

GGOS Portal

Advances in the future metadata platform for geodetic data and products

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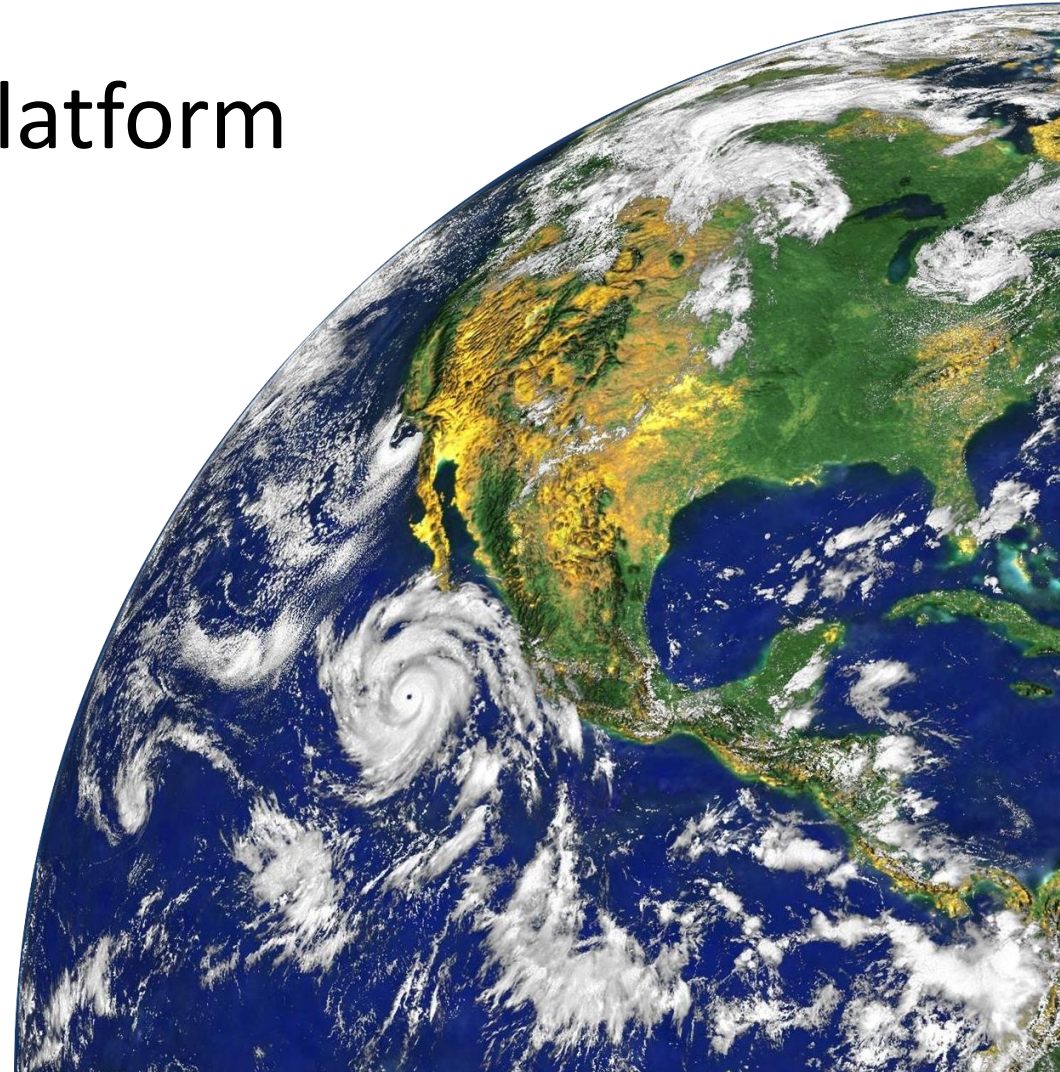
(1) BEV, Federal Office of Metrology and Surveying - Austria

(2) TU Wien, Department of Geodesy and Geoinformation, Research unit Higher Geodesy - Austria

