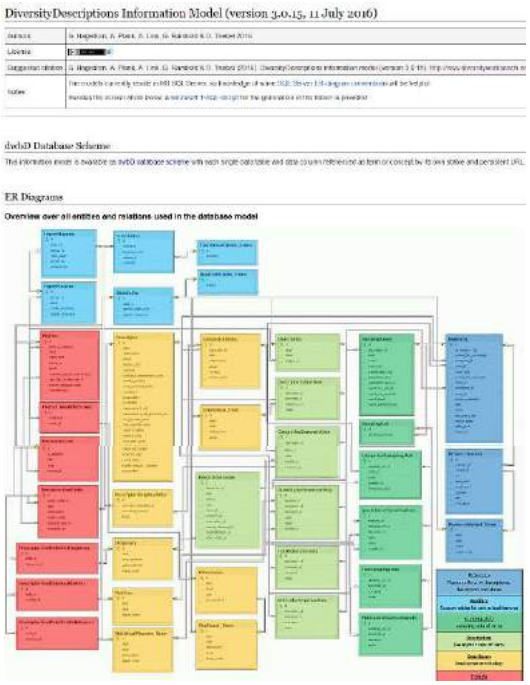
DWB software solutions - open source and free for download

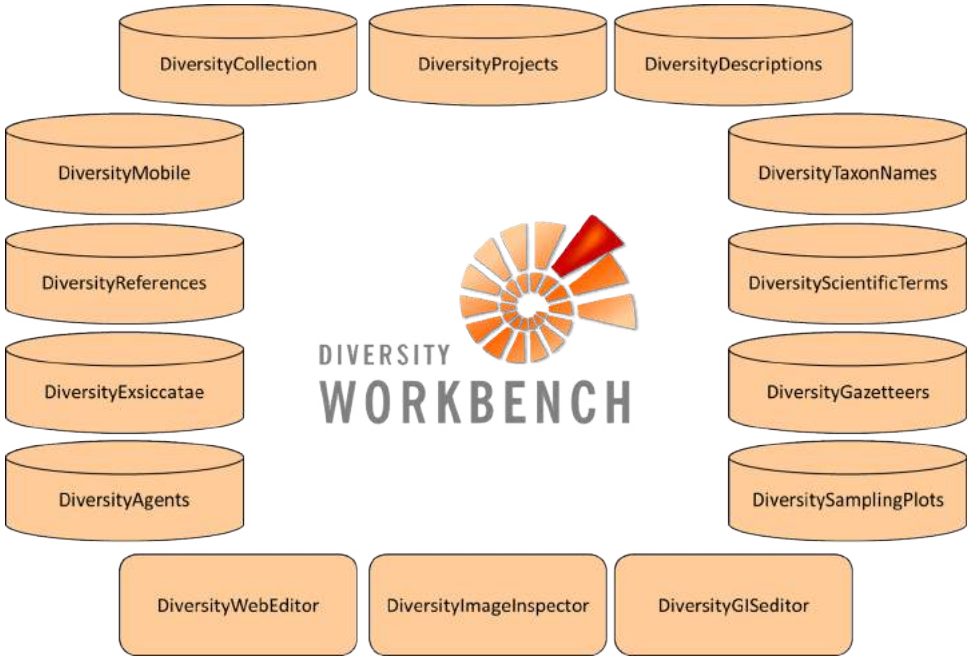
Dagmar Triebel, Tanja Weibulat, Markus Weiss, Andrea Grigat, Michaela Harbeck

DWB – a set of software tools

Diversity Workbench (DWB) is a suite of tools

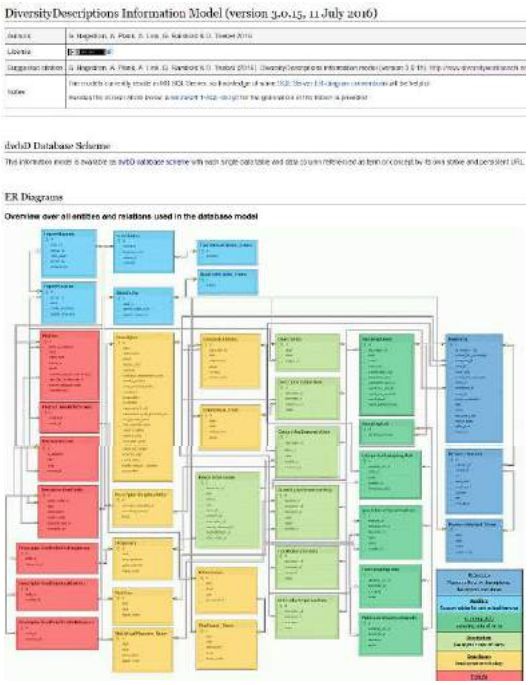
- to manage bio- and geodiversity data
- to address data generation, data management, quality assurance and basic data analysis issues

