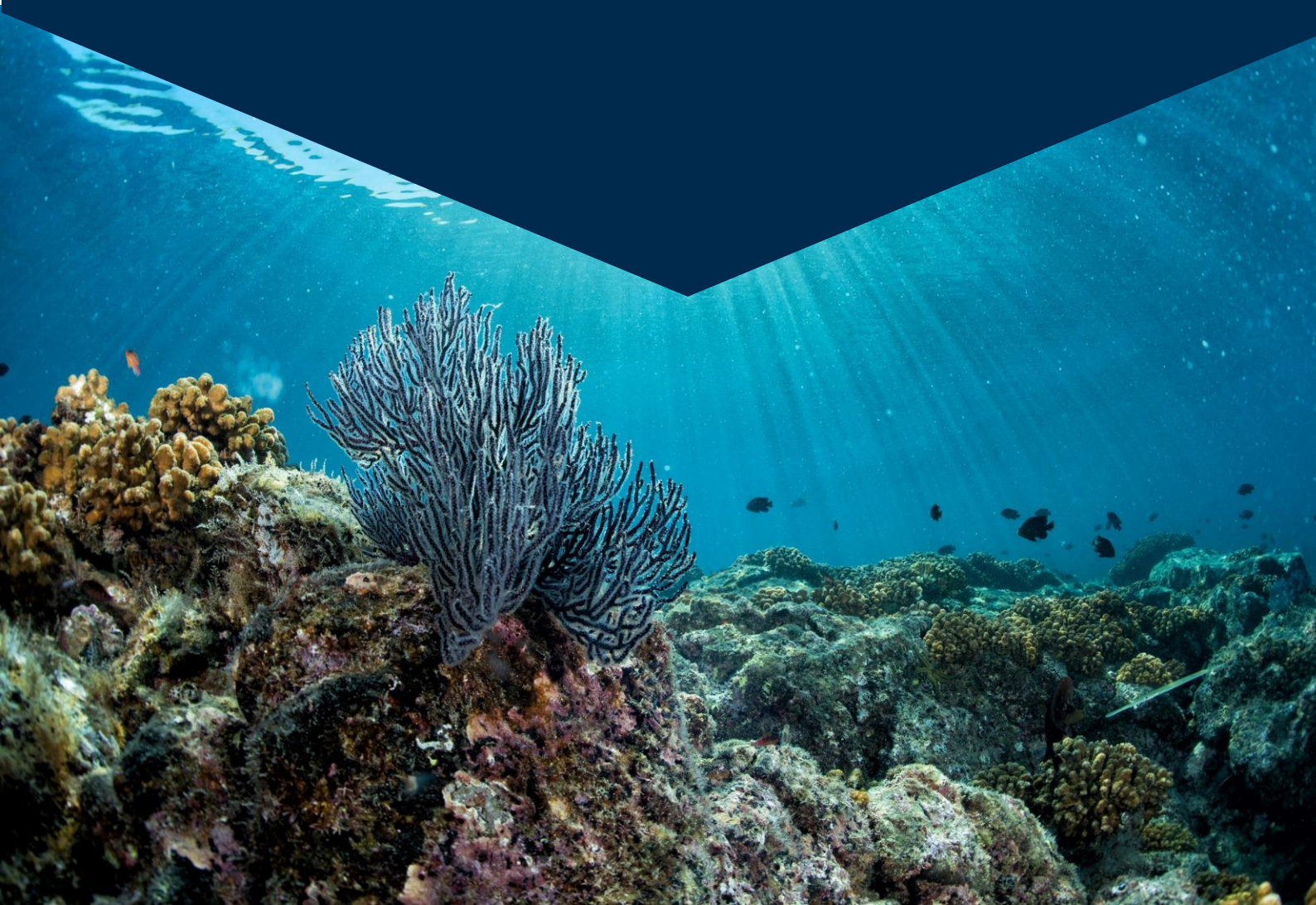
Australian Government
Office of the Chief Scientist

2022 Scientific Consensus Statement on land-based impacts on Great Barrier Reef water quality and ecosystem condition: Australian Chief Scientist Assurance Statement



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The purpose of this publication is to provide an assurance statement for the development of the 2022 Scientific Consensus Statement on land-based impacts on Great Barrier Reef water quality and ecosystem condition (2021-2024).

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Executive summary

Australia's Chief Scientist, Dr Cathy Foley, was tasked in 2021 by the Prime Minister to provide quality assurance and oversight for the development of the *2022 Scientific Consensus Statement on land-based impacts on Great Barrier Reef water quality and ecosystem condition (2021-2024)*.

