

Central Data Services of DFG RU 402 / 816

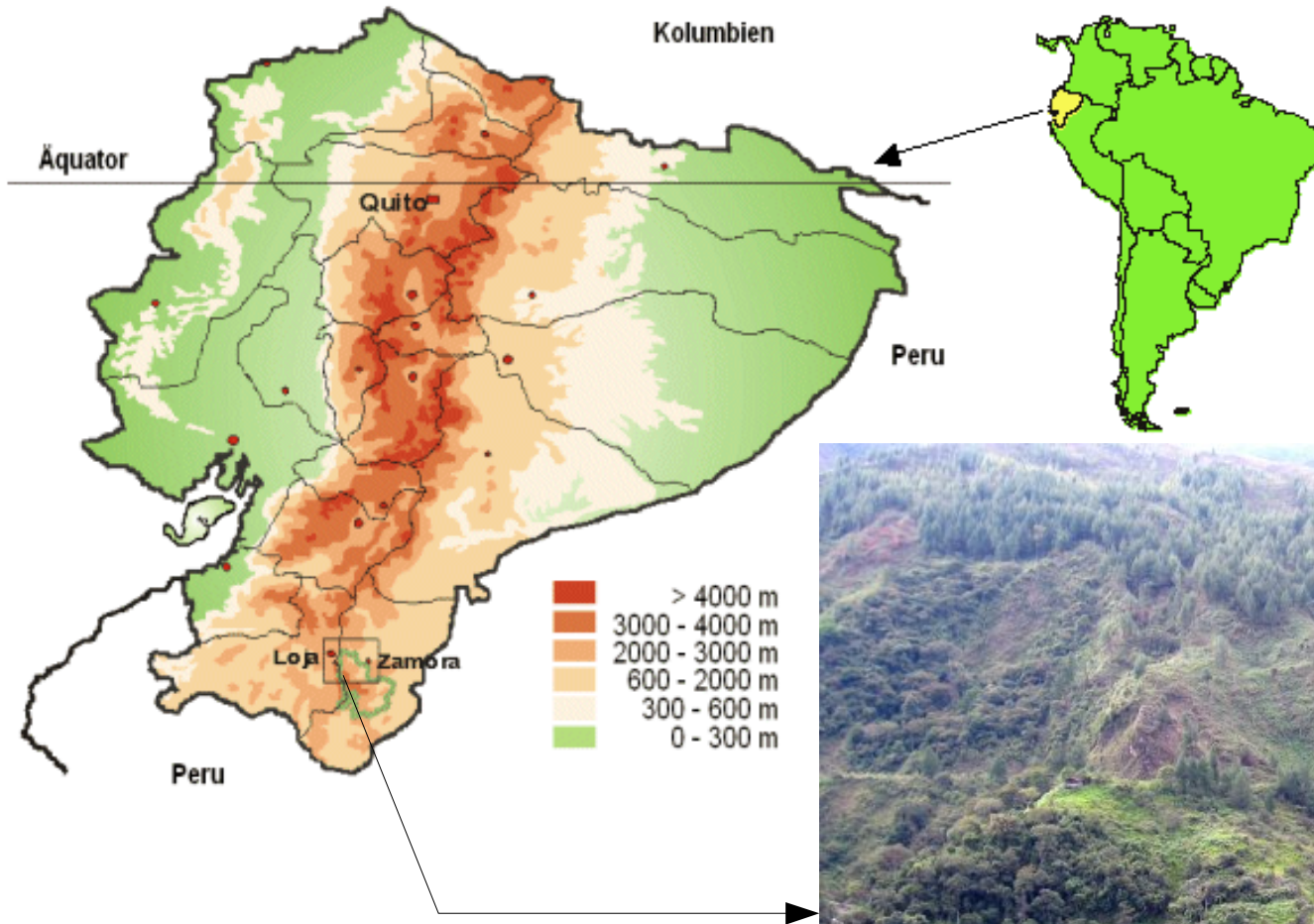
Initial Concept – Lessons Learned – Future Perspectives

Thomas Nauss



DFG Research Units 402 and 816

Main Research Area: ECSF



DFG Research Units 402 and 816

- DFG Research Unit 402
 - Functionality in a Tropical Mountain Rainforest: Diversity, Dynamic Processes and Utilization Potentials under Ecosystem Perspectives
 - Time-frame 2001 to 2007
- DFG Research Unit 816
 - Biodiversity and Sustainable Management of a Megadiverse Mountain Ecosystem in South Ecuador
 - Time-frame: 2007 to 2010 and beyond

Central Data Services within RU 402 and 816

- Initial concept of RU 402: Meta-Database
- Actual concept of RU 816: “Real-”Database

FOR402*meta*
Central Data Services within DFG RU 402

Background

- Many different working groups (>30)
- Many different backgrounds
- Many different attitudes towards work with computers
- Main research targets
 - Basis inventory
 - Analysis of main ecosystem functions
- **Mainly sectoral to interdisciplinary working packages**

Initial Targets

- Central storage system for heterogeneous data
- User friendly data up- and download
- Global availability of the system
- Long-term data storage and access for future RUs

Subsequent Targets

- Optimization of data exchange between the WG
- Promotion of data exchange within the RU
- Promotion of interdisciplinary work within the RU
- Other common targets...
 - Security
 - Flexibility
 - Budget friendly

