



La Rochelle

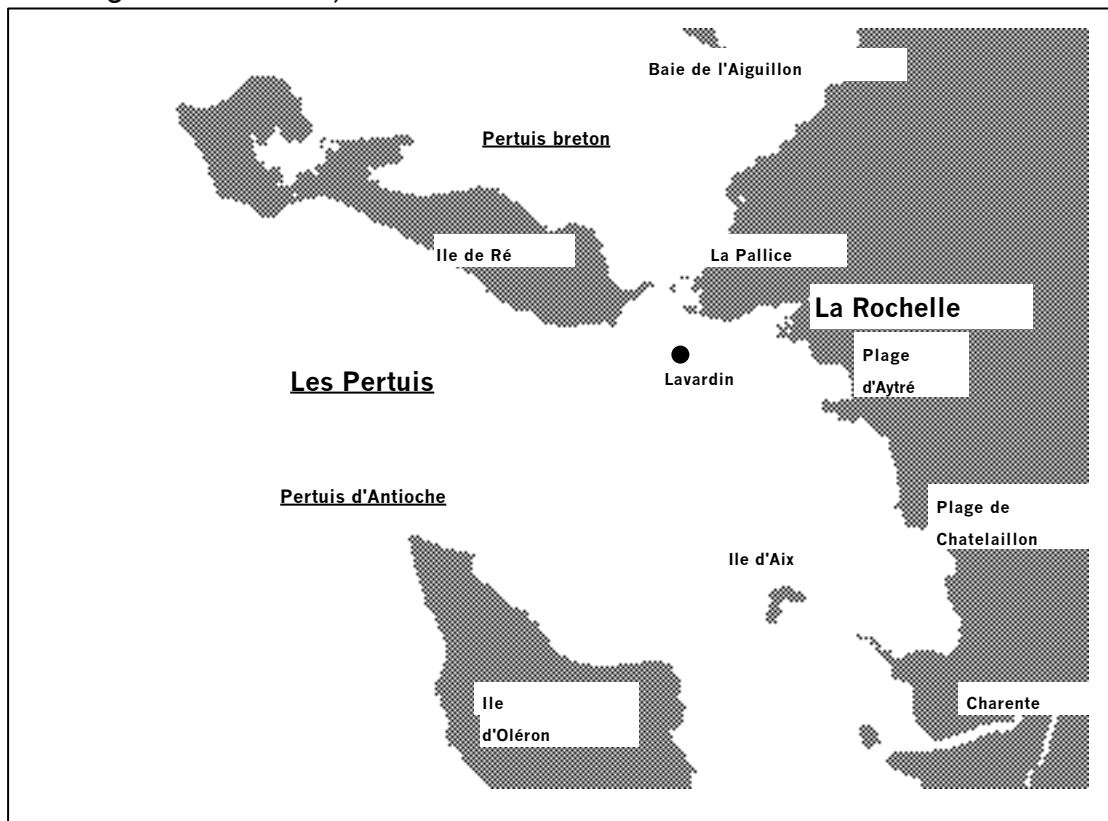
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La Rochelle

This is details about La Rochelle. We will discuss :

- coastal effects
- sea breeze
- tide

This is the sailing area with the name of the most important area (please, don't forget the accent...)



Coastal effects

The surrounds of La Rochelle are characterised by a low coastline in general, except for certain areas, for example " Chef de Baie " and the Narrows between l'Ile de Re and the mainland.

On a low coastline, the dominating effects are related to differential friction between the sea and the ground.

If one adapts this to La Rochelle, one can state the following :

1. Les Pertuis, between Ile de Re and Ile d'Oleron

We study ther wind pattern for the major synoptic wind direction.

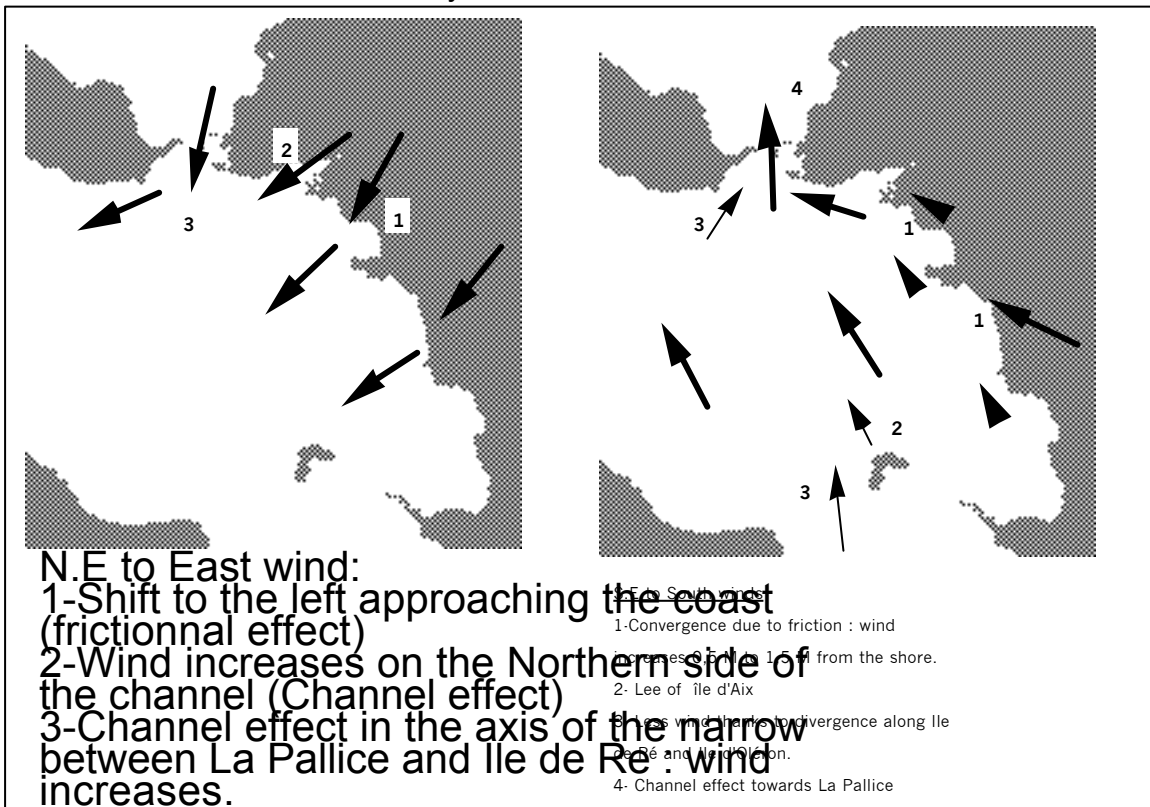
1.1. NE to SE Winds.

