Climate Systems

National Environmental Science Program

NESP Climate Systems Hub

Climate training 2022-2024

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This project is supported with funding from the Australian Government under the National Environmental Science Program.

The Climate Systems Hub is a partnership of CSIRO, Bureau of Meteorology, Australian National University, Monash University, University of Melbourne, University of New South Wales and University of Tasmania and the Cross-jurisdictional Community of Practice for Climate Science. For more information, visit www.nesp2climate.com.au.

Please cite as: Clarke, J, Boulter, S., Hoffmann, D., & Murphy, B. (2025) *NESP Climate Systems Hub: Climate training* 2022-2024. Climate Systems Hub Report. Climate Systems Hub. National Environment Science Program, Australia.

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Cover image: Participant group photo at the climate training in Perth. Photo provided by Brad Murphy.

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Background

The NESP Climate Systems Hub project, Synthesis communication and data: Tailored information for stakeholders, co-developed a two-day training course on climate science, information and adaptation to meet the needs of government decision-makers. The initial co-design was undertaken in 2022 and the 'mature' course co-delivered throughout 2023 and 2024.

Pilot program

The project team comprised researchers with over 35 years of collective experience in delivering climate and adaptation training within and outside Australia. Drawing on this experience, a draft training program was developed. Initially, this was a one-day course. Following the first training pilot in Perth, the program was revised to include a second day. The 'day two' material was subsequently delivered to the Perth participants and the new two-day program delivered in Canberra. In total, around 60 participants attended the pilots. For all workshops, pre- and post-surveys were conducted to gauge the level of climate and adaptation literacy among participants, before and after the training (CSIRO Human Research Ethics Committee approval 198/22). The programs were well attended with good engagement throughout the day, and with great feedback highlighting the importance of such training.

The training was split into different topics with presentations covering

- climate 101 (past climate, climate models, projections and uncertainty),
- places to find climate information (existing portal landscape and what they offer for whom),
- climate adaptation and planning approaches, and
- climate communication (in Canberra).

The presentations were interspersed with interactive breakout sessions and Q&As on

- interpreting climate change projections, where participants had to decipher climate change statements in small groups;
- climate information needs and delivery format, where participants collated questions, they wanted to answer with climate change information and work out what climate variables they would need to do that; and
- Q&A with climate scientists.

Drawing on the discussions during the training and feedback received in the evaluation surveys, a revised program was developed. The new program formed the starting point for the co-delivery of the future programs.

Rollout of the ‘mature program’

The ‘mature program’ comprised two consecutive days of face to face (usually in person) training, usually comprising the following sessions:

- Day 1: finding, understanding and using the right climate information
- Part 1: understanding climate change science
- Understanding how our climate changing, now and in the future
- Interpreting climate change projections
- Communicating climate change information
- Part 2: using climate change information
- Guidance on where to access climate data and information
- Break-out activities: Identifying and refining the climate information that you need
- Day 2: adaptation planning approaches
- Part 3: undertaking and implementing an adaptation plan
- introduction to climate risk assessment
- Break-out activity: developing a first pass risk assessment
- Building, implementing, and monitoring an adaptation plan
- Break-out activity: identify adaptation options
- Creating scenarios of the future
- Break-out: ask an expert, reflect on your needs

As the program was rolled out, modules were added and/or adjusted to suit the needs of the participant group. Their needs were identified through a co-design process with key stakeholders, complemented by a pre-training survey to identify areas of emphasis for the training team. Two contrasting examples of the detailed program are included in Appendix A, and descriptions of core sessions are provided in Appendix B.

In total, the ‘mature program’ was delivered five times between October 2023 and November 2024. More than 150 participants from local, State and Commonwealth governments attended these courses.

Training was delivered to all States and Territories except NSW and the Northern Territory – see Table 1. Note that the training delivered in Brisbane was a half-day ‘taster’ session as part of the Climate Ready Australia National Summit organised by Griffith University.

State/ Territory	Contact/s	Stakeholders	Location	Date	No. of participants
ACT	Danielle Klomp (DCCEEW)	DCCEEW	Canberra	24 Nov 2022	25
WA	Kelly Barnes, Emily Gifford & Anna Gstaettner (DWER)	State/local government	Perth	22 Nov 2022	31
WA	Anna Gstaettner (DWER)	State government	Perth	29 June 2023	35
ACT	Chris Gouramanis (DCCEEW)	DCCEEW NAPO	Canberra	17-18 Oct 2023	20
Qld: Climate Ready Australia National Summit	Cheryl Briars Ed Morgan	Varied	Brisbane	23 Nov 2023	48
SA	Andrew Nesbitt (SA LGA), Susan Sweeney (KB)	Local government	Adelaide	20-21 Feb 2024	30
Vic	Helen Bloustein (DEECA)	State government	Royal Australasian College of Surgeons	30 Apr-1 May 2024	35
Tas	Hannah Snape (LGAT)	Local, State & Commonwealth governments	Hobart	20-21 Nov 2024	17
				Total:	**241**

Table 1: Training courses delivered from 2022 to 2024 with number of participants.