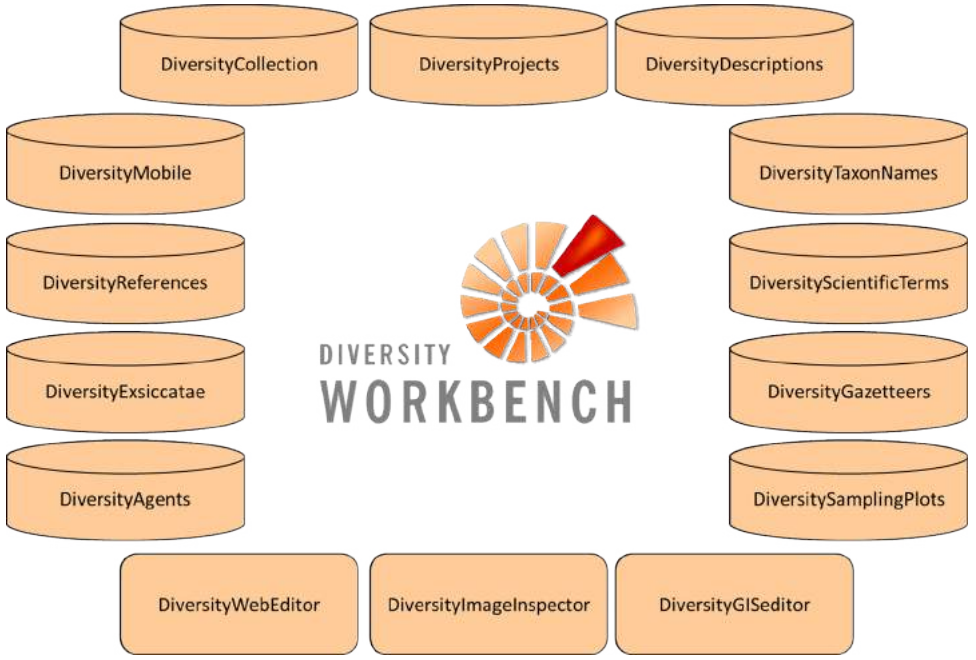




DWB – a set of software tools

- Relational SQL databases, used stand alone or in a (internal) server/ cloud network
- Software design is adapted to data domain-specific demands and user scenarios, including those of scientific collections, ecologicial and descriptive sciences

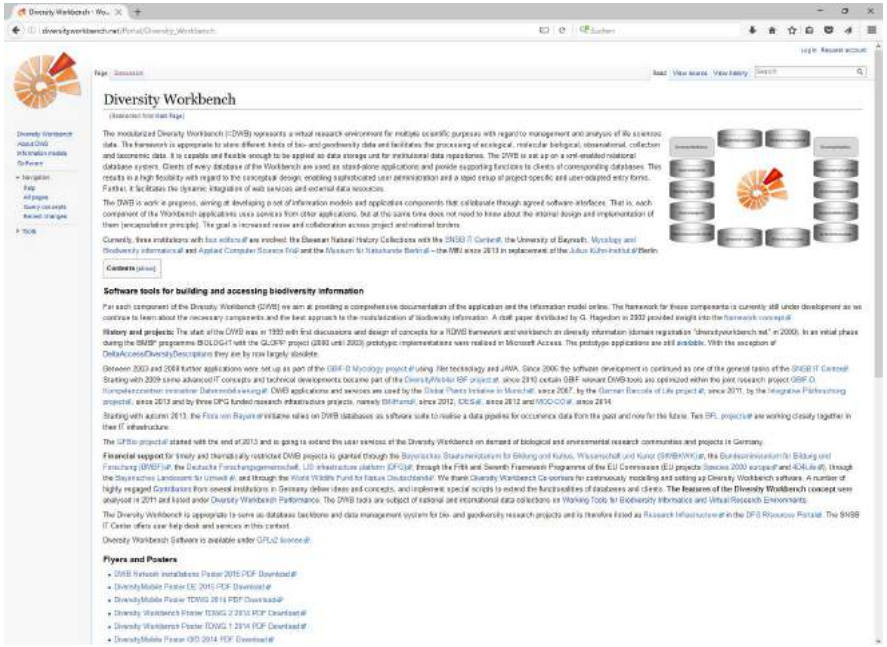




DWB – Agile Software-Development

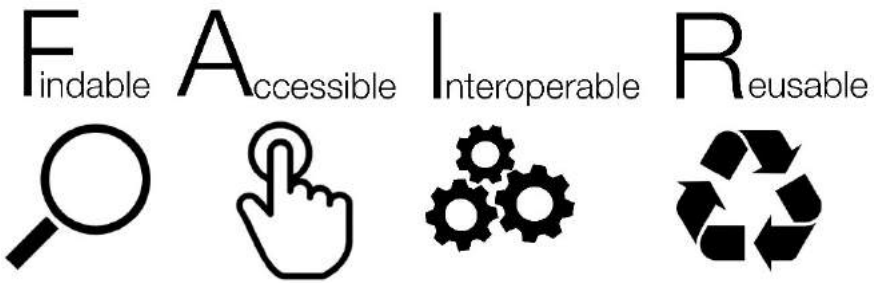
Since 20 years

- four software developers at SNSB, support from BT, MfN and other teams
- software is free for download under **www.diversityworkbench.net**
- open source (more than two mio code lines)
- software design, data models and ER-schemata are published (OA)
- agile software development is done on user demand and with a number of engaged users involved
- workshops since 15 years



DWB – Data management

Focus: Providing structured and FAIR data



- Target user group
  - intend to manage diversity data (mainly from life sciences and geosciences)
  - are ready to invest time in professional data curation
  - intend to keep authority over their high quality data for a long time

Technical documentation for the core applications and rich clients

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

DWB – Data management services

Focus: Providing structured and FAIR data

Services for all DWB users include:

- own and hosted content (DWB cloud services)
  - terminologies
  - vocabularies
  - taxonomies
  - gazetteers
- access to consume external services
  - terminologies
  - vocabularies
  - taxonomies
  - gazetteers

DWB rich clients allow for data ingest via web services

Users of DWB Rich Clients (e.g., DC, DD, DP, DR, DSP, DTN) are able to directly consume a number of web services (up tp now: nine web services with taxon names, taxonomies and hierarchical classification, three with geoinformation, one with fossil terminologies, one with literature information and one with information on provenience of digital objects). Seven are provided by the GFBio Terminology Service.

The features to enrich DWB data by using external global authoritative resources is supplied by the DWB cloud services established at the SNSB and curated by the DWB user community.

