# RESEARCH DATA MANAGEMENT GUIDELINES

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**First Approved by:** Deputy Vice-Chancellor (Research and Innovation)

**Custodian title & e-mail address:** Deputy Vice-Chancellor (Research and Innovation)
  research-services@uow.edu.au

**Author:** Research Reporting Manager
  ccarter@uow.edu.au

**Responsible Division & Unit:** Research and Innovation Division (RaID): Research Services Office

**Supporting documents, procedures & forms:**
- [Academic Integrity Policy](#)
- [Authorship Policy](#)
- [Code of Practice – Research](#)
- [Copyright Policy](#)
- [Cyber Security Policy](#)
- [IP Fellow, Volunteer and Visiting Student Assignment of Intellectual Property Policy](#)
- [IP Intellectual Property Guidelines](#)
- [IP Intellectual Property Policy](#)
- [IP Student Assignment of Intellectual Property Policy](#)
- [Privacy Policy](#)
- [Records Management Policy](#)
- [Research Data Management Policy](#)
- [University Archives Policy](#)

**Relevant Legislation & External Documents:**
- [Australian Governments Open Access and Licensing Framework (AusGOAL)](#)
- [Australian National Data Service (ANDS) website](#)
- [Australian Code for the Responsible Conduct of Research – December 2007](#)
- [Copyright Act, 1968 (Commonwealth)](#)
- [General Retention and Disposal Authority – University Records (GDA23)](#)
- [Health Records and Information Privacy Act, 2002](#)
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<td>National Privacy Principles</td>
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<td>National Statement on Ethical Conduct in Human Research</td>
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<td>NSW Government State Archives and Records, Destruction of Records Guidelines</td>
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<td>Privacy and Personal Information Protection Act 1998 (NSW)</td>
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<td>SAL Research Project Support website</td>
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<td>SMART Data Management website</td>
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**Audience:** Public

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1 Introduction/Background

1. These guidelines recognise the need for researchers to manage the increasing volume and complexity of data created at the University of Wollongong (UOW) and set out a framework for best practice research data management by:
   a. recognising research data as a valuable product;
   b. improving the efficiency of research;
   c. supporting the evolving global data-intensive research environment; and
   d. making data available for sharing, validation and re-use.

2. UOW also acknowledges that the management of research data and primary materials must be consistent with relevant legislation, codes and guidelines.

2 Scope/Purpose

1. To provide guidance regarding the management of research data and primary materials throughout the research data lifecycle at UOW with the objective of:
   a. informing researchers, both staff and students, about the best-practice management of their research data and primary materials;
   b. ensuring efficient and effective long-term management and usability of research data in durable formats;
   c. establishing research data as a valuable product from the research process. As well as being inefficient to recollect the same type of data in future, it may also be impossible. Good practices will ensure that researchers are able to meet any obligations related to data retention and reuse by protecting against data loss; and
   d. ensuring that research data management practices are in accordance with the Research Data Management Policy.

3 Definitions

<table>
<thead>
<tr>
<th>Word/Term</th>
<th>Definition (with examples if required)</th>
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<tbody>
<tr>
<td>Archive space</td>
<td>Secure space for permanent storage after completion of the project.</td>
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<tr>
<td>Data Access Agreement (DAA)</td>
<td>An agreement governing the terms on which access will be granted to data.</td>
</tr>
<tr>
<td>Data curation</td>
<td>The ongoing activity of managing the use of data from its point of creation to ensure it is available for discovery and future re-use.</td>
</tr>
<tr>
<td>Data licenses</td>
<td>Define the permissions, terms and conditions for reuse of data and allow prospective re-users to understand what they can and cannot do with a dataset. There are several options available that are applicable to both open-access and closed datasets.</td>
</tr>
<tr>
<td>Data sharing</td>
<td>Refers to sharing of data sets upon completion of the original project, not sharing between collaborators in the current project.</td>
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<tr>
<td>Dataset</td>
<td>A collection of research data.</td>
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<tr>
<td>Digital Object</td>
<td>A unique identifier that can be assigned to any object that is a form of intellectual property, consisting of alphanumeric character sequence that is divided in two parts, separated by a forward slash (e.g. “10.3233/ICA-120410”).</td>
</tr>
<tr>
<td>Identifier (DOI)</td>
<td></td>
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<tr>
<td>Durable Formats</td>
<td>Digital file formats that will remain readable and usable over time. This has implications for choices relating to both software and hardware.</td>
</tr>
<tr>
<td>Geospatial</td>
<td>Pertaining to the geographic location and characteristics of natural or constructed features and boundaries on, above, or below the earth’s surface; especially referring to data that is geographic and spatial in nature.</td>
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<tr>
<td>Higher Degree</td>
<td>A student who has been accepted for admission to or enrolled in any postgraduate research degree offered at, or in conjunction with, the University of Wollongong.</td>
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<td>Research (HDR)</td>
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<td>Students</td>
<td></td>
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<td>IMTS</td>
<td>UOW’s Information Management and Technology Services Division</td>
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<tr>
<td>License Agreement-</td>
<td>A contract between a student and the University which grants the University the legal right to market sell or otherwise profit from the data.</td>
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<td>Provision of Data</td>
<td></td>
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<tr>
<td>Managing records</td>
<td>Managing records refers to any action relating to the life cycle of a record, including the storage, assignment of metadata, retrieval, transfer, preservation, and eventual destruction of records.</td>
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<tr>
<td>Metadata</td>
<td>Information about the context, content, quality, provenance, and/or accessibility that describes a research data set, for example collection title, chief investigator, description, collection period, access conditions and storage location.</td>
</tr>
<tr>
<td>Metadata Schema</td>
<td>Defines a set of terms that will be used to describe a resource and a set of rules that define the syntax or application and language. Metadata created using an existing schema assists in interoperability and the ability to share data.</td>
</tr>
<tr>
<td>Non-disclosure</td>
<td>An agreement designed to protect confidential information, trade secrets and expertise (know-how) from being misused by those to whom such information will be or has been disclosed. It should be used in any situation where information that must remain confidential is being disclosed.</td>
</tr>
<tr>
<td>agreement (NDA)</td>
<td></td>
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<tr>
<td>Project space</td>
<td>Secure, safe, reliable, accessible storage space used to store data in the shared stage of the project. Access is open but not everything is shared.</td>
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<tr>
<td>Primary materials</td>
<td>Physical objects that are collected or used for research, from which data may be obtained. For example, laboratory notebooks, interview recordings, biological specimens, and survey responses.</td>
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### Research data

