Report for External Advisory Board

2021/2022

Reporting Period: 08/2021 – 07/2022
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Summary

The Göttingen eResearch Alliance (eRA) is a service unit of the University of Göttingen for the Göttingen Campus with a focus on research data management and related topics. The eRA started in 2014 offering consulting, training, networking and IT services. The report at hand summarizes the results and events between August 2021 and July 2022 for the External Advisory Board of the Göttingen eResearch Alliance.

Structure of the Report

Following the overview, we provide general feedback on the recommendations provided by the External Advisory Board for the period of 2020/2021. After that, we report on the results of the four main pillars of the eRA portfolio: (i) Consulting, (ii) Training, (iii) Networking, and (iv) [Digital] Services. Each section contains selected results for each of the pillars as well as updated key performance indicators (KPIs). Next, we describe a number of outreach activities and the status as well as selected results of 3rd party funded projects acquired by the eRA. The report is completed by an outlook on the plans for the next reporting period.

eRA Team and Governance

The core staff of the Göttingen eResearch Alliance consisted during the reporting period of the following people.

Coordination and Management

- Timo Henne 100% (**funded through eRA**)
  - General management and coordination
  - Support for GRO.instruments
  - Support for GRO.identifiers
  - General consulting
  - Training
- Jan Brase 10% (funded through SUB)
  - Scientific coordination
  - Liaison to RDD from SUB Göttingen
  - Management of eRA networking and liaisons
  - Consulting specifically for Humanities & Mathematics
- Philipp Wieder 10% (funded through GWDG)
  - Scientific coordination
  - Liaison to eScience group from GWDG
  - Management of eRA service development
  - Consulting specifically for Natural Sciences and Life Sciences

Team and Associated Members

- *Raisa Barthauer 75% (funded through SUB) until 02/2022*
  - *Support for GRO.identifiers*
  - *DOI help desk*
- Sven Bingert 10% (funded fully through GWDG)
  - Planning and execution of the Data Science Summer School
  - Consulting specifically for Physics and Natural Sciences
  - Technical consulting for research data management projects
- Marcel Hellkamp 50% (**funded through eRA**)
  - Service architect and service developer (backend)
  - Technical consulting on repository, archival and data management solutions
- Péter Király 100% (**funded through eRA**)

    - Service development and support for GRO.data
    - Technical consulting and integration of project data into GRO.data
    - Consulting for the Humanities & Libraries
    - Consulting on data visualization
    - Training on RDM and GRO.data
- Harald Kusch 10 % (funded through the Medical Informatics Department of the UMG)
    - Liaison to UMG
    - Project manager of the menoci.io research data management platform
    - Consulting specifically for Medicine and Life Sciences
- *Claudia Malzer 25% (funded through SUB) until 02/2022*
    - *Service development*
    - *Geodata analyst*
- Jens Nieschulze (funded through University of Göttingen)
    - Liaison to the University of Göttingen
    - General consulting
- José Calvo Tello 10% (funded fully through SUB)
    - Contact point for DARIAH services
    - Consulting of projects from the Humanities
- Adrian Sturm 100% (funded through 3rd party funding)
    - Service development for project DIGIS/GEOROC
- Lena Steilen 10% (funded through GWDG)
    - General administration and organisation
    - Outreach and Training
- Ubbo Veentjer 50% (**funded through eRA**)
    - Service development and support for GRO.data and GRO.plan
- Daniel Beucke 10% (funded through SUB)
    - Liaison to EPU from SUB Göttingen
    - Liaison to ORCID
    - Support for GRO.publications
- Saskia Brauns 50% (funded through SUB)
    - Support for GRO.publications
- Sabine Witt 10% (funded through SUB)
    - Support for GRO.publications
- Bastian Weber 50% (funded through SUB)
    - Support for GRO.publications
- Marianna Mühlhölzer 20% (funded through SUB)
    - Service development for GRO.publications
- Natalie Neumann 20% (funded through SUB)
    - Service development for GRO.publications

Depending on the actual support request or consultation task, other people from Göttingen Campus partners are involved through the extended network the eRA has created over the years.

Research Assistants

The following research assistants are funded by the GWDG to support the eRA:

- Antonia Colán Bräunig 25%

- Esteban Lazo Huanqui 25%
- Stina Riegelmann 25%

Changes During the Reporting Period

Raisa Barthauer and Claudia Malzer left the SUB and the eResearch Alliance end of February 2021. It is currently discussed on management level how support for the respective tasks (GRO.identifiers and geo-spatial services) can be extedend again.

Steering Group

The Steering Group is meeting monthly. The meetings are used to update the Steering Group members on the progress of the eRA and to discuss general as well as specific topics related to RDM. In addition, members communicate developments at the Göttingen Campus and beyond that are related to the work of the eRA. This includes reports from other working groups and organisations, substantial outcomes of workshops and conferences, as well as results from projects. Furthermore, the evolution of the service portfolio is discussed and organised.

In February 2021, Arnulf Timm, Co-Head of “Informations- und Literaturversorgung Zentrale Erwerbung und Erschließung” at the SUB Göttingen, left the Steering Group due to his retirement. All current steering group members can be found in Appendix A – Members of the Steering Group.

Effects of the Pandemic on the Work of the eRA

The effects of the measures against the Corona virus pandemic were not as severe to the work of the eRA as in the year before. Mainly because almost all meetings, consulting and training offers had been held in digital/remote format since March 2020, access restrictions and home office obligations did not impact eRA work to a large extend. The daily virtual short meeting (30 minutes) of the team members was continued in addition to the weekly virtual team meetings to keep frequent communication.

Key Performance Indicators

In early 2019, the eRA defined an initial set of key performance indicators, which were then presented to and commented on by the External Board members. In 2020, these KPIs were extended and refined based on the recommendations of the External Board. The values for the KPIs for this and the previous reporting period are given in tables in the respective sections throughout this report.

The current set of KPIs will remain subject to change: the eRA will continue to check the feasibility and applicability of its KPIs, adjust them or add further KPIs. A full list of definitions of the 55 KPIs as of July 2022 can be found in the detailed table in Appendix B – List of extended KPIs.

Addressing the Feedback from the eRA External Advisory Board

We would again like to highly acknowledge the effort and the time invested by the External Advisory Board to analyse and assess the directions and deliverables of the Göttingen eResearch Alliance. Following up the 2021 meeting, the EAB provided again very useful recommendations. Unlike previous years, most of the recommendations were of a broader strategic nature. Therefore, some of the recommendations have not directly led to quantitative results, but encouraged further and ongoing strategic changes and new processes. In this section, we address these suggestions.

Mapping of eRA Service and Application Architecture

EAB Recommendation: *"Provide high-level design documents to illustrate the working and processes of services provided, to support*

- *development planning,*
- *demonstrating value delivered*
- *aligning overall vision with concrete goals*
- *strengthening communication efforts"*

Actions executed by the eRA: We have started an internal agile discussion with members from the steering group to work on conceptual and architectural overviews as well as the respective design documents.

We called one pillar of this discussion "The House of GRO" (see Figure 1), which represents an approach to assign the eRA offers to the different steps of the research life cycle (see Figure 2). This approach helps on a variety of levels, including communication to stakeholders and users, service portfolio development, or gap analyses. Furthermore, it can be used as an instrument to create a kind of visual brand to increase the identification of the campus partners contributing to the house.

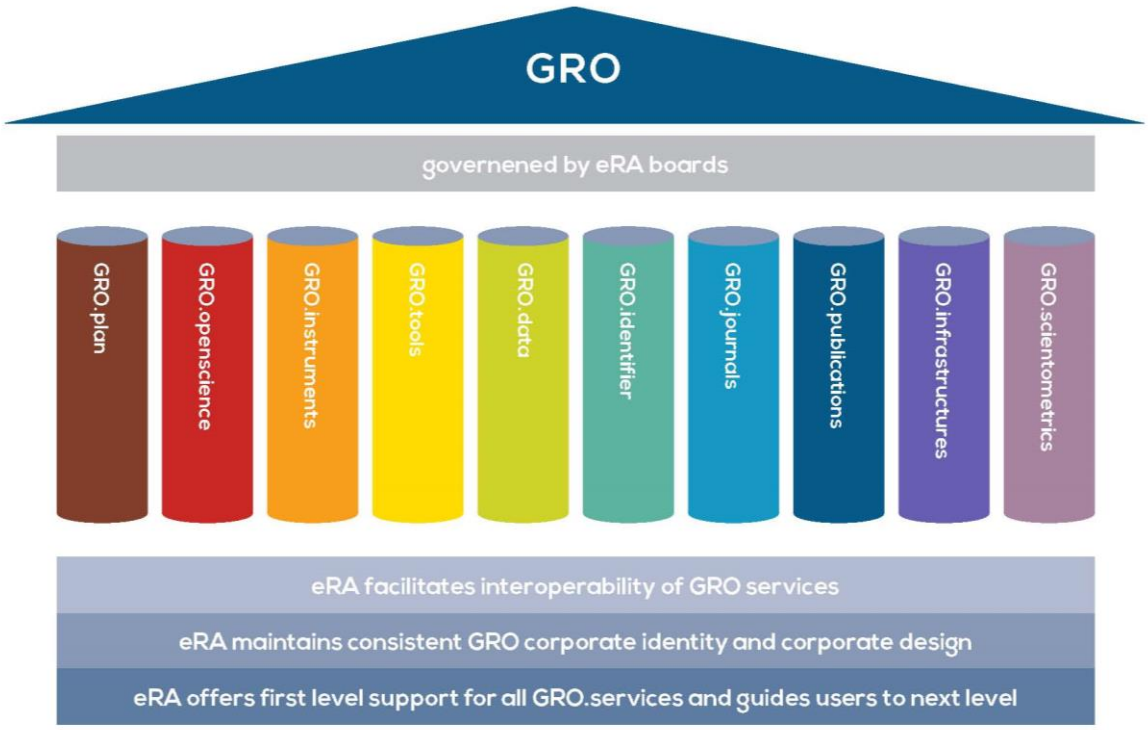


Figure 1: The House of GRO.

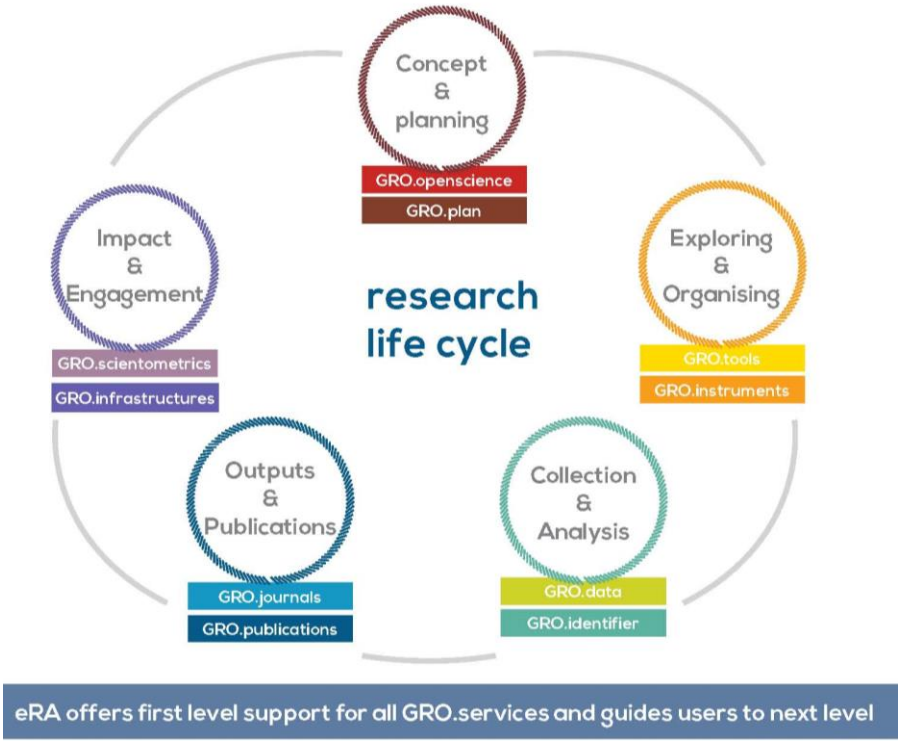


Figure 2: GRO services assigned to the research life cycle.

Another, more technical approach, is based on an integrative view of the different services and their functions. We tried to sketch an ideal picture of what a we think should be an integrated set of research data management services including data sources, interfaces, and presentation layers. This could help to discuss potential projects to bring the existing services together and, in case funding can be secured, generate added value to the already exist8ing services.

Unfortunately, we are currently behind schedule with respect to this endeavor and just started discussions. We are planning to have the respective documents within the next six months ready to be communicated towards a broader audience.

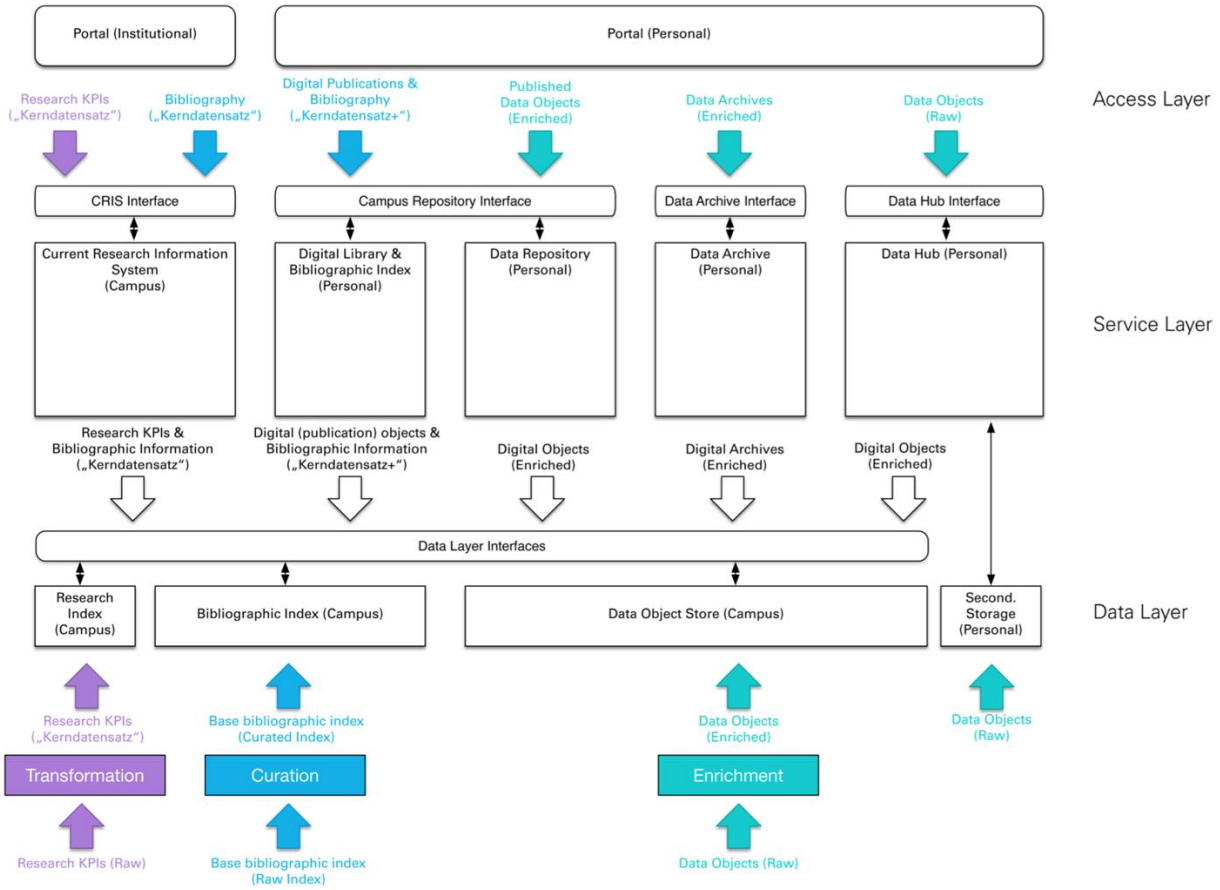


Figure 3: Technical view on GRO.

