



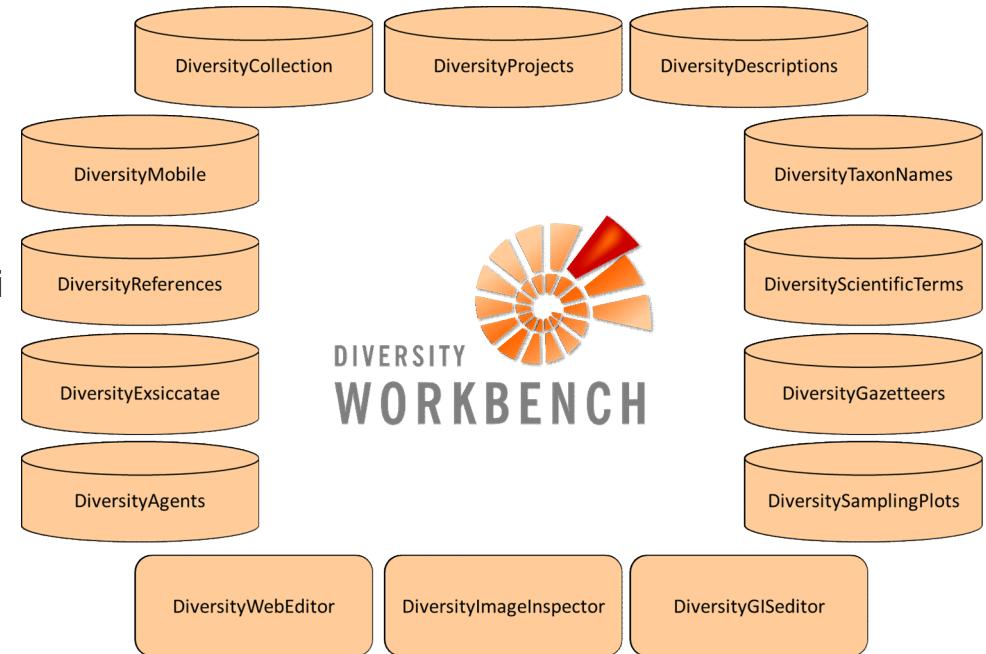
# Diversity Workbench

## Einführung

Dagmar Triebel

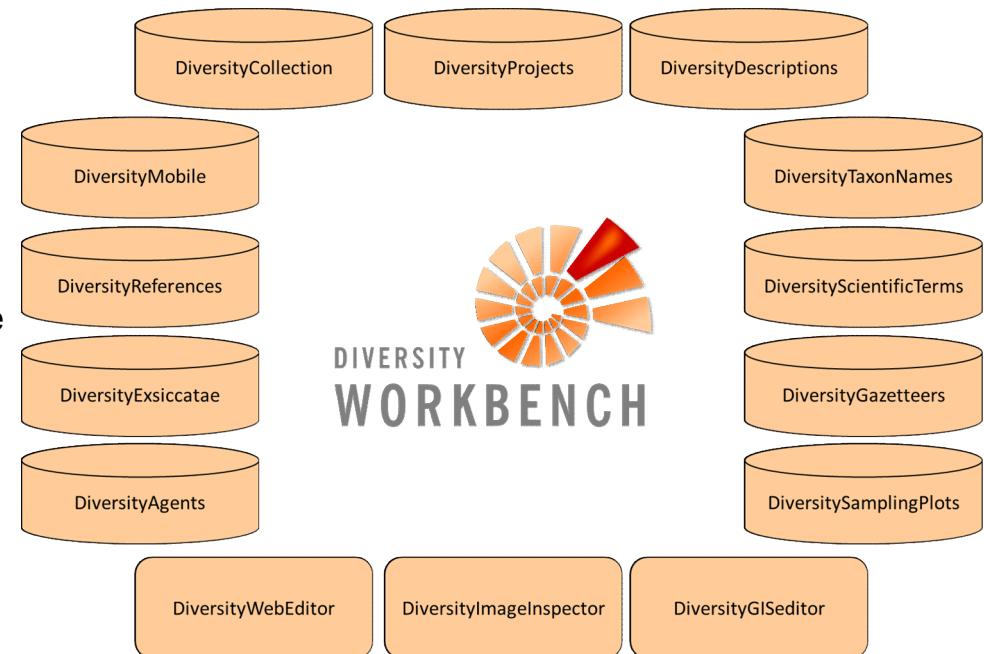
# DWB – System aus SQL-Datenbanken

- 11 Datenbanken als Werkzeuge zum Datenmanagement nach Datendomänen
- Direkte Interoperabilität von Datenbank-Komponenten untereinander und mit den drei weiteren Tools zur Datenprozessierung



# DWB – System aus SQL-Datenbanken

- Diversitätsdatensätze aus Bio- und Geowissenschaften; aus allen organismischen Großgruppen: Pflanzen, Algen, Pilze, Wirbeltiere, Insekten, Fossilien...
- Monitoringdaten, ökologische und molekulare Daten
- Geeignet als Datenmanagement-System für Datenzentren / naturwissenschaftliche Sammlungen, aber auch für einzelne Forscher und große Forschungsprojekte



# DWB – Dokumentation online

- [www.diversityworkbench.net](http://www.diversityworkbench.net)

The screenshot shows a web browser displaying the 'Diversity Workbench' documentation. The left sidebar contains navigation links such as 'About DWB', 'Information models', 'Software', 'Navigation', 'Help', 'All pages', 'Query concepts', 'Recent changes', and 'Tools'. The main content area features a large image of a sunburst chart. Below it, the text describes the modularized Diversity Workbench (DWB) as a virtual research environment for managing and analyzing life sciences data. It highlights its modularity, flexibility, and integration capabilities. A diagram on the right illustrates the modular architecture, showing various components like 'DiversityCollection', 'DiversityDescriptions', 'DiversityEditor', 'DiversitySamplingTool', 'DiversityGatherer', 'DiversityReferences', 'DiversityExecutor', 'DiversityProject', and 'DiversityResources' connected to a central 'DiversityMobile' component.

**Diversity Workbench**  
(Redirected from Main Page)

The modularized Diversity Workbench (=DWB) represents a virtual research environment for multiple scientific purposes with regard to management and analysis of life sciences data. The framework is appropriate to store different kinds of bio- and geodiversity data and facilitates the processing of ecological, molecular biological, observational, collection and taxonomic data. It is capable and flexible enough to be applied as data storage unit for institutional data repositories. The DWB is set up on a xml-enabled relational database system. Clients of every database of the Workbench are used as stand-alone applications and provide supporting functions to clients of corresponding databases. This results in a high flexibility with regard to the conceptual design, enabling sophisticated user administration and a rapid setup of project-specific and user-adapted entry forms. Further, it facilitates the dynamic integration of web services and external data resources.

The DWB is work in progress, aiming at developing a set of information models and application components that collaborate through agreed software interfaces. That is, each component of the Workbench applications uses services from other applications, but at the same time does not need to know about the internal design and implementation of them (encapsulation principle). The goal is increased reuse and collaboration across project and national borders.

Currently, three institutions with four editors are involved: the Bavarian Natural History Collections with the SNSB IT Center, the University of Bayreuth, Mycology and Biodiversity informatics and Applied Computer Science IV and the Museum für Naturkunde Berlin – the MN since 2013 in replacement of the Julius Kühn-Institut Berlin.

