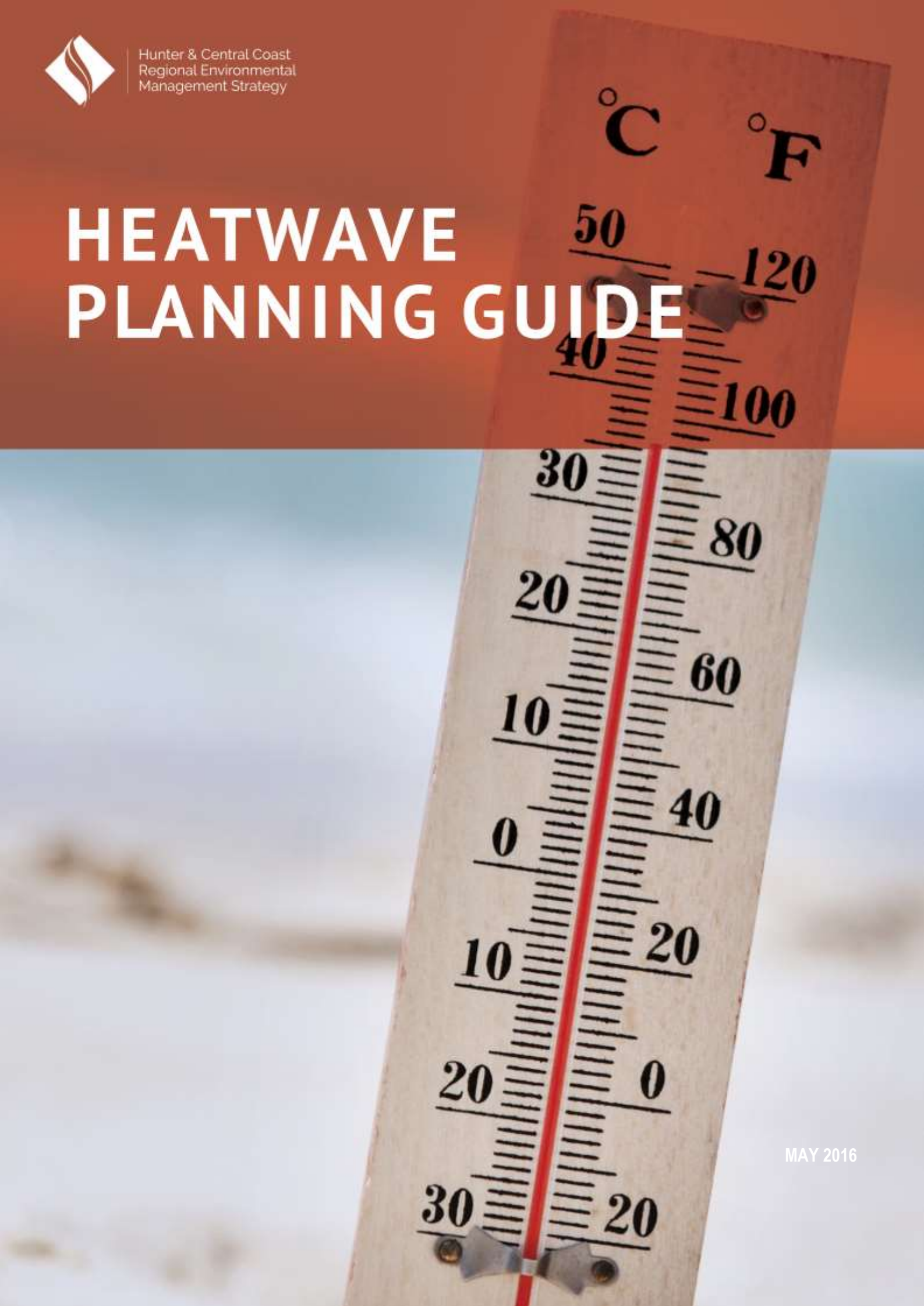
Hunter & Central Coast
Regional Environmental
Management Strategy

HEATWAVE PLANNING GUIDE



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Executive Summary

Heatwaves are a silent killer. Major heatwaves have caused more deaths since 1890 in Australia than bushfires, cyclones, earthquakes, floods and severe storms combined. 2015 was the hottest year on record and the 39th consecutive year above the 20th century average. Severe heatwaves, worsened by climate change, caused thousands of deaths worldwide throughout the year, particularly across large areas of western Asia and the Middle East. In response, the United Nations released heatwave guidelines for the first time, aimed at helping decision makers and health services develop early warning systems in an effort to reduce health impacts and deaths from heatwaves (Hughes, Hanna and Fenwick, 2016).

Climate change is driving longer hotter and more intense heatwaves in Australia. Since 1960, the number of record hot days in Australia has doubled and heatwaves have become longer, hotter and more intense (Hughes, Hanna and Fenwick, 2016). In its 2011 report `*The Critical Decade – Climate Change & Health*', the Australian Climate Commission predicts that Australians will face extreme hot weather far more often, and that if climate change continues on its current path, the number of days over 35°C each year will likely rise substantially in all major cities by the end of the century. In the absence of more active planning (short and long term) it is expected that the number of heat-related deaths in Australia will continue to rise, particularly within more vulnerable sections of the community (Hughes & McMichael, 2011).

Extreme heat events, particularly prolonged heatwaves, can have severe effects on human health. These include both direct heat illnesses (e.g. heat exhaustion), and indirect illnesses (e.g. cardiovascular failure). As extreme heat events worsen due to climate change, the risk of adverse human health impacts will also increase (Hughes, Hanna and Fenwick, 2016).

There is clear evidence that the impacts of heat waves are not experienced evenly across the community. Research clearly shows that certain sections of the community are more susceptible to the health impacts caused by heatwaves, namely the elderly, people with a disability, families with young children, low-income households, Culturally and Linguistically Diverse (CALD) communities, outdoor workers, Indigenous communities, obese and overweight people and those living in rural and isolated communities.

In addition to the direct health impacts of heatwaves on individuals, there is a much broader range of direct and secondary social, financial and economic costs arising from heatwaves. These include:

- Increased demand on General Practitioners, community health and emergency health services
- Increased stress on physical infrastructure (e.g. railway lines, roads and electrical wires)
- Increased power consumption and risk of power failure
- Reduced economic / workplace productivity arising from greater absenteeism, heat related illness, and altered work practices to reduce risk to staff health and safety
- Direct interruptions to business continuity arising from health impacts or loss of key services and inputs such as electricity, water or other materials.
- Increased demand on staff, facilities and resources (e.g. public swimming pools, lifeguard services, community health services, and air conditioned community facilities).

This Guide has therefore been developed to provide support and guidance to encourage more active and collaborative planning within the Hunter, Central Coast and Mid Coast region of New South Wales to reduce the direct and indirect impacts of heatwaves. It addresses not only short term preparation and response to individual heatwave events, but provides recommended approaches for building the long term resilience of communities to this natural hazard that is increasing in both frequency and intensity.

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LIST OF ACRONYMS

ABS	Australian Bureau of Statistics
BoM	Bureau of Meteorology
CCLHD	Central Coast Local Health District
CMG	Consequence Management Guideline
CSO	Community Service Organisation
DEOCON	District Emergency Operations Controller
HCCREMS	Hunter and Central Coast Regional Environmental Management Strategy
HNELHD	Hunter New England Local Health District
IPCC	Intergovernmental Panel on Climate Change
IPWEA	Institute of Public Works Engineering Australia
LEMC	Local Emergency Management Committee
EMPlan	Emergency Management Plan
LGA	Local Government Area
LHD	Local Health District
OEH	NSW Office of Environment & Heritage
PPRR	Prevention, Preparedness, Response & Recovery
REMC	Regional Emergency Management Committee
RFS	NSW Rural Fire Service
SEOCON	State Emergency Operations Controller
SES	NSW State Emergency Service

1. INTRODUCTION

1.1. Purpose

Heatwaves are a silent killer. Major heatwaves have caused more deaths in Australia since 1890 than bushfires, cyclones, earthquakes, floods and severe storms combined. 2015 was the hottest year on record and the 39th consecutive year above the 20th century average. Severe heatwaves, worsened by climate change, caused thousands of deaths worldwide throughout the year, particularly across large areas of western Asia and the Middle East. In response, the United Nations released heatwave guidelines for the first time aimed at helping decision makers and health services develop early warning systems in an effort to reduce health impacts and deaths from heatwaves (Hughes, Hanna and Fenwick, 2016).

Climate change is driving longer hotter and more intense heatwaves in Australia. Since 1960, the number of record hot days in Australia has doubled and heatwaves have become longer, hotter and more intense (Hughes, Hanna and Fenwick, 2016). In its 2011 report `*The Critical Decade – Climate Change & Health'*, the Australian Climate Commission predicts that Australians will face extreme hot weather far more often, and that if climate change continues on its current path, the number of days over 35°C each year will likely rise substantially in all major cities by the end of the century. In the absence of more active planning (short and long term) it is expected that the number of heat-related deaths in Australia will continue to rise, particularly within more vulnerable sections of the community (Hughes & McMichael, 2011).

This Heatwave Planning Guide seeks to provide support and guidance to facilitate more active and collaborative planning at a local council level to reduce the impacts of heatwaves. In particular, it addresses not only short term preparation and response to individual heatwave events, but identifies opportunities and ideas for building the long term resilience of communities to this natural hazard that is increasing in both frequency and intensity. Key elements included n the planning guide are:

1. Definition of a heatwave
2. Heatwave planning objectives
3. The legislative and planning context supporting local heatwave planning
4. An overview of heatwave trends and their impacts
5. An overview of opportunities and strategies for building organisational and community heatwave resilience

1.2. Focus Area

This Guide has been developed for the Hunter, Central Coast and Mid North Coast region of New South Wales. This region comprises the local government areas of:

- Central Coast Council (formerly Gosford and Wyong Councils)
- Lake Macquarie City Council
- City of Newcastle
- Port Stephens Council
- Mid Coast Council (formerly Greater Taree, Great Lakes and Gloucester Councils)
- Maitland City Council
- Cessnock City Council
- Singleton Council
- Muswellbrook Shire Council
- Upper Hunter Shire Council
- Dungog Shire Council

However, the information included in the Guide is considered relevant to other Local Government Areas and regions with an interest in proactively planning and implementing strategies to improve the resilience of their organisations, customers and local communities to heatwaves.

1.3. Heatwave Planning Objectives

Priority objectives recommended by this Guideline for governing the focus and implementation of local heatwave planning and action include:

Primary Objective

To create a community that is safe from, prepared for, and resilient to the current and projected impacts of heatwaves.

Secondary Objectives

1. *To protect human health from the immediate impacts of heatwaves (consistent with the objectives of the NSW Heatwave Sub Plan)*
2. *To create communities that are connected and informed in their preparation, communication and response to heatwaves*
3. *To produce urban design and infrastructure that facilitate long term community resilience to heatwaves*

1.4. Definition of a Heatwave

There is no universally accepted definition of a heatwave. In Australia, each state and territory has its own definition that is used for triggering heatwave alerts. While a national heatwave forecasting system has been adopted by the Bureau of Meteorology (Hughes, Hanna and Fenwick, 2016), an agreed national definition of a heatwave is yet to be established.

For the purpose of heatwave planning in the Hunter, Central Coast and Mid Coast region, the definition included in the NSW Heatwave Sub Plan (refer Section 2.1) is therefore recommended:

> *"a set of meteorological conditions that is described by the Bureau of Meteorology as a Heatwave which may affect the Lake Macquarie, Wyong and Gosford Local Government Areas. Generally, this is a sequence of three days of abnormally hot conditions"*

2. LEGISLATIVE AND PLANNING CONTEXT FOR LOCAL HEATWAVE PLANNING

There is an increasing level of policy and planning work being undertaken by all levels of government around Australia focused on reducing the community health impacts of heatwaves. Key principles underlying this planning include:

1. Encouraging an integrated approach by health services and non-health agencies (e.g. local government & community health organisations) (Williams et al, 2010).
2. Mainstreaming preparedness messages within existing policies and programs (Williams et al, 2010).
3. Establishing local government heatwave plans to provide a framework for best responding to local conditions and circumstances (Williams et al, 2010).
4. Promoting coordination between the health sector and the broader community to develop and support community care options, particularly for the elderly and other vulnerable populations (*Blashki, Armstrong, Berry, Weaver, Harley, Spickett & Hann, 2010)*.
5. Encouraging the health sector to collaborate with urban planners and housing regulators to ensure that housing and urban design provide a health-protective element during heatwaves (Blashki et al, 2010).

In line with these principles momentum is also building toward the development of local heatwave plans (i.e. at a sub-regional or LGA scale). This reflects:

- Local and regional variation in the frequency and intensity of heatwaves.
- Varying thresholds across regions at which communities start to experience the impacts of heatwaves.
- Local variation in the nature of communities and their relative vulnerability to heatwaves
- The relatively greater effectiveness of local networks and mechanisms for communicating with vulnerable community sectors.
- The capacity for local government, as a local planning authority and provider of infrastructure, to influence the resilience of the "built" environment.

2.1. The Role of Councils

While in New South Wales there is no individual statute that prescribes the requirement for Local Heatwave Plans, under *the Local Government Act 1993* Councils do have a responsibility to provide community health, recreation, education and information services, environmental protection and a range of administrative functions. All of these responsibilities are potentially relevant to preparing for and managing the impacts of heatwaves (Wilson, L. 2013).

Councils, working in partnership with state government agencies and community service organisations, are well placed to minimise the health impact of heatwaves on local communities, especially vulnerable populations, council staff and others affected by council operations. Local level planning of this nature is considered critical for maintaining community health and the adequate functioning of the LGA. As such councils are considered to have a duty of care to not only their constituents but to their staff and collaborating agencies to ensure living and working within the LGA is safe (Wilson, L. 2013).

Planning to reduce the impacts of heatwaves and extreme heat events on customers, local communities, staff and business services is also entirely consistent with similar efforts to reduce threats posed by other natural disasters such as fire, floods and storms.

Key Council plans and policies of councils across the region clearly establish their commitment to safe, healthy and connected communities, which in many cases includes community preparedness to natural disasters, (including heatwaves). Key examples are identified in Table 1. Attachment 1 also provides the broader policy and planning context supporting more active heatwave planning in NSW and Australia more broadly.

Table 1. Existing Council Plans and initiatives that support local heatwave planning

PLAN, POLICY OR INITIATIVE	DESCRIPTION
Wyong Community Strategic Plan 2030 (revised 2013)	*Goal* Communities will be vibrant, caring and connected *Strategies* • Ensuring communities are safe • Supporting people in the community to lead healthy, active lifestyles • Maintaining and making available information about the environment and environmental change • Community awareness of sustainability and environmental issues impacting Wyong Shire
Gosford Community Plan 2025 (updated 2013)	*Goal* Our health and wellbeing provide for a satisfying and productive life (& include consideration of a changing climate) *Strategy* Manage the impacts to humans and the environment from pollution (including climate change impacts) *Direction* • Increase awareness of the impact of climate change • Increase resident's ability to get help from friends, family and neighbours in time of need
Lake Macquarie Community Strategic Plan 2013-23	*Priority*: A community that is resilient and prepared for threats from the environment *Strategies*: • Increase preparedness for natural disasters • Increase capacity to adapt to climate change
Lake Macquarie Environmental Security Assessment (Cardno, 2010)	Identifies following management goals for reducing the number of deaths associated with heatstroke within the city: • 10% reduction in annual cost by 2019 • 12% reduction in annual cost by 2023 • 15% reduction in annual cost by 2029 • 30% reduction in annual cost by 2049
Newcastle 2030 Community Strategic Plan	*Strategies* • Develop and communicate a clear understanding of environmental and climate risks • Ensure that all actions, decisions and policy responses to climate change remain current and reflects capacity, community expectations and change in environmental and climate change information • Provide support to community organisations to improve their ability to plan and deliver appropriate and accessible services to the community • Encourage the implementation of sustainability principles in the development of

PLAN, POLICY OR INITIATIVE	DESCRIPTION
	new homes and improvement of community assets to provide increased energy and water efficiency
Port Stephens Council Integrated Strategic Plans 2010	*Strategic Direction* Port Stephens is a vibrant community where services and infrastructure are integrated and support a culture in which people are cared for, healthier, more active, informed and better connected.
Great Lakes 2030 – Strategy for a Sustainable Future	*Objectives* Protecting the natural environment while addressing the challenges of population growth *Strategy* Planning for and minimising the potential impact of climate change
The Manning Valley Community Plan 2010 – 2030	*Strategies* • Effective management of environmental risks and hazards • A community that is informed and prepared for climate change and any necessary adaptation. *Actions* Assess the potential risks of climate change and plan for community adaptation
Gloucester Community Strategic Plan 2012-2022	*Objectives* • Manage environmental risks • Protect public health, safety and amenity *Strategies* • Respond to the impacts of climate change • Support the provision of emergency services to ensure public safety and address community needs
Dungog Shire 2030 Community Strategic Plan	*Goal* The potential impacts of climate change on our natural environment need to be monitored and addressed. *Strategy* Ensure that appropriate agencies at all levels are involved in addressing issues surrounding climate change
Singleton Council Our Place, A Blueprint 2023	*Outcome:* Our community is safe *Strategy:* Plan for a sustainable and safe community
Draft Singleton Community Environmental Sustainability Strategy and Action Plan (2016)	*Goal* A community that is prepared for and resilient to the impacts of extreme climate events *Strategies* • The community (particularly at risk and vulnerable groups) understand and are well prepared for climate induced natural disasters • Emergency responses to natural disasters are well prepared, co-ordinated and resourced.

PLAN, POLICY OR INITIATIVE	DESCRIPTION
	• All sectors of the community are aware of, consider and adapt to a changing local climate
Muswellbrook Shire Council Community Plan 2011-21	*Long term goals* • Reduce the vulnerabilities of people in the Shire. • Well trained and equipped emergency services *Outcomes* • Suitable communication networks are in place. • Standing orders and procedures for Council staff in dealing with Shire wide emergencies are developed. • The built environment is adaptive to climate change impacts.
Upper Hunter Shire Council Community Strategic Plan – 2010 Plus	*Key Focus Areas* • Support families, the disadvantaged, children, young people and the aged for an equitable and caring community. • Promote wellbeing, through health, education, recreation and culture for a healthy, vibrant and fulfilling life for our community.

It is not practical for Councils to operate alone in respect to planning and responding to heatwave events. The avoidance of duplication, consistency in approach and efficiencies that can be gained from collaboration between councils, state agencies, community service organisations, emergency services and utility companies when preparing for and responding to heatwaves are significant. This planning guideline aims to provide support to Councils and other stakeholder organisations to achieve collaboration of this nature.

