ARCTIC MONITORING AND ASSESSMENT PROGRAMME (AMAP)

Guidelines for AMAP Assessments



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Purpose of this Document

The purpose of this document is to provide those involved in producing AMAP assessments with general information about the goals and principles applied in this work, as well as references and links to other sources of information that may be relevant in relation to practical implementation of the assessment process. It is intended to be useful both to those new to this work and to those who have previously participated in AMAP assessment work.

These *Guidelines for AMAP Assessments* have been prepared by the AMAP Secretariat and will be reviewed and approved by the AMAP HoDs¹. The guidelines will be further updated as necessary.

It is intended that all experts involved in the drafting of AMAP assessments follow the guidance presented in the *AMAP Strategic Framework* and these guidelines, especially in relation to principles regarding scientific integrity. Specific guidance, in some cases with reference to other documentation, is also available regarding quality assurance and data handling procedures, as well as instructions to authors and drafting groups regarding language, document registration and identification, exchange and distribution of assessment texts, units, symbols, abbreviations, statistics, biological data and bibliographical references, etc.

Brief Introduction to AMAP²

The Arctic Monitoring and Assessment Programme (AMAP) is one of six Working Groups of the **Arctic Council**. AMAP's work is mandated by the Ministers of the Arctic Council and their **Senior Arctic Officials (SAOs)**, in consultation with the **six Permanent Participant** (PP) organizations.

AMAP is mandated to:

- Monitor and assess the status of the Arctic region with respect to pollution and climate change issues.
- Document levels and trends, pathways and processes, and effects on ecosystems and humans, and propose actions to reduce associated threats for consideration by governments.
- Produce sound evidence-based, policy-relevant assessments and public outreach products to inform policy and decision-making processes.

Ministers and SAOs have also requested AMAP to support international processes that work to reduce the global threats from contaminants and climate change. These include the UN

¹ Unless otherwise indicated, 'HoDs' in this document refer to both AMAP Heads of Delegation from Arctic Council member states and Heads of Delegations of the six Permanent Participants to the Arctic Council/AMAP.

² More information on many of the concepts and terms introduced in this section can be found in later sections of these guidelines.

Framework Convention on Climate Change, UNEP's Stockholm Convention on Persistent Organic Pollutants and Minamata Convention on Mercury, and the UN's Economic Commission for Europe (UN ECE) Convention on Long-range Transboundary Air Pollution.

AMAP's work to implement its mandate is directed by **AMAP Working Group Heads of Delegation (HoDs)** from the eight Arctic countries: Canada, Kingdom of Denmark, Finland, Iceland, Norway, Russian Federation, Sweden and the United States, together with representatives of the six **Permanent Participants** (Arctic Indigenous Peoples organizations: Arctic Athabaskan Council (AAC), Aleut International Association (AIA), Gwich'in Council International (GGI), Inuit Circumpolar Council (ICC), Russian Arctic Indigenous Peoples of the North (RAIPON), Saami Council (SC)) and supported by the **AMAP Secretariat**. The AMAP Working Group is also open to participation of observers from Arctic Council/AMAP <u>Observing</u> <u>Countries and Organizations</u>.

AMAP's assessment work is undertaken by experts organized in **AMAP Expert/Assessment Groups (EG)** responsible for different 'subject areas' and supplemented by additional experts recruited from AMAP's '**Expert Pool'** (see further information below). AMAP currently has the following EG:

- Climate Expert Group (CEG)
- Human Health Assessment Group (HHAG)
- Litter and Microplastics Expert Group (LMEG)
- Mercury Expert Group (MEG)
- Persistent Organic Pollutants Expert Group (POPs EG)
- Radioactivity Expert Group (REG)
- Short Lived Climate Forcers Expert Group (SLCF EG)

The EGs are also responsible for supporting other AMAP work, such as development of its monitoring programme, responding to *ad hoc* requests, supporting communication and outreach activities, etc. Each AMAP EG has a contact point(s) at the AMAP Secretariat, and its work is also 'tracked' by one of more AMAP HoDs (referred to as '**Tracking HoDs**^{3'}). Most AMAP areas of work are associated with '**lead countries**' (one or more of the Arctic countries that has expressed a priority interest in that work area). Tracking HoDs are typically the HoDs from the relevant 'lead countr(ies)', as well as any other interested HoDs. It is the HoDs of the lead countries that are also normally responsible for nominating/appointing and supporting the **Expert Group leads** for those work areas that they lead.

