Neue Aufgaben für Bibliotheken

GFBio als disziplinspezifisches Beispiel für verteilte Forschungsdateninfrastrukturen

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Abteilung Forschung und Entwicklung

Niedersächsische Staats- und
Universitätsbibliothek Göttingen

27. Treffen der AG GIS-Küste

Münster, 21. & 22. Juni 2018

Agenda

Die SUB Göttingen

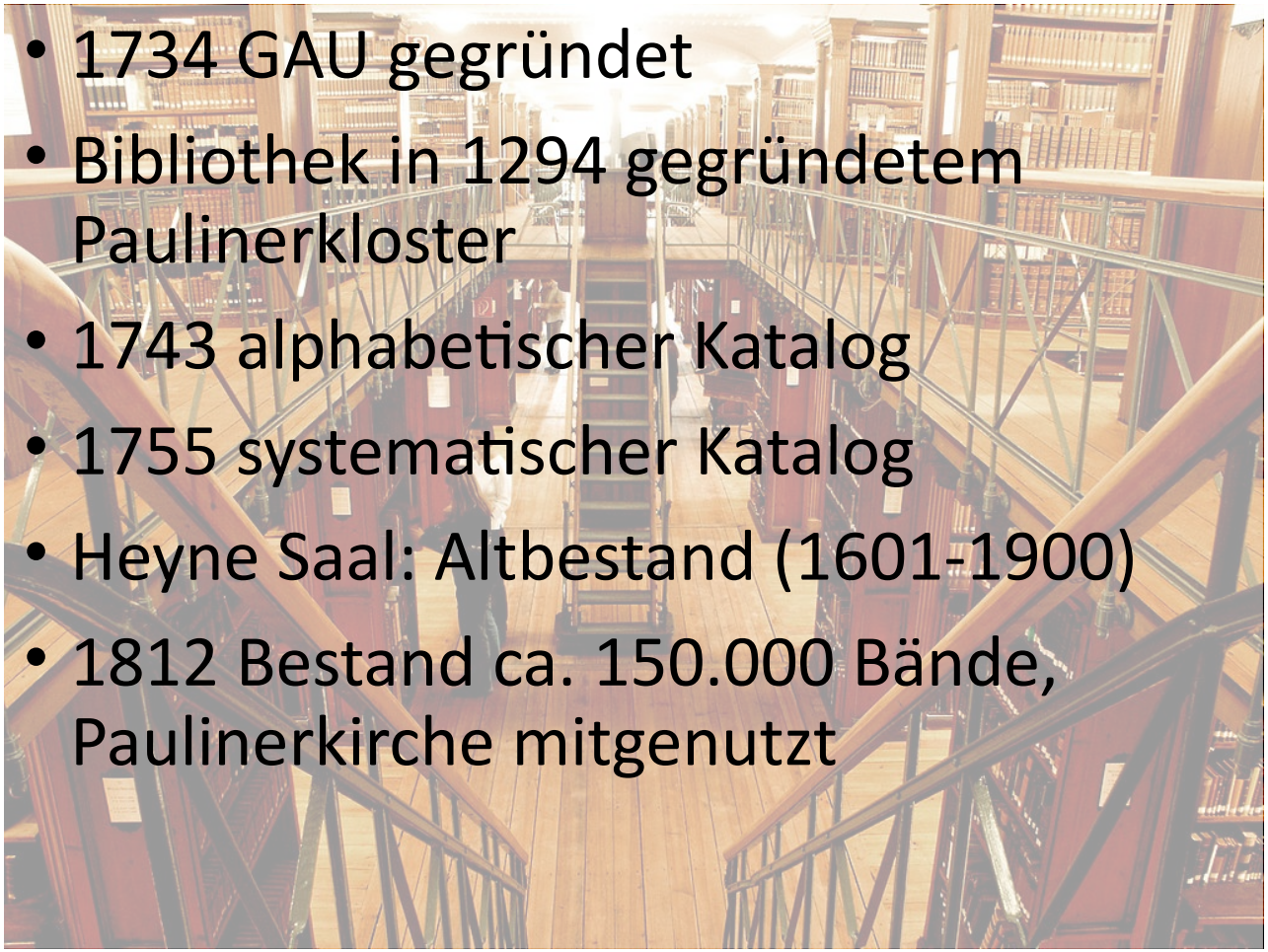
Anforderungen an das Datenmanagement

GFBio als verteilte Forschungsdateninfrastruktur

GFBio Services

Die Niedersächsische Staats- und Universitätsbibliothek (SUB) Göttingen

SUB Göttingen

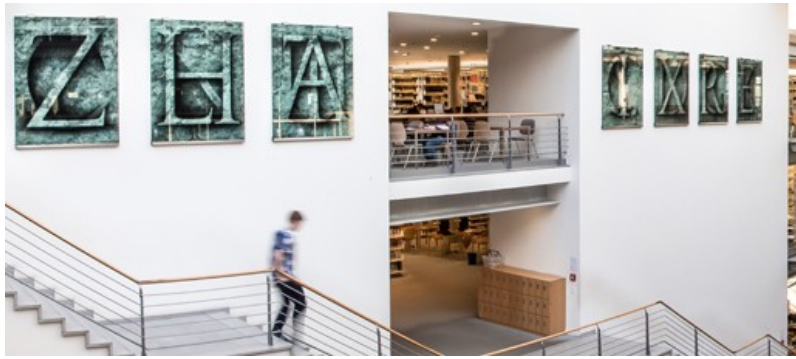


- 1734 GAU gegründet
- Bibliothek in 1294 gegründetem Paulinerkloster
- 1743 alphabetischer Katalog
- 1755 systematischer Katalog
- Heyne Saal: Altbestand (1601-1900)
- 1812 Bestand ca. 150.000 Bände, Paulinerkirche mitgenutzt

SUB Göttingen

- 1950 > 1 Mio. Bände
- 1957 Niedersächsischer Zentralkatalog (NZK)
- 1967 Einstieg in die elektronische Datenverarbeitung; Katalogisierung der Zeitschriften
- 1977 Katalogisierung der Monographien
- 1982 Einrichtung des Bibliotheksrechenzentrums Niedersachsen (BRZN); Aufbau des Niedersächsischen Monographiennachweises (NMN) und des Niedersächsischen Zeitschriftennachweises (NZN)
- Seit 1993 Gemeinsamer Bibliotheksverbund (GBV)

SUB Göttingen



- 1992 Bezug Neubau
- 2000-2006 Sanierung des Historischen Gebäudes
- Parallele Entwicklung der Bereichsbibliotheken (Medizin, Forst, Physik,…)
- 2002 Gründung Abteilung F+E, Schwerpunkt Langzeitarchivierung von Forschungsdaten
- 2015 Langzeitarchivierung fester Teil der Bibliothek
- Heutiger Bestand ~8 Mio. Medieneinheiten

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Anforderungen an das Datenmanagement

Neue Herausforderungen für die Wissenschaft: Guidelines & Principles

1998 **Sicherung guter wissenschaftlicher Praxis**
DFG Denkschrift

- ✓ **"Primärdaten als Grundlagen für Veröffentlichungen sollen auf haltbaren und gesicherten Trägern in der Institution, wo sie entstanden sind, zehn Jahre lang aufbewahrt werde."**

2010 **Grundsätze zum Umgang mit Forschungsdaten**
Verabschiedet von der **Allianz der deutschen Wissenschaftsorganisationen**

