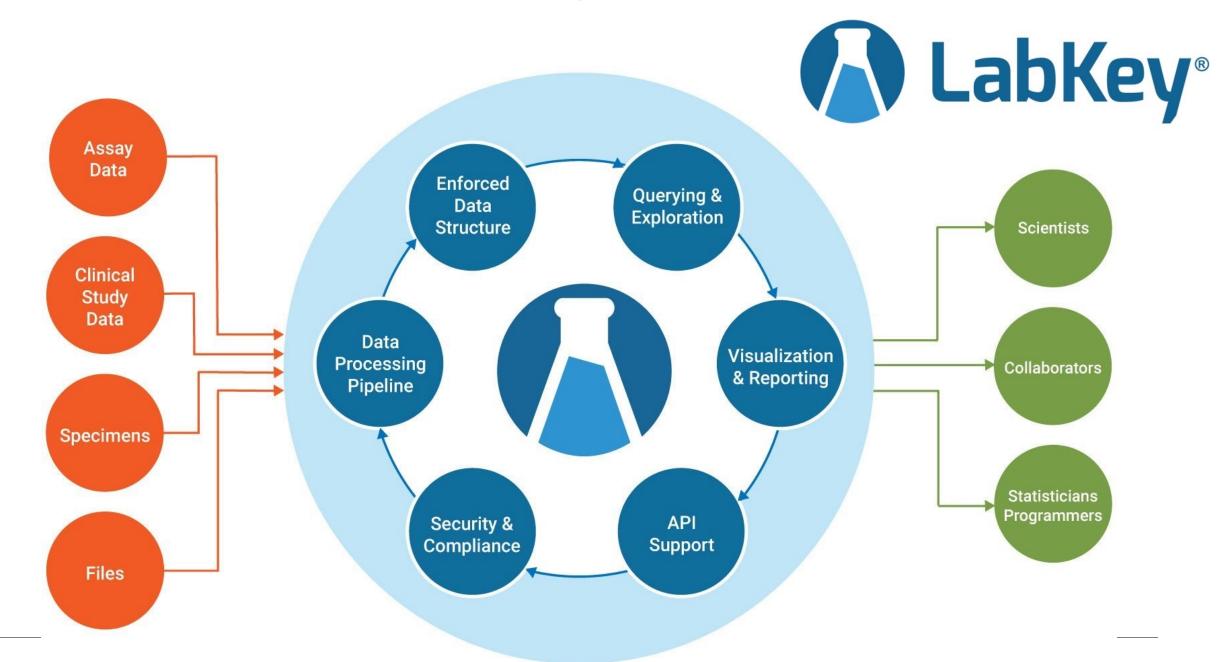


LabKey for data management

Sofia Georgakopoulou - 02 June 2023

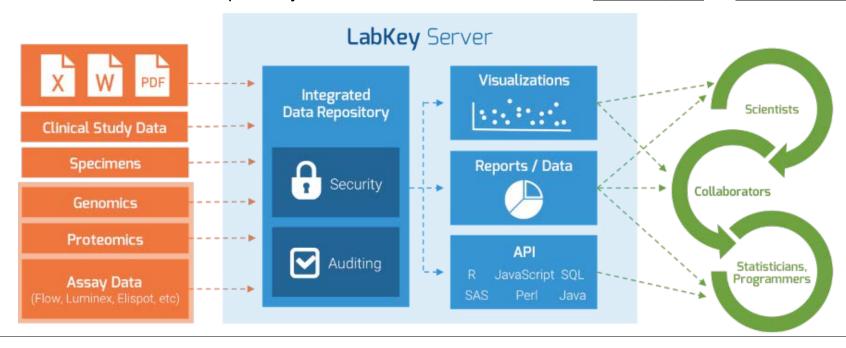




What is the LabKey Server

- Software platform for managing, analyzing and sharing biomedical data.
- Web server: a request-response machine taking in requests over the web (i.e. URLs through a web browser) and then craft responses which are displayed to the user.
- User-friendly interface to a relational database: web-based querying, reporting and collaborating across sources.
- Open source and Free license (Apache)
- Base platform in Java
- Extendable with a.o. JavaScript, R, Python

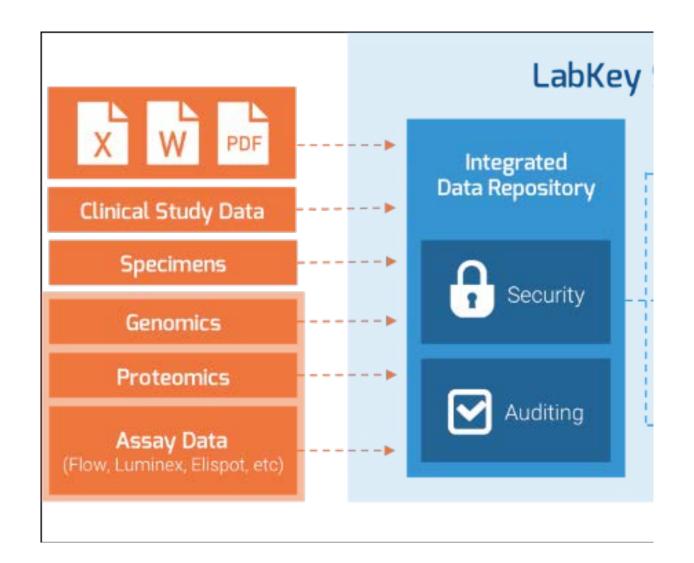
www.labkey.com and https://labkey.scicore.unibas.ch.



1. Data repository

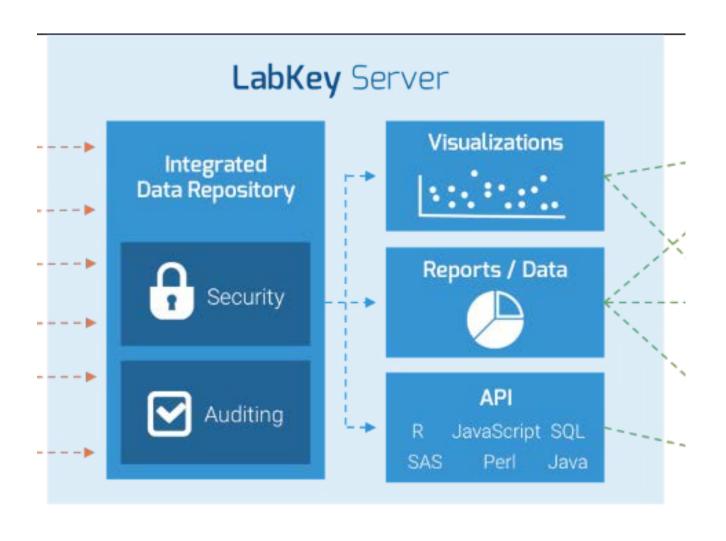
- Data from multiple sources into one repository.
- Sources can be physically separated in different systems.
- Sources can be separated "morphologically".

→LabKey Server can bring all of this data together to form one integrated whole that you can browse and analyze together.



