



## The importance of playing waves

According to my online dictionary, a wave is “a disturbance on the surface of a liquid body, such as the sea or a lake, in the form of a moving ridge or swell.” For racing sailors, waves are a fact of life – if there is enough wind to sail, there are usually waves to go along with the breeze.

Waves have an impact on almost every single aspect of sailboat racing, both upwind and downwind. They are absolutely critical to speed, of course, affecting everything from weight placement to steering to sail trim and tuning. Waves also change how you perform boathandling maneuvers like tacks and jibes (page 9), they add new dimensions to crew work (page 8), and they can even have a significant influence on tactics and strategy (pages 1 and 16).

Waves make it harder to sail your boat fast all the way around the race course, and because of this, they tend to separate the good sailors from the less experienced. That’s why most of this issue is devoted to how you can sail faster and smarter in bumpy water.

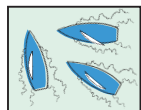


Tactics & STRATEGY

2010 IQ TEST

50 questions about real situations!

INSIDE  Pages 10-13



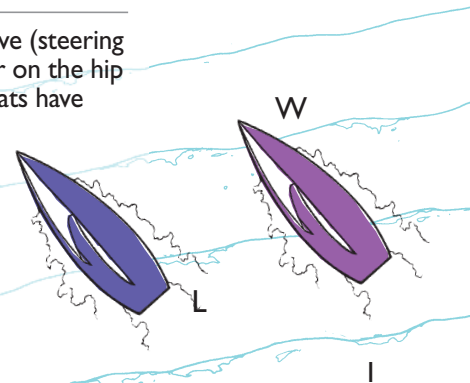
### TACTICS

## Waves and other boats

When you’re racing in waves, this affects your tactics (i.e. the moves you make relative to your competitors) in at least two ways. First, you have to stay a little farther away from other boats when you are required to keep clear of them or give them room or mark-room. Maneuvers that might be seamanlike in flat water may not be in waves, and this affects the definitions of room and mark-room. The bottom line is that you must give other boats a little more space and time to carry out their maneuvers.

Second, and more significantly, waves affect how you position yourself relative to your competition. You can’t survive quite as well in bad air, and it’s harder to hold a thin lane of clear air. The most noticeable change is that the lee-bow position becomes an even stronger tactical move because it’s very hard for a windward boat to ‘live’ in any proximity to a leeward boat (see below).

In flat water boats have a fairly narrow groove (steering range), so a windward boat can ‘hang’ longer on the hip of a leeward boat. In waves, however, the boats have to change their courses much more to sail around waves or power through them. This puts W in a bind – if she bears off to play the waves she will fall into L’s bad air, but if she doesn’t bear off she will end up slow and fall into L. Tactically, this a bad position for W in chop.



### ISSUE # 110

#### Waves

<b>THEME</b> Importance of waves .....	1
<b>TACTICS</b> Waves and boats .....	1
<b>IN THEORY</b> Key wave concepts .....	2
<b>BOATSPEED</b> Upwind in waves .....	4
<b>BOATSPEED</b> Downwind in waves.....	6
<b>CREW WORK</b> Take the initiative .....	8
<b>TECHNIQUE</b> Tacking and jibing.....	9
<b>IQ TEST: Tactics/Strategy</b> ...	10
<b>RULES</b> 2010 rule changes .....	14
<b>STRATEGY</b> Consider waves .....	16

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



# Key wave concepts

Waves are like snowflakes. No two are exactly the same, and therefore you have to treat each one as a unique and different entity. The same is true in the big picture – every sequence of waves you face during a race will be at least a little different from anything you have ever seen before. So you must continually work at finding the optimal path through the waves you face.

When you get to the race course, it is helpful to ask a few questions to understand the waves and how they will affect your race:

- *What's causing the waves?*

The size and shape of waves will depend on whether they are caused by wind, current or boats. You could

have smooth swells from a storm far away, steep chop when a strong breeze blows over shallow water or when current flows against the wind, or random chop from motorboats in a spectator fleet.

- *Are the waves the normal size that you would expect for the wind velocity?* For various reasons, the waves might be larger or smaller than normal (see below). This could have huge implications for steering, trimming and sailing the boat.

- *Are the waves perpendicular to the wind direction?* If the waves are flowing in the same direction as the wind, then you will generally have symmetry from tack to tack. But if not, you will need to set things up

differently on each tack.

- *Are you going faster or slower than the waves downwind?* Figure out if the waves are helping you (i.e. they're going faster than you) or hurting you (you're faster than them). Also, do surfing conditions exist? This is key to knowing if you are allowed to pump your sails.

Here are further explanations of some of these concepts.



JH Peterson photo

## Waves relative to wind

In any wind velocity, there is a certain size and shape of waves that you normally see with that amount of wind. In a five-knot breeze, for example, the water surface should be almost totally flat. In 18 knots of wind, however, you expect to see fairly good-sized waves with whitecaps.

But as every sailor knows, you don't always get 'normal' sea conditions. You might see bigger or smaller waves than what's typical for that wind velocity, and this will affect how you set up and sail your boat.

When I'm racing, I categorize the wave state in three general ways: 1) Normal waves for the wind; 2) More wind than waves; and 3) More waves than wind. Here's a closer look at each.



### 'More wind than waves'

*This is almost always a fun condition for sailing (unless you're trying to do a windy jibe). It's great for pointing and speed, and makes staying in the 'groove' pretty easy.*

Here are several times when you are likely to see this condition:

- A building breeze – the breeze is up but the waves haven't had time to build yet.
- An offshore breeze – the water is flatter as you get closer to land because there is less 'fetch' for the waves to build.
- Current flowing with the wind.

When you have more wind than waves, you can trim your sails flatter and harder than you normally would in that breeze. You should sail most boats as flat as possible and go for maximum height (pointing).

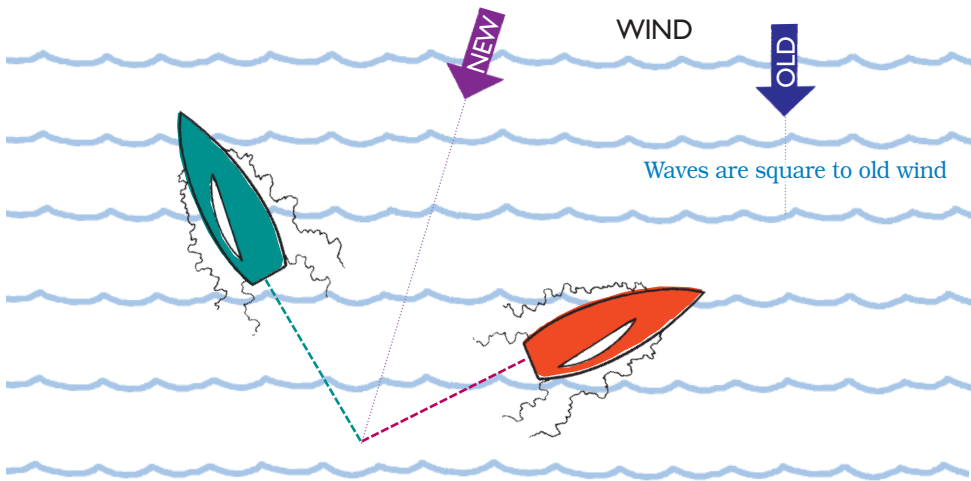
### 'More waves than wind'

*This is almost always a tough condition for sailing (unless you are sailing downwind with enough breeze to surf). It makes finding the groove difficult, and it quickly separates the good sailors from the rest.*

You will typically see this condition with:

- A dying breeze – the breeze always changes faster than the wave state.
- An onshore breeze – when the wind is blowing toward the shore, it usually has a long 'fetch' for the waves to build.
- Current flowing against the wind.
- Lots of motorboat wakes (the worst!).

When you have more waves than wind, be careful about trimming too hard or pointing too high. Err on the side of twist, power and footing so you keep going fast.



## Check for wave asymmetry

When you're racing upwind, are the waves equal on each tack? They are usually similar on port and starboard tacks because waves are created by the wind and therefore they come from that direction. However, this is not always the case. Sometimes the waves are not perpendicular to the wind, and this can have a huge impact on the way you sail your boat.

There are several reasons why waves may be different from tack to tack:

- *Windshifts* – If the waves are at first aligned with the wind, any change in wind direction will make them unaligned (at least for a while). This is very common.
- *Presence of nearby land* – If there is land to windward of the course, it could affect how waves move across the racing area.
- *A distant storm* – When you're racing on the ocean, there are often swells coming from a direction that's very different from your sailing wind.
- *Cross-current* – If you have a strong current that is not aligned with the wind, it often creates waves that aren't square to the wind.

When you first start sailing in your race area, check to see if the waves are the same on each tack. If not, make the appropriate sail trim adjustments. For example, you will have to make your sails fuller and more twisted on the bumpier tack (which goes more directly into the waves). On the other (smoother) tack you may be able to trim your sails much flatter and tighter. You can point higher on this tack, too, and keep your weight a little farther forward.

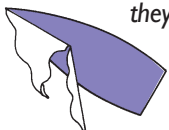
There are also strategic implications of wave asymmetry. For example, if port tack is smoother it might mean the wind has shifted to the right. When wave asymmetry is caused by a persistent windshift, it's better to sail the smoother tack first since that will take you in the direction where the wind is shifting.

