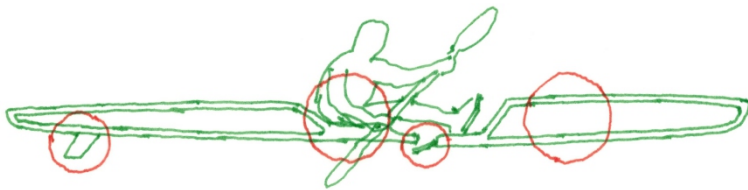
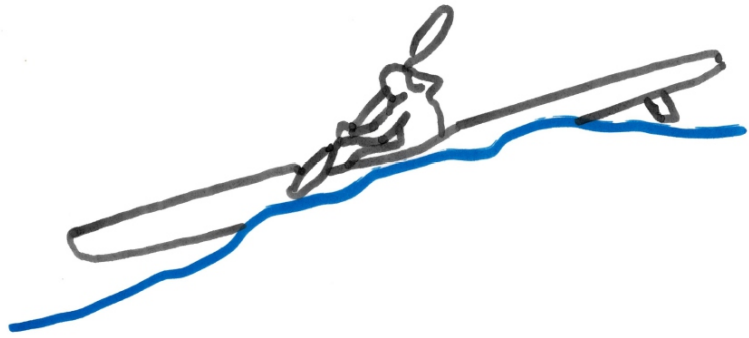


Henning Hansen: SURFSKI

A paddlers introduction



Lightweight and fast like a racing kayak
Long and seaworthy like a sea kayak
Great safety at sea:

- Closed hull, cannot sink
- With self-draining bailer
- Sit-on-top, easy reentry
- Big rudder for good control

Built for **OCEAN RACE**
Suitable for all conditions -
a surfski goes everywhere!



OCEAN RACE AND SURFSKI

What is it?

Ocean race is a competition at open sea, or at least in similar conditions. The distance is 15-30 km for most races, and "downwind" conditions with 1-2 m waves are preferred. There are also much longer races, often inspired by local geography, when nature provides interesting challenges to go from one point to another. For optimal downwind conditions, the exact route as well as the time of the race (even the day) is often decided as late as possible, but since it depends on the weather you eventually need to accept the conditions of the day. Ocean races are usually open for anyone, so participating is on your own responsibility - most events do have specific rules regarding safety equipment, though.

What is a surfski then? A surfski is a sit-on-top kayak with a closed water-tight hull, that's basically it. There are no restrictions with regards to build materials, weight, size, or the shape of an ocean race surfski. There must be an attach point for a leg leash, and you will not make it without a rudder. Apart from this, the design is very open, and there is no demand that everyone use similar equipment. The choice of boat is a personal one, and it will depend on your own abilities as well as the conditions of the race.

Ocean Race is an Extreme Sport

Any paddler can enjoy paddling a surfski, but ocean race is obviously not for beginners. You need experience to paddle safely in the waves, and you must be sure to get up again if you fall into the water. Or more precisely: WHEN you fall into the water. For experienced paddlers, however, ocean race offers opportunity to develop your skills in new and exciting ways, that can provide pleasure for many years to come, often as a "second career" after sprint or marathon paddling. The sea is always changing, and it's always stimulating and satisfying to experience yourself as part of the elements of nature.

"Life is a Beach"

Ocean race has developed from the surfski discipline in surf life saving, and has become very popular in Australia and South Africa. Races have been organized locally and have grown bigger over the years. For many years the Molokai Challenge in Hawaii has been recognized as the unofficial world championship of surfski ocean race. The sport is still characterized by an open "Life is a Beach" attitude, forming a friendly and relaxed society where elite and beginners meet and participate in the same events, and you will find helpfulness and exchange advice about training and technique.

Since 2010 ocean race has been an acknowledged sports discipline by the ICF (International Canoe Federation), so there are now official ICF championships and efforts to "organize" ocean race.

NEW TO SURFSKI

Before you start

It would be a shame to damage your new boat (or your club's boat) the first time you try a surfski. If you come from other kayak disciplines, here are some issues you should pay attention to.

Take care of the boat

A surfski is long, so pay attention to both ends when handling it on land. Hold with a good grip on the ski, especially if it is windy. Not all surfskis have handles, and with wet hands they can be difficult to carry safely. Turning the ski in the direction of the wind helps.