These are offshore winds, which are generally in a stable air mass. Therefore the frictional effects are important and extend two miles out to sea, sometimes 3 miles by the East to SE winds.

1.2. Winds from SE to S.

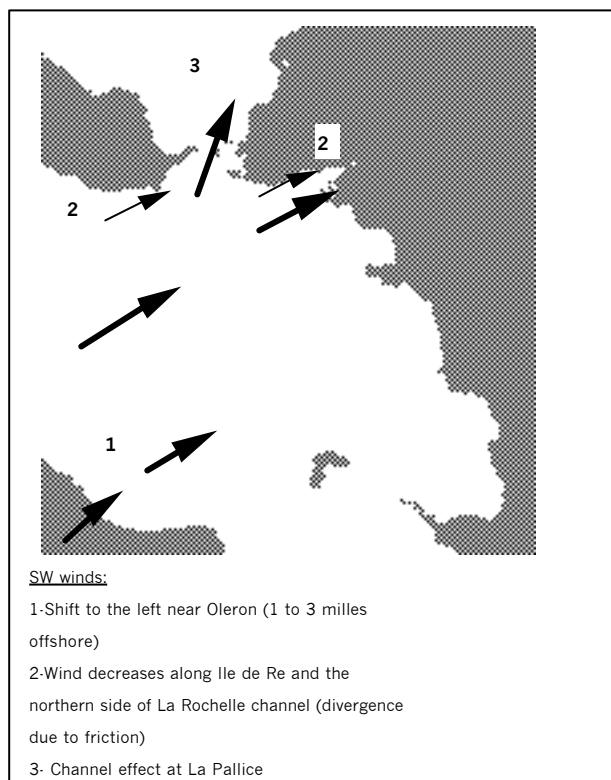
Winds from SE to South : there is more wind on the left of the course, thanks to the coastal convergence. (except very close to the beach.)

Wind from the South : l'ile d'Aix seriously disrupts the flow of the wind and it must therefore be avoided to stay in it's "wake".



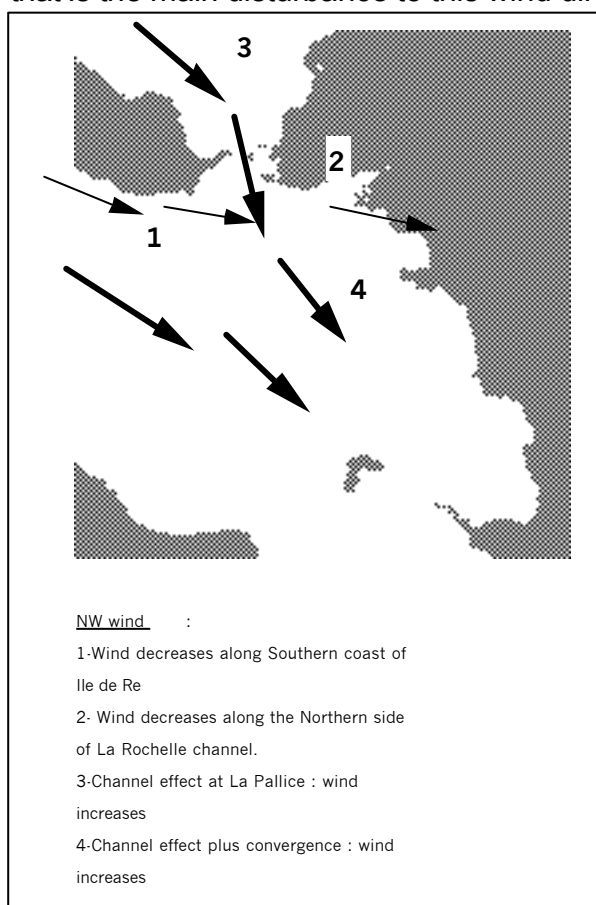
1.3. Winds from SW.

The influence of "Ile d'Oleron" reaches 1 to 3 miles off the coast.



1.4. NW to NW Winds.

It is l'Ile de Re that is the main disturbance to this wind direction.



2. The Channel effect in the vicinity of 'Chef de Baie' and 'La Pallice'.

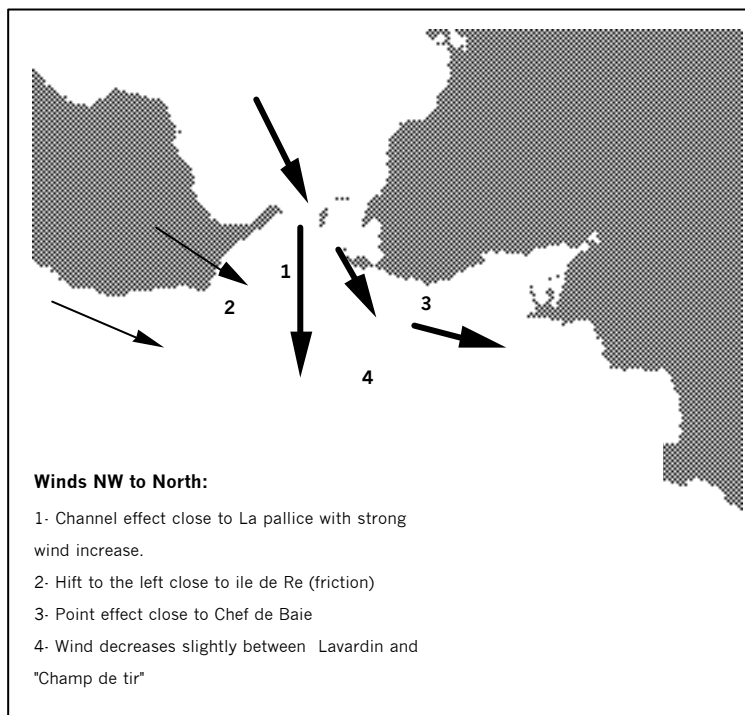
The small cliffs at point "Chef de baie" get an important channel effect on the Northern side of La Rochelle channel. Moreover, the narrow between La Pallice and Ile de Re, has a strong impact on the wind pattern.

