

Tambora.org as a New Tool for Collaborative Work in Historical Climatology and Environmental History

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Ruediger Glaser¹, Ato Ruppert², Sebastian Lenz³*

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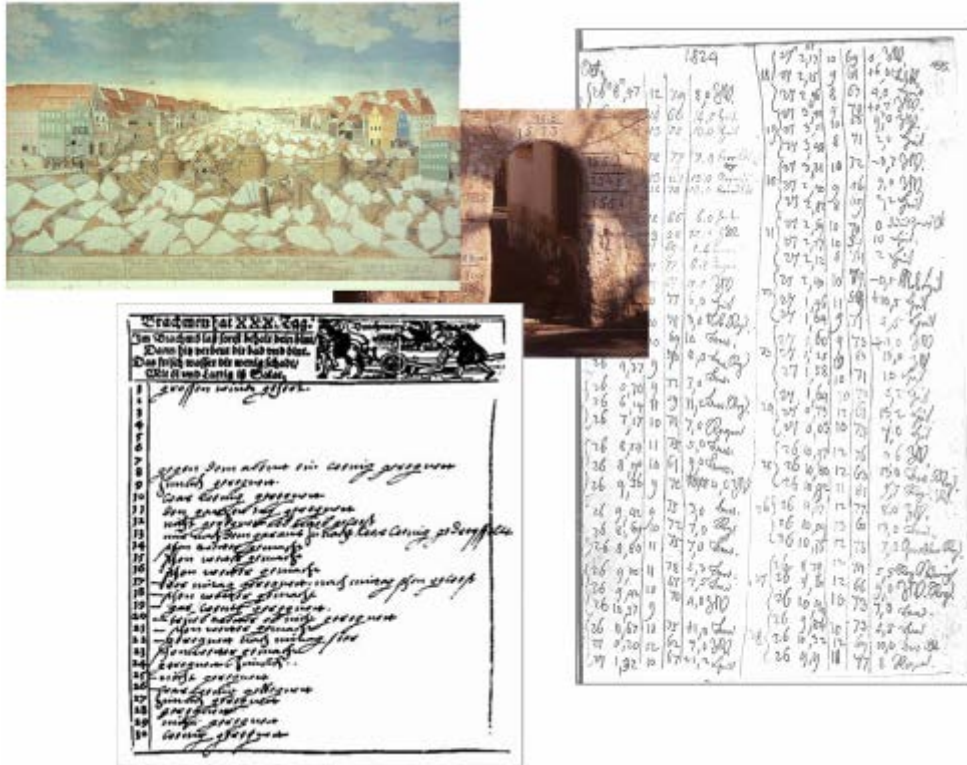
²University Library, University of Freiburg

³Leibniz Institute for Regional Geography, Leipzig

CNI Fall Meeting 2012
Washington, 2012-12-11

Albert-Ludwigs-Universität Freiburg
www.geographie.uni-freiburg.de

Historical Climatology research areas

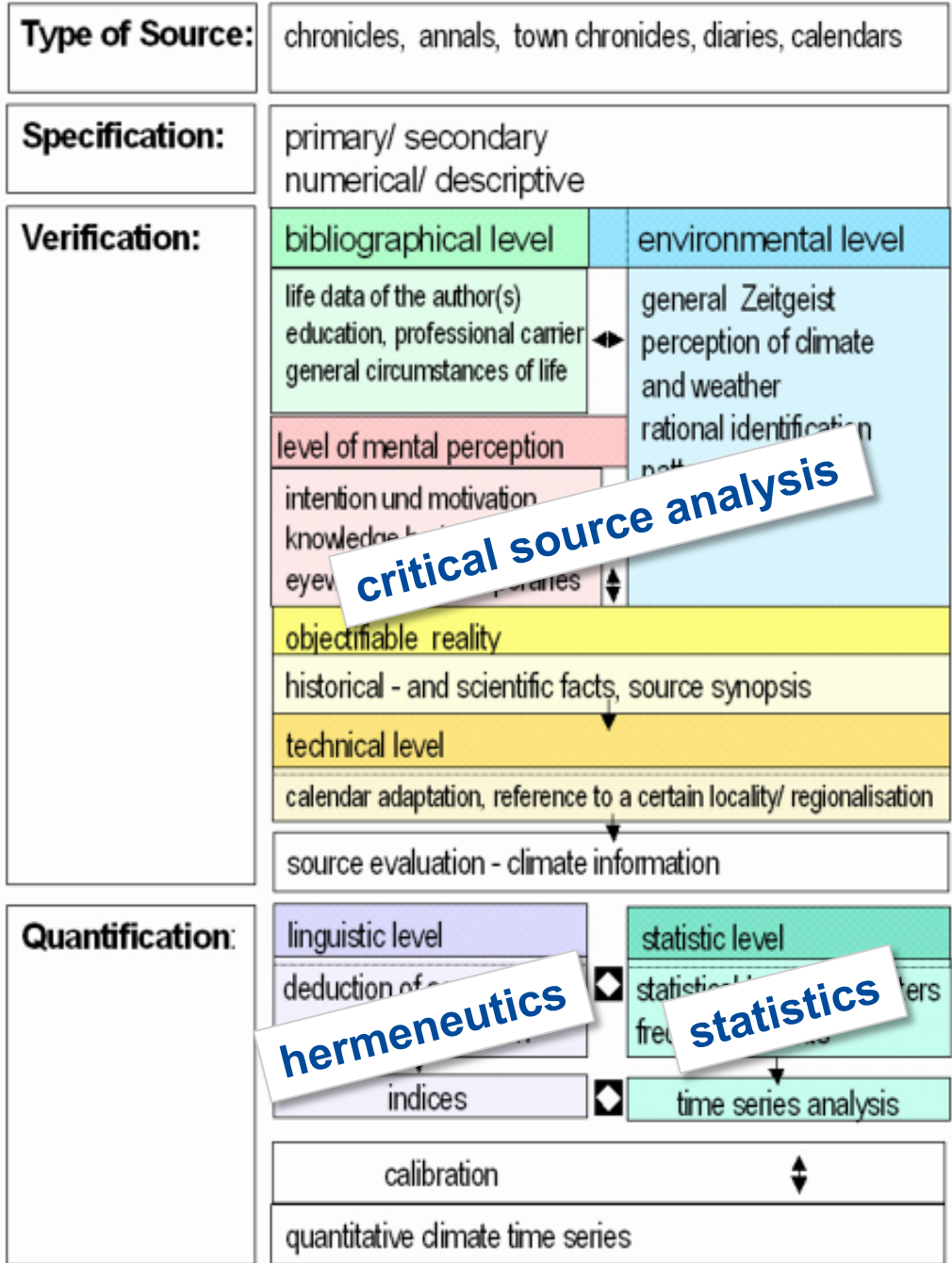
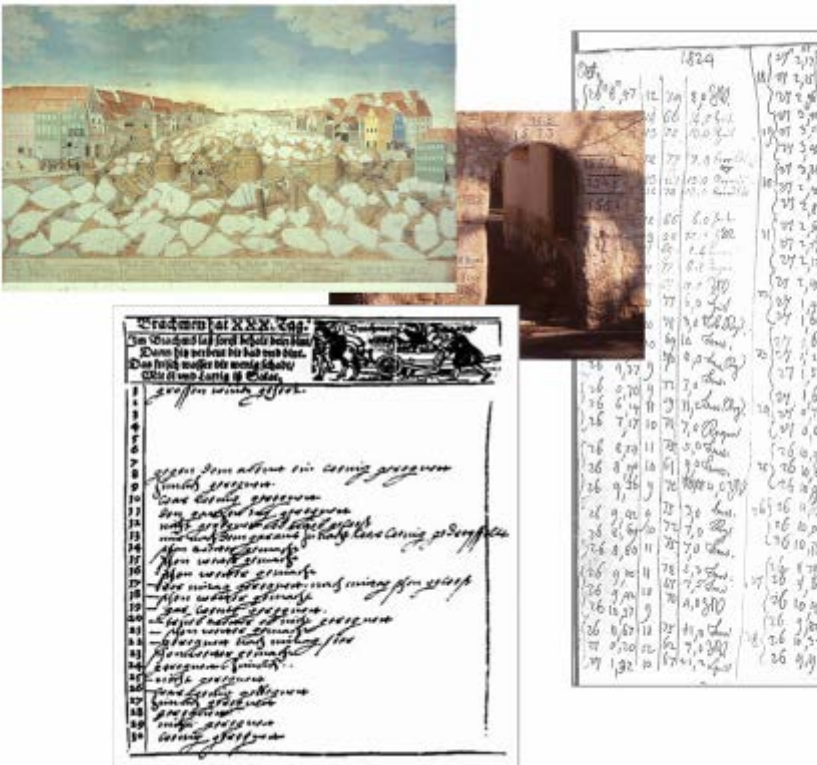


- reconstruction of past weather and climate
- impact of climate variations and climate extremes on societies
- past discourses and social representation of climate

(e.g. Glaser 2001/2008, Brazdil et al. 2005)



Methodology



critical source analysis

hermeneutics

statistics



Historical Climatology workflow...