The data, records, files or other evidence, irrespective of their content or form (e.g. in print, digital, physical or other forms), that comprise research observations, findings or outcomes, including primary materials and analysed data. Research data referred to in these guidelines relates to data generated in research projects and is to be distinguished from the information about research performance and statistical research data which is used by UOW for planning and budgeting purposes.

### Research data lifecycle

The research data lifecycle begins in the private domain, with the creation of research data by a researcher. It may include a large number of data objects which are updated frequently. At this stage researchers manage their own data. Preservation and metadata may not be needed and access to the data is limited. Data then passes the curation boundary into the shared domain where collaboration occurs. Access is more open, but not everything is shared. When the data passes the next and final boundary, ideally it will be open to all.

### Research data management

All the processes and actions required to manage data throughout the research lifecycle to enable it to be preserved and accessible by a controlled audience for current and future research.

### Research data management plan

A document that outlines how the research data for a specific project will be collected, organised, stored, backed-up, preserved shared, archived and disposed.

### Research data security

The protection of data from loss, unauthorised access and unauthorised modification. Security must be maintained while data is both at rest and in transit.

### Researchers

A Staff Member, Research Student and/or Visitor who undertake or have undertaken Research at the University.

### Working space

Storage space used for the initial stage of a project. Storage and backup is the responsibility of the researcher. Working space includes UOW provided personal network “H: drive”, external hard drives, mobile devices, USB thumb drives, laptops and laboratory computer hard drives and cloud storage.
4 Research Data Lifecycle

1. Research data must be carefully managed throughout the data lifecycle. Data can have a longer lifespan than the original research project that generates them, as they may be used for follow-up projects or for research with an entirely different focus, undertaken by other people. These guidelines provide advice on how to effectively manage data at each stage to ensure that researchers can maximise opportunities for learning and innovation.

Adapted from Research Data Lifecycle, UK Data Archive.

5 Research Data Management Planning

Data Management Planning

1. Data management planning is an important component of responsible research conduct. Thorough planning from the outset of a project helps to:
   a. establish the availability of required resources and services;
   b. minimise the risk of accidental loss, destruction or theft of data;
   c. enhance data security and integrity;
d. ensure that data is suitable for reuse by others where appropriate;

e. protect the rights of research participants; and

f. protect the intellectual property owned by researchers, the University and commercial partners.

**Research Data Management Plans (RDMP)**

2. An RDMP outlines how research data will be managed, documented, stored, secured and accessed both throughout the project and after completion.

3. The UOW Research Data Management Policy recommends that an RDMP accompany every research project. Generally the project leader is responsible for creating the plan and updating it to reflect any significant changes in the focus of the research.

4. RDMPs are viewed favourably by Australian funding providers, such as the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC). In some instances, data management plans are required to support applications for competitive funding schemes.

5. The content and detail required for a data management plan varies significantly depending upon:

   a. the type of research being undertaken;
   
   b. the type and number of participants;
   
   c. the research ethics approval required for the project;
   
   d. whether data will be shared, and with whom;
   
   e. whether the data will be published or otherwise made available to third parties;
   
   f. the legal jurisdictions under which data is held or used; and
   
   g. the geographic locations and countries involved in the research project (in some cases).

