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DIR 16 0456

Australian Government Productivity Commission

Data Availability and Use

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Submission to Productivity Commission Inquiry into Data Availability and Use

The Australian Government Environmental Information Advisory Group (AG-EIAG) was established in 2010 as a cross-agency mechanism to improve collaboration and coordination, to develop cross-agency policy positions around major environmental information related issues and to improve awareness of the breadth of environmental information activity underway in Australian Government.

The environmental information domain is well suited to innovation and leadership in lowering barriers to data availability and use given reduced privacy concerns, relatively high open data provider maturity and significant community and industry benefit. As such, the AG-EIAG welcomes the Productivity Commission's Inquiry into Data Availability and Use and in response has developed the attached submission to inform the inquiry's activities.

We are pleased to provide further contributions to the inquiry. All correspondence can be directed to Louise Minty at environment@bom.gov.au.

We look forward to reviewing the final outputs from this important process.

Yours sincerely

(MS Vicki Middleton)

DIRECTOR OF METEOROLOGY

Attachment: AG-EIAG Productivity Commission Submission

26 July 2016

Australian Government

SUBMISSION TO THE PRODUCTIVITY COMMISSION INQUIRY INTO

DATA AVAILABILITY AND USE FROM

AUSTRALIAN GOVERNMENT ENVIRONMENTAL INFORMATION ADVISORY GROUP

EXECUTIVE SUMMARY

The Australian Government Environmental Information Advisory Group represents Australian government agencies with a responsibility and interest in environmental information. The group draws the Productivity Commissions Inquiry into Data Availability and Use to the following observations and recommendations:

1. The **environmental** domain is well suited to innovation and leadership in lowering barriers to data availability and use given reduced privacy concerns, relatively high open data provider maturity and significant community and industry benefit.
2. An open **standards-based approach** should be adopted for improving data accessibility and re-use where data remains maintained and curated at-source, but through the application of community agreed standards made available broadly.
3. Continued support and expansion of **data.gov.au** is critical given its strategic leadership and tactical role as a data discovery gateway for government data.
4. Establishing enduring **governance and coordination arrangements** is fundamental to develop a robust national open data infrastructure. Current approaches can be ad-hoc and not well resourced to achieve requisite improvements.
5. Continuing Australian Government's commitment to support **open data** principles remains a major priority for broader data use.
6. **Downstream long-term economic benefits** of open government environmental data exceed any short term benefits from adopting cost-recovery approaches.
7. Beyond research and educational outcomes, the **research sector** plays a critical role in supporting Australia's open data infrastructure. This requires recognition, resourcing and coordination to better leverage the installed base.

PURPOSE

To provide a submission to the Australian Government Productivity Commission Inquiry into Data Availability and Use from the Australian Government's Environmental Information Advisory Group

BACKGROUND – ENVIRONMENTAL INFORMATION

1. Australia invests significant resources in environmental data acquisition, management and publication through the activities of many organisations.

2. Publically resourced environmental data acquisition, management and delivery also offers significant value to the Australian economy, to community safety and for enhancing environmental outcomes. For example, a recent study that examined the benefits of only one environmental data type, earth observation data from space, noted the data contributed over $4.3 billion to annual GDP and over $1billion of environmental value to Australia (Acil Alen, 2015). Similar conclusions have been reached in related international studies (Borzacchiello and Craglia 2011).

3. Further, the sharing of this data can provide reciprocal benefits from major international environmental monitoring initiatives such as the US Landsat and MODIS programs that would be challenging to access without reciprocal open data arrangements.

4. A recent synthesis by the Bureau of Communications Research (2016) provides contemporary evidence from multiple domains of the direct value of open data. Combined with indirect benefits the study makes a compelling case for continued investment and provision of open data by government in Australia.

5. Environmental data is an excellent domain to innovate and show leadership in lowering barriers to availability and use given the lack of privacy issues, the data maturity of agencies operating in this space and the benefits of supporting the community and industry with better data.

6. Environmental data also contains the unifying attribute of *location (*or geography) thus enabling its ready integration with other data, for example social or economic information that may share this trait or for use in integrating frameworks such as environmental economic accounting.

7. Regarding the status of environmental data in Australia two main observations can be made:

    - Although data are abundant, users are typically hampered by an inability to discover, access and re-use the data for their own purposes. In an

environmental information context, re-use is defined as providing value beyond the original business driver. Data often exists only within individual agencies to support internal business requirements or within individual environmental domains. Consequently, enabling discovery, access, and re-use across domains (e.g. air, water, land, oceans, ecosystems and the built environment) remains challenging. The challenge in this context is not about but in having adequate resources to deliver and support open data in a manner that provides an operationally robust data stream.