1709 war der grosse Winter, der in die 4. Monath gedauret, und seines gleichen seit [...] 1608 nicht gehabt. [...] Den 6. Januar erhob sich die Kälte wieder zu einer ausserordentlichen Strenge, die bis zum 23. fortgieng, allwo bey einigem Nachlaß eine ungemeyne Menge Sch unsäglichen Schaden getha in Frankreich erfrohren, and das Wild in den Wäldern, die [...] [Auch der] Zürcher See Tagus zu Lissabon war mit

Dreyhaupt, J. C. (1749): Pag historische Beschreibung de

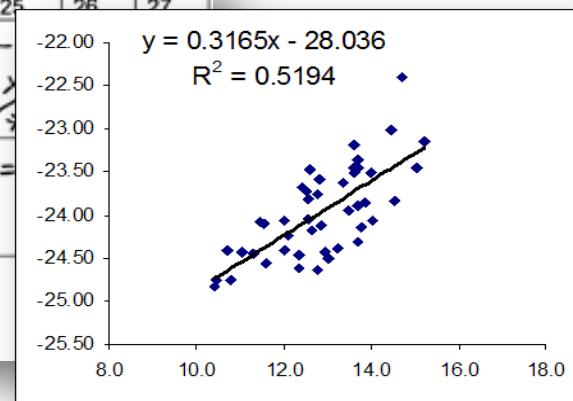
18	19	20	21	22	23	24	25	26	27
	—		—	—	—	—	—	—	—

search

transcribe

- *date and location*
- *climatological and environmental events*

code



analyse



DOI

publish

The Diary of Ibn Tawq (1430 –1509)



A diary of a
Damascene citizen,
covering the years
1480-1502 AD

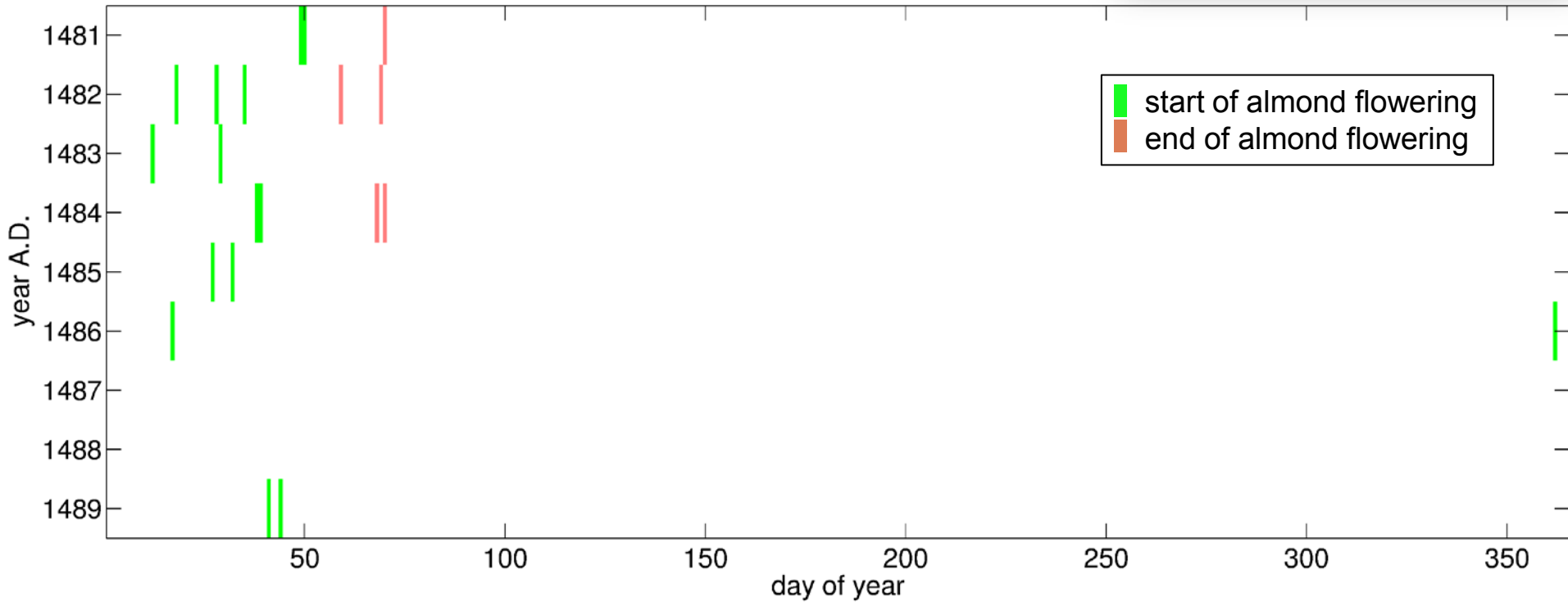
Manuscript:

Al-Assad National Library,
Damascus
Az-Zahiriyyah Ms 4533

Az-Zahiriyyah Ms 4533, fol. 1
(Source: al-Muhajer, 2000, p. 575)



