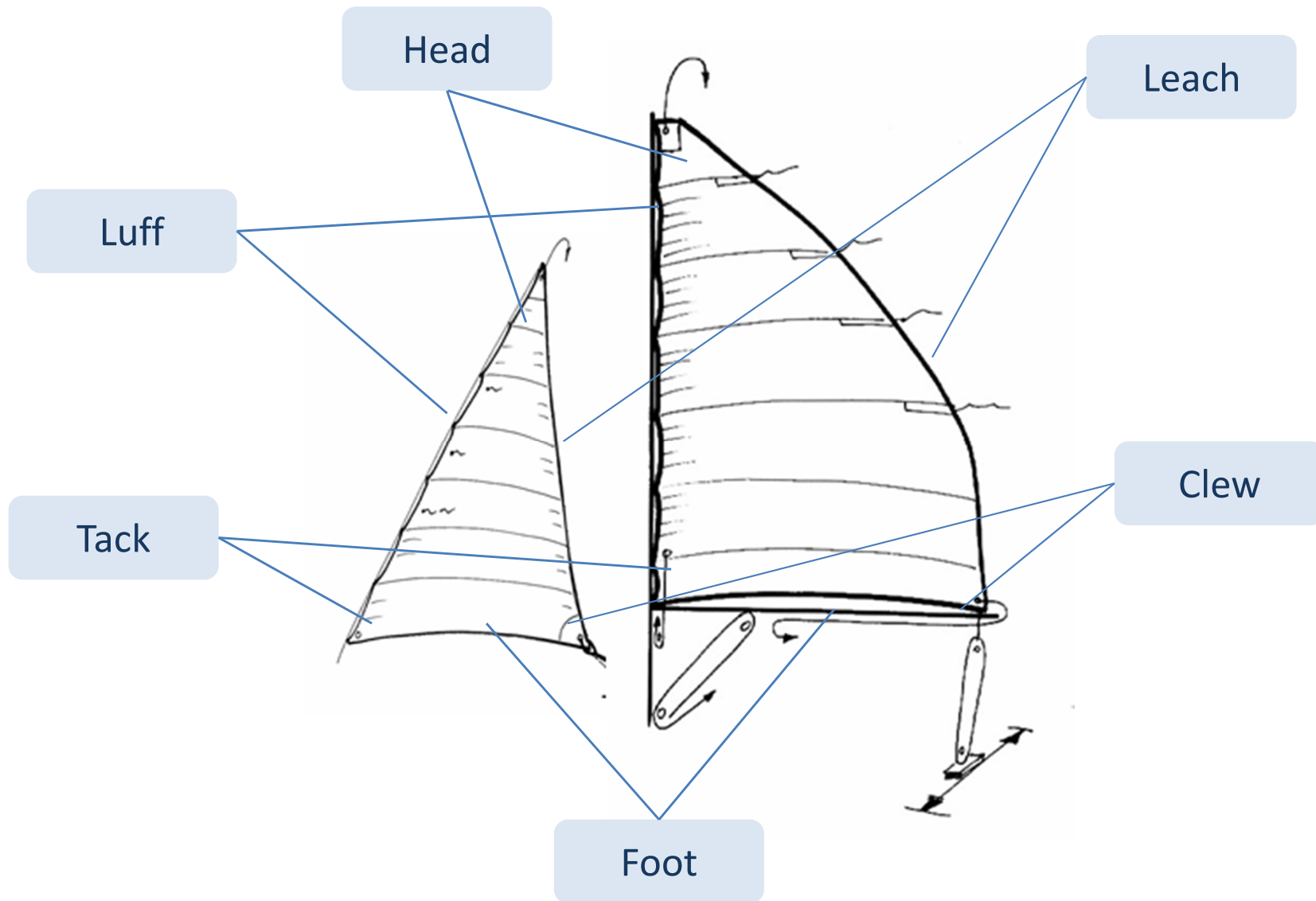


Parts of the Boat: Sail



Parts of the Boat: Sails

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Parts of the Boat: Sail Controls

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- Sheet
- Halyards
- Boom vang
- Cunningham
- Outhaul
- Jib leads

Parts to the Boat:

- Blocks – ratchet features
- Shackles/pins – point to starboard
- Winch/winch handle



SAILING CONCEPTS

Sailing Concepts

- How to read the wind
- Points of sails
- No-Go Zone
- Tack and gybing
- Sailing by the lee

How to Read the Wind

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- Flags on shore
- Windex (masthead fly)
- Other sail boats
- Ripples on water
- Boats on moorings

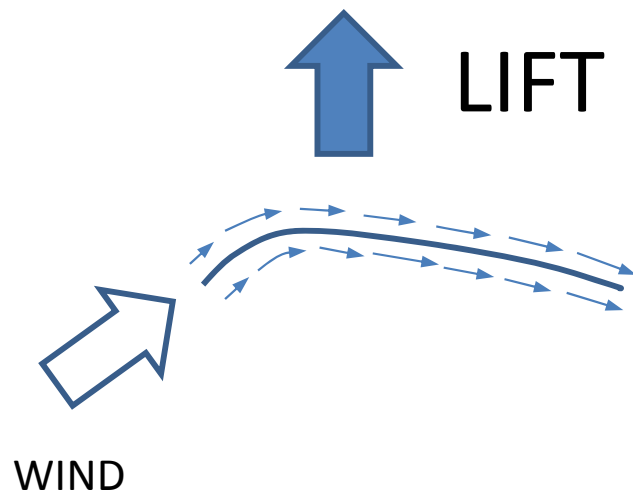
- True wind



How a Sail Works

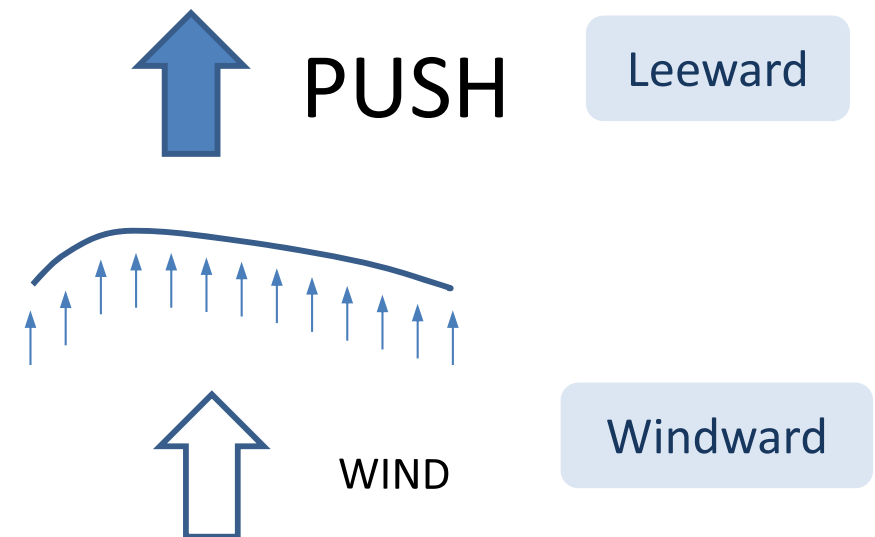
Lift Mode

- Air flow over both sides of sail

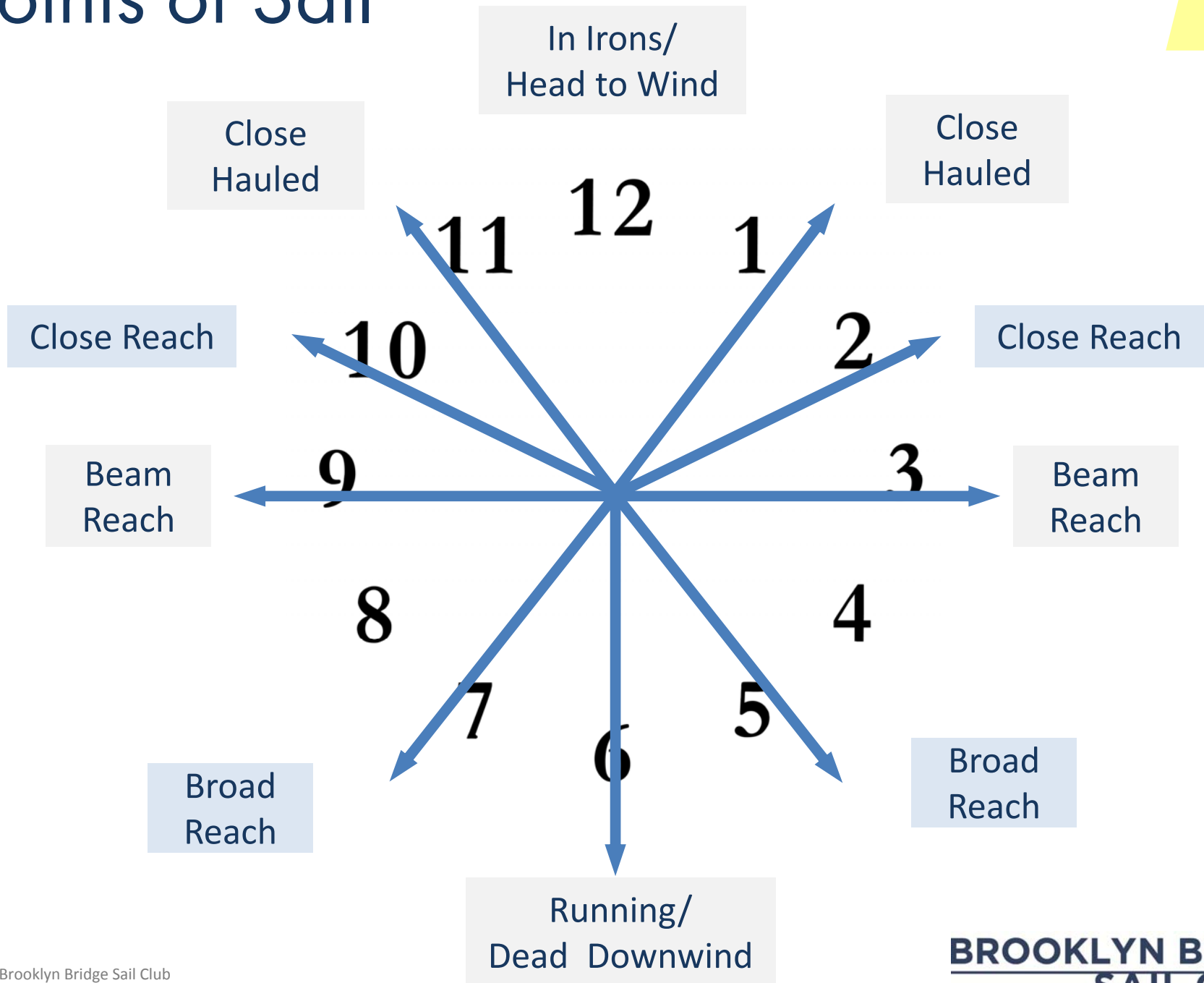


Push Mode

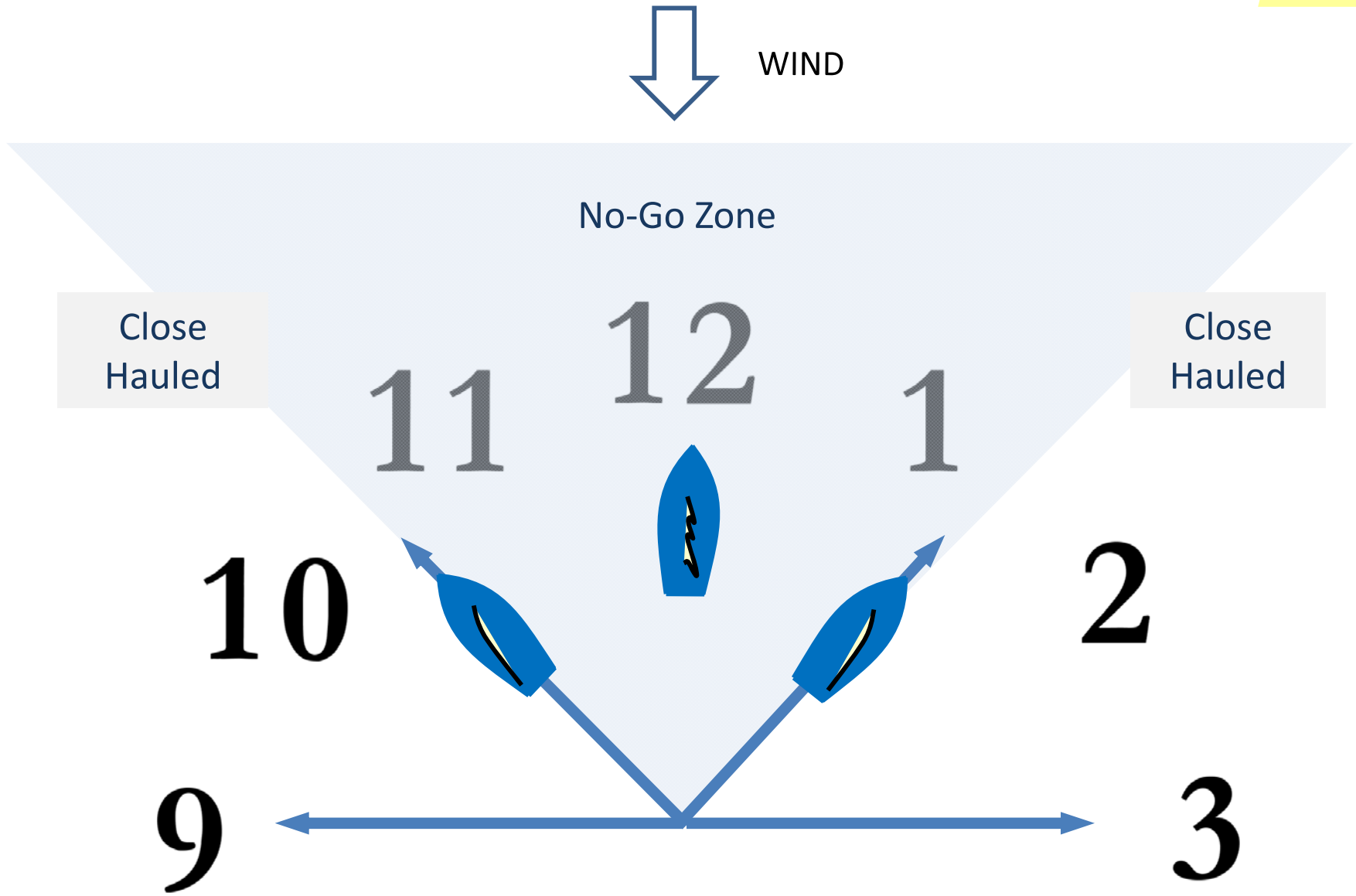
- Air flow pushes on one side of sail



Points of Sail



No-Go Zone

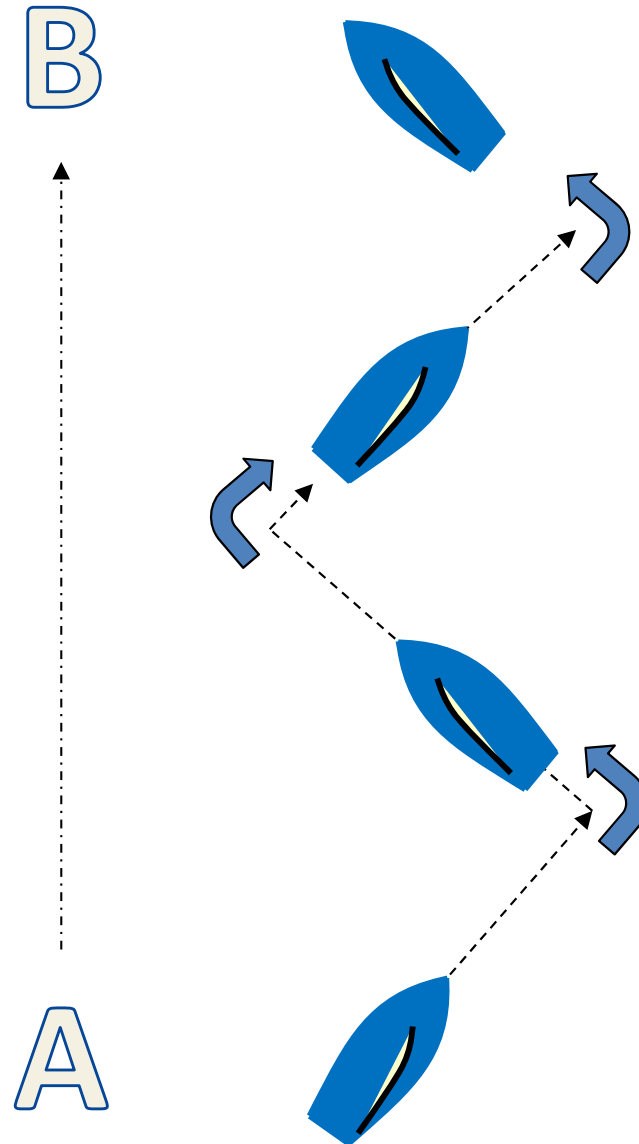


Tacking – Going Upwind



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- Want to go upwind (A to B)
- Unable to sail directly into no-go zone
- Must tack from close hauled to close hauled to work upwind