2.2. NSW Heatwave Sub Plan

The most specific directive for Councils in New South Wales in respect to heatwave planning is included in the *NSW Heatwave Subplan.* This plan details the control and coordination arrangements for the preparation for, response to, and immediate recovery from a heatwave event in NSW. The plan identifies:

- The preservation of human health as being the primary focus of heatwave response in NSW.
- That heatwaves are estimated to cause more deaths in Australia than any other natural hazard except disease.
- That certain groups are especially vulnerable including; the elderly, infants and young children, people with chronic medical problems or taking certain medications, those who are socially isolated and people who work outdoors.
- The roles and responsibilities for organisations in the event of a Heatwave emergency.

While the plan identifies that councils *are not* required to prepare District or Local Plans for responding to heatwaves, it does prescribe the following preparedness responsibilities for local government (NSW Government 2011):

1. Distribute warnings and other relevant advice to local stakeholders.
2. Develop and implement strategies to minimise heat stress and the effects of Heatwaves on vulnerable populations.
3. Assist as requested by State Emergency Operations Controller (SEOCON) or District Emergency Operations Controller (DEOCON).
4. Provide regular information / situation reports to the DEOCON.

It is important to note however, that new guidelines for developing Local Emergency Management Plans, released in 2015 by the NSW Government, now include heatwaves as a hazard to be assessed. Where the risk from heatwaves is identified as medium or higher, a Consequence Management Guideline, a key component of the revised local emergency planning processes, should be prepared (NSW Government, 2015). Refer to section 4.8 for more detail on integrating heatwaves into Local Emergency Management Plans.

The preparedness responsibilities for all organisations that are identified within the NSW Sub Plan are provided in Table 2. As can be seen from this, there exists a high degree of commonality and overlap in the preparedness responsibilities of a number of organisations. Local heatwave planning provides a mechanism through which more collaborative, streamlined and efficient approaches to preparedness can be facilitated, thereby reducing the potential for duplication of effort and potentially conflicting communication messages.

Table 2. Preparedness responsibilities identified within the NSW Heatwave Sub Plan.

AGENCY / ORGANISATION	PREPAREDNESS RESPONSIBILITIES
Bureau of Meteorology	• Issue heatwave warnings when capability exists. • Provide forecasts and briefings regarding the meteorological conditions.
• Fire and Rescue NSW • Rural Fire Service • Ambulance Service of NSW	• Maintain a heightened readiness, • Assist as requested by State Emergency Operations Controller (SEOCON) or District Emergency Operations Controller (DEOCON). • Provide regular information/situation reports to State Emergency Operations Centre (SEOC).

AGENCY / ORGANISATION	PREPAREDNESS RESPONSIBILITIES
Health Services	• Advise SEOCON whenever NSW Health issues Heat Health Alerts. • Distribute warnings and other relevant advice to participating and supporting organisations and other associated stakeholders. • Coordinate the health response to heatwaves and other extreme temperature events in accordance with HEALTHPLAN and Health Services Heatwave Concepts of Operations. • Assist as requested by SEOCON or DEOCON. • Provide regular information/situation reports to SEOC.
Welfare Services	• Distribute warnings and other relevant advice to participating and supporting organisations. • Assist Health Services to provide health advice to vulnerable groups including to facilities which are regulated or coordinated by Dept of Family and Community Services. • Assist as requested by SEOCON or DEOCON. • Provide regular information/situation reports to SEOC.
Local Government	• Distribute warnings and other relevant advice to local stakeholders. • Develop and implement strategies to minimise heat stress and the affects of heatwaves on vulnerable populations. • Assist as requested by SEOCON or DEOCON. • Provide regular information/situation reports to DEOCON.

3. NATURE AND IMPACTS OF HEATWAVES

"The impacts of heatwaves are often under-the-radar compared to other extreme weather events, but they are widespread and serious, damaging human health, infrastructure and natural ecosystems; and decreasing workplace performance and agricultural productivity" (Steffen W., Hughes L., and Perkins S., 2014). This conclusion drawn by the Climate Commission of Australia in its 2014 report "*Heatwaves: Hotter, Longer More Often",* draws directly on the peer-reviewed scientific literature as well as on authoritative assessments, such as those of the Intergovernmental Panel on Climate Change (IPCC). More specifically the Climate Commission report identifies that:

1. Climate change is already increasing the intensity and frequency of heatwaves in Australia. Heatwaves are becoming hotter, lasting longer and occurring more often.
2. Climate change is making heatwaves worse in terms of their impacts on people, property, communities and the environment. These impacts are widespread, ranging from direct impacts on health to damage to ecosystems, agriculture and infrastructure.
3. The climate system has shifted, and is continuing to shift, increasing the likelihood of more extreme hot weather.
4. Record hot days and heatwaves are expected to increase in the future.

These conclusions are among an increasingly significant amount of scientific research, meteorological data and documented experience that clearly identifies that that the frequency and intensity of heatwaves in Australia has been increasing, and that these events pose a significant human health risk, particularly to more vulnerable or "at risk" sections of the community.

3.1. Heatwave Trends

Since 1960, the number of record hot days in Australia has doubled and heatwaves have become longer, hotter and more intense. The first summer heatwave is occurring earlier in almost all parts of the country (19 days earlier in Sydney and 17 days earlier in Melbourne) and the hottest day in a heatwave – its peak - is becoming even hotter (Hughes, Hanna and Fenwick, 2016).

Climate change has significantly worsened recent extreme heat events. 2013 was Australia's hottest year on record, with 123 records broken in a 90-day period over the 2012/2013 summer. Research shows that climate change likely tripled the odds of heatwaves during the 2012/2013 summer, and doubled the odds of such intensity of heat being experienced (Hughes, Hanna and Fenwick, 2016).

The State of the Climate Report 2014 (Commonwealth of Australia, 2014) identifies that "*the duration, frequency and intensity of heatwaves have increased across many parts of Australia, based on daily temperature records since 1950. Days where extreme heat is widespread across the continent have become more common in the past twenty years. Some recent instances of extreme summer temperatures experienced around the world, including record-breaking summer temperatures in Australia over 2012–2013, are very unlikely to have been caused by natural variability alone"*. The report also identifies that since 2001 "*the number of extreme heat records in Australia has outnumbered extreme cool records by almost 3 to 1 for daytime maximum temperatures, and almost 5 to 1 for night-time minimum temperatures"*.

The trend is also being seen globally. 2015 was the hottest year on record, beating the previous record set in 2014, and making it the fourth time this century that a new record high annual temperature has been set. Throughout 2015, heatwaves contributed to more than 3,500 deaths across India and Pakistan alone. The globally averaged temperature in December 2015 was 1.11°C above the average global December temperature for the 20th century, making it the first month ever to depart from the long-term average by more than 1°C (Hughes, Hanna and Fenwick, 2016).

These patterns support the projections identified by the Australian Climate Commission in its 2011 report '*The Critical Decade – Climate Change & Health'* (Hughes & McMichael ,2011). This predicts that Australians will face extreme hot weather far more often, and that if climate change continues on its current path, the number

of days over 35°C each year will likely rise substantially in all major cities by the end of the century. Future heatwaves will also tend to be hotter and longer lasting. The number of heat-related deaths in Australia is likely to rise accordingly.

Closer to the focus of this Heatwave Planning Guide, research exploring historic and projected climate variability for the coastal zone of the Hunter, Central and Lower North Coast region has also concluded that the frequency of extreme heat days is projected to increase (Blackmore & Goodwin, 2010). A more detailed analysis specifically exploring the nature of extreme heat days across the entire region has also concluded that (Blackmore, Goodwin & Wilson, 2010):

- An overall increase in the frequency of extreme heat events at current community threshold levels are expected during the period 2020 – 2080 across the entire region
- Projected decreases in maximum temperatures during summer and spring are likely to lower community threshold levels to extreme heat events (i.e. lower average maximum temperatures, combined with more intense occurrences of periodic extreme heat days, are likely to make the community more susceptible extreme heat events)
- The frequency of extreme heat events is likely to increase beyond known levels of variability (i.e. become more severe than what has been experienced in the past).

3.2. Heatwave Impacts

Heatwaves are a silent killer. Major heatwaves have caused more deaths in Australia since 1890 than bushfires, cyclones, earthquakes, floods and severe storms combined. 2015 was the hottest year on record and the 39th consecutive year above the 20th century average. Severe heatwaves, worsened by climate change, caused thousands of deaths worldwide throughout the year, particularly across large areas of western Asia and the Middle East. In response, the United Nations released heatwave guidelines for the first time aimed at helping decision makers and health services develop early warning systems in an effort to reduce health impacts and deaths from heatwaves (Hughes, Hanna and Fenwick, 2016).

Extreme heat events, particularly prolonged heatwaves can have severe effects on human health. These include both direct heat illnesses (e.g. heat exhaustion) and indirect illnesses (e.g. cardiovascular failure). As extreme heat events worsen due to climate change, the risk of adverse human health impacts will also increase (Hughes, Hanna and Fenwick, 2016).

The `*National Framework for Protecting Human Health and Safety During Severe and Extreme Heat Events*' (Commonwealth of Australia 2011) identifies that "*Heatwaves kill more Australians than any other natural disasters. They have received far less public attention than cyclone, flood or bushfire – they are private, silent deaths which only hit the media when morgues reach capacity or infrastructure fails. Heat events have killed more people than any other natural hazard experienced in Australia over the past 200 years*".

The Australasian chapter of the Fifth Climate Change Impact Report released by the Intergovernmental Panel on Climate Change (IPCC, 2014) identifies that:

- Exceptional heatwave conditions in Australia have been associated with substantial increases in mortality and hospital admissions in several regional towns and capital cities.
- Projected increases in heatwaves will increase heat-related deaths and hospitalisations, especially among the elderly, compounded by population growth and ageing.

There is also clear evidence that the impacts of heat waves are not evenly felt across the community. Research clearly shows that certain sections of the community are more susceptible to the health impacts caused by heatwaves. The nature of these impacts and those most affected are identified in Table 3.

Table 3: Summary of health effects from heatwaves and those most affected.

EXAMPLES OF HEALTH EFFECTS	PEOPLE MOST AFFECTED
• Higher incidence of heat-related illnesses, such as exhaustion, heatstroke and acute renal failure • Exacerbation of existing health conditions, such as predisposition to heart attack and kidney disease • Higher incidence of mental and behavioural disorders • More premature deaths	• Those with existing illnesses • City dwellers • Low-income households • Outdoor workers • Older Australians • Indigenous communities • Tourists • Obese and overweight people • Children • People with a disability • Culturally and Linguistically Diverse (CALD) Communities • People living in rural and isolated communities

In regard to specific health impacts, research completed by the Australian Climate Commission (Hughes & McMichael, 2011) has identified that:

- Heatwaves around Australia have caused increased hospital admissions for kidney disease, acute renal failure and heart attacks, and increased deaths. During the severe heatwaves in south-eastern Australia in 2009, there were 980 deaths; 374 more than the estimated 606 that would have occurred on average for that time of year, or an estimated increase of 62%. Most of this increase was among people aged 75 or older.
- Hospital admissions for heart attack among people aged 15-65, particularly men, have been shown to increase in Adelaide during heatwaves. In Melbourne, a study across 1999 to 2004 found that hospital admissions for heart attacks increased by about 10% on days when temperatures exceeded 30°C, and by almost 40% during heatwaves in which the three-day average temperature exceeded 27°C .
- Children and people who are elderly, work in heat-exposed jobs or have low incomes are all at greater risk from heat extremes. In addition, most people live in cities and cities are going to be even hotter because of the "urban heat island effect".

A review by the Victorian Chief Health Officer (State of Victoria, 2009) on the impacts of the January 2009 Victorian heatwave, identified that while the 2009 Black Saturday bushfires killed more than 170 people, the preceding heatwave killed double that amount. The Chief Health Officer's report also found that the economic burden of heatwaves is significant, through the demand placed on emergency services, infrastructure stress and breakdown. More specific findings identified in the report include

- A 25% increase in Ambulance Victoria total emergency cases and a 46%increase occurred over the three hottest days.
- A 34-fold increase in Ambulance Victoria cases with direct heat-related conditions (61% in those 75 years and older).
- A 12% overall increase in emergency department presentations, with a greater proportion of acutely ill patients, and a 37% increase in those aged 75 years and over.
- An eightfold increase in direct heat-related emergency department presentations (46 per cent in those aged 75 years and older).
- An almost threefold increase in patients dead on arrival (69% aged 75 years and older) at emergency departments.
- 374 excess deaths over what would be expected: a 62% increase in total all-cause mortality.

In 2013 the results of research completed in Sydney to explore the impact of heatwaves on human mortality and morbidity concluded that (Wilson, Morgan, Hanigan, Johnson, Abu-Rayya, Broome, Gaskin & Jalaludin, 2013):

- Single and three day events of unusually high temperatures in Sydney are associated with similar magnitude increases in mortality and hospital admissions.
- Events of this nature may lead to a rapid deterioration in persons with existing cardio-vascular disease resulting in death.
- To reduce the adverse effects of high temperatures over multiple days, and less extreme but more frequent temperatures over single days, targeted public health messages are critical.

Based on the available research, "*the evidence is now clear that there are, and have been, public health impacts on Australians as a result of extremes of weather, particularly heatwaves, and that these extreme events will increase in frequency and intensity"* (Williams at al 2010).

In addition to the heat related illness, there are also a much broader range of social, financial and economic costs arising from heatwaves. These include:

- Increased demand on General Practitioners, community health and emergency health services
- Increased stress on physical infrastructure (e.g. railway lines, roads and electrical wires)
- Increased power consumption and risk of power failure. Where power is out, can further impede the ability of individuals to manage their exposure to high temperatures.
- Reduced economic / workplace productivity arising from greater absenteeism, heat related illness, and altered work practices to reduce risk to staff health and safety
- Direct interruptions to business continuity arising from health impacts or loss of key services and inputs such as electricity, water or other materials.
- Increased demand on staff, facilities and resources (e.g. public swimming pools, lifeguard services, community health services, and air conditioned community facilities).
- Impacts on water quality arising from algal bloom outbreaks
- Exacerbation of air quality issues, such as pollution from car exhausts and industrial fumes as well as an increased level of ozone. The lack of a breeze or wind can allow pollution to stagnate, causing air quality health impacts. Prolonged dry conditions can also increase rates of dust and pollen, and also result in bushfires.
- Food safety - higher air temperatures can increase cases of salmonella and other bacteria-related food poisoning because bacteria grow more rapidly in warm environments. These diseases can cause gastrointestinal distress and, in severe cases, death. Food safety can also become an issue if blackouts cause refrigeration to be interrupted. Food spoilage can occur both in public eating places as well as within the home.
- Increased demand on community services, potentially resulting in extended response times, or emergency infrastructure works (i.e. cooling asphalt roads) during periods of extreme heat.

4. STRATEGIES FOR BUILDING HEATWAVE RESILIENCE

Local planning and action can play a significant role in building both immediate and longer term organisational and community resilience to heatwaves. The strategies outlined in this section of the Guide aim to provide an overview of some of the key areas in which Councils, their local communities, and other stakeholder organisations, can proactively take action to build resilience of this nature. Key opportunities are identified in the areas of:

1. Research and information
2. Community awareness
3. Community Cool Spots
4. Organisational resilience (business continuity)
5. Workplace Health and Safety
6. Urban Green Cover
7. Built Environment
8. Local Emergency Management Plans
9. Community Strategic Planning

4.1. Research & Information

Research and information play a valuable role in improving and evaluating the effectiveness and efficiency of emergency management activities across all stages of the emergency management spectrum (i.e. Prevention, Preparation, Response and Recovery). Key information and knowledge building that can directly contribute to improved local and regional emergency planning around heatwaves includes:

1. Identifying the location and nature of “at risk” communities
2. Understanding the nature of risk perceptions, preparedness and communication preferences / barriers to better inform the nature and delivery of information
3. Identification of heat sources contributing to heat island effects in urban areas.

In addition to local research of this nature, there is also a significant body of research being completed at national, state, and international levels that is looking at the likely impacts of heatwaves on human health, populations and the environment. Keeping abreast of this information and integrating new information and recommendations within local heatwave planning activities is important to ensure they remain current.

Identifying the location and nature of `at risk communities

Given the current availability and ongoing development of spatial datasets representing population, environmental and natural hazards, there exists significant potential to integrate and analyse this data to inform local and regional heatwave (and other natural disaster) preparedness planning. In particular, it can be used to:

- Identify the location and relative vulnerability of communities
- Identify the characteristics of communities identified as vulnerable, to subsequently support the development of communication and emergency management arrangements that are better tailored to community needs and preferences.

During 2014, work of this nature was undertaken by HCCREMS in collaboration with AECOM, Gosford, Lake Macquarie, and Wyong Councils. This work involved the development of a spatial data library to facilitate the integrated collation and analysis of spatial information datasets (representing population, environmental and natural hazards), to identify the location and relative vulnerability of communities most `at risk’ to natural disasters. For the purposes of the project “at risk” communities were defined as:

1) Low income households (i.e. under or in proximity of the poverty line);
2) Very young and elderly communities:
   - People < 5 years of age.
   - People > 65 years of age.
   - People > 75 years of age.
3) People with disabilities; and
4) Culturally and Linguistically Diverse (CALD) communities.

This initiative focused on the four hazards of flooding, bushfire, extreme heat events and sea level rise. The database created provides the capacity to identify the relative risk to communities posed by these hazards at a Statistical Area 1 scale, and to interrogate the factors that contribute to the risk rating (e.g. adaptive capacity, sensitivity or exposure). This information provides a valuable tool that can now be used to prioritise and inform the location and focus of community natural disaster preparedness initiatives.

For heatwaves / extreme heat events, the analysis improved understanding of where the potential impacts of heatwaves on communities may be most felt across the project area. For example, the outputs (Figure 1) identified that communities most vulnerable to extreme heat events are typically located in urban areas. However, those rural communities located furthest from the urban centres (e.g. areas in the north west of Wyong and Gosford LGAs) are also shown to be at elevated risk.

As well as analysing vulnerability to individual natural disasters, analysis was also completed that explored relative community vulnerability to the combined risks of bushfire, extreme flooding & sea level rise. By identifying the location of communities who are vulnerable to more than one type of hazard, these outputs (refer Figure 2) now provide the opportunity inform the development and prioritisation of cross organisational preparedness programs that holistically address the primary risks in each locality.