- ✓ **Lanzeitarchivierung**
- ✓ **Open access**
- ✓ **Konformität mit disziplinspezifischen Konventionen**

2014 **Rat für Informationsinfrastrukturen**

- ✓ **berät als Sachverständigengremium Politik und Wissenschaft in strategischen Zukunftsfragen der digitalen Wissenschaft**
- ✓ **will Kooperation und Abstimmung bestehender Aktivitäten befördern**
- ✓ **identifiziert Synergiepotenziale im Wissenschaftssystem und will Doppelförderung vermeiden helfen**
- ✓ **benennt neue Handlungsfelder, die durch technischen und kulturellen Wandel entstehen**

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DFG Richtlinien

2015

DFG Leitlinien zum Umgang mit Forschungsdaten

Konkretisieren den in den Grundsätzen der Allianz der Wissenschaftsorganisationen vorgegebenen Rahmen im Kontext der DFG-Förderregularien

DFG Richtlinien zum Umgang mit Forschungsdaten in der Biodiversitätsforschung*

Arbeitsgruppe zum Forschungsdatenmanagement der Senatskommission für Biodiversitätsforschung

„durch ihre Förderung auch zur Sicherung, Aufbewahrung und Nachnutzbarkeit von Forschungsdaten beizutragen"

„Alle Forschungsprojekte/Anträge sollen einen Datenmanagementplan aufweisen."

- ✓ **Erste disziplinspezifische Richtlinie**
- ✓ **Datenmanagementplan (DMP)**
- ✓ **Langzeitarchivierung**
- ✓ **Open access**
- ✓ **Reproduzierbarkeit**
- ✓ **Dokumentation entsprechend Standards, Qualitätssicherung**
- ✓ **Nachnutzung**

*http://www.dfg.de/en/research_funding/announcements_proposals/2015/info_wissenschaft_15_36/index.html

FAIR Data Principles

2016

FAIR Data Principles

Launched in 2014 at a workshop of the **Lorenz Center for Scientific Workshops in All Disciplines** and published in 2016

Findable **Accessible** **Interoperable** **Reusable**

Guidelines on Implementation of Open Access to Scientific Publications and Research Data for H2020 projects

by the European Research Council

- ✓ Strongly advice open access
- ✓ Mandatory data management plan (DMP)
- ✓ **Adoption of the FAIR Principles**

Institutional Guidelines & Policies

1998 DFG Memorandum: Safeguarding Scientific Practice

2010 Principles for the Handling of Research Data

2014 Council for Information Infrastructure (Rat für Informationsinfrastrukturen) launched

Research Data Policy Georg-August-Universität Göttingen

2015 DFG Guidelines on the Handling of Research Data

DFG Guidelines on the Handling of Research Data in Biodiversity Research

2016 FAIR Data Principles

Guidelines on Implementation of Open Access to Scientific Publications and Research Data for H2020 projects

Position paper on the management of research data in the Helmholtz Association

2017 **Grundsätze zum Umgang mit Forschungsdaten WWU Münster**

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Publishers Data Policies

1998 DFG Memorandum: Safeguarding Scientific Practice

2010

2014

2015

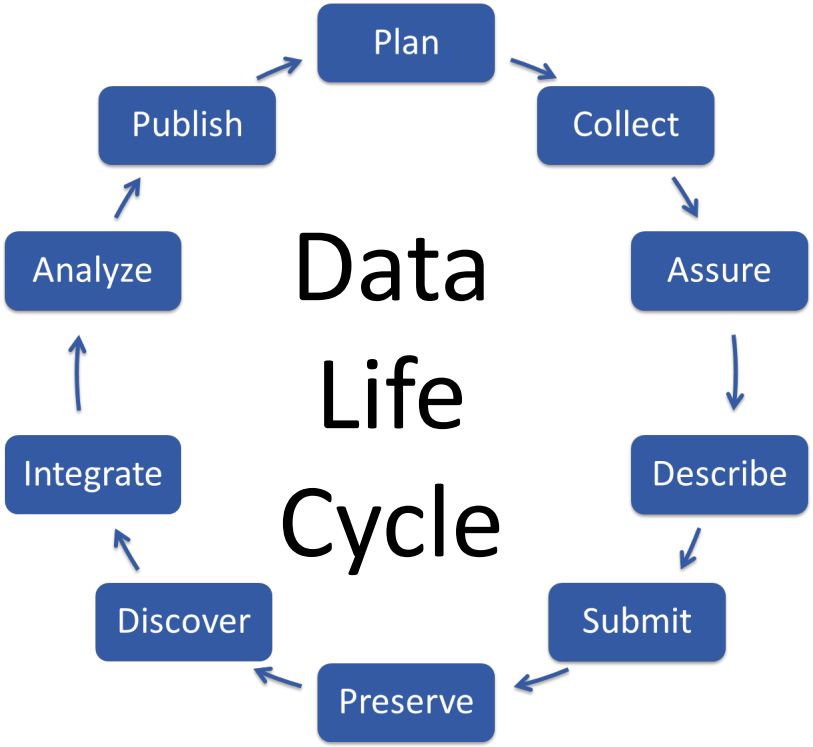
2016

Position p

2017 Adoption of guidelin

Für die Wissenschaftler bedeutet das…

- Den Anforderungen von Institutionen, Förderern und Verlagen muss entsprochen werden
- Alle Schritte der Forschungsdatenprozessierung müssen dokumentiert werden
- Daten müssen veröffentlicht, geteilt und nachnutzbar sein



SUB Göttingen: Strategie 2018-2021

4. Forschungsservices „Gemeinsam Digitale Forschung gestalten“

Beteiligungen in Forschung und Lehre zu digitalen Inhalten und Methoden am Göttingen Campus seitens der SUB Göttingen strukturell etablieren und innovativ vorantreiben. Dieses Ziel wird im Rahmen der eResearch-Alliance realisiert.

Maßnahmen für 2018

- Repositorium für die dauerhafte Speicherung und zitierfähige Publikation von Forschungsdaten
- Nachweis- und Buchungssystem für experimentelle Großgeräte an der Universität Göttingen
- Werkzeuge zur Erstellung von Datenmanagement-Plänen
- Fachspezifische Beratung zum Forschungsdatenmanagement (Ausweitung)
- Unterstützung der Göttinger Exzellenzcluster-Initiativen

Weitere Planung

- Beiträge zum Campus Institut Data Science
- Labor für virtuelle Realität
- Überregionale und internationale digitale Infrastrukturangebote für die Geistes-, Sozial- und Naturwissenschaften

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German Federation for Biological Data

GFBio als verteilte Forschungsdateninfrastruktur

Consortium

- DFG funded project since 2013
- 2018-2021 3rd phase
- non-profit organization since 2016
- Central contact point for biological and environmental sciences
- Support and services throughout the DLC
- 9 data centers involved

PANGAEA.
Data Publisher for Earth & Environmental Science

staatliche naturwissenschaftliche sammlungen bayerns

NATURKUNDE MUSEUM STUTTGART

BG BM Botanischer Garten & Botanisches Museum Berlin

museum für naturkunde berlin

200 JAHRE SENCKENBERG SEIT 1817

museum KOENIG

DSMZ

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ENA European Nucleotide Archive