Take care of the rudder. It is big and you can easily damage it either on land, or on low water. If you hit a stone with the rudder, it may bend and make a hole in the bottom of the boat.

The bailer in the bottom of the boat can easily be damaged when the boat is on land. If the bailer can be closed, remember to do so.

Steering pedals can be damaged if you put pressure on both sides at the same time. Remember that your feet should apply force from your heels in a surfski. Adjust the pedals so you have good feeling with the rudder without putting weight on them.

Safety on the water

Before paddling on the ocean, be sure that you can get back up into the boat after a capsize. The reentry is your basic technique to avoid getting in trouble, and you are going to need it. It's not difficult as such, since a surfski is by far the easiest type of kayak to get back into - however, you must be able to do it in conditions where you would not find yourself paddling in other kayaks.

Remember the leg-leash. A surfski is very light and floats on top of the water, so it drifts away very easily in just a little wind, much faster than you can swim.

How to get on the water - and back in

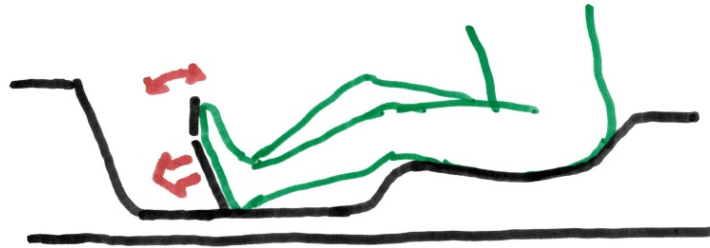
You go out from the beach. When water height is to your knees, sit down from the side and move your legs in, using your paddle for support. Remember the leg-leash, and take care not to damage the rudder.

Coming back in, just jump out to the side and stand up.

Don't use a boat pier, unless you really have to (in a harbour). It's actually a little difficult.

SETUP

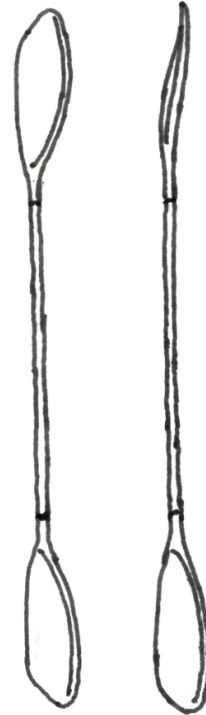
Surfski and paddle



Your position in the surfski is adjusted by moving the footplate. Keep the legs in a low position for stability, when paddling in waves. Keep knees together so your legs can move freely during rotation without disturbing balance. Legs should not rest on the sides of the boat. During rotation, one leg can be almost stretched, but must allow easy "cycling" movement.

Force is transferred to the boat from your heels, and the rudder is controlled via foot pedals using your toes. The footplate leans forward to support your foot at the best angle, and the steering pedals should be adjusted to be between vertical and the angle of the footplate, so you have good feeling with the rudder.

It's probably best to use a smaller and a little shorter paddle than you would normally use in a racing kayak. This is easier to use in strong winds, a long paddle is hard to paddle against the waves, and a short paddle suits a low paddling style for better stability and balance in difficult conditions. With the lower style follows also that the preferred feather angle of the blades will be smaller - if you don't prefer zero feather, that is.



SAFETY

Think about safety before you need it



Dressing in the summer

Bathing suit or light paddling suit, sun protection: sun glasses, hat, thin shirt, etc.

Dressing in the winter

Dry- or wetsuit, neoprene socks and gloves, warm cap. Remember light when it's dark.

Drysuit

- Warm and dry - at low intensity
- Sweat can make it not so warm
- Only works when dry, not when damaged
- Loose fit, not good for swimming
- Easy to get on and off
- Good drysuits are expensive
- Underwear can be varied to suit conditions

Safety list

- PFD (Personal Floating Device, life jacket)
- Leg-leash (line connecting paddler and boat)
- Smoke or light flare (on your body, not in boat)
- Dress for water temperature
- Plan B (swimming to land, help nearby)
- Mobile phone (in water tight bag)
- Compass (or GPS)

Beware of false safety

- It feels safe to paddle with others, but how can they help you when in trouble?
- It feels safe to bring your phone, but can you use it when in the water? Don't count on it.
- Do you know how to use your flare?
- A PFD is only of help if you are wearing it!