Contact information for AMAP WG HoDs, Secretariat and Expert groups can be found on the AMAP website: <u>Contacts</u>.

³ Link to the Tracking HoDs List on Sharepoint (AMAP's Useful information): <u>Tracking HoDs List.docx</u>

What is an AMAP Assessment?

An AMAP assessment is a compilation of current knowledge about a defined subject, an evaluation of this information in relation to agreed policy relevant science questions, and a statement of the prevailing conditions in the Arctic regions, and potential future changes. An assessment may also be conducted to address an identified emerging issue of concern. An assessment utilizes available data and information from different types of knowledge systems, but optionally may also require new data and information to be collected during the assessment process to address identified gaps.

AMAP assessments are intended to inform the decision-making process at local, national, regional and global levels, to answer key questions and address existing gaps in knowledge, to produce the best possible evidence-based assessments and to develop (non-prescriptive) policy-relevant evidence-based recommendations for action.

AMAP's first 'Strategic Goal' (see below) reflects this intention: "to produce timely and relevant science-based assessments and targeted communication and outreach products utilizing the best available scientific information and other relevant knowledge ... to provide the basis for sound policy-relevant recommendations ..."

The assessment process involves three main steps:

- Define the scope of the work and the **Policy-Relevant Science Questions (PRSQs)** to be addressed.
- Organize the work, identify experts to be involved, compile relevant data and information, and perform the assessment.
- Deliver and communicate the assessment results to relevant target audiences.

Typically, an AMAP assessment produces a detailed, fully referenced and peer-reviewed **Technical Assessment Report (TAR)** and (based on this) a **Summary for Policy-Makers (SPM)** presenting key findings and recommendations, as well as derivative communication and outreach products that can include scientific journal articles, presentations, podcasts, videos, press releases, etc.

Since its establishment in 1991, AMAP has produced a series of high-quality reports and related communication products that detail the status of the Arctic with respect to climate and pollution issues and that include policy-relevant science-based advice to the Arctic Council and governments. All AMAP assessment products are freely available on the <u>AMAP Website</u>, with reports available in a searchable online <u>Publication Library</u>.

What Guides an AMAP Assessment Process?

AMAP's work is designed to achieve a series of **Strategic Goals** and performed according to a series of **Guiding Principles** that are set out in the **AMAP** <u>Strategic Framework</u> document. These are currently⁴ as follows:

Strategic Goals:

- 1. Improved knowledge and understanding of Arctic change through collaborative assessment processes, for use in evidence-based decision-making.
- 2. A strong, sustained and coordinated circumpolar monitoring and observation network.
- 3. Enhanced understanding of Arctic change and its impacts through inclusive partnership with Indigenous Peoples and local residents.
- 4. Effective communication on Arctic challenges and global implications.
- 5. Support relevant international processes.

Guiding Principles:

- 1. Scientific Integrity: All AMAP products undergo rigorous quality control and peer review as an essential part of the process to ensure objective and complete assessment of the state of knowledge. (...)
- 2. Value of Diverse Perspectives: AMAP is committed to encouraging and utilizing diversity in all of its activities. (...)
- Inclusion of Arctic Indigenous Peoples and Local Residents: Permanent Participant organizations are an integral part of all Arctic Council and AMAP work, and AMAP is committed to working in partnership with Arctic Indigenous Peoples and local residents.
 (...)
- 4. **Responsiveness to Emerging Challenges:** AMAP will remain at the forefront of identifying and characterizing changing trends and emerging issues in order to continue to provide evidence-based and policy-relevant information. (...)
- 5. **Knowledge Mobilization:** AMAP commits to the development of such products that involve and target audiences appropriately (...)
- 6. **Cooperation, Coordination and Interaction:** AMAP will encourage and facilitate cooperation and coordination among relevant bodies on cross-cutting issues (...)

Policy-relevant Questions (PRQs):

AMAPs work is intended to inform policy-making. An important concept that has been introduced in guiding AMAP assessment work to date is that of '**Policy-relevant Science Questions (PRSQs)'**. These are key questions, often of a scientific or technical nature, that a

⁴ As of September 2024

given assessment would try to address through scientific methods and based on best available science and other relevant knowledge. In some cases they comprise a hierarchy of increasingly detailed questions that relate both to policy priorities and key gaps in scientific knowledge that influence possibilities to inform decision-making. With the increasing attention on co-production and use of Indigenous Knowledge in AMAP assessment work, other PRQs defined by interests of Indigenous and local communities will be an important component of the PRQs addressed in AMAP assessment work. PRQs and PRSQs are formulated by AMAP HoDs (in particular Tracking-HoDs) in consultation with the lead experts responsible for a given assessment. PRQs are also often used as the basis for policy communication and structuring the content in SPMs and other documentation.