6. Examples of projects that require particularly careful data management planning include:

   a. patient records or health-related data;
   
   b. data relating to children;
   
   c. data with ethno-cultural sensitivity; or
   
   d. data considered sensitive to national security or the operations of the Australian Defence Force.

7. A template is available [here](#) to assist with the development of research data management plans.

**Support for Research Data Planning**

8. In partnership with IMTS and UOW Library, the Research Services Office provides support for data management activities, including advice on data planning considerations, recommendations and referrals for data management tools, storage and infrastructure, and a review service for draft Data Management Plans. Email [research-services@uow.edu.au](mailto:research-services@uow.edu.au) for further information.
9. Expertise is also available within faculties, schools and research groups. Additionally, the Australian National Data Service (ANDS) runs a range of training, workshops, webinars and outreach events throughout the year for researchers and support staff. (Visit the website for more information).

10. Specialised, comprehensive data management expertise is available for SMART and Spatial Analysis Laboratory (SAL) research projects. For further information about these services, visit the SMART Data Management website, or the SAL Research Project Support website (refer to the cover page of this document).

6 Documentation and Metadata

1. Metadata is a set of data that describes and gives information about other data. Metadata summarizes the basic information, which can make finding and working with particular instances of data much easier. In some cases, metadata can be generated or extracted from digital files automatically, in other cases, human effort will be required to create it.

2. Examples of metadata include:
   a. Title of the data collection
   b. Description of the data
   c. Time and date of creation, publication or review
   d. Creator or author of the data
   e. Location of the data
   f. Standards used
   g. File size
   h. Digital Object Identifier (DOI)
   i. Licensing information

3. Recording elements like these make data easier to find, re-use, share and publish.

4. For example, a digital image may include metadata that describe how large the picture is, the colour depth, the image resolution, when the image was created, and other data. A text document's metadata may contain information about how long the document is, who the author is, when the document was written, and a short summary of the document.

5. See Appendix 4 for an example research data metadata template.

6. Simple templates allow researchers to easily add or remove metadata elements. When groups of metadata elements are required for specific purposes, these groups of elements are called schemas or standards.

7. Collections found in UOW’s Research Online are based on the Dublin Core metadata standards. The SMART Metadata System uses a subset of the ISO 19115 standard, and metadata in the Research Data Australia repository uses the RIF-CS standard.

8. Researchers at UOW can publish their metadata in any of these repositories.

Assigning Digital Object Identifiers (DOIs)
9. The Australian National Data Service (ANDS) offers a national service to publicly funded Australian research organisations for minting DOIs through its membership of DataCite. UOW Library uses the DataCite service to assign DOIs to research data projects upon request.

Contacts for Metadata queries:

- For information about UOW Research Online and Research Data Australia, email UOW Library: research-pubs@uow.edu.au.
- For information about the SMART Metadata System, email: smart-data@uow.edu.au.
- For information about the SAL Spatial Data Repository and Metadata, visit the website provided on the cover of this document.

7 Data Storage and Preservation

1. As per the Australian Code for the Responsible Conduct of Research, the central aim in the management of research data is that sufficient data and primary materials be retained to justify the outcomes of the research and to defend them if they are challenged. The potential value of the material for further research should also be considered, particularly where the research would be difficult to repeat.

2. As such, all researchers must manage research data and primary materials in accordance with the UOW Research Data Management Policy and retain research data in a durable, indexed and retrievable form for the duration of the retention period, or longer if required.

Storage

3. Researchers must decide which data and materials should be retained, although in some cases this is determined by law, funding agency, publisher or by convention in the discipline. Researchers must ensure that the appropriate research data is stored securely with appropriate back-up facilities in place.

4. In general:

   a. during the initial stages of the project, it is anticipated that researchers will use working spaces for storage. Researchers are responsible for protecting data stored in working spaces. Working spaces include H: drive space (University provided personal network drive), external hard drives, mobile devices, USB thumb drives, cloud storage, laptops, and laboratory computer hard drives; and

   b. secure University storage for the project and archive spaces is also provided on the UOW network drive. Contact the IMTS Helpdesk on x3000 for guidance regarding storage space for exceptionally large datasets.

5. The nature of the research data collected dictates the appropriate storage solution to use. Researchers are encouraged to select the appropriate storage solution prior to data collection so as to ensure proper management of the data, avoid potential data loss, or security breach for confidential data.

Selecting a Storage Solution

6. The various storage solutions can be compared against two main criteria:
a. The value of the data and its potential for re-use
b. The storage components which give value to data, such as enabling discoverability, curation, and whether the storage is reliable, large, sustainable and secure.

7. While local working space solutions can be established quickly, it is recommended that researchers plan for appropriate data storage at the beginning of the project (ideally included in the data management plan).

