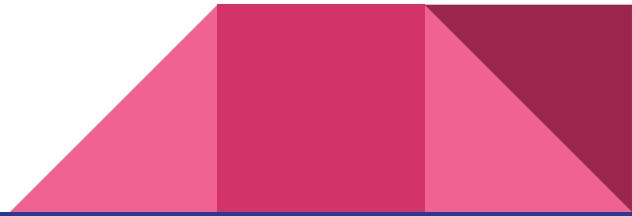
Data Versioning WG

RDA Plenary 12 | 07 November 2018

Agenda

- Introduction
- Recap of Why, How and What of Data Versioning
- Review of use cases, including the W3C Dataset Exchange Use Cases and Requirements
- Work plan for RDA Data Versioning WG
- Engagement with other RDA and external groups
- Outline of white paper on data versioning practices
- Scheduling of online meetings up to Plenary 13



Meeting Objectives

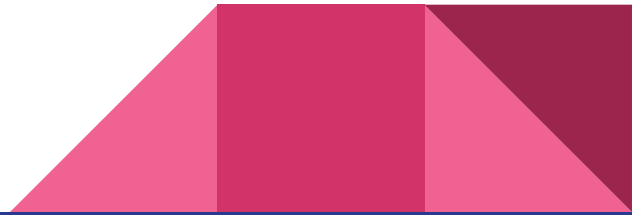
- Update the work plan for this RDA Working Group on developing agreed practices for Data Versioning. This includes planning of how to engage with other groups in RDA and externally where data versioning is required.
- Overview of documented cases where groups and organisations are undertaking data versioning.
- Develop the outline of a white paper on recommendations for versioning for a spectrum of data types (files, databases, unstructured data, model runs, etc.), and align these with the practices for the assignment of persistent identifiers.

RDA Guidelines: Review Criteria for a Working Group

- **Focus**: Are there measurable outcomes?
- **Impact and Engagement**: Will the outcome(s) of the Working Group be taken up by the intended community? Will the outcome(s) of the Working Group foster data sharing and/or exchange?
- **Timeframe**: Can the proposed work, outcomes /deliverables, and Action Plan described in the Case Statement be accomplished in 12-18 months?
- **Scope/Fit**: Is the scope too large for effective progress, too small for an RDA effort, or not appropriate for the RDA?

Recap: The Why, How and What

- Datasets published on the Web may change over time.
- Some datasets are updated on a scheduled basis, and other datasets are changed as improvements in collecting the data make updates worthwhile.
- Others are updated because errors are found
- In order to deal with these changes, new versions of a dataset may be created.
    - What is the significance of the change?
    - Is the new version compatible with the previous version?



Issues with ‘external’ data versioning you may not of thought of … yet
(with apologies to Beethoven)

Lesley Wyborn
National Computational Infrastructure ANU

NCRIS National Research Infrastructure for Australia An Australian Government Initiative
Australian Government Bureau of Meteorology
Australian Government Geoscience Australia
Australian Government Australian Research Council
CSIRO
Australian National University
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@NCInews

We need to move on from the ‘book on the shelf’ mentality

The traditional thought mode for finding a dataset via metadata is the old library way of locating the ‘book on the shelf’ via the card catalogue.

File is catalogued, found and down loaded for local processing: curation is minimal

is this mode appropriate for access for datasets via services?

http://commons.wikimedia.org/wiki/File:Shelves_of_Language_Books_in_Library.JPG

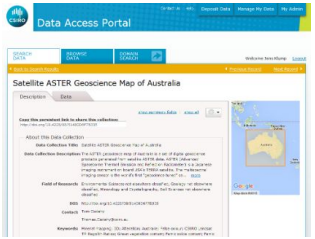
http://en.wikipedia.org/wiki/Library_catalog#/media/File:Schlagwortkatalog.jpg

Three New Kids on the block

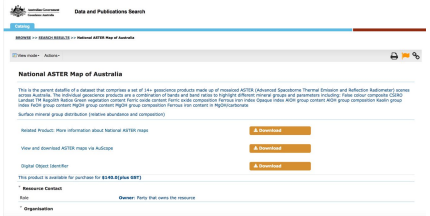
1. **Web Services**
2. **Analysis Ready Data (ARD)**
   - Products that make data more accessible, easier to analyze, and reduce the amount of time users spend on data processing prior to analysis
   - i.e., Data are consistently processed to the highest scientific standards and level of processing required for common access
   - May not be all that big
3. **High Performance Data (HPD)**
   - HPC variation of ARD
   - Data moved to be close to compute because bandwidth limits capacity to access it in realistic time frames
   - Multiple individual data sets, potentially from multiple sources, aggregated into homogenous data sets to enable ‘high performance’ access, including parallelisation to improve access

lesley.wyborn@anu.edu.au

The Australian ASTER Data Service Crisis



CSIRO ASTER Collection
Data in TIFF format, and the files are broken up into chunks of ~2GB for downloading: there are 1258 files.