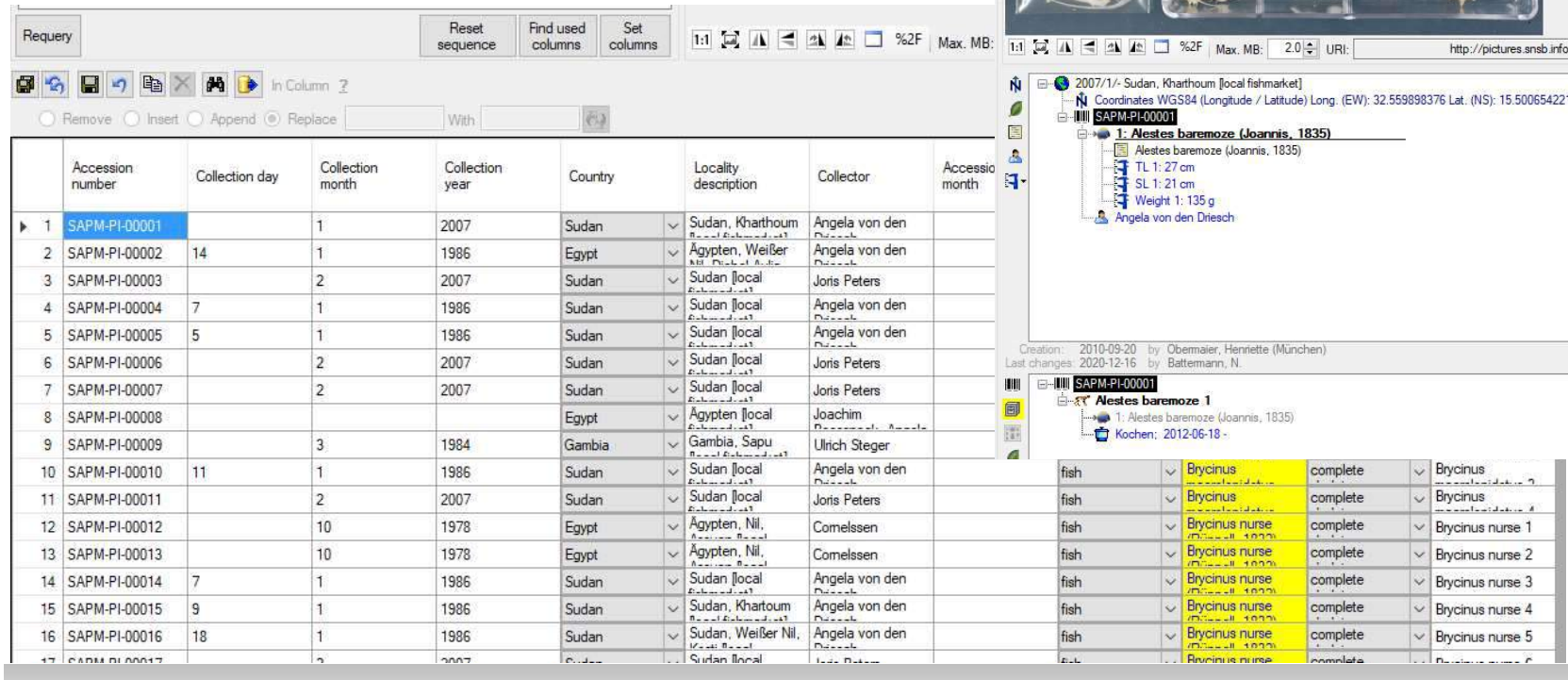
List of web services connected

- Catalogue of Life with CoL WS (service permanently offline; service provider is reorganising the service)
- EU-nomen: Pan-European Species directories Infrastructure with PESI NameService
- GBIF API with GBIF Species API
- GFBio Terminology Service Widgets with gfbioEnvironmentOntology
- GFBio Terminology Service Widgets with gfbioGeonames
- GFBio Terminology Service Widgets with gfbioIsoCountries
- GFBio Terminology Service Widgets with gfbioKingdom
- GFBio Terminology Service Widgets with gfbioProkaryoticNomenclature
- GFBio Terminology Service Widgets with gfbioRecordbasis
- GFBio Terminology Service Widgets with gfbioWorldSeas
- Index Fungorum with Index Fungorum WS
- Mycobank with Mycobank WS (service temporarily offline for technical reason on the provider side)
- The Paleobiology Database with Gateway to PalaeoDB
- Recent Literature on Lichens RLL with RLL WS
- Tropicos with Tropicos WS
- WoRMS with WoRMS WS

DWB – for anthropology?

Focus: Providing structured and FAIR data

- DWB DiversityCollection (DC) is ready to manage osteological collection data (540 elements in 48 tables)
- DWB DC Table Editor is already used for non-human osteological collections