Risk Assessment

EAB Recommendation: *“Foresee and proactively address potential IT risks:*

- *Cyber risks*
- *Rising IT costs on the operations/maintenance side*
- *Growing IT complexity*
- *Vendor/provider/community dependencies*
- *Skills shortage”*

Actions executed by the eRA: Both core partners of the eRA, but also the University and the UMG, are partners of a combined IT group at Göttingen Campus, the so-called “Campus IT”. This group has been established to work collaboratively on topics, which are in a similar manner relevant to all partners, to consolidate effort, and to exchange experience and know how. Example projects are a combined support structure for the whole campus (called “Support 2.0), an integrated service catalogue, combined efforts to establish higher levels of information security, or a a collaboratively used Confluence wiki for unified documentation. The eRA services, which are integrated with the Campus’ IT infrastructure as much as possible, are treated here as equal pears and benefit from the Campus IT with respect to risk maintenance and cost handling. A particularly important stop will be the ISO 27001 certification of GWDG that will take place in winter 2022 and that will improve information and IT security for GWDG, but also for the services provided by eRA. Furthermore, the topics mentioned here are regularly addressed by the eRA Steering Group, leading, to just provide one example, joint job advertisements.

Communication

EAB Recommendation: *“Build a strong narrative connecting eRA’s activities to overarching trends, e.g.*

- *shifting demands, standards and processes in scholarly communication (transparency, open science),*
- *data-driven research approaches and importance of AI-technologies across disciplines (replicability / reproducibility)*
- *evolving curricula (skills, methods)*
- *rising expectations regarding the societal role of universities (transfer/participatory research)"*

Actions executed by the eRA: In the last year, the eRA has gained strong internal visibility. In the current semester for the Bachelor and Master studies in Data Science there are courses offered on Research Data Management and Data Science Infrastructures via the established eRA lectures. Furthermore, eRA helped to evolve both the curricula of the aforementioned programs.

The eRA was co-organizing with the Campus Institute Data Science (CIDAS) a joint proposal for a call by the German government to establish "data competency centers". We expect to hear about a possible acceptance of the proposal this fall, nevertheless the proposal itself was a proof of strong and extensive local cooperation between the eRA, the CIDAS, the whole Göttingen campus, the city of Göttingen and a selection of local industries and businesses.

Representatives of the eRA are furthermore advisers to the current university strategy for Digital Transformation and are therefore in strong communication and synchronization with presidency of the university.

Governance

EAB Recommendation: *"Increase visibility of bottom-up approaches/channels already in place user-centric product improvement/development."*

Actions executed by the eRA: There are first steps taken to respond to this advice, but a coordinated program has not yet been established. Based on suggestions of the eRA Council, a number of web sites have been produced to e.g. to promote existing data platform solutions and communicate IT and information security solutions offered by Campus IT partners to the eRA customers. Furthermore, user feedback on services like e.g. feature requests are taken up and lead to the evolution of the respective services (in particular GRO.plan, GRO.data, and GRO.publications). Wherever possible, these additions are communicated upstream into the respective products (RDMO, Dataverse, and DSpace-CRIS). Further advice whether these directions are in-line with the ideas of the EAB would be helpful.

Report of eRA Activities

In the following sections, we describe the activities and progress for each of the four pillars of the eResearch Alliance portfolio: Consulting, Training, Networking, and [Digital] Services.

As an introduction, we present some numbers and proportions of the eRA activities in the following figures (Figure 4, Figure 5, and Figure 6).

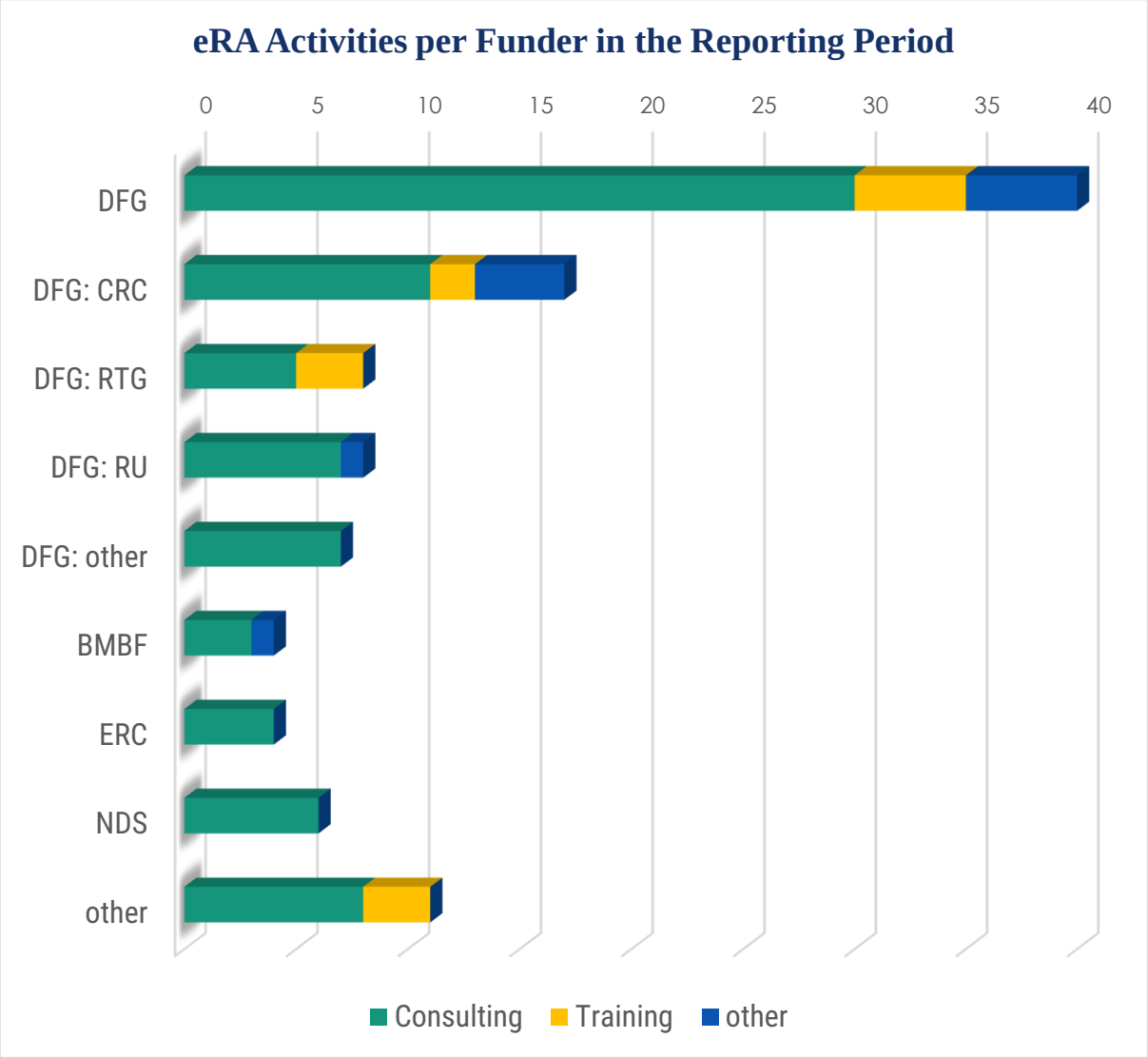


Figure 4: Numbers of eRA activities per funder in reporting period.

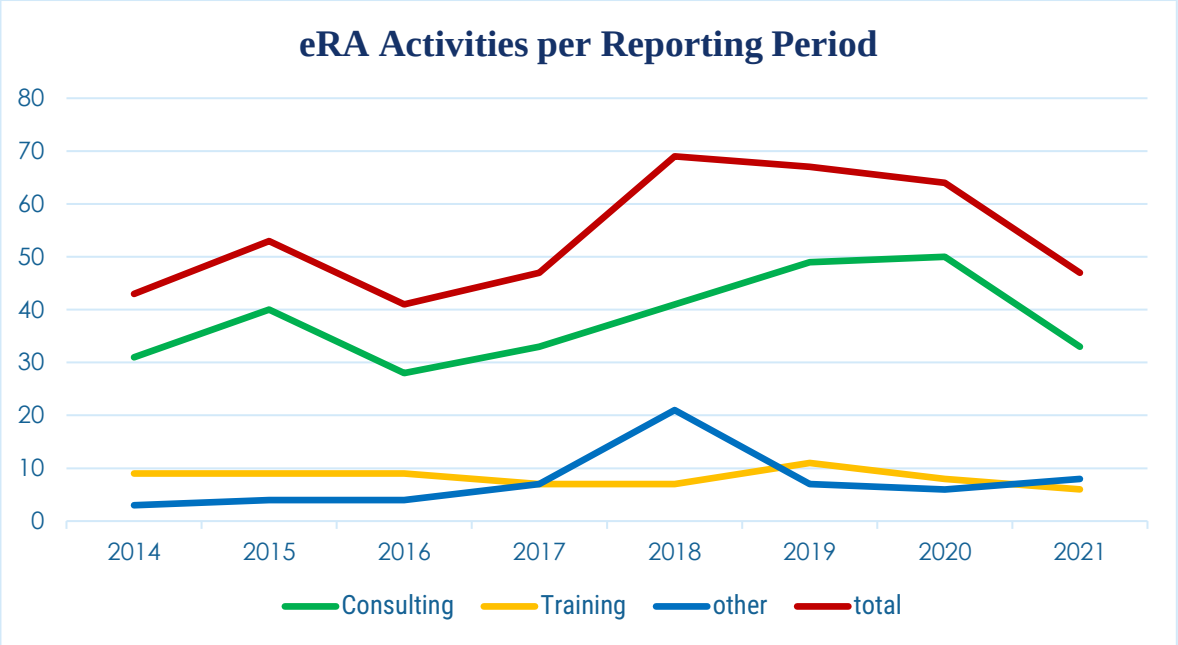


Figure 5: eRA activities per reporting period.

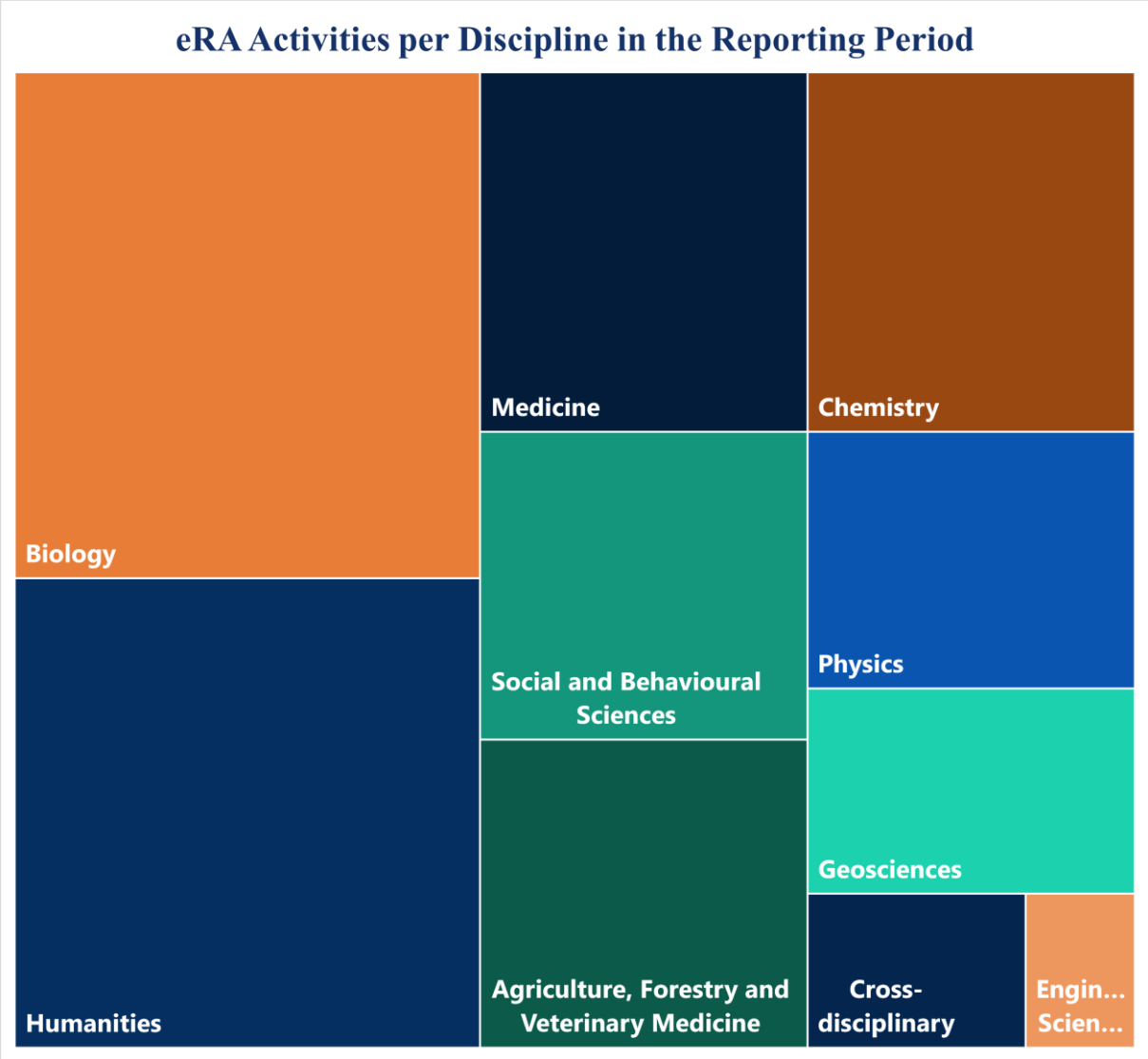


Figure 6: Proportions of eRA activities per discipline in reporting year 2021/2022.

Consulting

The eRA offers consulting related to a large spectrum of research data management and complementing topics. The eRA consults individual researchers, groups, and projects, but also institutes and whole organisations. The consulting is not strictly limited to a pre-defined range of topics, i.e., the eRA does in general not refuse any consulting request. Requests that cannot be fulfilled by the eRA itself are brokered to other stakeholders of the Göttingen Campus or other partners from the extended network of the eRA.

With respect to resource consumption, consulting is a particular demanding task for the eRA. This is due to the amount as well as the diversity of requests. In the reporting period, there was again a clear focus on the consultation of large-scale DFG projects, projects related to the German National Research Data Initiative (NFDI[1]), and requests from individuals.

Consulting of Large-Scale DFG Projects

As in the past years, the eRA was dealing with a constant stream of proposals for DFG projects (see also Figure 4). The workflow that integrates the eRA into the university-wide quality assurance process for DFG projects, which is steered by the department Research and Transfer Services, has in the past year been implemented by the eRA as gitlab project templates. This improves the timely communication between all persons involved in the consultation process, and allows for easier knowledge transfer in substitution situations. Furthermore, the documentation of all consultation processes becomes well-structured and accessible, and also allows for easier evaluation of invested resources and successful strategies. The gitlab workflow was established in cooperation with the Research and Transfer Services and is used in production since June 2022.

