CCC Sea Kayak Course 2026 Handout

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Table of contents

1 Introduction

Welcome to the CCC beginner's sea kayak course! The course aims to take beginner sea kayakers to the point where they can:

- Join intermediate level club trips (see our trip designations here).
- Plan and undertake their own trips on the sea, with peers, in simple conditions

We'll (loosely) we working with the syllabus of the British Canoeing Sea Kayak Award and we're hoping that all participants reach a level where we can sign them off for this award.

These notes are based around the Sea Kayak Award syllabus and are intended to serve as a reminder and reference for the material that we'll be covering. There's no need to read it in detail (or at all!), but you might find it helpful if you've forgotten something we've covered, missed a session, or are practicing the skills by yourself.

1.1 Syllabus

The Sea Kayak Award is intended for paddlers who can safely plan and undertake trips on the sea in winds up to force 3 and tides up to 1 knot. The award syllabus is available online at the British Canoeing Awarding Body website, and is summarized as a set of skills below. It's important to note that, whilst the syllabus does contain some paddling skills, the majority of it covers the knowledge required to safely plan and undertake a day's paddling on the sea. In particular, it's hard to over-state the importance of being able to synthesize information from maps, guidebooks, tide tables and weather forecasts to come up with a good plan for the day.

1.1.1 Location and Planning

Create a plan for the day, considering wind, tide, swell, other water uses etc.

- Obtain and describe a wind forecast
- Understand the impact of wind (including local / topographic effects) on sea kayakers
- Obtain and describe a swell forecast

- Obtain times of high and low water and describe the effect of tides on plans
- (At a basic level - be able to forecast tidal streams)
- Be able to find and evaluate access and escape options
- Be able to synthesize the information described above to formulate a plan for a safe day's sea kayaking

1.1.2 Kit

Decide what to take, and describe other options (e.g. for winter). Describe how you'd repair a boat.

- Decide what to wear, describe other options
- Describe different boat designs, their intended uses and how they feel to paddle
- Describe different paddle designs, their advantages and disadvantages
- Know what safety kit to take sea kayaking
- Describe how to perform a simple boat repair

1.1.3 Safety

Deal with a cold casualty, summon help (identifying location), group skills, towing

- Know how to avoid, recognise and treat hypothermia and hyperthermia
- Describe equipment and approaches for summoning outside help
- Be able to navigate along a coastline
- Be able to work around other water users, including large vessels
- Be able to communicate effectively with your paddling group
- Be able to tow both an individual and a raft with an incapacitated paddler

1.1.4 Dry(er) Skills

Paddle forward efficiently, including in wind. manoeuvre effectively in confined spaces

- Demonstrate effective and efficient forward paddling
- Be able to maintain direction in winds up to force 3
- Demonstrate effective and efficient turning of a sea kayak
- Be able to move the boat sideways
- Demonstrate entry and exit of confined spaces (rockhopping)

1.1.5 Wetter skills

Brace, self rescue, assisted rescue

- Demonstrate a brace with the boat off-balance
- Demonstrate a self rescue in simple conditions
- Demonstrate an assisted rescue as victim and rescuer, including dealing with loose kit

2 Course plan

The course is planned to run over a series of **evening sessions** and two **weekend trips**. The plan will, of course, be flexible to take account of weather and other unexpected events.

2.1 Evening sessions

Our evening sessions will be held on Tuesday evenings 6:30-8:30 at the clubhouse. We'll try to get there a bit earlier than that in case people want to use the kitchen/kettle/microwave to grab some food before we start.

Our plans for the evening sessions will be somewhat flexible depending on the weather. The plan is outlined below (*=club committee meeting, so we may need to be on the river):

Date	Likely topics to cover
21 April	(Classroom) Introduction, weather and (non-tidal) planning
28 April	(River) Personal kit, forward paddling, turning, towing
5 May*	(Classroom) Buoyage, charts, tides and planning
12 May	(River, wet session) Navigation, turning, rescues
19 May	(River, wet session) Boat handling skills, braces, self-rescues
26 May	(Classroom) Planning exercise, safety kit, dealing with mishaps
2 June*	(River, wet session) Boat handling skills, more complex rescues

We'll confirm whether we're planning a classroom session or a session on the river (and whether we expect to be getting wet) by email ahead of each session.

We anticipate that some people may need to miss the occasional evening session. Please let us know if you won't be able to make it along. We'll make a plan for you to catch up on whatever we were planning to cover (hopefully these notes will help with that!).

2.2 Weekend trips

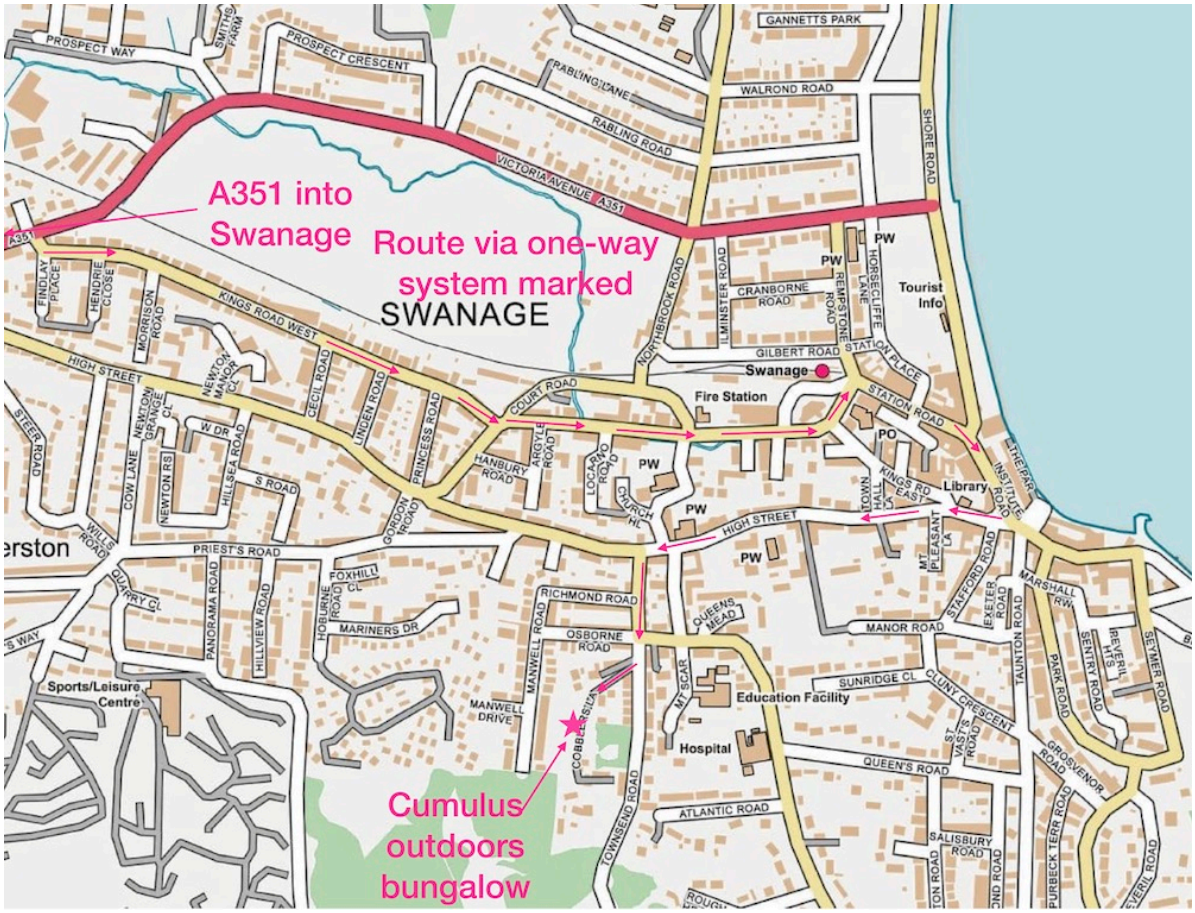
2.2.1 First trip - Dorset

Our first trip will leave on the evening of May 15th and return on the evening of May 17th. We'll head to Dorset to explore the Jurassic coast. Depending on conditions, we'll likely focus on:

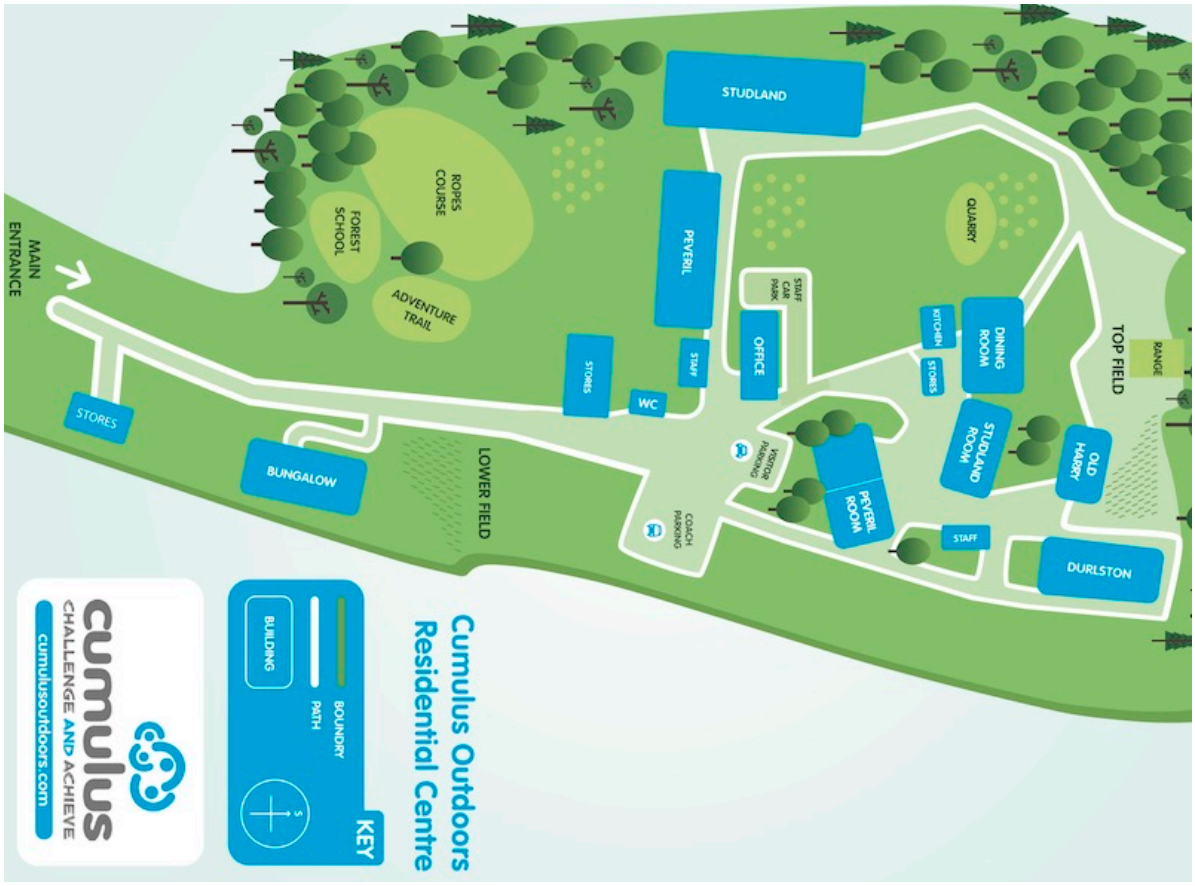
- Planning trips
- Map/chart reading on the water
- Working around other water users and large vessels
- Maintaining direction in wind

We will be staying at Cumulus Outdoors in Swanage, using their self-catering bungalow.

The address is: Cumulus Outdoors Residential Centre, Cobbler's Lane, Swanage, Dorset, BH19 2PX. Swanage has a one-way system, so I suggest using a satnav.



If you arrive after 9pm, the gate to the site will be locked. We have the combination to open it, but please close and lock it after you have come in. The bungalow is just after the entrance to the center site, on the right. It has it's own parking area adjacent to it:



The key is located by the front door in a lock box.

A few notes / rules for this accommodation:

- The center is located in a residential area and they ask that we don't make noise outside after 9pm
- No smoking
- Linen & towels are not supplied - please bring your own. Pillows & single duvets are supplied
- Toilet paper, soap, washing up liquid and sponges are supplied
- We need to depart by 10:00 on Sunday (although we'll likely plan to leave somewhat earlier!)
- We are asked to use only the car park at the bottom of the site (I think this is the closest one to the accommodation)

- We are welcome to use the grass area opposite the accommodation, but not the football field adjacent to it
- We should leave the key in the lockbox when we leave the site, rather than taking it with us
- Gates to the site are locked at 9pm. We have the code to the gate lock, but should lock it behind us if we do open it.
- The Site Manager can be contacted on 07881 794931

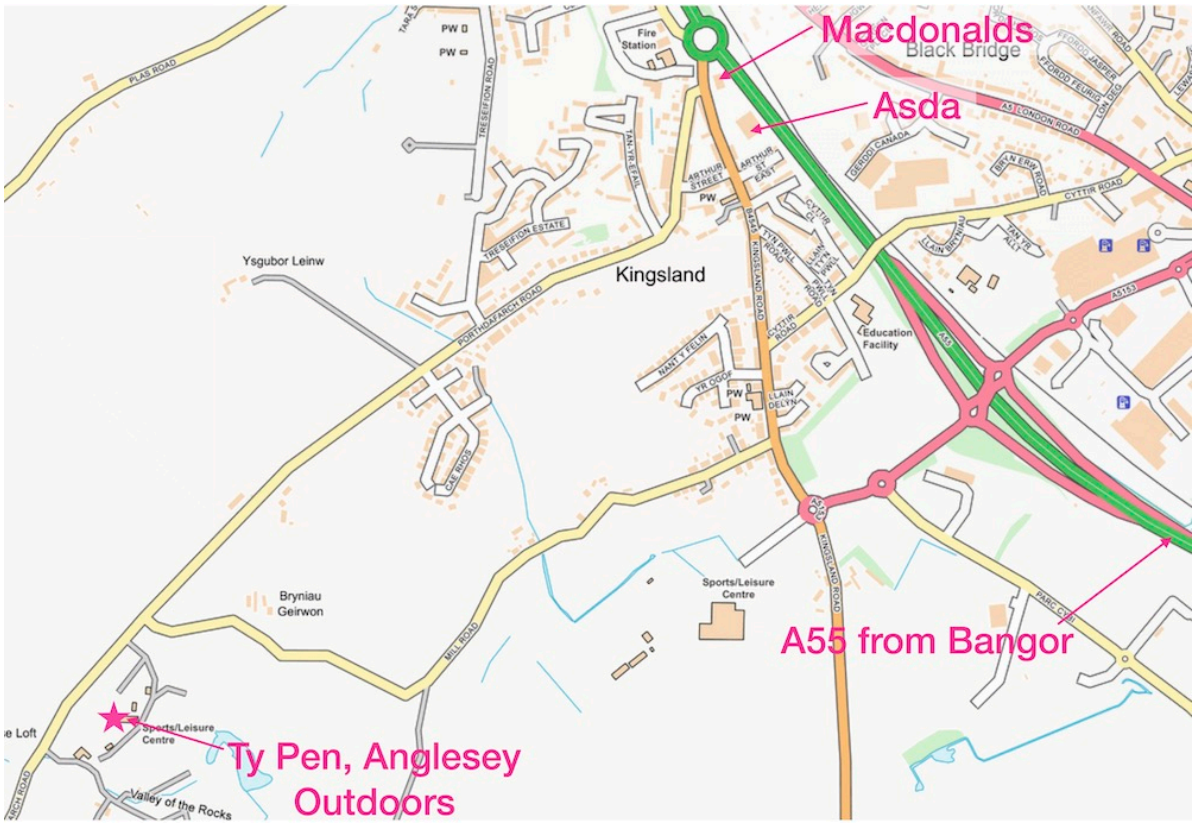
2.2.2 Second trip - Anglesey

Our second trip will leave on the evening of June 5th and return on the evening of June 8th. On the 8th June we plan to cover Paddle UK's Sea Kayak Safety & Rescue Award. This is optional, but included in the course fees, and is a great way to deepen your knowledge of safety and rescue skills.