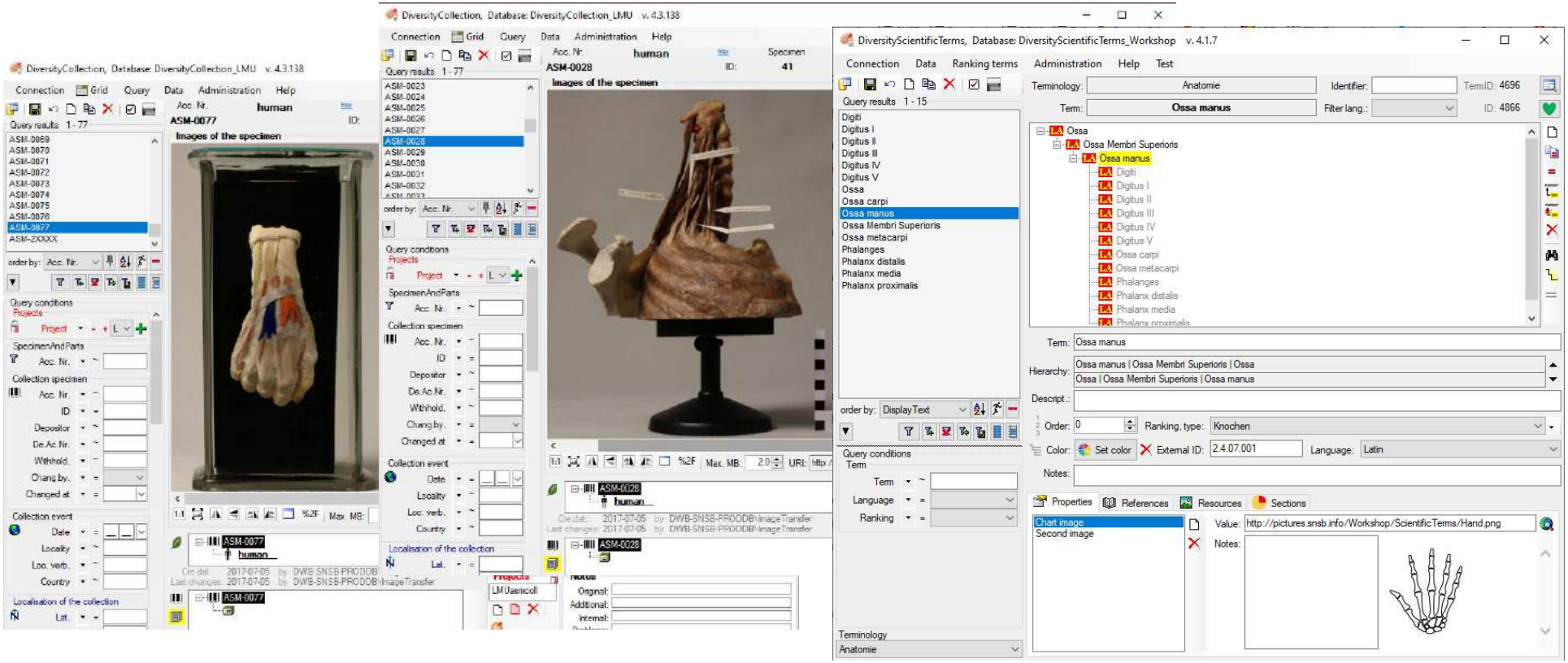
	Accession number	Collection day	Collection month	Collection year	Country	Locality description	Collector	Accessio month
1	SAPM-PI-00001		1	2007	Sudan	Sudan, Kharthoum	Angela von den	
2	SAPM-PI-00002	14	1	1986	Egypt	Ägypten, Weißer	Angela von den	
3	SAPM-PI-00003		2	2007	Sudan	Sudan [local	Joris Peters	
4	SAPM-PI-00004	7	1	1986	Sudan	Sudan [local	Angela von den	
5	SAPM-PI-00005	5	1	1986	Sudan	Sudan [local	Angela von den	
6	SAPM-PI-00006		2	2007	Sudan	Sudan [local	Joris Peters	
7	SAPM-PI-00007		2	2007	Sudan	Sudan [local	Joris Peters	
8	SAPM-PI-00008				Egypt	Ägypten [local	Joachim	
9	SAPM-PI-00009		3	1984	Gambia	Gambia, Sapu	Ulrich Steger	
10	SAPM-PI-00010	11	1	1986	Sudan	Sudan [local	Angela von den	
11	SAPM-PI-00011		2	2007	Sudan	Sudan [local	Joris Peters	
12	SAPM-PI-00012		10	1978	Egypt	Ägypten, Nil,	Cornelssen	
13	SAPM-PI-00013		10	1978	Egypt	Ägypten, Nil,	Cornelssen	
14	SAPM-PI-00014	7	1	1986	Sudan	Sudan [local	Angela von den	
15	SAPM-PI-00015	9	1	1986	Sudan	Sudan, Khartoum	Angela von den	
16	SAPM-PI-00016	18	1	1986	Sudan	Sudan, Weißer Nil,	Angela von den	

fish	Brycinus	complete	Brycinus
fish	Brycinus	complete	Brycinus
fish	Brycinus nurse	complete	Brycinus nurse 1
fish	Brycinus nurse	complete	Brycinus nurse 2
fish	Brycinus nurse	complete	Brycinus nurse 3
fish	Brycinus nurse	complete	Brycinus nurse 4
fish	Brycinus nurse	complete	Brycinus nurse 5

DWB – for anthropology?