AMAP's Geographical Area

AMAP has defined a circumpolar region as a focus for its assessment activities that includes both High-, Low- and sub-Arctic regions (see figure below). AMAP's 'Arctic area' is operationally defined by a combination of physical, climate and administrative related features, as described in the <u>1998 AMAP assessment report</u> (section 2.2.4). Other processes, including other Arctic Council groups, have defined different boundaries as appropriate to their objectives.



This regional definition is intended as a general framework for AMAP's work rather than any 'limit' on the geographical extent of information that is relevant to AMAP's assessment work. Where relevant to its assessment activities, AMAP's work extends beyond the Arctic to address global connections associated with, for example, documenting a gradient towards the Arctic, discussing long-range transport of contaminants, species migration and global climate linkages.

Many studies, for example a modelling activity, may apply a boundary at 60°N, or use the Arctic Circle (66°34'N, 66.57°N) to define an 'Arctic area'; it is therefore important in assessment work that where reference to 'the Arctic' is made, this is fully defined, if appropriate.

How is an AMAP Assessment Initiated?

An assessment is generally the outcome of a decision by AMAP WG HoDs, either in response to a specific request from Arctic Council Ministers/SAOs, or as a result of discussions between the AMAP HoDs and EGs that has identified that an assessment would be appropriate and timely. For priority issues identified in the original AMAP mandate (as set out in the <u>1991 Arctic</u> <u>Environmental Protection Strategy</u>) or added since that time, there has been a general intention to update key assessments at ca. 5-year intervals. However, this approach is now moderated by (i) a review of whether such an update is warranted by availability of new information and/or new considerations that need to be addressed, and (ii) prioritization with respect to capacity to undertake comprehensive assessments. Increasingly, some of the assessment work is being completed in more defined 'packages', in some cases with a distinction between, e.g. updating routine data products on trends at ca. 2-yearly intervals and focusing on other assessment components as appropriate; these guidelines also apply to the development of such products.

Typically, assessments have been planned to deliver findings and policy-recommendations to the Arctic Council at the end of their two-year Chairship cycles; however, this is not a requirement and in more recent work, assessments have been timed to, e.g., provide input at times aligned with other relevant key policy initiatives, such as input to an IPCC climate assessment, etc.

Once the AMAP HoDs have agreed to move forward with an assessment, they will normally assign the task to an existing Expert Group or establish a new Expert Group or Assessment Group to accomplish the work.

How is AMAP Assessment Work Organized?

There is no prescribed method for organizing an AMAP assessment. Assessments differ in scope, complexity, the group responsible and, e.g., whether it is an update to earlier work or a new assessment activity. However, there are certain steps and procedures that need to be included in an assessment process, as well as experiences gained in work to date that can be useful in organizing an assessment. The following describes a typical assessment process to provide generic guidance; this can be adapted for a given assessment, but certain activities (such as review components) are generally required, so adaptations should be discussed with the AMAP (tracking) HoDs and Secretariat.

General Principles

An AMAP assessment is produced by experts who are expected to act in their capacity as **independent experts**, i.e., not influenced by national or policy directions, and not subject to conflicts of interest.

The **content of an AMAP** assessment technical report is the responsibility of the authors and experts involved in authoring the report. It may be reviewed/commented by countries,

Permanent Participants and stakeholders but is not 'approved' by the AMAP HoDs. It should address policy-relevant science questions that are identified in scoping the assessment as well as identifying gaps in knowledge and proposals for addressing these in future work.

Formulation and communication of policy-relevant recommendations arising from an assessment, including **the content of an assessment summary for policy-makers (SPM), is the responsibility of AMAP HoDs**. Typically, a science writer will be engaged to draft a SPM, working together with assessment lead authors to ensure correct interpretation of the technical report. AMAP HoDs will negotiate and agree (by consensus) the texts of the SPM; assessment leads/chapter leads will be expected to confirm that the SPM accurately reflects the findings of the technical report and does not contain any errors or important omissions.