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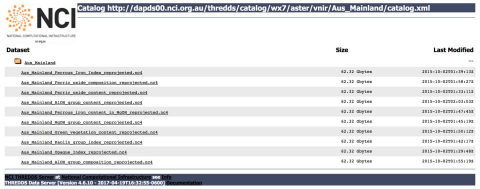

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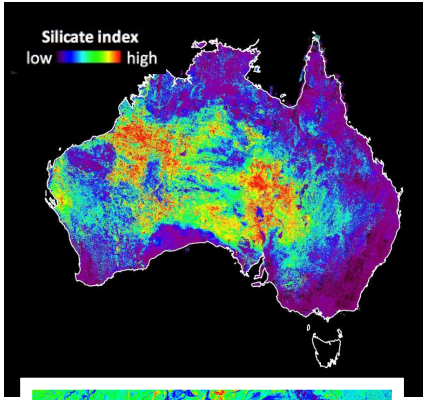
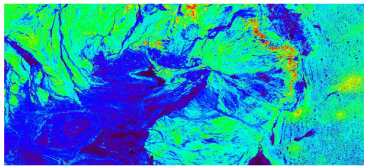
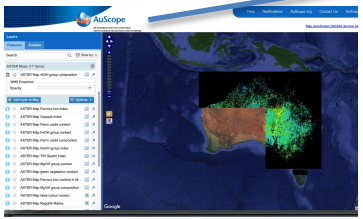
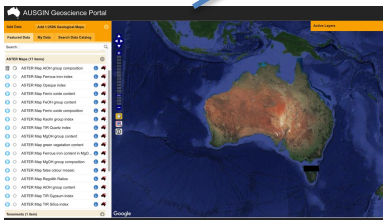






AuScope Portal (WMS)



AusGIN Portal (WMS)

lesley.wyborn@anu.edu.au

FRBR - Functional Requirements for Bibliographic Records

- This is a **conceptual** model developed by the International Federation of Library Associations and Institutions (IFLA)
- It represents a more holistic approach to retrieval and access of book resources
- The ways that people can use FRBR data have been defined as follows:
  - to find entities in a search
  - to identify an entity as being the correct one
  - to select an entity that suits the user's needs
  - or to obtain an entity (physical access or licensing)

Source: https://en.wikipedia.org/wiki/Functional_Requirements_for_Bibliographic_Records

B. Tillet,2003: What is FRBR https://www.loc.gov/cds/downloads/FRBR.PDF

More on FRBR

- FRBR comprises 3 groups of entities:
  - **Group 1** entities are work, expression, manifestation, and item (WEMI). They represent the products of intellectual or artistic endeavor.
  - **Group 2** entities are person, family and corporate body, responsible for the custodianship of Group 1's intellectual or artistic endeavor.
  - **Group 3** entities are subjects of Group 1 or Group 2's intellectual endeavor, and include concepts, objects, events, places.

Source: https://en.wikipedia.org/wiki/Functional_Requirements_for_Bibliographic_Records

