

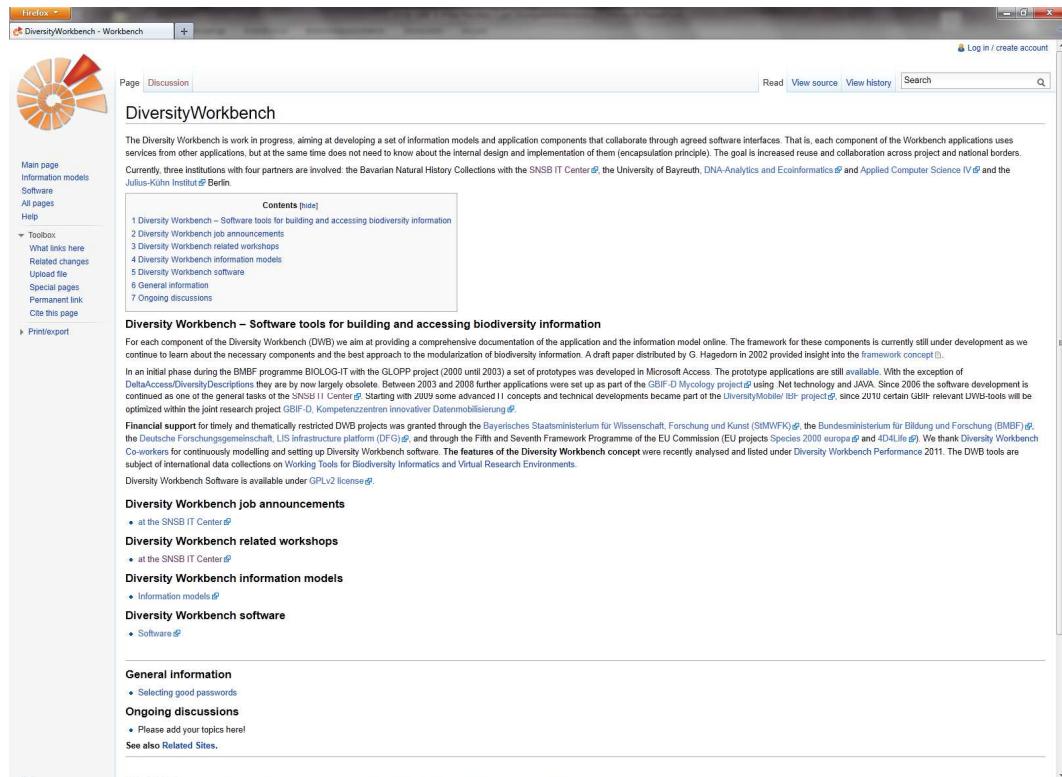
The Concept of the Diversity Workbench

Dagmar Triebel

Diversity Workbench Initiative

- Cooperation since 1999
- 4 editors, 5 software developers
- 3 institutions involved
- Download Center

