Our commitment to best practice science

We ensure that the science and research, across all disciplines, done by or on behalf of the Department of Climate Change, Energy, the Environment and Water uses best practice methods and accepted standards of scientific rigour. This is in accordance with legal, ethical and professional frameworks.

Our science and research work includes collecting, modelling, mapping, analysing and sharing data and information. Data can include information resources and databases stored in formats such as hardcopy, digital, audio, video, image, graphical, cartographic, physical sample, textual, geospatial or numerical form. We use many tools to collect and analyse data and information. These include field and laboratory research, artificial intelligence, experiments, monitoring, remote sensing, coding, modelling, analysis and surveys. We use diverse expertise to ensure our science is robust and relevant, including Aboriginal cultural knowledge, social sciences and economics.

We collaborate with end users to ensure our data and evidence are fit for purpose and amplify impact. We do this by creating decision-ready science and data products that meet the needs of the NSW environment, communities and economies. We use our findings to make evidence-informed environmental decisions at all operational levels, from on-the-ground management through to major strategic policies. We establish hierarchies of evidence to guide differing approaches to our work based on need.

Adhering to best practice enables us to produce defensible and trusted science and research, underpinned by a culture of integrity. Our work is validated through internal and external expert peer review. We communicate our findings openly, transparently and objectively.

Anthony Lean

Secretary, NSW Department of Climate Change, Energy, the Environment and Water

What is scientific rigour?

Scientific rigour is a process of ensuring sound and defensible science. It requires:

Appropriate design

- Establishing a clear objective
- Developing appropriate methods or using approved standard methods, including evaluation of the project
- Engaging and consulting with people who have relevant skills and experience
- Peer-reviewing project methods and the design approach before implementation

Meticulous implementation

- Adhering to adopted methods
- Documenting variations to project methods and design
- Ensuring data is reproducible, secure, discoverable and accessible

Objective analysis and reporting of results

- Ensuring our results and conclusions accurately reflect the evidence
- Peer-reviewing findings before publishing data, results and conclusions
- Evaluating projects and documenting lessons learnt
- Recording, publishing and communicating results

Definitions

Science: We base our definition of 'science' on the Australian Academy of Science definition. 'Science' is used to define both a body of knowledge (what we have already discovered) and the process of acquiring new knowledge using the scientific method (a systematic process of observation, experimentation, testing and hypothesising). It draws on evidence collected using scientific methods to study biological, chemical and physical processes, and social and human behaviour.

Research: We base our definition of 'research' on the Australian Research Council definition. 'Research' is the creation of new knowledge and/or use of existing knowledge in a new and creative way to generate new concepts, methodologies, inventions and understandings. This includes synthesis and analysis of previous research to the extent that it is new and creative.

Peer review: We base our definition of 'peer review' on the Australian Code for the Responsible Conduct of Research definition. 'Peer review' is the 'impartial and independent assessment of research by others working in the same or a related field'. Peer review may be undertaken by departmental staff and/or external reviewers. The critical element is objective assessment by a qualified person who is independent of the work.

Impact: We define impact as the contribution of our science, research and data products in informing decision making to address environmental and socio-economic problems.

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