MORE INFORMATION

1. Summary Report. Spatial Analysis and Mapping of Community Vulnerability to Natural Disasters in the Lake Macquarie, Wyong and Gosford Council Areas (Hunter Councils NSW) http://www.hccrems.com.au/product/natural-disaster-resilience-summary-analysis-report/

Figure 1: Relative community vulnerability to extreme heat events in Gosford, Lake Macquarie and Wyong Councils

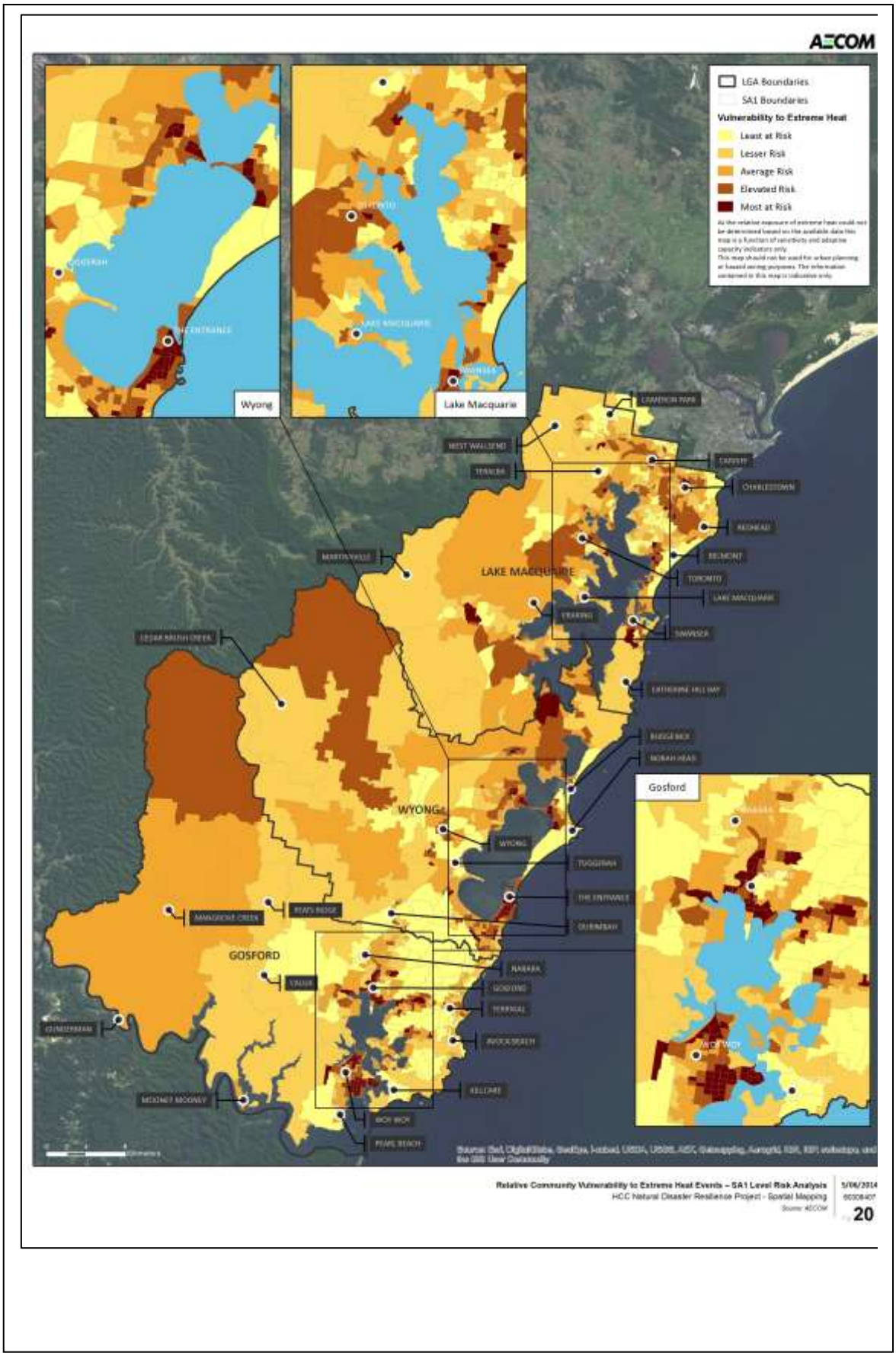
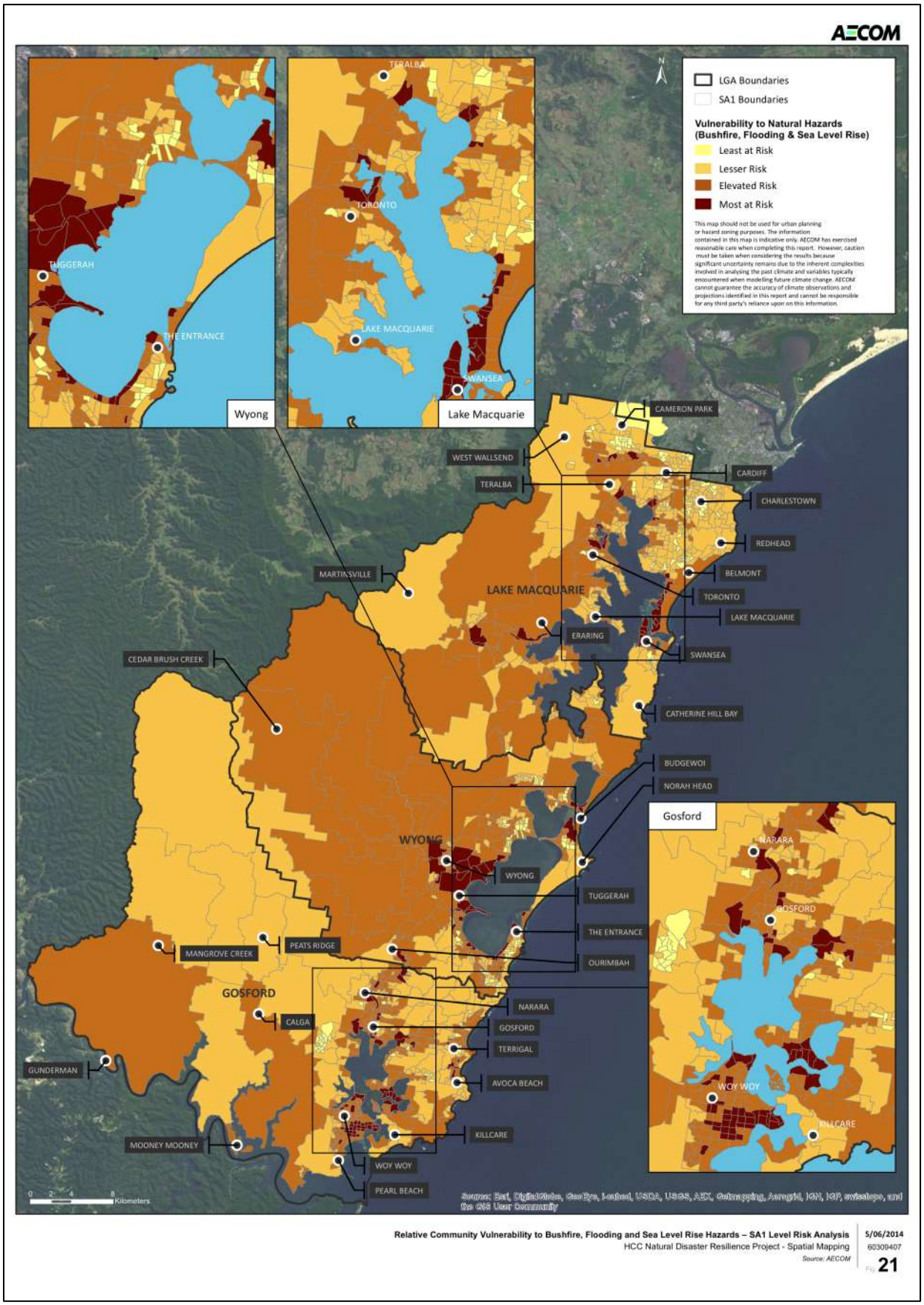


Figure 2: Relative community vulnerability to combined hazards of fire flood and sea level rise in Gosford, Lake Macquarie and Wyong Councils.



Community Risk Perceptions and Preparedness

There are a number of social factors that also have a significant impact on the capacity of "at risk" communities to effectively plan, prepare and recover from a natural disaster. These include (HCCREMS, 2014[1]):

Vulnerability indicators (i.e. can increase a persons risk)	• Social isolation or reliance on only one person for support and information in the event of a natural disaster. • Communication challenges – both in being heard and in understanding and responding to messages regarding preparation before a natural disaster, as well as actions to implement during the event. • Limited material resources limiting capacity to prepare and to respond to the immediate and longer term impacts of a natural disaster. • Past trauma or current experience living in a crisis in terms of day to day living. These experiences left little capacity for managing further emotional crises such as the impact of a natural disaster.
Protective or buffering factors (i.e. can reduce a persons risk)	• Experiences of past crisis events and successful recovery. • Practical knowledge of their local area, of their own situation. • Capacity to seek information and support from emergency and other human services. • Connections and relationships with informal support networks including neighbours, family and friends. • Thinking, planning and some level of action in preparing for potential risks.

Understanding these social factors can play a significant role in informing the nature of communication and emergency management arrangements to be implemented for a particular community.

Work of this nature was also undertaken during 2014 by HCCREMS in collaboration with the University of Newcastle. Utilising the outcomes of the spatial analysis and mapping process (refer previous section), geographical localities were identified where mapping indicated communities were relatively more vulnerable to natural disasters. Research focus groups were then held in these localities with community members representing the "at risk" groups of:

- Low income families with young children and other low income earners
- Aged populations
- People with a disability
- Culturally and linguistically diverse (CALD) communities.

These focus groups sought to identify within these `at risk' communities:

- The risk perception regarding natural disasters
- The level and nature of preparedness for natural disasters
- The capacity of "at risk" groups to respond and recover from natural disasters.
- The primary means via which 'at risk' groups receive natural disaster warnings as well as barriers to communication within "at risk" communities.

While the focus groups addressed a range of natural disasters / extreme climate events, key findings identified specifically in respect to extreme heat / heatwave events included:

1. Overwhelmingly, participants across all focus groups had *low or no* risk perception in relation to heatwaves.
2. Heatwaves were not viewed by most as a potentially dangerous event even though many participants described living in housing with no air conditioning or fans or housing which was poorly insulated.
3. There was a very low level of risk perception in relation to the impacts of medication on the body in hot weather or the potential for medications to spoil if exposed to extreme heat. Although a

significant number of participants described taking medication frequently, they almost *universally* had not considered any risks in relation to medication in extreme heat events.

4. In respect to preparing for heatwaves, while a number of people reported that they would stay inside or planned to go to an air conditioned shopping centre, most did not report any detailed preparation for this kind of event

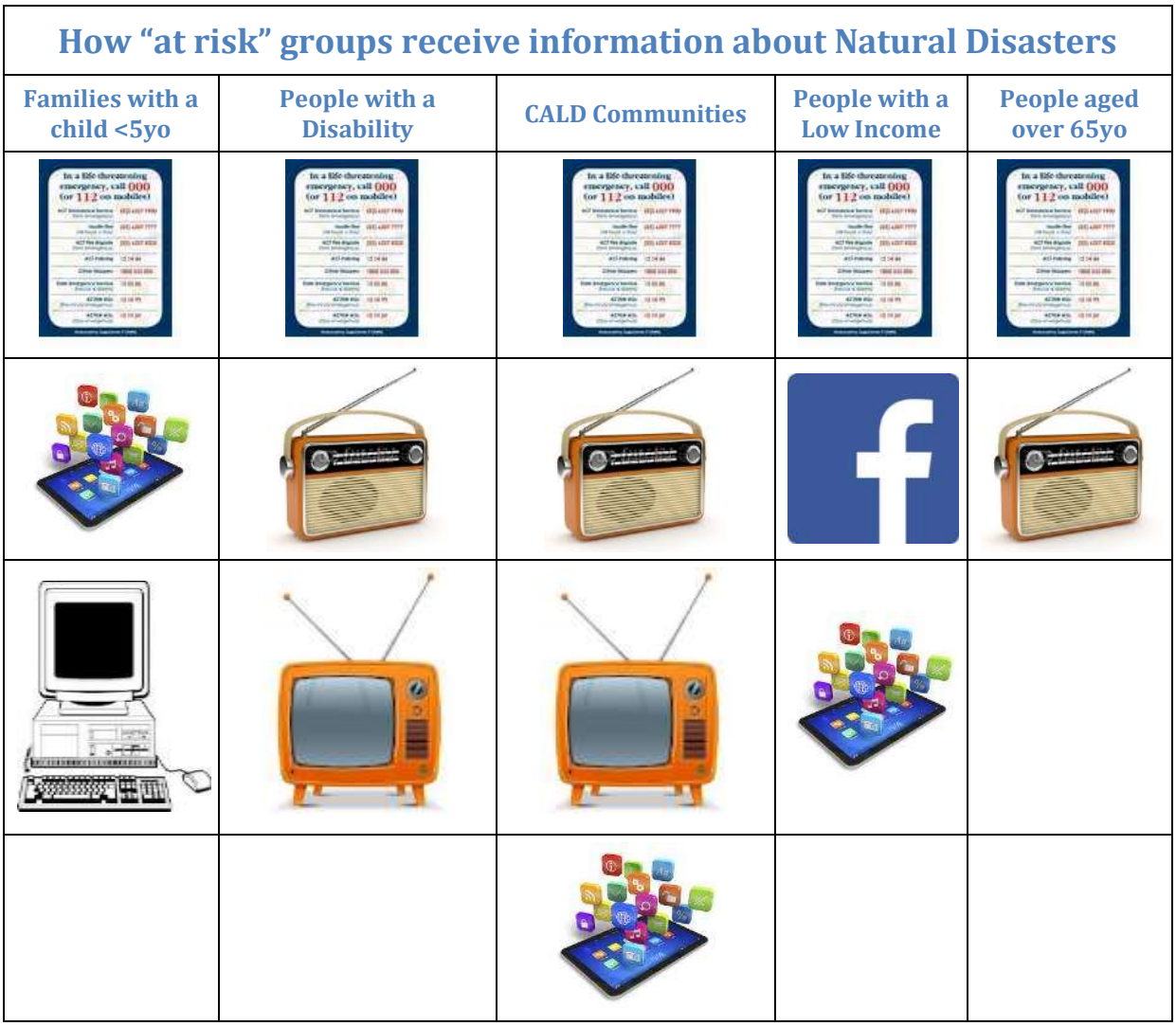
The fact that overwhelmingly participants across all focus groups had low or no risk perception and that most did not report any preparation for such events highlights the important role that local heatwave planning needs to play in fundamentally raising and building community awareness and preparedness.

Central to achieving this is the need to establish appropriate and effective communication approaches and messages that target the specific characteristics and needs of different target audiences. In this respect the focus groups also explored how participants currently receive information in respect to natural disasters, as well as their preferred communication methods for finding out about natural disasters more broadly. These findings are summarised in Figures 3 and 4 respectively. The variability of these finding across target audiences demonstrates how important understanding the characteristics of specific communities can be to maximising the effectiveness of emergency preparation and response strategies.

MORE INFORMATION

1. Identifying risk perceptions, level of preparedness and communication channels for "at risk" communities in respect to natural disasters (Hunter Councils NSW).
   http://www.hccrems.com.au/product/disaster-preparedness-in-at-risk-groups/

Figure 3. How "at risk" groups currently receive information about natural disasters (Source: HCCREMS, 2014[1])



Legend

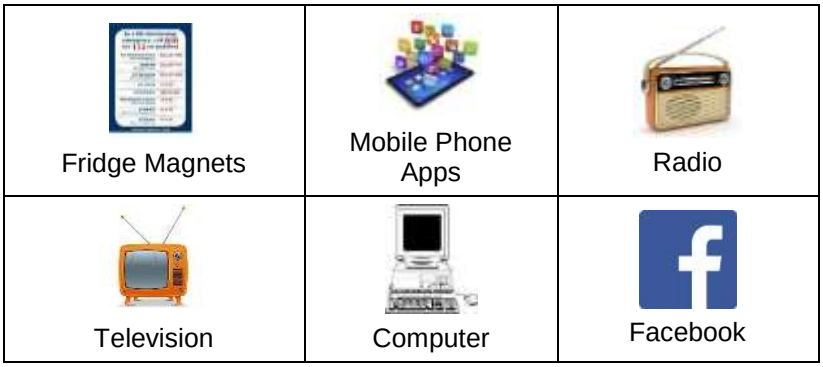


Figure 4. Preferred communication channels for "At Risk" groups during a natural disaster (Source: HCCREMS, 2014[1])

Preferred Communication Means in a time of Natural Disaster				
Families with a child <5yo	People with a Disability	CALD Communities	People with a Low Income	People aged over 65yo
				
				
				

Legend

 Personal visit from emergency services	 Text Message to Mobile	 Call to Mobile Phone
 Siren	 Call to Landline Phone	 Facebook

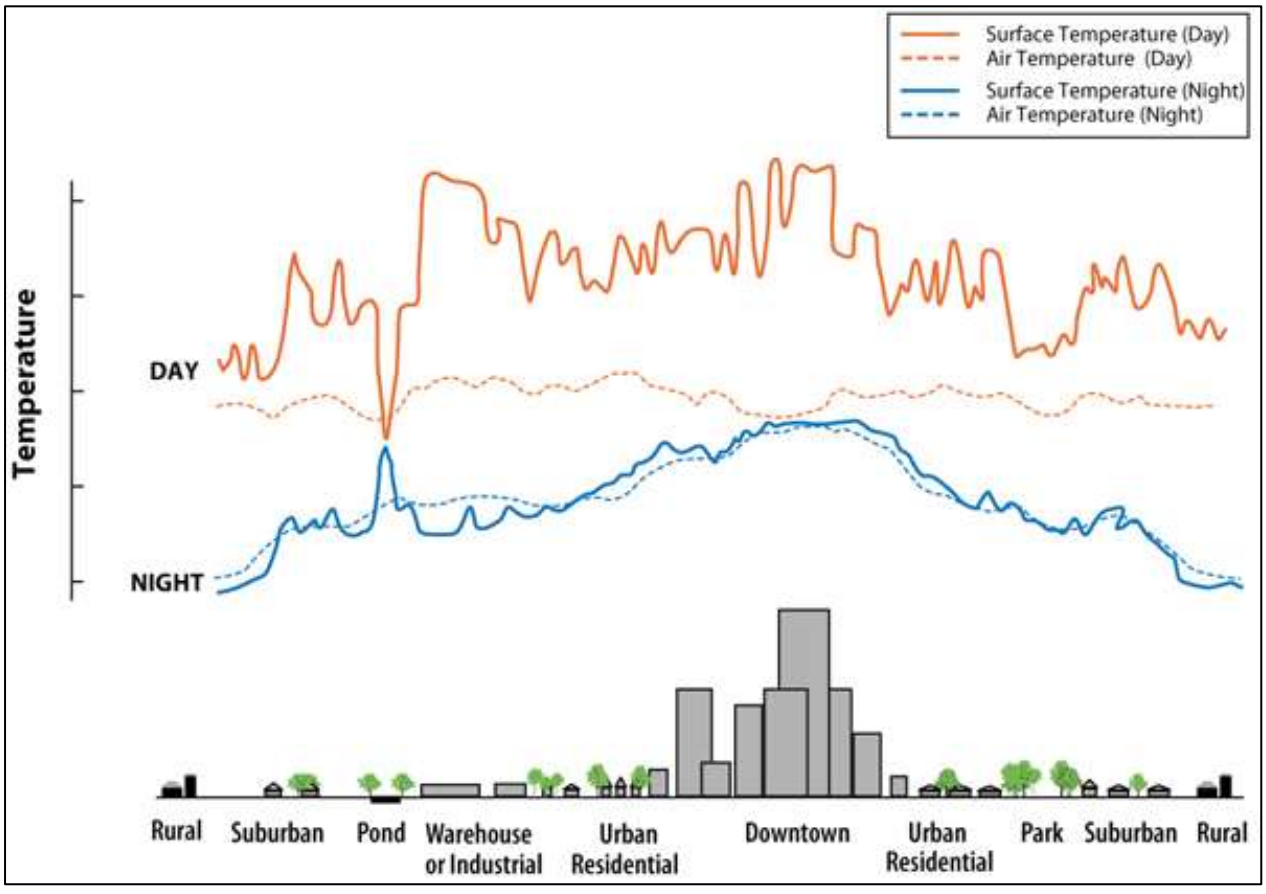
Identifying and Measuring Urban Heat Islands

Urbanisation typically results in the loss of natural landscape areas to man-made, engineered structures. These dark, impervious surfaces and buildings absorb solar energy which causes the surface temperature of cities and towns to rise as much as 10-20°Celsius higher than surrounding air temperatures. As the surface temperatures increase, overall ambient air temperature also increases. This temperature difference is larger at night as rural areas cool while dense urban environments remain relatively warm. This is commonly known as the Urban Heat Island (UHI) effect (State of NSW and Office of Environment and Heritage, 2015). Better understanding urban heat islands generally occurs through measuring either surface or air temperatures.