Weather conditions

- Cold weather (and water) must be taken seriously. Small accidents can have fatal consequences.
- Off-shore winds is no problem - until you have another problem. But from then on it will only get worse!
- If in doubt - don't!

Wetsuit

- Slim and flexible (if good quality)
- Safe, keeps warm even if damaged
- Works well above as well as in the water
- Size must fit or it's no good
- A thick wetsuit is not easy to get out of
- Cheaper than drysuit, but you may want to have two for different temperatures

KAYAK PADDLING

Basic technique

The 4 phases of the paddle stroke

Catch - blade entry into the water

Power - accelerating the boat

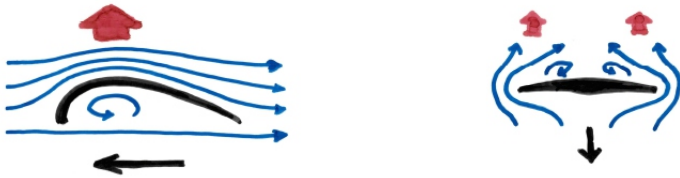
Exit - lift blade out from water

Glide - rest and get ready for next catch

Use the core of your body

The power phase is not a push and pull with your arms, it's a rotation of your body, using the strong muscles in your legs and body core to put pressure on the paddle. Arms are just connectors, transmitting the force from body to paddle. The movement is in your legs and lower body. Arms and shoulders move with your upper body as a connected figure, in a rotation supported all the way from your feet (heels).

This is made possible by the wing paddle, which does not work like flat paddles by being dragged along the side of the boat, but as a wing that produces a forward force, when it is moved away from the boat. It's like comparing an old steamboat wheel to a modern propeller.



Your upper hand should follow the rotation of your body and move horizontally before your eyes, not too far away from your face. If your top hand loses height, it is because you do not apply pressure on the paddle due to lack of rotation.

When paddling correctly using your legs and body rotation, your knees will move up and down, as the legs are working. Don't focus on leg movement to get better technique. Think about paddling with your body instead of your arms, getting an efficient paddle stroke based on body rotation. Leg movement will then follow naturally and perfectly coordinated.

Canoing is not an arm sport!

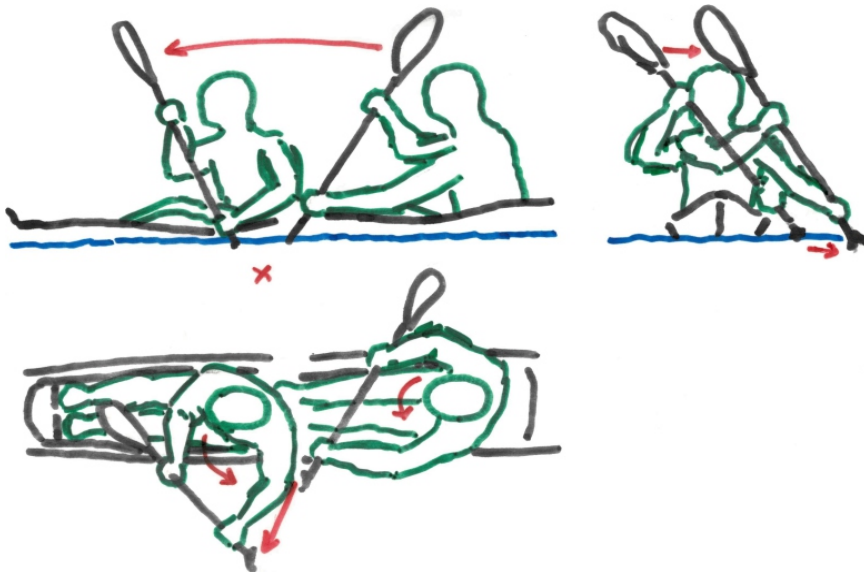
- If you push with the upper hand, the paddle will move past vertical and the stroke becomes too short.
- If you pull with your lower arm, the blade stalls in the water, and you drag yourself into the water instead of moving forward.

Technique during the stroke

- The catch must be clean and silent, sliding the blade forwardly down into the water, without splashing or applying force, except downward push from your upper arm.
- Keep top arm bend and in a fixed position during the power phase, while the lower arm is almost fully stretched. Put weight on the paddle by forcing the top arm shoulder in direction of the opposite knee.
- Lower arms shoulder should be loose to allow the paddle blade to move away from the boat during the rotation.
- Exit should be early, before the hips. When the paddle passes vertical and pressure goes away, slide the blade outwards and up, without lifting water with it.