## Watch for leeway caused by waves

Waves make sailboats go up and down, and they also push boats to leeward. The difference between the course you steer and the course you make good through the water is your leeway angle. The size of this angle is a result of many factors such as heel angle, wind velocity, boat design and wave height. Though leeway for racing boats is usually not more than a few degrees, it will get slightly larger as the waves get bigger.

The main place where you will notice leeway is in relation to fixed objects like marks. Your laylines are wider, for example, in waves, so you must allow a little extra distance before tacking.

One place where it's easy to see how much the waves push you to leeward is at the starting line. When boats attempt to luff in place on the line, they often slide much farther to leeward than they think. That's one reason why there is often a significant line sag when the waves are big.



## Motorboat waves

It would be hard to run most sailboat races without motorboats, but it sure would be nice if we could run them without motorboat wakes! Unfortunately, waves from motorboats are a fact of life in most racing venues, and the good sailors simply figure out how to handle them.

Motorboat waves differ from wind-generated waves in several important ways. They are often steeper and closer together (and therefore can potentially hurt your speed much more). Boat waves typically hit you at strange angles (rather than straight with the wind). And, fortunately, they usually come and go pretty quickly.

The first rule for maintaining speed through waves is to hit them at an angle (instead of head on). This is normally

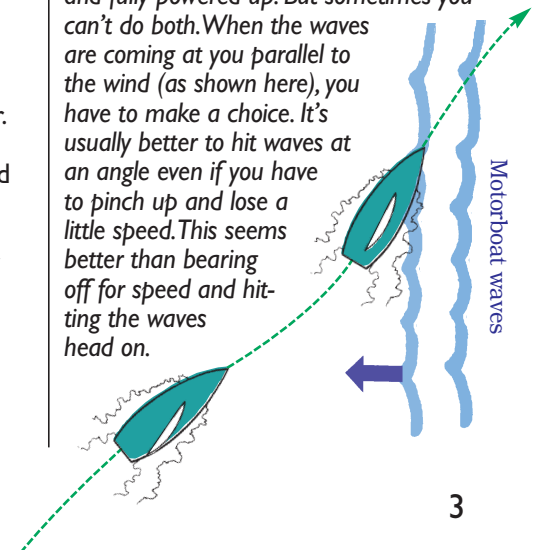


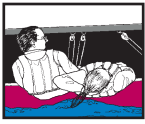
PhotoBoat Inc. photo

worth doing even if it requires a significant alteration in the course you have been sailing. In fact, it may even make sense to tack or jibe so big waves hit your stern rather than your bow.

The second rule of thumb for motorboat waves is to make sure you are going fast just before you hit them. In other words, be proactive by bearing off (or heading up on a run), easing (or trimming) your sails, moving weight aft, etc. Don't wait until the first wave hits you before making these changes!

As I mentioned above, you ideally want to hit motorboat waves at an oblique angle and fully powered up. But sometimes you can't do both. When the waves are coming at you parallel to the wind (as shown here), you have to make a choice. It's usually better to hit waves at an angle even if you have to pinch up and lose a little speed. This seems better than bearing off for speed and hitting the waves head on.





# Go fast upwind in waves

Except for those few times when you are able to ride a motorboat wake coming from behind, waves are never helpful when you're racing upwind. It's always faster to sail in flatter water, and that should be your first rule of thumb on beats.

Sailing fast in waves requires a team effort that involves the driver, trimmers and the rest of the crew. You have to look ahead for waves that are coming, shift gears and find the best way to steer through them.

There are three basic strategies for dealing with waves upwind. You can sail directly through the waves,

steer over the waves, or try to avoid the waves. More likely, you will do some combination of the above.

**Going straight through waves** is usually the best option when the waves are everywhere and too small to steer around. The bigger and heavier your boat, the more likely you are to take this approach since it's often impossible or slow to turn your rudder for individual waves.

This is not a great option for bigger waves, but sometimes it is your only choice (e.g. when all the waves are big and steep!). In that case, try to keep the boat going a

little faster than usual up the beat. The most costly mistake is to be too slow when you hit a bad wave.

Anticipation is important. The key to maintaining speed through bad waves is to shift gears *before* you get to them. That means you need enough warning to power up your sail plan before the bow digs into the first wave.

**Steering over the waves** is a good idea when they are larger and spaced farther apart, and when going straight through them is slow. The smaller and lighter your boat, the more effective this is.

The basic technique for sailing over waves is to head up on the front side and bear off the back side. In other words, luff toward the wind a little as you go up the wave and then bear off away from the wind as you go down the back side. The steeper the wave and the faster your speed over the waves, the more sharply you will have to turn your helm and your boat.

In boats that are light enough to be affected by the positioning of crew weight, combine the steering with a rotational movement of your bodies: Lean aft (and maybe in a little) as you go up the wave. Then lean out and forward as you go over the top and down the back side.

**Avoiding waves** is always the preferred option. This works well when you have identifiable areas of bad waves, such as boat wakes or sets of especially large, steep waves. Since you can never avoid all waves, you must use this in concert with other ways to sail through waves – but this strategy should always be a part of your upwind plan.

The techniques that work best in waves are often subtle enough that you never know how well they are working until you measure your performance against nearby boats. So test your wave strategy before the start and continue to evaluate it during the race. If you're not fast, change something and try again!



J-H Peterson photo

## Put your weight in the right places

One of the reasons why waves make a boat go more slowly is because they cause it to 'hobby-horse,' which disrupts the air flow around its sails and the water flow around its foils. This is especially harmful in lighter air.

The main goal of positioning your weight in waves, therefore, should be to reduce hobby-horsing. Keep your crew together as much as possible and near the middle of the boat. In light air, the ideal spot is right at the top of the keel, since that is the point around which the sail plan, hull and foils pivot. When conditions are bumpy and light, it's not unusual for crews to sit down below on the cabin sole (in bigger boats) or to crouch down inside the cockpit (one-designs). This reduces the range of motion of the mast and keel/centerboard.

In heavy air the crew can't be inside the boat, of course. Instead they should sit tightly together like the crew on the boat above. The fore-and-aft position of their weight depends on the boat, wind strength and wave shape. Generally, the crew should be at least slightly farther aft when it's rough (than when it's flat with the same wind velocity) to keep the bow from plowing into waves.

• If you're racing upwind in waves and you think your weight is positioned perfectly but you aren't going fast, try moving your crew a little farther apart. Sometimes the boat doesn't 'click' with the natural frequency of the waves – but different crew spacing may improve this harmony (and therefore your speed!).

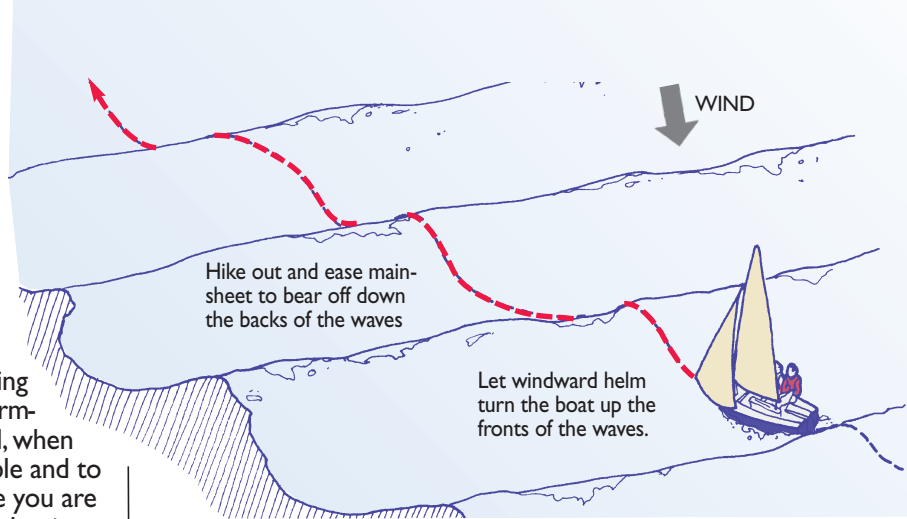
## How much to steer in waves?

When you're sailing upwind, waves will always slow you down, so you should avoid them as much as possible (see below). However, when you turn your rudder to steer around waves, the drag you create will also make you go slower. Therefore, you are always searching for the optimal tradeoff between using a lot of rudder and missing waves versus using less rudder and hitting waves.

The only true way to judge whether you are doing a good (fast) job of this is by comparing your performance to that of a nearby boat. That's why it's critical, when you have waves, to train with another boat if possible and to tune up with a competitor before every race. While you are doing this, try different steering techniques to see what is fastest in the unique conditions that you have on any day. The last thing you want to do in a wavy race is to be looking for the groove as you come off the starting line.