The role of the Chief Scientist was to identify, recommend and support process enhancements that would increase transparency, accountability and confidence in the findings and conclusions of the 2022 Scientific Consensus Statement (SCS), to build on the continuous improvements applied to successive scientific consensus statements since their commencement in 2002.

Australia's Chief Scientist provided advice and made several recommendations to enhance the 2022 Scientific Consensus Statement process. This included strengthened processes to manage conflicts of interest through the engagement of an external probity advisor and providing guidance on the development of the peer-review process including appointment of editorial board members and eminent reviewers. For the five major process steps in the development of the 2022 SCS, Australia's Chief Scientist concluded:

- **Question setting:** The approach to question-setting was iterative and inclusive. The consultation process involved more than 70 stakeholders, Traditional Owner groups and end users from a range of organisations and industries. This ensured the final list of questions was broadly supported and as a result was relevant to non-government stakeholders, experts, policymakers and managers.
- **Author selection:** The approach to author selection was transparent and robust and achieved the objectives of minimising bias and avoiding real or perceived conflicts of interest.
- **Methods development:** The approach to the methods development was objective and transparent and took account of multiple lines of evidence and the best available science. There was adequate oversight to evaluate and review the validity and quality of the methods for all stages of the process.
- **Peer review:** The peer-review process was comprehensive and fully transparent, including the process for managing conflicts of interest. An editorial board was established to manage the review process. The editorial process involved contributions from 69 external reviewers from Australia and overseas to ensure the outputs were rigorous and credible.
- **Consensus process**: Best practice methods were used for the consensus process and developed in an objective and transparent manner, taking account of multiple lines of evidence and including the best available science, which contributed to the quality and integrity of the process. There was adequate oversight to evaluate and review the validity and quality of the 2022 SCS.

The *2022 Scientific Consensus Statement on land-based impacts on Great Barrier Reef water quality and ecosystem condition* is an exemplar of the academic methods for reaching scientific consensus. The public can trust the processes used to develop the 2022 SCS, and the conclusions can be relied on and trusted to inform decision-making.

Background

In October 2021, Prime Minister Morrison tasked Australia's Chief Scientist with providing quality assurance and oversight for the development of the 2022 Scientific Consensus Statement on land-based impacts on Great Barrier Reef water quality and ecosystem condition. The Chief Scientist's oversight role for the 2022 SCS continued under the current government. The appointment of Australia's Chief Scientist to this role was announced in February 2022, with formal terms of reference being finalised in June 2022. A comprehensive list of Australia's Chief Scientist's engagements on the 2022 SCS is provided at Attachment A.

The SCS brings together the latest scientific evidence to understand how land-based activities can influence water quality in the Great Barrier Reef (GBR), and how these influences can be managed. The SCS is one of several important sources of evidence used to inform the design, delivery and implementation of the Australian and Queensland governments' Reef 2050 Water Quality Improvement Plan.

C2O Consulting coasts|climate|oceans was engaged by the Australian and Queensland governments to coordinate and deliver the 2022 SCS.

Other groups involved in the development and delivery of the 2022 SCS:

- Australia's Chief Scientist, who provided oversight and assurance for the whole 2022 SCS process.
- Successive Queensland Chief Scientists (Professor Hugh Possingham, followed by the Interim Chief Scientist, Dr Bronwyn Harch), who engaged in the oversight role, up to the appointment of Dr Kerrie Wilson on 4 August 2023.
- The Reef Water Quality Independent Science Panel, which had both a technical advisory role and a review role for specific steps in the process.
- The Reef 2050 Plan Independent Expert Panel, which had a technical advisory role only for specific steps in the process.
- Non-government stakeholders, who had input into the question-setting process.
- Policy and management representatives and stakeholders, including the Reef 2050 Advisory Committee, who were kept informed throughout the process.

The first report on the impact of land-based activities on GBR water quality was produced in 2002; it has been updated every four to five years since. The methods used to develop the SCS have evolved over time.

The role of Australia's Chief Scientist

The terms of reference for the role of Australia's Chief Scientist are provided at Attachment B. The role was to:

- Provide an additional layer of assurance that the processes and methods used to synthesise and review the available evidence to inform the 2022 SCS were independent, transparent, robust and credible.
- Provide guidance throughout the 2022 SCS process and identify process steps which required strengthening.