You can find an overview of consulted projects and the consultation topics in Appendix C – Consulting of Large-Scale DFG Projects

NFDI Consultation and Participation

As of today, 19 NFDI projects are already funded, 10 of which have started their work in October, 2021. In 2021, the third and last phase of the NFDI projects was submitted. The respective funding decisions will be communicated in fall 2022.
As of today, the eRA is directly participating (in different roles and with varying resources) in the following NFDI consortia:

- Text+[2] (Humanities)
- NDFI4Culture[3] (Humanities)
- NFDI4Biodiversity[4] (Biodiversity)
- NFDI4Ing[5] (Engineering)
- NFDI4Earth[6] (Earth System Sciences)

Five more NFDI consortia have participants from the Göttingen Campus, adding up to 10 out of 19 NFDI projects with participation from Göttingen. For the third phase, the eRA has again consulted a number of projects, in particular NFDI Neuroscience, NFDI4Phys, and NFDIxCS (Computer Science). A strong role for Göttingen is also envisioned with the cross-disciplinary proposal BASE4NFDI; this is the joint proposal

[1] https://www.dfg.de/en/research_funding/programmes/nfdi/index.html

[2] https://www.text-plus.org/

[3] https://nfdi4culture.de/

[4] https://www.nfdi4biodiversity.org/

[5] https://nfdi4ing.de/

[6] https://www.nfdi4earth.de/

of all NFDI consortia with a focus and base RDM services. The goal of this proposal is to analyse which base RDM services (such as PID assignment, identity and access management, or long-term archiving) are currently operated by whom, to evolve existing solutions, and to develop strategies and business management models for such services.

As an additional instrument to ensure thorough communication and information flow among those either involved or interested in the NFDI activities on the Göttingen Campus, the eRA established an NFDI Interest Group and organizes regular meetings. These meetings are used to inform the projects about the contributions of partners from Göttingen, provide information and advice on the NDFI processes, and inform and connect the individual partners to the overall strategy and NFDI developments.
Last, but not least, the eRA also published a page on its website, providing an overview of Göttingen's involvement in the respective NFDI consortia and sections.[7]

On-Demand Service Development

One specific offer within the portfolio of the eRA is related to consulting on service development. As projects and faculties not only struggle with the sustainability of their services beyond the project funding, but also with the proper integration into campus infrastructures (or the knowledge about them), the eRA offers consulting on the following topics:

- Connection to campus services
- Migration of data towards eRA services like GRO.data
- Customizing existing services to meet the requirements of specific projects
- Software development of complete services

In case it is requested, the eRA also helps with the recruiting of software developers or even develops services for customers. As this normally requires resources beyond those available for such tasks, this kind of work normally has to be paid for by the customer.

Consultation for the Humanities

The consultation for research groups in the Humanities continue to pose large challenges (see also the previous report).

A positive development of the past years for the Humanities is the funding of the NFDI Consortium Text+, with the SUB as one of the applicant institutions. This new phase of the research data infrastructure is already allowing us to integrate already existing resources, creating a more sustainable digital environment. For example, new corpora are being published in already existing repositories such as TextGrid Repository. The subject librarian and eRA link has already presented these new developments within some faculties of the University through some presentations and workshops, receiving feedback which can be then considered for the further development of these resources. This synergistic effect allows the user to know new tools, improve the development of the tools and increase the visibility of the eRA.

Evaluation of Consultations

Based on the KPIs related to Consulting (see also Section Key Performance Indicators, p.6 and Appendix B), the eRA has been evaluating all consultation activities for the reporting period. As of today, a total number of 283 consulting activities have been collected from records, tickets, and mail communication.

[7] https://www.eresearch.uni-goettingen.de/services-and-software/nfdi-and-the-gottingen-campus/

ID	Name	Metric	Previous Reporting Period	Reporting Period	Total
C-01	Consultations	Number of consultations	56	41	283
C-02	Consultations per Discipline	Amount of consultations per discipline	Humanities: 11	13	63
			Social & Beh. Sciences: 15	6	55
			Biology: 15	14	62
			Medicine: 7	7	47
			Agric., Forestry & Vet. med.: 4	6	29
			Chemistry: 5	7	19
			Physics: 4	5	18
			Mathematics: 1	0	4
			Geosciences: 3	4	10
			Engineering Sciences: 5	1	10
			Cross-disciplinary: 3	2	7
			other/unkn.: 0	0	0
C-03	Consultations per Funder	Amount of consultations per funder	DFG: 36	35	133
			BMBF: 3	1	8
			ERC: 4	3	15
			NDS: 4	1	7
			other: 9	1	43

Table 1: KPIs related to eRA consulting activities.

Training

The eRA has a large portfolio of research data management trainings and also offers courses tailored to the needs of its customers. This offer is well-received at the Göttingen Campus and beyond, which is also reflected in the continuously high number of training events during the reporting period. Unfortunately, one of the internationally acclaimed events, the Göttingen Summer School on Data Science, could not take place for now three subsequent years due to Covid-19.

Fourth International Göttingen Summer School on Data Science

The eResearch Alliance planned to organize the fourth International Göttingen Summer School on Data Science in 2020, and again in 2021, and again in 2022. Due to the worldwide and continued measures against Covid-19, the school had to be cancelled again. We strongly hope that the situation will allow us to finally implement the school again in 2023. As there is planned a high-level meeting of the HekkSaGOn Network for summer 2023 in Göttingen the target group and the focus for the Summer School will be slightly different. The planning and organizing phase will start in September 2022.

Talk series on “Rechtliche Aspekte im Forschungs-Daten-Management” – second edition

Topics like copyright, data protection, data security or licensing have become an important part for the consulting activities of the eRA. To address these topics for a broader audience, provide more information and also to present the supporting offers at the Göttingen Campus, the eRA organized again an online talk series on “Legal aspects in Research data management” in March 2022.

The talk series took place from 21-25 March 2022 with each event of the series lasting about one hour over lunch time. The number of participants per session ranged again between around 70 and 130. The series started with copyright issues, then looked at the implications of data protection in general and for medical research in particular, requirements of good scientific practice and research funding, and aspects of information security regulations. New was a talk about the specific requirements in digitization projects. The talks gave introductions, hints and examples on each of these topics. At the end of each talk the audience had the opportunity to ask some questions, and the slides of the talks were made available afterwards on the eRA webpage.

The eRA was happy to win the Data Protection Officers of Göttingen University and its Medical Centre, the Information Security Officer of the University and representatives from the Ombudsman Service, the Research Department, the Subject Specialist for Law of the SUB, and a lawyer from iRights as speakers. It is planned to offer a similar talk series in 2023 as well. In the effort to offer more help also for the Max-Planck Institutes at Göttingen Campus, it is planned to include representatives of the Max-Planck Society.

Other Training Events

The eRA offers a large variety of training topics to individual researchers as well as research groups and projects. Here, we report on the events that a) target larger groups and b) consume a lot of time to plan and implement. During the reporting period, this includes:

- The open online training format “Love your data – data management basics for study and research”, which was started in 2020, was continued in the reporting period. The next event is planned for November 2022.
- Carpentries Training events: eRA members participated in 5 Carpentries training events which were organized by the SUB Göttingen, 2 Data Carpentries and 2 Library Carpentries event. Topics covered in these workshops were “Data organization with spreadsheets”, “Data cleaning with OpenRefine”, “Data management with SQL” and “Introduction to R” in the Data Carpentries

workshops, “Regular expressions”, “Tidy data & OpenRefine”, “Unix shell”, “Introduction to Git”, “SQL” and “Python for libraries” in the library Carpentries workshop. There are now 5 members of the eRA who are certified Carpentries instructors, and who are regularly participating and involved in organizing and teaching these events.

- We provided an introduction to GRO.data to the project BioDivRestore, who plan to use our service for their international project.
- For the RTG 2636 “Form-meaning mismatches” we gave an in-presence RDM introduction on April 20, 2022, with more topics such as GRO.data and GRO.plan being requested for fall 2022.
- We organized a collaborative 2-day in-presence workshop for the CRC 1073 “Atomic scale control of energy conversion” and the RTG 2455 “Benchmark experiments for numerical quantum chemistry” in June 2022, covering the following topics: “Introduction to Research Data Management”, “Selected Tools and Services for PhD students”, “Working with GRO.data” and a final Q&A session, where also a homework from the GRO.data session was discussed. After first being set up in Spring 2021 for the RTG 2455, this format is now also being requested and used in variations with other research groups.
- The RTG 2654 “Sustainable Food Systems” received a 2-day in-presence training on RMD basics and “Selected Tools and Services for PhD students” in July 2022, also with a request for more topics in late fall 2022.
- Info Events at UMG: The regular info events at UMG were reduced in frequency to a yearly schedule. We found the online format to be more inclusive and will continue this way for the next event in late 2022.
- The eResearch Alliance has participated in several OpenScience Meetups[8], a regular workshop format established by the SUB Göttingen, where varying topics around Open Science are presented and discussed.
- The format “Research Support XXL” established by the SUB in 2021 was found to not attract many people from our target group. This format was intended to promote general services teaching and supporting research skills, including research data management, to students. However, after 2 events where the eRA topics found no interested participants, we have reduced our effort for this activity and will continue to offer our consultation and training services upon request and by promotion through our general Outreach channels.

eResearch Labs

The eRA continues to provide a series of trainings on research data-related topics under the label “eResearch Lab”. While the lab was initially planned as an open physical space for information exchange on eResearch topics, the format currently serves as an open online format to address different aspects of dealing with research data, while also introducing interested students and researchers to our GRO services.

Date	Topic
04.08.2021	GRO.publications
17.08.2021	GRO.plan
01.09.2021	GRO.publications
14.09.2021	GRO.data
30.09.2021	GRO.plan
06.10.2021	GRO.publications

[8] https://pad.gwdg.de/s/OpenScienceGOE#

19.10.2021	GRO.data
03.11.2021	GRO.publications
02.11.2021	SKOS with SkoHub Vocabs
09.11.2021	GRO.data
23.11.2021	GRO.plan
01.12.2021	GRO.publications
14.12.2021	GRO.data
11.01.2022	GRO.data
27.01.2022	GRO.plan
02.02.2022	GRO.publications
08.02.2022	GRO.data
15.02.2022	GRO.geomapper
02.03.2022	GRO.publications
08.03.2022	GRO.data
22.03.2022	GRO.plan
06.04.2022	GRO.publications
12.04.2022	GRO.data
04.05.2022	GRO.publications
10.05.2022	GRO.data
12.05.2022	GRO.plan
01.06.2022	GRO.publications
14.06.2022	GRO.data
21.06.2022	GRO.plan
06.07.2022	GRO.publications
12.07.2022	GRO.data

Table 2: eResearch Lab online events

The number of participants usually varies between 1 and over 30. It is still planned to integrate the eResearch Lab as much as possible into the Digital Creative Space (opened in July 2022) at the SUB main building, in order to host research data related workshops and meetings and also serve as a central spot for consultation and support.

Evaluation of Trainings

Based on the KPIs related to Training (see Section “Key Performance Indicators”), the eRA is constantly evaluating all training activities. In the reporting year, a total number of 22 training activities have been implemented or supported, all of them as online events.

ID	Name	Metric	Previous Reporting Period	Reporting Period	Total
T-01	Trainings	Number of trainings	22	18	61
T-02	Open training events	Number of open training events	3	2	5

T-03	Discipline-specific training materials	Percentage of all disciplines covered by specific training material available on website	n/a	n/a	n/a
T-04	Info events	Number of Info events	2	2	13
T-05	Webinars	Number of online training courses and webinars offered	22	14	38
T-06	Training reception	Overall and specific scores of training evaluation questions	n/a	n/a	n/a

Table 3: KPIs related to eRA training activities.

Networking

In the last 12 months, the networking activities conducted by the eRA have not been as severely been affected by the pandemic as in the year before (see also the previous report). Video conferencing and tools for mobile work became more common and other collaborative tools have been developed and offered (like e.g. collaborative white boards). Furthermore, travelling become possible again. Still some networking activities, in particular those which are based heavily on personal contact and mutual visits, continued to suffer. This was in particular true for the collaboration with the SCSD in the US.

RDA Germany

From February 22nd to February 25th, 2022, the eResearch Alliance supported again the annual meeting of RDA Germany[9]. As in the previous year, Göttingen University provided the Zoom infrastructure for the online event and Jan Brase was part of the meeting organisers and programme committee.

The meeting was very successful, attracting over 500 unique views and over 250 attendees in individual sessions.

German U15

The eRA is actively contributing to the German U15[10] initiative, in particular to the series of research data management workshops. Philipp Wieder, e.g., contributed to the workshop on March 29th, 2022, a talk and assessment of the NFDI basic services initiative.

NHR

Göttingen is one of eight national high-performance computing locations (called NHR[11]). The NHR is also dealing with RDM on the level of high-performance computing. The eRA is contributing to this effort, linking local expertise, services, and endeavors with the NHR (and, where possible, the NFDI). Philipp Wieder, e.g., presented the eRA service offer at an NHR RDM workshop on May 18./19. 2022.

Other eRA Networking Events

- Regular participation in RDMO community events and development meetings to provide input to and get first-hand knowledge about the software that is the basis for the eRA's data management planning service GRO.plan.

[9] https://indico.desy.de/event/28294/overview

[10] https://www.german-u15.de/en/index.html

[11] https://www.nhr-verein.de/en

- DARIAH Research Data Management Working Group: Regular participation in the working group efforts with a focus on RDM for Humanities.
- NFDI Interest Group at Göttingen Campus (27.09.2021, 09.03.2022).
- Participation as keynote speaker at BfN[12]/NMZB[13] workshop "Langfristiges Management von Biodiversitätsdaten" 30./31.5., Leipzig
- The eRA again took part in the Postdoc Fair[14] on June 23, 2022, and explained their services to interested postdocs.

Evaluation of Networking Activities

ID	Name	Metric	Previous Reporting Period	Reporting Period	Total
N-01	Stakeholder Coverage	Percentage of stakeholders covered (Göttingen Campus partners, faculties of the University of Göttingen, selected individuals)	n/a	n/a	n/a
N-02	Conference/ Workshop participation	Number of participations per year	6	9	n/a

Table 4: KPIs related to eRA networking activities.

[12] Bundesamt für Naturschutz, https://www.bfn.de/en

[13] Nationales Monitoringzentrum zur Biodiversität, https://www.monitoringzentrum.de/

[14] https://goettingen-campus.de/postdoc-fair

Services

One central task of the Göttingen eResearch Alliance is the support for and the development of services for research data management and related topics. As support for all other services is mostly covered by consulting and training (except the actual technical support of the service operation), the Services pillar mainly reflects the portfolio of services developed by the eRA.

The overall goals of the provision of this service portfolio are to establish a core set of essential services that is required by researchers, and to integrate existing and upcoming services in the best possible manner. This portfolio is marketed under the label “Göttingen Research Online”, or in short GRO.

As of today, the following services are (partially) developed, maintained, and supported through the eRA:

- An institutional, general-purpose data repository (productive, service name: GRO.data)
- A service for visualizing geospatial data (productive, service name: GRO.geomapper)
- Several running services for the provision of persistent identifiers (each of them productive, service name: GRO.identifiers)
- A service to manage large-scale instruments (test phase, service name: GRO.instruments)
- A service to develop data management plans (productive, service name: GRO.plan)
- A publication data management service (productive, service name: GRO.publications)

The respective services are described in detail in the following sections.