We'll head to the island of Anglesey - a truly world-class sea kayaking venue, which gives us many options. Depending on conditions, we'll likely focus on:

- Planning trips - we'll be expecting participants to be coming up with their own plans by this point in the course
- Rockhopping - the art of exploring rocky channels close to the shoreline
- Paddling in more demanding conditions
- Rescues and towing

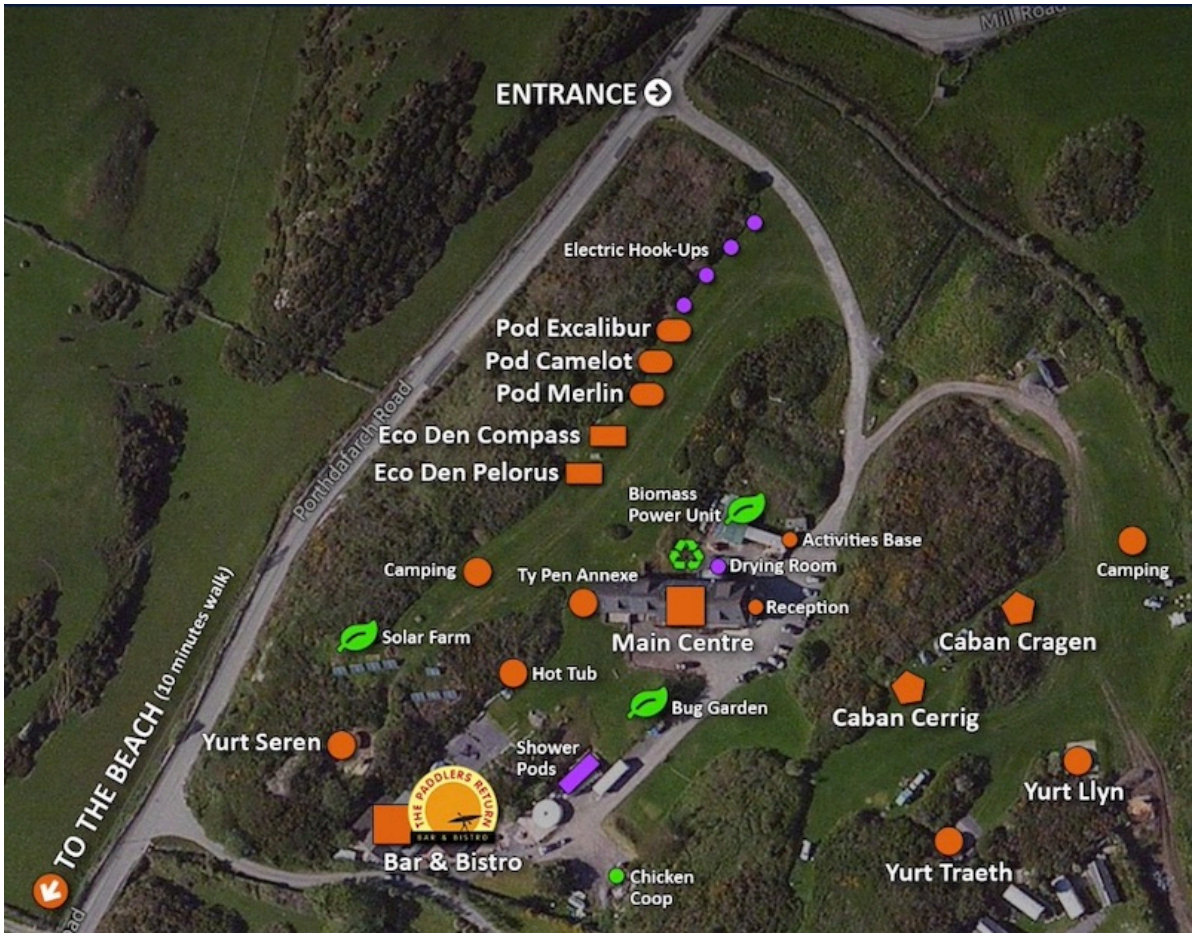
We will stay at Anglesey Outdoors in the Ty Pen Annexe. Anglesey Outdoors is on the Porthdafarch Road out of Holyhead, postcode LL65 2LP.



Driving directions are as follows:

1. Arriving at the last roundabout from the A55 you will see McDonalds and Asda supermarket on the left hand side of the road.
2. Take first left off the roundabout (signed to Trearddur Bay B4545).
3. Immediately take the first right turn between the Angel Chippy (red Building) and an old Pub, currently being refurbished. There is a white road sign for Porthdafarch Road. This turning is before the pelican crossing you see ahead of you.
4. Continue out of Holyhead along this road for 1.5 miles.
5. There is a tarmac road on the left called Mill Lane. Immediately after this, there is a track to the left signed to Anglesey Outdoors and the Paddlers Return Bar.
6. The track runs past a camping area on the right to the main centre building. The Ty Pen Annexe occupies the far end of this building.

Here's a map of the Anglesey outdoors site:



If you arrive late and can't find us at the accommodation, it is most likely that we will be in The Paddlers Return Bar.

2.3 Kit list

There's more information on equipment later in this handout, but here's a basic kit list for weekend trips:

- **Sea kayak** - we'll allocate club boats. Please check that your boat is in good repair and has a working skeg. If you let us know ahead of time, we'll be more than happy to help you fix it!!
- **Paddles** - find a set that's a good length for you.

- **Towline:** We have several club towlines to lend out (if you'd like one, the Peak 15m is a good option). If possible, you should have a knife in you buoyancy aid in case the line gets tangled (e.g. the Palm one).
- **Spraydeck:** Neoprene, the club has them
- **Helmet**: from club
- **Buoyancy aid**: from club. You may find a pocket useful.
- **Wallet, phone + charger, keys** etc.
- **Guidebook, maps** - we'll hand these out ahead of the trips, roughly one per car (if you'd like your own, we'll be using the SW Sea Kayaking and Welsh Sea Kayaking guides from Pesda Press).
- **Paper and pen/pencil** - you'll find it helpful to make notes of forecasts, tides and the trip plans that you come up with. Thin tipped permanent marker (OHP pen) for marking up maps.
- **Wind+waterproof outer shell: top and bottom:** The club has cagoules and a pair of walker's waterproof trousers will suffice for bottoms to keep the wind off
- **Warm layers:** Plenty of warm layers to wear on the water and to carry as spare layers in the boat. Avoid cotton. We tend to wear close fitting tops (e.g. rash vest) and bottoms (leggings), with fleecy warm layers if it's colder. Take a complete change of clothes in the boat, unless you're wearing a drysuit.
- **Towel**: for changing, drying if you get wet
- **Good paddling shoes:** Trainers can work if they fit in the boat. Neoprene boots are great - Lomo sells cheap and durable ones.
- **Water bottle + thermos flask.**
- **Sunglasses and sunblock**
- **Warm hat + sunhat**
- **Drybags**: At least one for lunch+snacks and one for spare clothing. Also dry bags for phones / car keys / inhalers if you need these on the water. Fairly inexpensive from Decathlon or (better) Lomo. 10 liters is a good size.
- **Food:** Lunches, snacks and anything special you want to eat at other times
- **Linen & towels**: (Linen not supplied for Dorset trip

3 Planning

Being able to decide where to go paddling and being able to plan a safe day on the water are the most important things that we'll cover on the course. We'll cover the basic theory and spend time applying it to hypothetical situations before using our planning skills on trips.

Please do get involved with trip planning as much as you can. Get hold of guidebooks and maps for the locations that we're heading to (I'll have a few copies to share). Spend some time on the Friday night car journey getting weather forecasts on your phone, coming up with ideas and discussing them with the people you're travelling with. We'll start each day with a group discussion of our plans. The more you've thought about this ahead of time, the more you'll get from these discussions - which are probably going to be the most valuable learning opportunities on the course.

3.1 Wind forecasts

The weather, especially the wind, is critically important to sea kayakers.

The main things to know about the weather are where to find a good forecast and how to interpret it.

Unsurprisingly, the internet is a great source of weather information. Good sites include:

- https://www.metoffice.gov.uk - the 'official' forecasts for the UK, including marine forecasts
- https://www.windy.com - my current favorite site
- https://www.windfinder.com - usable interface and a good phone app

These forecasts will give the following information:

- Wind speed
- Wind direction - typically given as the direction that the wind will blow **from**. However, many forecasts will provide an arrow in the direction that the wind is blowing to. Useful to know, as we can plan paddles that start by going upwind to give us an easy homeward leg, or we can choose to find shelter behind the land (but beware the dangers of an offshore wind).
- Information on waves

- General weather - cloud, precipitation, temperature - how miserable or pleasant will the day be? How much of a danger is hypothermia if things go wrong?

It is useful to be able to interpret the **inshore waters forecast** issued by the met office. This is available:

- on the Met office website
- on Radio 4
- over VHF radio at regular intervals

The forecast includes the following elements, in order:

- Wind strength (Beaufort scale) and direction -e.g. "West 4 or 5, backing southwest 5 or 6 later."
- Sea state - e.g. "Slight or moderate." See below.
- Weather - e.g. "Occasional rain later."
- Visibility - e.g. "Good."

Some of the terms used in the forecast are explained in more detail below.

Timing - the words used have precise meanings:

- Imminent: within 6 hours
- Soon: 6-12 hours
- Later: >12 hours

Sea state - innocuous sounding sea states can cause problems for kayakers:

- Calm: <0.1 m wave height
- Smooth: 0.1-0.5 m
- Slight: 0.5-1.25 m
- Moderate: 1.25-2.5m
- Rough: 2.5-4m

Visibility

- Good: > 5 miles
- Moderate: 2-5 miles
- Poor: 1 km to 2 miles
- Fog: < 1 km

The map shows the places referenced to define the areas of the forecast.

Figure 3.1: Met office inshore waters areas

You hear the following over your VHF:

'The inshore waters forecast, issued by the Met Office at 05:00 UTC on Tuesday 2 June 2017 for the period 06:00 Tuesday 2 June to 06:00 Wednesday 3 June. St Davids Head to Great Orme Head, including St Georges Channel. 24 hour forecast: West 3 or 4, backing southwest 6 or 7, later. Smooth, becoming moderate later. Rain later in north. Good, occasionally moderate later.'

How does this affect your paddling plans on Anglesey?

The weather for today's paddle seems reasonable for a competent group, but we might choose to start the day paddling westwards into the wind so we can be blown home. We expect less than 0.5 m waves. Visibility should be at least 5 miles.

The weather 'later' - i.e. after 18:00 UTC or 19:00 British Summer Time sounds decidedly worse, but we'll be off the water by then. The wind overnight would make paddling difficult, as would the waves up to 2.5 m. We'd expect rain, which will limit visibility to 2-5 miles.

3.2 Impact of wind

It is important to be able to understand the effect that the wind will have on us as sea kayakers. The table below describes conditions at each level of the *Beaufort Scale,* along with wind speeds in other units.

Beaufort force	Speed in knots	Speed in mph	Sea conditions	Land conditions	Paddling
1	1-3	1-3	Small ripples	Smoke drifts, but wind vanes don't move	Easy
2	4-6	4-7	Small wavelets that don't break	Wind felt on face, leaves rustle and wind vanes move	Easy
3	7-10	8-12	Large wavelets, which occasionally break	Leaves and twigs in motion, light flags extend	Fairly easy, but noticeable work paddling into headwind. Novices struggle in crosswind.
4	11-16	13-18	Small waves, frequent white horses	Raises dust, small branches move	Effort into headwind. Following seas start to form.
5	17-21	19-24	Moderate longer waves. Many white horses, some spray	Small trees sway	Hard effort and paddle flutter. Cross winds awkward.

As a rough guideline, wind of force 1-2 doesn't affect kayakers too much. It makes sense to plan to paddle upwind at the start of the day when the wind is force 2-3, and certainly when it's stronger than that. For inexperienced paddlers, boat handling can become tricky in force 3-4 winds, and less strong paddlers may find it hard to paddle upwind.

A few subtitles about interaction of wind with land and water:

- When wind, or waves are going the opposite direction to a tidal stream, they become shorter, taller and often break - we call this 'wind against tide'
- If the wind is strong, it often makes sense to seek coastlines that are sheltered from the wind. However, the wind on these coastlines will blow offshore, creating a potential hazard. What seems like a light wind close to land and cliffs may be a strong wind further out. If the group gets blown away from land, getting back to shore may be difficult.

- We can sometimes gain protection from the wind by tucking in close to the coast - e.g. into bays and behind headlands. This does, of course, depend on the way the wind is blowing, the shape of the coast and how tall the cliffs are (this tactic tends to be ineffective on the East Anglian coast!).
- The wind blowing over the sea creates waves. The further and harder it blows, the bigger the waves. When the wind stops blowing, waves continue to travel across the ocean as a swell.
- Waves reflect off cliffs, sometimes at an angle. The reflected waves interfere with the incident waves to create a steep, and often confused sea close to cliffs.