GGOS Days 2024

Friday, October 11, 2024

Potsdam, Germany

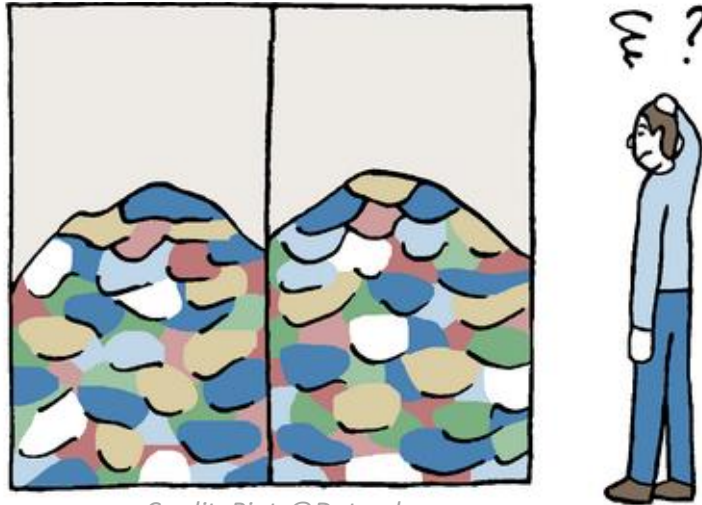


Why do we need a GGOS Portal?

Federal Office
of Metrology and
Surveying



DATA LAKE



Credit: Piotr@Dataedo

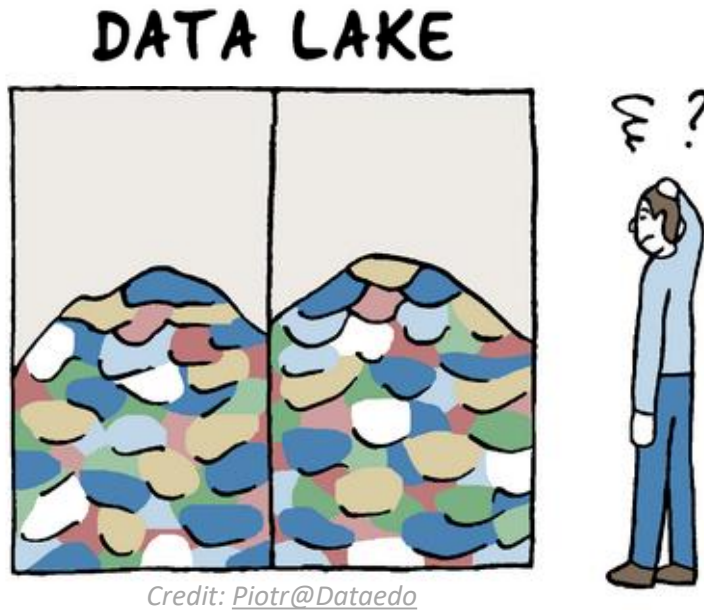
DATA WAREHOUSE



Credit: Piotr@Dataedo



How does it work?



METADATA



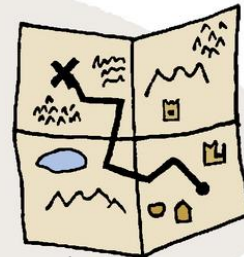
2023	9	1	60188	0.3053	0.4132
2023	9	2	60189	0.3059	0.4114
2023	9	3	60190	0.3065	0.4092
2023	9	4	60191	0.3071	0.4069
2023	9	5	60192	0.3077	0.4045
2023	9	6	60193	0.3084	0.4021
2023	9	7	60194	0.3090	0.3996
2023	9	8	60195	0.3096	0.3972
2023	9	9	60196	0.3101	0.3947
2023	9	10	60197	0.3105	0.3923
2023	9	11	60198	0.3109	0.3899
2023	9	12	60199	0.3112	0.3875
2023	9	13	60200	0.3115	0.3851
2023	9	14	60201	0.3117	0.3827
2023	9	15	60202	0.3118	0.3802
2023	9	16	60203	0.3119	0.3777
2023	9	17	60204	0.3119	0.3752
2023	9	18	60205	0.3119	0.3726
2023	9	19	60206	0.3119	0.3700
2023	9	20	60207	0.3118	0.3674
2023	9	21	60208	0.3117	0.3648
2023	9	22	60209	0.3116	0.3622
2023	9	23	60210	0.3115	0.3597
2023	9	24	60211	0.3113	0.3571

