



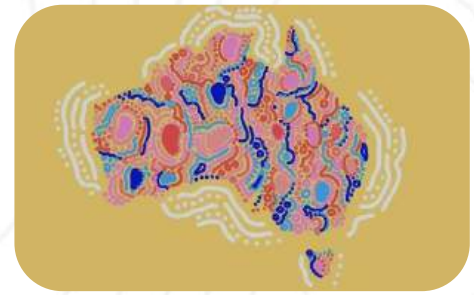
Outdoor Weather Survey Report

20th June 2024

Dr Loren Miller
Nicky Hanson



Today's Webinar



Source: ABC iView

Thank you to the BOM, the Peaks and everyone who completed the survey

Share the Weather Survey Findings

Gather Feedback and Ideas

- Please engage through the chat function on Teams



We are particularly interested in your thoughts on emerging questions...

Consult on Next Steps

Thanks for your participation!



Exec Summary

140 Responses to the February 2024 NatCORR survey, with good representation by State and Organisation type.

Findings are presented in 4 parts:

1. Call for action
2. Organisational Readiness
3. Weather Forecasting Needs
4. Weather Information Sources

Followed by key messages and next steps...



1. Call for Action



About the Survey



Survey Objectives

To investigate outdoor practitioners' weather information access, use, capabilities, issues and opportunities for improvement to support safe outdoor education and recreation in increasing extreme weather events.



Methodology

An online survey comprising approximately 20 questions was developed in consultation with The Bureau of Meteorology. The survey was distributed in January to February 2024 to NatCORR stakeholders, and promoted through the peak outdoor sector associations to reach the target population.



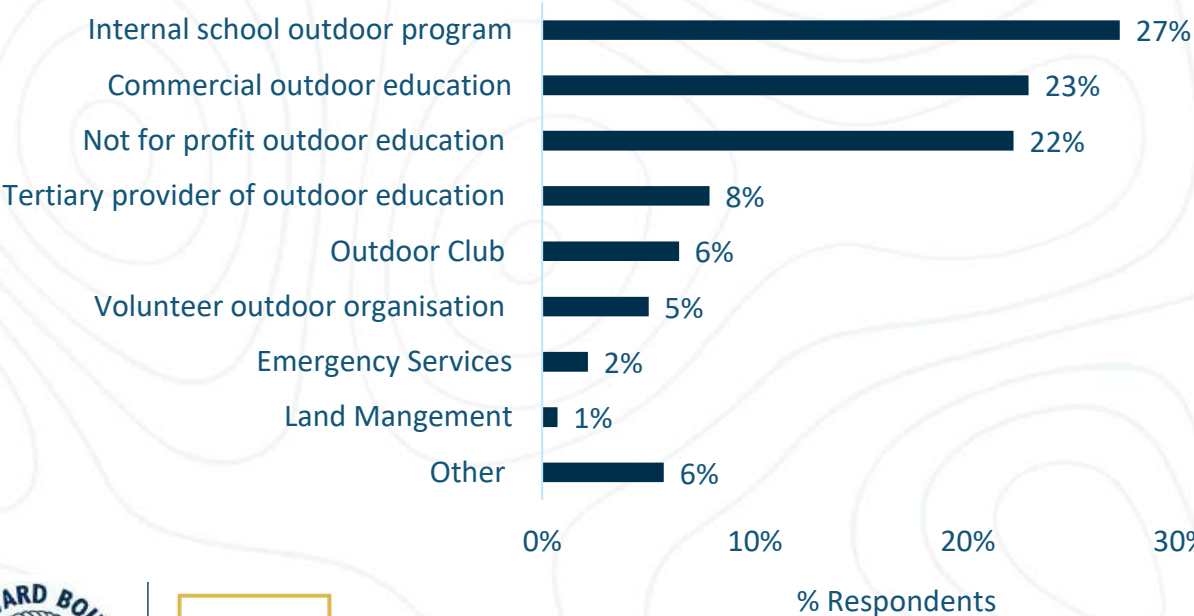
Response Rate

140 responses were received and considered in this survey analysis.

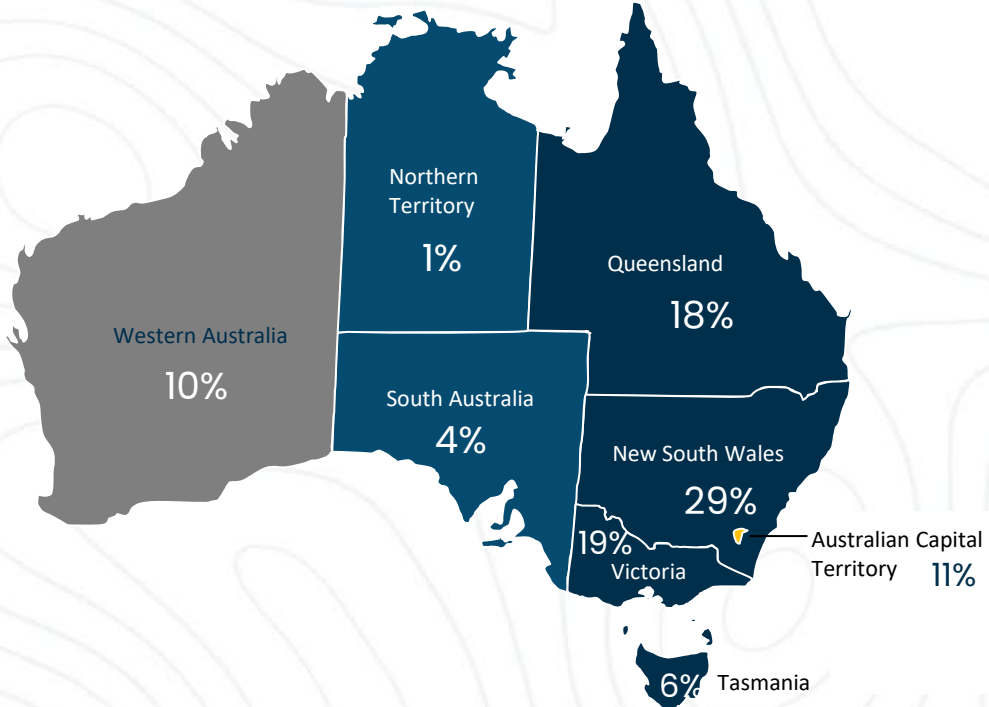


Cross-sector National Responses

- Total of 140 responses
- 45% of responses from outdoor education providers
- 27% from school outdoor educators
- Universities, TAFE, Clubs, volunteers and others participated



- Responses received from all States and Territories.
- More responses from the East, with NSW, ACT, Victoria and Queensland representing 77% of responses.



Important topic...with a call for action

96%

Respondents actively consider the accuracy and reliability of weather information important to support safe planning and decision making for outdoor programs

29

Unprompted open worded responses:

- **noting importance**
- **grateful for the work**
- **commenting on need for training**
- **keen to see useful outcomes**

"More needs doing ASAP!"

"Thanks such an important topic"

"Super critical area for work"

"Thanks for raising and working on this very important issue"

"Great initiative, look forward to seeing the outcomes"

"Appreciate your work, especially as our members are all volunteers and NFPs"

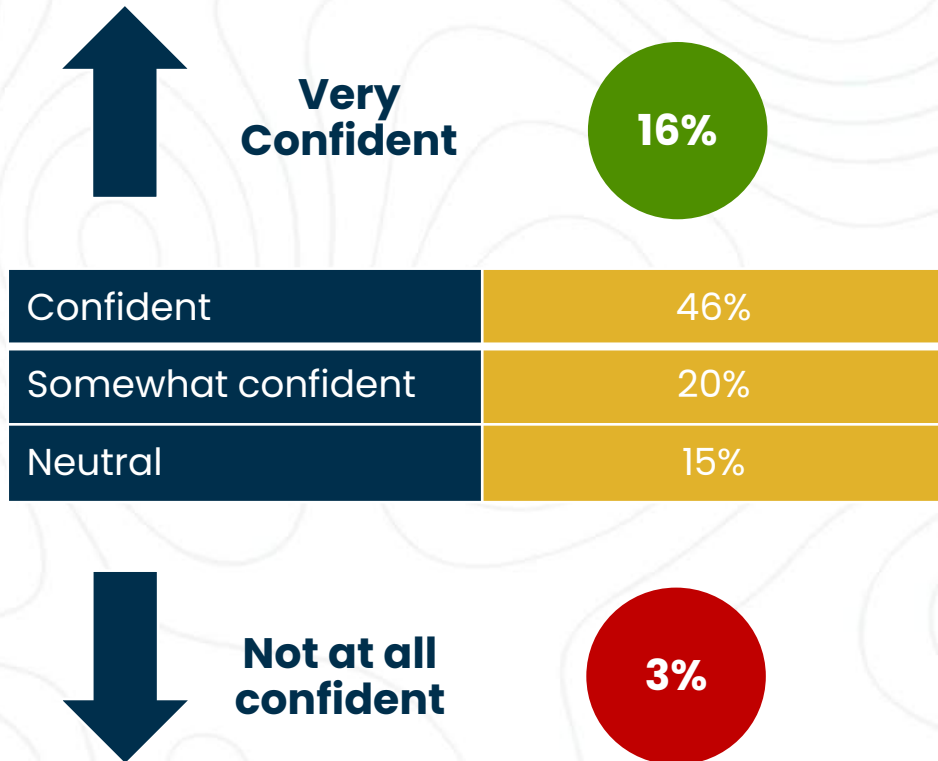
"Thank you for taking this initiative and reminding me that I need to do more research"



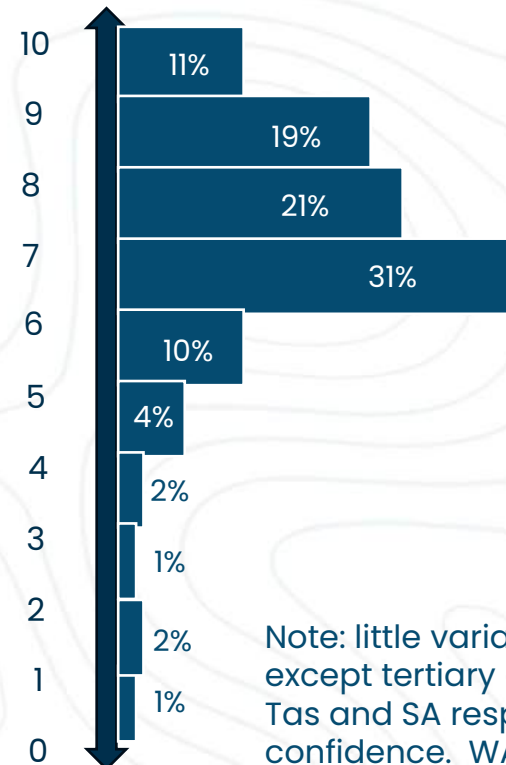
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Most are reasonably confident they have sufficient information and skills to support decision making

I feel confident my organisation has sufficient weather information to support outdoor program decision making in our specific area(s) of operation



How confident are you of your skills for reading and interpreting weather forecasts (sliding scale 1 - 10)?



"Based on starting in this industry with only synoptics and ABC news to go by, we have SO much info available compared to what we used to."

"I find the current knowledge and available information adequate, however targeted OE specific info would be great. I feel that there is always more to learn, especially in a changing climate."

Note: little variation by type of organisation, except tertiary average slightly higher. Tas and SA respondents slightly higher average confidence. WA and Qld, slightly lower.



But are less confident they are up to date with global best practice

I feel confident my organization is up to date with global best practice in weather forecasting for outdoor practitioner decision making



Very Confident



10%

Only 25%

have attended training on weather forecasting & interpretation in the last 5 years

- Half of these did so in their Tafe or Uni course
- 2% at another outdoor course (Paddle Aust & WFA)
- 2% through the BOM
- 2% through a peak sector conference
- 1% at internal organizational training
- 1% with the SES
- 1% an online course

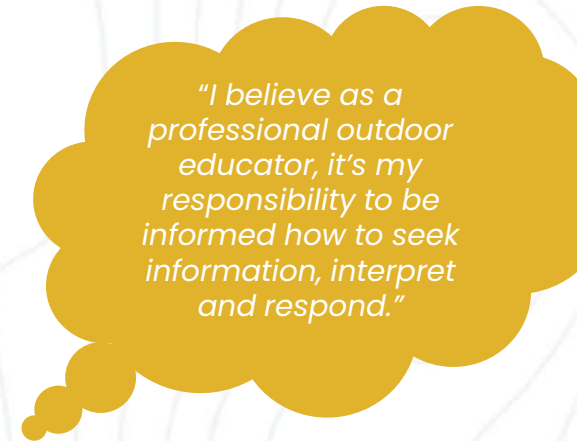
Confident	31%
Somewhat confident	21%
Neutral	32%