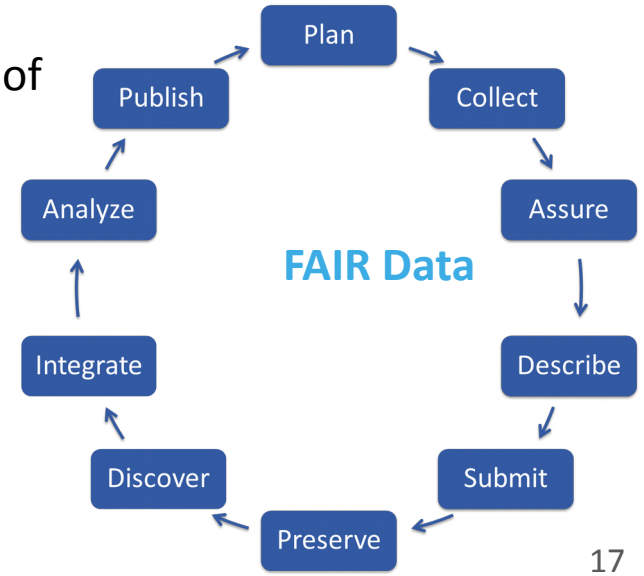
GFBio als disziplinspezifische Infrastruktur

2013

GFBio launched

- Co-initiated by and funded by the DFG
- Central, discipline-specific point of access to services and infrastructures for RDM
  https://www.gfbio.org/
- Covering the entire data life cycle
- Secure long-term availability and reusability of biological and environmental research data

2021



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GFBio Roadshows

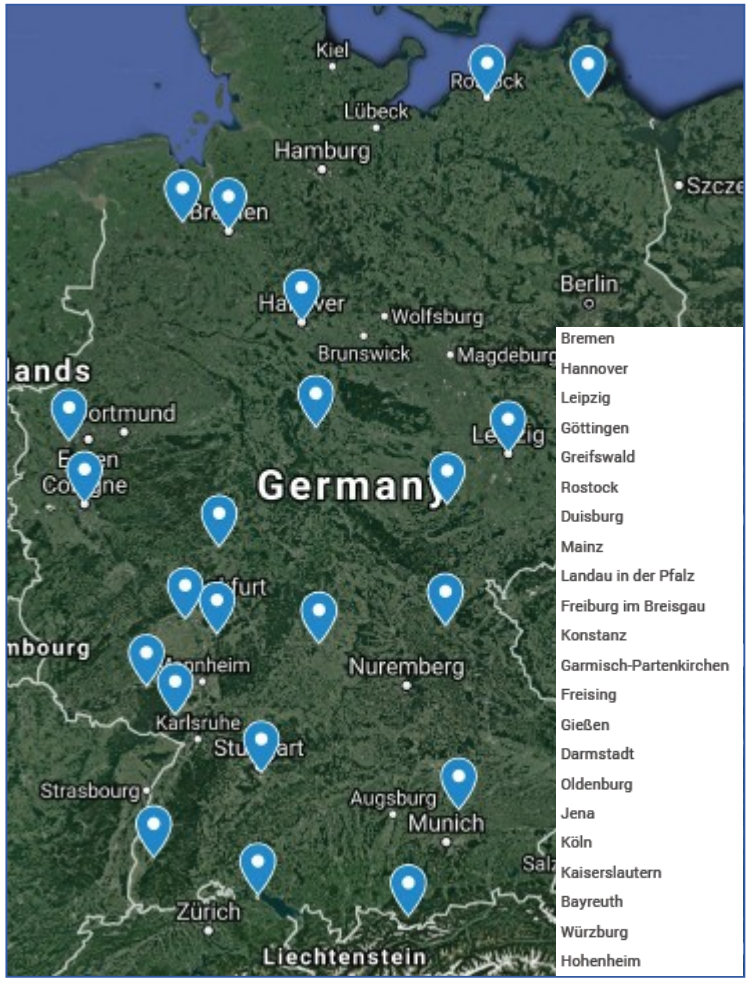
15 Roadshows in 2017

10 Roadshows in 2018, ongoing

- visiting working groups
- Open exchange and discussion

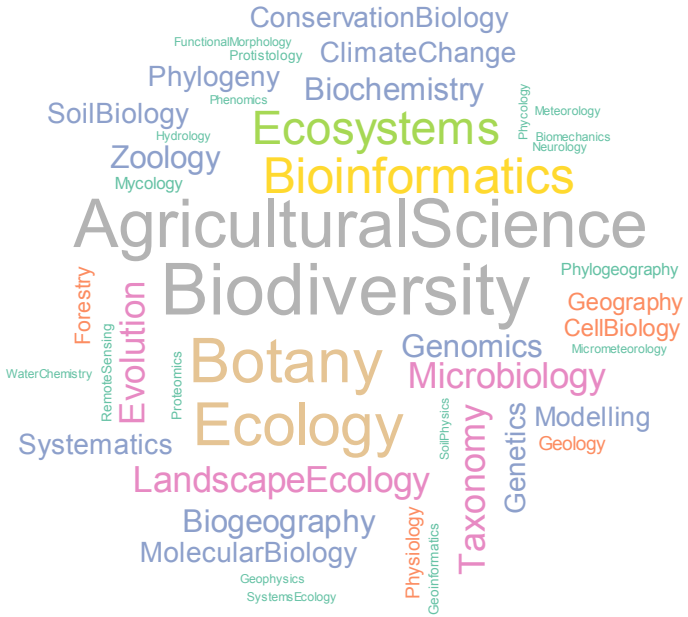
Online survery on the researchers' perspectives

- Jul – Oct 2017

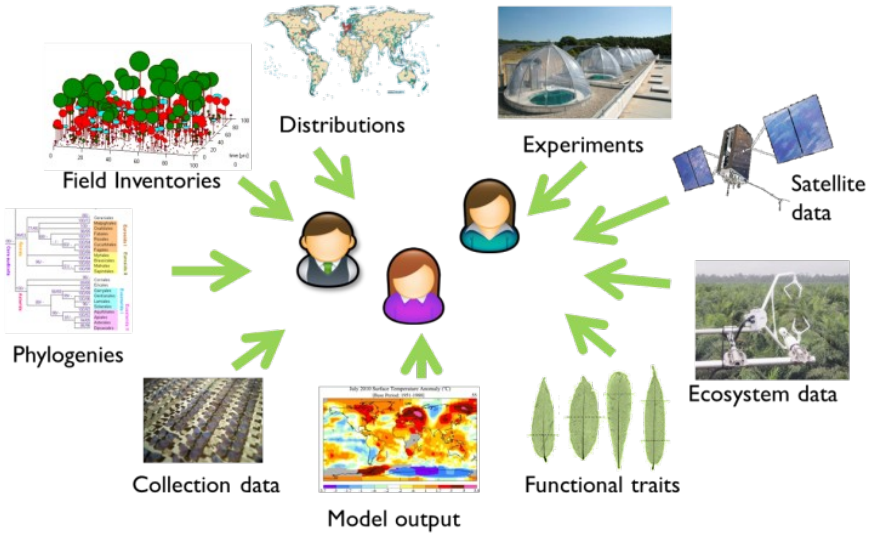


Bio ≠ Bio

Diverse research fields and disciplines



Interdisciplinary approaches



Quantity

Quality

- Data Producers
- Data Re-Users
- Data Managers

- ★ Beginners
- ★★ Advanced
- ★★★ Experts

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Wissenschaftler ≠ Wissenschaftler

- Why do I need data management?
- What are the benefits of data management?
- How do I organize my folders?
- How do I name my files consistently?
- How do I structure my data?
- Why should I publish my data?