Figure 3.2: Reflected waves causing choppy conditions

3.3 Swell forecasts

Wave and swell forecasts can be obtained from most of the same places as wind/weather forecasts. It's sometimes also worth consulting information intended for surfers - e.g. http://magicseaweed.com. Wave forecasts will normally include:

- Wave height - can our group cope with the forecast waves? What effect will they have when they strike the coast? Waves of 1 meter will feel serious to an inexperienced group. This is about the height when group members will sometimes disappear in the troughs.
- Wave period - long period swell (e.g. 10 seconds or greater) is easier to paddle in than short period chop. However, long period swell implies a bigger wave for a given height, so the effect of the wave breaking will be more powerful.
- Wave direction - suggests where we can find shelter. Waves will tend to diffract around headlands, so shelter may be imperfect depending on the shape of the coastline. This video (15 mins) gives a good illustration of this sheltering effect. If you watch it, I suggest keeping a map of the area to hand so that you can easily understand how the locations mentions relate to each other.

3.4 High and low water

3.4.1 Using tide tables

Tides are caused by the moon pulling on the water in the earth's oceans. Around the UK, the tide varies from it's highest (high water) to it's lowest (low water) over about 6 hours. The range of the tide varies by location and over time. The largest tides are called 'spring tides', the smallest 'neap tides'. It takes about a week for the tide to cycle from springs to neaps.

The tide at ports is of significant interest to mariners and data exists on the height of tide going back many years. For example, data at https://www.bodc.ac.uk gives records of the tide at Newlyn in Cornwall going back to 1915. These data enables very accurate forecasts to be made of the times of high and low water at locations known as 'standard ports', which are given in tide tables.

Tide tables are easy to use, but often report times in Greenwich Mean Time (GMT). During summer, when British Summer Time (BST) is in operation, an hour needs to be added to give the correct time. Some tide tables are given with the corrections for BST already applied - so always check if you're using an unfamiliar tide table!

PLYMOUTH (DEVONPORT), 2020, GMT. Mean ranges: springs = 4.73 m, neaps = 2.20 m.

MAY				JUNE			
1	0458 2.2	16	0000 4.6	1	0053 4.9	16	0117 4.6
F	1125 4.4		0657 2.3	M	0728 1.8		0804 2.2
	1733 2.4	SA	1253 4.3		1343 4.9	TU	1400 4.6
	2355 4.6		1927 2.4		2002 1.9		2030 2.3
2	0629 2.2	17	0114 4.6	2	0205 5.1	17	0220 4.7
SA	1252 4.5		0808 2.2	TU	0838 1.5		0858 2.0
	1912 2.3	SU	1408 4.5		1449 5.2	W	1457 4.8
			2033 2.2		2108 1.5		2122 2.0
3	0119 4.8	18	0224 4.7	3	0311 5.4	18	0316 4.9
SU	0802 1.9		0903 1.9	W	0938 1.2		0944 1.8
	1412 4.8	M	1507 4.7		1549 5.4	TH	1546 5.0
	2036 1.9		2124 2.0		2204 1.2		2207 1.8
4	0235 5.1	19	0320 4.9	4	0411 5.6	19	0406 5.0
M	0911 1.5		0948 1.7	TH	1031 0.9		1026 1.6
	1521 5.2	TU	1551 5.0		1643 5.7	F	1631 5.2
	2139 1.4		2207 1.7		2255 0.9		2248 1.6
5	0342 5.5	20	0405 5.1	5	0505 5.7	20	0451 5.2
TU	1008 1.0		1027 1.5	F	1120 0.8		1106 1.4
	1619 5.5	W	1630 5.2		1732 5.8	SA	1713 5.4
	2232 1.0		2245 1.5		2343 0.8		2328 1.4
6	0439 5.8	21	0444 5.3	6	0554 5.7	21	0534 5.3
W	1058 0.6		1102 1.3	SA	1206 0.8		1145 1.3
	1711 5.8	TH	1705 5.3		1817 5.8	SU	1754 5.5
	2320 0.6		2320 1.3				

JULY				AUGUST			
1	0131 5.1	16	0120 4.5	1	0333 4.9	16	0253 4.6
W	0803 1.7		0747 2.4	SA	0951 1.8		0920 2.2
	1415 5.1	TH	1359 4.6		1606 5.2	SU	1525 4.9
	2035 1.8		2025 2.4		2223 1.6		2156 2.0
2	0241 5.1	17	0226 4.6	2	0439 5.1	17	0359 4.9
TH	0909 1.6		0854 2.2	SU	1049 1.5		1021 1.8
	1521 5.2	F	1501 4.8		1702 5.4	M	1623 5.3
	2139 1.6		2127 2.1		2317 1.4		2251 1.5
3	0347 5.3	18	0328 4.8	3	0532 5.3	18	0456 5.2
F	1008 1.4		0951 1.9	M	1138 1.3		1113 1.4
	1621 5.4	SA	1557 5.0		1749 5.6	TU	1716 5.6
	2236 1.3		2220 1.8				2340 1.1
4	0447 5.4	19	0423 5.0	4	0004 1.2	19	0548 5.5
SA	1101 1.2		1041 1.7	TU	0615 5.4		1200 1.1
	1714 5.6	SU	1648 5.3		1222 1.2	W	1806 5.8
	2328 1.2		2308 1.5		1828 5.7		
5	0540 5.4	20	0514 5.2	5	0045 1.1	20	0025 0.8
SU	1150 1.1		1128 1.4	W	0652 5.4		0637 5.7
	1801 5.7	M	1735 5.5		1300 1.1	TH	1244 0.8
			2354 1.3		1902 5.7		1853 6.0
6	0015 1.1	21	0603 5.4	6	0122 1.1	21	0108 0.6
M	0626 5.4		1213 1.2	TH	0723 5.3		0724 5.7
	1235 1.1	TU	1821 5.7		1335 1.2	F	1326 0.7
	1842 5.7				1932 5.6		1939 6.0

Figure 3.3: First few rows of a tide table for Plymouth. The table gives times and heights of high and low water for each day. Note that times are given in GMT – one hour needs to be added to convert to British Summer Time.

Tide tables are available from many sources. I find that the most useful are:

- The National Tide and Sea Level Facility: Accurate data for all major UK ports for the next 28 days.
- Easytide: UKHO site giving predictions 7 days ahead for practically anywhere in the world.
- Visit My Harbour: An impressive array of free tide tables for the whole of the current year.
- Imray Tides Planner phone app - provides yearly data for a few pounds

Tide tables can, of course, be purchased in printed form. They also appear in nautical almanacs that are republished each year. I find it useful to obtain a copy of *Reeds Small Craft Almanac* each year so that I'm not reliant on an internet connection when I'm doing tidal planning.

Find times of high and low water during the day at Plymouth on June 4th 2020.

Consult the tide table for Plymouth above. Note that times are given in GMT. Find the entry for June 4.

Big values of tidal height (5.6 m, 5.7 m) must refer to high water (HW). Low values (0.9, 0.9) refer to low water. So, during the day, the times are:

```
10:31 GMT   0.9 m   Low water
16:43 GMT   5.7 m   High water
```

(we're ignoring the early morning high tide and the late night low tide)

Being June, British Summer Time (BST) is in operation. To convert to BST, we must add one hour to the times given:

```
11:31 BST   0.9 m   Low water
17:43 BST   5.7 m   High water
```

3.4.2 Find local high and low water times

We saw in the last section how to use a tide table.

PLYMOUTH (DEVONPORT), 2020, GMT. Mean ranges: springs = 4.73 m, neaps = 2.20 m.

MAY				JUNE			
1 F	0458 2.2 1125 4.4 1733 2.4 2355 4.6	**16** SA	0000 4.6 0657 2.3 1253 4.3 1927 2.4	**1** M	0053 4.9 0728 1.8 1343 4.9 2002 1.9	**16** TU	0117 4.6 0804 2.2 1400 4.6 2030 2.3
2 SA	0629 2.2 1252 4.5 1912 2.3	**17** SU	0114 4.6 0808 2.2 1408 4.5 2033 2.2	**2** TU	0205 5.1 0838 1.5 1449 5.2 2108 1.5	**17** W	0220 4.7 0858 2.0 1457 4.8 2122 2.0
3 SU	0119 4.8 0802 1.9 1412 4.8 2036 1.9	**18** M	0224 4.7 0903 1.9 1507 4.7 2124 2.0	**3** W	0311 5.4 0938 1.2 1549 5.4 2204 1.2	**18** TH	0316 4.9 0944 1.8 1546 5.0 2207 1.8
4 M	0235 5.1 0911 1.5 1521 5.2 2139 1.4	**19** TU	0320 4.9 0948 1.7 1551 5.0 2207 1.7	**4** TH	0411 5.6 1031 0.9 1643 5.7 2255 0.9	**19** F	0406 5.0 1026 1.6 1631 5.2 2248 1.6
5 TU	0342 5.5 1008 1.0 1619 5.5 2232 1.0	**20** W	0405 5.1 1027 1.5 1630 5.2 2245 1.5	**5** F	0505 5.7 1120 0.8 1732 5.8 2343 0.8	**20** SA	0451 5.2 1106 1.4 1713 5.4 2328 1.4
6 W	0439 5.8 1058 0.6 1711 5.8 2320 0.6	**21** TH	0444 5.3 1102 1.3 1705 5.3 2320 1.3	**6** SA	0554 5.7 1206 0.8 1817 5.8	**21** SU	0534 5.3 1145 1.3 1754 5.5

JULY				AUGUST			
1 W	0131 5.1 0803 1.7 1415 5.1 2035 1.8	**16** TH	0120 4.5 0747 2.4 1359 4.6 2025 2.4	**1** SA	0333 4.9 0951 1.8 1606 5.2 2223 1.6	**16** SU	0253 4.6 0920 2.2 1525 4.9 2156 2.0
2 TH	0241 5.1 0909 1.6 1521 5.2 2139 1.6	**17** F	0226 4.6 0854 2.2 1501 4.8 2127 2.1	**2** SU	0439 5.1 1049 1.5 1702 5.4 2317 1.4	**17** M	0359 4.9 1021 1.8 1623 5.3 2251 1.5
3 F	0347 5.3 1008 1.4 1621 5.4 2236 1.3	**18** SA	0328 4.8 0951 1.9 1557 5.0 2220 1.8	**3** M	0532 5.3 1138 1.3 1749 5.6	**18** TU	0456 5.2 1113 1.4 1716 5.6 2340 1.1
4 SA	0447 5.4 1101 1.2 1714 5.6 2328 1.2	**19** SU	0423 5.0 1041 1.7 1648 5.3 2308 1.5	**4** TU	0004 1.2 0615 5.4 1222 1.2 1828 5.7	**19** W	0548 5.5 1200 1.1 1806 5.8
5 SU	0540 5.4 1150 1.1 1801 5.7	**20** M	0514 5.2 1128 1.4 1735 5.5 2354 1.3	**5** W	0045 1.1 0652 5.4 1300 1.1 1902 5.7	**20** TH	0025 0.8 0637 5.7 1244 0.8 1853 6.0
6 M	0015 1.1 0626 5.4 1235 1.1 1842 5.7	**21** TU	0603 5.4 1213 1.2 1821 5.7	**6** TH	0122 1.1 0723 5.3 1335 1.2 1932 5.6	**21** F	0108 0.6 0724 5.7 1326 0.7 1939 6.0

Figure 3.4: First few rows of a tide table for Plymouth.

Such detailed data is not available everywhere that we would wish to paddle. To overcome this problem, reference books quote **tidal constants** for other locations. These are either added or subtracted to times of high and low water at standard ports to give local high and low water times. For example, this extract from a paddling guidebook tells us when HW and LW will occur at a location in the Isles of Scilly.

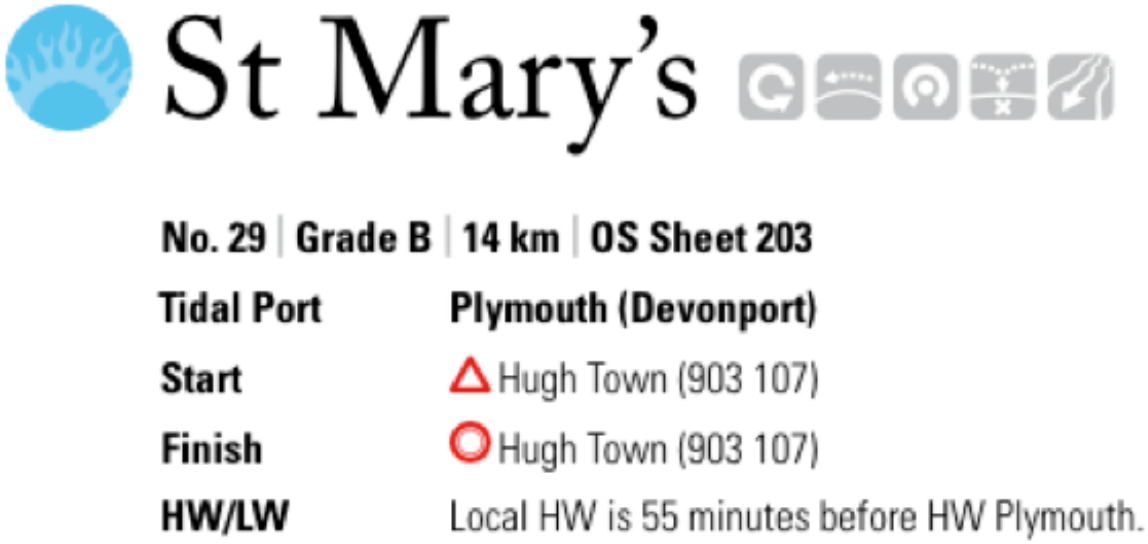


Figure 3.5: Extract from the excellent Pesda Press (https://www.pesdapress.com) guidebook to South West England. Notice that it tells us that high water at St. Mary's will occur 55 minutes before high water at Plymouth.

Find times of high and low water at St. Mary's during the day on June 1st 2020.

Using the tide table, we can find the times of high and low water at Plymouth - ignoring the high water in early morning, and the low water late at night and **remembering to add an hour for British Summer Time**:

```
08:28 BST High water Plymouth
14:43 BST Low water Plymouth
```

We are told that HW and LW occur 55 minutes earlier than they do at Plymouth. Subtracting 55 minutes from the Plymouth times gives:

```
07:33 BST   HW ST MARYS
13:48 BST   LW ST MARYS
```

3.4.3 Effects of tides on planning

The degree to which the rise and fall of the tide affect our paddling plans depends on where we're going paddling. Where coastlines are steep cliffs and the water is deep, the effect may be small. When coastlines are less steep and the water is shallow, large areas of the sea bed can

be exposed at low water. This can make for long carries across beaches to get to the water. In some cases (e.g. paddling in estuaries), the options we have to paddle may be very different at high water and low water. The best approach to this is to consult a nautical chart - areas that dry at low tide are shown in green.