In undertaking the oversight role, Australia's Chief Scientist:

1. Participated in joint meetings of the Reef 2050 Plan Independent Expert Panel and Reef Water Quality Independent Science Panel to speak to the assurance process.
2. Reviewed and provided advice on the methodology used to develop the 2022 SCS (undertaken at the commencement of the process), including example question framing, author selection and synthesis of evidence, and provided a final review of the quality and consistency of the 2022 SCS report once completed.
3. Provided guidance to the Australian and Queensland governments on improving and facilitating the engagement of the community in GBR water quality, including how to communicate, inform and educate stakeholders about the science and the scientific process.

From April 2022, Australia's Chief Scientist held monthly meetings with C2O Consulting, which was appointed to lead the project, to provide ongoing guidance throughout the process and to:

- receive project updates
- identify any areas of concern for discussion
- when required, provide advice on the governance or process for the 2022 SCS, including author selection, editorial board establishment and operation, working group membership and terms of reference, peer review process, challenges with author coordination and delivery, consensus process and communications.

Part A: Summary of enhancements from the 2017 SCS

The approach recommended by Australia's Chief Scientist for the 2022 SCS built on and enhanced the approach used to develop the 2017 SCS in the following ways:

1. Recommended that members of the SCS Coordination Team exclude themselves from being reviewers or lead authors, to maintain their independence and impartiality over the entire process.
2. Recommended that a set of guiding principles be developed and used to underpin the design, delivery and implementation of all aspects of the 2022 SCS. The development of the guiding principles was led by the SCS Coordination Team, and agreed by the Australian and Queensland Chief Scientists, the Reef Water Quality Independent Science Panel, the Reef 2050 Plan Independent Expert Panel and the Reef 2050 Advisory Committee, and Australian and Queensland government contract managers. The guiding principles were to:
    i. Demonstrate independence from end users in the synthesis of the evidence and review of the outputs.
    ii. Establish and use fit-for-purpose methods and processes and engage fit-for-purpose experts.
    iii. Increase transparency and robustness in design and delivery.
    iv. Minimise the potential for bias in reviewing outputs and synthesis.
    v. Assess and present levels of confidence in the evidence.
    vi. Ensure inclusive, genuine and timely engagement with end users, stakeholders and audiences.
    vii. Improve accessibility to the science underpinning the SCS.
3. Sought probity advice to guide all aspects of the SCS process.
4. Developed and documented systems and processes to manage real or perceived conflicts of interest and confidentiality throughout the process.
5. Recommended enhancements to the formal author-selection process.
6. Recommended enhancements to how the level of confidence in the body of evidence for each of the 30 questions was communicated to stakeholders.
7. Implemented a more rigorous peer-review process, managed by an editorial board:
    a. Two to three external, independent peer reviewers reviewed each question, with at least half of the reviewers having specific GBR expertise, and half having relevant international expertise.
    b. Three external, independent eminent reviewers reviewed the final consensus products (the 2022 SCS conclusions and summary), made up of one international and two domestic reviewers.
    c. All technical content was reviewed by the Reef Water Quality Independent Science Panel.
8. Recommended enhancements to the formal consensus methods to appoint at least one external independent member with specific expertise in consensus processes to the Consensus Process Working Group.
9. Recommended engaging with the CSIRO Responsible Research Unit to support the evaluation process.
10. Recommended that the more detailed evidence synthesis should be used to support decision-making, and that individuals involved in the review process explicitly check to ensure outputs in the 2022 SCS, and specifically the conclusions, could be linked clearly to the evidence base.

The SCS Coordination Team drafted 'approach' documents that set out the detail of how the question setting, author selection, methods development for the synthesis of evidence, peer review and consensus processes were conducted. Each approach document specifies what measures and processes were applied to implement the guiding principles for each of the five parts of the 2022 SCS process.

The Chief Scientist reviewed and approved each of these documents as set out in Part B of this assurance report.

Part B: Assurance of the 2022 SCS approach documents

Specific methods and processes were developed to apply the guiding principles to all parts of the 2022 SCS process. In the sections below, the assurance summary draws out the methods and processes most relevant to the terms of reference for the assurance role of Australia's Chief Scientist.

Question setting

The questions included in the 2022 SCS were selected before Australia's Chief Scientist's commencement in the assurance role.

The question-setting process is outside the scope of this assurance report. However, the approach document outlined retrospectively how the seven guiding principles were adhered to in the question-setting process, which indicates the rigour applied to this process step.