- How do I develop sustainable RDM routines for my working group?
- How do I organize, store, and preserve data from a complex experiment with different collaborators?
- How can I create standard compliant metadata?
- How can I make my data publicly available?

- Which metadata standards should I use?
- How are data processed and transferred to GFBio?
- Does GFBio use an own metadata schema, on which the metadata should be mapped or do you use common standards?
- Which terminologies should be used?
- Do you provide APIs for data submission and terminology access?

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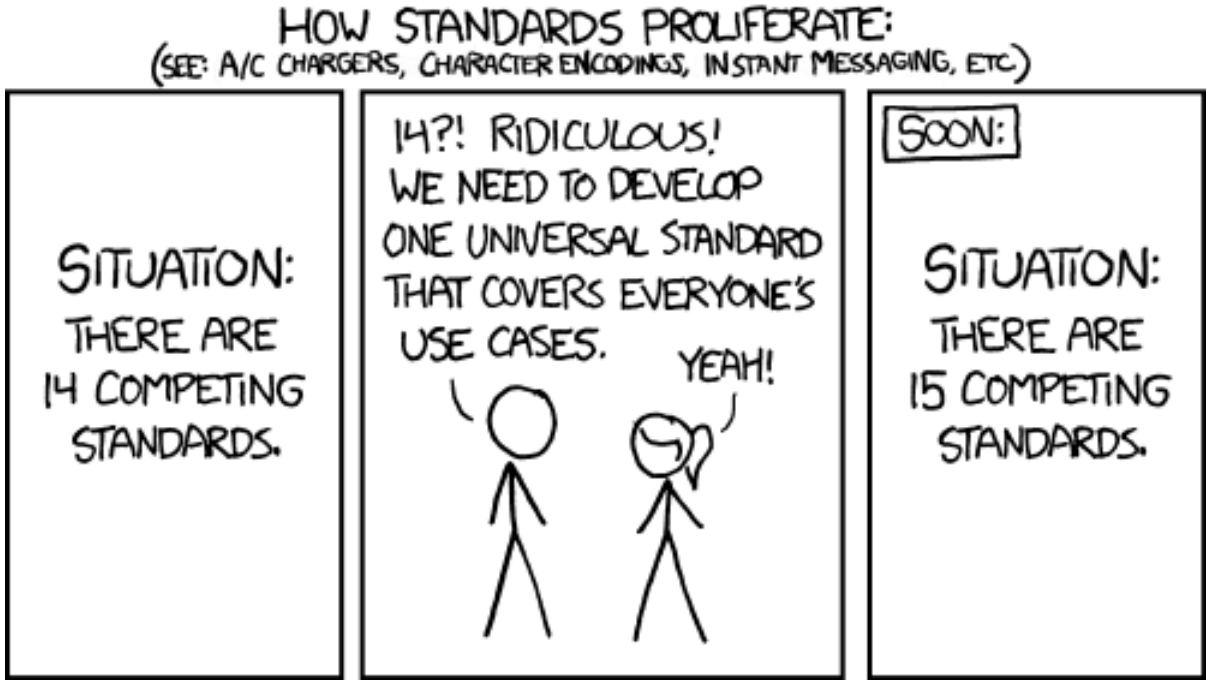
Data Center ≠ Data Center



http://xkcd.com/927/

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GFBio Services

GFBio Services

SERVICES

The Key Features of our Work

PLAN

Prepare a custom Data Management Plan (DMP).

SUBMIT

Submit your data to GFBio.

SEARCH

Search the GFBio data pool.

VISUALIZE & ANALYZE

Dynamically integrate, analyze and visualize GFBio datasets.

PUBLISH

Make your data citable.

TRAIN

Train your data management skills.

ARCHIVE

Deposit data and specimens in dedicated long-term archives.

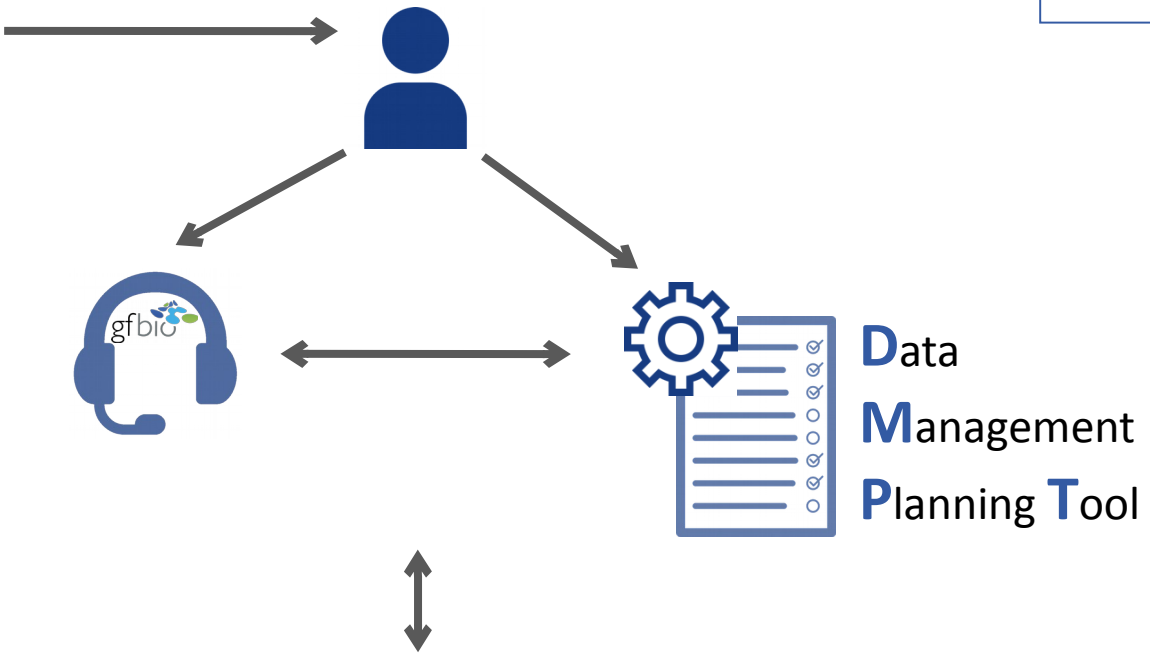
ANNOTATE & CONNECT

Use the GFBio Terminology Service to describe your data and share terminologies with other researchers.

GFBio Services: Plan Custom DMPs

DFG Deutsche Forschungsgemeinschaft

Guidelines on the handling of research data in biodiversity research *



Individual Support

- ✓ Personal contact / review of proposal
- ✓ Creation of custom data management plan

more information:
www.gfbio.org/data/plan

*http://www.dfg.de/download/pdf/foerderung/antragstellung/forschungsdaten/guidelines_research_data.pdf

GFBio Services: Plan
Data Management Planning Tool

Check out the **GFBio Data Management Planning Tool** and prepare your own **Data Management Plan**.

- ✓ *Collect information about your project*
- ✓ *Complete your DMP checklist*
- ✓ *Get GFBio DMP support*

1. General Project Information | 2. Data Collection | 3. Documentation and Metadata | 4. Ethics and Legal Compliance | 5. Preservation and Sharing

What is the official name of your research project? *

Project Name

Please select a category:

Select

Is your research data reproducible?

One-time observation | Repeatable experiments | Time series

Add additional information (e.g. data reproduction might cause high costs or a lot of effort).