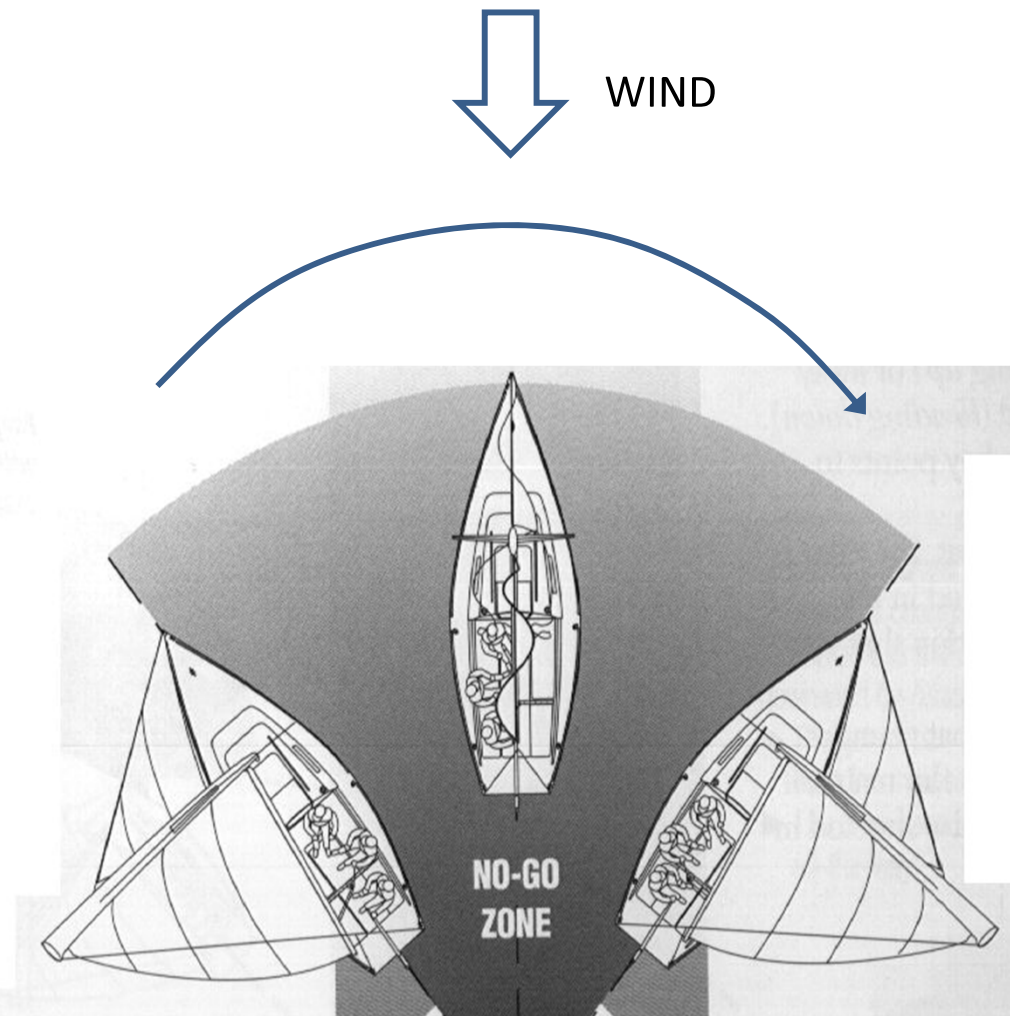


Tacking

- Bow turns towards wind
- Through no go zone
- Onto other tack

Commands

- Skipper: "ready to tack"
- Crew: "ready", "
- Skipper: "hard a-lee",
"helms a-lee", "tacking"



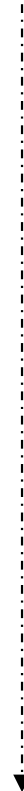
Gybing – Going Downwind



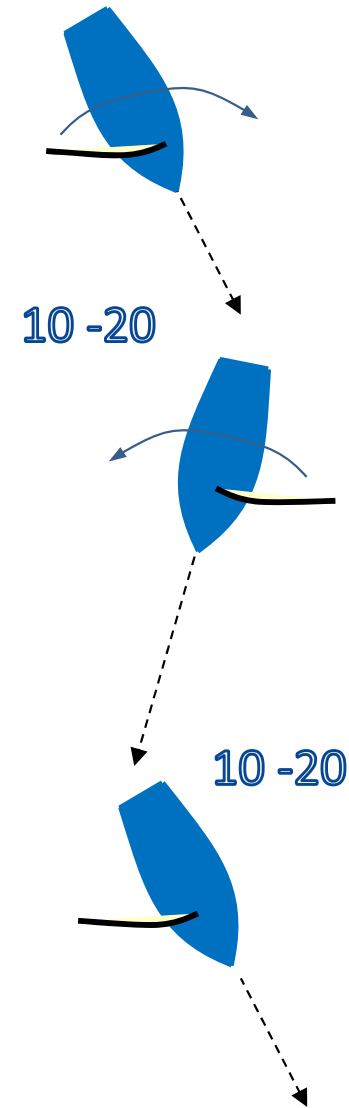
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- Want to go downwind (C to D)
- Unable to sail directly downwind (run)
 - Risk of accidental gybe
- Stern crosses wind with each gybe
- Boom crosses in a controlled fashion

C



D



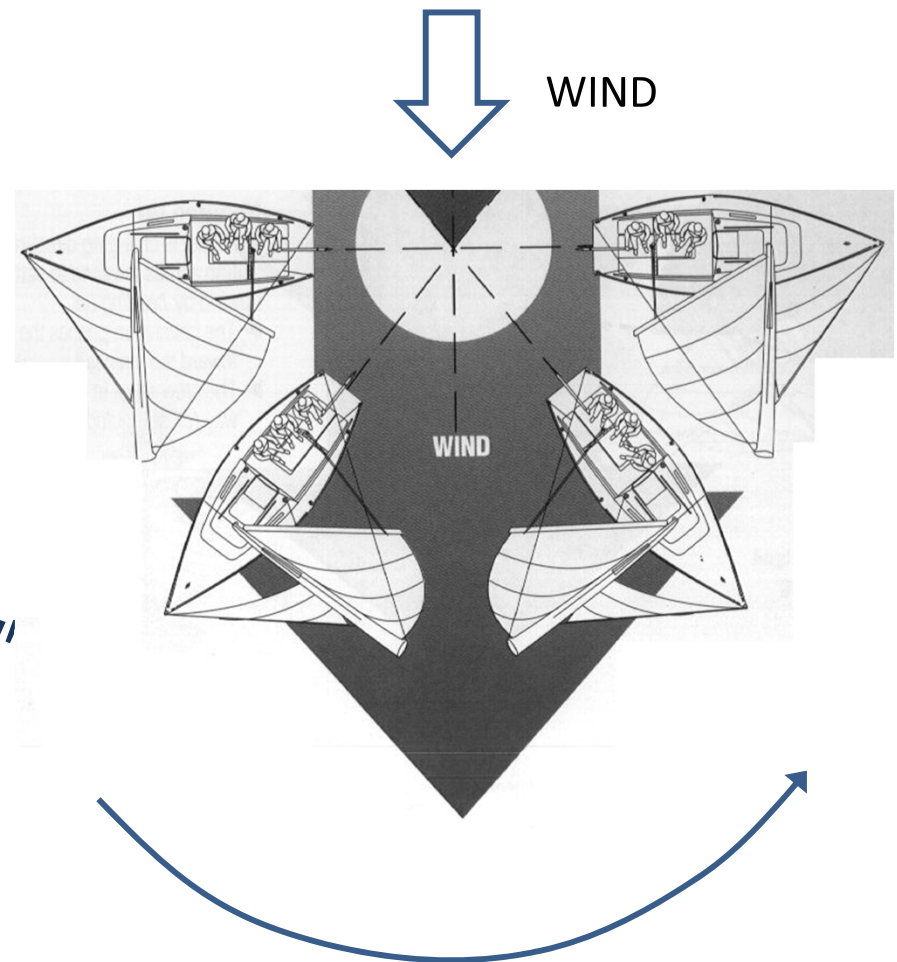
**BROOKLYN BRIDGE
SAIL CLUB**

Gybing

- Bow away from wind
- Stern through wind
- Bow towards wind

Commands

- Skipper: "ready to gybe"
- Crew: "ready"
- Skipper: "gybe-Ho",
"gybing"



Knots

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58-61

- Stopper knots, slip knot
- Cleat hitch
- Bowline
- Clove hitch
- Sheet bend
- Square knot
- Round turn 2-half hitches

Practice throwing a line



Winches:

- Wrap around clockwise
- Take slack out to drum
- Hold winch handle carefully
- Return winch handle to holder



Cleats

- Cam cleats
- Horn cleats – cleat hitch w/locking hitch
- Jam/Clam Cleats



GETTING READY

Boarding a Boat

- Hand over gear first
- Hold onto shrouds (widest part of boat)
- Step on the outside toe rail with both feet
- Step over lifelines
- No hands or feet between the dock and boat
- Walk towards the cockpit (one hand for yourself and one for the boat – boom/lifelines)
- Safe area: Cockpit and mast
- Look out for hatch cover, forward hatch (J80), side hatches, avoid swinging boom

Rigging the Boat

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- Rig the mainsail
 - Loosen sail controls
 - Flake mainsail on boom
 - Attach halyard
- Check the jib/attach jib sheets
 - Check jib car settings
 - Check roller furler
- Instructions to hoist the sail

SAILING SESSION #1

Pre-Departure Check

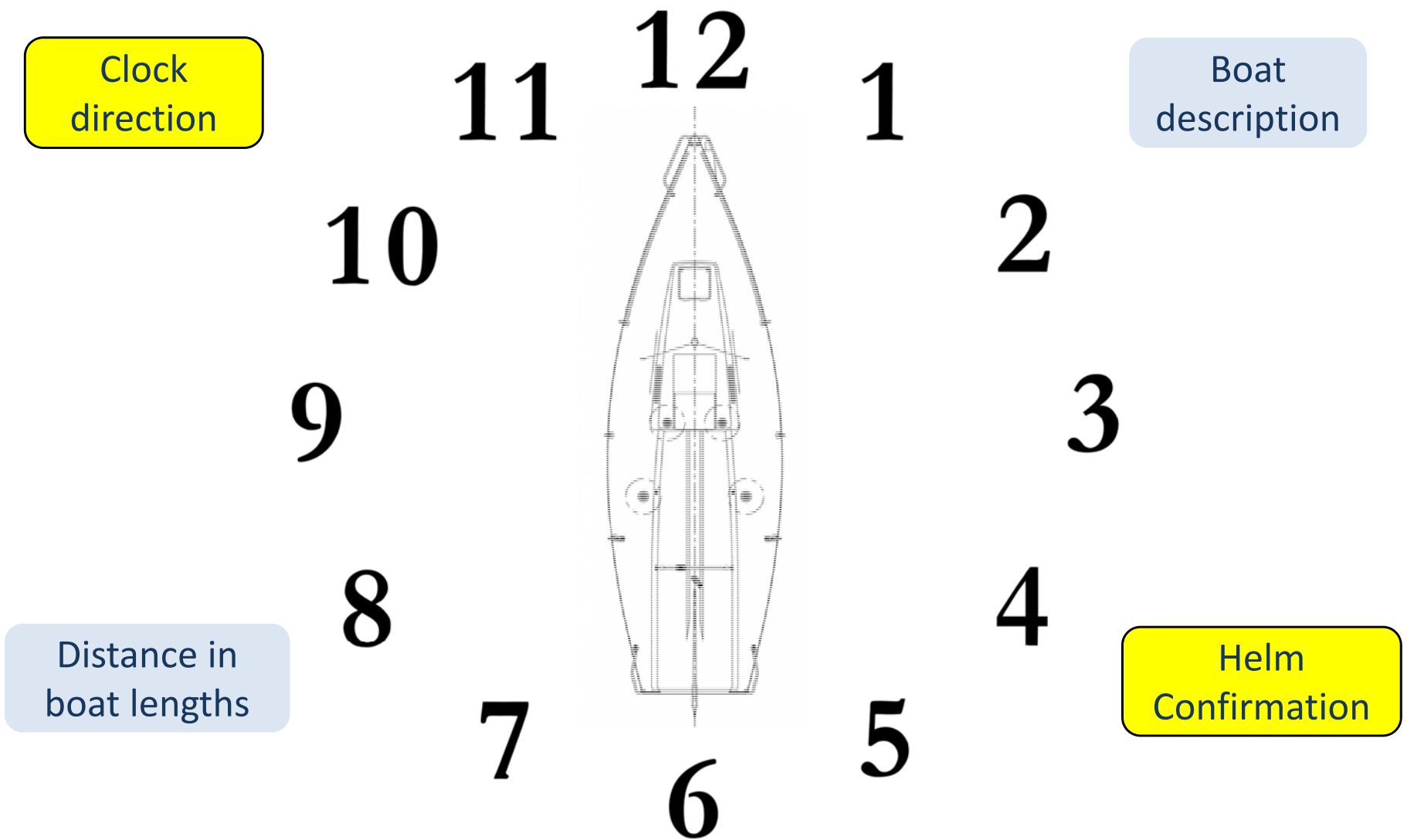
- Donning a life jacket
 - Hatches closed
 - Equipment properly stowed
 - Main sail and halyards ready
 - Check equipment
-
- Crew positions for casting off
 - Procedures for fending off



Co-ordination for departure

- Wind direction and wind strength
- Current direction and strength
- Traffic conditions
- Radio for permission
- Crew positioned
 - Release stern, bow and the spring lines
- Procedures for fending off

Looking out for traffic

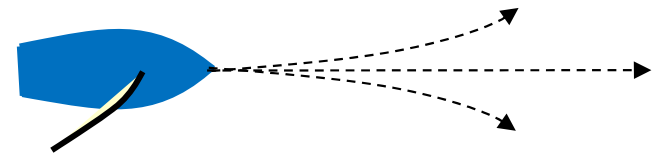


Hoisting sails

- Ensure boom vang, mainsheet and backstay off
- Point boat into wind – No Go position
- Keep a lookout for traffic
- One person thread bolt rope
- One person hoists
- Get a full hoist – black band
- Cleat off halyard and stow line for quick release
- Set mainsail controls

First Sailing Session

- Sail 90 degrees to wind
- Sail a straight line – using a tiller
- Heading up – Bearing away
- Trimming sails
 - Coarse tune, fine tune
 - Look at telltales
- Steering with sails
- Steering with boat heel

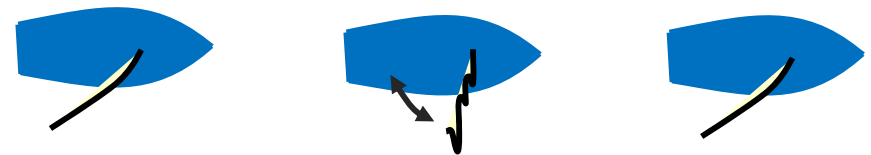


Sail Trim

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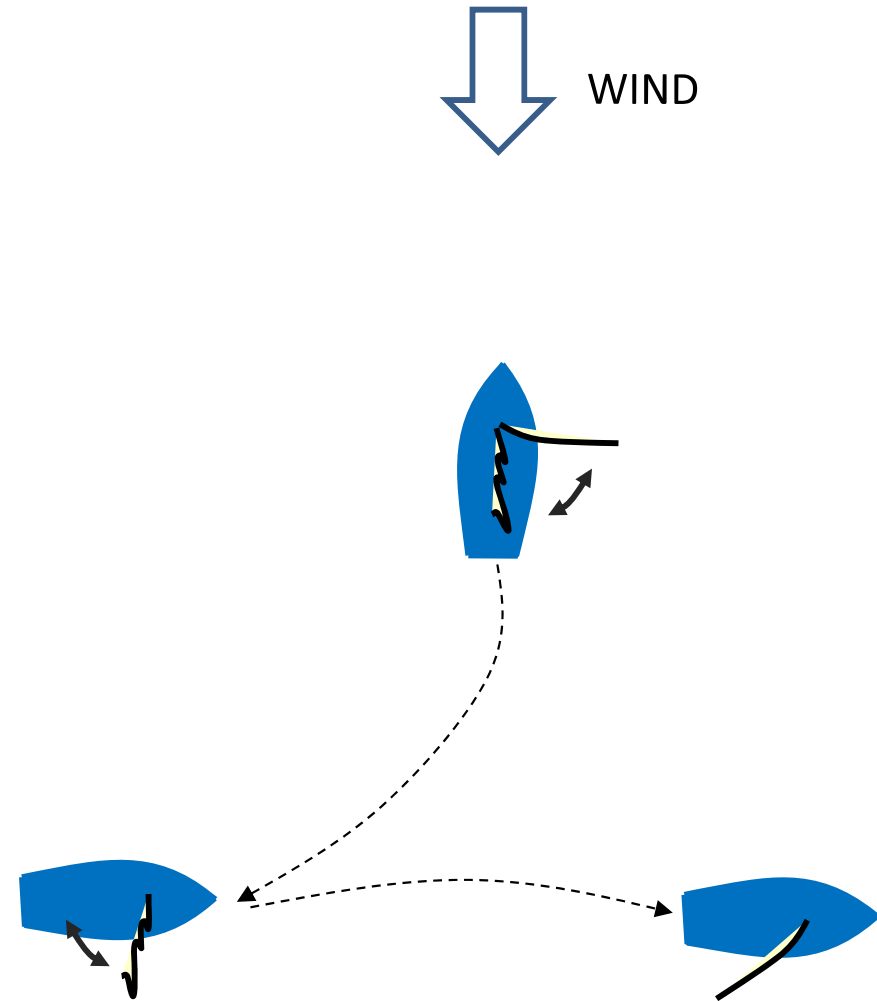
- Trim for ballpark position and then fine tune
- Look at jib telltales
- Look at main telltales

- Ease sails to slow down



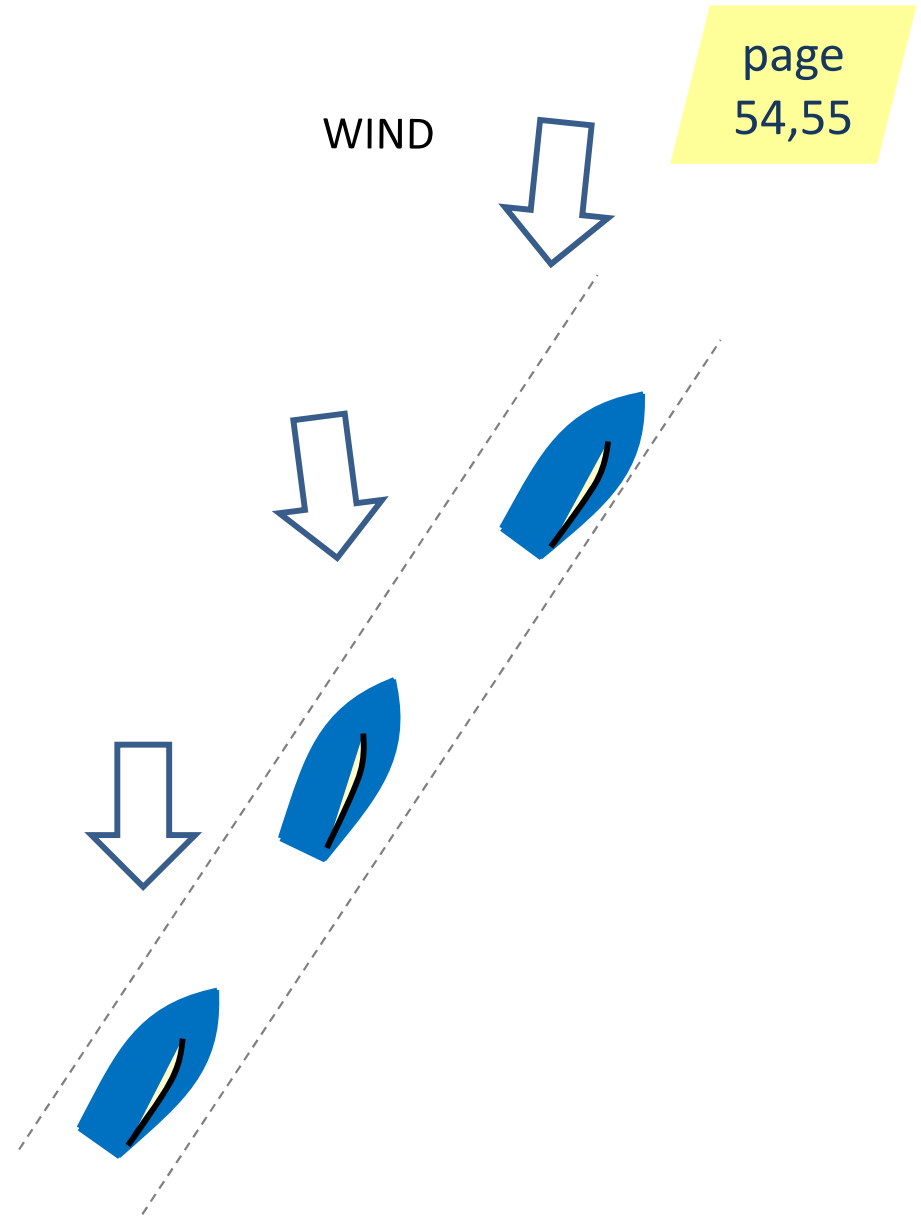
Basic Sailing Maneuvers

- Starting and stopping
- Backing the main sail
- Tacking
- Getting out of irons



Sailing Upwind

- Sail close-hauled
- Sail trim
- Steering with telltales
- Wind shifts
- Wind puffs
- Tacking and heaving-to