Not at all confident



6%



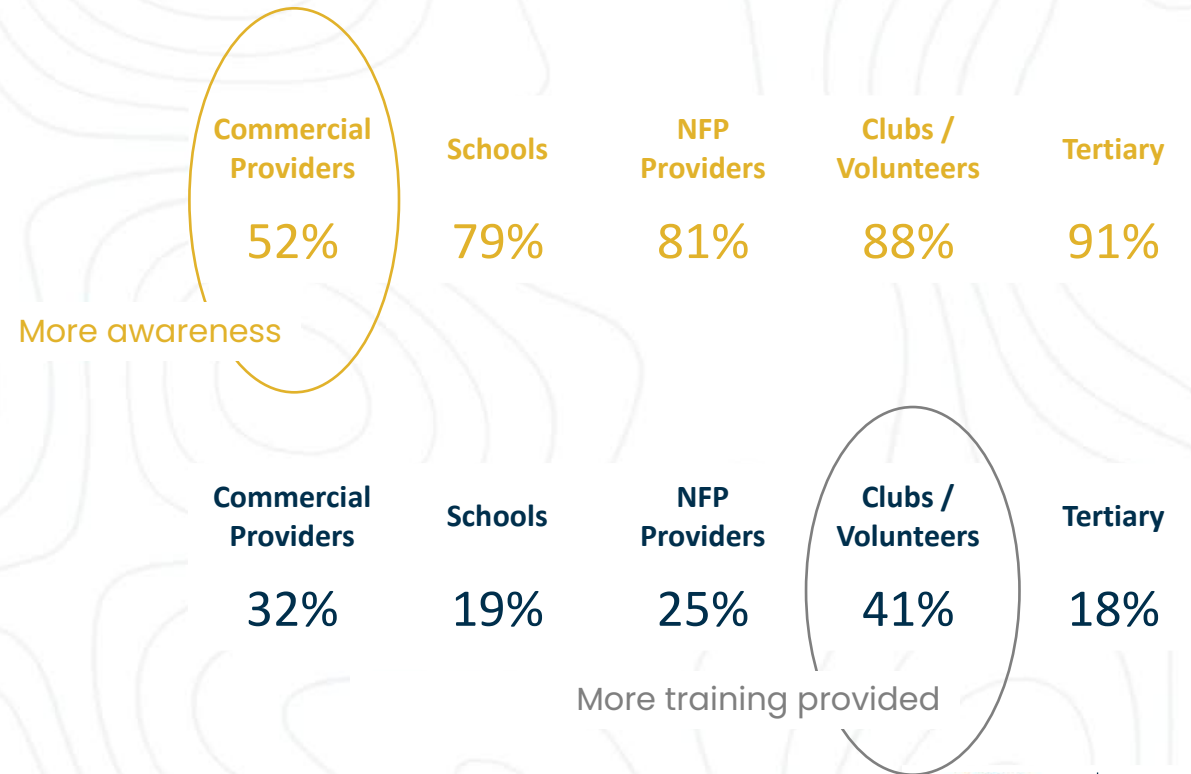
Most outdoor practitioners don't know where to find relevant professional development on weather

77%

Don't know where to find relevant professional development on accessing & interpreting weather information

26%

Organisations make weather training available to their staff



Note: little variation by State / Territory



There is a strong interest in training

94%

Interested in attending weather specific webinars or workshops by weather experts for outdoor practitioners hosted by NatCORR

For 6% NO, why not?

- Time and priority
- Use books and online
- Happy with BOM information

Examples from 10 open ended response comments on need for training

“I believe this is one of the most important upskill areas for any professional outdoor educator.”

“The more informed with regards to weather changes the better we can make safe decisions.”

“More training opportunities are needed. They must be relevant to the outdoor sector with 100+ students in the field – and reliable.”

“Any and all PD would be really beneficial as the knowledge I have is all learned through experience rather than specific PD’s.”

“Webinars and online courses from a national institute is highly needed.”

“I think you are on the right track about PD and systems.”



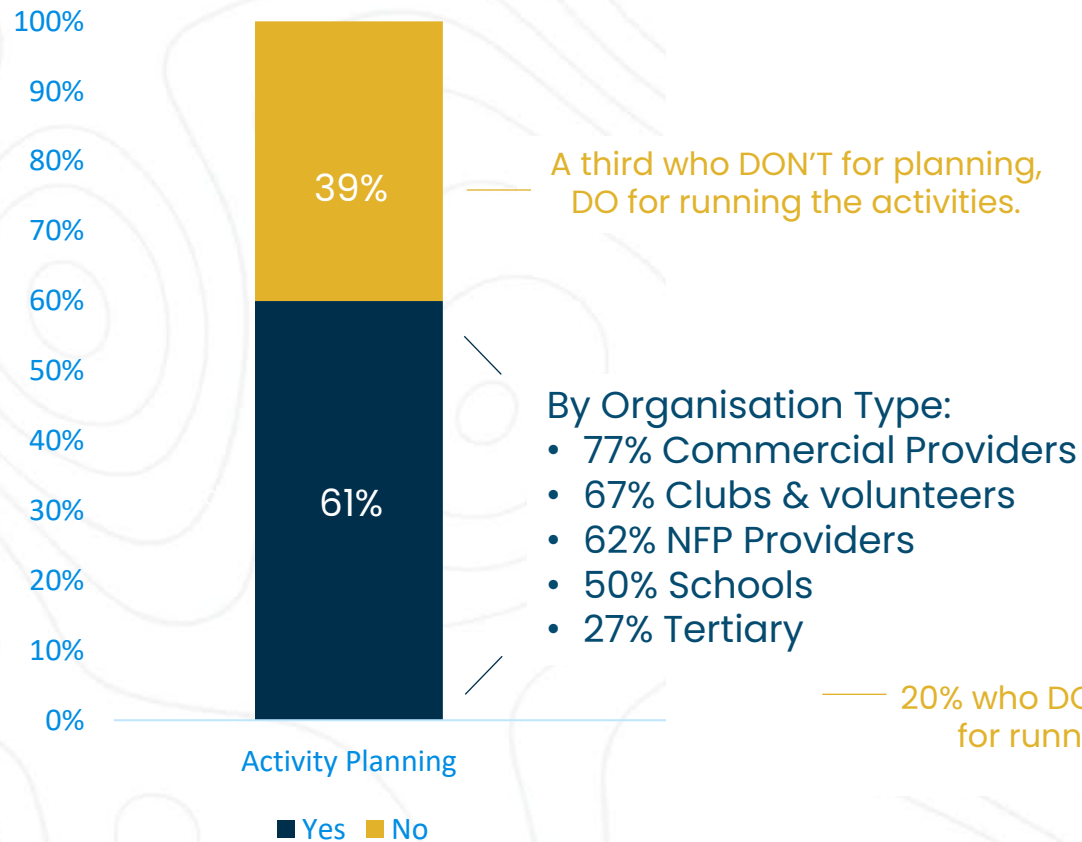
2. Organisational Readiness



Nat
CORR

61% have a formal organisational processes for weather information in **planning** outdoor activities

Does your organisation have a formal process or operating procedure around accessing & using weather information for planning outdoor activities?



A third who DON'T for planning, DO for running the activities.

20% who DO for planning, DON'T for running the activities.

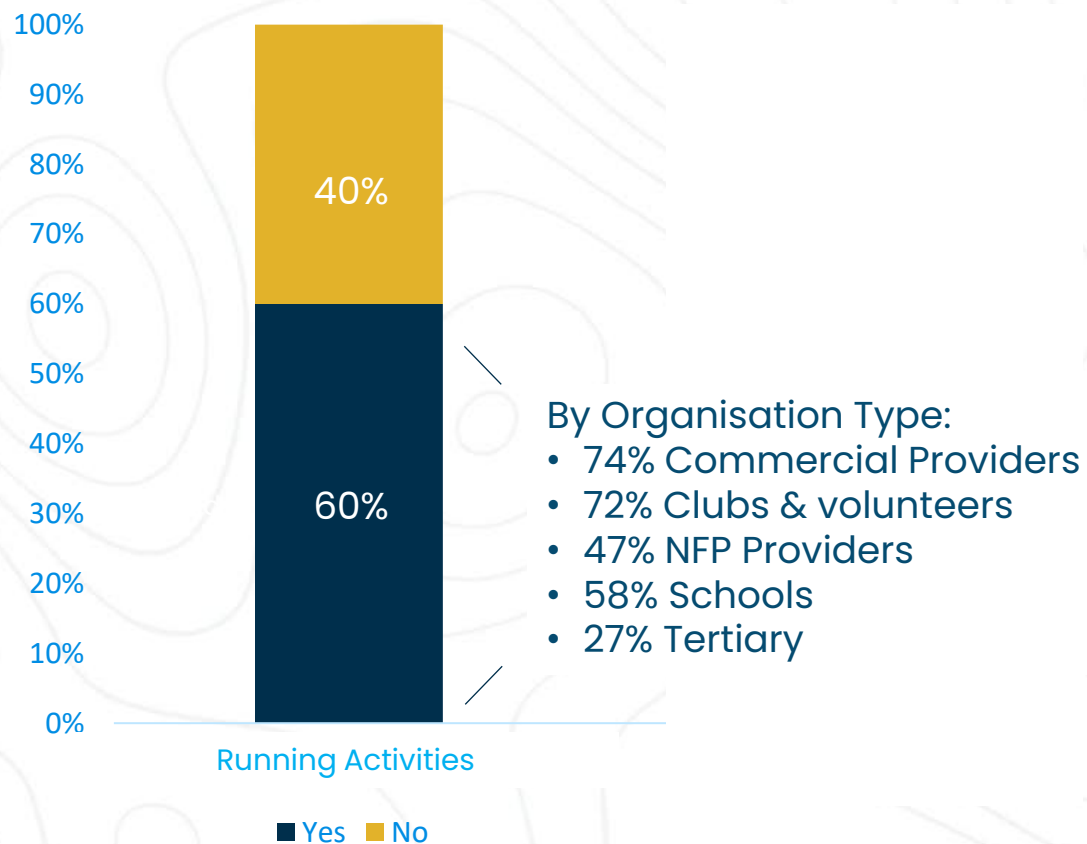
What type of formal process?

- Seasonal outlooks
- Checking weather forecasts
- SOPs and policies
- Risk planning and assessment
- Thresholds, triggers and severe weather warnings



Only 60% have a formal organisational process for weather information in **running** outdoor activities

Does your organisation have a formal process or operating procedure around accessing & using weather information for **running** outdoor activities?



What type of formal process?

- Checking weather forecasts
- Severe weather warnings
- Thresholds and triggers
- SOPs and policies



Formal processes for weather in SOPS and risk assessments for **planning**

Standard Operating Procedures (SOPS)

“SOPS on capturing and recording weather information.”

“Weather is part of a broader procedure for pre-trip preparation that staff must follow.”

“Pre-program checklists and a part of briefings.”

“SOPS around each weather event and contingencies for different activities.”

“SOPS for checking weather warnings, particular to lightening, bushfire risk, wind and wave conditions.”

“SOPS require detail trip plan which includes weather report from day before and morning of trip.”

“Process in order to talk to customers.”

“Staff training and policy.”

Risk Assessments

“Risk assessments include assessment of weather prior to activities.”

“It’s a part of the overall risk planning and then identified as something to monitor daily.”

“Include in risk planning documentation how weather will be assessed and information gained.”

“Risk management procedures discuss monitoring weather and have triggers to cease activities.”

“Risk assessments pre-activity and alternate plans, links to sites for rain, creeks, weather, storm warnings, park closures etc.”

“It’s built into our Emergency Management Plan, Bushfire Response Plan and our activity-specific SOPs.”

Formal processes for weather checks for planning

Seasonal Outlooks and Weather Checks

“Focus on seasonal planning, changes in weather patterns, and historical information.”

“Use of State emergency and National weather information pre-program in advance (by term) and 3 week and 1 week timeslots.”

“Seasonal outlook impacts program design and mitigations, fortnightly outlook affects final messaging and comms to the stakeholders, immediate forecast is used to assess plans against local conditions expected – with modifications if necessary.”

“Regular monitoring pre-trip, as well as comparison to seasonal data.”

Weather Checks for Planning

“Weather is checked a week out, 24 hours prior and an hour prior to event.”

“We use rainfall predictions, current river levels, as well as wind, fire and temperatures to inform where we paddle, how far and what supplies we bring.”

“Events of 6, 12 and 24 hour duration are organised at times of year and location with weather a main factor. Final instructions issued about 4 days prior include forecast and requirements on gear.”

“Check weather warnings, particular around lightning or bushfire risk.”

“Weather forecast or reading must be as close to the planned activity location as possible. BOM Meteye is good for this.”

Processes for weather checks while **running programs**

Highly Specified Process

Scheduled timed weather checks (typically twice daily- morning & evening)

Sources/APPs specified. (BOM Meteye most common)

Automatic alerts set up

Threshold triggers in place

SWW policies carried in field

Specified communications between oncall/office and field

In-field technology to support (sat phone etc) communication and forecast access

Varied Processes for Weather Checks During Programs

Less Specified Process

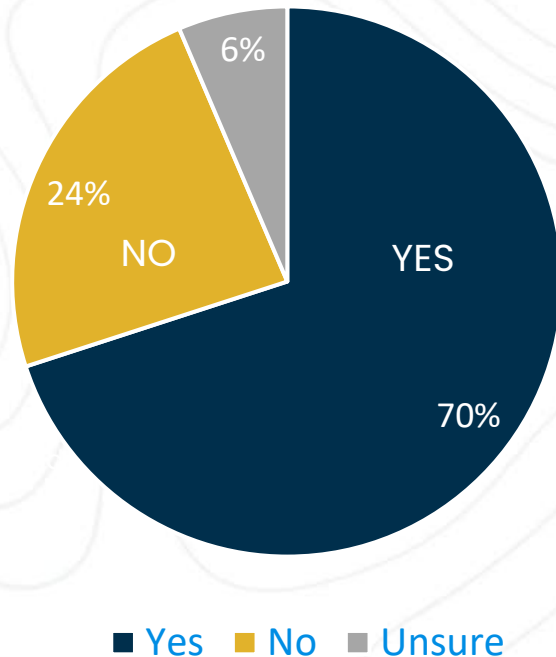
Standard Operating Procedures (SOPs) require regular checks of weather conditions but are less specific about timing, source and field /office communication

Acknowledge that some programs are out of mobile phone / internet access range



Weather warning thresholds are used by 70% of organisations

My organisation has pre-defined weather warning thresholds



Different approaches are used for severe weather



Formal thresholds set for weather/conditions for land and water activities:

- Heat
- Storms
- Wind
- Rainfall (& snow)
- River levels
- Bushfire / fire risk
- Waves / Swell
- Cyclones



Emphasis on professional judgement

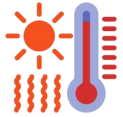
- Rely on training and expertise of field workers
- Judgement based on local knowledge, context and risk appetite
- Some lack expertise to know what/how to apply thresholds

The use of thresholds varies by type and level

"It would be nice to see what other company policies are and what their cancellation thresholds are."

"Clear trigger tables as a baseline would help new outdoor leaders."

