



## Adverse Weather Conditions Guidelines includes: Hot and Cold weather, Air quality, Storms/Lightning

<b>Title</b>	Adverse Weather Conditions Guidelines	<b>Policy No</b>	PN-0021
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### Introduction

Participants in Dragon Boat Racing may be exposed to extreme weather conditions during both training and competition at any time throughout the year.

A variety of weather events, including hot, cold, stormy and polluted conditions may be hazardous to the health and wellbeing of participants, volunteers and race officials.

This policy covers the potential adverse impact of these conditions on the health and wellbeing of participants volunteers and race officials and how the risks can be managed and how the health impacts can be managed or avoided.

The impact of weather extremes on the ability to safely conduct training and competition should not be underestimated.

The human body has a number of Thermoregulatory mechanisms designed to maintain the normal body temperature of 36.7°C when exposed to weather extremes. Thermoregulatory mechanisms include alteration in skin blood flow (either increased or decreased), sweating, panting and shivering. Serious health conditions may result when these Thermoregulatory mechanisms are overwhelmed by either extreme heat or cold.

Due to their age, Junior participants, especially 16U, often have poorly developed Thermoregulation making them more susceptible to extremes of both heat and cold. Senior aged (50+) participants and others with underlying medical conditions may also be more at risk of temperature extremes.

All participants are encouraged to have an annual [Health Check](#) including a 12 lead ECG to assist with identifying any developing health issues which may be impacted by competitive paddling and further exacerbated by adverse weather conditions.

During adverse weather conditions it is ultimately the responsibility of individual participants to decide whether to participate, for coaches to decide whether to modify or cancel training and for officials to decide whether to proceed with competition when conditions are potentially hazardous.

### 1. Hot Weather

The impact of heat will depend on the intensity of the activity (light training vs intense racing), the age and fitness of the participants, their athletic ability (novice vs elite paddler), any underlying medical condition and whether a paddler is acclimatised to the conditions.

Heat Illness is not a trifling matter – if untreated it can lead to the life-threatening Heat Stroke. Heat Illness is most likely to occur as a result of high intensity exercise over prolonged periods during hot weather. It can

also occur as a result of prolonged exposure to high temperatures even without strenuous exercise and is a risk for Volunteers and Officials during regattas.

It is possible for participants to acclimatise to hotter weather over a period of 5-7 days and this occurs naturally during the summer months. However, heat wave conditions are an added risk because of the lack of time to acclimatise to the extreme conditions. As the climate changes, extreme weather events are predicted to become more frequent increasing the likelihood of heatwaves.

16U and older Senior (50+) participants are at increased risk of developing Heat Illness because of difficulties with Thermoregulation (16U) and possible underlying medical conditions (Seniors 50+). Medical conditions which may be exacerbated by heat exposure include current viral infection or gastro, underlying cardiovascular disease, diabetes, asthma, pregnancy and epilepsy. Certain medications, including blood pressure tablets, may also make people more susceptible to heat stress.

It is possible to prepare ahead in order to reduce the risks of developing Heat Illness during hot weather. Adequate hydration both before and during the event, wearing lightweight sun-protective clothing including a wide-brimmed hat, using high SPF 30+ sunblock and reapplying it frequently, and staying in the shade as much as possible are all ways of reducing the risk of Heat Illness.

To minimise dehydration, it is advisable to drink about 500ml of water in the 2 hours before exercising and continue to drink cool water or sports drinks during sustained exercise lasting greater than 60 minutes. (500 – 750ml).

**a. Heat Illness**

**Signs and symptoms of Heat Illness** - rapid heart rate, dizziness, fatigue, nausea, headache, loss of endurance or skill, progressing to confusion, unsteadiness, aggressive or irrational behaviour, altered consciousness and collapse. The skin may still be cool and sweaty but there will be signs of developing vasoconstriction as the condition progresses (ashen, grey, pale skin with loss of sweating).

Participants who show signs of altered mental function, loss of consciousness or collapse during exercise are likely to be suffering from Heat Stroke. This is a life-threatening condition and must be treated urgently.

**b. Management**

During regattas and prolonged training it is important for participants to take frequent rest breaks in the shade, drink cool water or sports drinks, assist evaporative cooling using mists, sprays and fans and use ice packs in groins and armpits if available. It is also important for Officials and Volunteers to have frequent breaks out of the sun and use the other means listed above to minimise the risk of Heat Illness.