Several factors influence the tradeoff of how aggressively you should steer (i.e. how quickly and how far you should turn the rudder). Here are two important considerations:

- *Size and shape of the waves* – Are the waves big, small, rounded or crested? How steep and close together are they? You don't have to steer much in small waves or even big swells, but medium-size waves can present a tough challenge, especially when they're steep and/or close together;
- *Characteristics of your boat* – Is your boat large or small (relative to the waves), light or heavy? Does it turn easily? Does it have a narrow bow that cuts easily through the waves or a fat bow that slams into waves? All these factors



*These waves are unusually large, uniform and rounded on top, so it's not necessary to steer around them very much. The ideal course would be a gradual, slight arc to windward on the approaching face of the wave, followed by a similar bearing off down the back side.*

affect the tradeoff of hitting a wave versus turning to miss it.

One thing that's true for all boats and waves is that when you turn the boat, it's best to do this with as little rudder as possible. Reduce drag by steering with sail trim and body weight. For example, use windward helm to allow the boat to carve its own turn to windward on the front of the wave. Then, at the top of the wave, hike out hard and ease the mainsheet or traveler to help bear off down the back side. If you can turn the boat without so much drag, then the trade-off moves in the direction of steering to miss more waves.

## Like skiing through a huge mogul field

Sailing upwind in waves is a lot like skiing in moguls. In both cases, bumps are bad for speed. It's hard to go fast on a bumpy trail and the same is true for racing in waves. Therefore, your first goal as a helmsperson should be to avoid the worst waves as much as possible.

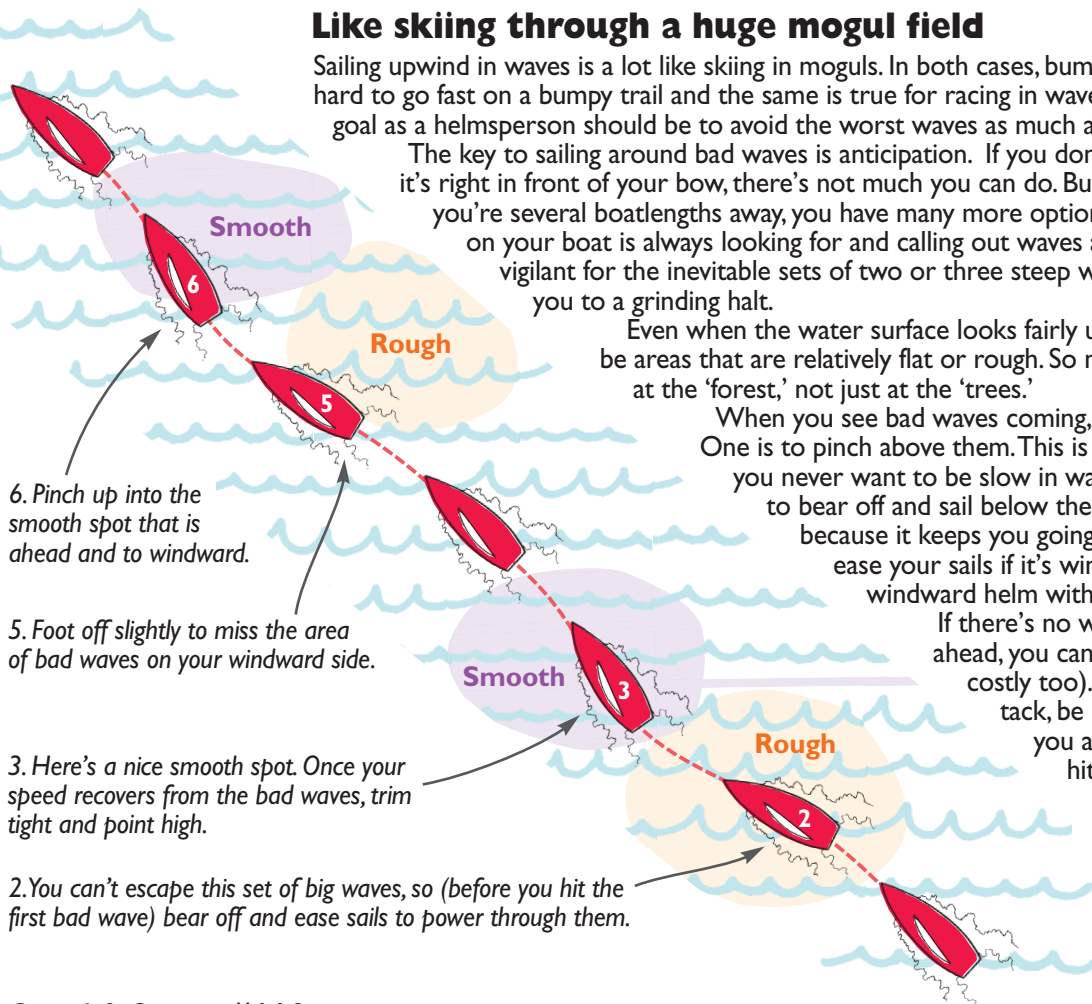
The key to sailing around bad waves is anticipation. If you don't see a huge wave until it's right in front of your bow, there's not much you can do. But if you see that wave when you're several boatlengths away, you have many more options. So make sure someone on your boat is always looking for and calling out waves and flat spots. Be especially vigilant for the inevitable sets of two or three steep waves that can almost bring you to a grinding halt.

Even when the water surface looks fairly uniform, there will always be areas that are relatively flat or rough. So make sure you look ahead at the 'forest,' not just at the 'trees.'

When you see bad waves coming, you have several options. One is to pinch above them. This is a bit risky, though, since you never want to be slow in waves. A second choice is to bear off and sail below the bad waves. This is safer because it keeps you going fast – just remember to ease your sails if it's windy so you don't fight windward helm with the rudder.

If there's no way to avoid bad waves ahead, you can always tack (but that is costly too). When you don't want to tack, be proactive and shift gears so you are powered up before you hit the first wave.

Likewise, if you sail into a flat spot trim your sails and hull for point mode – then be sure to shift back into speed mode before the flat spot ends.





# Playing waves downwind

Going downwind is the fun part about sailing in waves. On a reach or run, waves are usually your friends. They can help you go faster (by surfing), and they often allow you to sail lower.

The general rule of thumb in waves is to steer for the 'low spots' in the water ahead of your bow. By keeping your bow aimed toward the valleys you will be sliding downhill, and that is fast! Don't be afraid to alter your course significantly to get on a surf, to maintain a surf or to start rebuilding speed when it looks like you will fall off a wave.

One time waves won't help you downwind is in light air. In these conditions, you may actually have to sail higher to keep your sails full in the slop. And you must keep a close eye on your VMG relative to other boats since this may be the only way to find your optimal angle.

Another time waves don't help is when your average speed down the run is faster than the waves. In this case the waves are a bunch of roadblocks, and the key to better downwind performance is figuring out the best way to get around or over each wave in front of your bow.

More often your speed down the run is slower than the waves, so you are constantly working hard to catch and stay on the wave ahead. The more time you spend surfing, the closer your overall speed will be to that of the waves, and the faster you will go relative to the fleet.

Certain combinations of waves and wind can make it hard to stay in control downwind. One thing to remember is that 'out of control' is not necessarily slow. When the boat is rocking and rolling it generates a lot of kinetic energy.

However, capsizing or broaching is not fast. To get more control on runs, move your crew weight aft and spread them apart laterally. This will make it much easier to keep the boat stable, and that will improve your overall boatspeed.



## Improve downwind speed with 'kinetics'

Kinetics (the body movements you use to help sail your boat) are essential for fast reaching and running in waves. Though a few sailors abuse the use of kinetics, most employ only a small percentage of the kinetic techniques that are permitted, and therefore their boatspeed is slower than it could be.

In all conditions, a boat's crew "may adjust the trim of sails and hull, and perform other acts of seamanship, but shall not otherwise move their bodies to propel the boat" (rule 42.1). These trim adjustments are especially important in bumpy water because you must change your course constantly to avoid or take advantage of waves. Every time you hit a wave or turn your boat, you should be adjusting sail trim and the position of your crew.

For example, when you want to turn to leeward and surf down a wave, move crew weight to windward to help the boat bear off and then move forward while you are surfing. Just before you get to the bottom of the wave, move aft and then to leeward to help the bow head up to catch the next wave. Very few crews move their weight enough fore and aft in waves – you must be very aggressive so you don't drag the stern or bury the bow in a wave.

Of course, you can also turn the boat with your rudder, but this is pretty slow because it creates drag. When you're racing downwind, the rudder is not needed for lift so you want to sail with a neutral helm (straight rudder). Even a tiny bit of rudder drag may keep you from getting on a plane or catching a wave.

In addition to the kinetic actions that are always permitted, there are certain exceptions. The most important one for sailing downwind in waves is rule 42.3c, which says that when surfing or planing is possible on a downwind leg, you may "pull the sheet and the guy controlling any sail in order to initiate surfing or planing, but only once for each wave or gust of wind."

This means that when you have surfing conditions, you can pump your main and spinnaker sheets and spinnaker guy one time for each wave (when you have a chance of surfing). It usually works best to pump all three simultaneously, but you cannot pump when 1) surfing is not possible for your boat, or 2) you are already surfing or planing. Class rules can modify the rules about kinetics (see below).