- In some environmental domains there remains a paucity of nationally consistent data and where data acquisition, management and delivery is resourced through short-term programmes or ad-hoc arrangements. The environmental information community may also rely on the research and research infrastructure sector to fill this gap.

AUSTRALIAN GOVERNMENT ENVIRONMENTAL INFORMATION ADVISORY GROUP

8. The Australian Government Environmental Information Advisory Group (AG-EIAG) was established in 2010 as a cross-agency mechanism to:

    - Improve cross-agency awareness of the breadth of environmental activity underway in Australian Government agencies
    - Increase opportunities for collaboration and coordination of environmental information activity
    - Develop cross-agency policy positions around major environmental information-related issues
    - Advise on how to maximise the value of activities under the National Plan for Environmental Information initiative, and
    - Provide a single point of coordination into agencies to support the activities of the National Plan for Environmental Information initiative.

9. The Group meets twice a year. Its membership includes 15-20 Australian government agencies, depending on extant portfolio management arrangements, and is currently chaired by the Director of Meteorology.

10. Since inception it has completed a number of strategic environmental data and information-focussed activities and provided support to others across Australian Government. These include:

    - Developed the *Statement of Australian Government Requirements for Environmental Information* (Australian Government Environmental Information Advisory Group, 2012)

- Supported the *Independent Review of Australian Government Environmental Information Activity* (Morton and Tinney, 2012)
- Supported and guided the development of the Australian Government environmental information eCommuniqué *eXchange* that is now published three times per year
- Supported the design and public consultation process around the development of the *National Environmental Information Infrastructure Reference Architecture* (Bureau of Meteorology, 2014)
- Released the *National Principles for Environmental Information* (Australian Government Environmental Information Advisory Group, 2015)

11. To address some of the challenges identified by the Australian Government environmental information community, the AG-EIAG is involved in two key cross-agency activities: (i) development and adoption of the *National Principles for Environmental Information* and (ii) the adoption of a *National Environmental Information Infrastructure*.

12. These activities and additional input from advisory group members have informed this submission to the inquiry.

NATIONAL PRINCIPLES FOR ENVIRONMENTAL INFORMATION

13. The National Principles for Environmental Information (Attachment A) are a policy instrument developed by the AG-EIAG to provide guidance to Australian government information custodians on how to make the environmental information for which they are responsible more discoverable, accessible and re-usable.

14. The principles identify the relevant standards, frameworks and approaches that should be adopted by data custodians to enable the integration and interpretation of their data and its incorporation into applications, products and decision-making.

15. Although focussed on environmental information, the principles align well with other more general, national and international, government open data policies.

16. In terms of the focus of this inquiry, the principles of particular importance are Principle 3 (Standardised), Principle 5 (Discoverable), Principle 6 (Available under and open licence) and Principle 8 (Governed and managed):

- **Standardised** - Building an effective national information infrastructure, whether for environmental, social or economic data, should be standards-based. The National Environmental Information Infrastructure has adopted a federated model of operation. In such a model, where possible, data is managed and curated at-source and, through the adoption of standards, made readily discoverable,

accessible and re-useable. A set of relevant standards is identified in the *National Environmental Information Infrastructure Reference Architecture.*

- **Discoverable** - Data should be registered, searchable and visible through relevant web portals such as data.gov.au, to increase awareness of the existence of relevant information by government, community and industry. The AG-EIAG supports the role of the data.gov.au infrastructure and recognises its importance as one of the primary mechanisms for allowing users to discover government data. However, there is a case for improving how such infrastructure assesses and communicates data quality to users. At present differentiating high-quality data that is effectively governed and managed, from ad-hoc programme or activity data that is not, remains challenging for users.

- **Available under an open licence –** A key enabler for more effective and streamlined use of environmental data is the flexibility offered by the licensing framework adopted by data providers. To this end the environmental information community continues to encourage the adoption of open data principles with respect to licensing.

- **Governed and managed** - Supporting standards adoption and effective use of data requires sustained and robust governance arrangements, particularly in the case of federated information systems. Making data open is only the first step and ongoing governance and management is critical. This is particularly important for supporting ongoing business use of government data, which for surety of business continuity demands ongoing high quality data supply. The Morton and Tinney (2012) review made important recommendations around governance and resourcing in an environmental information context. These findings may provide value to the national data agenda.

National Environmental Information Infrastructure (NEII)

17. The Bureau of Meteorology is leading the development of a National Environmental Information Infrastructure in partnership with the members of the AG-EIAG. The primary focus of the development activity is improving the discovery and re-use of nationally significant environmental data that is already well-managed, but that currently has limited application beyond its original business purpose.