Don't forget tidal streams which may modify the picture (see further)

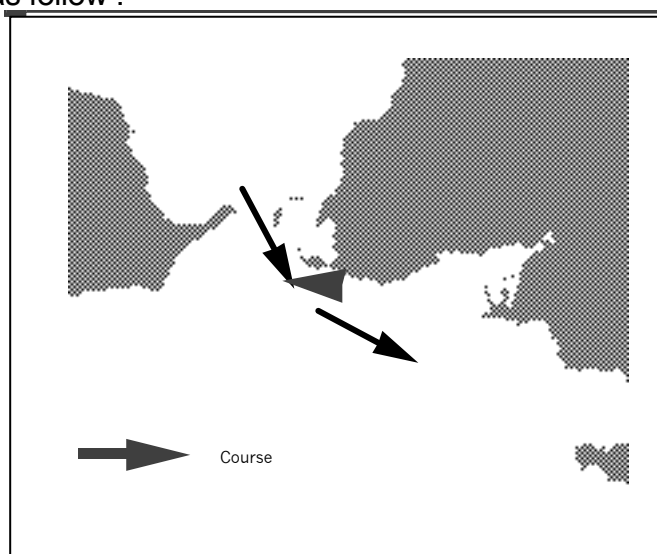
2.1. Winds from NW to North

With NW winds, friction is important on the Ile de Re side of the course. This means :

- a huge shift to the left, very close to Ile de Re
- a channel effect close to La Pallice.



Note that by those N.NW to North wind, the point effect is important and should be used as follow :

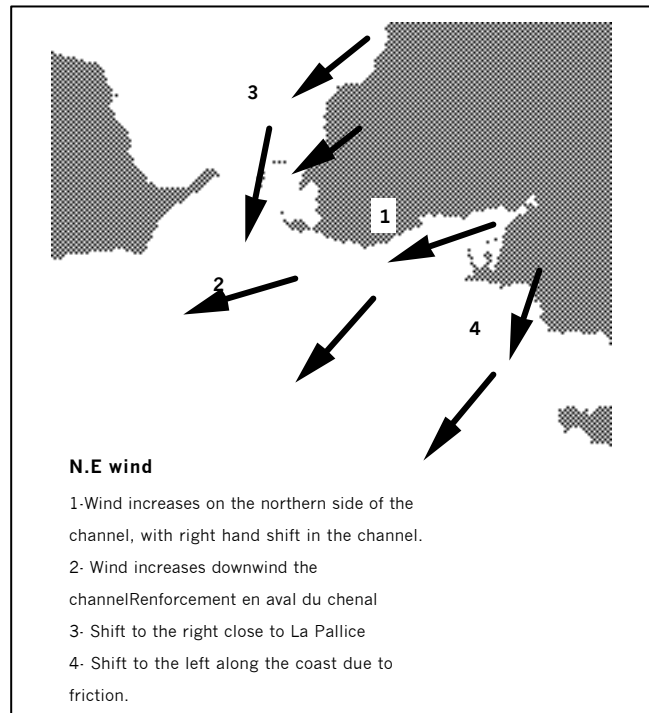


2.2. N.E wind

The major effect is the wind modification by La Rochelle channel. Wind is stronger on the Northern side of the channel, and this effect will continue downwind of the channel (1,5 Mille).

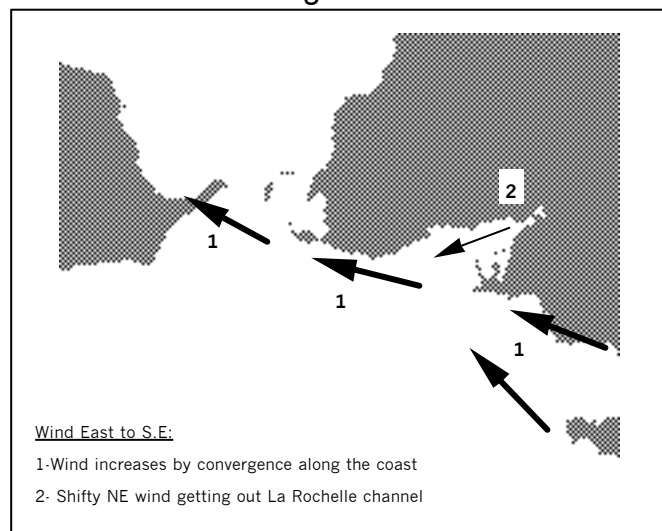
Keep in mind that this effect is at it's maximum when air is stable, for instance in early morning.

Note the right hand shift, with stronger wind along La Pallice, which is important.



2.3. East to S.E wind

Friction effect and channel effect give a much better wind along the coast.



Diurnal Variations of the wind in La Rochelle

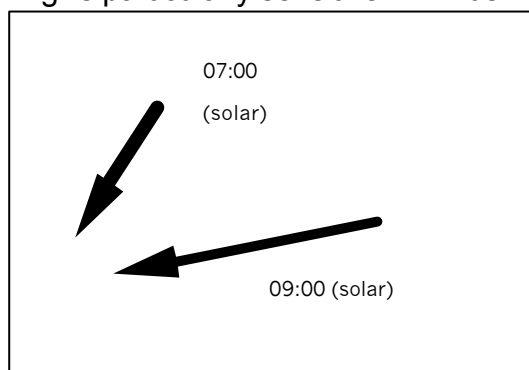
There are two types of diurnal effects:

- Thermal mixing
- Breeze effect

1. Thermal Mixing

Thermal mixing is the product of the heating up of an air mass during the early morning. The air mass becomes unstable, due to heating, and we will encounter around 7:00 to 8:00 (solar time) a 20° shift to the right, with a 5 kt increase of windspeed. This effect precedes the sea breeze and is not related to it.