DATA



Credit: Piotr@Dataedo

METADATA

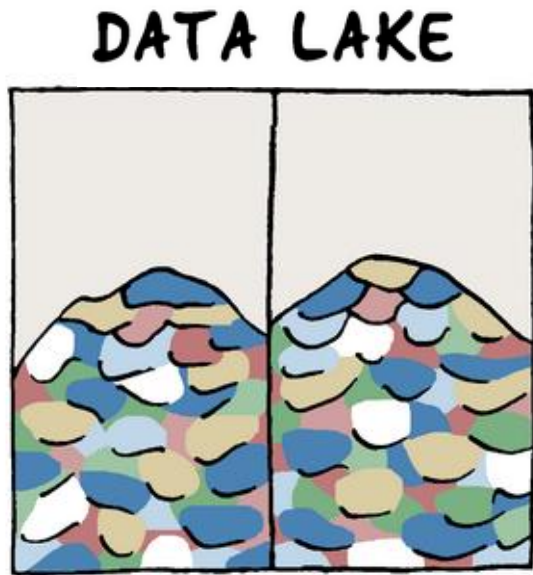


Title	IERS Bulletin A
Content	IERS Bulletin A contains pole, UT1-UTC and their predictions for 1 year into the future
Format	ASCII
Description	http://hpiers.obspm.fr/iers/bul/bul_a/
Data	section 1: DUT1 [sec], T/UT1-UTC [sec] section 2: x ["], y ["], UT1-UTC [sec] section 3: MJD, x ["], y ["], UT1-UTC [sec] section 4: dpsj, depx, dX [sec]

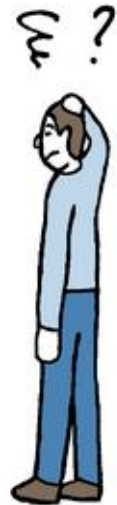
+ descriptions about techniques and products

+ Essential Geodetic Variables (EGV)

How does it work?



Credit: Piotr@Dataedo



Link back to
original data



Credit: Piotr@Dataedo

*„A unique access point
for all data, products and information
relevant in the framework of GGOS
for Earth Science and applications”*

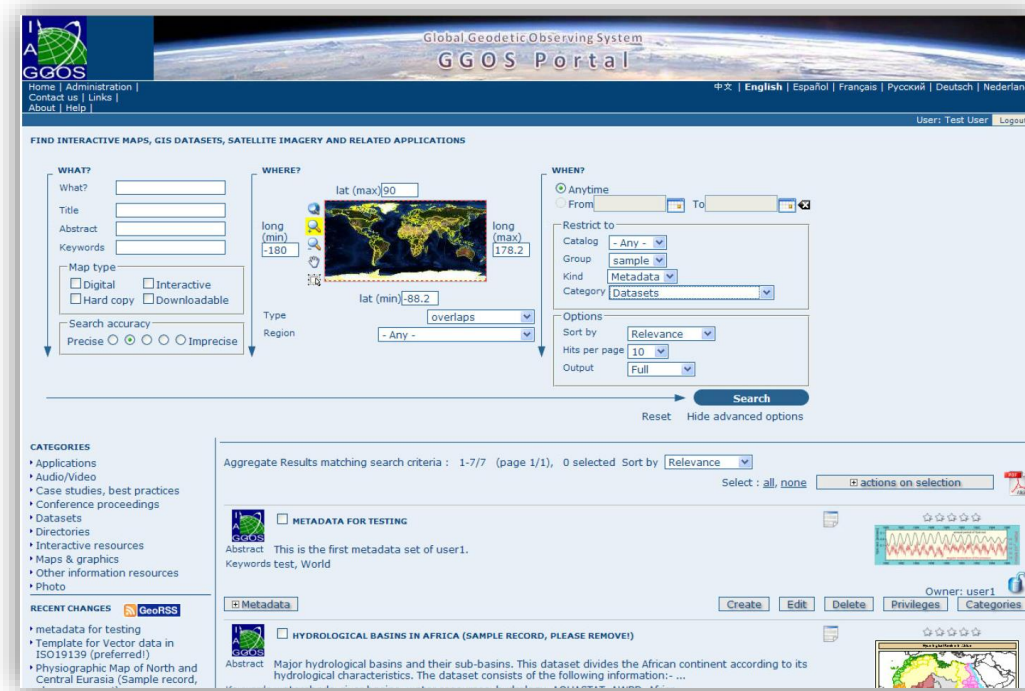


History of GGOS Portal

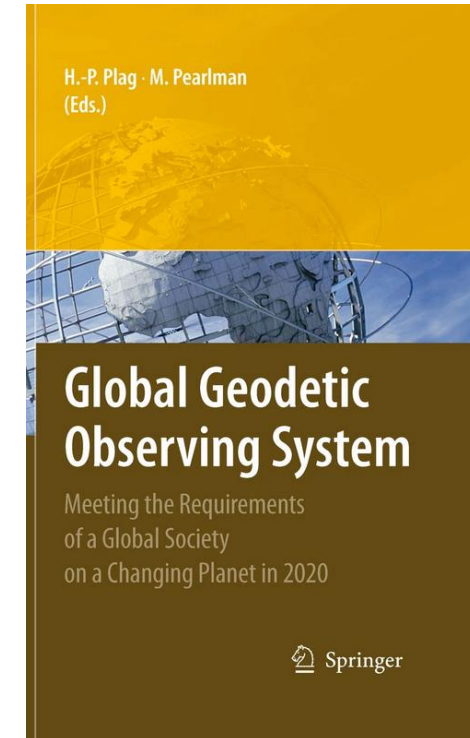
Federal Office
of Metrology and
Surveying