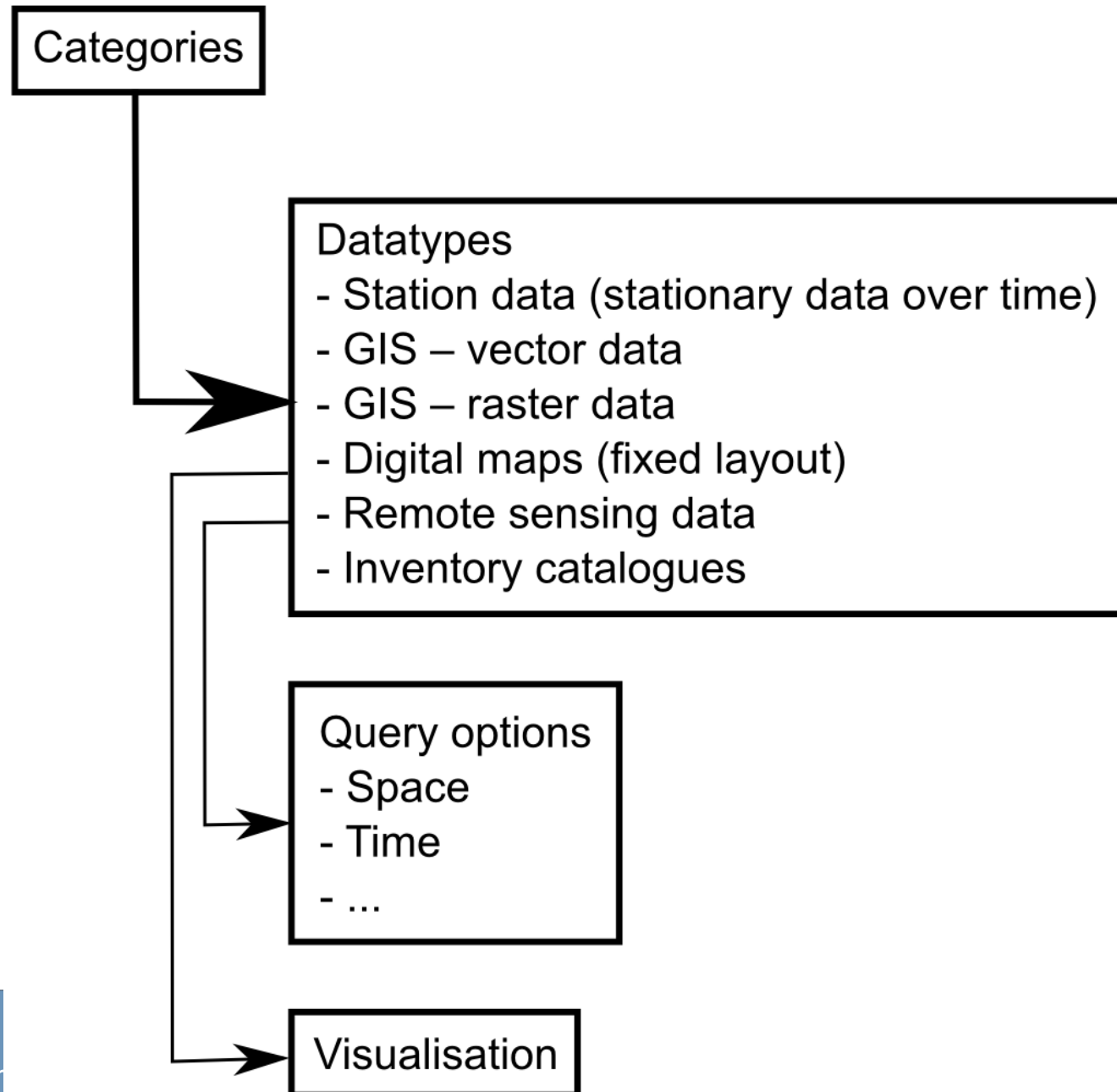
Principal Design

- Combined file system and meta-database
- Web-interface for data query and download
 - Query functions for data types and dimensions
 - Download of files by individual users
- Upload of files and meta-data by the central data service project

Principal Implementation

- PHP
- MySQL database
- Apache Webserver
- Exclusive use of open source/access software

Consequences: Access Hierarchy



Consequences: Access Hierarchy

FOR402 Metadatenbank - Firefox

File Edit View History Bookmarks Tools Help

http://137.248.191.94/for402meta/index.php?lang=de§ion=search&catID=1&typID=1&show=typ& Google

thomas.nauss@gmx.org

Dietrich Göttlicher

Home MyDB Mail Logout

03.04.2007

Arbeitsgruppe

Z 1

Abschicken

Kategorien

Abiotik

- Klimatologie <3155>
- Geomorphologie <7>
- Hydrologie <27>
- Landnutzung <10>
- Bodenkunde <76>

Botanik / Vegetation

- Pflanzenarten-/ abundanzlisten <3>
- Waldstruktur / Aufforstung <33>
- Pilze <0>
- Phänologie <1>
- Pflanzenarten <1>
- Wurzelsysteme <6>
- Kronenbilder / LAI <12>
- Vegetation <36>

Topographie / GIS

- Luftbilder <75>
- allgemeine GIS-Layer <77>
- digitale Karten <46>
- Satellitendaten <2654>
- Topographie <14>

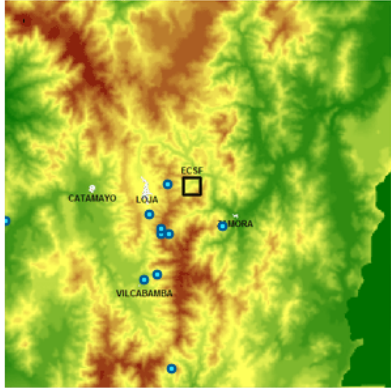
Zoologie

- Tierarten <0>
- Mikroarthropoden <21>
- Tierarten-/ abundanzlisten <0>

Auswahlverzeichnis

- Klimatologie <3155>
- Stationsdaten <81>
- GIS Daten (Vektor) <1>
- Fernerkundungsdaten <3073>

Detailsuche



Noch keine Station ausgewählt!
Klicken Sie in der Karte auf die gewünschte Station!

