

Aufbau einer Geodateninfrastruktur mittels GeoNode für das Projekt ADDFerti

Alexander Steiger
Universität Rostock
Professur für Geodäsie und Geoinformatik

- Vorstellung Projekt ADDFerti
- Geonode
 - Architektur
 - Funktionen & Features
 - Layer
 - Maps
 - Dashboards
 - APIs
- Fazit

Projekt ADDFerti



Ghent University, BE



Aristotle University
Thessaloniki, GR



Rostock
University, DE



Bursa Uludag
University, TR



Sezer Inc., TR



Quantis, CH



A Data-Driven Platform for Site-Specific Fertigation

Projektdauer: 01.03.2021 bis 31.8.2024

Gesamtprojektförderung: 1 279 400 €

Technology Readiness Level (TRL): TRL6 (System Validated in Simulated Environment)

Förderorganisation: **ERA-NET COFUND**

ICT-AGRI-FOOD 2019 Joint Call - Call for transnational,



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Integrative teilflächenspezifische Düngung und Bewässerung

- Entwicklung einer mobilen Berechnungsmaschine mit Düsenwagen zur teilflächenspezifischen Düngung und Bewässerung (**Fertigation**)



- Einsatz innovativer Bodensensoren

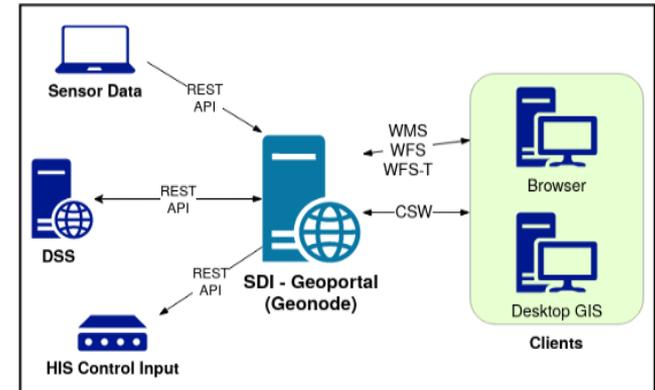


Mobiler Bodenscanner



LoRaWAN-Bodenfeuchtesensoren

- **IT-Infrastruktur:**
 - Management und Speicherung von Sensordaten
 - Berechnung von Applikationskarten
 - Veröffentlichung von Applikationskarten



- 54 m Arbeitsbreite
- 530 m Schlauchlänge
- 4 unabhängig steuerbare Sektoren
- Bewässerung + Düngung
- Steuerung mittels Applikationskarten

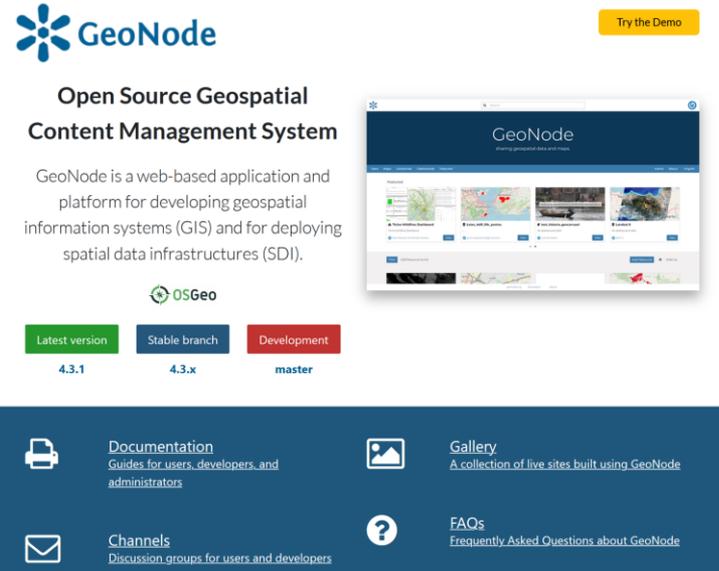




GeoNode

- Open-Source-Content-Management-System für Geodaten
- Lösung für die Verwaltung, Freigabe und Visualisierung räumlicher Daten
- Open-Source-Architektur
- Kostenlose freie Software
- Unterstützt OGC-Standards (WMS, WFS, WCS)
- Verwendet gängige Geo-Datenformate (Shapefile, GeoJSON, Geopackage)