2. Electronic Laboratory

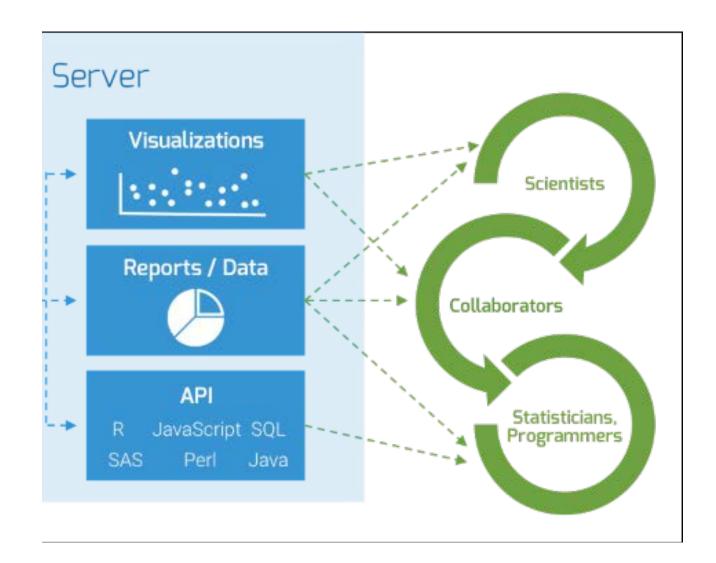
- Analyzing and inquiring into data.
- Data itself is the object of inquiry.
- Craft reports and visualizations, confirm hypotheses.
- Provide new insights into your data by bringing it all under one roof.



3. Data Showcase

- Securely present and highlight data over the web.
- Present different profiles of your data to different audiences.
- Collaborate with external or internal team members.

→LabKey Server lets you create different relationships between data and audiences.



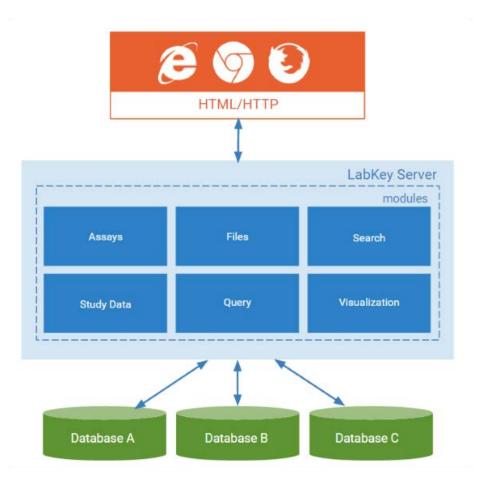
LabKey Modules

They are the main functionaries in the server.

They interpret requests, craft responses, contain all the web parts, and application logic.

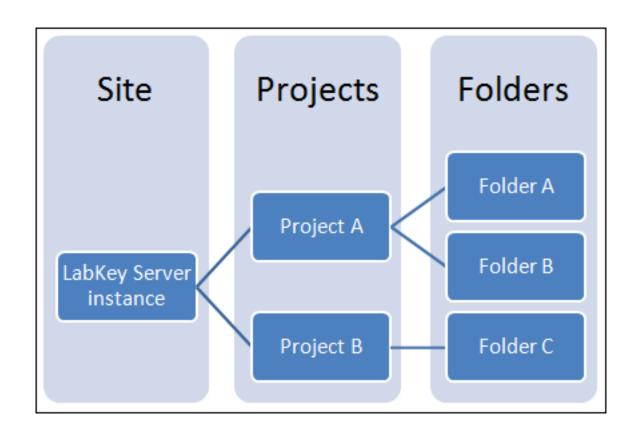
Responses can take many different forms:

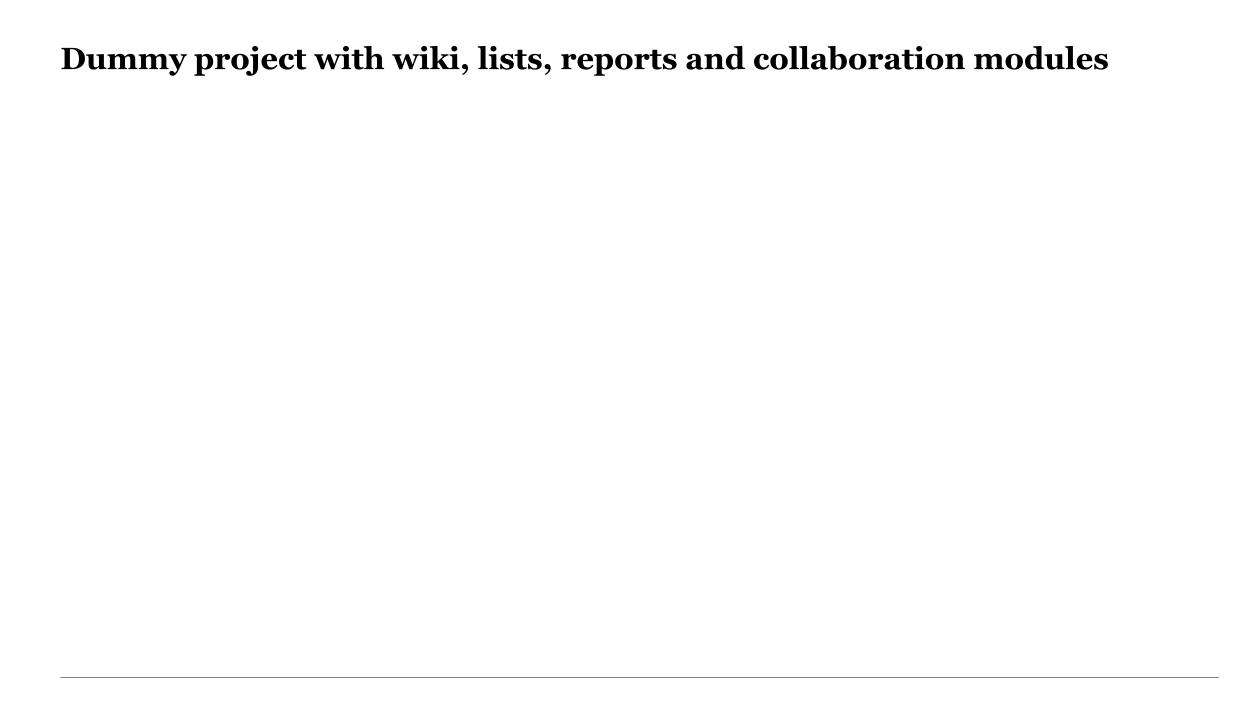
- a web page in a browser
- an interactive grid of data
- a report or visualization of underlying data
- a file download
- a long-running calculation or algorithm



What is a "project" in LabKey?

- A LabKey server installation is organised as a **folder** hierarchy.
- The first and second ranks of folders have special names: site and projects (Administrator level).
- A project can contain any number of folders and sub-folders underneath (User level).