Feedback and lessons learnt

Formal evaluations were conducted following each course. Participants were asked to self-assess their levels of confidence in the subject matter of the training, before and after the course. In addition, the post-training survey asked participants to indicate if their confidence level had changed because of the training. Most participants indicated that the training had increased their confidence in seven subject areas as summarised below.

Change in confidence (%)			
Subject Area	Improved	Not improved	No response
Understanding the process of undertaking a climate risk assessment	94%	5%	2%
Undertaking a first pass climate risk assessment	94%	5%	2%
Understanding approaches to adaptation planning	95%	3%	2%
Understanding observed/historic…	94%	5%	2%
Understanding future climate projections	94%	5%	2%
Understanding where to find relevant climate information	94%	3%	3%
Understanding ways to effectively communicate…(not covered in Hobart)	85%	11%	5%

The training pilot programs were conducted under Human Research Ethics Approval. Evaluations of the ‘mature rollout’ were undertaken solely to inform the ongoing improvement of the training program. Accordingly, no human research ethics approval was required.

Selected comments received as part of the evaluation:

“My thanks to all the presenters and facilitators today - the workshop was pitched at the right level, and content was highly relevant and engaging. One of the things I valued the most was the ability to hear about the experiences of other attendees and learn from my peers.”

“Great session thanks. Would be great to see some more case studies of how the science has been applied to demonstrate risk and support decision-making to reduce future risk exposure”

“Good combination of presentations & interactive tasks. Nice flexibility to allow conversations to flow.”

Development of online training

While the need and effectiveness of the in-person training are clear from feedback received, its reach is limited by capacity of hub staff to deliver it. Several organisations, DCCEEW in particular, expressed the desire for delivery of the training to additional staff and on a regular basis to new staff. To meet these needs, and to extend the life of the training beyond the end of the project, online training resources were planned based on the in-person training. Videos presenting similar material to the in-person presentations were recorded and linked with supporting material, including fact sheets and other resources:

- Climate essentials
- Australia's changing climate and extremes
- Climate projection science
- What is climate change adaptation?
- Adaptation planning step 1: Scoping
- Adaptation planning step 2: Undertaking a vulnerability and climate risk assessment
- Adaptation planning step 3: Plan response
- Adaptation planning step 4: Implement the plan and monitor

Alongside these materials, several guidance documents were also developed. These are hosted on the hub website under a "Training" section of the Learning Centre (https://nesp2climate.com.au/learn/). The videos and other material are designed for self-paced learning, allowing participants to increase their knowledge in whichever topics they require.

Insights

Key insights drawn from running these courses include:

1. Participants place high value in having domain experts in the room
2. Opportunities to share experience among participants are highly valued
3. Hands-on break-out activities are important to consolidate learning and provide opportunities to apply learnings to individual's own circumstances
4. Providing ample time for discussion and Q&A is vital to consolidate learning
5. There is support for online learning materials but most participants view these as an adjunct to in-person training.

Collectively, the training team have been designing and delivering climate and/or adaptation training to a diverse range of participants over many years. In the past, efforts were focussed on 'train-the-trainer' style courses.

However, these had limited success, due largely to high turnover of personnel in roles and agencies. Another important factor though, is the complexity of the content. Once trained, many participants lack the confidence to deliver the training themselves. This is compounded by the very high value that participants place on having recognised subject matter experts (e.g. climate scientists, adaptation practitioners) in the room. Taken together, these factors lead to an ongoing (and growing) demand for the type of training we delivered under this project.

Appendix A: Example training programs

1. Program for Local Government Association of Tasmania (LGAT), November 2024
2. Program for Department of Climate Change, Energy, the Environment and Water (DCCEEW), October 2023

Break-out session amongst participants at the climate training in Tasmania.

Group photo of participants at the climate training in Victoria.