1. Air temperature

Air temperature is often used in discussion of urban heat islands in the context of urban areas having a higher air temperature at night when compared surrounding rural areas (refer Figure 5). Air temperature can be impacted by a range of factors, for example prevailing winds, proximity to the ocean and local meteorological conditions (AECOM Australia Pty Ltd, 2013). As such it is generally not utilised to inform specific on ground mitigation strategies for reducing local heat loads.

Figure 5. Surface and air temperatures vary over different land use areas. Surface temperatures vary more than air temperatures during the day, but they both are fairly similar at night (AECOM Australia Pty Ltd, 2013).



2. Surface temperature

Surface heat has an indirect but significant influence on air temperatures. For example, parks and vegetated areas, which typically have cooler surface temperatures, contribute to cooler air temperatures. Dense built-up areas, on the other hand, typically lead to warmer air temperatures (US Environmental Protection Agency, 2015). Surface temperatures can be addressed through a range of mitigation measures (AECOM Australia Pty Ltd, 2013).

It is for this reason that thermal imaging to identify the relative heat contributions of different aspects of the urban landscape are being increasingly utilised to inform heatwave resilience strategies. Thermal imaging can be applied at various scales, for example city wide as shown in Figure 6, or at street locality level as shown in Figures 7 & 8.

By identifying the nature and location of surface temperatures across the urban landscape, adaptation strategies such as urban greening programs, building retrofits or building / asset modifications can be targeted to these locations to reduce their contribution to the overall Heat Urban Heat Island effect.

Figure 6. Land surface temperatures observed from MODIS satellite imagery for daytime (left) and night time (right) (AECOM Australia Pty Ltd, 2013).

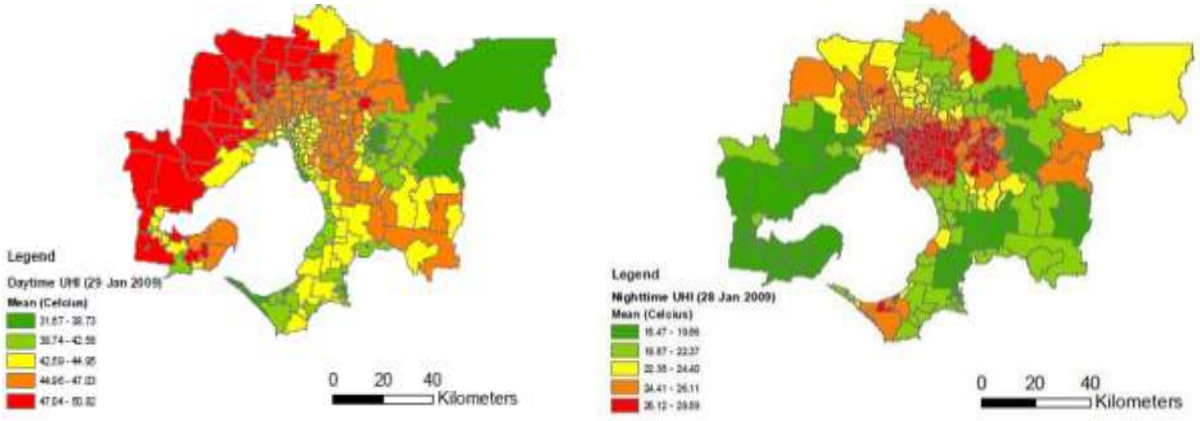
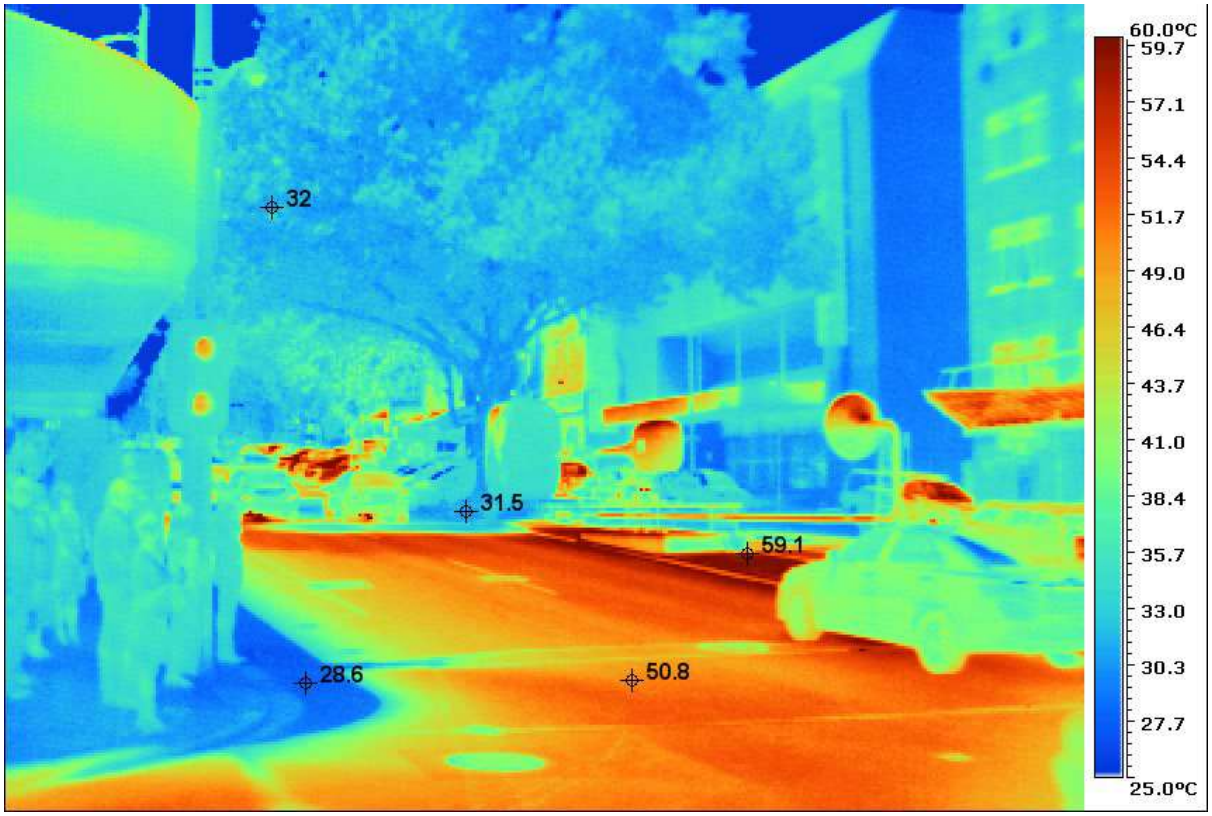


Figure 7: Thermal imagery measurement of surface temperatures at a precinct level (AECOM Australia Pty Ltd, 2013)

Figure 8. Thermal imaging at a street level (State of NSW and Office of Environment and Heritage, 2015)



MORE INFORMATION

1. Urban Heat Island Report: City of Greater Geelong and Wyndham City Council (AECOM Australia Pty Ltd)
   http://www.geelongaustralia.com.au/common/Public/Documents/8d07ddbc8d1be5a-Urban%20Heat%20Island%20Study%20-%20Wyndham%20and%20Geelong.pdf
2. Measuring Heat Islands (US Environmental Protection Agency)
   https://www.epa.gov/heat-islands/measuring-heat-islands

4.2. Community Awareness

The focus of communication and awareness around heatwaves is to:

1. Build general community awareness and preparedness to heatwaves over both the short and longer term.
2. Alert the community (particularly vulnerable sectors) of impending heatwave threats.
3. Advise the community of what to do during an actual heatwave event to protect the health and safety of themselves and those around them.

In the Hunter, Central Coast and Mid Coast region there are a number of key organisations including Local Health Districts, Primary Health Care providers, Councils, Community Service Organisations, and community volunteer groups / networks who can play a key role in communicating and building heatwave preparedness to communities considered most "at risk" from heatwaves. This reflects the strong links and interaction of these organisations have with "at risk" communities via the delivery of health and community support services and due to their role as a provider of trusted information. In particular these organisations have a significant opportunity and ability to act as "agents of change" for building awareness and preparedness within their organisations, clients, customers and communities about heatwave impacts and strategies to improve personal and community resilience.

As seen from the previous section "Community risk perceptions and preparedness", the manner and preferences through which different "at risk" communities receive or want to receive information varies. Therefore, in order to be effective, communication strategies, materials and campaigns around heatwave resilience (as well as for other natural hazards) need to be tailored in both their focus and format to the specific needs and preferences of the audience they are targeting.

To support delivery of consistent, coordinated and targeted heatwave risk and preparedness messages in the region, a suite of tailored communication resources have been developed. These adapt the existing messages included on the NSW Beat the Heat website (http://www.health.nsw.gov.au/environment/beattheheat/) into a range of formats that can be utilised to specifically engage a variety of "at risk" communities. In addition to audience specific messages, they also address key issues and impacts (e.g. medications and dehydration) that are relevant to the community as a whole.

These resources and the messages they convey are tailored to three different alert levels to encourage communication that reflects the level and timing of risk, thereby enhancing the relevance and immediacy of the message to the target audience. These alert levels include:

Stage 1: General Awareness	Resources aim to raise general awareness of heatwave / extreme heat impacts and preparedness. They are for issuing periodically during the lead up to and during summer.
Stage 2 Heatwave / Extreme Heat Conditions Forecast	Resources are for issuing in the days preceding a forecast heatwave / extreme heat event to encourage preparatory action by the target audience.
Stage 3 Heatwave / Extreme Heat Conditions Occurring	Resources are for issuing during a heatwave / extreme heat event to encourage immediate and direct action by the target audience to protect health and safety.

The resources available for each target audience / issue and the online location at which they can be freely downloaded is provided in Table 4. Examples of these resources for "All of Community" and "Medication Impacts" are provided in Figures 9, & 10, while Attachment 2 provides an example of all of the resources that are available for the "All of Community" target audience.

Table 4. Heatwave Communication resources available for the Hunter

Target Audience / Issue	Website location	Resources Available
General Community	http://www.hccrems.com.au/product/all-of-community-heatwave-communications-resources-kit/	• Beat the Heat Poster • Beat the Heat Information Flyer • Webpage content • Social Media content • Newsletter Articles • Scripts for Community Service Announcements • E-mail alerts • Text Alerts
The Elderly and those with a Disability	http://www.hccrems.com.au/product/all-of-community-heatwave-communications-resource-kit-copy/	
Families with young children	http://www.hccrems.com.au/product/the-elderly-and-people-with-a-disability-heatwave-communications-resource-kit-copy-copy/	
Rural and isolated communities	http://www.hccrems.com.au/product/impacts-on-medications-heatwave-communications-resource-kit-copy/	
Impacts on Medications	http://www.hccrems.com.au/product/families-with-young-children-heatwave-communications-resource-kit-copy/	• Poster • Information Flyer • Webpage content • Social Media content • Newsletter Articles • Scripts for Community Service Announcements • E-mail alerts • Text Alerts
Avoiding Dehydration	http://www.hccrems.com.au/product/urine-colour-chart-are-you-drinking-enough/	Are you Drinking Enough? (Urine Colour Chart Poster)
Promotion of public facilities as community `Cool Spots'	http://www.hccrems.com.au/product/community-cool-spots-poster/	Community Cool Spots Poster

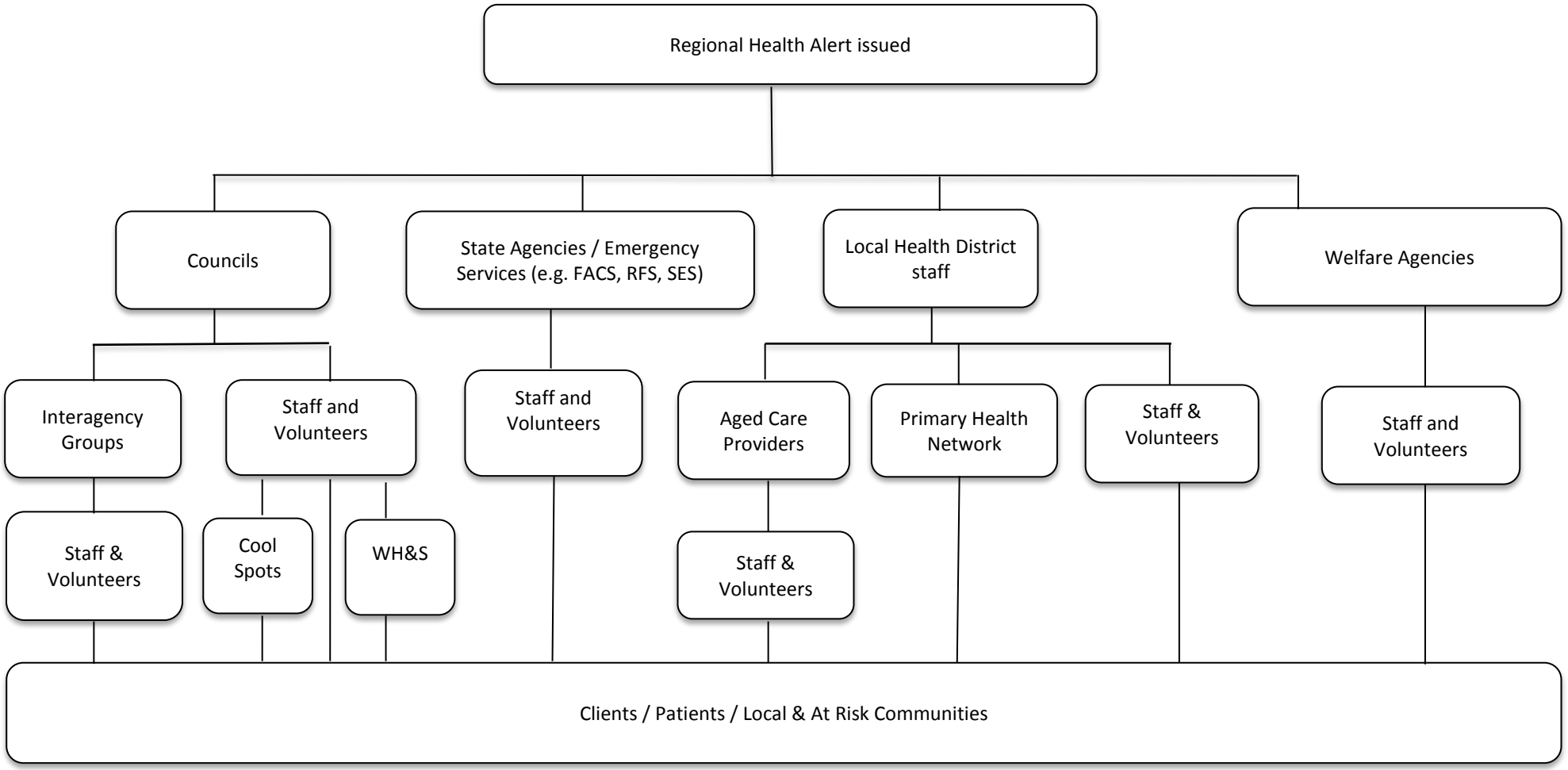
Given the number of partner and stakeholder organisations that can play a role in engaging and communicating heatwave preparedness, either to the community as a whole or to particular audiences, the potential for duplication of effort and / or miscommunication is high. It is for this reason that development of a communications framework has the potential to clarify the roles and responsibilities for each organisation, including the focus and timing of message delivery. In addition to promoting consistent and agreed messages by all organisations, a communication framework can also maximise the extent of market penetration. This is because the community will more exposed to consistent, concerted and repeated messages across different media platforms and organisations during each alert stage.

An example of a communication framework with the potential for further development and piloting across the region is included in Figure 11. For each of the alert stages, the draft framework identifies how warnings and communication could potentially be activated and delivered by key stakeholder organisations across the region.

