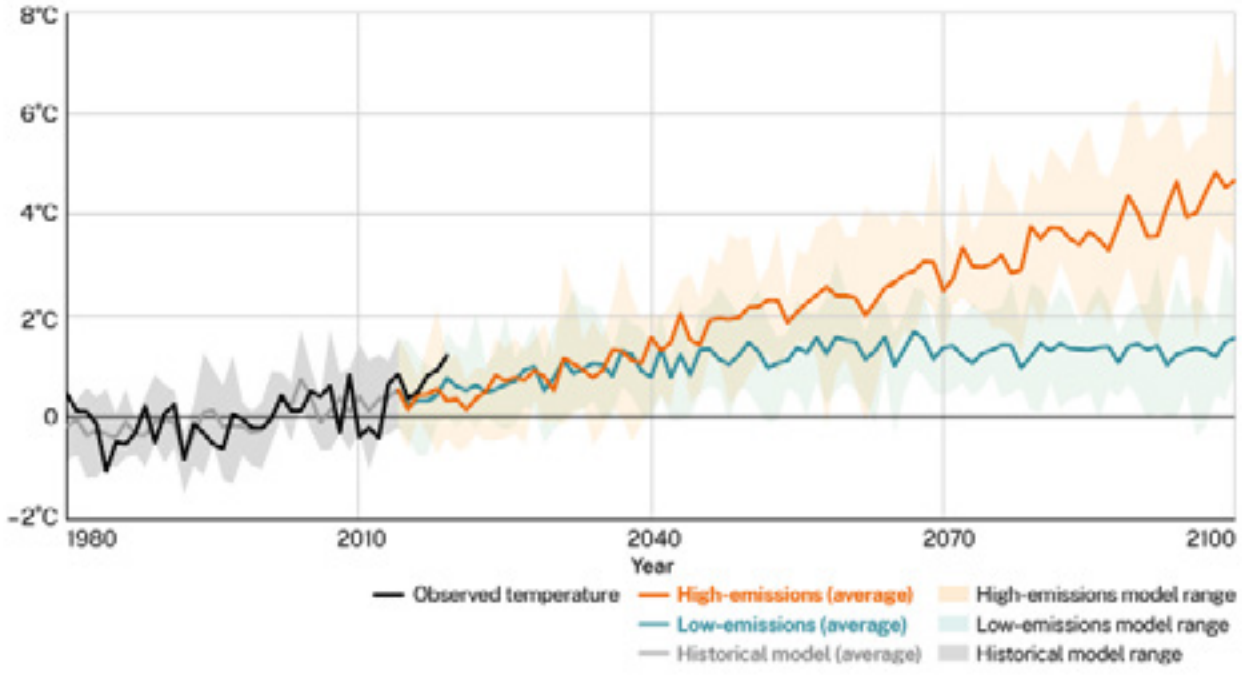
2.7. Environmental Sustainability and Climate Change

Waverley Council not only strives to achieve long-term financial sustainability, but also environmental sustainability, which means considering and responding to projected, local impacts of climate change on our assets and operations.

Human activities are causing atmospheric concentrations of heat-trapping greenhouse gases to rise higher and faster than ever before in recorded history. 2024 was the warmest year since modern record-keeping began, and the world's ten warmest years have all occurred in the last decade. This unprecedented rise in global temperature is causing extreme weather events such as heat waves, bushfires, droughts and floods to become more frequent and more intense and altering average temperatures and weather patterns around the world.

In Australia, our climate has warmed consistently since records began in 1910, and the 10 hottest years on record for Australia have all occurred since 2005. Extreme heat days are more common, overall cool season rainfall is declining in the southeast and bushfires are starting earlier and are more severe. Sea level rise and more frequent storm and extreme rain events are increasing the risk of inundation and damage to coastal infrastructure and communities. Oceans are acidifying, warming and expanding, which is negatively impacting coral reefs and other marine ecosystems.