Many one-design classes modify Rule 42 (Propulsion). Some (e.g. Finn, 470, I420) permit unlimited pumping, rocking and ooching when the wind exceeds a specified speed (e.g. 11



**Flag O**

knots for the Finn) and the race committee displays code flag O (see rule P5 in Appendix P). Other classes modify rule 42 in different ways. For example, the Lightning Class does not allow pumping with the guy or with more than one part of the mainsheet. Make sure you know exactly what's allowed by your class so you can go as fast as possible – legally!

## Avoid hitting the wall ahead!

Unless the waves are small or you're going fast enough to blast up and over bigger waves, it's usually slow (and risky) to plow into the back of the wave ahead. But it's often hard to prevent this when you hook onto a good wave and surf rapidly toward the next one. Here are several techniques you can use to avoid hitting the wall:

1) **Turn to windward** (red arrow). As you approach the back of a wave, head up so you converge with the wave at an oblique angle rather than straight on. By heading up, you avoid sticking your bow into a wall of water and you put yourself on a tighter angle of sail that keeps you going fast. The problem is that you may lose ground to leeward and, if it's windy, you risk getting overpowered.

2) **Turn to leeward** (purple arrow). As you approach the back of the wave ahead, bear off so you don't hit the wave head on. The big advantage of this is that by bearing off (instead of heading up) you will be working your way to leeward, which is usually fast on a run. However, sometimes you can't bear off far enough to avoid hitting the wave ahead, and often you are at risk of a sudden jibe or broach. This works best when the waves are big enough to surf and your boat is under control.

3) **Slow down!** This may seem counter-intuitive when you're racing, but it's often the safest (and therefore fastest) approach. One reason why turning to leeward or windward works is because this slows your progress toward the wave ahead. But sometimes turning is not enough, or not possible. In that case, be more proactive to slow your speed. In strong breeze, for example, overtrimming your spinnaker may be a good way to make sure you don't hit the next wave sooner or faster than you want.

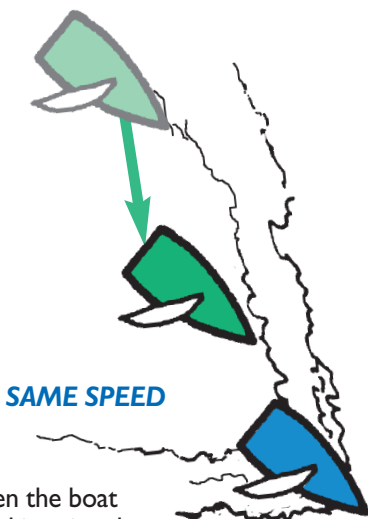
## Drafting (or escaping) the waves from boats ahead

When there's a boat just ahead of you on a reach or run, the waves they leave in their wake often affect your speed (either positively or negatively). The best way to handle those waves depends a lot on whether the other boat is faster, slower or the same speed as you (see below). Boats almost always go different speeds in handicap races, and this is usually true in one-design fleets too!

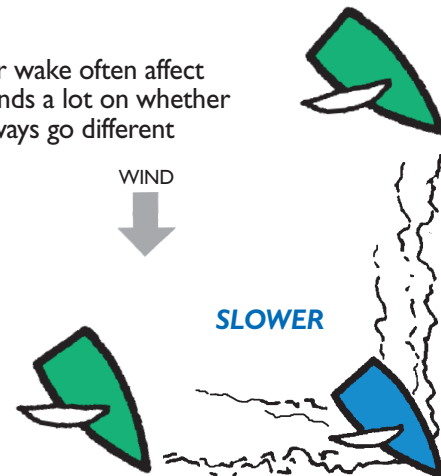


When the boat ahead is faster, you can often get a free ride (for a while at least) by drafting on their quarter wake. Try to get very close behind them – the farther away you are the smaller that quarter wake will be and the harder it will be to stay on the wave.

On tighter reaches, aim for the wake on the other boat's windward side so you avoid their bad air to leeward. On broader reaches, go for the leeward side so you don't threaten to blanket or roll the boat ahead. Work your boat hard to stay on the wave as long as possible.



When the boat ahead is going the same speed, you have two options. Often if you catch the tail end of their quarter wake (above), you can ride this wave all the way to their transom. You may gain several boatlengths this way, though once you get to their transom you will have no passing lane. If it's early in the leg or if you think you may have a chance to pass the other boat, a better option may be to stay out of their wake altogether.



When the boat ahead is going slower than you are, try to avoid their wake completely. Unless there is a good bit of breeze, it's often difficult to break through those waves (even if you are a little faster), and this means you will be stuck going the same speed as the boat in front of you.

Instead, look ahead and plan your course so you stay outside the tail end of their quarter wake (either to windward or leeward). This makes tactical sense too because you want to stay far away when passing them to windward (so they don't luff you) or to leeward (so you don't get their bad air).



## CREW WORK

# Take the initiative in waves

There are several keys to being a successful crew member when you are racing in waves. One is that you have to be proactive. There is not time for the helmsperson to tell you how to move your weight for every wave – you just have to do it.

The general concept is to use your weight to help steer the boat over and around the waves, both upwind and downwind. Few sailors move their bodies forward and aft aggressively enough. Slide aft (or simply lean your upper body aft) when your bow is lower than the stern and/or it's headed for a wave. Slide (or lean) forward when your bow is higher than the stern and/or it's headed for a trough.

On a beat, lean out when you're about to bear off down the back side of a wave, and lean in when you're going up the front side. When it's windy, don't lean in too far (or at all) because you'll load the rudder too much. When it's light don't lean out too far (because you need some heel to keep the boat in the groove).

Downwind lean to windward to help the boat turn and surf down the wave. Lean to leeward when you are losing the wave and you need to head up to build speed and catch the next wave.

Another key to success is the willingness (and the skill) to change



PhotoBoat Inc. photo

**When you're racing in waves, it's good to get your weight low in the boat to lower your center of gravity and reduce pitching. This applies to any wind velocity (in boats with cabins crews often sit down below when it's light and bumpy), but unfortunately it means the crew usually has a harder time looking around and helping with strategy and tactics in these conditions.**

gears constantly. In waves, your speed and angle are much more erratic than in flat water – therefore you must trim and ease your sheets and other sail controls correspondingly to keep the boat going fast.

Good communication among crewmembers is always important, but especially so when you're trying to sail upwind through waves. This begins with keeping a good lookout. On most smaller boats, this must be done by the helmsperson, who is

sitting up higher and always facing forward. On bigger boats, this job should go to a crewmember sitting on the rail facing outboard.

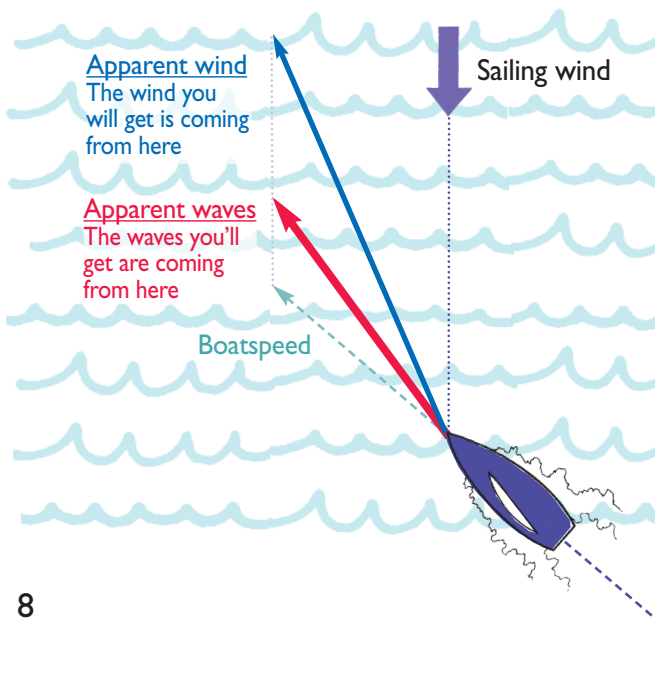
This person must give a warning, in a voice loud enough to be heard by the helmsperson and all trimmers, of substantial waves and flat spots that are coming. He or she might typically say, "A big wave in 15 seconds," or "Three steep waves straight ahead," or "Very flat for two boatlengths."

## Where to look for waves and flat spots

When you're sailing upwind and looking for the next wave or flat spot that will hit your boat, keep in mind that the waves you encounter do not come from straight ahead of your bow. They also don't come from the side of your boat, or from the direction of your sailing wind or even of your apparent wind.

Just as the wind you feel is a vector combination of the true wind speed plus the wind created by the forward movement of your boat, the waves that hit you are coming from a direction (red arrow) that's a vector sum of your boatspeed and the speed of the waves. This is where you must look to see the waves and smooth spots you're going to hit.

Since it's hard to calculate this direction while sailing, a rough guide is to look half way between your bow and the apparent wind you feel. The waves below this will pass to leeward of your boat; the waves to windward will pass to windward of you. The direction of the wind you feel (blue arrow), of course, is where you should look to see the puffs and lulls that you will get.