ILLUSTRATION OF PADDLING TECHNIQUE

Rotation and support stroke (brace)



Forward paddling with rotation

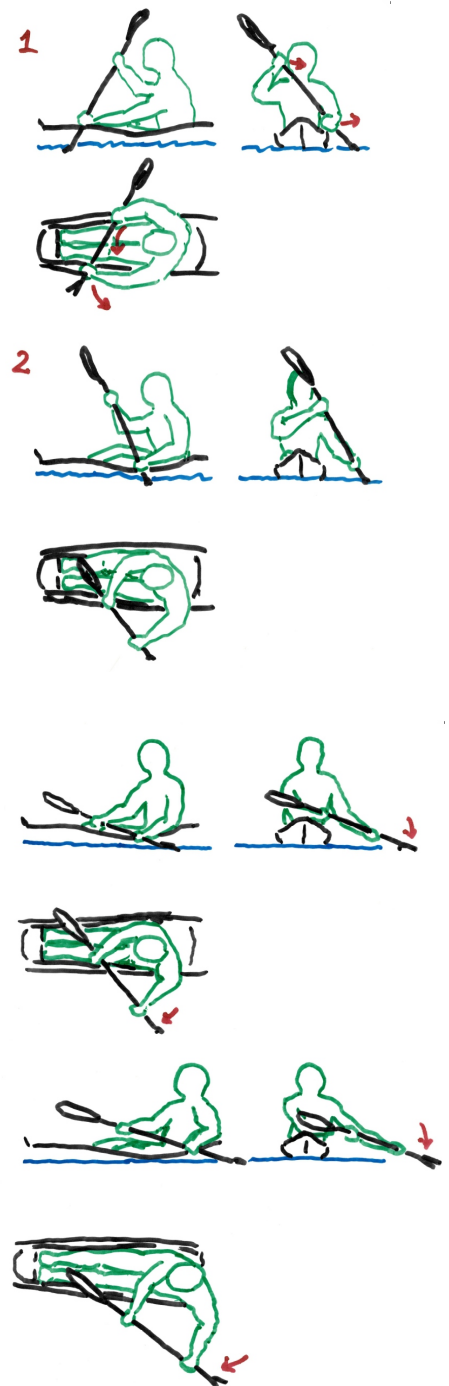
A wing paddle is not dragged backwards along the boat, it's the boat going forward. The lower arm moves freely in the shoulder, to allow the paddle blade to move away from the boat and out of the water. The paddle may actually move slightly forward while sliding away from the boat.

During the power phase (acceleration) the upper body is rotating as a whole, so all work is done by legs and lower body core.

Bracing - the support stroke

On top of a wave, bracing is used to control speed and position. You can also change the balance of the ski by moving your body weight. When surfing sideways on a wave, brace to the downwind side for better control. If taken by a braking wave, put your paddle on top of the wave and brace to the wind side until control is regained.

Two illustrations of bracing to the right, bracing in paddle position, and leaning back on the paddle for more powerful bracing.



