

Antipodean historic gardens and climate change

Avoiding a didactic approach in favour of one that used personal exemplars, I wanted approaches to managing climate change to be viewed as experimental rather than conclusive from the outset.

Trevor Nottle, author of *Plants for a Changing Climate*



This, too, is the approach the Australian Garden History Society is taking to assist garden owners and managers plan for and respond to the challenges of climate adaptation. This brochure synthesises the themes emerging from an AGHS project on climate adaptation, partly funded by a grant from the international charity, the Historic Gardens Foundation. The full stories of how other gardeners are responding to climate change are available on the AGHS website: <https://www.gardenhistorysociety.org.au/climate-adaptation/>

Drone shot of *Kentgrove*, image courtesy Doug Rawlinson

‘Climate change often highlights long-standing preservation issues rather than discovering new problems’ observes Professor May Cassar, Director of University College London’s Institute for Sustainable Heritage. Claire Baddeley explores this idea in an interview with Doug Rawlinson, owner of *Kentgrove* on the Southern Tablelands of NSW:

<https://www.gardenhistorysociety.org.au/2024/03/kentgrove-a-case-study/>

Greenhouse gases and gardens

The burning of fossil fuels has dramatically increased the exchange of carbon from the ground back into the atmosphere and oceans as carbon dioxide. In addition, agriculture, forestry and other types of land use account for 23 per cent of greenhouse gas emissions.

These emissions are occurring at a rate that is hundreds to thousands of times faster than it took to bury the carbon, and much faster than it can be removed by the natural cycle. This accumulation of carbon dioxide and methane in the atmosphere – leading causes of the greenhouse effect – is increasing average temperatures and, in turn, exacerbates the incidence of extreme weather.



TOP Domestic honeybee (*Apis mellifera*)

BELOW Susan Marsden's garden in Adelaide, 2020, photo Susan Marsden

Susan Marsden has recorded the steps she and her partner have taken to adapt to Adelaide's changing climate: <https://www.gardenhistorysociety.org.au/2024/03/notes-from-a-global-warming-garden-an-update/>

Arrhenius' equation

In 1896 Arrhenius, a Swedish physical chemist, figured out how much heat the earth trapped thanks to its carbon dioxide blanket:

$$\Delta F = a \ln(C/C_0)$$

where ΔF is the increase in temperature is equal to a constant multiplied by the natural log of the ratio of carbon dioxide increment. In short, beware climate change.

Starting with this equation, Max Bourke offers a history of climate politics in Australia: <https://www.gardenhistorysociety.org.au/2024/04/climate-change-my-short-history/>

Land is both a source and a sink of greenhouse gases; it plays a key role in the exchange of energy, water and aerosols between the land surface and atmosphere. The Intergovernmental Panel on Climate Change's special report on land (2019) reported with high confidence that sustainable land management can help reduce the contribution of agriculture and forestry to increasing net greenhouse gas emissions, loss of natural ecosystems and declining biodiversity.

The IPCC did not address the role of gardening in this effort but gardeners too can make a difference by making sustainable choices about where and what they plant, what resources and products they use and how they encourage pollinators and birds to visit them.

Adapting to climate change

From 2014 through 2023, the world experienced the 10 hottest summers ever recorded in 174 years of climate data. And gardeners know it. They are seeing the seasons change and with that plant behaviour, as well as the arrival of more pests and disease. They have taken much of this in their stride. But with the increased incidence of extreme weather events, many garden owners and managers are realising that to cope with global warming they must plan, and plan well ahead.

The task is daunting but small steps do count. Hence AGHS's commitment to help historic garden owners and managers address climate-related challenges in their gardens.

In both Australia and New Zealand, about 70 per cent of people are concerned about climate change. A [New Zealand study](#) of property owners found, however, that they were not well informed about preventative planting and adaptation. Once they found out what they could do, more than two thirds of people acted. The key then is to inform people of what to do to ameliorate the effects of climate change.



January 2020



March 2024



TOP LEFT Part of Simon Grant's garden in the Southern Highlands, NSW, photo M Grant

TOP RIGHT photo Simon Grant

LEFT Coombe Wood maple (*Acer palmatum* 'Chantilly Lace') tolerates the heat very well but avoid wet soils, photo Simon Grant

Simon Grant writes about his experience with both drought and rain, and their effect on maples: <https://www.gardenhistorysociety.org.au/2024/04/in-extremis-the-effects-of-climate-change-on-our-gardens/>

Framework for action

The *Antipodean historic gardens and climate change* project illustrates the importance of thinking before doing when it comes to conserving the heritage values or significance of a garden or cultural landscape. The AGHS's framework for action suggests this sequence for garden owners and managers.