- 2007: **First idea** -> written down in GGOS Book
- 2009-2011: **First prototype** -> developed at BKG, Germany
- 2012: **Stop of developments**




GGOS-Portal Screenshot – IAG Travaux Report 2007-2011



Chapter about the GGOS Portal in
the “GGOS Book” DOI:
[10.1007/978-3-642-02687-4_9](https://doi.org/10.1007/978-3-642-02687-4_9)

History of GGOS Portal

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- 2022: Idea to **revive** the GGOS Portal
- 2023: **Community survey**
Feasibility study

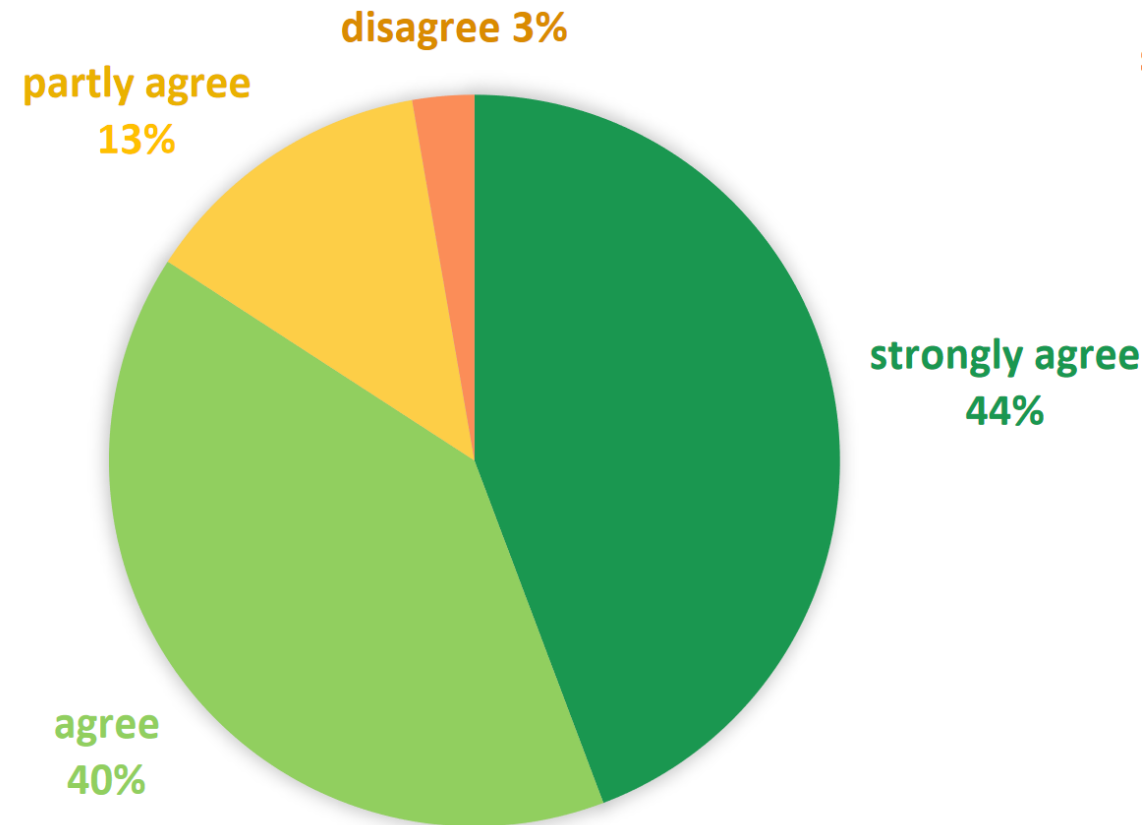


GGOS Portal
ggos.org/portal



Community Survey – USER Perspective

Do you agree that a **central point of access for geodetic data & products is missing?**