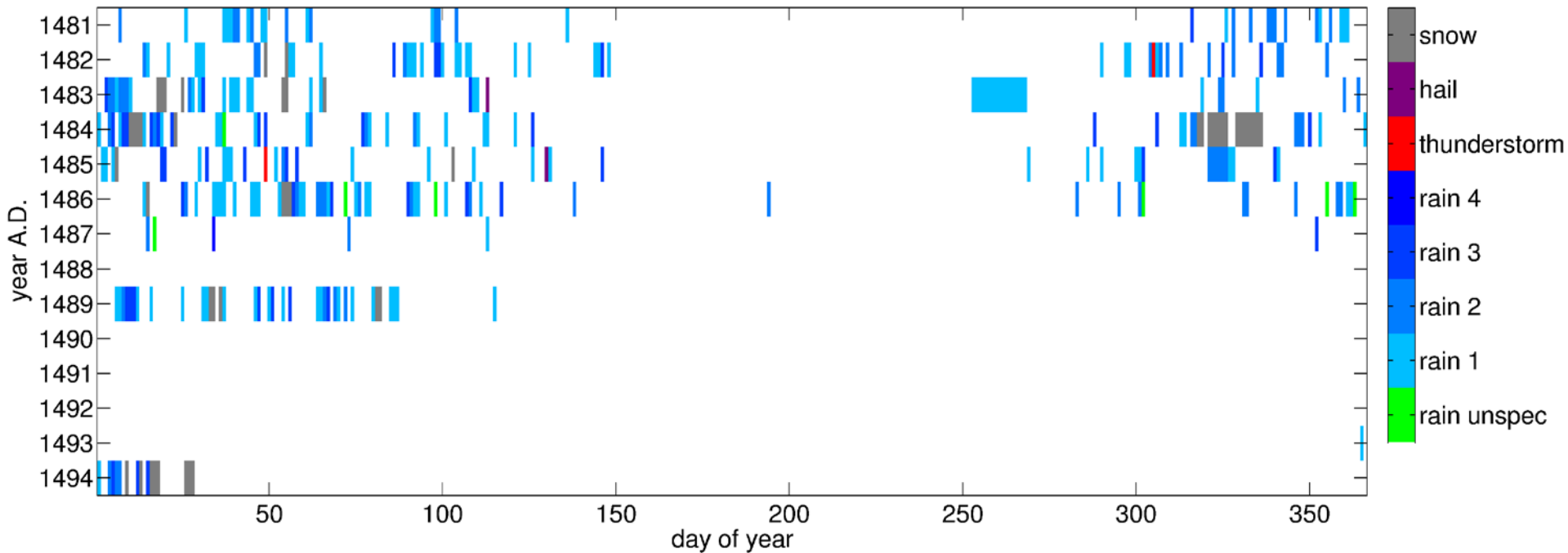
Phenological dates



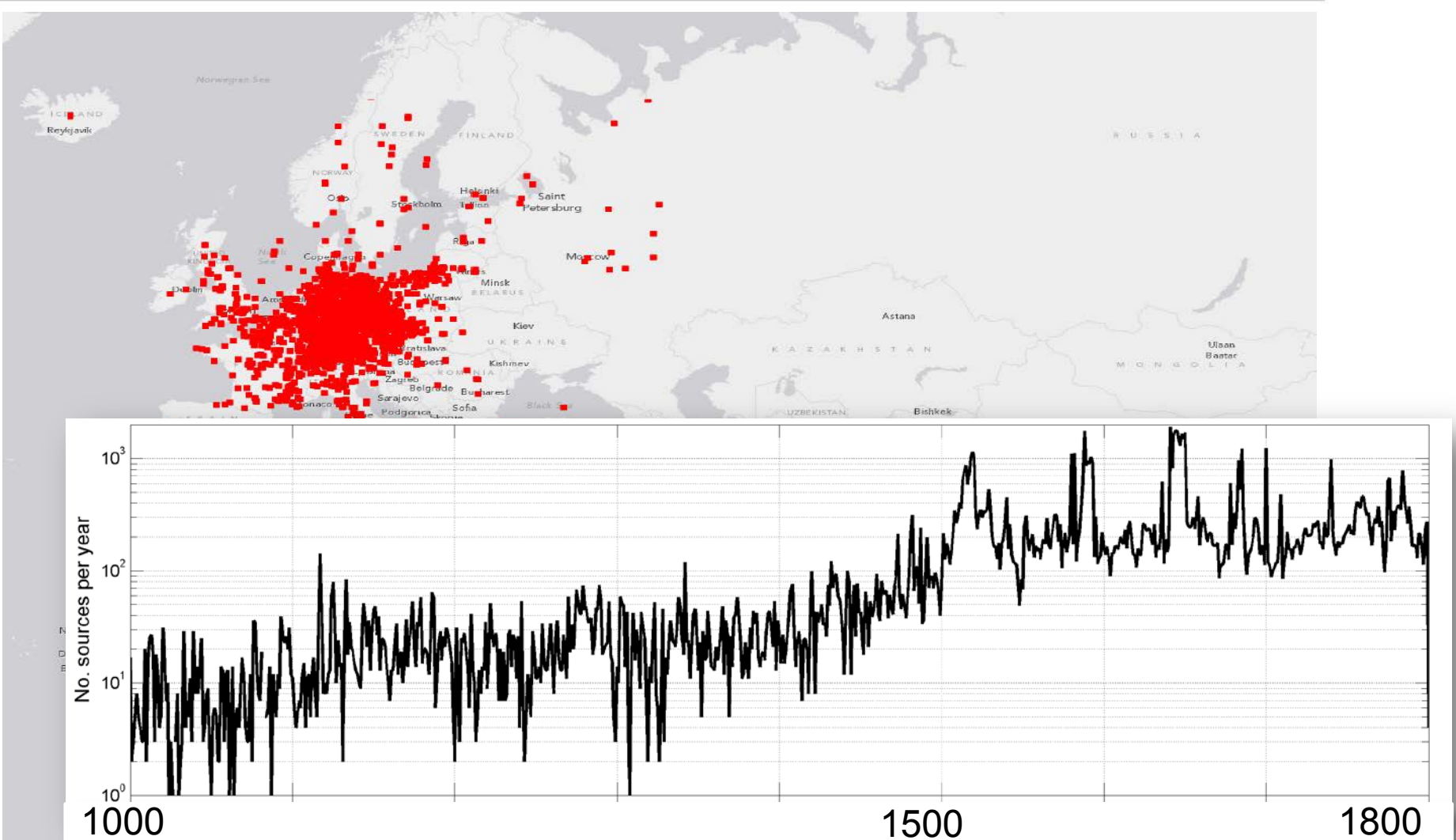
*Note: multiple observations in one year come from different locations



Precipitation

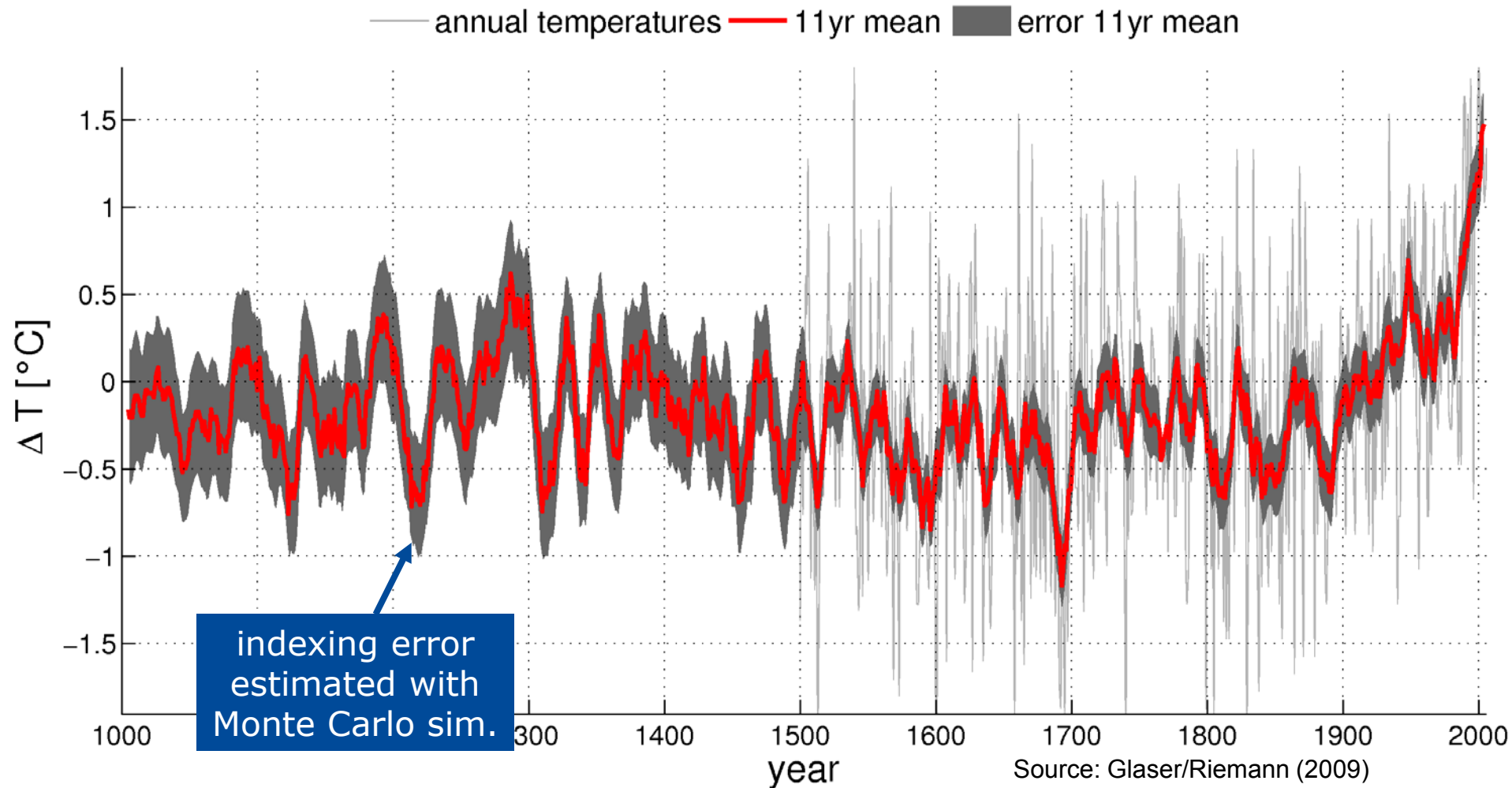


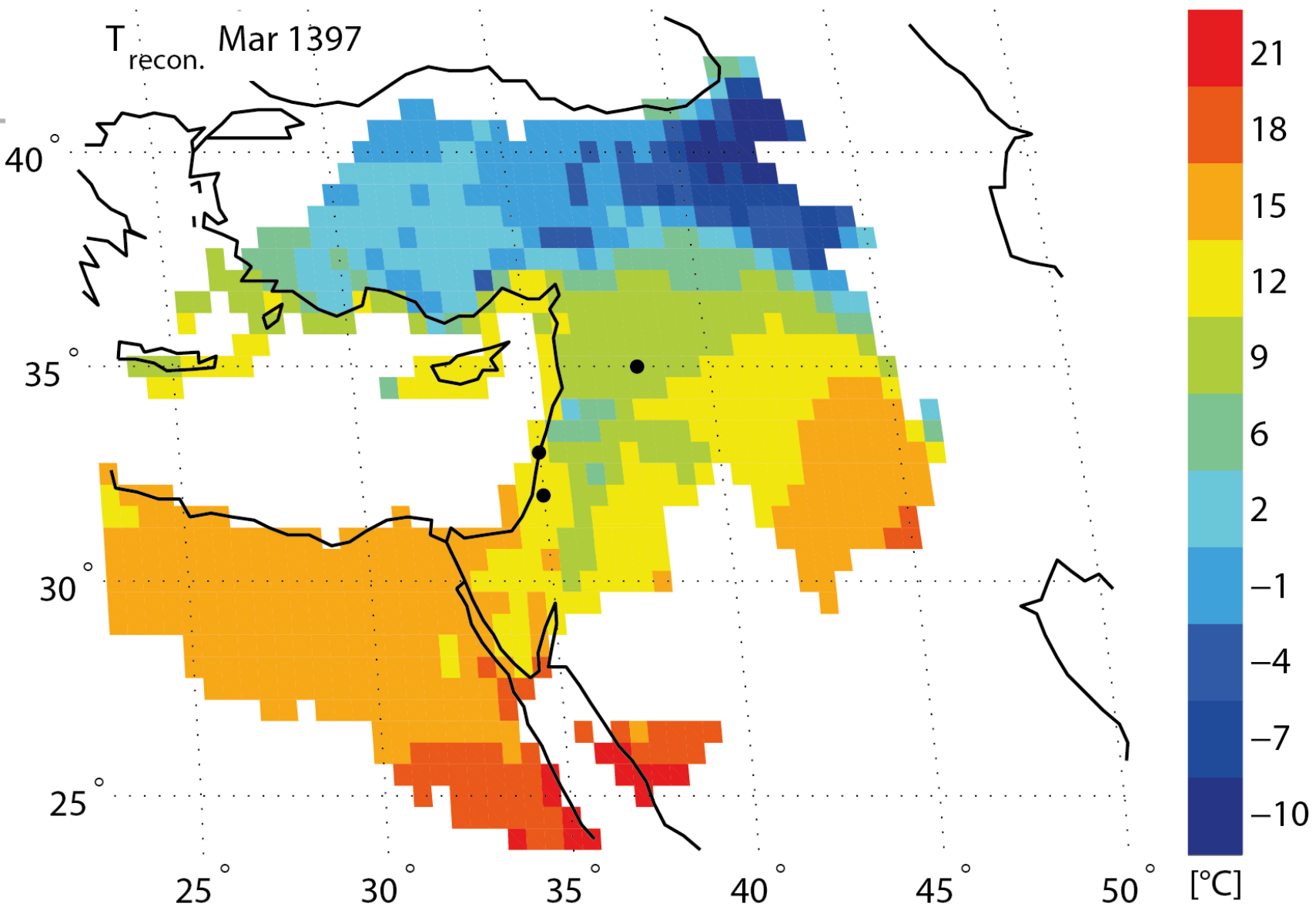
Spatiotemporal distribution of reported events