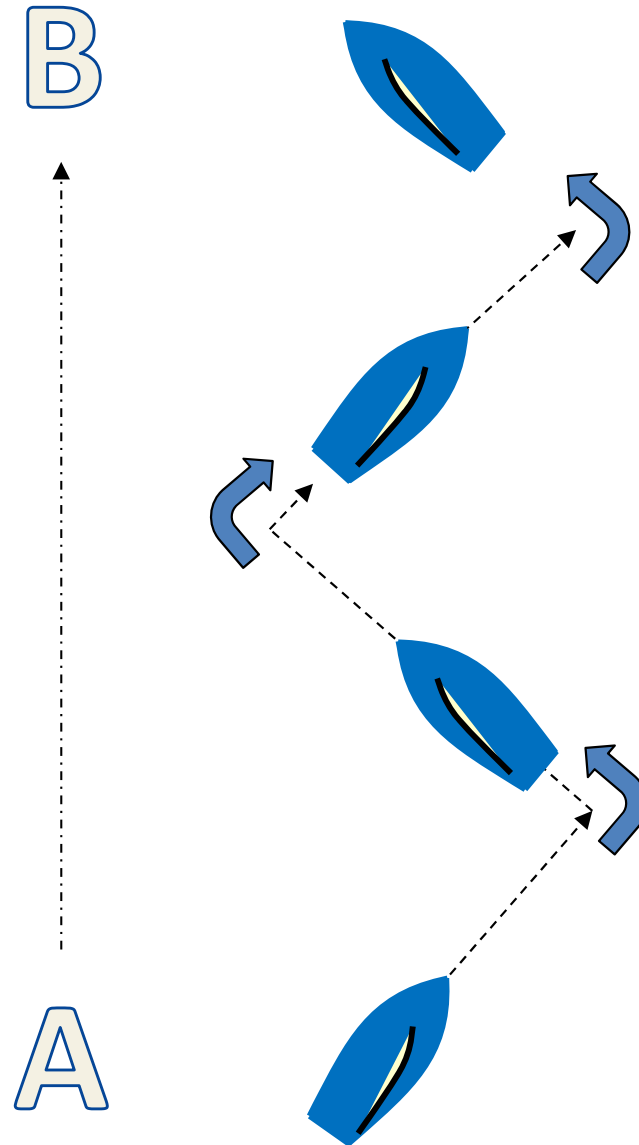


Tacking – Going Upwind



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18,19

- Want to go upwind (A to B)
- Unable to sail directly into no-go zone
- Must tack from close hauled to close hauled to work upwind



Co-ordination for return

Prepare, plan and execute

- Turn on engine
- If available, add topping lift
- Go head to wind
- Ease main sheet and mainsail controls
- Lower mainsail into pocket
- Secure pocket on mainsail using sail ties
- Keep halyard attached ready for a hoist

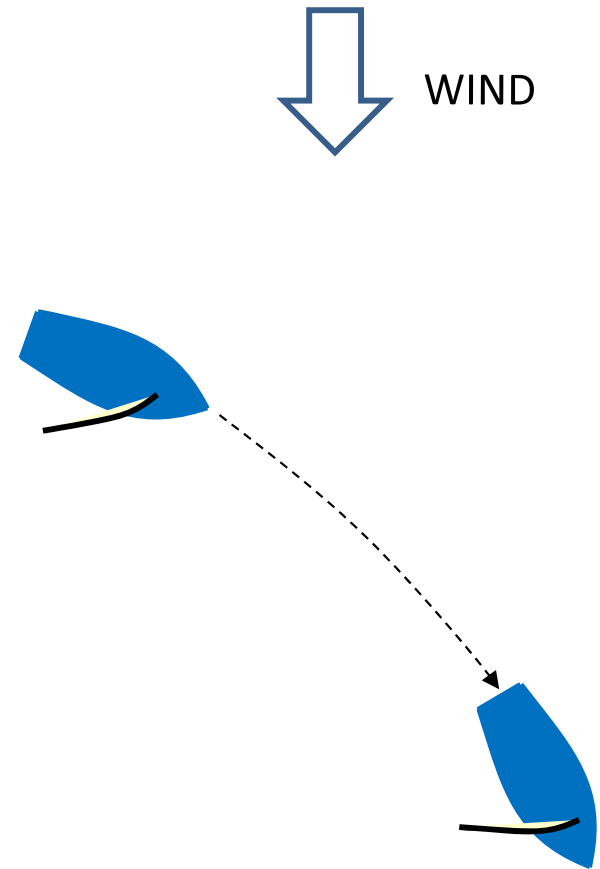
Return to Dock

- Prepare, plan and execute
 - Have spring and docklines and fenders ready
 - Talk about what is going to happen when you arrive at dock
 - Check for traffic at Marina entrance – 360 check
 - Check wind and current situation at Marina entrance
 - Radio for permission to enter Marina
 - Keep a look out
 - Be ready to fend off or hoist sails

SAILING SESSION #2

Sailing Downwind

- Sail a broad reach and run
- Sail trim
- Steering
- Cruising gybing
- Signals for impending gybe



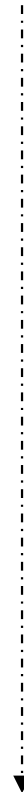
Gybing – Going Downwind



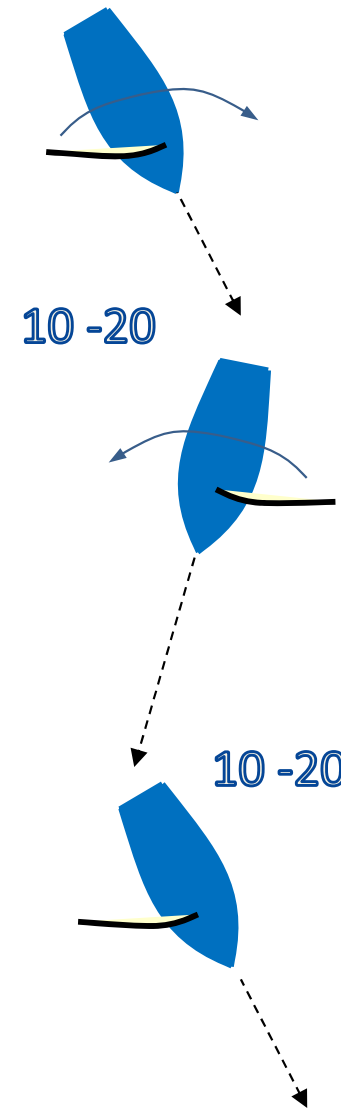
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- Want to go downwind (C to D)
- Unable to sail directly downwind (run)
 - Risk of accidental gybe
- Stern crosses wind with each gybe
- Boom crosses in a controlled fashion

C



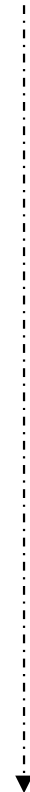
D



Sailing by-the-Lee

- Sail downwind
- Stern turns through the wind OR wind shifts
- Boom is now on the windward side – “sailing by-the-lee”
- Stay alert – head down

C

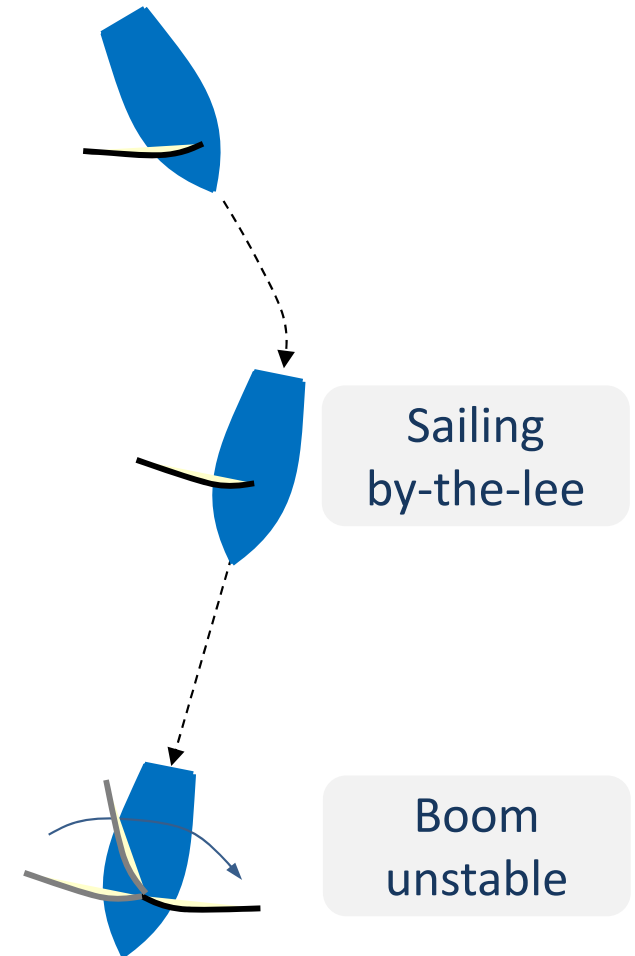


D

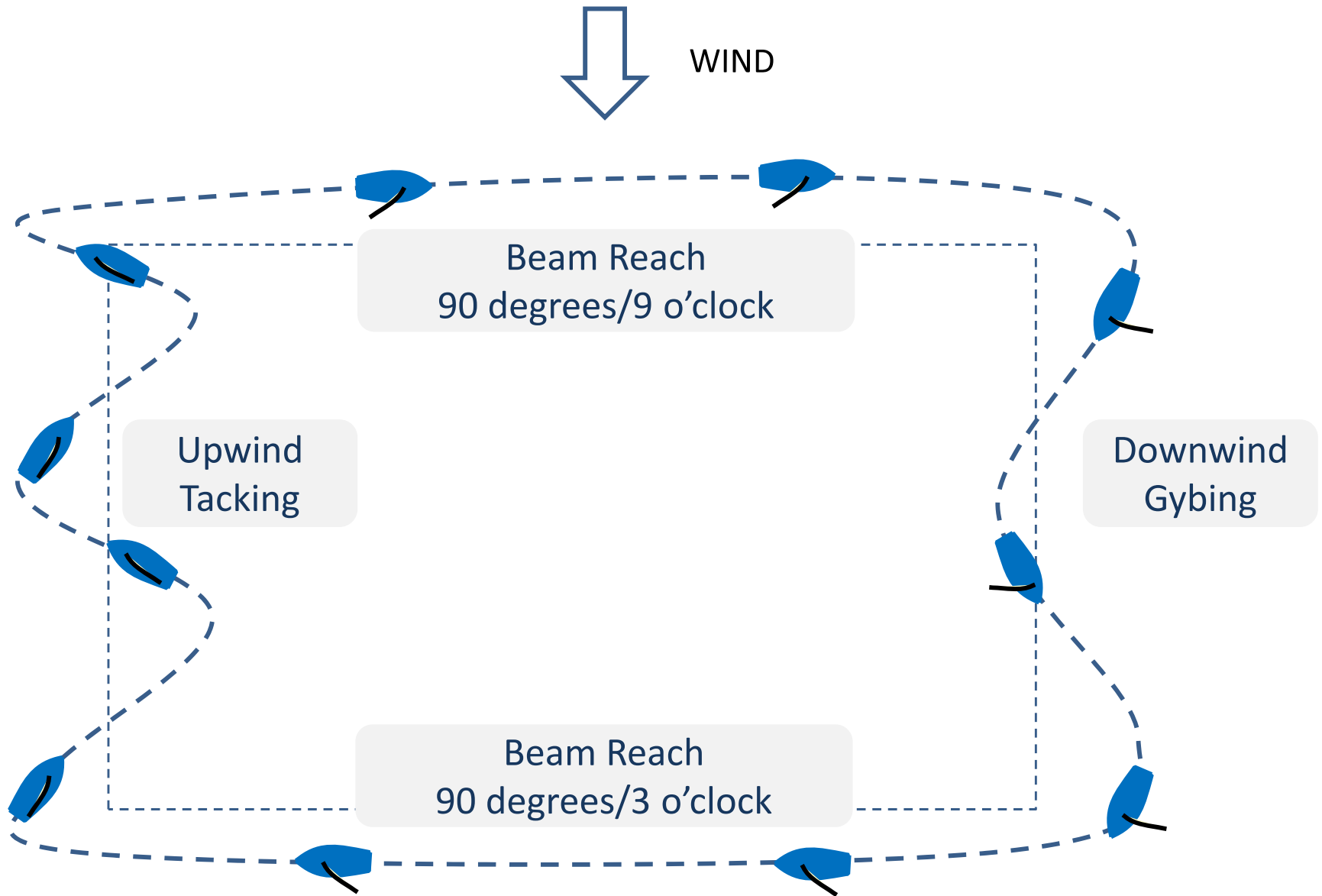


WIND

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Sailing a Rectangle



Securing the Boat

- Secure dock lines
 - Attach bow and stern lines
 - Attach spring lines
- Housekeeping
 - Stow sails and halyards, secure with sail ties
 - Install covers
 - Coil all lines
 - Remove garbage and clean below
 - Rinse anything that moves
- Leave boat in better condition than when you found it