Figure 9. "All of Community" poster

Figure 10. "Medication Impacts" poster

Figure 11. Potential communication framework for coordinated regional heatwave communications



MORE INFORMATION

1. Heatwave Communication Resources – Hunter, Central Coast and Mid Coast Region (Hunter Councils)
   http://www.hccrems.com.au/climate/
2. NSW Beat the Heat website (NSW Government)
   http://www.health.nsw.gov.au/environment/beattheheat/pages/default.aspx

4.3. Community Cool Spots

When heatwave conditions are prevalent, one of the key messages promoted by health authorities is to spend time during the hottest part of the day in a cool location, whether it be a family or friends home, or possibly other publicly accessible location such as libraries, shopping centres, clubs, restaurants and cinemas.

Publicly managed facilities such as libraries, community / neighbourhood centres, galleries and swimming pools can therefore provide a very important role in directly reducing heatwave impacts on the community. This is particularly true for those in who may be reluctant to visit commercial locations such as shopping centres or cinemas because of the financial or other pressures that accessing and spending time in these locations may present. For example, the costs of going to the cinema for a low income family can be prohibitive.

Promoting freely accessed public facilities as `Community Cool Spots' (refer Figure 12) is therefore a key way in which councils, public authorities and Community Service Organisations can directly support the community avoid the negative impacts of heatwaves. In addition to the direct health benefits, promoting facilities in this way has the potential to increases visitation and therefore community exposure and utilisation of the range of services and benefits that these facilities provide. Depending on their capacity to resource, some organisations may also choose to change or extend their operating hours (e.g. opening until later in the evening until the most extreme heat has dissipated). Ideally facilities promoting themselves as a `cool spot' should have:

- Functioning air conditioning (preferably with back up power)
- Adequate and freely available drinking water
- Amenities
- Nearby, accessible parking facilities
- Connection to public transport
- Adequate staffing during a heatwave event
- Capacity to accommodate a number of people
- A plan for managing visitor safety should power and water supply be lost

'Community Cool Spots' are not intended to be seen as a designated emergency refuges. Rather they aim to promote access to existing, already open and resourced, cool environments in which community members can temporarily and freely gain respite from the heat.

Nevertheless if promoting a facility as a `Community Cool Spot' there are a number of factors that an organisation should consider to ensure the comfort and safety of both staff and the community. Key matters to consider include (Australian Red Cross, 2016):

- Who will be receiving / checking for heatwave alerts?
- What will be the process for activating / promoting the facility as a Community Cool Spot ?
- Will additional staff members be required?
- What additional resources / activities may be required (e.g. water, fans, games, DVD's, chairs, tables) and who will be responsible for putting these in place?
- How will the facility be promoted as a Community Cool Spot?
- How and what information (e.g. Beat the Heat education resources) will be communicated to staff and customers?
- Will staff be debriefed following the event?
- What are the health and safety considerations? What actions will be implemented if electricity and water supply (and therefore cooling systems) are lost?

Managing these should ideally be addressed within an organisational procedure or risk assessment and treatment plan prior to promoting a facility as a Cool Spot. Such a procedure should establish all actions to be undertaken once the facility has received notification that a heatwave forecast through to when the heatwave has passed, and identify who is responsible for each action and the timeframe for when that action needs to be completed.

Figure 12. Managers of public facilities may wish to promote their venues as a `Community Cool Spot' during heatwave conditions

4.4. Organisational Resilience (Business Continuity)

Business continuity planning involves developing practical plans for how a business can prepare for, and continue to operate, after an incident or crisis. A business continuity plan aims to (NSW Government, 2015):

- Identify and prevent risks where possible
- Prepare for risks that you can't control
- Respond and recover if a risk (e.g. an incident or crisis) occurs.

Similar to other natural disasters such as fires, floods and storms, heatwaves have the potential to directly disrupt business operations, resulting in reduced service delivery, financial and productivity losses.

From a productivity perspective alone, recent research (Zander, K., Oppermann, I. and Garnett, S., 2015) estimates that heatwaves cost the Australian economy nearly $7b in lost productivity during 2014. Outdoor workers were most affected but indoor staff also, possibly due to reduced sleep. Findings included:

- 7% didn't go to work on at least one day due to heat stress
- 70% thought they were less efficient at work
- On average people were less productive due to heat stress on 10 days per annum
- Outdoor heat affects were particularly felt among men
- Indoor workers also affected – including fatigue and impaired decision making
- The level of impact arising from heatwaves is on a par with cost of chronic health conditions such as migraines or back pain.

Additional disruptions that can also arise from heatwaves include:

- Facility closures / shut down of key infrastructure arising from loss of power or water supply
- Increased staff absenteeism due to reluctance to work during severe heat conditions, or the need to care for family members affected by heat related illness
- Reduced productivity due to uncomfortable working conditions or the need to reallocate staff to alternative work
- Increase in work place injuries and heat related illness in employees and volunteers
- Cancellation of community events due to extreme heat conditions
- Disruption to supply of materials or cancellation of works due to extreme heat (e.g. temperatures are outside the optimal bounds for the laying of bitumen, concreting, painting, tree planting / gardening)

Heatwave / extreme heat conditions can also impact directly on the level of resourcing that may be required to maintain delivery of core council services. For example, additional lifesavers may need to be employed to supervise beaches and public swimming pools due to significantly increased patronage, while additional visitation of council libraries, galleries and community centres, by those trying to escape the heat, may require additional staffing to maintain specified service levels. This represents a direct additional operating cost for a Council in order to maintain some of its core business functions.

Other potential risks from heatwaves that may be worth Councils considering and planning for include:

- Are adequate plans in place to ensure community health and safety can be maintained during periods of greater patronage? For example, what procedures are in place to protect customer safety if power and therefore air conditioning is lost in a heavily populated facility such as public library or community centre?
- Potential impacts on participants at community events such as festivals, sporting events, markets, concerts and other celebrations (e.g. Seniors Week activities, tourism promotions) that are run by council or taking place on council managed land.
- Potential impacts on the health and safety of community members and volunteers involved in Council supported activities and facilities such as volunteer lifeguards, Men's Sheds, Meals on Wheels, Senior Citizens Centres, and Community Transport services.

- What duty of care is owed by Council to sporting groups and associations using Council facilities? Does Council have a responsibility to ensure that these groups are informed and have in place heatwave plans to reduce potential impacts during extreme heat / heatwave conditions? Such plans could include cancellation polices, changes in the scheduling of sporting events (e.g. to later in the evening), or incorporating more rest / drink breaks during matches.

Preparing a business continuity plan, or integrating heatwaves (and other natural disasters) into an existing plan to minimise disruptions and productivity losses, will ensure Council is adequately prepared and can respond and recover quickly, and in an organised fashion, when a heatwave or other natural disaster occurs.

MORE INFORMATION

1. Business Continuity (NSW Government)
   http://www.secure.nsw.gov.au/what-you-can-do/business-continuity/

2. What's in a business continuity plan? (Queensland Government)
   https://www.business.qld.gov.au/business/running/risk-management/business-continuity-planning/whats-in-business-continuity-plan

4.5. Workplace Health and Safety

Heatwaves or extreme heat events, can have direct implications on health and safety. As with other workplace risks, identifying, evaluating and managing these risks is therefore important. It is also important to recognise that these risks relate not only to employees, but to the many volunteers who are often involved in the delivery of community services and activities. Examples include Meals on Wheels, Tidy Towns / Bushcare/ Landcare activities, community transport services, senior citizens programs, volunteer lifeguards and Men's Shed activities. Key health and safety risks arising directly from extreme heat / heatwave events include (NSW Government):

- Direct heat related illness including dehydration, heat stress and heat stroke
- Exacerbation of existing medical conditions
- Loss of grip while handling tools, objects and controls due to sweaty hands
- Slips trips and falls due to dizziness, fainting or fatigue
- Errors and mistakes due to fatigue and loss of judgement
- Not using Personal Protective Equipment (PPE) due to discomfort
- Burns due to contact with hot surfaces or substances
- Reduced productivity, fatigue and potentially aggression

The level of safety risk will also increase over the duration of a heatwave event, arising from increasing levels of fatigue and ill health due to extended exposure to extreme heat conditions and reduced sleep. As a result, the likelihood of workplace accidents arising from fatigue or misjudgment will increase over the duration of a heatwave event. When developing workplace management strategies around heatwaves it is therefore important to consider the not only the immediate and direct impacts of individual extreme heat events / days, but the cumulative stress factors and impacts that can arise from an extended heatwave conditions.

Examples of management strategies that can be implemented to reduce the impacts of individual extreme heat days and extended heatwave conditions on workplace health and safety include:

1. Staff Alerts

Issuing alerts to staff and volunteers that heatwave conditions are forecast or occurring, and advising of the appropriate workplace practices / procedures and personal preparedness measures to be implemented to reduce impacts on staff, volunteers and customers is an important strategy for raising workplace awareness and preparedness.

The communication resources outlined in Section 4.2 of this Guide can provide a foundation for the personal preparedness measures that can be undertaken by staff and volunteers to reduce health and safety impacts.

2. Planning

Actively considering and planning for heatwaves at a corporate level is an important means of ensuring that their impact on workplace health and safety is minimised. Development of an organisational heatwave plan (or including heatwaves as a subset within a broader organisational disaster resilience or business continuity plan) is a key strategy through which this can be achieved. The nature of information and strategies that can be addressed by a plan of this nature include:

- What are the conditions / triggers at which heatwave management procedures and protocols will be implemented?
- How and when will staff alerts, information, instruction and training be provided?
- What changes to work protocols and procedures will be implemented to reduce staff exposure (e.g. greater job rotation, extra rest breaks, early / late shifts, provision of bottled water to staff)?
- How and to what level are staff trained and resourced to apply first aid procedures?

3. Workplace Facilities and Infrastructure

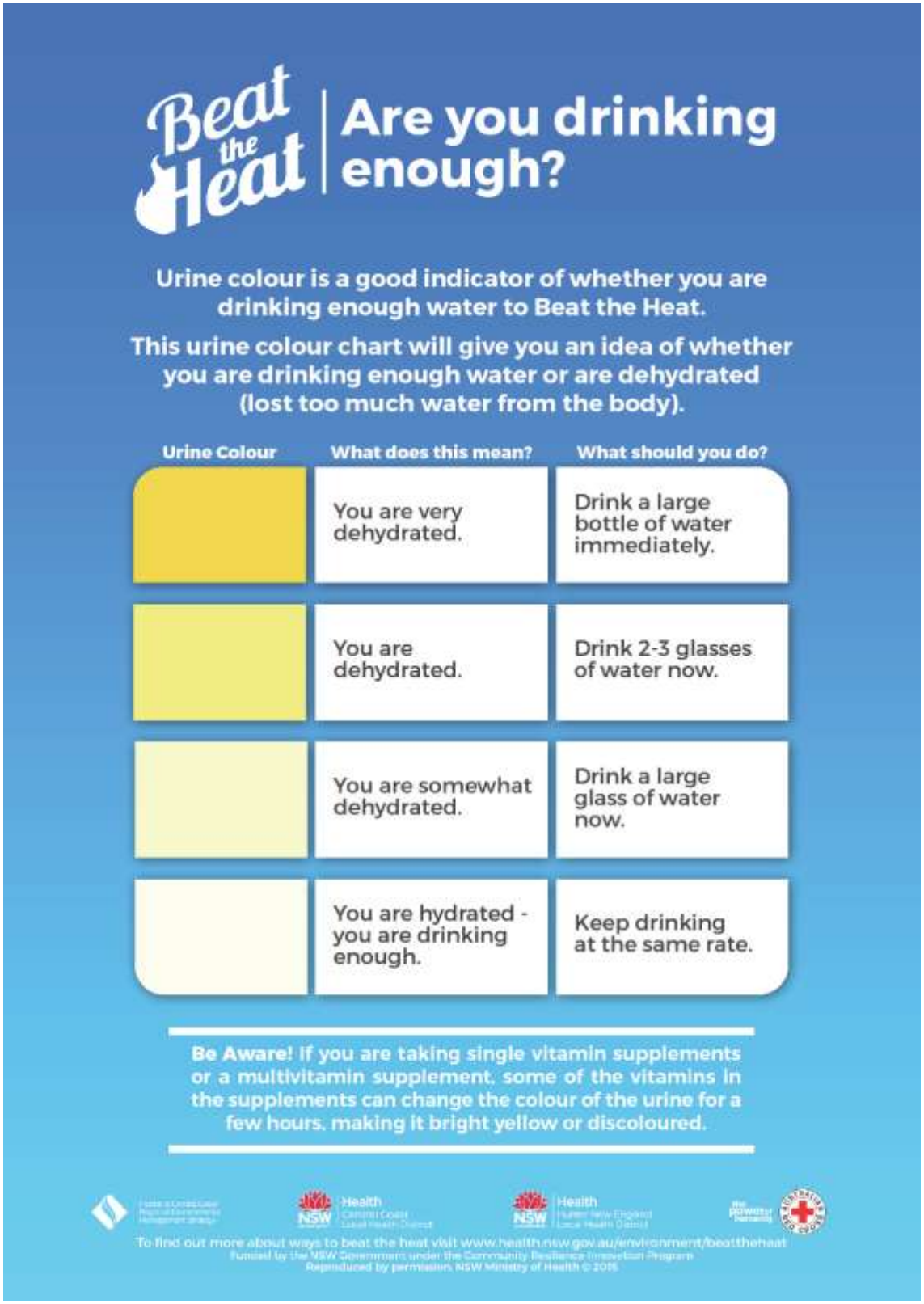
    - Do fridges, fans, and air-conditioners work properly? Do they have adequate capacity to provide appropriate levels of comfort during a heatwave / extreme heat conditions?
    - Does workplace / building design provide resilience to extreme heat / heatwave conditions (e.g. building orientation, external shading, insulation)?
    - Is there a strategy in place to maintain minimum standards of workplace comfort should water and power supply be lost during a heatwave (e.g. capacity to open windows, back up power supply, battery powered fans)?

4. Personal Preparedness
    - Providing staff with information through induction and training programs to assist them:
        - Understand the nature and increased level of increased risk to health and safety arising from heatwaves
        - Increase their level of personal preparedness to heatwaves
        - Recognise the early signs of heat related illness in themselves (e.g. Figure 13) and others
    - Providing staff with loose fitting and sun smart clothes, or relaxing dress codes during heatwaves to improve personal comfort
    - Ensuring adequate supplies of personal protective equipment (e.g. hats, water bottles, sunscreen, ice packs) are available

MORE INFORMATION

1. Heat Stress: Frequently Asked Questions (Workcover NSW)
   http://www.workcover.nsw.gov.au/squiz-sandbox/2015-work/whsd-scraped-html-july-15/heat-stress-frequently-asked-questions
2. Heatwave Communication Resources – Hunter, Central Coast and Mid Coast Region (Hunter Councils)
   http://www.hccrems.com.au/climate/
3. NSW Beat the Heat website (NSW Government)
   http://www.health.nsw.gov.au/environment/beattheheat/pages/default.aspx

Figure 13: Are You Drinking Enough? (Urine Colour Chart) Poster



4.6. Urban Green Cover

Urbanisation typically results in the loss of natural landscape areas to man-made, engineered structures. These dark, impervious surfaces and buildings absorb solar energy which causes the surface temperature of cities and towns to rise as much as 10-20°Celsius higher than surrounding air temperatures. As the surface temperatures increase, overall ambient air temperature also increases. This temperature difference is larger at night as rural areas cool while dense urban environments remain relatively warm. This is commonly known as the "Urban Heat Island" (UHI) effect (State of NSW and Office of Environment and Heritage, 2015) – (refer Section 4.1 – Research and Information).

Research is increasingly demonstrating that increasing the vegetation on and around urban environments produces a cooling effect for neighbourhoods and nearby buildings. This is because, unlike hard surfaces, trees and vegetation reflect heat and actively cool and clean the air by evapotranspiration. With Australia having one of the most urbanised societies in the world, with approximately 89% of residents living in cities or towns, urban green cover has a very important role to play in building long term community resilience to heatwaves (State of NSW and Office of Environment and Heritage, 2015).

The concept of "urban green cover" involves the integration of vegetation with permeable and reflective surfaces to minimise local temperatures and encourage evaporation from soil and plants into the urban environment. Urban green cover can include bushland, private and community gardens, parks, greenways, habitat corridors, street trees, green roofs and green walls, as well as reflective and permeable pavements and surfaces (State of NSW and Office of Environment and Heritage, 2015)

Increasing green cover in urban environments can be achieved in a number of ways, from protecting local green spaces and designing eco-friendly buildings, through to creating a green space network.
Urban green cover delivers a high performance landscape. Current global best practice examples of urban green cover integrate multiple environmental benefits, which can include (State of NSW and Office of Environment and Heritage, 2015):

- Stormwater management
- Thermal insulation
- Air quality improvement
- Reduction in Urban Heat Island effect
- Ultra Violet (UV) radiation protection for buildings
- Increase in open space
- Increased vegetation and evapotranspiration
- Wildlife habitat and improved biodiversity
- Food production and urban agriculture
- Pollination of crops and other important plants
- Improved visual amenity and urban design
- Noise reduction
- Maintaining atmosphere composition (i.e. CO_2/O_2 balance)
- Creating micro climates for buildings and urban canyons

The NSW Office of Environment and Heritage has modelled the influence of vegetation cover on land surface temperature in the Sydney Basin (State of NSW and Office of Environment and Heritage, 2015). This found that in Sydney during summer mornings, urban structures increase land surface temperature by 1.5°C. However, every 10% increase in tree cover can reduce land surface temperatures by more than 1°C. This means that a 14% increase in tree cover would completely offset the thermal loading effect of urban structures in the Sydney basin. It also found that when vegetation cover is greater than 40% of a total area, a 10% increase in vegetation leads to a reduction in land surface temperature of more than 1°C. However, when mixed vegetation cover is less than 40%, there is no reduction in land surface temperature.

In addition to directly reducing temperatures, green spaces have also been shown to improve community cohesion and well being. This is because more trees and greenery in urban areas and public spaces, leads to

greater utilisation of these spaces by residents. Research has found that (State of NSW and Office of Environment and Heritage, 2015):

- Compared with residents living near barren spaces, those closer to greenery enjoy more social activities, have more visitors, know more of their neighbours, and have stronger feelings of belonging.
- Children who live in close proximity to green space are more resistant to stress; have lower incidence of behavioural disorders, anxiety, and depression; and have a higher measure of self-worth
- There are direct links between urban green spaces and enhanced sense of wellbeing, improved mental well being, improved attention span and a reduction in stress and anxiety. This is a result of a number of factors including an increase in physical activity, an increase in social contact and the restorative qualities of green spaces that provide opportunities for relaxation and respite from the often demanding urban lifestyle

To facilitate and support greater use of urban green cover the NSW Office of Environment and Heritage have developed Technical Guidelines for Urban Green Cover in New South Wales. This resource aims to support uptake by local and state government and private sector professionals of green cover principles and practices through providing practical information and typical details to encourage best practice applications of green cover, so as to minimise urban heat impacts across NSW.

