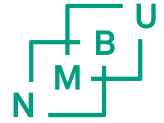


# Research Data Management and Data Management Plans (DMP)

27th October 2021

Solveig Fossum-Raunehaug (Research Support Office)

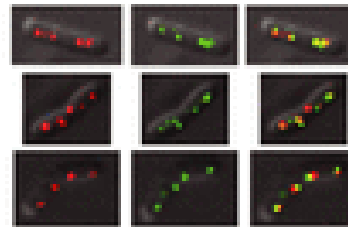
# What is Research Data?



Research data are all registrations/records/reports of numbers, texts, pictures and sounds generated or created during research projects.



Questionnaire

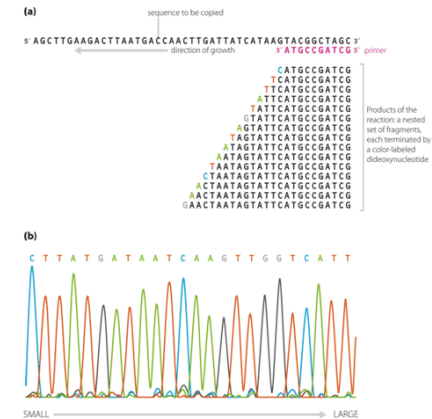
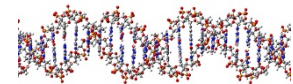
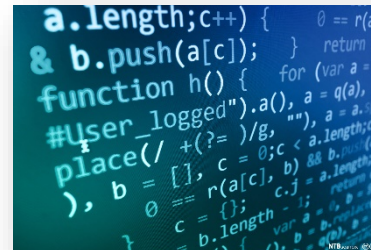


Pictures



Data from the field

Algorithms



Sequencing data

And more...

# What is Research Data Management?

- Research Data Management is how researchers
  - Collect research data
  - Store research data in ongoing projects
  - Process and analyze research data
  - Archive/ deposit research data
  - Share research data (if possible)



# Research Data is Classified



- Open (**Green**)
  - Data about animals, plants, bacteria, etc.
- Limited (**Yellow**)
  - Anonymised data, unpublished data, non-sensitive personal data
- In confidence (**Red**)
  - Certain types of sensitive personal data, personal files and information about a person's health
- Strictly in confidence (**Black**)
  - Large amounts of sensitive personal data, e.g. about people's health, research data of huge economic value

# Policy and guidelines

- National strategy on access to and sharing of research data (Ministry of Education and Research Aug 2017)
- Policy for Open Access to Research Data (The Research Council of Norway Dec 2017)
- Guidelines Research Data Management at NMBU (Apr 2018)

National strategy on  
access to and sharing  
of research data



Approved by the rector 10 April 2018

## Guidelines Research Data Management at NMBU

- The Norwegian University of Life Sciences (NMBU) is compliant to the principle "standard" – for research data generated in projects financed through public research
- This will contribute to:

# Why Research Data Management is important?



## «The Researcher Benefits»

- The digitale age
- Increased possibilities for sharing and reuse
- New collaborations
- Increased overview of your own and the research group's research results

# Why?

## «The PhD regulations and Research Ethics»



- From July 2020 - all new PhD candidates at NMBU should have a Data Management Plan (DMP)
- NMBU Guidelines for Research Ethics



