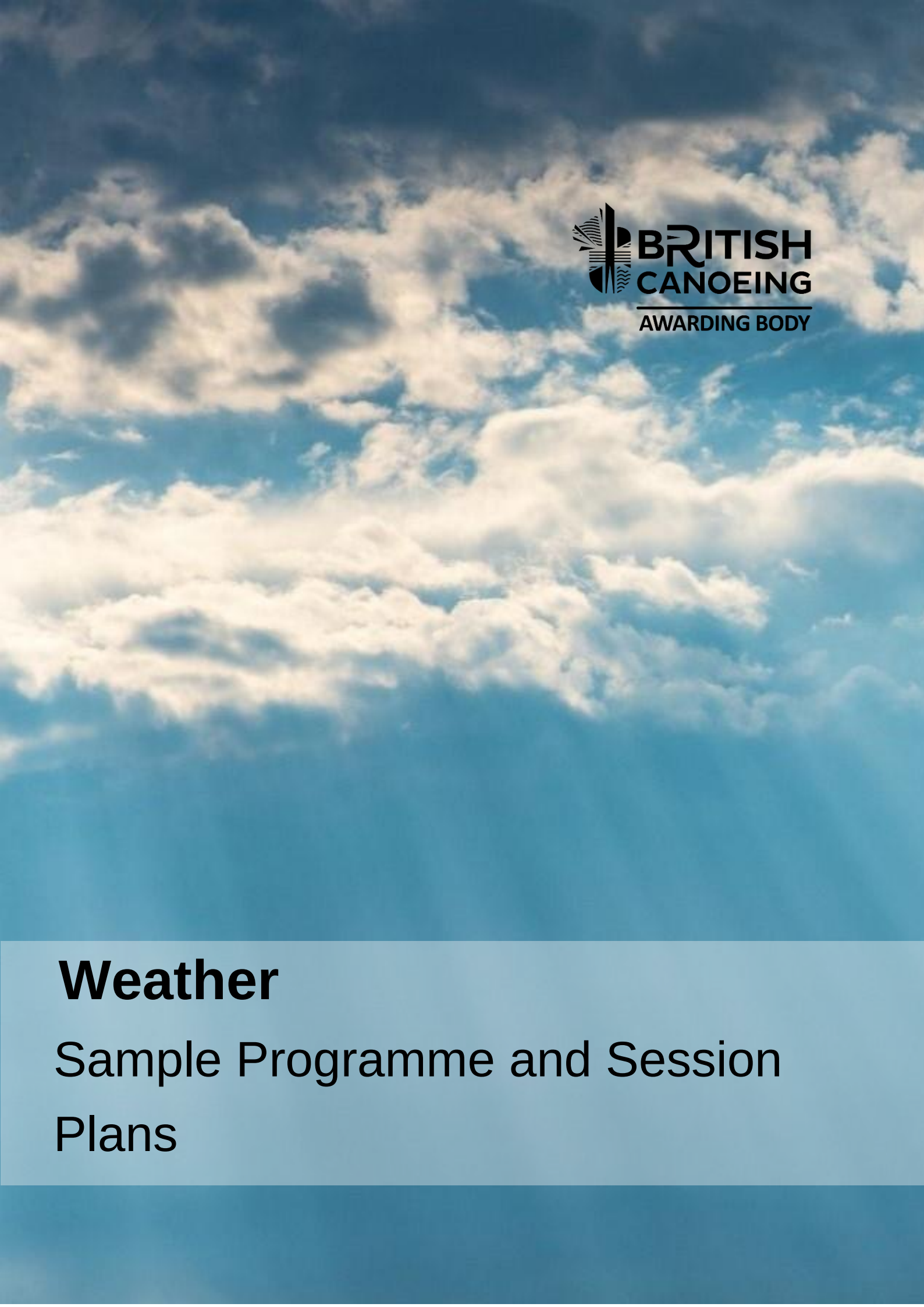


BRITISH CANOEING
AWARDING BODY

Weather

Sample Programme and Session Plans

BCAB Weather Module

Sample Programme and Session Plans

Introduction

This document provides an example of the British Canoeing Awarding Body (BCAB) Weather module and the accompanying plans for the 7 activities.