Program for Local Government Association of Tasmania (LGAT)

Climate information for policy-makers
C3 Convention Centre, South Hobart

Agenda day 1: 20 November 2024

Time	Topic
09:00	Coffee and networking
09:10	1. Welcome, and Acknowledgement of Country 2. Introduction (5 minutes) 3. Introduction from hosting institution (5 minutes) 4. Short Round table introductions (10 minutes) 5. The current state of risk assessment - Katrina Graham (10 minutes) 6. Q&A (5 minutes)
Part I : Responding to climate change	
09:45	**Session 1 (Presentation): Why is adaptation important, and what do we know about the challenge?** (20 minutes) • What is adaptation? • The value of adaptation planning frameworks
10:05	**Session 2 (Break-out): What is already challenging you?** (20 minutes) • Understanding what participants have already experienced, and what they are trying to achieve
10:25	**Session 3 (Presentation): Past climate change and observations** (20 minutes) • Understanding observations of climate change, and the multiple lines of evidence that our climate is changing Q&A (10 minutes)
10:55	Morning tea (15 minutes)
Part II : Stepping through a climate change management framework	
11:10	**Session 4 (Presentation): Step 1 Scoping** (20 minutes • Decide how to approach the process • Engagement • Scale Q&A (10 minutes)

Time	Topic
11:40	**Session 5 (Presentation): Climate change experiments help understand how our climate is changing now and in the future** (60 minutes) • The climate system • Using models to simulate the Earth's climate
12:45	Lunch break (45 minutes)
13:30	**Sessions 5 (continued)** (30 minutes) • What are climate projections and how do we know they are 'right' • Scale of information • Using projections information including the dreaded 'uncertainty' Q&A (10 minutes)
14:10	**Session 6 (Break-out): Developing a first pass risk assessment - scope** (30 minutes) • In groups undertake the scoping step of a first pass risk assessment • Look at different projections and information for you scenario
14:40	Afternoon tea (20 minutes)
15:00	**Session 7 (Presentation): Step 2 Undertaking a vulnerability and climate risk assessment** (60 minutes) • Assessing vulnerability • Assessing risk
16:00	Close

Program for Local Government Association of Tasmania (LGAT)

Climate information for policy-makers
C3 Convention Centre, South Hobart

Agenda day 2: 21 November 2024

Time	Topic
09:00	Coffee and sign-in
09:15	Introduction
09:20	**Session 8 (Presentation & discussion):** Recap of key concepts (20 minutes)
Part III : Hazard based risk assessment	
09:40	**Session 9 (Break-out 2): Developing a first pass risk assessment** (60 minutes) • Past climate hazards and approaches to risk reduction • Residual risk • Future hazards and impact • Vulnerability report back (20 minutes)
11:00	Morning tea (20 minutes)
11:20	**Session 10 (Presentation): Steps 3 & 4 Assessing options and M&E** (20 minutes) • Evaluate options • Sequence options • Monitor and evaluate
11:40	**Session 11 (Break-out 3): Completing your first pass risk assessment** (60 minutes) • Consider adaptation options
12:40	Lunch break (40 minutes)
13:20	**Session 12 (Presentation): What are your next steps** (20 minutes) • Detailed risk assessment • Who does this work? Getting outside help • What about when things/ino change Q&A (10 minutes)

Time	Topic
13:50	**Session 13 (Presentation): How and where to access climate data and information** (30 minutes) • National and international portals and websites providing climate data and information • What to look out for when usig the different sources Q&A (10 minutes)
14:30	**Session 14 (Break-out 2): What questions are you trying to answer and who are you trying to communicate with?** (30 minutes) • In small groups discuss a use case for climate information for your sector/region • Considering the use case, what variables do you need to consider and the specific nature of that • What other information do you need?
15:00	Afternoon tea (15 minutes)
15:15	**Session 9 (Break-out 2): Developing a first pass risk assessment** (60 minutes) • Past climate hazards and approaches to risk reduction • Residual risk • Future hazards and impact • Vulnerability report back (20 minutes)
16:00	Morning tea (20 minutes)
16:15	Close

Program for Department of Climate Change, Energy, the Environment and Water (DCCEEW)

Climate information for decision-makers
Location: 51 Allara St, Canberra

Agenda day 1: 17-18 October 2023 | Finding and understanding the right information

Time	Topic
09:15	Coffee and networking
09:30	• Wecome, and Ackowledgement of Country • Introduction (5 minutes) • Introduction from hosting institution (5 minutes) • Short Round table introductions (10 minutes)
Part I : Understanding climate change science	
10:00	**Session 1 (Presentation): Climate change experiments help us understand how our climate is changing now and in the future** (60 minutes) • Observed information • Using models to simulate the earth's climate • What are climate projections and how do we know they are 'right' • Scale of information • The dreaded 'uncertainty'
11:00	Q&A (15 minutes)
11:15	Morning tea
11:35	**Session 2 (Break-out): Interpreting climate change projections** (20 minutes) • In groups look at different projections and information • Report back
11:55	**Session 3 (Presentation): 'Go to' climate information statements** • Discussion: Is this what you need?
Part II : Climate adaptation	