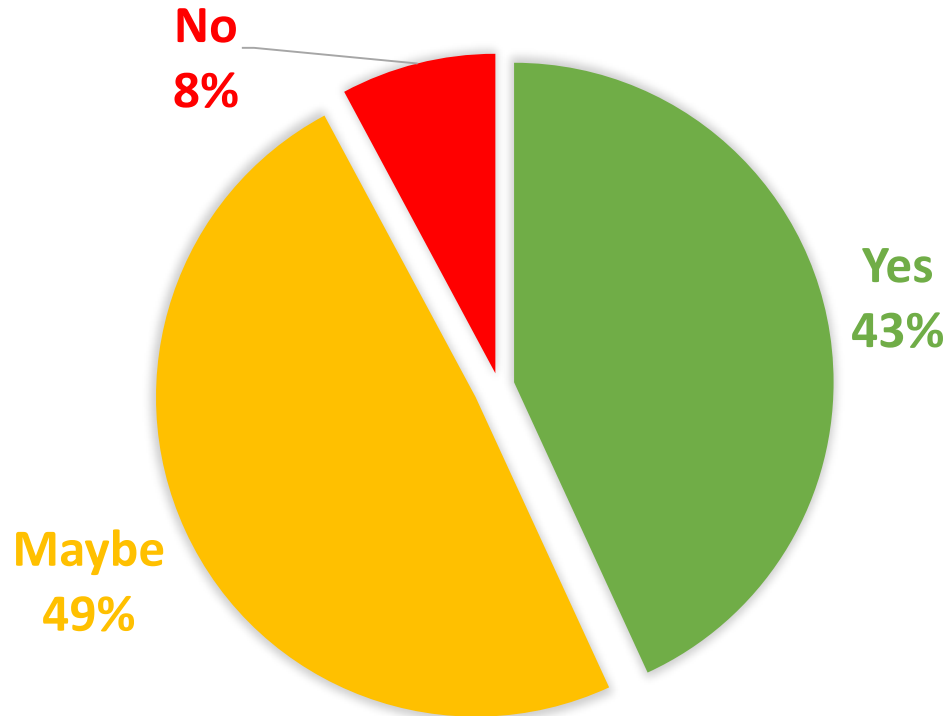


Community Survey – DATA PROVIDER

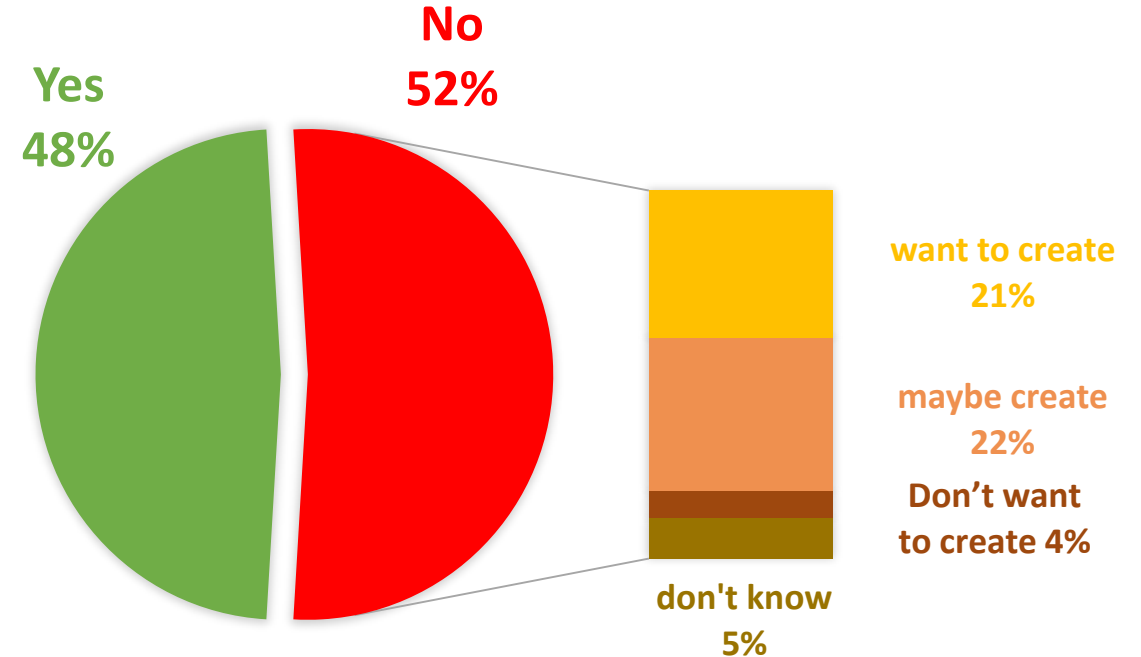
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Interest on publishing data at GGOS Portal?