Beginn der Untersuchung: Tag: Monat: Jahr:

Ende der Untersuchung: Tag: Monat: Jahr:

Abschicken

Ergebnis

Klimatologie <3155> » Stationsdaten <81>

Datensätze 1 - 10 Seite [1 2 3 4 5 ...]

Excel	AG: D 2a - D 2a - Phase 2 FOR	Ansprechpartner: Rollenbeck, Rütger	434.5 KB >> Download
quicklook not available	Klimastation: Antenas Parameter: Niederschlag, Lufttemperatur, relative Luftfeuchte, Windgeschwindigkeit, Windrichtung, Globalstrahlung, Bodentemperatur daily	Länge: 79°03'15.1" W Breite: 3°59'45.0" S Höhe: 2917m ÜNN Name: Antenas	Zeitraum: Start: 02.04.1998 00:00 Ende: 24.02.2005 00:00 Quellenangabe: R. Rollenbeck & AG Richter. 2005 Qualität: quality controlled by R. Rollenbeck
Excel	AG: D 2a - D 2a - Phase 2 FOR	Ansprechpartner: Rollenbeck, Rütger	8.2 MB >> Download
	Klimastation: Antenas Parameter: Niederschlag, Lufttemperatur,	Länge: 79°03'15.1" W	Zeitraum:

Consequences: Access Hierarchy

FOR402 Metadatenbank - Firefox

File Edit View History Bookmarks Tools Help

http://137.248.191.94/for402meta/index.php?lang=de§ion=search&catID=1&typID=1&show=typ&

thomas.nauss@gmx.org

Dietrich Göttlicher

Home MyDB Mail Logout

03.04.2007

Arbeitsgruppe

Z 1

Abschicken

Kategorien

Abiotik

- Klimatologie <3155>
- Geomorphologie <7>
- Hydrologie <27>
- Landnutzung <10>
- Bodenkunde <76>

Botanik / Vegetation

- Pflanzenarten-/ abundanzlisten <3>
- Waldstruktur / Aufforstung <33>
- Pilze <0>
- Phänologie <1>
- Pflanzenarten <1>
- Wurzelsysteme <6>
- Kronenbilder / LAI <12>
- Vegetation <36>

Topographie / GIS

- Luftbilder <75>
- allgemeine GIS-Layer <77>
- digitale Karten <46>
- Satellitendaten <2654>
- Topographie <14>

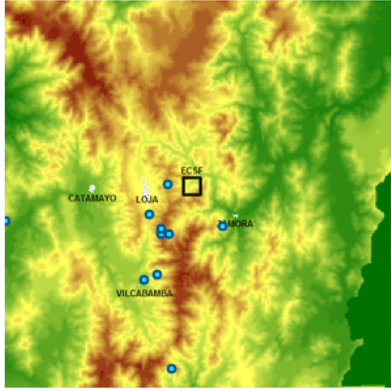
Zoologie

- Tierarten <0>
- Mikroarthropoden <21>
- Tierarten-/ abundanzlisten <0>

Auswahlverzeichnis

- Klimatologie <3155>
- Stationsdaten <81>
- GIS Daten (Vektor) <1>
- Fernerkundungsdaten <3073>

Detailsuche



Noch keine Station ausgewählt!
Klicken Sie in der Karte auf die gewünschte Station!

Beginn der Untersuchung: Tag: Monat: Jahr:

Ende der Untersuchung: Tag: Monat: Jahr:

Abschicken

Ergebnis

Klimatologie <3155> » Stationsdaten <81>

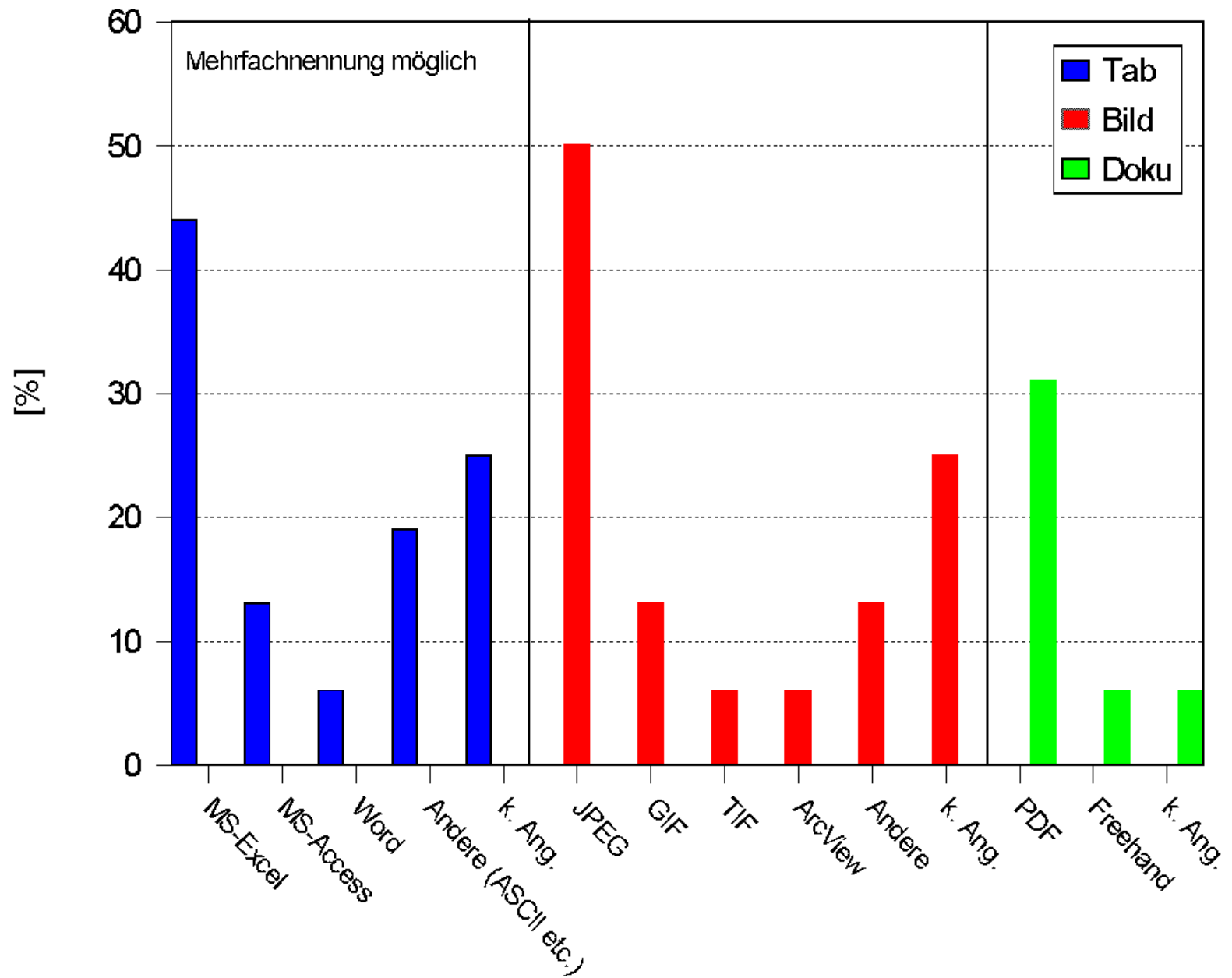
Datensätze 1 - 10 Seite [1 2 3 4 5 ...]