Figure AS12: NSW historical and projected average temperature change. (NSW Department of Climate Change, Energy, the Environment and Water 2024)



Local shifts in seasonality and increased exposure to natural hazards presents risks to human health and wellbeing, ecosystems, infrastructure and services, and will require significant investment in adaptation, to avoid increasing damage and recovery costs.

2.7.1. Impact to Waverley Council

Historically, Waverley's climate is characterised by warm to hot summers and mild to cool winters. There is minimal seasonal variation due to our coastal location. Average annual rainfall is ~1200mm but with significant variability (809mm-2165mm over the last 50 years). Going forward summer is projected to be longer, hotter and drier, and a reduction in the duration of cooler months and winter rains has been projected

Waverley Council must prepare for and adapt to:

Average year-round temperatures that will increase yearly

Extreme heat days (over 35°C) that will occur more frequently, and nights that will also be warmer on average. This will result in more energy needed for cooling and less needed for heating our homes and buildings.

Projected rainfall is showing significant decreases in winter (-25%) and spring by 2030 under current emissions levels. Along with temperature rises this may lead to extended periods of drought

Atmospheric instability is increasing the risk of hail prone days Sydney and intense rainfall events are projected to increase, particularly in autumn and the increased likelihood of storm activity, particularly in summer and autumn

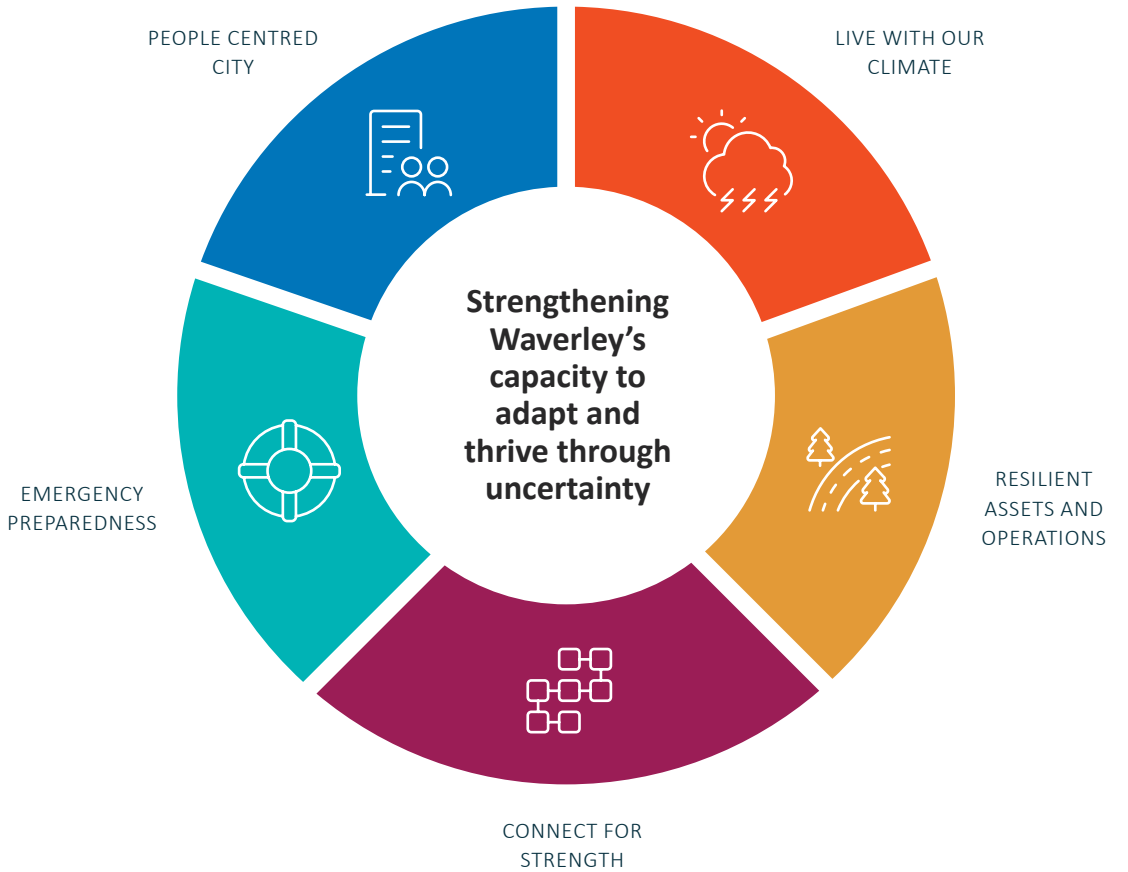
Risks to air quality associated with increased bushfire risks in southeast NSW