Tutors are required to obtain, understand and consider the participants' current understanding, knowledge and the craft and environment that they paddle. This can be done prior to activity 1 through introductions or part of a more formal process.

Notes:

1. Tutor to participant ratio is maximum 1:8.
2. A module specific eLearning is also available to learners, which could be considered as an appropriate method of a learner accessing the information or used to compliment delivery.
3. Tutors are required to consider the aspirations of the learners and develop their knowledge appropriately in the context of where they are paddling. For aspirants Leaders that want to operate on the sea, additional methods and practices may need to be covered.
4. If delivering using a blended approach, (on and off the water), Tutors are required to obtain an understanding of water confidence and ability in the environment that will be used. This can be done through introductions or part of a more formal process.

The main focus for the Tutor is to ensure all participants are able to contribute, explore and practice. The 2-hour module does not take into account introductions, information gathering, administration or any logistics, the timings provided are for the delivery of the activities.

All activities are interactive sessions, discussing and using resources, exploring and practising the knowledge to better understand the weather to aid decision making and planning.

Participant prerequisites

- There are no prerequisites for this module.
- Providers should check participants' suitability to attend the course, as well as having appropriate mechanisms for anyone under 18.

Venue

The Weather module can be delivered online, blended or face to face, of which Tutors should ensure participants are able to engage throughout.

Course duration

The Weather module is a 2-hour programme that consists of 7 activities, of which can be delivered in one session or modular.

Weather Module

Activity	Time	Activity Outline
Activity 1	20 minutes	Weather forecasts • Different sources • What do those symbols really mean
Activity 2	20 minutes	Wind • Strength and direction • Effects from land features • Wind and tides • Sea and land breezes • Local waves and swell
Activity 3	10 minutes	Other considerations • Visibility / fog • Thunder and lightning
Activity 4	20 minutes	Opportunities and impacts • Water levels • Actual conditions v forecast • Deciding where to go and where not to go
Activity 5	20 minutes	Environmental clues • Wind direction • Clouds
Activity 6	15 minutes	Synoptic Charts • High and Low Pressure • Isobars
Activity 7	15 minutes	Maritime Forecasts • Shipping forecasts and areas • Terminology

Weather Module

Activity 1

Activity Title:	Weather forecasts
Time:	20 minutes

Activity Outline:

- Different sources
- What do those symbols really mean

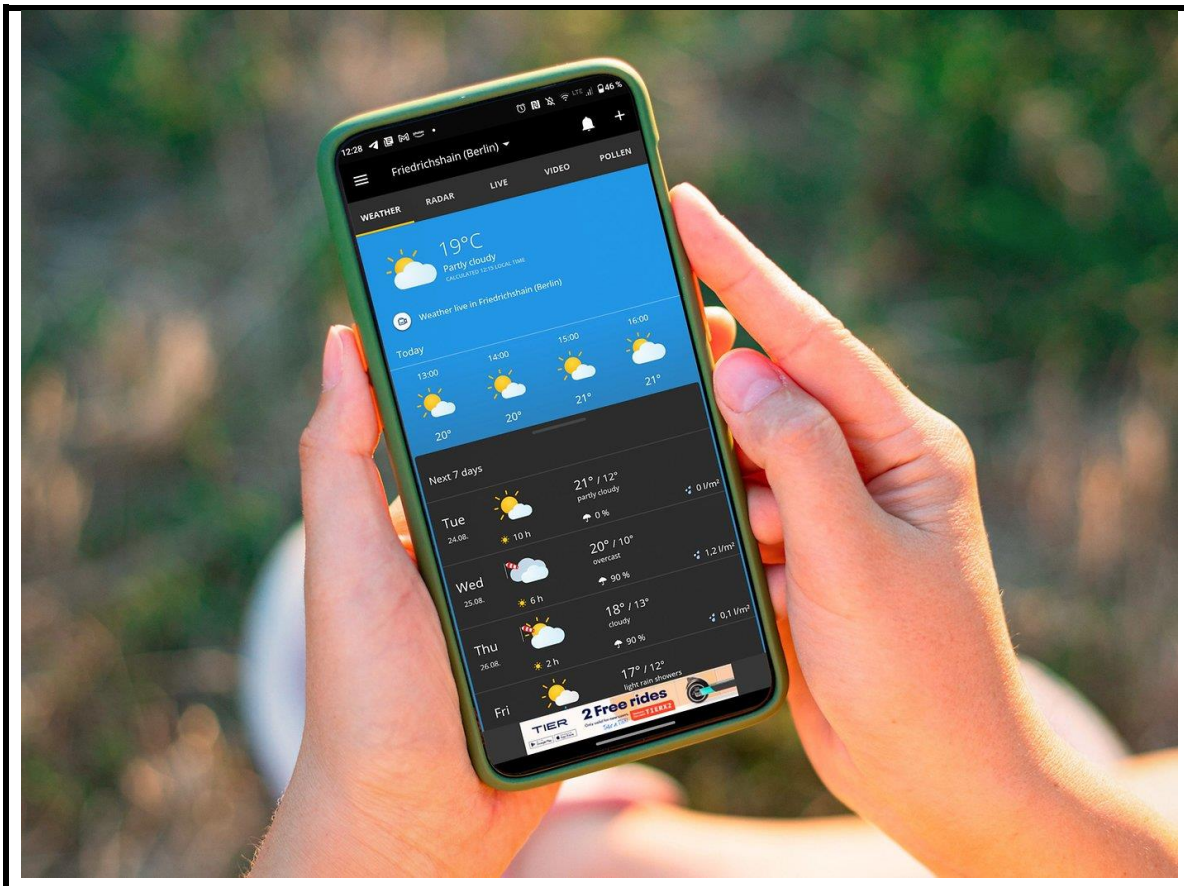
Delivery:

Different sources:

Using resources, encourage the group to explore and then compare different weather forecasts, taking into consideration what information is available. Show apps from a phone and websites or screenshots if no service is available.

Discuss what information within a weather forecast is useful to paddlers, ensuring that the focus is within the context of participants and the environments that they paddle. Including wind strength and direction (further detail in module 2), rainfall, visibility, outlook (sunny/cloudy/overcast, etc.).

Explain and get participants to consider the importance of looking at and understanding past, present and future weather forecasts.



What do those symbols really mean:

Emphasise the importance of understanding the forecast data and symbols on the weather app/forecast that is being used. Highlight that settings can be changed, such as measurement of wind speed, temperature, etc.

Consider using crib cards, or similar resources. As a group, explore the different symbols used, providing clarity as well as addressing typical misunderstandings:

1. Wind speed and direction: The speed represents the average wind speed expected at that point in time, i.e. the mean wind speed you may encounter (in reality the wind will strengthen and lull constantly above and below this value).
2. The arrow shows the direction that the wind is blowing and the letter represents the direction the wind is blowing from (N - North/ SE - South East, etc.).
3. Chance of precipitation: A 70% chance of rain represents a 7 in 10 chance that precipitation will fall at some point during that period.
4. Chance of precipitation represents how likely it is that rain (or other precipitation: sleet, snow, hail, drizzle, etc.) will fall from the sky over a certain time period.

Activities for consideration:

1. Card game on what symbols mean.
2. Wind direction and speed - what is the direction of wind.
3. What app, website or forecast do you use?

Weather Module

Activity 2

Activity Title:	Wind
Time:	20 minutes

Activity Outline:

- Strength and direction
- Offshore winds
- Effects from land features
- Wind and tides
- Sea and land breezes
- Local waves and swell

Delivery:

Strength and direction:

Emphasise and remind the importance of understanding the wind forecast, both strength and direction. Wind speed and direction: The speed represents the average wind speed expected at that point in time, i.e. the mean wind speed you may encounter (in reality the wind will strengthen and lull constantly above and below this value).

The arrow shows the direction that the wind is blowing and the letter represents the direction the wind is blowing from (As per a compass rose - of 16 points).

As a group, provide an overview of the Beaufort scale, which is used widely in forecasts as well as in the Met Office marine forecasts, and is an empirical measure for describing wind intensity based on observed sea and land conditions. Remind participants that in many apps and online forecasts, the units can be changed and the beaufort scale can be selected.

