



PlantNetwork

Connecting gardens, sharing skills

Climate Change & Gardens

Annual Conference 2019

8th & 9th May

Abbotsbury Subtropical Gardens, Dorset

@PlantNetwork
#PlantNetworkConference2019
#ClimateChampions



PlantNetwork is a charity and membership organisation that provides training and network support to gardens and gardeners throughout Britain and Ireland.

Through its work, PlantNetwork contributes to maintaining and developing the horticultural and plant conservation skills for which our gardens are renowned. The goals of PlantNetwork are:

- Supporting gardens and plant collections for conservation, knowledge and enjoyment.
- Providing networking and professional development for the plant network community.

Since being formed in 1996, PlantNetwork has brought together both institutional and private members and now represents over 300 gardens including all the major public horticultural and botanic gardens in the countries.

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Treasurer: Christopher Weddell
Co-Treasurer: Robert Brett
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Table of Contents

Introduction	1
Programme – 08 May 2019	2
Programme – 09 May 2019	3
Speaker information	4
Keynote speaker:	4
Climate Change in the UK	5
Abbotsbury Subtropical Gardens	8
Planting choices in a changing climate	9
Lightning Talks	13
Building resilience in gardens	14
Plant issues in a changing climate	18
Minterne Garden	21
Sponsors	21
Resources	22
Notes and contacts:	24

Introduction

Climate change can be a politically divisive subject. Irrespective of the causes of climate change, horticulturists in Britain and Ireland are undoubtedly seeing the effects of a changing climate in their gardens, arboreta and plant collections. More extreme weather events, rising global temperatures, and changing rainfall patterns are just some of the challenges facing botanic and public gardens. The PlantNetwork Conference: Climate Change & Gardens provides a platform to discuss some of the challenges facing gardens – and looks at opportunities that might also emerge.

With speakers presenting across a range of different issues from invasive ornamentals and plant health to planting choices and water management, the PlantNetwork Conference will address topical issues and showcase the latest research.

'Right now, we are facing a man-made disaster of global scale. Our greatest threat in thousands of years. Climate change.'

David Attenborough, December 2018

There will be many opportunities to explore and learn more about Abbotsbury Subtropical Gardens during the conference including a brief introduction to the history and plants of the garden as well as a garden tour.

For more information about the garden, visit: abbotsbury-tourism.co.uk/gardens/

Programme – 08 May 2019

09.30 – 10.30	Registration & Coffee and opportunity to look around the garden	
10.30 – 10.45	Welcome	Simon Toomer, Chair of PlantNetwork & Stephen Griffith, Curator of Abbotsbury Subtropical Gardens
10.45 – 11.15	Keynote speaker: Peter Gibbs Weatherman & Chair of BBC Radio 4's Gardeners' Question Time	
Session title: Climate change in the UK Chair: Simon Toomer		
11.15 - 11.45	Strawberries at Christmas? Variability and change in UK climate	Dr Mark McCarthy, Manager National Climate Information Centre, Met Office
11.45 – 12.15	Climate Sensitive Soil Management	Dr Marc Redmile-Gordon, Senior Scientist for Soil and Climate Change, RHS
12.15 – 12.45	Evolution in action? Public perception of non-native planting in the designed urban landscape	Dr Helen Hoyle, Senior Lecturer in Healthy Built Environments, University of the West of England
12.45 – 13.00	Climate change and Abbotsbury Subtropical Gardens	Stephen Griffith, Curator of Abbotsbury Subtropical Gardens
13.00 – 14.00	Lunch & Networking	
14.00 – 14.30	PlantNetwork 22 nd AGM	Simon Toomer, PlantNetwork Chair
14.30 – 15.30	GARDEN TOUR	Stephen Griffith & team
15:30 - 15:45	Coffee	
Session title: Planting choices in a changing climate. Chair: Robert Brett		
15.45 – 16.15	Plant choices in a changing climate - Drought Tolerant Plants in a Hotter, Drier Future.	John Edmiston, Director, Tropical Britain
16.15 – 16.45	Challenges of a changing environment	Richard Baines, Curator of Logan Botanic Garden
16.45 - 17.15	Thinking Again: species choice for adaptation and resilience in designed historical treescapes	Simon Toomer, National Specialist for Plant Conservation at the National Trust
17.15 – 17.45	Designing landscapes for resilience and regeneration	Mark Laurence, Garden and Landscape Design
17.45 – 18.30	Lightning Talks and Discussion	Short talks from delegates – see page 3 for speakers list
From 18.30	Conference dinner: The Club House, West Bexington (DT2 9DF)	