Increasing risks of coastal inundation. Under current emission rates Sydney's mean sea levels are projected to rise 15cm by 2030 and 50cm by 2070, but storms and wave setup can also increase local water levels, especially when storm surge conditions and sea level rise risks combine.

2.7.2. Waverley Council's Plan

It is important that Council assesses risks arising from expected climate changes so we can manage impacts to local residents, businesses and visitors and protect our public infrastructure and environmental assets.

Waverley's Resilience Framework



Community Aware & Safe
Local Emergency Management Officers

Access & Opportunity
Strategic Planning

Reduce Climate Risks
Environmental Sustainability

Resilient Systems
Asset Management

Improve Social Cohesion
Community Programs

Council's Resilience Framework was adopted in 2022 and introduced as a key pillar of Waverley's Community Strategic Plan 2022-2032. To inform operations and budgeting, resilience was also reflected in SAMP 6 under objectives 2.3 Climate change and resilience - Prepare and adapt to the impacts of climate change and 2.3.1 Deliver the climate change adaptation and resilience framework.

A Climate Change Risk Assessment was undertaken between 2021 and 2023, using the NSW Government's Climate Risk Ready Risk Assessment Tool, which follows the Australian and New Zealand Standard AS/NZS 4360 Risk Management to determine and analyse climate change risks to our assets and operations by 2040. Of the 62 risks rating high or extreme, the vast majority impact Assets, Facilities, Open Space and Parks and Living Infrastructure and relate to damages or degradation related to expected climate impacts, including Increasing temperatures and heatwaves, extreme rainfall and flooding and coastal inundation.

