

Corporate responsibility

Responsibility to the Australian community

Inherent in its vision and mission, the Bureau has a responsibility to the Australian community to support a safe, prosperous, secure and healthy Australia. The Bureau's focus is on providing trusted, reliable and responsive weather, water, climate, ocean and space weather services that benefit the Australian community and drive competitive advantage for business and industry.

The Bureau is accountable to the Australian Government for fulfilling its legislative mandate with the resources invested in it but is ultimately answerable to the Australian community. Under the *Meteorology Act 1955*, the Bureau performs its functions largely in the public interest as well as for sectors such as defence, shipping and aviation, and in support of primary production, industry, trade and commerce.

Throughout 2022–23, the Bureau continued to provide warnings, forecasts, information and advice on which Australians depend – providing round-the-clock services to support informed decision-making by governments, emergency services, industry and the community. The value of these services is expanding as Australians become increasingly vulnerable to a range of severe weather events due to changes in climate, population, settlement patterns and the growth of infrastructure.

The Bureau's services are particularly crucial when conditions are extreme. The organisation continues to assist Australians to better manage the impacts of their natural environment, including drought, floods, fires, storms, tsunamis and tropical cyclones. The Bureau's warnings and advice to the emergency services support essential decision-making when people and property are under threat.

In fulfilling its duties, the Bureau remains committed to:

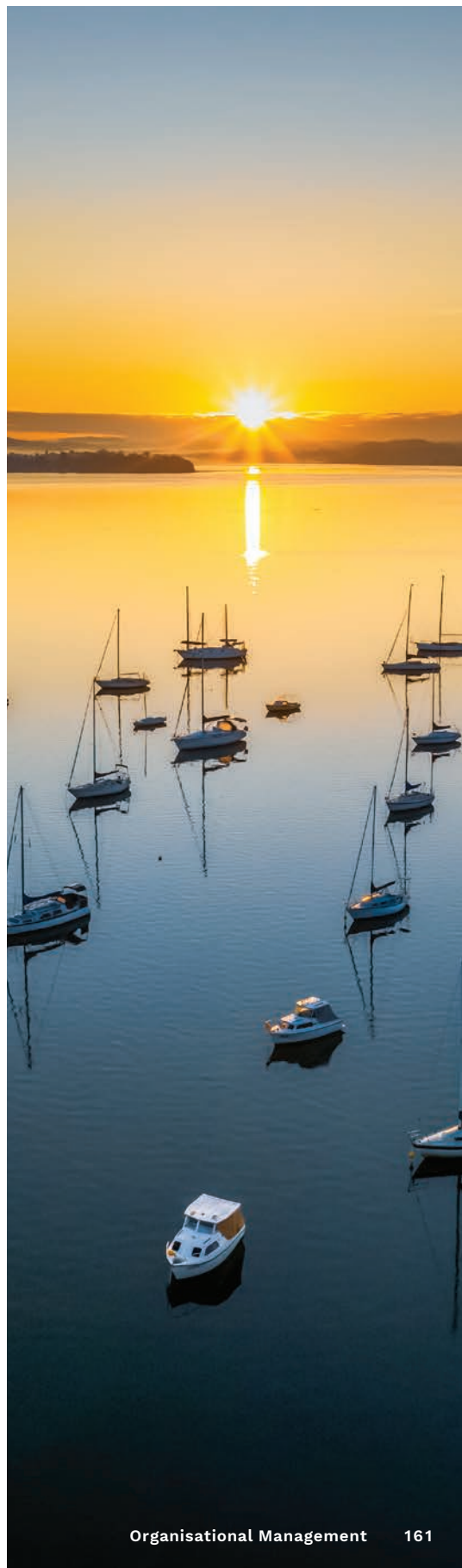
- providing the best possible information about Australia's weather, climate, water, oceans and space weather
- providing timely information to allow planning and response to impending critical events
- presenting information clearly, using plain English and easy-to-understand graphics, and making it accessible to vulnerable communities
- meeting increasing user expectations by incorporating relevant advances in science and technology, and enhancing its products and services in line with community needs
- identifying any limitations in its products and services, and providing information regarding the source, reliability, completeness and currency of any data supplied
- notifying users of service changes and interruptions at the earliest opportunity.

National outreach

The Bureau has continued to improve its delivery of weather, water, climate, ocean and space weather services to the Australian community. 2022–23 was the second year of the Bureau's new operating model, created under the Public Services Transformation Program to produce a more responsive and resilient organisation that can more flexibly mobilise its full capabilities to respond to weather threats and community needs. The Bureau's presence and capability within Australia's states and territories remains vital to how services are delivered, integrating local knowledge into Bureau services and focusing on local and regional needs. This is especially crucial given the variation in climate patterns across Australia (see map on p.162).

The Bureau's Decision Support Services Program leads national, regional and local community engagement in hazard preparedness and response, with a focus on the emergency management sector and key Australian Government stakeholders. The program has staff deployed across 3 regions: East (New South Wales, the Australian Capital Territory and Queensland), South (Tasmania, Victoria and South Australia) and North and West (Western Australia and the Northern Territory). Staff work alongside state and local governments and emergency service agencies as part of the emergency management and disaster mitigation networks within their respective jurisdictions. This includes outposted decision support staff within several combat agencies and emergency management centres providing direct access to the Bureau's expertise and specialisation.

At the national level, the Hazard Preparedness and Response (HPR) National Operations Support unit embedded in the National Situation Room delivers tailored services encompassing weather, climate and hydrology supporting the National Emergency Management Agency to deliver services to the Australian Government and the wider community. Routine services such as presentations and briefings are supplemented by on-request services when severe or extreme hazardous events occur. The HPR National Operations Support unit works as part of the Australian Climate Service delivering integrated impact services to the Australian Government's National Situation Room (see p.132).