Beaufort Wind Speed Scale: Sea State

	Speed km/hr	knots	Term	Sea
0	Calm	Calm	Calm	Sea like mirror
1	2-5	1-3	Light Air	Ripples with appearance of scales: no foam crest
2	6-11	4-6	Light Breeze	Small wavelets; crests of glassy appearance, not breaking
3	12-18	7-10	Gentle Breeze	Large wavelets; crests begin to break; scattered whitecaps.
4	19-30	11-16	Moderate Breeze	Small waves, becoming longer; numerous whitecaps.
5	31-39	17-21	Fresh Breeze	Moderate waves, taking longer form; many whitecaps; some spray
6	40-50	22-27	Strong Breeze	Larger waves forming; whitecaps everywhere; more spray.
7	51-61	28-33	Near Gale	Sea heaps up; white foam from breaking waves begins to be blown in streaks.
8	62-74	34-40	Gale	Moderately high waves of greater length; edges of crests begin to break into spindrift; foam is blown in well-marked streaks.
9	75-87	41-47	Strong Gale	High waves; sea begins to roll; dense streaks of foam; spray may reduce visibility.
10	88-102	48-55	Storm	Very high waves with overhanging crests; sea takes white appearance as foam is blown in very dense streaks; rolling is heavy and visibility is reduced
11	103-117	56-63	Violent Storm	Exceptionally high waves; sea covered with white foam patches; visibility further

Offshore winds:

Explain off-shore winds and how incidents have increased in recent years when winds blowing from land out onto the water have not been considered.

<u>RNLI data:</u>

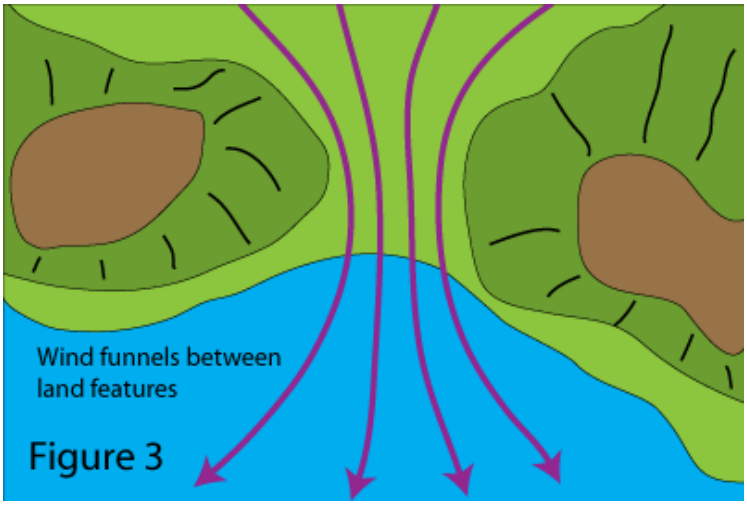
Data obtained from the RNLI covering a period from 2020 - 2022 show that 54% of SUP rescues requiring RNLI assistance, cited offshore winds as a contributing factor. This is an increase from 33% in 2019.

Emphasise how significant wind direction and speed are in deciding whether, as a paddler, you and others have the appropriate skills to paddle in such forecasted environments, considering fatigue and how demanding paddling in wind is.

Using maps or a flip chart, show how the land can provide shelter from the wind, as well as moving further from land, the wind will have a significant effect.

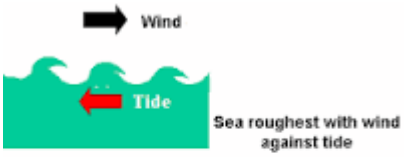
Effects from land features:

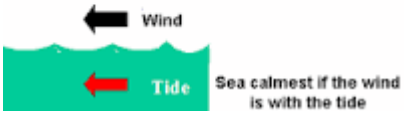
Discuss and show how land features can affect the wind, creating funnelling and how features may speed up and slow down the wind.



Wind and tides:

Explain and show that when the wind blows against the tide, the waves become steeper and break, but when the tide turns the waves flatten and lengthen giving much more pleasant conditions. This effect can change the sea state enormously and in strong winds should always be considered. It should be emphasised that this also happens in estuaries and tidal rivers.