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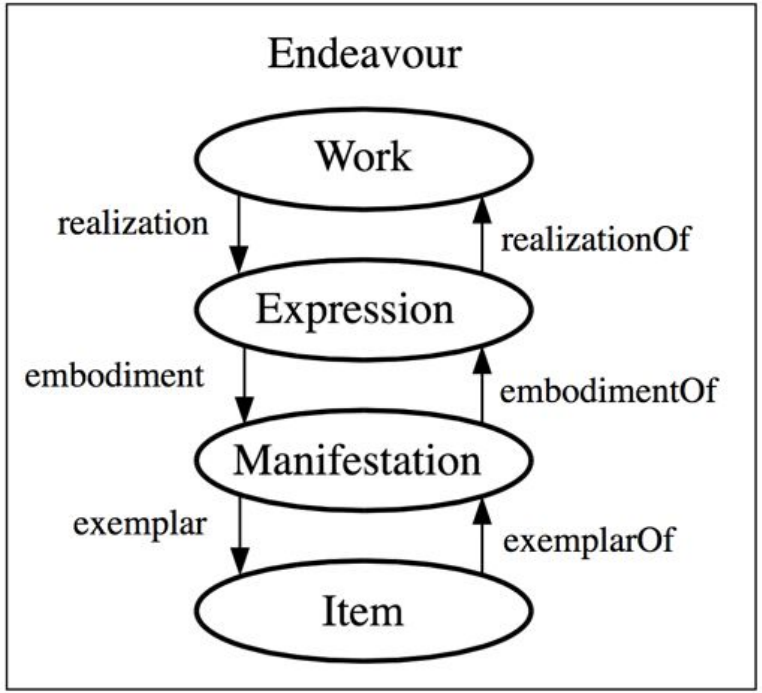
In other words for Group 1 (with apologies to Beethoven)



- **Group 1** entities are work, expression, manifestation & item.
  - *They represent the products of intellectual or artistic endeavor.*
- **A Work** is a 'distinct intellectual or artistic creation'
  - *e.g., Beethoven's Ninth Symphony*
- **Expression** is 'the specific intellectual or artistic form that a work takes each time it is 'realized.''
  - *e.g., Each draft score of the Ninth that Beethoven writes*
- **Manifestation** is 'the physical embodiment of an expression of a work'.
  - *e.g., The performance the London Philharmonic made of the Ninth in 1996*
- **Item** is 'a single exemplar of a manifestation. The entity defined as item is a concrete entity.'
  - *e.g., Each copy of the 1996 pressings of that 1996 recording is an item.*

Source: https://en.wikipedia.org/wiki/Functional_Requirements_for_Bibliographic_Records
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Relationships

Equivalence relationships

- Exist between exact copies of the same manifestation of a work or between an original item and reproductions of it, so long as the intellectual content and authorship are preserved
  - e.g., reproductions such as copies, issues, facsimiles and reprints, photocopies, microfilms.

Derivative relationships

- Exist between a bibliographic work and a modification based on the work, e.g.:
  - Editions, versions, translations, summaries, abstracts, and digests
  - Adaptations that become new works but are based on old works
  - Genre changes
  - New works based on the style or thematic content of the work

Descriptive relationships

- Exist between a bibliographic entity and a description, criticism, evaluation, or review of that entity
  - e.g., between a work and a book review describing it.
  - e.g., annotated editions, casebooks, commentaries, and critiques of an existing work.

Source: https://en.wikipedia.org/wiki/Functional_Requirements_for_Bibliographic_Records

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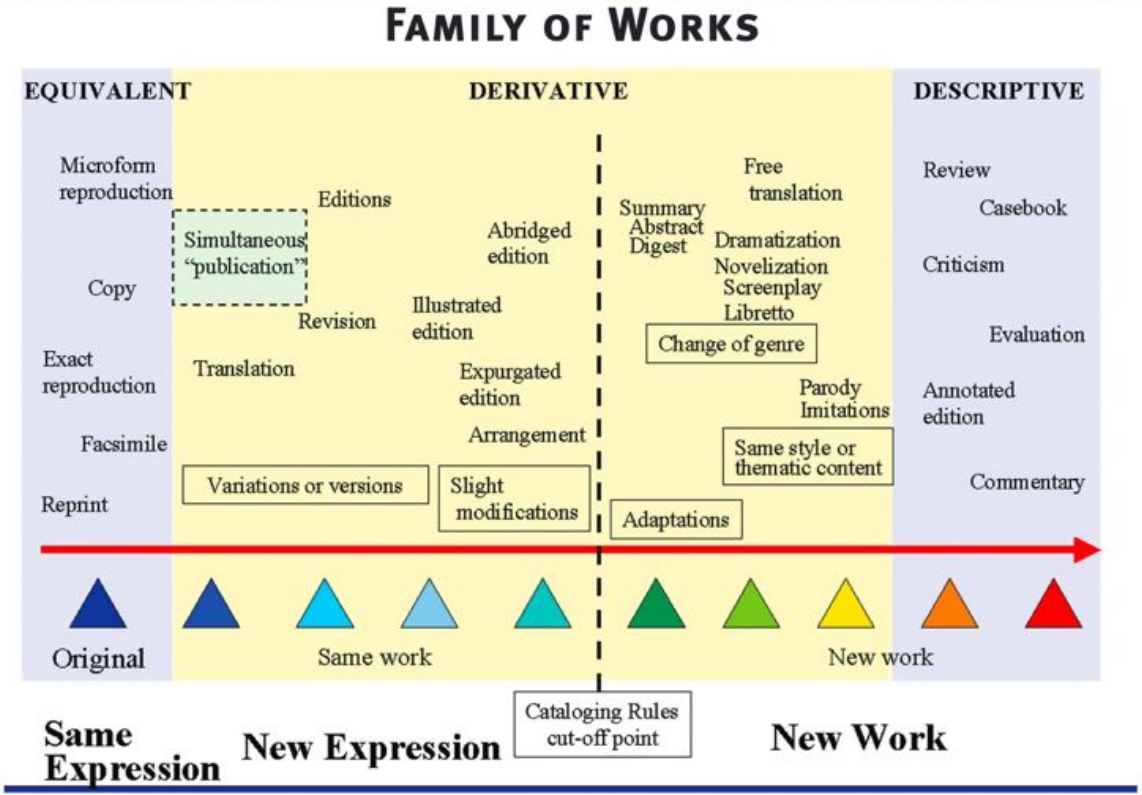
Does this conceptual model work for digital data?