**Software tools for building and accessing biodiversity information**

For each component of the Diversity Workbench (DWB) we aim at providing a comprehensive documentation of the application and the information model online. The framework for these components is currently still under development as we continue to learn about the necessary components and the best approach to the modularization of biodiversity information. A draft paper distributed by G. Hagedorn in 2002 provided insight into the framework concept.

**History and projects** The start of the DWB was in 1999 with first discussions and design of concepts for a RDMs framework and workbench on diversity information (domain registration "diversityworkbench.net" in 2000). In an initial phase during the BMBF programme BIOLOG-IT with the GLOPP project (2000 until 2003) prototypic implementations were realised in Microsoft Access. The prototype applications are still available. With the exception of DeltaAccess/DiversityDescriptions they are by now largely obsolete.

Between 2003 and 2008 further applications were set up as part of the GBIF-D Mycology project using Net technology and JAVA. Since 2006 the software development is continued as one of the general tasks of the SNSB IT Center. Starting with 2009 some advanced IT concepts and technical developments became part of the DiversityMobile/ IBF project, since 2010 certain GBIF relevant DWB-tools are optimized within the joint research project GBIF-D. Kompetenzzentren innovativer Datennomobilisierung. DWB applications and services are used by the Global Plants Initiative in Munich, since 2007, by the German Barcode of Life project, since 2011, by the Integrative Pilzforschung project, since 2013 and by three DFG funded research infrastructure projects, namely BiNHum, since 2012, IDES, since 2012 and MOD-CO, since 2014.

Starting with autumn 2013, the Flora von Bayern initiative relies on DWB databases as software suite to realise a data pipeline for occurrence data from the past and now for the future. Two BFL projects are working closely together in their IT infrastructure.

The GFBio project started with the end of 2013 and is going to extend the user services of the Diversity Workbench on demand of biological and environmental research communities and projects in Germany.

**Financial support** for timely and thematically restricted DWB projects is granted through the Bayerisches Staatsministerium für Bildung und Kultus, Wissenschaft und Kunst (StMBWKW), the Bundesministerium für Bildung und Forschung (BMBF), the Deutsche Forschungsgemeinschaft, LIS infrastructure platform (DFG), through the Fifth and Seventh Framework Programme of the EU Commission (EU projects Species 2000 europa and 4D4life), through the Bayerisches Landesamt für Umwelt, and through the World Wildlife Fund for Nature Deutschland. We thank Diversity Workbench Co-workers for continuously modelling and setting up Diversity Workbench software. A number of highly engaged Contributors from several institutions in Germany deliver ideas and concepts, and implement special scripts to extend the functionalities of databases and clients. The features of the Diversity Workbench concept were analysed in 2011 and listed under Diversity Workbench Performance. The DWB tools are subject of national and international data collections on Working Tools for Biodiversity Informatics and Virtual Research Environments.

The Diversity Workbench is appropriate to serve as database backbone and data management system for bio- and geodiversity research projects and is therefore listed as Research Infrastructure in the DFG Resources Portal. The SNSB IT Center offers user help desk and services in this context.

Diversity Workbench Software is available under GPL2 license.

**Flyers and Posters**

- DWB Network Installations Poster 2015 PDF Download
- DiversityMobile Poster DE 2015 PDF Download
- DiversityMobile Poster TDWG 2014 PDF Download
- Diversity Workbench Poster TDWG 2 2014 PDF Download
- Diversity Workbench Poster TDWG 1 2014 PDF Download
- DiversityMobile Poster GIÖ 2014 PDF Download

# DWB – Dokumentation online

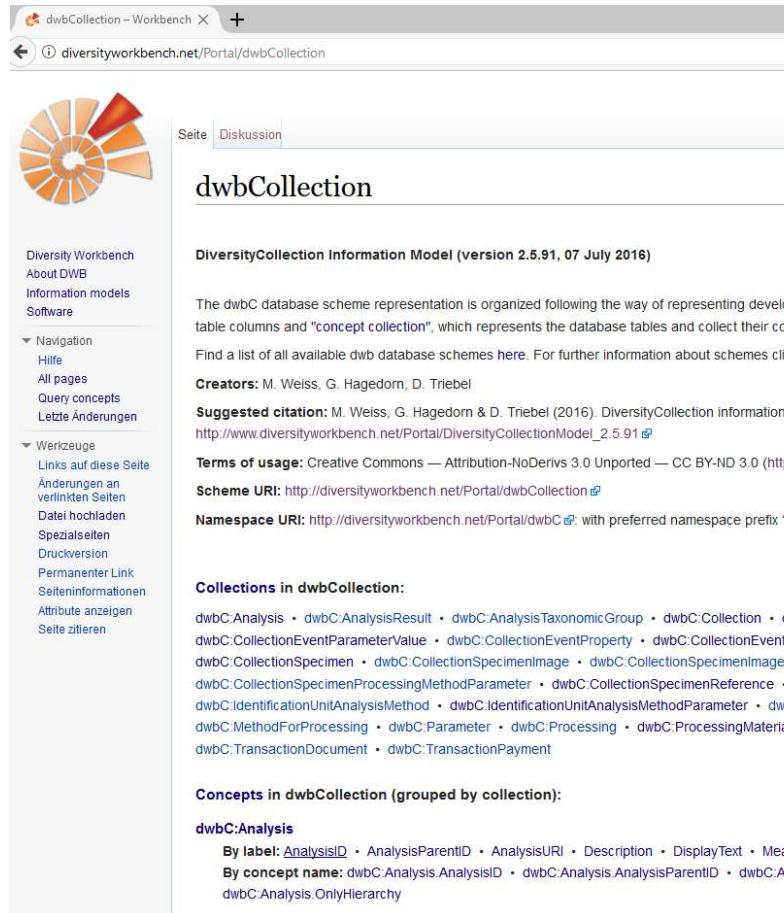
- Technische Dokumentation

Technical documentation for the core applications and rich clients

<b>Name of the database framework</b>	Diversity Workbench (DWB)
<b>DWB contact persons</b>	T. Weibulat, D. Triebel at the SNSB IT Center <a href="#">↗</a>
<b>Operating system server</b>	MS Windows Server 2008 R2, 2012 R2
<b>Database system</b>	MS SQL-Server 2008 R2 to <a href="#">MS SQL-Server 2014 ↗</a>
<b>Clients</b>	C# desktop applications (local clients) (and web APIs for various projects)
<b>Operating system local clients</b>	MS Windows XP (not recommended), MS Windows 7 to MS Windows 10
<b>GIS functionalities</b>	<a href="#">GIS-Editor</a> , management of geometry and geography data
<b>GUIs for data import</b>	Import-Wizards, txt, CSV, xml in various schemes, xml/xslt, shapes in ESRI-Format
<b>GUIs for data export/ reports</b>	Export-Wizards, txt, CSV, xml in various schemes, xml/xslt, shapes in ESRI-Format
<b>GUI language</b>	default: english (multilingual through translation tables)
<b>Open access</b>	DWB software download
<b>Open source</b>	<a href="#">DWB SVN code repository ↗</a> , <a href="#">DiversityMobile GitHub repository ↗</a>
<b>Licenses</b>	GPL v.2
<b>Information models online</b>	<a href="#">DWB data models</a>
<b>State of development</b>	since 1999, ongoing
<b>Code language, developer platform</b>	C#, .Net Framework 3.5
<b>User manuals</b>	under <a href="#">DWB user manuals</a> and with the download of the respective applications in the DWB Wiki
<b>Training</b>	<a href="#">DWB workshops ↗</a> for users and database administrators since 2007