Northern Territory

The Top End of Australia has a tropical climate characterised by a wet season from October to April and a dry season from May to September. At different times of the year, parts of the Northern Territory experience severe thunderstorms, wildfires and widespread flooding. All coastal areas are subject to tropical cyclone landfall.



Western Australia

Western Australia is susceptible to a wide range of severe weather events all year round. The warmer months are characterised by heavy rain, tropical lows and cyclones in the north, and extreme heat and bushfires in the south. During the cooler months, bushfires occur in the north while cold fronts with destructive winds and heavy rain are common in the south.



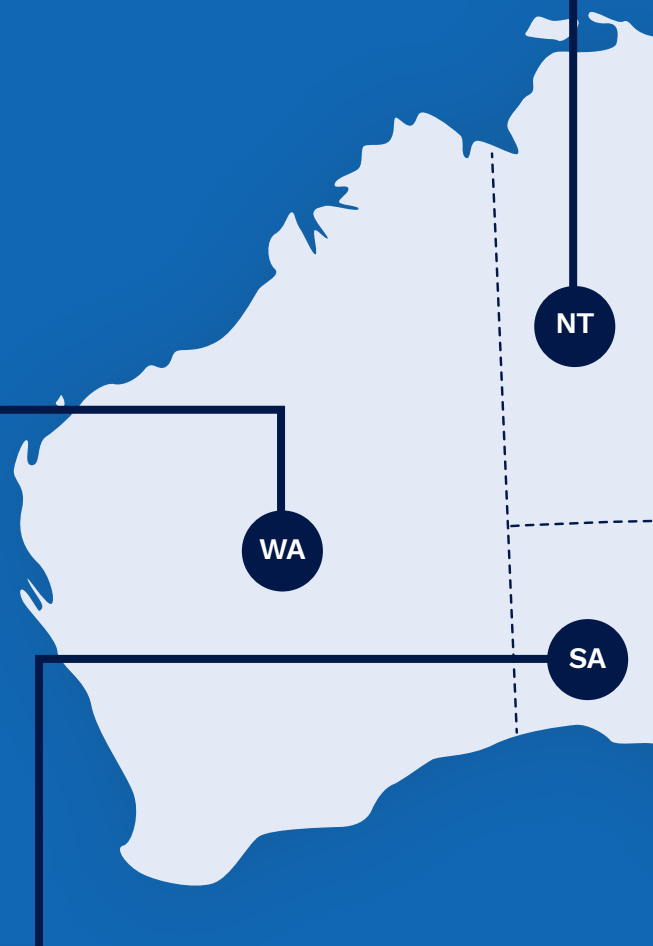
South Australia

South Australia's climate is characterised by relatively hot and dry summers featuring heatwaves, bushfires and thunderstorms with damaging winds, large hail and flash flooding. In the south of the state, cold fronts and low pressure systems in the winter months bring cold, wet and windy conditions. Across the inland north of the state winters are mild but often dry. Rainfall in these parts is usually sporadic and can be driven by tropical systems in the summer and northwest cloud bands in the winter.



Tasmania

Tasmania's location in the path of the 'roaring forties' westerly wind belt brings heavy and reliable rain to the western half of the island and much warmer and drier conditions to the sheltered east coast. Snow can fall any time of year in the highlands, but summer heatwaves and windy weather fronts bring dangerous fire conditions to the east and south.





Queensland

The meteorology of Queensland extends from the deep tropics through to temperate and arid regimes, and encompasses coastal waters that include the Great Barrier Reef, the Torres Strait Islands and the eastern Gulf of Carpentaria. The large and dispersed population is vulnerable to risks posed by tropical cyclones, flooding, severe thunderstorms and bushfires. The State's strong agricultural sector grapples with droughts and other broadscale impacts of climate.



New South Wales

The diversity of New South Wales' weather and climate reflects its many landscapes; from the highest alpine areas in Australia to some of the country's most productive agricultural areas to its offshore islands. New South Wales is often affected by heatwaves, drought, bushfires (and their smoke), intense coastal storm systems, severe thunderstorms and hailstorms. Weather on the coastal strip is influenced by the steep coastal escarpment and ranges, which accentuate heavy rains and bring major flooding to coastal rivers.



Victoria

Victoria is renowned for its very changeable and challenging weather events. These include heatwaves, extreme fire weather, and the effects of bushfire smoke in summer; damaging winds from winter storms; and rain, severe thunderstorms, and floods in all seasons. Victoria is also vulnerable to thunderstorm asthma events, when the right weather conditions and fine grass pollen can combine to cause acute asthma episodes.