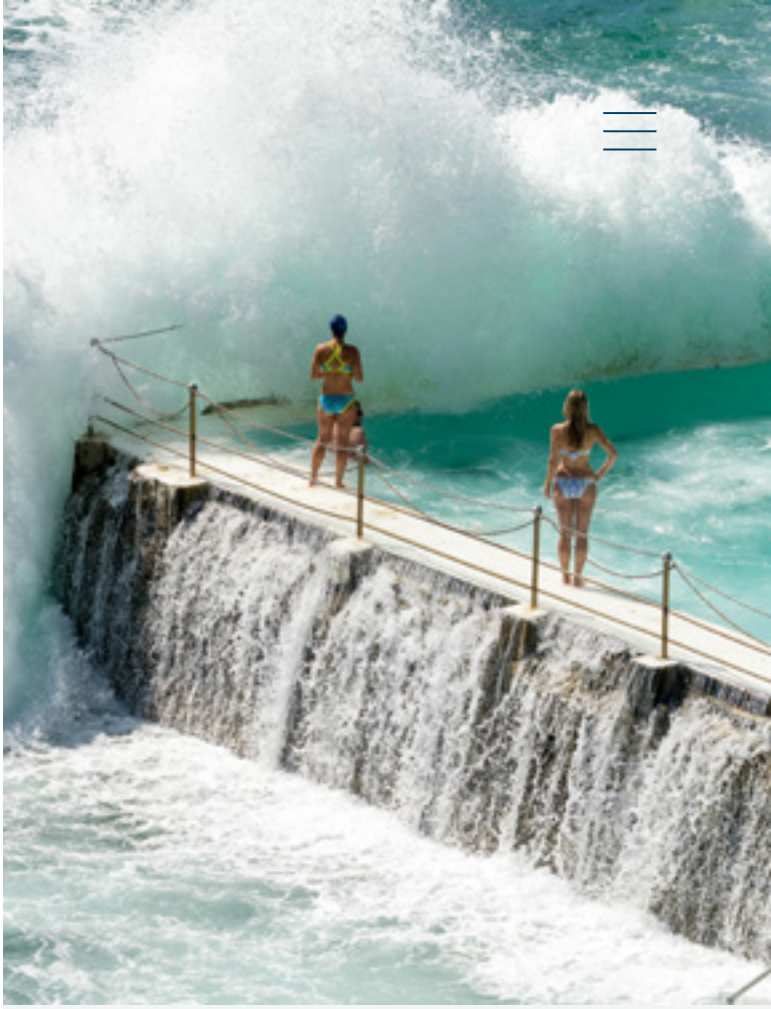


Figure AS13: Climate Hazards Contributing to Assessed Council Risks

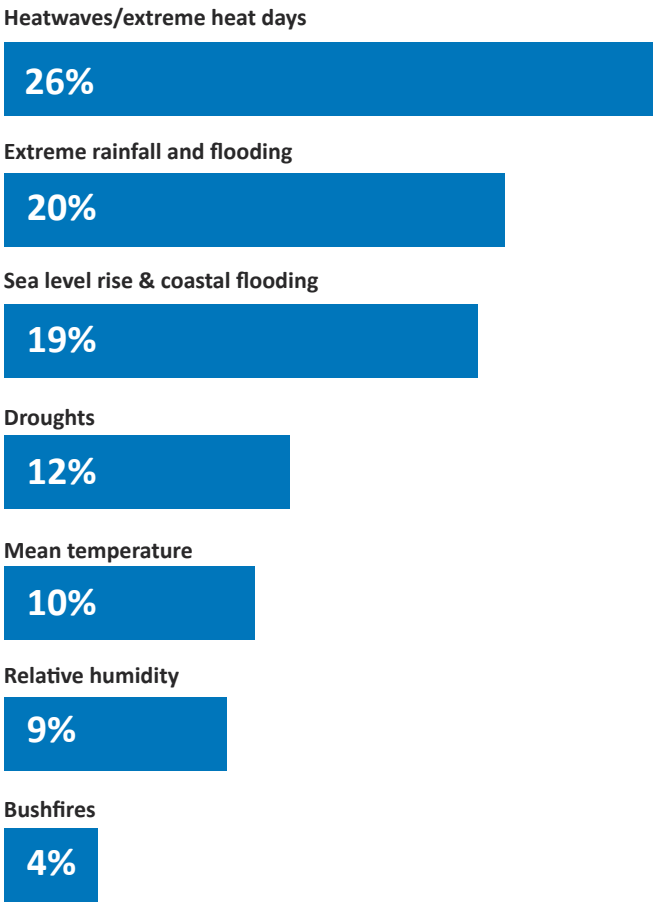
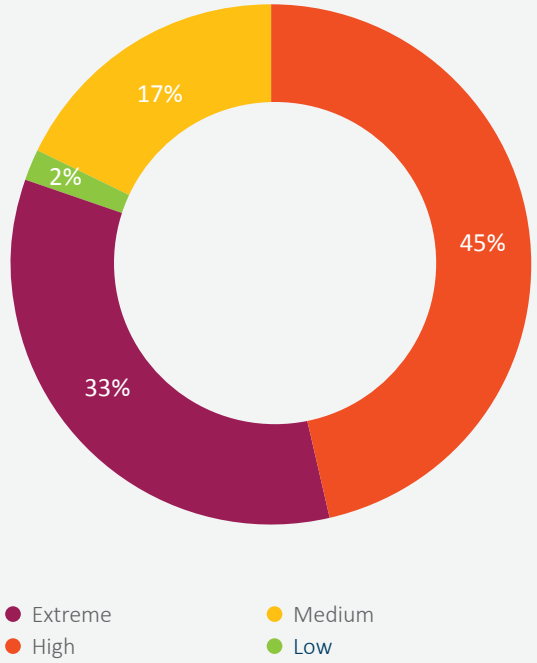
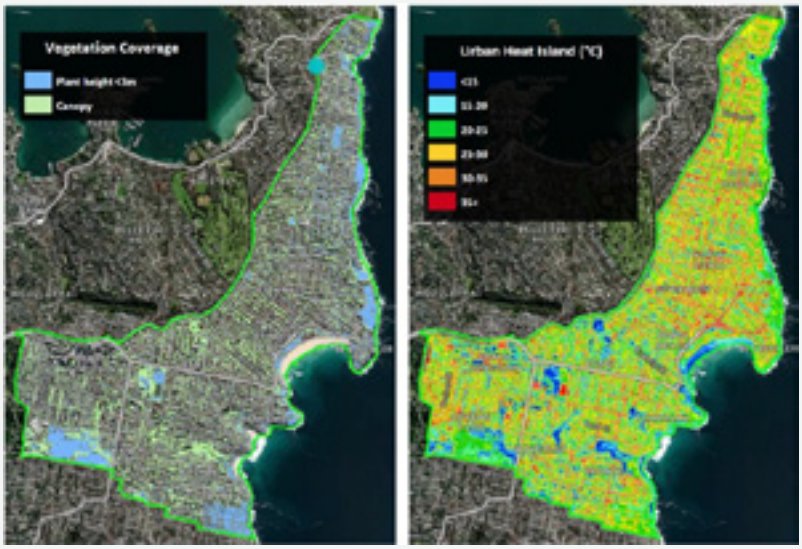