Example Thresholds by Type



Extreme Heat

35C activities pause – seek shade or water

35C stop activities

> 35C cancellation

34C forecast

30C review

28C modify, 35C no activity

>26C no walks

Two consecutive days BOM forecast >40C - cancel



Audible thunder

Lightning within 50km

Lightning procedure

No canyoning if severe thunderstorms forecast

Heavy snow falls



Gale force winds

>90km/h forecast

40km/h winds

Wind warning 50km/h land, 20km/h water

>35km/h winds

Gale force factor 7

No camping in high winds

Beaufort 4 - 5

>10 knots

>14 knots on water

>15 knots for kayaking

17 knots modify water activities, 22 knots cease water and modify land, 28 knots cease land activities

Swell reports

Cyclone



Predicted rainfall >100mm for one day within water catchment area

Avoid activity after >50mm rain

50-mm watch/modify, >100mm cancel

>10mm no walks

Flood warning

Strict river level guidelines when to cancel water activities

River height cut-offs

River height triggers

Cancel or re-arrange if can't pass creeks in vehicle, at defined mm rain



Bushfire code red. Bushfire threat

Code red

Bushfire rating for evacuation

Extreme fire danger, trips cancelled

Catastrophic fire danger requires event cancellation

Total Fire Ban – all activities cancelled or a safe location used

Total Fire Ban – school cancels all activities

A fire classified as 'out of control' <20km of operating area. Or within 50km if wind could direct towards sites. Rating of Catastrophic or instruction by authorities to evacuate

Severe Weather Warnings are also used as thresholds for action

SEVERE WEATHER WARNING

The Bureau of Meteorology has issued a severe thunderstorm warning for damaging winds and heavy rainfall.

LOCATION

CANBERRA REGION

WHAT TO DO

PREPARE NOW



“If we receive a localized weather warning then we know we need to act sooner than later”

Severe Weather Warnings (SWW) Response Commentary

“SWW – all groups moved to pre-determined locations.”

“If SWW declared, it alters what activities can be done and where students can camp.”

“SWW cause programs to pause or move to safest location.”

“SWW – impacts activities and where to camp.”

“SWW – adjust or postpone. If thunderstorm, get group in lightening position.”

“Most common threshold is storm activity – tents/groups must be moved to a SWW site.”

“Alerts for severe weather events are turned on or communicated to all staff, checking morning, lunch and evening. Ceasing activities if predicted weather is expected to get worse on following days.”

“Alternate activities for SWW.”

External advice and instructions play a role



National Park Closures

- Some threshold based, others situational
- Vary by jurisdiction and Park



Education Department Guidelines

- Vary by jurisdiction and sector
- Some thresholds, other guidelines, others left to schools



Department of Fire and Emergency Services

- Vary by State / jurisdictions
- General fire and emergency advice
- Instructions during events



State Emergency Services

- Specific instructions based on local conditions



Australian Adventure Activity Standards (AAAS)

- Few weather / conditions based thresholds
- Broad guidelines

“[For thresholds we use] a combination of Department guidelines and local area knowledge (with predictions)”.

“Clear trigger tables would be useful. I realise that there are many factors, but a baseline would be beneficial, especially for new outdoor leaders and managers who don’t have outdoor experience.”



What will happen with the review of AAAS?



Organisational SOPs allow for variation with location, activity and nature of warning

Comments on SOPs for Thresholds & Warnings

The Severe Weather Policy has thresholds for all the different weather types. From this we can see what actions are to be taken.

There is a threshold matrix, depending on activity.

Thresholds are different for each type of event. Might include cancellation, postponement, seeking refuge etc.

Thresholds vary depending on the weather, client type (age/ability) and activities.

It varies per walk – we have general company extreme weather guidelines, then walk specific guidelines. There are trigger points for certain types of extreme weather – is documented.

Extensive document. Generally postponement, relocation or cancellation due to forecast or actual weather event.

Policies for all weather situations.

Depends on location, activity and type of weather warning. We assess if the warning is likely to increase the risk of the activity / location.

They vary based on local conditions and sites and what the weather warning is for.



Others emphasise professional judgement

“What weather thresholds or formal process are you using?” Professional judgement related responses

- It's a case by case basis
- If I, the CEO, consider it is unsafe or my customers are starting to express concerns
- Cert IV outdoor recreation staff monitor weather in the local area and are trusted to make judgement calls
- For most, it's the responsibility of the guide to monitor the weather
- For most of my employers the lead guide decides if they can safely run the trip, unless it is an obvious serious weather event
- SES has SOPS, but normally members use their IMSAFER and Take5 discretion

Some responses identify challenges in the use of thresholds



“Thresholds are difficult, especially with lightning”

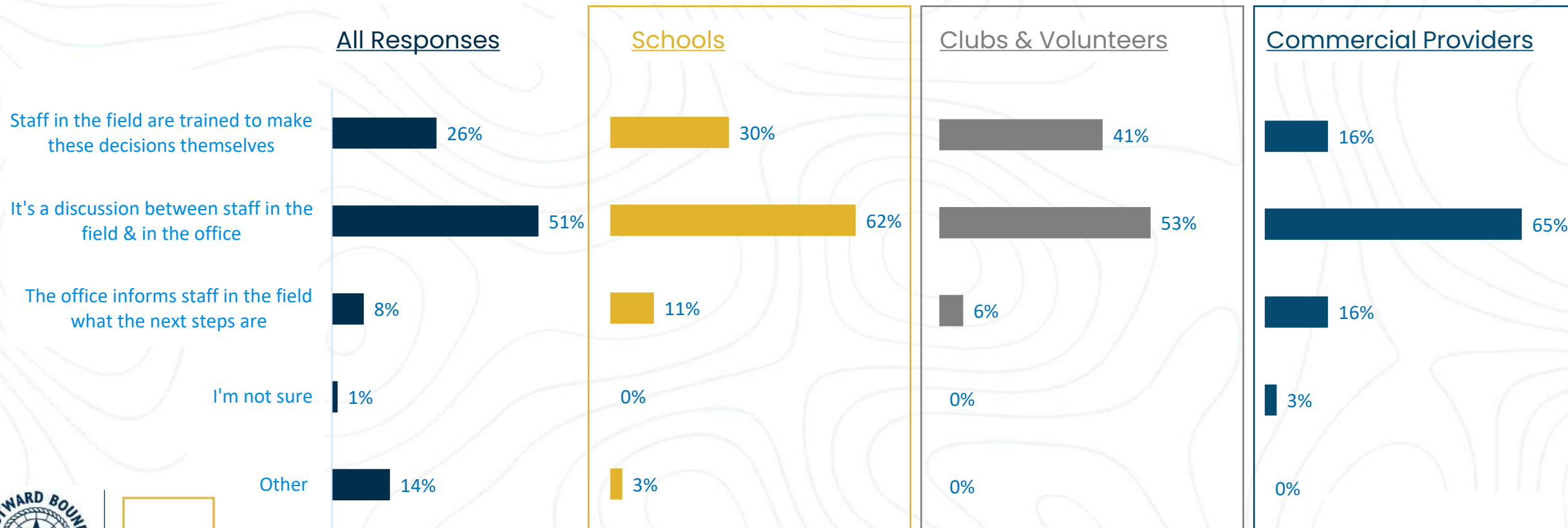
“Uncertain how to implement thresholds”

“We somewhat use thresholds. However, it is not clear what to do in all circumstances, and obviously more challenging on multiple day trips.”



Organisational decision-making is most commonly shared between the field and the office

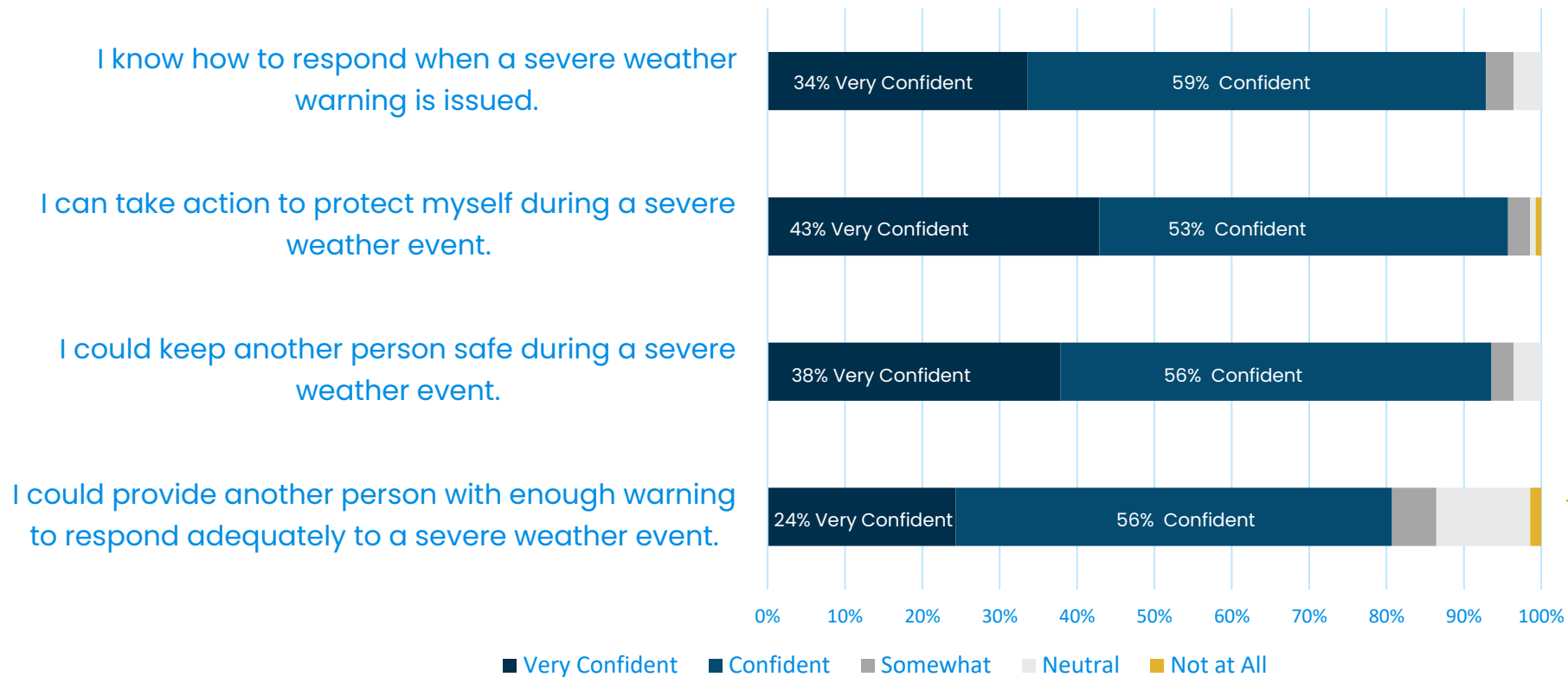
How are decisions made in your organisation in response to adverse weather information/forecasts & warnings once an activity or program is underway?



NFP Providers: Staff in field 38%, Discussion 53%, Other 9%
 Tertiary: Staff in field 27%, Discussion 64%, Office 9%



Most are confident they know how to respond to a SWW, but are less confident with duty of care for others