Public education and community engagement

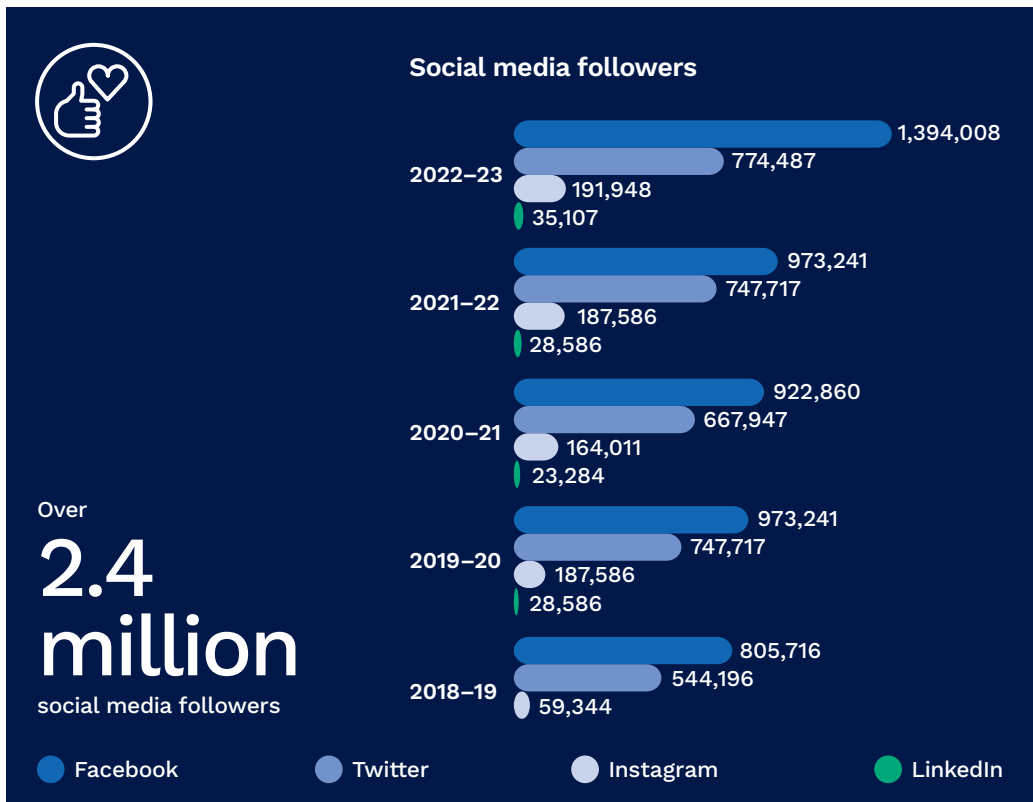
Helping Australians understand and use its products and services is one of the Bureau’s core responsibilities under the Meteorology Act. The aim is to give Australians timely weather, water, climate, ocean and space weather information, education and updates across a range of channels, particularly when conditions put lives and property in danger.

Through a prolonged severe weather season, the Bureau’s structured and agile approach to communicating with customers in impacted communities across multiple states was clear and timely. In collaboration with governments and key emergency services partners across states and territories, the Bureau’s advice was clear, informative and action oriented.

During 2022–23 the Bureau responded to over 5,450 media enquiries, issued more than 139 media releases and published over 5,500 posts, videos, and Instagram stories to keep the community informed on a range of topics and events. The Bureau also continued to engage with Indigenous media outlets to assist in communicating severe weather events to Indigenous communities.

Throughout the year, the Bureau’s social media channels proved especially effective for promoting public safety campaigns on the risks and impact of severe weather as well as building understanding of hazards and our forecasting and warning services. Messaging was amplified during severe weather events such as the floods in New South Wales, Victoria and Tasmania in October, tropical cyclones Ellie, Ilsa and Freddy during the summer months and the Lord Howe Island tsunami warning in May.

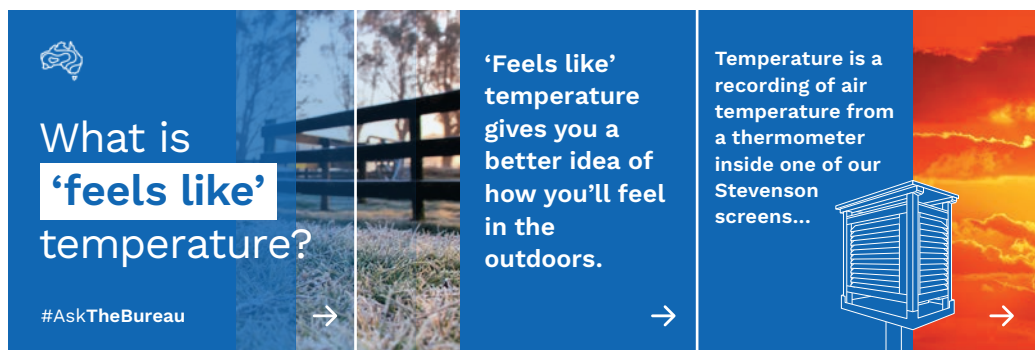
The steady growth in engagement across the Bureau’s social media platforms continued – as of 30 June 2023 the Bureau had over 2.45 million followers in total. Followers increased across all platforms, with LinkedIn up by more than 22.8%, Twitter by more than 3.6% and Facebook by 2.6%. For Instagram, a focus on using images with a human element to demonstrate the impact of weather on the lives of Australians saw numbers grow by more than 2.3%.



The Bureau works closely with traditional media and emergency partners to ensure that communication with the Australian community is timely and accurate and that forecasts and warnings are broadcast widely. Staff interact with a broad range of stakeholders and provide a focal point for the delivery of services to local industry and government customers, supporting the Bureau's sectoral leaders to engage with customers and provide high-quality and clear information.

The Bureau also supports the community in understanding and responding to weather and related phenomena through its Weather Connect customer service centre and through direct information emails to customers.

During 2022–23, the Bureau of Meteorology Training Centre continued its public education program in delivering 21 Introduction to Meteorology courses to members of the public and key stakeholders. The courses provide expert insight into weather fundamentals and weather information, helping to inform decision-making.



Instagram post explaining the 'feels like' temperature

Stakeholder participation

Third-party participation in the Bureau's policy formulation and service provision is facilitated through:

- the Australia–New Zealand Emergency Management Committee and its working subcommittees (Community Outcomes and Recovery, Mitigation and Risk) and related groups including the Australian Tsunami Advisory Group, the National Flood Risk Advisory Group, the Australian Tropical Cyclone Advisory Group, and the National Heatwave Working Group
- AFAC (the Australasian Fire and Emergency Services Authorities Council)
- the Bureau of Meteorology Hazards Services Forum
- the Jurisdictional Reference Group on Water Information
- state and territory consultative committees for flood, marine, and climate
- consultative meetings with private meteorological service providers, the aviation industry and Defence
- state, territory and local government emergency management and disaster mitigation committees
- Australian Government and regional international development programs
- intragovernmental forums on water and energy management
- national research and science forums and programs.

The Bureau's Hazards Services Forum continues to demonstrate the productive collaboration between the Bureau and our federal, state and territory emergency management partners. Co-chaired by the Bureau and the National Emergency Management Agency, the Hazards Services Forum provides the opportunity for senior emergency services representatives to provide forthright feedback on the current and future direction of the Bureau's hazards services.