GRO.data

Status: Production
Service manager: Péter Király
Software: Dataverse[15]
URL: https://data.goettingen-research-online.de

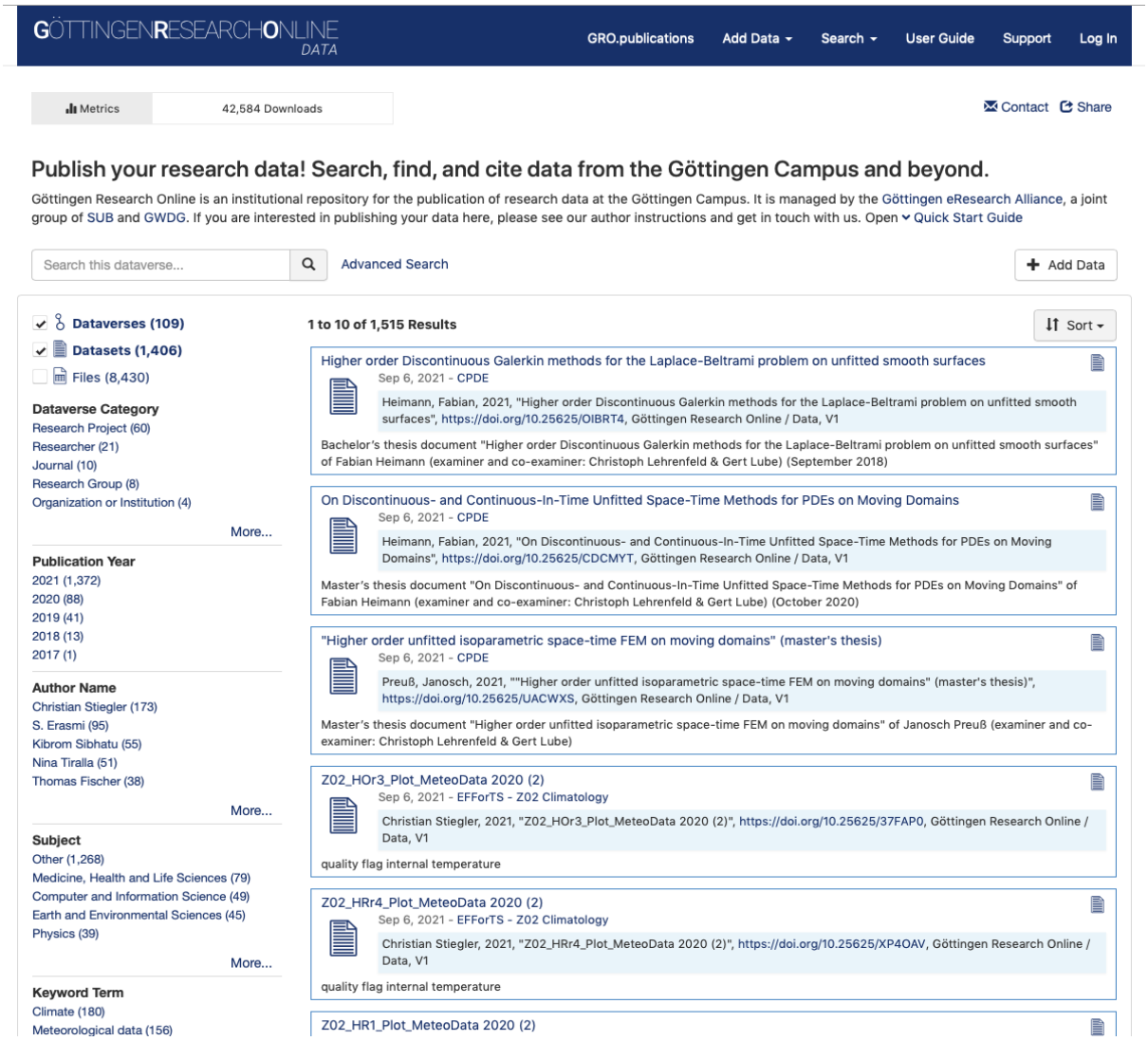


Figure 7: Screenshot from GRO.data.

The institutional research data repository GRO.data enables depositing, storing, sharing and publication of any kind of research data. Data can be ingested via interfaces, e.g. through the Electronic Lab Notebook, or exported for long term archival. The data can be amended with metadata directly upon deposit or selection. GRO.data supports researchers in publishing data according to the FAIR principles. In addition, researchers can receive persistent identifiers such as DOIs or ePIC PIDs for their data. The differentiated management of roles and rights facilitates access to data collections ("Dataverses") or data sets for single users as well as for user groups.

Below are some visualizations of GRO.data KPIs[16].

[15] https://dataverse.org

[16] Also available online at: https://data.goettingen-research-online.de/dataverse-metrics/

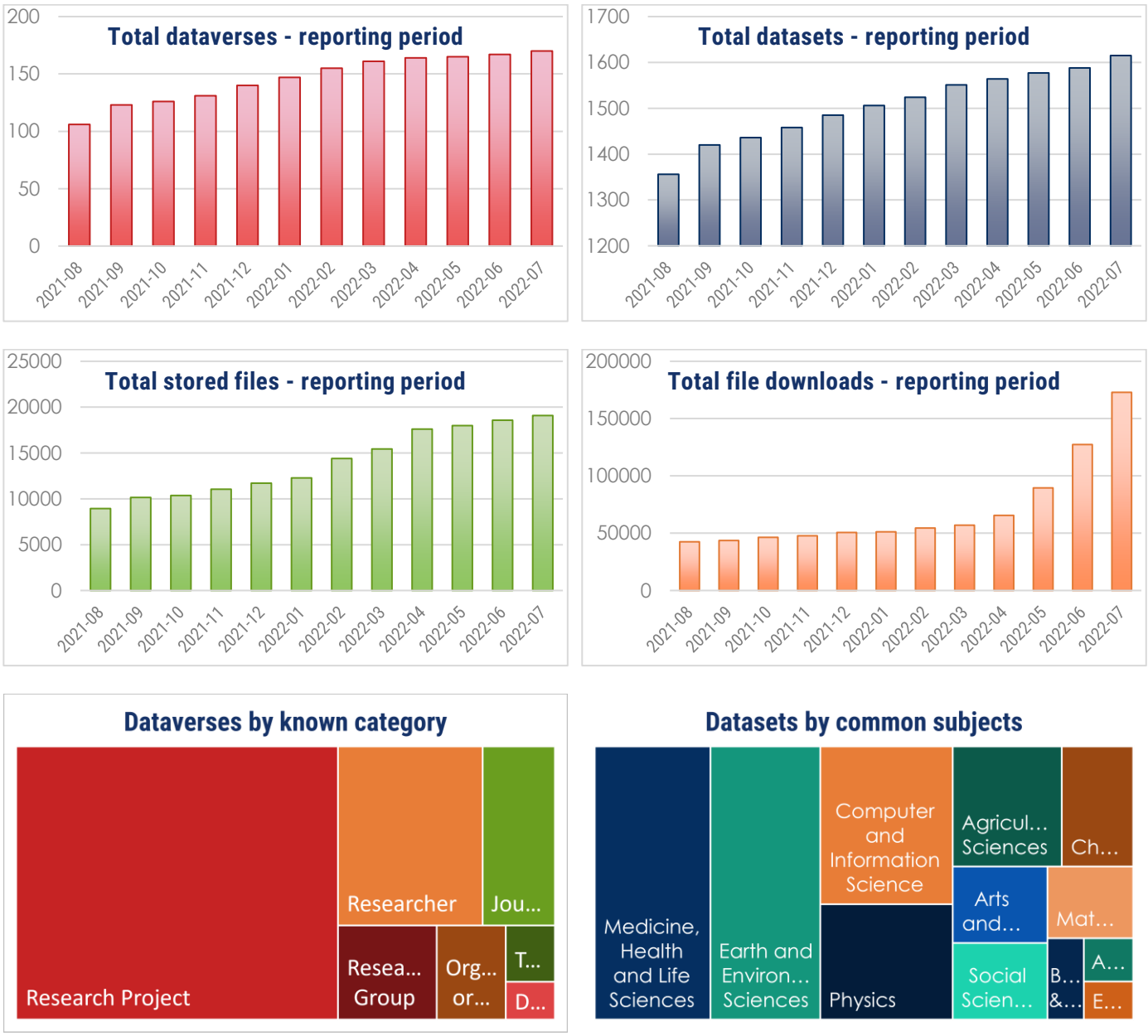


Figure 8: Various usage metrics for GRO.data.

Recent developments for GRO.data in the reporting period were:

- GeoMapper integration: Display datasets from GRO.data with geolocations in an interactive map
- Transfer from a legacy research data repository of the CRC 990 research group: 39 collections, 1,463 datasets, 3,689 files. Special trainings for their user community.
- Embargo: users can lock files for a limited time; GRO.data will lift embargo automatically.
- Displaying author's identifier (ORCID, VIAF, etc.) as link.
- External vocabulary support — users can link simple knowledge organisation system APIs (linked open data, autocomplete).
- Successfully finished Social Sciences & Humanities Open Cloud (SSHOC) project's Dataverse Task (T7.2). The aim of the project was to improve the features of the software to support the requirements of social science and humanities, including domain specific metadata scheme support, external vocabularies, virtualization with Docker, improving search support.

- Continued participation in SSHOC aiming to improve Dataverse software, focusing on the needs of digital humanities and social science researchers.
- Continued contribution to Dataverse development and improvement, with pull requests authored by Péter Király in the following topics: improving smaller issues of the API, linking ORCID and other identifier profiles from the metadata tab, fixing bugs, improving documentation.
- Linear increase for all usage metrics (number of data collections, datasets, files, downloads) over the past two years[17].

Evaluation of GRO.data KPIs

ID	Name	Metric	Previous Reporting Period	Reporting Period	Total
S-Dat-01	Dataverses stored	Number of Dataverses added/stored	74	64	170
S-Dat-03	Datasets published	Number of datasets published	1.3k	260	1.61k
S-Dat-04	Files stored	Number of files added/stored	7.14k	10.26 k	19.1k
S-Dat-05	Files downloaded	Number of files downloaded	40.3k	131k	173k
S-Dat-06	Users registered	Number of (new) users registered	169	228	576
S-Dat-08	Dataverses categories	Distribution of Dataverses over categories	Research projects: 47% Researchers: 23% Research groups: 8% Journals: 10%	n/a	54% 16% 6% 8%

[17] https://data.goettingen-research-online.de/dataverse-metrics/

S-Dat-09	Datasets subjects	Distribution of datasets over most common subjects	Medicine/Life Sc.: Comp./Inform. Sc.: Agricultural Sc.: Arts & Humanities: Earth/Environm. Sc.: Physics: Social Sciences: Chemistry:	26% 16% 8% 7% 13% 13% 7% 0%	n/a	16% 9% 7% 5% 13% 6.5% 8% 7%

Table 5: KPIs related to GRO.data service.

GRO.geomapper

Status: Production
Service manager: Claudia Malzer (until 02/22) / Ubbo Veentjer
Software: Based on geotiff.io[18]
URL: https://geomapper.goettingen-research-online.de/

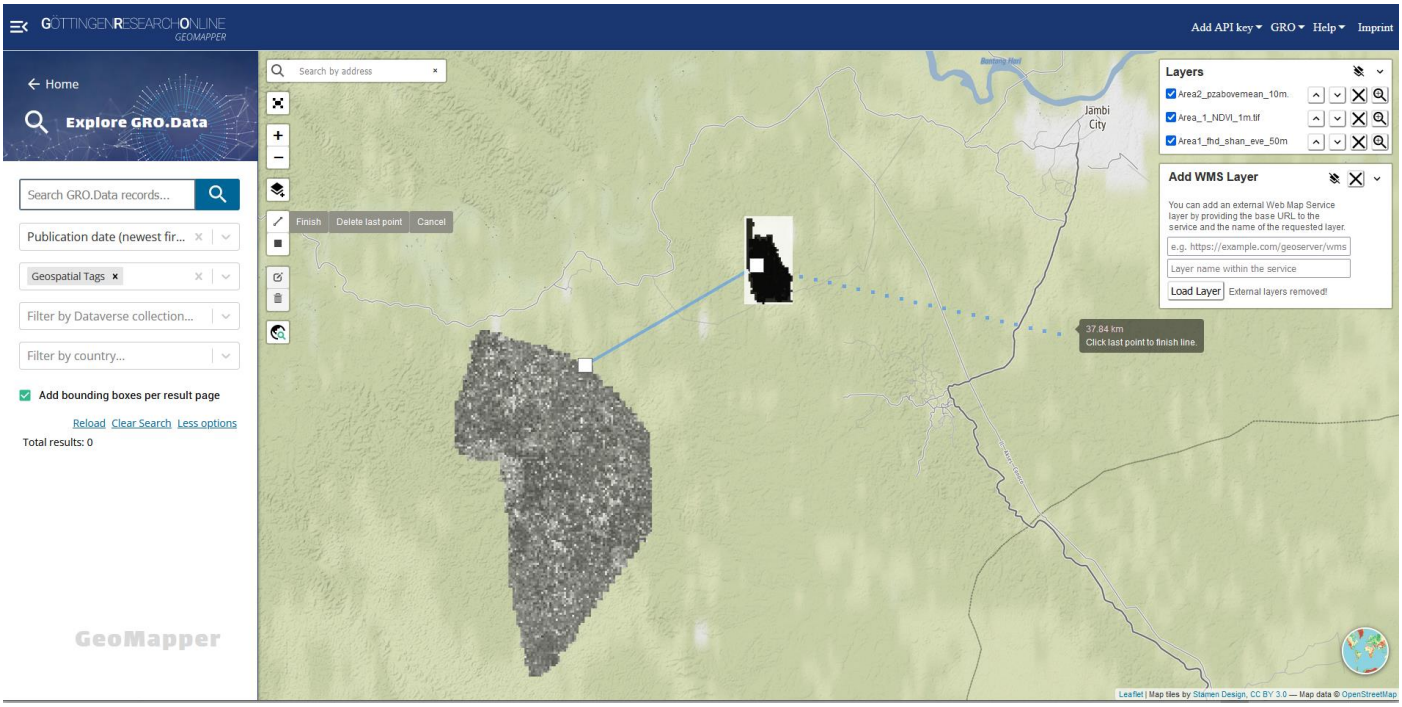


Figure 9: Screenshot from GRO.geomapper

Sparked by a request from the CRC 990[19], for which the eRA performed a data migration from their original BExIS[20]-based data repository to GRO.data in summer 2021, we developed the tool GRO.geomapper to allow for visualizing geospatial data from GRO.data, but also from external sources. The tool is based on the open software geotiff.io, but was extended to support also other common geospatial files: GeoJSON, zipped shapefiles, KML, and CSV with columns for latitude and longitude coordinates.

Besides enabling researchers to load their own files by URL or from disk, GRO.geomapper provides the option to directly search GRO.data for geospatial files, which can then be added to the visualization map. The search works either by keywords or by drawing a rectangular search area on the map. GRO.geomapper can also be used to draw and add a bounding box to a GRO.Data dataset.

The service started in test operation in October 2021 and was announced officially at the eRA Council meeting in Nov 2021. It was introduced to the broader public in an eResearch lab on Feb 15, 2022. Since the developer, Ms. Malzer, left the eRA and the SUB in March 2022, the service has currently not been developed further, and there also no metrics available yet regarding its use. The eRA plans to evaluate the service and ask for requested further features by performing a survey among the geo-related communities on campus in January 2023.

[18] https://github.com/GeoTIFF/geotiff.io/

[19] "CRC 990: Ecological and Socioeconomic Functions of Tropical Lowland Rainforest Transformation Systems (Sumatra, Indonesia)", see https://www.uni-goettingen.de/en/310995.html

[20] https://www.biodiversity-exploratories.de/en/public-data-bexis/

GRO.identifiers

Status:	Production
Service manager:	T. Henne (DOI Service); S. Bingert/T. Kalman (ePIC PID Service)
Software:	DOI Service (Datacite[21] & Crossref[22]) and ePIC PID Service[23]

The eRA offers two different services for persistent identifiers: the DOI Service and the ePIC PID Service. While the former mainly aims at persistent and long-term identification of published elements (whether these are papers or data objects), the latter is mainly used to integrate its API into added value services (like repositories or archives) to persistently identify large numbers of data objects.

Both services are based on the handle.net system[24]. Parts of the core global infrastructure of the ePIC PID Service are operating in Göttingen.

DOI Service

The DOI service was further consolidated. The SUB still acts as a consortium lead under the new Datacite membership model, which was started in Jan 2021.