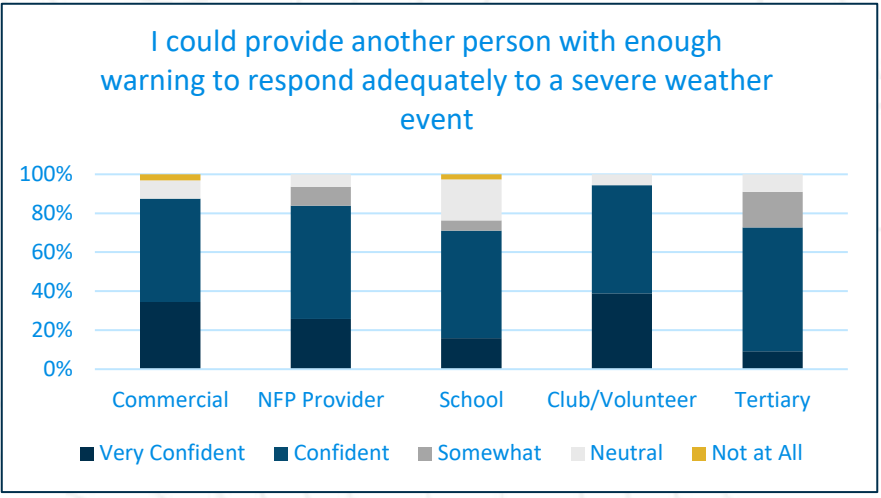
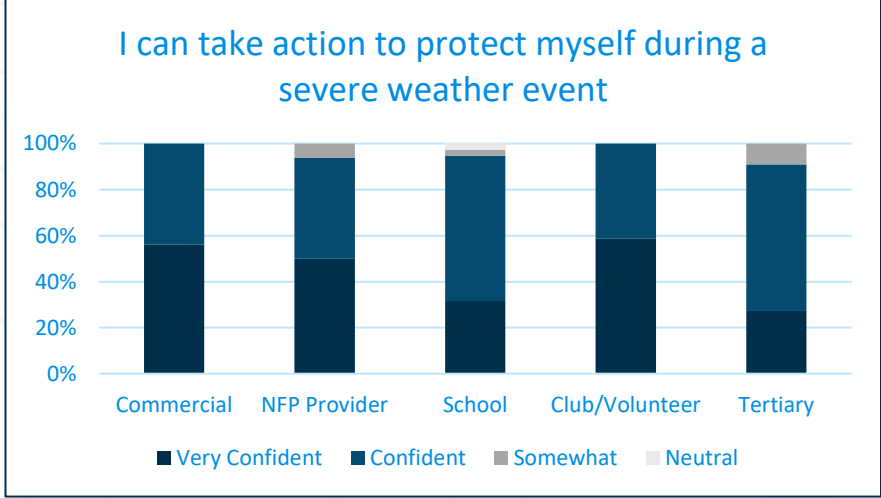
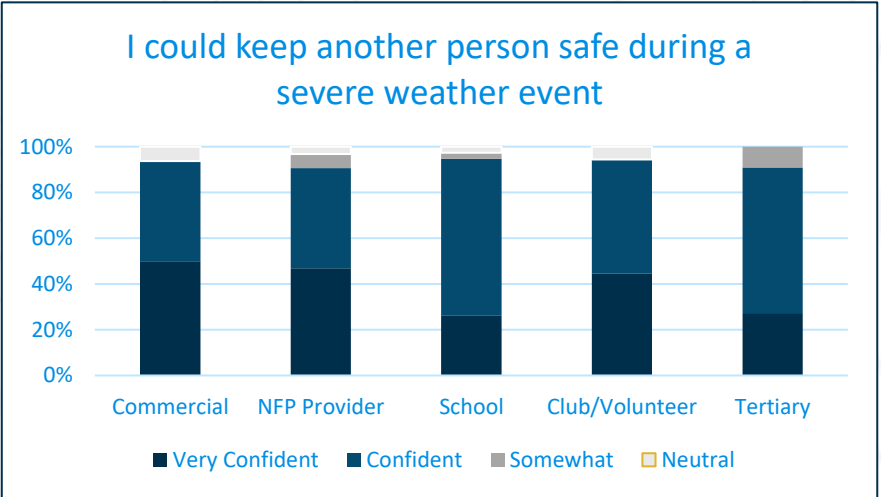
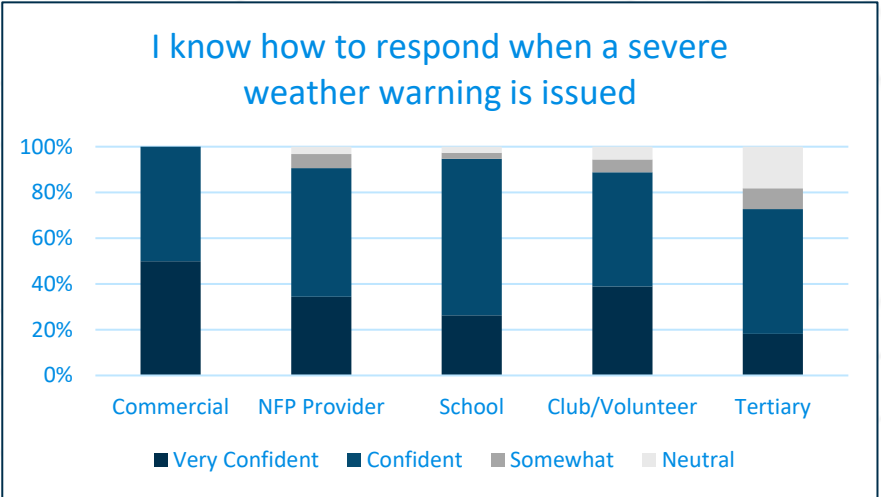
20% lack confidence in their capacity to provide others with enough warning to respond to a severe weather event



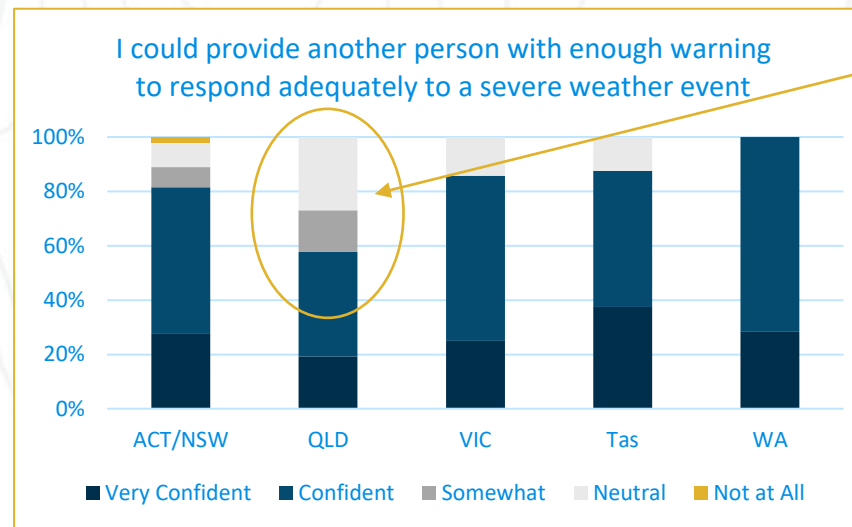
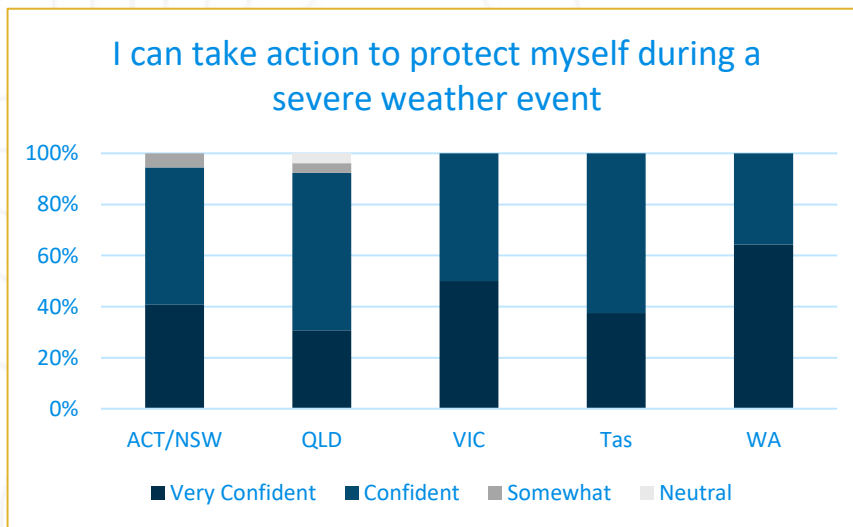
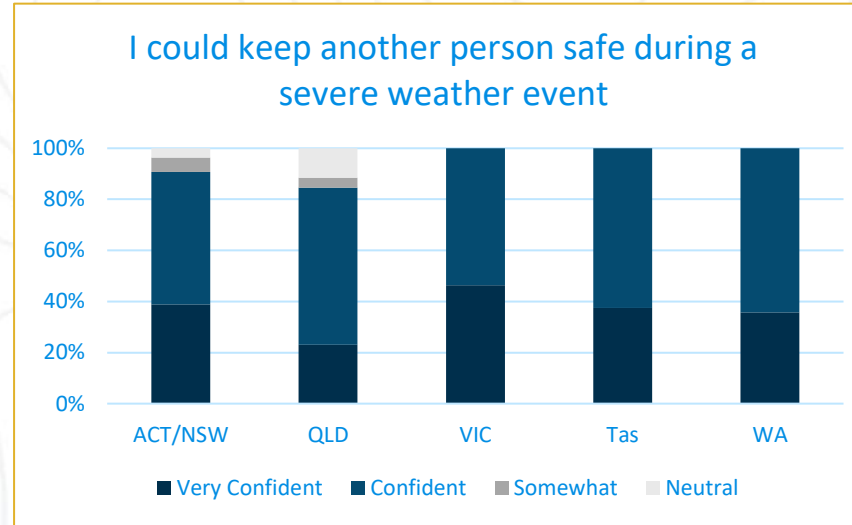
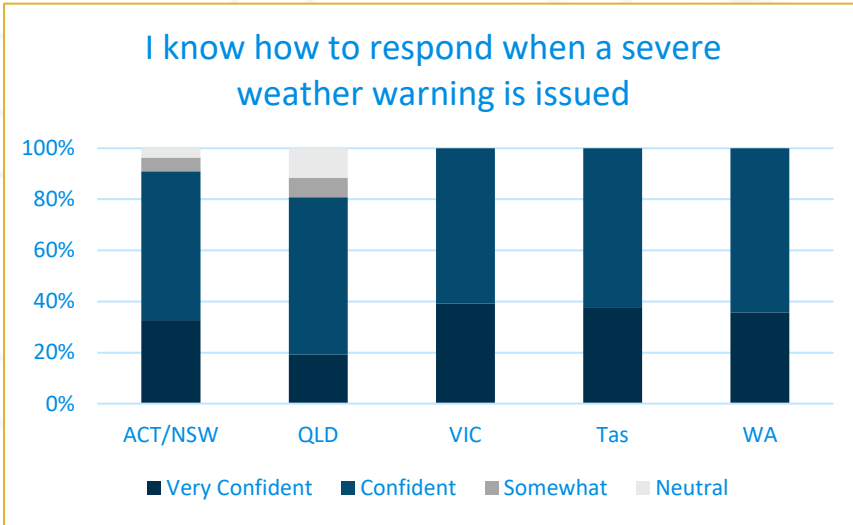
Commercial providers are the most confident, followed by Clubs & Volunteers

Self

Others



QLD & ACT/NSW are slightly less confident in their capacity to respond to severe weather events



40% of QLD responses lack confidence in their capacity to provide others with enough warning to respond to a severe weather event



3. Weather Forecasting Needs



Weather forecasting needs for the outdoors



Source ownership and intent

Emphasis on the importance of knowing where the information comes from – govt source (BOM) or private. Outdoor users want to ensure that the intent isn't skewed towards sensationalism or fear-mongering.



Reputation and reliability

Trust in the reliability and past accuracy of the source. Outdoor users want to know if the source has a proven track record and whether information aligns with on-the-ground conditions. Knowing about the quality of data and models builds trust in assessing accuracy of predictions.



Accuracy for local terrain

Outdoor practitioners are looking for accurate forecasting for specific locations and terrains. They are also looking for information to support specific outdoor activities (eg canyoning, alpine hiking, river paddling, star gazing).



Frequency and timeliness

Outdoor users are looking for regular updates, timeliness and real-time data for making informed decisions.



User friendly experience

User-friendly interfaces and easy to access information is highly valued. Outdoor users would ideally like a National approach, with a one-stop-source, with role clarity between SES, BOM and land managers.



Local interpretation and insights

Outdoor practitioners seek to incorporate local knowledge to interpret forecasts in the context of specific areas, particularly for remote or less populated areas. They will use community insights or ground observations to complement formal forecasts.



Multiple source comparison

Many rely on cross referencing information from multiple sources and locations to enhance accuracy. Comparing information across different platforms and considering consistency in forecasts over time helps users gauge reliability.

Thunderstorms and wind are most concerning

Natural Hazards Ranking

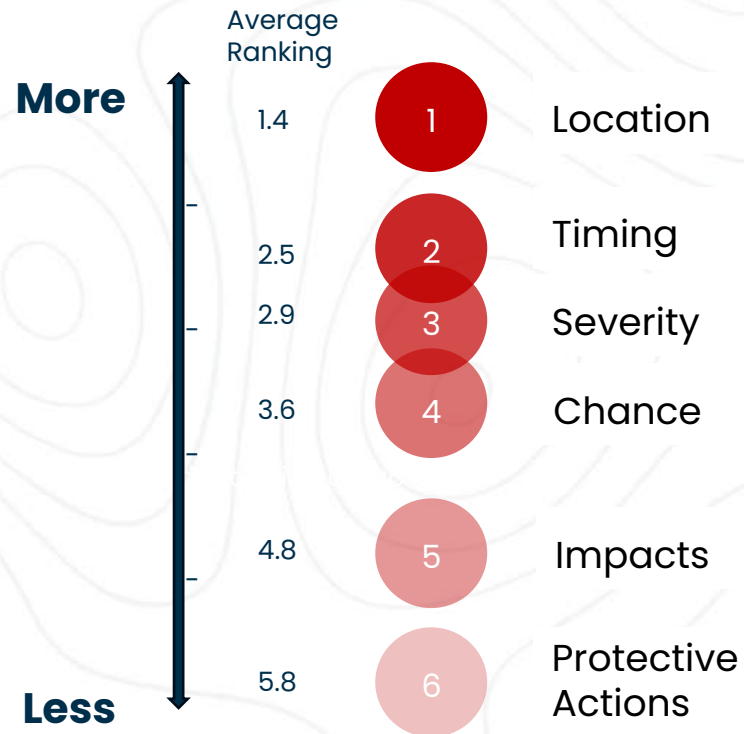
- 1 Thunderstorm & lightning
- 2 Strong winds & gusts
- 3 Bushfire ← Ranked higher for clubs and volunteers, lower for schools
- 4 Heavy or continuous rain ← Ranked higher in Qld and NSW, and for schools
- 5 Heat ← Higher ranked for outdoor providers and tertiary trainers
- 6 Flood
- 7 Hail
- 8 Landslides ← Lower ranked in Qld, Victoria and SA, and for schools
- 9 Snow ← Lower ranked in Qld, Victoria, Tas and SA
- 10 Frost
- 11 Fog
- 12 Cyclone ← Higher ranked in Qld, Vic and SA, and for clubs and volunteers
- 13 Dust storm