Focus: Providing structured and FAIR data

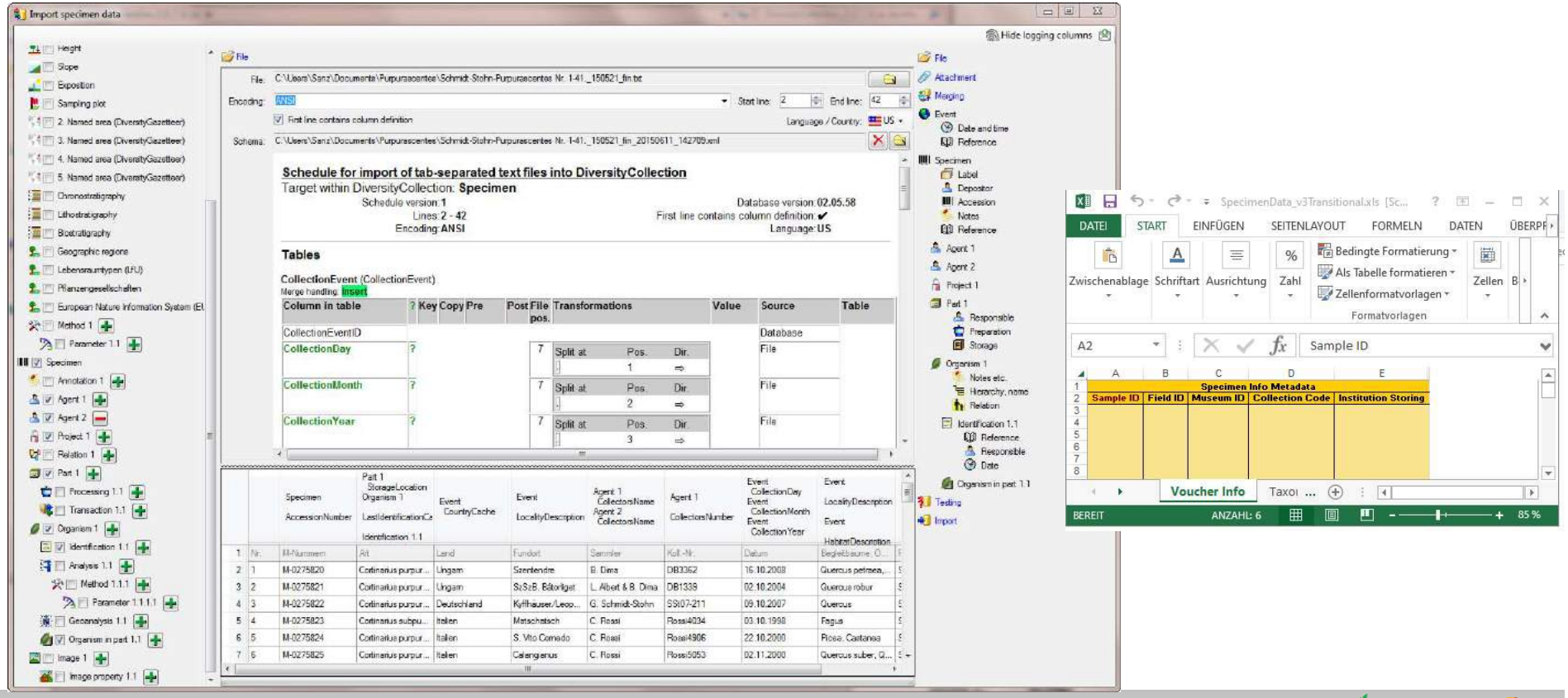
- Anatomical collection of the LMU (in progress)
- Terminologica Anatomica (in progress)