Previous SCSs were structured around four to five major thematic chapters. The 2022 SCS addressed specific questions that were defined through a consultative process involving policymakers, managers and non-government stakeholders to ensure that the outputs met the needs of decision-makers. The use of well-defined questions also supported the guiding principle to engage fit-for-purpose people by enabling the identification and appointment of experts with strong subject matter expertise as authors and reviewers. This enhanced the overall rigour of the synthesis and review process.

The 30 questions were grouped into eight themes: values, condition, sediments and particulate nutrients, dissolved nutrients, pesticides, other pollutants, human dimensions and emerging science. For consistency, each pollutant theme contained questions that covered ecological processes, delivery and source, and management options. These groupings were useful in the evidence synthesis part of the process as they provided a mechanism for lead authors to coordinate and check for consistency in the evidence between related questions.

The approach to question setting was iterative and inclusive. The consultation process involved more than 70 stakeholders, Traditional Owner groups and end users from a range of organisations and industries. This ensured the final list of questions was broadly supported, and as a result was relevant to non-government stakeholders, experts, policymakers and managers.

The *2022 Scientific Consensus Statement: Approach to question setting* document outlines the full detail of the measures and processes applied to this part of the 2022 SCS process.

Author selection

Lead authors were a pivotal part of the evidence selection and synthesis process; they identified, reviewed and synthesised the evidence relating to the question they were allocated to lead.

The primary criteria for the selection of lead authors were defined to ensure they had the necessary expertise in the subject matter and experience in evidence synthesis, and that real or perceived conflicts of interest were avoided and/or appropriately managed.

Processes and measures were developed for all guiding principles. However, the most relevant guiding principles for this part were the need to demonstrate independence from end users in the synthesis of the evidence and review of outputs (i), establishing a fit for purpose process (ii), and ensuring transparency and robustness in design and delivery (iii).

The initial call for expressions of interest for lead authors was published before Australia's Chief Scientist's commencement in the assurance role. Upon commencement, Australia's Chief Scientist recommended that the government seek probity advice to manage conflicts of interest for the 2022 SCS, including for the selection of authors. As a result of the probity review, additional steps were implemented to guide the

selection of authors, the allocation of questions to the lead authors selected, and the management of potential conflicts of interest for these authors.

Other changes implemented from previous SCS iterations were the exclusion of C2O Consulting (the consultant overseeing the development of the 2022 SCS) from being appointed as lead authors, and implementation of an open expression of interest process, which was shared with more than 500 Australian and international experts over three selection rounds.

The approach to author selection was transparent and robust and achieved the objectives of minimising bias and avoiding real or perceived conflicts of interest.

The *2022 Scientific Consensus Statement: Approach to author selection* document outlines the full measures and processes applied to author selection.

Methods development

This section refers to the documented methods that were applied by the 2022 SCS authors to synthesise the evidence for their allocated question.

The methods for the 2022 SCS were designed to "adopt a more systematic approach to evidence synthesis that minimises author bias, critically appraises quality and relevance of the evidence and provides an indication of confidence in the evidence".[1] The methods were consistently implemented for all questions, and as such, provided a degree of repeatability in the evidence synthesis.

An independent expert in evidence synthesis methods was appointed to lead the development of fit-for-purpose methods. These methods were peer reviewed by three independent experts not associated with the SCS. The SCS Coordination Team and the evidence synthesis expert provided overall support to guide authors throughout the drafting process. This guidance was delivered through regular meetings with authors to:

- coordinate authors within thematic groups to minimise overlap between the evidence syntheses
- clarify the approach to the application of the methods
- discuss and address common issues in the application of the methods.

Formal checkpoints were introduced throughout the synthesis process for every question to enable the SCS Coordination Team and the evidence synthesis expert to assist authors to consistently address all steps of the method. The SCS Coordination Team also provided training and support in the use of a standard template to synthesise the evidence and guidance on how to extract the data from the literature in a standardised way to ensure alignment with the methods and facilitated consistency between the syntheses.

Each synthesis of evidence for the 30 questions also included assessment of the level of confidence in the body of evidence.

The guiding principles most relevant to the methods development were (i) to (iv). Measures and processes applied to implement the principles for the methods development component included: the appointment of an independent evidence synthesis expert to develop the methods; the external peer review of the methods; the development of standardised guidelines, templates and spreadsheets to ensure consistency and repeatability and to minimise risk for bias; and the introduction of a measure of confidence in the evidence to increase transparency, among other measures.