## TECHNIQUE

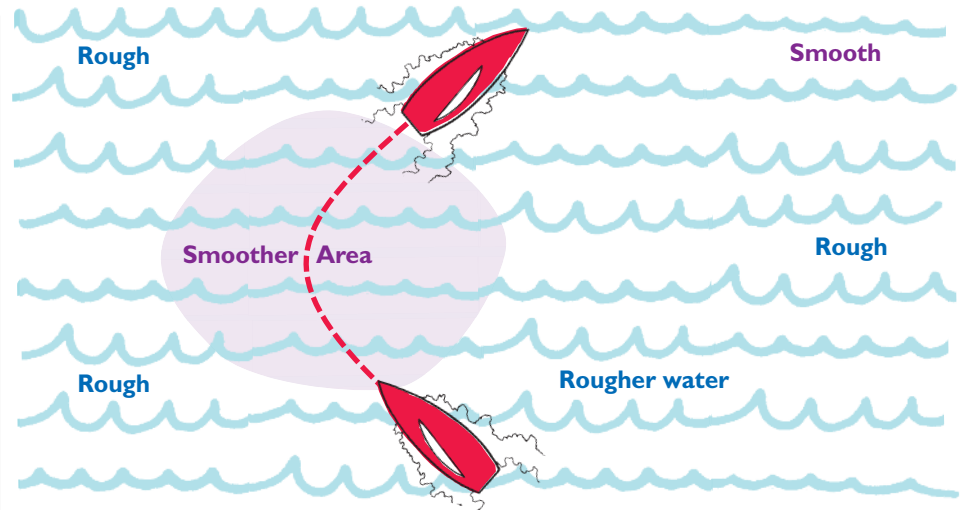
# Tacking and jibing in waves

The first, and by far the most important, thing about tacking in waves is that you should try not to do it. Tacking is costly enough under the best circumstances, but when you make a maneuver like this in choppy water you lose a lot.

Of course, many races are sailed in rough seas and you have to tack somewhere! In that case your goal is to find spots that are relatively smooth (see right) so you lose as little distance as possible relative to your competition.

One of the best strategies for a successful maneuver in waves is to tack when you *want to*, not when you *have to*. If you decide to leebow a starboard tacker, for example, you must turn in one particular spot, and that's slow if the waves happen to be bad there. A better strategy is to sail the beats so you can tack when and where you want to since the distance you gain by tacking in flatter water can be significant.

Though waves are bad for tacking, they can actually be very good for jibing. While you are surfing down a wave, the boat is stable with less wind pressure in the sails. But in light wind, waves make it harder to keep flow attached to the sails and to accelerate after the jibe.



## Executing a good tack in waves

When you are considering a tack in bumpy conditions, make sure you plan ahead! In flat water you can make a fast tack anywhere on the race course, but in waves you have many fewer chances. Look for a relative flat spot ahead and to windward (roughly 30° off your bow), making sure you will have at least a short distance to accelerate on the new tack before hitting any big waves. Since the helmsperson has to make the call about exactly when and how to turn the rudder, it is essential that he or she has a clear view of the water ahead. Here are some other tips:

- *Make sure you have good speed before you tack* – One of the worst things you can do is to begin a tack when you are not going full speed upwind. So don't tack during a lull, while you are pinching or just after hitting a set of bad waves. In many cases it's actually better to be going slightly faster than normal when tacking.
- *Turn a little faster than usual* – The slower you turn through a tack, the bigger your chance of hitting a bad wave in mid-tack (the worst time to hit a wave). So speed up your rate of turn slightly, especially the part of the tack where you are head to wind since this is when you hit the waves most squarely.
- *Turn a little farther than usual* – When you come out of the tack you'll need extra power to accelerate in the waves, so make sure you come out a little 'fat' (slightly footing) rather than a little 'thin' (slightly pinching).

## Jibe while surfing!

These sailors are hoisting their spinnaker, but this would also be a good place to jibe. When it's windy, jibe when you are surfing down a wave (i.e. when your stern is higher than your bow and the boat is sliding downhill). The speed you gain when surfing on a wave will decrease your apparent wind pressure, unload your sails and make the boat more stable.

While flat water is a good place to tack, it's not so great for jibing in breeze because you can't unload the pressure on your sail plan. That's one reason why waves are your friends downwind. But if there's not enough wind for surfing, it's probably better to make your jibe in flatter water, too, since it will be easier to maintain and build speed that way.

In any case, be patient until you find a good place to jibe. Once you do, be decisive and go for it. Hesitation often leads to disaster.



J.H. Peterson photo

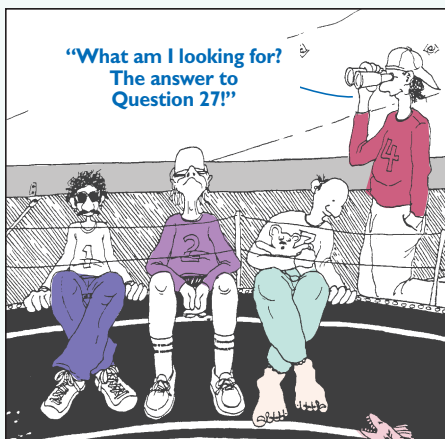
# Tactics & STRATEGY

# 2010 IQ TEST

## Be a detective!

If you want good race results, you have to think a bit like Sherlock Holmes. That is often the best way to find and use all the tactical and strategic clues that are scattered around any racing area. On the next four pages are four race scenarios and 50 questions. All of the questions on each page are based on the scenario that is described at the top of that page.

We have designed this 'test' to help you think about situations you will face in future races. When you finish, check out the answer key on the last page (and look for full explanations in Issue #111). Since many questions are subjective, they may have valid answers other than the ones given. Now grab a pencil and start looking for clues. Good luck!



### SCENARIO A (1-9)

You are steering a Melges 24 in the national championship. It's the first race of a seven-race series and there are 30 boats in the fleet. The course is a windward-leeward twice around with a short windward offset mark, a gate at the leeward mark and a finish to leeward. The wind has been blowing a steady 15 to 18 knots and there are moderate waves. Just before your start, the wind direction is a steady  $210^\circ$ , but it has been shifting very slowly to the right and is forecast to end up around  $220^\circ$  after a few more hours.



PhotoBoat Inc.

**1** The starting line is about 40 boatlengths long. If you reach along the line at 7 knots, roughly how long will it take you to sail from the committee boat to the pin?

- A) One minute
- B) One minute 30 seconds
- C) Two minutes
- D) Two minutes 30 seconds

**2** As you reach toward the pin, you notice that the line bears  $130^\circ$ . If Boat A starts at the pin end on port tack and Boat B starts at the boat end on starboard tack:

- A) A will cross B by 5 lengths
- B) A will cross B by 10 lengths
- C) B will cross A by 5 lengths
- D) B will cross A by 10 lengths
- E) It's not possible to determine

**3** Given the bias of the starting line and the prediction for the wind, where would you start?

- A) Near the committee boat end
- B) Near the middle
- C) Near the pin end
- D) It doesn't matter

**4** On the first beat, you sail pretty far to the right side and then the wind shifts three degrees to the right. How much did you just gain on a boat that was one half mile away on the left side of the beat?

- A) One boatlength
- B) 5 boatlengths
- C) 10 boatlengths
- D) 20 boatlengths
- E) It's not possible to determine

**5** Sailing all the way to the right corner of the first beat is not a good idea for the following reason(s)

(In this test, choose all that apply):

- A) It's too risky for the first race
- B) You'll overstand if you get lifted
- C) The left side is favored
- D) You may get tacked on
- E) All of the above

**6** You round the windward mark in mid-fleet with the ability to jibe if you want. The wind pressure looks steady across the course. What should you do?

- A) Keep going on starboard jibe
- B) Jibe to sail on port
- C) It won't really matter
- D) It's not possible to determine

**7** On the run you sail low to play the waves, but you're not sure if this is working. While you are on port jibe, a boat that's sailing higher and faster bears  $305^\circ$  from you. A minute later the same boat bears  $309^\circ$ . What should you do?

- A) Keep sailing your low angle
- B) Head up like the other boat
- C) It doesn't matter
- D) It's not possible to determine

**8** Bigger waves make your jibing angle narrower and mean you will get to your downwind laylines sooner. T F

**9** As you approach the downwind finish, you are planing on port tack and just fetching the left (RC boat) end of the line. As you get closer, it looks like the pin (right) end is farther upwind by about one boatlength. What should you do?