8. For further information about digital research data storage options at UOW, refer to Appendix 1.

Back-ups

9. Researchers are responsible for ensuring that their digital and non-digital research data is backed up regularly. In general:
   a. during and upon completion of a project and/or thesis, research data should be saved in a secure manner;
   b. regular back-ups of files in working spaces should be made to protect against accidental or malicious data loss;
   c. back-up copies of data must be stored in a different location from the original;
   d. data in central University storage will be secure and backed up on a regular basis;
   e. the integrity of stored data files should be checked at regular intervals;
   f. data files should be copied or migrated to new media between two and five years after they were first created, since optical media and magnetic media are subject to physical degradation; and
   g. areas for storage of digital data should have suitable temperature, lighting and humidity conditions for the purpose.

Data Formats

10. It is important that researchers adopt durable formats for research data. Durable formats are those that will be usable for the lifetime of the project and the duration of any statutory, convention and/or legislative retention periods. In general:
    a. research data should be saved in formats that will permit long-term readability and usability of the data and will last the statutory retention period;
    b. to avoid the risk of obsolescence of any software, it is safer to use standard interchangeable formats that most software is capable of interpreting;
    c. open (non-proprietary) formats are preferable so that data is not lost in conversion.

11. There are many acceptable formats and the judgement of what is acceptable lies with the researcher. Refer to Appendix 2 for an overview of some of the various formats available.

File Naming and Organisation

12. File naming conventions should be developed in the data management planning stage. The conventions should be agreed upon between researchers and collaborators before data is created.
In general:

a. conventions will differ depending on the nature and size of the research project. In all cases, file names should be unique, persistent and consistently applied;

b. to maintain best practice in file naming:
   i. avoid punctuation and special characters;
   ii. use hyphens and underscores rather than spaces, especially where files may be accessed using a web browser;
   iii. when recording dates in file names, use a format of YYYYMMDD to ensure files remain in chronological order, even over the span of many years;
   iv. avoid lengthy file names as they may not function properly with certain types of software; and
   v. consider including version numbers (e.g. ‘v1.2’) or status information (e.g. ‘draft’, ‘final’) if there are likely to be multiple versions.

c. researchers should ensure that documents always contain titles, project name, author names, and contact details including university/agency affiliation, dates, and version information. Spreadsheets should always have unambiguous column and row labels.

8 Data Security

1. In order for research data and primary materials to be secure, it is recommended that the researcher:
   a. store sensitive information and confidential agreements in a safe place;
   b. securely protect intellectual property rights;
   c. protect personal data;
   d. back up data regularly and store it in a different location from the original data; and
   e. ensure data is adequately protected prior to transmitting to another authorised person.

2. Researchers must provide the same level of care and protection to non-digital research data and primary materials, such as laboratory notebooks, interview recordings, biological specimens, and survey responses.

3. It is the University’s responsibility, as per the Cyber Security Policy to ensure that all computer systems are secure.

4. There are various data protection techniques available including:
   a. Password protection on files and folders;
   b. Encryption;
   c. De-identification;
   d. Saving in “read only” formats; and
e. Keeping portable storage devices locked away when not in use.

5. For further information about keeping research data secure, visit the UOW Cyber Security website.

9 Publication and Dissemination of Research Findings

1. It is the responsibility of researchers, in accordance with the Code of Practice – Research, to ensure:
   a. they communicate their research findings to the wider community wherever appropriate, and subject to restrictions related to intellectual property and confidential or cultural sensitive data;
   b. research results are published according to the requirements of the University’s Authorship Policy;
   c. accuracy of publications and dissemination of research. If inaccurate or misleading statements are inadvertently released they are to be rectified as soon as possible; and
   d. work of others is correctly cited and used with permission as required by the Authorship Policy and Academic Integrity Policy.

Privacy

2. In accordance with the University of Wollongong Privacy Policy:
   a. the University is committed to ensuring the protection of the privacy of individuals pursuant to the Privacy and Personal Information Protection Act, 1998, the Health Records and Information Privacy Act, 2002 and the Privacy Amendment (Enhancing Privacy Protection) Act, 2012 (Commonwealth); and
   b. the University adheres to the National Privacy Principles and, as part of the University’s commitment to comply with the Privacy and Personal Information Protection Act (NSW), a privacy management plan details the steps to be taken.

3. When the University is engaged in collaborative research with the private sector, the federal public sector or with research projects in other jurisdictions, it will be necessary to comply with the requirements of the Privacy Act 1988 (Commonwealth), as well as the legal and administrative privacy protections of NSW and the University.

4. Before personally identifying data can be used for research, it may be necessary to:
   a. seek consent from the person to whom it relates; and/or
   b. de-identify data so that it no longer reveals a person’s identity or compromises their information privacy.

5. Ensure that confidential or sensitive data is not stored on internationally-owned cloud storage services to prevent any data sovereignty issues. Refer to the Australian Privacy Principles (Section 8) for further information about “Cross-border disclosure of personal information”.