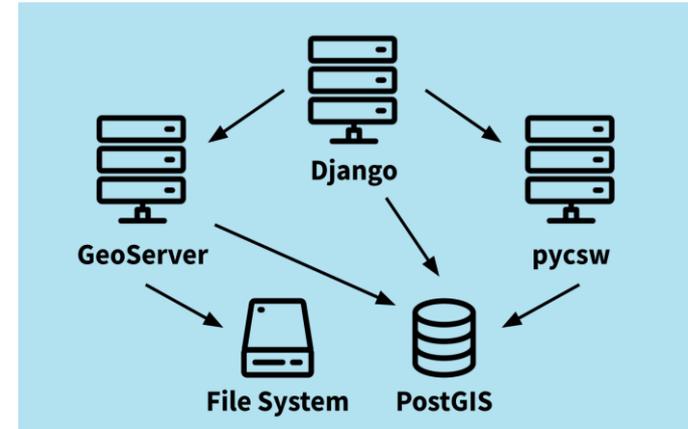
GeoNode is free software: you can redistribute it and/or modify it under the terms of the **GNU General Public License** as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.



The screenshot shows the GeoNode website homepage. At the top left is the GeoNode logo. To the right is a yellow button that says "Try the Demo". Below the logo is the text "Open Source Geospatial Content Management System". Underneath is a paragraph: "GeoNode is a web-based application and platform for developing geospatial information systems (GIS) and for deploying spatial data infrastructures (SDI)." Below this is the OSGeo logo. There are three buttons: "Latest version" (green) with "4.3.1" below it, "Stable branch" (blue) with "4.3.x" below it, and "Development" (red) with "master" below it. At the bottom, there are four links with icons: "Documentation" (document icon), "Gallery" (image icon), "Channels" (envelope icon), and "FAQs" (question mark icon).

<https://geonode.org/>

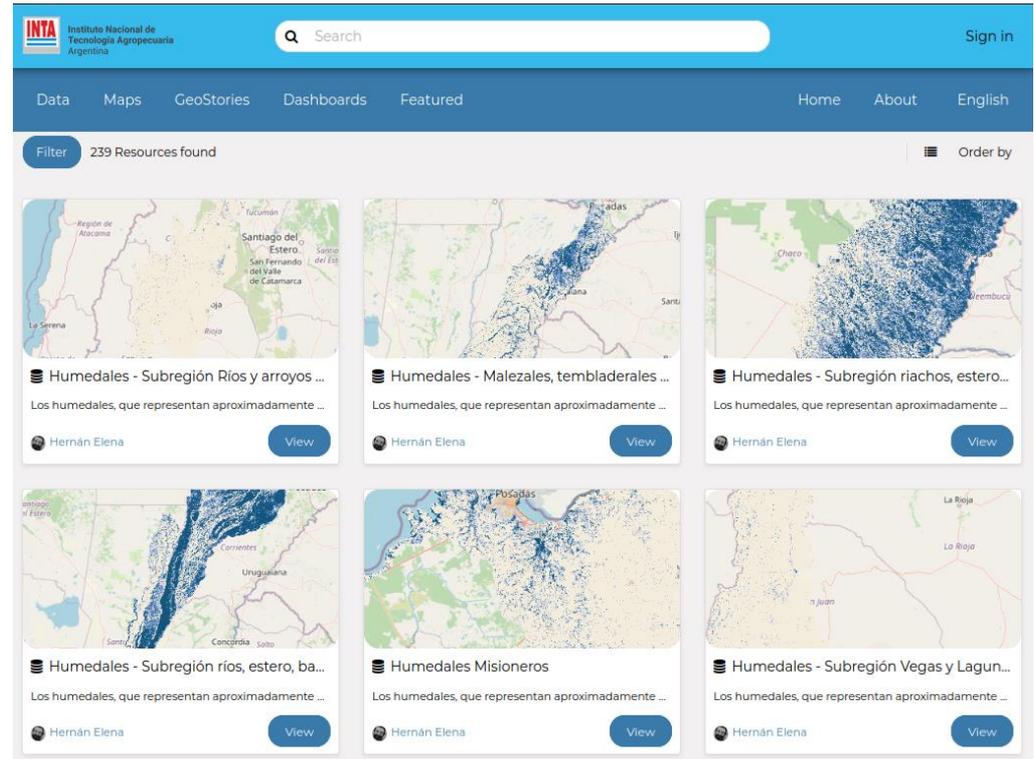
- **Komponenten:**
 - **Django** als Webframework (Sprache: Python)
 - **Geoserver** zur Veröffentlichung der Geodaten
 - **OpenLayers** als WebGIS
 - **pycsw** als Metadatenkatalog
 - **PostgreSQL + PostGIS** als Datenbank für Vektordaten
 - Rasterdaten und Dokumente werden im **Dateisystem** abgelegt
- **Installation:**
 - Standardmäßig auf Ubuntu-Server mittels Docker