Co-production

The concept of **co-production**, whereby project development is a collaborative process involving experts, including scientists, Indigenous Peoples, local knowledge holders and possibly other stakeholders, has been adopted as part of AMAP's approach to implementing its strategic goals and guiding principles (see above). Co-production also has associations with the use of data and information from community-based monitoring and utilization of Indigenous knowledge in AMAP assessment work.

Implementation of co-production principles in AMAP's work today is an ongoing process where a pragmatic approach is being applied to increase understanding of the concept and introduce it into assessment work in a step-wise, but at the same time ambitious, manner. The engagement of PPs in this work is critical to its successful development, adoption and routine use in the assessment process.

Assessment Scoping

An initial stage in most AMAP assessment work involves a scoping activity to establish the framework for the assessment; typically this includes:

- defining the policy-relevant science questions that it will address;
- identifying, as appropriate, the assessment management structures (steering groups, assessment leads, key experts, etc.);
- establishing a provisional timeline for the work;
- identifying potential challenges or issues requiring attention (dependencies, potential bottlenecks, resource needs, etc.), with suggestions for solving these;
- producing a provisional structure/outline of the technical assessment report;
- identifying potential policy-relevant deliverables; and,
- producing a provisional assessment communication and outreach plan.

Scoping work is normally done by the leads of the relevant Expert/Assessment Group in consultation with tracking HoDs and the Secretariat, and result in a document (variously referred to as an assessment 'scoping document', 'prospectus', 'implementation plan', etc. depending on its content). Results of scoping work are presented to the AMAP HoDs for their review and endorsement. The document is often maintained over the course of the assessment and updated as the assessment proceeds, as a reference document that can also serve to report on progress, etc.

Review Process

During the production of an assessment (technical) report, three review processes should be included in the planning.

- (i) National data check the purpose of this check is to ensure that no significant (national) data or information has been missed. The national data check should be undertaken early in the assessment process, when assessment leads are confident that most relevant data and information has been acquired/compiled. An overview of the available data/information should be circulated to HoDs who should arrange work internally in their countries/organizations to identify any missing data/information and take actions to make it available and fill any identified gaps.
- (ii) Internal review the purpose of the internal review is to identify any major inaccuracies or misinterpretation of data/information or any other significant concerns that need to be addressed in draft chapters before they are circulated for external review; it is part of a general quality assurance process and not a national 'censoring' of the product (see <u>AMAP Expert Appointment and Review Procedures</u>). The internal review should be performed as soon as chapters are in a suitable state and involve countries/stakeholders and 'friendly reviewers'. Draft chapters should be provided to HoDs who should arrange work internally in their countries/organizations to collect and compile responses to lead authors.
- (iii) Peer review independent peer review is the final part of the assessment quality assurance, performed according to standard journal practices for peer review. Ideally 2-3 reviewers will be identified for each substantive part (chapter or section of a large chapter) of the technical assessment report. The process for nominating peer reviewers is open, and assessment leads can make suggestions in this respect (see <u>AMAP Expert Appointment and Review Procedures</u>). In some assessments, external bodies (e.g. international organizations) may be asked to assist in identifying peer reviewers, and in some cases, they may organize the peer review. Lead authors are expected to receive review comments and respond to them, including compiling/documenting responses so that these can be made available if required.

AMAP Expert/Assessment Groups

Where an assessment is assigned to an established EG, the leads of that EG will normally function as the (co-)leads of the assessment, with members of the EG also forming the core group of the lead authors for particular chapters or parts of the assessment.

Where an assessment is a new activity, an 'assessment (steering) group' may be established to organize and lead the work, including the identification of (co-)leads for the assessment.

For larger assessments, and joint assessments co-arranged, e.g., with other Arctic Council WGs, a **steering committee** (typically including assessment leads, WG representatives (HoDs), Secretariat members, and in some cases external advisors or representatives of external bodies) may also be established to manage the process and ensure appropriate liaison and coordination between the assessment team and its parent working group(s).

AMAP assessments are open and transparent, this includes an open process for nomination of experts to produce and review the assessment as well as transparency in handling of review comments, etc.

In relation to an assessment activity, there is little difference between an AMAP Expert Group and an 'assessment group'. An Expert Group is a more permanent body within the AMAP organizational structure and has additional functions. An 'assessment group' may be dissolved once the work on a particular assessment has ended or may continue, e.g. where regular updates are planned.