# Why?

## «Requirements from the funding agencies»

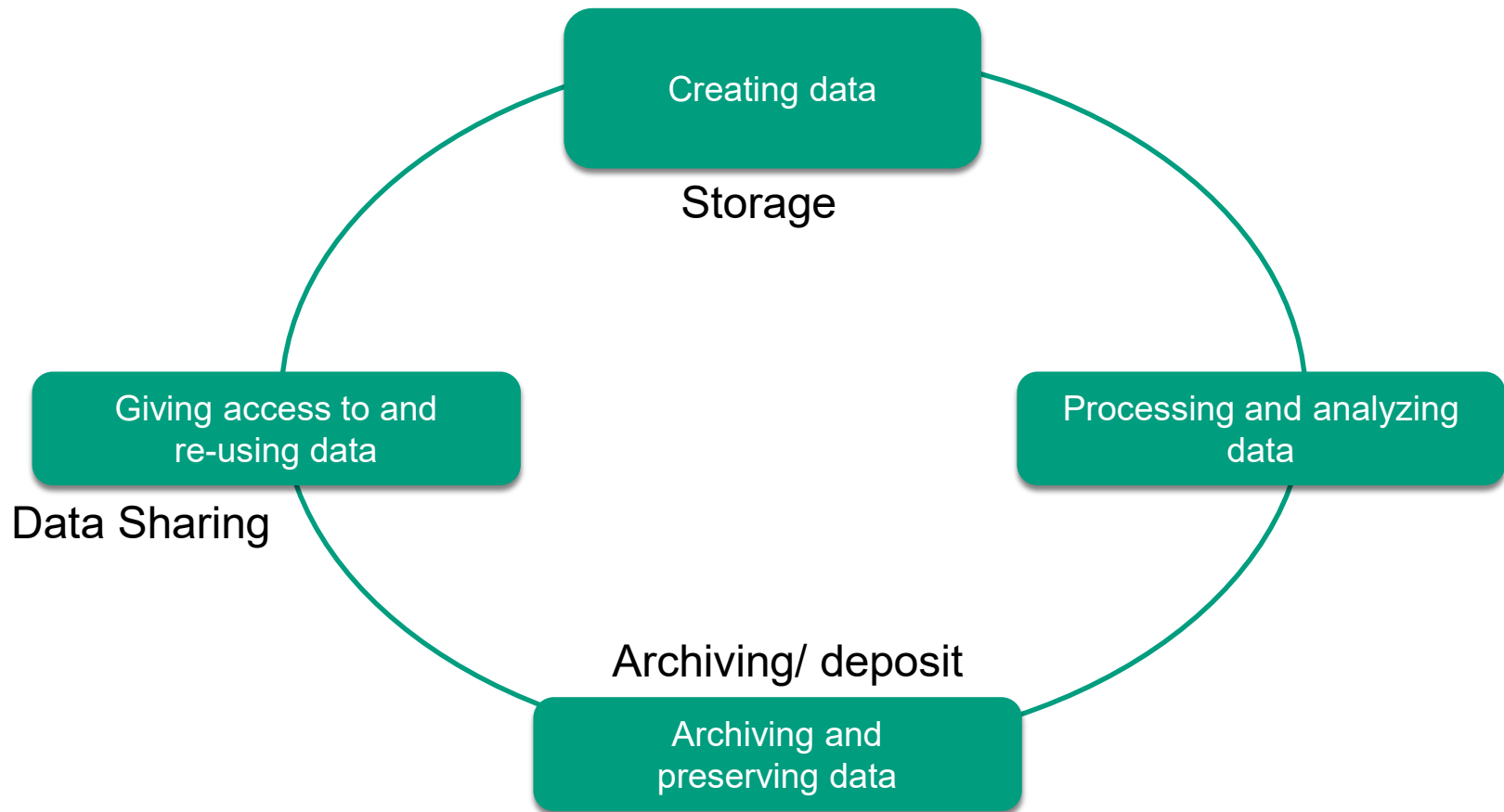
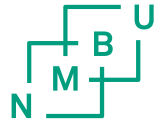
- The Research Council Norway and the EU
  - Description of research data management in the application
  - Data Management Plan (DMP) must be delivered upon contract agreement