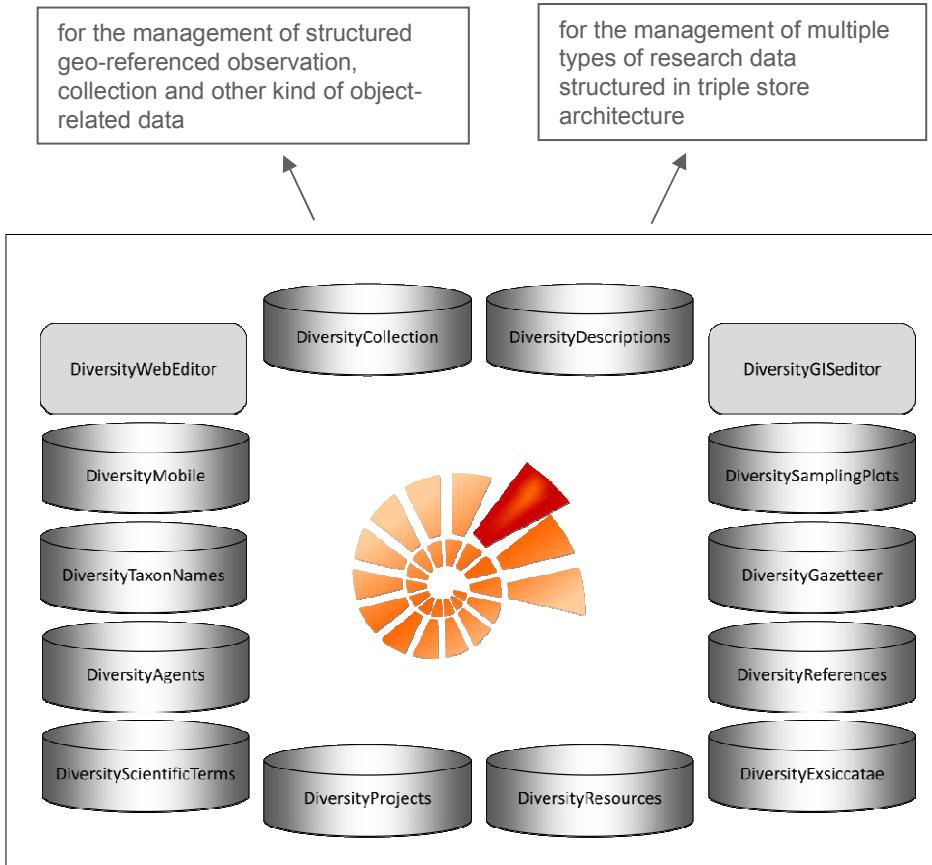
Software under GPL License



The screenshot shows a Firefox browser window displaying the 'DiversityWorkbench - Workbench' website. The page title is 'DiversityWorkbench'. The main content area contains several sections: 'DiversityWorkbench', 'Diversity Workbench – Software tools for building and accessing biodiversity information', 'Diversity Workbench job announcements', 'Diversity Workbench related workshops', 'Diversity Workbench information models', 'Diversity Workbench software', 'General information', and 'Ongoing discussions'. On the left side, there is a sidebar with links such as 'Main page', 'Information models', 'Software', 'All pages', 'Help', 'Toolbox', 'What links here', 'Related changes', 'Upload file', 'Special pages', 'Permanent link', 'Cite this page', and 'Print/export'. At the top right, there are links for 'Log in / create account', 'Read', 'View source', 'View history', and 'Search'. The overall layout is a standard wiki-style page with a sidebar on the left.

Diversity Workbench Framework

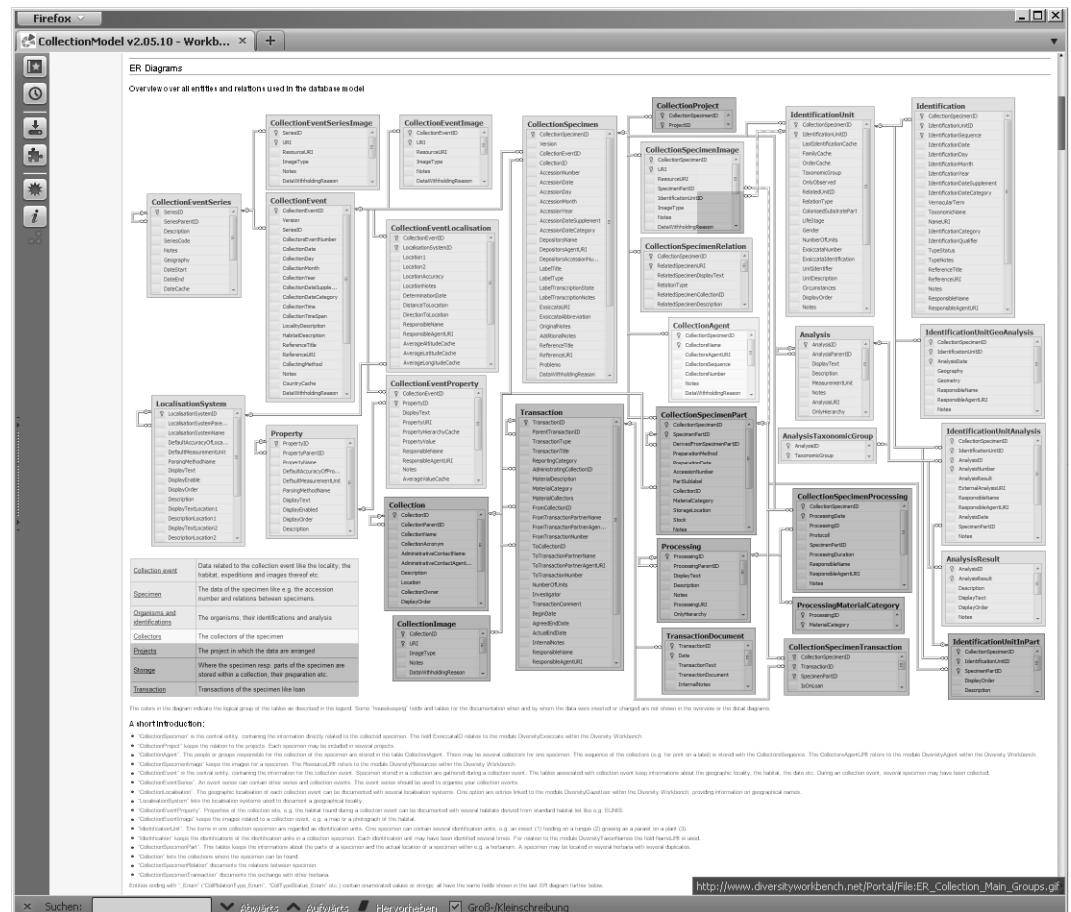
- Modeling (ER diagrams)
and implementation (since 2002 in C#)
 - Components (‘Moduls’)
 - * Tables
 - * Data elements/ attributes
 - * Rich clients and web clients
 - * Source code lines
(in 1.789 source code files) (*Status 1.2014)
 - Since 2007 User Workshops
 - Participants
 - Institutions
- 14
~ 250
~ 4.200
27
1.126.074
28
~ 270
>55