Source: www.tambora.org. (2012-11-16)

Temperature reconstruction for Central Europe





Source: Vogt et al. (2011)

Reconstructed temperature field (March 1397 AD)


Tambora.org: A Collaborative Research Environment

 Search Explore About Contact Login

[Home](#) » Home

Welcome! Please sign up

Welcome to



The banner features a central blue globe with orange brushstrokes. To the left is a historical document snippet. To the right is a map of Indonesia with a color scale from -7.4 to 14.2. Below the globe is a line graph showing temperature anomalies (ΔT [°C]) from 1800 to 2000, with a red line for the 11-year mean and a grey shaded area for the error. The word 'tambora' is written in large, bold, black lowercase letters across the center.

temperatures — 11yr mean ■ error 11yr mean

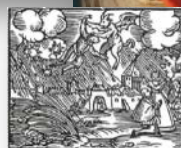
tambora

the climate and environmental history collaborative research database

Funded by
DFG



Historical Climatology workflow...



search



1709 war der grosse Winter, der in die 4. Monath gedauret, und seines gleichen seit [...] 1608 nicht gehabt. [...] Den 6. Januar erhob sich die Kälte wieder zu einer ausserordentlichen Strenge, die bis zum 23. fortgieng, allwo bey einigem Nachlaß eine ungemene Menge Sch unsäglichen Schaden getha in Frankreich erfrohren, and das Wild in den Wäldern, die [...] [Auch der] Zürcher See Tagus zu Lissabon war mit h

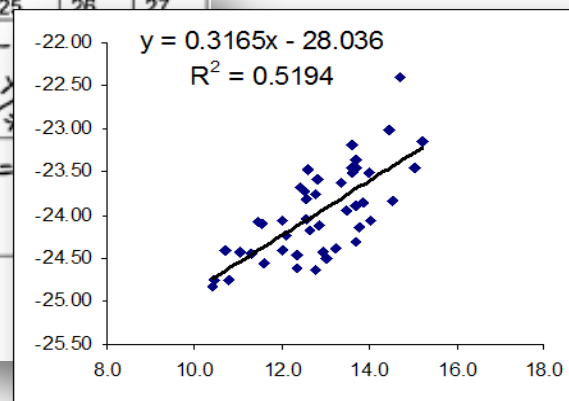
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transcribe

18	19	20	21	22	23	24	25	26	27
	—		—	—	—	—	—	—	—

- *date and location*
- *climatological and environmental events*

code

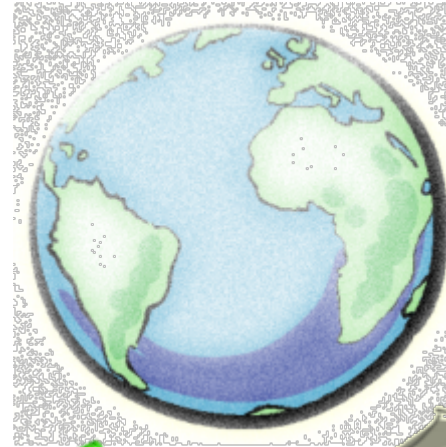
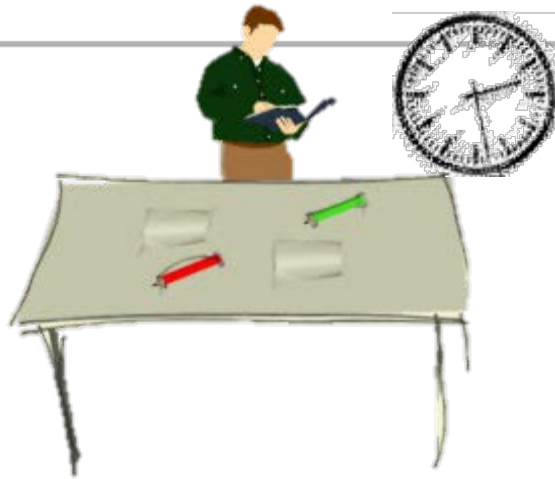


analyse

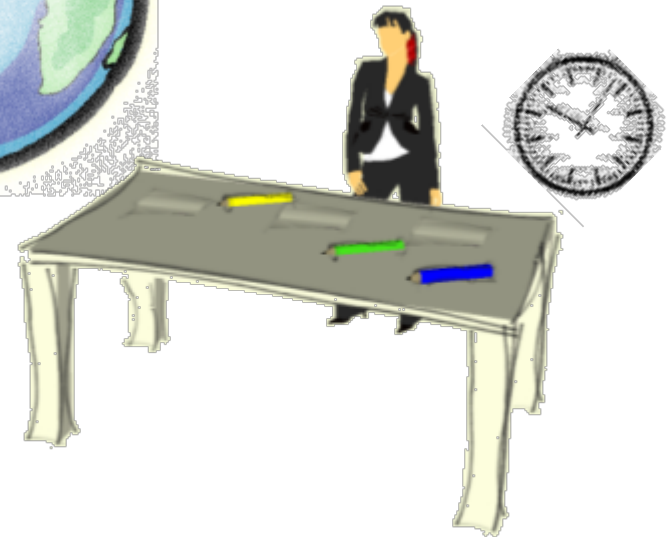


publish

Collaborative Work – Challenges



- different disciplines
- different tools
- different locations
- different working hours
- availability of data to all partners
- availability of tools to all partners
- long term storage and accessibility
- make data citeable

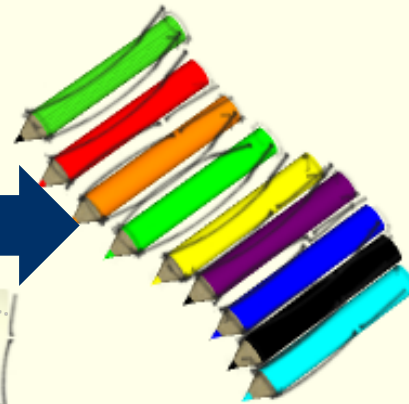


Collaborative Research Environment (CRE)

24/7 online access



same tools for all partners



same data format for all partners

Tools: Data entry and coding

Admin Workspace Search Locations Geographic Names Logout steffen

Home » Events Profile | Role: sysadmin | Project: HCI / HCI_Madras

Source
superintendent Fort St. George
Records of Fort St. George - Letters from Fort St. George to S


Quote
From January 1678/9 to dec. ULT: 1679, Fort St. George y (e) Chief & C(A) Council "We have before us yours of fthe 20th: (our hands the 5(th): &[18] Currant by the first wee take notice Metchlepatam the 13th : october which [has] Layd a great pa the houses and people in them boardering next [a word lost] s violent winds untilling all the Hono(ble): Companys Warehouse Damaged and all the cloth brought in by the Merchents ready and Dirt[...].