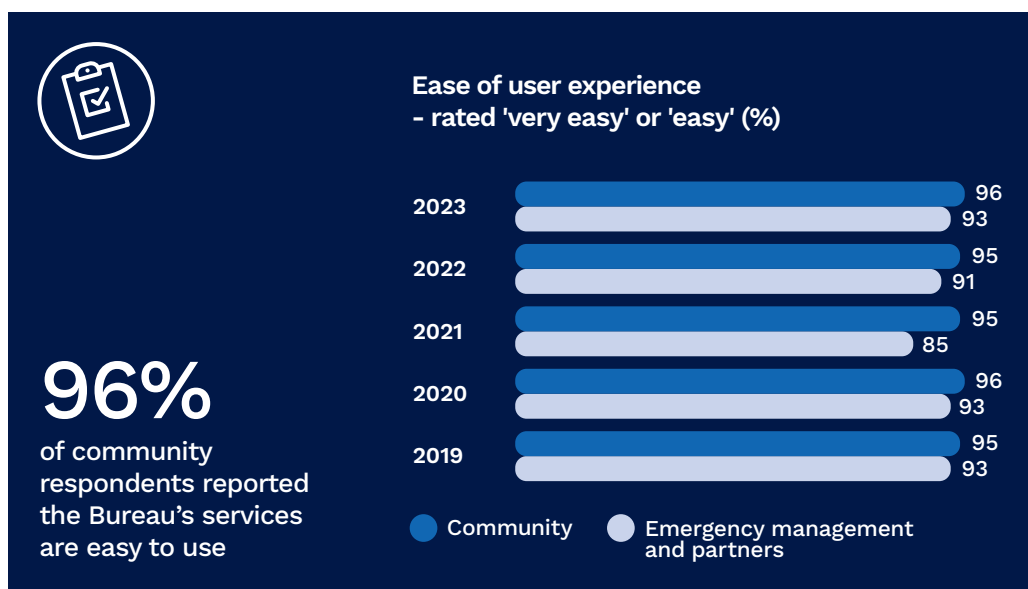
The forum did not physically meet within the 2022–23 period, however, out-of-session work drove several key projects that are critical in helping our partners provide essential preparedness, response and recovery services to the Australian public. These included the Australian Smoke Dispersion System, Australian Fire Danger Rating System and National Heatwave Warning Services. A highlight of the forum this year was the constructive feedback received from member agencies on tropical cyclone, storm tide and flood products. In 2022–23, the Bureau extensively consulted with Hazards Services Forum member agencies as well as other key stakeholders as part of the review of the *Intergovernmental Agreement on the provision of Bureau of Meteorology Hazard Services to the States and Territories* (see p.56).

Customer feedback and response

The Bureau uses a range of surveys and feedback mechanisms to ensure its products and services meet the growing needs of its customers. In 2022–23, the Bureau monitored and evaluated feedback from general community and emergency management customers and partners, focusing on the 4 performance areas of preference, experience, impact and reputation.

Four community surveys were undertaken in September, December, March and June, helping to identify areas for improvement and inform service development. Overall performance was largely consistent with the previous year's results. The surveys of more than 1,500 community users found that Bureau products and services are continuing to provide a positive experience, with the experience score of 81% in 2023 (compared with 79% in 2022). 96% of community users rated their most recent experience with the Bureau as 'easy' or 'very easy', compared with 95% in 2022.

Community users also reported high levels of satisfaction across all aspects of the Bureau's services, including with the convenience of getting information (79%), the clarity of information (78%) and speed of accessing information (78%).



A survey of more than 200 emergency management customers and partners was undertaken in May. When compared with 2022, performance in 2023 was largely consistent in the areas of experience and impact, with an increased rating reported for preference and a decreased rating for reputation. The 2023 survey found that 87% of emergency management customers and partners who used the Bureau's services in the past month said that service helped them do what they needed to do to a 'great' or 'very great' extent, compared with 86% the previous year. 93% of emergency management customers and partners rated their most recent experience as 'easy' or 'very easy', compared with 91% in 2022.

Emergency management customers and partners also reported high satisfaction with the services provided by Bureau staff, with 90% satisfied with their professionalism. These results continue to highlight the significance that Bureau products and services have in helping to facilitate the important roles of these customers.

The Bureau uses the net promoter score index (ranging from -100 to +100) as a way of gauging the willingness of its customers to recommend products or services to others. In 2023, the Bureau's forecast and warning service achieved an average net promoter score of +47 from community customers and +58 from emergency management customers and partners. These results are around the top quarter of the range of possible scores, indicating strong customer satisfaction and loyalty. For community customers, their belief that the Bureau acts in the best interest of all Australians was strongly linked to their likelihood to recommend its services. For emergency management customers and partners, this was linked to their trust in the Bureau's ability to provide accurate forecasts and its effectiveness in its role as Australia's national forecaster. More survey results are included in the Annual Performance Statement (see p.33).

As at 30 June 2023, the BOM Weather app was used by over 1.3 million users on average each day and recorded an average rating of 3.8 in the Google Play Store and 4.5 in the Apple App Store (compared with 4.4 and 4.5 respectively in 2021–22). Over 521,000 items of feedback on the app were provided to the Bureau in 2022–23 across 4 categories, including:

- technical issues
- customer experience
- data accuracy
- feature or enhancement requests.

This feedback enabled the Bureau to prioritise enhancements to the app, including features such as 'dark mode', warnings notifications, a 90-minute rain radar forecast and technical defect fixes (see p.94).

The Bureau continued to enhance its approach to gathering and reporting feedback from its digital channels in 2022–23, including through:

- triggering a customer satisfaction notification in the BOM Weather app for users to easily and seamlessly submit feedback
- refining the reporting of insights on customer feedback using natural language processing.

At 30 June 2023, the Bureau's online research community had 2,477 registered testers and BOMIdeas was used to invite customers to participate in online surveys and testing to provide feedback on potential service enhancements or ideas.