# DWB – Dokumentation online

- ER Diagramme and db Schemata



**dwbCollection**

**DiversityCollection Information Model (version 2.5.91, 07 July 2016)**

The dwbC database scheme representation is organized following the way of representing developer table columns and "concept collection", which represents the database tables and collect their column

Find a list of all available dwb database schemes here. For further information about schemes click [here](#)

**Creators:** M. Weiss, G. Hagedorn, D. Triebel

**Suggested citation:** M. Weiss, G. Hagedorn & D. Triebel (2016). DiversityCollection information model. [http://www.diversityworkbench.net/Portal/DiversityCollectionModel\\_2.5.91](http://www.diversityworkbench.net/Portal/DiversityCollectionModel_2.5.91)

**Terms of usage:** Creative Commons — Attribution-NoDerivs 3.0 Unported — CC BY-ND 3.0 (<http://creativecommons.org/licenses/by-nd/3.0/>)

**Scheme URI:** <http://diversityworkbench.net/Portal/dwbCollection>

**Namespace URI:** <http://diversityworkbench.net/Portal/dwbC> with preferred namespace prefix "dwb"

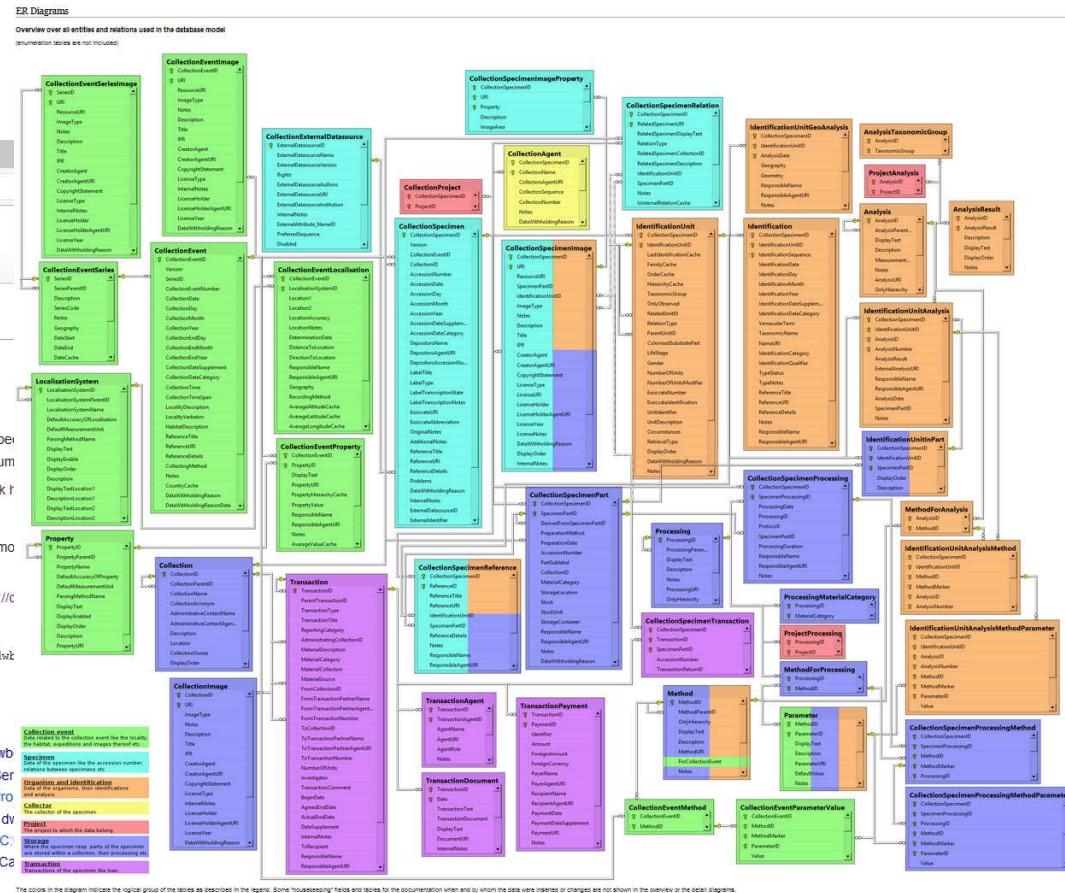
**Collections in dwbCollection:**

- dwbC:Analysis • dwbC:AnalysisResult • dwbC:AnalysisTaxonomicGroup • dwbC:Collection • dwbC:CollectionEventParameterValue • dwbC:CollectionEventProperty • dwbC:CollectionEventSpecimen • dwbC:CollectionSpecimen • dwbC:CollectionSpecimenImage • dwbC:CollectionSpecimenImagePro • dwbC:CollectionSpecimenProcessingMethodParameter • dwbC:CollectionSpecimenReference • dwbC:IdentificationUnitAnalysisMethod • dwbC:IdentificationUnitAnalysisMethodParameter • dwbC:MethodForProcessing • dwbC:Parameter • dwbC:Processing • dwbC:ProcessingMaterialCategory • dwbC:TransactionDocument • dwbC:TransactionPayment

**Concepts in dwbCollection (grouped by collection):**

**dwbC:Analysis**

By label: AnalysisID • AnalysisParentID • AnalysisURI • Description • DisplayText • MeasurementUnit • Notes • OnlyHierarchy  
By concept name: dwbC:Analysis.AnalysisID • dwbC:Analysis.AnalysisParentID • dwbC:Analysis.AnalysisURI • dwbC:Analysis.Description • dwbC:Analysis.DisplayText • dwbC:Analysis.MeasurementUnit • dwbC:Analysis.Notes • dwbC:Analysis.OnlyHierarchy



# DWB – Dokumentation online

- Download von (Client-)Software: offiziell freigegebene Versionen u. Beta-Versionen

## DiversityCollection [edit]

[Hide] [Download the Client software 3.0.8.9 z7I \(zip archive\)](#), 2017/10/25

New features and fixes:

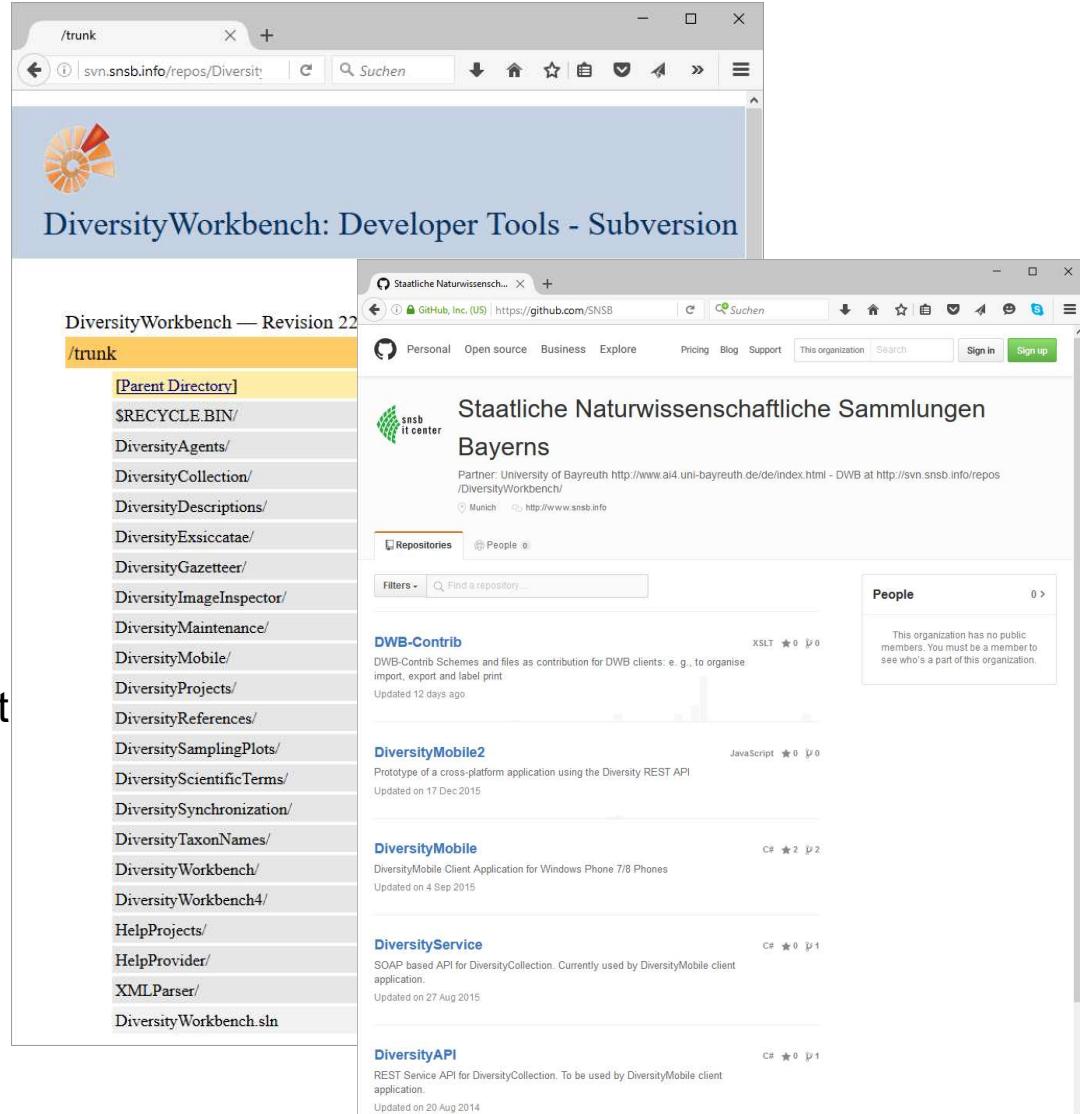
- User can not change password
- Call back if application should be closed
- Non biological taxonomic group (e.g. rock, mineral) connect to DiversityScientificTerms for a name translation
- Show or hide relation details
- Display of subcollection content: Bugfix
- Display of query fields: Bugfix
- Adding external identifiers to references
- Administration of Data withholding for the collection date: Bugfixes
- Labelprint: TransactionTitle added
- Labelprint Bugfix: rank subsp. was not detected, infos from DiversityTaxonNames included, transaction date
- Extension of remote sources with projects [OK](#) [Manual: Customize - Settings \(D. Triebel\)](#)
- Identification: bugfix when inserting default identifier URL without identifier [OK](#)
- Setting the resources directory (Administration - Resources directory) [OK](#) ([P. Grobe](#)); [Manual: Customizing the DWB Workbench](#)
- TK25 - updated form for getting the coordinates, bugfix
- Distribution maps: Bugfix
- Display of analysis in overview including date and number [OK](#)
- Create stable identifier for whole database [OK](#) ([T. Weibulat](#)); [Manual: Stable identifier](#)
- Links to module entries for local databases - bugfix
- Choosing entry from linked modules via keyboard and space key [OK](#) ([A. Rosenbauer](#)), [Manual: Module selection](#)
- Analysis administration: several columns for query added [OK](#)
- Stock - removing enabled [OK](#) ([D. Neumann](#))
- Setting timeout for database updates for Postgres only [OK](#) [Manual: Cache database packages \[?\]](#)
- Showing processing ID in interface [OK](#)

The screenshot shows a web browser window titled "Software - Workbench" with the URL "diversityworkbench.net/Portal/Software". The page has a sidebar on the left containing a circular logo and a navigation menu with sections like "Diversity Workbench", "About DWB", "Information models", "Software", "Navigation", "Help", "All pages", "Query concepts", "Recent changes", "Tools", "What links here", "Related changes", "Upload file", "Special pages", "Permanent link", "Page information", "Browse properties", "Cite this page", and "Print/export". The main content area is titled "Software" and includes sections for "Contents [show]", "Technical documentation at a glance [edit]", "General Download Notes [edit]", "How to create a personal local DWB environment [edit]", and "Diversity Workbench core applications, databases and rich clients [edit]". The "Diversity Workbench core applications, databases and rich clients" section lists various software releases with their last versions: DiversityAgents, DiversityCollection, DiversityDescriptions, DiversityExsiccatae, DiversityGazetteers, DiversityGisEditor, DiversityImageInspector, DiversityMobile, DiversityProjects, DiversityReferences, DiversityResources, DiversitySamplingPlots, DiversityScientificTerms, and DiversityTaxonNames. A note at the bottom says "For downloads of beta versions check [DWB clients for beta testing](#)".

# DWB-Entwickler und DWB-Open Source Code

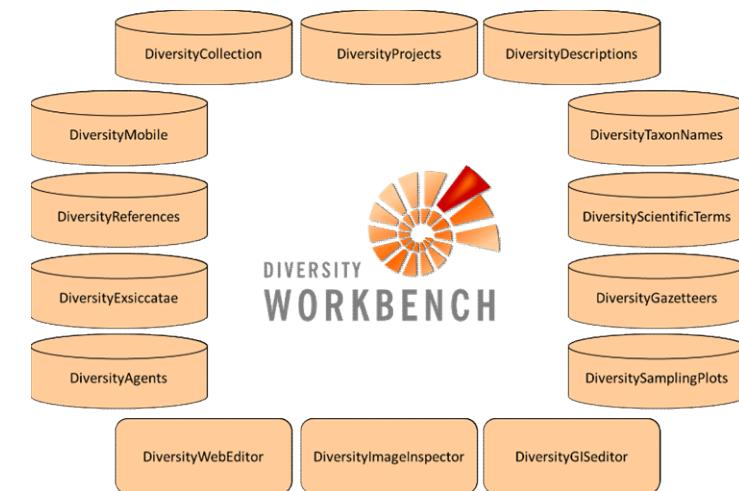
z. Zt. 4 DWB Entwickler an den SNSB

- Quellcode in 2 Code-Repositorien
- Quellcode-Zeilen >1.6 Mill.  
(in 3.224 Quellcode-Dateien)  
*(Status 10.2017)*
- Angepasste Services werden derzeit an der UBT, SMNK und ZFMK entwickelt