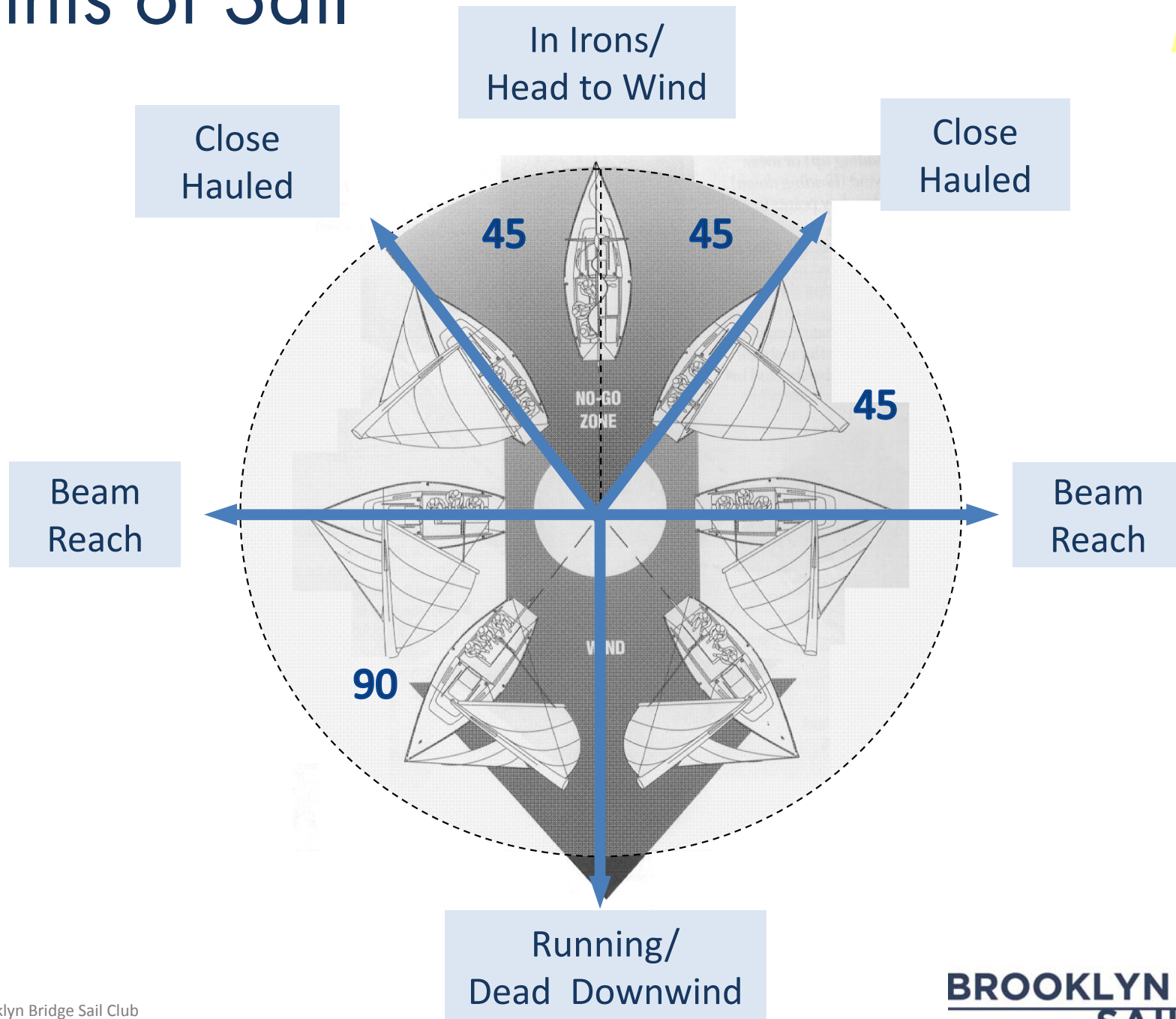
DAY 1

ADDITIONAL MATERIALS

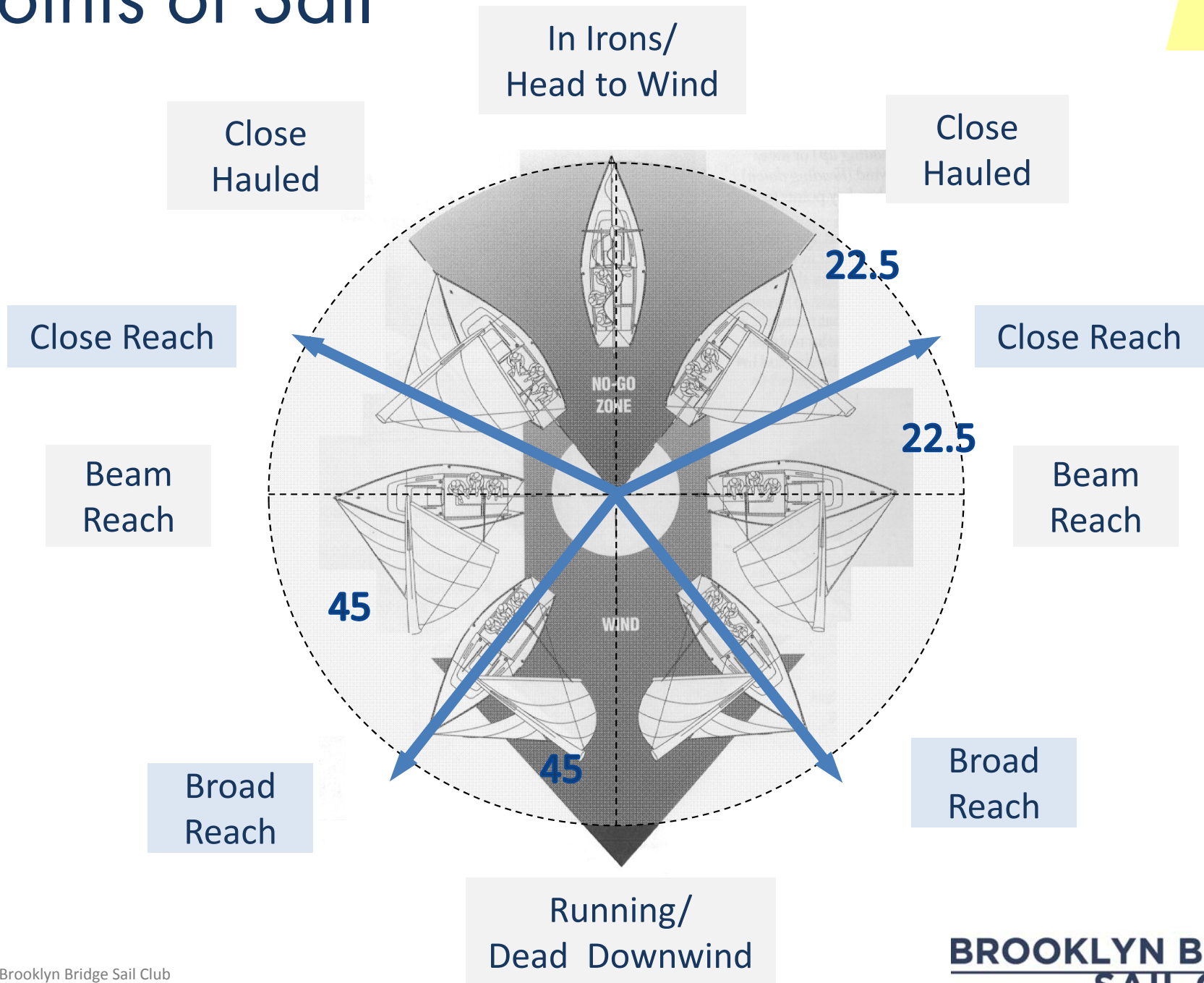
Parts of the Boat: Misc

- Bolt 'rope'
- Roller furler
- Traveler
- Backstay
- Batten
- Telltales
- Hanks
- Transom
- Pintels and gudgeons
- Leech line
- Foot line

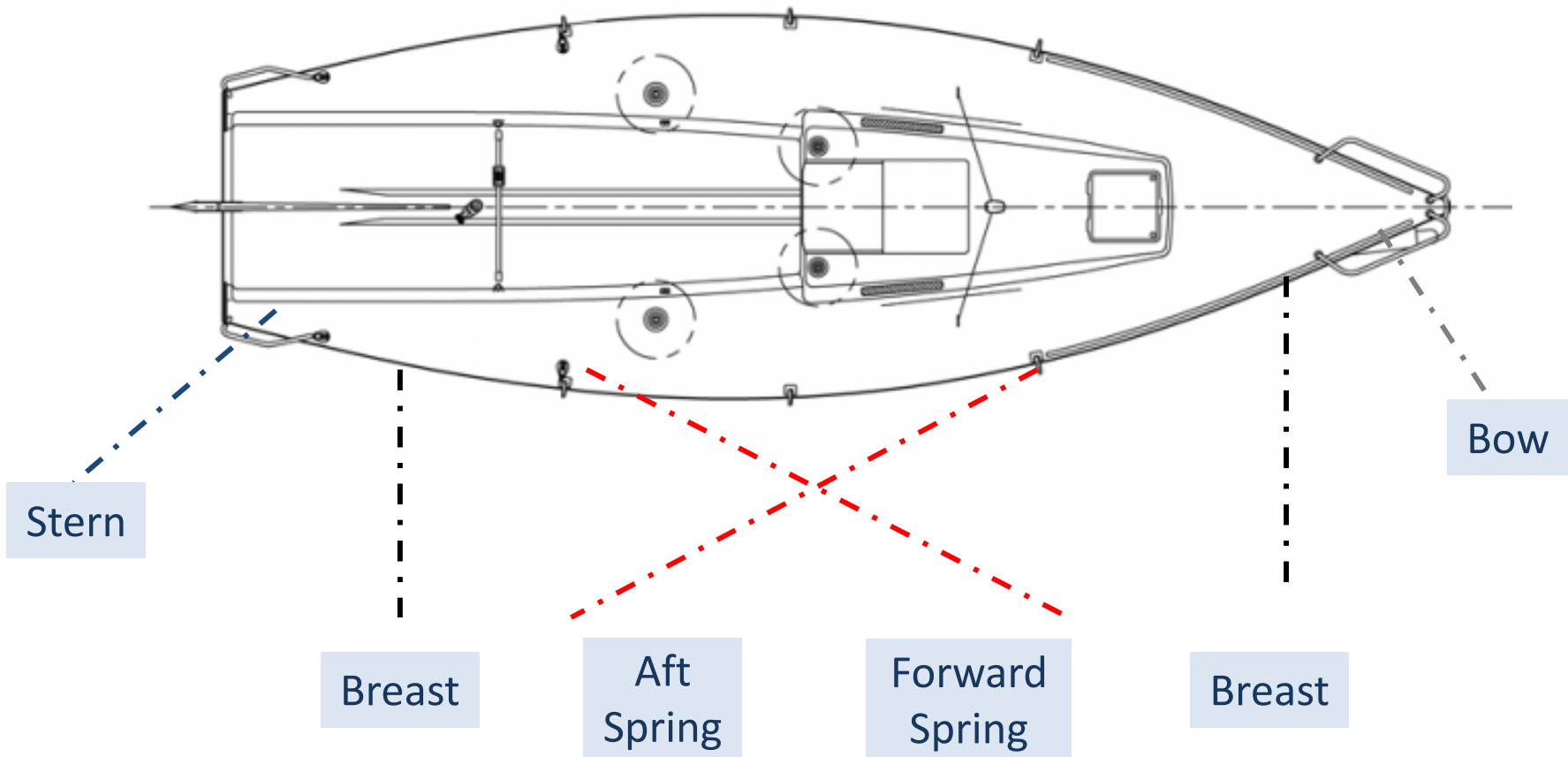
Points of Sail



Points of Sail

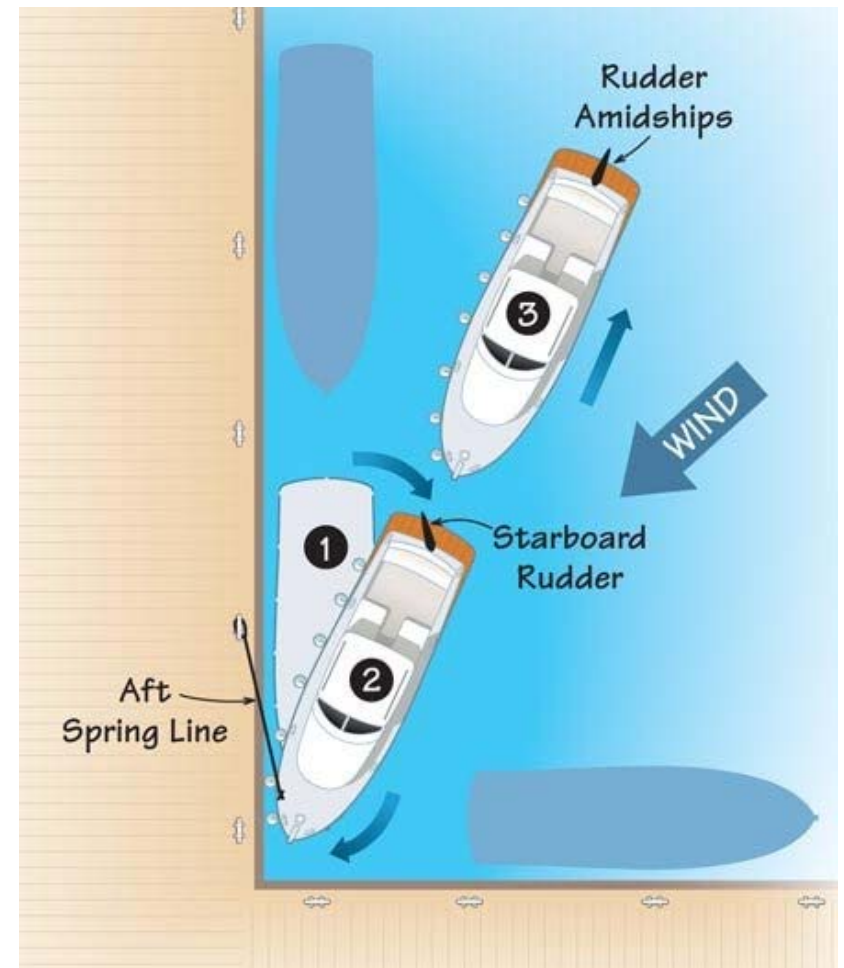
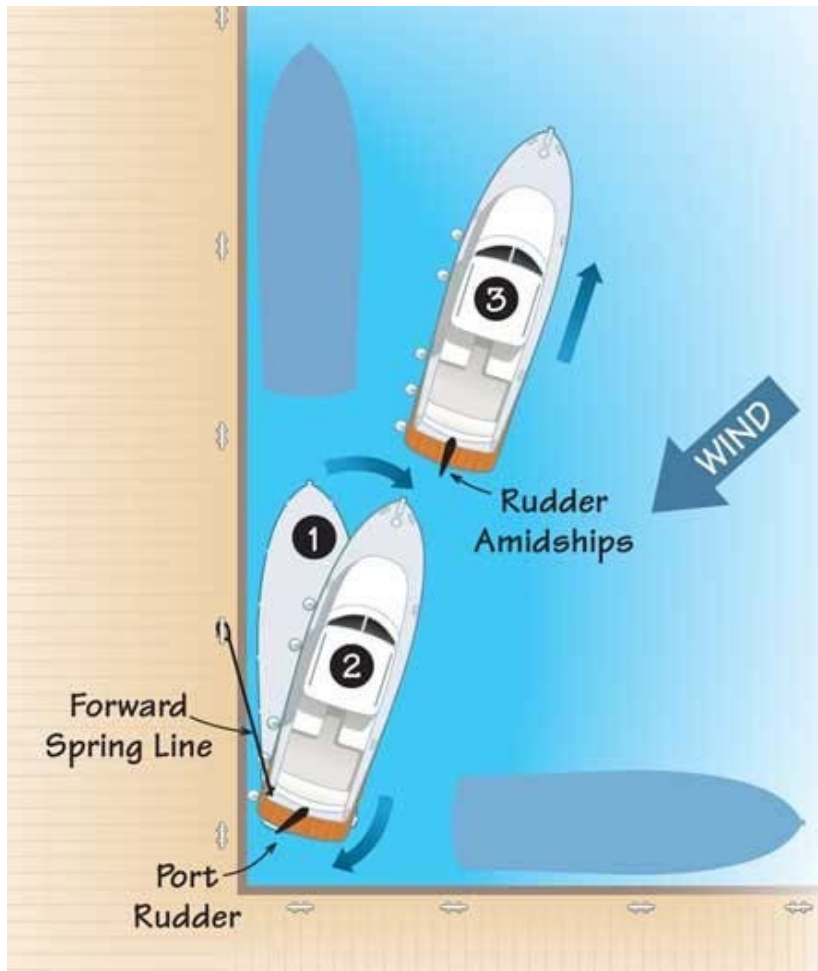


Docklines



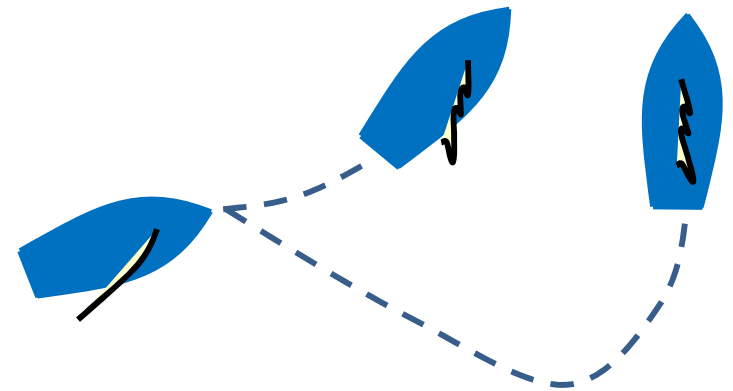
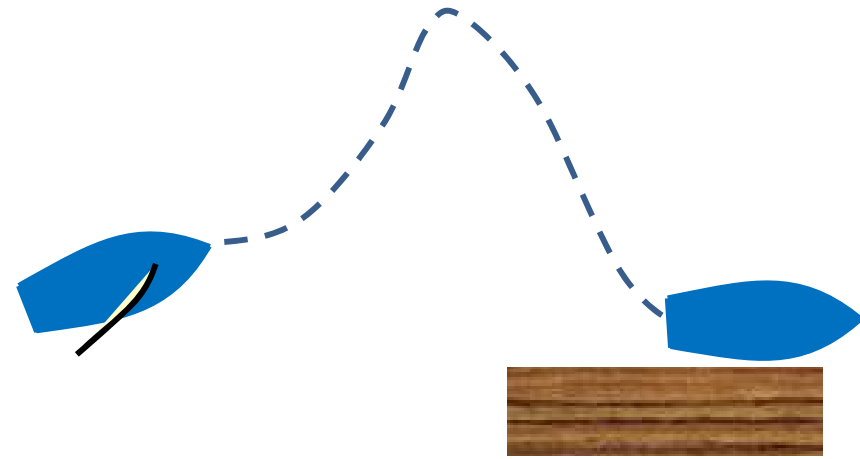
Springing off the dock

- Use springs lines to get off dock



Docking Under Sail

- Preparation and planning
 - Check wind direction and wind shadows
 - Check current
 - Check traffic conditions
- How will the boat slow down
 - Glide path - using the wind to slow down
 - Backwind sails to slow down
 - Sharp turns on rudder
- Be ready
 - Dropping mainsail and furl jib - halyards uncoiled, ready at mast
 - Spring line and dock lines ready
 - Fenders out



True Wind vs Apparent Wind

- True Wind
 - Wind detection when boat is not moving
- Apparent wind
 - Wind detection when boat is moving
 - Combination of True Wind plus wind created by the boats motion

KNOWLEDGE SESSION #2

Knots

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- Stopper knots, slip knot
- Cleat hitch
- Bowline
- Clove hitch
- Sheet bend
- Square knot
- Round turn 2-half hitches

Practice throwing a line



RULES OF THE ROAD

Rules of the Road

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- Right of way
- Power vs power
- Port and starboard tack
- Sail meeting sail
- Sail meeting power
- Avoid collisions

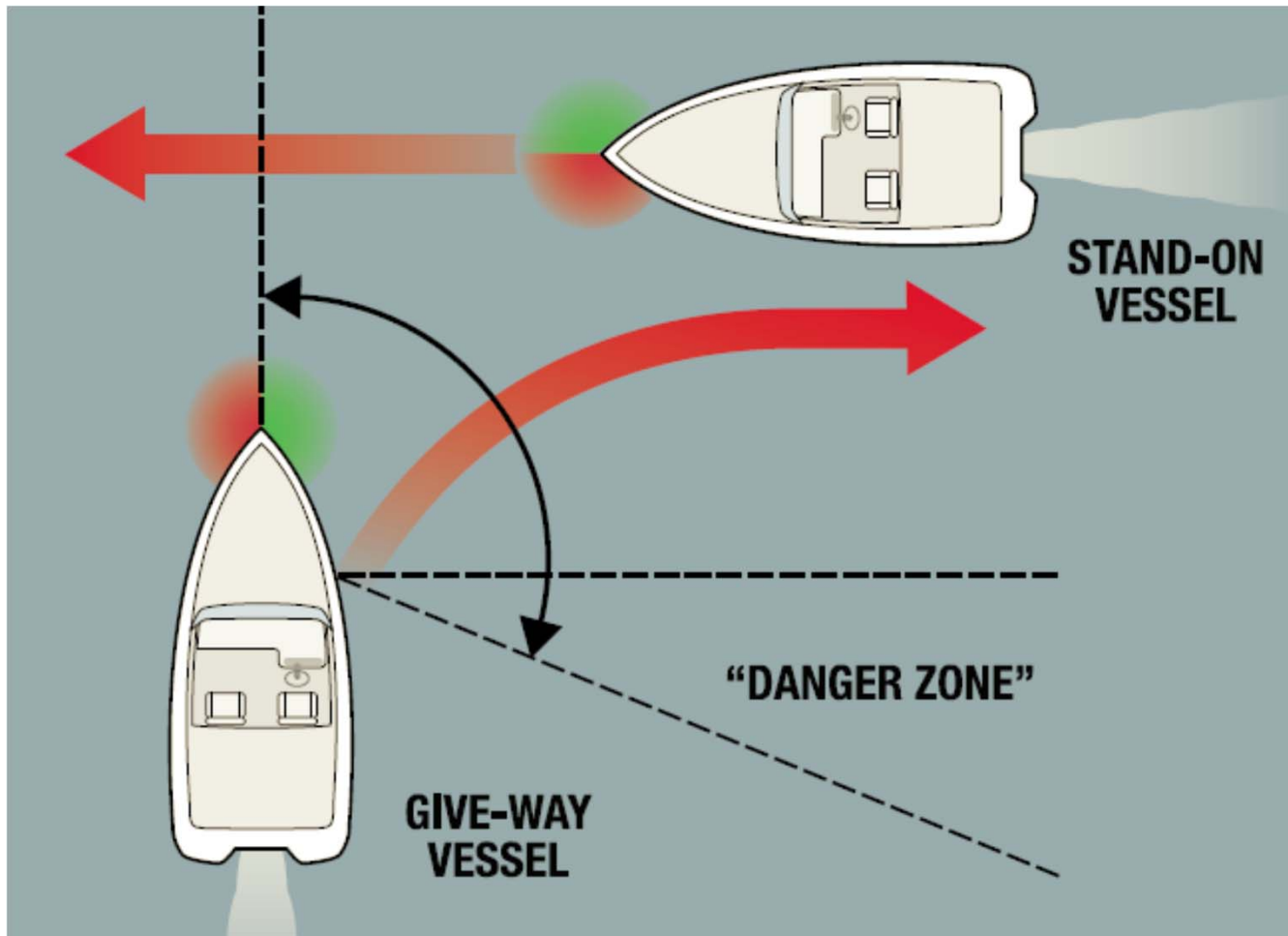
Right of Way

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66-67

- **Stand on Vessel:** Maintains course and speed unless give-way vessel is not keeping clear
- **Give-way Vessel:** Alter course early and substantially to avoid danger
- **Avoiding collisions**
 - Look out
 - Early recognition of situation