Employing user-centred design to ensure customer-centric services

The Bureau continues to utilise user-centred design (UCD) practices to ensure that new and enhanced products and services deliver maximum value and impact to customers. In 2022–23, UCD practices were successfully deployed in the Water and Agriculture Program to deliver key Australian Government investments.

The Murray-Darling Basin Water Information Portal (MDBWIP) is an output of 2 government investments – the northern Murray-Darling Basin Remote Sensing and Hydrometric Funding Program and a 2019 election commitment to improve understanding of water availability in the Murray-Darling Basin. The first version of the MDBWIP was released in 2021 and was designed to meet needs identified through the Murray-Darling Basin Authority (MDBA) and Bureau research. Four subsequent versions have been released, each of which responds to customer feedback and testing of features in a face-to-face format with a diverse group of users. This process has facilitated ongoing engagement with community representatives who can see their needs met through product enhancements.

Similarly, the Climate Services for Agriculture (CSA) program has seen enduring relationships formed with customers and the development of high-quality tools that directly meet customer needs. CSA is funded by the Future Drought Fund and has been delivered in partnership with the CSIRO. It provides climate and resilience information through an interactive, digital platform tailored to the needs of farmers, the broader agriculture sector and regional communities. Features have continuously been added and changed in response to user testing.

International engagement

International cooperation is an essential and integral part of the Bureau's operations. Through reciprocal relationships and knowledge-sharing with countries and agencies around the globe, the Bureau leverages scientific expertise and technological and operational developments and collects and exchanges information critical for monitoring and predicting the state of the atmosphere and hydrosphere.

The Bureau is deeply engaged in international activities that provide direct and indirect benefits to the organisation and to the broader Australian and international community. Through these activities, the Bureau continues to build its profile and reputation, foster goodwill with key partners and strengthen its skills, capabilities and knowledge base.

In 2022–23, the Bureau made important contributions on behalf of Australia to the activities of the World Meteorological Organization (WMO) including the development and adoption of a new Unified Data Policy that will strengthen the exchange of observations data and in turn enhance the quality of global weather, water and climate modelling. It also met its obligations under the Meteorology Act, international treaties and agreements including the provision of aeronautical meteorological services on behalf of Australia as the designated authority under the International Civil Aviation Organization. As Australia's representative to the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Intergovernmental Oceanographic Commission (IOC), the Bureau continued to engage with and represent the interests of Australian marine science stakeholders in IOC activities including the UN Decade of Ocean Science for Sustainable Development (2021–2030).

The Bureau has several bilateral and multi-lateral agreements with overseas agencies and actively cooperated throughout 2022–23 with counterpart meteorological and hydrological agencies in the United States, United Kingdom, Japan, South Korea and New Zealand. These collaborations focus on mutual and complementary fields of technical and scientific expertise and included the

Bureau’s ongoing partnership with Japan Meteorological Agency to strengthen the capability of meteorological satellites to respond to severe weather events and bushfires (see p.96).

Australian aid-funded capacity development programs represent a significant component of the Bureau’s international activities and the Bureau has a long history of supporting counterpart meteorological and hydrological services in the Pacific. These engagements strengthen organisational capabilities and skills and contribute to broader whole-of-government objectives. In 2022–23, the Bureau has worked closely with its Pacific partners to devise the Weather Ready Pacific roadmap for strengthening the region’s weather and climate resilience (see p.82).

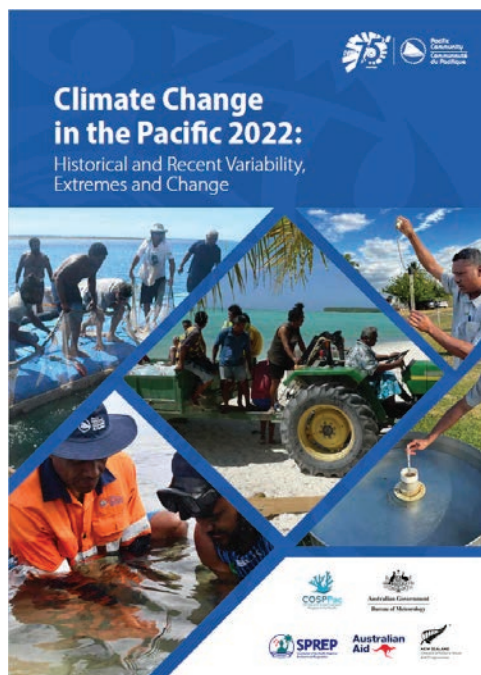
An important part of this work is the Bureau’s involvement in the Australia and New Zealand-Aid-funded Climate and Ocean Support Program in the Pacific Phase 2 (COSPPac2) – a foundational climate information services sub-program of the Australia Pacific Climate Partnership. Other aid-funded activities have included capacity building work with Papua New Guinea, Tonga and Samoa.

Understanding the extent of climate change in the Pacific

The Climate and Oceans Support Program in the Pacific (COSPPac) forms an important part of the Bureau’s work to grow national and international partnerships aligned with Australia’s national interest. It aims to enhance the capacity of Pacific Islands to manage and mitigate the impacts of climate variability and tidal events.

The Bureau’s Pacific Climate Services team took part in an online launch of the *COSPPac Climate Change in the Pacific 2022 Historical and Recent Variability, Extremes and Change Report* with Pacific partners in January. Over 200 people registered to attend from 21 different countries.

Pacific communities experience extreme events such as droughts, tropical cyclones, coastal and river flooding, and coral bleaching – which can have devastating impacts.



COSPPac Climate Change in the Pacific 2022 report

The report was produced in response to a request from leaders at the 15th Pacific Islands Forum in Funafuti in 2019 for increased support and assistance for Pacific-led, science-based initiatives intended to improve their understanding of risk and vulnerability.