Location **Time** **Parameter** **Comment** **Publish**

Name
Machilipatnam | 11294
name assignment certain

Create

Show 10 entries Search:

ID	Name	Begin	End	Time	Parameter	
215755	Machilipatnam	1679-10-13 00:00:00		begin: 1679-Oktober -13 end: -Oktober -13	p: wind force v: 11 a:	

Showing 1 to 1 of 1 entries

First Previous 1 Next Last

70380
CASSUMBAR NOVEM: [1679]To the President & encountered with a Storme coming over the [flats Companys sloopes which [one word lost]us in so God wee [escaped] free of Damage, since our arri Employed in setting the Companys business [to?] great Disorder especially as to the Acco(ts): for 9 wee have been soe [a word lost] wee arived at thi and if wee [should?] hear any goode news of the f [Pattana] which is near 1000 tonns stopt there, w suddainly, but by reason thereof [they] will bee lat and wee [fear] must at the Last to buy Petre at Hl succeed for the best and to yourselves health and unfeighn[ed] desires of Sirs Yo(r): ... Streynsham

From January 1678/9 to dec. ULT: 1679, Fort St. George y (e): 27.11.16(79). Mr. Christopher Hatton Chief & C(A) Council "We have before us yours of



Tools: Geolocation

- Operations**
- List Locations
 - Manage Locations
 - This Location
 - Update Location
 - Delete Location
 - Add Name
 - Manage Names

Chennai (Ort, ID8220)

primary name
Chennai* (0)

other names
சென்னை* மெட்ராஸ்*

location reviewed by
Vogt. *Reviewed names are marked with '*'*

location

Chennai (Ort, ID8220)

primary name
Chennai* (0)

other names
சென்னை* மெட்ராஸ்* Madras* (22) add name...

location reviewed by
Vogt. *Reviewed names are marked with '*'*

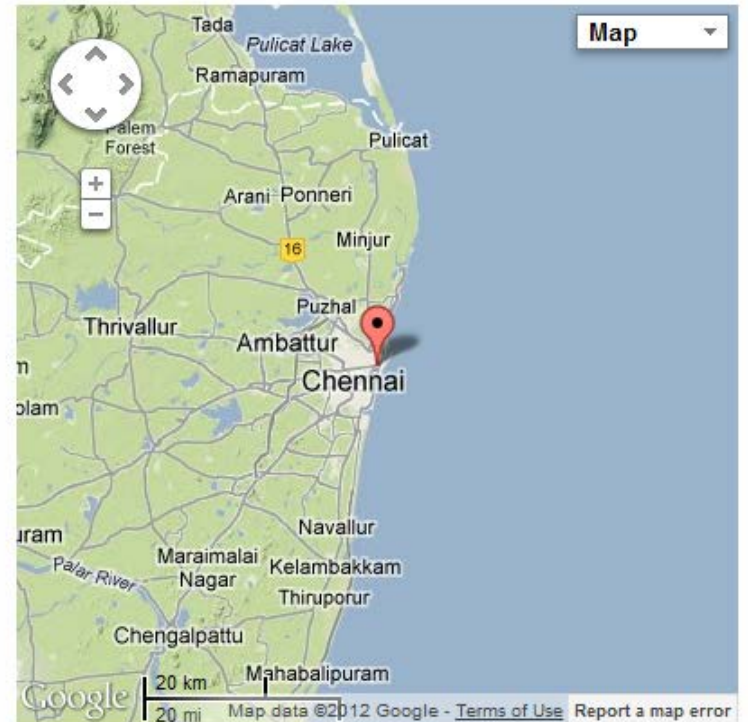
location

Chennai

Update...

< previous similar location

next similar location >



Tools: Search and find data



Documents **Parameter**

Search All Fields

Search in particular fields:

Search Document Text

Search Source

Search Author

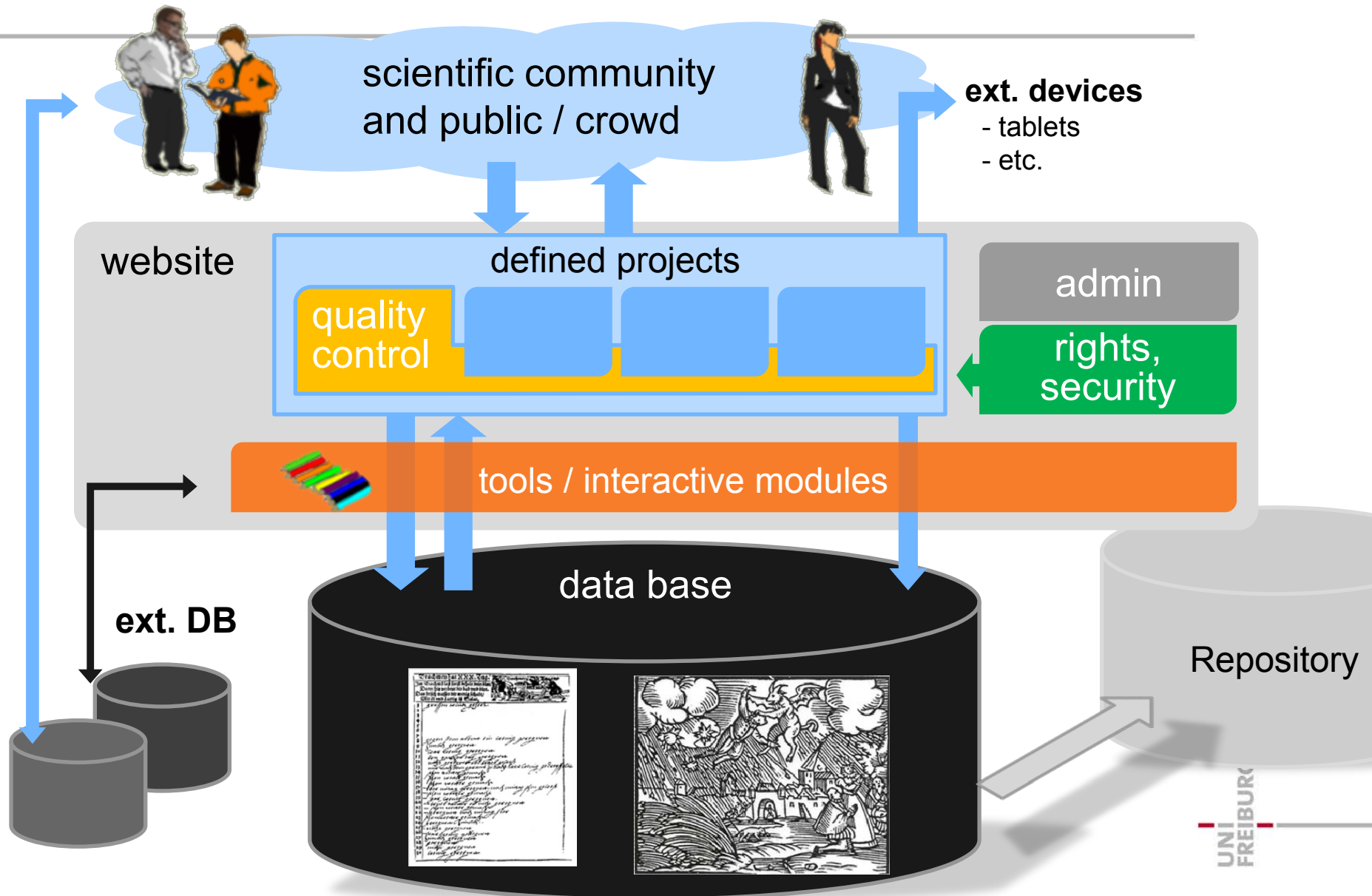
Year **Project**

Hisklid
 Weikin
 Freiburger Zeitung

Show 10 entries

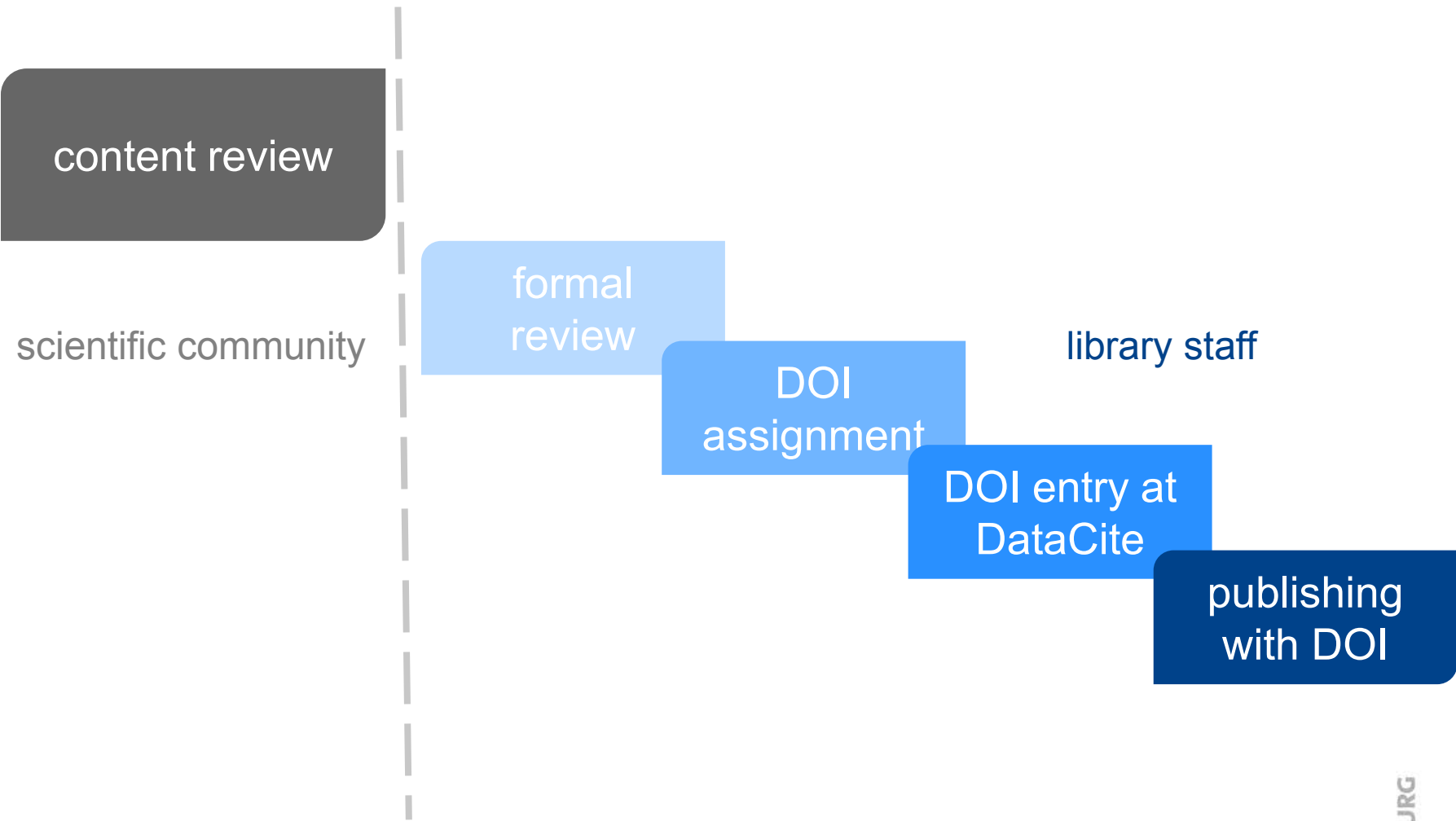
	Source	Document Text	Location	Begin	End	Events
<input checked="" type="checkbox"/>	HASPER, F.W. L. (1812): Chronicon Annabergense; (1504-1658).	* Den 4. July ist eine unzehliche Menge Hewschrecken, wie eine finstere Wolcke über die Stadt gezogen, an etlichen Orten so dicke, daß sie d...	Stadt Annaberg-Buchholz	1542		p: grasshopper v: 1 a:
<input checked="" type="checkbox"/>	ZOPF, M. Joh. Caspar (1692): Reußische Gerauische Stadt- und Land Chroni...	* 1542. Jm August-Monat circa Assumptionis Mariae sind gewaltige grosse Heuschrecken durch das Land geflogen / und durch Pohlen und Schlesie...	Deutschland - D	1542		p: grasshopper v: 1 a:
<input checked="" type="checkbox"/>	BRAUN, J. (1648): Nordgauchronik von Johannes	* Dies Jahr sind viel schreckliche Conjunctiones Planetarum gewesen, und sonderlich Congressus Solis, Martis, Veneris, Mercurii et Lunae. un...	Deutschland - D	1558	1558	p: grasshopper v: 1 a:

System architecture of CRE





Publishing and quality control





CRE + Repository

tambora.org

input tools

research
tools



data

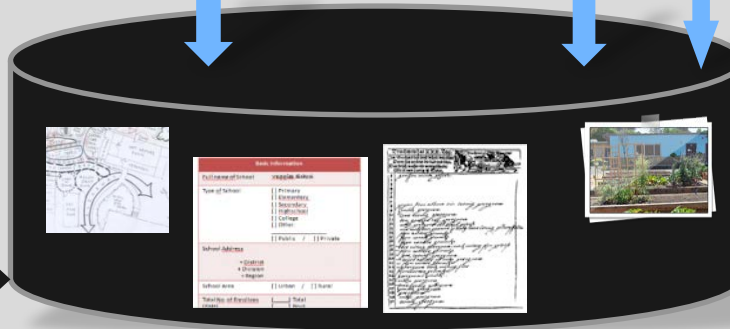
other
CRE

other
DBs

...

Repository

for scientific data
University of Freiburg



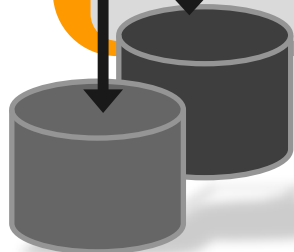
data collections
(with DOIs)

meta data

library staff



ext. catalogs





tambora.org

Historical Climatology

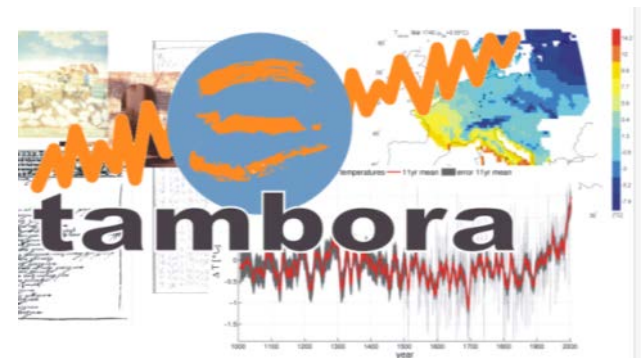
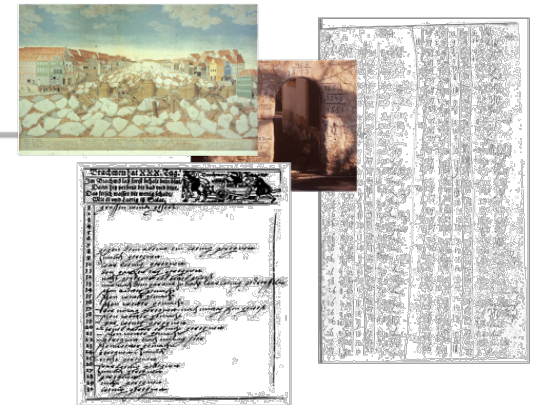
- highly interdisciplinary research

CRE provides tools for complete workflow

- data entry
- search, analysis and visualization
- publishing with DOIs
- project and data access control
- gazetteer

Sustainable operation of CRE

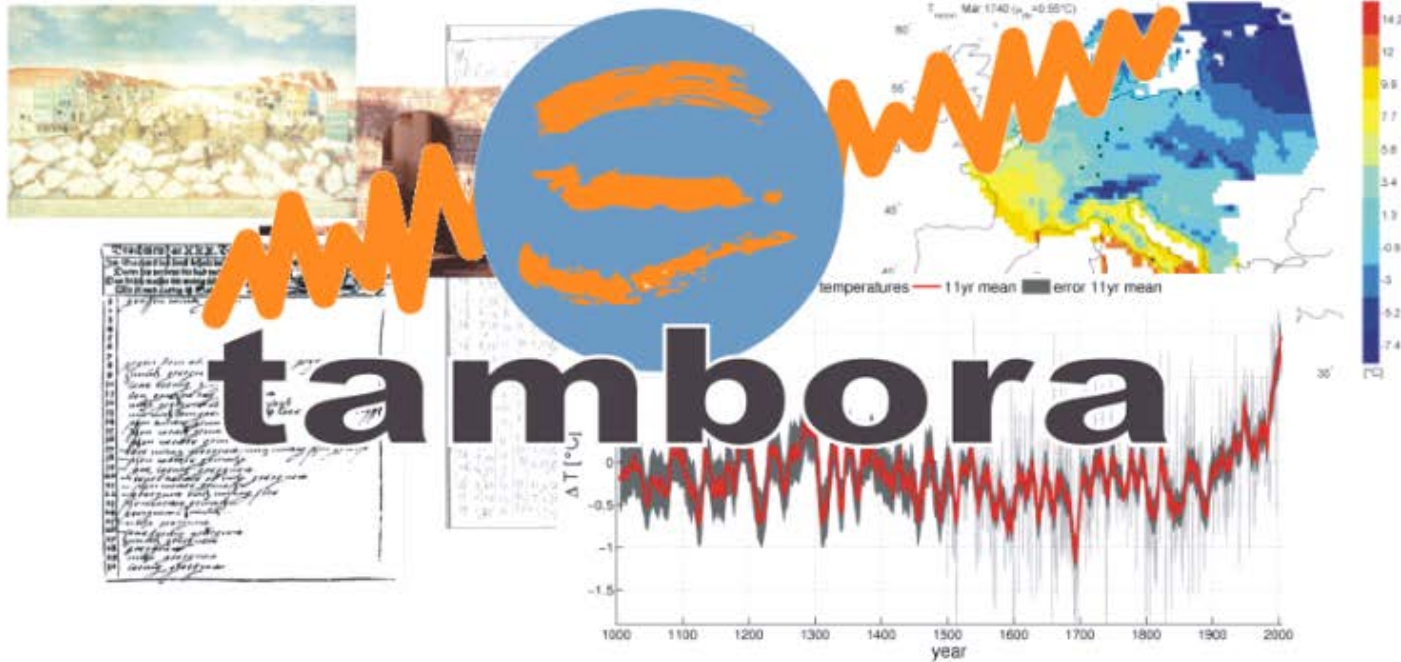
- content and metadata quality control
- long term data archiving and accessibility
- maintenance part of regular library operation services