- A) Jibe on the layline to the pin
- B) Keep sailing to the boat end
- C) There is no difference

**10** In the breezy conditions that you have for this race (*below*), it will be relatively more important to sail for puffs than shifts. T F

**11** Since you are doing well in the regatta, you want to be somewhat conservative. During this race, in which situation(s) would you consider taking more risk?  
A) It's early in the race  
B) It's late in the race  
C) You are doing well in the race  
D) You're not doing well

**12** As you come off the starting line on starboard tack, you are steering 300° on a nice lift. The wind starts shifting left and you start to get slowly headed. At what compass heading would you ideally tack onto port?  
A) 295°                      B) 285°  
C) 275°                      D) 270°

**13** When the wind is oscillating, it usually pays strategically to foot slightly while you are on the lifted tack. T F

**14** When boats are crossing you on a beat in an oscillating breeze, it's usually good to "bite the bullet" and go behind them. T F

**15** A few minutes ago you were on port tack and you ducked behind a starboard tacker. At that point your heading was about 355°. Now you are on starboard, converging with the same boat and you are heading 295°. You will probably:  
A) Cross ahead of the other boat  
B) Cross behind the other boat  
C) Collide with the other boat

**16** A couple minutes later you are in the middle of the first beat and still on starboard tack sailing a course between 295 and 300. You converge with a port tacker who cannot quite cross ahead of you. What should you do?  
A) Tack before you reach her  
B) Yell "Starboard!"  
C) Pinch up slightly  
D) Bear off and go behind her

**17** You are 2 or 3 minutes from the windward mark, sailing a nice lift on port tack and steering about 350°. Slowly you start to get headed. At what heading should you tack to starboard (assuming you don't overstand the mark)?  
A) 355°                      B) 005°  
C) 010°                      D) 020°

**18** You are second around the windward mark. To slow the boat ahead, you should position yourself directly between them and the true wind direction. T F

**19** When the wind is oscillating, you will usually experience fewer shifts during a run than during a beat. T F

**20** You're in third place on the second beat. Half way up the leg you're on starboard tack crossing several lengths ahead of the fourth place boat on port tack. Which of these are not good times to tack on the other boat's wind?  
A) You are sailing on a lift  
B) You are sailing on a header  
C) You're near the port layline  
D) You see a puff straight ahead  
E) Most boats are to your left

**21** When the wind is oscillating regularly, you should usually tack when you sail into a velocity header. T F

**22** Which of these conditions is (are) most likely to produce oscillating wind shifts?  
A) More current on one side  
B) Land on one side of the beat  
C) A cold front recently passed  
D) Breeze blowing offshore

**23** On your boat, one of the jib trimmer's jobs is to read the compass upwind. Assume you are sailing on a nice starboard-tack lift, steering 300°. Now the wind shifts to the left, and you have to bear off so you are steering 290°. What should your jib trimmer say?  
A) "Down 10"              B) "Up 5"  
C) "We're at the median"  
D) "Tack!"

**24** At the end of the second beat you approach the windward mark on a starboard-tack lift. After rounding the mark you should:  
A) Jibe to port tack  
B) Continue on starboard tack  
C) It doesn't matter  
D) It's not possible to determine

**25** On the third beat you work hard to sail on the lifted tack. As you approach the upwind finish on port tack, it looks like the line has been set square to the median wind direction. At which end should you finish?  
A) The port (pin) end  
B) The starboard (boat) end  
C) It doesn't matter  
D) Not possible to determine

### SCENARIO B (10-25)

You are sailing a Lightning in your District Championship. It's the third race of a five-race series and you are leading the 45-boat regatta. Your course is a triangle-windward-leeward-windward with marks to port. The breeze is blowing offshore at 12 to 15 knots and the velocity looks equal on both sides of the first beat, but there are lots of puffs. The wind direction seems to be oscillating regularly with about five minutes between shifts. Before the start, you find your average headings on each tack are:  
Starboard tack: High 300° Median 285 Low 270°  
Port tack: High 350° Median 005 Low 020°



PhotoBoat Inc.

## SCENARIO C (26-40)

You are calling tactics on a J/109 in Class 3 at Race Week. After six of the scheduled 10 races, you are fighting for the class lead with an Evelyn 32. Your PHRF rating is 75 and theirs is 87 (so you owe them 12 seconds per mile), and neither boat has finished worse than third so far. The course for Race 7 is a windward-leeward twice around with 3-mile legs (and no offset mark or gate). The wind is blowing from the west (270°) at 8 to 10 knots and looks slightly stronger on the left side of the beat.



PhotoBoat Inc.

**26** A few minutes after the start, you're still on starboard tack. Using your compass, you take a bearing of 356° on the Evelyn 32, which started near the RC boat on your windward hip. How are you doing in the race with this boat?

- A) You are ahead of them
- B) You are behind them
- C) Both boats are even
- D) You can't tell from this info

**27** Half way up the first beat you are on port tack in the middle of the course. What are some signs that the wind may be shifting persistently to the right? (*Select all answers that apply.*)

- A) Boats on the right are gaining
- B) Boats on the left are losing
- C) You are sailing your highest-ever heading on starboard tack
- D) The boats farthest to the right are lifted the most.

**28** If you notice wind sheer at the top of your mast, this may also indicate an upcoming change in wind direction. T F

**29** Which of the following are consistent with the presence of wind sheer aloft?

A change from tack to tack in your:

- A) sail trim or sail behavior
- B) true wind direction
- C) apparent wind angle
- D) boatspeed.

**30** When there is wind sheer, you will often sail faster on one tack than the other. Strategically, it's usually better to sail on the slower tack first. T F

**31** Three quarters of the way up the first beat, the wind is still 270° and you are steering 305° on port tack. The skipper asks you to call the starboard-tack layline.

What will be the compass bearing of the mark when it's time to tack?

- A) 225°
- B) 235°
- C) 270°
- D) 340°

**32** As you approach the first mark on starboard tack, your crew prepares for a bearaway set. You know your jibing angle in these conditions is about 80°. What do you tell the helmsman when he asks for a course to steer on starboard jibe after the spinnaker set (assuming the wind is 270°)?

- A) 050°
- B) 130°
- C) 180°
- D) 230°

**33** As you round the leeward mark after the first lap, you start your watch to find out how you are doing with your rival (and therefore how conservative you should be). They are one minute 27 seconds behind you. How are you doing on corrected time?

- A) You are ahead by 15 seconds
- B) You are ahead by 5 seconds
- C) You are behind by 10 seconds
- D) None of the above

**34** In nine knots of wind, your upwind target speed is 6.35 knots. Under what condition(s) would you sail faster on port tack?

- A) The wind is in a left phase
- B) There's a puff to windward
- C) Most of the fleet is to your left
- D) The sea state gets rougher

**35** While sailing up the second beat, you notice the wind is finally starting to shift persistently to the right. This type of shift is most likely when you experience the following condition(s):

- A) The wind is blowing offshore
- B) You can see puffs on the water
- C) You have a building thermal
- D) Boats always gain on one side

**36** When the wind direction shifts, the amount you gain or lose relative to another boat is roughly proportional to (*select all*):

- A) amount of the windshift
- B) lateral distance between boats
- C) distance from the layline
- D) distance from the next mark

**37** When you are sure the wind is shifting persistently, your best strategy is usually to go all the way to the layline before tacking or jibing. T F

**38** As you approach the second windward mark, the wind is shifting very slowly to the right and the pressure looks better on the left (looking upwind). What should you do on the run?

- A) Play the left (looking downwind)
- B) Play the right
- C) Stay in the middle

**39** As you approach the downwind finish, you see that the pin end of the line is favored (i.e. it is farther upwind). In order to finish as soon as possible, you should approach the finish line:

- A) Right on the layline to the pin
- B) Slightly above the layline
- C) Slightly below the layline

**40** Which do(es) not describe the ideal fastest way to finish at a downwind finish line?

- A) Finish near an end of the line
- B) Finish on starboard tack
- C) Bear off dead downwind
- D) Finish on a course that's perpendicular to the line

## SCENARIO D (41-50)

You are sailing a Laser Radial in a fleet of 70 boats at the North Americans. It's the last race of a ten-race series and you're in 8th place overall (but you already have an OCS as your one allowed throwout). The wind at the start is easterly (090°) and quite light (4 to 6 knots), but it's expected to build slowly during the afternoon. There are also more waves than wind, and the current is running fairly strong right to left as you look upwind (it's flowing to the north). Your course is a modified outer trapezoid with the following legs (V-W-R-L-V-W-L-R-W).



PhotoBoat Inc.

**41** As you prepare for the start, you track the wind patterns. When there's current, which are *not* good ways to gauge the direction of your sailing wind?

- A) Shoot head to wind
- B) Bisect your tacking angle
- C) Watch the flag on the RC boat
- D) Use the ripples on the water
- E) Check an online wind service

**42** The starting line is set square to the sailing wind. Since the current is running from the boat end toward the pin, the boat end is favored because it's farther upcurrent. T F

**43** Before the start, you are not sure which side of the first beat is favored. So it's probably best to stay in the middle as you sail up the windward leg. T F

**44** Several minutes before the start you go head to wind on the starting line, and your bow is pointing directly at the windward mark. What can you say about the relative time you will spend on each tack during the first beat?

- A) Port tack will be longer
- B) Starboard tack will be longer
- C) Both tacks will be the same
- D) You need more information to determine this

**45** One of your goals for this race should be to avoid wind shadows since the negative effects of sailing in bad air are generally more pronounced in light air than in heavy air. T F

**46** Half way up the first beat you are on the left side, in fifth place, with a lot more port tack to sail to the first mark. Which of these are valid reasons for sailing the shorter (starboard) tack first?

- A) The entire fleet is to your right
- B) To gain on boats to the right
- C) To find a lane of clear air
- D) Current is better on the left

**47** When you approach the layline to the windward mark, you are a little farther from the mark than you wanted. Which of the following factors will *not* influence the location of the layline?