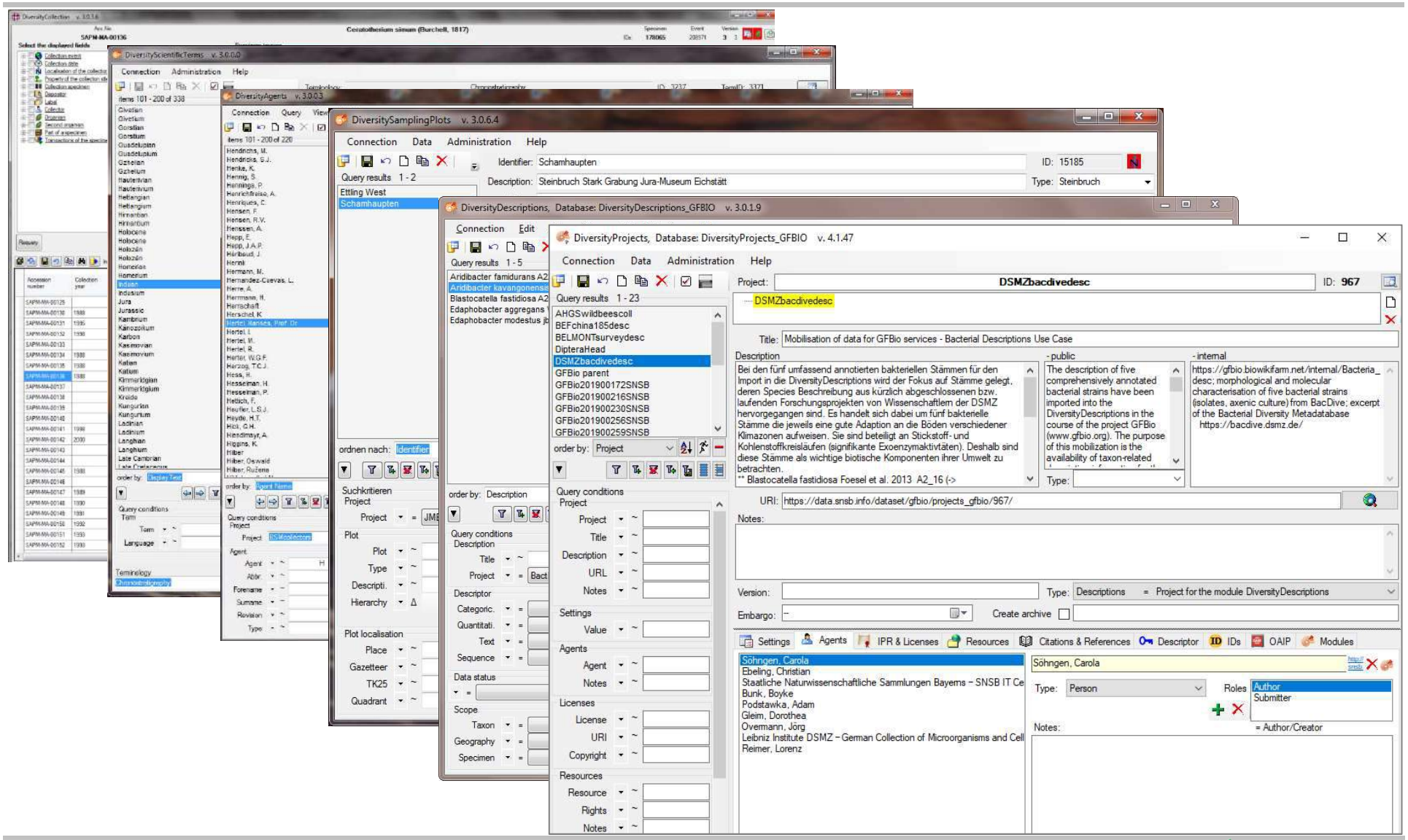
DWB-DC – Import tools

Focus: Providing structured and FAIR data

- DC Import Wizard is guiding import from excel sheets
- compliant excel templates and import schemes for zoological collections exist (for human osteological collections currently planned together with SNSB-SAPM)

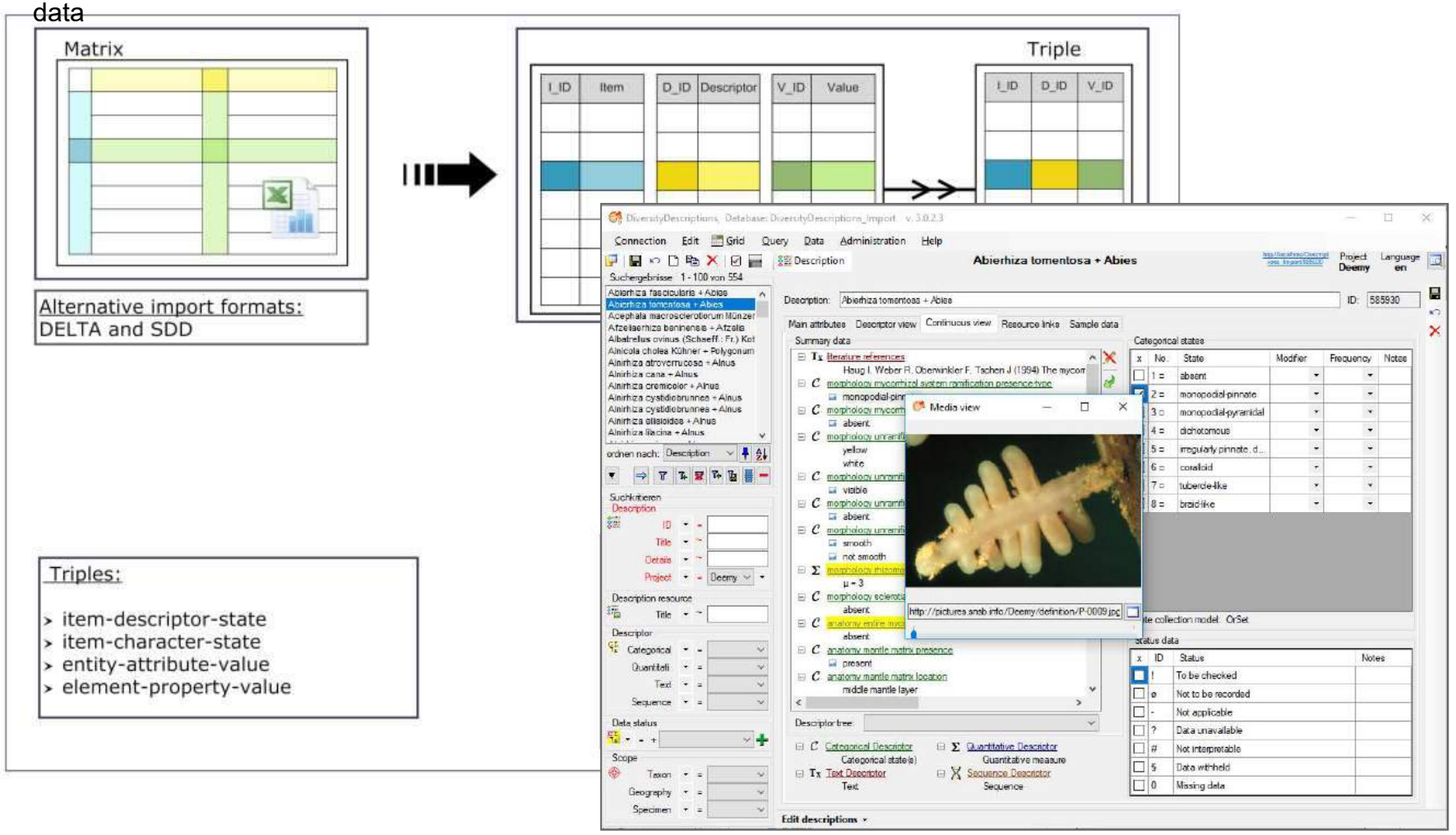


DWB – Rich Clients for data management



DiversityDescriptions (DD) for matrix data

DWB-DD with open schema (EAV model): User is designing his/her own data structure.
→ Descriptors, characters, properties, traits; descriptor states (categorical, text), values (measurements), entity/items store item data



DWB – in GFBio

- GFBio recommended
- GFBio helpdesk with advice for data management in DWB
- GFBio is hosting DWB environments for GFBio user (under development)

Tools & Workbenches for Data Management

GFBio supports researchers with software for data management. Two German developer groups (Diversity Workbench (DWB) and BEXIS 2) providing open source platforms for biodiversity data management extend their applications in t
active phase of research projects will facil
via the GFBio portal.