Figure AS14: Identified Climate Risk Ratings



Taking steps to reduce our exposure and vulnerability to climate change builds our capacity to respond and be resilient as the climate continues to warm. For example, Council's commitment to increase tree canopy and vegetation cover to 35% by 2032 will provide localised cooling and shading, minimise urban heat islands, improve air quality and decrease energy consumption, while protecting shelter and habitat for local biodiversity.

Figure X: Maps of Waverley Council local government area showing Vegetation Coverage and Urban Heat Island effect, where colour represents the temperature of a surface on a hot day (Arbor Carbon, 2024).



Planning and responding to climate change involves adapting practices, policies, designs, and materials. There is no single solution, but by working together across community, business, and government we can increase our resilience to climate change impacts. Some ways Council is addressing climate risks include:

- Increasing and protecting urban vegetation and canopy trees to provide cooling, health, and wellbeing benefits
- Increase permeability in public spaces to retain water in the landscape and minimise localised flooding
- Encouraging climate-appropriate designs for new buildings to reduce energy and water use and account for warmer summers (e.g. shaded north and west-facing windows, insulation, effective ventilation and landscaping to mitigate urban heat).
- Reviewing asset management strategies to increase the resilience of essential services at risk from climate hazards (e.g. transport, telecommunications and water infrastructure).
- Incorporating sea level rise risk into coastal infrastructure design and management planning.

To ensure a safer future with less global warming and fewer extreme weather events, deep, rapid, and sustained reductions in greenhouse gas emissions to Net Zero is urgently required by all sectors of society.

Meanwhile it is prudent that Waverley Council adapt and responds to the current global emissions trajectory which is *RCP 8.5 or between **SSP2-4.5 to SSP3-7.0.

*Representative Concentration Pathways are trajectories that describe future greenhouse gas concentrations (not emissions) and were adopted by the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report. RCP 8.5 denotes a future with little curbing of global emissions concentrations reaching 940parts per million by 2100. As current ppm is 428ppm, it is considered by many scientists as a Business-as-Usual scenario, as it is tracking within 1% of current actual emissions.

**Shared Socioeconomic Pathways (SSPs) are the most recent emissions scenarios adopted in the IPCC Sixth Assessment Report and describe how greenhouse gas emissions and socioeconomic factors – such as population, economic growth, education, urbanisation and land use – may change in the future.

- SSP2-4.5 describes reasonable (or median) level of success from climate change initiatives and programs
- SSP3-7.0 describes a high-emissions future of regional conflict and development where countries do not collaborate on tackling climate change and do not focus on sustainable and equitable development. Recommended for when applying to critical infrastructure.