Bushfires and heat concern clubs & volunteers a bit more than others



Location, timing & severity is the most important severe weather information

Importance Ranking of Severe Weather Information



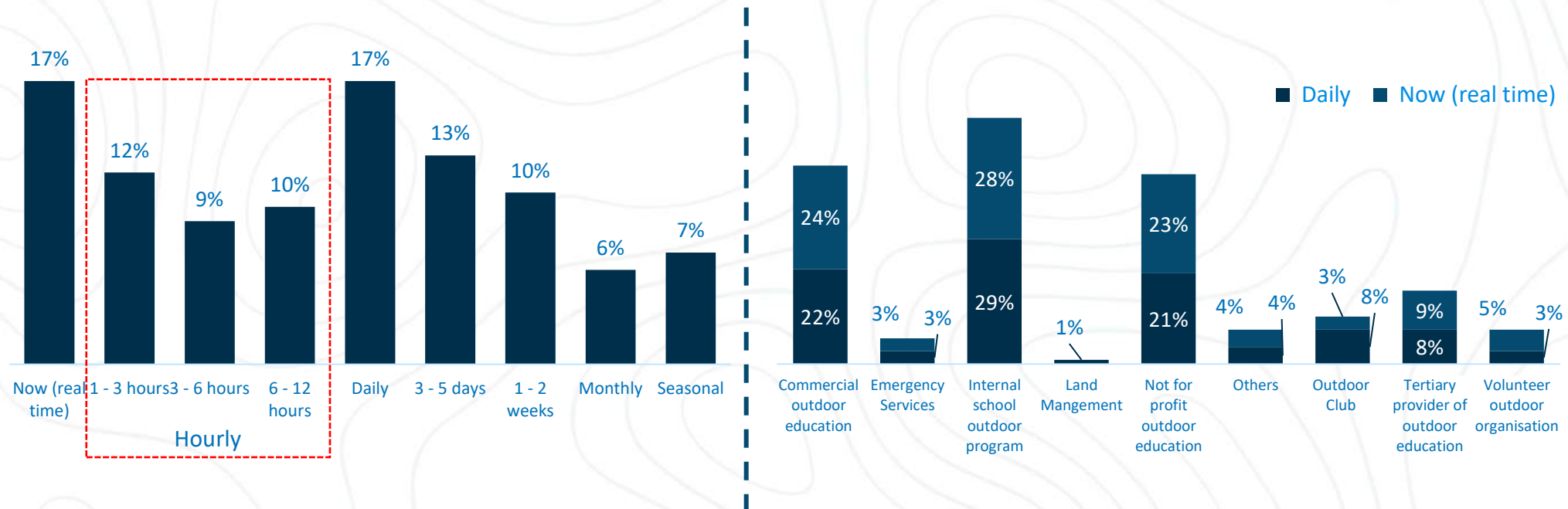
Importance ranking is consistent by organisation type and State / Territory, with only minor variation in average rankings

	Maximum Variation in Average Ranking	
	Organisation Type	State / Territory
Location	0.2 Clubs/vol higher, Schools lower	0.3 Vic & WA higher, Tas & Qld lower
Timing	0.15	0.5 Tas higher, Qld lower
Severity	0.3 Clubs/vol lower	0.6 NSW/ACT & Qld higher, Tas lower
Chance	0.2 Tertiary higher	0.4 Qld higher, Vic, WA & Tas lower
Impacts	0.2 Schools higher, Clubs/vol lower	0.4 Tas higher, NSW/ACT lower
Protective Actions	0.3 Clubs/vol higher	

Preferred Time-scale for Weather Forecasts

At what time scales do you require weather information for your outdoor activities?

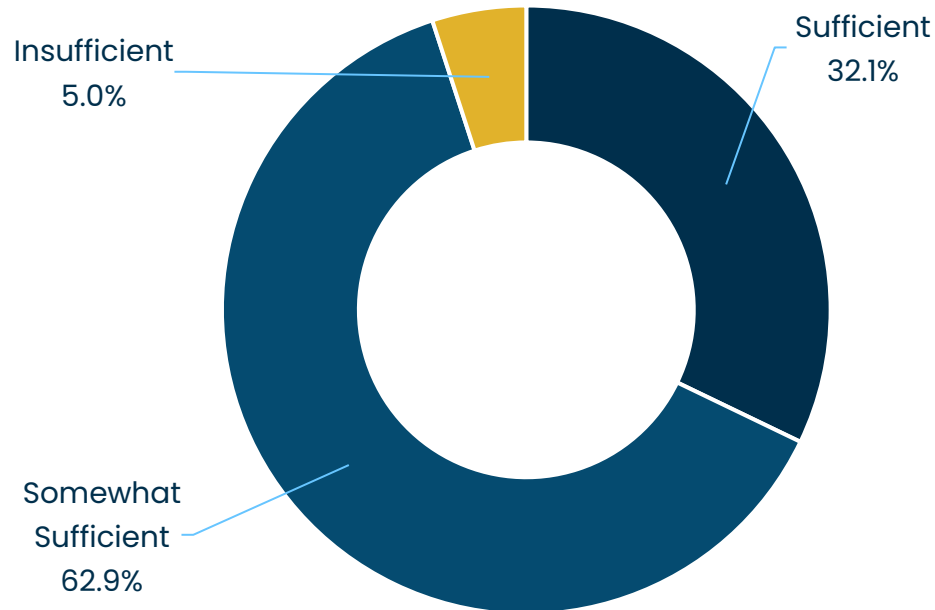
- Majority of the respondents preferred most updated weather forecast information before an outdoor activities; with daily and real-time updates being most preferred by 17% respondents
- In case of hourly forecasts, 1-3 hours remained an ideal timeframe



BOM Weather Warning Systems are mostly sufficient

To what extent are the current weather warnings from the Bureau of Meteorology sufficient for your outdoor activities?

BOM Weather Warnings



Note: Scale of <25: Insufficient, 50-74: Somewhat Sufficient, >75: Sufficient

Feedback and Suggestions

“It would be very useful if the BOM app made it easier to access MetEye information and accumulated rainfall.”

“BOM Youtube has been excellent as a resource and has sometimes informed my decision making, and that of school leaders.”

“The more informed with regards to weather changes, the better we can make safe decisions.”

“Keep improving the models and factor in as far as possible how they can be affected by climate change.”

“Severe weather is not a one-off occurrence now, its just standard day to day risk management practice at all levels.”

“The reduction of BOM staff providing interpretation of data has been incredibly detrimental to the quality of complex forecasts in certain areas (even when considering the offsets provided by higher quality data).”



We would like more specific, timely storm information

More timely warnings, more local and accurate, including BOM lightning tracking and wind at different elevations.

"We have been caught out so often over the past 2-3 years with severe weather events, especially during expedition hiking programs. The storms have been unpredictable at times and it is hard to make the right call at an earlier stage, rather than chasing our tails to react in a short period of time."

"Severe weather warning (specifically thunderstorm) timeframes from BOM have been too slow and too short lately"

"Thunderstorm forecasting to know likely duration and intensity: fast-moving cells need a different field approach to a slow-moving storm"

"We find the weather warnings often do not give enough specific information on areas likely to be impacted. Clarity on timing would be extremely helpful, as often the warnings precede the event by very little."

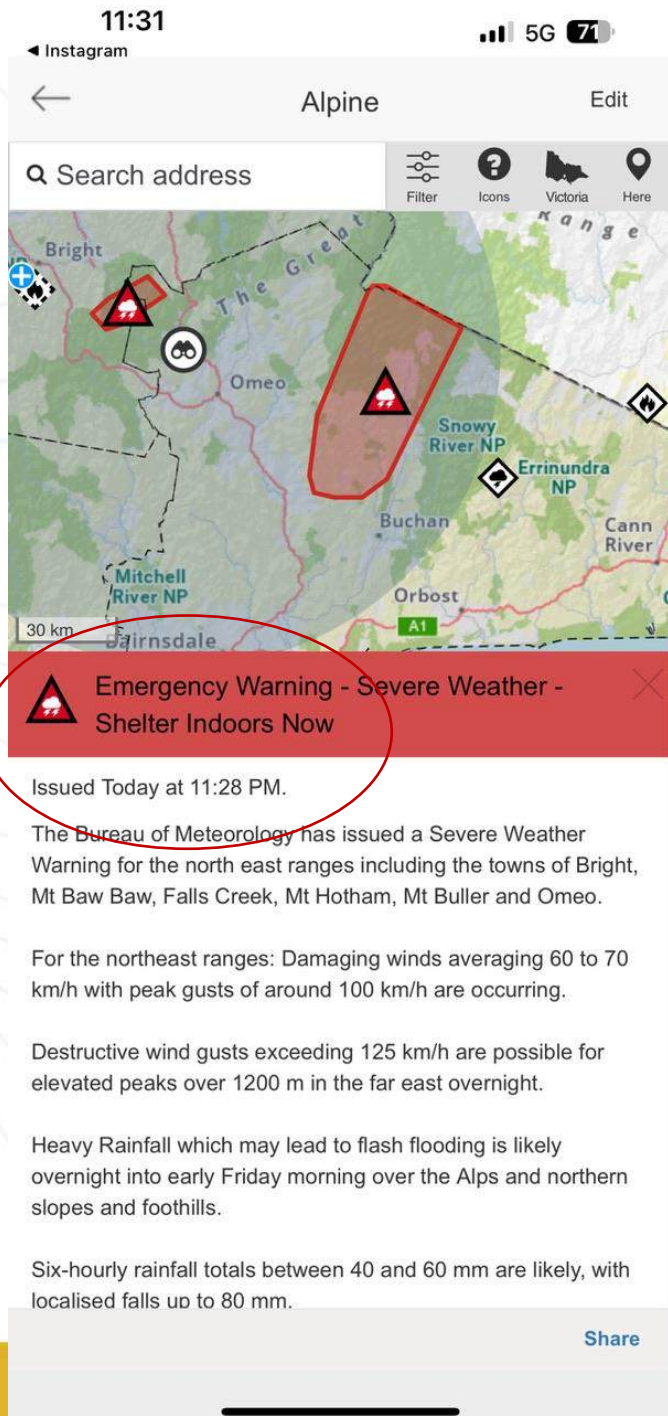
"The chance of a thunderstorm' being listed for 5 days in a row is not particularly helpful – particularly for the alpine region during peak hiking season"

"Addition of lightening alerts on BOM / BOM radar"

"I am not sure why BOM don't release a real-time lightning tracker?"

"We would like wind forecasts for different elevations eg 850hPa"

"Better inshore coastal wind forecasts – time specific not just for a day"



For example...

What do you do when an SWW is issued at **11.28pm?**



Coverage needs improving

More weather stations are needed to support forecasting in high use outdoor recreation/education areas, and improved forecasting via satellite devices for out of mobile signal remote access.

“With changing urban and peri-urban demographics, BOM must establish more weather stations. In the Blue Mts, weather stations are more than 50km apart, with 1000m altitude difference.”

“It is challenging to get accurate weather in remote areas of Tasmania, due to the lack of infrastructure. With the rise of very popular walks and paddling, [we need] warnings specific to these activities – not just areas.”

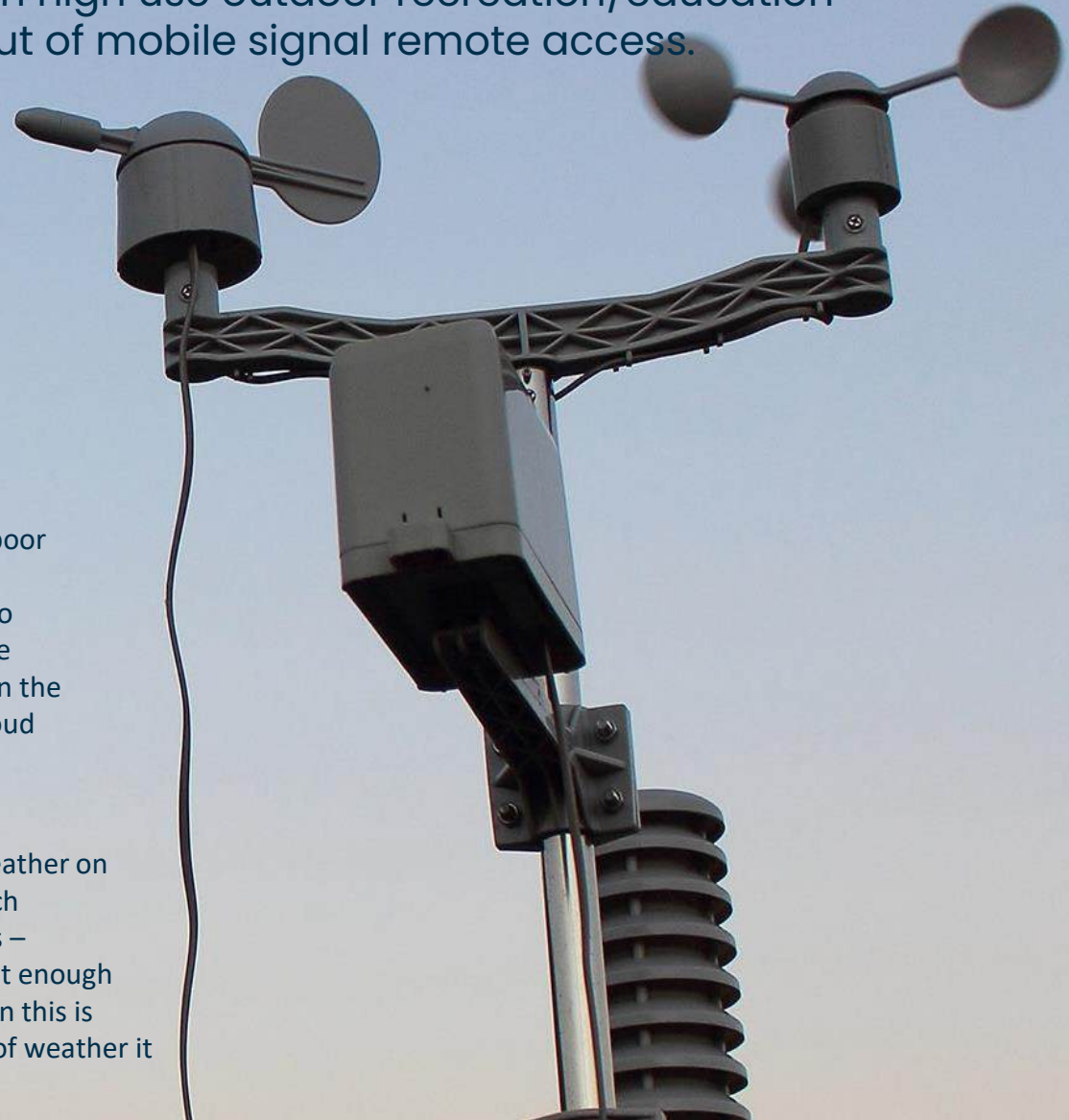
“There need to be more automatic weather observation points so values such as local wind are more accurate, and you are not relying on a point miles away.”