The report provides country-specific historical climate change science information for 15 Pacific Island countries or territories. It focuses on average and extreme rainfall, air temperature, tropical cyclones, sea (ocean) surface temperature, sea level and ocean waves – aspects of Pacific climate most important to Pacific communities.

The Bureau and co-authors noted a significant decline in the availability of high-quality Pacific Island data and metadata. While this doesn’t compromise the quality of the 2022 report, it does mean the analysis is limited geographically and historically. Unless urgent action is taken, data availability will continue to decline limiting the region’s ability to understand Pacific-specific climate change.

Diversity and inclusion

The Bureau strives to be the model of an inclusive culture where diversity of thought and background is valued to provide better outcomes for staff, customers and the community. Success is based on creating an inclusive environment where people feel respected and valued, share a sense of fairness and of belonging, and are encouraged to make a unique and meaningful contribution.

The Bureau values the diversity of its staff, respecting differences that include – but are not limited to – gender, ethnicity, religion, age, ability or disability, sexual orientation, language, skills, experience, education, industry sector and thinking approaches.

The Bureau brings its commitment to life by:

- developing and promoting an equitable, respectful and inclusive workplace culture where staff are engaged, are valued for their uniqueness and feel like they belong
- bringing together people with different backgrounds and ways of thinking, which helps to drive better decision-making, innovation and overall performance
- ensuring recruitment from the broadest talent pool that reflects the Bureau’s customers and communities with which it works
- supporting the use of flexible work arrangements at all levels to enable staff to balance their personal and professional commitments.

During Harmony Week, the Bureau celebrated multiculturalism, inclusiveness, respect and belonging for all Australians, regardless of cultural or linguistic background. In offices across the country, staff gathered to hear stories from colleagues who have migrated from countries around the world to make Australia their home. Exploring the Harmony Week theme of ‘everyone belongs’, staff shared their own cultural and religious traditions and spoke of their experiences of being welcomed to Australia and the Bureau.

Several staff events were held throughout 2022–23 to foster diversity and inclusion within the Bureau (see p.119).



Wesam Al-Sudani, Technology Operations Manager (left) and Jayaram Pudashine, Precipitation Nowcast Scientist (right) with Piero Chessa, Group Executive of Community Services Group (centre) at a Harmony Week event in Melbourne.

Disability reporting

Australia's Disability Strategy 2022–2031 is the overarching framework for inclusive policies, programs and infrastructure that will support people with disability to participate in all areas of Australian life. The Disability Strategy sets out where practical changes will be made to improve the lives of people with disability in Australia. It acts to ensure the principles underpinning the United Nations Convention on the Rights of Persons with Disabilities are incorporated into Australia's policies and programs that affect people with disability, their families and carers. All levels of government have committed to deliver more comprehensive and visible reporting under this Strategy. A range of reports on progress of the Disability Strategy's actions and outcome areas will be published and available at: www.disabilitygateway.gov.au/ads.

Disability reporting is included the Australian Public Service Commission's State of the Service reports and the APS Statistical Bulletin. These reports are available at: www.apsc.gov.au.

Ethical standards

The Bureau supports a safe, inclusive and respectful work culture that reflects the diversity of the community it serves. It operates within the context of Australia being a signatory to the 7 key human rights treaties, with human rights being protected and promoted through domestic legislation, policies, practices and independent bodies. The Bureau undertakes a range of activities to meet this commitment, including:

- promoting APS Values, Code of Conduct and Employment Principles, and awareness of workplace discrimination, through communication with staff, training and induction packages for new employees
- endorsing the Public Interest Disclosure Framework, through communication with staff and supporting policy documents
- supporting the Commonwealth Child Safe Framework which sets the minimum standards for creating and maintaining a child safe culture and practice in Australian Government entities
- providing an online training course entitled APS Values and Code of Conduct at the Bureau, which covers topics such as accountable and ethical decision-making
- providing employees with access to information on ethical standards via the intranet, and through the APS Commission's website
- issuing APS Code of Conduct guidelines for Bureau staff, and providing guidance and policies with respect to duty of care, making public comment, conflicts of interests and the performance of outside work/employment
- developing a new Unacceptable Behaviours and Complaint Handling Procedure to complement the existing procedures that document the ethical standards expected of staff
- reviewing and refreshing the established internal Harassment Contact Officer network, ensuring that these Officers are appropriately trained with access to relevant support material
- initiating disciplinary processes, including counselling and investigations when allegations relating to breaches of the APS Code of Conduct were reported
- making available a review-of-action process, as provided for in section 33 of the *Public Service Act 1999*, to aggrieved employees
- initiating investigation processes into disclosures received under the *Public Interest Disclosure Act 2013*
- initiating a review and uplift of Bureau integrity arrangements, in support of the Government's integrity agenda and the establishment of the National Anti-Corruption Commission (NACC).

Supporting sustainable development

The Bureau recognises the opportunity and privilege it has to support sustainable development in Australia and beyond, contributing to prosperous, fair, healthy and sustainable communities. Both in the way it conducts its operations, and in the vast array of products and services it provides for the community, the Bureau's work supports Australia's commitment to the United Nation's 2030 Agenda for Sustainable Development, and the achievement of the Sustainable Development Goals (SDGs). Throughout 2022–23, the work of the Bureau has contributed to 15 of the 17 goals as follows.