- A) The wind direction
- B) Whether you're in a puff or lull
- C) Strength of the current
- D) Size of the waves
- E) None of the above

**48** You should generally *not* sail high on a reaching leg when:

- A) You're expecting a header
- B) The wind velocity is decreasing
- C) Boats behind are going high
- D) Current is flowing to windward

**49** It could be a good strategy to take the low road on the first reach when:

- A) The reach is quite broad
- B) The wind speed is building
- C) Boats behind are going high
- D) Boats ahead are going high
- E) Low is inside at next mark
- F) The wind is shifting right

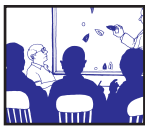
**50** You round the last leeward mark in second place with a short beat to the finish. You are a half length behind the leader, in their bad air, and the third boat is in the same place behind you; then there is a large gap to the fourth boat. Should you:

- A) Keep going on port tack until the third boat tacks; or
- B) Tack to starboard and go just far enough to clear your air?

## THE ANSWERS

Here are answers to the 50 questions on the previous four pages. Some of these are a bit subjective, so there may be more than one answer that makes sense in some cases. Look for expanded answers in Issue #111.

1. B 2. B 3. C 4. C 5. A, B, D 6. A 7. B 8. True 9. B 10. False 11. B, D 12. B 13. True 14. False 15. A 16. D 17. D 18. False 19. True 20. A, D, E 21. False 22. C, D 23. B 24. A 25. B 26. B 27. A, B, C, D 28. True 29. A, C, D 30. True 31. B 32. B 33. A 34. A 35. C, D 36. A, B 37. False 38. B 39. B 40. D 41. C, E 42. False 43. False 44. A 45. True 46. A, C 47. E 48. B, D 49. A, D, E, F 50. A



# A closer look at three rules!



## Recent history of Rule 18.2 (Giving Mark-Room)

For many years, rule 18 has said that when a boat enters the zone clear ahead, she essentially “owns” the zone. This means she is ‘thereafter’ entitled to mark-room from any boat that had been clear astern, unless the clear ahead boat passes head to wind. When that happens (e.g. often while tacking around the windward mark), the boat that was clear ahead is no longer entitled to mark-room. This is how the rules have worked for a long time.

When the 2009-2012 rulebook was published, however, rule 18.2c was slightly different. It still said that a boat clear ahead at the zone was entitled to mark-room ‘thereafter’ and that she lost this entitlement if she passed head to wind! In other words, a boat that entered the zone clear astern could get rid of her obligation to give mark-room simply by passing head to wind.

This notion of allowing the clear-astern boat to proactively get rid of her obligation (a tactic that was used occasionally in team racing during 2009) was unintended, unprecedented and potentially unsafe, so rule 18.2c has been changed. Now the rule says that only the clear-ahead boat can do something (e.g. pass head to wind) to give up her right to mark-room. This is the way it should be.

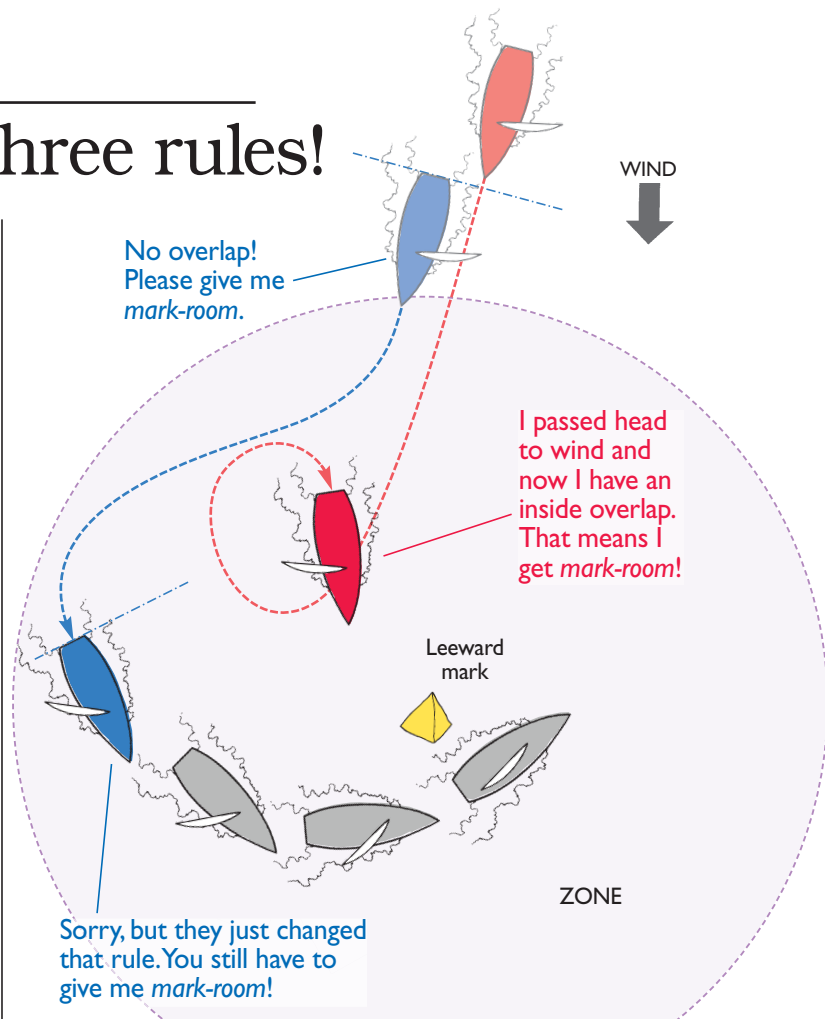
### CURRENT Rule 18.2c

(c) When a boat is required to give mark-room by rule 18.2b, (1) she shall continue to do so even if later an overlap is broken or a new overlap begins ...

However, if the boat entitled to mark-room passes head to wind or leaves the zone, rule 18.2b ceases to apply.

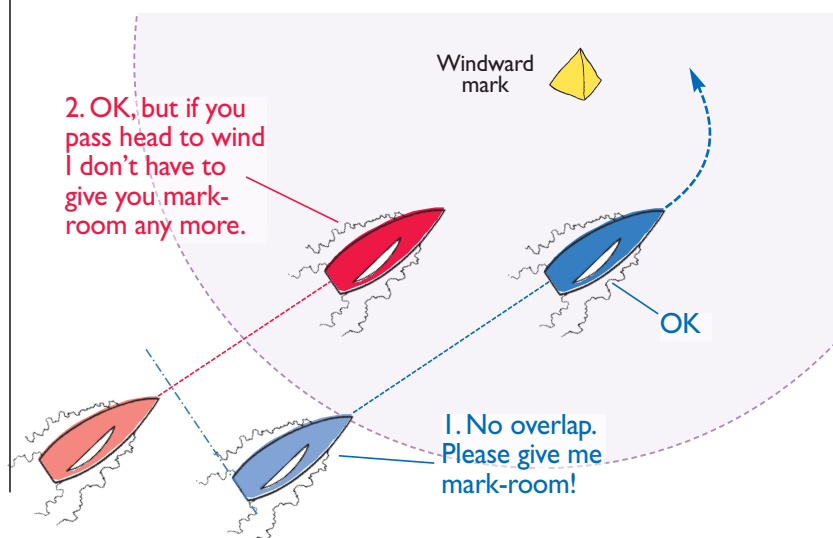
### OLD Rule 18.2(c)

(c) When a boat is required to give mark-room by rule 18.2(b), she shall continue to do so even if later an overlap is broken or a new overlap begins. However, if **either boat passes head to wind** or if the boat entitled to mark-room leaves the zone, rule 18.2(b) ceases to apply.



▲ According to rule 18.2c, when Blue enters the zone clear ahead of Red (above) she is ‘thereafter’ entitled to mark-room from Red as long as rule 18 applies. However, the old version of rule 18.2c said that if Red passed head to wind she no longer had to give mark-room to Blue. So when Red tacked (above) she got rid of her obligation to give mark-room to Blue. In fact, since Red came out of her tack with an inside overlap, Blue then had to give mark-room to Red (rule 18.2a)!

▼ The rulemakers changed this to be like the pre-2009 rule. This means only the actions of the clear-ahead boat can turn off her entitlement to mark-room. Now this rule will apply typically as before – when two boats on the same tack have to tack around a windward mark (below).



## Recent history of the definition of *Obstruction*

Though the current definition of *Obstruction* has been largely unchanged since 1997, recent incidents on the race course motivated rulemakers to reconsider one of its provisions. The problem involved other racing boats that were defined as obstructions. It was always intended that right-of-way boats should be considered obstructions to give-way boats. But the old definition also included, as obstructions, boats that were entitled to room or mark-room.

As you can see from the two sample situations at right, this led to some unexpected outcomes. When a right-of-way boat changed course, for example, she had to give all other boats room to keep clear, and therefore they were obstructions. This became very complicated in multi-boat situations, so the rulemakers changed the definition by deleting the words “give her room or mark-room.” That means a give-way boat can no longer be considered an obstruction unless rule 23 applies (i.e. the give-way boat is capsized, anchored, aground or helping a boat or person in danger).