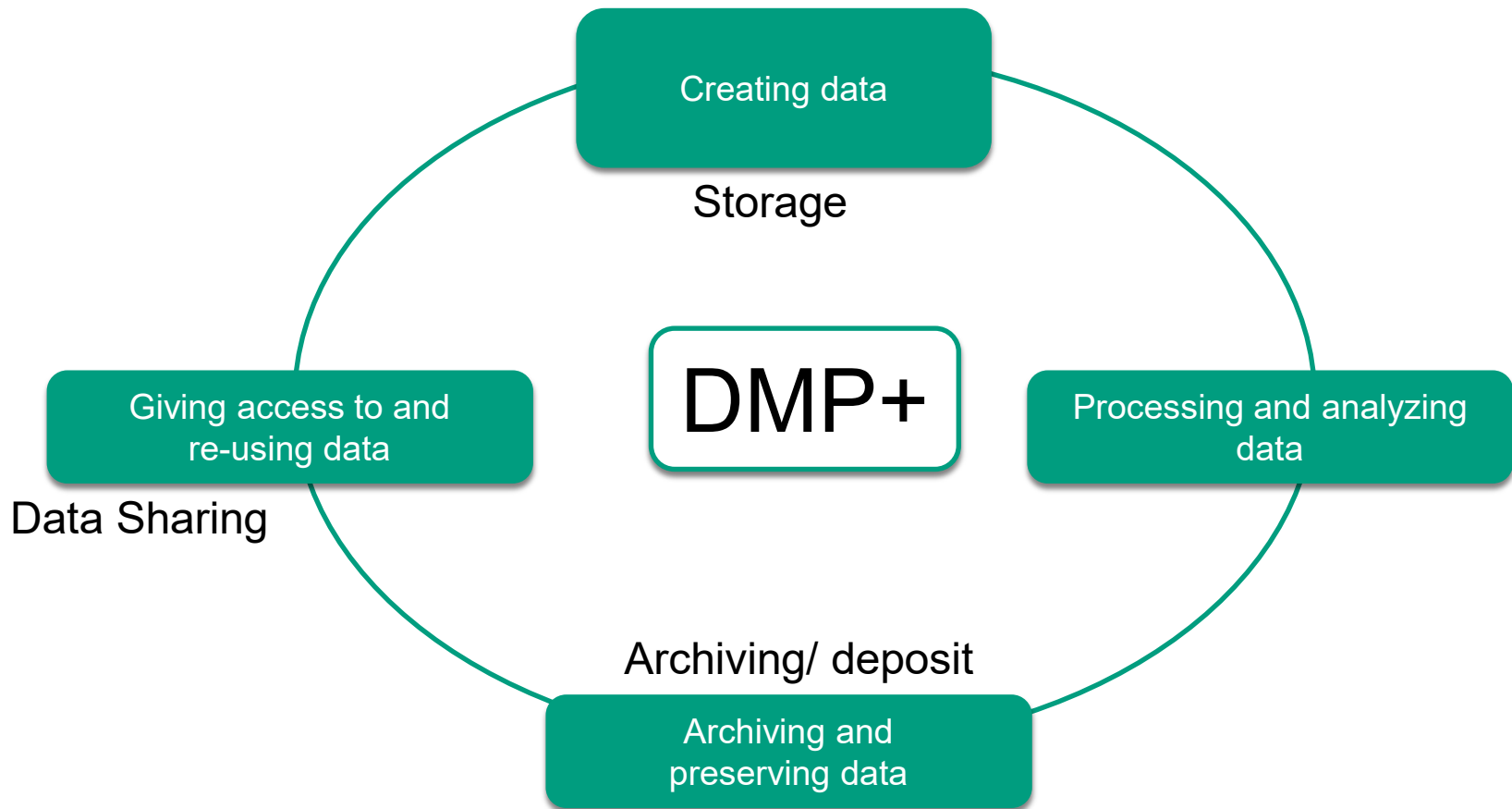
# Data lifecycle



NORSK SENTER FOR  
FORSKNINGSDATA



# Data lifecycle



# FAIR principles

**F**indable  
**A**ccessible  
**I**nteroperable  
**R**eusable

- FAIR is an acronym for the words Findable, Accessible, Interoperable og Reusable (gjenfinnbare, gjenbrukbare, skal kunne håndteres maskinelt og ha et konsistent vokabular)
- Research data must be of a quality enabling it to be found and possible to reuse.
- Both **data and metadata** must be designed for mechanical handling and consistent vocabulary must be used (interoperable).
- The Archives must fulfill the [FAIR principles](#).
- The Data Management Plans must be according to the [FAIR principles](#).