In relation to AMAP Expert Groups, it is useful to introduce some additional terminology:

Key National Experts (KNEs) are the core members of AMAP Expert Groups. They are normally nominated to the groups by AMAP HoDs with an associated national commitment to support their engagement in the work of the group; they include the expert group (co-)leads. Some KNEs may also have a responsibility for coordinating, at the national level, input of data, information and other forms of knowledge to an AMAP assessment process. KNEs often take responsibility as lead authors for chapters or parts of AMAP assessments and have an important role in scoping the assessment.

Designated experts are other members of the EG. Most are nationally nominated with a defined area of expertise who supplement the KNEs but may have different levels of support for their engagement in AMAP work.

In an assessment process, additional experts may be identified/recruited to fill gaps in required expertise and contribute on specific topics. Involvement of such experts is at the discretion of the assessment leads. Together with EG KNEs and designated experts, these individuals are part

of the 'AMAP Expert Pool' – the expert resource upon which AMAP draws to deliver its assessments and other work.

As noted, experts involved in AMAP assessments are expected to do so in their capacity as **independent experts**. The process for nominating experts to an AMAP EG and/or Assessment Group (i.e. experts with a major responsibility for producing an assessment) is defined in separate guidance, see <u>AMAP Expert Appointment and Review Procedures</u>.

Roles and Responsibilities in Assessment Work

Expert/Assessment (co-)leads: AMAP Expert/Assessment Groups generally have two or more coleads, to share the work and ensure continuity in the event of change in leadership. In an assessment process, the main role of an assessment lead is to:

- Organize and oversee the technical part of the assessment process and (supported by the AMAP Secretariat) coordinate all work related to the preparation of the assessment reports;
- Identify and engage relevant experts and foster cooperation and cross-fertilization between the chapters/sub-parts of the assessment;
- Call for and integrate inputs from AMAP HoDs as well as observer countries and/or organizations;
- Report to AMAP HoDs on progress and, in consultation with AMAP HoDs and Secretariat, attempt to resolve any issues that interfere with the production and delivery of the assessment;
- With support of the Secretariat, ensure circulation of draft reports to Arctic countries and Permanent Participants for checking/comments;
- With support of the Secretariat, arrange for independent peer review of final drafts, and documentation of handling of review comments;
- Coordinate and forward assessment results, including conclusions and recommendations, to AMAP HoDs and support work to draft the Policy Document (i.e. SPM) and its recommendations;
- Support the work to communicate the findings of the assessment, both internally (to HoDs and SAOs) and externally to other key target audiences including relevant international organizations/processes;
- Promote communication to national regions and local residents where appropriate and possible, through e.g. engagement with community leaders and relevant local authorities, including local health boards.

Assessment leads may take responsibility as a lead author for drafting parts of an assessment, but there are also advantages in their tasking others in this respect in order to avoid situations where drafting and managing the assessment work may conflict. Chapter Lead Authors in an Assessment are responsible for:

- In consultation with the assessment (co-)leads and AMAP Secretariat, recruiting contributing authors/contributors to their chapter, with the aim of ensuring broad geographical representation as well as covering the topics being addressed in the chapter to the greatest possible extent. The names of potential contributors will be presented to AMAP HoDs for their review, including addressing potential questions regarding financial support. HoDs may also nominate potential contributors, who would then be contacted directly by the chapter co-leads;
- Assisting assessment (co-)leads in developing the outline and timeline for the assessment, including its communication and outreach plan and possible derivative products (see below);
- Coordinating the documentation management and drafting work on the chapter for which they are responsible, including application of relevant editorial guidelines, etc.;
- Together with assessment (co-)leads, contributing as required to reporting on progress in work on their chapter, including raising concerns or issues that may need to be addressed.
- Together with assessment (co-)leads, reviewing all draft report chapters prior to the peer review to identify and address any potentially important gaps in coverage, overlaps between chapters and potentially conflicting statements or material.
- If relevant, assist in planning and delivering communication and outreach and assisting science writers responsible for drafting of SPMs.
- Respond to and document responses to peer review comments.

In an assessment process, the AMAP Secretariat is responsible for:

- assisting the assessment (co-)leads in overseeing and coordinating the work related to the assessment, including identifying experts to support the assessment work;
- assisting in arranging for the submission of special inputs to the assessment;
- assisting the Lead Authors in the drafting of assessments, including (if relevant) the Executive Summary and Front Matter (Preface; Acknowledgements, etc.)
- arranging the circulation of drafts to AMAP HoDs and observers for checking/comments;
- identifying and arranging of circulation of drafts to peer reviewers, making review comments available to assessment lead authors and compiling information on handling of comments;
- arranging for report production.

