Connecting tribes: how we connected the GRASS GIS database natively to GeoServer

…introducing the GeoServer GRASS raster datastore

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2022-08-24

Idea

- We work a lot with both GRASS GIS and GeoServer
- Need to also see intermediate results as web services, enabling colleagues and collaborators to review and give feedback
- Big datasets, therefore no data duplication wanted!

Wouldn’t it be great, if we could point a GeoServer web service at a GRASS database?

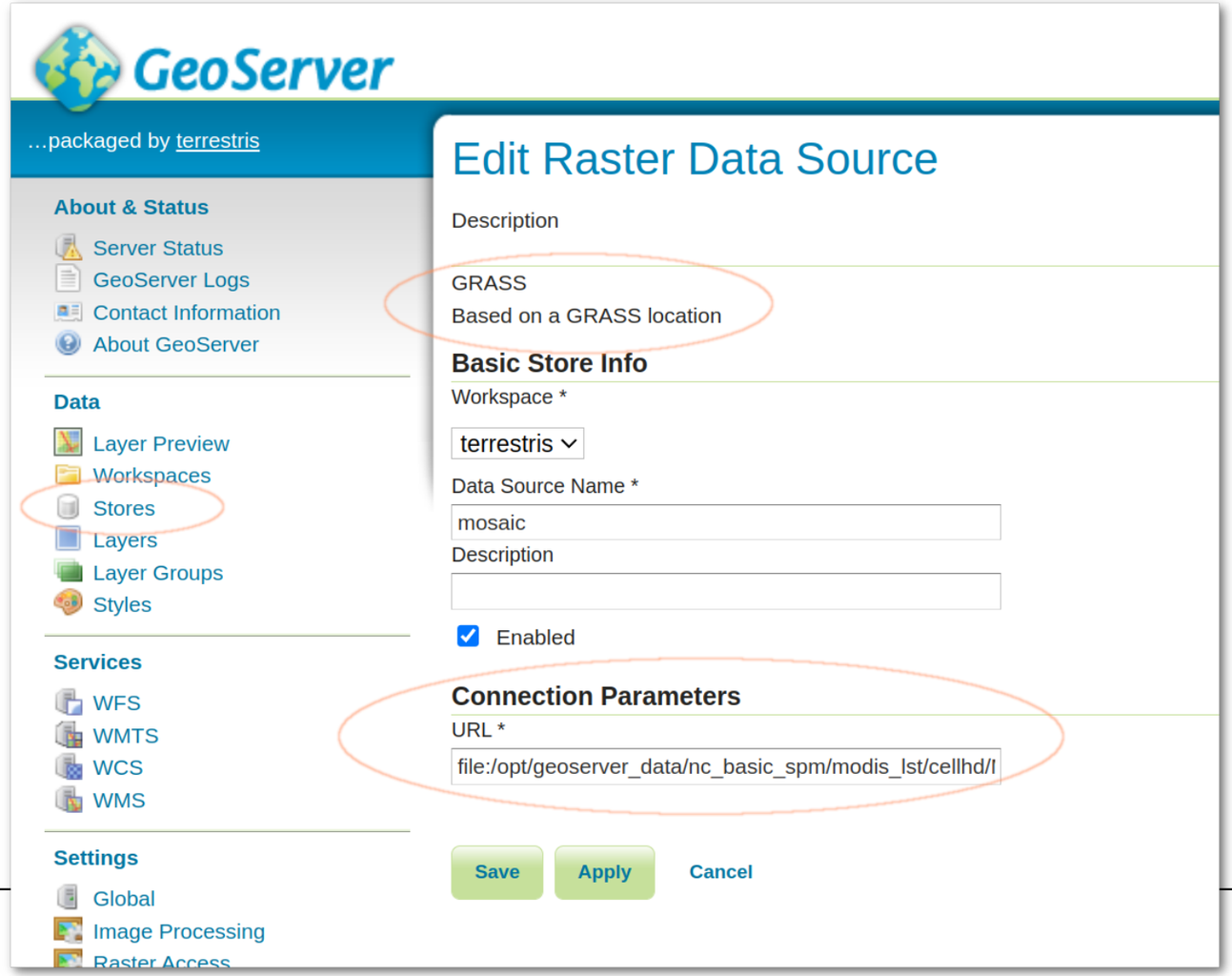
GeoServer-GRASS raster datastore

- How? Let's use **GDAL** (GDAL-GRASS driver)!