Any paddler who feels unusually fatigued or distressed or is showing other signs of Heat Illness should not continue to race. They should be taken to First Aid if this is available. If no First Aid is available, lie the person down in a cool place and remove excess clothing. Elevate the legs to improve blood flow and cool by wetting the skin liberally and vigorously fan to aid evaporation. Apply ice packs to groins, neck and armpits and give cool drinks if conscious, to improve rehydration and reduce core temperature.

If the paddler remains confused, vomiting or shows signs of altered consciousness, **call 000**. Continue to cool the patient whilst waiting for the ambulance.

**c. Assessment of risk related to increasing temperature**

The Event Organisers have the responsibility to modify, postpone or cancel races on account of the weather conditions if they believe there is a real danger to the participants' health. It is important to be able to use an assessment tool to predict the likely impact of given conditions when deciding whether training or racing should be modified or cancelled because of the risk of heat stress. A number of methods are available.

- i. **Ambient Temperature** is easily understood and useful when the weather is hot and dry (low humidity) but at any given temperature, the impact of the heat on a competitor will be exacerbated by increasing humidity. The body's ability to Thermoregulate by sweating is reduced as the humidity level rises resulting in potential heat stress at lower temperatures than may be otherwise expected.

In order to take other weather parameters into account it is necessary to use other tools. Any of the following tools may be used to assess local conditions and decide whether an event or training should be modified or cancelled. The choice of tool used should depend on the data available.

- ii. **The "Feels Like" (BOM) or Apparent Temperature (AT)** also considers humidity and wind speed. This reading is readily available on the BOM Weather App and is an appropriate measure to use when making decisions regarding training and competition during adverse weather conditions. At times it may be much hotter (or in some instances colder because of wind chill) than the ambient temperature. The 'Feels Like' temperature (AT) can be used to give a better indication of the risk of heat related illness in humid weather than the Ambient Temperature as it can indicate higher risk at lower than expected temperature. The BOM utilises a modified Wet Bulb Globe Temperature (WBGT) Index to produce the "Feels Like" Temperature (AT) but does not include the effects of Radiant Heat from full exposure to the sun. Under Australian conditions the effect of full sun produces a maximum increase in the Feels Like/AT of 8°C when the sun is at its highest elevation in the sky. ([BOM Thermal Comfort](#) observations).
- iii. **The Wet Bulb Globe Temperature Index (WBGT)** also includes the effect of sun exposure and can be used where activities are held in full sunshine with little or no respite from the sun. It is difficult to obtain accurate Wet Bulb Globe readings in Victoria as the BOM does not have WBGT instruments at any observation site.
- iv. **The Heat Stress Index** can be used as a means of incorporating both Ambient Temperature (temperature measured in the shade) and Relative Humidity to give a single figure. It is an easy to read visual chart but does not take direct sun exposure and wind into account so the impact at various heat Index levels will be even greater for participants exposed to direct sunlight for long periods. This will give a similar figure to the "Feels Like" Temperature/AT in still conditions.

# Heat Stress Index

click here for (F°)		RELATIVE HUMIDITY (%)												
		40	45	50	55	60	65	70	75	80	85	90	95	100
TEMPERATURE (C°)	27	27	27	27	27	28	28	28	29	29	29	30	30	31
	28	28	28	28	29	29	29	30	31	32	32	33	34	35
	29	29	29	29	30	31	32	32	33	34	36	37	38	39
	30	30	31	31	32	33	34	35	36	38	39	41	42	44
	31	31	32	33	34	35	37	38	39	41	43	45	47	49
	32	33	33	35	36	38	39	41	43	45	47	50	53	56
	33	34	36	37	38	41	42	44	47	49	52	55	58	
	34	36	38	39	41	43	46	48	51	54	57			
	36	38	40	42	44	47	49	52	56					
	37	41	43	45	47	51	53	57						
	38	43	46	48	51	54								
	39	46	48	51	54									
	40	48	51	55										
	41	51	54											
	42	54												
43	58													