18. The Bureau of Meteorology's role is to provide the core coordination and integration infrastructure as well as the governance and collaboration framework for its development and operation. This role costs the Australian Government about $1.5 million per annum. Other essential roles in the NEII include those of data providers, service providers, domain authorities and information users.

19. When developed, the core infrastructure will include:

- An online metadata catalogue of environmental data services
- A national environmental monitoring sites register
- A vocabulary service publishing governed vocabularies hosted across environmental domains
- A register of observing methods
- A data hosting capability (as required)

20. NEII development approach engenders participation through voluntary mechanisms and has not enforced an adoption timeline. It uses a capability-maturity approach to participation recognising the diversity of capabilities and interests in contributing to an open federated information system.

21. The NEII recognises that the organisational change required to support a national infrastructure will be best achieved at major IT refresh points rather than necessarily through legacy systems. This approach is slow but cost-effective and ensures greater enterprise-level alignment with the NEII technical choices.

22. The benefits realisation is similarly slow but expected to be significant as the infrastructure matures. Expected benefits include:

    - More informed decision-making from using the best available environmental data
    - Data more directly available from the data custodian through web data services, which improves user confidence in the results from any analysis
    - Better fulfillment of legal and policy obligations, public safety and business needs through the delivery of interoperable data across environmental domains
    - Better public access to government environmental data, which supports the development of new industries, such as new software applications
    - Real-time delivery of data for timely decision-making
    - Reduction in resources needed to acquire and process data, and therefore more investment in value-add activities such as analysis and synthesis.
    - Reduction in the number of duplicates of datasets stored
    - More insights from integrated data analysis.

Additional Comments

23. The value of open environmental data has been proven while some questions remain regarding the application of cost recovery models for government data, particularly to commercial users. The AG-EIAG considers that cumulative national benefit to downstream sectors significantly exceeds any small-scale charging for access to data. Evidence from recent reviews also notes that limiting access through

commercial arrangements also impacts innovation thus limiting the development of new industries.

24. The environmental information community's focus to-date has been on improving data discovery, access and re-use. Relatively solid progress has been made around the former two, but the re-use objective requires further attention. Attention is required as some environmental data are big and complex, require integration with other data, or demand subject matter expertise to effectively re-use. This requirement demands new infrastructure capable of integrating data, analysing large integrated data sets, and collaboration approaches that bring together subject matter experts to better support potential users.

25. The AG-EIAG draws the Commission's attention to the critical role the research and innovation sector plays in developing, governing and managing data of value beyond only its own sector. This investment requires more effective and sustained management, governance and technical delivery. In particular, major national research and research infrastructure programmes such as the National Collaboration Research Infrastructure Strategy, National Environmental Science Programme and the CRC programme act as major producers of environmental data but not always with adequate functions or resources to effectively manage the data as a national resource, or to transition research data streams to ongoing government programs.

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Attachments

Attachment A – National Principles for Environmental Information

Australian Government

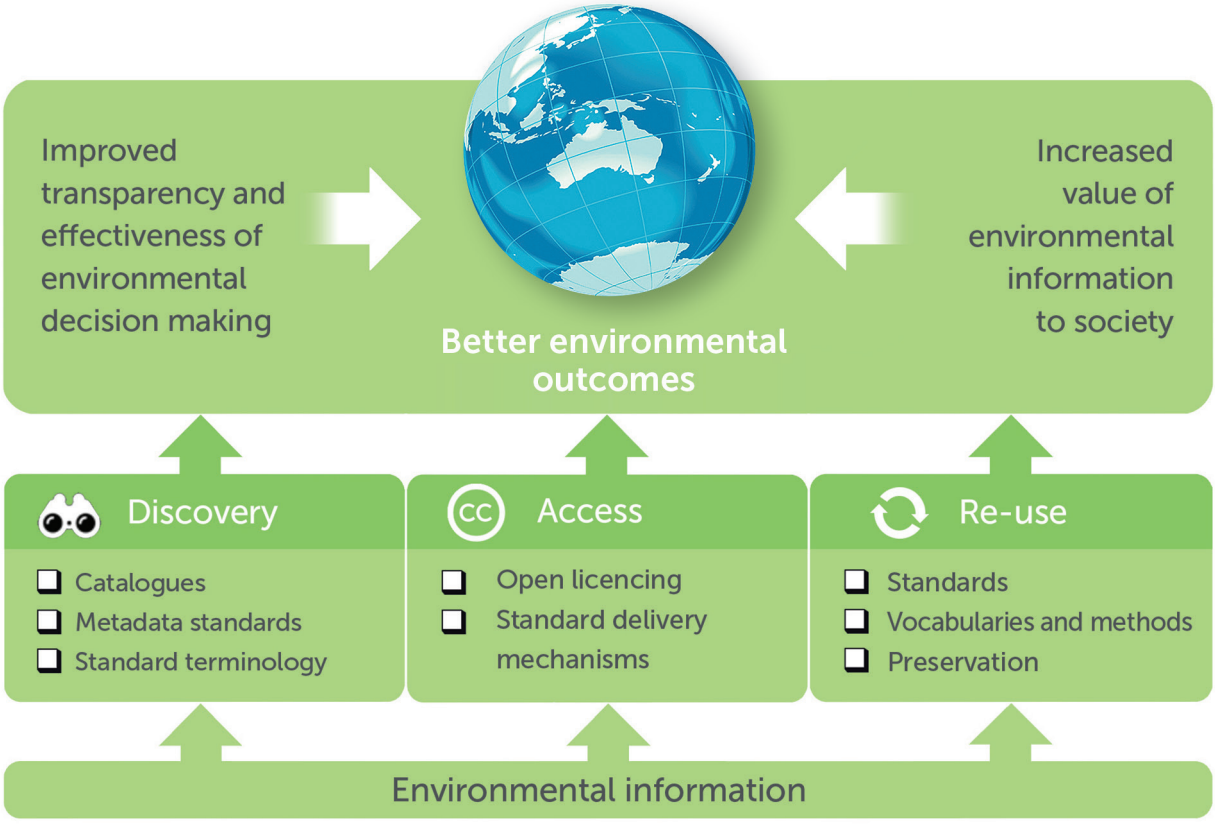
National Principles for Environmental Information

