

# Data Management Plans & LaTeX

## EEOB/BCB 546X

November 17, 2017

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# Reproducible Research

## Biological Data

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## Research Products

In addition to data, biology research also yields other products that are necessary for reproducibility and are tools that can advance the field (e.g., software, scripts, databases, tutorials).

# Planning for Data

## Write it down

A **Data Management Plan** is a written plan for dealing with scientific data and all of the products of a research project. This plan accounts for how data (and software, tools, etc.) will be handled during a research project and *after* the project is completed.

# Proposing Reproducible Research

## White House Mandate

In 2013 a **mandate from Pres. Obama** required that results of all federally funded research be made publicly available and that these funding agencies develop plans for data management. (The links to these mandates are no longer available on the White House website. Nevertheless, funding agencies persist in requiring DMPs.)

# Proposing Reproducible Research

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## DMPs are required for funding

NSF, NIH, USDA, NASA, DOE, HHS, CDC, FDA, NIST, NOAA, USAID, AHRQ etc.

These and many other funding agencies require data management plans for all proposed research projects and/or awards.

# Requirements of Data Management Plans

## Suggested Standards

In a DMP, you have to consider:

- **data type:** genomes, 3D models, CT scans, images, spreadsheets, alignments, field observations, audio recordings, etc.



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- **roles & responsibilities:** which members of the project will carry out components of the DMP

# Examples of Data Management Plans

## NSF-BIO Projects

### NSF DEB-1556615/DEB-1556701

The DMP for a collaborative award entitled: *Advancing Bayesian Phylogenetic Methods for Synthesizing Paleontological and Neontological Data*

- ShareLaTeX URL: <http://bit.ly/2nbk5TN>

### NSF IOS-1546719

The DMP for a collaborative award entitled: *The Genetics of Highland Adaptation in Maize*

- Overleaf URL (entire proposal): <http://bit.ly/2o6NR0K>

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## What are important data management issues for your research?

Think about your own work and the data you collect, how would you craft a DMP for your project?

- data type, data format, data storage & preservation, data sharing, publishing & dissemination, roles & responsibilities

# Assignment: Write a DMP

Due: December 1, 2017

Write a DMP for your research based on the NSF requirements.

# L<sup>A</sup>T<sub>E</sub>X for Typesetting

The intention of this lesson is mainly to give you an introduction to L<sup>A</sup>T<sub>E</sub>X so that you understand the benefits of using a typesetting system for creating documents.

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## $\text{\LaTeX}$

In 1985 Leslie Lamport released  $\text{\LaTeX}$ , which is a set of macros for document preparation that uses the  $\text{\TeX}$  typesetting program and language.

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- you are required to use it for many documents as an academic

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- it is not for everyone ☹

# How do Researchers Use L<sup>A</sup>T<sub>E</sub>X

## Some Examples

L<sup>A</sup>T<sub>E</sub>X is useful for many types of documents including journal articles, grant proposals, and presentations (like these slides!). Let's look at a few of these.

- a scientific manuscript
- a CV
- a presentation

## Thesis Template

Iowa State has a L<sup>A</sup>T<sub>E</sub>X [template for writing your graduate thesis](#).

## Download LaTeX

<https://www.latex-project.org/get>

## LaTeX Interactive Development Environments

TeX distributions often come with free LaTeX IDEs that allow you to compose and compile documents. There are also many nice 3rd party products (though many are not free).

- LyX (offers a WYSIWYMean environment)
- TeXMaker
- TeXPad (Mac OS X)

# Online $\text{\LaTeX}$ Tools

## Web-based $\text{\LaTeX}$ editors

In the last several years, collaborating online with  $\text{\LaTeX}$  has gotten easier and easier with web-tools.

- Overleaf (<https://www.overleaf.com>)
- ShareLaTeX (<https://www.sharelatex.com>)

Both are very nice and recently, Overleaf acquired ShareLaTeX. They will be merging to a single system on [overleaf.com](https://www.overleaf.com) in the future.

Let's get started!