The guidelines include practical information for planning and implementing green cover, in consultation with urban design and engineering professionals, utilities and relevant stakeholders. This information can also be used by local government for integration into strategic plans, development controls, public domain guidelines or urban design studies, so as to influence development outcomes in a local government area.

From a local government perspective, these guidelines provide a valuable resource to inform the design and delivery of programs to increase urban green cover so as to realise the substantial and wide ranging benefits it can provide to local communities. Particular applications to which they are relevant include:

1. Community Land Plans of Management for public open space including parks, reserves, and sporting facilities.
2. Placemaking initiatives to transform and attract people and investment into urban centres
3. Local Area Plans / Development Control Plans to guide new urban areas or urban renewal initiatives
4. Planning the design and construction / renewal local infrastructure including roads and cycleways
5. Street tree / community tree planting programs.

MORE INFORMATION

- Urban Green Cover in New South Wales: Technical Guidelines file:///C:/Users/Steve%20&%20Bron/Downloads/Urban%20Green%20Cover%20Technical%20Guidelines.pdf
- The Green Cover Demonstration Project – showcasing design principles for urban green cover. https://www.publicworks.nsw.gov.au/environment-sustainability/green-cover-demonstration-project
- 202020 vision - A partnership of organisations aiming to increase urban green space by 20 per cent before 2020. http://202020vision.com.au/
- World Green Infrastructure Network (WGIN) - promotes the use of green infrastructure in cities. http://www.worldgreenroof.org/

4.7. Built Environment

In addition to promoting urban green cover across the landscape, ensuring that buildings and facilities are designed or modified so that their occupants remain thermally comfortable with minimal auxiliary heating or cooling is a fundamental strategy for building long term community heatwave resilience. It is for this reason that encouraging passive building design (i.e. working with the climate, not against it) when building new, or retrofitting existing buildings and facilities, is an important strategy for reducing both short and long term heatwave impacts.

It is also important, given that approximately 40% of household energy is used for heating and cooling to achieve thermal comfort, and that this can be cut to almost zero through sound climate responsive design (Commonwealth of Australia, 2015). Encouraging passive design can therefore significantly reduce the need for fossil fuel based heating and cooling, thereby reducing the contribution of these activities to climate change and the accompanying increases in frequency and intensity of extreme heat events that are projected to arise from this.

While the opportunity for Councils in New South Wales to regulate building standards to improve passive design outcomes is limited, there are a number of ways in which they can influence or encourage this outcome. These include:

- Development of local building guidelines or covenants (e.g. requiring light coloured roofing) to encourage improved design outcomes
- Delivery of education programs to promote appropriate home design and modifications to promote heatwave resilience, while also reducing energy costs. Such a program could include:
    - Community education materials
    - Education workshops
    - Household audits
    - Formal / accredited training courses
- Incentives based measures to encourage new developments to be more resilient (e.g. through reduced development fees or development tradeoffs)
- Incentives to encourage the retrofitting of existing buildings (e.g. through subsidies to install window glazing, external blinds or to paint roofing in light colours)

Councils also manage the design, construction and management of a significant number of community assets and facilities. Ensuring that the design of these encompasses passive cooling design principles can be a primary means of showcasing and promoting more sustainable design practices to the community, as well as reducing the ongoing operating costs of these facilities.

Key principles for promoting passive cooling that minimises daytime heat gain, maximises night-time heat loss, and encourages cool breeze access include (Commonwealth of Australia, 2015):

- Designing the floor plan and building form to respond to local climate and site
- Using and positioning thermal mass carefully to store coolness, not unwanted heat
- Choosing climate appropriate windows and glazing
- Positioning windows and openings to enhance air movement and cross ventilation
- Shading windows, solar exposed walls and roofs where possible
- Installing and correctly positioning appropriate combinations of both reflective and bulk insulation
- Using roof spaces and outdoor living areas as buffer zones to limit heat gain

MORE INFORMATION

1. Your Home. Australia's Guide to Environmentally Sustainable Homes (Australian Government)
   http://www.yourhome.gov.au/
2. The Nationwide House Energy Rating Scheme (NatHERS) (Australian Government)
   http://www.nathers.gov.au/about
3. Townsville White Roofs Program
   http://www.whiteroofstsv.com.au/

4.8. Local Emergency Management Plans

While focusing on the prevention and preparedness components of the emergency management spectrum is considered paramount to building community resilience to heatwaves, effective emergency planning across the entire spectrum is also important. While other Australian States and Territories have historically considered and encompassed heatwaves / extreme heat events within their local emergency management arrangements, this has generally not been the case in New South Wales. Importantly however, a review of Local Emergency Management arrangements in recent years now recognises heatwaves as a potential hazard to be considered when reviewing and updating Local Emergency Management Plans (Local EMPLANs).

1. What is a Local Emergency Management Plan (Local EMPLAN)

In New South Wales Local Emergency Management Committees (LEMC) are responsible for the preparation and review of plans in relation to the prevention of, preparation for, response to and recovery from emergencies in the Local Government Area (LGA) for which it is constituted. The *State Emergency and Rescue Management (SERM) Act 1989* requires Councils to provide 'executive support' to the LEMC and Local Emergency Operations Controller (LEOCON). This role is known as the Local Emergency Management Officer (LEMO). Within this planning process, the LEMO is responsible for facilitating and collating Local EMPLANs for endorsement (NSW Government, 2015). The purpose of Local EMPLANs include (NSW Government, 2015):

- To clearly define roles and responsibilities of responders and community partners
- To demonstrate a level of preparedness by the LEMC
- To inform disaster management responses at region and state levels
- To detail how support will be co-ordinated to a combat agency and affected communities
- To provide a flexible set of arrangements that can be used a cross reference by LEMC
- To ensure compliance with the SERM Act 1989

2. Developing a Local EMPLAN

Local EMPLANs are usually developed during regular LEMC meetings. LEMC members and functional areas not normally represented on the LEMC, should be informed of the intention to hold a local emergency plan meeting and of the specific hazards that will be discussed. Planning for different hazards may occur over a number of LEMC meetings. Other stakeholders that can contribute an understanding of local resources, vulnerabilities and networks, such as local council representatives in community and environmental services should also be considered in the local emergency management planning process (NSW Government, 2015).

Engaging the community in the development of Local EMPLANs is also important. The National Strategy for Disaster Resilience Community Engagement Framework identifies community engagement in the emergency management context, as a "*process of stakeholders working together to build resilience through collaborative action, shared capacity building and the development of strong relationships built on mutual trust and respect*". This involves:

- Identifying existing community strengths, capacity and capabilities
- Sharing information in a way that is relevant and targeted to the demographic needs of the community
- Providing opportunities to promote individual and community disaster preparedness
- Including the community in the planning and decision making process

As part of the local planning process LEMCs should therefore consider local resources and seek advice from local agencies and community groups in respect to (NSW Government, 2015):

- What resources can be immediately provided locally to support emergency operations within the community?
- What resources are not available locally and may require regional/state assistance?

A Local EMPLAN must be reviewed and submitted to the Regional Emergency Management Committee (REMC) at least every three years to ensure that the plan complies with the NSW Local Emergency Management Guideline (NSW Government, 2015) guideline. This process is intended to encourage high quality plans that are consistent with the Guideline and identify whether there are opportunities to improve the proposed arrangements.

Local Emergency Management Planning Guidelines and Templates

The guidance and framework to assist LEMC's prepare Local EMPLANs in NSW is primarily guided by the following documents:

Local Emergency Management Planning Guideline	Prepared under the auspices of the State Emergency Management Plan (EMPLAN), this document aims to provide guidance and support to LEMC's to develop their Local EMPs.
Local Emergency Management Plan Template	This document provides the template structure for completing a Local EMP. It identifies 21 separate hazards as having the potential to create an emergency. Heatwave is identified as one of these hazards.
Consequence Management Guideline (CMG) Template	Provides a template structure for identifying agreed emergency management arrangements in a 'checklist' concept. The CMG template is used to develop a CMG for each hazard – generally rated as medium risk or above.

In accordance with these guidelines and templates, Local EMPLANs are broken down in three sections (NSW Government, 2015):

Part 1 – Administration (may be released to the public)
The Administration section addresses traditional elements of an emergency management plan including:

- Purpose
- Objectives
- Scope
- Principles
- Test and review process

The Local Emergency Management Officer (LEMO) or delegate has responsibility for completing this section.

Part 2 - Community Profile & Risk Assessment (may be released to the public)
The community profile assists the LEMC to understand the diverse needs, values and priorities of local community and its characteristics within the broader environment. This information is critical to inform planning and emergency operations

The assessment of emergency management risk by the LEMC is based upon the Australian/New Zealand Standard AS/NZ ISO 31000:2009 – Risk Management – Principles & Guidelines, and emergency risk management process detailed in the National Emergency Risk Assessment Guidelines. The hazards and risks that have been identified through the emergency risk management process are rated and listed. These are the types of emergencies that LEMC members are then required to plan for.

The Local EMP Planning Template identifies 21 separate hazards as having the potential to create an emergency. Heatwave is identified as one of these hazards, therefore requiring a risk assessment to be completed. Where hazards arising from heatwaves are rated as medium risk or above, a Consequence Management Guide should subsequently be prepared.

Part 3 - Consequence Management Guideline (not to be made publicly available)
A Consequence Management Guide (CMG) is a hazard specific document which provides agreed emergency management arrangements in a 'checklist' concept. This is particularly useful during the initial stages of an

emergency and provides for easy reference. A CMG should be developed for each hazard identified in the emergency risk management process. A CMG is not required where there is an endorsed local sub plan for a specific hazard. However, a CMG may also be developed where the sub plan does not fully address consequence management aspects. A CMG may be developed for both individual townships/sites or entire LGAs and to inform activities that require significant co-ordination (eg. Evacuation).

Where an agency is responsible for the planning for a particular hazard, it should ensure comprehensive consultation with members of the LEMC and other stakeholders identified as requiring actions under the sub or supporting plan.

Local Emergency Management planning is a collaborative process undertaken with the LEMC. Whilst led by the Combat Agency, the development of individual CMG requires input from LEMC members and other identified stakeholders. Discussion (or desk top) exercises are an excellent way to facilitate this planning process. Information included in the CMG includes:

General Description	Provide a short description of the hazard including recent/historic events and possible effects on the community. Select the relevant risk and risk rating using the drop down box.
Control	Specify the Combat Agency identified under EMPLAN for the hazard or the LEOCON where there is no Combat Agency. Identify where the Combat Agency Operations Centre is located.
Command/Co-ordination	Identify the LEOCON and where the Local Emergency Operations Centre (EOC) is located.
Triggers	Specify what occurrences or measures will be used to identify when these arrangements will be enacted.
Strategies	Up to five (5) key strategies may be detailed to inform outcomes required to be achieved by the EOC. These should be high level in nature and align with the actions listed in Box 6.
Actions	The table for actions should outline all the areas of impact on the community that requires a response, management decision or coordination to achieve. The primary elements that should be considered are already populated within most of the major hazard templates. There is room for the LEMC to identify other community elements within the local area for inclusion.
Recovery	Address only the key considerations that need to occur to initiate the recovery process and inform the requirement for the LEMC to meet and determine recovery committee requirements (including Impact Assessment process).
Supporting Documents	List the documents directly related to the hazard that may require referencing as part of the operational planning or response. This may include local documents as well as Regional and State level documents.
Evacuation Centres	The LEMC is required to maintain an Evacuation Centre Register, including summary and audit reports. Utilise the register to identify which evacuation centres are suitable for use with consideration to those that are outside of the hazard threat area.
Vulnerable Facilities & Infrastructure	Identify and list the vulnerable facilities (eg. schools, nursing homes) and infrastructure (eg. electricity sub stations, water treatment plants) that interface with the hazard area (ie. flood/bush fire prone areas) and may be impacted.
Notes	This section provides the ability for information, general considerations etc to be documented.
Endorsement	The LEMC Chair and LEOCON/Combat Agency representative endorse individual CMGs on behalf of LEMC members.

MORE INF0RMATION

1. National Strategy for Disaster Resilience (Australian Government)
   https://www.emergency.nsw.gov.au/media/309/1083/_/u352d6sy28s4sogkog/National-Strategy-for-Disaster-Resilience.PDF
2. National Strategy for Disaster Resilience Community Engagement Framework (Australian Government)
   https://www.emergency.nsw.gov.au/media/309/1084/_/u452c6yda7uz480oks/National-Strategy-for-Disaster-Resilience-Community-Engagement-Framework.pdf
3. Local Emergency Management Planning Guideline (NSW Government)
   https://www.emergency.nsw.gov.au/media/953/1068/_/to5gb75fysl2ckgo8c/Guideline_LocalEMPLANGuideline.pdf
4. National Emergency Risk Assessment Guidelines (Australian Government)
   http://coastaladaptationresources.org/PDF-files/1438-National-Emergency-Risk-Assessment-Guidelines-Oct-2010.PDF

4.9. Community Strategic Planning

Integrating heatwave and other natural disaster planning into the Community Strategic Plans, 4 Year Delivery Plans and Annual Implementation Plans of Councils also represents is an important strategy for ensuring that Council responsibilities for emergency management, across the entire Prevention, Preparedness, Response and Recovery spectrum, are recognised and appropriately resourced at a corporate level. However, to date, while emergency management is already an inherent part of council responsibilities, in the Hunter, Central and Mid Coast region, it has often not been recognised within these core Council planning documents.

Councils have the potential to deliver, a wide range of activities that can contribute to significantly improving the overall resilience of local communities to natural disasters, and these opportunities could easily be incorporated into Council plans and policies.

Table 5 provides examples of the range of potential activities that Councils should consider when preparing their Strategic, Delivery and Implementation Plans (NSW Government, 2012). As can be seen from these examples, there exists significant potential to embed the diversity of heatwave resilience strategies identified within this Guideline within the community strategic planning processes of councils.

Table 5. Emergency management considerations when preparing Community Strategic Plans, Four Year Delivery Plans and Annual Implementation plans.

Integrated Planning and Reporting Strategic Theme	Potential Considerations
Planning and development Land use planning to reduce hazard risk Undertake cost-effective measures to mitigate the effects of natural disasters	• Locating and designing built environments to avoid intolerable risk • Increasing societal resilience to hazards through appropriate spatial planning, development controls and design, as well as engineered mitigation options • Consider the limitations and requirements of emergency response in managing residual risk • Work with emergency services, other State agencies and insurers to promote resilient and sustainable built environments and structures • Work with emergency services, other State agencies and insurers to minimise areas of intolerable risk • Consider cumulative impact of multiple developments on losses and evacuation in large events • Work with emergency services, other State agencies and the LEMC and BFMC to include ERM considerations into future council policies, development control plans and the Local Environmental Plan
People and Places Safe and active places that are used by people	• Renewal of city centres and commercial and urban centres needs to take into account areas of hazard exposure • Consider hazards when identifying appropriate sites for future community facilities and sporting grounds.
Environment Environment and climate change risk understood and managed	• Considering the location of communities and infrastructure to minimise concentration of risk due to changes in climate extremes • Implications of changes in frequency and severity of natural disasters
Infrastructure Drainage works in forward works program	• Ensure mitigation infrastructure is identified as such in the asset management planning process, and related enhancements, maintenance and renewals are included in the Delivery Program and relevant Operational Plan • Opportunities for council to reduce risks without significant additional

Integrated Planning and Reporting Strategic Theme	Potential Considerations
Works programs to upgrade and renew infrastructure	expenditure increasing resilience and recovery • Consider the installation and maintenance programs of warning infrastructure to ensure timely advice to the community • Protect critical infrastructure - Consider the vulnerability of critical infrastructure to hazards by collating available hazard information into an asset vulnerability plan within council's Asset Management Strategy. The LEMC, BFMCs and agencies represented on these committees can provide information of key infrastructure to protect during emergencies • Consider adaptation options and foreseeable upgrade requirements in infrastructure design to accommodate future changes in exposure to hazards or increased reliance on particular assets • Consider adaptation options in infrastructure design to enable more resilient and cost effective rebuilding of infrastructure following disasters in order to limit the cost of rebuilding repeatedly damaged infrastructure • When rebuilding damaged infrastructure ensure appropriate land use review and planning takes into account risks from natural disasters for future development • Promote disaster resilient building design and materials in new developments and when rebuilding during recovery from disasters
An Engaged, Informed and Prepared Community Foster and build community resilience to disasters	• Promote community engagement and create opportunities for communities to contribute to discussion, assist in the development and implementation of solutions and to strengthen local ownership of decisions and actions • Partner with emergency services to assist in community engagement about disaster risk reduction and educate communities about preparedness across all hazards • Develop council knowledge of local community groups and networks and foster sharing this knowledge with emergency services. This information is fundamental for engagement, education and learning outcomes as well as effective recovery from disasters. • Promote business continuity planning in the business community • Through community education, promote community understanding of risk exposure and support informed decisions on what are 'acceptable risks'
Represent community interests in Emergency Management Advocacy for communities through community development	• Represent the interests of the community with emergency management agencies • Include the community in discussions and decisions about risk through targeted community engagement activities undertaken during the development of the Community Strategic Plan • Place community safety and a focus on resiliency at the core of decision making processes
Enterprise Risk Management Business continuity planning	• Detect and analyse emerging threats • Workforce continuity during response and recovery, infrastructure disruptions and a wide array of other events that may prevent employees from reaching their primary work sites • Infrastructure Hazards, IT Infrastructure, social networks, continuity of essential services, community wellbeing and quality of life • Integration with industry & business emergency arrangements • Consider the location of critical business and industry and their operational requirements during natural disasters
Planned, Resourced and Capable	• Provide support and expertise from across specialist areas of council to liaise and support the LEMO, LEMC and emergency services in their development of:

Integrated Planning and Reporting Strategic Theme	Potential Considerations
Emergency Management	• Emergency Risk Management Study • Emergency Plans • Implementation of Emergency Plans • Relevant expertise could be sourced from the following council units: • Community services and engagement • Strategic land use planning • Infrastructure and asset management • Information management • Enterprise risk management and insurance • Use the Workforce Management Planning process to consider dedicating a full-time position to emergency risk management • Provide sufficient staff and administrative resources to allow post-event data collection and analysis • Strategic Land Use Planners should undertake Risk Management Courses