Programme – 09 May 2019

Session title: Building resilience in gardens. Chair: Peter Gibbs		
09.00 – 09.05	Welcome to Day 2	PlantNetwork
09.05 – 09.35	Doing your bit in the climate crisis	Augusta Grand, Head of Policy, Eden Project
09.35 – 10.05	Looking after glorious gardens and healthy landscapes	Mark Roberts, National Trust Water Specialist
10.05 – 10.35	Water management in gardens: building resilience	Marcus White, Hydreau Consulting Engineers
10.35 – 11.05	Resilient trees: planning for the future	Mark Broadmeadow, Principal Adviser Climate Change, Forestry Commission
11.05 – 11.30 Coffee		
Session title: Plant issues in a changing climate. Chair: Dr Helen Hoyle		
11.30 – 12.00	New innovations & challenges for biological control at garden sites	Julian Ives, Dragonfli Ltd.
12.00 – 12.30	Ornamental plants: a threat to the environment due to climate change?	Tomos Jones, PhD student, University of Reading
12.30 – 13.00	Invasive plants, their “pests” and climate change	Dr Richard Shaw, Country Director CABI UK/Regional Coordinator Invasives
13.00 – 14.00 Lunch & Networking		
14.00 – 14.05	Conference outcomes	PlantNetwork
14.05 - close	Tour of Minterne Gardens, exploring the issue of resilience to climate change in another setting!	Stephen Griffith

Lightning Talks – 08 May 2019

- Gary Long – Curator of Trewithen Gardens, Cornwall: *Climate Resilience Within Our Master Plan*
- Janet Manning – Water Management Specialist at the Royal Horticultural Society: *Water – Painting by Numbers*
- Rob Brett – Curator of RHS Garden Hyde Hall: *Opportunities and Challenges of Climate Change to Public Gardens*
- Dr Phil Sterling, Programme Manager – Building Sites for Butterflies, Butterfly Conservation: *What is happening to amenity grasslands as the climate warms?*

Speaker information

Keynote speaker:

Climate is what you expect, weather is what you get

Peter Gibbs, Co-chair of BBC Radio 4's Gardeners' Question Time and Meteorologist

Biography:



Meteorologist and broadcaster Peter Gibbs spent more than 30 years as a front line forecaster with the UK's Met Office and as one of the BBC national weather presenting team.

Peter co-chairs the iconic Radio 4 show 'Gardeners' Question Time'(reputed to be the longest-running radio show in the world!) and is a regular reporter on the Radio 4 environment series 'Costing the Earth'.

Peter's first job as a meteorologist was running the weather observation programme at the British Antarctic Survey's remote Halley research station in Antarctica in the early 1980s, spending two consecutive winters on the ice. He returned to Antarctica in 2016 to report on the global importance of the science programme at Halley for the BBC's flagship science show 'Horizon'.

More recently, Peter has been working with a number of organisations to try to modernise and improve access to weather and climate services across Africa, which has the potential to improve the livelihoods of smallholder farmers.

Peter is a Fellow of the Royal Meteorological Society, and a Visiting Fellow at the University of Reading. He holds an Honorary Doctorate of Law from the University of Leeds.

Notes:

Strawberries at Christmas? Variability and change in UK climate

Dr Mark McCarthy, Manager National Climate Information Centre, Met Office

Abstract:

Human activities are estimated to have increased global temperatures by approximately 1.0 C compared to pre-industrial levels. It is likely to reach 1.5 C by 2030s to 2050s if warming were to continue at the current rate. The climate of the UK has warmed by a similar amount over the same period. The UK being situated where it is experiences considerable climate variability due to the competing influences of maritime, continental, polar and tropical air masses battling out overhead. Our long fascination with the weather provides the UK with historical weather observations spanning centuries, and today this is combined with modern numerical climate simulations to better understand the role of variability and change in our national climate and identify the hazards and opportunities that creates. In this talk I will review our rich climate history including 150 years of some surprisingly un-seasonal fruit, describe the context of some recent climatological extremes in the UK, most recently the UK's first recorded occurrence of temperatures above 20 C during winter, and present key findings from the most recent set of climate projections for the UK.

Historical UK Climate: <https://www.metoffice.gov.uk/climate>

Climate change <https://www.metoffice.gov.uk/weather/learn-about/climate-change>

UK Climate Projections: <https://www.metoffice.gov.uk/research/collaboration/ukcp>

Biography:



Dr Mark McCarthy is science manager of the National Climate Information Centre (NCIC) at the Met Office <https://www.metoffice.gov.uk/climate> . He provides monitoring and analysis of UK climate variability and change to help UK society better understand the challenges, risks and opportunities that result from our variable and changing climate. A physicist by training, Mark joined the Met Office in 1999 and his research interests over that time have included water vapour in the upper atmosphere, the Indian monsoon, the interaction between land-use and climate, urban micro-climates, and historical climatology. He provided consultation and peer-review of the climate content for the recent RHS Gardening in a Changing Climate report.

Notes:

Climate Change in the UK

Climate Sensitive Soil Management

Dr Marc Redmile-Gordon, Senior Scientist for Soil and Climate Change, Royal Horticultural Society

Abstract:

No abstract available.

Biography:

Marc is a researcher at The Royal Horticultural Society, Wisley, UK. His work on soil and biogeochemical cycling focusses on delivering practices to ameliorate climate change.