Confidence in the evidence was determined using assessable criteria as follows:

[1] Pineda M-C, Waterhouse J, Richards R (2024) *2022 Scientific Consensus Statement: Approach to the development of methods for the synthesis of evidence.* Published by C_2O Consulting on behalf of the Australian Government's Department of Climate Change, Energy, the Environment and Water (DCCEEW) and the Queensland Government's Department of Environment, Science and Innovation (DESI).

- the relevance of individual studies (i.e., spatial, temporal and overall relevance of findings in relation to the SCS question being addressed)
- the number and diversity of studies
- consistency of findings within a body of evidence.

The quality of the individual studies within the body of evidence was also assessed for the questions that required a higher degree of confidence for use by policymakers.

The methods are documented in 2022 Scientific Consensus Statement: Methods for the synthesis of evidence' (Richards et al., 2023).

Australia's Chief Scientist did not recommend any changes to the methods development. The approach was objective and transparent and took account of multiple lines of evidence and the best available science. There was adequate oversight to evaluate and review the validity and quality of the methods for all stages of the process. The public can have confidence and trust in the processes that were applied.

The 2022 Scientific Consensus Statement: Approach to the development of methods for the synthesis of evidence document outlines the full measures and processes applied in the methods development process.

Peer review

Australia's Chief Scientist recommended adopting a formal peer-review method like that used by indexed scientific journals for the 2022 SCS because it would provide the most transparent, well-documented and impartial method to provide assurance that the authors appropriately identified, synthesised and represented the research relating to their question. This recommendation was supported by the then Queensland Chief Scientist Professor Hugh Possingham, and Interim Queensland Chief Scientist Dr Bronwyn Harch (appointed in 2023).

Peer review is an essential component of academic publishing. It is well defined in academic literature. It is a critical aspect of the process to enable a trusted consensus statement.

In the 2022 SCS, authors were responsible for identifying, synthesising and representing the research findings. The purpose of the peer-review process was to check that the authors had identified, synthesised and represented the research findings appropriately and without bias, using the evidence synthesis methods that were prescribed for the 2022 SCS.

The selection of peer reviewers was guided by documented selected criteria developed to minimise conflicts of interest. The role of the peer reviewers was to examine three stages of the 2022 SCS process, including:

1. Methods for synthesising and evaluating peer-reviewed science papers/reports.
2. Synthesis of evidence for each of the 30 questions, including a high-level evidence statement outlining main findings.
3. The conclusions and summary documents, which combined key findings of significance from the synthesis of evidence into broader themes and overarching conclusions.

In the 2022 SCS, additional steps were added to the 2017 approach to peer review to increase transparency, demonstrate independence of the reviewers and enhance the rigour of the process. This was achieved through the following measures:

- Establishment of an independent editorial board to provide objective oversight of all phases of the peer review process, including the review of the 30 evidence syntheses and eminent expert review of the summary and conclusions documents.
    - The editorial board comprised of an editor-in-chief and six editors with specific topic expertise. Members of the editorial board were subject to the conflict-of-interest requirements.
    - The editor-in-chief provided leadership to the editorial board, chaired meetings and represented the editorial board at high-level meetings.

- Each question was managed by a lead and second editor.

- To mitigate any conflicts of interest between members of the editorial board and reviewers, 2 additional selection criteria were adopted for reviewers:
  - reviewers could not currently be collaborating with the lead editor for their question
  - reviewers could not be related to or have a close personal relationship with the lead editor for their question.
- Separate reviewers were appointed for every question and selected for their specific expertise relating to that question. This also broadened diversity of participation throughout the process, managed workload for reviewers, and helped to manage conflicts of interest between reviewers, authors and contributors to the question under review.
- Adoption of a single-blind peer review[2] process was appropriate because it was important for reviewers to know the names of the authors of the question they were reviewing, so any potential conflicts of interest could be managed/addressed.
- A semi-structured template approach to reviewing achieved consistency.

The government decided to offer an honorarium of $500 to peer reviewers participating in the 2022 SCS process, as their task required not only the review of the evidence synthesis, but also ensuring that the evidence had been properly identified and extracted, which was recognised as a time-consuming step. In addition, it was important to acknowledge that their review was supporting the development of a government document under strict timelines.

The editorial board oversaw the development of an initial list of experts to approach as peer reviewers for the 2022 SCS. Australia's Chief Scientist and the editor-in-chief considered this list and added to it. Australia's Chief Scientist personally invited and secured the appointment of the final list of eminent reviewers with expertise across a range of disciplines. The role of eminent reviewers was to assess the consistency of the SCS summary and conclusions.