MORE INFORMATION

1. Implementing Emergency Risk Management Through the Integrated Planning and Reporting Framework (Emergency NSW) https://www.emergency.nsw.gov.au/media/admin/763/_/l74w1rbo28hciscck4/Guide_ImplementingERM_20150501.pdf

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ATTACHMENT 1

LEGISLATIVE, POLICY AND PLANNING CONTEXT FOR HEATWAVE PLANNING

Policy, Strategy, Guideline	Context
Commonwealth Government	
Protecting Human Health and Safety during severe and extreme heat events – A National Framework (2011)	Identifies the following principles for managing severe and extreme heat events: 1. Prioritising individuals, communities and locations most at risk. 2. Recognising regional differences and circumstances, and harnessing the actual and latent capacity of social networks and local institutions. 3. Recognising interdependencies between planning, prevention, preparedness, response and recovery. 4. Enabling a response that is integrated (using appropriate segments of the community and levels of government) and that is scalable (recognising that the impacts of heat can be severe and extreme). 5. Management strategies need to be affordable and achievable.
National Strategy for Disaster Resilience	Identifies that a disaster resilient community is one where: 1. People understand the risks that may affect them and others in their community 2. People have taken steps to anticipate disasters and to protect themselves their assets and their livelihoods 3. Emergency management plans are resilience based, to build resilience within communities over time 4. Land use planning systems and building control arrangements reduce, as far as practicable, community exposure to unreasonable risks from known hazards, and suitable arrangements are implemented to protect life and property 5. Business and other service providers undertake wide reaching business continuity planning that links with their security and emergency management arrangements
State Government	
NSW 2021	*Goal 28* – Ensure NSW is ready to deal with major emergencies and natural disasters *Target* – Ensure NSW has appropriate arrangements in place to respond to and recover from natural disasters
State Heatwave Sub Plan (2011)	Details the control and coordination arrangements for the preparation for, response to, and immediate recovery from a heatwave event. The plan identifies: • The preservation of human health as being the primary focus of heatwave response in NSW. • That heatwaves are estimated to cause more deaths in Australia than any other natural hazard except disease • Certain groups are especially vulnerable including; the elderly, infants and young children, people with chronic medical problems or taking certain medications, those who are socially isolated and people who work outdoors • The roles and responsibilities for organisations in the event of a Heatwave.
NSW Health Disaster Risk Management Guidelines (NSW Health, 2009)	Identifies the role of NSW Health as providing "*a coordinated health communications response for prevention, preparation, emergency response and subsequent recovery from the impacts*"
NSW Health Policy Directive – Healthplan (NSW Health, 2009)	Identifies that: • Public Health Services are responsible for "coordinating the public health services response for prevention, preparation, emergency response and subsequent recovery from the public health impacts of an emergency" • Health Communications are responsible for `coordinating the communications response for prevention, preparation, emergency response and subsequent recovery from an emergency

Policy, Strategy, Guideline	Context
Implementing Emergency Risk Management Through the Integrated Planning and Reporting Framework (Ministry for Police & Emergency Services, 2012)	Provides guidance to Councils for integrating emergency risk management into planning and strategies when developing Community Strategic Plans and the supporting Delivery Program, Operational Plan, Resource Strategy and other documents required as part of the Integrated Planning and Reporting Framework. Provides a list of considerations for considering natural disasters that are directly relevant to heatwave planning in respect to: planning and development; people and places; environment; infrastructure; transport; and engaged and prepared communities.
NSW Beat the Heat Program (NSW Health 2011)	This NSW Health Education Program provides a range of information to assist the community: • Prepare for and stay healthy during heatwaves • Recognise and treat heat-related illness, • Care for people who are at risk of heat-related illness.
Central Coast Heatwave Pilot Project. (NSW Health, 2008)	Recommendations arising from this pilot project included: • Development of heatwave plans at the local level; • NSW Health working with local government & other agencies to develop responses targeting high risk groups at a local level; • Progressing long term adaptation to heatwaves and climate change through building design and greening the built environment.
Work, Health and Safety Act 2012	• Requires councils to provide a safe working environment (Wilson, L. 2013)
Public Health Act 2010 and *State Emergency and Rescue Management Act 1989*	• Council Environmental Health Officers are required to manage areas that could be affected by extreme heat (including food safety, public safety and environmental risk and emergency / disaster management) (Wilson, 2013)
Local Government	
Lake Macquarie Community Strategic Plan 2013-23	*Priority*: • A community that is resilient and prepared for threats from the environment *Strategies*: • Increase preparedness for natural disasters • Increase capacity to adapt to climate change
Lake Macquarie `*Be Ready Be Safe*' campaign	A community education campaign to communicate and promote preparedness for natural disasters in the community (including heatwaves).
Lake Macquarie Environmental Security Assessment (Cardno, 2010)	Identifies following management goals for reducing the number of deaths associated with heatstroke within the city: • 10% reduction in annual cost by 2019 • 12% reduction in annual cost by 2023 • 15% reduction in annual cost by 2029 • 30% reduction in annual cost by 2049 The report identified the following management strategies for implementation by Council: 1. Development Control Plans to incorporate heat reduction measures (e.g. awnings, reduced hard stand etc.) and to emphasise the provision of bubblers

Policy, Strategy, Guideline	Context
	2. Identify current and future funding streams available to help adoption of sustainable technologies (e.g. air conditioning units in nursing homes, schools etc). Educate individuals as to the availability of funding. 3. Liaise with emergency service providers to encourage residents to sign up to Early Warning Network Alert service 4. Liaise with Hunter New England Health to support mobile health units during heatwaves, particularly to disadvantaged areas 5. Upgrade public transport, recreational facilities etc to provide adequate shade, air conditioning etc.
Wyong Community Strategic Plan 2030 (revised 2013)	*Goal* • Communities will be vibrant, caring and connected *Strategies* • Ensuring communities are safe • Providing and maintaining a range of community programs focused on community development, recreation, culture, environment, education and other issues • Supporting people in the community to lead healthy, active lifestyles • Maintaining and making available information about the environment and environmental change • Community awareness of sustainability and environmental issues impacting Wyong Shire
Community Plan 2025 (updated 2013)	*Goal* • Our health and wellbeing provide for a satisfying and productive life (& include consideration of a changing climate) *Strategy* • Manage the impacts to humans and the environment from pollution (including climate change impacts) *Direction* • Increase awareness of the impact of climate change • Increase in resident's ability to get help from friends, family and neighbours in time of need
Case Study 2: Potential Impacts of Climate Change on Extreme Heat Events Affecting Public Health in the Hunter, Lower North Coast and Central Coast Region (HCCREMS, 2010).	Provides recommendations for adapting to projected increases in frequency and intensity of extreme heat events that include: • Development and implementation of Heat Management Plans • Integration of Extreme Heat Events into Disaster Management Plans • Improved interventions to increase coverage and support for socially isolated / vulnerable groups • Improved building design • Greening of the built environment
Coastal Councils Adaptation Plan (HCCREMS, 2010).	Identified following risks to councils and their communities: • Community anxiety associated with extreme climate events & expectation of council engagement and direction • Increase in heat stress in broader community especially amongst vulnerable groups • Increased exposure to heat stress in council run facilities The following adaptation responses are identified: • Development of a regional heatwave plan for the Hunter, Central & Lower North

Policy, Strategy, Guideline	Context
	Coast; • Delivery of research to understand risk perceptions in vulnerable communities; • Delivery of education campaigns to increase household preparedness to heatwaves; and • Reviewing design standards for community facilities to provide cool spaces during heatwaves.

ATTACHMENT 2.

EXAMPLES OF REGIONAL "BEAT THE HEAT" COMMUNICATION RESOURCES TARGETING "ALL OF COMMUNITY"

Beat the Heat

You can Beat the Heat this summer by following four easy steps

DRINK PLENTY OF WATER and avoid alcoholic, hot or sugary drinks

KEEP COOL - do less and avoid being outside during the hottest part of the day

CHECK ON elderly friends, neighbours and relatives, especially if they live alone

HAVE A PLAN for how to stay cool when it heats up

Know the early signs of heat related illness

Dizziness, fainting

Tiredness

Thirst

Bright or dark yellow urine

Take steps to avoid it reaching dangerous levels.
Move somewhere cool and drink water.
If you start to feel unwell, seek medical advice.

Stay well and enjoy summer

Health NSW Central Coast Local Health District
Health NSW Hunter New England Local Health District

To find out more about ways to beat the heat visit www.health.nsw.gov.au/environment/beattheheat
Funded by the NSW Government under the Community Resilience Innovation Program

Beat the Heat

Heatwaves or long periods of extreme heat can have serious impacts on your health. They are a major cause of health problems every summer in Australia.

You can Beat the Heat by following four easy steps

DRINK PLENTY OF WATER
and avoid alcoholic, hot or sugary drinks

KEEP COOL
do less and avoid being outside during the hottest part of the day

CHECK ON
elderly friends, neighbours and relatives, especially if they live alone

HAVE A PLAN
for how to stay cool when it heats up

Know the early signs of heat related illness

- dizziness, fainting
- tiredness
- thirst
- bright or dark yellow urine

Take steps to prevent it reaching dangerous levels. Move somewhere **cool** and **drink water**. If you start to feel unwell, seek medical advice.

Learn more about how to Beat the Heat this summer at www.health.nsw.gov.au/environment/beattheheat

NSW Health

NEWSLETTER ARTICLE

Stage 1 Messages: General Community Awareness

These messages seek to raise general community awareness of heatwave / extreme heat impacts and preparedness and would be issued periodically during the lead up to and during summer.

Beat the Heat this Summer!

Many of us simply don't realise that extreme heat is a major cause of health problems every year in Australia, with heatwaves causing more hospitalisations and deaths than any other natural disaster.

In addition to heat stress, heat exhaustion and heat stroke, heatwaves can seriously worsen existing health conditions including cardiac disease, mental health and behavioural disorders, asthma and obstructive lung conditions.

This summer, it is time we all started to take heat related illness seriously.

Four simple actions we can all take to protect ourselves against heat related illness are:

- **Drink plenty of water** and avoid alcoholic, hot or sugary drinks
- **Keep Cool** – do less and avoid being outside during the hottest part of the day
- **Check on** elderly friends, neighbours and relatives, especially if they live alone
- **Have a Plan** for how to stay cool when it heats up

To make your home more comfortable during hot weather keep windows, blinds and curtains closed during the heat of the day to keep the heat out. If you have an air conditioner, reduce running costs by setting it to 24 degrees, and turn it on before the room heats up so it doesn't have to work as hard.

If it gets too hot at home have a plan of where else you might go to stay cool and how to get there safely. Swimming pools, community centres, public libraries and galleries are great low-cost places to beat the heat during the hottest part of the day, as are shopping centres, cinemas and restaurants.

[Freely accessed public facilities registered as `Cool Spots' in the (INSERT COUNCIL AREA NAME) include (INSERT FACILITY NAMES) and will be open as normal (INSERT OPERATING HOURS)]

It is also very important to know the **early** signs of heat related illness:

- tiredness
- thirst
- bright or dark yellow urine
- dizziness or fainting.

If you or others experience any of these symptoms take steps to prevent it reaching dangerous levels. Move somewhere cool, drink water or diluted fruit juice (1 part juice in 4 parts water) and avoid tea, coffee or alcohol. If symptoms worsen, seek medical advice.

To find out more about ways to beat the heat and be prepared during a heatwave visit www.health.nsw.gov.au/environment/beattheheat

WEBSITE CONTENT

Stage 1 Messages: General Community Awareness

These messages seek to raise general community awareness of heatwave / extreme heat impacts and preparedness and would be issued periodically during the lead up to and during summer.

Beat the Heat This Summer!

Heatwaves, or long periods of extreme heat, can have serious impacts on your health.

Heatwaves are a major cause of health problems every summer in Australia.

Heat related illness includes dehydration, heat stroke and heat cramps, while extreme heat can also seriously worsen existing health conditions including cardiac disease, mental health and behavioural disorders, asthma and obstructive lung conditions.

Four easy actions everyone can take to protect their health during heatwave / extreme heat events include:

Drink plenty of water and avoid alcoholic, hot or sugary drinks
Keep Cool – do less and avoid being outside during the hottest part of the day
Check on elderly friends, neighbours and relatives, especially if they live alone
Have a Plan for how to stay cool when it heats up

Find out more about what you can do beat the heat this summer:

- Families [LINK TO CONTENT BELOW]
- The Elderly and people with a Disability [LINK TO CONTENT BELOW]
- Rural and Isolated Communities [LINK TO CONTENT BELOW]
- Medication impacts [LINK TO CONTENT BELOW]

Families with Young Children

Babies and young children are more susceptible to the heat than the general community because they cannot adjust to changes in temperature as well as adults. They also sweat less, which reduces their ability to cool down, and they generate more heat during exercise than adults.

This increases their risk of overheating and developing a heat-related illness. The heat can also worsen existing conditions.

To beat the heat parents and carers of children under five years of age should:

- Make sure babies, children and breastfeeding mums are getting plenty of fluids.
- Breast or bottle feed babies more often (babies are getting enough fluids if they have 6-8 pale wet nappies in a 24-hour period)
- Offer older children drinks, preferably water, more often.
- Dress the family in cool, loose clothing
- Never leave people or pets in the car
- Plan active or outdoor activities for the coolest times of day
- If going into the sun wear a hat and sunscreen, even if only for short periods.

Know the signs of heat related illness in babies and children, such as

- looking unwell and more irritable than usual
- pale and clammy skin
- sleepy and floppy

- fewer wet nappies than usual
- dark urine (normal is light straw colour)
- refusing to drink
- intense thirst
- dry skin, mouth and eyes (no tears when crying) or
- the soft spot on a baby's head (fontanelle) may be lower than usual.

If you think your baby or young child is suffering from heat exhaustion, seek medical advice.

Move the child to a cool area and remove all extra clothes, if conscious and able to drink give then small sips of cool fluid and bring their temperature down using any method available (sponging with cool water, cool bath or covering with cool damp cloths).

For more information go to the NSW Health Beat the Heat website -
http://www.health.nsw.gov.au/environment/beattheheat

The Elderly and People with a Disability

The elderly and people with a disability are particularly susceptible to extreme heat. It is recommended people from these groups stay in regular contact with family, friends, carers or neighbours as temperatures rise so that they know you are okay or can provide help if needed. Make sure they also know your plan to manage during the heat.

Other important ways to Beat the Heat:

1. Prepare your home, or part of your home as cool retreat
    - To make your home more comfortable during the heat of the day, keep blinds and curtains closed to keep the heat out. If it is safe to do so, open them again in the evening or when the temperature drops to help cool down the house
    - Set air conditioners to 24 degrees to reduce running costs, and turn on before the room heats up so it doesn't have to work as hard.

2. Think about your medications
    - Some medications can increase the risk of heat related illness
    - Some medications can be less effective or occasionally more toxic when exposed to and stored in high temperatures
    - Most medications need to be stored below 25°C or in the fridge if indicated. This applies particularly to antibiotics, adrenergic drugs, insulin, analgesics and sedatives.
    - Talk to your doctor about the correct use and storage of your medications and any affects they may have on you during hot weather.

3. Know the early signs of heat related illness:
    - dizziness, fainting
    - tiredness
    - thirst
    - bright or dark yellow urine.

Take steps to prevent it reaching dangerous levels. Move somewhere cool, drink water or diluted fruit juice (1 part juice in 4 parts water). Avoid tea, coffee or alcohol. If you start to feel unwell, seek medical advice.

For more information go to the NSW Health Beat the Heat website -
http://www.health.nsw.gov.au/environment/beattheheat]

Rural and Isolated communities

Those living in rural or isolated communities can be especially at risk during heatwaves due to their isolation from services and the often physical, outdoor nature of their work. It is therefore important to stay in regular contact with family and friends as temperatures rise.

If you live in a rural or isolated area it is important to prepare early for a heatwave:

- Plan your work and chores for cooler days and the coolest times of the day
- Plan to keep livestock cool, fed and in the shade
- Have a back up plan in case you lose power or water during a heatwave
- Stock up on food and water for both people and livestock so you don't need to head out during the heat of the day
- Check your medications (and also those for animals and livestock) are stored in a cool, dark place (generally below 25°C is recommended)
- Speak to your doctor about any affects medications may have on you during hot weather.

Know the early signs of heat related illness:

- dizziness, fainting
- tiredness
- thirst
- bright or dark yellow urine.

Take steps to prevent it reaching dangerous levels. Move somewhere cool, drink water or diluted fruit juice (1 part juice in 4 parts water). Avoid tea, coffee or alcohol. If you start to feel unwell, seek medical advice.

For more information go to the NSW Health Beat the Heat website - http://www.health.nsw.gov.au/environment/beattheheat]

Medication impacts

Heat can have a direct impact on medications, making them less effective or occasionally more toxic when exposed to and stored in high temperatures.

Some medications can also increase the risk of heat related illness.

Most medications need to be stored below 25°C or in the fridge if indicated. This applies particularly to antibiotics, adrenergic drugs, insulin, analgesics and sedatives – so check your medications for details.

If you transfer you medicines to a pill box or Webster pack make sure these are stored in a suitable location. Keeping on the window sill or top of the fridge during a heatwave is probably not the best location.

Talk to your doctor about the correct use and storage of your medications and any affects they may have on you during hot weather.

Know the early signs of heat related illness:

- dizziness, fainting
- tiredness
- thirst
- bright or dark yellow urine.

Take steps to prevent it reaching dangerous levels. Move somewhere cool, drink water or diluted fruit juice (1 part juice in 4 parts water). Avoid tea, coffee or alcohol. If you start to feel unwell, seek medical advice.

For more information about medications go to the NSW Health Beat the Heat website - http://www.health.nsw.gov.au/environment/beattheheat/Pages/information-for-health-professionals.aspx#medication

COMMUNITY SERVICE ANNOUNCEMENTS

Stage 1 Messages: General Community Awareness

These messages seek to raise general community awareness of heatwave / extreme heat impacts and preparedness and would be issued periodically during the lead up to and during summer.

Beat the Heat this Summer!

Many of us simply don't know that extreme heat is a major cause of health problems in Australia.

The fact is, more Australians are hospitalised and die as a result of heatwave than any other natural disaster.

Beat the Heat this summer.

Drink plenty of water and avoid alcoholic, hot or sugary drinks

Keep Cool – do less and avoid being outside during the hottest part of the day

Check on elderly friends, neighbours and relatives, especially if they live alone

Have a Plan for how to stay cool when it heats up

Find out more at health.nsw.gov.au/environment/beattheheat

Stage 2 Messages: Heatwave / Extreme Heat Conditions Forecast

These messages are for issuing in the days preceding a forecast heatwave / extreme heat event to encourage preparatory action by the target audience.