The 'Thermal Mixing' is particularly sensitive in winds from the shore.



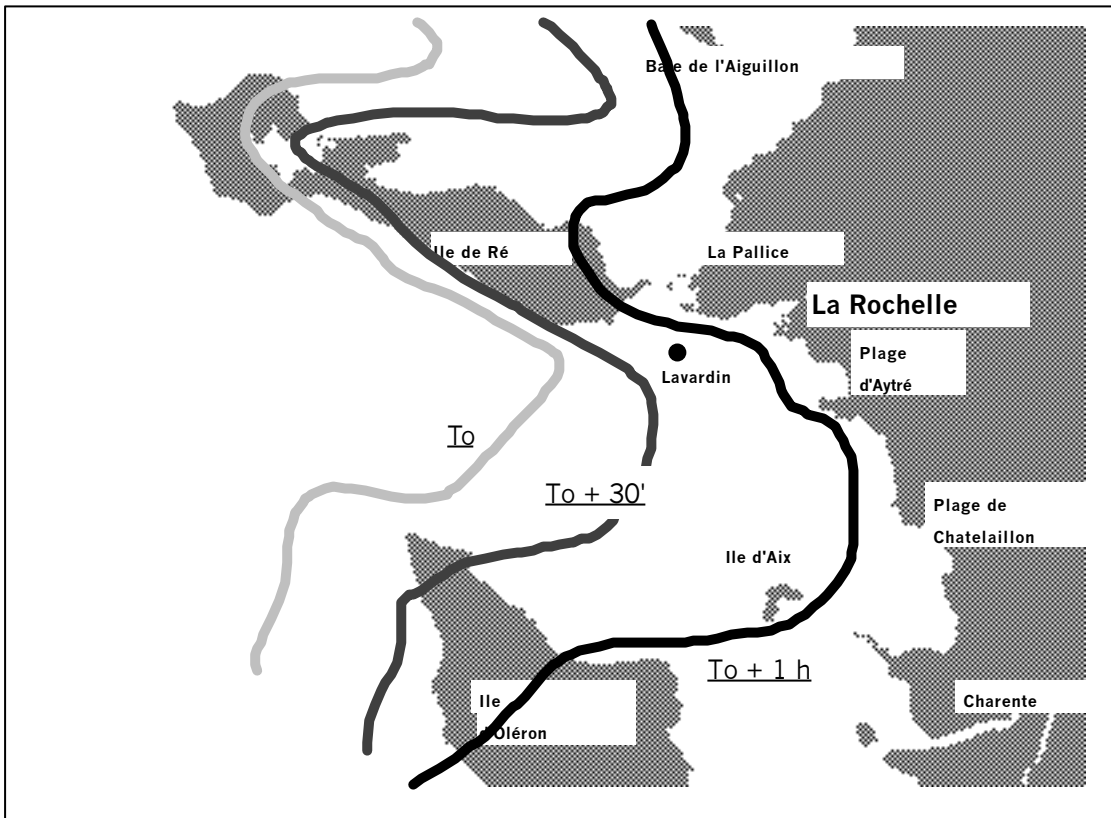
2. The Sea Breeze in 'La Rochelle'.

The classic phenomenon which precede the establishment of the breeze are:

- Clearing of the offshore horizon and the disappearance of a sea mist. (This is the most important warning of a sea breeze coming in)
- The appearance of cumulus clouds over the islands and along the coastline.
- The dropping of the wind around 11:00 hours local time.

The breeze front arrives generally from the open sea and is substantially slowed down by the islands. Its traveling speed is around 4 kt and it takes approximately 10 to 15 minutes to cross by the fluctuating wind area.

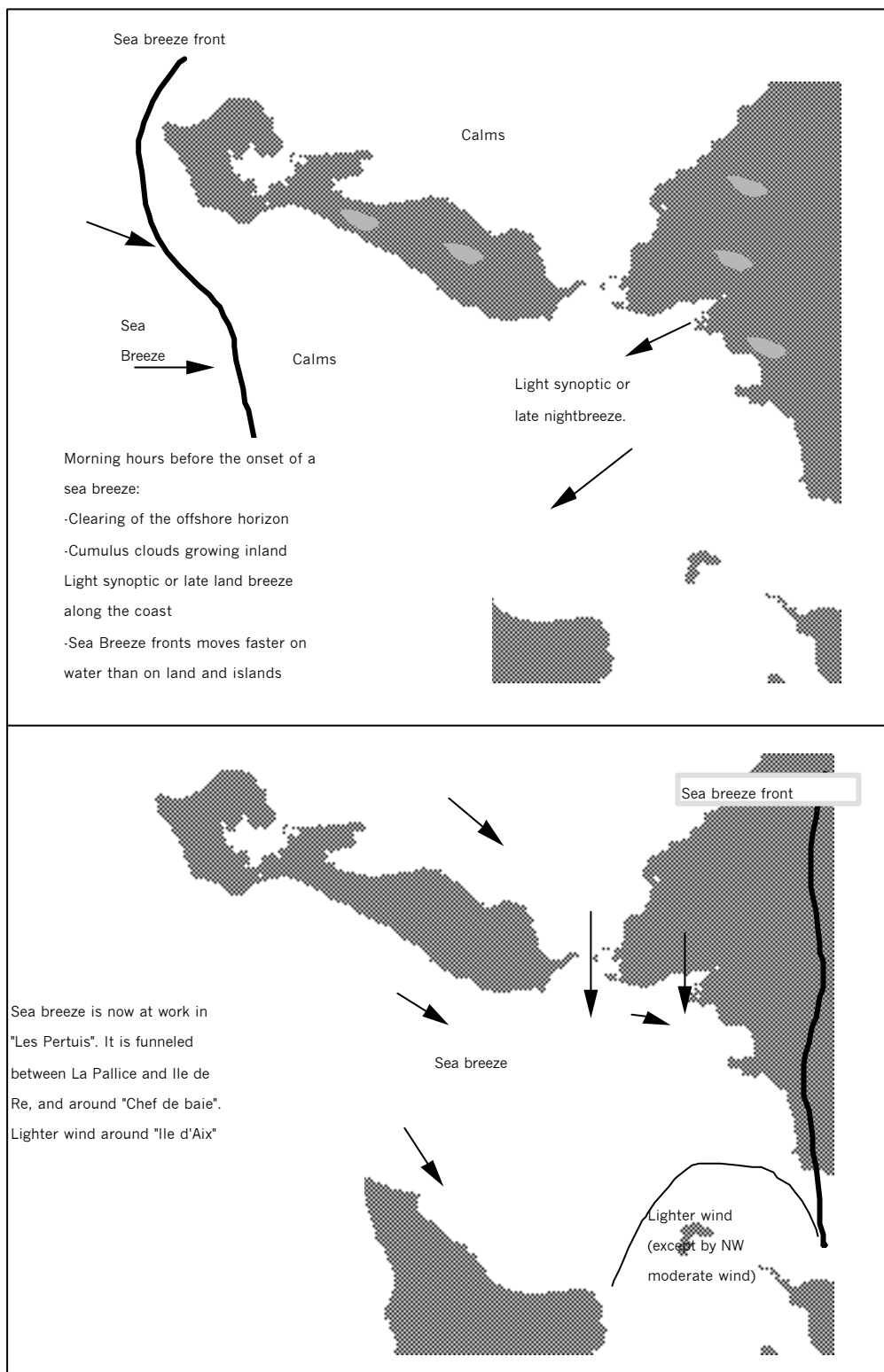
The following picture gives an idea of the progression of the sea breeze front.