The peer-review process was comprehensive and fully transparent including the process for managing conflicts of interest. The review process was managed by an editorial board and involved contributions from 69 external reviewers from Australia and overseas to ensure the outputs were rigorous and credible.[3]

The *2022 Scientific Consensus Statement: Approach to the peer review process* document outlines the full measures and processes applied in the methods development process.

Consensus process

The 2022 Scientific Consensus Statement: Approach to the consensus process document outlines the purpose of using a consensus process:

> *Consensus methods are used to determine the extent to which experts, or a broader audience agree about a given issue. Adopting formal consensus methods can be particularly useful when scientific evidence is intended to inform policy decisions as such methods can provide a level of confidence and assurance about the extent of agreement about specific findings. Formal consensus processes can be used to:*
>
> - *assess the extent of agreement (consensus measurement) among experts*
> - *identify where there may be a lack of consensus, for example, because of limited or contradictory evidence*

[2] Single-blind peer review is the traditional method of peer review where reviewers know the identity of authors, but authors do not know the identity of reviewers. In double-blind review, neither reviewers nor authors know who the other party is. The double-blind method was not appropriate for the 2022 SCS process because of the need to manage conflicts of interest between reviewers and authors.

[3] Two peer reviewers did not agree to be identified.

- *resolve disagreement among experts (consensus development)*
- *minimise personal or group bias*.[4]

The development of the 2022 SCS consensus process involved two stages: a scoping phase, where widely recognised consensus methodologies were reviewed and considered by the SCS Coordination Team, and a design phase, with the assistance of a group of independent experts in consensus processes (the Consensus Process Working Group).

Australia's Chief Scientist was not involved in the scoping phase for the consensus process but provided advice on potential experts to invite to the working group and assurance throughout the design and development of the consensus process.

All guiding principles (i-vii) underpinned the design of the 2022 SCS consensus process, including: independence from policy and management representatives in the consensus process and review of the outputs; establishment of an independent Consensus Process Working Group to provide guidance and oversight; transparency and robustness in the design and delivery of the consensus process; and external peer review of all consensus outcomes.

Several formal consensus methods were considered during the design of the 2022 SCS consensus process. The *2022 Scientific Consensus Statement: Approach to the consensus process* document outlines the combination of methods applied by the SCS Coordination Team for the 2022 SCS.

Convergence on the theme summary statements was reached using the 'single-draft text procedure' method. This involved the development of an initial draft (produced by the SCS Coordination Team) drawing on the evidence in the syntheses. This initial draft was circulated to all lead authors and several contributors with specific expertise within a theme, who revised the text iteratively until agreement was reached on the final summary statement for each theme. The summary statements developed through this process formed the basis for the development of the 2022 SCS conclusions. An international expert in consensus methods from the Consensus Process Working Group provided oversight and advice throughout this process.

The development of the conclusions involved 35 experts in an expert elicitation process, followed by an interactive consensus workshop facilitated by an external expert in translating science into policy. Experts refined the final conclusions through an iterative process that continued until all experts reached agreement on, and fully endorsed, the conclusions.

The summary and conclusions documents were formally peer reviewed by three external, independent (from the SCS process) eminent scientists and the Reef Water Quality Independent Science Panel. The Independent Science Panel and the eminent reviewers each independently formed the view that the final content of the summary and conclusions documents was robust and met the highest standards of academic rigour.

Australia's Chief Scientist reviewed the approach to the consensus development method retrospectively and confirmed that it was developed in an objective and transparent manner, taking account of multiple lines of evidence and including the best available science which contributed to the quality and integrity of this process. There was adequate oversight to evaluate and review the validity and quality of the 2022 SCS.

The *2022 Scientific Consensus Statement: Approach to the consensus process* document outlines the full measures and processes applied in the consensus process.

Conclusion

The *2022 Scientific Consensus Statement on land-based impacts on Great Barrier Reef water quality and ecosystem condition* is an exemplar of the academic methods for reaching scientific consensus. The findings and conclusions contained within it can be relied on and trusted to inform decision-making.

[4] Pineda M-C, Waterhouse J (2024) *2022 Scientific Consensus Statement: Approach to the consensus process.* Published by C_2O Consulting on behalf of the Australian Government's Department of Climate Change, Energy, the Environment and Water (DCCEEW) and the Queensland Government's Department of Environment, Science and Innovation (DESI).