Please specify your project type.

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GFBio Services: Collect & Assure

BEXIS
RESEARCH DATA MANAGEMENT

Data Management Platform (i.e. software)

generic, scalable, modular

collaborative, **large projects → Admin needed**

IBM DB2 + XML, PostgreSQL, MS SQL Server

Focus on **active data** (i.e. project life-time)

Focus on **tabular data**, but not limited to

Focus on **data integration** and **re-use**

Modular virtual research environment with **focus on collection data**

Small to medium-size projects

Private/independent installations possible

Used by some data centers as internal data management system

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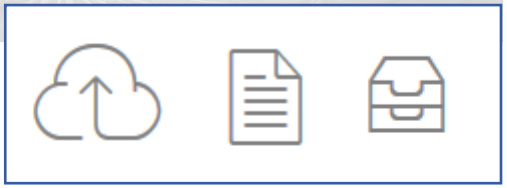
GFBio Services: Submit, Publish, Archive



Submit Your Data to a Public Repository

Transfer your data from your private research domain to the GFBio data centers for **long-term archival** and **publication**. Our curation experts will find the best solution for storing your data within the GFBio consortium and making it FAIR (findable, accessible, interoperable and re-usable).

Start a data submission

Submit Molecular Sequence Data

Molecular sequence data are submitted to the European Nucleotide Archive, any accompanying environmenal data are archived in PANGAEA. We will also help you apply the MIxS standard to your meta-data.

Start a Molecular Submission

Data Center Recommendation Tool

Use our Data Center Recommendation Tool (DCRT) to find out which of the GFBio data centers fits best for your research data. You can also read their detailed information and even contact each data center directly.

Start the Data Center Recommendation Tool

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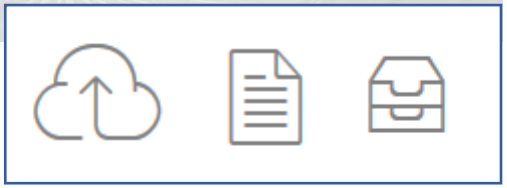
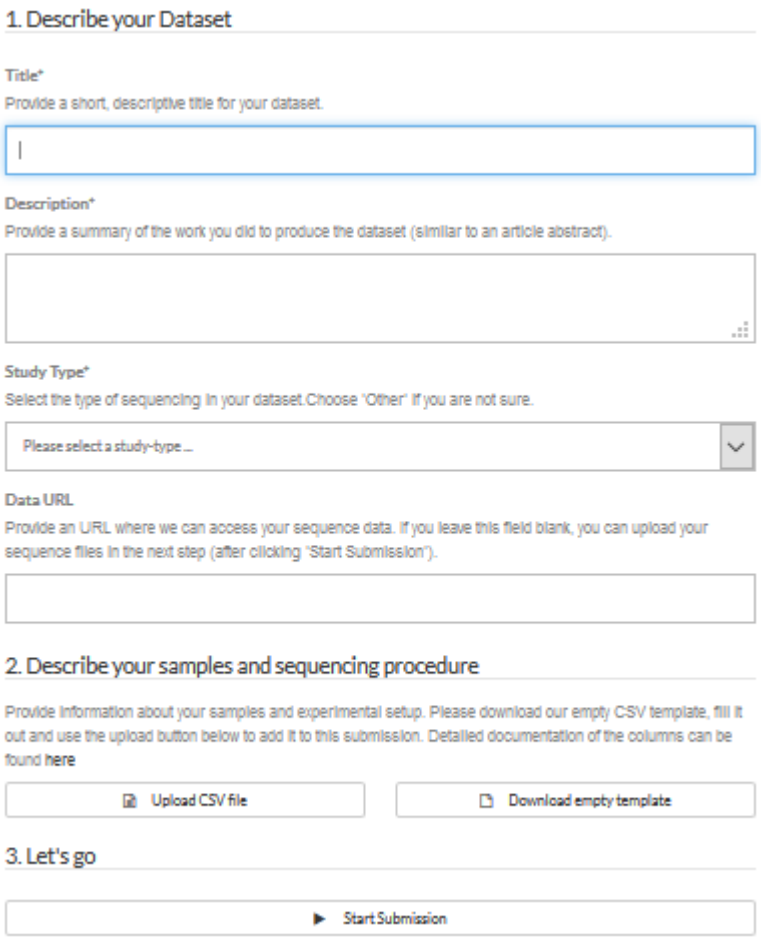
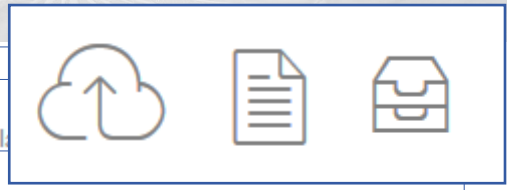
GFBio Services: Submit, Publish, Archive





https://www.gfbio.org/data/submit/molecular

GFBio Services: Submit, Publish, Archive



1. Dataset information

Title*

Provide a short, descripti

Description*

Provide a summary of the

Data collection time

Provide the time period,

Dataset label

Please provide keywords for your dataset (one keyword per line //use semicolon to separate the words). If avail

your Gepris-No.).

Categories

Choose one or mo

Algae & Protist

Botany

Geoscience

Mycology

Zoology

Dataset author*

Please, enter the a

Franziska Helbing

License*

Under which license will your data be accessible?

CC BY: Creative Commons Attribution 4.0

Related publication(s)

Provide this information, if the dataset is related to a publication.

2000

Metac

Which

Embar

Provic

Legal

Select

Na

Ser

2. Dataset Upload

Upload from your file system

Link online ressource

Choose your files for upload. You can select more than one file with an upload. If the file size exceeds 20 MB, please upload only representative data. Later, a data curator will assist you in uploading the entire data set.

For one upload, please select all your files.

Choose files

3. Submission options

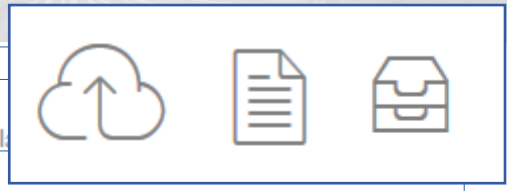
With the start of submission you will send your information to the GFBio curator team. A contact person will get in touch with you as soon as possible. This curator will suport you through the rest of submission process.

Request submission

Reset all information

https://www.gfbio.org/data/submit/generic

GFBio Services: Submit, Publish, Archive



1. Dataset information

Dataset label

Please provide keywords for your dataset (one keyword per line //use semicolon to separate the words). If avail

Title*

Provide a short, descripti

your Gepris-No.).

License*

Under which license will your data be accessible?

CC BY: Creative Commons Attribution 4.0

Related publication(s)

Descr

Provi

Data

Provi

Franziska Helbing

Legal

Select

Na

Ser

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Concepts and Standards
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Events
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Tools

Data submission forms for the deposit of biological and environmental samples

To facilitate data submission for scientists interested in depositing their project results, GFBio provides standard excel templates commonly used in the involved natural history collections to document records on **either** biological and environmental physical samples (voucher objects) along with associated data on geographical and temporal occurrence **or** on observational data without deposition of physical vouchers, which is often the case in the context of established long-term monitoring projects. The following selection of excel templates is appropriate for deposition of physical objects together with associated data. Templates for recording observational data on temporal occurrence without deposition of voucher objects can be found under Data submission forms for occurrence data. We will gradually optimise these data submission files and add additional information to fields and content.