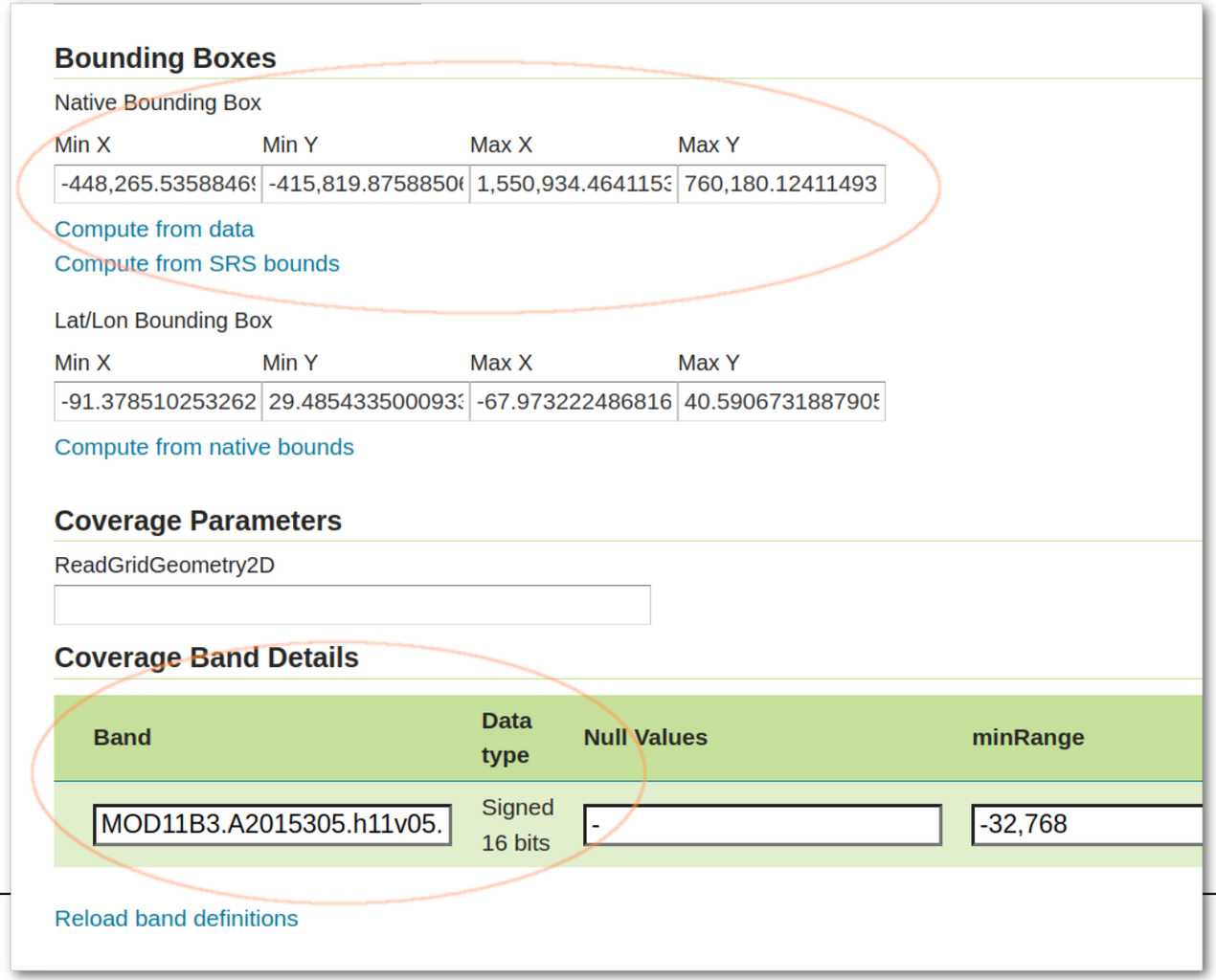
- Requirements (excerpts)
  - Keep the GRASS GIS raster format
  - Handle also **space-time raster datasets** (strds) and turn them into **WMS-Time**
  - Handle datastores **> 2 GB**

- **Implementation: in JAVA (just 750 LOC)**

First create a “GRASS raster store”



Then select a GRASS GIS raster map



Bounding Boxes

Native Bounding Box

Min X	Min Y	Max X	Max Y
-448,265.5358846	-415,819.8758850	1,550,934.4641153	760,180.12411493