quicklook not available	Klimastation: Antenas Parameter: Niederschlag, Lufttemperatur, relative Luftfeuchte, Windgeschwindigkeit, Windrichtung, Globalstrahlung, Bodentemperatur daily	Länge: 79°03'15.1" W Breite: 3°59'45.0" S Höhe: 2917m ÜNN Name: Antenas	Zeitraum: Start: 02.04.1998 00:00 Ende: 24.02.2005 00:00 Quellenangabe: R. Rollenbeck & AG Richter. 2005 Qualität: quality controlled by R. Rollenbeck
Excel	AG: D 2a - D 2a - Phase 2 FOR	Ansprechpartner: Rollenbeck, Rütger	8.2 MB >> Download
	Klimastation: Antenas Parameter: Niederschlag, Lufttemperatur,	Länge: 79°03'15.1" W	Zeitraum:

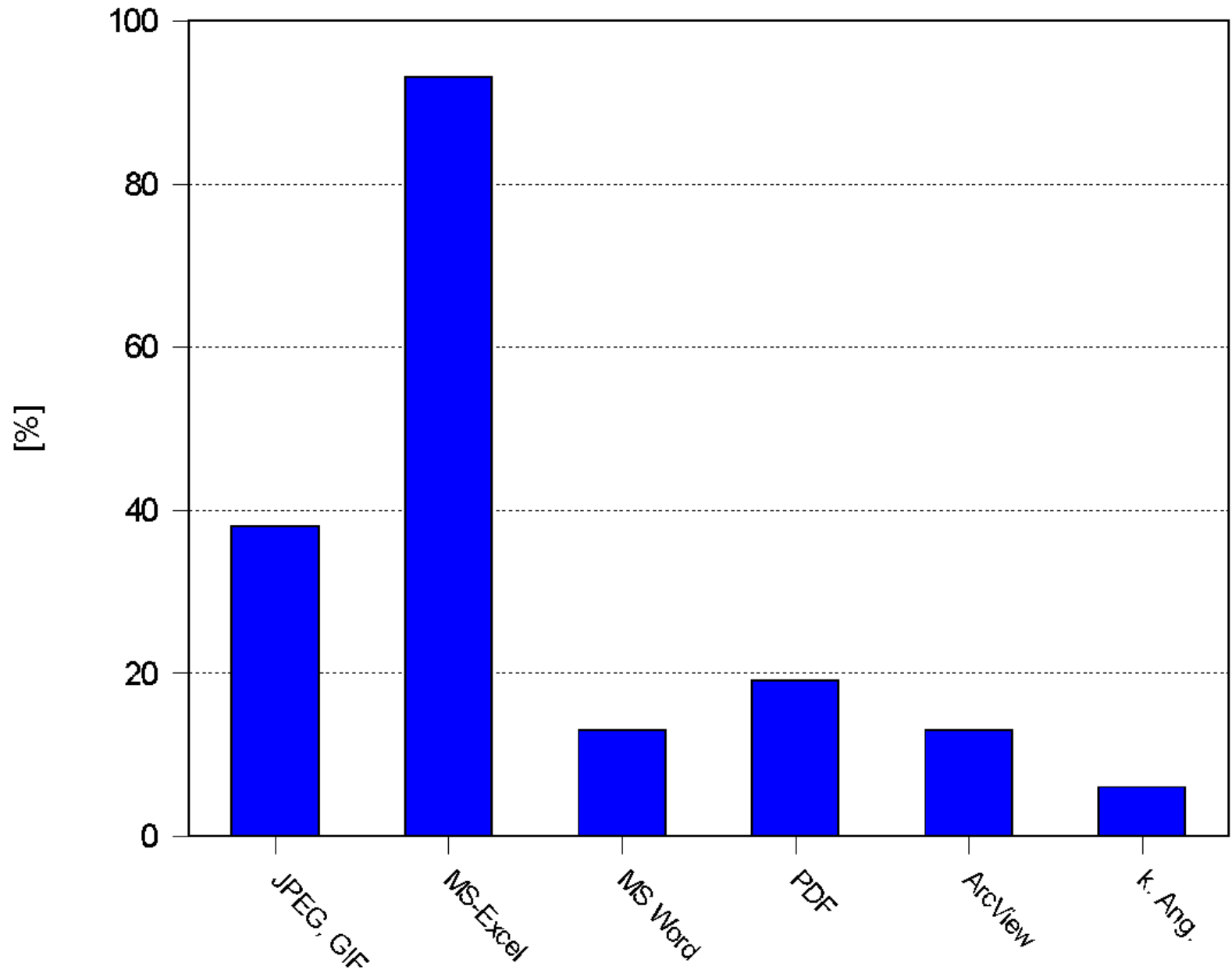
Done