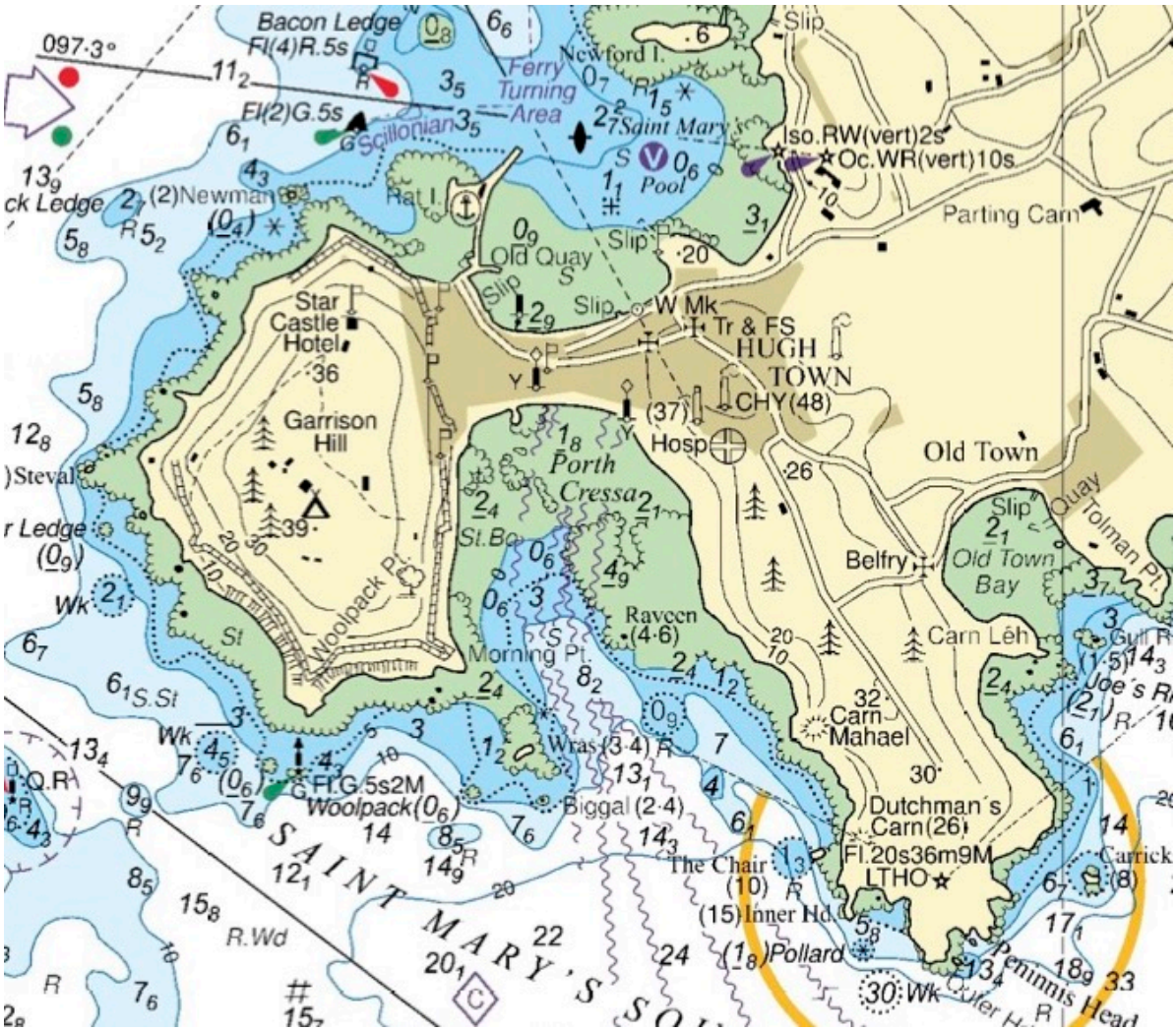


Figure 3.6: Detail for chart of the Isles of Scilly. Note the areas in green that dry at low tides. Near Penninnis Head (south-east corner of image), there are cliffs and not much sea bed is exposed. However, the beaches to the north and south of Hugh Town clearly become much larger at low water, potentially requiring a longer carry to get boats to and from the water.

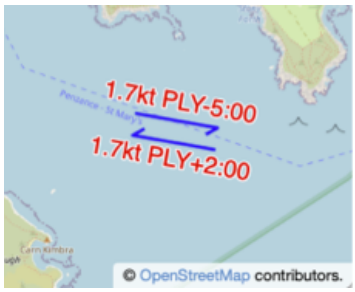
Often, we find that tidal streams, flows of water caused by the tide, are equally important for paddlers to consider as times of high and low water.

3.5 Tidal streams

The Sea Kayak Award is limited in scope to areas where tidal flow does not exceed 1 knot, and tidal planning is not explicitly covered in the syllabus. However, it is important to be able to identify locations where there may be strong tides, and it may well be important for our planning on the course trips to understand tidal streams.

A range of information sources about tidal streams exist, but we will focus here on using sea kayak guidebooks (like the excellent ones produced by Pesda Press).

Sea kayaking guidebooks include the most important tidal information from pilots and other sources. Being focused on kayaks, rather than large ships or yachts, they're a great source of information in a compact format. Over the last few years, Pesda Press has published an excellent set of guidebooks covering most of the UK.



St Mary's Sound: The east going stream begins at 5 hours before high water at Plymouth (Devonport). The west going stream begins at 2 hours after high water at Plymouth (Devonport). The flow reaches a speed of 1.7 knots at springs. A race can form on Peninnis Head. The flow accelerates over the Bartholomew ledges, marked with a red pole.

Figure 3.7: Example of tidal stream information. The Pesda Press series of guidebooks use a very similar format

Guidebook information is presented in a fairly understandable format. Its use is best illustrated by an example.

Describe the tidal flow in Saint Mary's Sound on June 1st 2017

We begin by consulting a tide table to find *high water* times for Plymouth, being careful to account for British Summer time:

PLYMOUTH (DEVONPORT), 2020, GMT. Mean ranges: springs = 4.73 m, neaps = 2.20 m.

MAY				JUNE				JULY				AUGUST			
1	0458 2.2	16	0000 4.6	1	0053 4.9	16	0117 4.6	1	0131 5.1	16	0120 4.5	1	0333 4.9	16	0253 4.6
F	1125 4.4		0657 2.3	M	0728 1.8		0804 2.2	W	0803 1.7		0747 2.4	SA	0951 1.8		0920 2.2
	1733 2.4	SA	1253 4.3		1343 4.9	TU	1400 4.6		1415 5.1	TH	1359 4.6		1606 5.2	SU	1525 4.9
	2355 4.6		1927 2.4		2002 1.9		2030 2.3		2035 1.8		2025 2.4		2223 1.6		2156 2.0
2	0629 2.2	17	0114 4.6	2	0205 5.1	17	0220 4.7	2	0241 5.1	17	0226 4.6	2	0439 5.1	17	0359 4.9
SA	1252 4.5	SU	0808 2.2	TU	0838 1.5	W	0858 2.0	TH	0909 1.6	F	0854 2.2	SU	1049 1.5	M	1021 1.8
	1912 2.3		1408 4.5		1449 5.2		1457 4.8		1521 5.2		1501 4.8		1702 5.4		1623 5.3
			2033 2.2		2108 1.5		2122 2.0		2139 1.6		2127 2.1		2317 1.4		2251 1.5
3	0119 4.8	18	0224 4.7	3	0311 5.4	18	0316 4.9	3	0347 5.3	18	0328 4.8	3	0532 5.3	18	0456 5.2
SU	0802 1.9	M	0903 1.9	W	0938 1.2	TH	0944 1.8	F	1008 1.4	SA	0951 1.9	M	1138 1.3	TU	1113 1.4
	1412 4.8		1507 4.7		1549 5.4		1546 5.0		1621 5.4		1557 5.0		1749 5.6		1716 5.6
	2036 1.9		2124 2.0		2204 1.2		2207 1.8		2236 1.3		2220 1.8				2340 1.1
4	0235 5.1	19	0320 4.9	4	0411 5.6	19	0406 5.0	4	0447 5.4	19	0423 5.0	4	0004 1.2	19	0548 5.5
M	0911 1.5	TU	0948 1.7	TH	1031 0.9	F	1026 1.6	SA	1101 1.2	SU	1041 1.7	TU	0615 5.4	W	1200 1.1
	1521 5.2		1551 5.0		1643 5.7		1631 5.2		1714 5.6		1648 5.3		1222 1.2		1806 5.8
	2139 1.4		2207 1.7		2255 0.9		2248 1.6		2328 1.2		2308 1.5		1828 5.7		
5	0342 5.5	20	0405 5.1	5	0505 5.7	20	0451 5.2	5	0540 5.4	20	0514 5.2	5	0045 1.1	20	0025 0.8
TU	1008 1.0	W	1027 1.5	F	1120 0.8	SA	1106 1.4	SU	1150 1.1	M	1128 1.4	W	0652 5.4	TH	0637 5.7
	1619 5.5		1630 5.2		1732 5.8		1713 5.4		1801 5.7		1735 5.5		1300 1.1		1244 0.8
	2232 1.0		2245 1.5		2343 0.8		2328 1.4				2354 1.3		1902 5.7		1853 6.0
6	0439 5.8	21	0444 5.3	6	0554 5.7	21	0534 5.3	6	0015 1.1	21	0603 5.4	6	0122 1.1	21	0108 0.6
W	1058 0.6	TH	1102 1.3	SA	1206 0.8	SU	1145 1.3	M	0626 5.4	TU	1213 1.2	TH	0723 5.3	F	0724 5.7
	1711 5.8		1705 5.3		1817 5.8		1754 5.5		1235 1.1		1821 5.7		1335 1.2		1326 0.7
	2320 0.6		2320 1.3						1842 5.7				1932 5.6		1939 6.0

We'll focus on the afternoon high water at 14:43 BST. We'll need to subtract and add times to this as described in our guidebook extract above:

```
The ESE stream begins HW Plymouth -5:00
14:43 - 05:00 = 09:43 BST

The WNW stream begins HW Plymouth +2:00
14:43 + 02:00 = 16:43 BST
```

So, we expect the tide to run ESE from 09:43. It'll turn WNW at 16:43.

3.6 Access and escape options

Whilst it's possible to guess at places we can access the sea by looking at a map, and (sometimes) to check on feasibility with Google Earth, its far easier to consult information in guidebooks.

Difficultly of using a given access point might depend on:

- Whether we can park cars nearby
- How busy the location is - often depends on time of the day and of the year
- How far we'll need to carry boats from the car to the sea (may depend on how high the tide is)
- Whether it's an easy carry, or a route with steps, corners, slippery rocks etc.

- Will we be launching off a beach, a slipway, a pontoon or a harbor wall?
- Do we expect waves and surf at our access point?
- Is there a sheltered area close to the access point to warm up?

We should always have fallback plans in place in case we can't make it back to our chosen access point. Clearly, we might accept less ideal options for these fallback plans, but we do need to be sure that the escape routes we choose are usable (e.g. not likely to be impossible due to heavy surf). In some locations, e.g. those with tall cliffs, it can be difficult to egress from the sea along long sections of coastline.

3.7 Synthesizing information

It's fairly easy to learn to understand a weather forecast, predict tides and get information from a guidebook. The real challenge lies in synthesizing this information to create a good plan for a day's paddling - especially when conditions aren't straightforward.

The ability to make good plans comes with time and experience. However, the following process might provide a guide for beginners:

A) Choosing where to go

1. Check wind strength and wave size. Is the wind light enough (e.g. F1) that we can **ignore it**? Is it strong enough (e.g. F4 or more) that we need to **hide from it** behind land? If not, it's probably still sensible to plan a paddle that **starts upwind**, so that the wind is behind us at the end of the day.
2. Assuming we need to consider wind, use an overview map of the area to identify coastlines that we might be able to paddle on and access points that allow us to start upwind. This should give us a short-list of options
3. Are there any tidal effects (height of tide, tidal streams) to worry about for the areas in our short list. Does this limit options due to (e.g.) wind-against-tide effects, having to paddle against tidal stream or access constraints due to areas drying out?
4. Are there any other limits to our options or hazards to consider - e.g. other water users, danger areas, logistics, lack of escape routes?
5. We should now have a list of options that are safe and practical, and need to discuss which we'd prefer to do.

B) Focused planning

1. Confirm wind, waves and tide for the area. How will they change through the day? How do we expect the shape of the coastline to affect these? Do we need to consider other factors (e.g. shipping, local rules…)?
2. Where are the put ins and take outs? Where do we park and how far do we need to carry? Where else can we get off if things go wrong?
3. How far will we paddle? What are the rough timings? Do they fit with weather and tidal changes? Are there critical places that be need to be at specific times? Where will we stop for breaks and lunch?
4. What are the main hazards and where are the crux points of the trip (e.g. exposed sections, headlands, concentrated wind, waves or tidal stream?). Where are our key decision points to keep going or turn back? How will we make those decisions? Do we have fallback plans if conditions prove worse than expected? At what points do we become committed? What will we do if things go wrong at each point?

Finish by copying key information to the map that you will carry on the water. Aim to keep your plans flexible - consider different options and be prepared to change if things don't turn out as expected.

4 Equipment

It's important to bring the right equipment along to any sea kayak trip, and we'll discuss what to bring before we head off on the course trips. The club can provide most specialist equipment, although you might want to acquire some warm and windproof kit - Decathlon is a good place to buy cheap decent kit, and there's a store in Cambridge.

People who get hooked on sea kayaking often find themselves acquiring shiny new equipment rather faster than they anticipated. If you're thinking about making purchases, why not ask for opinions from the course participants and coaches? Having used, worn out and broken a lot of kit over the years, we can hopefully provide some useful insights.

4.1 What to wear

Sea kayakers will choose what to wear depending on weather conditions. There's often a balance to be struck between dressing to be comfortable paddling and dressing for immersion in case things go wrong.