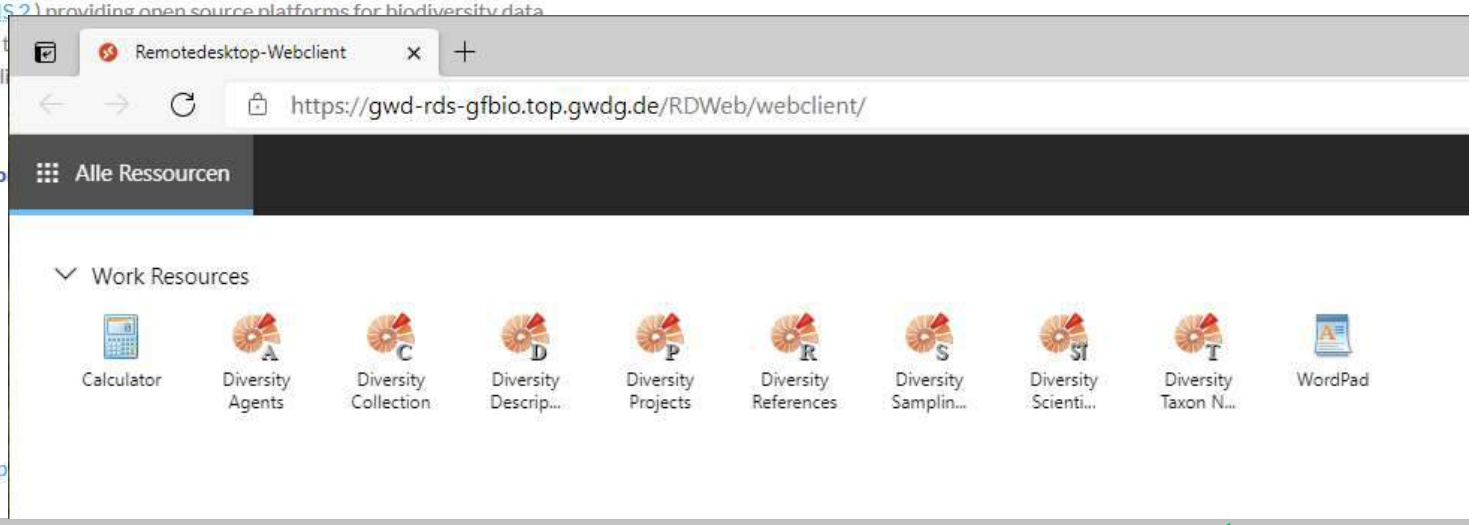
Learn more about the scope of applicatio

DWB in 10 Questions

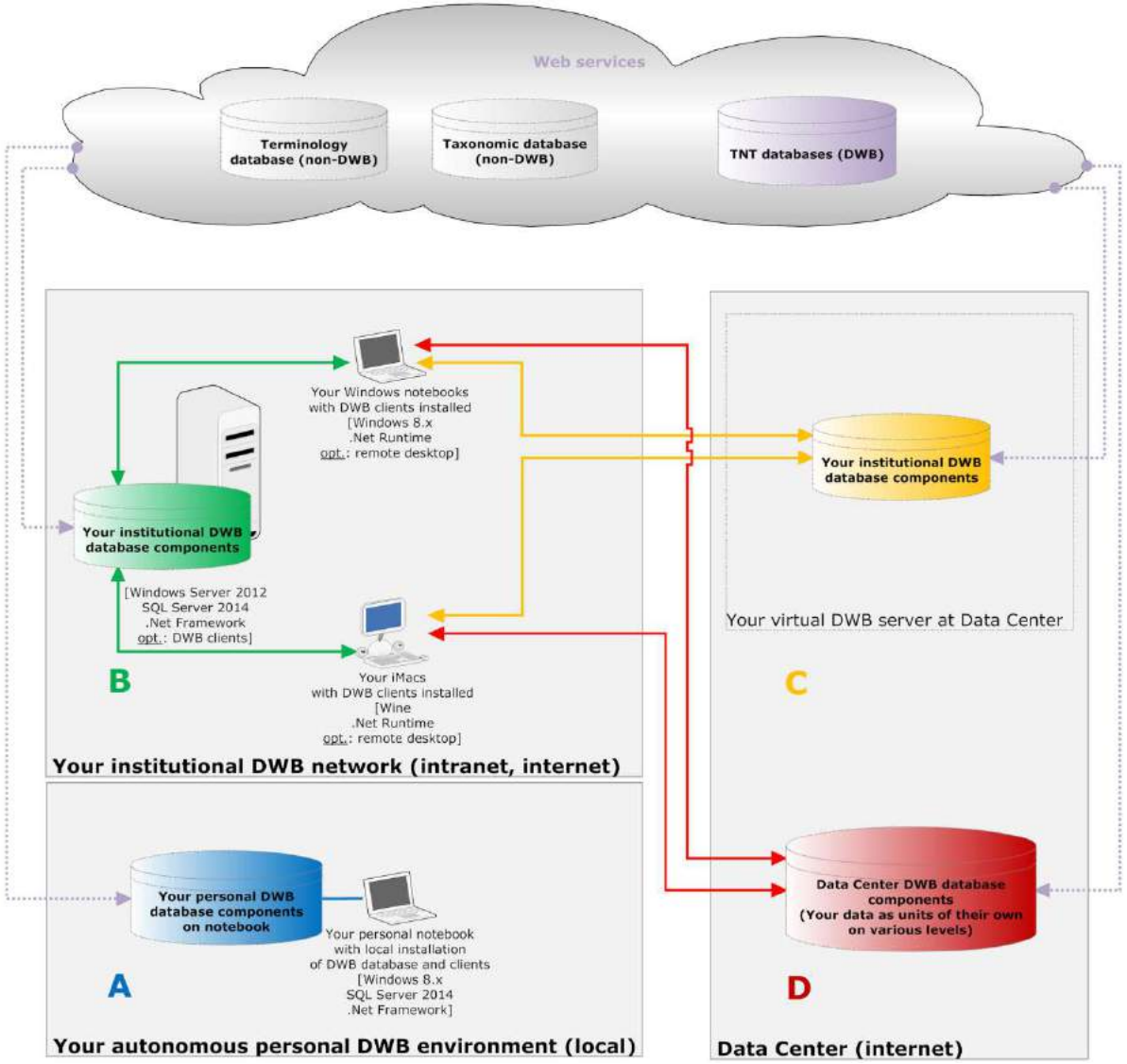
+ What is DWB?