Compute from data

Compute from SRS bounds

Lat/Lon Bounding Box

Min X	Min Y	Max X	Max Y
-91.378510253262	29.485433500093	-67.973222486816	40.590673188790

Compute from native bounds

Coverage Parameters

ReadGridGeometry2D

Coverage Band Details

Band	Data type	Null Values	minRange
MOD11B3.A2015305.h11v05.	Signed 16 bits	-	-32,768

Reload band definitions

Voilà – visual inspection in OpenLayers

Scale = 1 : 9M

MOD11B3.A2015305.h11v05.single_LST_Day_6km

fid	MOD11B3.A2015305.h11v05.single_LST_Day_6km
	14505.0

Cool.

… but we want some raster map *styling*!

Publishing maps with style

NAME

r.geoserver.publish - Publishes a raster map o
GRASS-datastore.

KEYWORDS

geoserver-grass-datastore, raster, temporal, geo

SYNOPSIS

r.geoserver.publish
r.geoserver.publish --help

NAME

r.geoserver.style - Publishes a map style based on GRASS GIS map and attaches it to layer through the GeoServer-GRASS-datastore.

KEYWORDS

geoserver-grass-datastore, raster, temporal, geoserver

SYNOPSIS

r.geoserver.style
r.geoserver.style --help

WorldPOP map:
actinia → GRASS GIS → GeoServer

terrestris mundialis

https://actinia.mundialis.de/geoserver/web/wicket/bookmarkable/org.geoserver.web.demo.MapP 120% Search

GeoServer

Logged in as admin. Logout

...packaged by terrestris

About & Status
- Server Status
- GeoServer Logs
- Contact Information
- About GeoServer

Data
- Layer Preview
- Import Data
- Workspaces
- Stores
- Layers
- Layer Groups
- Styles

Services
- WMS
- WFS
- WMTS
- WCS

Layer Preview

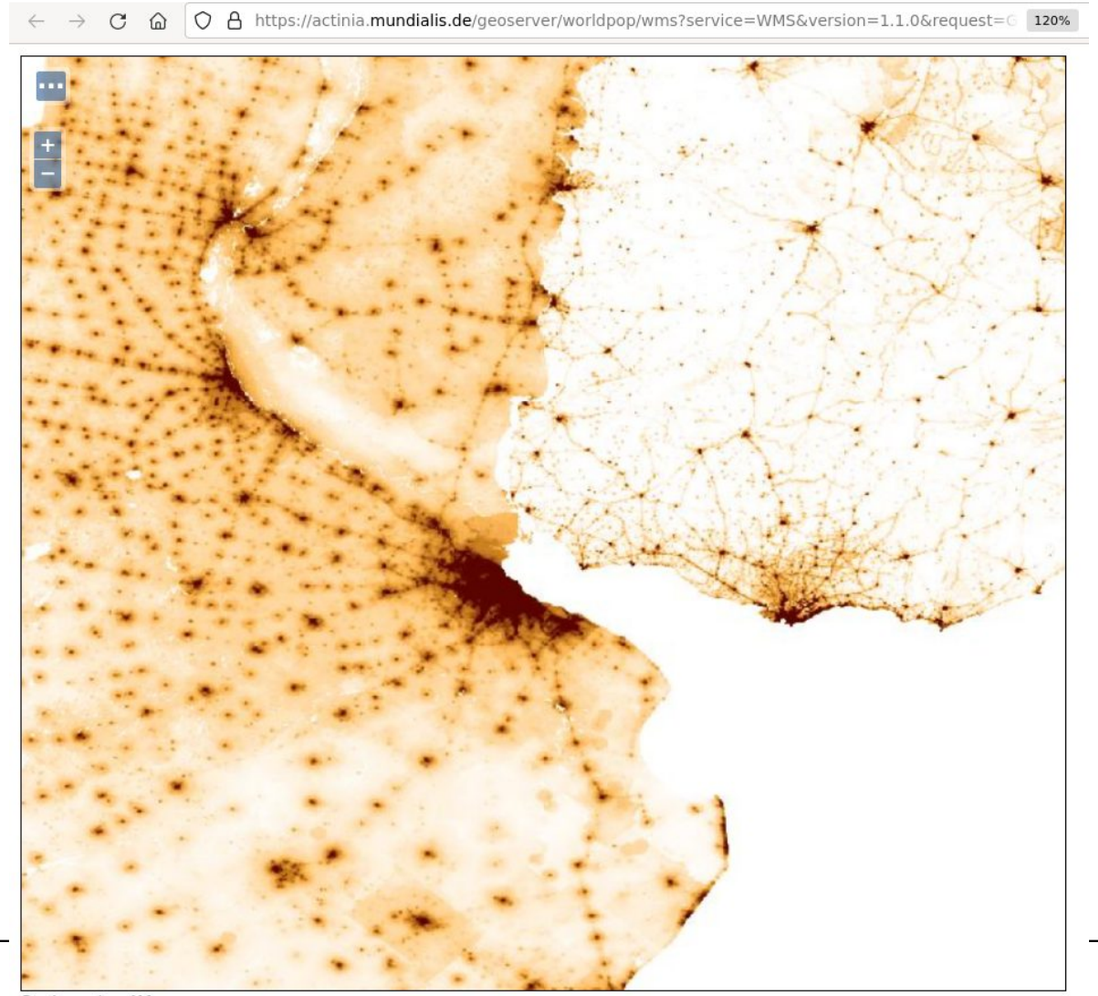
List of all layers configured in GeoServer and provides previews in various formats for each.