GeoNode Quellcode:

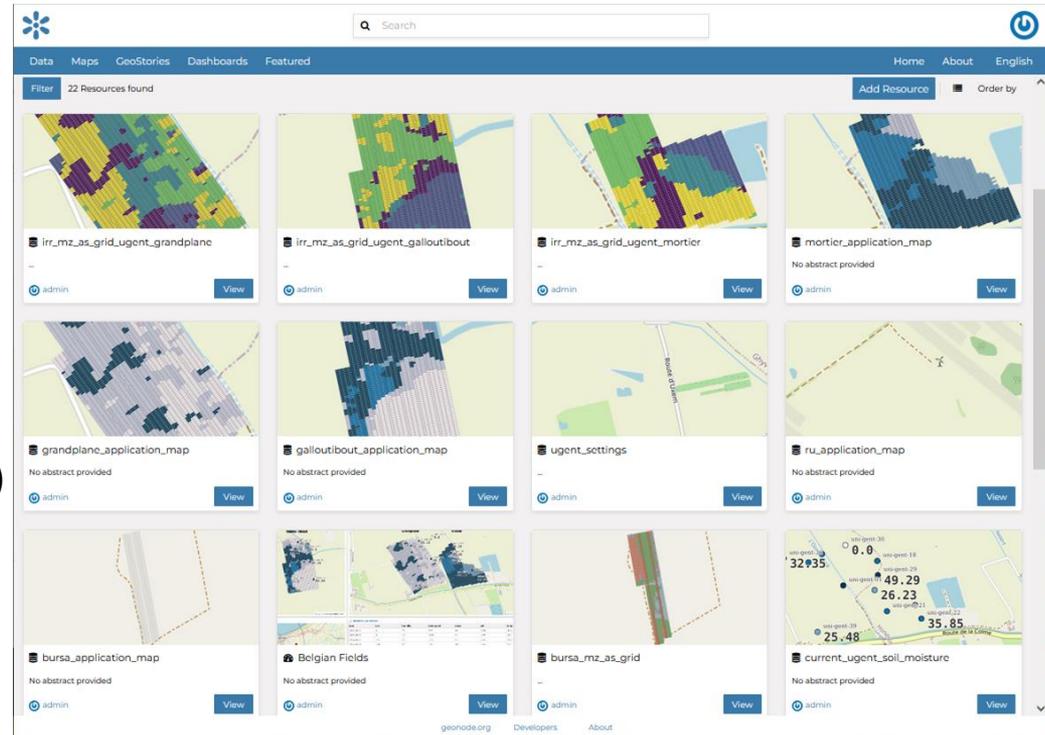
<https://github.com/GeoNode/geonode>

- Vektor- und Rasterdaten
 - Upload
 - Shapefile
 - GeoJSON
 - GeoPackage
 - KML, KMZ
 - GeoTIFF
 - Download
 - Shapefile
 - GeoJSON
 - GeoTIFF
- Symbolisierung kann per online-Editor angepasst werden
- Metadaten und Keywords