In this interval the wind is very weak and it is essential to know how to play between the old and new winds.

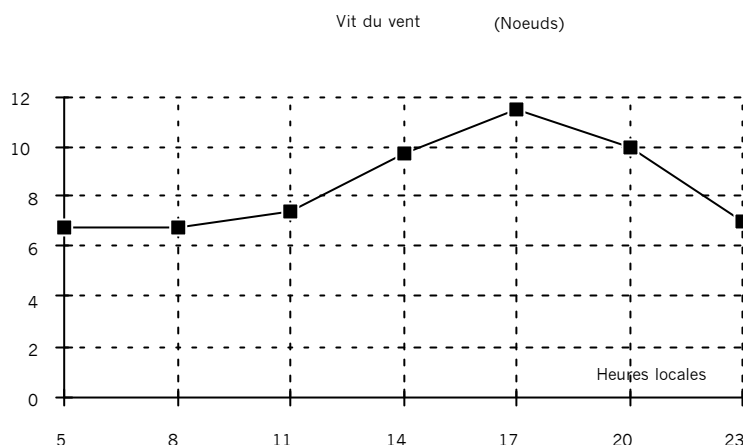
Once the breeze is fully established, its direction is truthfully described by the polygons of the breeze, which we will study further.

The following figures sum up the classic formation of the breeze during a day of weak synoptic or for weak synoptic SW to North wind.



3. The development of the Breeze

The following graph depicts a classic diurnal of wind strength by light synoptic or light winds from SW to North. (local time : UTC+2)

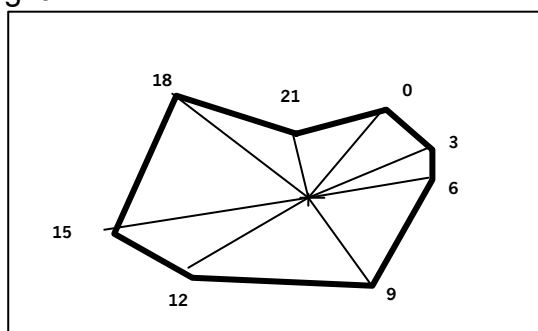


One is able to see the light morning wind, the onset of the breeze around 11:00 hours and the strongest wind around 17:00 hours (which is nearly twice the speed of the morning wind).

The directional development is described by the polygons of the wind which one can refer to in the notes attached. The following notes give some comments as to the anticipated developments.

4. Genuine Sea Breeze

This refers to an almost non-existent synoptic. It is the only case in which the breeze makes a complete clockwise turn, during the length of the day. One can note the usual strengthening between 11:00 and 14:00 hours and the regular rotation towards the right.

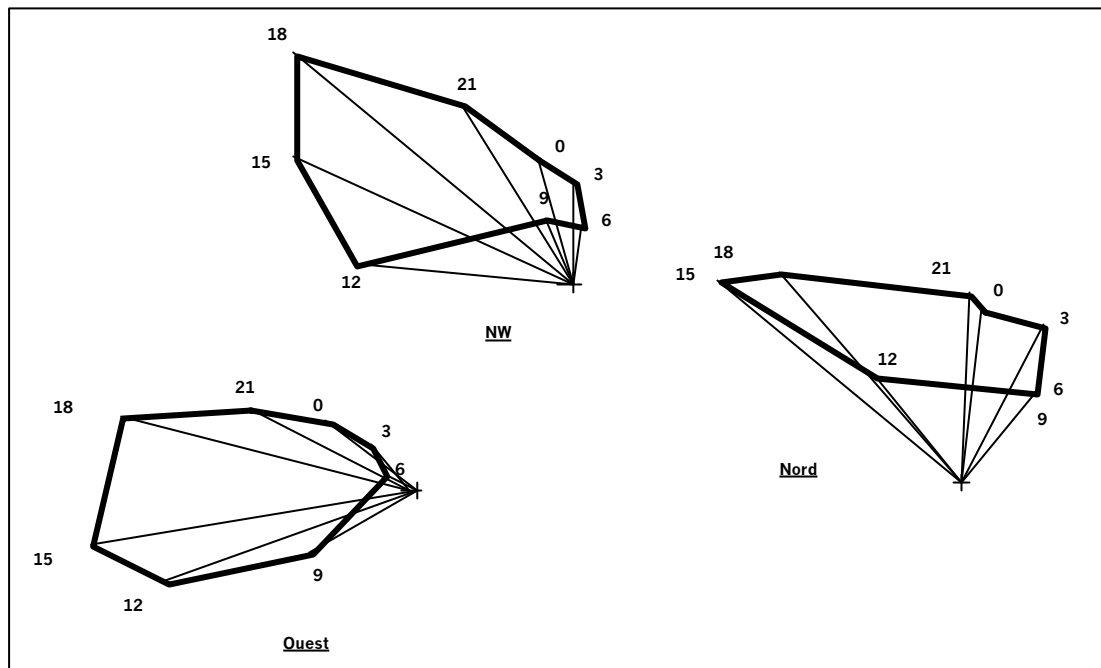


5. Light Synoptic less than 8 knots

5.1. Synoptic from West to North

For synoptic of less than 8 kt, the sea breeze effects of these areas are well noted for those synoptic direction.

