Tidal Planning for Sea Kayakers

There is almost a reputation around tidal planning that it is a 'black art'. Well, this handout aims to remove that notion and ensure that the important link is made between kitchen table planning and what you actually do on the ocean.

Real life jargon is used in this handout, but don't worry as at the end of the handout there is a jargon busting glossary.

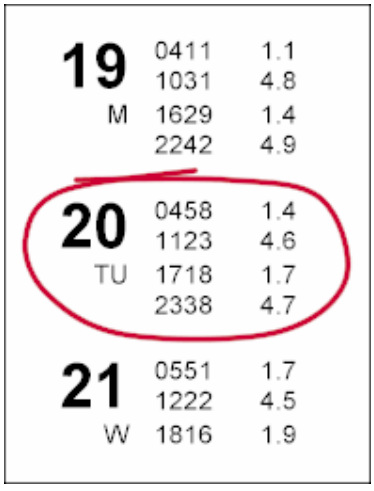
'Tide goes to and wind comes from' - remember this crucial difference especially with regards to a wind against tide situation. Wind against tide produces short, sharp seas which aren't that comfortable to paddle in or safe depending on the size of the existing sea, wind & tide speeds.

Don't write lot's of scribbles on several pieces of paper. One piece for scribbles, and one for clear, legible figures which you have calculated. Pencil is better than pen as even the most experienced tidal planner gets wrong now and again!

The times of high and low water do not equal to tidal streams directly.

1. Work out the tides for the 'standard' port

Well a standard port is a 'big' port historically which the tide times and heights have been worked out for. The tidal stream information for the surrounding area (few miles to a few hundred) is relative to it.



19	0411	1.1
	1031	4.8
M	1629	1.4
	2242	4.9
20	0458	1.4
	1123	4.6
TU	1718	1.7
	2338	4.7
21	0551	1.7
	1222	4.5
W	1816	1.9

Some examples for the West Coast of Scotland include Greenock, Oban and Ullapool. So for tidal stream info between the Islands of Bute and Cumbrae the information is given in a time relative to Greenock. It is generally clear from the source you are using, what the standard port is. The UK standard port which all British Admiralty tidal info is relative to is Dover.

Remember British Summer Time!

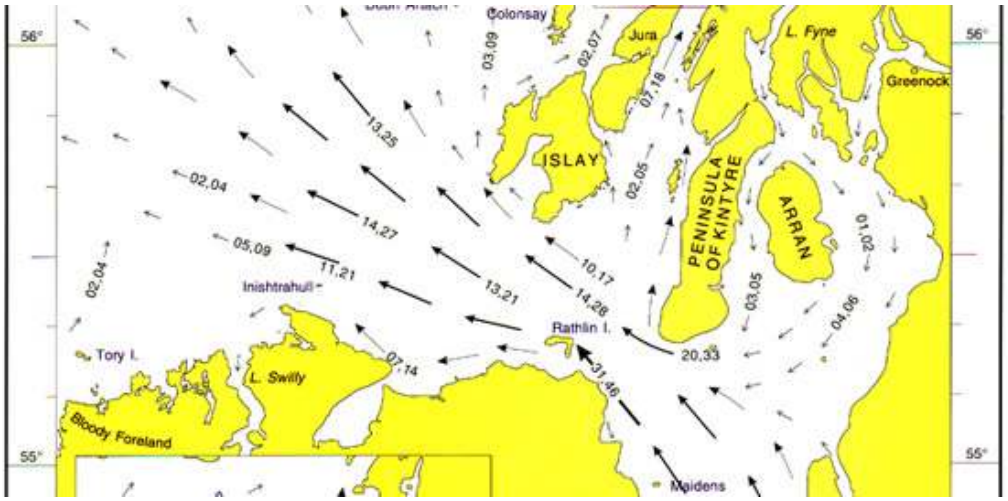
2. Identify the most suitable sources of info for your planned trip

Source (examples)	Positive aspects	Negative aspects
Tidal Stream Atlas (Admiralty and in some pilot / sailing directions)	+ Very visual picture + Gives you an overview of your trip + Hour by hour picture + Some very specific areas have micro insets, e.g. Kylehrea & Rathlin Island	- Lacks detail for specific areas often - Not all arrows have exact speed values against them
Tidal Diamonds (On charts)	+ Hour by hour info + Bearing of flow + Springs and Neaps speed values given	- Only useful for exact location of diamond and immediate surrounding area - Murphy's Law states they are never where you want to paddle!
Pilot, Sailing Directions & Almanac (Reeds, Imray, Clyde Cruising Club, Admiralty)	+ Give you the start times of tidal streams + Supplemental information is often given about 'local things' and presence of overfalls or tide races.	- You only get the maximum speed value (springs) - Lacks the hour to hour detail Some almanac's only mention the 'big' tidal stream areas and not every sea loch and place we going paddling in.
Guidebook (Channel Islands by Mansell or Scottish Sea Kayaking by Cooper & Reid)	+ All relevant info is condensed into one location + Designed by sea kayakers for sea kayakers	- Timings and speed values taken from a variety of sources (possible discrepancies) - Quality varies in terms of info between different publishers / authors.