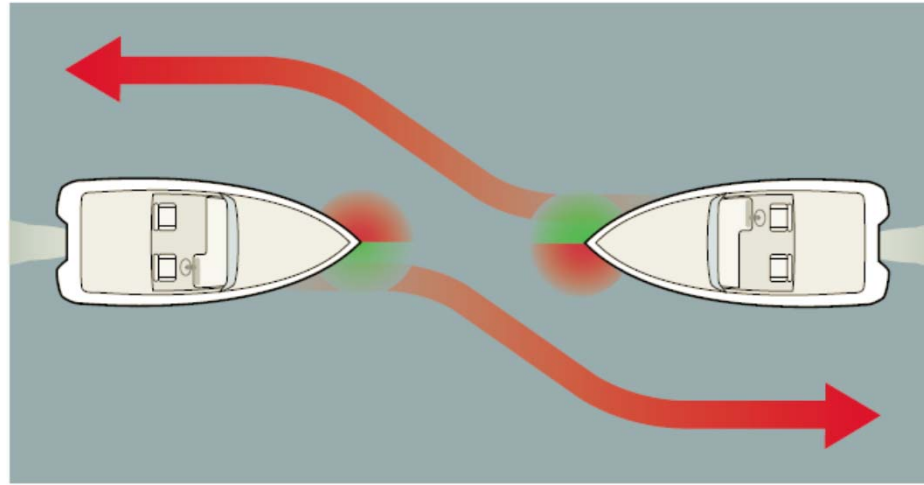
Power vs Power

- Crossing: Danger Zone 12-4

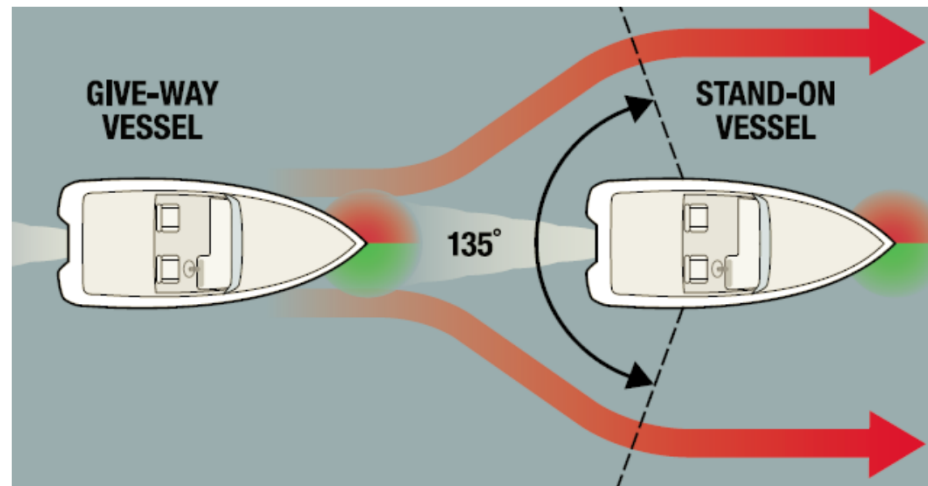


Power vs Power

- Head-on:
Port to Port



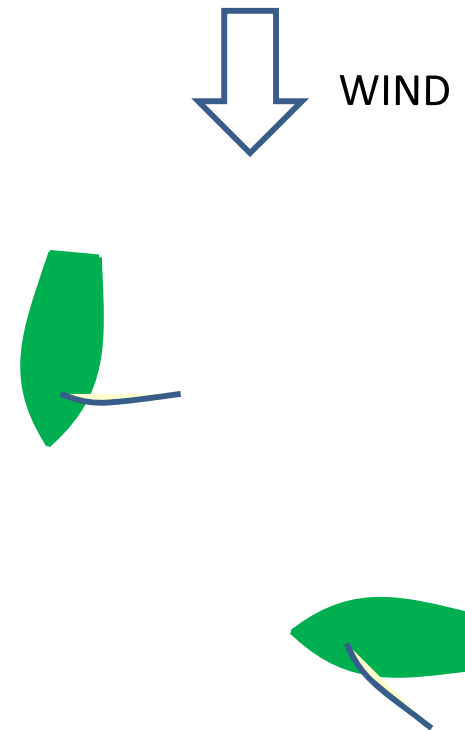
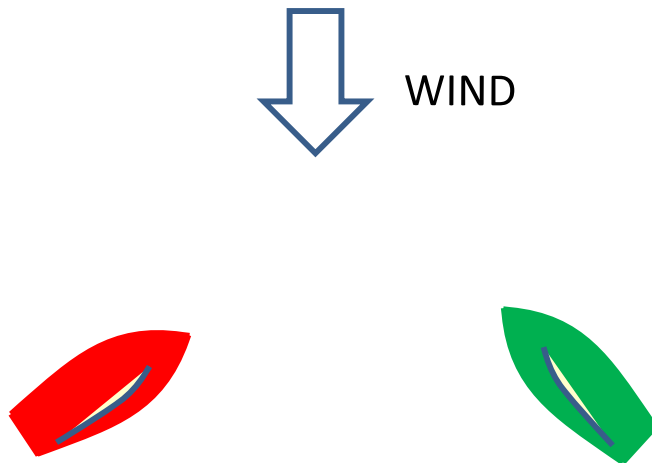
- Overtaking:
Give-Way



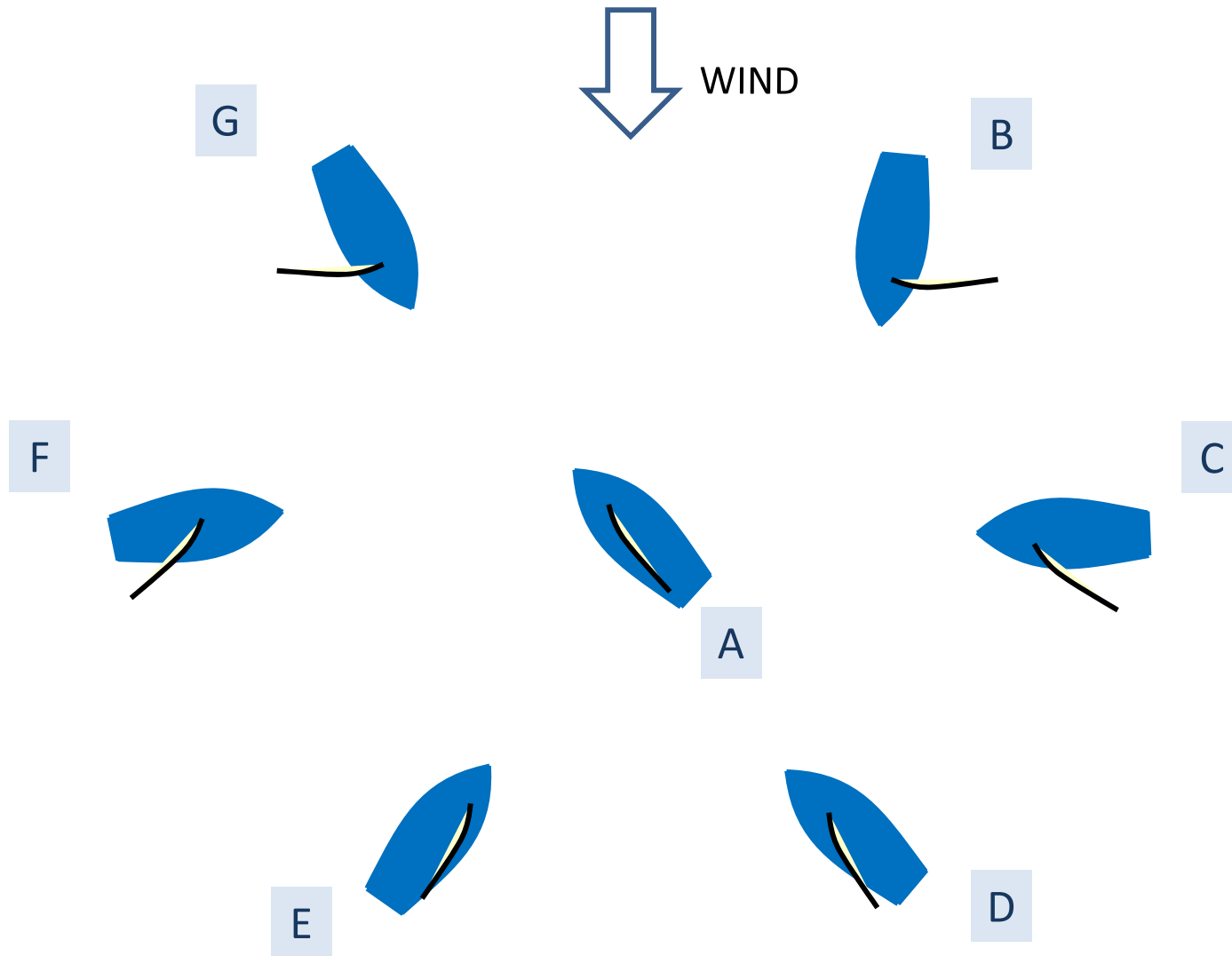
Sail vs Sail

Give-Way

- Port vs Starboard
- Overtaking
- Windward vs Leeward



Rules of the Road



Right of Way - Priorities

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Highest Priority



- Vessel not under command
- Vessel restricted in its ability to maneuver
- Vessel engaged in commercial fishing
- Sailing vessel
- Power driven vessel

Lowest Priority

Sound Signals by Power Vessels

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66-67

- Short Blast = 1 sec; Long Blast = 4-6 seconds
- Crossing, Head-On, Overtaking
 - 1 Short: intend to leave to you on port side
 - 2 Short: intend to leave to you on starboard side
 - Repeat if you agrees, otherwise...
 - 5 Short Blasts: danger, doubt, intentions unknown
 - 3 Short: operating astern propulsion
 - 1 Long Blast: leaving dock or harbor

CREW OVERBOARD RECOVERY/ SAILING SESSION #3 & #4

Crew Overboard Recovery

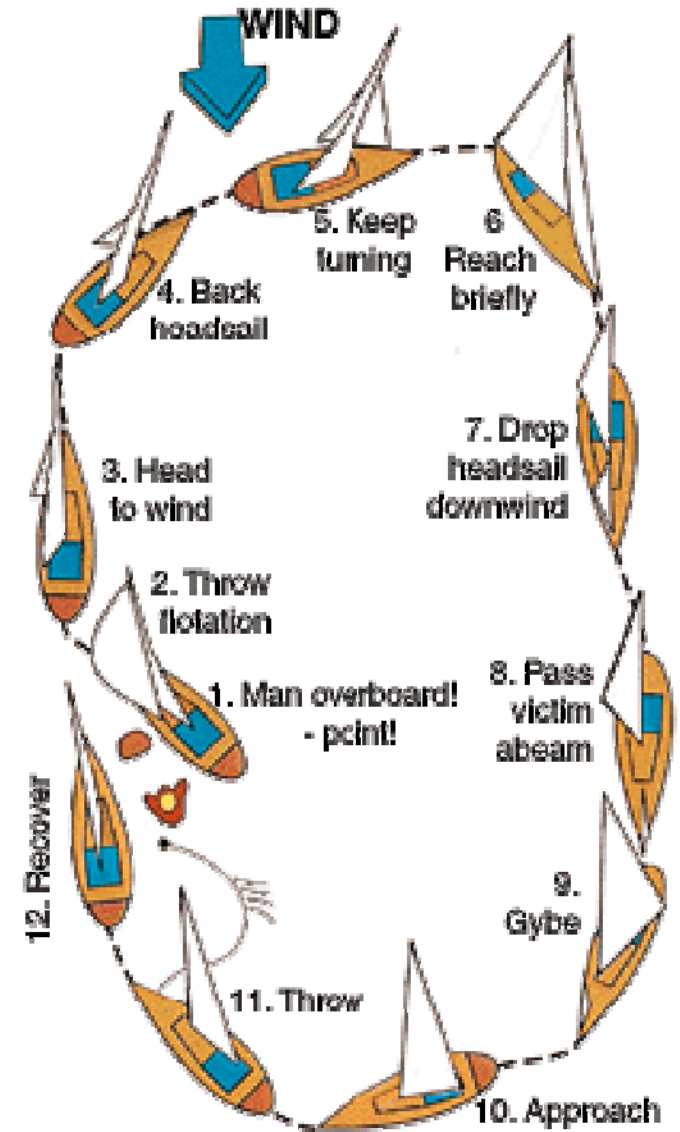
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- Common elements
 - Yell “Crew overboard”
 - Throw floatation
 - Appoint spotter
 - Pick-up on close reach

- Methods:
 - Quick-Stop
 - Figure-8
 - Others

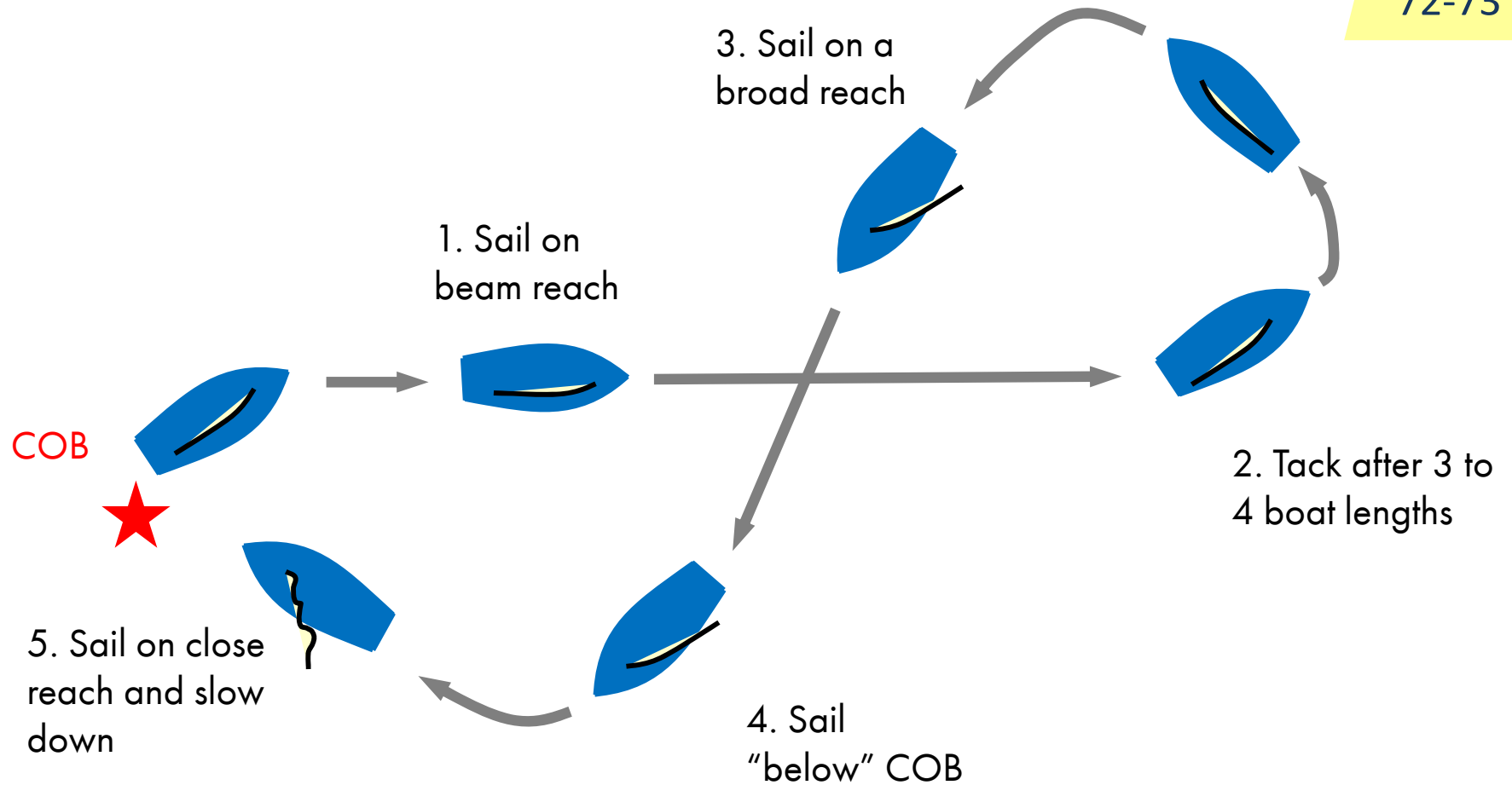
Quick-Stop COB Recovery

- Go and head-to-wind and backwind head sail
- Turn downwind
- Keep main centered, drop headsail
- Gybe
- Ease main and slow down,
- Pick up on close reach