Here we now have 70 clients ("repositories" in the Datacite terminology) and over 143,000 findable DOIs registered as of July 2022, with additional numbers of around 750 in draft and 420 in registered state.

Beyond this, some repositories and services for electronic paper publication or registration at the Göttingen Campus are registering DOIs via the SUB sponsored membership with CrossRef, e.g. the University Press[25], eDISS[26] and the FID AAC[27].

The planned further consolidation of the service, including workflows and policies, has been paused due to the fact that the position for the DOI helpdesk, which was filled by Raisa Barthauer, was not being prolonged, and that Ms Barthauer left the SUB in February 2022. The future of the helpdesk and thus the integration of both DOI services and the ePIC PID service is still in discussion, as funds as well as personnel are currently hard to acquire.

ePIC PID Service

The ePIC PID Service is increasingly used by the community. The discussion on whether ePIC should consider applying for a DOI license through the International DOI foundation (IDF) - or how else we could establish a sustainable solution to provide DOIs and PIDs in general for free to researchers in Göttingen or in Germany – is ongoing. The main service developments in the reporting period were:

- ePIC is planning to deliver the PID statistics in an automated way. Currently there is work going on the policies as well as on the technical framework.
- ePIC is working on adopting a PID policy checker service (developed in the DICE project) for all ePIC prefixes to monitor the fulfilment of the mirroring policy.
- Taking up an outcome of the PID4INST working group of RDA, in the context of DICE project ePIC plans to provide a service for registering PIDs for scientific instruments. Currently a prototype from SURF has been successfully installed as test service at GWDG.

[21] https://datacite.org

[22] https://www.crossref.org/

[23] https://www.pidconsortium.eu

[24] http://handle.net

[25] https://www.univerlag.uni-goettingen.de/

[26] https://ediss.uni-goettingen.de/

[27] https://libaac.de/

Projects and Networking

GWDG is participating in the project FAIRCORE4EOSC, which is building nine core services for the European Open Science Cloud. Furthermore, GWDG is leading and SUB is contributing to the NFDI working Group PID Services, which is responsible to develop concepts[28] for PID provision and usage across all projects related to the national research data infrastructures. The results of both activities will be used by eRA and experience will be exchanged.

Evaluation of GRO.identifiers KPIs

ID	Name	Metric	Previous Reporting Period	Reporting Period	Total
S-Idf-01	DOIs	Increase in DOIs registered through the DOI service	76k	29.5k	143k
S-Idf-02	DOI prefixes	Increase in DOI prefixes registered through the DOI service	8	10	70
S-Idf-03	ePIC prefixes	Increase in productive prefixes registered through the ePIC PID service	30	15	135
S-Idf-04	ePIC PIDs	Increase in PIDs registered through the ePIC PID service	n/a	n/a	ca. 57M

Table 6: KPIs related to GRO.identifiers service.

[28] https://doi.org/10.5281/zenodo.6507759

GRO.instruments

Status: Test phase (partially productively used)
Launch date: To be decided
Service manager: Timo Henne
Software: openIRIS
URL: https://instruments.goettingen-research-online.de/

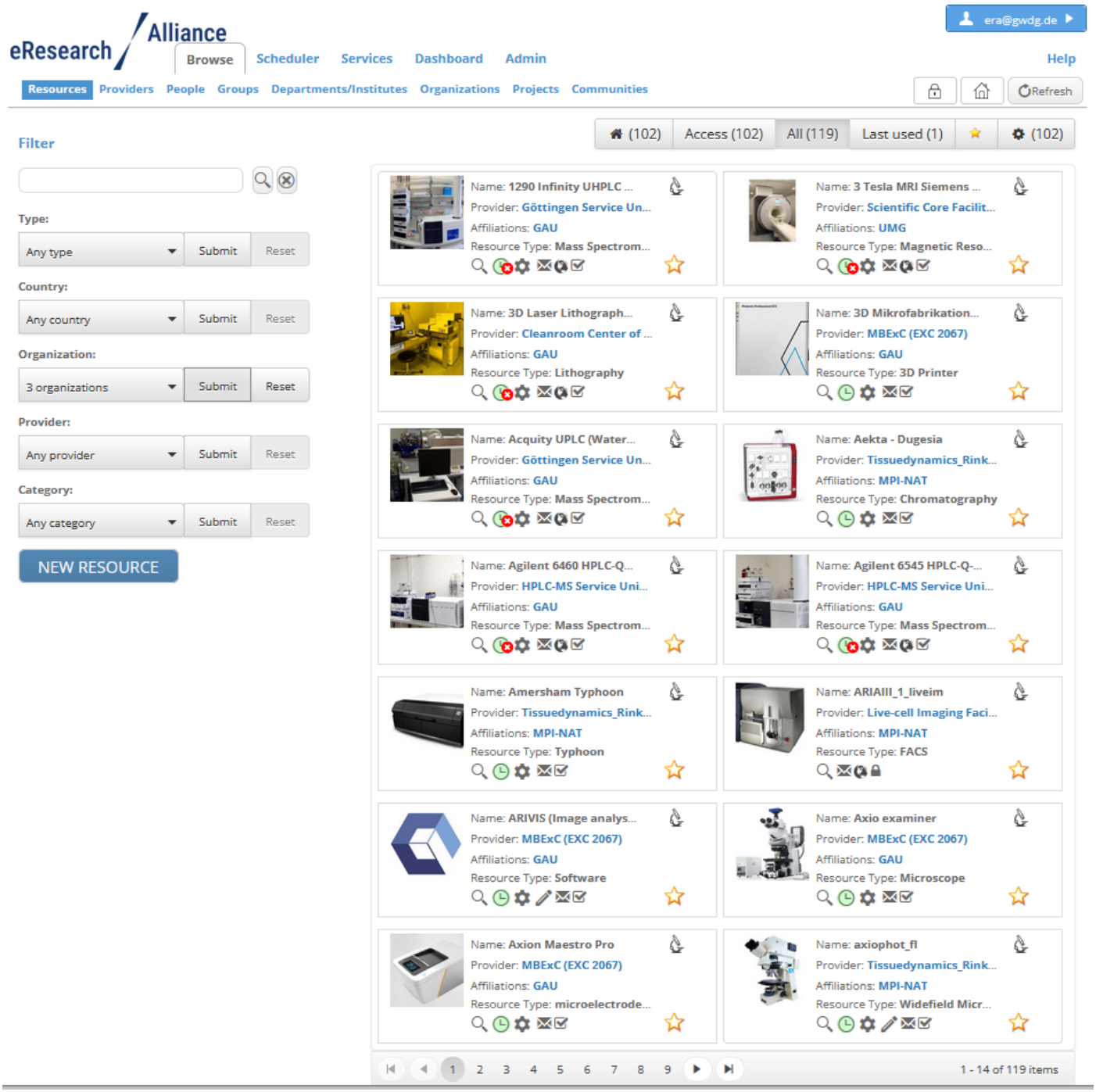


Figure 10: Screenshot from GRO.instruments.

GRO.instruments serves as the Large Instruments Portal for the Göttingen Campus. Its transition into productive status has been planned for almost 2 years now, but has been postponed several times for various reasons. On the one hand, the support from openIRIS[29] has been of varying reliability, strongly depending

[29] https://iris.science-it.ch/

on the workload of 1-2 persons. This situation is currently being improved, after the main stakeholders have formed a consortium in which also the GWDG takes part.

The other factor is the ongoing process amongst the GRO.instruments task force at the Göttingen Campus for defining workflows, responsibilities and support for distributing the task of adding more providers and instruments to the service. The task force was formed in November 2020 and is led by the eRA. Other members are staff from the university Research and Transfer, the UMG Research Department, and several interested researchers and early adopters. The feedback from the group was mainly positive, but there was hardly any capacity for becoming more involved in deciding on the above workflows and implementing them. Neither did the eRA put enough time and effort into scheduling and preparing the meetings, so the process slowed down until spring 2022. After the VP for infrastructure asked for the status and offered more support at the eRA Council meeting in May 2022, the process has gained momentum again, and we hope to be able to discuss the final steps to production status with the VP at a meeting in mid-September 2022.

eRA is also contributing to a European initiative to define a consortium for the continuous and sustainable development of the underlying software used for GRO.instruments, which is called openIRIS. A group of universities (like ETH Zürich or University of Basel), research organisation (like Helmholtz), and others (like the Charité) are aiming at defining processes and establishing a governance model.

Evaluation of GRO.instruments KPIs

ID	Name	Metric	Previous Reporting Period	Reporting Period	Total
S-Ins-01	Registered Facilities	Number of facilities registered	19	7	26
S-Ins-02	Registered Resources	Number of resources registered	83	36	119
S-Ins-03	Researchers registered	Number of new Göttingen Campus researchers registered with the service	63	100	163
S-Ins-04	Bookable resources	Number of registered resources being available for booking	n/a	n/a	93

Table 7: KPIs related to GRO.instruments service.

GRO.plan

Status: Production
Service manager: Ubbo Veentjer
Software: RDMO
URL: https://plan.goettingen-research-online.de

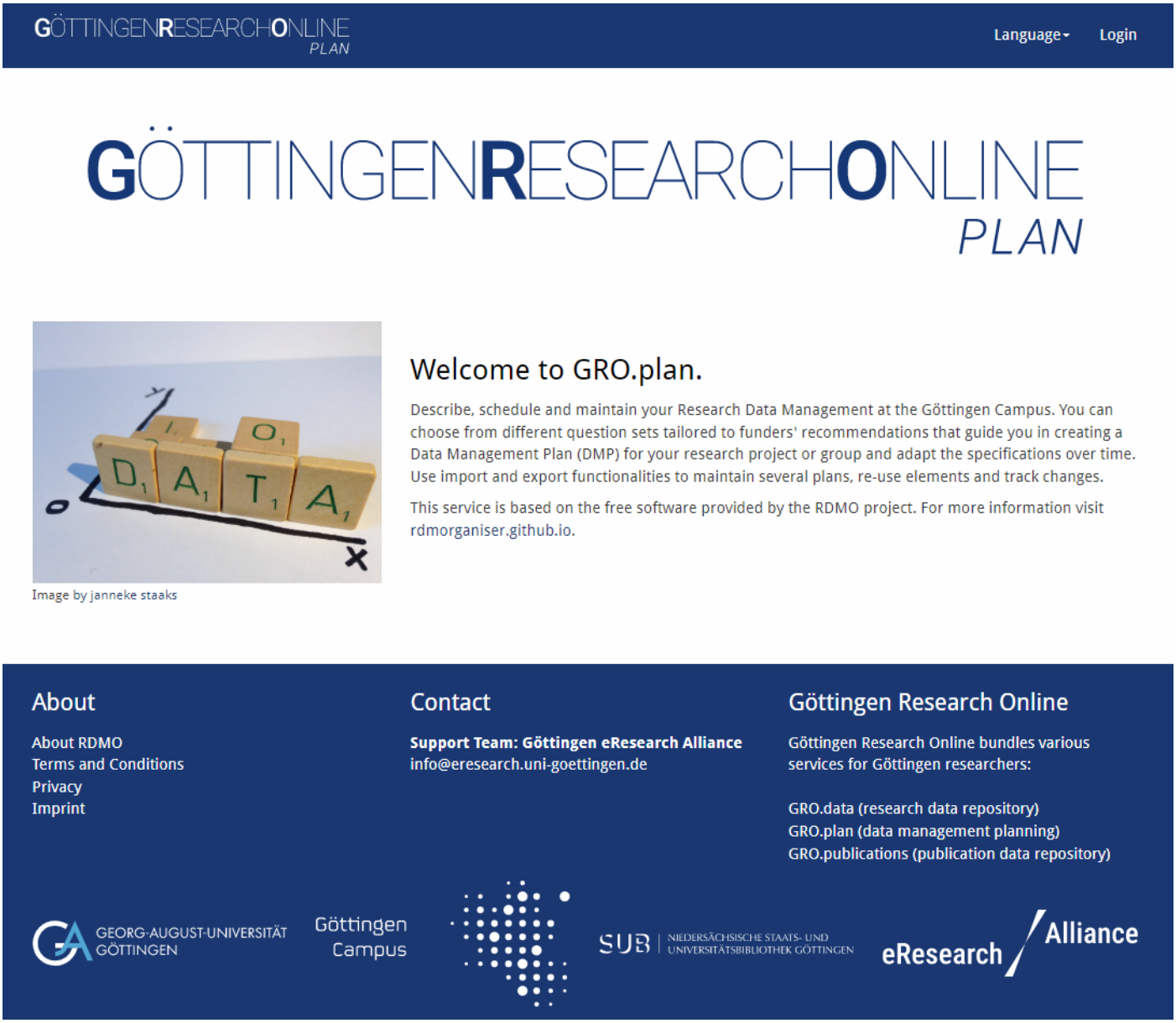


Figure 11: Screenshot from GRO.plan

The service GRO.plan for creating data management plans is in production state since October, 2020. GRO.plan is a custom themed version of the RDMO[30] software, integrated with the Academic Cloud authentication provided by the GWDG. The code of the respective instance is openly available at https://gitlab.gwdg.de/era-public/plan.

[30] https://rdmorganiser.github.io

Below you can find visualizations of the usage numbers of GRO.plan over the reporting period (Figure 12 - Figure 15).

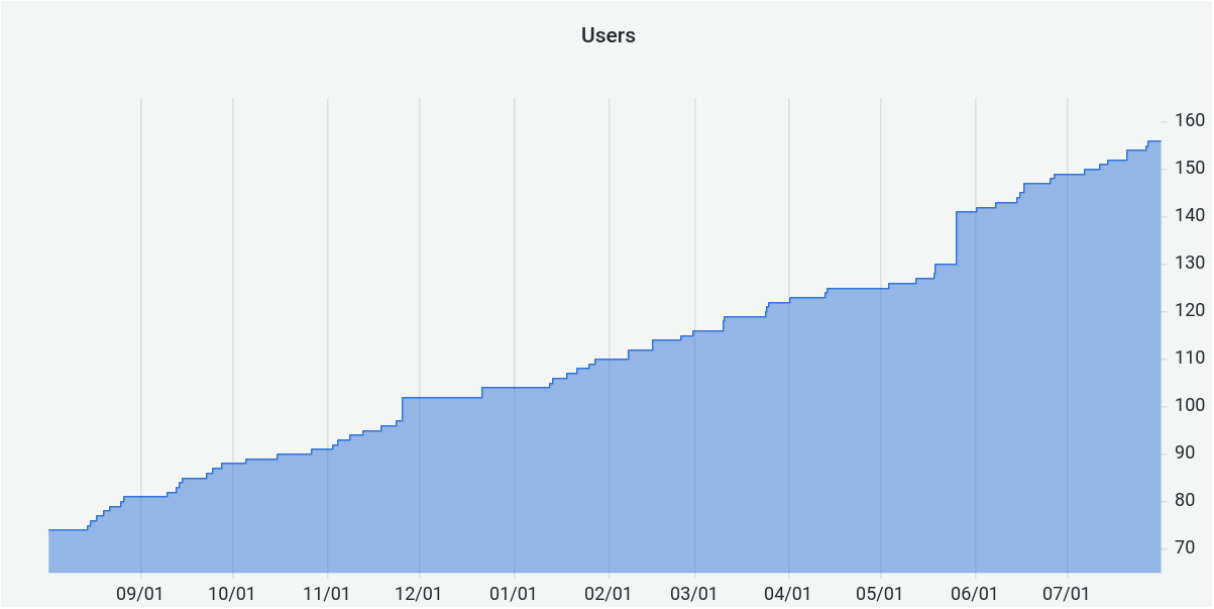


Figure 12: Number of users registered with GRO.plan (01.08.2021-31.07.2022)