Entire data file has to be downloaded

Some statistics – File Formats provided by Users

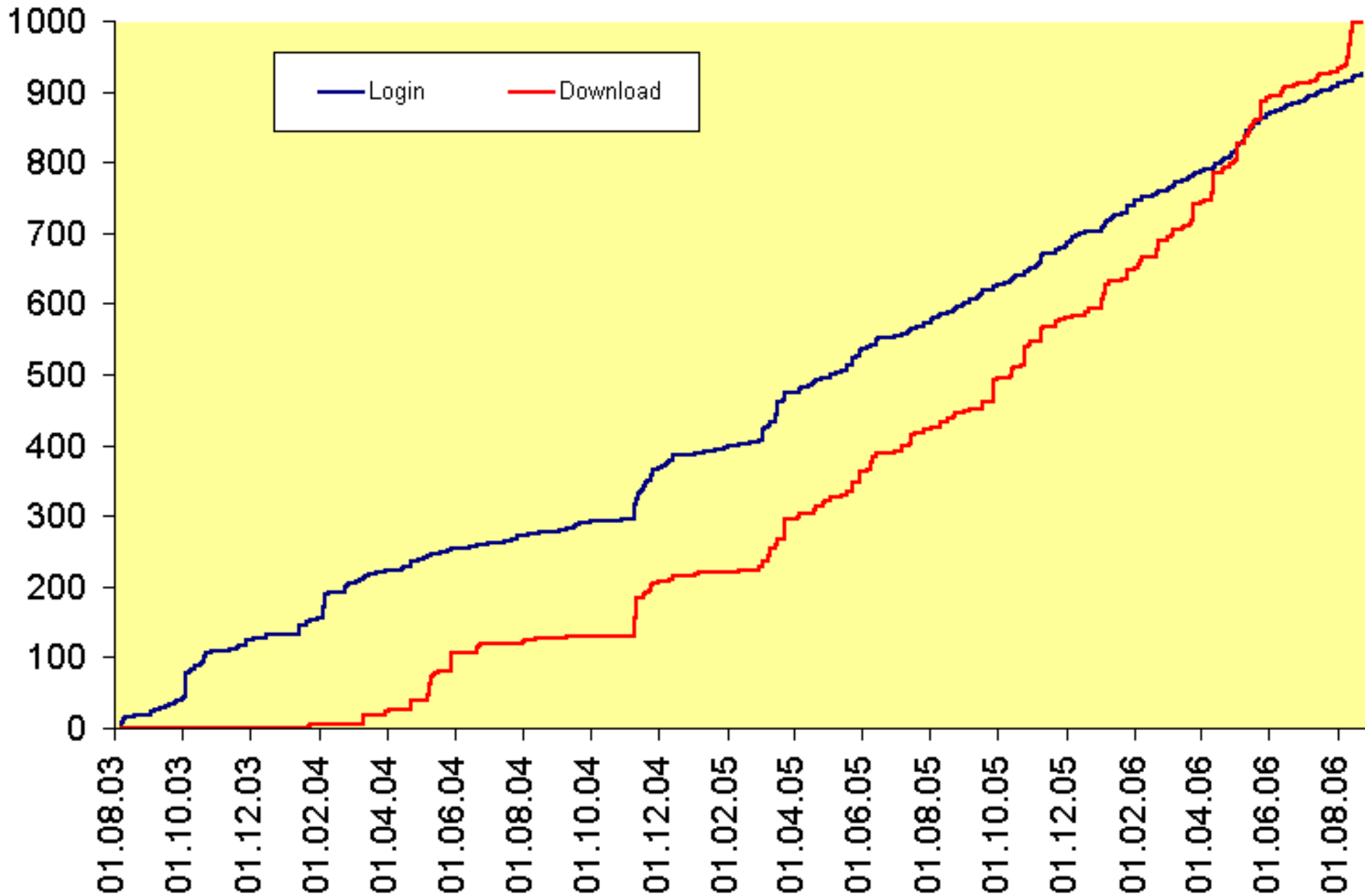


Some statistics – File Formats requested by Users

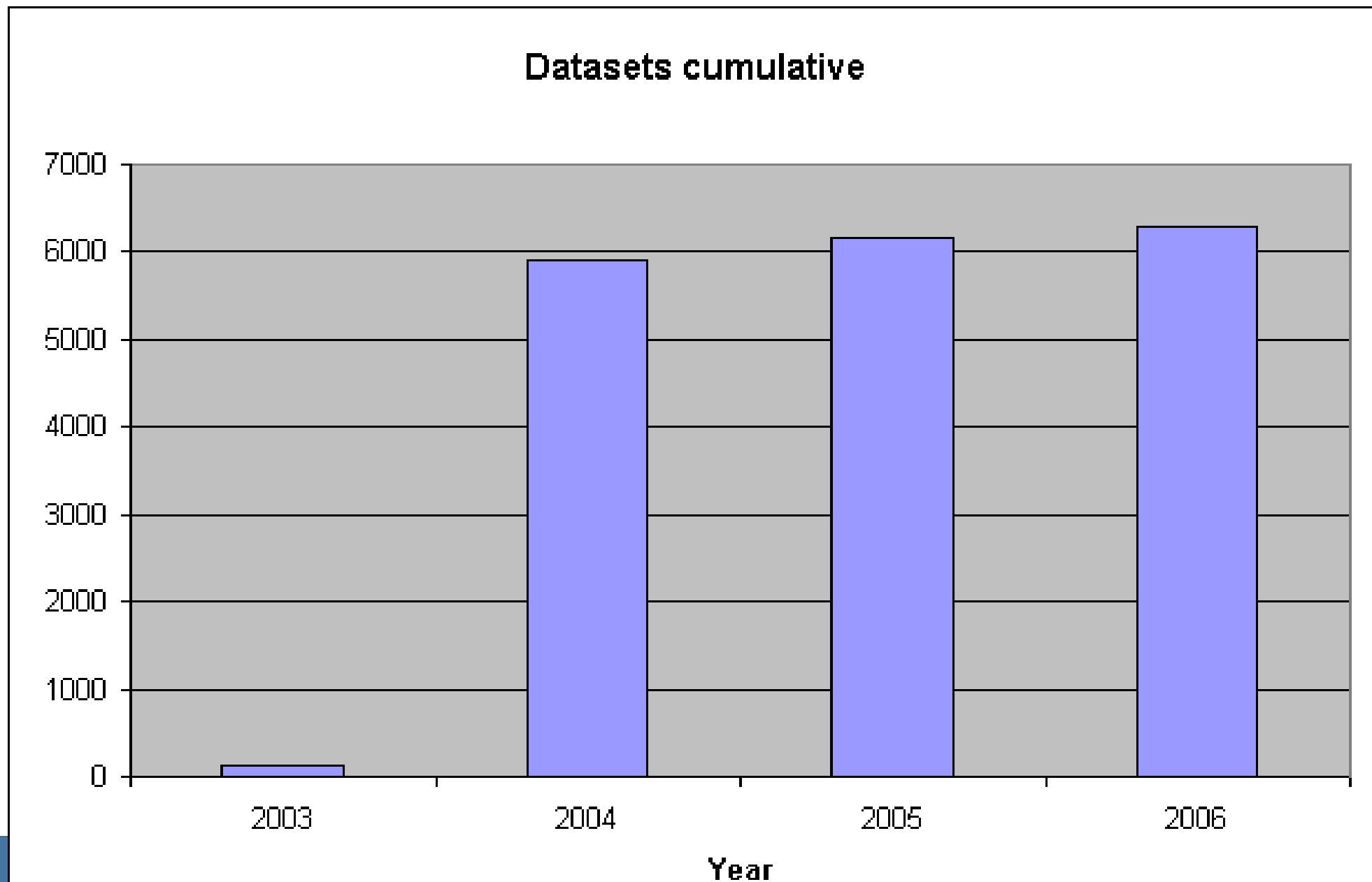


Acceptance by Users

User Statistics FOR402meta



Acceptance by Users



Benefit to Other Projects

- Cooperation with BIOTA Africa

Main Advantages of FOR402*meta*

- ✓ Central storage system for heterogeneous data
- ✓ Global availability of the system
- ✓ Long-term data storage and access for future RUs
- ✓ Cost-efficient (solely open source software)
- ✓ User friendly data “upload” (+/- user-defined file format)

Main Disadvantages of FOR402*meta*

- ✗ Data access: always entire dataset in a proprietary file format (mainly Excel)
- ✗ Availability of the data storage system (+ 2 years)
- ➔ Optimization of data exchange between the WG
- ➔ Promotion of data exchange within the RU
- ➔ Promotion of interdisciplinary work within the RU

Human Factor

- ✓ General acceptance of FOR402*meta*
- ✓ Provision of data to FOR402*meta*
- ✓ Use of the data system for interdisciplinary WP
- ✗ Lack of awareness of the importance of data storage
- ✗ Insufficient meta-data information (coordinates etc.)
- ✗ Willingness to spare time for data provision