Sea kayakers will typically wear:

- A buoyancy aid. It's useful to have one with pockets.
- Spraydeck
- Helmet - if paddling near rocks on in the surf. Given that opportunities for rockhopping and the need to land through surf can't always be anticipated, many sea kayakers choose to always carry a helmet in or on their boat.
- Decent footwear, suitable for scrambling over rocks with heavy boats. Most of us use neoprene boots (as for many items of kit, Lomo is excellent and good value).
- Shell layer - a wind and waterproof outer layer. Either separate cagoule (cag) for the upper body and trousers, or an one-piece suit. Choice depends on weather, as there's a compromise to be struck here between waterproofing and venting. In cold conditions, or if expecting to get wet, a drysuit is the best choice. However, most of the time, I'll prefer to wear dry trousers with a separate cag. Sea cags sometimes (but not always) have latex wrist seals, but often don't have seals at the neck. If it's really hot, shorts can be the best option - but I'd always carry something warmer in the boat. For those starting out, waterproof walking trousers are a good choice to keep wind off legs. A club

cag, or even a light walker's waterproof can be used on the top half. Clearly, those won't keep you dry if you swim, but carrying spare clothes can mitigate the risk somewhat.

- Warm layers - underneath the shell layer, kayakers wear layers to keep warm. It's important that these layers work when wet, so close fitting clothing is better, and cotton should be avoided. A range of thin layers gives more options than one thick layer.
- Spare clothing - always take some spare clothes in the boat in case of an unexpected swim. Clearly, you'll want to carry more clothing if you've begun the day dressing light because it's warm. Bear in mind the worst case scenario of ending up wet and cold on a beach you didn't expect to get stranded on.
- Hat - warm hats are great for flexibly regulating temperature. Neoprene hats can work well too.
- Gloves - some people dislike paddling in gloves, whilst others seem to prefer it. Various options are available from full neoprene gloves to palm-less gloves and 'pogies' that fit over the paddle shaft.
- Towline - everyone in the group should have a towline and know how to use it.
- Knife - always have a knife on hand in case you need to cut an entangled towline. Also useful for cheese at lunchtime.
- Whistle - for attracting attention
- Sun hat, sunglasses, sunscreen - because we do sometimes get nice weather!

4.2 Boat designs

The modern British sea kayak has been developed to be seaworthy in a wide variety of conditions. It is long enough to be fast, but retains some maneuverability. It has a number of watertight compartments with sealed hatches. Its decklines and elastics allow kit to be stowed and the boat to be handled during rescues. It typically has a fairly low profile above the water to reduce windage, but has a raised bow to cut through waves.

Sea kayak manufacturers include:

- P&H http://www.phseakayaks.com - part of the Pyranha group
- Valley http://www.valleyseakayaks.com - a longstanding maker of sea boats
- Sea Kayaking UK https://www.seakayakinguk.com - run by Nigel Dennis on Anglesey
- Rockpool https://www.seakayakinguk.com - another Anglesey based firm
- Tiderace http://www.tideraceseakayaks.co.uk - recently acquired by Nelo, some innovative designs

- Northshore http://www.northshoreseakayaks.co.uk - well priced range of boats

Boats are normally made from either composite or plastic:

- **Composite** construction involves combining mats of glass, diolen, kevlar or carbon fibres with epoxy resin to produce a very strong and stiff material. These boats are stiff and can be made light - although low weight designs are rather expensive. Composite boats are more expensive than plastic models. Whilst composite boats are easier to damage, they are also easy to repair. Because each boat is virtually a one-off, a degree of customisation (e.g. in bulkhead position or deck fittings) is often possible.
- **Plastic** boats are moulded in polyethylene. More modern designs use multi-layer constructions, with a foam core to reduce weight and increase stiffness. These boats are lower cost and more robust than composite - a good choice for playing near rocks or dragging around. They do have a degree of flex, although many paddlers aren't bothered by this.

A range of boat designs exist, each with their own characteristics. The images below show a small selection of currently available designs to illustrate some of the options.

The Inuit, the kayak hunters of Greenland and the Arctic, made their boats from seal skin stretched over wood frames. Early UK designs in fibreglass, like the Anas Acuta, copied these closely, retaining the hard corners in the hull shape.


Anas Acuta, Valley

These designs were refined into classic designs like the Nordkapp - boats designed to carry expedition loads and handle rough conditions.


Nordkapp, Valley

Modern expedition boats like the P&H Cetus, Valley Etain and Northshore Atlantic are typically more stable and easier to paddle than the older boats, but are designed for much the same role.

Cetus, P&H

Whilst an 18 foot long boat is perfect for expeditions and paddling in a straight line, it is less well suited to exploring rocky shorelines and surfing tide races. For many sea kayakers who mostly paddle on day trips to rock hop and play in races, shorter boats around the 16 foot mark are a better compromise. Sea Kayak UK's Romany is a classic design in this category. More modern boats have incorporated flat bottoms, harder chines and reshaped bows like the P&H Aries and the Tiderace Xcite.

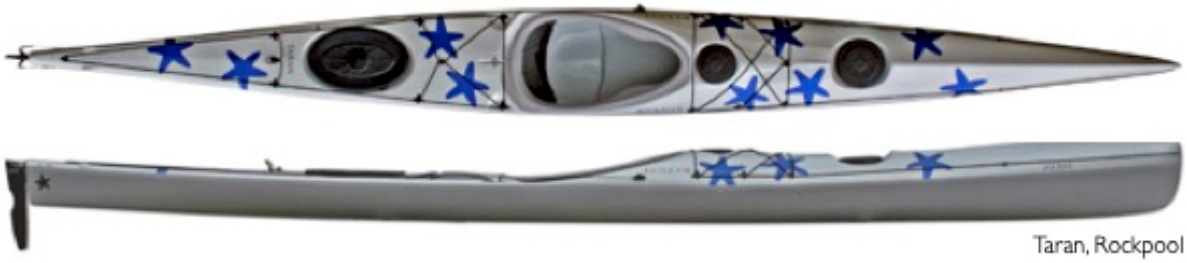
Aries, P&H

More recently, a series 16 foot sea kayaks more focused on general day paddling (and a little less on playing) has emerged. These include the P&H Volan/Leo and the Valley Sirona. These boats are an excellent compromise for many sea kayakers,

Extreme ocean playboats have shrunk to around 14 foot long, and become less suitable for journeying - the P&H Hammer being one example.

Hammer, P&H

Another strand of kayak development has focussed on boats that simply go faster. Designs like the Valley Rapier were designed for pure speed and sea racing, compromising handling and stability. More modern boats, led by the Rockpool Taran have more predictable handling and somewhat improved stability.



Taran, Rockpool

As well as race use, they have been used for expeditions, breaking records for circumnavigations of Ireland and the British Mainland. Some say that the Taran and similar boats are a vision of the future of the expedition sea kayak.

4.3 Paddle designs

The Inuit used long slender wooden paddles. This was likely due to the materials (driftwood) and fabrication techniques available, but some modern paddlers enjoy using 'greenland sticks'. They require a different technique compared to standard 'euro' paddles.

Greenland stick: Eastpole Nanook Tip

Low-cost Euro paddle: Palm Drift

High-end cranked paddle: Werner Cyprus

Paddle materials vary, depending mostly on the cost of the paddle. Shafts for cheap paddles use aluminium, although carbon and fibreglass composites are becoming increasingly widespread at many price points. Blade materials vary from injection moulded plastic for cheap paddles to fibreglass and carbon composites at the high end.

Paddle shafts can be straight, or 'cranked' with a bend that places the wrist at a more neutral angle. Some paddlers find these cranked shafts more comfortable to use, or find that they reduce the incidence of injury. Sea kayak paddles almost always split into two sections to enable them to be carried as spares. The joint generally allows feather to be adjusted and often allows length to be varied by around 10 cm.

Paddle blades come in a range of shapes. The main categories are:

- Low angle paddles - long and thin - intended for a ‘low angle’ stroke where the top hand is kept around shoulder height or lower.
- High angle paddles - shorter and fatter - are intended for a more efficient ‘high angle’ stroke where the top hand comes to forehead height.
- Wing paddles - originally designed for racing, these paddles provide an impressive level of power if used correctly. Whilst they can be challenging to use in rough water, some advanced paddlers find them excellent for covering long distances on the sea.

Paddle length and area are important as they affect the force that the paddler applies to the paddle. Using overly long or large blades can cause fatigue or injury over long days.

Some kayakers use paddle leashes to attach the paddle to their boat. This prevents the paddle being lost during swims and rescues. However, they are unusual in the UK due to the the potential for the paddler to become entangled in the leash in rough water.

4.4 Safety kit

What and how much safety kit to carry depends on the conditions, the type of paddle that you're doing and whether you're responsible for other people. An advanced water sea leader operating in a remote corner of Scotland in winter is going to carry more kit than a member of a group being led on a day paddle around Cornish beaches in high summer.

I'd suggest the following as a start point:

- Spare clothing.
- Food (lunch, snacks) and drink (water bottle and/or thermos flask)
- A means of summoning external assistance e.g. VHF, PLB, phone, flares - ideally carry more than one option!
- Towline - everyone in the group should have a towline and know how to use it.
- Knife - always have a knife on hand in case you need to cut an entangled towline. Also useful for cheese at lunchtime.
- Whistle - for attracting attention
- Compass - hiking baseplate compasses are ideal
- Basic first aid kit - to treat simple bumps and scrapes and including any personal medication
- Basic repair kit - 'Flex Tape' has become my primary approach to repairing things, as it works so well in the wet. Cable ties are always useful, and it's good to have tools to tighten the bolts on your boat.
- Exposure bag or emergency shelter - for treating hypothermic casualties. Exposure bags come in a variety of designs from the traditional orange plastic bag to modern advanced designs like the 'Blizzard Bag' that reflect heat and open out to create air pockets that act as insulation. Emergency shelters are larger, such that you can fit an entire group in - like a tent but without the poles.

4.5 Boat repair

A range of methods have been developed over the years to repair sea kayaks whilst on trips. If things go badly wrong, it can be important to carry out an initial repair at sea before being able to return to land for a more permanent fix. Howard Jeffs is considered something of an expert, and his Youtube channel is a useful resource.

Having tried a number of the traditional approaches, and a few new ones, I've found that 'Flex Tape', a strong, wide tape with a rubber adhesive, is the best approach to tackling most kayak

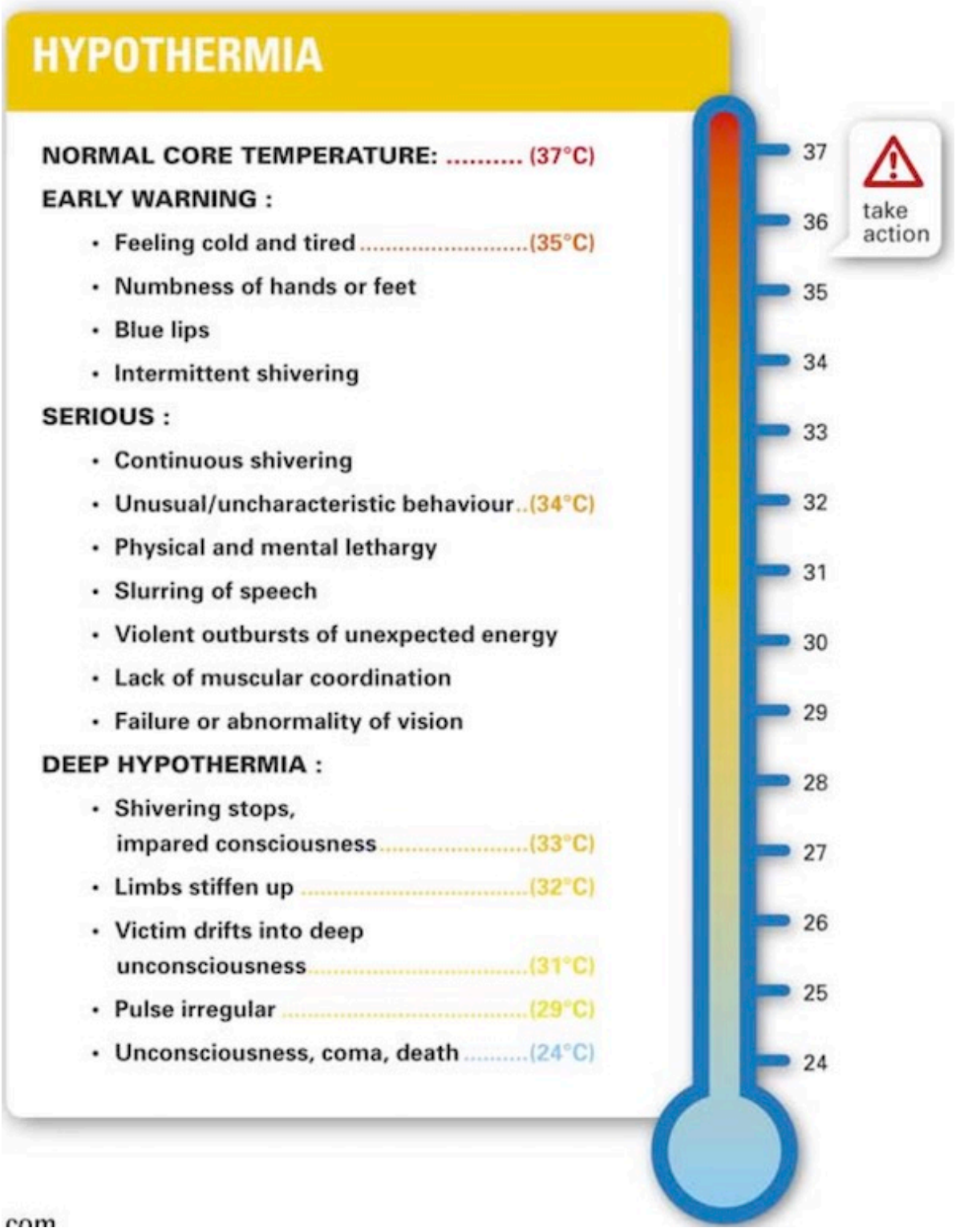
damage. If you've not seen them before, the marketing videos with the inimitable 'Phil Swift' are worth watching.

5 Safety

5.1 Hypothermia / Hyperthermia

5.1.1 Hypothermia

Hypothermia is a condition brought about by the lowering of the body's core temperature. It can badly affect judgement and be very dangerous. The diagram below shows typical symptoms against core body temperature.