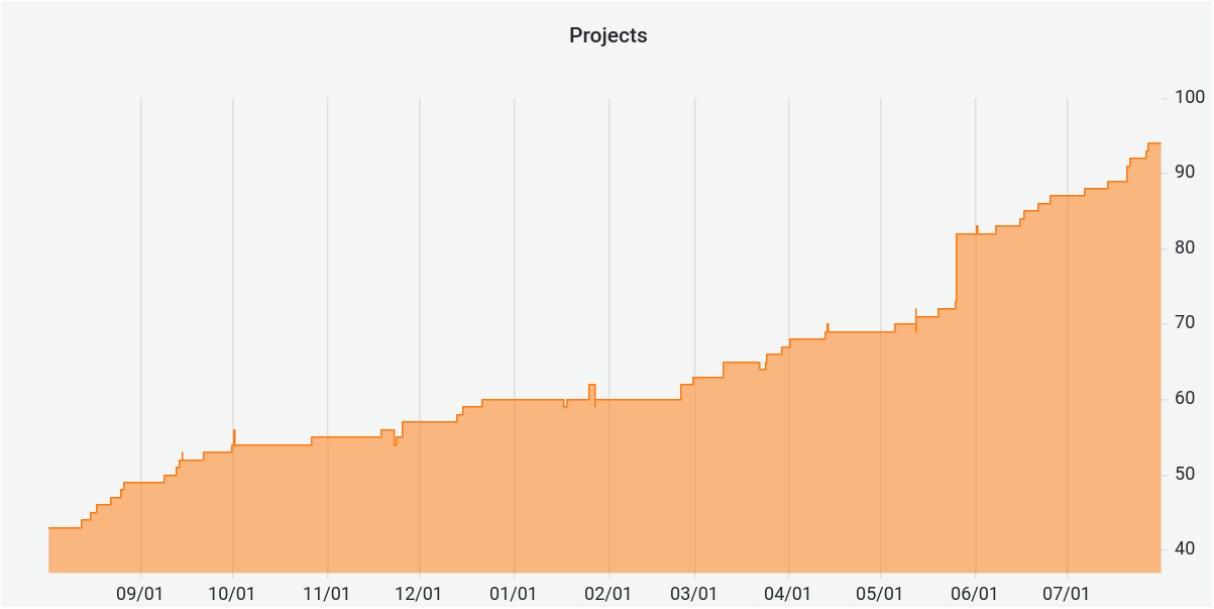
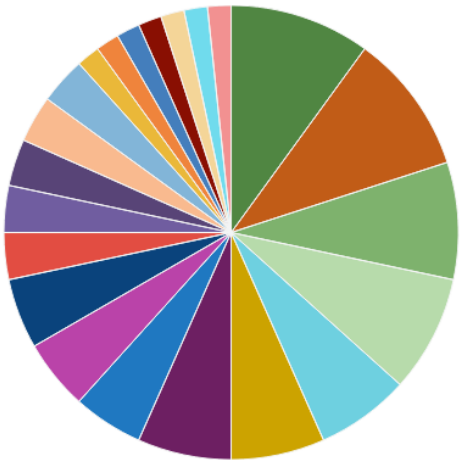


Figure 13: Number of DMP projects on GRO.plan (01.08.2021-31.07.2022)

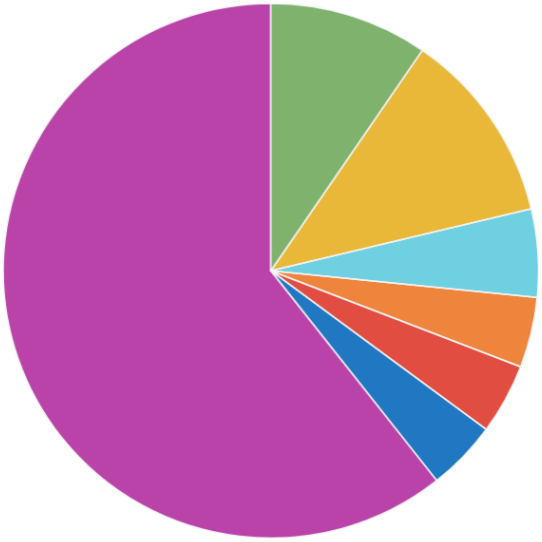


Research fields (current)

	current	percentage
Humanities and Social Sciences / Psychology	6	10%
Life Sciences / Agriculture, Forestry, Horticulture and Veterinary Medicine	6	10%
Engineering Sciences / Computer Science	5	8%
Life Sciences / Zoology	5	8%
Engineering Sciences / Systems Engineering	4	7%
Humanities and Social Sciences / Social Sciences	4	7%
Life Sciences / Neurosciences	4	7%
Humanities and Social Sciences / Linguistics	3	5%
Humanities and Social Sciences / Literary Studies	3	5%
Life Sciences / Medicine	3	5%
Humanities and Social Sciences / Education Sciences	2	3%
Humanities and Social Sciences / Non-European Languages and Cultures, Social and Cultural Anthropology, Jewish...	2	3%
Life Sciences / Plant Sciences	2	3%
Natural Sciences / Geophysics and Geodesy	2	3%
Natural Sciences / Physical and Theoretical Chemistry	2	3%
Engineering Sciences / Materials Engineering	1	2%
Humanities and Social Sciences / Ancient Cultures	1	2%
Humanities and Social Sciences / Theology	1	2%
Life Sciences / Basic Biological and Medical Research	1	2%
Natural Sciences / Condensed Matter Physics	1	2%
Natural Sciences / Geography	1	2%
Natural Sciences / Mathematics	1	2%

Figure 14: Disciplines/Research fields used in GRO.plan projects (as of 31.07.2022)

Catalogs used (current)



	current	percentage
DCC Checklist 4.0	9	10%
DFG	11	12%
DFG 105 Edition	5	5%
DFG 109 Educational Research	4	4%
DFG 111 Social Sciences	4	4%
DFG Biodiversity research	4	4%
RDMO	57	61%

Figure 15: GRO.plan catalogues used (as of 31.07.2022)

In the reporting period two revisions of GRO.plan have been released, each including new features and fixes from the RDMO software. This included:

- Release „Fall 2021" (8.12.2021) based on RDMO 1.7
  - Nested question sets
  - Default values for questions
- Release „Spring 2022" (2.6.2022) based on RDMO 1.8.1
  - Help-overlays for a "guided tour" through the software
  - Usability/performance improvements and bugfixes

RDMO allows the usage of different discipline- and funder-specific catalogues for creating a data management plan. The RDMO community continuously develops and shares catalogues[31,32], which can be used with own RDMO installations. The eRA provided some of these catalogues for GRO.plan initially, and continues to evaluate which catalogues fit the needs at the Göttingen Campus. A much-requested new catalogue for the Horizon Europe funding programme from the European Commission was finished within the RDMO community in June 2022 and will soon be made available also in GRO.plan.

The eRA continued its engagement in RDMO community meetings and participation in monthly calls of the RDMO content group and the RDMO software development group. The content group takes care of developing and discussing catalogues and their integration into the RDMO schema and user interface, while the software group discusses general software features and development. The RDMO community continues to grow – currently RDMO instances are installed at 45 research institutions in Germany, with 25 of these being in productive use. Additional 3 test instances have been set up in Austria, Italy and France[33]. RDMO is also being considered as becoming the standard DMP tool in the NFDI consortia.

Evaluation of GRO.plan KPIs

ID	Name	Metric	Previous Reporting Period	Reporting Period	Total
S-Pla-01	Data Management Plans	Number of data management plans created	43	51	94
S-Pla-02	GRO.plan users	Number of new users registered	74	82	156
S-Pla-04	Plans per discipline	Number of plans created per discipline	Humanities & Social. Sci.: 12 Life Sci.: 9 Engineer. Sci.: 7 Natural Sci.: 3	10 12 3 4	22 21 10 7

Table 8: KPIs related to GRO.plan service.

[31] https://www.forschungsdaten.org/index.php/RDMO#Verf.C3.BCgbares_und_in_Vorbereitung_befindliches_Zubeh.C3.B6r_in_der_RDMO-Community

[32] https://github.com/rdmorganiser/rdmo-catalog

[33] https://rdmorganiser.github.io/en/cooperations/

GRO.publications

Status: Production
Service manager: Daniel Beucke
Software: DSpace CRIS
URL: https://publications.goettingen-research-online.de

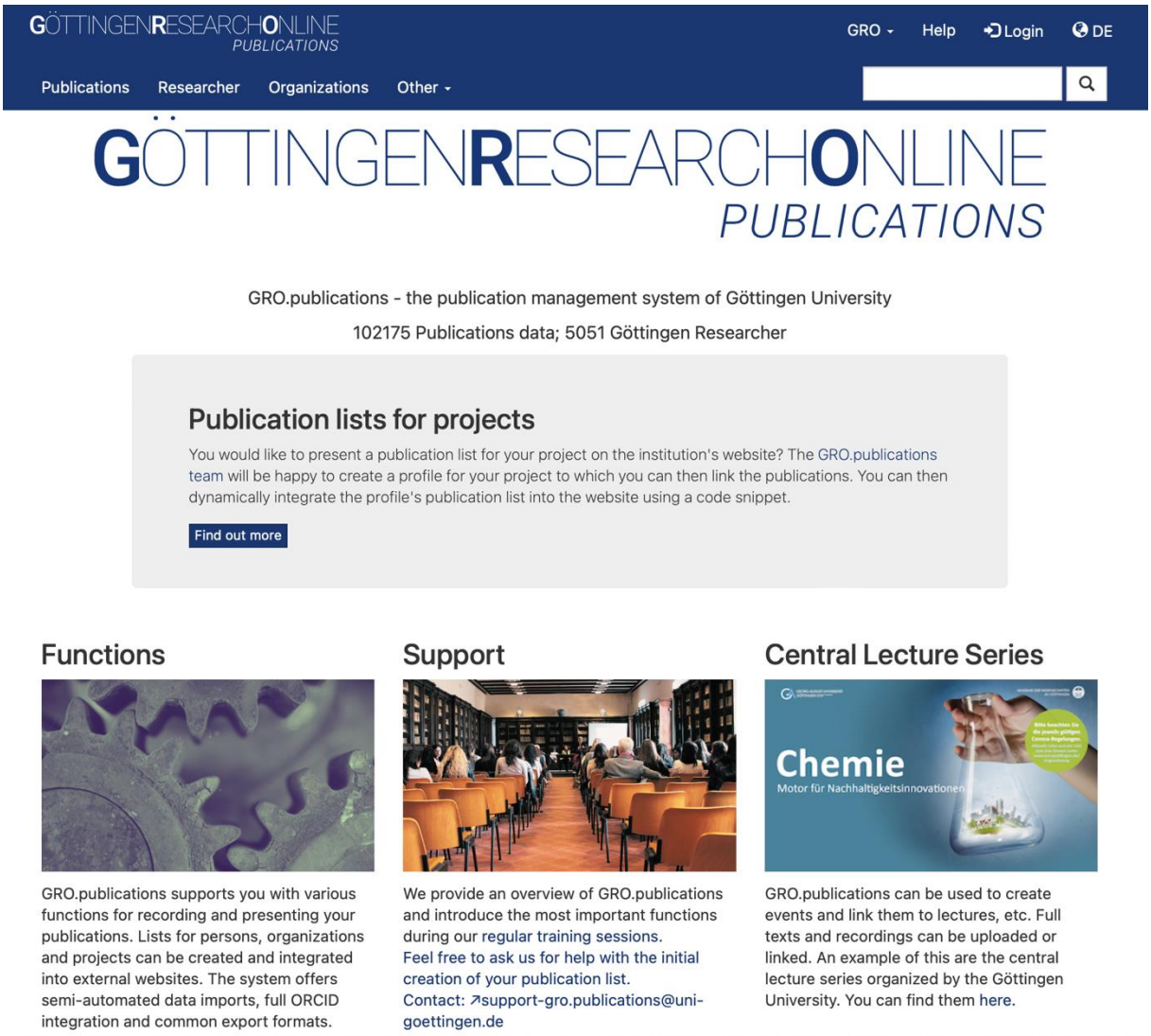


Figure 16: Screenshot from GRO.publications

GRO.publications is a modern publication data management system and aims to bundle and increase the visibility of research output and publications produced at the University of Göttingen. It offers researchers an optimal infrastructure and platform for the presentation of their scientific publications.

The service regularly imports publication data from scientific resource systems like Web of Science and PubMed. Researcher can export customized publication lists as needed and embed their publications, always up-to-date, in other websites via a JavaScript snippet. Ideally, the publication data will also contain links so that you can go directly to the full text. Additionally, researchers can synchronize their ORCID profile with GRO.publications in both directions. GRO.publications is based on the repository software DSpace-CRIS[34], which is an extended module of DSpace. The technical release took place in August 2019.

The developments of the service within the reporting period include:

[34] https://wiki.lyrasis.org/display/DSPACECRIS/DSpace-CRIS+Home

- Continuous expansion of help wiki including tutorials[35]
- New entity unlocked (working groups)
- Established support channel via Rocket.Chat
- Completed migration from GoeScholar (the former Göttingen repository for peer-reviewed publications) to GRO.publications, including all full texts and series
- Established a central repository for primary and secondary publications from Göttingen
- Implemented an API to import publication data from FACTScience (the administrative RIS at Göttingen University and UMG) to GRO.publications for journal articles
- Regular imports from external sources (e.g. OA-Monitor with ca. 9000 publications, PubMed with ca. 7000 publications). Since April/May 2021 monthly imports from Science and PubMed.

Evaluation of GRO.publications KPIs

ID	Name	Metric	Previous Reporting Period	Reporting Period	Total
S-Pub-01	Publications stored	Number of publications added/stored	21.650	18.330	102.198
S-Pub-03	Researchers registered	Number of new Göttingen Campus researchers registered with the service	252	262	5.052

Table 9: KPIs related to GRO.publications service.

[35] https://gropublications.wiki.gwdg.de/doku.php?id=startseite

Other Services

Menoci.io

The menoci-based Research Data Platform (RDP) concept has been in active development for the last decade at the Göttingen Campus, primarily targeting research consortia in the life sciences. menoci.io[36] is a collection of open-source Drupal extension modules that can be used to rapidly deploy an integrated website and data management portal for research consortia. The menoci modules are actively developed and maintained by the University Medical Center Göttingen, Department of Medical Informatics, and Scientific Data Center Göttingen, GWDG in close collaboration with the targeted scientists. The framework is currently applied by several life science research consortia at Göttingen Campus (CRC1002, CRC1190, CRC1286, MBExC, TRR274, FOR2705, FOR2848).

The eRA team and expert network was and is essential to establish the menoci-based RDP concept as a sustainable process and software framework development approach. During the eRA consulting process of preparations for grant applications, the RDP concept is used to determine RDM requirements of new research consortia. In a modular fashion, the RDP concept can then be implemented to be specifically tailored to the RDM needs of the new consortia. This strategy drives reuse of existing processes and technologies and avoids unnecessary redundant developments of already available tools and processes.

The menoci-based RDP concept includes a variety of functions to cross-link different (and also external) services and data sources. Recently, cross-linking concepts for the Göttingen Research Online services (GRO.data, GRO.publications, GRO.instruments) were successfully implemented. This enables the representation of consortium-specific research data in Campus-wide data and metadata repositories.

Data Lakes

Data lakes are a fundamental building block for many industrial data analysis solutions and becoming increasingly popular in research. Often associated with big data use cases, data lakes are, for example, used as central data management systems of research institutions or as the core entity of machine learning pipelines. The basic underlying idea of retaining data in its native format within a data lake facilitates a large range of use cases and improves data reusability.

The eRA is involved in a growing number of projects where a data lake is built as the central entity for data management and analysis. Many of these projects are not yet production ready, but it is foreseen that there will be more details will be provided in the next reporting period.