Notes:

Evolution in action? Public perception of non-native planting in the designed urban landscape
Dr Helen Hoyle, Senior Lecturer in Healthy Built Environments, University of the West of England

Abstract:

Throughout Europe climate change has rendered many plant species used in contemporary urban planting design less fit for use. There is growing evidence for the ecological value of introducing non-native species, yet urban policy and practice guidance continues to portray non-native species negatively, focusing on their assumed invasiveness. In this context there is a lack of research focusing on the cultural relevance of non-native species in the urban landscape. To address this gap we surveyed 1411 members of the UK public who walked through designed and semi-natural planting of three levels of visual nativeness: “strongly native”; “intermediate” and “strongly non-native”, whilst completing a site-based questionnaire. We later carried out semi-structured, in-depth interviews with 34 of the original questionnaire participants. A majority (57.6%) of our participants would be happy to see more non-native planting in UK public spaces, rising to 75.3% if it were better adapted to a changing climate than existing vegetation. Participants recognised the three broad levels of nativeness, yet this was not a factor driving perceptions of the attractiveness of the planting. In addition to climate change, we identified four key factors driving acceptance and rejection of non-native planting: *aesthetics*; *locational context*; *historic factors and inevitability*; and *perceptions of invasiveness and incompatibility with native wildlife*. Our research indicates that in the context of a changing climate, designers should focus on the potentially positive role of non-invasive, climate-adapted, aesthetically pleasing species within urban planting schemes. There is convincing evidence that these could be well-received by the public.



Image: The Mediterranean Bank, Abbotsbury Subtropical Gardens (author's own).

Biography:



Helen is Senior Lecturer in Healthy Built Environments at the University of the West of England, Bristol. She has a background in Geography and Landscape Architecture and previously conducted award-winning research culminating in the delivery of the London 2012 Olympic meadows. She has since applied findings to ordinary urban spaces in Bedfordshire, working with local authority partners on an urban meadows experiment. Helen believes strongly in the need to produce urban planting design which is attractive to the public, biodiverse and adapted to a changing climate. She conducted some of her PhD research at Abbotsbury Subtropical Gardens (2012-14) and in summer 2018 collaborated with Matthew Pottage at RHS Wisley to gauge public reaction to the new Exotic Garden.

Urban Meadows Project: <http://bess-urban.group.shef.ac.uk>

Read more about Helen's work: <https://people.uwe.ac.uk/Person/HelenHoyle>

Abbotsbury Subtropical Gardens

Climate change and Abbotsbury Subtropical Gardens

Stephen Griffith, Curator, Abbotsbury Subtropical Gardens

Introduction to the garden (adapted from 'The Abbotsbury Gardens Story' by Stephen Griffith, published by Step-Up Books, 2015):

Hidden in a gently undulating valley just a short distance from the famous Chesil Beach, lies the unique Abbotsbury Subtropical Gardens. Originally conceived in the 18th century, the Gardens have been held under the stewardship of the Earls and Countesses of Ilchester and their succeeding generations since 1765. Towering evergreen Holm Oaks from the Mediterranean dominate the overhead canopy. Ponds, streams and exotic vegetation from all over the world thrive in its balmy atmosphere, where the shelter and calm serenity are only broken by the shrill cry of Golden Pheasants or the rather startling banter from the call of the resident aviary Kookaburras.

Here lies a very different woodland garden, not trying to conform to trend or design, but letting the plants do the talking. Skilful juxtaposition of bold foliage against upright and linear subtle shades of colour, subduing hot primary colours, this is gardening on the limit of the plants' natural ability to deal with winter cold. Aided by its very own special microclimate, rare and tender exotic plants grow relatively unhindered in the humid sheltered valley in a place where spring comes early and sea frets or misty mornings linger, creating the kind of humidity and warmth more reminiscent of far-off Mediterranean landscapes.

Biography:



An experienced horticulturalist who has held the post of Curator at Abbotsbury SubTropical gardens since 1990 where he has been responsible for the restoration and development of this once neglected historic garden. Here he has amassed a considerable collection of rare and unusual plant taxa from around the world.

He is also gardens advisor to Melbury House, also known as "Great Hintock Court" in one of Thomas Hardy's novels. Stephen is a gardening lecturer, an author, and tour leader for special interest holidays. As an

experienced traveller he has been on botanising expeditions to remote parts of Borneo, Chile, Myanmar and the Himalayas.

Formerly holding posts as Head gardener for several important historic house gardens in the UK, South of France, Head gardener on the Island of Sark in the Channel Islands, tree surgery in Southern Ireland, and as Landscaping manager on prestigious projects in Saudi Arabia.

He is a member of the Institute of Horticulture, Winston Churchill Memorial Trust Fellow, and has been on the Royal Horticultural Society Woody plants Committee.