# Anzahl der DWB-Anwender mit DB-Installationen (soweit bekannt)

- Installationen an den SNSB inkl. ZSM  
(diverse VM und Instanzen; inkl. Datenbank(DB)-Hosting  
für rund 25 Partnerorganisationen; v.a. Universitäten) z. Zt. 200 Anwender
- Installationen am ZFMK z. Zt. 50 Anwender
- Installationen am SMNK z. Zt. 20 Anwender
- Installationen am SMNS z. Zt. 25 Anwender
- Weitere Installationen ? > 50 Anwender



# DFG und GFBio: DWB empfohlen

The screenshot shows the GFBio website home page. At the top is a navigation bar with links for About, Data, Training, Support, News, Contact, and Sign In. Below the navigation is the GFBio logo and the text "Research Data Management Step by step through the Data Life Cycle." A "GET MORE INFORMATION" button is visible. The main content area features four icons: "Submit" (cloud with arrow), "Search" (telescope), "Manage" (gears), and "Workbenches" (pencil and ruler). Below these are two sections: "WHAT WE DO" and "WELCOME TO GFBIO.ORG!". The "WHAT WE DO" section contains text about supporting scientists in all aspects of research data management. The "WELCOME TO GFBIO.ORG!" section contains text about the German Federation for Biological Data (GFBio) and its mission.

The screenshot shows the GFBio website's "Tools & Workbenches" page. The header includes the GFBio logo and navigation links for About, Data, Training, Support, News, Contact, and Sign In. The main content area is titled "Tools & Workbenches" and discusses GFBio's support for data producers in DFG projects. It mentions the BexIS 2 and Diversity Workbench (DWB) platforms. A blue arrow points to the "DWB" link. The page also features sections for the "GFBio Consortium", "Want to know more?", "Contact us!", and "Sign up". At the bottom, there are links for "Search", "Submit", "Manage", and "Tools", along with social media icons for email, Facebook, Twitter, and GitHub.

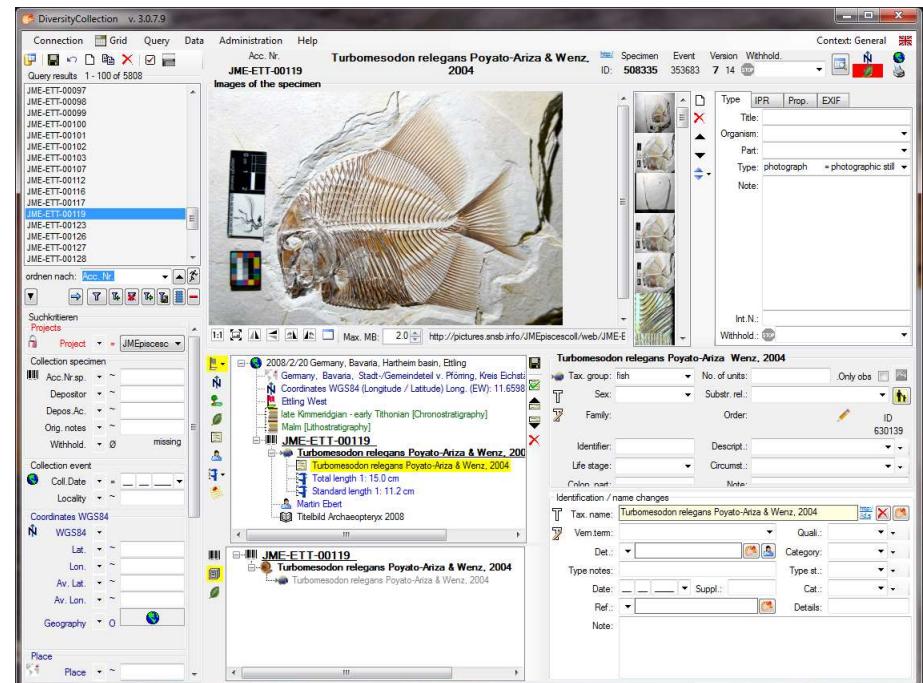
# Diversity Workbench – Schnittstellen zum Datenmanagement

The screenshot displays four windows from the Diversity Workbench:

- DiversityCollection v. 3.0.3.6**: A database browser showing collection events. A search result for "SAPM-MA-00136" is selected, showing details like Acc No., Collection date, and Locality.
- DiversityScientificTerms v. 3.0.0.0**: A terminology browser showing terms like "Bryophyta", "DiversityAgents v. 3.0.0.3", and "Induan".
- DiversityAgents v. 3.0.0.3**: An agent editor for "Hertel, Hannes, Prof. Dr." (ID: 12732). It shows fields for Given name, Postfix, Prefix, Inherited name, Abbreviation, Type, Gender, and Role.
- DiversityTaxonNames, Database: DiversityTaxonNames\_Fungi v. 3.0.1.5**: A taxon editor for "Biatora sylvana Körb." (ID: 1036334). It includes tabs for Taxon, Taxonomic name, Nomenclature, Taxonomic reference / Protologue, Typification, and Synonyms.

# DiversityCollection (DC)

- Management von Beobachtungs- und Sammlungsdaten
  - Beobachtungs-Ereignisse, Expeditionen
  - Identifikation von Objekten
  - Administration von Objekttransfer (Ausleihe, Inventarisierung)
  - Präparation und Lagerung von Objekten
  - Experimente und Analysen
  - Verwaltung von Multimediaobjekten
- Druckoptionen: Reports, Labels
- Generation of distribution maps



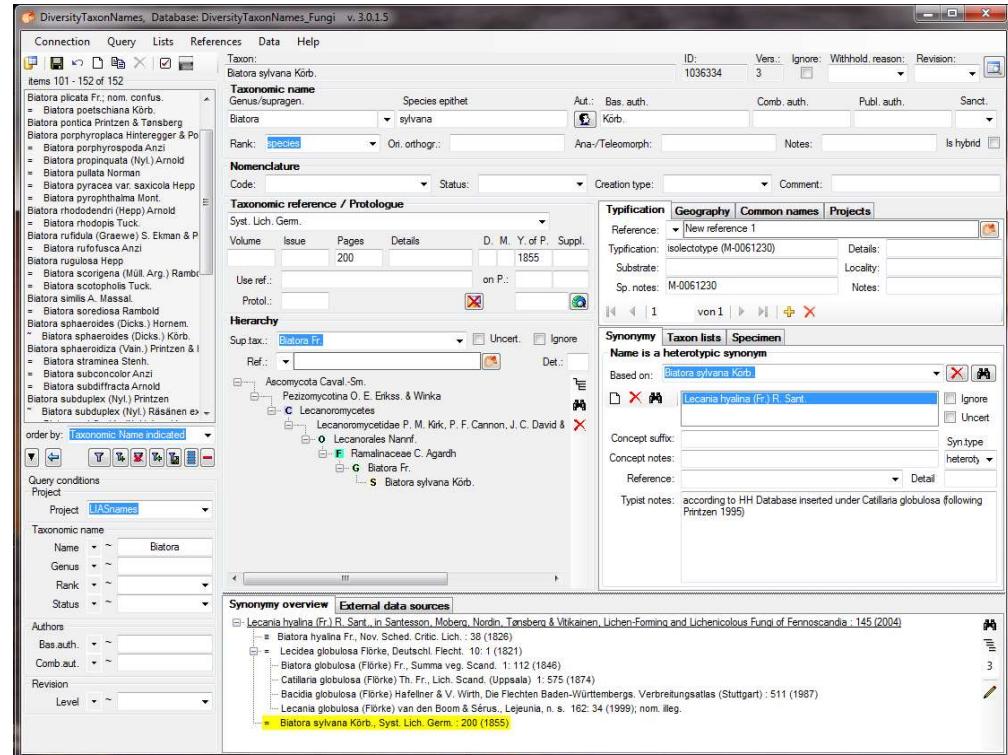
# Browser-basierte Schnittstellen mit DC-Daten, z. T. dynamischer Datenfluss