DWB – ER Diagrams

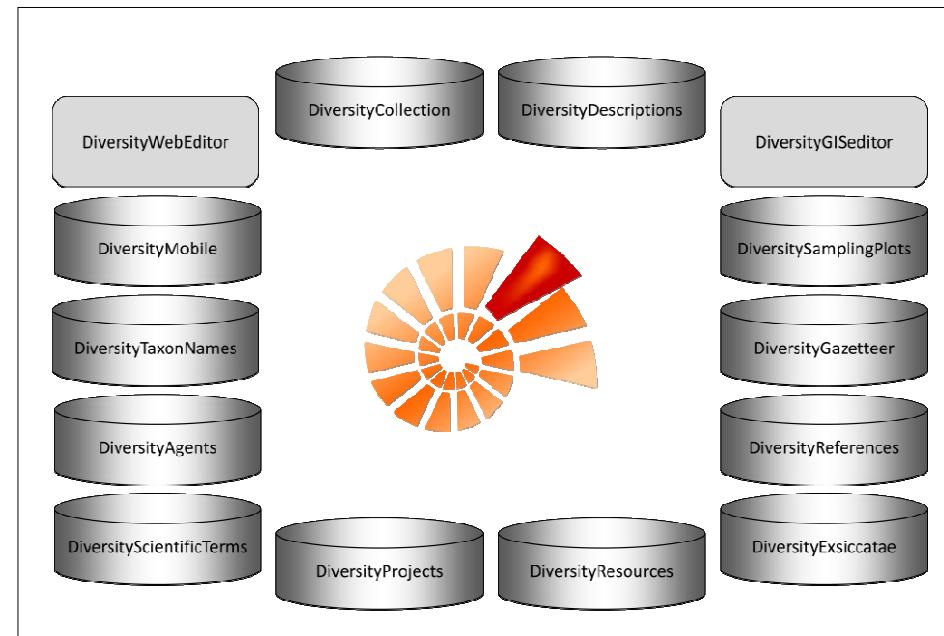
- Publication of DWB information models under Creative Commons License

www.diversityworkbench.net



DWB Design

- Business Solution
- Interoperability
- Framework for Diversity Research
- Focus on biological disciplines
 - Biodiversity research (collections incl. culture collections, DNA and environmental samples)
 - Taxonomy
 - Floristics and Faunistics, Phytosociology
 - Molecular ecology
 - Ecophysiology
- Management of data records and vocabularies for all organismic groups



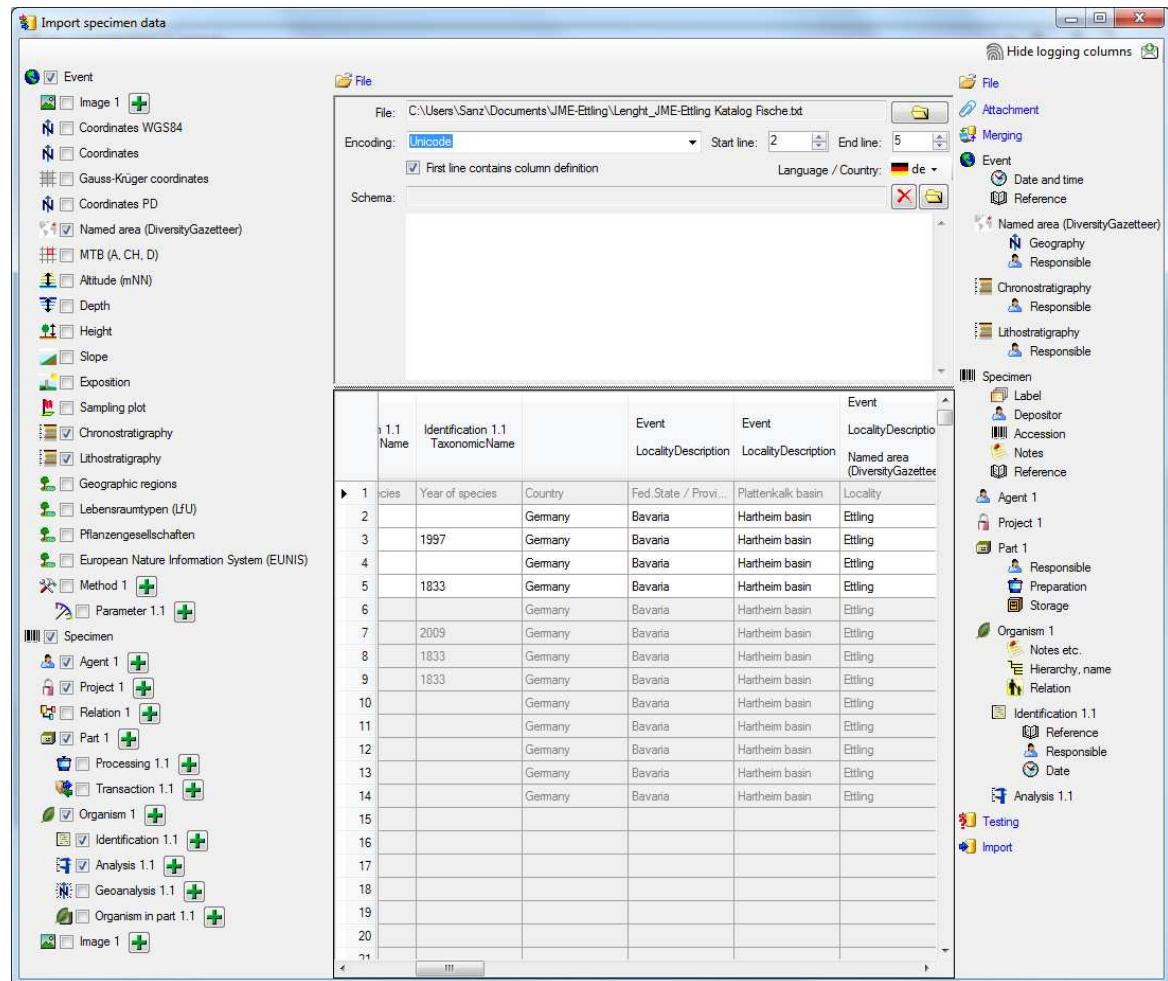
Diversity Workbench – Rich Clients

The screenshot displays four windows from the Diversity Workbench:

- DiversityCollection v. 3.0.3.6**: Shows a list of collection events and specimens. A specimen image of *Ceratotherium simum* (Duchell., 1817) is shown.
- DiversityScientificTerms v. 3.0.0.0**: A terminology browser showing terms like "Induan".
- DiversityAgents v. 3.0.0.3**: An agent editor for "Hertel, Hannes, Prof. Dr.".
- DiversityTaxonNames, Database: DiversityTaxonNames_Fungi v. 3.0.1.5**: A taxon name editor for *Biatora sylvana* Körb. It includes a synonym overview and external data sources.

DWB Import and Export Wizards

- freely configurable interfaces for data exchange
- under development



Management of Descriptive Data

DiversityDescriptions DD

- triple store architecture: **item (taxon, object, measurement event) – descriptor (character, trait, variable, factor) – value**
- generalised information structure
- appropriate for various types of biodiversity research data, e.g. trait data, measurement data, interview data, even molecular data

DiversityDescriptions – Trait Data

Screenshot of the DiversityDescriptions software interface showing trait data for *Erythroneura aclys* McAtee.

The main window displays the following details:

- Project:** Erythroneura
- Language:** en
- DB key:** 868
- Description:** Erythroneura aclys McAtee

The left sidebar shows a search results list for *Erythroneura aclys* McAtee, including various subspecies and authors. The search criteria are set to "Description".

The central area contains a table of "Main attributes" with 24 rows, each with a categorical descriptor name and its type (categorical). The first few rows include:

- ID: 1, Type: categorical, Descriptor name: Ground color of dorsum
- ID: 2, Type: categorical, Descriptor name: Coloration of vertex
- ID: 3, Type: categorical, Descriptor name: Coloration of vertex midline
- ID: 4, Type: categorical, Descriptor name: Anteclypeus coloration
- ID: 5, Type: categorical, Descriptor name: Pronotum color pattern

To the right of the table is a "Categorical states" grid with columns for ID, State, Modifier, Frequency, and Notes. Row 3 is selected, labeled "entirely dark".

A "Media view" window is open, displaying a photograph of a brown insect specimen. Below the image is the URL: <http://ctap.inhs.uiuc.edu/dmitriev/images/aclys1.gif>.

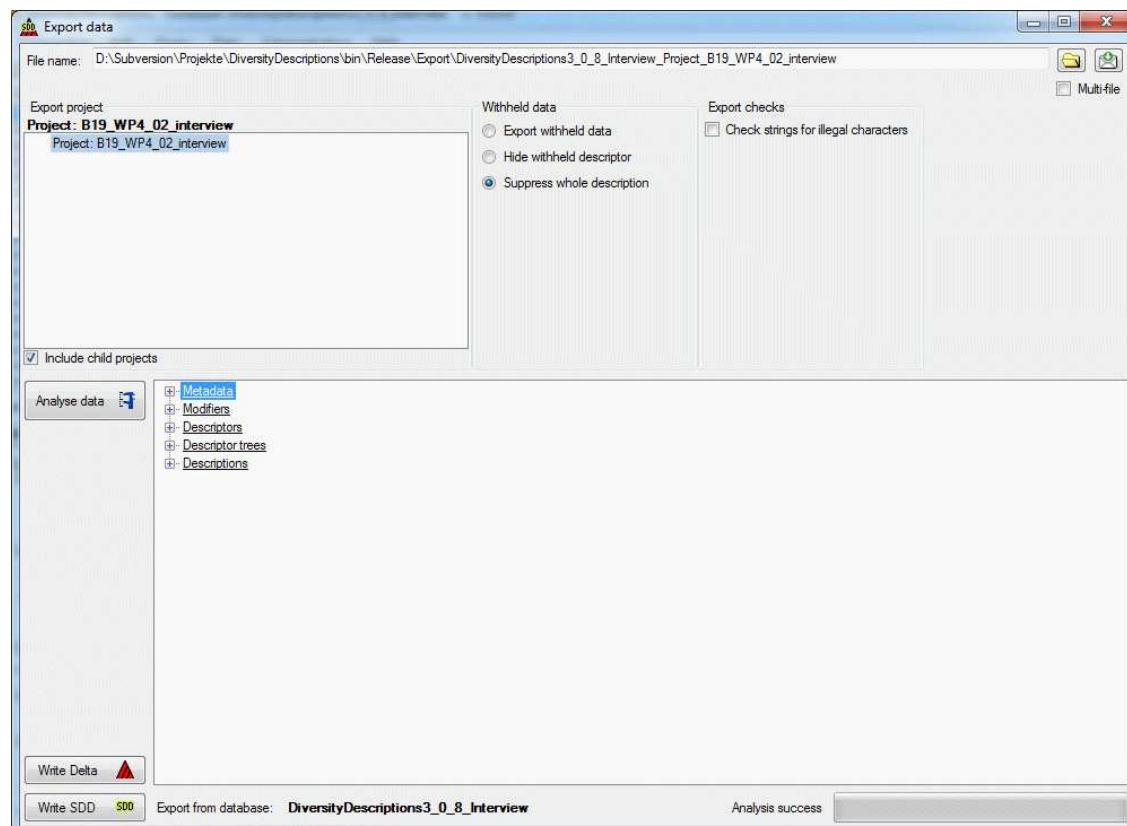
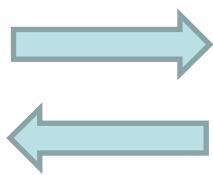
The bottom right corner of the main window shows a legend for data status codes: Not to be recorded, Not applicable, Data unavailable, Not interpretable, Data withheld, and Missing data.