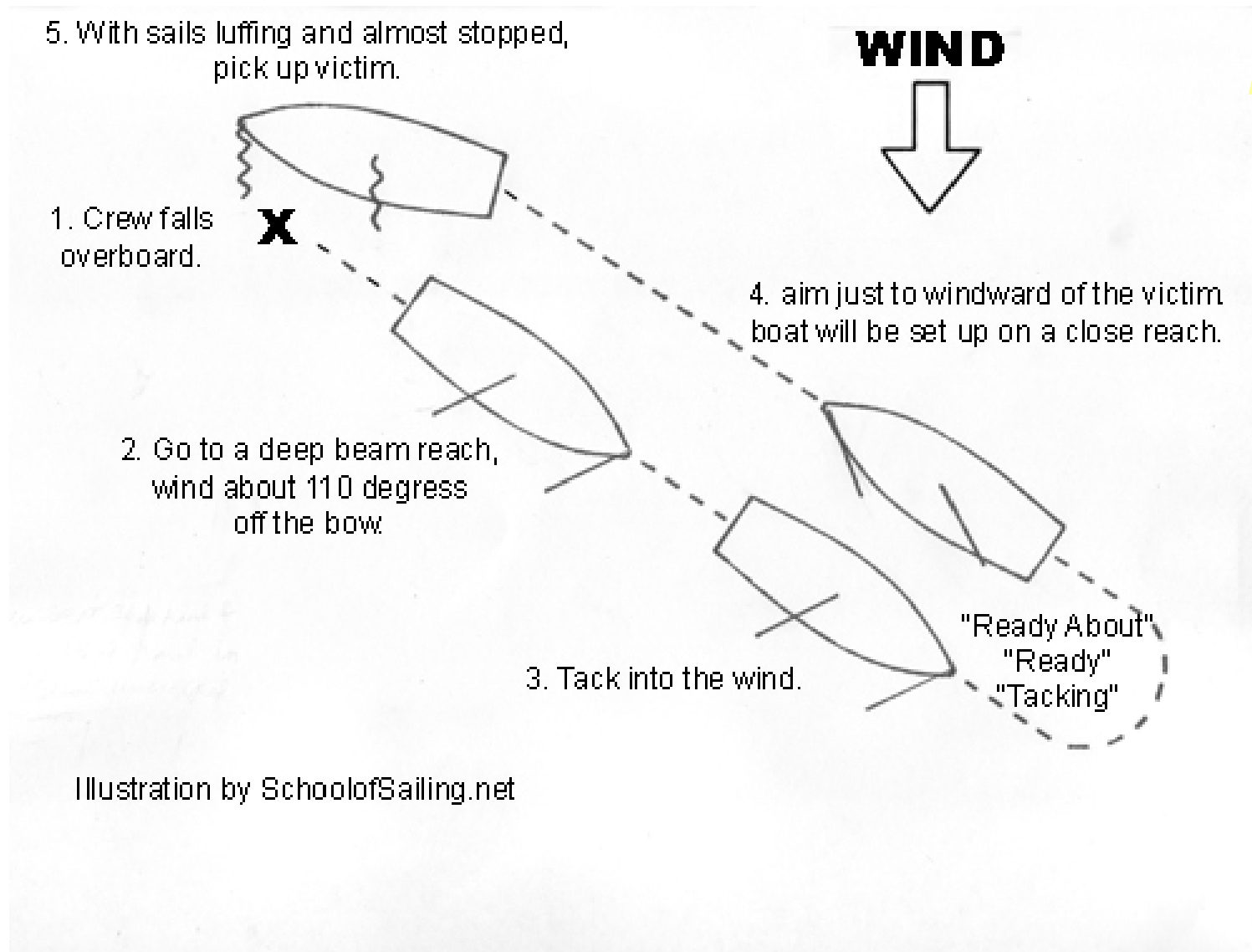
Quick-Turn (Figure-8) COB Recovery

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Broad Reach and Return COB Recovery

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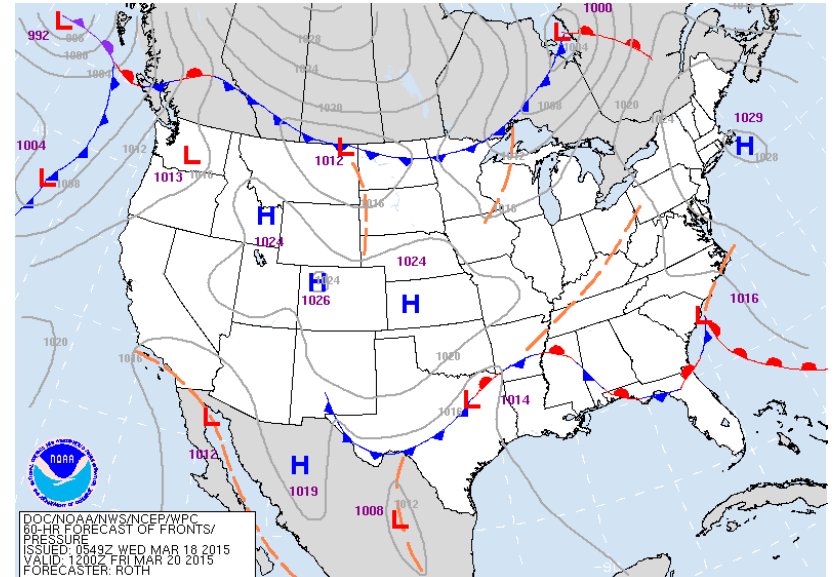
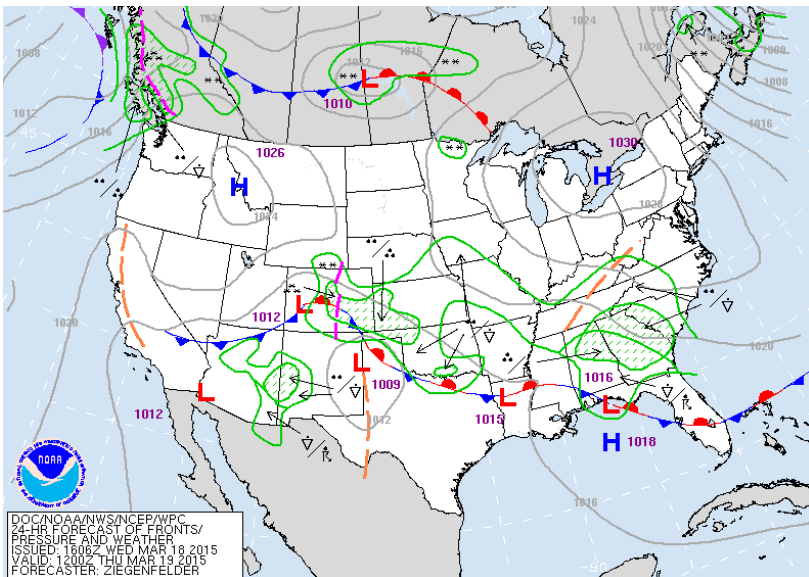
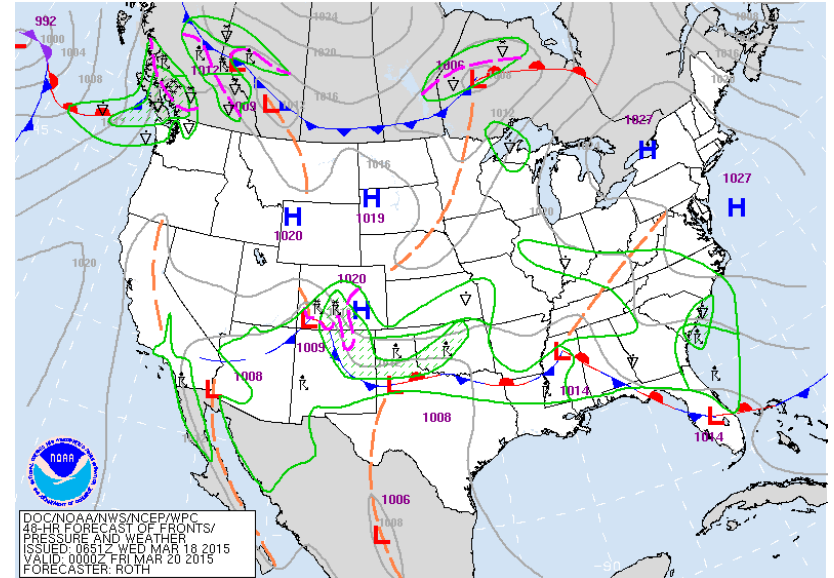
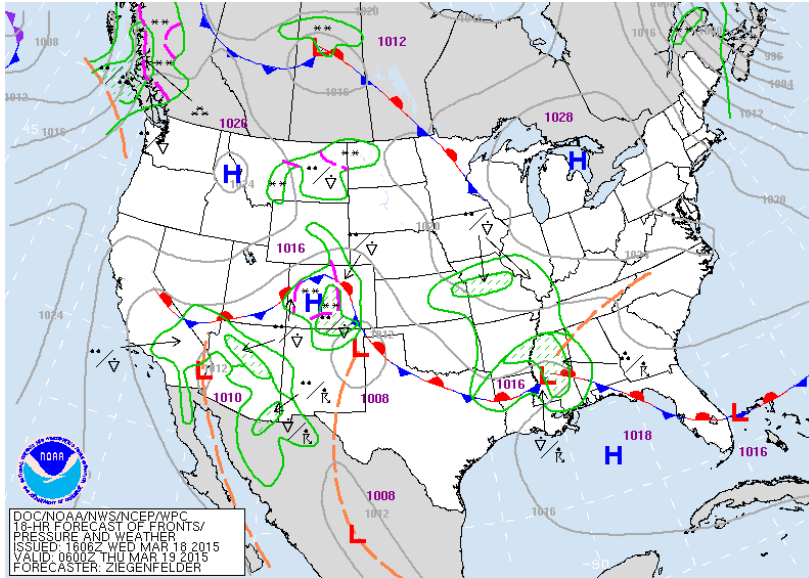
Sailing Well

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- Weather helm and lee helm
- Angle of heel/balance
- Adjusting sail shape
 - Outhaul, Cunningham, boom vang
 - Backstay
 - Traveler
 - Jib leads

WEATHER

NOAA NWS Weather Prediction Center



NOAA Forecast

MARINE ZONE FORECAST

...SMALL CRAFT ADVISORY IN EFFECT UNTIL 11 PM EDT THIS EVENING...

Synopsis: LOW PRES OVER THE CANADIAN MARITIMES WILL INTENSIFY AS IT DEPARTS. MEANWHILE...HIGH PRES OVER THE MIDWEST GRADUALLY BUILDS EAST...AND WILL MOVE OVER THE WATERS ON THURSDAY BEFORE DEPARTING THURSDAY NIGHT. LOW PRES PASSES SOUTH OF THE WATERS ON FRIDAY...FOLLOWED BY A COLD FRONT ON SATURDAY. HIGH PRES RETURNS FOR THE START OF THE NEW WEEK.

This Afternoon NW winds 20 to 25 kt. Waves 2 to 3 ft. Scattered flurries early.

Tonight NW winds 15 to 20 kt with gusts up to 30 kt...diminishing to 10 to 15 kt with gusts up to 20 kt after midnight. Waves around 2 ft in the evening...then 1 ft or less.

Thu NW winds 10 to 15 kt with gusts up to 20 kt. Waves 1 ft or less.

Thu Night NW winds 5 to 10 kt...becoming NE after midnight. Waves 1 ft or less.

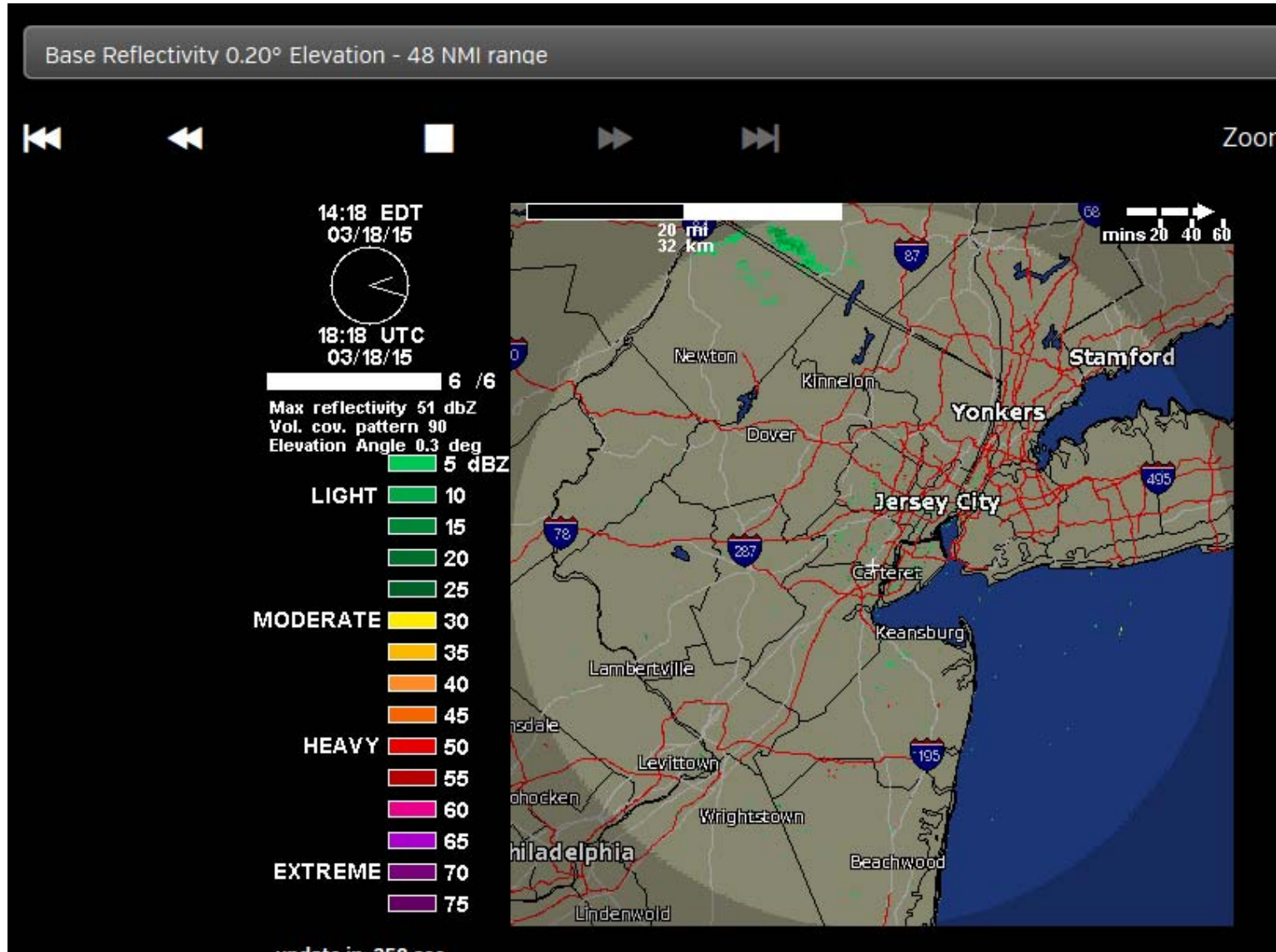
Fri E winds 5 to 10 kt. Waves 1 ft or less. Snow. Vsby 1 to 3 nm.

Fri Night E winds around 10 kt with gusts up to 20 kt...becoming N after midnight. Waves 1 to 2 ft. Rain and snow likely...mainly in the evening. Vsby 1 to 3 nm.

Sat NW winds 5 to 10 kt...increasing to 10 to 15 kt. Waves 1 ft or less...then 1 to 2 ft.

Sun NW winds 10 to 15 kt. Waves around 2 ft.