Attachment A: Terms of Reference

Role of the Australian and Queensland Chief Scientists in providing advice and assurance to governments on the process for delivering the Scientific Consensus Statement for Land use impacts on Great Barrier Reef water quality and ecosystem condition.

Purpose

The Scientific Consensus Statement is an important component of the Australian and Queensland governments' Water Quality Improvement Plan (WQIP), providing the mechanism for science to inform actions within the plan. It helps to ensure a common understanding of the most up to date science to inform policy and management decision-making relating to reef water quality and ecosystem condition and improve transparency and accountability to stakeholders impacted by that decision making. Stakeholders are key partners in delivering the WQIP, so it is fundamentally important to build trust in the Scientific Consensus Statement.

In progressing the 2022 update to the statement, the Australian and Queensland governments have sought expert advice on possible process refinements to enhance confidence and improve accessibility to the scientific evidence. Australia's and Queensland's Chief Scientists, in conjunction with the reef science advisory bodies, will provide independent advice on developing the 2022 statement.

Role

The Australian Government has engaged Australia's Chief Scientist to provide an additional layer of assurance that the analytic processes used to synthesise and review the available evidence to inform the next Scientific Consensus Statement are independent, transparent, robust and credible, and provide guidance throughout the Scientific Consensus Statement process and identify areas which require strengthening.

The Australian Chief Scientist will report to the Australian Government.

The Queensland Chief Scientist is a whole-of-government position that sits within the Queensland Department of Environment and Science. The position provides high-level strategic advice to the Queensland Government on the role of science, research and innovation to meet Queensland's challenges. The Office of the Queensland Chief Scientist will provide advice to the Queensland Government on the Australian Chief Scientist's oversight role for the Scientific Consensus Statement.

Terms of Reference

The responsibilities of the Chief Scientists are to:

1. Review and provide advice on the methodology used to develop the Scientific Consensus Statement covering, for example, question framing, selection of authors and synthesis of evidence, with a further review of the Scientific Consensus Statement once completed. The proposal would cover the 2022 and 2027 updates.
2. Evaluate and advise on the peer review process to identify additional opportunities to strengthen the approach and stakeholder confidence. This may include either participation in an overarching editorial board to oversee the peer review process or endorsement of the Editorial Board's processes.
3. Provide a statement to be included in the final Scientific Consensus Statement detailing their assurance, oversight and any additional steps put in place to deliver a transparent and rigorous process. It will be at the Chief Scientists' discretion as to whether this statement includes an endorsement or not.
4. Participate as observers in joint meetings of the Reef 2050 Independent Expert Panel (IEP) and Independent Science Panel (ISP) (one to two meetings per year) where strategic water quality science issues are discussed.

5. The Australian Chief Scientist will provide guidance on improving and facilitating the engagement of the community in reef science, including how to communicate, inform and educate affected stakeholders about the science and the scientific process. This may include how science is translated into government policy such as through updates to the Reef 2050 WQIP (due in 2022 and 2027).

Optional responsibilities

6. Following development of the Scientific Consensus Statement, the Chief Scientists may also provide advice on how science is translated into government policy such as through updates to the Reef 2050 WQIP.

Decision making

7. The Chief Scientists will not be authors or peer reviewers of the Scientific Consensus Statement. They will not be contributors to the consensus process, but will provide advice on the process to government, contracted parties involved in development of the Scientific Consensus Statement and relevant advisory bodies.

Ways of working

8. The Chief Scientists will collaborate with members of the Independent Expert Panel (IEP) and Independent Science Panel (ISP) to evaluate and endorse processes including the development and implementation of the peer review and consensus methodology. This collaboration and advice should aim to confirm good process and identify additional opportunities to strengthen the approach and stakeholder confidence.
9. Meeting dates of the ISP and IEP are fixed and will proceed on the set date. If a Chief Scientist is unable to attend, they may send a proxy from their office to represent them and report back on key issues. Alternatively, the IEP or ISP Chair will meet with the Chief Scientist(s) after the meeting to provide an update on key issues. It is essential that the process is not delayed due to lack of availability.
10. The Department of Climate Change, Energy, the Environment and Water will provide appropriate resourcing to support Australia's Chief Scientist at each stage, including through briefing and assistance in preparing formal advice. The Queensland Office of the Great Barrier Reef will provide appropriate resourcing to support the Queensland Chief Scientist including through briefing and assistance in preparing formal advice.
11. The department will maintain a formal advice register to capture advice provided by the Chief Scientists that falls within the scope of this assurance process. This will include actions taken to consider and address that advice.