The polygons given below, display the onset of the breeze between 11:00 and 4:00 hours, the strengthening of the wind in the afternoon (reaching its maximum speed at around 17:00 hours) is marked by a slow rotation to the right.



Time is UTC-Add 2 hours for local summer time

A more detailed study give the following informations (in local summer time):

5.1.1. West wind

- The breeze develops between 11:00 and 14:00 hours with a slow rotation to the right (10 degrees in 3 hours). The wind is already nearly perpendicular to the coast.
- Maximum wind strength towards 17:00 hours.
- After 17:00 hours the wind lightens and turns to the right much quicker (25 degrees in 3 hours).

5.1.2. Winds from the NW.

- The breeze develops between 11:00 and 14:00 hours with a rapid rotation to the right (60 degrees in 3 hours). The wind comes nearly perpendicular to the coast. The wind front is rather narrow.
- Later on following the regular rotation to the right: approx. 10 degrees an hour. Maximum wind strength around 20:00 hours.
- After 20:00 hours, the wind lightens and continues to turn steadily to the right.

5.1.3. Winds from the North.

- The development of the breeze between 11:00 and 14:00 hours with a rapid rotation to the left (60 degrees in 3 hours). The wind turns to become perpendicular to the coast.
- The rotation to the left continues until the breeze reaches its maximum strength around 17:00 hours.
- After 17:00 hours the wind lightens and turns quickly to the right (approx. 10 degrees an hour).

5.2. Synoptic from N.E. to South.

Everything is a lot harder to do in this in this wind. The contrast between the breeze and the synoptic gives a variable system of winds, with unsteady wind shift.

5.2.1. NE Winds.

During sea breeze onset, the wind will become lighter, as the breeze trends

to overcome the synoptic wind. (The breeze is not strong enough in these sectors to completely reverse the direction of the wind).

One therefore has :

- A slow rotation to the right in the morning due to the thermal mixing.
- The development of the breeze between 11:00 and 14:00 hours which leads to a lighter wind.

Then there are the following two cases:

1. The breeze conditions are very favourable. The breeze shifts rapidly to the NW. Thereafter it gains in strength until 16:00 hours after which it makes a slow rotation to the right whilst at the same time reducing in speed.

2. The breeze conditions are not so favourable. Slow wind shift to the left until 20:00 hours: the breeze tries to take the wind perpendicular to the coast.

(See fig below)

5.2.2. Winds from the East.

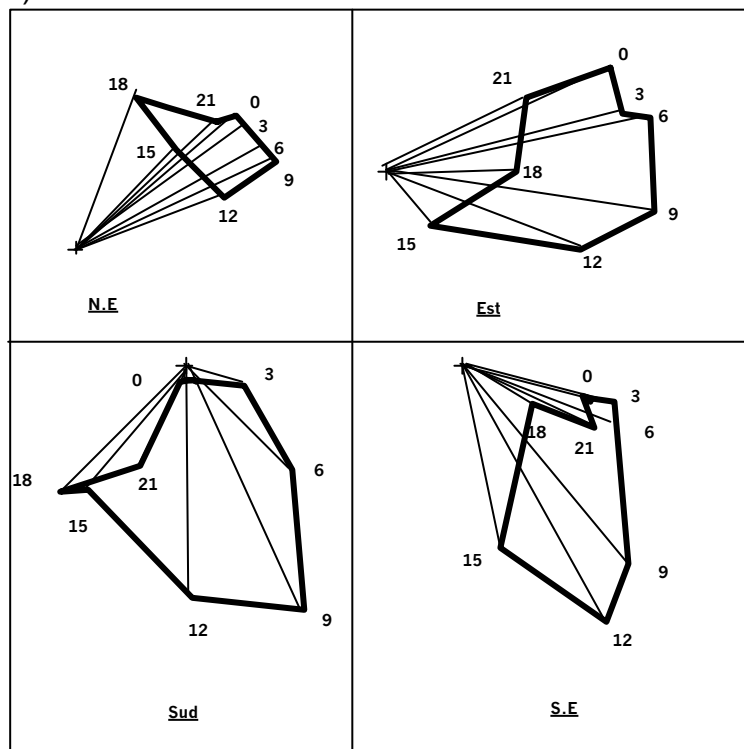
The main effect is thermal mixing which gives a shift to the right. The sea breeze therefore has little effect. Note the wind conditions are very turbulent and small wind shifts are very irregular.

(See fig below)

5.2.3. Winds from SE to South

This system is similar, with the exception that the breeze almost completely 'kills' the synoptic between 14:00 and 17:00 hours. Dead calm and dead winds for the whole day !

(See fig below)



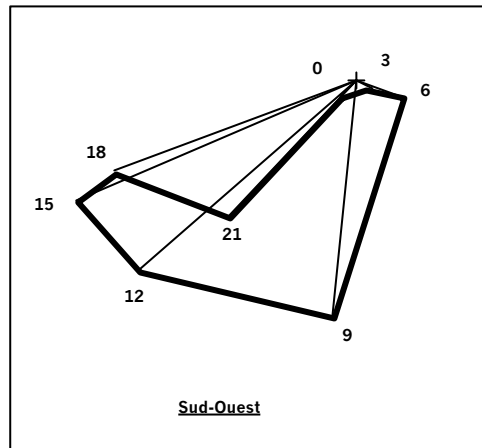
Time is UTC-Add 2 hours for local summer time

5.2.4. Synoptic from the SW.

Everything gets a little better. The breeze always establishes itself between 11:00 and 14:00 hours and the winds maintain themselves throughout the afternoon until 20:00 hours.