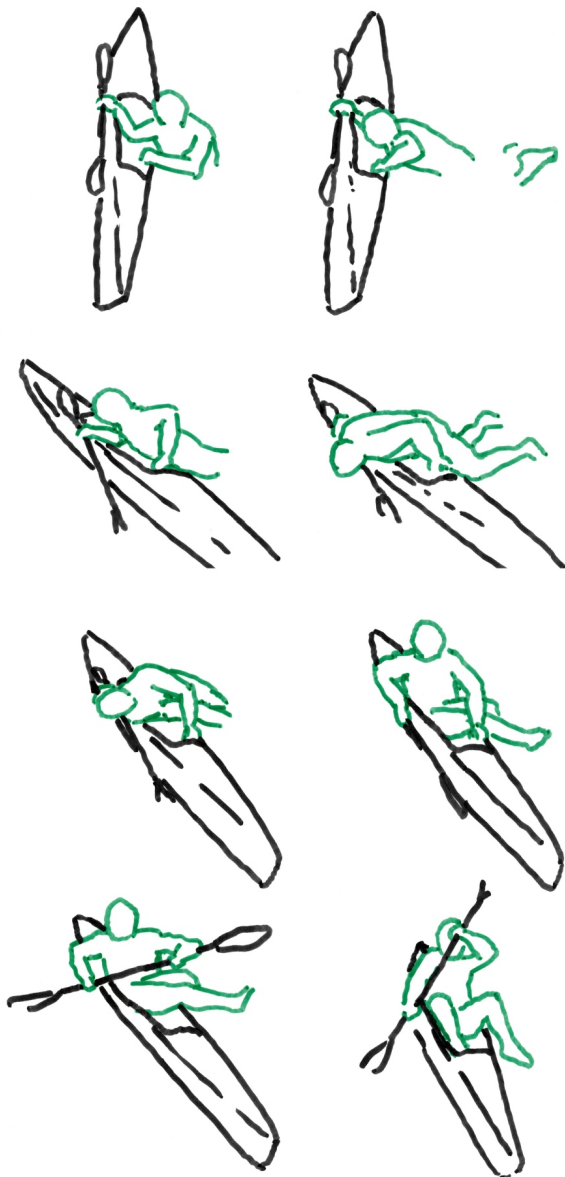
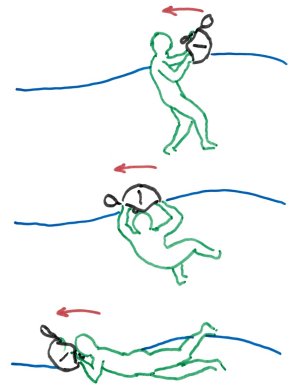
REENTRY OF SURFSKI FROM THE SEA

To be practised regularly, in realistic conditions

Before reentry

You cannot enter the boat if it is blown against you, so it must be done from the wind side. Reentry must be practised from both sides.

Hold one hand opposite of the seat, and the other hand more up front at the near side. Paddle is in the opposite hand. Take care not to entangle with the leash.



Now you are ready for reentry

- Hold boat with one hand on each side, the paddle at the far side. One elbow over seat.
- Legs high in the water to get up easily.
- Use legs in the water, and slide up over boat.
- Rest over boat, turn near hand so thumb is inside boat. Keep head low for stability.
- When ready, roll into the seat. Don't sit on the edge. Legs still to the side.
- Use legs in water to stay in balance.
- Grab paddle with both hands and begin paddling.
- Pull legs into the boat while paddling, one at a time. Support with the paddle to the side where your legs are coming from.

If you need more stability when lying still in the boat, put one leg out to each side to obtain stability.

TECHNIQUE

For paddling in waves

Low paddling style

- Stability, low center of gravity
- Less sensitivity to the wind
- Flexibility, easier to adjust to waveform
- Low elbows, more relaxed, better endurance

Weight on the paddle

- Weight on paddle blade applies forward force
- The blade is your point of support for balance
- Will catch the water whatever the waveform
- Avoid "air stroke"



Accelerate and rest

- Hunting: Keep speed up between waves, wait for a good opportunity. *Focus on timing.*
- Catching the wave: Accelerate onto wave, a few powerful strokes only. *Focus on speed.*
- Ride the wave: Stay on top, conserve energy and gain speed. *Focus on energy.*
- From wave to wave: Look for an opening and glide through at high speed, with a clean catch, efficient rotation, and early exit to avoid being held back. *Focus on technique.*

Choose a stable boat

- Balance must not be an issue
- One missed stroke is one missed wave
- Stability comes before speed

Choose a smaller paddle

- More flexibility in choppy waters
- Better control in side- or headwind
- More effortless acceleration

HOLD ON TO YOUR TECHNIQUE IN WAVES

You need to use your strongest muscles when catching the waves.

Good technique improves stability, endurance, speed - and fun.

Efficient technique with rotation and leg-drive works as well in big waves!

POSITIONING ON THE WAVE

Where to be, where to go?

Let the waves do the hard work

- Always look where you want to go
- Find the easy spot on the wave
- Height is energy - and control
- Find your path, the sea is like a mountain landscape
- Save energy, gain speed

