

# Identifying actors: a first step in effectively communicating provenance

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**Abstract:** Decision makers are increasingly requiring not only scientific information as evidence for their decisions, but also transparency with respect to the data, processes and decisions that were used to generate this information. There are challenges in not only recording and representing the provenance of this information, but also in communicating the provenance information. This paper uses the Bioregional Assessment Programme ([www.bioregionalassessments.gov.au](http://www.bioregionalassessments.gov.au)) as a case study to discuss the issues in communicating provenance information. The actors (the people, roles and systems that interact with the provenance information) are identified as a first step in effectively communicating provenance information.

The programme provides scientific information for decision makers, industry and the community to use when considering coal seam gas and coal mining developments and their potential impacts on water resources. A significant effort in data management and process reporting has allowed a suite of integrated products (both documents and an information platform) to present both scientific results and also the research data used to generate results. Cross-links to the data are reported using in-text data citations with persistent uniform resource identifiers (URIs) that are resolved to online publication of metadata and (where possible) the data itself. While complete provenance has not yet been formally represented, stored or used consistently across the programme, future products are expected to report formalised provenance, and current products need to anticipate this future reporting for consistency.

To communicate provenance information well it is necessary to consider the following actors and their requirements:

- researchers in the programme, who need to record, report, re-use and communicate the provenance information
- industry, who need to understand, re-use and potentially re-purpose the provenance information, so that they can undertake similar bioregional assessments on different systems
- decision makers, who need to understand, check and compare the provenance information with that provided by proponents of developments
- stakeholders with an interest in the potential developments and their impacts (e.g. environmentalists, landholders, concerned public), who need to understand the provenance information in order to judge the credibility and usefulness of the scientific information for their local needs.

For effective communication, the language used to describe and categorise the provenance information needs to be understood by this diverse range of actors. The provenance information must be integrated into the rest of the scientific information presented, to ensure that actors understand the context as well as the linkages to content, data and metadata. Finally, the different actors might want to consume the information in multiple ways, each of which pose different communication challenges: human-readable text, machine-readable text, static visualisations, or searchable and traversable dynamic user interfaces. If multiple formats are provided, the system would need to store information in a way that makes it possible to easily translate between these different formats.

Once the actors and their requirements are fully understood, the programme needs to move from an environment where only minimum provenance information is stored and communicated, to one where complete provenance is stored, formally represented and actively communicated. This is a substantial change in work practice and a social process must be put in place to facilitate this change, so that researchers can effectively record and communicate provenance information that is useful and relevant for these actors.

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