Notes:

Planting choices in a changing climate

Plant choices in a changing climate - Drought Tolerant Plants in a Hotter, Drier Future
An Overview of some useful taxa from the American South West
John Edmiston, Director, Tropical Britain

Abstract:

In the cool temperate climate of the UK, plants-people have always aspired to introduce and grow new plant taxa. For many decades, one of the major trends in British gardens has been the use of perennials. Now - with a changing climate and an increasing pattern of warmer weather - mesic, water-thirsty, herbaceous plants are no longer the most sustainable choice. Drought-resistant perennials and more modern, less high-maintenance perennial plantings may represent only part of the way forward. The UK climate is a complex picture with regional differences and differing wind directions bringing our famously changeable weather but a pattern of hot, dry summers (often following on from a hot, dry spring) has become more prevalent - particularly in the south. Extended heat-waves challenge the most ardent gardener. Mediterranean planting is often quoted as being a model for the future UK garden but the flora of the American South-West - in particular, from the mountains - may be a more useful analogue with plants there subjected to extremes of cold and heat, wet and dry. At high elevations, plants experience extended periods of sub-zero temperatures and wet snow-melt followed by long hot summers. John explores the use of xeric plants and some of the more suitable taxa for UK conditions and suggests that a fusion planting - incorporating xeric plants that are hardy in the UK together with drought-resistant perennials - may be the 'mixed border' of the future. While many xeric plants have the disadvantages of being monocarpic or spiky or both, John outlines his constant search for the Holy Grail - xeric plants that are hardy, polycarpic and non-spiky!

Biography:



John Edmiston is a Director of Tropical Britain, an online plant nursery that specialises in hardy exotics with a focus on the changing climate. A self-confessed plantaholic, he built his first glasshouse at the age of twelve and has been unable to stop growing plants ever since. John is a strong believer in the part that both gardeners and nurseries can play in botanical conservation.

Tropical Britain:
<https://www.tropicalbritain.co.uk>

Notes:

Planting choices in a changing climate

Challenges of a changing environment

Richard A. Baines, Curator, Logan Botanic Garden - a regional garden of the Royal Botanic Garden Edinburgh

Abstract:

There is well-documented evidence that the climate across the planet is changing. The global mean surface temperature is increasing, rainfall patterns are changing and droughts are becoming more frequent and pronounced. Coastal gardens may now be subject to flooding with the increase in the frequency and severity of tidal surges. In future years it is theoretically possible that some parts of the UK could be frost free. So what are the implications for horticulturists?

There is no doubt that there are implications from these changes in relation to both opportunities and disadvantages. A longer growing season with warmer overall temperatures with increased solar radiation will benefit plant growth overall and extend the range of species that can be grown. Extreme rainfall causing flooding will present challenges in its own right especially in northern parts of the UK. Prolonged dry spells will strongly influence plant selection, affect plant maintenance and focus our minds on how we capture water during intense rainfall. Warmer conditions may favour the spread of new and existing pests and diseases, presenting challenges to their control and minimal use of pesticides. Even if we achieve current gas emissions, our climate will change due to historic emissions thus we need to consider how plants planted today will be suited to the climate in 2040, for example.

The presentation will focus on ways that you can reduce climate change and take advantage of opportunities that may present themselves.

Biography:



Richard Baines is Curator of Logan Botanic Garden, RBGE, a position he has held for 12 years. An experienced plantsman, he has participated in many overseas plant collecting expeditions, field research and lecture tours.

He has a particular interest in Rhododendrons, Magnolias and southern hemisphere exotics and is an experienced broadcaster and author in his field.

Notes:

Planting choices in a changing climate

Thinking Again: species choice for adaptation and resilience in designed historical treescapes

Simon Toomer, National Specialist for Plant Conservation at the National Trust

Abstract:

The presentation will include an examination of the process of planning for sustainable tree replenishment in historical landscapes. There will be a discussion of how to find the balance between conserving distinctive design style, including choosing species that enhance 'spirit of place', while ensuring resilience to change and uncertainty.

Threats from pests and diseases and changing climate provide challenges and necessitate a new approach. Changing public expectations, visitor pressures and resourcing will also influence what species and cultivars will be represented in the heritage and historical landscapes of the future.

Using examples from a number of registered historical parks and gardens, the presentation will describe the philosophy, rationale and decision process involved in determining species choice. It will include suggested plant 'substitutions' for specific tree characteristics and landscaping situations.

Biography:



Simon is the National Specialist for Plant Conservation at the National Trust. Originally trained in environmental biology and forestry, Simon Toomer has worked as a forester, land management advisor and arboriculturalist in private, local authority and charity sectors. Simon previously worked for 15 years as Curator and Director at Westonbirt, The National Arboretum. He is Chair of PlantNetwork, a member of the Plant Conservation Committee of Plant Heritage and a profession member of the Arboricultural Association.

Notes:

Planting choices in a changing climate

Designing Landscapes for Resilience and Regeneration

Mark Laurence, Mark Laurence Design Ltd.

Abstract:

How can we design gardens and landscapes to adapt to climate change and create new emerging ecologies? Novel ecosystems, adoption of mass green-blue urban infrastructure and whole-system thinking give us the tools to adapt and regenerate our landscapes and our lives.

Biography:



Mark Laurence has 40 years' experience as a landscape designer, contractor, arborist, nurseryman and living wall specialist. He is a committee member of the Society of Garden Designers (Technical & Sustainability) and a Chartered Horticulturalist. Mark has always sought to develop ecological connections with his work and practiced sustainability long before the word came into use, as well as developing an understanding of Design Psychology and Pattern Language in landscape.