The figure displays three separate browser windows showing different types of data interfaces:

- GBIF.org Data Publisher - Staatliche Naturwissenschaftliche Sammlungen Bayerns:** A screenshot of a GBIF.org interface for the State Collection of Bavaria. It shows a thumbnail of a herbarium specimen, a "View Larger" button, and download options for PDF and other formats.
- BiNHum Portal - Bayernflora:** A screenshot of the BiNHum Portal showing a map of Germany with data points. The map includes a legend for collection numbers (19-49) and a scale from 54 to 58. The URL in the address bar is [www.binhum.net/?fq=institution%3A'M'&fq=country%3A'Afghanistan'](http://www.binhum.net/?fq=institution%3A'M'&fq=country%3A'Afghanistan').
- GFBio website - home:** A screenshot of the GFBio website showing a world map with data distribution. Below the map is a search bar and a list of occurrence records for *Gagea villosa* (M. Bieb.) Sweet. The first record is: "Gagea villosa (M. Bieb.) Sweet, a human observation record of the 'Occurrence Data of Vascular Plants collected or compiled for the Flora of Bavaria' dataset [ID: 328501962489]. Data Center: Data Center SNSB Summary: http://wiki.bayernflora.de/web/Flora\_of\_Bavaria\_%E2%94%80\_occurrence\_data\_online".

# DiversityTaxonNames (DTN)

- Management von taxonomischen Namen, verknüpfter Information
- Management von Synonymen, akzeptierten Namen, Klassifikationen, Typifizierung und Volksnamen
- Erstellung von Taxonreferenzlisten, Checklisten mit z. B. geographischen, naturräumlichen oder Naturschutzkategorien



# Webdienste – DiversityTaxonNames

- Eine Reihe von DTN-Installationen am SNSB IT-Zentrum: intern und auf TNT Server „DWB Cloud“ stellen Inhalte bereit
- Inhalte über Web Services und GUIs bereitgestellt



**DTN taxon lists - Fungi and Lichens, Fungal-like organisms**

List title	List code	Taxonomic or biotic group	Region	Taxon names below genus level (number)	Synonyms (number); Higher classification above subgenus/genus level (+/-)	Vernacular names : DE (number)	List curator(s)	Organisation(s) and/or project(s) supporting curation activities	Publications
About "Taxon list of fungi and fungal-like organisms from Germany compiled by the DGfM"	TaxRef_DGfM_Fungi_DE (1140)	Fungi (including lichens, downy mildews and myxomycetes)	Germany	29.680	11.766; +	3.664	Frank Dämmrich	DGM	Index Fungorum online; Kirk et al. (2008); MycoBank online
Taxon list of Pucciniales from Germany compiled in the context of the GBOL project	TaxRef_GBOL_Pucciniales_DE	Pucciniales	Germany				Dr. Markus Scholler	SMNK; GBOL	Kirk et al. (2008); Scholler et al. (2011)
Taxon list of lichenicolous fungi from Germany compiled in the context of the LIAS project	TaxRef_LIAS_LichFungi_DE	Lichen-associated fungi	Germany	826		4	Wolfgang von Brackel, Dr. Dagmar Triebel, Dr. Konstanze Bensch	SNSB-BSM; LIAS	Wirth et al. 2011; LIASnames

**Regionalised and Domain-specific Taxon Lists**

The DWB REST Webservice for Taxon Lists is part of a Diversity Workbench (DWB) services network. It is delivering basic information on taxon names in use, synonyms, classification and German vernacular names of a number of groups of animals, fungi and plants.

The current focus is on domain-specific lists (checklists, taxon reference lists, red lists) from Germany under active curation by experts on taxonomy or floristics and faunistics. Each regionalised and domain-specific taxon list has its own history and objectives, is managed completely separately and has its own hierarchical classification. The DiversityTaxonNames (DTN) data resources accessed by the REST API may include additional taxon-related data useful, e.g., for regional nature conservation agencies and environmental projects. This information might be mobilised in a next step.

For more information please refer to [DTN\\_Taxon\\_Lists\\_Services](#)

**Regionalisierte und domän-spezifische Taxonlisten**

Der DWB REST Webservice für Taxon Lists ist Teil eines Netzwerkes aus Diversity Workbench (DWB) Diensten. Er liefert Basisinformation zu anerkannten Taxonnamen, Synonymen, Klassifikationen und deutsche Volksnamen für eine Anzahl von Tier-, Pilz- und Pflanzengruppen.

# Browser-basierte Schnittstellen mit DTN-Daten, z.T. dynamischer Datenfluss

The screenshot displays three overlapping browser windows illustrating dynamic data interfaces:

- GBIF Global Biodiversity Information Facility**: Shows a checklist dataset for fungi and fungal-like organisms from Germany.
- LIAS names**: A database for Lichens, Lichenicolous Fungi, and Non-Lichenized Ascomycetes. It includes a search interface for species names like "Lecano".
- Catalogue of Life**: Indexing the world's known species. It shows a detailed view of the LIAS database, including its full name, abbreviations, and various statistics such as the number of living species (9,614), infraspecific taxa (216), and extinct species (0).

Global Species Database

# DTN Taxon Lists REST Web Service connected to the GFBio Terminology Server



## Regionalised and Domain-specific Taxon Lists

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For more information please refer to DTN\_Taxon\_Lists\_Services



Home    Content    Developer Section    Tools    About

## CONTENT / EXTERNAL SERVICES

### Web services connected to the Terminology Server

The following services have been integrated into the search API:

- The Catalogue of Life: <http://cybertaxonomy.eu/cdmlib/rest-api-name-catalogue.html>
- The Integrated Taxonomic Information System (ITIS): [http://www.itis.gov/web\\_service.html](http://www.itis.gov/web_service.html)
- The World Register of Marine Species (WoRMS): <http://www.marinespecies.org/aphia.php?p=webservice>
- Fauna Europaea via PESI: <http://www.eu-nomen.eu/pesi/about-pesi>
- The GeoNames geographical database (Geonames): <http://www.geonames.org/export/web-services.html>
- The DWB REST Webservice for Taxon Lists (DTNtaxonlists): <http://services.snsb.info/DTNtaxonlists/rest/v0.1/static/api-doc.html>
- The Prokaryotic Nomenclature Up-to-Date Taxon list (PNU): <http://bacdive.dsmz.de/api/pnu/>