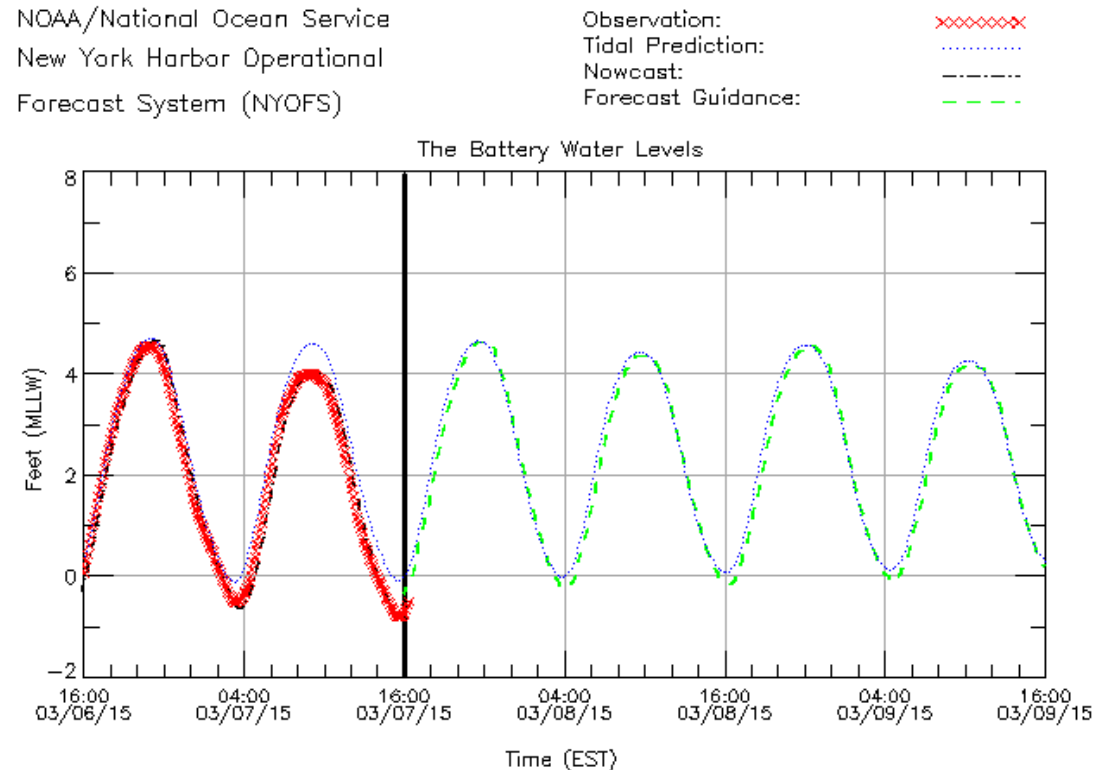
Wunderground – Newark Radar



NAVIGATION AIDS

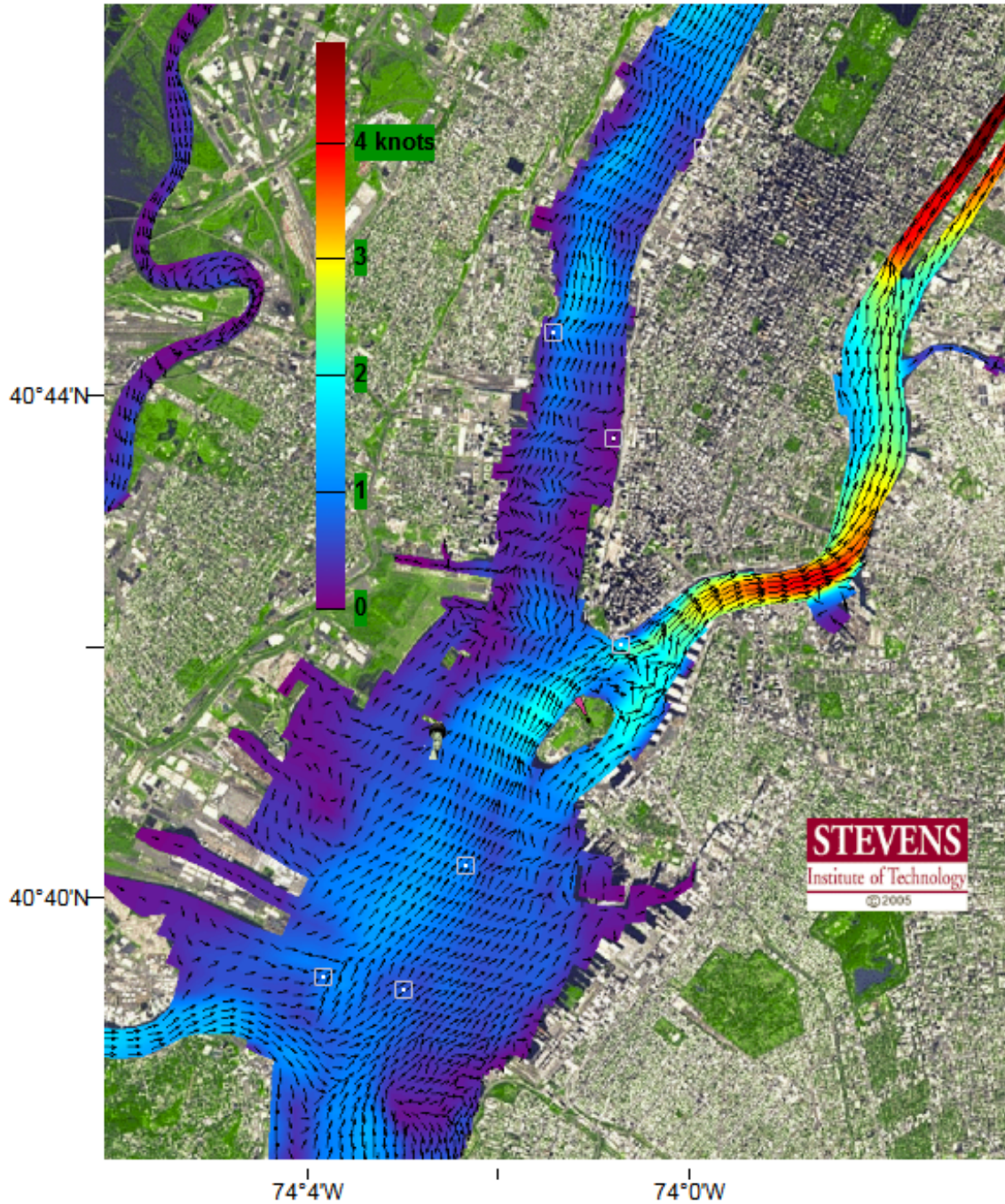
Tides and Current

- Gravitational pull of sun and moon
- Happens twice a day in New York Harbor



Manhattan Waters Surface Currents (knots)
Mar 17, 2015 19:00 - 20:00

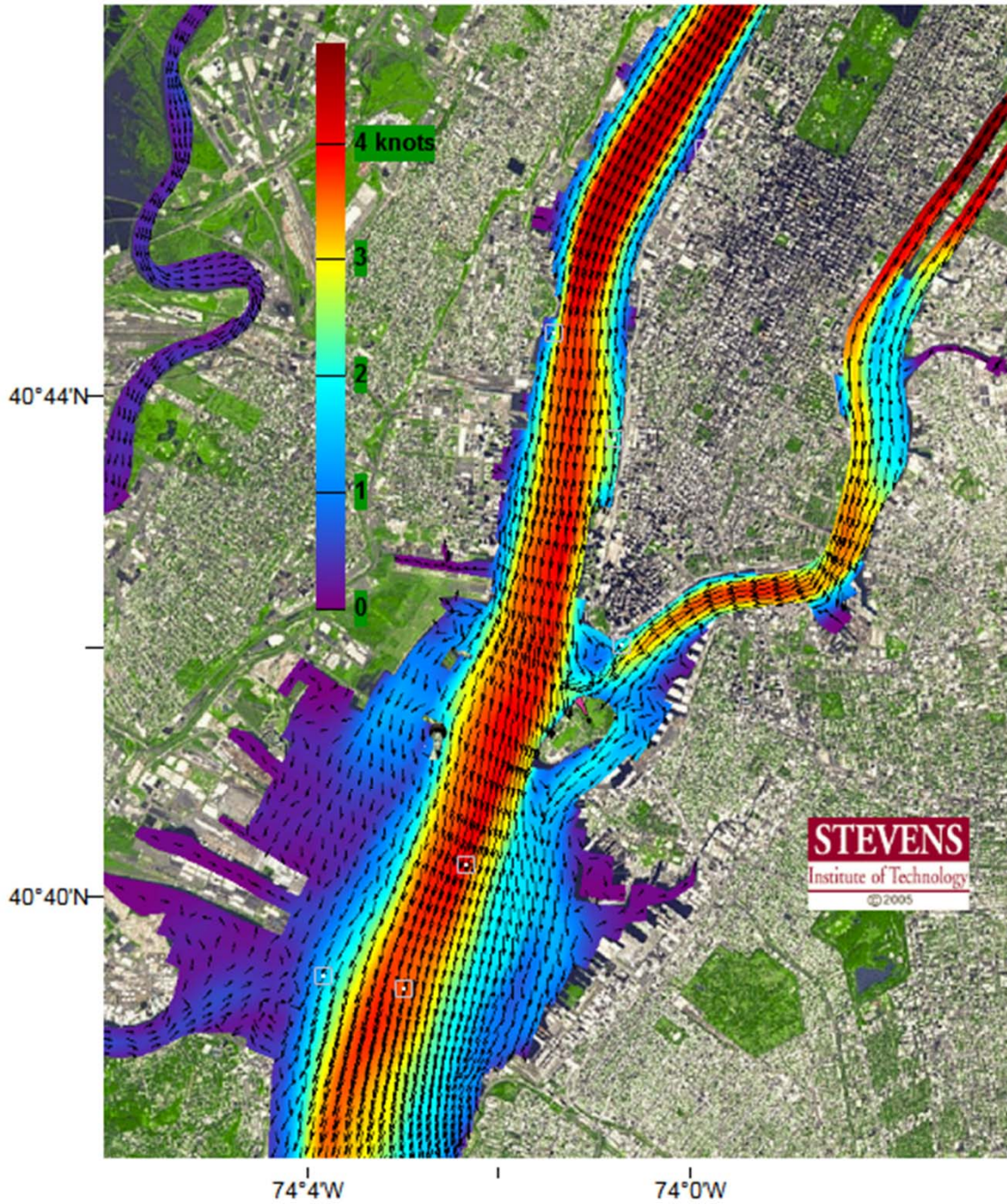
High Tide



**BROOKLYN BRIDGE
SAIL CLUB**

Manhattan Waters Surface Currents (knots)
Mar 18 2015 1:00 - 2:00

Low Tide

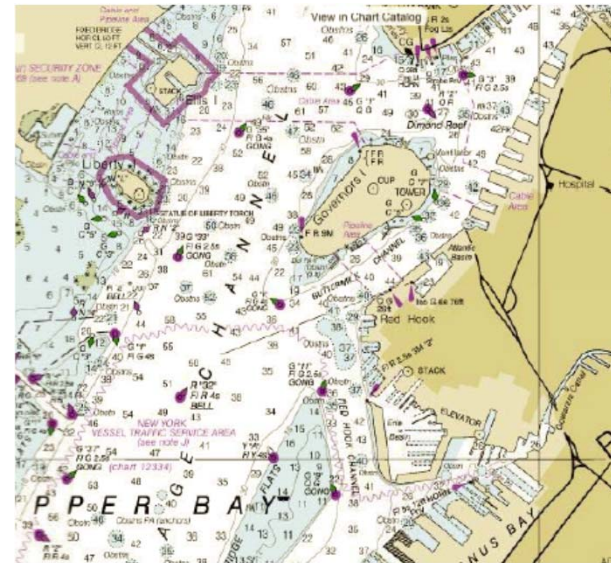
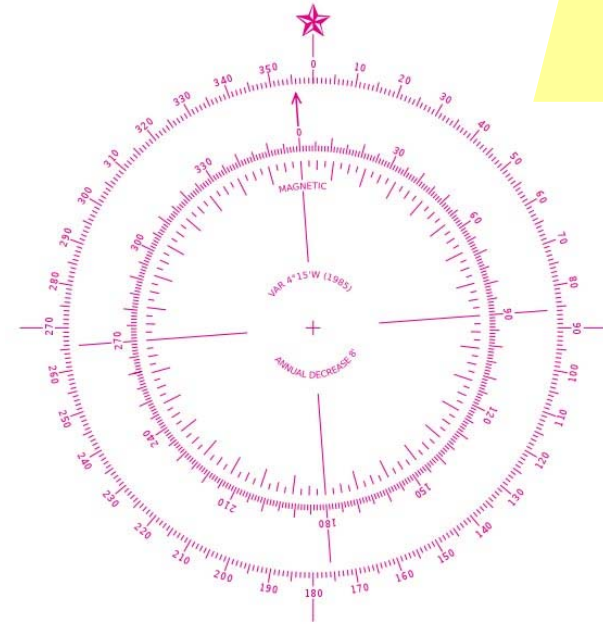


**BROOKLYN BRIDGE
SAIL CLUB**

NAVIGATION AIDS

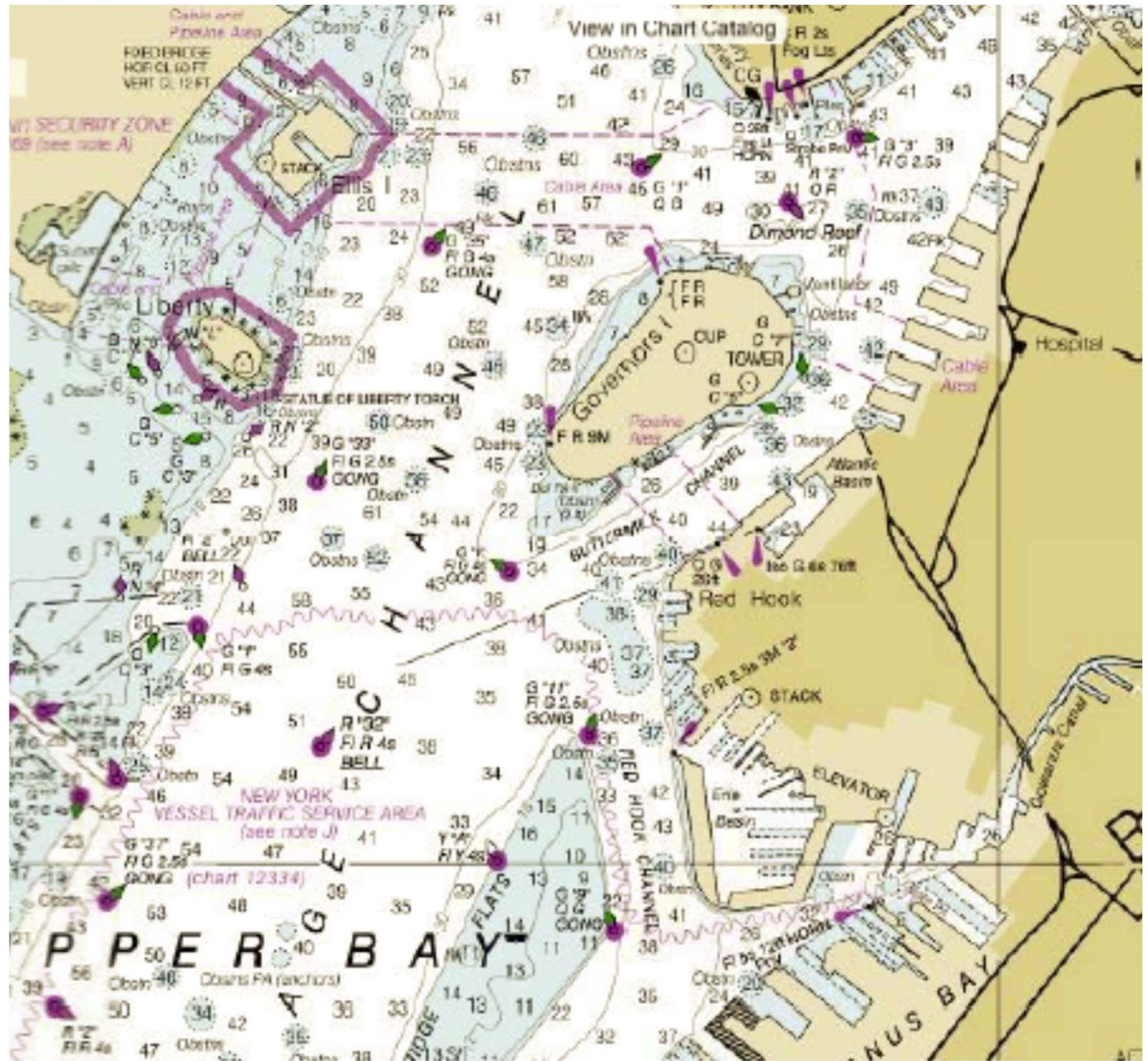
Charts

- Date of Chart
- Compass rose - true and magnetic
- 1 minute = 1 mile
- Depth on charts
- Type of bottom



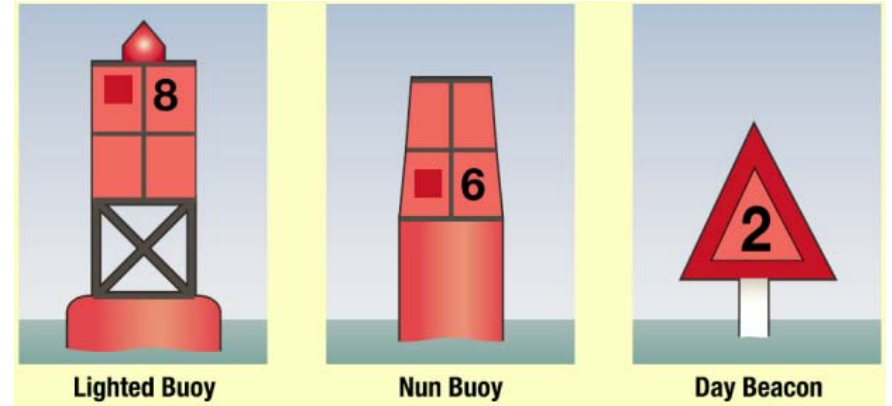
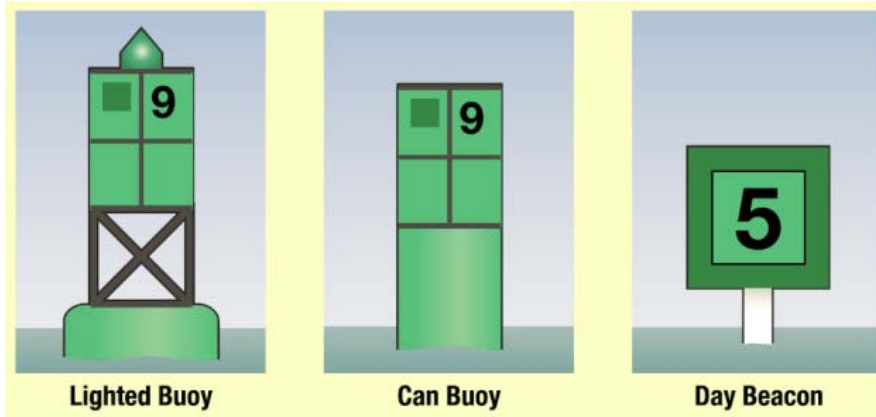
New York Harbor

Charts
12334,
12335,
12327

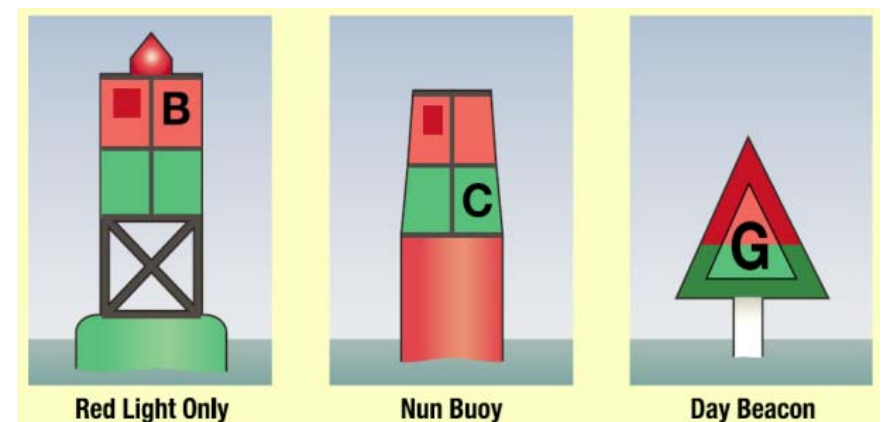
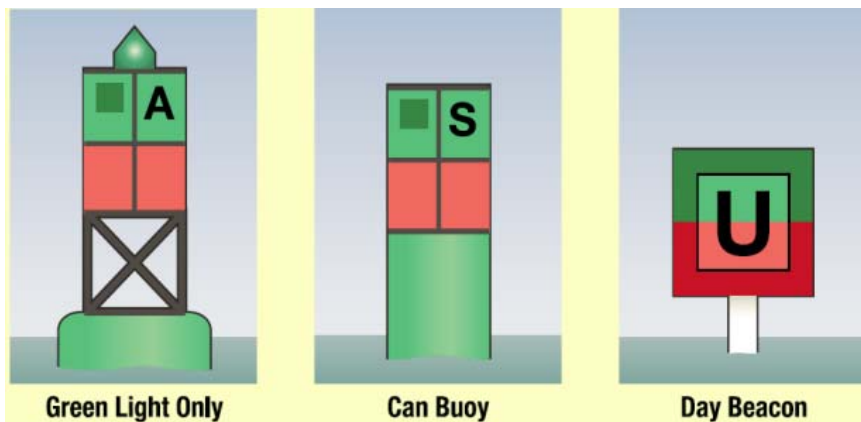