For the past decade Mark has specialised in Living Walls, developing his patented hydroponic modular system and worked in climates as diverse as Norway, Chicago and the United Arab Emirates. He also works in the UAE as a consulting Arborist where he has managed the surveying, training of staff and pruning of hundreds of trees in parks and royal palaces.

Current concerns are developing sustainability standards for the landscape industry, creating a profession of Ecological Horticulture for the UK and working on the restoration of soils for resilience and carbon storage.

Notes:

Lightning Talks

According to Wikipedia, lightning is 'a violent and sudden electrostatic discharge where two electrically charged regions in the atmosphere temporarily equalize themselves'. The Lightning Talks session at the PlantNetwork Conference 2019 might not be violent but they certainly will be charged!

This session is about high energy, high interest talks of 5-10 minutes that seek to enthuse, inspire and involve all participants. They are delivered by delegates who want to contribute to discussion around climate change and gardens. Taking place at the end of the first day of the conference, the Lightning Talks will end the day on an energetic high note, prior to the conference dinner at a not -so-secret beach-side location.

PlantNetwork is pleased to announce the following speakers in the Lightning Talks session (all times are approximate):

17:50: **Gary Long** – Curator of Trewithen Gardens, Cornwall
Climate resilience within our Master Plan

18:00: **Janet Manning** – Water Management Specialist at the Royal Horticultural Society
Water: painting by numbers

18:10: **Rob Brett** – Curator of RHS Garden Hyde Hall
Opportunities and Challenges of Climate Change to Public Gardens

18:20: **Dr Phil Sterling**, - Programme Manager: Building Sites for Butterflies, Butterfly Conservation
What is happening to amenity grasslands as the climate warms?

Janet Manning, Water Management Specialist at the Royal Horticultural Society

Abstract:

This presentation will numerically explore the challenges to horticulture and gardeners posed by upcoming changes in legislation and climate change. It will show that small marginal gains in water saving in the garden quickly multiply to a significant impact on carbon emissions and resilience to drought and flood, and how gardeners in the UK can play a part in managing the water cycle for everyone's benefit.

Biography:

After 17 years working as a Scientist at Wessex Water, I returned after a career break to work at Cleeve (production) nursery, gaining practical experience growing ornamental plants for my local garden centre.

I began my scientific career with three science A-Levels working in laboratories at the Ministry of Agriculture, studying for a degree in chemistry at UWE and an MSc in water pollution control technology with Cranfield University on a part-time basis while working full time. I became the UK's first garden water scientist in November 2018

<https://www.rhs.org.uk/science/articles/UK-first-garden-water-scientist>

Notes:

Building resilience in gardens

Doing your bit in the climate crisis

Augusta Grand, Head of Policy, Eden Project

Abstract:

No abstract available.

Biography:

Augusta has worked at Eden since 2001, on climate change, mining and conservation issues. She has a master's degree in Tropical Horticulture and has previously worked in zoology and garden design.

Notes:

Building resilience in gardens

Looking after glorious gardens and healthy landscapes

Mark Roberts, National Specialist Water, National Trust

Abstract:

The National Trust is tasked with looking after special places 'forever for everyone'. That includes both our glorious gardens and our wide open landscapes. In a world where the climate is changing; our operations need to work hard to ensure we are minimising our impact on the natural environment around us. One element of this is the efficient use of water supplies and particularly drinking water. We need to respect nature by leaving enough water in our landscapes. With one eye on the prolonged dry weather experienced during the summer of 2018 this presentation will look at how our water use behaviours need to change and what innovative practices are being implemented at some of our gardens to better understand and ultimately minimise our water consumption.

Biography:

Mark Roberts works for the National Trust as their specialist for water. His role is to provide properties with advice and guidance on all aspects of water including mains water usage, private water supplies, private wastewater treatment systems, flood risk and sustainable drainage. Mark has always enjoyed nature and landscapes and has spent his whole career trying to understand how we, the human race, impact on the environment so we can begin to live more harmoniously with it.

Notes:

Building resilience in gardens

Water management in gardens: building resilience

Marcus White, Director of Hydreau Consulting Engineers

Abstract:

Resilience is future proofing against uncertainty by sensibly defining what that uncertainty might bring. A key concept is tying in sustainability and efficiency with reducing your costs - both in terms of capital project outlay and long-term annual maintenance. Drought, short or long term is obviously one major water related concern, the other being flood protection and drainage capability. This discussion concentrates on water supply and irrigation, touching only on flood resilience concepts.

On a practical level we will look at how to maximise available water resources plus various engineering techniques and decision-making processes to fit site and budget constraints. The discussion will centre on the UK environment as statutory legislation has a big impact on what is both possible, and what might be mandatory.

Biography:

Marcus White, Director of Hydreau Ltd is a Chartered Engineer with twenty-five years experience in water engineering and environmental water management, drainage engineering, irrigation engineering and construction management and planning. He has worked extensively in historic environments, landscapes and golf courses. As a consulting engineer, Marcus designs and engineers irrigation systems, boreholes, reservoirs, drainage and river & lake restoration. He has successfully applied for over a hundred abstraction licences, carried out multiple flood risk assessments and has worked extensively with English Heritage, Natural England, The National Trust and The Royal Parks. He has been employed in large and small scale water management projects throughout Europe and as far afield as Russia, The Middle East, North Africa and Argentina.