PROTECT

- heritage
- design intent

MANAGE

- resources (water, energy, soil, fertiliser)
- species

SUPPORT

- diversity
- adaptability
- compatability
- resilience

First, understand the significance of a garden or landscape. This must be done before assessing the climate risks. Note that heritage values of a place or object change over time, as do their intent and purpose.

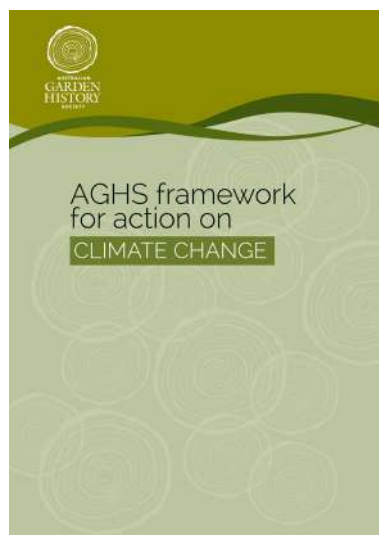
Seek the best, evidence-based advice on conservation, adaptation, mitigation and management.

Assess the risks to the garden or landscape. What are the likely consequences and risks of 'doing nothing'? Examine the capacity for adaptation and the consequences of intervention for heritage values, intent and purpose.

Engage communities and stakeholders. Gauge community and key stakeholder appetite for change. Where possible, engage with traditional custodians as co-designers of any intervention.

Finally, respond. Minimise harm.

See the full framework for action at <https://www.gardenhistorysociety.org.au/2022/11/climate-change-position-statement-2/>



[Climate action](#) is one of the UN Sustainable Development Goals

Where to start?

Adopting sustainable practices

AGHS fosters [a low-carbon approach](#), for example by reducing use of plastics, limiting its face-to-face meetings to reduce carbon miles, using recycled paper for its journal and other hard-copy publications.

Designing for new climates

The Australian Institute of Landscape Architects offers guidance on [climate positive design](#).

Looking after the soil

The [CSIRO's Australian National Soil Archive](#) provides facilities and protocols for conserving the long-term, scientific value of soil specimens and associated soil data. The oldest specimens in the archive date back to 1924 before widespread artificial fertiliser and herbicide application started, providing a useful baseline of soil properties.



Planting for the future

The Climate Change Alliance of Botanic Gardens has created a Climate Assessment Tool (CAT) to provide guidance on the suitability of plants under predicted future climate scenarios for selected locations.

<https://www.gardenhistorysociety.org.au/2024/04/changing-to-stay-the-same/>



Responsible and considered water use

Sustainable Gardening Australia has advice on [water smart gardening](#).

Responding to new weeds, pests and diseases

The Botanic Gardens of Sydney offers advice on dealing with a variety of [biohazards](#).



TOP Inside the Australian National Soil Archive at CSIRO Black Mountain, Canberra. © CSIRO, photo Stuart Walmsley

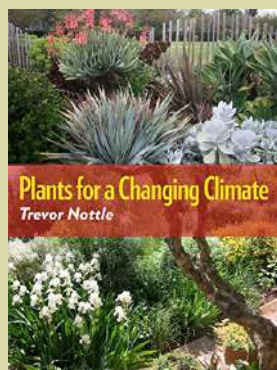
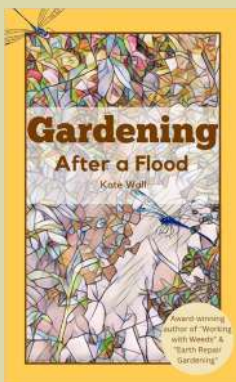
MIDDLE Royal Botanic Gardens Victoria Melbourne Gardens, image courtesy Royal Botanic Gardens Victoria

BOTTOM *Armillaria luteobubalina*, Botanic Gardens of Sydney

Dealing with hotter, drier, wetter conditions

What the case studies in this project demonstrate is the heartbreak caused not only by lack of water but by too much of it, falling in quantities or times outside historical norms.