<< < 1 > >> Results 1 to 6 (out of 6 items) Search

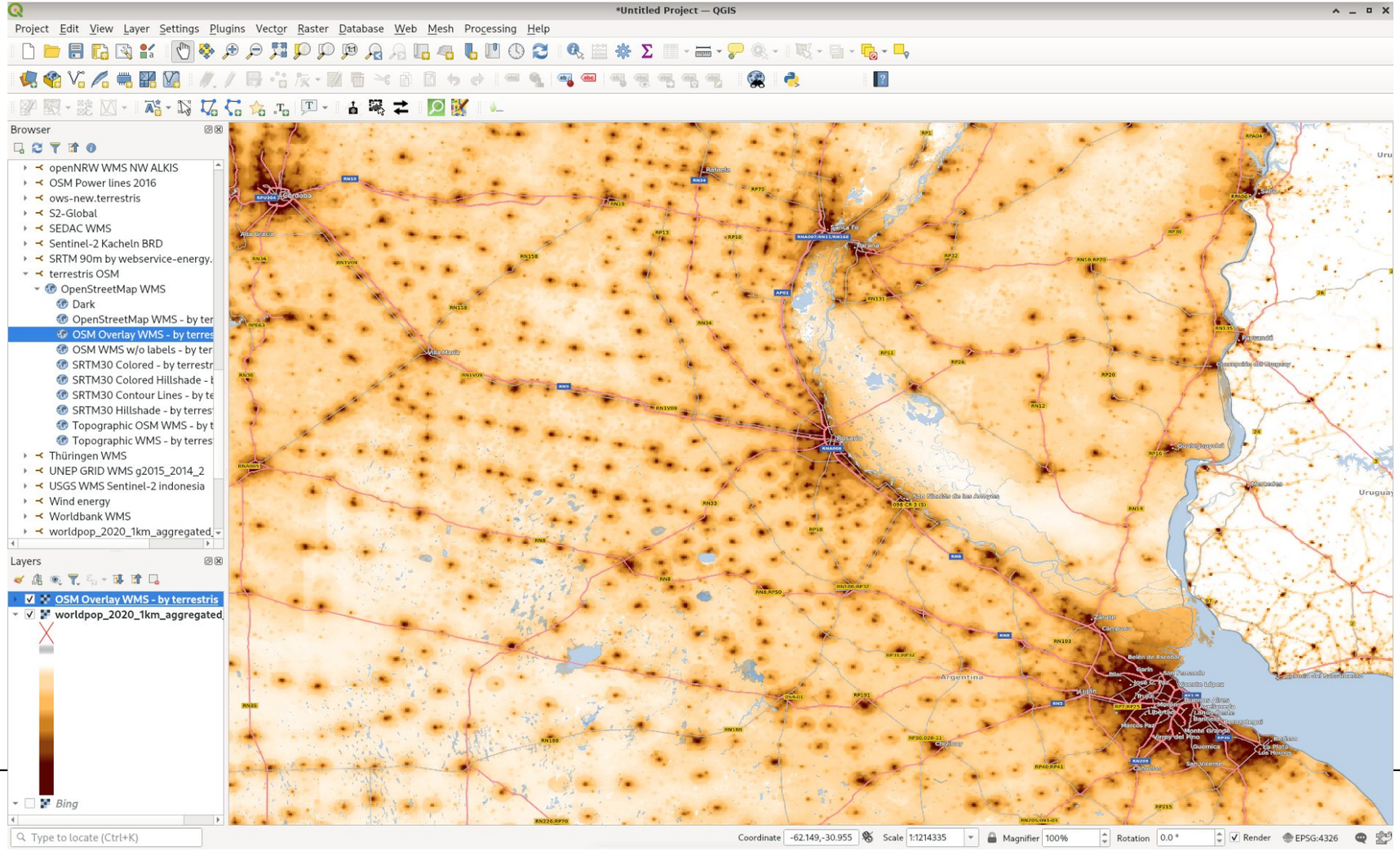
Type	Title	Name	Common Formats	All Formats
	lsat7_2000_70	spieltag:lsat7_2000_70	OpenLayers KML	Select one
	worldpop_2020_1km_aggregated_UNadj	worldpop:worldpop_2020_1km_aggregated_UNadj	OpenLayers KML	Select one
	copernicus_dsm30	copernicus_dsm30:copernicus_dsm30	OpenLayers KML	Select one
	copernicus_dsm30_shaded	copernicus_dsm30:copernicus_dsm30_shaded	OpenLayers KML	Select one
	elevation	basedata:elevation	OpenLayers KML	Select one
	LST_Day_monthly@modis_lst	modis:LST_Day_monthly@modis_lst	OpenLayers KML	Select one