HYPOTHERMIA
NORMAL CORE TEMPERATURE: ..... (37°C)
EARLY WARNING :
• Feeling cold and tired .....(35°C)
• Numbness of hands or feet
• Blue lips
• Intermittent shivering
SERIOUS :
• Continuous shivering
• Unusual/uncharacteristic behaviour..(34°C)
• Physical and mental lethargy
• Slurring of speech
• Violent outbursts of unexpected energy
• Lack of muscular coordination
• Failure or abnormality of vision
DEEP HYPOTHERMIA :
• Shivering stops, impared consciousness.....(33°C)
• Limbs stiffen up .....(32°C)
• Victim drifts into deep unconsciousness.....(31°C)
• Pulse irregular .....(29°C)
• Unconsciousness, coma, death .....(24°C)
37
36
take action
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com

The best approach is avoid becoming hypothermic:

- Avoid swimming
- Maintain personal fitness
- Eat well before paddling
- Wear suitable clothing
- Look after each other, watch out for early signs
- Be flexible in plannin
- Be aware that if one person is getting cold, the rest of the group probably are as well

It is useful to distinguish types of hypothermia by the speed on onset, although in reality these lie in a spectrum and both can occur together:

- Immersion hypothermia occurs quickly following submersion in cold water. If the victim can be re-warmed effectively, they are likely to recover rapidly and can then continue.
- Exhaustion hypothermia which sets in over a longer period and will involve depletion of energy, meaning the victim can become unfit to continue.

Early stage hypothermia is treated by:

- Preventing further use of energy
- Preventing further heat loss - e.g. more clothes, shelter, sleeping bag
- Slowly rewarm, ideally with warm moist air. This can be done effectively in a group shelter. In a tent or hut, a pot of boiling water on a stove can help
- Encourage victim to eat

Serious hypothermia is treated in the same way, but will require hospital treatment and potentially a very difficult evacuation (stretcher).

Especially for more serious cases, attempts to rewarm the skin by hot objects or rubbing can be counterproductive as they may cause blood to flow from the core to peripheral vessels.

For those wanting to learn more, the classic (20 minute) video 'Cold, Wet and Alive' is worth watching. Although long and somewhat dated, it's a realistic portrait of the downward spiral that can set in when things start going wrong in chilly conditions.

5.1.2 Hyperthermia

Hyperthermia describes a range of medical conditions caused by hot weather. The table provides a brief summary. Like hypothermia, avoidance is the best tactic - drink lots, dress for the conditions, wear suncream, sun hat and sunglassees and use seawater to keep cool if it's really hot.

Condition	Symptoms	Treatment
Dehydration	Dry mouth, headache, dizziness, dark urine, cramp	Drink plenty of fluids
Sunburn	Red skin, blistering	Cover skin, cool skin by dabbing with water, drink fluids
Heat exhaustion	Headaches, dizziness, confusion, nausea, sweating with clammy skin, cramps, rapid weak pulse and breathing	Cool casualty down, give plenty to drink, ideally with oral re-hydration salts. Monitor carefully for signs of heatstroke.
Heatstroke	Can follow heat exhaustion, when the body's thermostat fails and sweating ceases. Symptoms as heat exhaustion, but skin is now hot, flushed and dry, pulse is full and bounding and core temperature rises.	Cool casualty with wet clothes or sheets. Get medical help (e.g calling 999). Monitor carefully.

5.2 Summoning outside help

The UK Coastguard exists to safeguard people on the sea around the UK, including sea kayakers. It is a good idea to inform them of your plans before setting out. This can be done:

- By phone - look up the number of the coastguard station that covers the area
- By VHF radio, if you have a license
- Using the new RYA SafeTrx App, which also enables you to register your details

If you tell the Coastguard of your plans, ensure that you inform them once you are off the water.

If something does go wrong, sea kayakers need to be able to summon assistance. A variety of methods are available, summarized in the table below. In practice, it is sensible to have a range of options:

Method	Advantages	Disadvantages
Mobile Phone	Most people already have one and are familiar with its operation. Call 999 and ask for 'Coastguard'.	Typically not waterproof. Poor signal in many sea kayaking areas.
VHF Radio	Allows two-way communication with rescue services. Transmission may be picked up by other vessels.	Requires at least a basic understanding of radio use and protocols. Handheld VHFs have limited range.
Personal locator beacon (PLB)	Simple to use. Satellite communication ensures that transmission will most likely be picked up from any location. Modern units transmit precise location.	No two-way communication. Unit has only one use, is still somewhat expensive and needs occasional battery checks.
Rocket flares	Red flares are a widely recognised signal of distress	Relies on someone seeing the flare and reporting it. Flares are quite dangerous to use. They have a limited lifetime before requiring replacement.

After carrying them for years, I'm recently given up on flares. They're a pain to keep in date and dispose of, and they can be very dangerous to use. They rely on someone seeing and reporting the flare, and seem to offer no advantages over more modern methods.

I would advise anyone planning their own trips to buy a PLB. They're small, simple and should work everywhere. VHF radios are useful, but spend your money on a waterproof phone case and a PLB first.

As well as having a means to call for help, kayakers also need to able to pinpoint their location for rescue services, who may be searching a large area. Options include:

Method	Advantages	Disadvantages
Handheld flares	Extremely bright and distinctive, compared to any other method. Produce enough smoke to provide a wind indication to a helicopter.	Flares are quite dangerous to use. They have a limited lifetime before requiring replacement.

Method	Advantages	Disadvantages
Smoke flares	Provide a wind indication to a helicopter.	Useless in the dark. Smoke tends to stay low and disperse in high winds. Somewhat dangerous, but less so than flares.
Lights and strobes	Simple and compact - dedicated marine units are available, but some tests have shown that even bike lights can be effective.	Not as bright or distinctive as flares. Depend on a waterproof unit with charged batteries.
Laser lights	Very compact, capable of producing a bright and distinctive flash if used correctly.	Needs to be carefully aimed. Requires charged batteries.
VHF radio	Can be used to pinpoint location using direction finding equipment on lifeboats and helicopters. Also enables 2-way communication to describe location.	Requires charged batteries. Useful to have some knowledge of radio protocol.
Bright and reflective equipment	Simple and easy to achieve. Reflective 'SOLAS' tape can be remarkably effective under searchlights at night.	Not as distinctive over long ranges as lights. Decent 'SOLAS' tape is a little more expensive than alternatives, but much more effective.

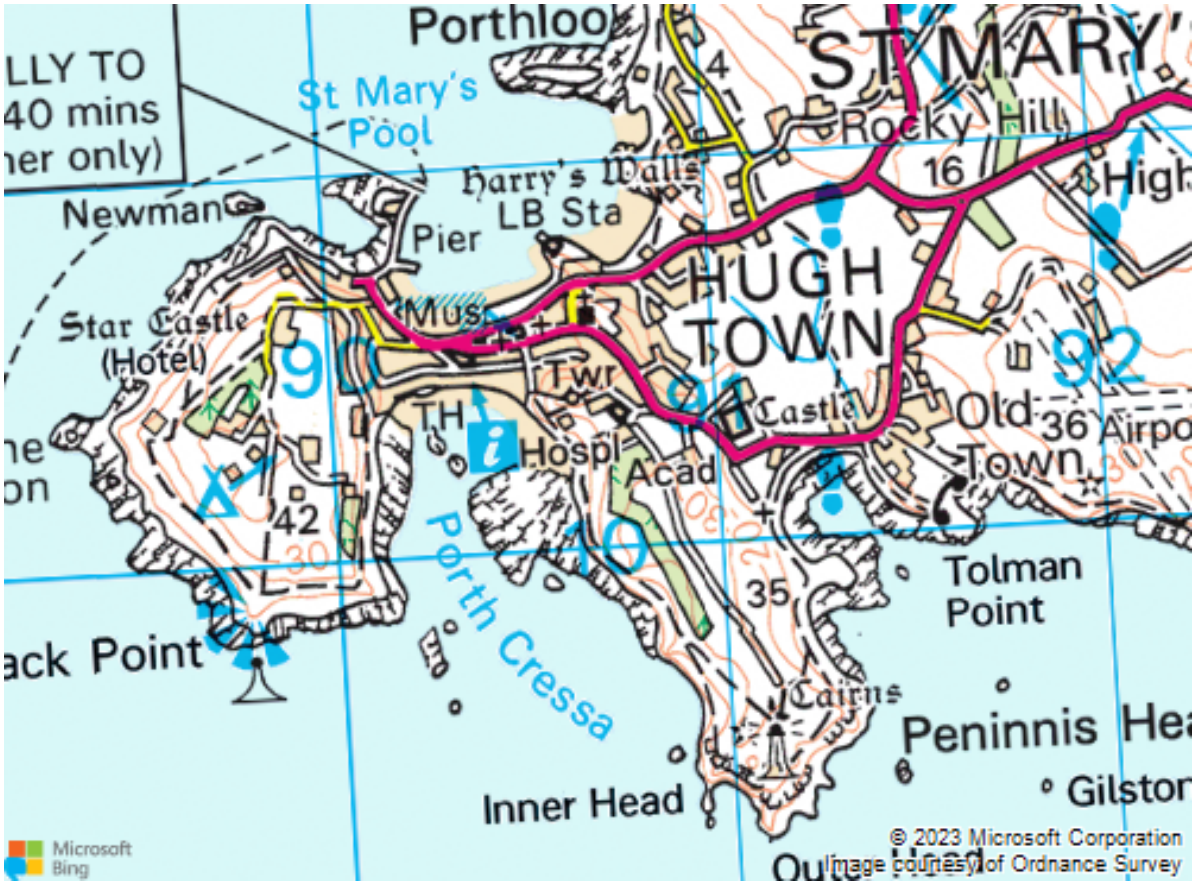
I think there's a stronger argument for handheld flares than rocket flares, but I gave up on carrying these recently in favor of strobes that last a great deal longer, are a lot safer and don't require regular replacement. If you do ever use a handheld flare, hold it horizontally to reduce the amount of burning material that falls on your hands. Smoke flares have a very narrow range of uses, and I've never carried one.

I do carry all of the non-pyrotechnic options in the list above. Having many lights makes sense - they're compact things. VHF radios are generally useful to have. Buying bright kit and sticking reflective 'SOLAS' tape all over your boat and paddles makes a lot of sense.

5.3 Coastal Navigation

The simplest approach to coastal navigation is simply to follow a linear feature (like a coastline) and know how far along this we are by the things that we have passed.

What landmarks would we expect to see on a paddle from Portloo to Old Town?



Paddling out of Portloo, turn left around a rocky area (island at HW). Pass a small beach, a rocky promontory, a second beach and a lifeboat station. Paddle past the town beach and round the pier. Pass a small island, turning left. Pass a point and turn left again. Left again at a point with a beacon offshore. Sharp left inside some islands into a beach with buildings behind. Back out of this bay, past an indent (island) to a major headland (lighthouse). Round the headland, offshore island, smaller headland and into Old town bay (look for main road and the town).

The Ordnance Survey, who create maps for the UK, have lots of resources on map reading that you might find useful.

5.4 Other water users

We often share the sea with other types of craft. Some of them, especially swimmers, are more vulnerable than us, and need to be looked out for, especially in surf. Mostly, we need to be aware of other craft, make ourselves visible by traveling in groups, and take avoiding action where necessary.

Large vessels can be a hazard in some areas that we paddle in. They travel remarkably fast, and are often unable to maneuver to avoid things due to their size, or because they're travelling in a narrow deep water channel. Clearly, kayakers need to keep out of the way. It's worth understanding a little about the navigational marks that large vessels use so that we can understand where they are likely to go.

5.4.1 Navigational marks

To assist the navigation of ships, navigational marks such as lighthouses, buoys and beacons are placed around the coastline. Because kayaks can operate in very shallow water, these aren't relevant to us in the way as for large vessels. However, they do provide useful landmarks if you're carrying the nautical chart. A basic understanding of what the main buoys mean will help you understand where larger vessels are likely to go and thus help you avoid them.

Lateral marks are used to mark the edges of shipping channels – for example into and out of a harbor. As a big ship enters a harbor, red can-shaped port-hand buoys will be on the left, whilst green conical starboard-hand buoys will be on the right.

A mnemonic to remember this is "no more cans of red port left".

Figure 5.1: Lateral marks - green starboard mark to the left of the image, red port mark to the right of the image

This is the system known as 'IALA A', used in the UK and many other parts of the world. Some areas, notably the US, use 'IALA B', in which the colors of the buoys, but not the shapes, are reversed.

Cardinal marks indicate the presence of hazards – normally shallows that big vessels would rather avoid. A cardinal mark indicates the direction from the mark in which safe water can be found. For example, safe deep water will be found to the north of a north cardinal buoy, with the hazard lying to the south. The marks are differentiated by the orientation of two cones at the top as well as the sequence of black and yellow colors on the buoy, as shown in the diagram.

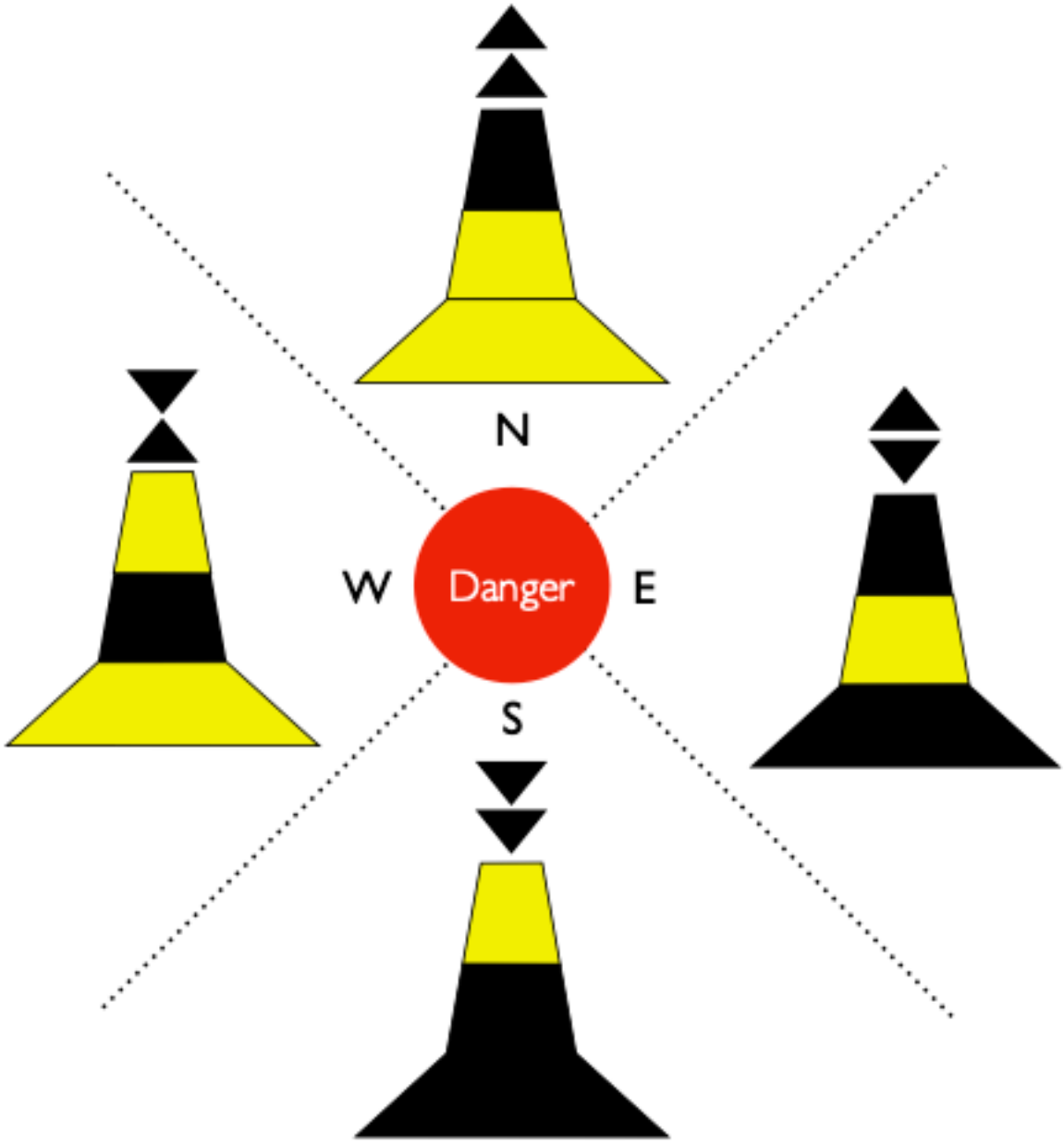


Figure 5.2: Diagram showing how cardinal marks are positioned relative to a danger.