Goal	Bureau contribution
 <p>2 ZERO HUNGER</p>	<ul style="list-style-type: none"> • help graziers and horticulturalists determine optimum crops, timing around planting and harvesting, fertilisation and chemical spraying • help meat and livestock farmers control stocking rates, and pre-empt health issues in livestock • alert farmers to conditions such as frost, hail, storms and floods • optimise agricultural water use productivity through regional-specific information on current and forecast water availability • support government drought assistance programs
 <p>3 GOOD HEALTH AND WELL-BEING</p>	<ul style="list-style-type: none"> • help Australians protect themselves from cyclones, floods, severe storms and bushfires • support authorities in making evacuation decisions to get people at risk to safety • help Australians avoid dangerous ultraviolet (UV) exposure, to protect against skin cancer • help protect vulnerable Australians against heat exhaustion and extreme cold • alert health authorities to periods of heightened demand • help Australians plan their sporting and outdoor activities • support management of biohazards, airborne allergens and diseases
 <p>4 QUALITY EDUCATION</p>	<ul style="list-style-type: none"> • provide quality education in meteorology including capacity building in neighbouring countries • help the community understand Australia's weather, ocean and climate-related risks • contribute to the global knowledge base in the meteorological sciences and contribute to cutting-edge developments • promote ongoing learning and development for Bureau staff
 <p>5 GENDER EQUALITY</p>	<ul style="list-style-type: none"> • promote gender equality through implementation of the Bureau's Gender Equality Action Plan • provide family-friendly working conditions including flexible working options for all staff • provide training and development to managers on inclusive leadership and unconscious bias

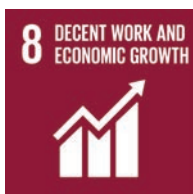
Goal	Bureau contribution
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- coordinate national water information standards, and collection and dissemination of Australia’s water information, including water quality information
- help governments and water authorities in planning and water management
- aid decision-making in water supply and the management of water allocations and rights
- support dam management and the protection of water and sanitation infrastructure, particularly during severe weather events
- inform the design of new water infrastructure



- enable the Australian energy market to forecast power demand, particularly during heat and cold extremes
- support renewable energy generation by informing production potential and energy output estimates
- support operations and efficiency in Australia’s offshore oil and gas industry
- support improved planning and mitigation of disrupted electricity supply due to severe weather events
- invest in energy efficiency and renewable energy projects within the Bureau’s property portfolio





- provide economic benefits in the order of 11.6:1 (for every dollar spent by the Bureau on delivering services, there is a return of \$11.60 to the Australian economy)
- support economic growth in key sectors (see Goal 9)
- provide good employment opportunities for Bureau staff



- support safe and efficient air travel in Australian airspace, inform routing and fuel load decisions and help protect aircraft from volcanic ash
- help businesses manage the impact of weather on their operations and minimise disruption from severe weather events
- provide valuable information to the financial and insurance services sector
- support the construction of climate-appropriate infrastructure and help protect infrastructure from weather and climate-related events
- provide information products as a basis for innovation and value-adding by industry

Goal	Bureau contribution
 <p>10 REDUCED INEQUALITIES</p>	<ul style="list-style-type: none"> • provide consistent, comprehensive services for all Australians, including in rural and remote areas • promote Australian Indigenous culture through the Indigenous Weather Knowledge website and support reconciliation through the Reconciliation Action Plan • implement initiatives that promote Diversity and Inclusion • support capacity building and development of Pacific Island nations to manage severe weather impacts and mitigate climate change • assist Pacific and Indian Ocean countries prepare for and respond to tsunamis
 <p>11 SUSTAINABLE CITIES AND COMMUNITIES</p>	<ul style="list-style-type: none"> • support the emergency services in carrying out effective emergency and disaster preparation, response and recovery • warn communities to prepare for hazardous weather events, to protect housing and community infrastructure, and to make timely evacuations • allow emergency services to pre-position personnel and equipment to minimise infrastructure damage and to restore essential services following an emergency • help individuals and communities to organise their activities and daily commute • support management of public and private green spaces
 <p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p>	<ul style="list-style-type: none"> • implement a Bureau environmental framework to minimise the effect of operations on the environment • support responsible purchasing policies, efficient use of natural resources, and the management of chemicals and wastes through their lifecycle
 <p>13 CLIMATE ACTION</p>	<ul style="list-style-type: none"> • help Australians understand the nation's climate patterns, trends and variations in climate, and climate-related risks • provide climate research, modelling and forecasting to support policy decisions and mitigation strategies • help Pacific Island nations measure and respond to climate change impacts
 <p>14 LIFE BELOW WATER</p>	<ul style="list-style-type: none"> • support marine management including sustainable fishing and aquaculture • support safety at sea, and inform search and rescue operations • support response to ocean environmental incidents (such as oil spills) • implement changes to the Bureau's balloon program to reduce the likelihood of ingestion by marine birds and turtles

Goal	Bureau contribution
	<ul style="list-style-type: none"> • support the management of ecosystems • support bushfire mitigation including controlled burns • institute ecological protection measures for Bureau operations at environmentally sensitive sites
	<ul style="list-style-type: none"> • contribute to the activities of the World Meteorological Organization, the Intergovernmental Oceanographic Commission of UNESCO, and the International Civil Aviation Organization • collaborate with 10 overseas agencies through bilateral agreements • partner with local, regional, state and territory and national emergency management authorities

Environmental sustainability

The Bureau is committed to leadership in environmentally sustainable practices and managing potentially adverse impact from operations, with the pursuit of a high level of environmental sustainability a success measure of its Strategy 2022–2027. The Bureau’s environmental management system aligns with international standard ISO 14001:2015 and provides the framework for managing environmental risks and optimising opportunities to improve environmental performance.

The Bureau also supports the principles of ecological sustainable development as outlined in the *Environmental Protection and Biodiversity Conservation Act 1999*. The broad range of Bureau products, services and advice empower stakeholders to make informed decisions on matters of ecosystem and biodiversity conservation, both now and for the future.