3. Tidal Stream Atlas

A page for each hour of the tidal cycle (6 Hours before high water, high water and 6 hours after high water). A top tip is to use a pencil and annotate your tidal stream atlas with the times for that day. Example HW is at 1200, so you write on that page 1200 and the next page 1300 and so on. Allows you to quickly refer to the atlas during your planning but don't forget to rub out the times before your next trip!

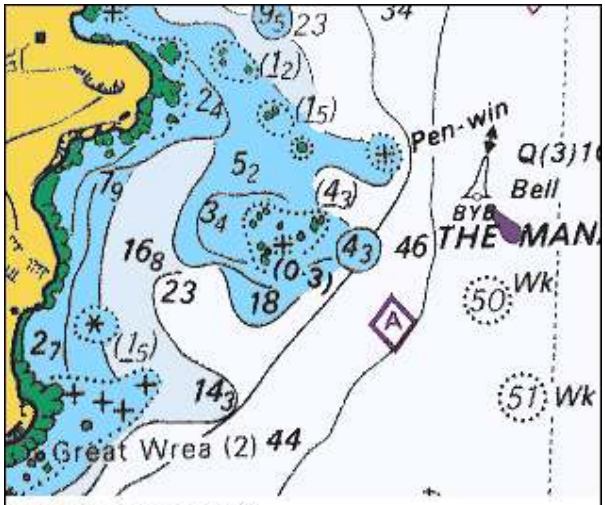
See an example of a page from tidal stream below:



Some general rules:

- Thicker the arrow, the faster the water it represents is flowing at
- Two figures relate to springs (bigger) and neaps (smaller)
- The decimal place is missing, e.g. 31 is not thirty one but 3.1
- Speeds are given in knots

4. Tidal Diamonds



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Not to be used for navigation

Tidal diamonds are purple / magenta coloured diamonds funnily enough! Printed somewhere around the edges or on the land will be the table which the tidal diamond refers to.

People who like pictures when figuring things out, might like to plot out the bearings for the different hours onto the diamond.

It's usually done by drawing short line (bearing) out from the diamond with the hour it represents written at the end of the line with + or – sign beside it.

Hours	Geographical position		
	Directions of streams (degrees)	Rates at spring tides (knots)	Rates at neap tides (knots)
Before High Water 6			
Before High Water 5			
Before High Water 4			
Before High Water 3			
Before High Water 2			
Before High Water 1			
High Water			
After High Water 1			
After High Water 2			
After High Water 3			
After High Water 4			
After High Water 5			
After High Water 6			

	A 50°02'44N 5°02'36W		
-6	201	1·0	0·5
-5	309	0·1	0·0
-4	006	1·0	0·5
-3	011	1·4	0·7
-2	015	1·5	0·8
-1	022	1·5	0·7
0	028	1·2	0·6
+1	030	0·5	0·2
+2	202	0·4	0·2
+3	196	1·2	0·6
+4	195	1·7	0·9
+5	197	1·6	0·8
+6	202	1·2	0·6

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The bearings in the table are relative to true north and not magnetic north.

5. Pilots, Sailing Directions, Almanacs & Guidebooks

Tidal Stream information from the pilot for Noup Head, Papa Westray, Orkney Islands.

+ 0355 HW Aberdeen ENE going tidal stream begins

- 0220 HW Aberdeen WSW going tidal stream begins

Maximum spring rate is 6 knots

So HW Aberdeen is at 1000 and 2240 today.

1000 – 0220 = 0740 WSW going tidal stream starts
1000 + 0355 = 1355 ENE going tidal stream starts
2240 – 0220 = 2020 WSW going stream starts
2240 + 0355 = 0235 ENE going stream starts

Using the rule of thirds we can work out the speeds for the different hours of the tidal cycles. There is roughly 6 hours between the 1355 ENE and 2020 WSW start times. If the time interval between the start times is not roughly 6 then you need to divide the time by six and use the resulting time for the rule of thirds system to work.

Hr of Cycle	1	2	3	4	5	6
Fraction of Max Speed	1 / 3	2 / 3	3 / 3	3 / 3	2 / 3	1 / 3
Resulting speed for Noup Head	2	4	6	6	4	2