FOR816*dw*

Central Data Services within DFG RU 816

Background

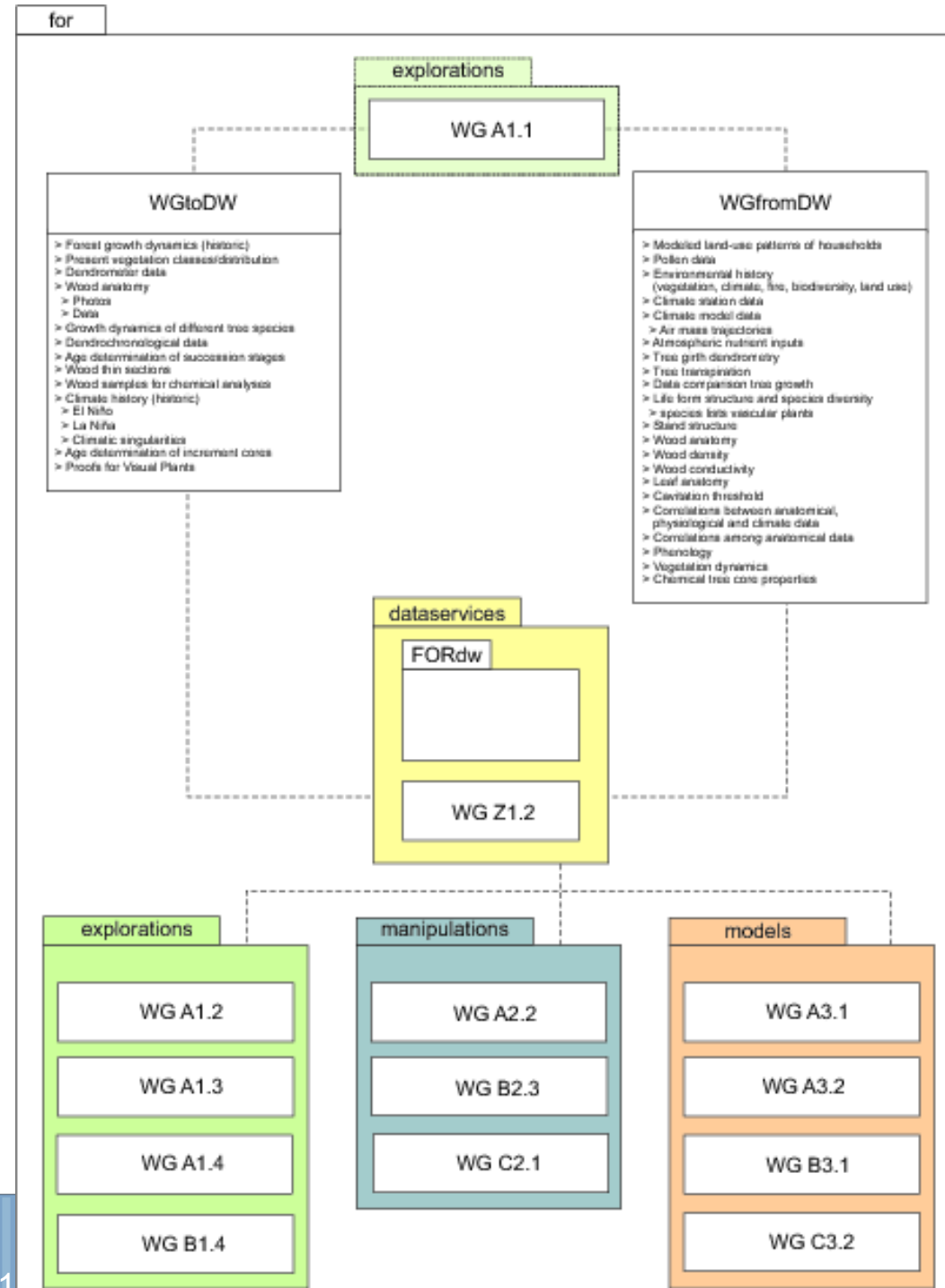
- Many different working groups (>30)
- Many different backgrounds
- Many different attitudes towards work with computers
- Many different research targets
 - Provide basis for scenarios of future development
 - Assess services of natural ecosystems
 - Define and analyse future scenarios (numerical, statistical)
- **Mainly interdisciplinary to integrative working packages**

Main Consequences from FOR402*meta*

- Awareness/willingness of users must be increased
- Data utilization must be more time efficient

Analysis of Working Package Interactions

- ➔ Promote awareness of potential interaction
- ➔ Promote willingness for data provision



Initial Targets in Addition to FOR402*meta*

- Differentiated, individual data download options
- Semi-automatic data upload by users
- Integration of administration and information services

Principal Design: Data Warehouse System

- **Storage of most of the data inside database tables**
- Filesystem only for some special datasets
 - GIS (ESRI formats)
 - Remote sensing (flat binary, HDF)
 - Numerical model data (netCDF)
 - Automated file format conversion routines
- Web-based staging area for ETL processes (data upload by individual users)

Principal Implementation

- Model-View-Controller design pattern
- Apache STRUTS framework
- MySQL database
- Java Server Pages for dynamically generation of the View component
- Exclusive use of open source/access and self-developed software

Consequences

- Datasets can be queried by their dimensions
- Datasets can be re-aggregated by their dimensions
- Dimensions are scaleable
- **Download of only those data that is actually requested**

Current Status

- Core system is implemented
 - Database systems for administrative/information services
 - Database system for metadata (revised from FOR402*meta*)
- Administration and information services are online
- First version of scientific data services will be cleared within II/2007



Firefox

File Edit View History Bookmarks Tools Help

thomas.nauss@gmx.org

http://www.tropicalmountainforest.org/

User: username PW: ***** Login

DFG Research Unit 816

Biodiversity and Sustainable Management of a Megadiverse Mountain Ecosystem in South Ecuador

you are here: home.start

FOR816 News Publications Documents + Services Mail Forum Data

Home of the DFG Research Unit 816



« go back

up to content »

Latest News

FOR816 in the press

Next appointments

21.02.2007-GTÖ Meeting
Bonn

Weather at ECSF



more

Impressum

©2007 DFG and LCRS - Laboratory for Climatology and Remote Sensing.

Firefox

File Edit View History Bookmarks Tools Help

thomas.nauss@gmx.org

http://www.tropicalmountainforest.org/

User: thomas.nauss Logout

DFG Research Unit 816

Biodiversity and Sustainable Management of a Megadiverse Mountain Ecosystem in South Ecuador

you are here: documentservices.Intro

FOR816 News Publications Documents + Services Mail Forum Data

Documents and Services

- Booking System
- Accounting System
- General Information
- Templates
- Protocols
- Administration

Documents and Services

Please select a menu item from the left menu.

Booking System:
Hier erreichen Sie das Stationsbuchungssystem der ECSF-Station in Ecuador.

Accounting System:
Hier erreichen Sie diverse Formulare zur Abrechnung von Kosten.

General Information:
Hier können Sie sich allgemeine Informationen als PDF herunterladen.

Templates:
Hier finden Sie Formbögen zum ausfüllen.