DiversityDescriptions – Import, Export

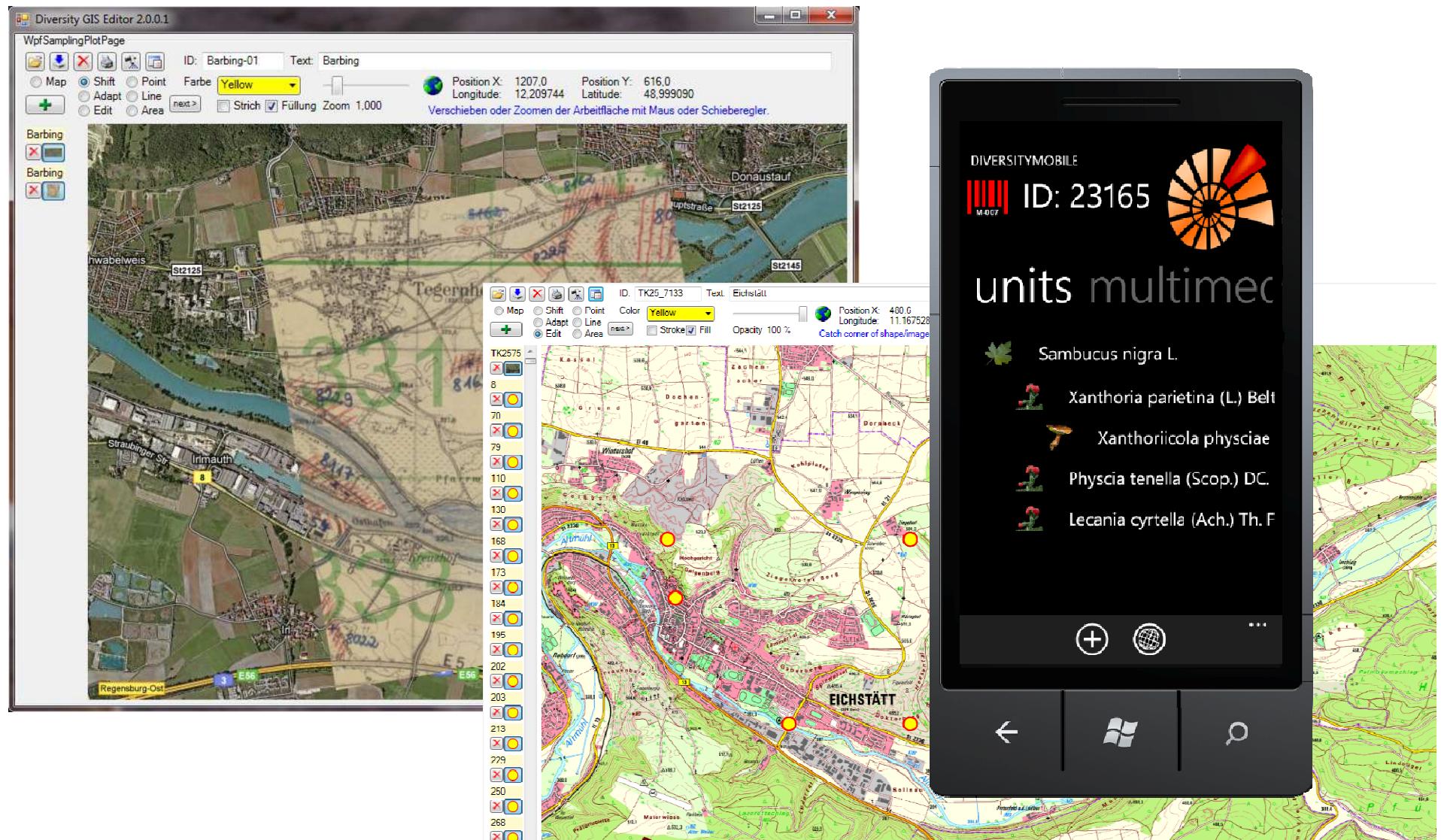
- Data exchange formats

DELTA
and
SDD

Biodiversity
Information
Standards
T D W G



Diversity GIS Editor and DiversityMobile



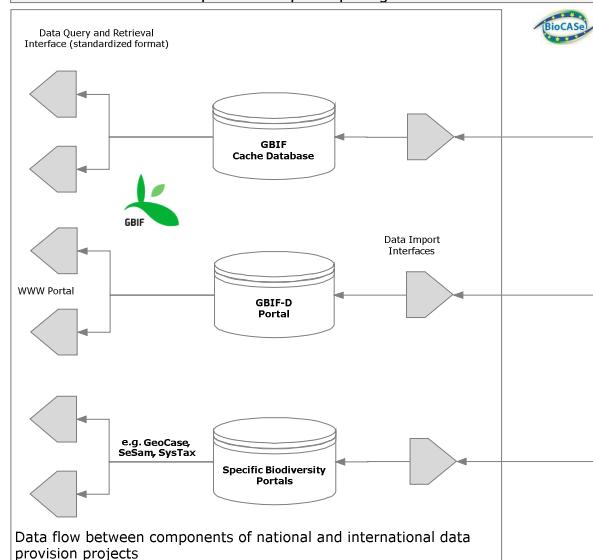
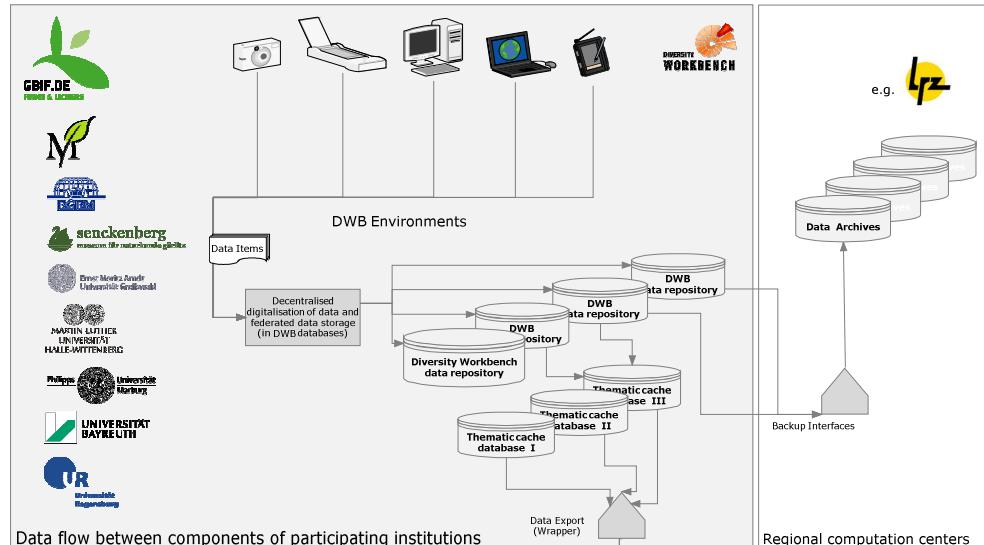
DWB for Processing Image Meta Data



DWB for Organising Data Flows to Web Portals



- Long-time data management as pre-condition for a data flow to national and international portals
- hosting of data for small and medium-sized natural science collections
- realised for ~ 10 institutions in Germany



DWB – Infrastructure for an Ecological Research Project



- „IBF – DiversityMobile“

DWB as system for data
mobilisation and data storage

The screenshot shows a Firefox browser window displaying the main page of the Diversity Mobile Wiki at www.diversitymobile.net/wiki/Main_Page. The page title is "Diversity Mobile". The left sidebar contains a navigation menu with links to "Diversity Mobile", "IBF Project", "News & Events", "Selected Publications", "Links", "Help", and "Contact". Below the menu is a search bar with "Go" and "Search" buttons. A toolbar below the search bar includes links for "What links here", "Related changes", "Special pages", "Printable version", and "Permanent link". The main content area features several images of mobile devices (smartphones and tablets) displaying the Diversity Mobile interface. The text on the page describes the Diversity Mobile Wiki as a platform for information networks in the context of DiversityMobile, mentioning the Diversity Workbench and the DaltOn framework. It notes that the project is currently focused on a DFG-funded project "Setting up an Information Network on Biological Research