Caution	Extreme Caution	Danger	Extreme Danger
Fatigue possible	Sunstroke, muscle cramps, and/or heat exhaustion possible	Sunstroke, muscle cramps, and/or heat exhaustion likely	Heat stroke or sunstroke likely

**d. Training**

- i. **Once the Heat Stress Index is in the yellow zone (Feels Like temperature 33 -39)**, it is advisable to reduce the intensity and duration of training and take frequent rest breaks.
- ii. **Once the Heat Stress Index is 38-41**, reduce warmup duration and intensity, training sessions should be limited to less than 60 minutes. If possible, avoid training during the hottest part of the day.
- iii. **Once the Heat stress Index reaches 42 and above**, training should be postponed or cancelled.

**e. Competition**

Adequate shade should be provided for participants, volunteers and race officials to reduce the effect of radiant heat. Access to cool drinks, adequate seating and misting fans should also be provided. Frequent PA notifications regarding risks of Heat Stress and sunburn should be made regularly during the event.

- i. **Where the Heat Index is between 38-41**, the Event Organisers may need to modify the format of the event to reduce the impact on participants, volunteers and race officials either by reducing the number of races, combining categories, increasing the rest time between races, etc..

Event Organisers should consider strategies to minimise the risk to volunteers and race officials by rotating their roles, providing additional food/drinks/shade and frequent rests. Any volunteers or race officials with underlying medical conditions which predispose them to developing Heat Illness should consider stepping down from their role until conditions improve.

- ii. **Where the Ambient Temperature is 34°C or above and the Heat Index is 40 or above**, Junior 16U participants should not compete. Older Senior (60+) participants should be assessed on their level of fitness, athletic ability and level of acclimatization as to whether they are suitable to continue competing.

Ultimately primary responsibility for the safety and wellbeing of each participant rests with themselves or in the case of Junior 16U participants with their parents and coach. If a participant feels unwell, they should **not** race. Once a participant has been treated for Heat Illness, or dehydration, they should **not** compete again that race day. If a participant has been unwell in the days before the event and has not fully recovered, they should not compete.

- iii. **Where the Heat Index is in the Red zone – 42 or above** – competition should be postponed or cancelled as there is a high risk of Heat Illness developing in participants, volunteers and race officials.

Sports Medicine Australia has [fact sheets](#) and [guidelines](#) available for more information

## 2. Cold Weather

**Signs and Symptoms of Hypothermia** – feeling cold, shivering, clumsiness and slurred speech, irrational behaviour, apathy. If untreated, this may progress to severe hypothermia with cessation of shivering, slow and difficult to find pulse and loss of consciousness. This is a **Medical Emergency**.

Dragon Boat participants are at risk of **Hypothermia** when training and competing in cold weather, especially when the weather is also windy (wind chill) and/or wet.

It is advisable to wear several layers of protective clothing when training with the aim of keeping the body dry and reducing heat loss. It is also important to have extra layers of clothing to put on after training or between races and where possible, protection from the wind.

If races are being held during cold, wet and windy weather ensure that officials and volunteers can be protected from the wind as much as possible as they are also at risk of Hypothermia.

Cold water immersion following capsiz is a major risk factor for developing Hypothermia, especially when the water temperature is below 10°C. The severity of the Hypothermia depends on the degree of wind chill, the time a paddler remains in the water and the time taken to get them into warm clothing.

### a. Management

- i. As soon as possible, move the person to a warm dry place.
- ii. Avoid excess movement, lie down.
- iii. Remove any wet clothing.
- iv. Place patient between blankets or in a sleeping bag and wrap them in an emergency blanket.
- v. Cover patient's head to maintain body heat.
- vi. Give warm drinks if conscious.
- vii. Avoid alcohol.
- viii. Use heat packs or other external sources of heat on patient's neck, arm pits, groins – avoiding burns from excessive heat. Use body-body contact to aid rewarming if appropriate.

**Call 000** if concerned, if there is no improvement, or if the patient has evidence of severe hypothermia.

### 3. Air Quality

As well as air pollution from industrial sources, poor air quality may be associated with bushfire or controlled burning smoke. The fine air particles can pose a health risk to participants especially those with underlying medical conditions, for example asthma.

Small air particles especially PM 2.5 (less than 2.5 microns) and P10 (less than 10 microns) are readily inhaled into the lungs and can cause inflammation of the upper and lower respiratory tract and may exacerbate underlying conditions such as asthma.