# Data Management Plans (DMP)



- A Data Management Plan (DMP) should describe:
  - Type and scope of research data generated in a project
  - How the data will be stored
  - How the data will be archived
  - How data will be made available (if possible) after the project is completed
- DMP's must be according to the [FAIR principles](#)

# Data Management Plans (DMP) - tools



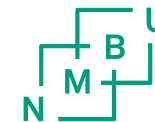
**NMBU recommends students and employees to make use of:**

- [The DMP made available at the Norwegian Centre for Research Data \(NSD\) \(DMP+\)](#)
- [ELIXIR Data Stewardship Wizard](#) might be used for research data management within life sciences.

**Examples of national and international systems to generate DMPs:**

- [National e-Infrastructure for Research Data \(NIRD/Uninett Sigma 2\)](#) (easy DMP)
- [FAIRDOM Data Management](#)
- [Digital Curation Senter - DMP online](#)

# Webpages



NMBU / Forskning / For forskere / Forskningsdata

Finansiering	Forskningsutvalget	Mobilitet	<b>Forskningsdata</b>	Åpen forskning
Publiserings - ABC	Juridisk bistand	Dokumenter og retnin...	Kurs og møter	Rekruttering
Postdoktor				



## Policy og retningslinjer for handtering av forskningsdata

Les meir om policyar/ strategiar og retningslinjer for handtering av forskningsdata vedteke av NMBU, Forskningsrådet, Kunnskapsdepartementet og EU. Med handtering av forskningsdata meiner vi lagring av data i pågåande prosjekt, arkivering av data ved publisering/ prosjektslutt og eventuell deling og tilgjengelegging av data.



## Informasjon for studentar om behandling av forskningsdata og persondata

I denne artikkelen kan du lese om retningslinjer og rutiner for handtering av forskningsdata. Handtering av forskningsdata innebærer innsamling, lagring, arkivering og eventuell deling av forskningsdata. I artikkelen finner du også informasjon om handtering av data med ikke-sensitive og sensitive personopplysningar (persondata).



## FAIR datahandtering

FAIR er eit akronym for orda findable, accessible, interoperable og reusable. Forskningsdata må vera tilgjengelege, gjenfinnbare og gjenbrukbare. Les meir om FAIR datahandtering, metadata og filformat her.



## Datahåndteringsplaner (DMP)

Forskningsrådet og EU krever nå datahåndteringsplaner (DMP) i prosjekter de finansierer. NMBU krever også at alle ph.d.-kandidater har en datahåndteringsplan. Les mer om datahåndteringsplaner og hvordan få grunnleggende ferdigheter i datahåndtering.



## Personvern i forskning

På denne sida finn du meir informasjon om kva du gjer når du skal handtera (behandla) forskningsdata som inneheld personopplysningar eller anna sensitiv informasjon. Informasjonen gjeld for både studentar og tilsette.

NMBU / Frontpage / Research / For researchers / Research Data

EU Research Funding	Postdoctoral fellow	<b>Research Data</b>	Research Excellence	Publishing ABC
Courses and meetings	Researcher mobility	Guidelines and docum...		



## Research Data - guidelines and policies

Read more about the policies/ strategies and guidelines for handling research data laid down by The Norwegian University of Life Sciences (NMBU), The Norwegian Research Council, The Ministry of Education and by EU. The term "handling research data" implies what has to do with storage of data in ongoing projects, archiving data when publishing or at end of project, any data sharing and making data available.



## Information for students about processing research data and personal data

Read more about the guidelines and routines for handling and processing research data. The term "handling and processing research data" implies what has to do with collection, storage, archiving (depositing) and any sharing of research data. In the article you can also read about processing data with non-personal and personal information (personal data).



## FAIR Data Management

FAIR is an acronym for the words findable, accessible, interoperable and reusable, i.e research data must be available, and able to be refound and reused. Research data must be stored and archived in the correct file format, and also be tagged as metadata. Read more here.



## Data Management Plan (DMP)

The Norwegian Research Council and EU are currently demanding Data Management Plans (DMP) for all projects they are funding. Read more about the DMPs and how to attain basic skills in data management through Software carpentry.