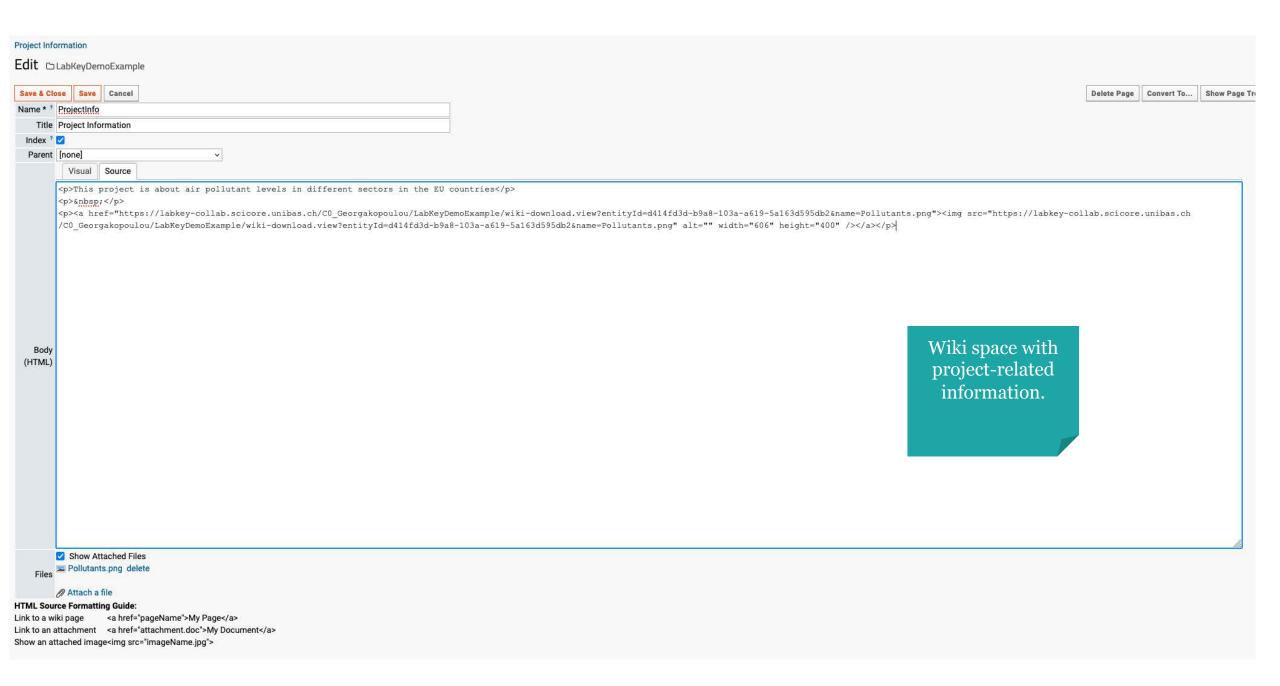




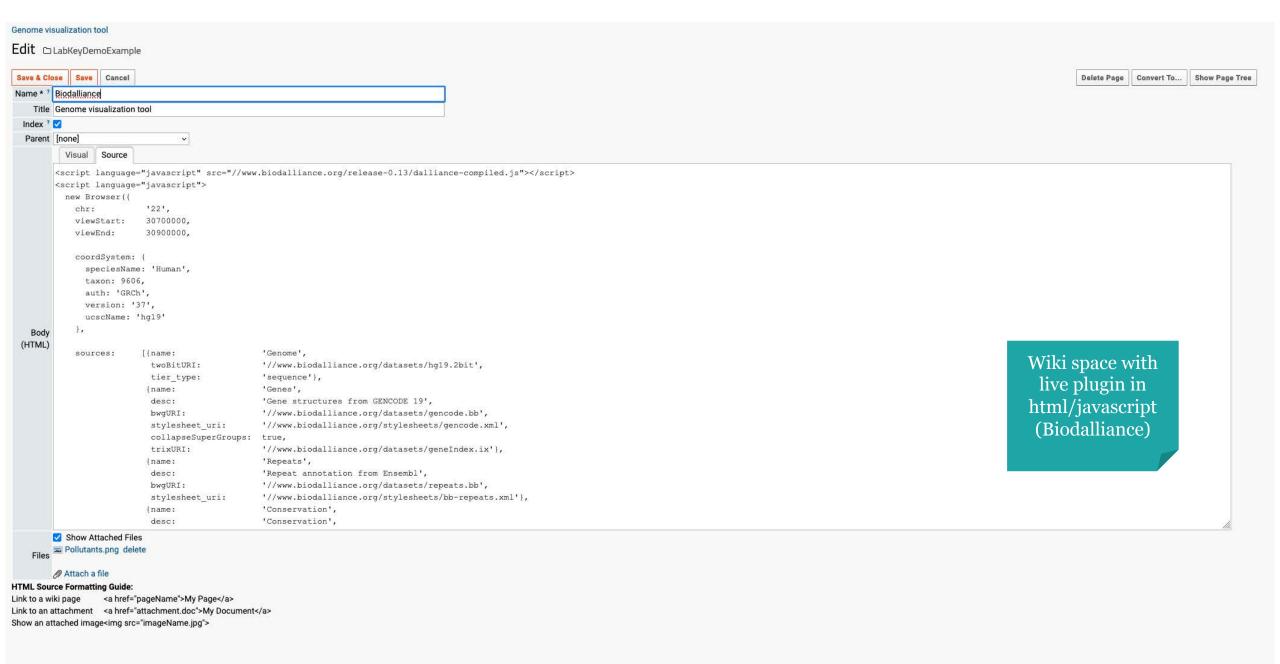








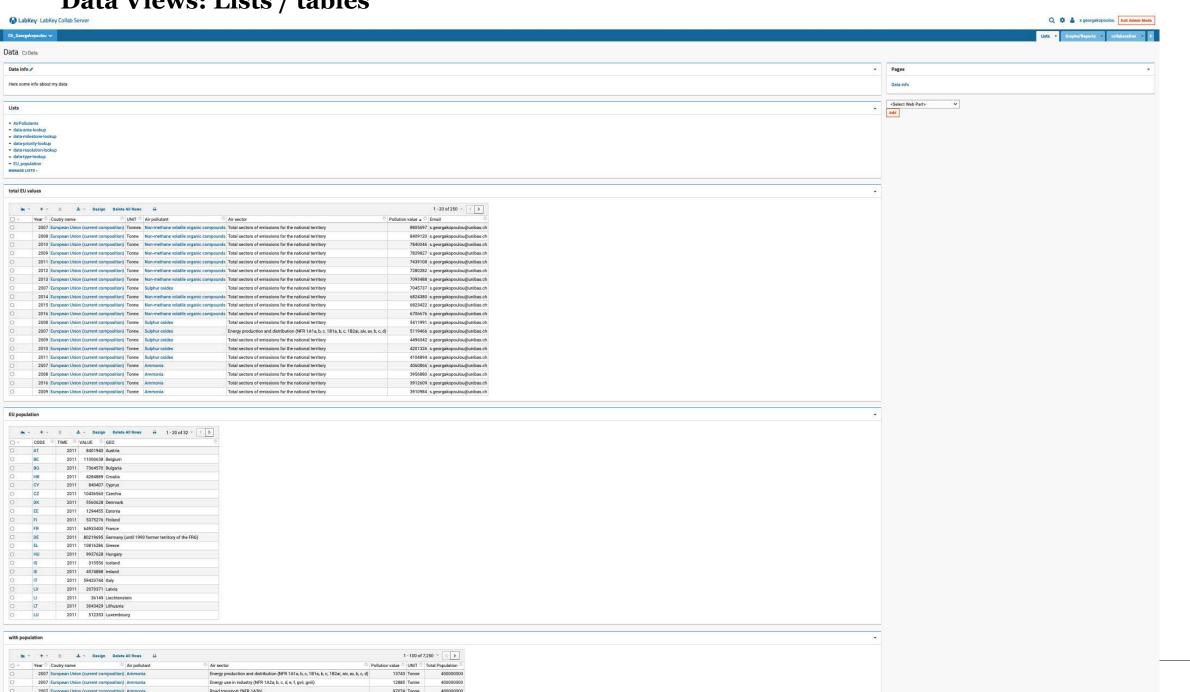






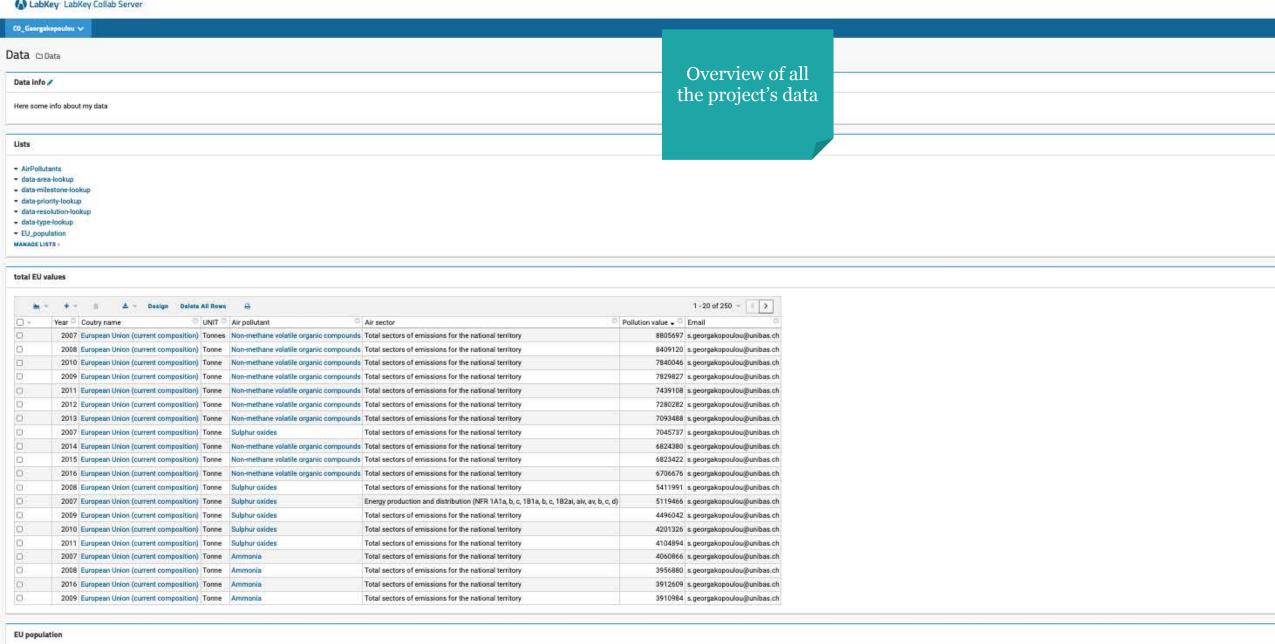
Non-road transport (NFR 1A3a, c, d and 1A4ciii)

285 Tonne



± - Design Delete All Rows ⊕ 1-20 of 32 = ↑ >





- data-priority-lookup
- data-resolution-lookup
- data-type-lookup
- ▼ EU_population MANAGE LISTS .

