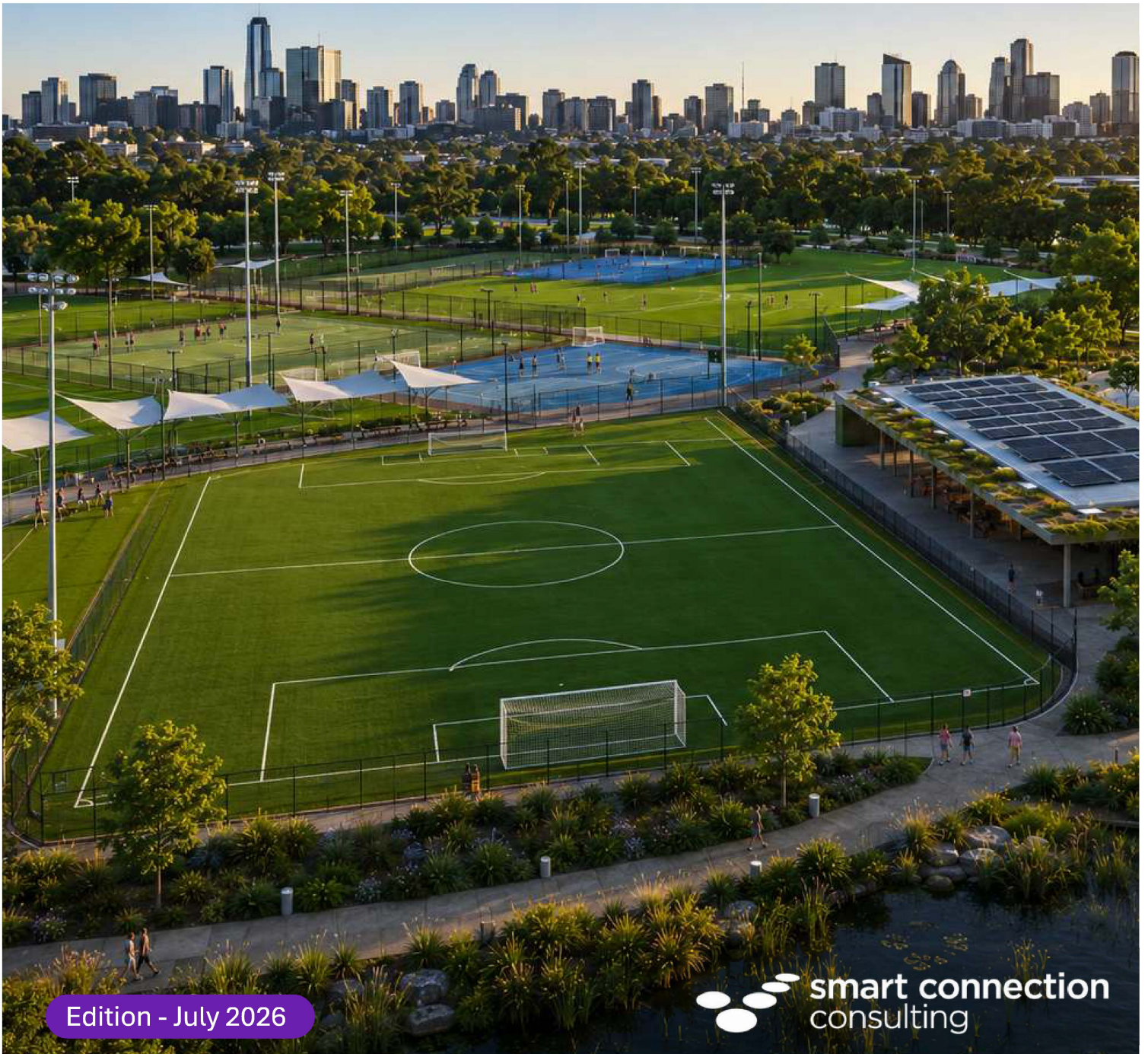


CLIMATE CHANGE AND SPORT

Impacts on sport and sports opportunity to reduce its impact on climate change



Climate Change and Sport

Purpose and Context

Climate change is no longer a future environmental challenge; it is a current operational challenge affecting the planning, delivery and management of sporting infrastructure throughout Australia and globally.

The Intergovernmental Panel on Climate Change (IPCC) has confirmed that global average temperatures have increased by approximately 1.1°C above pre-industrial levels, resulting in more frequent and intense heatwaves, extreme rainfall events, flooding, drought, bushfires and severe storms. These changes are affecting communities, ecosystems, infrastructure and public health worldwide.