Relationships in the Organization of Knowledge, edited by Carol A. Bean and Rebecca Green, 2001, p. 23, "Bibliographic Relationships" by Barbara B. Tillett, Figure 2, © 2001 Kluwer Academic Publishers Boston, with kind permission of Kluwer Academic Publishers.

See more in B. Tillet, 2003: What is FRBR
https://www.loc.gov/cds/downloads/FRBR.PDF

Expressions of satellite imagery (NASA)

Data Product Level	Description
Level 0	Reconstructed, unprocessed instrument data at original resolution, time ordered, all communications artifacts removed.
Level 1A	Level 0 data time referenced and annotated with ancillary information, including radiometric and geometric calibration coefficients and georeferencing parameters (i.e., platform ephemeris) computed and appended, but not applied to Level 0 data.
Level 1B	Radiometrically corrected and geolocated Level 1A data that have been processed to sensor units.
Level 1C	Level 1B data that have been spatially resampled.
Level 2	Derived geophysical parameters at the same resolution and location as the Level 1 data from which they are derived.
Level 3	Geophysical parameters derived from Level 1 or 2 data that have been spatially and/or temporally re-sampled to a global grid.
Level 4	Geophysical parameters derived by assimilating Level 1, 2, or 3 data into a land surface model.

Source: http://smap.jpl.nasa.gov/data/

A Metaphor for Data Services: Beethoven's 9th Symphony

WHAT

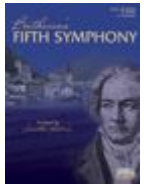
WHERE

WHO

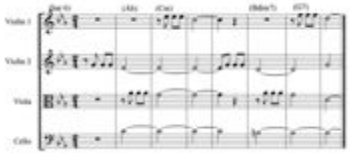
HOW

Collection


Dataset (Data Set?)

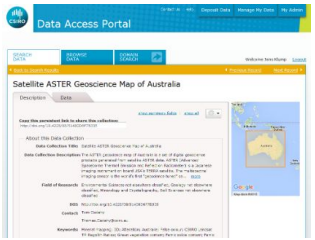
Granule



lesley.wyborn@anu.edu.au

The ASTER Data Services modelled on Beethoven (Is there an analogy to physical samples?)

What is Beethoven's 9th – i.e., the body of work = ?JAXA, ?CSIRO, ?Geological Surveys



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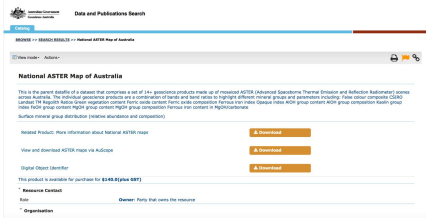

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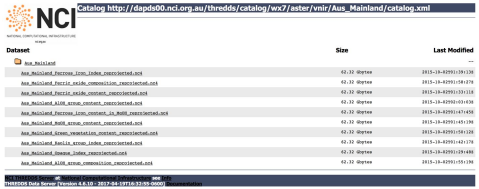