Data gained in the Field up to the Sustainable Storage in a Primary Data Repository (I-B-F)". Participating institutions include the Staatliche Naturwissenschaftliche Sammlungen Bayerns (SNB IT Center), the University of Bayreuth (Applied Computer Science IV and DNA-Analytics and Econinformatics), and the University of Regensburg (Ecology/Biology). Partners and co-workers are listed under "Contact". The page also links to the "IBF Project" and provides technical repository information for DiversityMobile implementations and DiversityCollection on Tablet PC. A note at the bottom states that Diversity Workbench Software is available for download under GPLv2 license. The DFG logo is present at the bottom of the page.

DWB – Infrastructure for Collections



- „IDES“

DWB for setting up an integrative working environment for zoological and paleontological collections (various object types)

The screenshot shows the IDES project website (ides.snsb.info/wiki/Hauptseite) in a Firefox browser. The page title is "Hauptseite". The left sidebar contains a navigation menu with links to IDES, Teamzusammenfassung, Aktuelles, Publikationen, Links, Kontakte, Intern, Hilfe, Werkzeuge, and a link to the DWD system. The main content area describes the project's goal of integrating data management for zoological and paleontological collections. It mentions the four participating institutions: SNSB, SAPM, BSPG, and ZSM. The text details the project's focus on digitizing collections from the Mesozoic era (Triassic) and beyond, using mobile work stations with innovative imaging facilities. The right side of the page features several small images illustrating various collection types, such as fish skeletons, fossils, and museum displays.