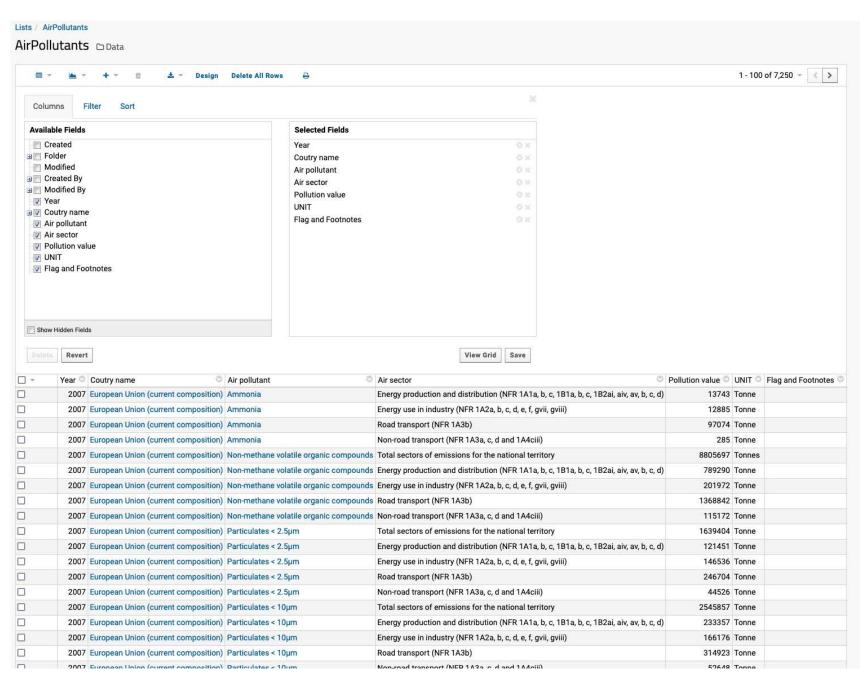
total EU values

. +	Year 🔍	Coutry name	UNIT 3	Air pollutant	Air sector	Pollution value 🗸 🔍	Email
0	2007	European Union (current composition)	Tonnes	Non-methane volatile organic compounds	Total sectors of emissions for the national territory	8805697	s.georgakopoulou@uniba
3	2008	European Union (current composition)	Tonne	Non-methane volatile organic compounds	Total sectors of emissions for the national territory	8409120	s.georgakopoulou@uniba
3	2010	European Union (current composition)	Tonne	Non-methane volatile organic compounds	Total sectors of emissions for the national territory	7840046	s.georgakopoulou@uniba
)	2009	European Union (current composition)	Tonne	Non-methane volatile organic compounds	Total sectors of emissions for the national territory	7829827	s.georgakopoulou@uniba
3	2011	European Union (current composition)	Tonne	Non-methane volatile organic compounds	Total sectors of emissions for the national territory	7439108	s.georgakopoulou@uniba
)	2012	European Union (current composition)	Tonne	Non-methane volatile organic compounds	Total sectors of emissions for the national territory	7280282	s.georgakopoulou@uniba
)	2013	European Union (current composition)	Tonne	Non-methane volatile organic compounds	Total sectors of emissions for the national territory	7093488	s.georgakopoulou@uniba
9	2007	European Union (current composition)	Tonne	Sulphur oxides	Total sectors of emissions for the national territory	7045737	s.georgakopoulou@uniba
1	2014	European Union (current composition)	Tonne	Non-methane volatile organic compounds	Total sectors of emissions for the national territory	6824380	s.georgakopoulou@uniba
)	2015	European Union (current composition)	Tonne	Non-methane volatile organic compounds	Total sectors of emissions for the national territory	6823422	s.georgakopoulou@uniba
)	2016	European Union (current composition)	Tonne	Non-methane volatile organic compounds	Total sectors of emissions for the national territory	6706676	s.georgakopoulou@uniba
1	2008	European Union (current composition)	Tonne	Sulphur oxides	Total sectors of emissions for the national territory	5411991	s.georgakopoulou@uniba
0	2007	European Union (current composition)	Tonne	Sulphur oxides	Energy production and distribution (NFR 1A1a, b, c, 1B1a, b, c, 1B2ai, aiv, av, b, c, d)	5119466	s.georgakopoulou@uniba
1	2009	European Union (current composition)	Tonne	Sulphur oxides	Total sectors of emissions for the national territory	4496042	s.georgakopoulou@ur
)	2010	European Union (current composition)	Tonne	Sulphur oxides	Total sectors of emissions for the national territory	4201326	s.georgakopoulou@ur
)	2011	European Union (current composition)	Tonne	Sulphur oxides	Total sectors of emissions for the national territory	4104894	s.georgakopoulou@ur
)	2007	European Union (current composition)	Tonne	Ammonia	Total sectors of emissions for the national territory	4060866	s.georgakopoulou@ur
3	2008	European Union (current composition)	Tonne	Ammonia	Total sectors of emissions for the national territory	3956880	s.georgakopoulou@ur
3	2016	European Union (current composition)	Tonne	Ammonia	Total sectors of emissions for the national territory	3912609	s.georgakopoulou@ur
3	2009	European Union (current composition)	Tonne	Ammonia	Total sectors of emissions for the national territory	3910984	s.georgakopoulou@ur

More detailed view of apsects of data of special interest

EU population

in -	* -	0	Ł – Design	Delete All Rows 🔒 1 - 20 of 32 -
D =-	CODE	TIME 0	VALUE 0	GEO C
	AT	2011	8401940	Austria
	BE	2011	11000638	Belgium
0	BG	2011	7364570	Bulgaria
0	HR	2011	4284889	Croatia
	CY	2011	840407	Cyprus
0	CZ	2011	10436560	Czechia
0	DK	2011	5560628	Denmark
0	EE	2011	1294455	Estonia
0	FI	2011	5375276	Finland
0	FR	2011	64933400	France
0	DE	2011	80219695	Germany (until 1990 former territory of the FRG)
D:	EL	2011	10816286	Greece
O	HU	2011	9937628	Hungary
0	IS	2011	315556	Iceland

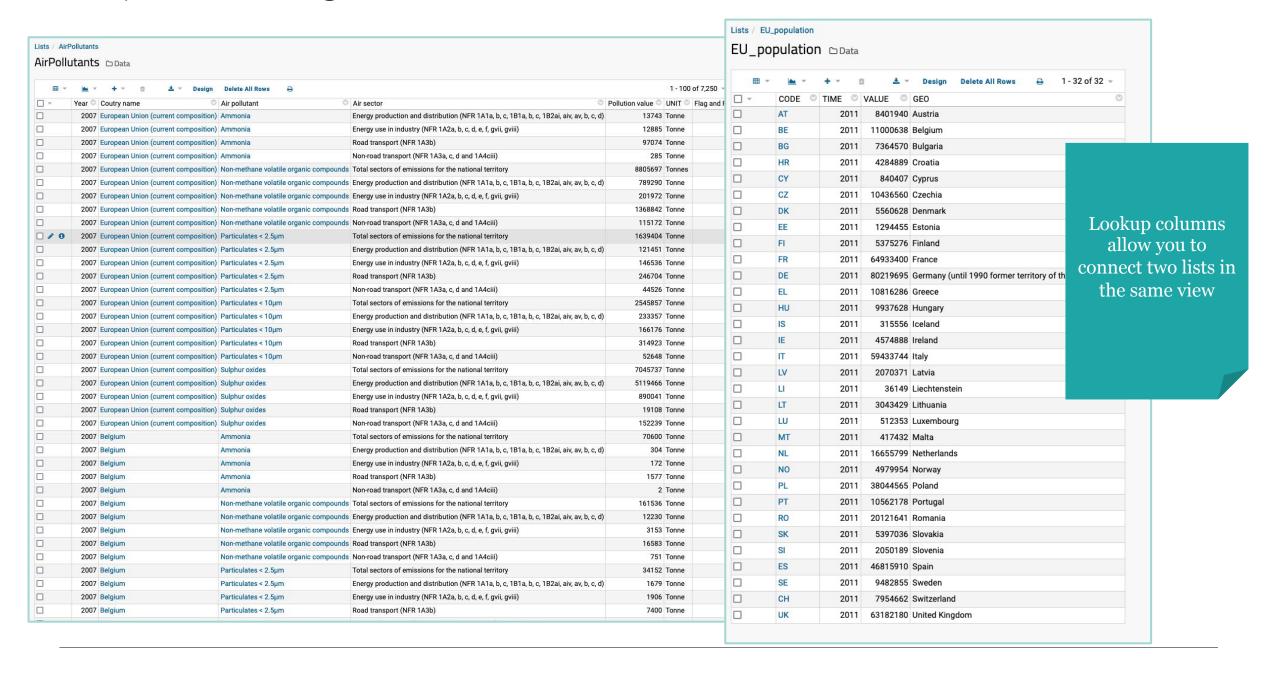


Each list contains the data as well as metadata related to the list (eg time and person of list creation)