Current availability of metadata?

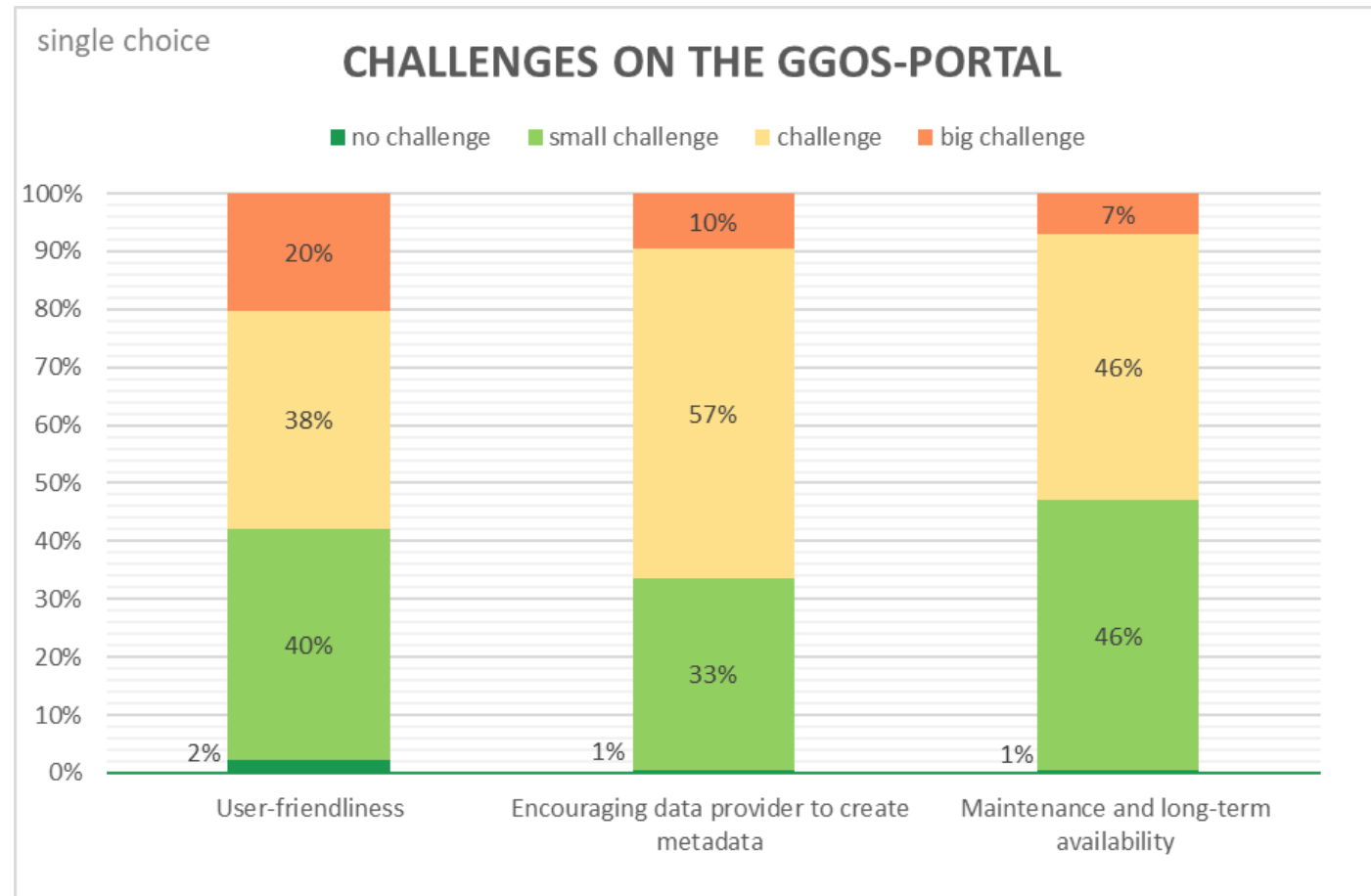


GGOS Portal
Survey Results
ggos.org/portal



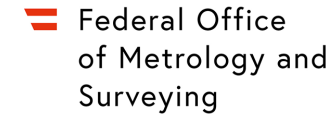
Community Survey – CHALLENGES

- **User friendliness**
- **Encourage data provider to create metadata**



Feasibility Study

- Carried out in 2023
- By Lena Steiner (Bachelor Thesis, German only!)
- Cooperation: TU Wien – BEV