+ For whom is DWB designed?

+ Which part of the data life cycle is p



DWB – alternative installation solutions



Online Workshop – Programm

41st Diversity Workbench Workshop:

27./28.04.2021

Arbeitsprogramm

27. April 2021

- 10.00 Uhr Begrüßung und Hinweise zum Einsatz von ZOOM (D. Triebel, T. Weibulat)
- 10.05 Uhr Vortrag: Diversity Workbench – Einführung (D. Triebel)
- 10.30 Uhr Live-Demo: Überblick über Grundfunktionen von Diversity Workbench (DWB) und DiversityCollection (DWB-DC), Beispiele (M. Weiss)
- 11.15 Uhr Vortrag: DWB Workshop Datenbanken und Trainingsserver (A. Link); siehe auch DWB Trainingsumgebung
- 11.30 Uhr **Selbständiges Arbeiten** mit DWB-DC: Anlegen von Daten, Grundfunktionen (Anleitung T. Weibulat, unterstützt von A. Link, W. Reichert, M. Weiss)
- 12.30 Uhr Mittagspause
- 13.25 Uhr ZOOM-Gruppenbild
- 13.30 Uhr Live-Demo: Überblick über Funktionen von DiversityProjects (DWB-DP), DiversityAgents (DWB-DA), DiversityScientificTerms (DWB-DST), Beispiele aus Monitoringprojekten wie der Flora von Bayern (M. Weiss, J. Wellsow)
- 14.15 Uhr **Selbständiges Arbeiten** mit verschiedenen DWB Modulen: Quellen für Daten in DWB-DC (Anleitung T. Weibulat und M. Weiss, unterstützt von A. Link, W. Reichert)
- 15.15 Uhr Kaffeepause
- 15.30 Uhr Vortrag + Live-Demo: AraGes: Überblick über Funktionen von DiversitySamplingPlots und DiversityTaxonNames (H. Höfer, F. Raub)
- 16.00 Uhr Vortrag + Live-Demo: GBOL DNA-Barcoding-Referenzprojekt: DWB-Datenmanagement und Datennetzwerk (P. Grobe)
- 16.30 Uhr Diskussion
- 17.00 Uhr Ende

28. April 2021

- 9.00 Uhr **Selbständiges Arbeiten** mit DWB-DC, Grundfunktionen (Anleitung M. Weiss, unterstützt von A. Link, W. Reichert, T. Weibulat)
- 10.00 Uhr Vortrag + Live-Demo: Flora von Bayern-Initiative: Import von Beobachtungsdaten aus Exceltabellen, Arbeiten mit dem Spreadsheet (M. Ruff, Julia Wellsow)
- 10.45 Uhr Kaffeepause
- 11.15 Uhr Live-Demo: Bayernflora-Editor (J. Wellsow)
- 11.30 Uhr Live-Demo: Bayerische TaxRef-Datenbank (DTN mit RL-Kategorien, LfU Code, Angabe des floristischen Status, Checklist-Infos etc.) und Darstellung der Info im BIB Datenportal (W. Diewald, J. Wellsow)
- 11.45 Uhr Vortrag: Publikation von Beobachtungsdaten über die DWB-BioCASe-Datenpipeline. Daten in GFBio, VAT Tool, GBIF und im Portal der Flora des Böhmerwaldes (T. Weibulat, W. Diewald)
- 12.00 Uhr Live-Demos: Portalfunktionen GBOL, Bayernflora und AraGes, aufbauend auf DWB gemanagten Daten (interaktive Verbreitungskarten, Artenlisten, Statistiken zu Artenzahlen ...)
- 12.30 Uhr Vortrag: NFDI4BioDiversity: Beratung von Artenmonitoringprojekten (N.N. ? M. Friedrichs-Manthey)
- 13.00 Uhr Mittagspause
- 13.45 Uhr Live-Demo: Einsatz von DiversityTaxonNames und Verwendung von Taxonlisten in GBOL (B. Quast)
- 14.00 Uhr Vortrag + Live-Demo: DWB-DTN Datenpipeline, Taxon-Checklist-Daten in GFBio und GBIF: Publikation von taxonomischen Daten, Klassifikationen, RL-Kategorien und Referenz-Codes im DWB-DTN Schema (REST-API) und im DwC Schema (S. Seifert)
- 14.15 Uhr Vortrag + Live Demo: Diversity Workbench als GFBio Service (S. Bingert, A. Link)
- 14.45 Uhr Kaffeepause
- 15.00 Uhr **Selbständiges Arbeiten** mit DWB-DC, spezielle Funktionen (Anleitung M. Weiss, unterstützt von A. Link, W. Reichert, T. Weibulat)
- 16.00 Uhr Live-Demo: Import von Bilddaten mit Bayernflora-Template, DiversityImageInspector (W. Reichert, J. Wellsow)
- 16.15 Uhr Live-Demo: Überblick über Funktionen des DWB GIS Editors (Video, 34 min) (W. Reichert)
- 17.00 Diskussion und Ende

http://www.snsb.info/SNSBInfoOpenWiki/Wiki.jsp?page=DivWorkbenchWorkshop_41