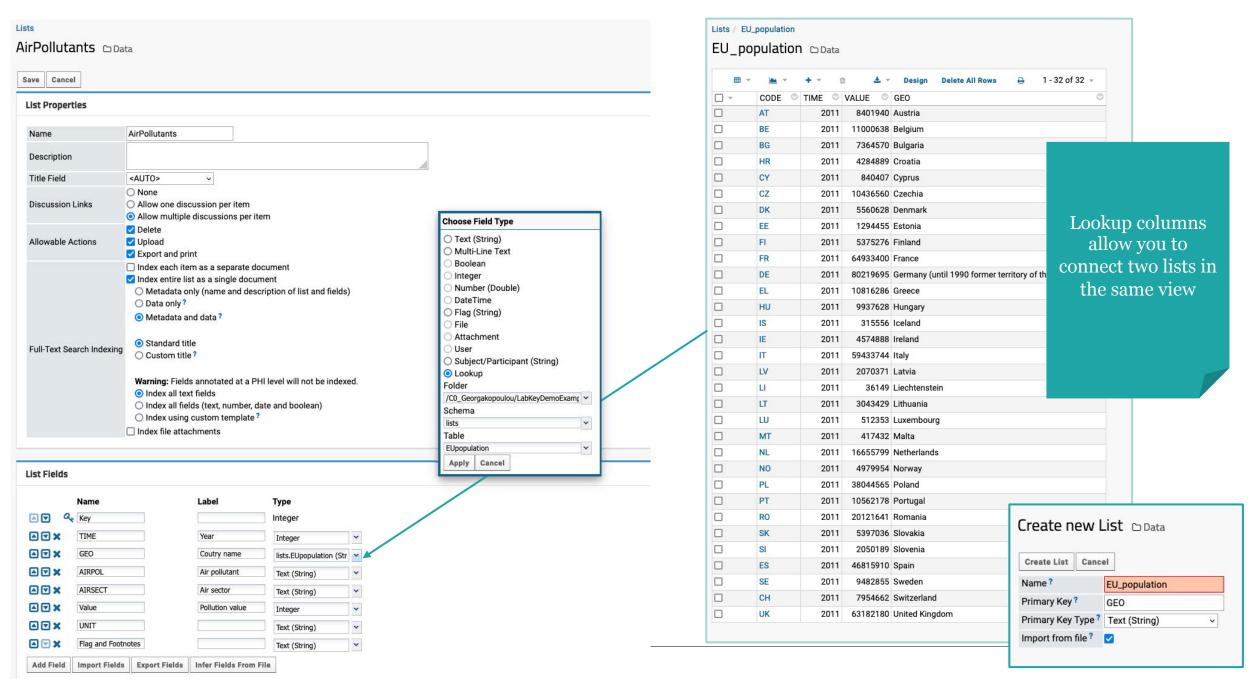
The actual view can be customized to the desired audience

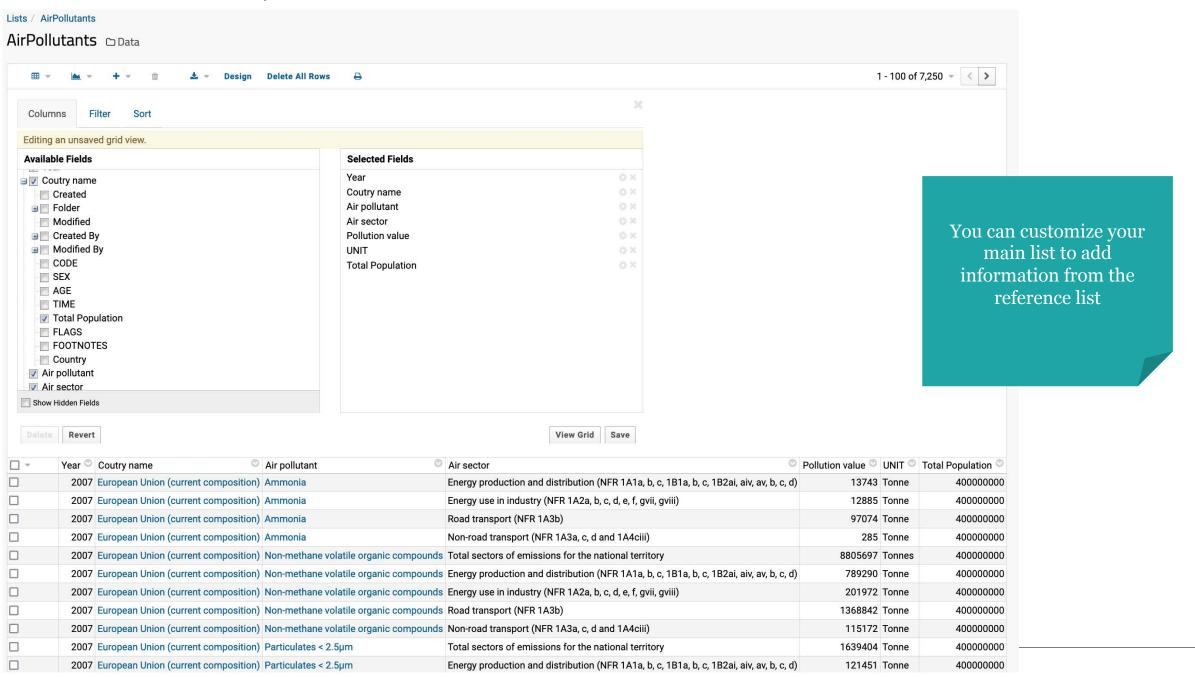
Save Custom	Grid View			>			
Grid View Name:	Default grid view for this page						
	Named	New Grid View					
Shared:	Make thi	s grid view available to all u	sers				
			Save	Cancel			