Because cardinal marks indicate shallow areas, they can sometimes be posts attached to the seabed rather than floating buoys.

The buoy in the image below is an west cardinal mark, indicating shallows to the east.

Figure 5.3: Bono Rock west cardinal buoy. The buoy marks the western extent of the Bogha Nuadh and Bogha Ghair reefs, south-west of Easdale in the Inner Hebrides. The eastern extent of the shallows is marked by the Bogha Ghair east cardinal buoy.

The chart extract below shows an example of how navigational marks might be positioned:

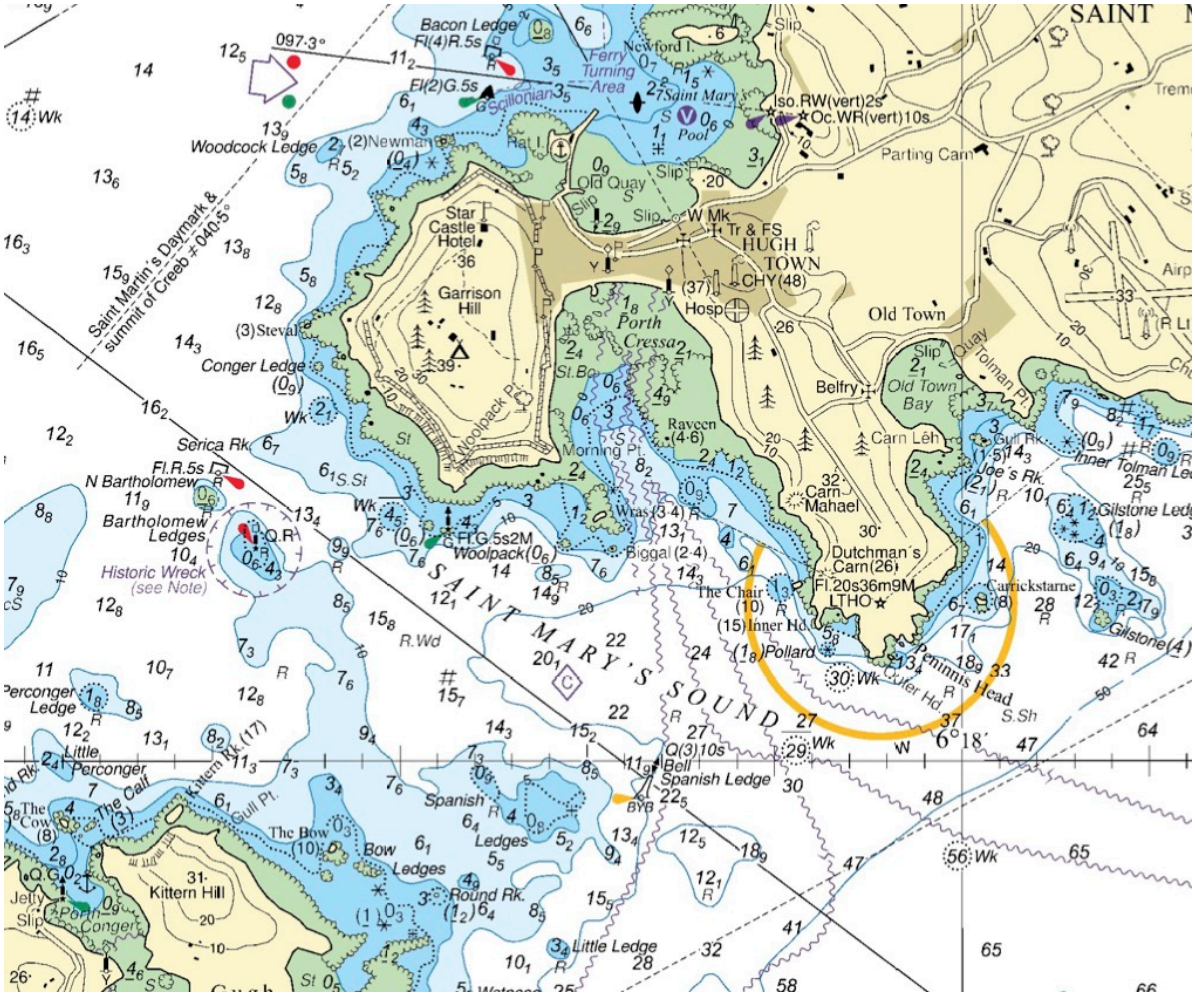


Figure 5.4: Southern approach to St. Mary's in the Scillies - this is the route taken by larger vessels, including the ferry, at low water The route is marked by a a series of solid and dashed lines. An east cardnal 'Spanish Ledge' marks the shallows of Spanish Ledges to the west - large vessels will keep east of this buoy. Further to the northwest, a green post ('Woolpack') and a red post and buoy ('N Bartholomew') mark the edges of a narrow channel with rocks either side. Sea kayakers might choose to avoid large vessels by keeping out of this channel. To the north east, two more lateral marks (including 'Bacon Ledge') mark the narrow channel into Hugh Town harbor. Note the arrow with green and red spots printed just north of Woodcock Ledge on the map. This indicates the 'direction of buoyage' - i.e. which side of the channel has red marks and which has green marks.

As sea kayakers, the hazards (e.g. shallows) indicated by lateral and cardinal buoys aren't an issue for us. It's often better to go the 'wrong' side to keep out the way of big vessels.

For example, imagine that we're crossing Saint Mary's Sound (see chart above) from Kittern Rock to the western corner of Garrison Hill. We'll use bearings and transits to keep on course, but the red post and buoy that mark the Bartholomew ledges will be useful landmarks along our way.

As we get close to the post and buoy, we notice the 'Scillonian' - a 68 meter long ferry - coming around the headland of Garrison Hill. It looks like it'll head to our right.

However, consulting the chart, we notice that the main shipping channel passes to the north-east of the Bartholomew ledges buoy - we can see the course marked with a line on the chart, and we know that the channel must go between the red Bartholomew ledges buoy and the green 'Woolpack' mark.

It is possible, but unlikely, that the ferry will go the south-west of the Bartholomew ledges. However, it certainly won't go through the middle of the very shallow ledges marked by the red buoy and post. The safest place to be is close to these lateral marks - ideally between the N Bartholomew buoy and the post.

So, we paddle the short distance across to the N Bartholomew buoy and pause our crossing, taking advantage of a slight eddy forming over the shallows so we don't need to paddle too hard into the tidal stream to hold our position. We watch the Scillonian turn. For a scary moment it points directly towards us, but it keeps turning, and soon passes to the east of us.

5.5 Group communication

Operating as a group is one of the main ways that we enhance our safety on the sea. However, it's not enough for everyone to launch at the same time - the group needs to work in a cohesive and supportive way.

Clearly, the group can only operate effectively if everyone stays together. There's a compromise, especially in challenging conditions, between staying close and giving each group member enough space to manoeuvre. This limits the size of effective groups at a more advanced level.

The group must communicate effectively both before and during its time on the water. Given it is easier to communicate on land, it make sense to review plans, roles, potential hazards and options before launching. On the water, the team takes advantage of quiet spots to chat and re-evaluate its options. When possible, the team paddles close enough together to hold a conversation.

A group can only work effectively if group members can see each other. This can become challenging among rock gardens. It helps if group members move so that they can see each other and can be seen by others.

It is easier to avoid trouble than to sort out problems after they occur. The group should be proactive in identifying hazards, decide what challenges it wants to take on, and formulate plans that enable progressive exposure to conditions and an opportunity to retreat. For example, the group might choose to launch in a river mouth and paddle upwind rather than beginning the day by paddling downwind and offshore.

5.6 Towing

There are several reasons why we might want to tow other members of our group:

Reason to tow	Likely towing technique
We might need to move a frightened or unsteady paddler out of challenging conditions	Contact tow
Someone may have become fatigued at the end of a long day - towing can help keep the group together at a good speed, with the tired paddler continuing to paddle as much as they are able	Towline
We may need to move a paddler incapacitated by (e.g.) injury or seasickness back to safety	Rafted tow
We might need to keep other paddlers who are performing rescues away from rocks	(we likely won't cover these more advanced techniques on this course)

Let's look at each technique in a little more detail

5.6.1 Contact tows

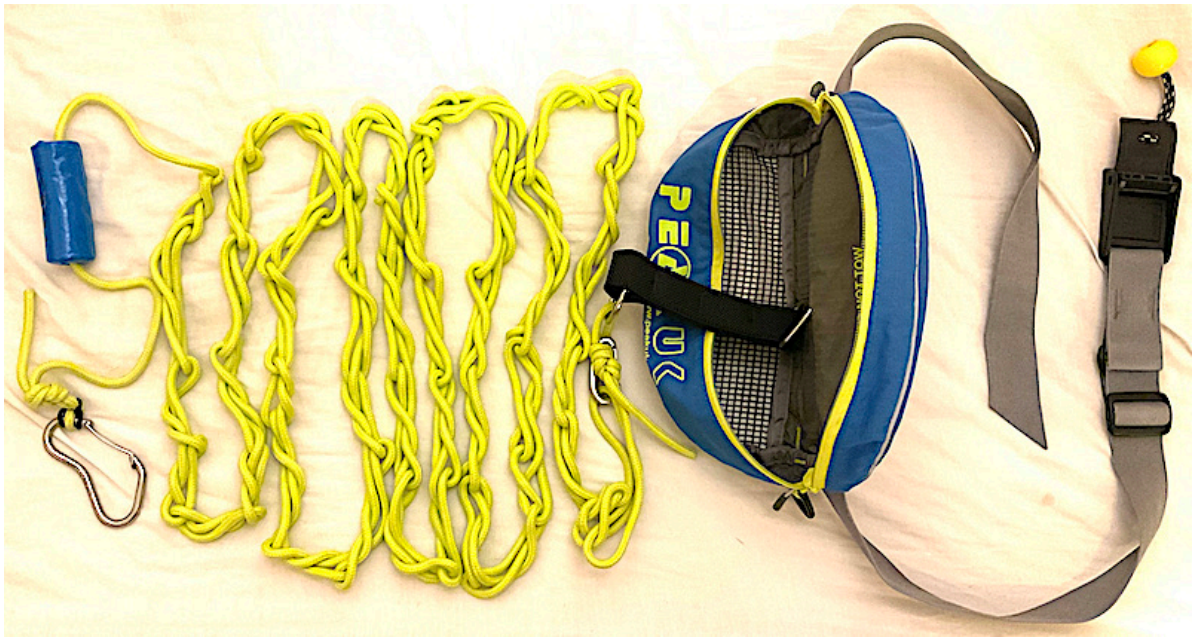
This is a simple approach to towing, using little or no equipment, to move other paddlers a short distance. In the simplest embodiment, the paddler being towed simply holds onto the rescuer's decklines whilst they paddle them to safety. As well as providing a connection for the tow, holding the rescuer's boat provides stability and reassurance.

Some paddlers use short lengths of cord clipped to their decklines as simple aids to contact towing.

This short video covers both approaches:

5.6.2 Using the towline

A towline (Peak, 15m) is shown in the image below:



This towline is worn around the paddler's waist, just above the spraydeck. A quick release buckle is used to secure the towline around the waist. Pulling the yellow ball releases the towline.

The line is kept inside a zipped bag when not in use. The line is attached to the waist strap by a black shock absorber, which stretches to reduce the peak forces transmitted to the paddler's

body. This makes towing more comfortable, especially in waves.

The line is 'chain linked' to reduce it's length from 15 meters to around 5 meters. This is a good length for many towing scenarios - keeping the paddler being towed close to you reduces the amount that the towed boat can wander around. A metal clip can be used to undo the chain linking to increase the towline length to 15 meters. This is useful if towing downwind in sizable waves to avoid the towed paddler crashing into the back of your boat.

The end of the towline has a section of non-chain-linked line for use in rafted tows and a float to stop the karabiner sinking. This towline has been retrofitted with a Whetman Kraken karabiner - these karabiners are easy to clip onto decklines, strong and corrosion resistant.

It's worth thinking about how and where to clip the towline on. We typically clip to the boat's decklines, as these are the strongest attachment points. It's better to clip the karabiner with the gate facing up rather than down, as this reduces its propensity to unclip itself.

Figure 5.5: A simple towing configuration, with one paddler towing another

5.6.3 Rafted tows

A paddler incapacitated by injury (e.g. shoulder dislocation) or seasickness may not be stable enough to be towed alone. Instead, we raft the incapacitated paddler up with another group member, who can hold them upright and keep an eye on them. The towline is passed under the assistant's decklines and clipped onto the victim's decklines. This arrangement enables the assistant to slide forward to unclip the tow if needed.

Figure 5.6: Rafted tow of an incapacitated paddler (red boat)

Towing a raft of two boats any distance is clearly going to be hard work, and it may make sense to involve another paddler in the tow. The simplest approach is for the second towing paddler to clip onto the front of the first towing paddler's boat, so that the boats are all towed inline.

Figure 5.7: Inline tow

6 Dry(er) Skills

As with any practical skills, kayak handling and rescue skills need practice to develop. I've provided some brief notes and linked to some videos to provide a reminder of the skills that we'll cover on the course.