Increasing the value of environmental information for the environment, society and the economy by improving its discovery, access and re-use.

In Australia, environmental information is collected across many disciplines and geographies, by many people and institutions for many purposes. As a consequence environmental information holdings can be fragmented and difficult to access and use by anyone other than the original collector.

Improving the discovery, access and re-use of environmental information will improve the transparency, efficiency, responsiveness and effectiveness of governments, businesses and communities making environment-related policies and decisions. Opening environmental information to its broadest user base also stimulates innovation and increases the value to society and the economy from the investment in environmental information collection.

The purpose of these principles is to provide guidance to Australian government information custodians on how to make the environmental information for which they are responsible more *discoverable*, *accessible* and *re-useable*. This will enable the integration and interpretation of data gathered from different sources across Australia and internationally by many different organisations. It will also enable the rapid incorporation of data into many applications, products and decision making.



Principles

1. Valued

Environmental information should be treated as a valuable and strategic asset, the value of which increases through access and re-use.

2. Well described

Environmental information and data services should be described with and linked to high quality metadata that enables users to evaluate its fitness for their various purposes.

3. Standardised

Environmental information, metadata and data services should use common standards such as those identified in the National Environmental Information Infrastructure (NEII) Reference Architecture: www.neii.gov.au/publications.

4. Published online

Environmental information should be published online in a timely manner and in machine-readable standards-based formats.

5. Discoverable

Environmental information should be registered, searchable and visible through relevant web portals such as data.gov.au increasing the awareness of relevant information by government community and industry.

6. Available under an open licence

Environmental information should be published for use under an open licensing agreement, preferably a Creative Commons Attribution (CC-BY) licence under the AusGOAL framework, and available at no cost: www.ausgoal.gov.au

7. Preserved

Data archives should be established to preserve the environmental information necessary to track changes in the environment. These archives should be aligned with the reference model for the OAIS (Open Archival Information System).

8. Governed and managed

Governance and management of environmental information collection, compilation, storage and delivery should:

- implement and promote effective, efficient and consistent practices
- be accountable, transparent and representative to stakeholders
- support users and managers to meet these principles through education, capacity building, and facilitating the participation and collaboration of all levels of government, industry and the community.

9. Compliant

Environmental information management practices should meet statutory, legal and ethical obligations such as privacy and sensitivity.

10. Feasible and cost effective

Practices for environmental information management and publication should be feasible to implement and cost effective to sustain by organisations of all sizes, enabling the widest range of participation. This can be best achieved by aligning with the approaches of the Australian Government's National Environmental Information Infrastructure (NEII) Reference Architecture.

FIND OUT MORE

For more information about the National Principles for Environmental Information go to **www.bom.is/enviroinfoprinciples** or **www.environment.gov.au/science/national-plan-environmental-information**

Page 1 image: Flowering Rushes (Restionacea), Moulting Lagoon Tasmania. Richard Mount.
Image this page: Aqua MODIsatellite image of section of Queensland, 4 January 2011, NASA.

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