Notes:

Building resilience in gardens

Resilient trees: planning for the future

Mark Broadmeadow, Principal Adviser Climate Change, Forestry Commission

Abstract:

Mark will explore the concept of resilience – specifically to climate change – and what is likely to constitute a tree, wood or forest resilient to whatever the future throws at it. The presentation will cover species; species assemblages; genetic diversity within species; assisted migration; biological characteristics that are likely to confer resilience; and, how tree and woodland management can enhance resilience. Maladaptation and actions that are unlikely to help trees and woodland adapt to a rapidly changing climate will also be considered. Finally, some thoughts will be presented on how to minimise the likelihood of maladaptation while ensuring that the selection of planting stock and management of existing trees and woodland provides a resilient a starting point as possible, given uncertainty in the future climate.

Biography:



Mark Broadmeadow is the Forestry Commission's Principal Adviser for Climate Change in England, currently leading their woodland creation programme. His role covers the development of policy and its application to delivery for both climate change mitigation and adaptation. Prior to transferring to Forestry Commission England in 2006, Mark led Forest Research's Environmental Change Research Group, covering forest monitoring and climate change adaptation/ mitigation research programmes. He is a plant physiologist by training.

Notes:

Plant issues in a changing climate

New innovations & challenges for biological control at garden sites

Julian Ives, Dragonfli Ltd.

Abstract:

The use of biological control in horticulture has greatly expanded over the last decade, driven by the reduced availability of new pesticides and environmental pressures to grow crops without the use of insecticides. For commercial growers, investment in research to find and develop new biological controls has been largely successful with many new beneficial insects and natural enemies becoming available for commercial use. This is not always the case with amenity horticulture and sites housing plant collections. Finding solutions for multiple plant types housed together rather than mono crops can create more of a challenge for the biological controls currently available in the UK. Biological control is also easier to manage in protected environments, with open garden sites attacked by outdoor pests such as the new invasive box tree moth. Non-native new pests are an increasing threat to UK gardens. Despite all these threats, significant progress is being made to control insect pests at garden sites by adapting techniques and products used by commercial growers and by creating bespoke biological control programmes for each site.

Biography:



Julian is the founder of Dragonfli Ltd, which specializes in the supply, application and development of biological control products. He has spent the majority of his career working in the Biological Control sector, spending over 10 years with the leading producer of beneficial insects, Koppert Biological Systems. Here he worked closely with growers developing integrated pest management systems before moving into management at Koppert. Julian left Koppert to work in the mail order business developing retail forms of biological control products that gardeners could access before forming Dragonfli in 2009. Dragonfli provide biological control solutions for both amateur and professional gardeners in the amenity sector.

Notes:

Plant issues in a changing climate

Ornamental plants: a threat to the environment due to climate change?

Tomos Jones, PhD student, University of Reading

Abstract:

Most ornamental plants have not escaped 'beyond the garden fence' – i.e. naturalised in the wider environment – and only a relatively small number of these have become invasive. However, climate change has the potential to facilitate naturalisation and/or invasion of species that have not previously been problematic. This is referred to as an 'invasion debt'. Adopting an interdisciplinary approach, this project is investigating this 'invasion debt' with both citizen science and species distribution modelling.

Gardeners can be the first to observe ornamental plants showing invasive characteristics within gardens. For this reason, an on-going survey is asking gardeners in Britain and Ireland to identify which ornamental plants are taking over or invading their gardens. Results from this survey will be presented. This approach has the potential to identify problematic plants early in the naturalisation-invasion process. These plants are being investigated further with species distribution modelling. This can project probabilities of occurrence or identify climatic suitability for the future, allowing for a measurement of naturalisation and/or invasive potential.

Such a focus on identifying invasive potential early is widely regarded to be both ecologically and economically preferable to having to manage plants which have already become invasive.

Biography:



Tomos is a NERC SCENARIO PhD student at the University of Reading. He studied Geography at Bangor University before an MSc in Sustainability at the University of Leeds. Between his studies, Tomos worked as a gardener at Treborth Botanic Garden in North Wales. This combination of geographical and horticultural interest led to his current PhD research on the invasion potential of ornamental plants; focusing on the role of gardeners in preventing and managing future invasions.

Notes:

Plant issues in a changing climate

Invasive plants, their “pests” and climate change

Dr Richard Shaw, Country Director CABI UK/Regional Coordinator Invasives

Abstract:

There will be many winners and losers under current climate change projections and while this may be an opportunity for horticulturalists to redesign their gardens, we will need to defend ourselves against new weeds and pests. Increased travel, trade and tourism not only contributes to climate change but also drives the increased arrival of new non-native species that can benefit from changing temperatures. Climate change can also influence the receiving environment to the benefit of the invader, be it through increased disturbance events, increased available carbon dioxide, changed fire regimes, favouring phenotypic plasticity or simply by making other/larger regions able to supply new invaders through current pathways. However, plant pests are also on the move and our usual suite of exotic natural enemies will also change and some of these could cause serious problems to agricultural productivity and hence food security. On the flip side many invasive species have potential biocontrol solutions or “beneficial pests” in their native range and this will not change and some of the current a future targets of this growing area of weed management are to be explored.