Following information comes from AIS Guidelines

There are three ways to get information on PM2.5 concentration levels (measured in  $\mu\text{g}/\text{m}^3$ ):

1. State and Territory air quality monitoring websites (hourly measures of PM2.5 concentration)
2. The **AirRater App** (or other similar App providing real time PM2.5 in  $\mu\text{g}/\text{m}^3$ )
3. A handheld portable device that measures PM2.5 in real time

**State and Territory air quality monitoring websites:** The following links will be useful in helping you find the relevant website in your State:

- [Australian Capital Territory](#)
- [Victoria](#)
- [New South Wales](#)
- [Queensland](#)
- [Western Australia](#)
- [South Australia](#)
- [Tasmania](#)

Unfortunately, different States and Territories have slightly different systems for measuring air pollution, different means of presenting information and varying categories and systems for different levels of pollution (good, fair, moderate etc.).

#### **THE AIRRATER APP**

The [AirRater App](#) was originally funded by the Australian Government and is currently funded by the Menzies Institute for Medical Research. AirRater draws its air pollution information from State and Territory air quality monitoring networks. It presents information on PM2.5 concentration in  $\text{mcg}/\text{m}^3$  and applies the same system of measurement for all locations in Australia. To find out more about how AirRater sources and presents its data visit: <https://airrater.org/air-quality-explainer/>.

#### **Handheld devices for measurement PM2.5**

There are range of commercial handheld measurement devices available for measuring PM2.5 concentration in the atmosphere. It is important that the device used is designed for measurement of outdoor rather than indoor concentrations of PM2.5. Teams and sporting clubs may wish to utilise one of these devices for providing real-time measures of PM2.5 concentration at their specific location at the time that they wish to exercise. That value can then be used to advise athletes and officials about appropriate exercise activity.



The AQI can be used to modify or cancel training and/or competition where the level is such that possible adverse health impacts are likely to occur.

AIS have published best practice guidelines on [Smoke Pollution and Exercise](#). Their recommendations are included in the Procedures linked to this Policy

AIS guidelines recommend that for healthy individuals, training/competition should be modified or cancelled if the AQI levels are more than 100 for prolonged intense endurance activities or more than 150 for shorter duration intense activities. Participants with underlying health conditions may need to modify their activity at even lower AQI levels depending on their symptoms.

#### **Additional Information**

- Air quality information on State and Territory government websites is generally updated hourly; therefore, there can be a lag between official measurements and what is occurring in real time. This can cause limitations when it comes to determining the air quality in your local environment. If smoke is affecting usual visibility within your area, it is likely that the air quality will fall into a higher risk category.
- Consecutive days of exposure to polluted air can have a cumulative effect, lowering an athlete's threshold for symptoms. This should be considered if your region has been exposed to increased smoke for several days in succession.
- Increases in exercise intensity and duration result in increased airway exposure to polluted air. The AIS recommends modifying training or training locations based on the table above.
- All athletes who suffer from asthma should have an updated asthma management plan and consult their doctor prior to exercising in smoke-affected environments.
- Recent respiratory infection increases the risk for development of smoke-related symptoms, even in non-asthmatics.

#### **4. Lightning, Storms and Strong Winds**

Lightning poses a real risk of death or serious injury especially when on the water. A safe distance from lightning is thought to be at least 10km. If the lightning is less than 10km away it will take less than 30 secs between seeing the flash of lightning and hearing the thunder. If that is the case it is recommended to stop paddling and seek shelter as soon as possible. It is recommended to wait 30 mins after the last flash lightning before resuming paddling or the competition.

Developing storms maybe monitored using the BOM radar. Avoid training and/or competition when there is a high likelihood of storm cells developing during the training period, especially if lightning, hail or high winds are forecast to occur with the storm.

Avoid training and/or competition during periods of locally high winds causing white caps because of the risk of the boat being swamped. Monitor conditions when Marine Wind Warnings are forecast to develop during the training period.

Any questions can be directed to – [info@ausdbf.com.au](mailto:info@ausdbf.com.au)

This document includes information from Sports Medicine Australia, BOM, Paddle Australia, EPA, AIS,

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