Welcome to

Funded by

DFG



the climate and environmental history collaborative research environment

www.tambora.org

dirk.riemann@geographie.uni-freiburg.de

steffen.vogt@geographie.uni-freiburg.de

We kindly acknowledge funding by DFG under contracts
GL358/9-1, INST 1475/3-1, INST 497/2-1, and JA 831/8-1

UNI
FREIBURG



Sustainability of CRE tambora.org

long-term archiving

- in regular service of university library
- part of larger scientific data repository
- maintained by library staff

maintenance of CRE

- in regular service of university library

further development of CRE

- subject to third-party funding
- university library provides technical advice

Technical components of tambora.org

OS on Virtual Machine

- SLES 11 VMWare SP2

Relational Database Management System

- Postgres 9.1.6 / Postgis 1.5.4

User Interface

- Apache 2.2
- Php 5.3.8
- Yii 1.12

Repository

- Fedora Commons 3.5.1

Role based access model

Project manager

- manage project and sub-projects
- assign project members
- create project meta data

Project staff

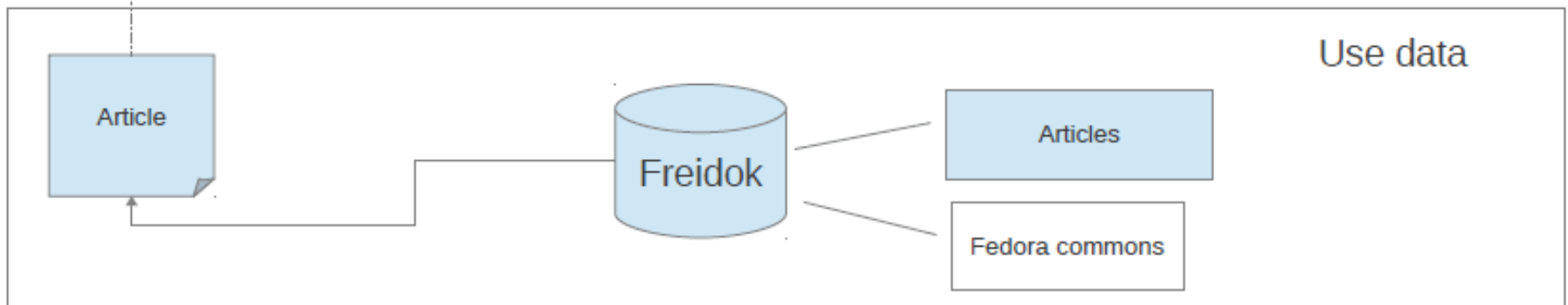
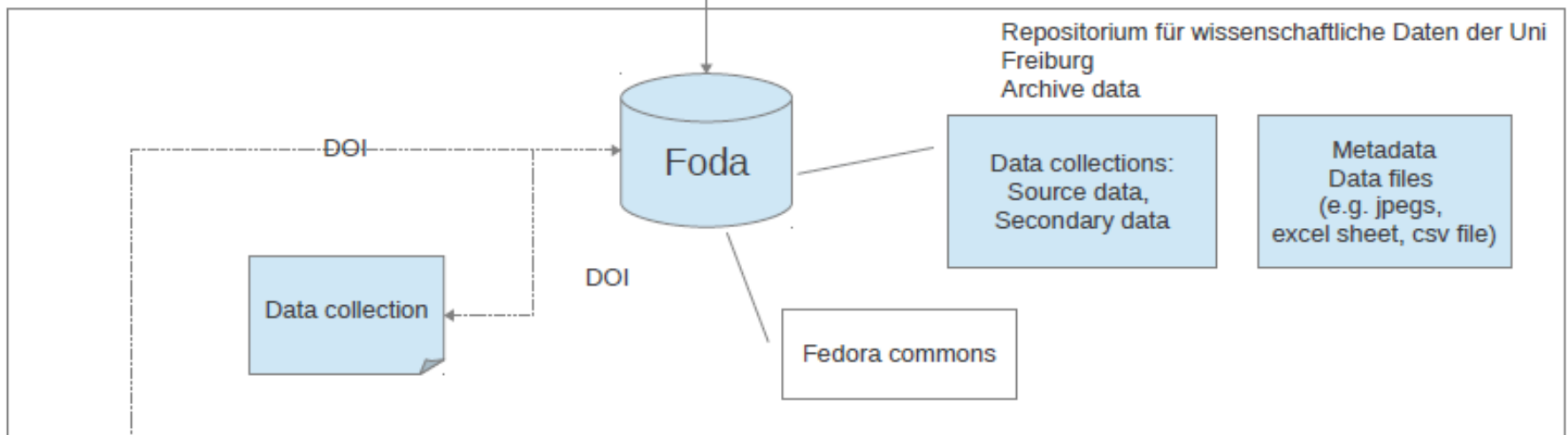
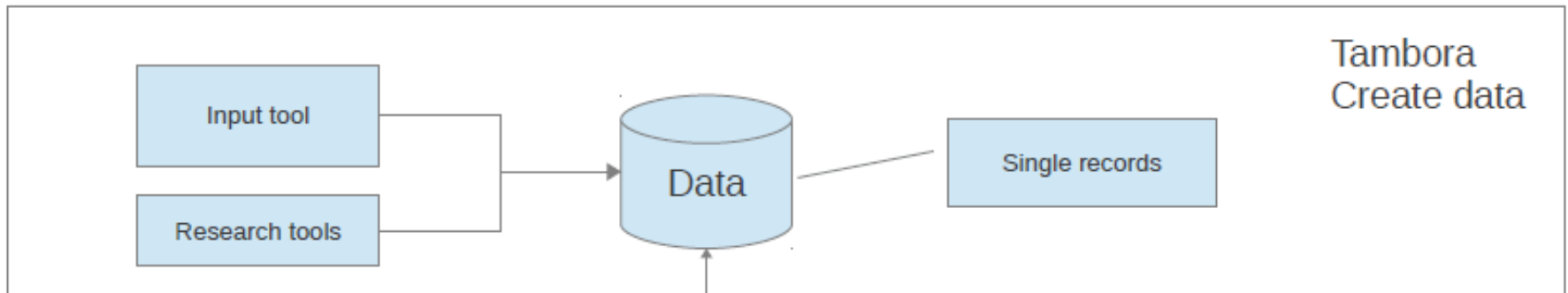
- data entry