Bachelor Thesis: Steiner L. (2023)
[DOI: 10.5281/zenodo.10255995](https://doi.org/10.5281/zenodo.10255995)



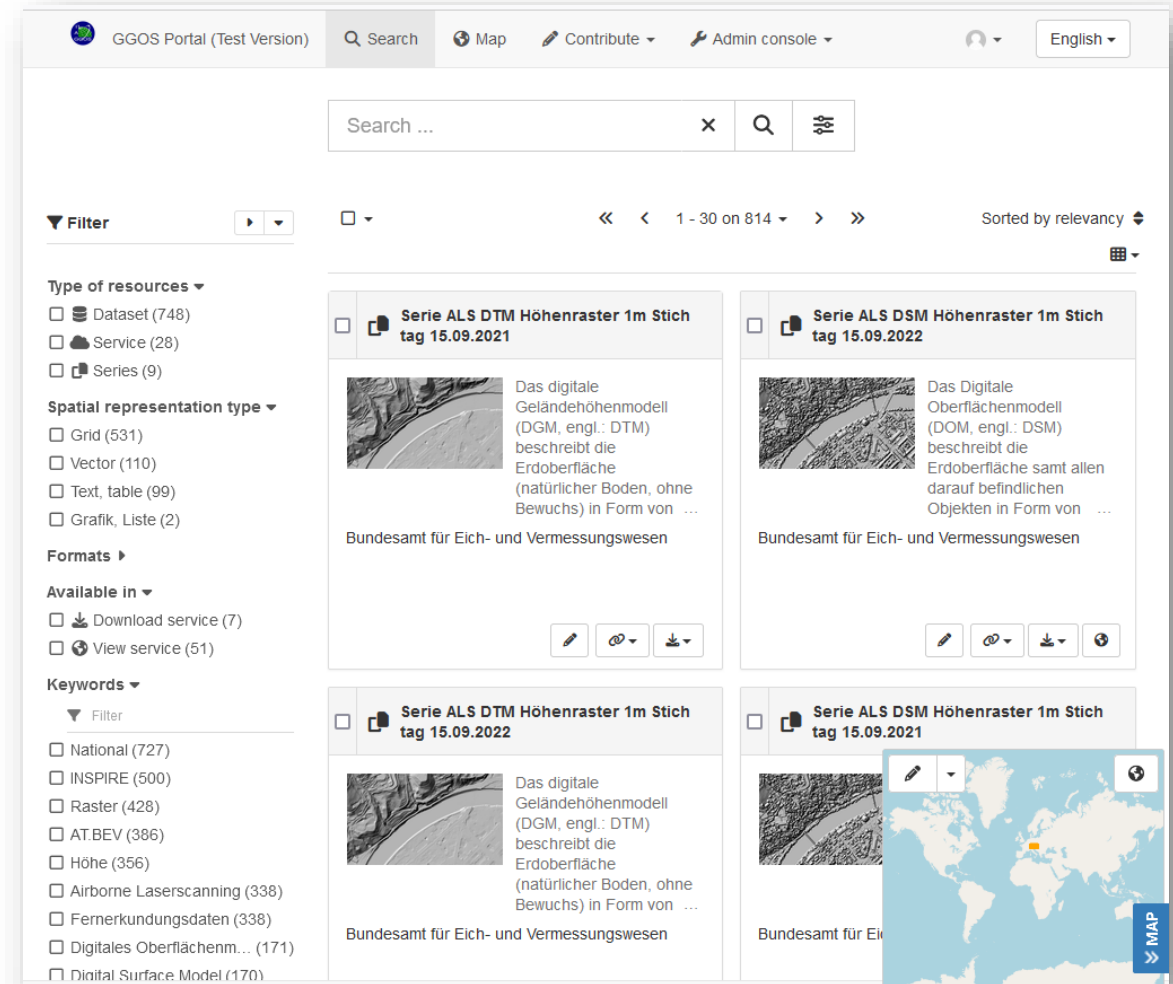
SOFTWARE PACKAGE



- Geospatial Extensions are partly outdated and no longer maintained



- + **Well established harvesting tools for geospatial data** -> easier to implement
- + **Continuous further developments** -> Geonetwork UI & Microservices
- **Recommended software package**



GeoNetwork Search Surface (Initial tests with prototype for GGOS Portal)

RECOMMENDATIONS

types of metadata provision	Readability		Accessibility		
	human	machine	HTML	File	API*
Text on website (HTML)	yes	x	yes	x	x
TXT (*.txt Sitelog)	yes	x	x	yes	x
XML (GeodesyML Sitelog)	yes	yes	x	yes	x
JSON	yes	yes	x	yes	x
Database (OAI-PMH,...)	x	yes	x	x	yes

*API – standardized interface to access web-database (e.g. OAI-PMH, RESTful, ...)