Sport is particularly vulnerable because much of Australia's sporting activity occurs outdoors, exposing participants, officials, volunteers and spectators directly to climatic conditions. Unlike many other sectors, sport depends on safe, accessible and resilient playing environments. When those environments are compromised by heat, flooding, drought or poor air quality, participation opportunities are reduced and community wellbeing is impacted. Climate change is fundamentally reshaping how sporting infrastructure is planned, designed and managed.

The question is no longer whether climate change will affect sport, but how quickly facilities can adapt to changing conditions.

The most successful sporting facilities of the future will:

- Be resilient to heat, drought and flooding.
- Maximise participation opportunities.
- Improve biodiversity outcomes.
- Reduce environmental impact.
- Support community health and wellbeing.

A climate-ready sports facility should not simply withstand future climate conditions; it should actively contribute to cooler, greener and more resilient communities.

By embracing integrated planning, water-sensitive urban design, tree canopy expansion, climate-responsive materials and whole-of-life asset management, councils and sporting organisations can ensure that community sport continues to thrive in a changing climate

Why Climate Change Matters to Sport

Sport relies on predictable and safe conditions. Climate change is disrupting those conditions in ways that are becoming increasingly visible across Australia.

Many councils and sports are already experiencing:

- Increased field closures following intense rainfall events.
- Water restrictions impacting irrigation.
- Increased maintenance costs.
- Surface degradation during prolonged drought.
- Heat-related event cancellations.
- Reduced participation during summer periods.
- Damage to sports infrastructure following floods and storms.

The Australian Bureau of Meteorology and CSIRO have identified a clear trend towards:

- More hot days.
- Fewer cool days.
- Increased rainfall intensity.
- Longer drought periods between rainfall events.
- Increased frequency of extreme weather events.

For sport, these changes translate directly into reduced field availability, increased operating costs and greater health risks for participants.

The challenge is particularly acute for community sport, where facilities often operate continuously from early morning until late evening and where budgets for adaptation are limited.

Impacts of Climate Change and Sport

Climate change affects sport through six interconnected pathways.

1. Extreme Heat - Heat is now recognised as one of the greatest climate-related risks to community sport. Heat impacts:

- Player health
- Spectator comfort
- Volunteer welfare
- Surface temperatures
- Competition scheduling

World Rugby's 2024 Climate Change and Rugby Report found that many countries could experience more than 10 additional days annually above 35°C under a +2°C warming scenario. For sports played on exposed surfaces, this can result in:

- Heat stress
- Heat exhaustion
- Reduced physical performance
- Increased injury risk

2. Drought and Water Security - Natural grass surfaces require water to remain safe and playable. As drought frequency increases and water restrictions become more common, councils face challenges maintaining turf quality and carrying capacity.

This can lead to:

- Reduced grass cover
- Surface hardening
- Dust generation
- Increased injury risk
- Greater renovation costs

3. Intense Rainfall and Flooding - Australia is experiencing fewer rainfall days but more intense rainfall events. This creates challenges including:

- Waterlogged surfaces
- Soil erosion
- Drainage failure
- Flood damage
- Event cancellations

Poor drainage infrastructure can render fields unusable for days or weeks after significant rainfall.

4. Urban Heat Island Effect - Urban areas are often significantly warmer than surrounding rural areas. This occurs because:

- Roads absorb heat.
- Buildings store heat.
- Trees are removed.
- Natural cooling processes are reduced.

Research has shown that urban temperatures can be between 1°C and 7°C warmer than surrounding landscapes.

For sports precincts, this means:

- Higher ambient temperatures.
- Reduced player comfort.
- Increased irrigation demand.
- Greater stress on vegetation.

5. Air Quality and Bushfire Smoke - Recent bushfire seasons demonstrated that poor air quality can significantly disrupt sporting participation. Smoke events can result in:

- Competition postponements.
- Training cancellations.
- Respiratory risks.
- Reduced outdoor activity.

Air quality management is increasingly becoming a core component of sports facility planning.

6. Biodiversity and Ecosystem Decline - Healthy ecosystems support sport through:

- Shade
- Cooling
- Stormwater management
- Water quality
- Habitat

The decline of tree canopy and biodiversity can amplify climate impacts on sports facilities.