Time	Topic
12:20	**Session 4 (Presentation): Adaptation and climate risk 101** (50 minutes) • What is adaptation • Adaptation planning frameworks • Climate risk assessment • Including Q&A
13:10	Close part I / Lunch break (45 minutes)
13:55	**Session 5 (Break-out 2): Developing a first pass risk assessment** (100 minutes) • Past climate hazards and approaches to risk reduction • Residual risk • Future hazards and impacts • Vulnerability • Options Report back on activity, including responses from climate scientists (last 25 minutes)
15:35	Break (15 minutes)
15:50	**Session 6 (Presentation): Communicating climate change** (30 minutes)
16:20	Wrap up Day 1 and prep Day 2 (20 minutes) • Include evaluation
16:40	Close

Program for Department of Climate Change, Energy, the Environment and Water (DCCEEW)

Climate information for decision-makers
Location: 51 Allara St, Canberra

Agenda day 2: 17-18 October 2023 | Finding and understanding the right information

Time	Topic
09:30	Coffee and sign-in
09:45	Recap Day 1 (15 minutes)
Part III: Applying climate science to risk assessment	
10:00	**Session 7 (Presentation): Turning risk assessment into action** (60 minutes) • Developing an adaptation plan • Local-National • Includes Q&A
11:00	Morning tea (30 minutes
11:30	**Session 8 (Activity): Bringing all together - national adaptation planning** (50 minutes) • Include report back
12:20	Lunch break
12:50	**Session 9 (Presentation): Knowledge Brokering** (40 minutes)
Part IV : First Nations	
13:30	**Session 10 (Presentation): First Nations and climate communication** (60 minutes) • Developing cultural governance • Tailored communication • Include discussion
14:30	Break (15 minutes)

Time	Topic
Part V: Access the expertise in the room	
14:45	**Session 11 (Break-out 2): Flexible session to ask your questions of the experts in the room** (45 minutes)
15:30	**Session 12 (Open discussion): What next** (20 minutes)
15:50	Wrap up and evalutation (10 minutes)
16:00	Close

Appendix B: Session descriptions

1. Climate projections science

1.1: Climate change experiments help understand how our climate is changing now and in the future

- Explore the importance of climate observations from multiple sources to understand past changes, improve climate modelling and evaluate the plausibility of climate results
- Learn about climate projections, how they are developed and how reliable they are
- Explore how climate models work
- Understand the influence of spatial scale on what projections can tell us
- Consider “uncertainty” – what it means to a climate scientist and how to deal with it

1.2: Interpreting climate change projections

- Interpret climate projections and other information
- Understand the key information being conveyed by a range of information and data products

1.3: Creating scenarios of the future – thinking about what you are planning to

- Understand how projections and multiple lines of evidence can be applied to develop scenarios of future climate

2. Finding the right information

2.1: Where to access climate data and information (including the local context), and what to look out for

- Explore different ways climate projections are conveyed – from the easy to understand to the highly complex
- Explore the levels of complexity that are right for your decisions
- Find the best available and most relevant local information

2.2: Deciding what climate information you need for decision-making

- Identify and explore your climate information needs
- Guidance on addressing specific problems for a sector/region

2.3: ‘Go-to’ climate information statements

- Explore a range of climate information statements at the state or national level that provide high-level information on climate change suitable for most applications
- Consider the level of complexity that is right for specific decisions

3. Climate risk assessment and adaptation

3.1: Adaptation and climate risk theory

- Understand adaptation and different adaptation types
- Understand the theory and practice of undertaking a climate change vulnerability and risk assessment
- Compare top-down and bottom-up approaches to considering climate risk
- Explore different approaches to adaptation planning
- Evaluate and implement adaptation options

3.2: Developing a first pass risk assessment

- Use a fictional scenario to explore a rapid first pass risk assessment

4. Building climate knowledge capacity

4.1: Communicating climate change

- Understand climate change communication
- Explore how audiences understand and receive climate information, and how to deliver climate information in a comprehensive and impactful way for a specific audience
- Understand how to effectively communicate complex information, including common pitfalls and communication techniques

4.2: The role of knowledge brokering

- Understand basic knowledge brokering skills and strategies
- Understand the co-design process
- Explore the gap between climate experts and those who need their insights and how you can address this by putting co-design into practice

4.3: Co-design and communications for First Nations projects

- Understand principles for co-designing and partnering with First Nations collaborators
- Consider culturally sensitive and inclusive communication strategies to bring together Western and Traditional knowledge

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