Natural History Collections with GFBio Data Center	Samples for: Curational field	File scope: Kingdom	File title and download (zip with txt, xls included)	File description	Notes
BGBM	Botanical collections	Plantae	BGBM collection data form (.zip, xls included)	BGBM collection data form, 1,06 MB	Tutorial (pdf) about the Excel Makro within the BGBM collection data form; if you would like to use the full functionality (e.g. including label printing) please download the BGBM collection data form ZIP-folder (1,06 MB) containing additional wordfiles and short instruction manuals
BGBM	DNA sample collections	Plantae	BGBM collection data form (.zip, xls included)	BGBM collection data form, 1,06 MB	Tutorial (pdf) about the Excel Makro within the BGBM collection data form; if you would like to use the full functionality (e.g. including label printing) please download the BGBM collection data form ZIP-folder (1,06 MB) containing additional

With the start of submission you will send your information to the GFBio curator team. A contact person will get in touch with you as soon as possible. This curator will suport you through the rest of submission process.

Request submission

Reset all information

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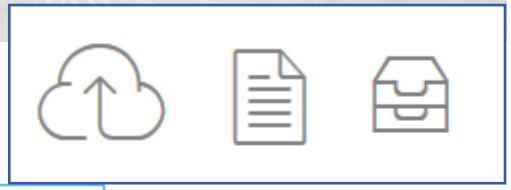
https://www.gfbio.org/data/submit/generic

GFBio Services: Submit, Publish, Archive



Data Center Recommendation Tool

Do you want to submit physical objects along with your data?

- (●) Yes
- ( ) No

Is your object dead or alive?

- ( ) Alive
- (●) Dead

Is your object taxon-based?

- ( ) Yes
- (●) No

Data Center Recommendation

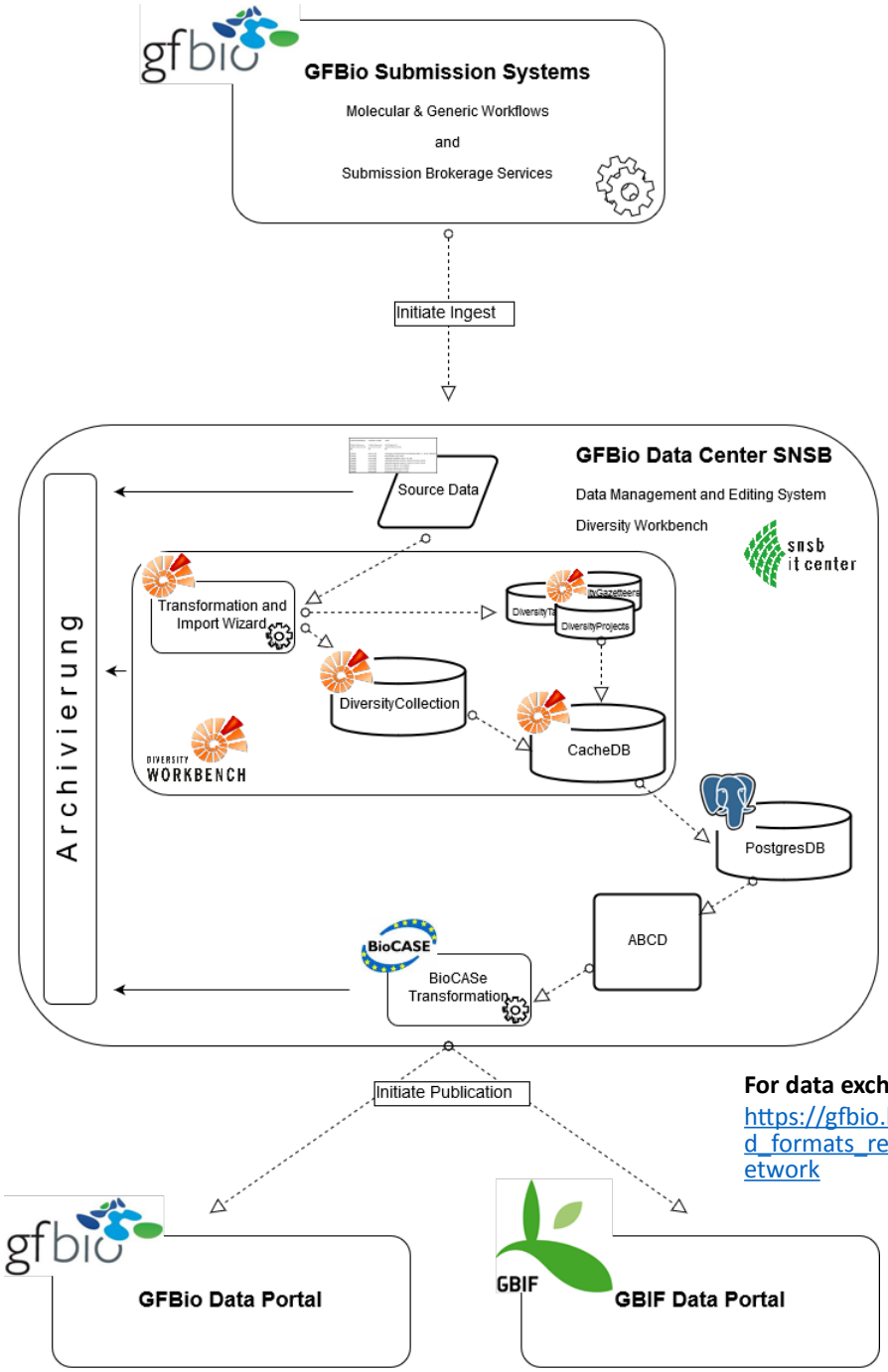
SENCKENBERG	Senckenberg Gesellschaft für Naturforschung - Leibniz Institute, Frankfurt	Contact · Submission · Details
	Staatliche naturwissenschaftliche Sammlungen Bayerns - SNSB IT Center, München	Contact · Submission · Details

Do you need support in selecting a suitable data center or do you have further questions concerning data management?
Please use our generic submission or get in contact with us:

gfbio	German Federation for Biological Data (GFBio)	Contact · Submission

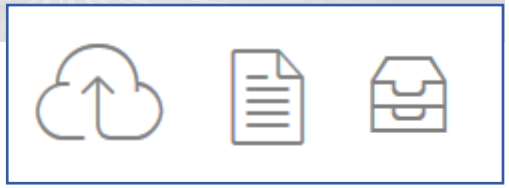
gfbio

Example workflow for collection and observation data



For data exchange standards used in the GFBio context, see:
https://gfbio.biowikifarm.net/wiki/Data_exchange_standards,_protocols_and_formats_relevant_for_the_collection_data_domain_within_the_GFBio_network

GFBio Services: Submit, Publish, Archive



GFBio Data Centers

One major goal of GFBio is the long-term preservation of biological data.
In order to cope with heterogenous data from multidisciplinary projects, a coordinated approach is needed. Therefore, GFBio brings together the data archiving and curation expertise of several national archives and data centers.