Heatwave Conditions Forecast

A heatwave is forecast to hit the region in the coming days.

Many Australian simply don't know that heat is a major cause of health problems. The fact is, more Australians are hospitalised or die as a result of heatwave than any other natural disaster.

Beat the Heat this summer – Drink plenty of water, keep cool by doing less and avoid being outside during the hottest part of the day, check on family, friends and neighbours, especially the elderly, and make a plan for how you will stay cool before the heat arrives.

Keep your home cool by closing windows, curtains and blinds during the hottest parts of the day. Stock up now on things you might need, like water, food and medicines, so you can avoid going out during the heat.

To find out more visit www.health.nsw.gov.au/environment/beattheheat

Stage 3 Messages: Heatwave / Extreme Heat Conditions Occurring

These messages are for issuing during a heatwave / extreme heat event to encourage immediate and direct action by the target audience to protect health and safety.

Heatwave / Extreme Heat Alert

Heatwave conditions have arrived in our region.

Keep your home cool by closing windows, curtains and blinds during the hottest parts of the day.

Know the early signs of heat related illness – tiredness, thirst, bright or dark yellow urine and sometimes dizziness or fainting, and take steps to prevent it reaching dangerous levels.

Move somewhere cool, drink water or diluted fruit juice (1 part juice in 4 parts water) and avoid tea, coffee or alcohol. If you start to feel unwell, seek medical advice.

Drink plenty of water and avoid alcoholic, hot or sugary drinks
Keep Cool – do less and avoid being outside during the hottest part of the day
Check on elderly friends, neighbours and relatives, especially if they live alone
Have a Plan for how to stay cool when it heats up

Find out more about ways to beat the heat at health.nsw.gov.au/environment/beattheheat

E-MAIL ALERTS

Stage 2 Messages: Heatwave / Extreme Heat Conditions Forecast

These messages are for issuing in the days preceding a forecast heatwave / extreme heat event to encourage preparatory action by the target audience.

Subject line: Heatwave Alert - Prepare for Extreme Heat Conditions

Body text
The Bureau of Meteorology (BOM) is forecasting heatwave conditions in the coming days.

Heatwaves pose a serious risk to human health.

Be prepared:

- **Drink plenty of water** and avoid alcoholic, hot or sugary drinks
- **Keep Cool** – do less and avoid being outside during the hottest part of the day
- **Check on** elderly friends, neighbours and relatives, especially if they live alone
- **Have a Plan** for how to stay cool when it heats up

Know the early signs of heat related illness - dizziness, fainting, tiredness, thirst, bright or dark yellow urine. If you or others experience any of these symptoms take steps to prevent it reaching dangerous levels. Move somewhere cool and drink water. If you start to feel unwell, seek medical advice.

Other things you can do:

- Cool your house by shading windows, shutting curtains and, if its safe to do so, opening windows at night to let in cool air
- Stock up on food, water or medications to avoid having to go out in the heat
- If you think it will be too hot at home, plan where else you might go to stay cool. For example local libraries, swimming pools, galleries, shopping centres and cinemas. Try to go early so you're not outside in the heat of the day.
- Check your medications are stored correctly. Most medications need to be stored below 25°C or in the fridge if indicated. This applies particularly to antibiotics, adrenergic drugs, insulin, analgesics and sedatives.
- Talk to your doctor about the correct use and storage of your medications and any affects they may have on you during hot weather

More Information:
How to prepare for a heatwave: www.health.nsw.gov.au/environment/beattheheat

Bureau of Meteorology weather forecasts
http://www.bom.gov.au/

Stage 3 Messages: Heatwave / Extreme Heat Conditions Occurring

These messages are for issuing during a heatwave / extreme heat event to encourage immediate and direct action by the target audience to protect health and safety.

Subject line: Heatwave Alert – Protect your health

Body text
Heatwave conditions are now occurring in the region.

Heat related illness is major cause of health problems for Australians every summer. To reduce health impacts:

- **Drink plenty of water** and avoid alcoholic, hot or sugary drinks
- **Keep Cool** – do less and avoid being outside during the hottest part of the day
- **Check on** elderly friends, neighbours and relatives, especially if they live alone
- **Have a Plan** for how to stay cool when it heats up

Other things you can do:

- Cool your house by shading windows, shutting curtains and, if its safe to do so, opening windows at night to let in cool air
- If you have an air conditioner, reduce running costs by setting it to 24 degrees and turning it on before the room heats up.
- Spend time in a cool place like local libraries, swimming pools, galleries, shopping centres or cinemas. Try to go early so you're not outside in the heat of the day.
- Check your medications are stored correctly. Most medications need to be stored below 25°C or in the fridge if indicated.

Know the early signs of heat related illness - dizziness, fainting, tiredness, thirst, bright or dark yellow urine. If you or others experience any of these symptoms take steps to prevent it reaching dangerous levels. Move somewhere cool and drink water. If you start to feel unwell, seek medical advice.

Try some vintage cooling methods:

- Suck on ice cubes
- Wipes your arms, face and neck down with a cool, wet cloth
- Pop your feet in a basin of cool water
- Put a bowl of ice cubes in front of a fan to create a cool breeze.

More Information:
What to do during a heatwave: www.health.nsw.gov.au/environment/beattheheat

Bureau of Meteorology weather forecasts
http://www.bom.gov.au/

SMS / TEXT ALERTS

Stage 2 Messages: Heatwave / Extreme Heat Conditions Forecast

These messages are for issuing in the days preceding a forecast heatwave / extreme heat event to encourage preparatory action by the target audience.

Short (160 Character) SMS / Text Alert
Heatwave conditions are forecast
Be prepared to protect your health
Tips to beat the heat
www.health.nsw.gov.au/environment/beattheheat
www.bom.gov.au

Long SMS / Text Alert
The Bureau of Meteorology is forecasting heatwave conditions in the coming days. Heatwaves pose a serious risk to health. Be prepared:

- Drink plenty of water
- Keep Cool – do less and avoid being outside during the hottest part of the day
- Check on elderly friends, neighbours and relatives
- Have a Plan for how to stay cool when it heats up

More information:
www.health.nsw.gov.au/environment/beattheheat
www.bom.gov.au/

Stage 3 Messages: Heatwave / Extreme Heat Conditions Occurring

These messages are for issuing during a heatwave / extreme heat event to encourage immediate and direct action by the target audience to protect health and safety.

Short (160 Character) SMS Alert
The region is experiencing heatwave conditions
Drink plenty of water
Keep cool
Check on others
More tips
www.health.nsw.gov.au/environment/beattheheat
www.bom.gov.au

Long SMS / Text Alert
The region is experiencing heatwave conditions. To reduce serious health risks:

- Drink plenty of water
- Keep Cool – do less and avoid being outside during the hottest part of the day
- Check on elderly friends, neighbours and relatives, especially if they live alone
- Know the early signs of heat related illness - dizziness, fainting, tiredness, thirst, bright or dark yellow urine. If you start to feel unwell, seek medical advice.

More information:
www.health.nsw.gov.au/environment/beattheheat
www.bom.gov.au/

SOCIAL MEDIA POSTS

Stage 1 Messages: General Community Awareness *These messages seek to raise general community awareness of heatwave / extreme heat impacts and preparedness and would be issued periodically during the lead up to and during summer.*		
Post	**Image**	**Link**
Heatwaves or long periods of extreme heat can have serious impacts on your health. They are a major cause of health problems every year in Australia. Do you know how to Beat the Heat this summer?	Campaign logo "Beat the Heat" Image of `All of Community' poster / flyer	http://www.hccrems.com.au/wp-content/uploads/2016/05/all-community-dl-flyer-final.pdf www.health.nsw.gov.au/environment/beattheheat
Know the four easy steps to Beat the Heat – Drink plenty of water, Keep Cool, Check on Others and Have a plan.	"Beat the Heat" logo Image of `All of Community' poster / flyer	www.health.nsw.gov.au/environment/beattheheat http://www.hccrems.com.au/wp-content/uploads/2016/05/community-poster-final.pdf
Drink plenty of water to Beat the Heat – avoid alcoholic, hot or sugary drinks	Info graphic / picture of someone drinking	www.health.nsw.gov.au/environment/beattheheat
Keep Cool - do less and avoid being outside during the hottest part of day to Beat the Heat. Surely you've earned a rest!	Pic of someone resting on couch	www.health.nsw.gov.au/environment/beattheheat
Have a plan for how to stay cool when it heats up.	Pic of kids in pool	www.health.nsw.gov.au/environment/beattheheat
Check on elderly friends, neighbours and relatives, especially if they live alone.	Pic of Grandparents on the phone	www.health.nsw.gov.au/environment/beattheheat
Prepare a cool zone in your home, but if it gets too hot at home have a plan of where else you might go to stay cool	Pic of Fan	www.health.nsw.gov.au/environment/beattheheat
Know where you can go to beat the heat. Local libraries, community centres swimming pools and galleries are great low-cost spots to cool down. Shopping centres, cinemas and restaurants are also all great places to beat the heat.	Pic of people in a `cool spot' Cool Spot poster image	http://www.hccrems.com.au/wp-content/uploads/2016/05/cool-spots-poster-final.pdf Website info on local cool spot locations (eg Council websites) [WHERE AVAILABLE]
Know the early signs of heat related illness – dizziness, fainting, tiredness, thirst, bright or dark yellow urine. Take steps to prevent it reaching dangerous levels. Move somewhere cool and drink water. If you start to feel unwell, seek medical advice.	Pic of person looking sweaty, feeling unwell Image of urine colour chart poster	www.health.nsw.gov.au/environment/beattheheat http://www.hccrems.com.au/wp-content/uploads/2016/05/are-you-drinking-enough-poster-final.pdf
Stage 2 Messages: Heatwave / Extreme Heat Conditions Forecast *These messages are for issuing in the days preceding a forecast heatwave / extreme heat event to encourage preparatory action by the target audience.*		
Post	**Image**	**Link**
The Bureau of Meteorology is forecasting heatwave conditions in the coming days.	Image of a checklist	www.health.nsw.gov.au/environment/beattheheat

Stage 1 Messages: General Community Awareness *These messages seek to raise general community awareness of heatwave / extreme heat impacts and preparedness and would be issued periodically during the lead up to and during summer.*		
Post	**Image**	**Link**
Heatwaves or long periods of extreme heat cause serious health impacts every year in Australia. Are you prepared?		www.bom.gov.au
Beat the Heat! – Drink plenty of water, keep cool (do less and avoid being outside during the heat), check on elderly friends, neighbours and relatives, and Have a Plan for how to stay cool when it heats up.	Campaign logo "Beat the Heat" Image of Beat the Heat flyer / poster	www.health.nsw.gov.au/environment/beattheheat http://www.hccrems.com.au/wp-content/uploads/2016/05/community-poster-final.pdf
A heatwave is forecast, stock up on water, food and medications now, so you don't have to head out when it heats up!	Pic of full grocery bags	www.health.nsw.gov.au/environment/beattheheat
Just like with storms, floods and fires prepare, or check your emergency kit is ready. This should include a torch, radio, batteries, matches, candle or lanterns that are easy to access if you lose power	Pic of emergency kit	www.health.nsw.gov.au/environment/beattheheat
Start making ice or icy treats and freeze ice packs, to help you stay cool during the heatwave.	Pic of kids eating ice/frozen fruit	www.health.nsw.gov.au/environment/beattheheat
Check your fridge and freezer are operating properly to prevent food spoiling or even worse, food poisoning	Pic of fridge or fridge thermometer	www.health.nsw.gov.au/environment/beattheheat
Beat the Heat - Bottle water, or buy water, just in case water supply is lost during the heatwave	Pics of water bottles	www.health.nsw.gov.au/environment/beattheheat
Beat the Heat - Bottle water, or buy water, just in case water supply is lost during the heatwave	Pics of water bottles	www.health.nsw.gov.au/environment/beattheheat
Did you know that closing windows, curtains and blinds can help keep your house cool during the heat of the day?	Pic of drawn curtains	www.health.nsw.gov.au/environment/beattheheat
Make sure you never leave people, children or pets in the car, not even for a minute. It takes just minutes for a stationary car to become dangerously hot.	Pic of car in sun/hot car	www.health.nsw.gov.au/environment/beattheheat
Know where you can go to beat the heat. Local libraries, community centres swimming pools and galleries are great low-cost spots to cool down. Shopping centres, cinemas and restaurants are also all great places to beat the heat.	Pic of people in a `cool spot' Cool spots poster image	http://www.hccrems.com.au/wp-content/uploads/2016/05/cool-spots-poster-final.pdf Website info on local cool spot locations (eg Council websites) [WHERE AVAILABLE]
Most medications need to be stored below 25°C or in the fridge if indicated. Heat can have a direct impact on medications, making them less effective or occasionally more toxic	Info graphic medical cross	www.health.nsw.gov.au/environment/beattheheat

Stage 1 Messages: General Community Awareness *These messages seek to raise general community awareness of heatwave / extreme heat impacts and preparedness and would be issued periodically during the lead up to and during summer.*		
Post	**Image**	**Link**
when exposed to and stored in high temperatures.		
Do you store medications in a pill box or Webster Pack? If so, make sure they are kept in a suitable place. When it heats up the window sill or top of the fridge is not a good location.	Pic of Webster Pack	www.health.nsw.gov.au/environment/beattheheat
Know the early signs of heat related illness: dizziness or fainting, tiredness, thirst and bright or dark yellow urine. Take steps to prevent it reaching dangerous levels. Move somewhere cool and drink water. If you start to feel unwell, seek medical advice.	Pic of person looking sweaty, feeling unwell Image of urine colour chart poster	www.health.nsw.gov.au/environment/beattheheat http://www.hccrems.com.au/wp-content/uploads/2016/05/are-you-drinking-enough-poster-final.pdf

Stage 3 Messages: Heatwave / <u>Extreme Heat Conditions Occurring</u> *These messages are for issuing <u>during a heatwave / extreme heat event</u> to encourage immediate and direct action by the target audience to protect health and safety.*		
Post	**Image**	**Link**
The region is experiencing heatwave conditions. Heatwaves or long periods of extreme heat cause serious health impacts every year in Australia. Take steps to protect your health.	"Beat the Heat" logo Image of `All of Communities' DL flyer or poster	www.health.nsw.gov.au/environment/beattheheat www.bom.gov.au http://www.hccrems.com.au/wp-content/uploads/2016/05/all-community-dl-flyer-final.pdf
Beat the Heat! – Drink plenty of water, keep cool (do less and avoid being outside during the heat), and check on elderly friends, neighbours and relatives.	Campaign logo "Beat the Heat" Image of Beat the Heat flyer / poster	www.health.nsw.gov.au/environment/beattheheat http://www.hccrems.com.au/wp-content/uploads/2016/05/community-poster-final.pdf
Beat the Heat! - DRINK plenty of WATER and avoid alcoholic, hot or sugary drinks	Pic of someone drinking water	www.health.nsw.gov.au/environment/beattheheat
Beat the Heat! - Do less and avoid going outside during the hottest part of day. Surely you've earned a rest!	Pic of someone resting on couch or in the shade	www.health.nsw.gov.au/environment/beattheheat
Beat the Heat! - check on friends and family, especially the elderly, to make sure they are okay.	Pic of Grand parents on the phone	www.health.nsw.gov.au/environment/beattheheat
Enjoy ice or icy treats and freeze ice packs, to help you stay cool during the heatwave.	Pic of kids eating ice/frozen fruit	www.health.nsw.gov.au/environment/beattheheat
Check your fridge and freezer are operating properly to prevent food spoiling or even worse, food poisoning	Pic of fridge or fridge thermometer	www.health.nsw.gov.au/environment/beattheheat
Never leave people, children or pets in the car, not even for a minute. It takes just minutes for a stationary car to become dangerously hot.	Car in sun/hot car	www.health.nsw.gov.au/environment/beattheheat
Always wear a hat and sunscreen if you need to go outside – even for short periods	Pic of someone in a wide brimmed hat	www.health.nsw.gov.au/environment/beattheheat
Are you Retro cool? Suck on ice cubes.		www.health.nsw.gov.au/environment/beattheheat
Are you Retro cool? Pop your feet in a basin of cool water		www.health.nsw.gov.au/environment/beattheheat
Are you Retro cool? Wipe your face, neck and arms with a damp, cool cloth.		www.health.nsw.gov.au/environment/beattheheat
Are you Retro cool? Put a bowl of ice cubes in front of a fan to make a cool breeze.		www.health.nsw.gov.au/environment/beattheheat
Are you retro cool? Keep your house cool by closing windows, blinds and curtains during the heat then open it up to ventilate when it		www.health.nsw.gov.au/environment/beattheheat

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cools down outside		
Know the early signs of heat related illness: • dizziness, fainting • tiredness • thirst • bright or dark yellow urine. Take steps to prevent it reaching dangerous levels. Move somewhere cool and drink water. If you start to feel unwell, seek medical advice.	Pic of person looking sweaty, feeling unwell Image of urine colour chart poster	www.health.nsw.gov.au/environment/beattheheat http://www.hccrems.com.au/wp-content/uploads/2016/05/are-you-drinking-enough-poster-final.pdf
Are you working or exercising outside, even though it's hot? Make sure you drink plenty of water, and if you can plan activity for cooler times of day	Pic of someone exercising	www.health.nsw.gov.au/environment/beattheheat
Be cool, dress cool in loose, light coloured clothing		www.health.nsw.gov.au/environment/beattheheat
Is the heat is making you sick? Take the health impacts of heatwaves seriously - if you start to feel unwell, seek medical advice.		www.health.nsw.gov.au/environment/beattheheat
How are you beating the heat?		www.health.nsw.gov.au/environment/beattheheat
Too hot at home? Local libraries, community centres swimming pools and galleries are great low-cost spots to cool down. Shopping centres, cinemas and restaurants are also all great places to beat the heat.	Pic of people in a `cool spot' Cool spots poster image	Website info on local cool spot locations (eg Council websites) [WHERE AVAILABLE]
Heading out – always take water with you	Pic of water bottle	www.health.nsw.gov.au/environment/beattheheat
Most medications need to be stored below 25°C or in the fridge if indicated. Heat can have a direct impact on medications, making them less effective or occasionally more toxic when exposed to and stored in high temperatures.	Info graphic medical cross Pic of medications	www.health.nsw.gov.au/environment/beattheheat
Do you store medications in a pill box or Webster Pack? If so, make sure they are kept in a suitable place. The window sill or top of the fridge is not a good location during a heatwave.	Pic of Webster Pack	www.health.nsw.gov.au/environment/beattheheat