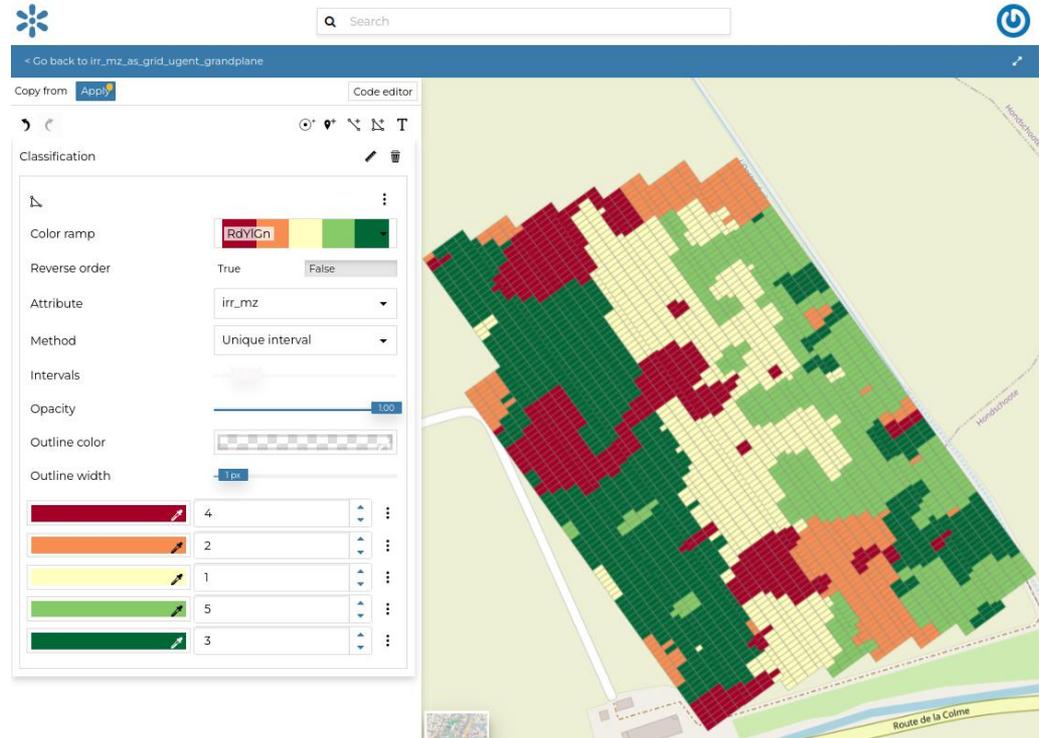


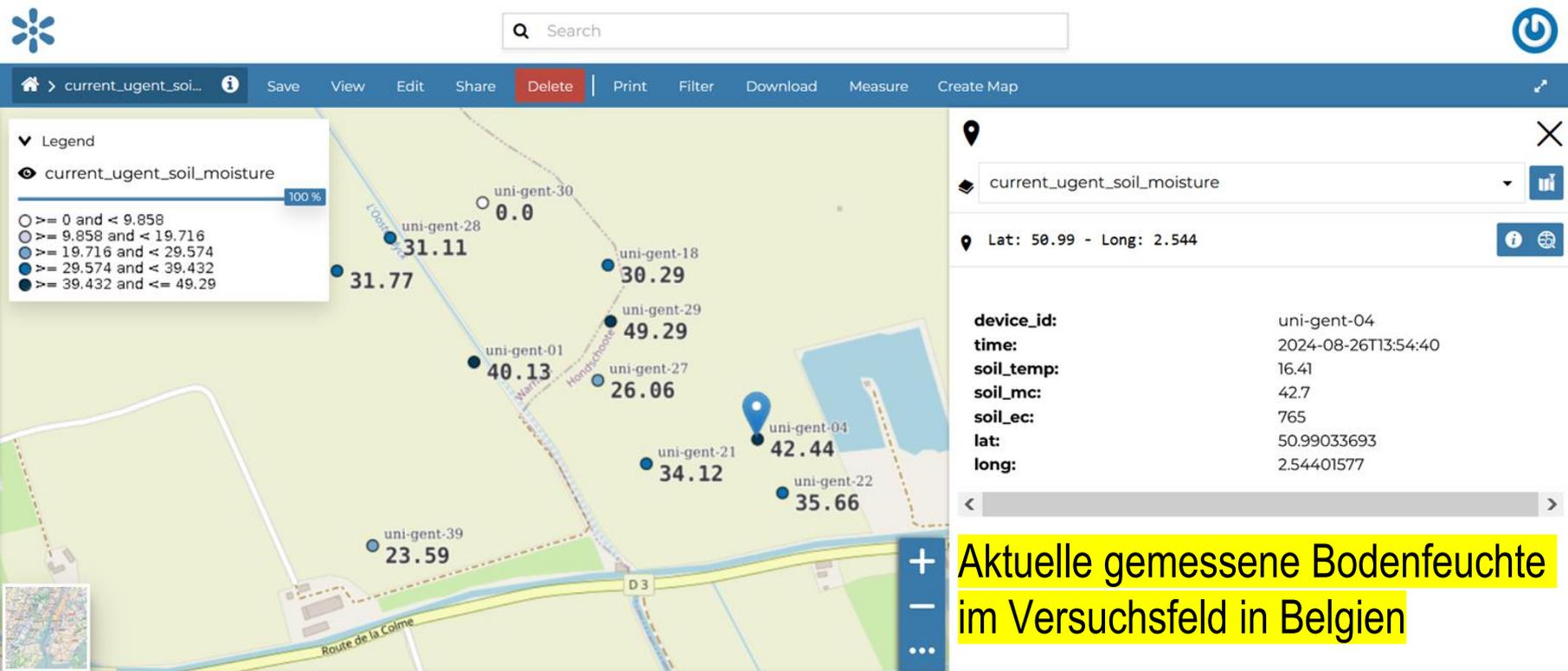
Nationales Institut für Agrartechnologie <https://geo-backend.inta.gob.ar>