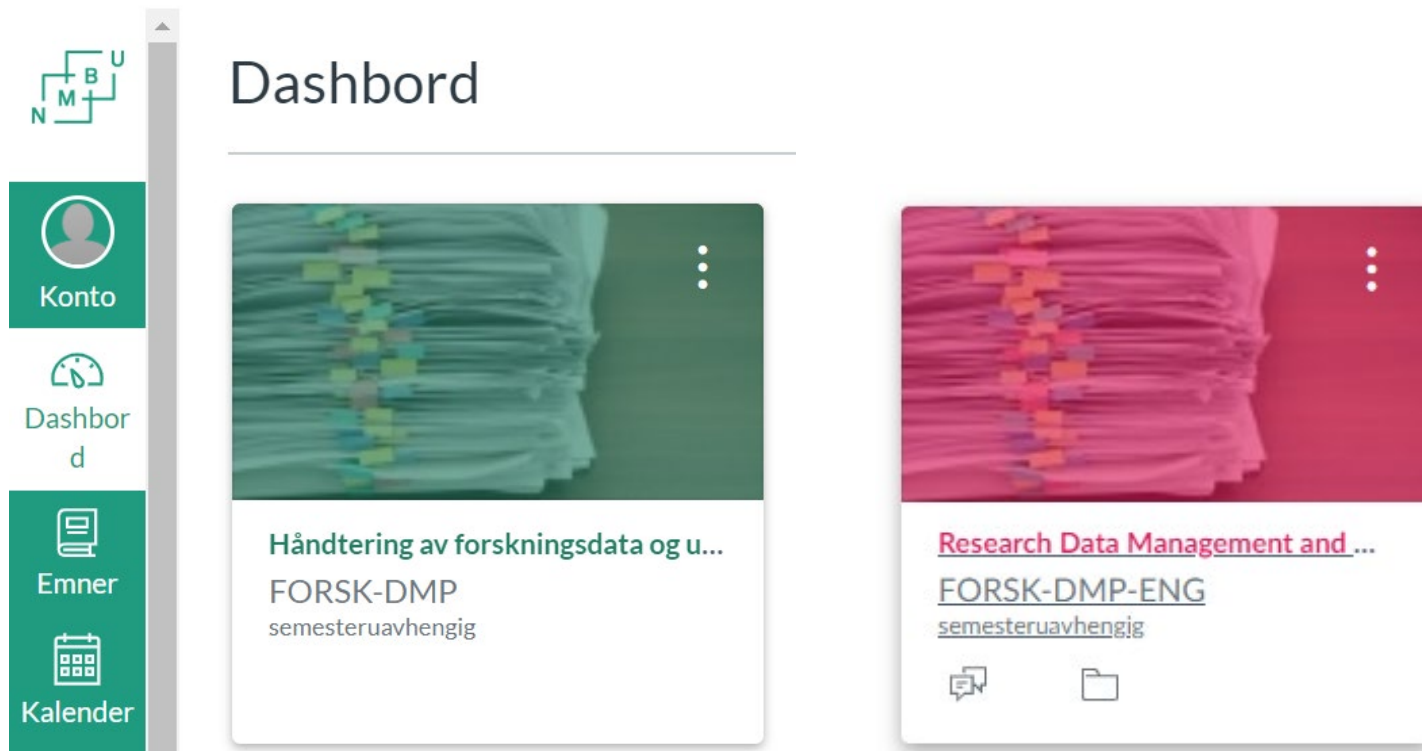


## How to handle and process personal or sensitive research data?

On this page you will find more information about what to do when handling and processing personal data in research projects. The information applies to both students and employees.