### CURRENT Definition: *Obstruction*

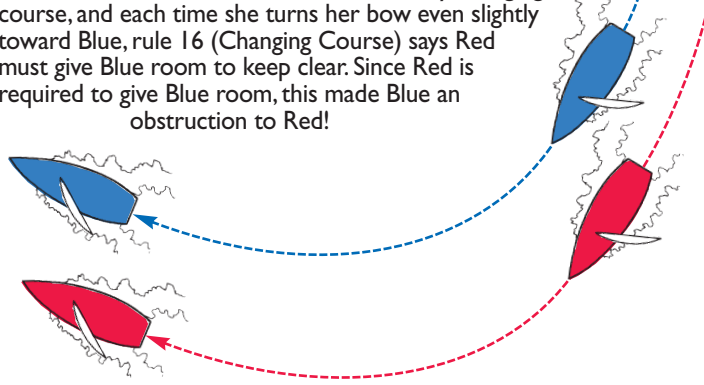
An object that a boat could not pass without changing course substantially, if she were sailing directly towards it and one of her hull lengths from it. An object that can be safely passed on only one side and an area so designated by the sailing instructions are also obstructions. However, a boat racing is not an obstruction to other boats unless they are required to keep clear of her or, if rule 23 applies, avoid her. A vessel under way, including a boat racing, is never a continuing obstruction.

### OLD Definition: *Obstruction*

An object that a boat could not pass ... are also obstructions. However, a boat racing is not an obstruction to other boats unless they are required to keep clear of her, **give her room** or **mark-room** or, if rule 22 applies, avoid her. A vessel ...

▼ According to both the new and old definitions of *Obstruction*, Red is an obstruction to Blue in this situation. Red is a leeward boat and therefore, according to rule 11 (On the Same Tack; Overlapped), she has the right of way. Since Blue has to keep clear of Red, this makes Red an obstruction to Blue.

Under the old definition, however, Blue was also an obstruction to Red here. Red is continuously changing course, and each time she turns her bow even slightly toward Blue, rule 16 (Changing Course) says Red must give Blue room to keep clear. Since Red is required to give Blue room, this made Blue an obstruction to Red!



▼ In this three-boat situation on a beat, Blue must keep clear of Purple (Rule 10 – Opposite Tacks) and Red must also keep clear of Purple (Rule 11 – On the Same Tack; Overlapped). Therefore, Purple is an obstruction to both Blue and Red.

But is either boat an obstruction to Purple? Since Purple is a right-of-way boat changing course, she must give each of the other boats room to keep clear (Rule 16 – Changing Course). Therefore, under the old definition of *Obstruction*, both Blue and Red were obstructions to Purple (and therefore Purple could have actually hailed Red for room to tack under rule 20!). This is changed in the current (2013-2016) definition of *Obstruction* (see left).



## Evolution of the Definition of *Party*

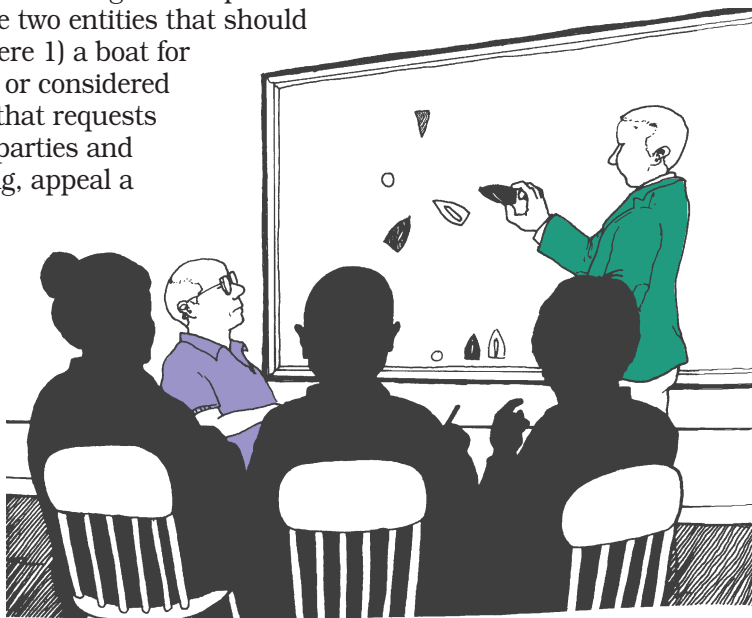
A party is a boat, competitor or committee that has certain rights in a protest hearing. Under the old definition of *Party*, there were two entities that should have been considered parties but were not. These were 1) a boat for whom redress was requested by the race committee or considered by the protest committee; and 2) a race committee that requests redress for a boat under rule 60.2b. These are now parties and therefore have the right to be present at the hearing, appeal a decision and so on.

### CURRENT Definition: *Party*

A party to a hearing is

- for a protest hearing: a protestor; a protestee;
- for a request for redress: a boat requesting redress or for which redress is requested, a race committee acting under rule 60.2(b);
- for a request for redress under rule 62.1(a): the body alleged to have made an improper action or omission;
- a boat or a competitor that may be penalized under rule 69.2.

However, the protest committee is never a party.



This issue was updated in January 2014.

To sign up or just learn more, click below:

**[Subscribe to Speed & Smarts](#)**

**[Get 'Learn the Racing Rules'](#)**

Our two-part DVD set explaining the current racing rules

#### © 2014 Speed & Smarts

All the material in this (and every other) issue of Speed & Smarts is copyrighted. Reproducing, sharing or giving this material to other people is expressly prohibited.

Speed & Smarts (ISSN 1075-5772) is published by Four Winds Inc.  
Address: PO Box 435, Easton, CT 06612  
Phone: 1-800-356-2200 or 203-445-0734

E-mail: [SpeedandSmarts@optonline.net](mailto:SpeedandSmarts@optonline.net)

Web site: [www.SpeedandSmarts.com](http://www.SpeedandSmarts.com)

FB: [www.Facebook.com/SpeedandSmarts](http://www.Facebook.com/SpeedandSmarts)

Publisher: David Dellenbaugh Manager: Joanne DeLuca Art: Brad Dellenbaugh

© 2014 Speed & Smarts All rights reserved.

#### Subscriptions:

We offer two versions of Speed & Smarts:

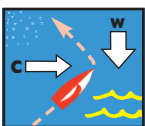
The **Email version** is available everywhere for \$38 per year (\$66 for 2 years).

The **Paper version** is available only in the U.S. (\$48/86) and Canada (\$53/95).

Speed & Smarts is published every other month.

Issues are numbered sequentially, and issue dates are approximate.

Almost all of the back issues are still available.



## STRATEGY

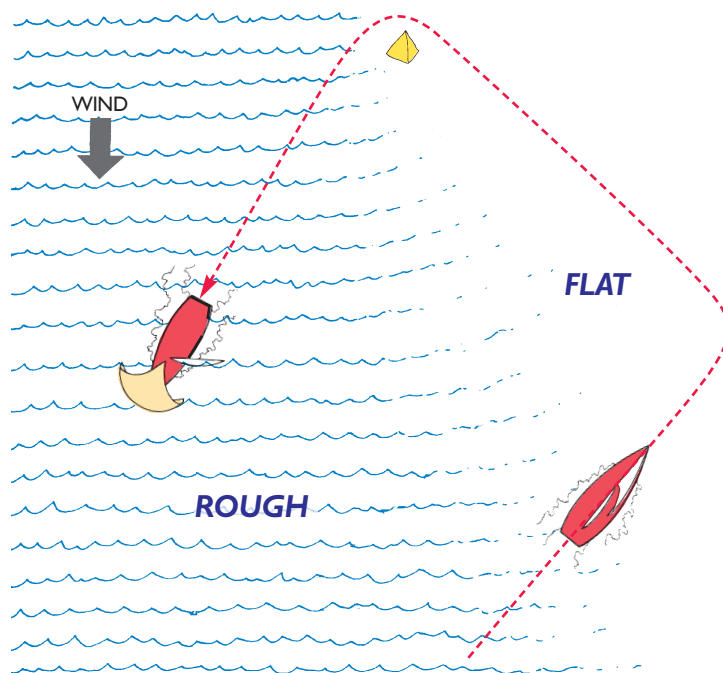
# How waves affect your gameplan

In most races, the waves are equal on both sides of the course, so they don't make a difference strategically. However, once in a while there is a noticeable variation in wave size across the racing area. Since waves can have a huge impact on your speed, you must consider this in your strategic gameplan.

If all other factors are equal, it's usually better to sail upwind in the smaller waves and downwind in the bigger waves. That will normally maximize your progress toward the finish line. But rarely are "all things equal" when there is a difference in waves across the race course.

In fact, waves are more likely to be 'strategic indicators' than 'strategic factors' of their own. In other words, an imbalance of waves probably means something else is happening. So when you're making a plan for the race, look for an underlying reason.

Typically, more waves mean there is stronger wind in that area, or they show an area where the current is running more strongly against (or less strongly with) the wind. In either case, it would probably be better strategically to sail into the bigger waves upwind. That's because the amount you gain by sailing in stronger wind or current usually outweighs the disadvantage of sailing in bigger waves.



One reason why you occasionally see a difference in wave heights across the course is the presence of a land mass to windward of the racing area. In the example shown here, the water is flatter on the right side where it is protected by the shore. The waves are bigger on the left side, away from shore, where they have more room to build.

If all other factors are equal (which is seldom!), it would be better strategically to play the right side of the beat and the opposite side of the run. This will minimize the degree to which waves hurt you upwind, and it will maximize the amount they (usually) help you downwind.

SHORE