Biography:



Dick Shaw has worked for CABI for 25 years and is now the Country Director for the UK responsible for the running of CABI’s UK science site in Surrey which absorbed the former CABI institutes of Parasitology, Entomology, Mycology and Biological Control. He is an applied entomologist, having completed both his MSc and PhD at University of London (now Imperial College) and specialises in Invasive Species. Dick is also the Regional Coordinator for invasive species in Europe and the Americas and led the pioneering work on a suite of classical weed biocontrol projects for the UK.

Dick has a particular interest in invasive weeds and their management using biological control and this requires looking at species home and away and ultimately depends on climatic matching. As an entomologist he is also interested in how insects will behave in the future in particular in the Developing World where CABI mainly operates

Notes:

Minterne Garden

The gardens of Minterne House are famous for their collections of rhododendrons, Japanese cherries and magnolias, many of which are rarely seen in cultivation and some are threatened in the wild. The majority of plants here originate from plant hunters who toured the world between 1850 and 1950, with a particular emphasis on plants from the Himalayas.

All are planted in a peaceful 20-acre wooded valley which has been described as a 'corner of paradise.' The gardens are at their best in May and June when many of these specimens are flowering. Small lakes, streams and cascades offer a new vista at each turn around the 1-mile round horseshoe-shaped gardens, and in the summer the streams are enhanced by primulas, astilbes and water-lilies. Over 200 maples provide autumn colouring.

Bring a camera and enter your photographs to win a chance to appear in the Minterne Calendar 2020! Competition closes in November 2019.

<http://minterne.co.uk/wp/>

Sponsors

Dragonfli provides specialist advice and products for the biological pest control of insect pests. Products include beneficial insects, nematodes, trapping systems and bio stimulants. Dragonfli is a Silver Sponsor of PlantNetwork.

www.dragonfli.co.uk



British Sugar TOPSOIL is the largest UK manufacturer and supplier of environmentally sustainable topsoil and topdressing products to the landscaping, construction and sports turf/amenity sectors, supplying over 250,000 tonnes annually. British Sugar TOPSOIL is a Silver Sponsor of PlantNetwork.

www.bstopsoil.co.uk



Visit the sponsor stands during the conference to find out more about their products and services.

Resources

The focus of the conference is adaptation and building resilience. We can all take measures to reduce our carbon footprint but the crucial step is very much accepting the reality of climate change and ensuring that gardens are adapted to withstand climate extremes.

What does climate change mean for botanic, heritage and other public gardens?

Dr Jo House, a lead author with the Intergovernmental Panel for Climate Change, the United Nations body for assessing the science related to climate change, suggests that 'the roles that gardens could play include reducing the use of peat and nitrogen-based manufactured fertilisers, supporting formation of soil carbon (with all its other multiple benefits to plants such as nutrient and moisture retention), and planting trees.'. Many gardens are already taking such steps, finding additional benefits from reduced running costs and providing stories to communicate to visitors.

While it is important to take steps to improve their energy and water efficiency and reduce the amount of waste generated, contributing to reduced emissions, it is important to consider the life cycle of goods and services. Many studies have demonstrated that it is only by factoring in all steps from production to end-of-life that the full environmental footprint (carbon and other emissions, water use, raw materials etc.) can be fully understood. As such, replacing existing equipment can, in certain circumstances, exert an overall negative impact on the environment even if the new equipment is badged as being cleaner and greener.

While we can all take action to reduce our carbon footprint, there is also a need to consider steps we can take to adapt to our changing climate and mitigate against its negative impacts through building resilience in gardens. Climate predictions indicate that the southern areas of the UK will be drier and northern areas potentially wetter, especially over winter, with more extreme rainfall events recorded across the country. As such, gardens might need to consider:

- approaches for storing water for use during summer (when lower rainfall rates are predicted) or to prevent pluvial flooding during winter/high rainfall;
- measures to prevent fluvial flooding in gardens with streams, rivers or other water bodies;
- planting designs suitable for flooding and/or drought including tree planting or creation of a peat bog (the 'Amazonian rainforests of the UK'); and,
- effective soil management to reduce soil capping for increased soil permeability and reduced surface run-off.

Rising temperatures across the UK will change what plants can be grown where and while it might allow more Mediterranean and even tropical plants to be grown due to reduced likelihood of frost, it might restrict other plants currently common in UK gardens that flourish at cooler temperatures. There is likely to be a longer growing season – good for productive/edible gardens – but also more opportunity for pests and diseases which flourish in wet and warm conditions without frost to control their populations. Introduced pests and diseases will also become more prevalent while our native/naturalised wildlife might be adversely affected, resulting in perturbations to food webs and potentially impacting natural predation/pollination.