Areas of assurance this oversight aims to provide

At the cessation of the scientific consensus process, the Chief Scientists' involvement will enable government to answer the following questions:

- Was the Scientific Consensus Statement developed in an objective and transparent manner, taking account of multiple lines of evidence and the best available science?
- Was the process for selecting authors transparent and robust?
- Was the process for managing conflicts of interest around author selection and peer review transparent and robust?
- Was there adequate oversight to test and review the validity and quality of the Scientific Consensus Statement?
- Can the public trust the process and the findings from the Scientific Consensus Statement?

Attachment B: Chief Scientist's Engagements

Date	Purpose
19/10/2021	Role initiation meeting Department of Agriculture, Water and the Environment (DAWE) officials: Deputy Secretary, Environment Group First Assistant Secretary, Heritage, Reef and Marine Division Assistant Secretary, Reef Programs
15/12 2021	Role scoping meeting DAWE officials: Deputy Secretary, Environment Group First Assistant Secretary, Heritage, Reef and Marine Division Assistant Secretary, Reef Programs Assistant Secretary, Reef Policy and World Heritage Branch
21/01/2022	Assurance process progress meeting DAWE officials: Deputy Secretary, Environment Group First Assistant Secretary, Heritage, Reef and Marine Division Assistant Secretary, Reef Programs
28/01/2022	Reef package announced including Chief Scientist's involvement.
09/03/2022	Assurance process initiation meeting C2O Consulting
09/03/2022	Research stakeholder meeting Multiple reef water quality researchers, James Cook University, Townsville
08/04/2022	Assurance process progress meeting DAWE officials
04/05/2022	Assurance process progress meeting C2O Consulting
01/07/2022	Assurance process progress meeting Queensland Chief Scientist, University of Queensland
29/07/2022	Stakeholder briefing Reef 2050 Independent Science Panel
18/08/2022	Assurance process progress meeting DAWE officials

Date	Purpose
23/08/2022	Assurance process progress meeting DAWE officials
20/09/2022	Assurance process progress meeting C2O Consulting
21/09/2022	Stakeholder briefing Reef 2050 Advisory Committee
11/11/2022	Progress meeting DAWE officials, C2O Consulting
30/11/2022	Stakeholder briefing Great Barrier Reef Water Quality Synthesis Workshop
09/12/2022	Stakeholder briefing Reef 2050 Independent Science Panel
16/12/2022	Assurance process progress meeting C2O Consulting
23/12/2022	Assurance process progress meeting Queensland Chief Scientist
23/01/2023	Assurance process progress meeting C2O Consulting
27/02/2023	Assurance process progress meeting DAWE officials, C2O Consulting
31/03/2023	Assurance process progress meeting C2O Consulting
21/04/2023	Stakeholder briefing Reef 2050 Independent Science Panel
22/05/2023	Assurance process progress meeting C2O Consulting
17/07/2023	Assurance process progress meeting C2O Consulting
18/07/2023	Stakeholder briefing Reef 2050 Independent Science Panel

Date	Purpose
31/08/2023	Assurance process progress meeting C2O Consulting
22/09/2023	Assurance process progress meeting C2O Consulting
23/10/2023	Assurance process progress meeting Department of Climate Change, Energy, the Environment and Water (DCCEEW) officials, Queensland Chief Scientist, C2O Consulting
23/11/2023	Assurance process progress meeting DCCEEW officials, C2O Consulting
08/12/2023	Stakeholder briefing Reef 2050 Independent Science Panel
13/12/2023	Assurance process progress meeting C2O Consulting
05/02/2024	Assurance process progress meeting C2O Consulting
04/03/2024	Assurance process progress meeting C2O Consulting
07/03/2024	Assurance process progress meeting C2O Consulting
12/03/2024	Stakeholder briefing Reef 2050 Independent Science Panel
02/04/2024	Assurance process progress meeting C2O Consulting
03/04/2024	Assurance process progress meeting Queensland Chief Scientist, Queensland Department of Environment, Science and Innovation (DESI)
09/04/2024	Assurance process progress meeting Queensland Chief Scientist, DESI Officials, DCCEEW Officials, C2O Consulting
08/05/2024	Assurance process progress meeting C2O Consulting

Date	Purpose
13/05/2024	Assurance process progress meeting C2O Consulting
05/06/2024	Assurance process progress meeting C2O Consulting
15/07/2024	SCS launch planning meeting C2O Consulting