- Umringe der Felder (Polygon)
- Karten mit Feldeigenschaften (Polygon)
 - Feldkapazität
 - Permanenter Welkepunkt
 - Dichte
- Wetterdaten (CSV)
- Live-Bodenfeuchte (Punkte)
- Applikationskarten (Polygon)

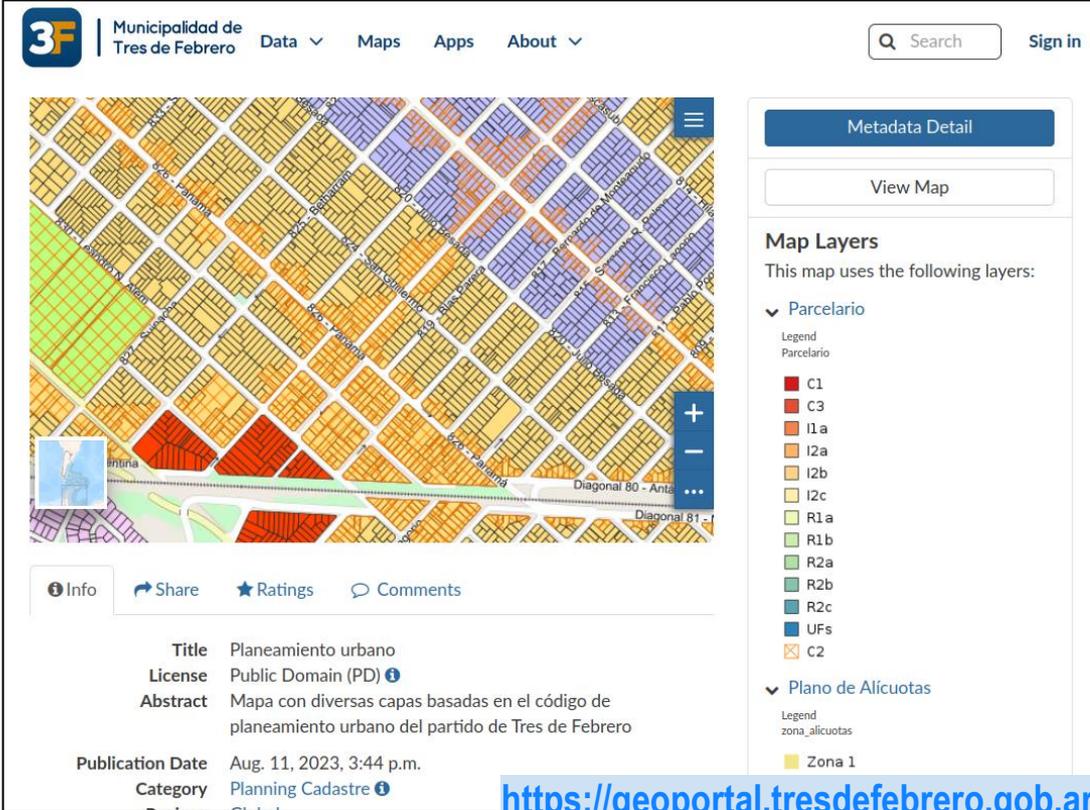


- Symbolisierung mittels
 - Web-Editor
 - SLD (styled layer descriptors)
- Style
 - Uniform
 - Klassifikation nach Attribut
- Beschriftungen (Labels)