10 Ownership of Research Data
1. In accordance with the University’s Research Data Management Policy, Copyright Policy, the IP Intellectual Property Policies, and relevant Commercialisation and Funding Agreements, ownership of data should be clear from the outset of the project.

Copyright

2. UOW Researchers have responsibility to:
   a. ensure they understand and comply with the legal restrictions and obligations regarding the use of third party copyright material; and
   b. read and understand the UOW Copyright Policy and relevant information provided on UOW’s copyright website.

3. HDR students have responsibility to:
   a. ensure that they read and understand relevant information provided in regards to copyright at UOW; and
   b. be aware of and therefore responsible for any copyright infringement resulting directly or indirectly from their own actions.

4. For assistance with copyright queries: email copyright@uow.edu.au.

Intellectual Property (IP)

5. In accordance with UOW’s IP Intellectual Property Guidelines, the IP Intellectual Property Policies and the IP Student Assignment of Intellectual Property Policy, the purpose of the IP assignment is to enable the university to:
   a. meet its contractual obligations to third parties;
   b. be equipped to Commercialise the IP; or
   c. protect its own pre-existing IP and any improvements made to it.

6. UOW Researchers should be aware that:
   a. if a person creates IP in the course of their employment using time, opportunity, information or facilities of their employer, the employer is entitled to the benefits of the IP, especially in the case of technical areas of work. However, sometimes there are exceptions, and effort should be made at the beginning of the project to establish ownership of IP derived from data. For further information, email icr-enquiry@uow.edu.au.

7. HDR students should be aware that:
   a. students, not being employees of UOW, personally own IP that they generate;
   b. the University also recognises that students may sometimes participate in projects that:
      i. are funded by third party sponsors, where UOW will accordingly have contractual obligations to third parties;
      ii. have commercialisation expectations;
      iii. are significantly reliant upon pre-existing IP owned or licensed by UOW;
c. where a research project is subject to contractual obligations to third parties, and/or has Commercialisation expectations, students participating in that project will be asked to assign any IP they generate in the course of the project to UOW;

d. if a research project involves pre-existing IP owned or licensed to the University, the student will be asked to assign any IP they generate in the course of the project to UOW;

e. if a student is attempting to make a decision to assign intellectual property to UOW, the student should obtain independent legal advice prior to the assignment of intellectual property. The University may contribute to the cost of this advice;

f. any IP assignment will not extend to copyright in a student’s thesis. The student will remain the owner of the copyright subsisting in the thesis.

Confidential Information

8. UOW is committed to protecting confidential information. Information that is held that is not generally known in an industry is termed know-how, confidential information or trade secrets. In general:

a. know-how and trade secrets are protected by keeping this information confidential;
b. information is not made public and prior to any disclosure, confidentiality or non-disclosure agreement must be signed by the person who is to receive the information;
c. this method of protecting intellectual property is often an alternative to patenting; and

d. information may also be provided to researchers on the understanding that it remains confidential.

11 Retention, Archiving and Disposal of Research Data

1. Researchers have a responsibility to retain research data in accordance with the University of Wollongong Code of Practice – Research, the Australian Code for Responsible Conduct of Research, the State Records Act, 1998 (NSW), the General Retention and Disposal Authority – University Records (GDA23), associated policies, legislation and contractual arrangements.

Retention

2. For minimum retention periods, refer to the Schedule at Appendix 3.

3. As a minimum, sufficient data must be retained in order to support the research outcomes in situations where an investigation is required.

4. Researchers given access to confidential information have a responsibility to maintain confidentiality and may only use such information in ways agreed with those who provided it.

5. Wherever possible, a copy of the original data is to be kept in the department or research unit in which it was generated, for the duration of the minimum retention period.

6. Where it is feasible to retain primary materials, sufficient materials should be kept to justify research outcomes, in accordance with the recommended timeframes.
7. If a researcher leaves UOW they should provide access to their data and relevant documentation to at least one other UOW researcher or to their supervisor. Master copies of working data owned by UOW, or a third party with an agreement with UOW, must remain at the University.

Archiving

8. When important or valuable research data has reached the end of its retention period and is no longer actively being used by the original researchers, it may be archived to ensure long term preservation. Archiving should be undertaken in accordance with the University of Wollongong Records Management Policy.

9. Consideration should be given to the location in which the data will be permanently archived and the format used to ensure that it will be accessible in the future. Refer to Appendix 1 to determine an appropriate storage solution.

Disposal of Research Data

10. Once the data retention period has passed and ethical requirements specify that data must be destroyed, or the data is no longer likely to be of value to others, it should be securely and permanently disposed of in accordance with the University of Wollongong Records Management Policy.

11. Digital data can be disposed of by overwriting or deleting information, utilising permanent erasing software, destroying the physical media or degaussing (exposing to a strong magnetic field). Paper records should be shredded or discarded in a confidential waste bin. Keep track of the disposal date and ensure that all copies of the data are also securely disposed of.