“Many times we are in areas without mobile coverage, and are unable to check weather forecasts. We rely on the last forecast received so any warnings need to be uploaded to BOM sites quickly.”

“The hardest part of my work is when there is no signal and being able to get live updates in remote areas. It would be amazing if weather information was more easily available in remote locations through satellites.”

“Weather forecasts are poor for stargazing tourism in Broken Hill, attempting to cover too big an area. We need better equipment in the area to better predict cloud and rain.”

“I find Garmin Weather on the Garmin Inreach absolutely useless – inaccurate and not enough information. When this is your only source of weather it can be difficult.”





Concern about risk of unnecessary cancellation

Blanket over-cautious advice or inaccurate forecasting of severe weather that does not eventuate can result in unnecessary cancellations of programs. This has serious economic and workload implications, and it creates an additional risk aversion for participation.

Weather warnings that don't eventuate...

- "Severe weather warnings often have significant impact on the business when the weather turns out to be ideal conditions."
- "We find the the over-cautiousness of BOM means tours are cancelled, and then the weather doesn't hit at all. Significant loss of income."
- "I am concerned that more SWW are issued because the BOM is becoming more conservative, or is the weather more unpredictable? Often when a SWW is issued there may be no adverse weather and events have been cancelled for no reason."
- "[Weather] sites over predicting events that don't happen create nervous people and staff. It's a tricky dynamic that is constantly changing and has definitely been one of the most difficult things lately. We have had our hottest, coldest, windiest, rainiest and stormiest days in the last 1-3 years. "

Blanket advice not nuanced to the outdoors...

- "There is quite a bit of ambiguity during a SWW from BOM and SES which could have legal ramifications eg 'Do not go outdoors. If you are outdoors seek shelter'. This isn't always possible or practical. That is where specific outdoor activity related advice would be useful."
- "Be very careful when making broad statements, when lots of things are very specific. We have issues with fire maps saying places are bushfire prone, when they are not, they are just included in a postcode."
- "Make sure the language used in warnings is not too restrictive. For example, years ago SWW had the sentence 'keep children indoors'. This was too restrictive and thankfully was removed giving staff latitude to conduct activities in safe, sheltered spaces."

We'd like the BOM to give more attention to people outdoors



More than 90% like the idea of specific weather forecasting services for the outdoors

- Potential to link to risk planning tool / framework

BUT... would want it to account for context & participant experience, and not be a simplistic version of the BOM

"It would be good if there was a higher profile of BOM services to help prepare and protect people outdoors."

"A shared forecasting resource specific to outdoor activities would be very useful."

"If a central platform is developed it is an opportunity to connect to a broader planning and dynamic risk management framework."

"An adapted version of the 'Disaster Dashboard' app which many local councils use is an essential 'real time dynamic tool' for the outdoors industry."

"Any weather forecasting and warning system for outdoor activities needs to account for the experience and preparedness of the participants."

"I am afraid an 'Outdoor Activities Weather Warning' system would dilute information so it is only usable in basic conditions, and would ask users to go to BOM for further info, which defeats the point."

"I am wary of warnings for specific activities, as a warning might be aimed at an average person, whereas a skilled person might enjoy and safely do the activity in challenging conditions."

We also need help navigating what is available through BOM

“Work needs to be put in to make BOM friendlier for all users. BOM has an incredible amount of information, but it's often hard to find the thing you need or re-find the thing you found. For instance, I often struggle to find the river water level predictions and end up in the historic data section which has no clear link to predictions. There also appears to be a historic outdated stuff which has been superseded by new systems, but the old stuff still lingers and pulls attention. It all needs to be consolidated into better pages and an easier to use system.”

It would be great for NatCORR to advocate for better funding of SPECIFIC activities at the BOM.



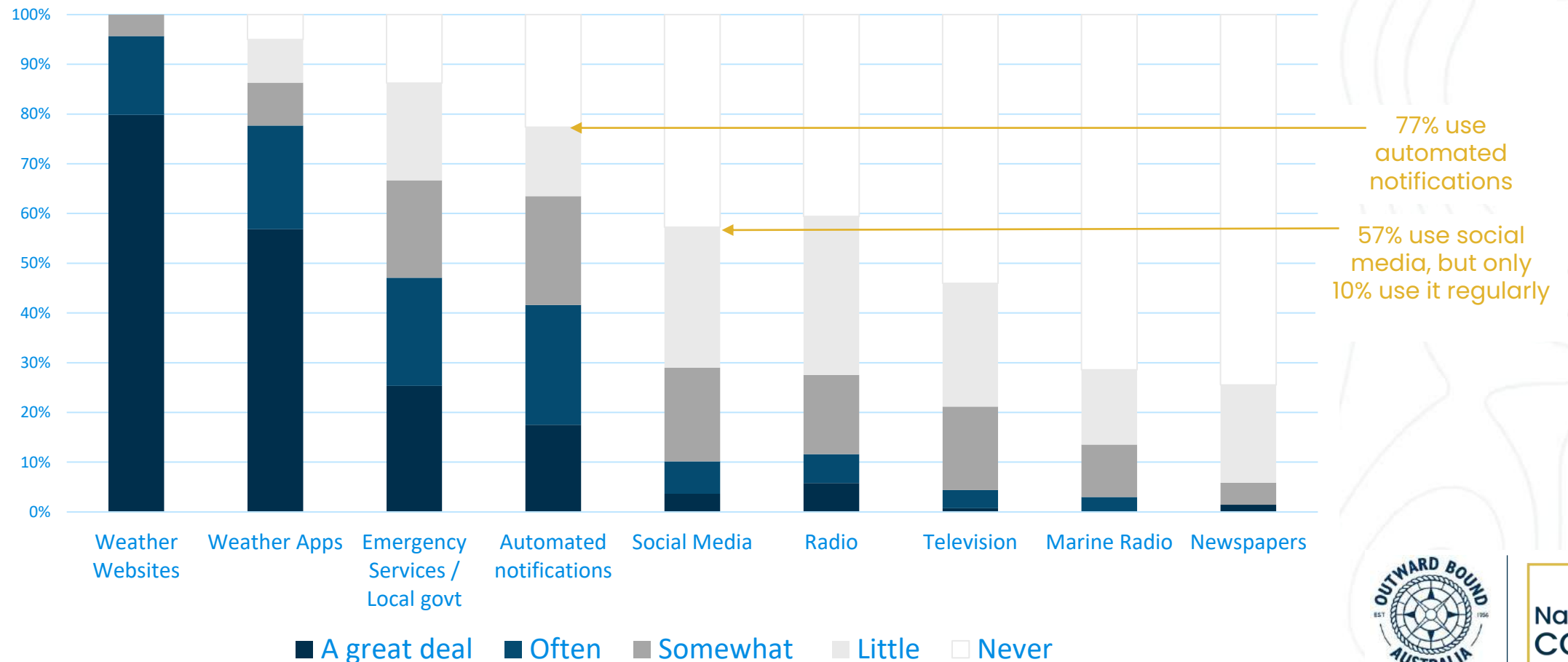
4. Weather Information Sources



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Weather information is most frequently sourced from websites and apps

Frequency of Weather Information by Source Type



Over 100 different named sources for accessing information

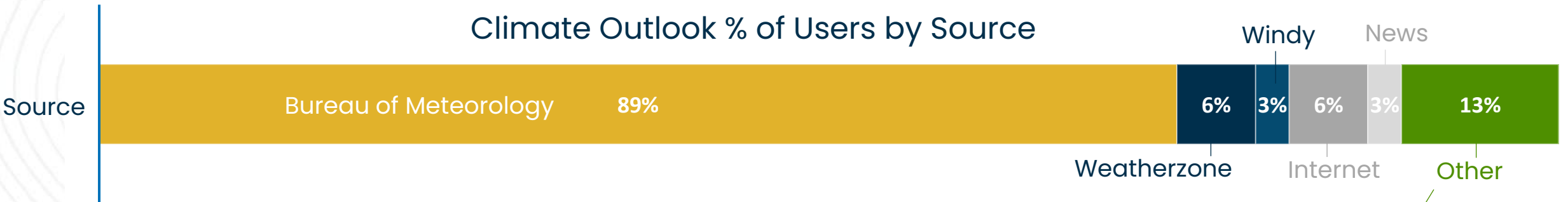
For climate outlooks, weather forecasts, severe weather, fire conditions, heat, flood, coastal conditions, air quality, water quality, cyclones and snow

ACA	DEWLP	Hazardwatch	Mountainwatch	Ski Resort Website	Water NSW
Accuweather	DFES (WA)	HealthyWA	My Fire Watch (WA)	Snow Cams	Water SA
ACT City Services	Dharawal Seasonal Calendar	Heatwatch	National Air Quality	Snowwatch	Water Testing
ACT Health	DPI	Higgins	National Parks	Snowy Hydro	Waterways Guide
Air Quality NSW	DPIE NSW	Hotspot	News	Social media	WeatherUnderground
Apple Weather	Early Warning Network (EWN)	Hydro Tasmanian	NSW National Parks	Surf Forecast	Weatherzone
Aqi	Elders Weather	Incidents NSW	Observation	Surfline	Whitehorse Canoe Club
Beachwatch	Emergency WA	Inreach Forecast	Outdoors Vic	Swellnet	Wikiriver
Bureau of Meteorology (BOM)	EPA	Internet	PaddleSafe	Sydney Water	Willy Weather
Bushfire National Hazards CRC	ESA.ACT.gov.au	Iqair	Parks Vic	Tas Alerts	Wind Finder
Bushfire.io	Eye-spy	Kumina, WA Dept of Water	Predict Wind	Tas Fire	Windy
CFA	Farmonline	Local Government	QFES (Qld)	Tide Reports	Word of mouth
CSIRO	Fires near me	Local Knowledge	Radio	Tides Near Me	Youtube
Dam operator	Floods Near Me	Manly Hydraulics Laboratory	RFS NSW	Tropical Tidbits	YR
DBCA	Flow X	Marine Services	River indicators	TV	
DEECA	Forest Fire Management Vic	Melbourne Water River Height	Seabreeze	VIC Emergency (EMV)	
Department of Water	Forestry - local wardens	MFS	SEQ water	Vic Fires	
Dept Agriculture	Google	Mountain Forecast	SES	Vic Health	
Dept of Health	Hazards Near Me	Mountain Safety Collective	Ski Patrol	Water Authority	

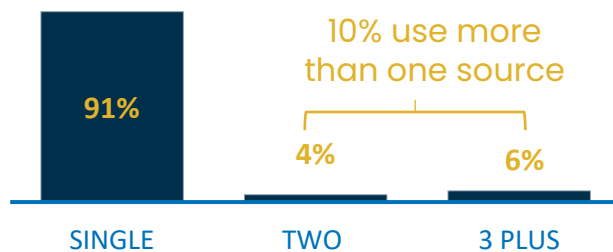
Most use the BOM for climate outlook forecasts

- ~50% of respondents don't use climate outlooks, or didn't respond
- ~90% of those who use climate outlook forecasts use the BOM
- 10% use more than one source
- There is a wide range of other sources – 14 listed

Climate Outlook % of Users by Source



Sources Used

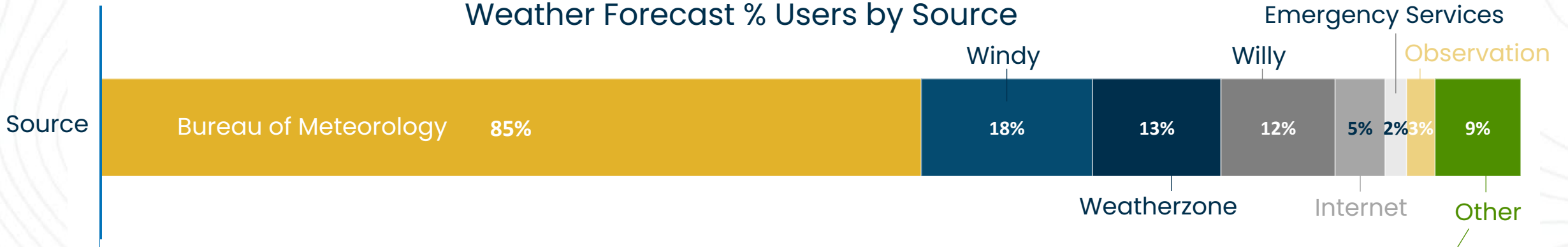


- CSIRO
- Bushfire Nat Hazards CRC
- Govt Dept: DPI, DEWLP, Ag
- Parks Vic
- Peaks: ACA, Outdoors Vic
- Accuweather
- Elders Weather
- Edgar long range forecast
- Dharawal Seasonal Calendar
- Call a knowledgeable friend
- Local observations

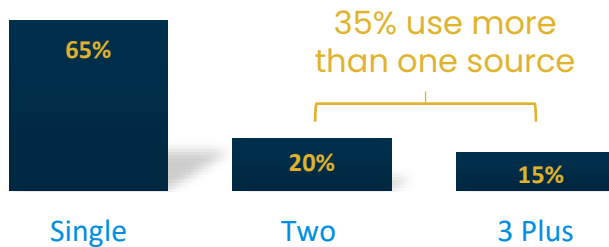
Wide range of sources used for Weather Forecasts

- A third of respondents use more than one source for weather forecasts
- 58% use the Bureau of Meteorology (BOM), 29% use Windy, Weatherzone or Willy
- Other sources include a wide range of online sources