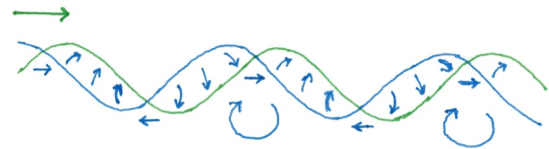
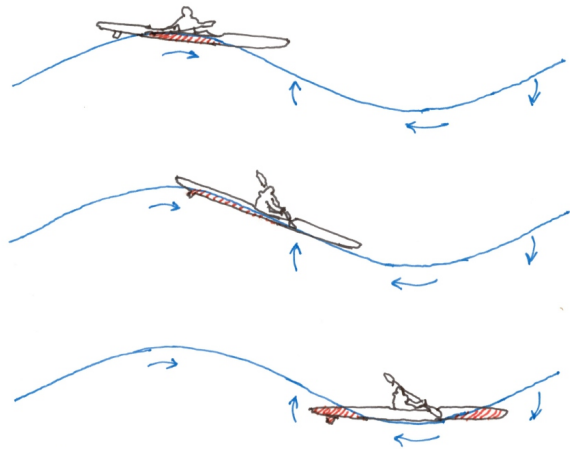
Special conditions

- Waves at the beach, passing through the surf

Bracing, not only for support

You can avoid an unwanted swim with a brace stroke, but in ocean racing the brace is an essential tool, when you wish to use the energy of the waves to obtain high speed with a minimum of effort.

- Used to position the ski on a wave and keep down speed, when needed.
- For control and stability when the wave is pushing from behind.
- For safe surf and good water contact.
- Brace to both sides for steering, low and relaxed, with weight on the paddle.
- Save energy while bracing, let the wave do all the work.



On the wave crest, water is moving forward, so you can save energy and stay in control. Less resistance with small wet surface area.

Acceleration can be found at the front of the wave, taking advantage of gravity and the lift of the rising wave.

Don't spend your time in the trough, water moves in the opposite direction, and both ends of the boat cause resistance.

GOING DOWNWIND

Surfing the waves

Preparing for surf

- Be ready, keep up in speed, use smaller waves to get up to speed
- Timing, wait for a good opportunity, don't go for waves you can't get
- Remember direction, what is your goal - don't let the wave decide where to go

Catching the wave

- Turn in the wave direction, so you need less speed to catch up
- Accelerate, the sooner the better
- Stop when the wave lifts your boat, avoid outrunning it and ending up in the trough

Staying on the wave

- Control position, speed, and direction
- Find the best spot, stay high and save energy
- Use bracing, rudder, "free-wheel" paddling
- Smile :-)

Catch waves in front (if possible)

- Surf sideways on the wave, increase the speed, look out for an opening
- At the right moment, accelerate from the top and pass through at high speed
- After passage, turn to the side looking for new surf on the front of a wave

Let go in time

- Don't fight hard to stay on the wave, there will be other waves
- Let it go in time, when you are losing the run
- Turn away from wave immediately not to lose speed going "nose up"
- Keep up speed, ready for a new try

ABOUT DOWNWIND

Remember...

Look where you want to go

- What you see in front, is also behind you
- Don't forget direction and your goal

Speed comes from

- Paddle stroke, physical power
- Height and gravity

It's OK to lose a wave

There will be other waves, they are all over the place. Be prepared, keep up to speed, it will come to you. Fighting too hard costs energy: speed, height, and power. Better to let one wave go than trying and losing. Let it go with minimum loss of energy. Energy is key, work with the waves, don't fight them.

Being good at catching waves is nice...

- letting them go in a good way is even better!

Always having bad luck?

Is it happening over and over – you just caught a good wave, and then it seems to dissolve and disappear. Maybe it's not bad luck!

Maybe you just don't let it help you, because you are too eager to accelerate away from it. Save your effort, wait for the wave to lift you up, and find "the spot" on the wave, where you don't have to work. Where you have best opportunity to take advantage of the wave height and speed, while you conserve physical and mental energy for your next upcoming challenge.

Very often, big waves come in groups (wave trains), and you should be patient and not necessarily go for the first wave in sight – there will probably come even better ones next after it. Unfortunately, a wave train moves with only half the speed of the waves, because the front waves lose size and the waves in the back grow bigger. So good waves tend to end up behind you anyway.

Downwind is an art form!

The ocean does not provide pure downwind.

In technical conditions with mixed up wave systems, it's about finding ways to keep the nose of the boat pointing downwards, avoid "nose up", find openings and surf, and keep a good flow at all times.

Exploiting this is the most exciting aspect of downwind paddling, and something you can improve forever.

The sea always changes, every downwind is a new experience, and new learning – it never gets boring.

This is why many K1 paddlers as well as swimmers, lifesavers, etc. find surfski an attractive choice, when looking for new challenges they can enjoy for years to come.

WAVES AND WAVES AGAIN

How does the sea turn into a mountain landscape?