Recommendations for metadata provision:

- ✓ **Format**: machine readable, like **XML**, **JSON** or **API** (database)
- ✓ **Interface**: **API** (OAI-PMH, RESTful, ...) or **downloadable file** (XML, JSON)
- ✓ **Standard**: **ISO19139/19115** (GML), **DublinCore**

or **xsl Transformation file** to your standard or **new schema** (xsd file)

METADATA AVAILABILITY

- Metadata information already available for a lot of geodetic data within IAG
- But a **majority not via machine readable format/interface: orange and red**

Best practise
example

Metadataprovider	Format	Standard	Implementation	IERS	IGS	ILRS	IVS	IDS	PSMSL	ICGEM	IDEMS	IGETS	ISG	BGI	COST-G
GFZ Data Service	XML	ISO19139	OAI-PHM Harvester							+		+	+		~
BEV	XML	ISO19139	Geonetwork Harv												
NASA Earthdata	XML	ISO19115	XML File System Harv	~	+	+	+	+							
	JSON	Echo-API	Simple URL Harvester												
Datacite - DOI	XML	Datacite	XML File System Harv		*	*	*	*		+		+	+	*	+
			OAI-PHM Harvester												
	JSON	Datacite-API	Simple URL Harv												
Station Sitelog	XML	Geodesy ML	XML File System Harv		+	+	+								
	Sitelog	z.B. IGS													
IDEMS	XML	no standard	XML File System Harv								+				
CDDIS	HTML	no standard	no Harvester		+	+	+	+							
PSMSL Website	HTML	no standard	no Harvester						+						
IERS Website	HTML	no standard	no Harvester	+											

■ Implementation works	+ Large amount of geodetic data with metadata
■ Metadata Standard not supported (XSL and/or XSD file missing)	~ Small amount of geodetic data with metadata
■ No Implementation provided (HTML content cannot be harvested)	* Little information in the metadata

Best Practise Example

- **GFZ Data Service**
- Provision via **OAI-PHM API interface**:

Service	Records	Datasets
ICGEM	45	Global Gravity Field Model
ISG	66	Regional Gravity Models
IGETS	26	Gravimeter Data




➤ **Easy to integrate into GeoNetwork**

The screenshot displays a grid of four metadata records in GeoNetwork. Each record includes a title, a description, the provider information, and a 'Complete' button with edit and link icons.

- The Combined Gravity Model GGM05C**: GGM05C is an unconstrained global gravity model complete to degree and order 360 determined from 1) GRACE K-band intersatellite range-rate data, GPS tracking and GRACE accelerometer data, 2) GOCE gradiometer data (ZZ+YY+XX+XZ) ... Center for Space Research The University of Texas at Austin, US
- SGG-UGM-1: the high resolution gravity field model based on the EGM2008 derived...**: SGG-UGM-1 is a static gravity field model based on EGM2008 derived gravity anomalies and GOCE Satellite Gravity Gradiometry (SGG) data and the Satellite-to-Satellite Tracking (SST) observations up to degree and order 2159. Block-diagonal normal ... School of Geodesy and Geomatics, Wuhan University, China
- ITU_GGC16 The combined global gravity field model including GRACE & GOCE data...**: ITU_GGC16 is a static global gravity field model up to degree order 280 computed from the combination of ITU_GRACE16 (up to d/o 180) and GO_CONS_GCF_2_TIM_R5 (up to d/o 280) by collaboration of various national institutions (YTU, KOU, NEU, ... Istanbul Technical University (ITU), Turkey
- The Combined Gravity Model GOCO05c**: GOCO05c is a static global combined gravity field model up to d/o 720. It has been elaborated by the GOCO Group (TU Munich, Bonn University, TU Graz, Austrian Academy of Sciences, University Bern). GOCO05c is a combination model based on the ... TU Muenchen, Institute of Astronomical and Physical Geodesy, Germany

Harvested metadata from GFZ Data Service with GeoNetwork (via OAI-PHM interface)

GGOS Portal – Future Realisation

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Start development in 2025

Strategy including IAG metadata:

- 1. Include already available metadata (machine-readable)**
 - API Interface (OAI-PMH)
 - Downloadable files (XML, PMH)
- 2. Release a first version of GGOS Portal**
- 3. Encourage data provider to create machine-readable metadata**



Thank you for your attention!

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