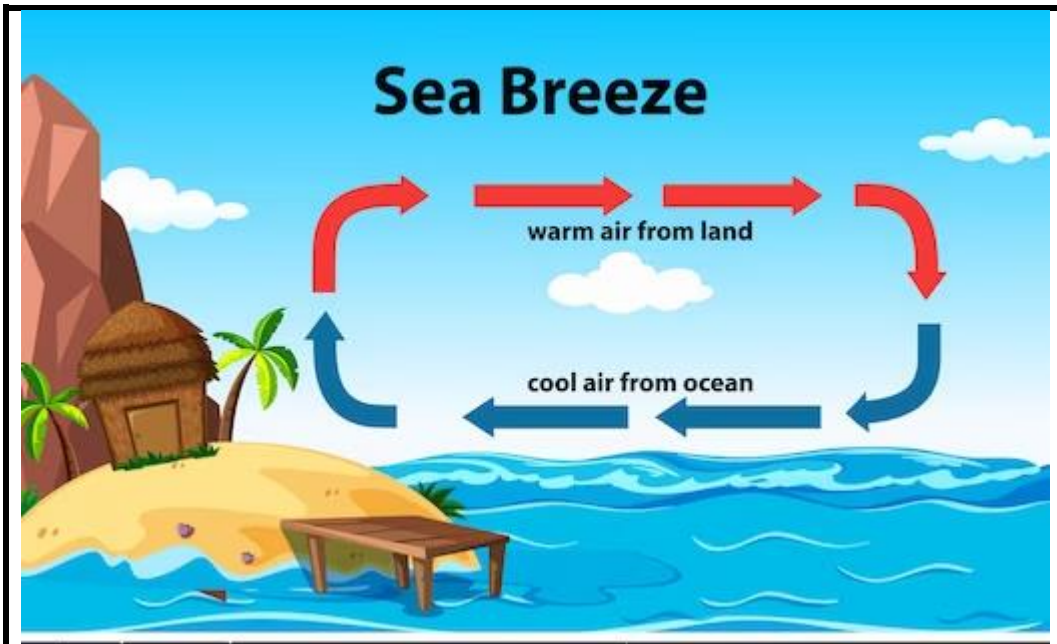




Sea and land breezes:

Explain and show to the group, the effects of the land warming up and cooling down. Highlight that during the day, the land heats up faster than the sea. The air above warms up too, becomes light and rushes up. Cooler air from the sea immediately replaces it, heading towards the land.

Emphasise such affects and raise awareness that during the day, the breeze blows from the sea to the land. The night breeze blows in the opposite direction, as the sea stays warm while the land cools down quickly at night.



Local waves and swell:

Explain to the group how wind on the water creates waves. Explain how waves are raised by winds blowing locally, the stronger the winds, the higher the waves, both on the sea and inland waters. Swells are caused by winds far away, winds that generate waves on the sea in a distant region.

Note: Signpost learners to the Surf and Swell module/eLearning.

Exercises for consideration:

1. If the wind is going one way and tide the other, how might the water behave?
2. Different landforms and wind direction - what could be the outcome.
3. Offshore wind research (SUP) / Podcast.

Weather Module

Activity 3

Activity Title:	Other considerations
Time:	10 minutes

Activity Outline:

- Visibility / fog
- Thunder and lightning

Delivery:

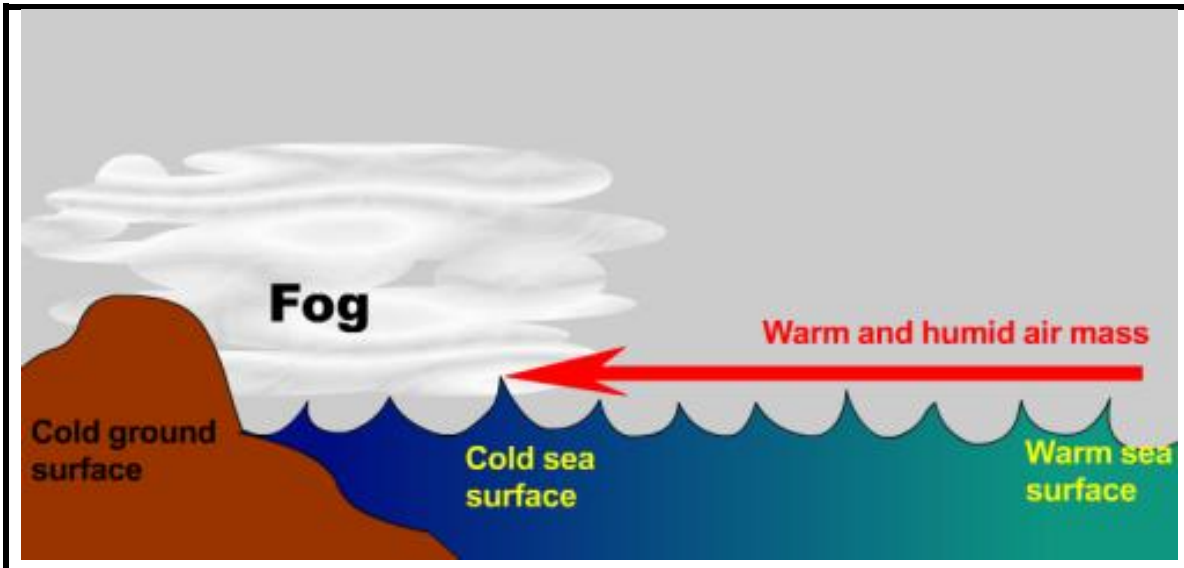
Visibility / Fog:

Discuss as a group where to obtain and understand information on visibility, as well as the associated dangers on limited visibility.

Show participants the visibility scale which measures the distance at which an object can be clearly seen.

Visibility index	Visibility in metres
VP (Very Poor)	Less than 1,000 metres
P (Poor)	Between 1,001 and 4,000 metres
M (Moderate)	Between 4,001 and 10,000 metres
G (Good)	Between 10,001 and 20,000 metres
VG (Very Good)	Between 20,001 and 40,000 metres
E (Excellent)	Greater than 40,000 metres

Explain to the group that sea fog is formed when warm moist air blows over a colder sea, usually warm S / SW winds, common in spring when the sea is at its coldest.



Thunder and lightning

Ask participants what the potential risks of thunder and lightning are, understanding it is not recommended to go paddling in a thunderstorm. Explain thunder storms can be forecasted and are represented by a cloud symbol with rain drops below it and a lightning bolt.

Exercise for consideration:

1. Visibility scale - mix and match

Weather Module

Activity 4

Activity Title:	Opportunities and impacts
Time:	15 minutes

Activity Outline:

- Water levels
- Actual conditions v forecast
- Deciding where to go and where not to go

Delivery:

Water levels:

As a group, return to the forecast and remember the symbols that indicate rain, drizzle, light rain, heavy rain shower and heavy rain. With participants, explore how rain affects river levels and the importance of understanding current water levels and how further rain can increase levels.

Show the group where river water levels can be accessed, as well as outlining the dangers of paddling on rivers in spate.

https://riverlevels.uk/

Actual conditions v forecast:

Emphasise why it is important to observe the actual conditions v forecasted conditions. Are the water and conditions aligned to the forecast? Remind participants of the environmental clues activity and the importance of taking time when arriving at the launch point, as well as throughout the day to understand what is happening, including wind direction and strength.

Deciding where to go and where not to go:

State clearly that if the conditions are not right for you or those you paddle with, then do not get on the water, even if everyone has travelled a significant distance, it's always good to have a plan B. Consider the forecast and what options are available that suit your ability, as well as those you paddle with. Using a weather

forecast and map can start to provide a picture of areas that will be exposed and others that are more sheltered, taking in consideration land features.

Note: When ready, signpost to other modules to support decision making for appropriate paddling environments.

Exercises to be considered:

1. River levels and forecast rain / no rain - prediction
2. Map sections with wind direction and strength, what's sheltered, what's exposed?

Weather Module

Activity 5

Activity Title:	Environmental clues
Time:	20 minutes

Activity Outline:

- Wind direction
- Clouds

Delivery:

Wind direction:

Provide participants an understanding of environmental clues that could indicate local wind directions and how these can support decision making when out on the water, such as flags, boats on swing moorings and birds.