# Canvas course

- <https://nmbu.instructure.com/courses/4825>
- <https://nmbu.instructure.com/courses/6249>



**Dashbord**

**Konto**

**Dashbord**

**Emner**

**Kalender**

**Håndtering av forskningsdata og u...**  
FORSK-DMP  
semesteruavhengig

**Research Data Management and ...**  
FORSK-DMP-ENG  
semesteruavhengig

# Upcomming courses



## KURS: Forskningsdata og datahåndteringsplan (3 timer)

I dette kurset får du kunnskap om hvordan du fyller ut en datahåndteringsplan, kunnskap om sikker lagring og arkivering forskningsdata, og hvordan du kan dele data med andre. Det er satt opp 2 kurs 27. oktober 2021, kurset er på 3 timer (ett på engelsk og ett på norsk). [Information in English.](#)

## KURS: Forskningsdata med personopplysninger og datahåndteringsplan (5 timer)

Kurset har fokus på personvern i forskning og hvordan håndtere forskningsdata med personopplysninger. I tillegg får du kunnskap om hvordan du fyller ut en datahåndteringsplan, kunnskap om sikker lagring og arkivering forskningsdata, og hvordan du kan dele data med andre. Dato for kurs høst 2021: 28. oktober. [Information in English.](#)





# Storage of Research Data - in ongoing projects

# Storage of Research Data without personal information – what do the guidelines say?



1. Research Data (raw data) must be stored at the NMBU server or in approved servers nationally or internationally.
2. You might take out a copy of the raw data and store it at your OneDrive server or personal computer for processing and analyzes.
3. However, research data should *NOT only be stored* on a personal computer (C-drive), external hard drives, dropbox etc.



Approved by the rector 10 April 2018

## Guidelines Research Data Management at NMBU

- The Norwegian University of Life Sciences (NMBU) is compliant to the principle "Open as standard" – for research data generated in projects financed through public money.
- This will contribute to:
  - The development of a global research community where the research data is widely shared
  - Improved quality of research through a better way to build upon earlier work and to

# Storage of Research Data without personal information - tools

- **Research Data** generated in ongoing projects should normally be stored at the LargeFile server (W:).
- **External cooperation (should not be used as the primary place for storage):**  
Sharing data using Office365 and OneDrive – NMBU services



LargeFile  
server W:



# Storage and computing power (calculations) large datasets - tools



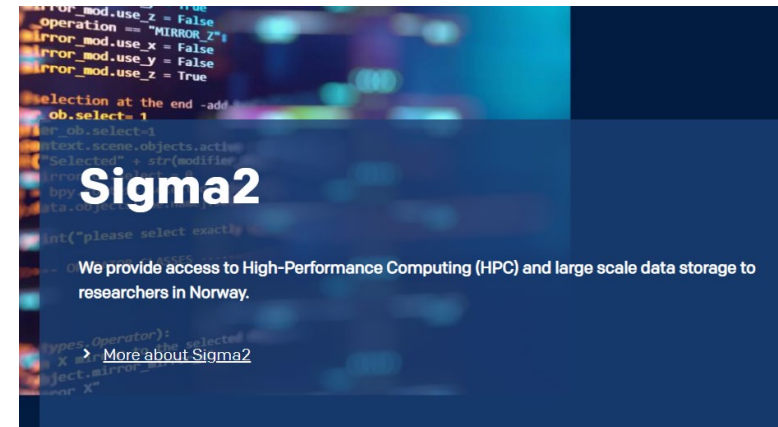
- Orion-cluster at NMBU or
- NIRD - UNINETT/ Sigma 2 service.

## NMBU Orion HPC Cluster

Orion is a High-Performance Computing (HPC) cluster infrastructure available to employees, PhD and master students at NMBU. Orion can handle small-scale projects, but if you need more CPU-hours, please consider applying for national infrastructure resources:

<https://www.sigma2.no/> If you want to apply to access Orion, please fill out [this file](#) and submit it using the [following form](#).

Contact: For any Orion compute cluster related enquiry: [orion-support@nmbu.no](mailto:orion-support@nmbu.no)



The Norwegian e-infrastructure for research and education.

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# Archiving (Deposit) and Sharing Research Data

# Archiving (Deposit)

## – what do the guidelines say?



- Research data upon which scientific publications is based must be archived in domain specific, national or international data archives.
- The data archives must be compliant to international standards (FAIR).
- Recommendation - Do not deposit your data via journals!