There is a steady shift to the right as long as the breeze holds, then after

20:00 hours it turns again to the left.



Time is UTC-Add 2 hours for local summer time

6. Synoptics between 8 and 16kt.

The systems are similar, but of course the effects of the breeze appear less important in amplitude.

Without exception one can note that the winds from the NE and East (overland winds) are influenced strongly by the thermal mixing which occur during the morning (rotation to the right with an increase in wind speed).

Tidal streams in Les Pertuis

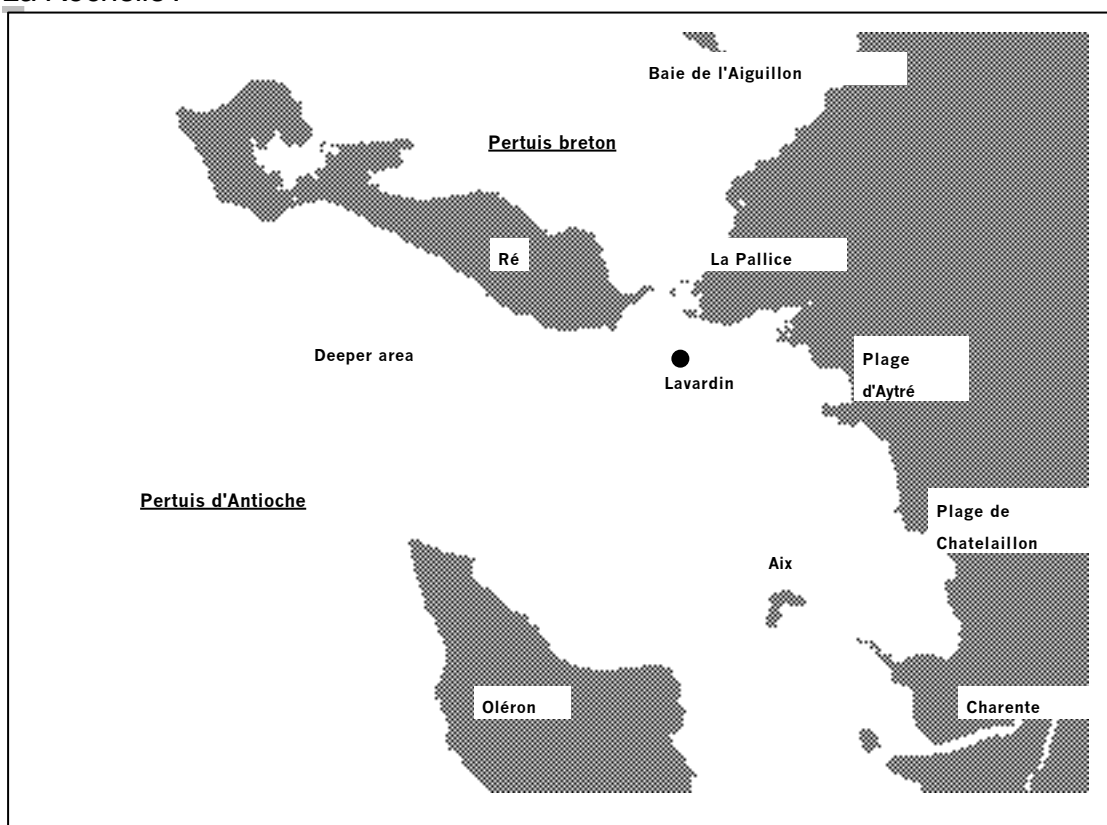
The tidal streams are significant in "Les Pertuis", and they exert considerable influence over the general strategy and tactics.

The currents in the region are very sensitive to tide strength : less sensitive on the area of the course when it's neap tide, they become important near spring tide.

A good description of the currents is given by the Tidal Atlas stream 559 from the French Hydrographic service (SHOM).

The workings of the system are explained by the following :

The ebb empties "La Charente", "Les Pertuis" between 'Oleron' and the mainland, the beaches to the south of La Rochelle (Aytre, Chatelaillon), as well as the "baie de L'Aiguillon" by the straits between 'Re' and the mainland 'La Pallice'. The current follows the deep sea trenches which forms a 'Y' shape in sea floor off 'La Rochelle'.



The flow works the opposite way : it fills the same bays from offshore. The turns of the tidal streams take place at low and high water (La Rochelle).

1. Ebb current

The tide is ebbing 6 hours before low water in La Rochelle, until low water in La Rochelle. First it affects the shore of "l'île d'Oleron".

The main branch of the current which empties the S. E part of the bay, orientates itself to the heading 280-290 and then follows the sea trench of "Pertuis d'Antioche". The north of 'l'île d'Aix' offers shelter from the current. The current is strong between the islands 'Aix' and 'Oléron'.