In an assessment process, AMAP HODs are responsible for:

- defining PRSQs to be addressed, agreeing scoping work including assessment timelines and outlines;
- providing resources, including expertise, necessary for production and delivery of the assessment and its products;
- in consultation with assessment leads, directing and managing the assessment process, resolving any issues that arise that could interfere with the work, ensuring that work is performed according to agreed procedures, protocols and timelines, etc.;
- if relevant, ensuring coordination with other assessment conveners in in co-arranged assessment processes;
- coordinating national data checks and reviews of assessment report drafts;
- supported by the assessment leads/lead authors producing the assessment policy communication products (e.g., SPMs).

Report Production

The production of an AMAP scientific/technical assessment report is one of the major tasks associated with a typical assessment activity. It involves several activities including the review procedures noted above. The following descriptions provide relevant practical information to guide some parts of this work.

Procedures vary and are adapted depending on the nature of the assessment and the report(s) being produced. The following provides a blueprint based on a typical approach when the drafting of the report is managed by the assessment leads in collaboration with a small group of 'chapter leads'; in all parts of the work flow the AMAP Secretariat is available to advise, assist with and support the work.

Organization of materials

During early stages of drafting, it is generally convenient for assessment leads and chapter leads to arrange for creation, sharing and updating of drafts according to their preferred work practices – typically using shared documents that can be jointly edited/commented by a team of co-authors and contributors. Some items to consider in this connection include:

- appointing a lead author to coordinate work on a given part of the assessment report with responsibility to manage related documents, as necessary;
- ensuring that co-authors and contributors can all access the materials (i.e. arranging permissions to access shared documents if using e.g. Teams/Sharepoint or Google docs, etc.);

- ensuring a common understanding of how additions/changes/edits made during drafting are tracked so that lead authors can approve changes, if necessary, etc.;
- making sure that documents are periodically saved offline (backed-up) so that critical versions can be recovered in the event of loss of version control and tracking changes, etc.;
- application as far as possible of agreed conventions, including, if appropriate, standard AMAP conventions for use of terms, units, etc.; these are described in separately available 'AMAP editorial guidance' (see below).

At a certain point in the process, typically latest by the stage where documents need to be circulated for national review, it becomes convenient to combine draft chapters/sections and harmonize working procedures across the drafting teams. At this point it is also convenient to adopt a common method for naming documents (including version registration) and combine all files in a single document repository/system that is used from that point on.

Following completion of the peer review and handling of peer review comments, drafts will be made available, if relevant, to the science-writer responsible for preparing a SPM who will work in consultation with assessment leads and chapter leads in drafting the SPM.

Evaluating quality of information and data

AMAP strives to ensure that all data and information used in its assessment products is of the highest quality; comprehensive internal and external (peer) review is part of this quality assurance procedure (see earlier section). In part, and in particular when qualitative information is concerned, evaluation of 'quality' is a subjective process and relies on the experience of the experts involved in the assessment work. A general principle is that only data and information where there is a high degree of confidence in its quality and reliability should be used as a basis for drawing key conclusions or making important recommendations. It can be useful to address assessment conclusions in relation to 'What is known', 'What is partially known and/or uncertain' and 'What is unknown', and address associated implications, conclusions and recommendations accordingly.

It is recommended that (where applicable and possible) monitoring data used in the assessment be critically reviewed by the drafting authors. This review should address quality with respect to:

- sampling design (site selection, spatial resolution, frequency determination etc.);
- field operations (sampling, field pre-treatment, field measurements);
- sample handling (shipments to laboratory, sample conservation and identification, time and method of delivery);
- laboratory operations (laboratory pre-treatment, analysis, laboratory data verification, analytical quality control including intercalibration exercises);

- data handling (data entry, storage, retrieval, presentation);
- data analysis and evaluation.

In some previous assessments, the following categories of data were proposed, based on quality assurance considerations:

- A. Data with evidence of certification or documented quality assurance on all stages of the data gathering process.
- B. Date where some parts of QA/QC process can be documented (but may not be fully described in e.g. published reports).
- C. Data where no information is available on QA/QC procedures, but results are consistent with other reports concerning the same sample types.
- D. Data where there is no evidence of data QA or of data compatibility with certified data.