 Approved by the rector 10 April 2018

### Guidelines Research Data Management at NMBU

- The Norwegian University of Life Sciences (NMBU) is compliant to the principle "Open as standard" – for research data generated in projects financed through public money.
- This will contribute to:
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# Archiving (Deposit) - services



## The NMBU Data archive:

- [NMBU Open Research Data](#) – NMBU service (University Library)

## Examples of national data archives:

- [Norwegian Centre for Research Data \(NSD\)](#) (all type of data)
- [National e-Infrastructure for Research Data \(NIRD\)](#). Is operated by UNINETT/ Sigma2 (large data sets)
- [The Norwegian Bioinformatics Platform \(NELS\) og ELIXIR NO](#) (biological and medical data)

## Examples of international data archives:

- [re3data.org](#) is a global registry of research data repositories that fulfil the FAIR principles
- [FAIRDOM](#) helps you to be in control of collecting, managing, storing, and publishing your data, models, and operating procedures.
- [CESSDA - Consortium of European Social Science Data Archives](#) provides large scale, integrated and sustainable data services to the social sciences.
- [DRYAD](#) is a data sharing system.
- [Zenodo](#) is a EU based data sharing system, widely used in humaniora.

The screenshot shows the DataverseNO website interface. At the top, there's a navigation bar with links like 'Horsking | Norges...', 'Forskerutdanning |...', 'Horskere | Norg...', 'Home - Unit4 bkv', 'Innsikt | horsking, l...', 'Helseinger N&K', 'Utsitt', 'Utsitt\_resultat', and 'Workbooks | la'. Below this is the 'DataverseNO' logo and 'NMBU Open Research Data Norwegian University of Life Sciences'. A search bar is present with the text 'Search this dataverse...' and a 'Advanced Search' button. On the left, there's a sidebar with filters: 'Dataverses (0)', 'Datasets (21)', 'Files (336)', 'Publication Year' (2021 (10), 2020 (6), 2019 (4), 2018 (1)), 'Distributor Name' (NMBU Open Research Data (21)), 'Subject' (Earth and Environmental Sciences (10), Medicine, Health and Life Sciences (6), Agricultural Sciences (4), Other (3), Business and Management (2)), and 'Keyword Term' (Alpine ecology (3)). The main content area shows '1 to 10 of 21 Results'. The first result is 'Replication Data for: Ontogenetic niche shifts in a locally endangered tree species (Olea europaea subsp. cuspidata) in a disturbed forest in Northern Ethiopia: implications for conservation' by Klanderud, Karl, 2021. The second result is 'Replication Data for: 3D atlas of the pituitary gland of the model fish medaka (Oryzias latipes)' by Royan, Muhammad Rahmad; Siddique, Khadeja; Caus, Gergely; Puchades, Maja; A.; Nourizadeh-Lillabadi; Rasoul; Bjaalie, Jan. G.; Herkel, Christian V.; Weltzien, Finn-Arne; Fontaine, Romain, 2021. The third result is 'Replication Data for: Long-term trends of Nordic power market: A review' by Chen, Yi-kuang, 2021.

# Sharing Research Data



- NMBU is compliant with the **FAIR-principles** (**F**indable, **A**ccessable, **I**nteroperable and **R**esuable) and the principle that

**"Research data should be as open as possible, as closed as necessary"**

## **Reasons for not sharing data:**

- *Safety measures*
- *Personal data/ personal information*
- *Legal matters*
- *Commercial provisions*
- *Other conditions*

«It should be known that you have a data set, but others should not necessarily have full open access to the (raw) data»

**Data Management Plan (DMP)**



# Summary NMBU guidelines



- The project leader have filled in a Data Management Plan (DMP) at the start of a project (continuous process)
- Data is stored at NMBU server or at national/ international platforms in ongoing projects.
- Data is tagged with metadata.
- Data is deposited in archives at the end of a project/ publication.
- Data is made open and available when/ if possible.



- Data is only stored at the local hard drive (C: disk).
- Data is only stored at Office365
- Data is only stored at an external hard drive.
- Data is stored in Dropbox.

# Questions and comments?