Just go downwind, it's that simple – and yet so complicated!

The ocean is not a downwind lane with waves all going in the same direction. The ocean is a mixture of waves and swell from different directions, with additional reflecting sea and other disturbances from many sources, the weather is changing all the time, and finally, any route has its unique characteristics that count, when planning your race strategy.

When more wave systems are interfering, you can have different conditions.

Wave trains come from waves with different wave length travelling in the same direction, and waves that come in different directions will also combine to create areas with almost calm water, where they are in opposite phases, and disturbed areas where waves slash together with breaking crests.

One example of two wavesystems interacting is, when waves are coming in against some cliffs acting like a vertical wall, that bounces the waves back to sea, so they cross the original waves. The result is two almost equal wave systems combined to create a pattern of steep wave tops, that can be hard to paddle. Go there for a technical challenge if you wish, but it's generally best to avoid reflecting wave areas.

Another common example, that you can possibly benefit from, is when your route goes along a coast line with long and fast waves or swells coming from the sea, but also smaller waves from behind, that are easier to catch. You can take advantage of the smaller waves to get up to speed while surfing slightly away from shore, and use the speed from this to get onto a bigger wave from time to time. If you loose the big wave or need to change direction, start up again with the smaller waves, and so on.

In more complicated "technical" conditions, it's also about being proactive, change direction, get your nose down to accelerate, find speed and openings, catching the best waves. It's about energy and flow!

There is a lot to learn on the water... you don't get good at downwind just by reading!

Get into it!

You learn by doing. Theory cannot replace time on the water, and it's not as much fun, either.

But it may help you get started, and teach you something that makes paddling even more fun.

Look for inspiration, find out what works for you, and forget about the rest for now. Maybe something that doesn't seem useful to you today will make sense later.

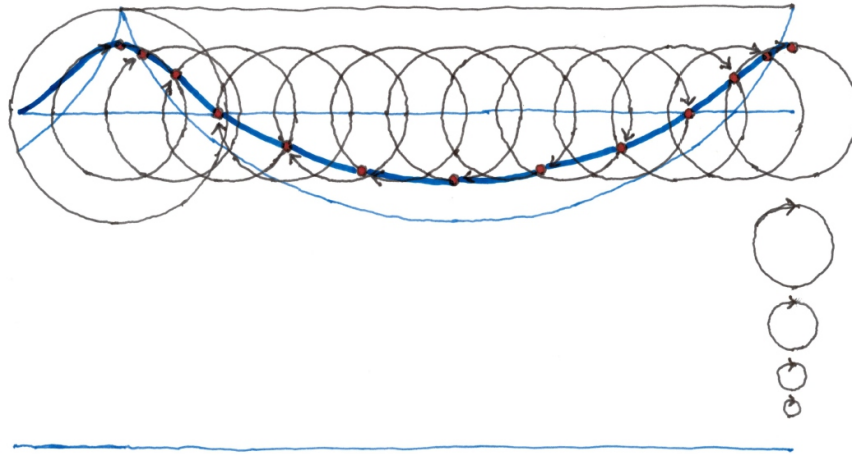
Find someone to go paddling with, attend some courses (clinics), and of course: take part in ocean races.

We will meet out there!

WAVE PHYSICS

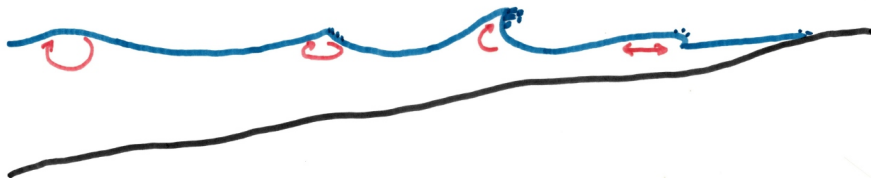
How is water moving?

When a wave is running on deep water, it's the wave form only that moves forward. The water itself moves in a circle, so when on top of the circle it moves in the wave direction on the crest of the wave, but in the trough it moves in the opposite direction. The circular movements repeat deeper down in the water, but in smaller circles until at the base depth of the wave, which for practical purposes is half the wave length.



When water depth is less than the base depth, a wave is slowed down, the wave length becomes shorter and the wave is compressed. Its shape changes in a number of phases, as the ratio between wave length and wave height decreases.