Public

- read-only access to all published data

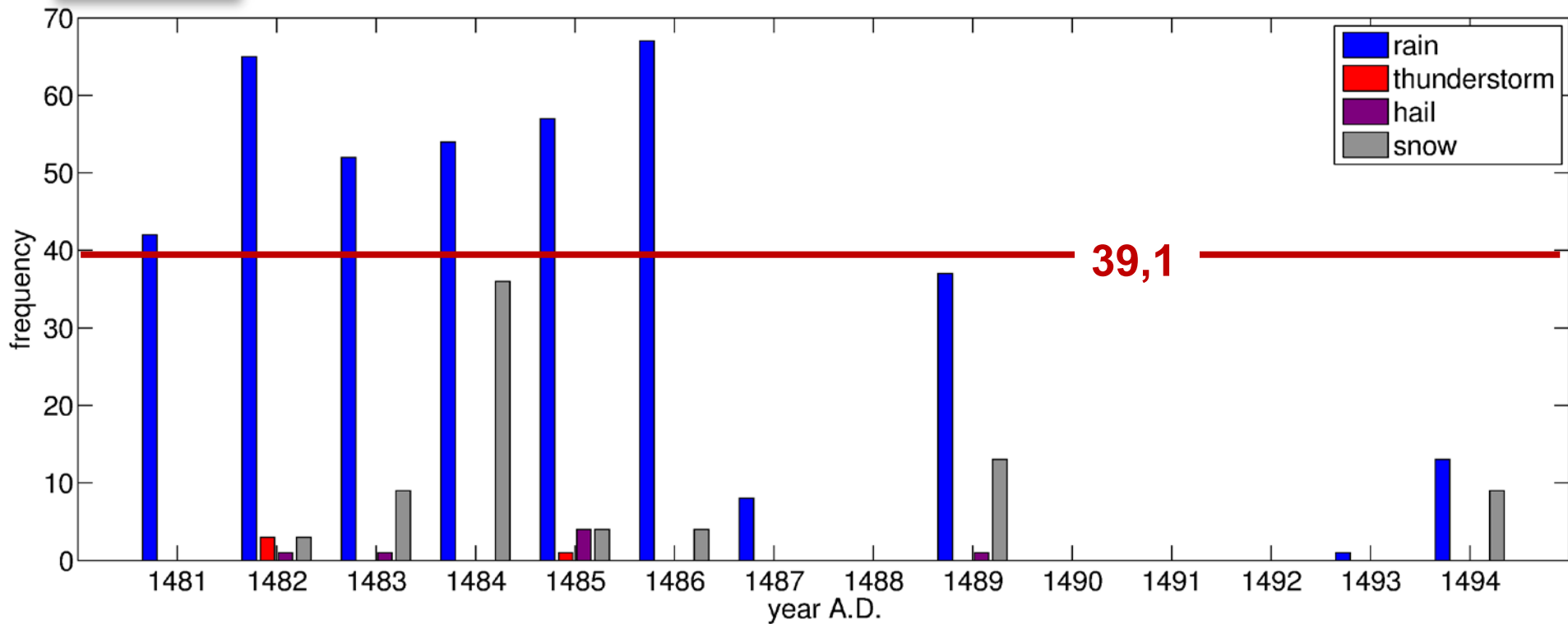
Project reader

- read only-access to non-published data of specific project



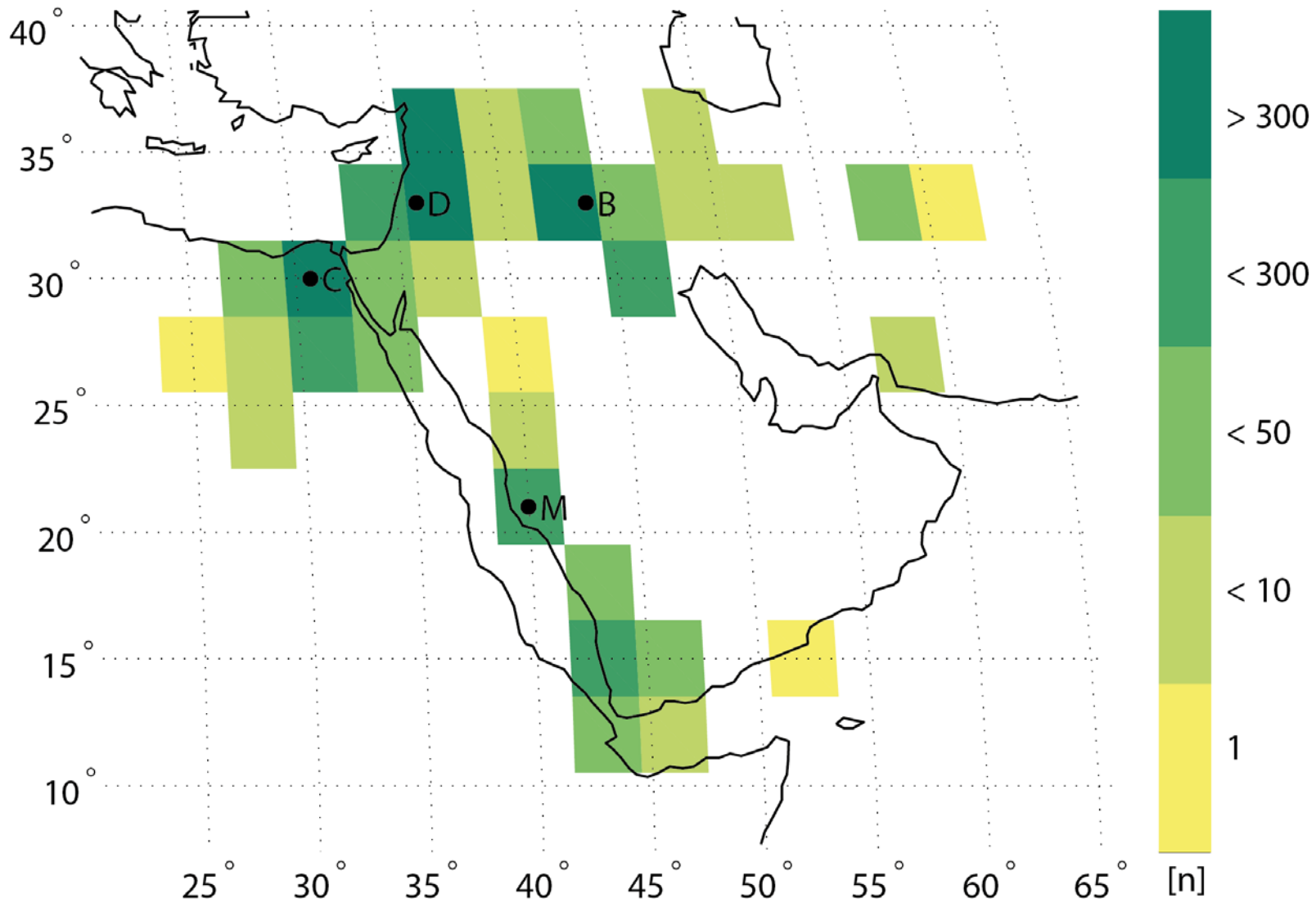


Days with precipitation per year



For comparison:

— Damascus average number of rainfall days per year (1960-90)

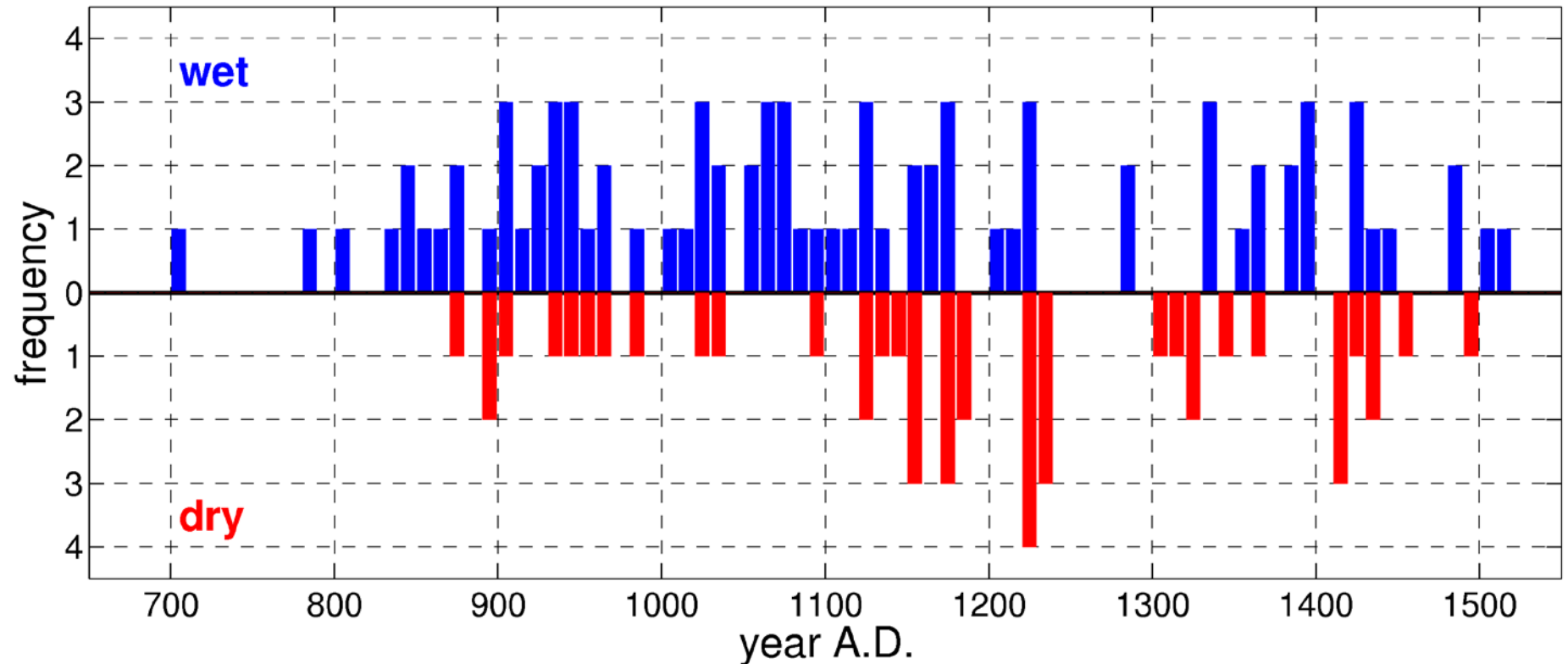


Project Middle East Historical Climatology:
 Distribution and number of total reported events,
 Temporal extent: 800-1800 AD

Source: Vogt et al. (2011)



Decadal indices of dry/wet winters



Source: Vogt et al. (2011)