Management of key impacts

The Bureau’s operations are diverse, encompassing land, water, atmosphere and oceans across Australia and its external territories. In 2022–23, Bureau activities addressed a diverse range of impacts associated with its property and operational footprint, including:

- consideration of environmental impacts for site works including equipment upgrades and the relocation of observational infrastructure
- participation in audits undertaken by Parks Australia on the Bureau’s activities in marine parks nationally
- hosting an all-staff event for World Environment Day with guest speaker Kate Lynch, Head of the Circular Economy Division for the Department of Climate Change, Energy, the Environment and Water who discussed the growing plastic problem and how Australian Environment Ministers are working with the private sector to design out waste and pollution, keep materials in use and foster markets to achieve a circular economy that protects the environment and human health
- in-house training sessions to ensure affected business groups understood the implications of new Victorian environmental legislation, with particular emphasis on waste disposal and the prevention and reporting of pollution events

- working with suppliers to develop and test more environmentally friendly weather balloon consumables
- collaboration with internal groups to uplift awareness and adherence to environmental sustainability obligations and due diligence processes
- progressing the ongoing audit program for a range of environmental aspects, including facets of the Bureau's environmental management system
- collaborating with international meteorological agencies to share environmental sustainability initiatives which the Bureau has successfully implemented in its upper air network.
- installing double glazing on all windows at the Kennaook / Cape Grim facility.

Improving sustainability

In 2022–23, the Bureau established 6 environmental sustainability principles to improve sustainability performance across carbon emissions, energy and resource use, estate management, operational impacts and heritage. Organisational demand on natural resource comes in many forms at the Bureau, from general office activities to waste generation, equipment and instrument use through to the transport of goods. The Bureau aims to incorporate sustainability into procurement practices to avoid unnecessary consumption and minimise the environmental impact of goods and services over whole of life.

Energy efficiency and carbon emission reduction was a key focus for the Bureau in 2022–23, with highlights being:

- the installation of hybrid solar power systems for 3 radars in New South Wales
- development of an off-grid power solution using solar and wind power for remote aviation automatic weather systems.

Australian Public Service Net Zero 2030

As part of the reporting requirements under section 516A of the *Environment Protection and Biodiversity Conservation Act 1999*, and in line with the Government's APS Net Zero 2030 policy, the Bureau is required to publicly report on the emissions from its operations.

The Bureau's greenhouse gas emissions reporting has been developed using a methodology that is consistent with the whole-of-Australian Government approach in accordance with the APS Net Zero 2030 policy.

The data in the table below was supplied by the APS Net Zero Unit as part of the new standardised carbon emissions reporting in the APS.

Greenhouse gas emissions inventory				
Emission source	Scope 1 kg CO ₂ -e	Scope 2 kg CO ₂ -e	Scope 3 kg CO ₂ -e	Total kg CO ₂ -e
Electricity	N/A	13,521,564	1,268,039	14,789,603
Natural Gas	243	N/A	19	262
Fleet vehicles	278,607	N/A	68,700	347,307
Domestic flights	N/A	N/A	1,358,610	1,358,610
Other energy	195,100	N/A	48,080	243,180
Total kg CO₂-e*	473,950	13,521,564	2,743,448	16,738,962

* CO₂-e = Carbon Dioxide Equivalent

Environmental performance indicator	2021–22	2022–23	Change
Energy use			
Total purchased electricity (kWh)	18,385,000	18,408,483	0.12%
Purchased electricity consumption offices (kWh)	2,649,000	2,449,000	-7.5%
Purchased electricity consumption data centres (kWh)	11,336,050	11,225,483	-0.9%
Purchased electricity consumption other sites (kWh)	4,399,950	4,734,000	7.5%
Vehicle fleet*			
Total number of fleet vehicles	81	78	-3.7%
Total distance travelled (km)	910,370	968,344	6.3%
Total fuel purchased (kL)	96.8	103.1	6.5%
Air travel			
Total number of flights	3,905	9,635	146%
Total distance travelled (km)	4,578 850	14,330,072	212%
Resource efficiency			
Planet-friendly stationery purchased	15%	10%	-5%

* the vehicle fleet data is for the Fringe Benefits Tax year period, 1 April 2022 to 31 March 2023

Note: This table is compiled using data sets from whole-of-government providers. Some values are estimated due to incomplete billing cycles at time of publication.

Untangling a tricky problem, one balloon at a time

Weather balloons are a critical component of the Bureau's observations program, providing a platform for capturing a detailed view of the atmosphere. The balloon train consists of the balloon and a radiosonde which measures temperature, humidity and pressure and derives wind direction and wind speed through GPS location. The radiosonde is attached to the balloon by a length of string. The string is important as it ensures the balloon's movement does not distort measurement, but with 55 metres of string per balloon, over 800km of string is released each year.

The Bureau has been working to find a biodegradable solution, strong enough to withstand the forces of launch and travelling through a thunderstorm, but not too strong so as to form a potential aviation hazard. To work effectively, the string needed to be roughly the same thickness as the original product.

These challenges were met with Biotwine meeting all requirements. Biotwine is made from the natural raw material cellulose, which is 100% biodegradable and does not contain microplastics. This biodegradable string has now been adopted across the Bureau's upper air balloon network.

The Bureau continues to drive positive environmental change through its procurement decisions and commitment to testing new prototypes. Over the last 10 years of weather balloons, the Bureau has reduced polystyrene waste with the introduction of cardboard targets and packaging, reduced the likelihood of marine animal ingestion by changing balloon colour from white to blue, and now adopted biodegradable string.



Cocos Islands automatic meteorological balloon launching system (left) and Biotwine (right).

Heritage

The Bureau has a demonstrated commitment to record and preserve significant parts of its own more than 100-year history in delivering meteorological services to Australia. The heritage values associated with sites owned or controlled by the Bureau is quite broad. Some sites have long-term associations with weather and meteorology, some sites are places of first use of significant technology such as radar, while others were key to major meteorological events. The Bureau continues to manage its heritage obligations in accordance with the *Environmental Protection and Biodiversity Conservation Regulations 2000*.

Cultural heritage is a key priority for the Bureau with particular focus on Aboriginal and Torres Strait Islander consultation and sensitive site protection. In 2022–23, activity focused on protecting Indigenous cultural heritage at sites associated with the Tennant Creek Radar project and the Toowoomba (Darling Downs) Radar project, the latter involving an Aboriginal Cultural Heritage Due Diligence Assessment.