DWB – Infrastructure for a Major Research Project



- „German Barcode of Life“

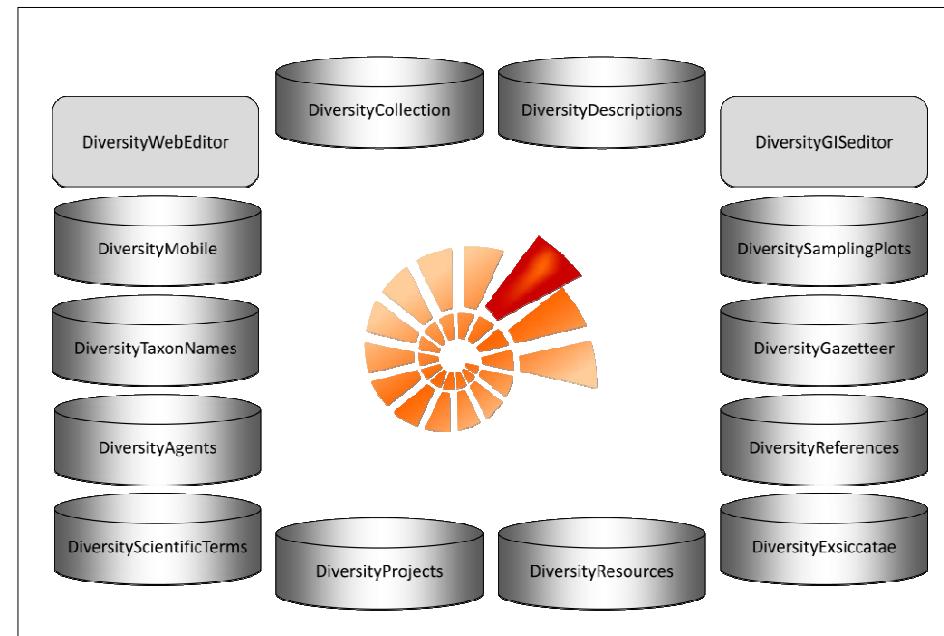
DWB as central database system for field data and final data storage system for all GBOL data (incl. molecular barcodes)

A screenshot of the GBOL website (https://www.bolgermany.de) displayed in a Firefox browser window. The page has a yellow header with the GBOL logo and a DNA double helix icon. Below the header is a large image of a green beetle. A navigation menu at the bottom includes links for "Das Projekt", "DNA-Barcoding", "Das Team", "Mitmachen!", "News & Publikationen", "Links", "Kontakt", and "Experten-Bereich". The main content area features sections on biodiversity, the project, DNA barcoding, the team, and a newsletter. There are also links to register and log in. The footer includes a link to the SNSB IT center.

DWB Services and Scaling

General services

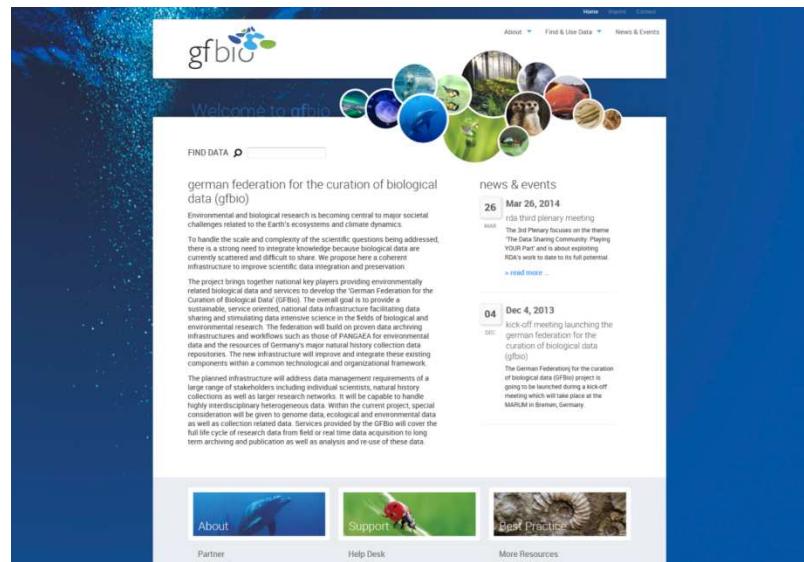
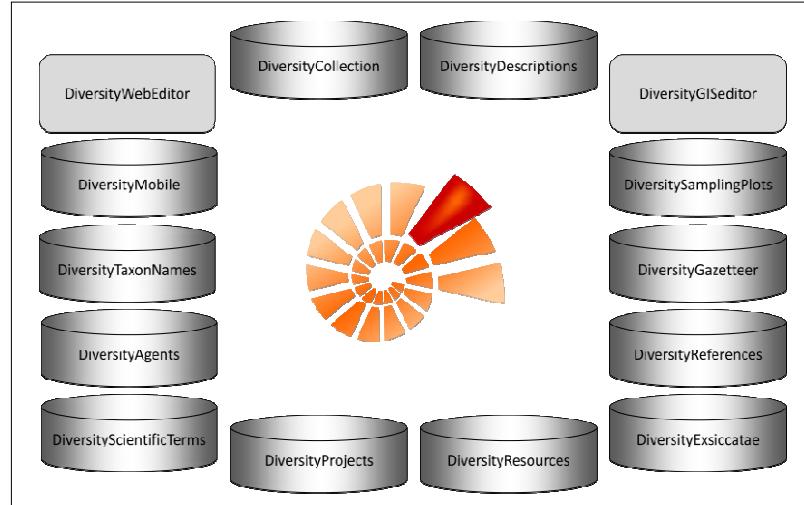
- **Download center**
- Subject-specific and technical **support** for single users and data archives