Weather Forecast % Users by Source



Sources Used



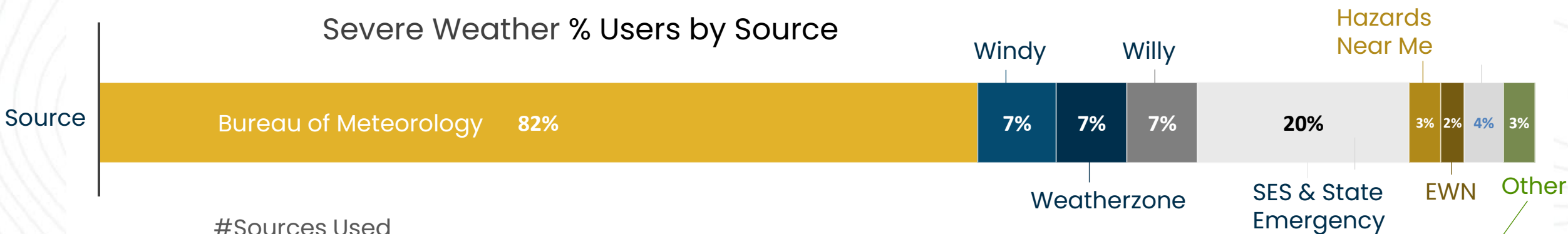
- YR.com
- Flow X
- Apple Weather
- Weather Underground
- Accuweather
- EWN
- Seabreeze
- Mountain Forecast
- Tropical Tidbits
- Farmonline
- TV and radio



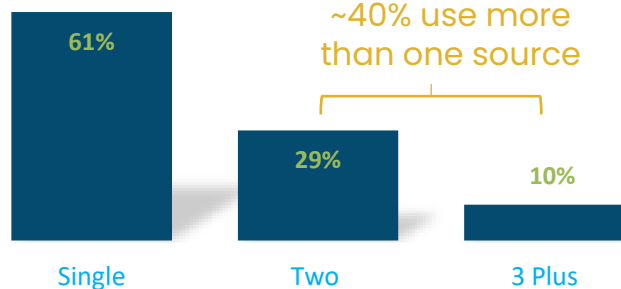
State Emergency Apps are used some in addition to the BOM for severe weather forecasts

- ~40% respondents use more than one source for severe weather forecasts
- 82% use the Bureau of Meteorology (BOM), 21% use Windy, Weatherzone or Willy Weather
- 20% use a range of different State Emergency sources that differ by State

Severe Weather % Users by Source



#Sources Used



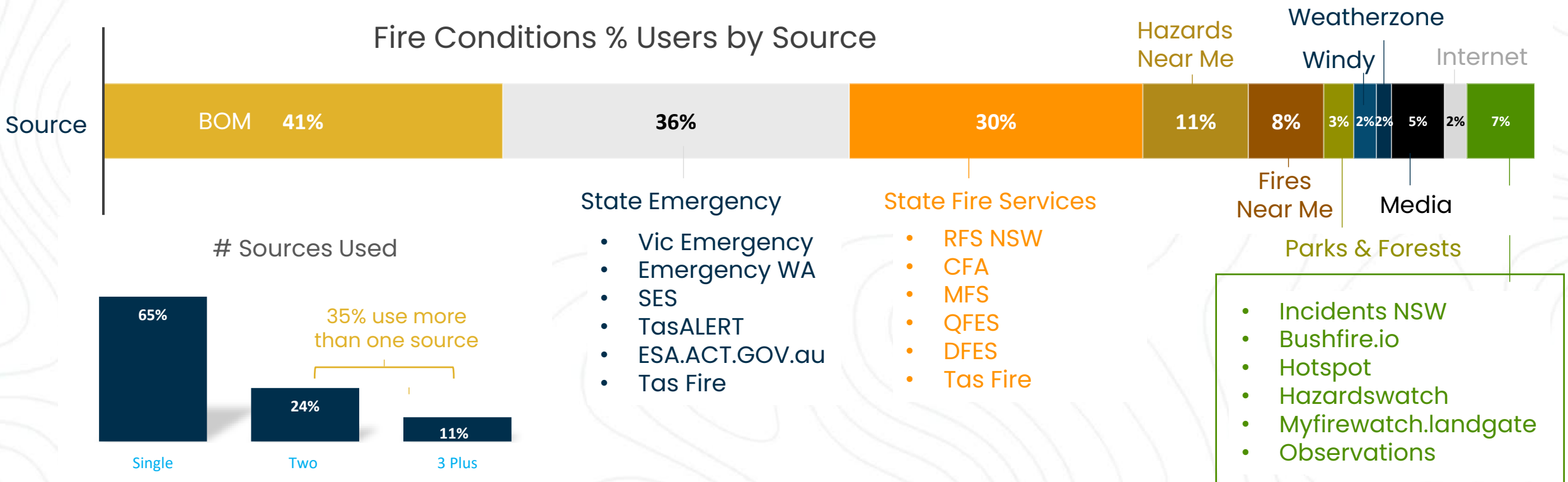
- YR.com
- Accuweather
- Apple Weather
- Tropical Tidbits
- Local radio
- Observations
- Lightning Tracker
- NSW Incidents
- SEQ Water
- Inreach Forecast
- National Parks
- CFA and RFS

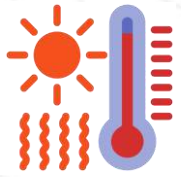


Information on bushfire conditions is mainly sourced from State emergency & fire services

- 36% use State Emergency websites and Apps, 30% use State Fire Service information
- 41% use the Bureau of Meteorology (BOM), 5% use various forms of media
- 35% use more than one source

Fire Conditions % Users by Source

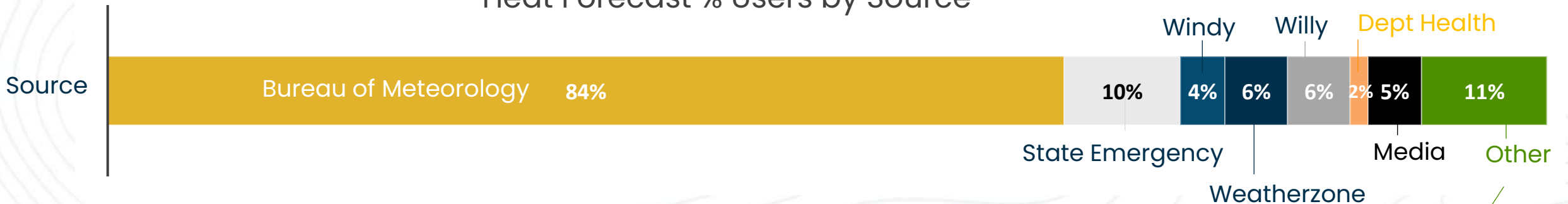




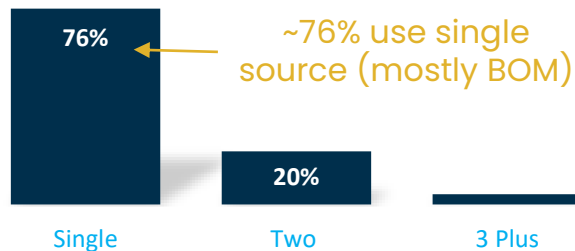
84% use BOM for Heat Information forecasts

- Most rely on a single source of information for heat information
- Windy, Weatherzone and Willy comprise 16% of users
- 10% use State Emergency websites/apps, a small number use Dept of Health

Heat Forecast % Users by Source



Sources Used



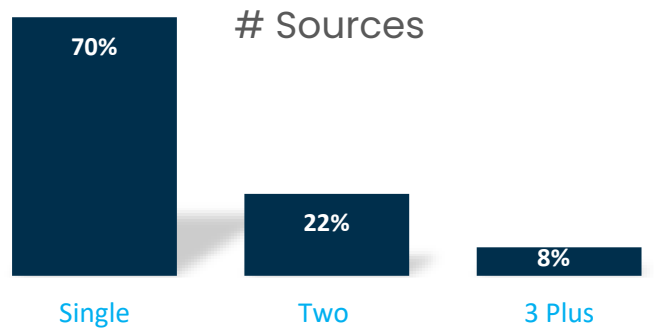
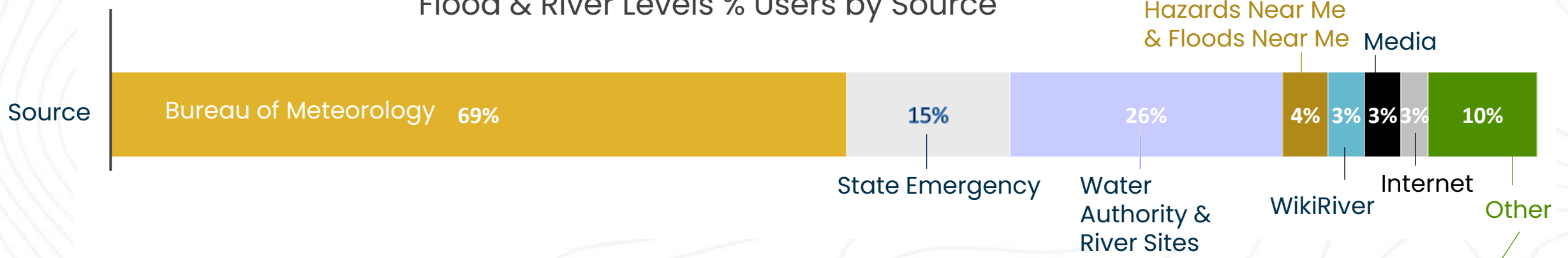
- Heatwatch
- YR.com
- Apple Weather
- Weather Underground
- Accuweather
- Elders
- Tropical Tidbits
- Incidents NSW



Flood & river levels are sourced from BOM, water authorities, state emergency sites and others

- Large range of different water authority and river level sites – locality specific
- Vic Emergency, SES and WA emergency referenced as sources by 15%

Flood & River Levels % Users by Source



"I often struggle to find the river water level predictions and end up in the historic data section which has no clear link to predictions."

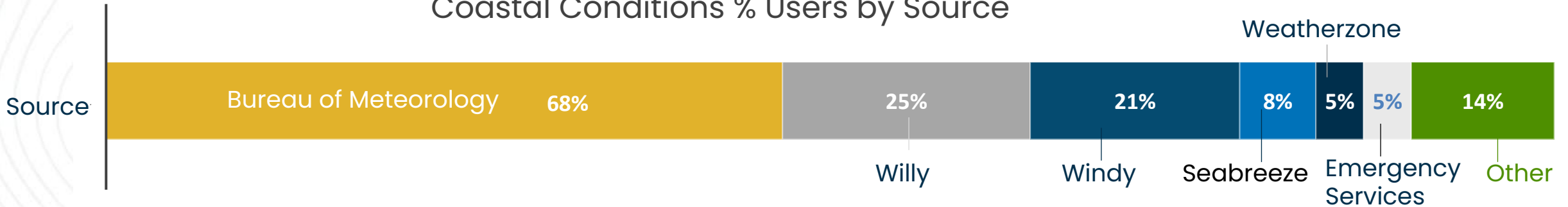
- Eye-spy
- Paddlesafe
- Canoe Clubs
- Nat Parks
- Weather websites
- Local Government



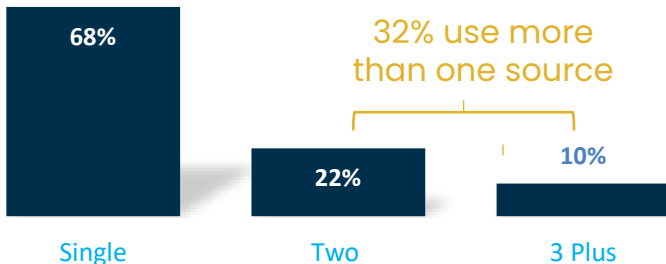
Coastal information sources include surf, wind and tidal apps

- 32% use more than one source of information, 68% use BOM
- 51% use Windy, Weatherzone or Willy
- 8% use Seabreeze. A wide range of other surf and tidal apps mentioned.

Coastal Conditions % Users by Source



Sources



- Swell net
- Surfline
- Surf Forecast
- Wind Finder
- Marine Services
- Tideschart
- Predict Wind
- Beachwatch
- Tides Near Me
- Apple Weather

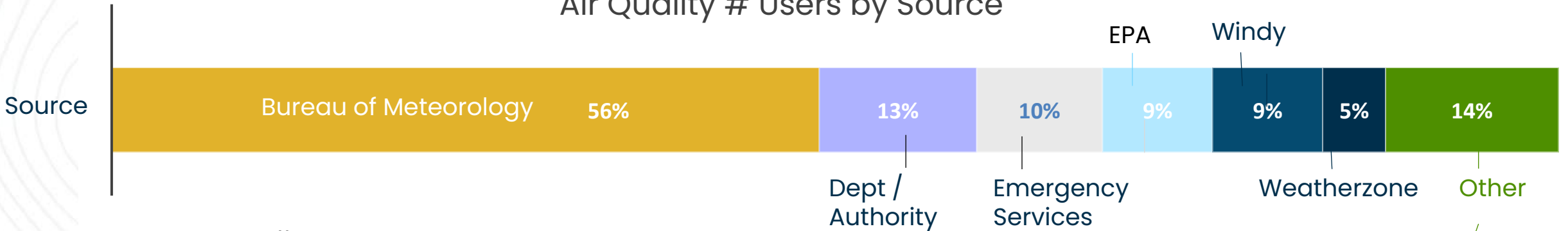


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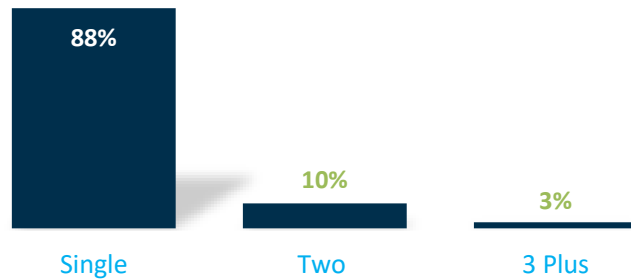
A diverse range of sources used for air quality

- Government departments, emergency services, EPA and other weather sources
- Sources may differ for smoke or thunderstorm asthma
- 43% of respondents left blank or N/A

Air Quality # Users by Source



Sources



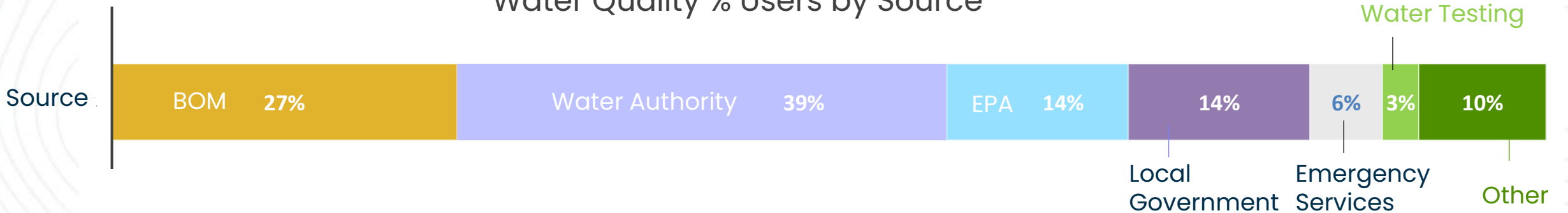
- Aqi website
- Iqair
- RFS
- Internet
- News & radio



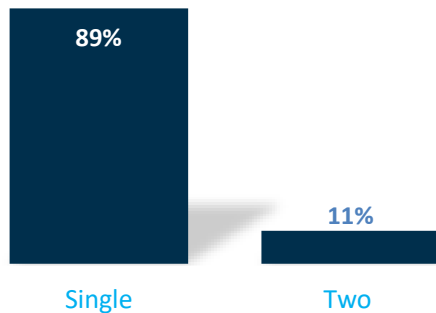
Water quality is mainly sourced from water authorities, BOM, EPA, local government

- Water authorities, EPA and local government are main sources
- Most rely on a single source of information
- Half of the responses stated N/A or left blank

Water Quality % Users by Source



Sources



"Warnings on blue-green algae outbreaks are harder to find than they should be - relevant for canoe/sea-kayak and water activities."