6.1 Forward paddling

Developing an efficient forward paddling strokes takes a lot of time and practice, and all of us are still learning! We're lucky to have an active community of racing kayakers at the club - getting tips from them, and perhaps joining some of their sessions, is a great way to learn.

The video below (and the associated notes here) is a good start point

For anyone wanting to get into this in more depth, I'd recommend videos of Ivan Lawler coaching (e.g. these or these).

Here's a few tips that might be useful (if these make little sense, I suggest watching the videos first!):

Get the right posture

- Keep the chest high and sit tall in the boat. Imagine that you're being pulled upwards by a thread attached to your head.

- Look where you are going!
- Keep the ‘nipple line’ horizontal - avoid dropping either shoulder when paddling
- Lean forward very slightly
- As you paddle, the body rotates about the spine

Catch

- Keep the bottom arm straight. With the body rotated, you should be able to reach the blade to enter the water around your feet
- The upper part of the top arm extends sideways from the body in line with the collarbone. The arm is bent at the elbow, with the forearm roughly vertical and a little forwards - think of the position you’d put it in for a press-up
- The blade is placed in the water by pushing along the shaft with the top hand

Pull

- Hold the shape - the upper forearm, upper arm and collarbone remain static relative to each other. There is flexing at the shoulder to allow the lower arm to stay straight and track with the paddle as the body unwinds. The top hand does not push forward, rather it acts as a pivot for the paddle shaft. You should see it track across the horizon in front of you.
- You should push with your foot on the side that the paddle is pulling to transfer force to the boat.
- The body rotates about the spine
- The paddle follows an angled trajectory backwards and away from the boat until it is extracted level or forward of the paddler’s hips. The paddle trajectory is the same with wings and flats.

Extraction:

- Take out with the back of the arm - lift ‘outwards’, not ’inwards, keeping the elbow low.
- The entire stoke keeps a a positive rake on paddle - generating support from the blade. Once the angle goes negative, the paddle should be out of the water.

Air work

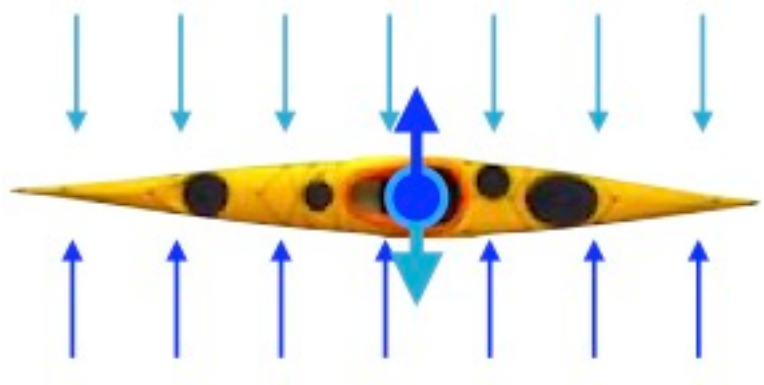
- The arms swap roles in the air, setting everything up for the next stroke.

6.2 Maintaining direction

Sea kayaks can behave like they have a mind of their own in wind and waves. Holding a straight course can be challenging. As with any skill, maintaining direction needs practice, but I think it's very helpful to understand a bit of the theory of what's going on. The explanations below focus on the effect of wind on the boat, but waves, especially short chop, can have similar effects.

6.2.1 The problem

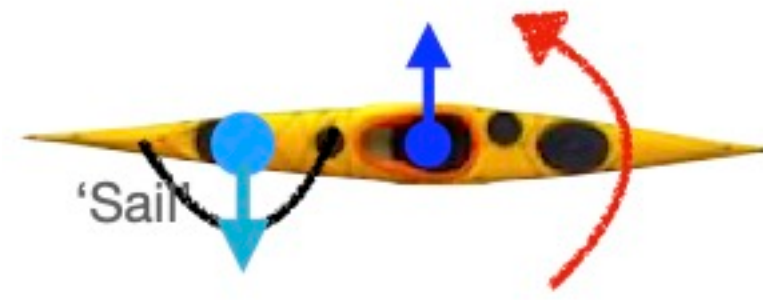
Let's start by thinking about a kayak sitting sideways-on to the wind:



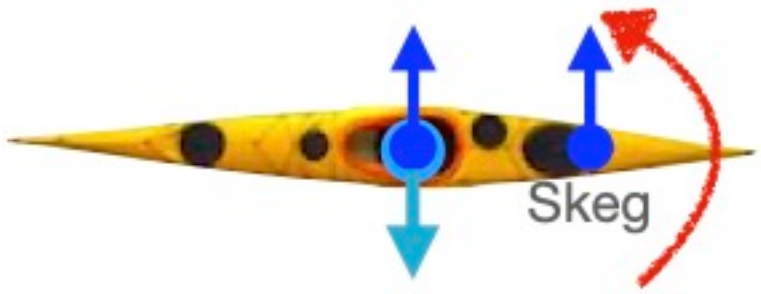
The kayak is subject to forces from the **wind** and from the **water**:

- The wind force acts all along the side of the boat (light blue arrows). In most sea kayaks, the side area exposed to the wind is fairly balanced front to back. The net effect is as if all the wind force were acting at a 'center of pressure' (light blue dot and thick arrow) around the middle of the boat
- As the boat starts to move sideways across the water, the hull of the kayak will experience water resistance (dark blue arrows). Like the wind force, this acts all along the boat. Again, most kayaks are fairly balanced front to back and the center of pressure of the water resistance (dark blue dot and thick arrow) is around the middle of the boat.

So, the forces of wind and water act in about the same place, and the boat will tend to stay sideways on to the wind. If we shift the wind force forwards (e.g. by placing a large object or sail on the front deck), the boat will tend to rotate anticlockwise:



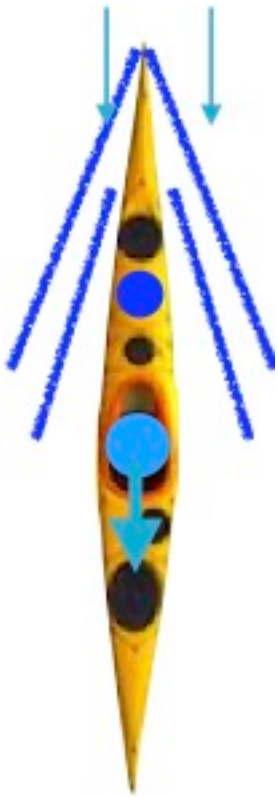
Similarly, if we change the shape of the hull, the water's resistance can change. One way to do this is to put the boats's skeg down (more on skegs below…):



The additional water resistance of the skeg is shown as a second blue dot. The skeg locks the back end of the boat in the water, and the boat rotates anticlockwise due to the wind.

We've not actually tried to paddle anywhere yet, but hopefully the physics is starting to make sense!

When we do start paddling, the wake at the front of the boat and the disturbed water at the back tends to shift the centre of water resistance of the boat forwards. It's as if the boat's bow becomes 'locked' in the wake, whilst the stern is free to move. If we've paddling into wind, this isn't a problem:

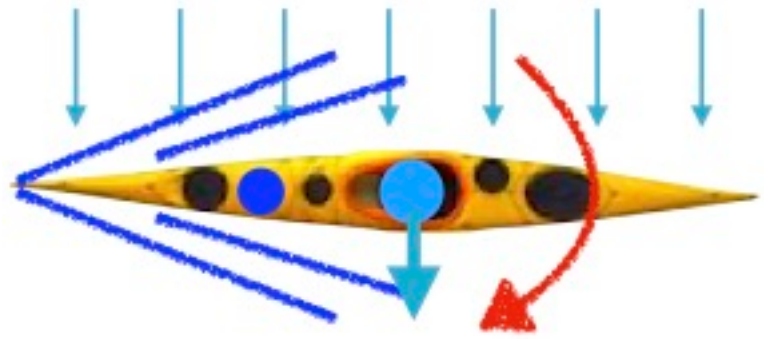


Notice that the boat's 'locked' at the centre of water resistance (dark blue dot), with the centre of wind pressure (likely mostly due to the paddler's body) behind it. Like a pendulum hanging vertically, having the wind force acting behind the water resistance is a stable configuration. Whilst it's hard work to paddle upwind (you're fighting both the water resistance and the wind), the boat will tend to go in a straight line.

What if we want to paddle downwind?

Everything is similar, except the wind force is now acting behind the water resistance force. It's like we've turned the pendulum upside-down. If we can keep the boat perfectly aligned, things might be OK, but any deviation from straight will tend to make the boat swing, with the stern moving away from the wind.

Paddling across the wind is even worse:



Now the wind force and the water resistance act at different places along the boat. The boat will tend to turn upwind. We refer to this as 'weathercocking'.

In summary, a kayak being paddled forward in wind will tend to turn towards the wind (weathercock), because the wind force acts further back on the boat than the water resistance force.

How do we deal with this?

6.2.2 Using the paddle

A simple approach is to shift your hands along the paddle shaft such that you have a longer lever on the upwind side of the boat and a shorter lever on the downwind side. Doing this puts more power into the upwind strokes, tending to counteract the turning effect.

Needless to say, this isn't very efficient!

6.2.3 Using edge

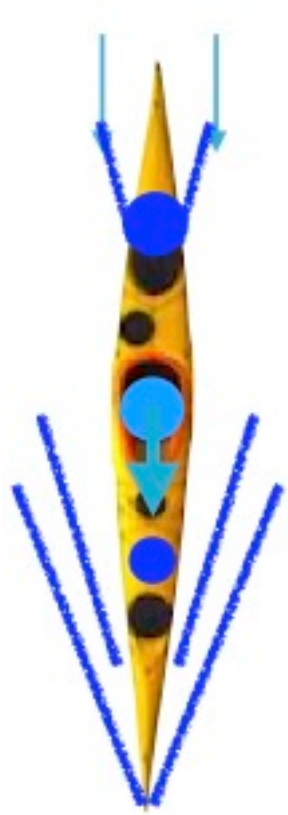
We've learned that sea kayaks edged to the right tend to turn left, and vice versa (see notes on "Demonstrate effective and efficient turning of a sea kayak". If we edge towards the wind, the turning effect of the edge counteracts the weathercocking tendency, and, with practice, we can get the boat to go where we want it to.

This actually works quite well for short distances. Over long distances, holding an edge can be quite tiring. In high winds, a lot of edge is required, which can feel quite unsteady.

6.2.4 Using the skeg

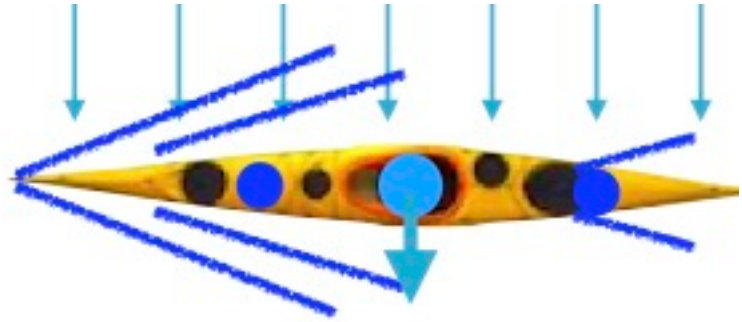
We discussed earlier how the skeg alters the water resistance on the boat hull. Given that our problems are caused by the water resistance acting too far forwards, it's logical to use the skeg to bring the resistance towards the stern of the boat.

This is easy if we're going downwind - putting the skeg all the way down helps the boat to track:



The extra lateral resistance of the skeg (big blue dot) now tends to pin the stern in place. The wind acts further forward on the boat, and everything acts in a nice stable line.

Going across the wind, things are a little more complicated:



We now have the lateral resistance of the skeg and boat acting sideways against the wind resistance. It's like a see-saw with the wind acting as the pivot in the middle and the boat and skeg resistances on either end. If we can balance everything out but putting the skeg down just enough, we'll go in a straight line. This takes practice, but once you've got it adjusted right, the boat should track well across wind.

Here's a video covering the same points. Note that rudders are more common on sea kayaks in the US, whilst UK paddlers have traditionally tended to use skegs:

6.3 Rockhopping

Exploring rocky coastlines with gullies, passages, caves and arches is one of the great pleasure of sea kayaking - we often refer to this as 'rockhopping'. Getting a long boat among rocks, along passages and back out again challenges boat handling skills. Rockhopping is a great a way to assess how your skills have developed.

Figure 6.1: Paddling group negotiating narrow channels on the Pembrokeshire coast

6.4 Turning

This video covers the sweep stroke - a sea kayaker's fundamental turing stroke.

Although it's not mentioned in the voice over, notice how the paddler is using edge to make it easier to turn the boat. The same coach discusses this in more detail in this follow-on video:

…and the use of edging for more gradual turns in this video:

6.5 Sideways

7 Wet skills

Like the dry skills, the wetter skills can only be acquired with practice. It's critical for safety that everyone can perform basic rescues, and we'll begin covering these early in the course. We'll let you know when we're planning a wet session, so please come dressed for immersion (e.g. wetsuit/drysuit) . We'll try and plan those sessions so that the time you're wet and cold for is minimized. It helps a lot if people can bring some enthusiasm in return! Remember that the club has warm showers - bring shower gel, a towel and some dry clothes.

7.1 Brace

7.2 Self rescue

This video shows the general idea of a 'scramble' type self rescue:

This longer video goes into more detail and includes some exercises:

Getting onto the back deck can be challenging - the video below has some useful tips:

7.3 Assisted rescue

Whist slickly executed sea kayak rescues can look simple, there's a lot of steps to follow. With practice, you'll be able to execute a rescue quickly and effortlessly.

Here's a list of the key steps as a reminder:

1. Victim turns boat upright and moves to the bow of their boat, holds onto paddles
2. Rescuer brings their bow to the victim and paddles forward to bring boats parallel
3. Transfer victim to the rescuer's boat, rescuer places paddle under decklines, moves boat square to each other

4. Rescuer edges towards victim's boat, slides it over deck, bringing it as far as the front hatch
5. Rescuer turns the victim's boat over - rolling towards them by holding the deck lines and keel
6. Rescuer edges away from victim's boat to empty, lifting if needed
7. The rescuer slides the boat off their deck, bring the boats parallel to each other and facing in opposite directions
8. The victim comes round to the cockpit, passes their paddle to the rescuer and re-enters the boat. There are several possible approaches - heel hook, bellyflop onto back deck as for the self rescue, or work along from the back of the boat (ladder)

If boat and paddler are separated, fetch the boat and bring it to the paddler (perhaps after emptying it). It's much easier to move a boat than a swimmer. The victim keeps hold of their paddle and holds one blade high to make it easier for the rescuer to keep an eye on them.