[36] https://menoci.io/

Outreach

Intensified Coordination with Göttingen Campus

The Göttingen eResearch Alliance serves the whole Göttingen Campus with all of its partners:

- University of Göttingen
- University Medical Center Göttingen
- Göttingen Academy of Sciences and Humanities
- German Aerospace Center
- German Primate Center
- MPI for Biophysical Chemistry
- MPI for Dynamics and Self-Organization
- MPI of Experimental Medicine
- MPI for Solar System Research
- MPI for the Study of Religious and Ethnic Diversity

We have intensified our communication with the Research Department (German: “Abteilung Forschung & Transfer) and the subject specialists at the SUB Göttingen. With the Research Department, a closed exchange was fixed with the implementation of our long-existing consultation workflow in gitlab for the purpose of ensuring timely responses and documentation. With the subject specialists, we have agreed on reviving our semi-annual meetings and agreed on procedures for better involving each other in consultation and training processes.

Website

The current design of the eRA website is online since July 2019, and was created by an external web designer. The website is since is being managed by the eRA team, which includes technical administration such as backups and updates, as well as content items like updating information pages, selecting images and posting news items. In the past year, these tasks were mainly cared for by two of our student helpers. While we have received great positive feedback in the past 2 years for the improvement in website usability and scope, we are constantly collecting internal and external suggestions for improvement.

We have continued our collaboration with the web designer and implemented several improvements and adaptations. These include automatic ToC generation and placement for our pages, adaptable header image sizes, free menu sorting, and filtering news items.

Upon requests in particular from the eResearch Council, we have also added new sections to our website:

- introducing our RDM service solutions for research projects, including example uses from research projects[37]
- providing an overview of NFDI activities at the Göttingen Campus and the eRA involvement therein[38]
- structured information on Data and Information Security contacts and information pages at the Göttingen Campus[39]
- overview of eResearch Labs information with past and future dates[40]

[37] https://www.eresearch.uni-goettingen.de/services-and-software/solutions/

[38] https://www.eresearch.uni-goettingen.de/services-and-software/nfdi-and-the-gottingen-campus/

[39] https://www.eresearch.uni-goettingen.de/consulting-and-training/data-and-information-security/

[40] https://www.eresearch.uni-goettingen.de/consulting-and-training/eresearch-labs/

As we already informed the Advisory Board, we also added a section providing the annual reports to the Board for download to the public.[41] Below you can find some screenshots from the current website.

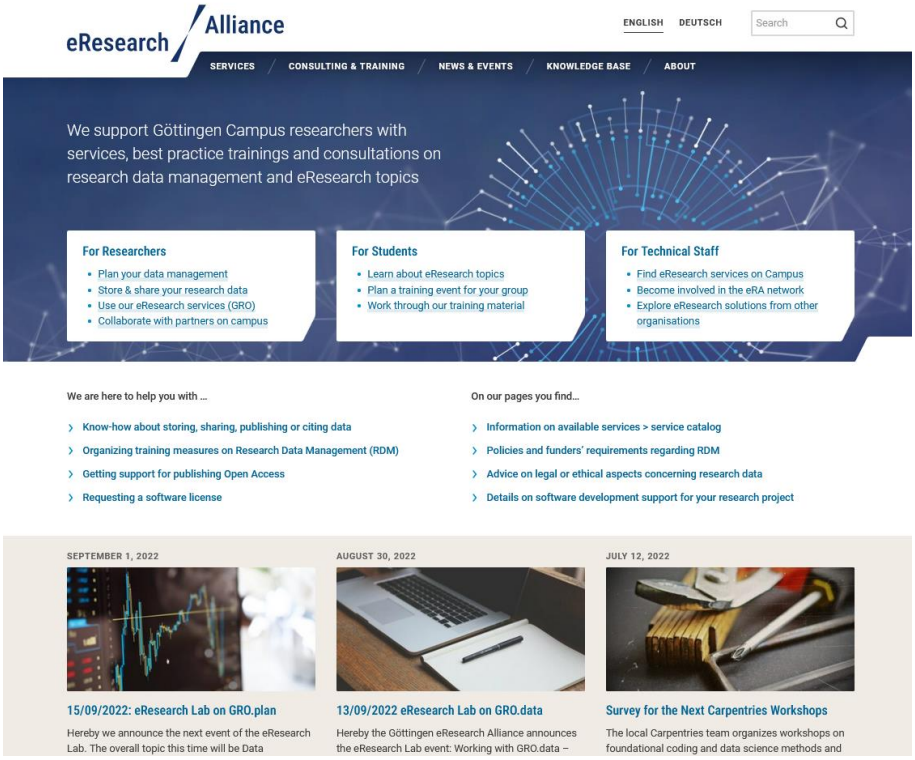


Figure 17: Screenshot of the eRA website start page

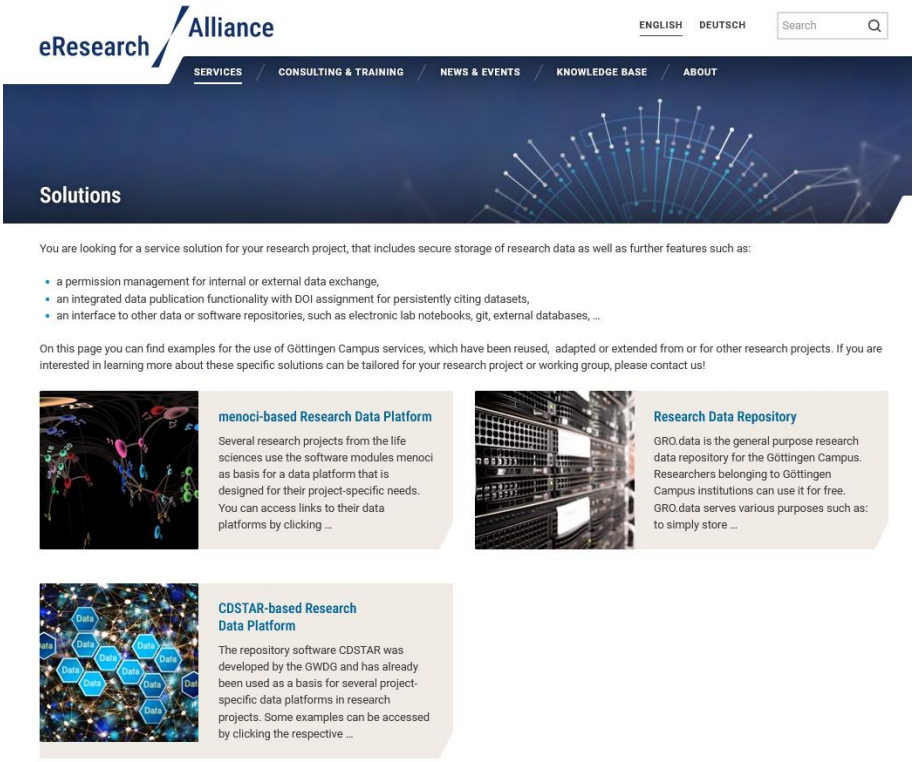


Figure 18: Screenshot of the eRA website Solutions page

[41] https://www.eresearch.uni-goettingen.de/about/press-material/#toc-1

Figure 19: Screenshot of the eRA website page on NFDI @ Göttingen Campus

Figure 20: eRA website page on eResearch Labs

Social Media

Twitter

In May 2020, the eRA launched its Twitter channel[42], which has since been used in addition to the website news, RocketChat channel and email distribution lists to announce eRA events and other interesting developments regarding eResearch topics. The management of our Twitter channel in the reporting period was also handled mainly by our student helper Stina Riegelmann, which led to more than doubling our total tweet count and increasing our follower count by another 100 to a total of 453.

RocketChat

While the eRA RocketChat channel[43] was established already in 2017, its use and reach in the first years was rather limited. By the end of 2020, the team started to post information more frequently. From July 2021 on, our student helper Stina Riegelmann increased the number of posts to over five per week, making this channel also a valuable means of communicating eRA topics to users on the Göttingen Campus that do not use other social media. Currently, there are 35 members in the channel, and the eRA team continues to promote the use of RocketChat in general and our channel in particular in consultations and training events.

Evaluation

ID	Name	Metric	Previous Reporting Period	Reporting Period	Total
O-02	Publications	Number of Publications	5	11	n/a
O-06	Tweets published	Number of tweets published in reporting year (cumulative until Jul 31st, 2021)	403	416	819
O-07	Twitter followers	Number of new Twitter followers in reporting year (cumulative until Jul 31st, 2021)	353	100	453

Table 10: KPIs related to eRA Outreach activities

[42] https://twitter.com/GottingeneRA

[43] https://chat.gwdg.de/channel/eresearchalliance

3rd Party Funded Projects

In this section, we describe the results of those projects, which are funded by 3rd parties like the German Ministry for Education and Research (BMBF), the DFG, or the European Commission.

NFDI

The eRA is already involved in five NFDI projects: Text+, NDFI4Culture, NFDI4Biodiversity, NFDI4Ing, and NFDI4Earth. Furthermore, the eRA contributed to the BASE4NFDI project proposal, which aims, in case of it being funded, at building basic services for the whole NFDI. For more details, see the Section "NFDI Consultation and Participation".

EOSC

The eRA is active in three EOSC-related projects funded through Horizon 2020 and HORIZON Europe: DICE, EOSC Future, and since mid 2022 the new FAIRCORE4EOSC[44]. In the first project, eRA partner GWDG is responsible for a task related to GRO.identifiers/ePIC PIDs. In EOSC Future, eRA partners SUB and GWDG are responsible for a number of RDM-related tasks.

The FAIRCORE4EOSC project focuses on the development and realisation of core components EOSC by supporting a FAIR EOSC and addressing gaps identified in the Strategic Research and Innovation Agenda (SRIA). Leveraging existing technologies and services, the project will develop nine new EOSC-Core components aimed to improve the discoverability and interoperability of an increased amount of research outputs. eRA partner GWDG is providing expertise and develops services related to GRO.identifiers.

DIGIS

The DIGIS project aims to build and maintain a German-based Digital Geochemical Data Infrastructure to provide access to up-to-date data archives for the earth science community.
Based on the existing GEOROC database (launched in 1999 by the Max-Planck Institute for Chemistry in Mainz), the new DIGIS concept "GEOROC 2.0" will refactor and extend the existing functionalities with end-to-end data mining, DOI integration and an integration with other well-established databases in the field.

DIGIS now has its own Dataverse in GRO.data, where datasets and precompiled files are stored and versioned. With this repository GEOROC now supports data submission by the community.
Regarding the integration with other databases, the DIGIS team is in close cooperation with the EarthChem[45] team from the Columbia University of New York. As a first result of this cooperation, an export-workflow of the GEOROC data to xml has been built and the data exchange between the two systems re-established. Updates to the GEOROC data holdings are ingested by the EarthChem Portal on a regular basis (quarterly).

Furthermore, both teams are working together on unified vocabularies for the data and metadata and to further improve the ODM2-based data model.

OCR-D

The eRA is involved in three projects of the third phase of OCR-D: "OLA-HD Service", "OPERANDI", and "OCR-D Coordination". All projects aim at building different components related to the digitalisation of historic prints including long-term archiving, performance improvements through the integration of high-performance clusters, or work-flow automation.

[44] https://faircore4eosc.eu/

[45] https://www.earthchem.org/

SSHOC

The project ended successfully in summer 2022.

MINE

The eRA members SUB and GWDG continued to work on the project MINE throughout the reporting period. The goal of the project is to make (all) text resources from the Göttingen Campus accessible and available for further research. The MINE product is a complex system architecture that allows to read and convert metadata from the sources and provide a sophisticated search interface. The MINE prototype is available at https://mine-graph.de/.

The official funding ended in autumn 2021, but the partners decided to continue working on MINE to evolve it towards a service capable of being integrated into larger projects like the NFDI.

Evaluation

ID	Name	Metric	Previous Reporting Period	Reporting Period	Total
M-01	3rd party Funding	Amount of 3rd party funding raised	n/a	n/a	n/a

Table 11: KPIs related to other eRA activities

Plans for the Next Reporting Period

For the next reporting period from 2022 – 2023 we plan to focus on the following aspects.

Consulting

The consulting activities of the coming reporting period will be dominated by the Cluster initiatives, those collaborative projects which are the core and foundation for a successful application of the University of Göttingen at the so-called Excellence Strategy[46]. Currently, the university prepares the proposals for selected Clusters[47] and the eRA is responsible for the research data management and related topics. Based on the experience from the previous application process it is clear that a substantial number of resources will be required to provide the best support to the Clusters and the initiative itself. The respective preparation already started and time plans have been released.

The established consulting will be continued, but, most likely, with less resources.

Training

As the eRA now has valuable KPIs on who is requesting which trainings, it is planned to reach out to those faculties and institutes, who have requested least trainings (and services) from the eRA. The purpose is to a) raise awareness of the offers of the eRA and b) to ensure that the current situation is not due to a lack of information at the customers.

Furthermore, the eRA will develop new formats for the so-called Digital Creative Space[48], an open co-working space at the SUB, which is equipped with smart boards, media tables, and other modern technical equipment. Potential formats are interactive, ad-hoc trainings on eRA services or RDM open hours.

Services

As stated in the previous, the strategic directive is to evolve the existing services and provide them in a reliable manner. This implies for the coming reporting period, that the eRA will provide the necessary documents and processes to integrate the eRA services into the scope of the ISO 27001 certificate of GWDG. This will improve the quality of the services, in particular with respect to the organisation measures, significantly.

In coordination with the vice president Norbert Lossau, the eRA will evaluate two additional services: a) long-term archiving and b) MINE (see also the Section “MINE”). Depending on the outcome of this evaluation, new services might be integrated into the eRA portfolio.

Networking/Outreach/Communication

Our cooperation with UCSD to implement the eRA concept on their campus had been stopped due to the COVID restrictions. We have now established new exchange channels with UCSD and will start to meet regularly in 2023 again.

On the national level we again have been very much involved in the third phase of the NFDI process, in consulting proposals and interest groups that have connections to Göttingen campus. Additionally, a new excellence initiative will be opened for German universities in 2023. The first preparation meetings for

[46] https://www.dfg.de/en/research_funding/excellence_strategy/index.html

[47] As long as the Cluster initiatives have not been officially announced, eRA is not able to provide details related to them.

[48] https://www.uni-goettingen.de/en/663186.html

Excellence Clusters in Göttingen are currently taking place. At the moment, the consortia are being prepared and all of them have selected eRA colleagues appointed as counsellors for all FDM related tasks. Some of these consortia will likely include members of eRA as PIs in the proposals.

Moreover, the RDM strategy for the state Lower Saxony will be implemented in the next reporting period with the help of the eRA and additional funding being granted to export the eRA processes further into the state.