Gardens are not islands but are interconnected with the surrounding environment. It is important to consider the feedbacks between garden and wider environment: will measures to protect a garden from flooding increase flooding incidence outside the garden, or will new plants introduced to warmer gardens increase the potential pool of invasive species? Linking gardens into national land use planning will be an essential consideration in the future, with gardens potentially rewarded for public goods that deliver climate services.

Horticulturists need to consider how their activities contribute to climate change and identify areas where they can reduce emissions or even how they can turn a garden from a carbon source to a carbon sink through effective soil management and planting. It is also important that gardens become more resilient in the face of climate change with management plans seriously considering the effect of climate change on the garden and the measures that can be adopted

to reduce negative impacts. Communicating these measures to visitors will help spread the word – small actions being adopted by a large number of people resulting in a real difference.

Information sources

Many horticultural, gardening and environmental publications feature regular articles on climate change: see the RHS' *The Garden* magazine and RSPB's *Nature's Home*.

BBC (2019). Climate change: LED lights making dent in UK energy demand. Reported 03 January 2019. Available from: <https://www.bbc.co.uk/news/science-environment-46741346>

CIRIA (2015). The SuDS Manual (C753). Published: 11 November 2015. Available from: https://www.ciria.org/Resources/Free_publications/SuDS_manual_C753.aspx

Committee on Climate Change (2018). Land use: Reducing emissions and preparing for climate change. Published 15 November 2018. Available from: <https://www.theccc.org.uk/publication/land-use-reducing-emissions-and-preparing-for-climate-change/>

Defra (2018). UKCP18 Science Overview report. Published 26 November 2018. Available from: <https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Overview-report.pdf>

Hendrickson, C.T., Lave, L.B., and Matthews, H.S. (2006). Environmental Life Cycle Assessment of Goods and Services: An Input-Output Approach. Washington, D.C., Resources for the Future. View online: https://books.google.co.uk/books?id=FZ2VUOX1gbAC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

IPCC (2018). Special Report: Global Warming of 1.5°C. Published October 2018. Available from: <https://www.ipcc.ch/sr15/>

RHS (2017). Gardening in a Changing Climate. Published 26 April 2017. Available from: <https://www.rhs.org.uk/science/gardening-in-a-changing-world/climate-change>

The Royal Society (2018). Greenhouse gas removal. Reported 12 September 2018. Available from: <https://royalsociety.org/topics-policy/projects/greenhouse-gas-removal/>

Historical UK Climate: <https://www.metoffice.gov.uk/climate>
Climate change <https://www.metoffice.gov.uk/weather/learn-about/climate-change>
UK Climate Projections: <https://www.metoffice.gov.uk/research/collaboration/ukcp>

Sharing experiences

PlantNetwork can and should be used to share good practice and test new ideas. By joining all member gardens together, we can report back on measures that work, steps that don't and solutions that might work better in different areas of the UK and Ireland...

If you would like to join the PlantNetwork Climate Discussion Group, please contact the PlantNetwork Coordinator. As a member of the group, you will be asked to send in a short annual summary of what measures you have taken to adapt your garden to a changing climate, how successful these measures have been, other aspects you are exploring and/or approaches you would like to discuss with other gardens (have others implemented an approach/measure? How successful was it? What were the cost implications?).

There will be a follow-up meeting in summer 2020 at Logan Botanic Gardens to discuss topics relating to a changing climate. We look forward to seeing you there!

Notes and contacts:

Will the conference change how you manage your garden or plant collection?
If so, we would like to hear from you. Let us know what you are planning to do:
office@plantnetwork.org or @PlantNetwork.

#ClimateChampions

PlantNetwork Events 2020

PlantNetwork Annual Conference and AGM
Excellence in Horticulture
April 2020

Training Days

- Winter Gardens
- Herbarium Techniques
- Glasshouse Forum
- Plant Records Group
- Exotic Gardening
- Tourism & Gardens
- Tree Forum
- Skills Forum

And introducing.... **The Sustainability Programme** with in-depth analysis of topical issues concerning growing media, plastics, herbicides, water use and many more issues.

If you have suggestions for training days or discussion topics, or would like to host an event, please contact us.

PlantNetwork Events 2019

Climate Change & Gardens: PlantNetwork Annual Conference and AGM
08-09 May, Abbotsbury Subtropical Gardens, Dorset.

Training days:

Plant Records, 15 May, Chester Zoo.

Arboreta and Woodlands: Tree Forum at RHS Rosemoor, 04 June, RHS Rosemoor, Devon.

Garden Masterplans and Management, 12 September, Trewithen Gardens, Cornwall.

Conservation, Preservation and Demonstration: the What, Why and How of National Plant Collections, 26 September, Upton House & Gardens, Warwickshire.

Play & Engagement in Gardens, 09 October, Walmer Castle & Gardens, Kent.

Tree Forum at Royal Botanic Garden Edinburgh, 22 October, Royal Botanic Garden Edinburgh.

More information and online booking at the PlantNetwork website:

www.plantnetwork.org



PlantNetwork
Connecting gardens, sharing skills