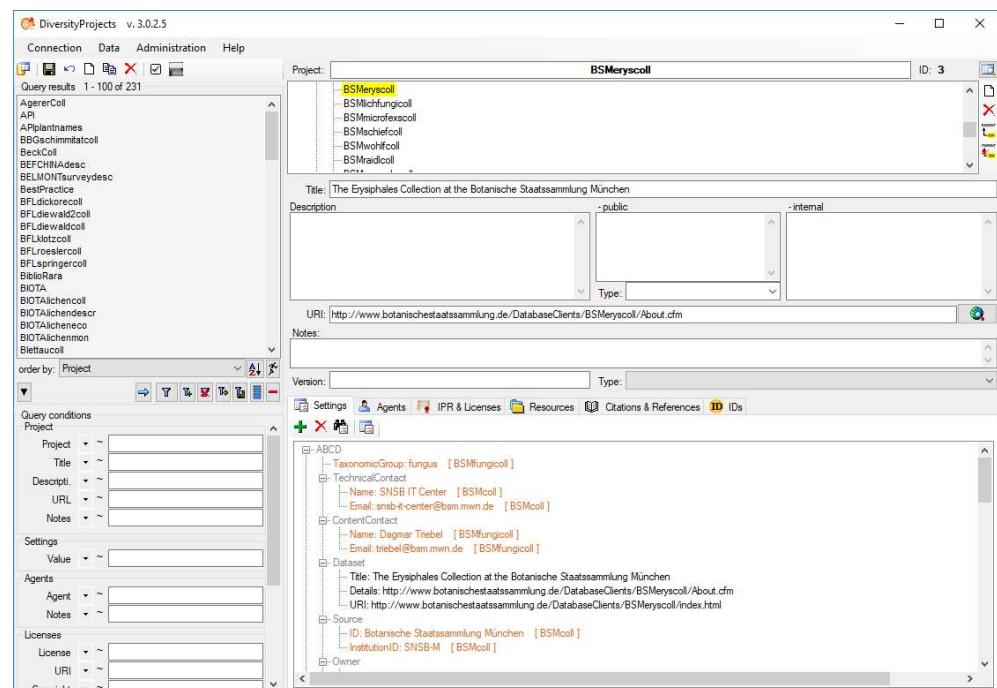


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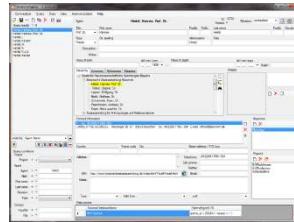
Imprint

# DiversityProjects (DP)

- Management von Datenpaketen, Datensammlungen und Datenprojekten, verknüpfte Information, wie Titel, Lizenzen, Projekt-Mitarbeiter und Verantwortliche
- Management von Projekthierarchien, Projekt-Settings, Identifiers, e. g. URLs und DOIs
- Erstellung von Exportroutinen zur Publikation von Datenpaketen mit Zitaten, Zusammenfassungen, etc.

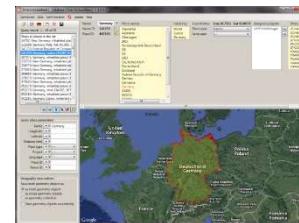


# Terminologien, Referenzen, Vokabularien.....



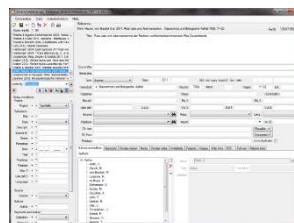
## DiversityAgents

Management von Personen und Organisationen



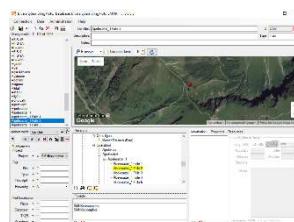
## DiversityGazetteers

Management von geographischen Thesauri, oft mit Ortsbeschreibung und GIS Information



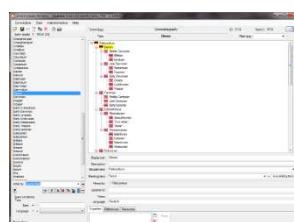
## DiversityReferences

Management von Literaturreferenzen und Literaturdokumenten



## DiversitySamplingPlots

Management von Beobachtungsgebieten und Untersuchungsflächen als Geoobjekte, oft mit GIS Information und Hierarchien