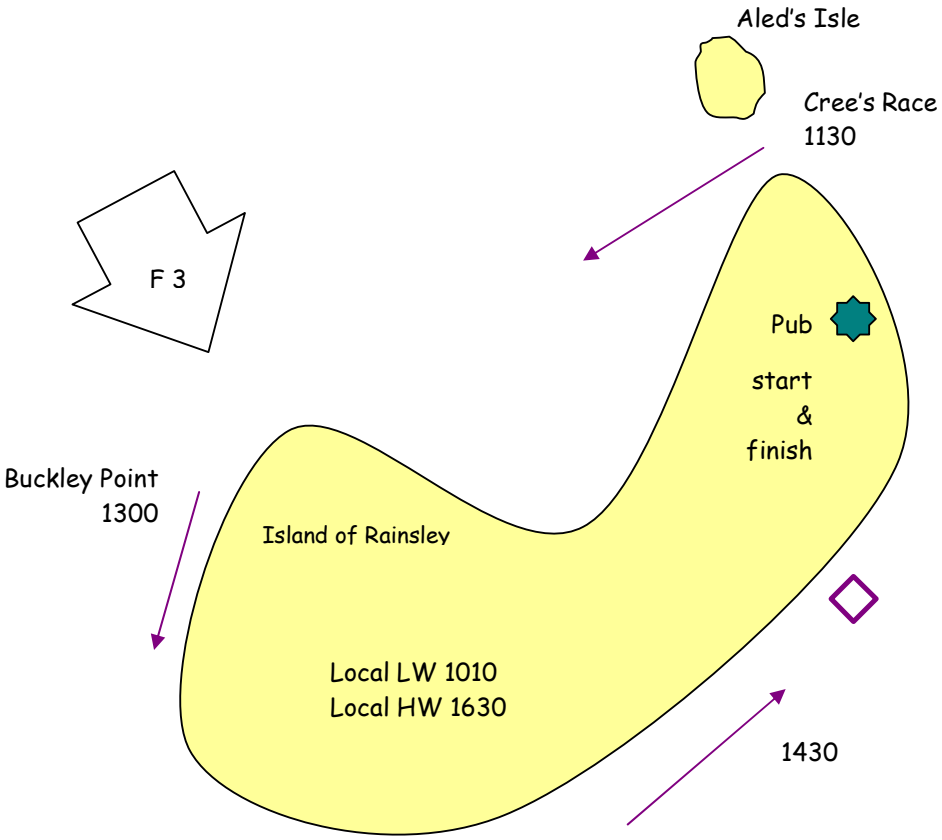
At 2020 the WSW will not be flowing at 2 knots. Why? Well the sea is a liquid and increases and decreases speed steadily over time and not in steps or stages. There is another rule for working out tidal speeds (50/90 rule) which works well in other areas of the UK. For a detailed description of it, please read Franco Ferrero's Sea Kayak Navigation book. www.pesdapress.com

6. Pulling it together

So now for the supposed 'tricky' bit, where you need to layer in more information and make some decisions. Considering; the ability of people you are paddling with, swell direction, put in and take outs, time available and importantly wind speed and direction.

Very often I sketch myself a map of the trip I want to do and then mark out my first set of tidal calculations and see if the big picture fits first. Then I identify my 'tidal gates' – points where the tide flows faster and I need to journey through them at particular times.

I then mark on a deck map or chart my tidal stream times with arrows, wind direction and local LW / HW times and head off to do the trip



7. Pre and on water awareness, judgements and decisions

Before leaving the relative safety of terra firma ensure you have all your calculations written onto your chart or map and a spare set somewhere in your group. Don't put all your eggs in one basket as Neptune would just love to spoil your day when your one chart with all your times disappears away. You can use a permanent overhead protector pen to write on your info (mentholated spirits takes permanent pen off) or chinagraph pencil.

When you get on the water, use transits and measure your time over set distances to check that the tide is doing what it should be doing! Other clues as to the tides direction of flow include; the way moored boats are lying (low wind speeds only though), crab pot buoys lines, navigational buoys leaning (big tidal flows) or the way the kelp stalks are lying.

Keep a careful watch on the water for changes in the prevailing environmental conditions, and ask yourself does it fit what I had planned for? Will it be safe around the next headland or in the next bay which has a bigger fetch?

Tidal planning is not an exact science as we are dealing with the ocean; one of the most undiscovered places in the world and such a dynamic environment, so don't get hung up on every last little minute detail in your calculations. Get out there into the real environment to test, check and ensure you are making the link between your kitchen table top planning and what the sea is actually doing - don't expect it to be right every single time.

Safe Paddling Journeys

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8. Jargon Buster!

Flood	When the tide is coming in and filling the bay or sea loch.
Ebb	When the tide is going out and draining the bay or sea loch.
Springs	When the moon and sun are in alignment to produce the maximum gravitational pull and hence the biggest and fastest tides.
Neaps	When the moon and the sun are at their weakest alignment so the gravitational pull is less and the tides are at their smallest and slowest.
Range	The height difference between high and low water. Varies every day.
Eddy	Area of recircling water caused by main tidal stream flowing past a headland.
Knots	Nautical speed value. If you put a rubber duck in the water and leave it for an hour and the tidal stream is flowing at 1.5 knots it will have moved 1.5 nautical miles by the end of that hour.
Transits	Not a builder's wagon's but lining up two objects and watching to see if they move out of line and therefore something is causing you to move – wind or tide.
Fetch	The distance over open sea which the wind can blow. Bigger fetch = bigger waves and smaller fetch = smaller waves.
Tide Race	Where the tide is constricted or squeezed through a gap and it flows faster. Think of squeezing a hose pipe – what happens to it?
Overfall	Where the tide is constricted by the sudden change in depth i.e. where is squashed by a narrow bank or reef for example. Where the volume and speed of water is fast enough produces surface turbulence.