Kate Wall, a gardening coach in Brisbane, has generously made free her book on how to deal with the aftermath of flood waters. See: <https://www.gardenhistorysociety.org.au/2024/03/gardening-after-a-flood/>



Several writers point out how important it is also to be proactive. Instead of planning for the coming season, year or even decade, we need to plan – and plant – for the climate and conditions expected during the life of a long-lived tree, even if we are unsure how things will pan out. Trevor Nottle's advice to take the experimental approach resonates in many a gardener's DNA. <https://www.gardenhistorysociety.org.au/2024/04/plants-for-a-changing-climate/>



Trees

Grand stands of trees, or one magnificent specimen, are often a hallmark of an historic garden created, in Australia or New Zealand, in the nineteenth or twentieth centuries. Many of those trees are coming to the end of their natural life or are being adversely affected by the changing climate.

Tara Edmondson, Estate Gardens Manager at Government House Hobart, uses the Climate Assessment Tool to decide on what trees to plant. She is also on the lookout for any opportunity to expand on native tree collections.

LEFT & RIGHT Government House, Hobart, photos Pen Tayler

<https://www.gardenhistorysociety.org.au/2024/04/government-house-tasmania-managing-change/>



It's time to plan for future history

Change is a constant for garden owners and managers. In the face of rapid global warming, it is time not just to respond when weather events, pests and disease wreak havoc but to plan for continuing and major changes to growing conditions. To this end, Carrick Hill in Springfield, Adelaide, is another heritage garden with a long-term – in this case 100-year – tree replacement plan.

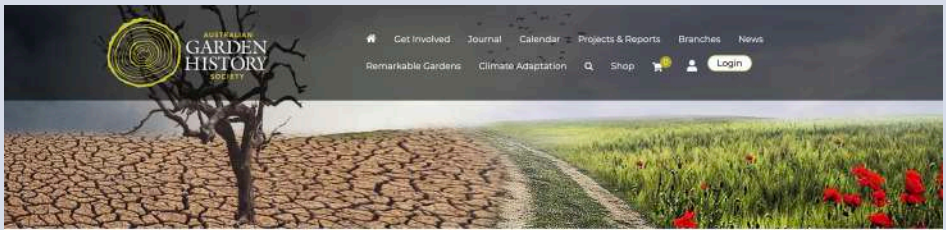
Clare Gleeson's survey of New Zealand historic gardens reveals a growing realisation about the need for plans to futureproof these important places. <https://www.gardenhistorysociety.org.au/2024/04/new-zealand-historic-gardens-and-climate-change/>

TOP At Ōtari-Wilton's Bush, New Zealand's only native plant botanic garden, the conservation laboratory has facilities to conduct essential research into the propagation and assessed its climate risk vulnerability and long-term storage of New Zealand's threatened plants, photo Kathy Ombler

BOTTOM Eryldene, a historic house and garden in Sydney, with an important collection of camellias, assessed its climate risk vulnerability and developed an Environmental Sustainability Action Plan to help integrate sustainability into all its activities from energy purchasing to event management. See www.eryldene.org.au

It's time those of us who care for gardens take a stand against climate change. There is more we can do to reduce our own carbon footprint, and much more needed to adapt gardens to an already changed climate.

Professor Tim Entwisle,
patron of the Australian Garden History Society



Climate Adaptation

Show all Framework for Action Case Studies Tools and Tips Links Activities



16 April 2024

Climate change: my short history

Smoke haze from bushfires, Sydney, December 2019, photo Francesca Beddie. I am on the verge of...

Read more



13 April 2024

New Zealand historic gardens and climate change

Seasonal Climate Outlook: April 2024 to June 2024 published by the National Institute of Water and...

Read more



5 April 2024

Changing to stay the same

Royal Botanic Gardens Victoria Melbourne Gardens, image courtesy Royal Botanic Gardens Victoria...

Read more



3 April 2024

Government House Tasmania: managing change

Government House Tasmania (GHT) is situated on 15 hectares of land. It is part of a complete estate...

Read more

Go to the AGHS website's climate adaptation page to get started:

<https://www.gardenhistorysociety.org.au/climate-adaptation/>

You will find the full version of AGHS's framework for action on climate change along with articles, case studies, tips and tools, and links to more information and advice.

The project, *Antipodean historic gardens and climate change*, was partly funded by a grant from the international charity, the [Historic Gardens Foundation](#).

Please support our ongoing advocacy with your donation.