Protocols:
Hier finden Sie Protokolle von Projekttreffen.

Administration:
Hier können Sie Ihre eigenen Benutzerdaten und, falls sie Projektadministrator sind, Informationen zu diesem Projekt ändern.

« go back

up to content »


Latest News

FOR816 in the press

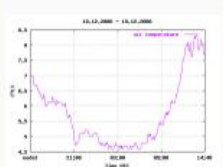
Next appointments

21.02.2007-GTÖ Meeting
Bonn

Weather at ECSF



more



more

Impressum

©2007 DFG and LCRS - Laboratory for Climatology and Remote Sensing.

Find: PAss

Next Previous Highlight all Match case Reached end of page, continued from top

Done

Now: Dense Fog, 0° C

Wed: 11° C

Thu: 10° C

- Booking system
- Accounting system
- General information, help
- Administration of personal and project data



Firefox

File Edit View History Bookmarks Tools Help

thomas.nauss@gmx.org

http://www.tropicalmountainforest.org/

Google

Benutzer: thomas.nauss Logout

DFG Research Unit 816

Biodiversity and Sustainable Management of a Megadiverse Mountain Ecosystem in South Ecuador

you are here: documentservices.administration.user

FOR816 News Publications Documents + Services Mail Forum Data

Documents and Services

- Booking System
- Accounting System
- General Information
- Templates
- Protocols
- Administration

Persönliche Daten verwalten

Username: thomas.nauss

Anrede/Titel:

Vorname:

Nachname:

E-Mail:

Passnummer:

Webseite:

Tel.:

Fax.:

mobil:

VoIP:

Geschäftliche Anschrift:

Verwaltungsbereich:

Stadt:

PLZ:

Land:

Organisation:

Lieferanschrift:

Private Anschrift:

Stadt:

PLZ:

Straße:

user

- Persönliche Daten verwalten
- Projekttexte verwalten
- Projektmitglieder verwalten
- Neues Projektmitglied registrieren
- Neue Mitteilung einstellen

Latest News

FOR816 in der Presse

Next appointments

21.02.2007 - GTÖ Tagung
Bonn

Weather at ECSF

more

LCRS satellite database webinterface - Firefox <2>

File Edit View History Bookmarks Tools Help thomas.nauss@gmx.org

http://137.248.191.94:8075/satellitedb/remoteControlQLSize.do

**Laboratory for
Climatology and
Remote Sensing** - satellite product database

[Satellite data base overview](#)

Viewsettings [single]: [\(help\)](#)

single | list raw | list products | order cart

Change Quicklooksize to *medium

Raw dataset information:

Date: 2007-04-01 10:32:00.0
Filesize: 1.089.320.657 byte(s)
Satellite ID: ta01m
Slot status: F10111
File-/Foldername: TERR200704011032
CD / DVD Identifier: MODS200704032206

Product description:

sensor - platform: Modis - Terra-1
band: no band
processing level: visualisations, colour composites (rgb), 0.65-0.55-0.48 (approximate wavelengths on r-g-b) [more info](#)
units: ca
projection: conical conformal Clark 1866
area covered: Europe (similar to IPWG)
resolution[m]: 001000

productid:
ta01m_vc02canb1_na001_1000_pl01ei_001000

Search database: [\(help\)](#)

START date:
2007 - 03 - 01 10 : 32
=today! =END date!

Switch START date / Time frame
Time frame:
0 HOUR

END date:
2007 - 04 - 01 10 : 32
=today!

Enable timestep options
step value: min(s)

Satellite system:
*Modis Terra

SEARCH!

2007-04-01 10:32:00.0

Associated products for ta01m at 2007-04-01 10:32:00.0: [\(help\)](#)
*visualisations, rgb (0.65-0.55-0.48)-no band
Select

Login:

Benefit to Other Projects

- Joint DFG application (under review):
“Functional ecology and sustainable management of mountain forests in Ethiopia”
(Speaker: Georg Guggenberg)
- DFG RU “Polylepis” (in preparation):
(Speaker: Isabell Hensen)
- EU FP 7 (in preparation):
“Chinese and Mongolian Dry Steppe Use (CAMDSU)”
(Coordinator: Karsten Wesche)

Main Advantages in Addition to FOR402*meta*

- ✓ Highly efficient data access
- ✓ Conversion of queried data to selected formats
- ➔ Ready to use datasets after download?
- ➔ Optimization of data exchange between the WG?
- ➔ Promotion of interdisciplinary work within the RU?
- ➔ Little more user effort for data upload
(standardized file formats)

Lessons Learned

Central Data Services

- System must be able to handle heterogeneous data
- Easy (and global) access to the system
- System must be as user friendly as possible
 - Data upload, query, and download
 - Software requirements on the user side
- System must be available as soon as possible
- (Additional benefit if only open source software is used)

Meta-Database vs. Data Warehouse

	Meta-database	Data Warehouse
Application:	sectoral to interdiszip. working packages	interdiszip....integrative working packages
Data input:	easy time inexpensive	easy little time expensive
Data query:	easy but limited maybe time expensive	easy, not limited little time expensive
Data utilization:	difficult highly time expensive	easy little time expensive

None-Software Factors

- Analysis of potential interfaces between single working packages
- ➔ Promote awareness of potential benefits
- ➔ Promote willingness of users to submit their data

None-Software Factors

- Obligatory data user agreement
 - Formalities for data provision
 - Definition of data and meta-data formats etc.
 - Consequences if users do not submit their data
 - Formalities for data usage
 - Framework in which data from others can be used
 - Formalities to be considered if data from others is used
 - Consequences if data from others is used without reference etc.
- ➔ Provision of confidence between project members
- ➔ Ensure full data access within the research unit

Thank you for your attention!