Aids to Navigation

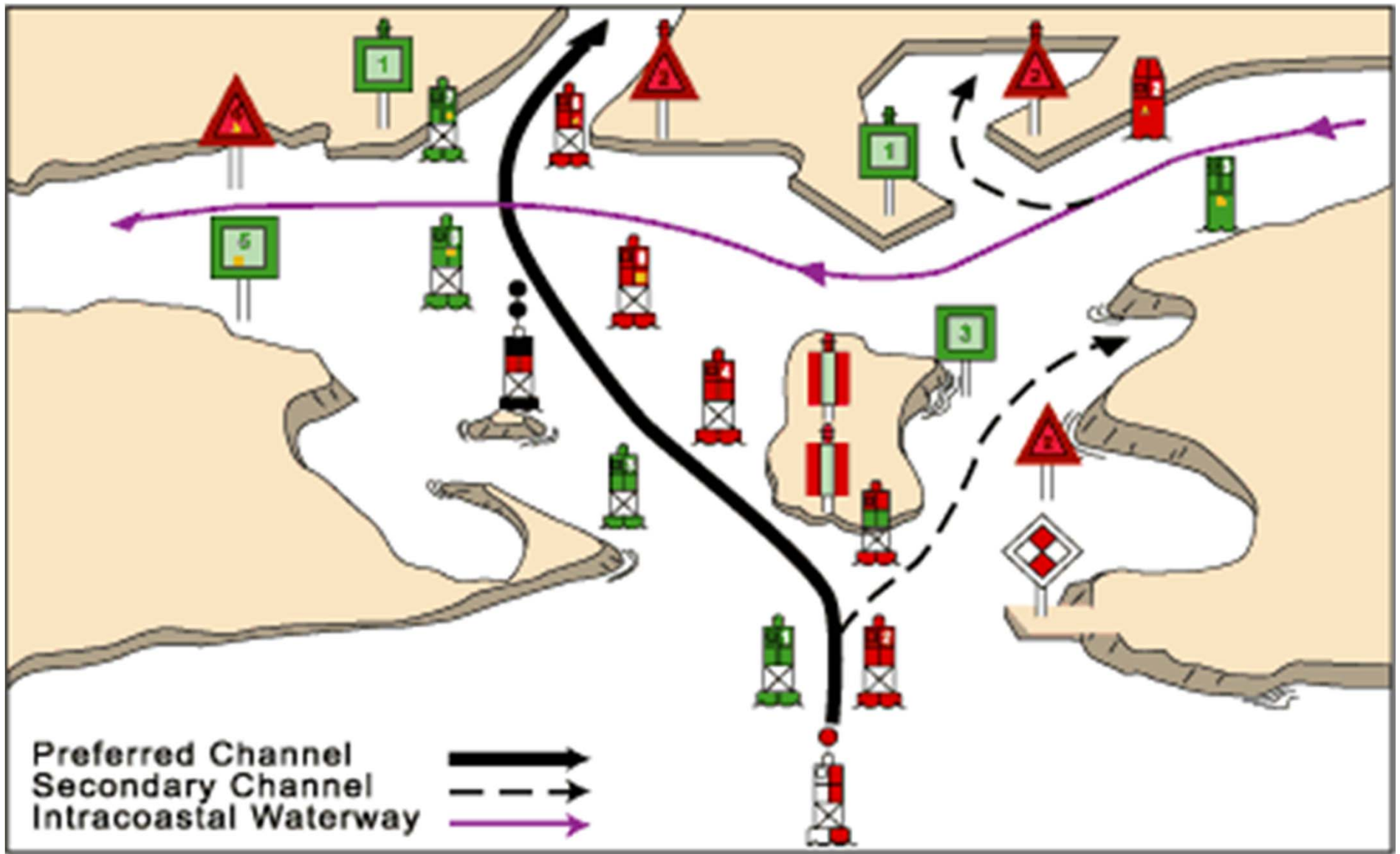
- Red Right Return, Even Nuns Blush



- Preferred channel markers



Aids to Navigation



Regulatory Markers

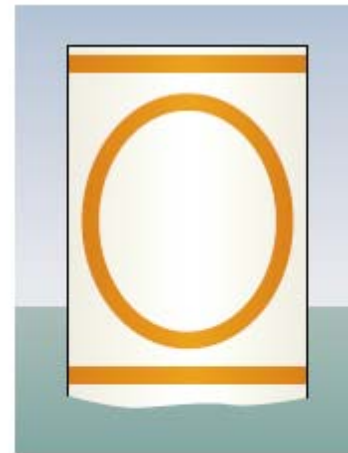
- E.g. Around Statue of Liberty and Ellis Island



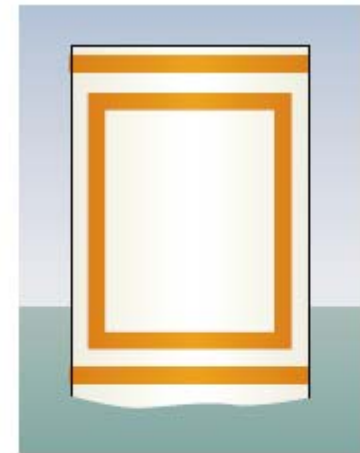
**BOATS KEEP
OUT!**



DANGER!



CAUTION!



INFORMATION

Trip Planning

- Location, weather, sea conditions
- Boat characteristics
- Crew experience and ability

- Plan ahead, be prepared, anticipate situations
- People safety first
- Minimize equipment damage
- Look at all the options

SAFETY

Electric Hazards

- Stepping masts
- Moving boats
- Low bridges

Safety Equipment

USCG Requirements

- PFDs
- Throwable PFD
- Horn
- Navigation lights
- Flares
- Fire extinguisher
- Registration

Great to have

- Bucket and pump
- Anchor
- VHF Radio
- First Aid Kit
- Tools and spare parts
- Paddle
- Extra line

VHF Radio

- Turn on radio, select VHF Channel
 - VHF CH 16 – USCG all boats monitor
 - VHF CH 13 – bridge to bridge
 - VHF CH 71 – BBSC operations
 - WX 01 – marine weather
- Adjusting volume and squelch
- Press to talk, release to listen
 - “Brooklyn Marina, Brooklyn Marina, Brooklyn Marina, This is Brooklyn Boat M# 1, requesting in(out)bound”
 - (VHF 16) “Mayday, mayday, mayday” – imminent loss of life

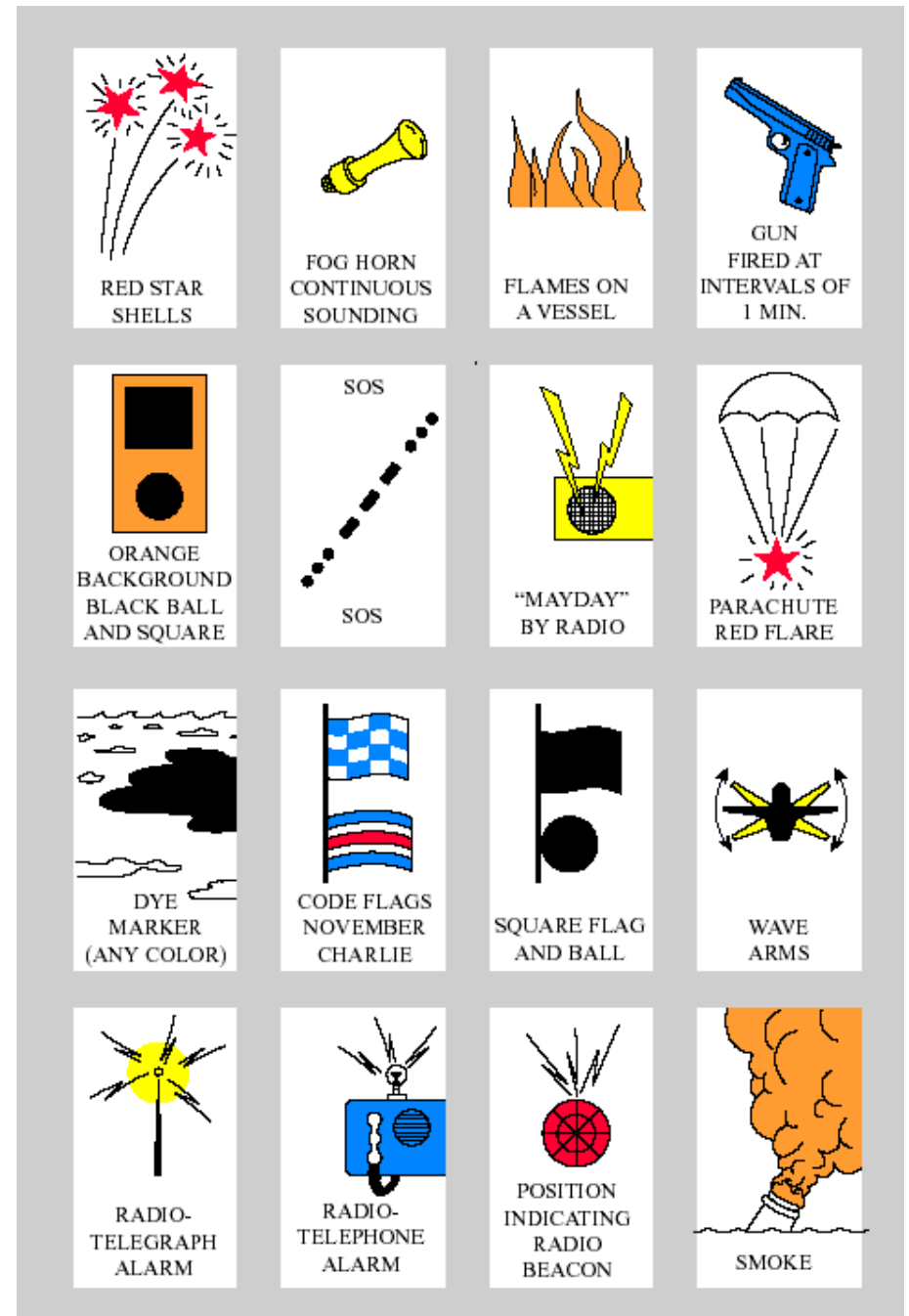


Safety Boating

- Required to provide assistance to anyone at sea
- US Protected by Good Samaritan laws
- Drinks – Like driving, no drinking and sailing. Limit = 0.08% (4 drinks in 2 hours for 160 lbs)
- Overloading and Capacity
 - Manufacturing capacity plate – power vessels < 20 ft.
 - Max people, combined weight, outboard power
 - Rule of Thumb: # 150 lbs crew = (length x width)/15

Distress Signals

- VHF radio
- Whistle
- Flares
- Wave arms



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EMERGENCIES

Emergencies

- Running aground
- Knockdown
- Equipment failure
- Towing

Running Aground

- Stop forward motion
- Ease sheets
- Check bilge for water ingress
- Check for hull damage

Knockdown

- Ease sails
- Pinch or feather
- Reduce sail area (see reefing)

Equipment Failure

- Standing rigging
 - Reduce load (tack, lower sail)
 - Use halyards to support mast

Towing

- Negotiate any commercial tow before accepting the tow. Use own tow line if possible.
- Use lines that stretch
- Attach tow line around something strong
 - Mast J80
 - Bow clip on Melges 24
- Use bow chocks if possible
- Keep main sail up until tow is secure
- Steer clear of towing vessel
- Lengthen tow line for open water
- Assume tow line will break – crew awareness
- Communication with tow boat

Weather

page
62,63

- Weather reports – NOAA forecast
- Weather system (high pressure and low pressure)
- Fronts
- Thermal effects – sea breeze
- Squalls

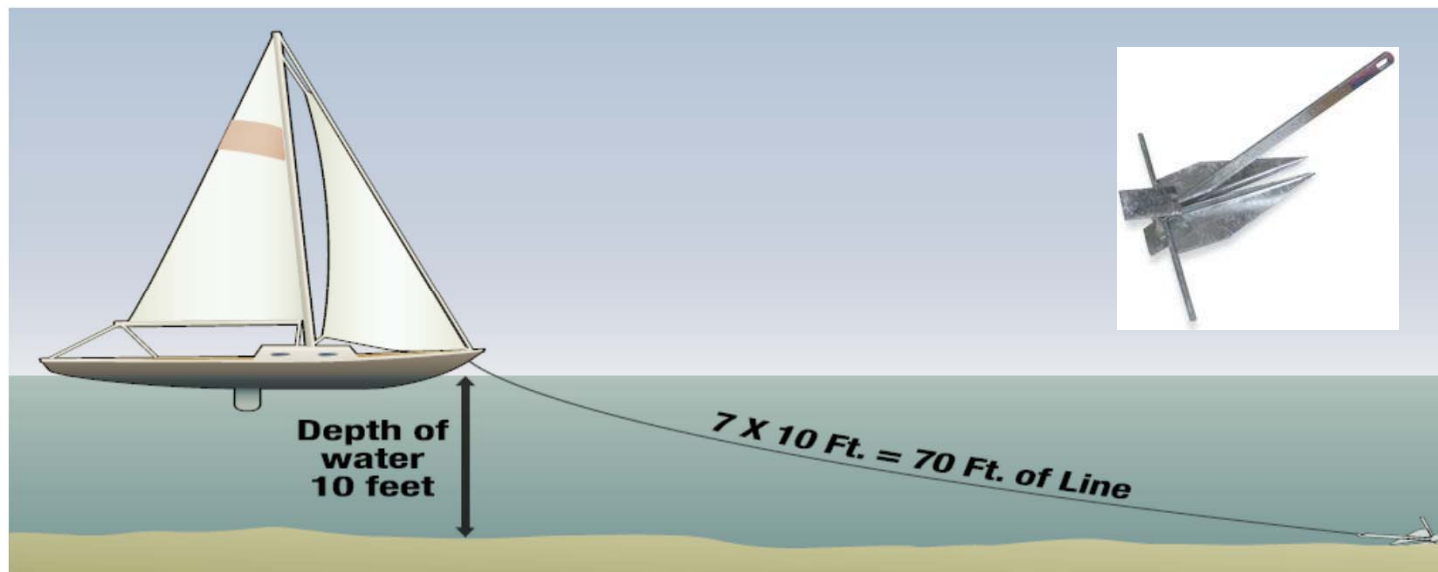
Reefing

- Reducing sail area
- Reef main sail
- Furl headsail

Anchoring

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76-77

- Depth, bottom
- Anchor type
- Scope (chain and rode)
- Swing room
- Go head to wind
- Lower anchor
- Drift backwards downwind
- Wait for anchor to sang and then increase rode



Outboard Engine: Pre-Start

- Tilt engine down and lock
- Lower engine down and lock
- Shift into forward, neutral and reverse
- Check fuel and fuel tank
- Check choke operates
- Engage kill switch
- Check starter pullcord

Outboard Engine – Starting

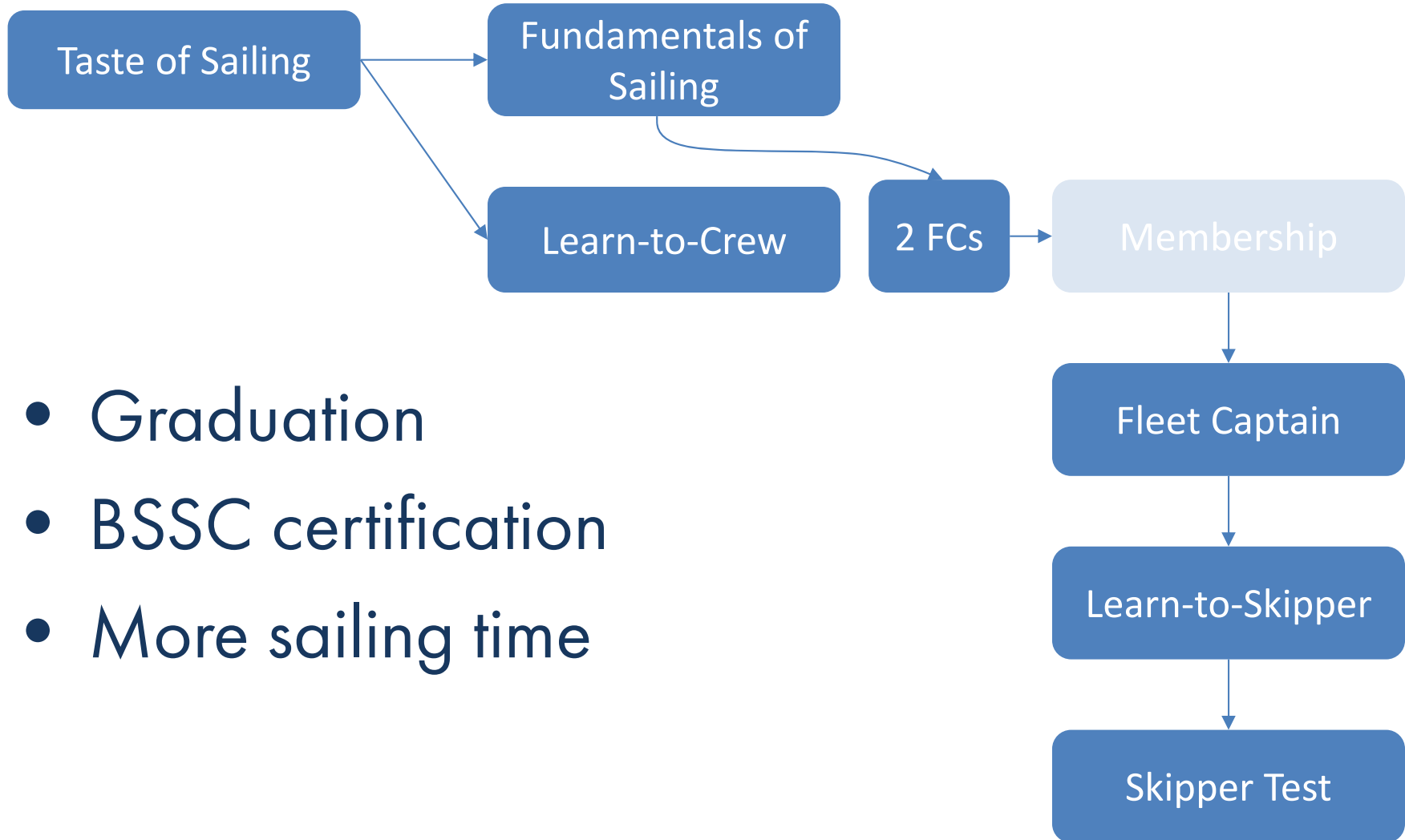
- Transmission in neutral
- Push choke in
- Center outboard, throttle down
- Check clearance when using pull cord
- Two good pulls, then choke out – two good pulls
- Push choke in – two good pulls
- Recheck fuel, fuel line, kill switch
- Check water cooling, transmission check



Outboard Engine Use

- Operations
 - Idle down before engaging transmission
 - Ensure no lines can catch the prop
 - Keep prop away from people
 - Check cooling water often – check water intake
 - Ensure no bags or debris foul the prop
- Refueling
 - Close hatches before refueling
 - No smoking
 - Wipe spillage

Instructional Programs



- Graduation
- BSSC certification
- More sailing time