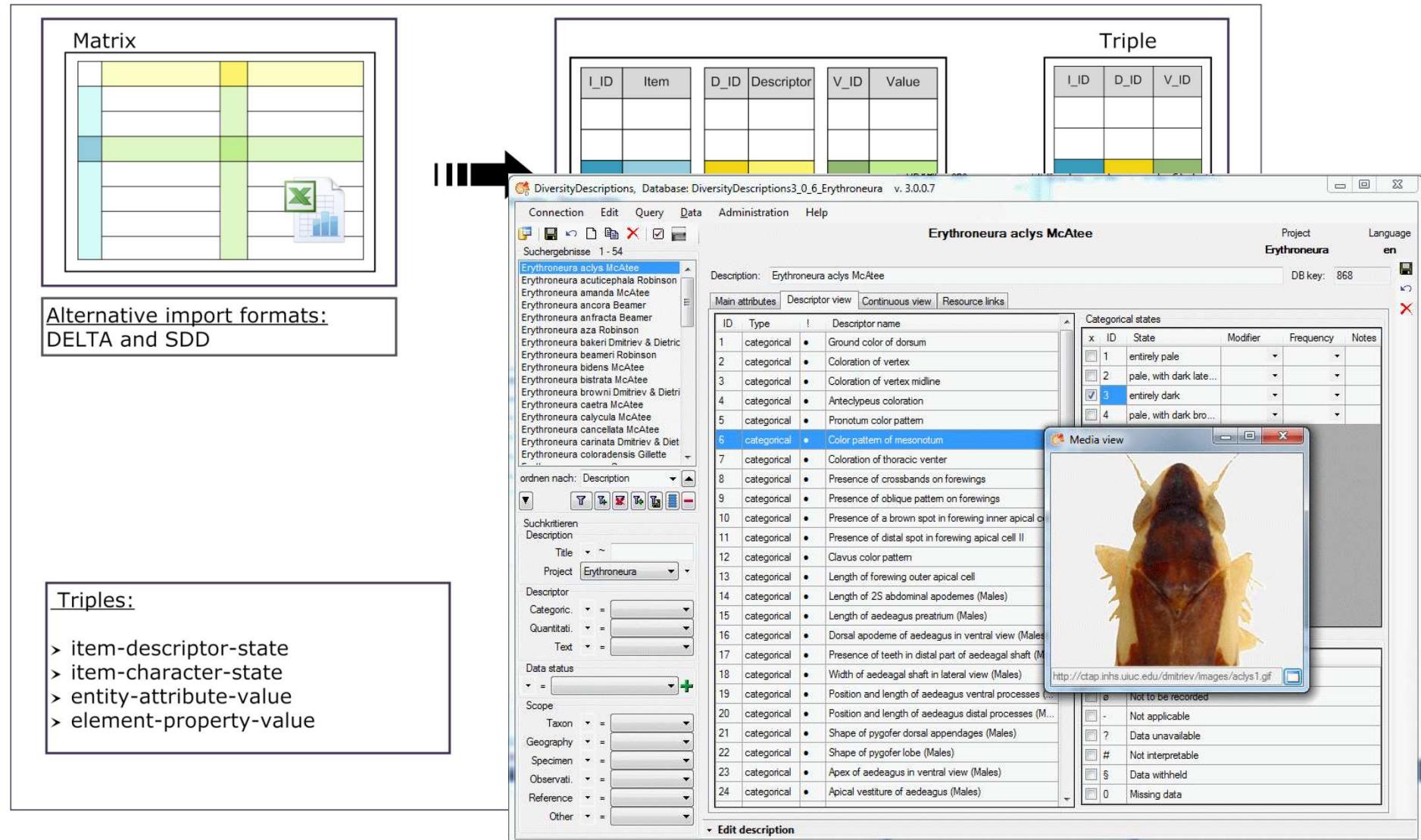


## DiversityScientificTerms

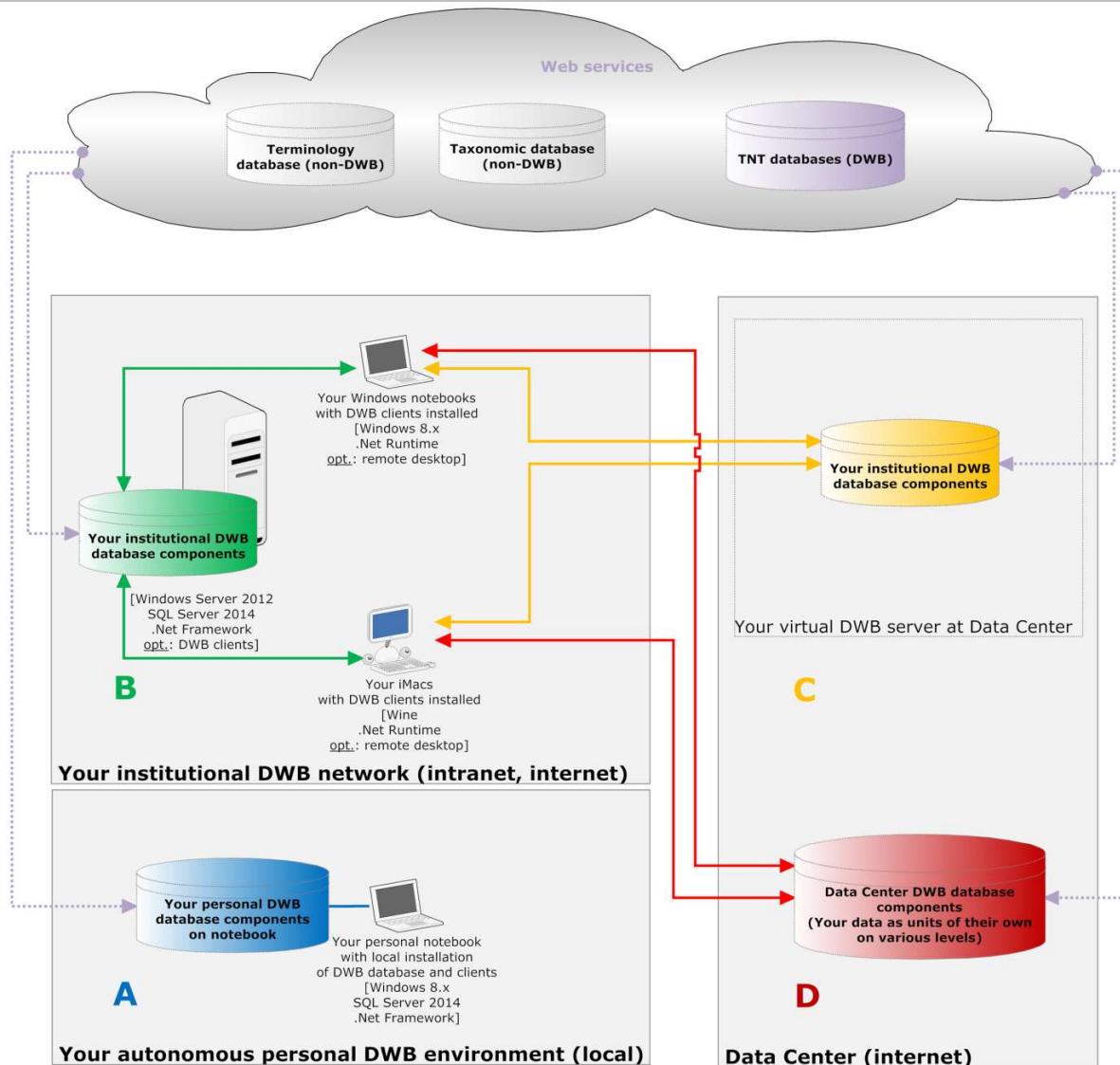
Management von Ontologien, Terminologien, Vokabularien ohne GIS Bezug, mit Hierarchien

# Datenmanagement

## Matrixdaten → DiversityDescriptions



# DWB – Alternativen der Installation



# SNSB IT Center

The screenshot shows a web browser window displaying the 'People' page of the SNSB IT Center website. The page has a green header bar with navigation links: HOME, ABOUT US, PEOPLE, SERVICES, and WORKSHOPS. Below the header, there is a large green graphic of a 3D grid cube. To the left of the grid is the 'snsb it center' logo. On the right side of the grid, there is a list of staff members under the heading 'People'. Below this section is another heading 'Former staff' with a list of former employees. The footer of the page includes the 'staatliche naturwissenschaftliche sammlungen bayerns' logo and a link to the homepage.

contact imprint disclaimer webmaster

**People**

<a href="#">Dr. Dagmar Triebel</a>	Head
<a href="#">Dr. Konstanze Bensch *</a>	Research Scientist
<a href="#">Wolfgang Diewald *</a>	Data Scientist and Research Assistant
<a href="#">Iris Leininger *</a>	Data Scientist and Research Assistant
<a href="#">Anton Link</a>	Software Developer and Database Administrator
<a href="#">Dieter Neubacher *</a>	System Administrator and Software Developer
<a href="#">Wolfgang Reichert *</a>	Software Developer
<a href="#">Marcel Ruff *</a>	Data Scientist and Research Assistant
<a href="#">Veronica Sanz *</a>	Data Scientist and Research Assistant
<a href="#">Dr. Stefan Seifert *</a>	System Administrator and Software Developer
<a href="#">Tanja Weibulat *</a>	Data Scientist and Research Assistant
<a href="#">Dr. Markus Weiss</a>	Software Developer

**Former staff**

Wolfgang Ahlmer	Data Scientist and Research Assistant
Jan Ingenhaag	Research Assistant, Web Application Developer
Manfred Knick	System Administrator and Software Developer
Asif Rashid Lakehsar	Software Developer
Dr. Andreas Plank	Research Scientist and Software Developer
Georg Rollinger	Software Developer
Wiltrud Spiesberger	Research Assistant, Web Application Developer

# DWB Workshop am 26. Oktober 2017



[http://www.snsb.info/SNSBInfoOpenWiki/Wiki.jsp?page=DivWorkbenchWorkshop\\_33](http://www.snsb.info/SNSBInfoOpenWiki/Wiki.jsp?page=DivWorkbenchWorkshop_33)