Surface-Specific Impacts

The impacts of climate change on natural surfaces are already being seen, with extended droughts, excessive rain intensity and frequency, temperature increases, and reduced availability of water for sports-field irrigation. A holistic approach needs to be considered for the future, including:

- Alternative surfaces to natural grass to ensure consistency of surface performance during drought and inability to irrigate or during the excessive rain events that are becoming more frequent.
- Surfaces that can sustain the intensity of usage that natural turf simply cannot match, e.g. 60+ hours a week.
- Consideration for the whole parkland, embracing technology appropriately to reduce the need to convert passive or virgin land into sports fields, while embracing climate-responsive landscape design
- Designing the sports surface to reduce impact on the environment and enhance community value to the whole parkland through initiatives such as water harvesting, reduction of heat stress with tree planting, and canopy expansion.
- Reduction of fossil-fuel use on site, including reduced mowing, use of electrical vehicles for maintenance, and yarn made from biopolymers as opposed to petrochemicals.

Mitigation Strategies

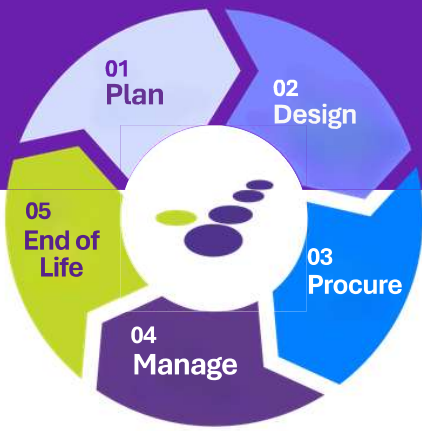
The most successful sports facilities will be those that combine sport performance outcomes with climate adaptation and environmental resilience.

Climate Adaptation Measures – including water harvesting systems, WSUD infrastructure considerations, increased tree canopy to meet State government targets, rain gardens and bioswales, flood-resilient drainage, drought-tolerant planting, shade structures and cool material selection.

Climate Mitigation Measures – including renewable energy, electric maintenance fleets, reduced irrigation demand, circular economy procurement, recycled and recyclable materials, reduced embodied carbon.

Rather than focusing on a single technology, councils should adopt a whole-of-park climate resilience strategy.

Recommendations



The Sports & Play Industry Association (SAPIA) brings together the organisations that create the places where people of all ages and abilities can play, move and participate. Through professional standards, industry leadership and innovation, we are building and maintaining better places for a more active world.

To provide these SAPIA Insight Notes, we have partnered with Smart Connection Consulting to provide the latest technical knowledge on the issues that the community are keen to understand better. These notes are based around the NSW & SA Governments Frameworks for Decision Making for Synthetic Sports Fields.

Plan

- Map heat, flood, drought, bushfire and air-quality risks early.
- Confirm participation demand, hours of use and seasonal pressure.
- Test whether natural turf upgrades, hybrid zones, hard courts or synthetic systems best meet need.
- Consider cumulative impacts across the wider sport and open space network.
- Include climate resilience in approvals, budgets and community consultation.

Design

- Retain and increase trees, shade and vegetated buffers.
- Use water-sensitive urban design such as swales, rain gardens and biofiltration.
- Design drainage for heavier rainfall and overflow events.
- Select cool materials, suitable infill and porous base systems where appropriate.
- Integrate water harvesting to support natural grass, trees and landscape cooling.
- Provide shade for players, officials and spectators.

Procure

- Specify climate-resilient performance outcomes, not just a product type.
- Ask suppliers for environmental footprint, heat, drainage and durability evidence.
- Require maintenance manuals, monitoring requirements and replacement planning.
- Include tree canopy, water harvesting, runoff treatment and end-of-life expectations in tender documents.
- Select experienced designers and contractors who understand sport performance and environmental risk.

Manage

- Maintain surfaces according to use intensity and weather exposure.
- Keep drains, filters, edges and surrounding landscape functioning.
- Monitor surface condition, heat performance, irrigation demand and closures.
- Use heat, smoke, lightning and air-quality protocols for training and events.
- Rotate training zones and high-wear activities where possible.
- Review management settings after major storms, floods or heatwaves.

End of Life

- Climate change should be considered across the full asset life, not only at construction. Renewal plans should test whether the surface remains fit for purpose under changing heat, rainfall and participation patterns.
- End-of-life planning should recover, reuse or recycle materials where feasible, retain long-life base and drainage infrastructure where suitable, and update the site resilience plan before replacement.
- Climate-ready assets are reviewed regularly so future upgrades can respond to new data, technologies and community expectations.

To understand how SAPIA can assist you in making a difference to your projects and the community understanding of this technical subject please contact the SAPIA office at office@sapia.org.au or on our website www.sapia.org.au.