<< < 1 > >> Results 1 to 6 (out of 6 items)

WorldPOP map: actinia → GRASS GIS → GeoServer → WMS

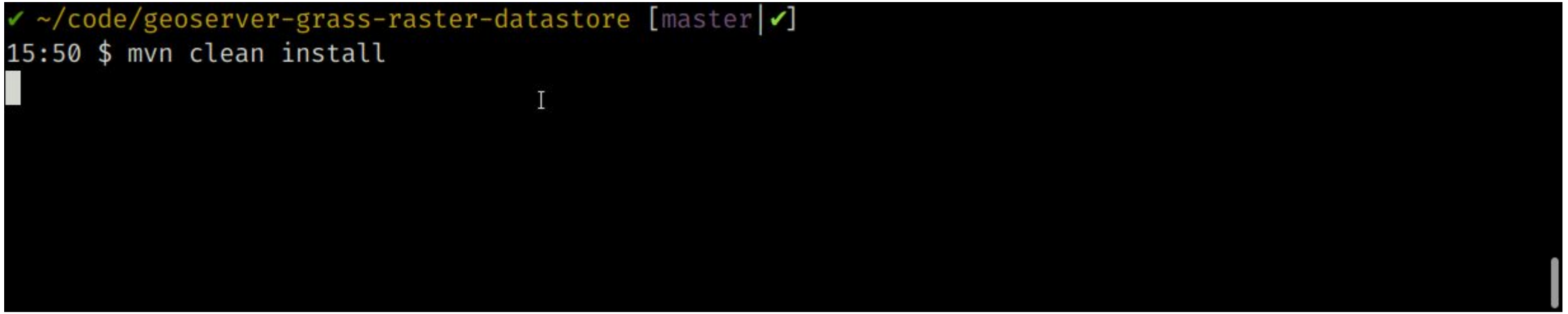


WorldPOP map:
actinia → GRASS GIS → GeoServer → WMS → QGIS



Implementation

- Homepage: https://mundialis.github.io/geoserver-grass-raster-datastore/
- Repository: https://github.com/mundialis/geoserver-grass-raster-datastore
- Nexus (release artifacts): https://nexus.terrestris.de/#browse/browse:public:de%2Fterrestris%2Fgeoserver-grass-raster-datastore



Acknowledgements

- This work has been co-financed under Grant Agreement Connecting Europe Facility (CEF) Telecom project 2018-EU-IA-0095 by the European Union (https://ec.europa.eu/inea/en/connecting-europe-facility/cef-telecom/2018-eu-ia-0095)

- This work has been partly developed as joint contribution of mundialis and terrestris to the mFUND project “Anwenderfreundliche Bereitstellung von Klima- und Wetterdaten – FAIR”
  https://www.fair-opendata.de/

Thanks!

Questions and/or remarks

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