Lists / tables: Creating data connections



Lists / tables: Creating data connections



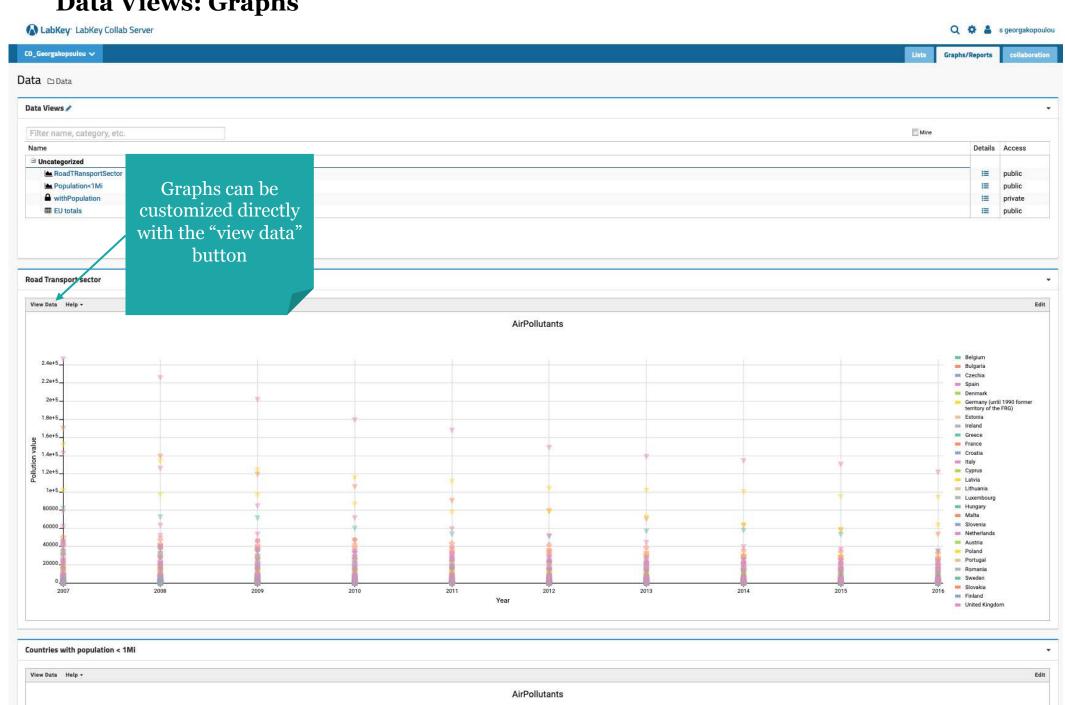


Data Views: Graphs

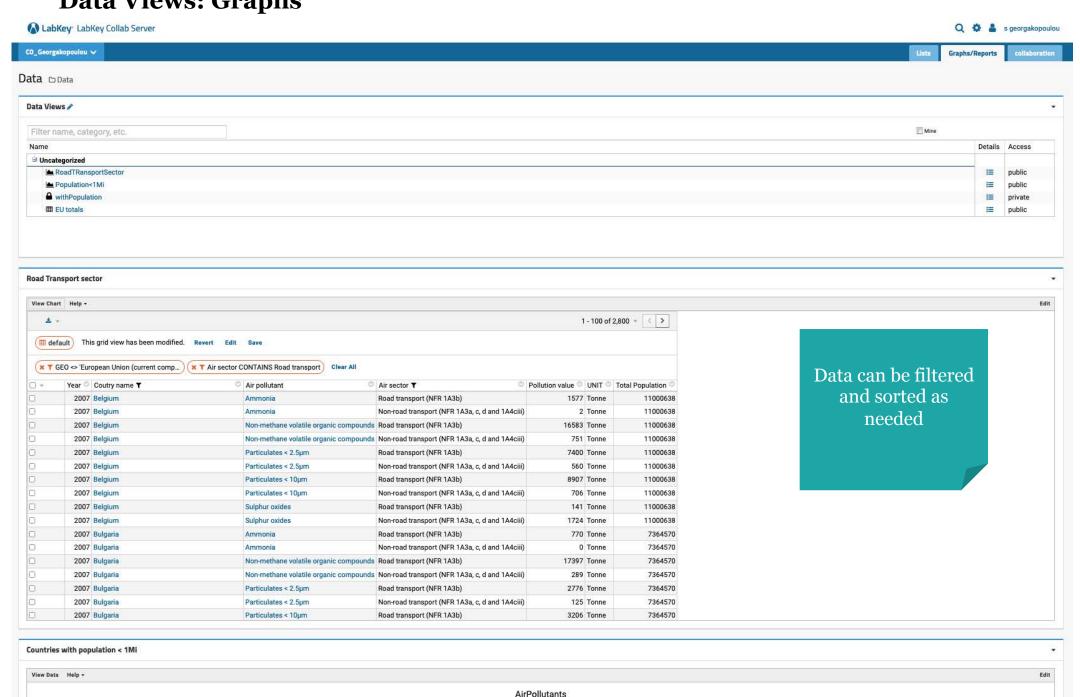


Graphs provide versatile options for visualizing the data

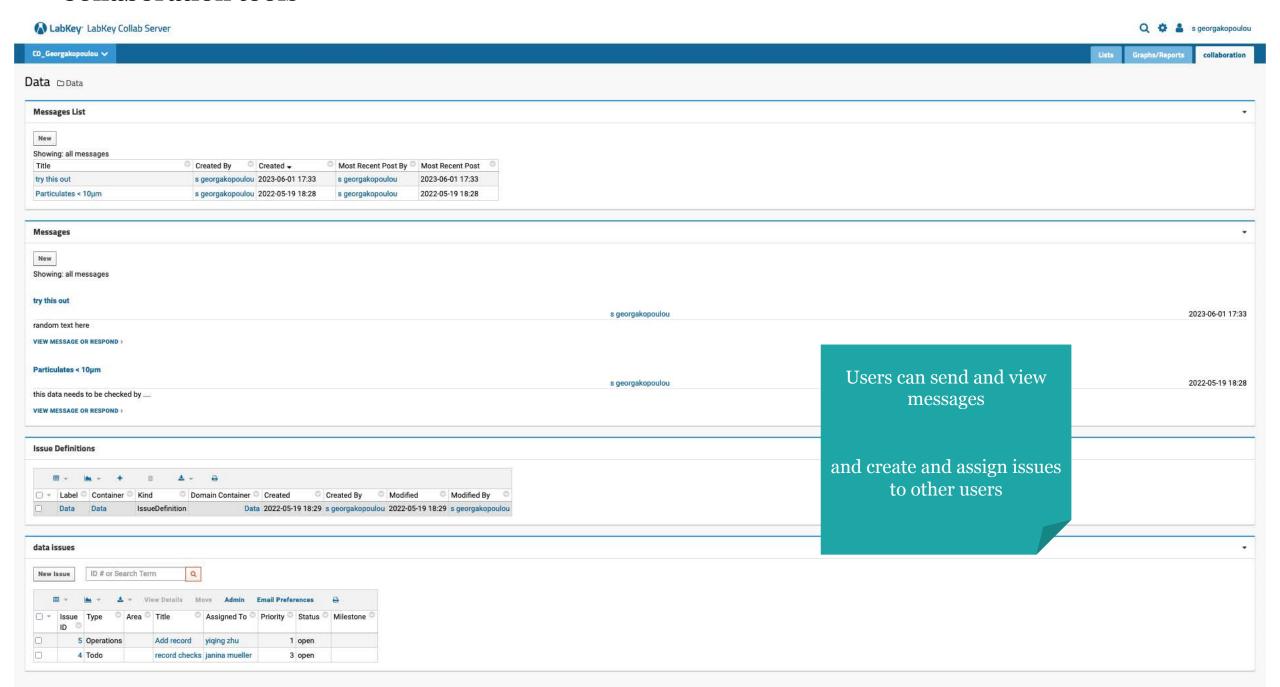
Data Views: Graphs



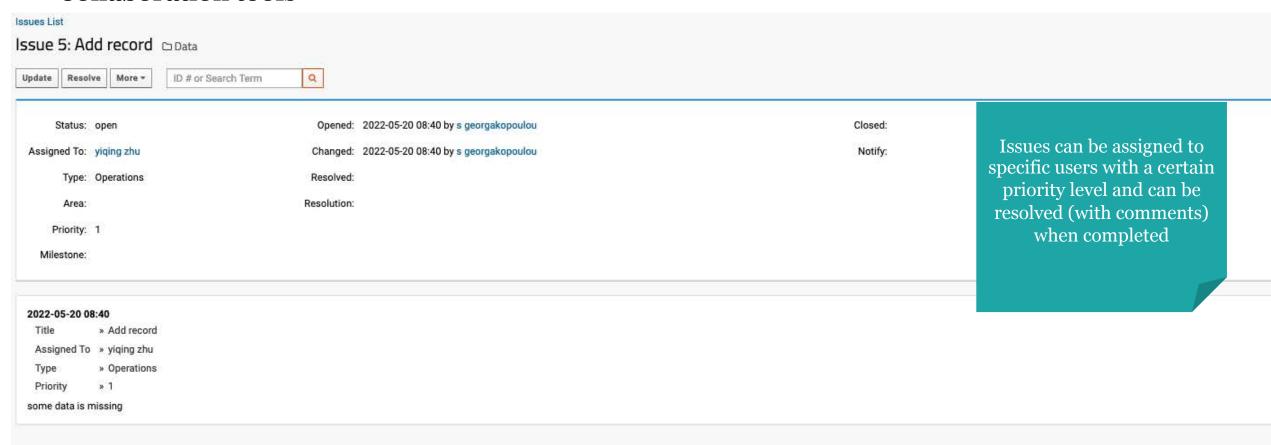
Data Views: Graphs



Collaboration tools

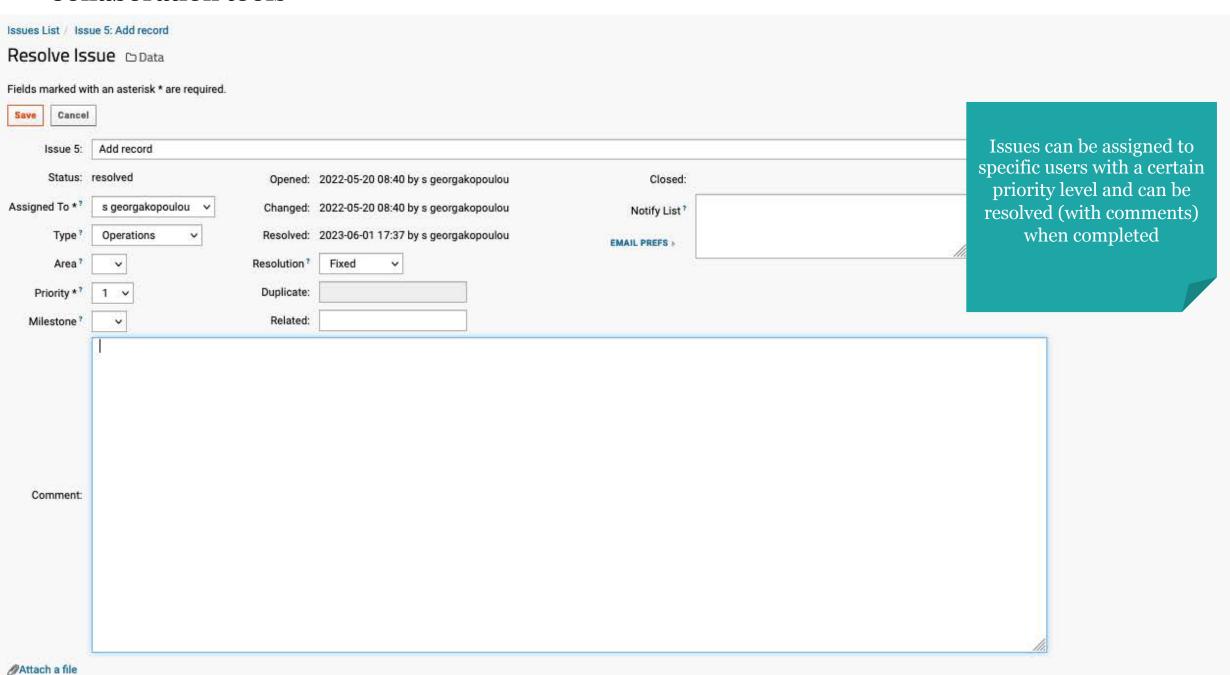


Collaboration tools



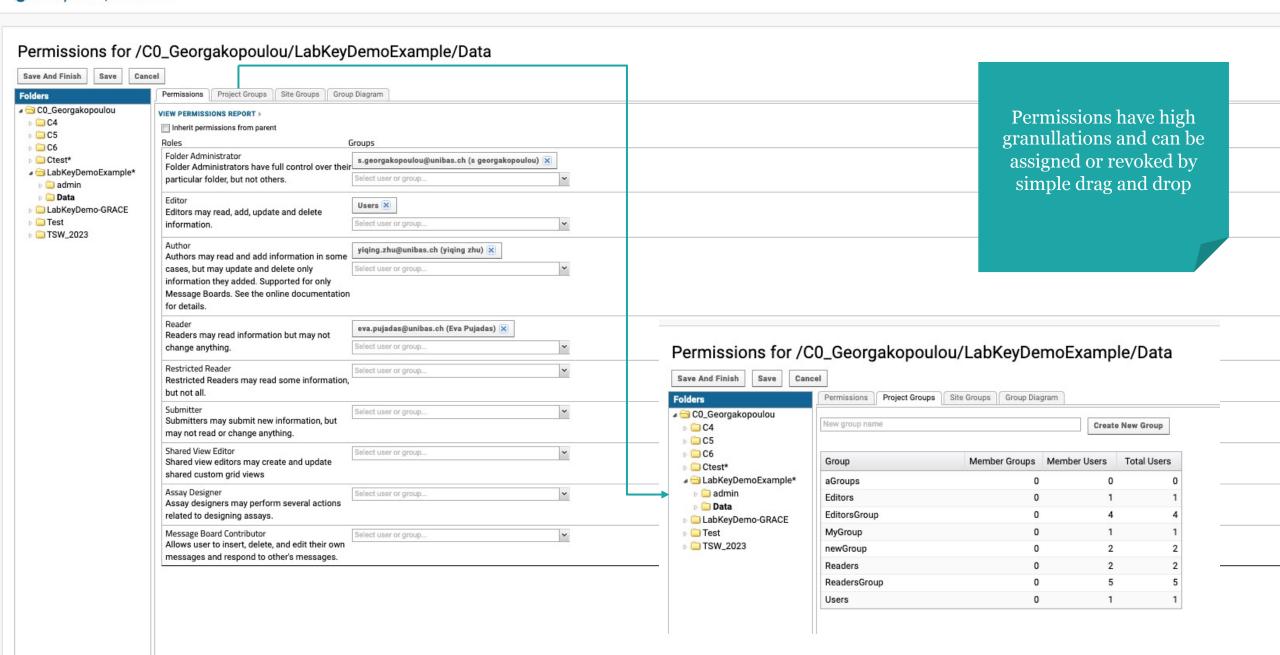
Collaboration tools

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Project permissions





LabKey and databases

LabKey Server uses a database as its main data store. There is always a main database, either PostgeSQL or MS SQL Server, and you can attach any number of other databases to the server. The following databases are supported:

- PostgreSQL
- MS SQL Server
- Oracle
- My SQL
- SAS

✓ LabKey Server offers non-disruptive integration with your existing systems and workflows. You can keep your existing data systems in place, using LabKey Server to augment them, or you can use LabKey Server to replace your existing systems.

Rlabkey API

Rlabkey is an API which makes it easy for R users to load live data from a LabKey Server into the R environment.

Features of Rlabkey:

- user must have appropriate permissions
- user credentials are obtained from a separate location than the running R program
- records stored on a LabKey Server can be:
 - read
 - inserted
 - updated
 - deleted
- it uses HTTP requests to communicate with a LabKey Server

Why LabKey sciCORE instance?

- Hosted, maintained and supported by sciCORE
- Data remains in Basel, in the university, in our servers.
- Data is regularly backed up.
- Using PostgreSQL database.
 - Currently >40 groups with active folders







www.labkey.org



scicore.unibas.ch

www.labkey.scicore.unibas.ch

scicore-admin@unibas.ch