12. Further information about destruction methods is available in the NSW State Archives and Records, Destruction of Records Guidelines.

12 Sharing, Re-use and Licensing of Research Data

Benefits of Sharing Data

1. Research data are a valuable resource that can have significant value beyond their original use. There are many benefits to sharing research data:

   a. The open sharing of research data significantly supports research communities by:

      i. supporting and verifying research claims;
      ii. avoiding duplication of research effort;
      iii. advancing academic discovery;
      iv. encouraging open and constructive academic discourse;
      v. combining datasets to create new data; and
      vi. re-purposing data to enable exploration of topics not envisioned by initial investigators.

   b. The open sharing of research data may benefit researchers through:

      i. increased publication citations;

Hardcopies of this document are considered uncontrolled please refer to UOW website or intranet for latest version
ii. reduced costs associated with collecting data;
iii. more competitive applications for promotion and tenure;
iv. further opportunities for collaboration with industry partners;
v. successful research grant applications;
vi. new discoveries and publications arising from the combination of datasets;
vii. fulfilling obligations to funding bodies.

Data Availability Options

2. Funding agencies in Australia are increasingly encouraging the sharing and re-use of data to ensure ongoing return on their investment. If researchers have data that they believe would be of value to other researchers, they should consider whether the data has access restrictions or can be shared. Levels of sharing are:
   a. open access;
   b. embargo (open access after the end of the embargo period); and
   c. mediated and by arrangement.

3. In some instances, datasets may not be available for sharing.

4. In accordance with the Australian Code for the Responsible Conduct of Research (2007), researchers and institutions must support and maintain research data. Funding agencies strongly encourage the depositing of data arising from a project in an appropriate publicly accessible repository.

Data Licensing

5. The UOW RDM Policy encourages researchers to make their data available under open licence for use by others. A licence specifies how the data may be used and provides clarity around permissions, terms and conditions.

6. The ANDS website features helpful information about enabling data reuse and they have also created a series of webinars that provide comprehensive information about data licensing. *

7. Refer to the Australian Government’s Open Access and Licensing Framework (AusGOAL) to determine a suitable licensing option from the endorsed recommendations. These include:

7.1. Creative Commons Licenses
   a. These six licenses are the preferred options for providing access to publicly funded information. They provide varying degrees of flexibility in the way that others may reuse data. The Creative Commons website features a “License Chooser” that recommends an appropriate license for a dataset, based on answers to some simple questions.
   b. A summary of the conditions of each of the different licenses is available on the website.

7.2. The Restrictive License Template
   a. This template is specifically for data that may contain sensitive or confidential information. For example, a research group may wish to share health data with
another group to conduct further medical research beyond the scope of the original project. It can also be used for data with other restrictive conditions (e.g. time limits on use, or ongoing payment arrangements). Refer to the AusGOAL website for further information.

7.3. The BSD 3-Clause Software License

a. This license is solely for those who are developing their own open source software. Refer to the AusGOAL website for further information.

13 Roles and Responsibilities

1. In addition to the responsibilities detailed throughout these Guidelines, researchers must act in accordance with the Roles and Responsibilities specified in the Research Data Management Policy (see Section 10).
### 14 Version Control and Change History

<table>
<thead>
<tr>
<th>Version Control</th>
<th>Date Effective</th>
<th>Approved By</th>
<th>Amendment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6 February 2017</td>
<td>Deputy Vice-Chancellor (Research and Innovation)</td>
<td>First version.</td>
</tr>
</tbody>
</table>
Appendix 1: Data Storage Options for Researchers at the University of Wollongong