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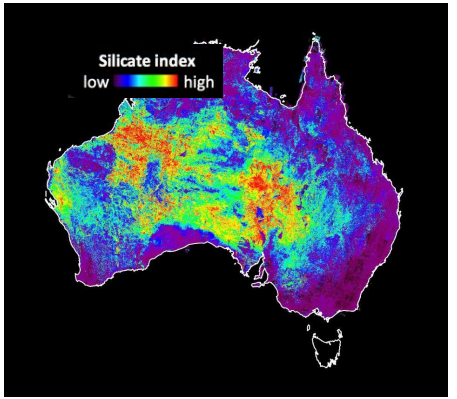

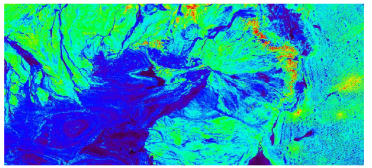

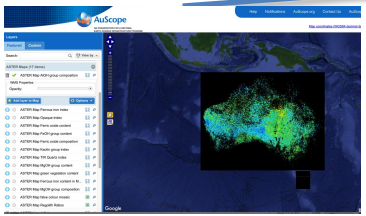

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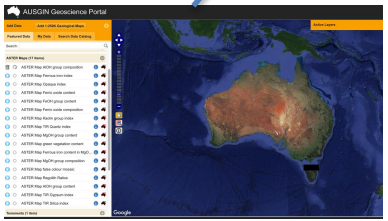


AusGIN Portal (WMS)

And then there is the issue of the push or pull copies….

lesley.wyborn@anu.edu.au

Versioning Patterns

- Version identification (PID)
- Release (Production)
- Manifestation (Formats)
- Granularity (Objects vs. Collections)
- Provenance (Derived Products)

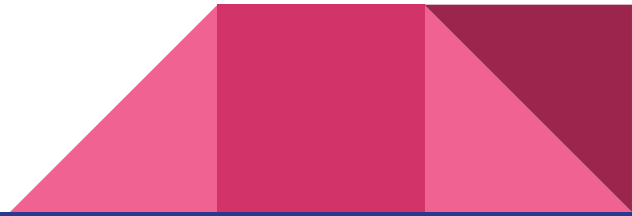
Versioning communicates that data have been changed and also refers to the significance and magnitude of change.

Use Cases

So far the Versioing WG has compiled a list of use cases at
https://docs.google.com/document/d/1TfBPlfjTVg0YcFxuw0UszAXPYrRmyZ6PCxtxKx8-uGg

RDA Use Cases Group: https://rd-alliance.org/groups/use-cases-group.html

Examples came from W3C, RDA Data Citation WG, RDA Data Foundations and Terminology IG, DA|RA, DIACHRON, USGS, ANDS, ...



Related RDA and External Groups

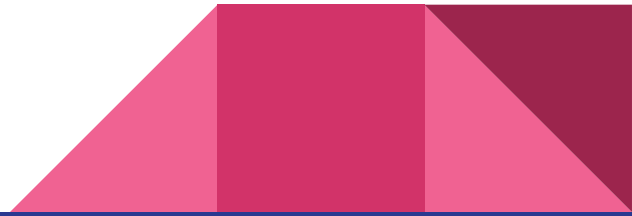
RDA Use Cases Group: https://www.rd-alliance.org/groups/use-cases-group.html

RDA Dynamic Data Citation WG:
https://rd-alliance.org/groups/data-citation-wg.html

W3C Dataset Exchange WG - Dataset Versioning Information
https://www.w3.org/TR/dxwg-ucr/

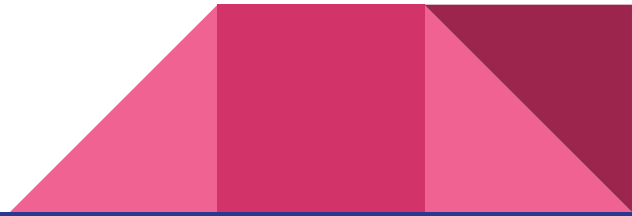
WG Data Versioning White Paper

What should be the outline of the white paper?



Work Plan for WG Data Versioning

- March 2018 - P11 Berlin:
- November 2018 - P 12 Gaborone:
- March 2019 - P13: Philadelphia
- August 2019: WG ends
- September - P14: Final report



Thank you!

See you at RDA P13

RDA Data Versioning WG

Jens Klump, Lesley Wyborn, Ari Asmi, Robert Downs

https://www.rd-alliance.org/groups/data-versioning-wg