In some assessments a decision may be made to only include data/information that has been published in peer-reviewed journals (e.g. assessments that need to meet IPCC requirements in respect to published data); but in most cases AMAP assessments aim to include all relevant 'state-of-the-art' data and information both published and unpublished/grey literature). In such cases it is good practice if data are "rated" by the drafting groups. Data in categories 'A' and 'B' are acceptable for determining spatial and temporal trends and other types of basic data interpretations. Data in category 'C' can be used to show relative trends i.e. assuming they are internally consistent. Category 'D' data should not be used in the assessment process.

Also important in this context is the recommendation to avoid, or at least define, subjective terms (e.g., 'significantly greater', 'more likely') when comparing data and to apply as far as possible the terminology agreed by the IPCC in statements referring to confidence or likelihood, as follows:

Confidence Terminology	Degree of confidence in being correct
Very high confidence	At least 9 out of 10 chance
High confidence	About 8 out of 10 chance
Medium confidence	About 5 out of 10 chance
Low confidence	About 2 out of 10 chance
Very low confidence	Less than 1 out of 10 chance

Likelihood Terminology	Likelihood of the occurrence/ outcome
Virtually certain	> 99% probability
Extremely likely	> 95% probability
Very likely	> 90% probability
Likely	> 66% probability
More likely than not	> 50% probability
About as likely as not	33 to 66% probability
Unlikely	< 33% probability
Very unlikely	< 10% probability
Extremely unlikely	< 5% probability
Exceptionally unlikely	< 1% probability

AMAP assessment reports are fully referenced, and it is essential that source references are included for all significant sources of data/information used and statements made in the assessment. Attention to the work necessary to compile reference lists/bibliographies is a time demanding but critical part of the assessment production and one that benefits from good organization and agreements from the outset concerning the related work.

Some classes of information/knowledge used in AMAP assessments, such as Indigenous knowledge may have particular requirements for attribution and/or recognition of rights of ownership. This is a subject that is currently under review/development.

Editorial guidance, scientific and technical editing

During drafting it is useful to apply, to the greatest possible extent, editorial guidance and conventions that are commonly used in AMAP assessment work; this can be found in the <u>AMAP</u> <u>Editorial Guidance document</u>.

Following the completion of the peer review process, it is normal practice to engage a scientific editor to conduct scientific/technical and copy editing on the draft prior to sending it for layout/publication. This work is organized by the AMAP Secretariat, with the expectation that assessment or chapters leads respond to questions that may arise from the editor in this connection, including review of editor's suggestions to ensure that they do not introduce any errors or misinterpretation.

Important information to compile

During the drafting process, it is useful (in some cases essential) for lead authors to compile information that can be available at later stages in the production work.

Most important in this respect is the reference list of sources of data/information cited in the draft report, including sources of published/unpublished data that are included and, if relevant, details for any 'personal communications'.

All contributors to AMAP reports are acknowledged in the published report, including (unless they wish to remain anonymous) individuals involved in reviewing the assessment. Assessment leads/lead authors are requested to maintain lists of all those involved in the work, including as relevant their roles in developing the report so that these can be appropriately acknowledged. Lead authors will normally be responsible for identifying authorship of a particular chapter/section of the report in terms of lead authors, co-authors, contributing authors/contributors of data, etc. If relevant, chapters can include required acknowledgements of projects and funding-sources, etc. supporting or contributing to the assessment work described in that chapter.

Other useful 'lists' that drafting groups should consider compiling include:

- List of graphics' (see <u>AMAP Editorial Guidance document</u>);
- List of named places or geographical features mentioned in the texts, especially places/features (e.g. small lakes) that will not be widely recognized, and if possible indicating the relevant geographical coordinates); in this connection, Indigenous settlement names should be used where appropriate.
- List of acronyms, terms or definitions that it would be appropriate to include in a glossary.

Such lists are not only useful to the report's scientific/technical editor and science-writers of SPMs, but are also useful for circulation to drafting teams to ensure consistency in their use during drafting.

Graphical production and layout

AMAP normally engages professional graphic designers to support graphical production work and layout reports according to AMAP standard specifications. More information related to this can be found in the <u>AMAP Editorial Guidance document</u>; AMAP Secretariat are responsible for organizing this part of the work and consult with assessment leads and chapter leads as necessary; assessment leads and chapter leads are involved in work to review and sign-off on the content of the laid-out technical assessment report before it is published.