DWB Services and Scaling

Installations of DWB at a scientific data center offer additional possibilities for services

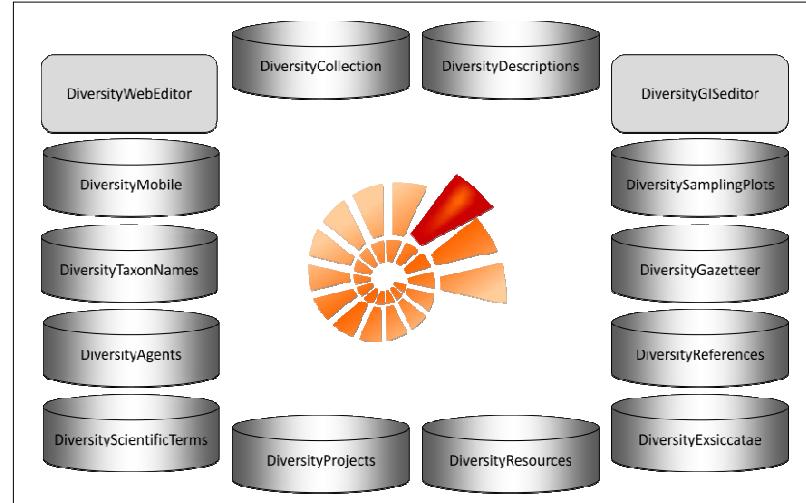
- Integration of small data collections as separate part of the DWB database installations of the data center (with own project management)
- appropriate for small research projects with limited financial resources



DWB Services and Scaling

Installations of DWB at a scientific data center offer additional possibilities for services

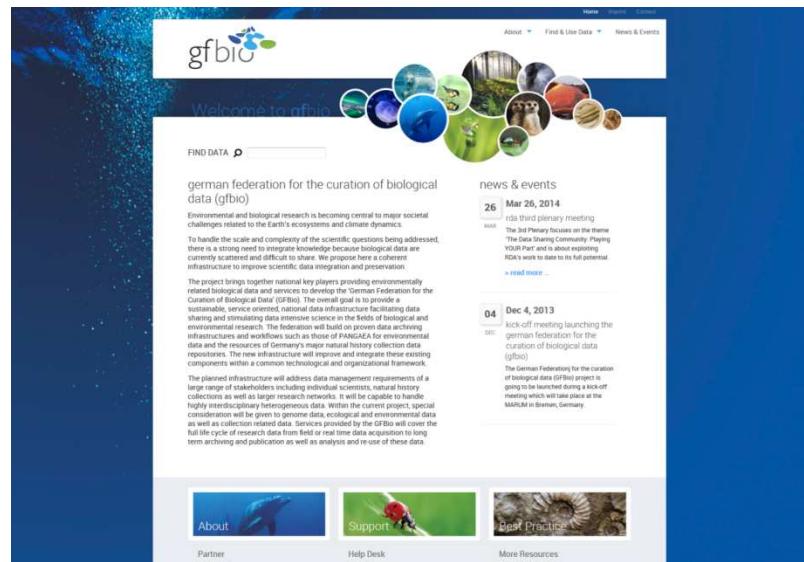
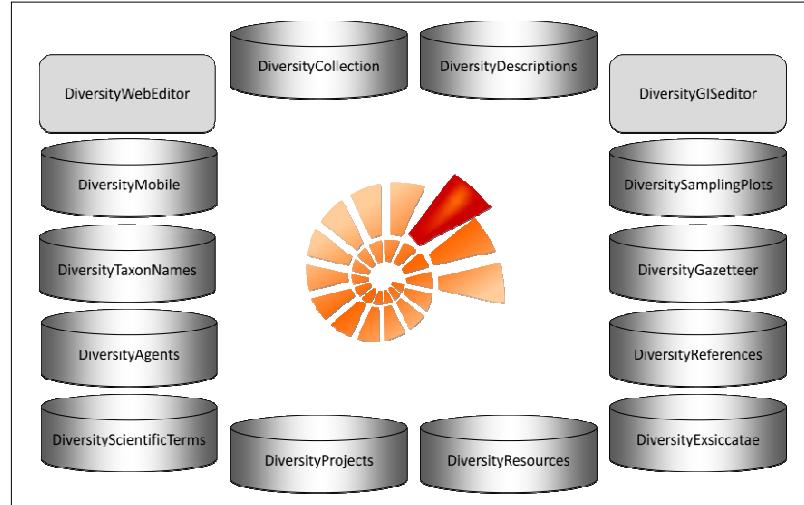
- Integration of large data collections in a separate DWB database framework
- appropriate for large research projects without commitment for an own long-term data storage



DWB Services and Scaling

Installations of DWB at a scientific data center offer additional possibilities of services

- Integration of large data collections in a separate DWB environment (VM)
- appropriate for large research projects and institutions with the commitment for a later data transfer



DWB and GFBio

GFBio

is a IT infrastructure project
funded by the DFG

- optimization of all levels of DWB services for DFG research groups
- improving scalability and flexibility, interfaces
- curation of data in DWB installations at GFBio collection archives



Thank you!



Workshop Infos under
<http://www.snsb.info/Workshops.html>