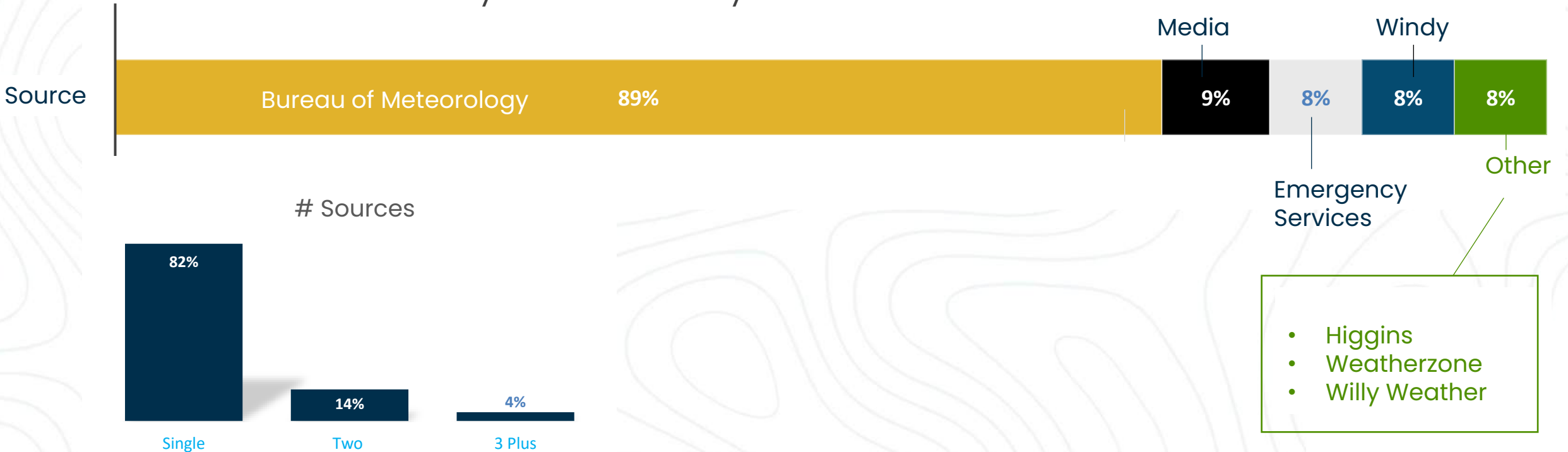
- Beachwatch
- Swim guide
- NCA website
- News & radio
- Weatherzone



BOM and media are main sources for cyclone

- BOM is the primary source of information for cyclones at 89%
- There is a higher use of news and media as a source at 9%
- Nearly half of the responses stated N/A or left blank – due to location

Cyclone % Users by Source

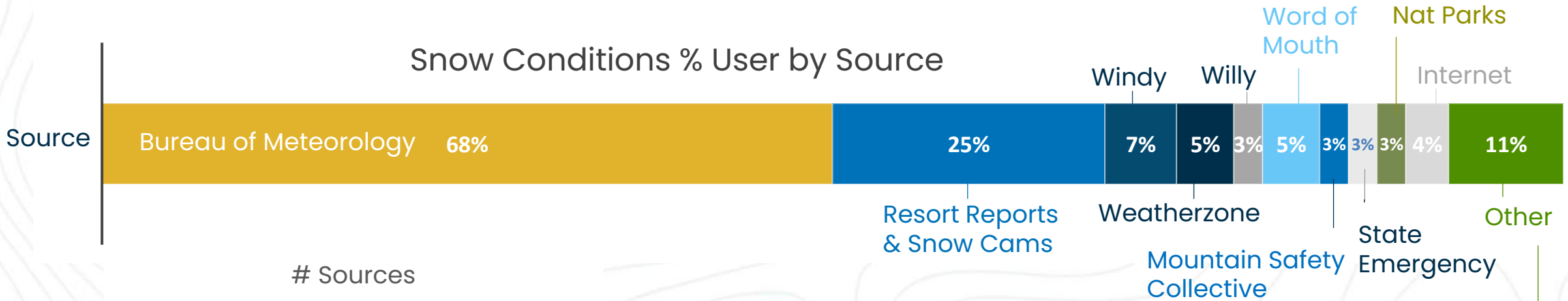




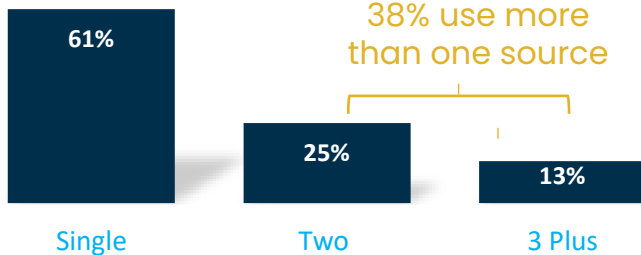
Resort Reports, word of mouth & Mt Apps play a role for accessing snow condition information

- ~80% users access BOM, Windy, Weatherzone and Willy for snow conditions
- 25% access mountain resort reports and snow cams, 5% speak to locals
- Only 2 users referenced use of the Mountain Safety Collective App

Snow Conditions % User by Source



Sources



38% use more than one source

~50% of respondents don't seek information on snow conditions, or didn't respond

- Snowy Hydro
- Snowwatch
- Mountainwatch
- Water NSW

Call for less fragmentation of information – a National approach?

“It would be great to have a National approach to this!”

“Too much fragmentation of data sources is frustrating - all weather and environmental forecasts and warnings should be compiled in one location.”

“A single app to draw all the data to a one stop shop that includes all information from emergency Vic and BOM would be great.”

“Operating in Tas, VIC, SA and NT, there is variance in approach, alert systems and response. It would be great to have a consistent nation-wide approach.”

“Hazardswatch should be upgraded to be a National system rather than every state having its own system.”

“It’s not much good to have the weather forecast if it’s too hard to find from multiple sources.”





How will changes in the forecasting market impact the outdoors sector?



There is growing / evolving commercial market in forecasting providing tailored information for large industry sectors.... mining, agriculture, energy, aviation, insurance, media... what about for outdoor ed / recreation?

There are fee subscription services with a number of providers... How do small / not-for-profit / volunteer organisations know what is best / available / value for money?

How will crowd sourcing weather information influence access / availability in the future?





What information can you rely on?

weatherzone^o WEATHER RADAR & CHARTS NEWS BUSINESS HELP

drivers influencing the country's weather patterns. So, what can we expect to see across Australia during winter 2024...

Australia can be the hottest place in the world at the height of summer, but in April 2024 the country was a...

Extremes & Records

Live Extremes	Today's Extremes	This Month's Extremes	This Year's Extremes
HIGHEST TEMP Oenpelli Airstrip, NT 31.9°C (5:10PM ACST) JUN LONG TERM AVERAGE: 33.4°C JUN RECORD: 36.8°C (2016)	HIGHEST TEMP Jabiru, NT 33.0°C (2:55PM ACST) JUN LONG TERM AVERAGE: 31.9°C JUN RECORD: 36.7°C (2022)	HIGHEST TEMP Mount Bunday North, NT 35.4°C (1 June) JUN LONG TERM AVERAGE: - JUN RECORD: -	HIGHEST TEMP Mt Buller, VIC 62.9°C (30 May) JAN LONG TERM AVERAGE: 17.4°C JAN RECORD: 30.3°C (2009)
LOWEST TEMP Perisher Valley, NSW -3.3°C (5:40PM AEST) JUN LONG TERM AVERAGE: -3.1°C JUN RECORD: -12.0°C (2019)	LOWEST TEMP Liawenee, TAS -6.2°C (10:46PM AEST) JUN LONG TERM AVERAGE: -0.9°C JUN RECORD: -11.2°C (2013)	LOWEST TEMP Century Mine, QLD -46.5°C (3 June) JUN LONG TERM AVERAGE: 13.8°C JUN RECORD: 4.3°C (2012)	LOWEST TEMP Pound Creek, VIC -69.6°C (20 February) JUN LONG TERM AVERAGE: 6.1°C JUN RECORD: -3.0°C (2015)



Source: Weatherzone.com.au June10th 2024, Mt Buller image, [The Guardian](#).





Who are our experts / gurus?

How do we find and build a community of outdoor weather gurus?

What are the best mechanisms for sharing and transferring expertise in a rapidly changing information and climate context?



Summary of Key Messages



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Key messages for action

For the Outdoor Sector

Develop training in weather decision support

- Organisational readiness
- Weather information

Build a community of outdoor weather experts to track and share learning

Engage with researchers for learning and publication

Consider thresholds guidelines in review of AAAS ?

Highlight and lobby for outdoor sector needs in weather forecasting?

Improve communication between the BOM and the outdoors sector

For the BOM

Timely updates of weather warnings

Addition of lightning alerts on BOM

More stations to improve local forecast accuracy in outdoor recreation settings

More attention to, and tailored services for the outdoors sector

- Meaningful wording
- Avoid unnecessary cancellations

Improve ease of access to BOM information

Consider National approach or less fragmentation of information

Training on how to find / use BOM services for the outdoors sector



Next Steps for NatCORR

- ▶ Formal presentation of Report to the Bureau of Meteorology
 - Including feedback from this webinar
- ▶ Work with BOM on creating professional development training for the outdoor sector.
 - Online training – guide to BOM services
 - PD – Organisational readiness, accessing weather information, decision support etc.
- ▶ Research paper development in partnership with ATOEN
 1. Organisational readiness
 2. Weather information access
- ▶ Call for expressions of interest in outdoor weather expert / guru group
- ▶ Feedback and liaison with Peaks for input into AAAS review
 - Consideration of thresholds?
 - Organisational readiness context?



Thank you

Webinar recording & pdf deck available on our website:
www.natcorr.org.au



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Exec Summary

1.

Call for Action

- Skills and access to weather information is critical for decision support for safety in the outdoors. This is an important topic and there is a call for action to address outdoor sector needs.
- Most are confident that they have sufficient weather information to support safe decision making, but are less confident that they are up to date with best practice.
- Only 25% have had training on weather in the last 5 years (half who did were at Tafe / Uni entry level).
- Most outdoor practitioners (77%) don't know where to go for professional development on weather.
- 94% would be interested in attending professional development on weather.



Exec Summary

2.

Organisational Readiness

- 60% have formal organisational processes for considering weather information in planning and running outdoor activities.
- Formal processes include Standard Operating Procedures (SOPs), risk assessments, checking weather forecasts (including alerts, SWW) and use of weather thresholds.
- Informal processes mostly rely on the expertise and judgement of outdoor leaders.
- Weather warning thresholds are used by 70% of organisations. What these thresholds are, and how they are used varies widely. There is a call for more information sharing and guidance on thresholds.
- Decision making in relation to weather events is mostly a shared responsibility between the office and the field.
- Most are confident that they know how to respond to a SWW, but are less confident when it comes to providing enough warning to protect others (40% of Qld responses lack confidence).



Exec Summary

Source ownership and intent
Reputation and reliability
Accuracy for local terrain
Frequency and timeliness
User friendly experience
Local interpretation and insights
Multiple source comparison

3.

Weather Forecasting Needs

- 7 key elements in outdoor sector weather forecasting needs
- Thunderstorms, strong wind, bushfires, heavy rain and heat are the most concerning weather events.
- Location, timing and severity are the most important elements of weather information.
- BOM SWW's are seen as mostly satisfactory: but we'd like more specific, accurate, timely weather warnings and more weather station coverage.
- There are significant concerns about SWW prompting unnecessary cancellations.
- We'd like BOM to give more attention to the forecasting needs of people outdoors.
- And provide help with training on how to find / access what services are available through BOM.



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Exec Summary

4.

Weather Information Sources

- Weather information is most frequently sourced through websites and Apps. 77% use automated notifications. 57% use social media, but only 10% regularly.
- There were over 100 different named sources of information across the 11 types of weather / conditions surveyed.
- BOM was the most common source, except for water quality, and less so for bushfire conditions (state emergency and fire services apps).
- ~30% typically use more than one source of information.
- There is a call for less fragmentation of information – ideally a National approach.
- This raises questions about the future of the weather forecasting market. The outdoors sector is not a large industry sector being serviced by commercial providers. How will the future changes impact the outdoors sector?
- How can we build a community of outdoor weather experts to support people outdoors?