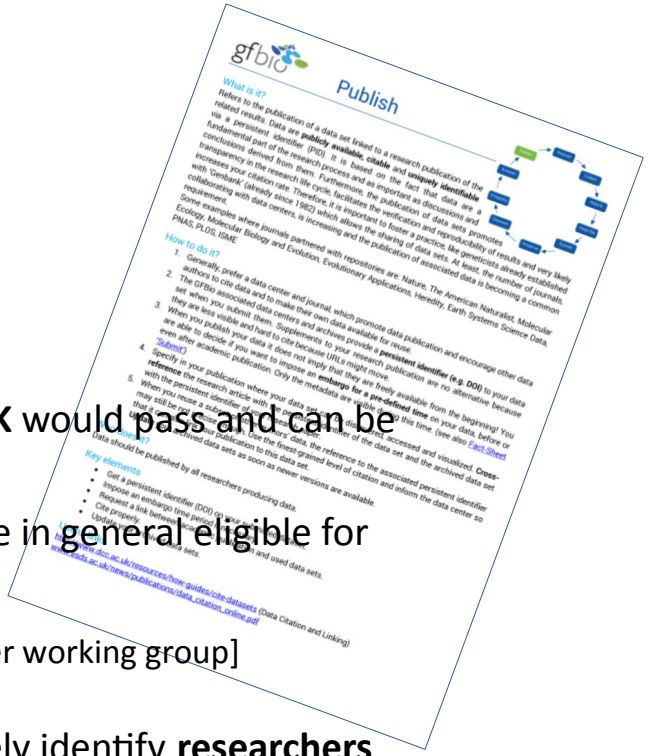
Learn more about the GFBio data centers in the following and make use of GFBio data submissions or contact us for detailed information about submission options.

Data Centers specialized on Nucleotide and Environmental Data

+ ENA – European Nucleotide Archive
+ PANGAEA – Data Publisher for Earth & Environmental Science

Data Centers at Natural Science Collections

+ BGBM – Botanic Garden and Botanical Museum Berlin, Freie Universität Berlin
+ DSMZ – Leibniz Institute DSMZ – German Collection of Microorganisms and Cell Cultures, Braunschweig
+ MfN – Leibniz Institute for Research on Evolution and Biodiversity, Berlin
+ SGN – Senckenberg Gesellschaft für Naturforschung – Leibniz Institute, Frankfurt
+ SMNS – State Museum of Natural History Stuttgart
+ SNSB – Staatliche Naturwissenschaftliche Sammlungen Bayerns – SNSB IT Center, München
+ ZFMK – Zoological Research Museum Alexander Koenig – Leibniz Institute for Animal Biodiversity, Bonn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Publish

What is it?

How to do it?

Key elements

Identifiers

- **DOI** (as implemented by DataCite), **Handle**, **EPIC**, **NBNs** and **ARK** would pass and can be considered to be eligible for GFBio
- **LSIDs** would fail due to the lack of an registration agency but are in general eligible for GFBio

  → GFBio will rely on several identifier systems for digital objects [identifier working group]

- **ORCIDs** are currently the most appropriate identifiers to uniquely identify **researchers**
- **for physical objects** currently no commonly accepted identifier system is available

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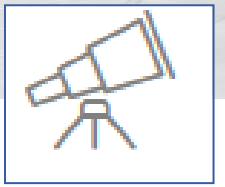
GFBio Services: Search



Filter Results: |clear filters |reset search|

▾ Author

Rick, Johannes J(427)

Wiltshire, Karen Helen(427)

Asmus, Ragnhild(279)

Search: wadden sea

Show 10 entries per page

Showing 1 to 10 of 1,179 entries

Previous Next

Buschbaum, Christian (2010): Biomass of Green algae in the northern Wadden Sea at station Sylt_Tonnenleger-Bucht in 2009

Data Center: PANGAEA: Data Publisher for Earth & Environmental Science

Parameters: DATE/TIME; DEPTH, sediment/rock; Enteromorpha; Cladophora; Chaetomorpha; Ulva; Green algae

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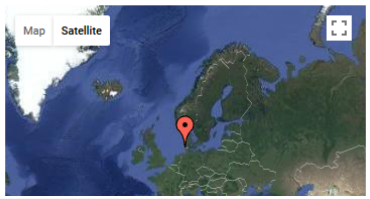
Data Description - Data Download

Citation:

Buschbaum, Christian (2010): Biomass of Green algae in the northern Wadden Sea at station Sylt_Tonnenleger-Bucht in 2009. *Alfred Wegener Institute - Wadden Sea Station Sylt, PANGAEA,* https://doi.org/10.1594/PANGAEA.755081

Always quote above citation when using data! You can download the citation in several formats below.

RIS Citation | BibTeX Citation | Text Citation | Facebook | Twitter | Google+ | Show Map | Google Earth



Parameter(s):

#	Name	Short Name	Unit	Principal Investigator	Method	Comment
1	DATE/TIME	Date/Time				Geocode
2	DEPTH, sediment/rock	Depth	m			Geocode
3	Enteromorpha	Enteromor	g/m²	Buschbaum, Christian	Ash-free dry weight	
4	Cladophora	Cladophor	g/m³	Buschbaum, Christian	Ash-free dry weight	
5	Chaetomorpha	Chaetomor	g/m²	Buschbaum, Christian	Ash-free dry weight	
6	Ulva	Ulva	g/m²	Buschbaum, Christian	Ash-free dry weight	
7	Green algae	Green algae	g/m²	Buschbaum, Christian	Ash-free dry weight	

Project(s):

Coverage:

Event(s):

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Comment:

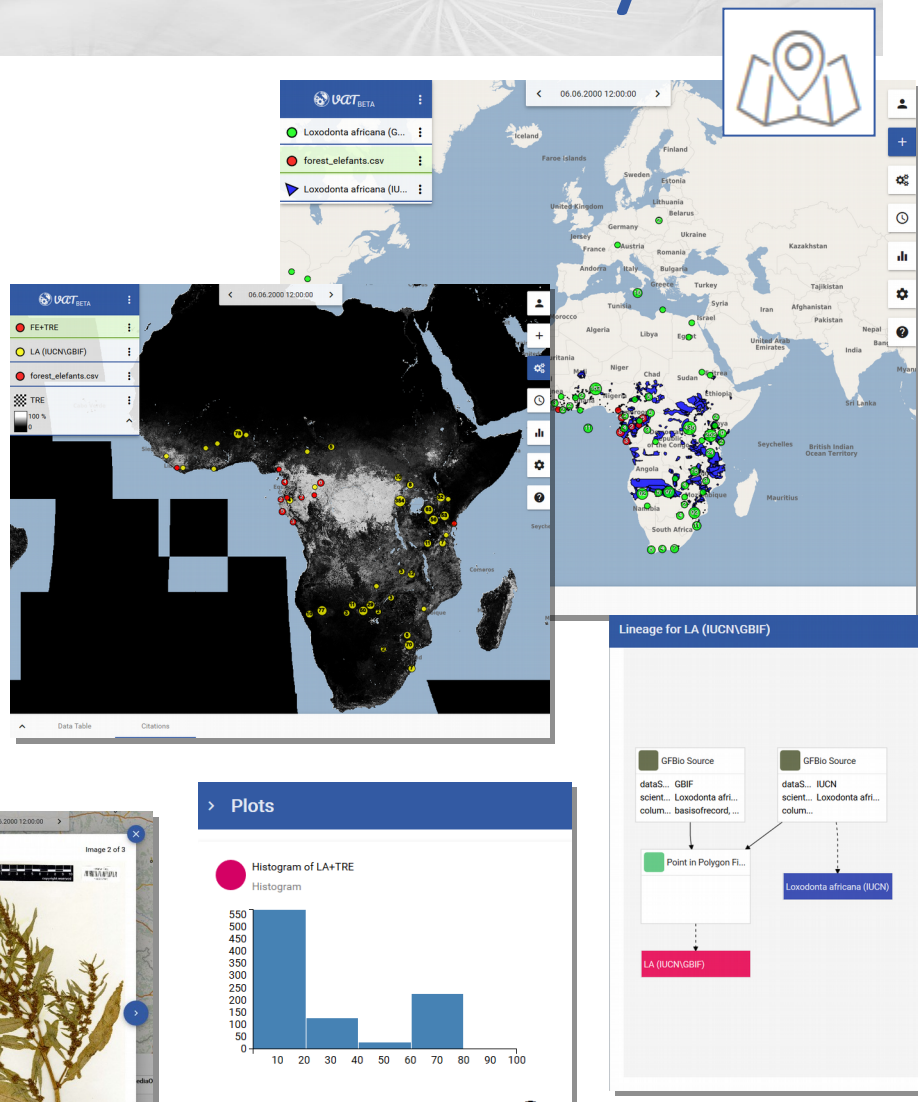
Size: 30 data points

Download Data

Download dataset as tab-delimited text *(use the following character encoding:* UTF-8: Unicode (PANGAEA default)

GFBio Services: Visualize and Analyze

- ✓facilitates data-driven research
- ✓process high volumes of data with minimum delay
- ✓species distribution maps, time series
- ✓filter and overlay data sets
- ✓save and share workflows
- ✓direct acces with statistical software (R)
- ✓multimedia



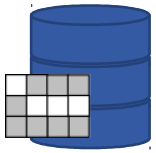
GFBio Services: Visualize and Analyze

Interface

Processing

C++

Storage



Custom
RasterDB

GFBio Services: Annotate & Connect

BROWSE terminologies that are relevant to their research in order to understand how to use them.

ACCESS terminologies programmatically to provide semantically enriched web services.

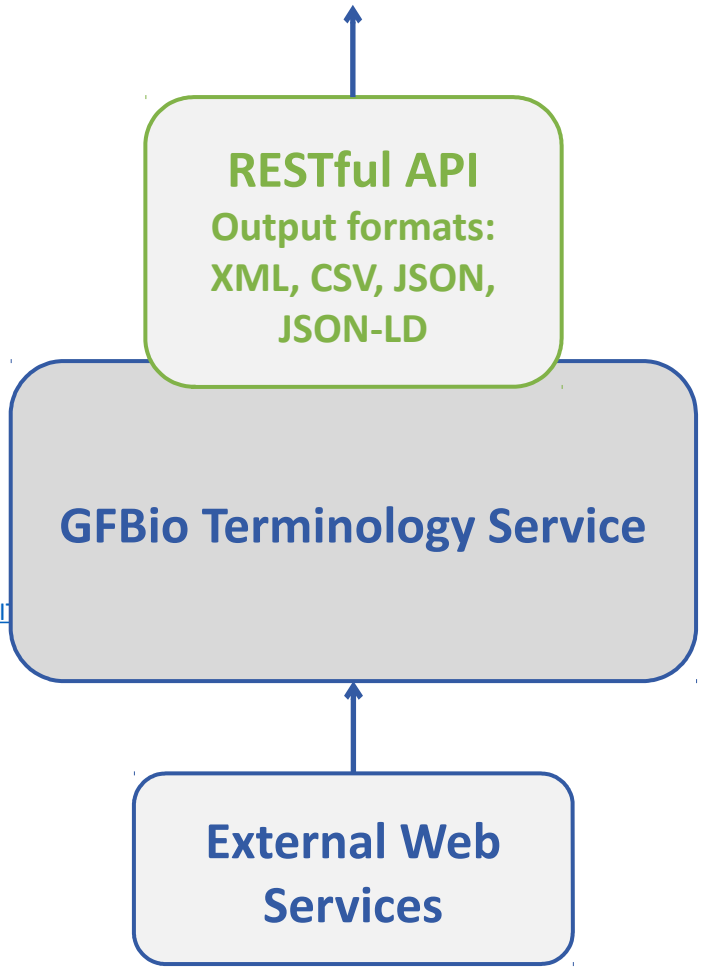
CONSUME information from the terminologies to your information system to use them locally.

CONTRIBUTE your terminologies to the TS to share them with your research team and the world.

Kindly provided by Claudia Müller-Birn et al.

GFBio Services: Annotate & Connect

- Biological Collections Ontology (BCO)
- Phenotypic Quality Ontology (PATO)
- Chemical Entities of Biological Interest Ontology (CHEBI)
- Oribatida Ontology (ORIBATIDA)
- RecordBasis (RECORDBASIS)
- Environment Ontology (ENVO)
- Bohlmann Ontology (BOHLMANN)
- Thysanoptera Ontology (THYSANOPTERA)
- Trichoptera Ontology (TRICHOPTERA)
- Extensible Observation Ontology (OBOE)
- Kingdom (KINGDOM)
- Quantity, Unit, Dimension and Type (QUDT)
- Semantic Web for Earth and Environment Technology Ontology (SWEET)
- ISO 3166 Countries and Subdivisions (ISOCOUNTRIES)
- The lithologs rock names ontology for igneous rocks (LIT_I)
- National Center for Biotechnology Information (NCBI) Organismal Classification (NCBI
- Regionalised and Domain-specific Taxon Lists (DTNtaxonlists_SNSB)
- Catalogue Of Life (COL)
- Prokaryotic Nomenclature up-to-date (PNU)
- Integrated Taxonomic Information System (ITIS)
- The GeoNames geographical database (GEONAMES)
- Pan-European Species directories Infrastructure (PESI) (PESI)
- World Register of Marine Species (WORMS)



GFBio Services: Train

Welcome to our Training Section!

Explore our training materials!

- Learn more about the data life cycle (DLC) and make use of our DLC fact sheets
- Stay informed about best-practices for research data management
- Check out our education modules and software training materials

Learn about our face-to-face training activities!

Keep informed about our outreach activities and meet GFBio!

- Do you want to receive first-hand information on data management and our services?
- Do you want to discuss how current developments in the field of data management might affect your research?
- Do you want to contribute to improve our services by giving us feedback?

Then take the chance to meet us at our GFBio outreach events and roadshows, at conferences and at assemblies!

Contact us for more information.

GFBio Services: Train

- ✓ **Pro-active personal training**

DIVERSITY WORKBENCH workshops

- ✓ **On-demand thematic training sessions**

- ✓ **Roadshow events for working groups, departments and institutions**

http://www.gfbio.org/training/
http://www.gfbio.org/support/how-tos

GFBio Services: Train

- Thematic DM training sessions on demand
- Workshops at ecological assemblies and conferences
- Software workshops (Diversity Workbench, BExIS)
- Integrated DM training and data analysis workshops (e.g. collaboration with de.NBI)
- GFBio Roadshows for working groups including mini-trainings
- Knowledge base (collection of training materials)

Contact and Upcoming Events

Contact

outreach@gfbio.org

https://www.gfbio.org

Upcoming Events

03 - 07 September 2018, Braunschweig

Summer School *Riding the Data Life Cycle!*

https://www.gfbio.org/training/de.nbi-summer-school-2018

18 September 2018, München

35. Diversity Workbench-Workshop; focus: DWB tools for data transformation and data publication

http://www.snsb.info/SNSBInfoOpenWiki/Wiki.jsp?page=UpcomingWorkshops