<table>
<thead>
<tr>
<th>Type</th>
<th>Description &amp; examples</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Storage Options</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removable Storage Devices</td>
<td>Includes USBs, CDs, DVDs, external hard drives etc.</td>
<td>* Responsibility lies with the owner/purchaser, e.g. security and backups&lt;br&gt;• Devices are prone to failure, theft and obsolescence, therefore not suitable for long-term storage or master copies of datasets&lt;br&gt;• Not suitable for large datasets</td>
</tr>
<tr>
<td>Local Data Storage</td>
<td>Includes the local home drive (c:/) and networked home drive (h:/)</td>
<td>* Cheap, fast, easy, convenient&lt;br&gt;• Difficult to enable external discoverability&lt;br&gt;• Only the H: drive option is backed up by IMTS - all other options require the researcher to implement a backup process</td>
</tr>
<tr>
<td>Institutional Storage</td>
<td>IMTS provides dedicated networked storage space for research data on the share drive (S:/)</td>
<td>* Cheap, fast, easy, convenient&lt;br&gt;• Backed up by IMTS&lt;br&gt;• Secure and suitable for sensitive data&lt;br&gt;• May not have sufficient space for large datasets</td>
</tr>
<tr>
<td>Institutional Repository</td>
<td>Research Online provides storage space for archiving open research data sets</td>
<td>* Cheap, fast, easy, convenient&lt;br&gt;• Backed up by provider&lt;br&gt;• Not suitable for large datasets&lt;br&gt;• Supports all file types and formats</td>
</tr>
<tr>
<td><strong>External Storage Options</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Data Store Infrastructure</td>
<td>The Research Data Services (RDS) project focuses on supporting nine research domains: astronomy, climate and weather science, data for culture and community research, image publishing data services, life sciences (genomics), marine science, medical and health science, minerals and exploration data and terrestrial systems research. Through the partnership with the National Computer Infrastructure (NCI), UOW researchers can utilise RDS-funded data storage nodes.</td>
<td>* Highly reliable&lt;br&gt;• Supports large datasets&lt;br&gt;• Share large datasets easily with collaborators&lt;br&gt;• Longevity based on Federal Government funding</td>
</tr>
<tr>
<td><strong>Cloud Storage</strong></td>
<td>Cloud storage is networked enterprise storage where data is stored in virtualized pools of storage which are generally hosted by third parties.</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>
|                    | * Relatively cheap, fast, easy, convenient  
|                    | • Automated backup, however responsibility to protect and secure data ultimately lies with the owner.  
|                    | • May be subject to internet bandwidth and file security concerns,  
|                    | • No control over where data is stored and who is accessing it  
|                    | • Not recommended for master copies of datasets  
|                    | • Not suitable for sensitive data  
| Includes Cloudstor, Dropbox, Amazon Simple Storage Service (Amazon S3), Google Drive, OneDrive, OwnCloud, FigShare, Nectar Cloud Storage and others. |

<table>
<thead>
<tr>
<th><strong>Discipline Repository</strong></th>
<th>Several disciplines have well-established locations for storing and sharing data, managed typically by a consortium of institutional members. This storing and sharing often occurs in combination with the publication process. A list of 1,200 data repositories (including many discipline specific options) is available at <a href="http://www.re3data.org">www.re3data.org</a>.</th>
</tr>
</thead>
</table>
|                           | * Supports researcher discovery and access  
|                           | • Long term funding support is highly variable  
|                           | • Not recommended for master copies of datasets or sensitive data  

For more information about data storage, please contact the UOW IMTS helpdesk on x3000 or email: [imts@uow.edu.au](mailto:imts@uow.edu.au).
Appendix 2: Example Data Formats

<table>
<thead>
<tr>
<th>Type of Data</th>
<th>Durable Formats (not a comprehensive list)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation</td>
<td>Rich Text Format (.rtf), PDF/A or PDF @ minimum 600 pixels/inch, HTML, Open Document Text (.odf), Plain</td>
</tr>
<tr>
<td></td>
<td>text (.txt), XHMTL 1.0, Widely used non-proprietary formats such as Word (.docx) and Excel (.xlsx)</td>
</tr>
<tr>
<td>Quantitative / tabular data</td>
<td>SPSS portable (.por), Stata, SAS , SPSS, DDI XML, comma-delimited (.csv), tab-delimited (.tab/.tsv),</td>
</tr>
<tr>
<td></td>
<td>MSEXcel (.xlsx), MSAccess (.mdb/.accdb), dBase (.dbf), OpenDocument Spreadsheet (.ods)</td>
</tr>
<tr>
<td>Qualitative data</td>
<td>extensible mark-up language (.xml), Rich Text Format (.rtf), plain text ASCII (.txt), hypertext mark-up</td>
</tr>
<tr>
<td>(Text)</td>
<td>language (.html), NUD*IST, NVivo and ATLAS.ti</td>
</tr>
<tr>
<td>Digital video data</td>
<td>Motion JPEG 2000</td>
</tr>
<tr>
<td>Digital image data</td>
<td>TIFF (version 6) uncompressed @ minimum 300 pixels/inch, JPEG or JPEG 2000 (.jpeg, .jpg, .jp2) @</td>
</tr>
<tr>
<td></td>
<td>minimum 300 pixels/inch, TIFF (other versions) @ minimum 300 pixels/inch, Adobe Portable Document Format</td>
</tr>
<tr>
<td></td>
<td>(PDF/A or PDF) @ minimum 300 pixels/inch, raw image format (.RAW) @ minimum 300 pixels/inch</td>
</tr>
<tr>
<td>Digital audio data</td>
<td>Free lossless audio Codec (.flac) WAV (.wav), MPEG-1 Audio Layer 3 (.mp3) also OK @ minimum 320 kbit/s</td>
</tr>
<tr>
<td>GIS and CAD</td>
<td>ESRI Shapefile (.shp), GeoTIFF (geo-referenced TIFF) CAD data (.dwg), Binary formats of GIS and CAD also</td>
</tr>
<tr>
<td>(vector &amp; raster)</td>
<td>suitable</td>
</tr>
<tr>
<td>Netcdf</td>
<td>(Network Common Data Form)</td>
</tr>
<tr>
<td>hdf</td>
<td>Hierarchical Data Format</td>
</tr>
</tbody>
</table>
Appendix 3: Minimum Retention Periods Schedule