Emphasis must be provided on such clues that other factors may need to be considered, including tidal effects and funnelling.

Clouds:

Explain to the group that it is more difficult to predict the weather using the clouds, but it can support us in determining what the weather might do next, or if the weather forecasted has arrived earlier or later. If the clouds above are dark and ragged, you could expect rain to follow. However, if the sky is mainly blue we can expect there to be little or no rain and cumulus clouds getting taller and taller may provide sharp showers in the evening or even thunder and lightning, if it has been hot and humid.

Provide the group with an overview on clouds. This can be broken into four categories, high clouds, middle clouds, low clouds and clouds with vertical growth.

Although this is not a full meteorological course, it provides participants with some key information that could support their understanding of weather.

High clouds form at 16,000 - 43,000 feet. Basically, these are the clouds that you only encounter on the top of really high mountains. High clouds do not block sunlight.

High clouds include: Cirrus / Cirrostratus /Cirrocumulus

Cirrus clouds are white wispy clouds that stretch across the sky. Cirrus clouds can indicate fair weather in the immediate future. However, they can also be an indication of a change in weather patterns within the next 24 hours.

By watching their movement and the direction in which the streaks are pointed, you can get a sense of which direction the weather front is moving.

Middle clouds form at 6,500 to 23,000 feet. Middle clouds often block sunlight, but not always.

Middle clouds consist of: Altostratus and Altocumulus

Altostratus are grey and/or blue clouds that cover the whole sky. They tend to indicate a storm some time in the very near future.

Low clouds form below 6,500 feet. Low clouds block sunlight and can bring precipitation and wind.

Low clouds include: Stratus, Stratocumulus and Nimbostratus.

Nimbostratus is the standard rain cloud. It is a large flat sheet of grey cloud.

Clouds with vertical growth which tend to have a base that hangs really low. Clouds in this category include: Cumulus and Cumulonimbus

Cumulus clouds are your stereotypical white "cotton ball" clouds. So long as the clouds remain low clumps floating across the sky, there will be fair weather. However, as a paddler, we need to keep an eye on these clouds because any vertical growth can indicate the start of a large storm.

Cloud spotting guide

Exercises to be considered:

Cloud card game - what cloud is it and what could it mean?

What is the wind direction activity - pictures and able to put in a direction arrow.

Weather Module

Activity 6

Activity Title:	Synoptic charts
Time:	15 minutes

Activity Outline:

- High and low pressure
- Isobars

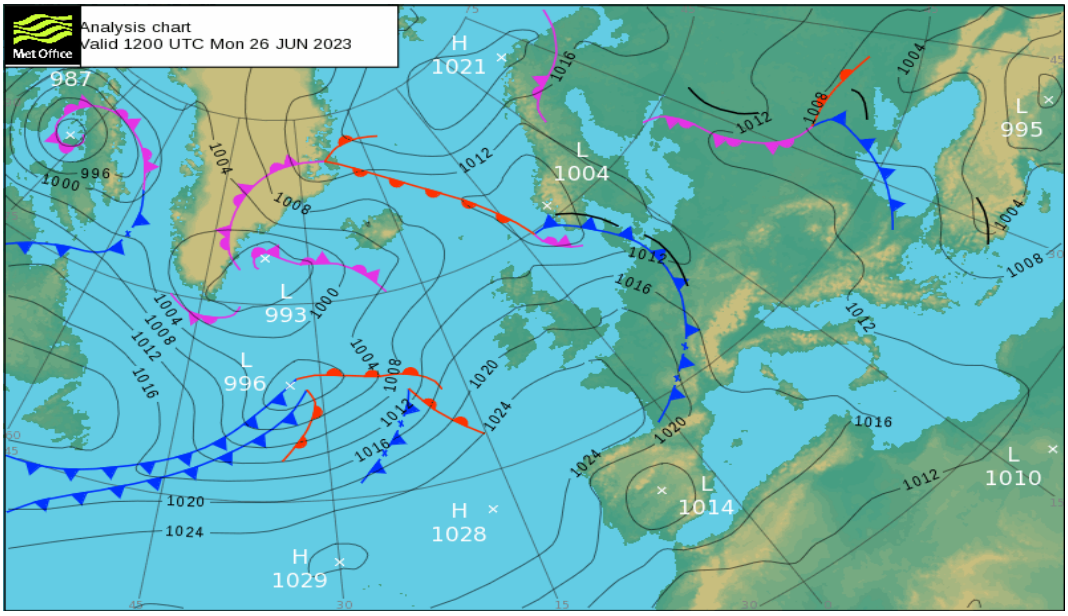
Delivery:

High and low pressure:

Explain to participants that understanding a summary of the current situation and that weather focuses on the pressure pattern, fronts, wind speed and direction and how they could change over a period of time.

Show participants using a synoptic chart the circular lines - isobars which join areas of the same barometric pressure. These patterns can inform where the wind is coming from and how strong it is. It also shows areas of high (H) and low (L) pressure.

Outline that high pressure is usually associated with settled weather while low pressure is normally associated with unsettled weather.



Isobars:

Using the synoptic chart, explain the relationship between isobars and wind, outlining the two important relationships between isobars and winds:

- The closer the isobars, the stronger the wind.
- The wind blows almost parallel to the isobars. Spiralling down and away from the centre of a high-pressure system. Spiralling up and towards the centre of a low-pressure system.
- Air moves around high pressure in a clockwise direction and low pressure in an anticlockwise direction.

This understanding makes it possible to identify the wind flow from the isobars.

For further information and develop a better understanding, signpost to Met Office - how to read a synoptic chart.

Exercise to consider:

1. Synoptic chart - SW England, what's the wind direction? NE - what's the wind direction.

Weather Module

Activity 7

Activity Title:	Shipping forecast
Time:	15 minutes

Activity Outline:

- Shipping forecasts and areas
- Terminology

Delivery:

Shipping forecasts and areas:

Explain the inshore weather forecast and that the coastal waters around the British Isles are divided into 19 areas which extend up to 12 nautical miles offshore and the inshore forecast contains details of wind direction and force, sea state, weather and visibility.


Shetland Islands
Cape Wrath
The Minch
Rattray Head
Ardnamurchan Point
Lough Foyle
Berwick-upon-Tweed
Mull of Galloway
Whitby
Carlingford Lough
Isle of Man
Great Ormes Head
Gibraltar Point
St David's Head
North Foreland
Land's End
Lyme Regis
Selsey Bill
Channel Islands

Forecasts for UK inshore waters are issued four times a day and cover a period of 24 hours from 0000, 0600, 1200 and 1800 UTC.

Signpost and outline to the group that inshore weather forecast can be obtained from:

https://www.metoffice.gov.uk/weather/specialist-forecasts/coast-and-sea/inshore-waters-forecast

As well as Radio broadcast times Weather bulletins for shipping are broadcast daily on BBC Radio 4 at the following times: 0048 and 0520 (long wave and FM) 1201 and 1754 (normally long wave only).

https://www.bbc.co.uk/programmes/b006qfvv#:~:text=BBC%20Radio%204%20%2D%20Shipping%20Forecast

Due to the amount of information provided, advise participants that when listening in to the shipping forecast to have a pen and paper to record the specific point of the forecast, focusing on the area required.

Provide an overview and order of the inshore forecast.

Gale warnings (if any)
General situation
Area forecasts (Wind direction and speed/weather/visibility)

Terminology used:

Imminent - Expected within six hours of time of issue

Soon - Expected within six to 12 hours of time of issue

Later - Expected more than 12 hours from time of issue

Becoming cyclonic - Considerable change in wind direction

Veering - The changing of the wind direction clockwise

Backing - The changing of the wind in the opposite direction to (anticlockwise)

Fog - Visibility less than 1,000 metres

Poor - Visibility between 1,000 metres and 2 nautical miles

Moderate - Visibility between 2 and 5 nautical miles

Good - Visibility more than 5 nautical miles

Exercises to be considered:

1. From the transcript of the inshore weather forecast, what is the predicted weather for Lyme Regis (state date and time).
2. Listen to the broadcast. What is the inshore forecast for the Isle of Man?