A wave approaching the shore first gets higher and steeper. When the wave height is $\frac{1}{7}$ of the wave length, the wave shape peaks and white water begins to appear at the crest. If the depth decreases further before the wave breaks, it will be pushed up and break from the top, before it falls together and ends up rolling into the beach - and back out again.



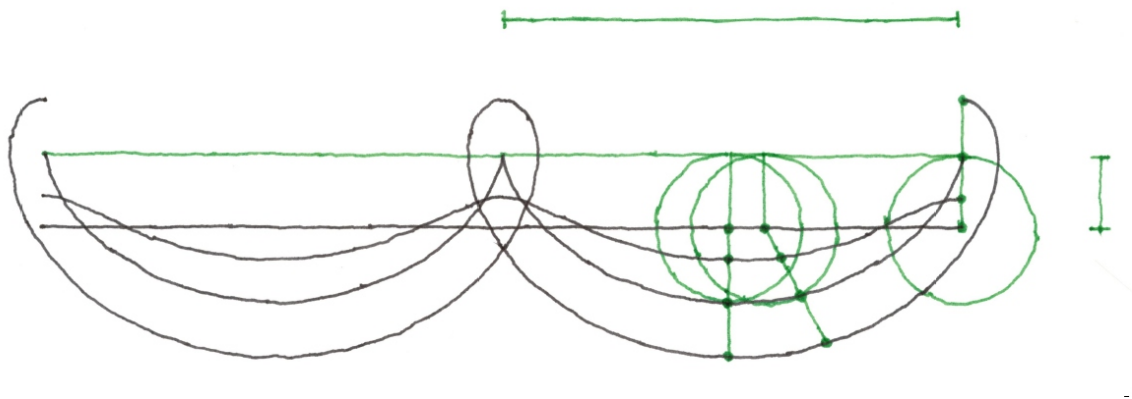
The trochoide

Geometrically, the shape of a wave is described by a trochoide, which is the curve rendered by a point on a rolling wheel. The wave length l is the distance a circle with radius r rolls in one round, and the wave height is the distance of the point from the center of the circle. To render a smooth wave, the point must be inside the circle, so the wave height is less than the radius of the circle. If the point is on the circle perimeter, so the wave height equals the circle radius, the wave crest will become a sharp peak (a cycloide). Mathematically the point can be located outside of the wheel, in which case the curve will intersect itself.

So to have a smooth wave, you need: $0 \leq h < r$. Since the wave length l equals $2\pi r$, this means: $l > 2\pi h$.

This explains why a wave crest peaks and begins breaking, when the wave length to wave height ratio becomes less than 7, which is near the theoretical limit of 2π .

Note that while the point on a rolling circle describes the surface of the waveform, this is not the movement of the water. Water on a smooth wave surface does move in a circle with radius h , but this circle does not "roll" in the direction of the wave.



What is wave height?

Wave height is the difference between flat water height (the middle value between crest and trough height) and the height of a wave crest (the amplitude). In many places, however, wave height is used for the measure of the difference between the highest and lowest height of the wave, from crest to trough.

It's often not clear from the context which definition is used, e.g. in weather forecasts.

SOMETHING TO WATCH

Links to selected videos

IVAN LAWLER: Kayak Technique Masterclass

"Canoing is not an arm sport"

Ivan Lawler at Richmond Canoe Club. Not about surfski, but good technique comes useful in all conditions. Ivan Lawler explains it as good as it gets.

<https://www.youtube.com/watch?v=VqXIF4ToUcE>

Oscar Chalupsky: Surfski Clinics

"Don't believe anything I say" - "You must know why"

Oscar Chalupsky surfski clinics from Nelo Summer Challenge 2018 and from Mauritius Ocean Classic. Ocean Race explained by the legend of downwind.

<https://www.facebook.com/NeloSummerChallenge/videos/263104530977997>

<https://www.youtube.com/watch?v=OLT0l2qf3AQ>

Oscar Chalupsky: Remount in extreme conditions

Most reentry videos are recorded in a swimming pool. Here Oscar demonstrates how it works in realistic conditions - like in the pool, really...

https://www.facebook.com/permalink.php?story_fbid=10155426218586157&id=594551156

Oscar Chalupsky: Nelo Summer Challenge 2018

Downwind video from Nelo Summer Challenge 2018, with comments. Oscar has done a number of such videos, this is just a short one.

<https://www.youtube.com/watch?v=cidpC-uroaE>