Appendix A – Members of the eRA Steering Group

Jan Brase	Head Research and Development, SUB
Mustafa Dogan	Deputy Head Digital Library, SUB
Timo Henne	eRA Team manager, SUB
Wolfram Horstmann	Director, SUB
Frank Klaproth	Chief Technical Officer, SUB
Harald Kusch	Member of Medical Informatics Department, UMG
Jens Nieschulze	Research data officer at University of Göttingen
Birgit Schmidt	Head of “Wissen als Gemeingut”, SUB
Philipp Wieder	Head of eScience Group, GWDG, and Deputy Head, GWDG
Ramin Yahyapour	Managing Director, GWDG

Appendix B – List of extended KPIs

ID	Name	Area	Service	Metric	Target value	Source of data	Means of acquisition	Type	Objective
C-01	Consultations	Consulting		Number of consultations per year	> 40 consultations per year (defined based on the mean value for the previous years)	gitlab tickets; List of consultations	Manual	Target	Ensure sufficient consultation support and available team resources
C-02	Consultations per Discipline	Consulting		Amount of consultations per discipline per year	Distribution should be in line with the expertise of the eRA team members	gitlab tickets; List of consultations	Manual	Monitoring	Understand required and available expertise w.r.t requirements of different scientific disciplines
C-03	Consultations per Funder	Consulting		Amount of consultations per funder per year	Distribution should be in line with the expertise of the eRA team members	gitlab tickets; List of consultations	Manual	Monitoring	Understand required and available expertise w.r.t. requirements of particular funders
C-04	Time Consumed per Consultation	Consulting		Amount of time required per consultation	tbd	gitlab tickets; List of consultations	Manual	Monitoring -> Target	Understand factors and resources required for consultation aspects, and plan adaptations
C-05	Successful proposal consultations	Consulting		Percentage of consultations	>50%	gitlab tickets; List of consultations	Manual	Target	Ensure sufficient team expertise with respect

				resulting in funding approval		funders feedback to researchers / Abt. Forschung			to requirements of particular funders
C-06	Successful other consultations	Consulting		Number of positive feedbacks from researchers	none	Consultation feedback	Manual	Monitoring	Understand if eRA meets researchers' expectations and requirements
T-01	Trainings	Training		Number of trainings per year	tbd; All training requests should be fulfilled	gitlab tickets; List of trainings	Manual	Target	Understand training demand and ensure sufficient team resources
T-02	Open training events	Training		Number of open training events per year	>3	gitlab tickets; List of trainings	Manual	Target	Increase visibility on Campus
T-03	Discipline-specific training materials	Training		Percentage of all disciplines covered by specific training material available on website	100%	gitlab tickets; List of trainings	Manual	Target	Understand discipline-specific needs for training material
T-04	Info events	Training		Number of Info events per year	>5	gitlab tickets; List of trainings	Manual	Target	Increase visibility on Campus

T-05	Webinars	Training		Number of online training courses and webinars offered per year	tbd	gitlab tickets; List of trainings	Manual	Monitoring -> Target	Increase visibility on Campus and accessibility of training offers
T-06	Training reception	Training		Overall and specific scores of training evaluation questions	tbd	Training evaluation sheets	Manual/semi-automated evaluation of training sheets	Monitoring -> Target	Understand training needs and quality of current training offers
O-01	Events	Outreach		Number of events per year	> 12 per year (at least one per month on average)	Calendars, emails, planning documents	Manual	Target	Increase visibility outside of Campus
O-02	Publications	Outreach		Number of Publications per year	> 3 (articles, guides, checklist)	Internal list of publications	Manual through team record	Target	Increase visibility outside of Campus
O-03	Website visits	Outreach		Number of distinguishable website visits per year	tbd	Website traffic metrics	Automatic	Monitoring -> Target	Understand visibility of Website
O-04	Files downloaded	Outreach		Number of file downloads per year	tbd	Website traffic metrics	Automatic	Monitoring -> Target	Understand usefulness of website content

O-05	Website retention	Outreach		Average duration of stay on website	tbd	Website traffic metrics	Automatic	Monitoring -> Target	Understand quality of user guidance and website structure
O-06	Tweets published	Outreach		Number of tweets in reporting year	>200	Twitter account	Manual	Monitoring -> Target	Establishing/Maintaining high level of visibility on social networks
O-07	Twitter followers	Outreach		Number of new followers on Twitter in reporting year	>10	Twitter account	Manual	Monitoring -> Target	Establishing/Maintaining high level of visibility on social networks
N-01	Stakeholder Coverage	Networking		Percentage of stakeholders covered (Göttingen Campus partners, faculties of the University of Göttingen, selected individuals)	100%	gitlab tickets; List of consultations, trainings, and service developments	Manual	Monitoring, later split by discipline or stakeholder type	Understand whether relevant stakeholders have been contacted
N-02	Conference/Workshop participation	Networking		Number of participations per year	none	List of participations	Manual through team record	Monitoring	Understand networking efforts

M-01	3rd party Funding	Misc.		Amount of 3rd party funding raised per year	Amount large enough to fulfil existing contracts	Grant agreements	Manual through the administrations of participating partners	Monitoring -> Target	Ensure funding coverage of staff and support mid-term planning of resources
S-Dat-01	Dataverses stored	Services	GRO. data	Number of Dataverses added per year	tbd	Dataverse metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
~~S-Dat-02~~	~~Datasets stored~~	~~Services~~	~~GRO. data~~	~~Number of datasets added per year~~	~~tbd~~	~~Dataverse metrics~~	~~Automatic~~	~~Monitoring -> Target~~	~~Understand the usage of the service and adapt the service offer and promotion~~
S-Dat-03	Datasets published	Services	GRO. data	Number of datasets published per year	tbd	Dataverse metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Dat-04	Files stored	Services	GRO. data	Number of files added per year	tbd	Dataverse metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Dat-05	Files downloaded	Services	GRO. data	Number of files downloaded per year	tbd	Dataverse metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Dat-06	Users registered	Services	GRO. data	Number of new users registered per year	tbd	Service logs	Automatic	Monitoring -> Target	Understand the visibility and acceptance of the service and plan actions to improve it

S-Dat-07	Datasets per user	Services	GRO.data	Median of the number of datasets stored per user	none	Dataverse metrics	Automatic	Monitoring -> Target	Understand the visibility and acceptance of the service and plan actions to improve it
S-Dat-08	Dataverses categories	Services	GRO.data	Distribution of Dataverses over categories	none	Dataverse metrics	Automatic	Monitoring	Understand the suitability of existing categories for searching
S-Dat-09	Datasets subjects	Services	GRO.data	Distribution of datasets over most common subjects	none	Dataverse metrics	Automatic	Monitoring	Understand the coverage and precision of predefined subjects
S-Dat-10	GRO.data user support	Services	GRO.data	Amount of time spent per user on supporting researchers	none	gitlab support tickets	Manual	Monitoring	Understand the amount of required resources for user support
S-Dat-11	GRO.data technical admin	Services	GRO.data	Amount of time spent on maintaining GRO.data service	none	staff estimation	Manual	Monitoring	Understand the amount of required resources for technical administration
S-Idf-01	DOIs	Services	GRO.identifiers	Increase in DOIs registered through the DOI Service per year	tbd	Fabrica metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion

S-Idf-02	DOI prefixes	Services	GRO. identifiers	Increase in DOI prefixes registered through the DOI Service per year	tbd	Fabrica metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Idf-03	ePIC prefixes	Services	GRO. identifiers	Increase in prefixes registered through the ePIC PID Service per year	tbd	Service logs	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Idf-04	ePIC PIDs	Services	GRO. identifiers	Increase in PIDs registered through the ePIC PID Service per year	tbd	Service logs	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Ins-01	Registered Facilities	Services	GRO. instruments	Number of facilities registered per year	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Ins-02	Registered Resources	Services	GRO. instruments	Number of resources registered per year	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Ins-03	Researchers registered	Services	GRO. instruments	Number of new Göttingen Campus	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand the visibility and acceptance of the

				researchers registered with the service per year					service and plan actions to improve it
S-Ins-04	Bookable resources	Services	GRO. instruments	Number of registered resources being available for booking per year	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand the acceptance of and trust in the service and plan actions to improve it
S-Ins-05	GRO.instruments accesses	Services	GRO. instruments	Number of logins to GRO.instruments per year	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Ins-06	GRO.instruments user support	Services	GRO. instruments	Amount of time spent per user on supporting researchers	none	gitlab support tickets	Manual	Monitoring	Understand the amount of required resources for user support
S-Ins-07	GRO.instruments technical admin	Services	GRO. instruments	Amount of time spent on maintaining GRO.instruments service per year	none	staff estimation	Manual	Monitoring	Understand the amount of required resources for technical administration
S-Pla-01	Data Management Plans	Services	GRO. plan	Number of data management plans	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand the growth of data management plans and (re-)design the

				created per year					service offer accordingly
S-Pla-02	GRO.plan users	Services	GRO. plan	Number of new users registered per year	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Pla-03	Plans per Funder	Services	GRO. plan	Number of plans created per funder per year	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand and adapt suitability of service content with respect to requirements of funders
S-Pla-04	Plans per discipline	Services	GRO. plan	Number of plans created per discipline per year	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand and adapt suitability of service content according to requirements of scientific disciplines
S-Pla-05	GRO.plan user support	Services	GRO. plan	Amount of time spent per plan on supporting/consulting researchers	none	gitlab support tickets	Manual	Monitoring	Understand the amount of required resources for user support
S-Pla-06	GRO.plan content administration	Services	GRO. plan	Amount of time spent on amending GRO.plan service content per year	none	staff estimation / gitlab tickets	Manual	Monitoring	Understand the amount of required resources for content administration

S-Pla-07	GRO.plan technical admin	Services	GRO. plan	Amount of time spent on maintaining GRO.plan service per year	none	staff estimation	Manual	Monitoring	Understand the amount of required resources for technical administration
S-Pub-01	Publications stored	Services	GRO. publications	Number of publications added per year	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Pub-02	Publications curated	Services	GRO. publications	Number of publications curated per year	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Pub-03	Researchers registered	Services	GRO. publications	Number of new Göttingen Campus researchers registered with the service per year	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand the usage of the service and adapt the service offer and promotion
S-Pub-04	Researchers curated	Services	GRO. publications	Number of researchers with >3 curated publications per year	tbd	Service logs/metrics	Automatic	Monitoring -> Target	Understand the usage of the service and ensure sufficient resources for curation

Appendix C – Consulting of Large-Scale DFG Projects

Project Type	Name/number	Discipline(s)	Consultation topics
EXC	confidential	Medicine, Neurosciences	Data platform, Antibody registration
CRC		Neurobiology	Data and software management
CRC		Biology, Ecology, Social Sciences	INF: Operation and support, Data repository, Data management
CRC		Medicine	INF: Data platform, Electronic lab notebook, Antibody registration
CRC		Material physics	Data management, Data policy
CRC		Medicine	INF: Data platform, Electronic lab notebook, Antibody registration
CRC		Neurosciences	INF: Requirements engineering, Establishment of data exchange platform
CRC		Mathematics	Data management, Data policy, Data ingest workflow
CRC		Neurosciences, Psychology	INF: Data pool, Data management
CRC		Medicine	Data platform, Data management
CRC		Biomedicine	Data platform
CRC		Social Sciences	Data management
TRR		Agriculture, Social Sciences	Data management
CRC		Forest Ecology	Data management
CRC		Statistics, Data Science	Data management
CRC		Humanities	Data management
CRC		Molecular Chemistry	Data management
CRC		Medicine, Physics	Data management
CRC		Chemistry	Data management

TRR	confidential	Neurobiology	Provision of data platform including support
RTG		Medicine	Data management
iRTG		Plant Sciences	Data management
RTG		Forestry	Data management, Data migration
RTG		Chemistry	Data management, Consultation for data publication platform, Data policy
RTG		Linguistics	Data management, Data policy
RTG		Ecology, Social Sciences	Data management, Data policy
RTG		Medicine, Biophysics	Data management, Data platform
RTG		Historical Sciences	Data management, Data publication
RTG		Medicine	Data management, Data platform
RTG		Molecular genetics	Data management, Data policy
RTG		Psychology, Neurosciences	Data management
RTG		Forestry	Data management
RU		Philology, History	Data management, Data platform, High Performance Computing
RU		Social sciences, Ecology	Data management, data exchange platform
RU		Zoology	Data management
RU		Medicine, Oncology	Data management
RU		Medicine, Neurology	Data management
RU		Humanities	Data management, Workshops and Training
RU		Medical ethics, Philosophy	Data management
RU		Condensed matter theory	Data management, Data policy
RU		Agricultural Sciences	Data management

RU	confidential	Agricultural Sciences	Data management
RU		Medicine	Data management, Data policy
CRU		Medicine, Biology	Data management

Appendix D – Publications

Articles

Rudolf Ungváry, and Péter Király. “Bemerkungen zu der Qualitätsbewertung von MARC-21-Datensätzen”. In Qualität in der Inhaltserschließung. Edited by: Michael Franke-Maier, Anna Kasprzik, Andreas Ledl and Hans Schürmann. Berlin, Boston: De Gruyter Saur. ISBN: 9783110691597, (Bibliotheks- und Informationspraxis, Volume 70) pp. 177-227. doi:10.1515/9783110691597-011

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Appendix E – Acronyms and Abbreviations

AAC	Anglo-American Culture
AAI	Authorization and Authentication Infrastructure
AG	Arbeitsgruppe (Working group)
API	Application Programming Interface
BExIS	Biodiversity Exploratories Information System
BfN	Bundesamt für Naturschutz (Federal Agency for Nature Conservation)
BMBF	Bundesministerium für Bildung und Forschung (Federal Ministry of Education and Research)
CDSTAR	Common Data Storage Architecture
CESSDA	Consortium of European Social Science Data Archives
CIDAS	Campus Institute Data Science
CLARIAH-DE	Joint Services of CLARIN-D and DARIAH-DE
CLARIN	Common Language Resources and Technology Infrastructure
CODATA	Committee on Data of the International Council for Science
CRC	DFG Collaborative Research Center, equivalent to SFB - Sonderforschungsbereich
CRIS	Current Research Information System
CRU	DFG Clinical Research Unit, equivalent to KFOR - Klinische Forschungsgruppe
DARIAH	Digital Research Infrastructure for the Arts and Humanities
DBMS	Database Management System
DCC	Digital Curation Centre
DFG	Deutsche Forschungsgemeinschaft (German Science Foundation)
DFN	Deutsches Forschungsnetz (German National Research and Education Network)
DIGIS	Digital Geochemistry Infrastructure

DOI	Digital Object Identifier
EAB	External Advisory Board
ELN	Electronic Laboratory Notebook
EOSC	European Open Science Cloud
ePIC	Persistent Identifiers for eResearch
eRA	Göttingen eResearch Alliance
ERC	European Research Council
EUDAT	European Data Infrastructure
FAIR	Findable, Accessible, Interoperable, Reusable
FID	Fachinformationsdienst (Specialised Information Service)
FOR	Forschungsgruppe, equivalent to RU - research unit
GEOROC	Geochemistry of Rocks of the Oceans and Continents
GeTS	Göttingen eResearch Toolbox Series
GFBio	German Federation for Biological Data
GIS	Geoinformation system
GRO	Göttingen Research Online
GWDG	Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen
HeKKSaGOn	Foundation of a German-Japanese University Consortium
IDF	International DOI foundation
INF	Subproject in CRCs for Information Infrastructure
ISO	International Organization for Standardization (https://www.iso.org/home.html)
KPI	Key Performance Indicator
MoU	Memorandum of Understanding
MPI	Max-Planck-Institute

MWK	Niedersächsisches Ministerium für Wissenschaft und Kultur (Lower Saxony Ministry for Science and Culture)
NFDI	Nationale Forschungsdateninfrastruktur (National research data infrastructure)
NMZB	National Monitoring Centre for Biodiversity
NOAD	National Open Access Desk (OpenAIRE)
OCR	Optical Character Recognition
ODM2	Observations Data Model 2
ORCID	Open Researcher and Contributor ID
PI	Principle Investigator
PID	Persistent Identifier
RDA	Research Data Alliance
RDD	Research and Development Department at SUB
RDM	Research data management
RDMO	Research Data Management Organizer
RIS	Research Information System
ROR	Research Organization Registry
RTG	DFG Research training group, equivalent to GRK - Graduiertenkolleg
RU	DFG Research unit, equivalent to FOR - Forschungsgruppe
SSHOC	Social Sciences and Humanities Open Cloud
SSO	Single sign-on
SUB	Niedersächsische Staats- und Universitätsbibliothek (Göttingen State and University Library)
TDM	Tool data management
ToC	Table of Content
TRR	Transregio (Transregional CRC)
UMG	University Medical Center Göttingen

UCSD	University of California San Diego
UI	User interface
VP	Vice president