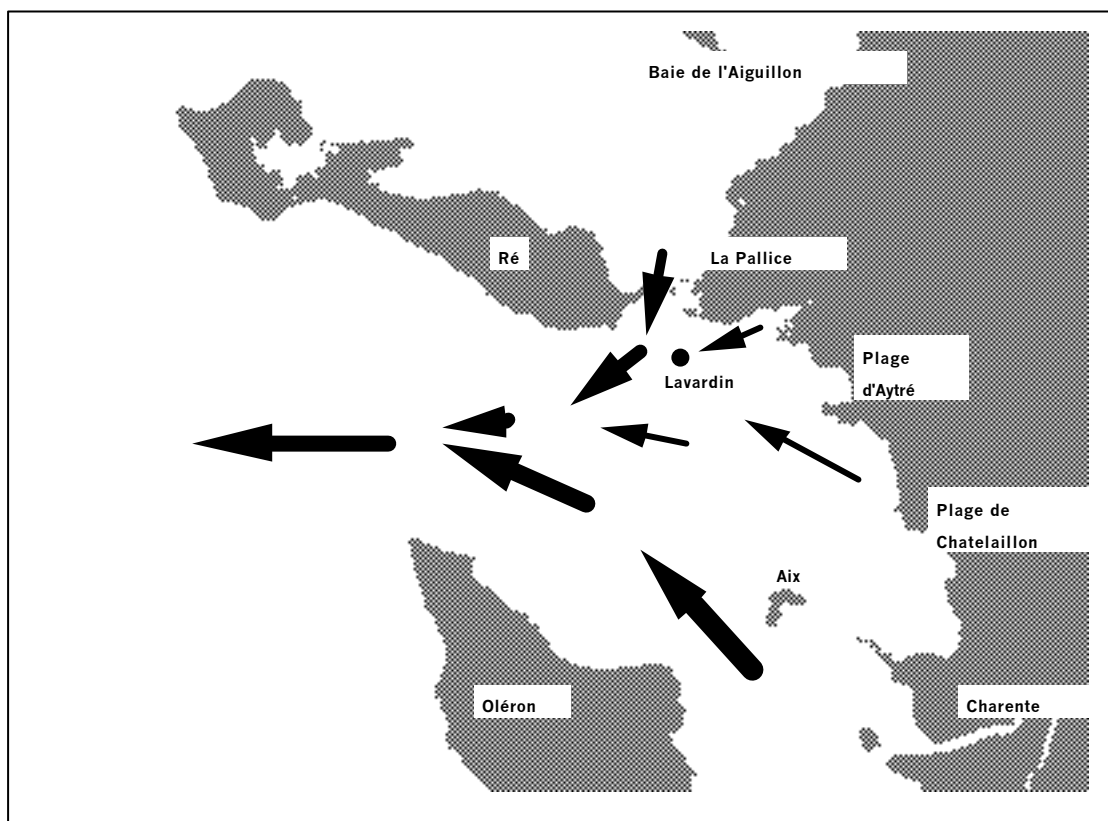
A secondary branch of the current arrives from the bay of 'Aiguillon' via 'La Pallice' and continues to the south before turning SW and joining the main branch

of the current. The current then follows the sea trench between 'Le Lavardin' and 'Re'.

Another much weaker secondary branch of the current originates from 'La Rochelle' and the beaches and proceeds roughly towards the West.

The current is weaker and rather W.SW in the centre of the channel of 'La Rochelle'. It is even weaker and rather W.NW towards 'Champ de Tir' and the beaches.

The speed of the current picks up rapidly once it has passed West of a line Lavardin - Mole de la Pallice.



2. The slack water and turn of the tide at low water

The turn of the tide starts at low water (La Rochelle) along the islands shore, then spreads to cover the whole zone.

3. The Flow

The flowing current starts 1 hour after low water (La Rochelle), until 6 hours after low water (La Rochelle). It runs along the channels previously described, but in the opposite direction.

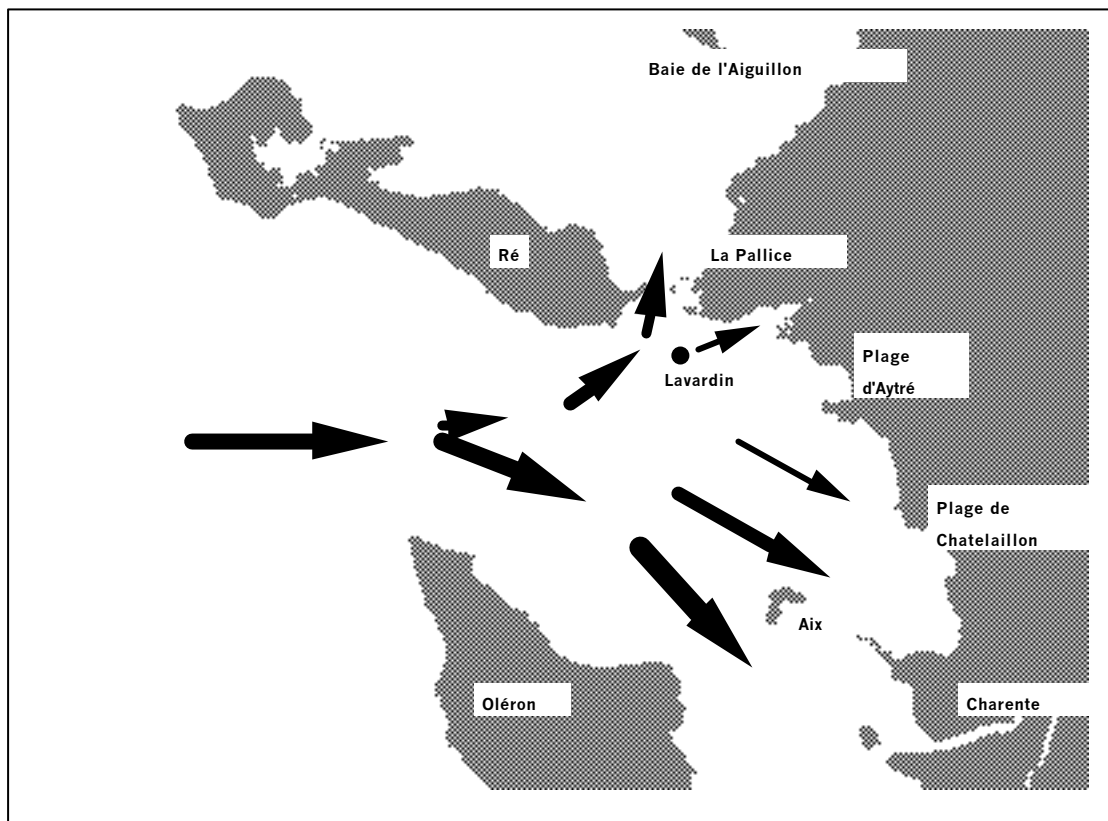
The main branch follows a heading of 110-130, and splits in two, north of 'Ile d'Aix':

One branch heads towards 'La Charente' and 'Chatellaillon', the other towards 'Oléron'.

The secondary branch follow Ile de Re shore, heads through the narrow between Ile de Re and La Pallice, then go to "Baie de l'Aiguillon".

The filling up of 'La Rochelle' and the beaches is effected by another branching of the current which heads East, before diverging in the zone 'Champ de Tir', where the current is weaker.

The speed of the current increases rapidly west of a line 'Lavardin-Mole de La Pallice'.



4. The slack water and turn of the tide at high water

The turn of the tide starts at low water + 6 hours (La Rochelle) along the islands shore, then spreads to cover the whole zone.