Resources

Financial resources required for work to prepare AMAP assessments and produce and deliver associated reports are managed by AMAP national HoDs and AMAP Secretariat.

Assessment leads and those responsible for significant parts of the work associated with drafting AMAP assessment reports normally engage in the work on a voluntary basis or with support from and agreed to by their respective national HoDs. Most others making contributions to AMAP assessments, either through delivery of data/information or contributing to drafting, do so voluntarily. Resources may be separately allocated for activities such as drafting meetings.

If assessment leads identify activities requiring additional resources, they should consult on this with the AMAP Secretariat and (tracking) HoDs.

Funding for report production and publication, including engagement of scientific/technical editors, science writers, graphical and report production and where relevant printing, is arranged by the AMAP Secretariat.

Communication and Outreach

A communication plan for the assessment should be developed as part of the assessment planning process, aiming to ensure policy relevance and timeliness through a two-way sciencepolicy dialog. This plan should be formulated in accordance with the <u>AMAP Communication</u> <u>Strategy</u> but should detail communication goals or activities specific to the assessment concerned. For example, timing of meetings, review and outreach activities, etc., to take advantage of opportunities associated with relevant conferences or events, and for developing plans for communicating assessment results to feed into external processes in a timely manner – for example, aligning timing with IPCC assessments, Conference of Parties (COPs) meetings, effectiveness evaluation processes associated with International Conventions, etc.

Derivative products

Journal articles

The normal, and strongly preferred approach in an AMAP assessment process is that the assessment is delivered in the form of an AMAP scientific/technical report, that can then be translated into derivative products, including scientific journal articles if there is an interest in this. In a few cases, AMAP assessments have been delivered through a process involving preparation of a series of scientific journal articles (e.g., in a journal Special Issue), which then forms the basis for a SPMs. However, this has a number of implications that make it less appropriate, including lack of possibility to ensure AMAP principles are fully applied, journal constraints on size and scope of material included, potential limitations on authorship,

requirements and costs associated with open access and rights to content of the article, control over timelines, etc.

Several recent AMAP assessment reports have been successfully translated into Special Issues and articles in high-impact scientific journals⁵, typically by submitting a scientific paper based on a report chapter. This activity is encouraged by AMAP as a means of making the AMAP assessment available to the wider scientific community; it is efficient for the experts involved as it recycles work undertaken in the AMAP assessment, and it is a means by which authors can obtain peer-recognition. However, unless part of an agreed atypical AMAP process, production of journal articles based on AMAP assessment work is an independent activity and not part of the AMAP assessment process.

Where assessment leads/lead authors plan to produce derivative scientific articles based on AMAP assessment products, they should discuss this with their AMAP assessment group coauthors and contributors in advance and preferably during the AMAP assessment work to ensure that everyone concerned is comfortable with the proposed publication arrangements, including selection of journal, etc. It is critical to ensure that there are no misunderstandings regarding e.g. authorship, acknowledgements, permission to use other peoples' data and information as this can impact experts' willingness to participate in future AMAP work. Much of this can be achieved by appropriate application of relevant ethical guidelines and standards, such as the <u>Vancouver</u> <u>Convention recommendations</u>. In some cases, the AMAP secretariat may support open access to such articles if the journal publication is part of the agreed assessment communication and outreach plan.

Articles based on work undertaken to produce AMAP assessments should include citations to the related AMAP report(s) and a short paragraph, e.g. in the introduction, explaining the relationship to the AMAP work.

Side-events, webinars, podcasts and films, fact sheets

Communications and outreach efforts associated with AMAP assessments may include arrangement of side-events at relevant policy-dialog meetings or presentations at scientific conferences, etc. Increasingly, use is being made of recorded presentations, and shorter and longer audio/video media products to communicate findings of AMAP assessment activities and this may be linked to outreach on social media channels and platforms such as YouTube. Such activities should be considered in developing an assessment communication and outreach plan. AMAP Secretariat can provide further advice and support in this connection.

⁵ Example derivative journal publications based on AMAP assessment work: <u>AMAP 2021 SLCF assessment;</u> <u>AMAP 2021 Mercury assessment</u>

Media communications

Release of AMAP assessment results/reports may be associated with outreach targeting media outlets. This may include the development of a press release and e.g. identification of experts who can be contacted for follow-up in this connection. Such activities are typically arranged by the AMAP Secretariat and coordinated with relevant national media communication efforts.