Minimum retention periods:

The NSW State Records Authority’s *General Retention and Disposal Authority – University Records (2005)* and the Australian Code for the Responsible Conduct of Research (ACRCR) specify the following minimum retention periods for Research data:

<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Description</th>
<th>Disposal Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.6.0</td>
<td><strong>Research Data definition:</strong> Records generated in the conduct of the research project where the university is entitled to control or ownership of research data. Note: For research involving human subjects this includes de-identification records, subject consent forms, and participant information letters specifying conditions of research.</td>
<td></td>
</tr>
<tr>
<td>23.6.1</td>
<td>Projects of major national or international significance, interest or controversy or where the principal investigator has a widely acknowledged influence on the area of scholarship and where the data is crucial to the substantiation of the research findings and cannot be readily or practically duplicated. <em>Projects with outcomes that have community or heritage value.</em></td>
<td><strong>Required permanently as State archives or within a national collection</strong> <em>(italicised text from ACRCR)</em></td>
</tr>
<tr>
<td>23.6.2</td>
<td>Projects which are not of major significance – where the project has human subjects and potential long term effects including animal testing for human products. Includes clinical or psychological research. For example: intervention or invasive testing, drug and complementary medicine trials, scanning and radioactivity, clinical studies, genetic manipulation, human tissue studies, trails of devices, some psychological research.</td>
<td><strong>Retain for minimum of 20 years after project completion, or after research subjects have reached the age of 25 years, whichever is longer, then destroy.</strong></td>
</tr>
<tr>
<td>23.6.3</td>
<td>Projects which are not of major significance – where the research has potential long term environmental effect. For example: genetic trials, disease and pest management, changes to ecosystems; use of environmentally hazardous materials.</td>
<td><strong>Retain for minimum of 20 years after project completion, then destroy.</strong></td>
</tr>
</tbody>
</table>

1. Note: this retention period has factored in the recommendations of the joint statement of the National Health and Medical Research Council (NHMRC) and Australian Vice-Chancellors’ Committee (AVCC). However, other considerations affecting retention may need to be taken into account. For example, workers compensation regulations allow for a claimant to reopen a case at any time during the lifetime of the claimant, which may necessitate records to be retained for up to approximately 70 years after the research project is completed.

2. Note: Retention periods for these records may need to also take into account other legislative or regulatory requirements such as the Environmentally Hazardous Chemicals Act (1985) and the Contaminated Land Management Act (1997).

3. Note: this retention period is based on the recommendations of the joint statement of the National Health and Medical Research Council (NHMRC) and Australian Vice-Chancellors’ Committee (AVCC).
<table>
<thead>
<tr>
<th>23.6.4</th>
<th>Projects which are not of major significance – where the research does not have potential long term affects, including research on animals.</th>
<th><strong>Retain for minimum of 5 years after project completion, then destroy.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>23.6.5</td>
<td>Paper records which have been converted to electronic format (e.g. through data entry or imaging).</td>
<td><strong>Retain until no longer required for reference or administrative purposes, then destroy.</strong></td>
</tr>
<tr>
<td><strong>EXCEPTION</strong>: Under UOW contractual agreements, paper laboratory books are generally required to be retained indefinitely, even when electronic copies have been produced.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>From ACRCR</td>
<td>Short-term research projects that are used for assessment purposes only, such as research projects completed by students.</td>
<td><strong>Retain research data for 12 months after project completion, then destroy.</strong></td>
</tr>
</tbody>
</table>

Note: this retention period is based on the recommendations of the joint statement of the National Health and Medical Research Council (NHMRC) and Australian Vice-Chancellors’ Committee (AVCC).

### Appendix 4: Example Research Data Metadata Template

<table>
<thead>
<tr>
<th><strong>Title</strong></th>
<th>XYZ Research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Aims to understand the universe</td>
</tr>
<tr>
<td><strong>Reference Dates:</strong></td>
<td></td>
</tr>
</tbody>
</table>
| 1. Creation | 1. 1/1/2012  
| 2. Publication | 2. 17/7/12  
| 3. Revision | 3. 30/6/13  |
| **Graphic Overview** (Thumbnail) |  |
| **Associated Resources** (e.g. Web Links, WMS, file for download, google earth file etc...) | [www.example123.net](http://www.example123.net) |
| **Geographic Extent** (bounding box) | NSW – Australia |
| **Temporal Extent** (begin and end date) | 1/1/15 – 31/12/18 |
| **Responsible Party** |  
| 1. Lead Investigator | 1. Prof John Smith  
| 2. Other Researchers | 2. Prof Jane Brown  
| 3. Metadata Contact | 3. Ms Kim Li |
| **Data Licence Information** | Open Access |