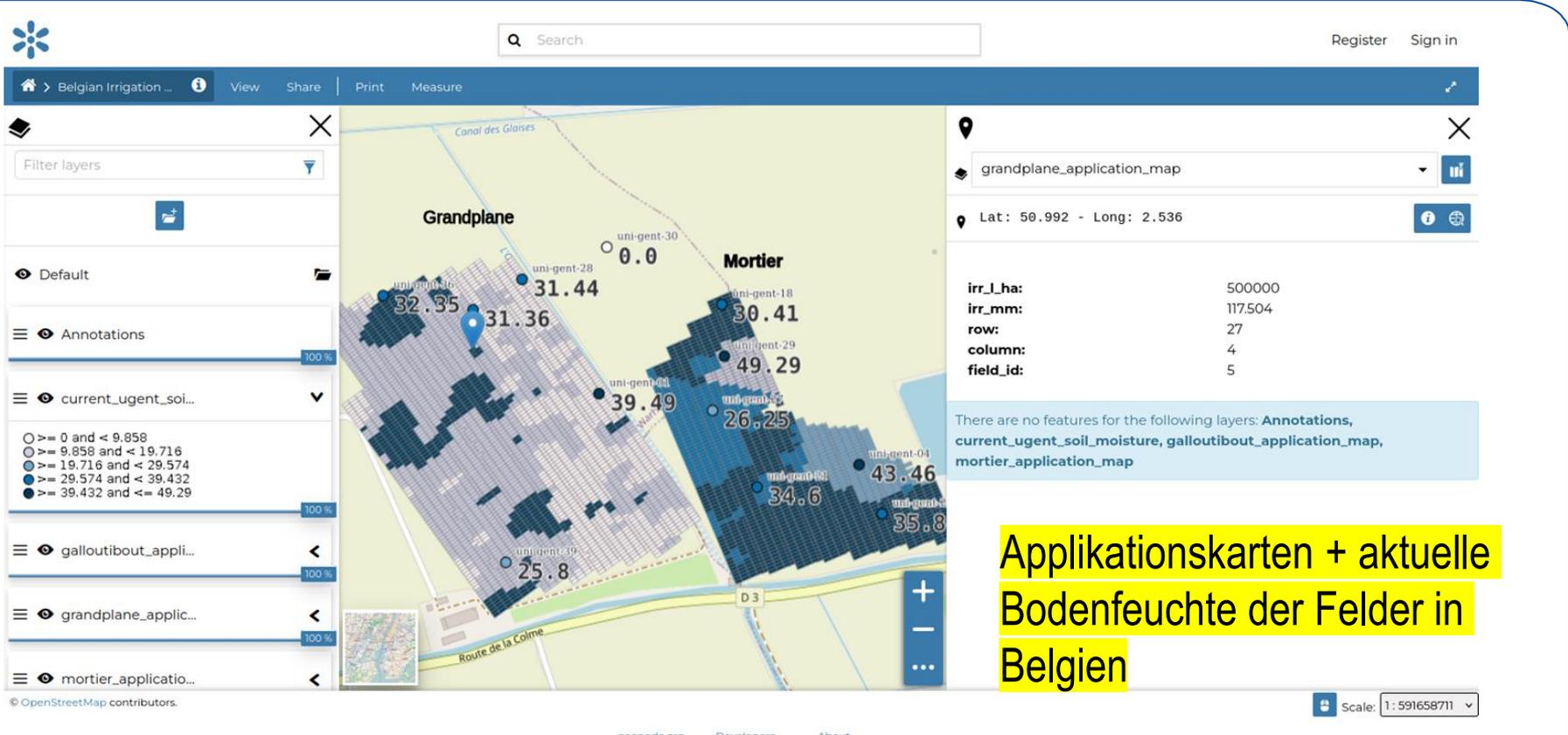
- Thematische Karten
- Datenquellen
- Layerkatalog
 - Hintergrundkarten
 - OpenStreetMap
 - OpenTopoMap
 - Sentinel-2
- Erstellte Karten können mittels Link in andere Websites eingebunden werden



The screenshot shows a web interface for a GeoNode map. At the top, there is a navigation bar with the logo '3F' and the text 'Municipalidad de Tres de Febrero'. The navigation menu includes 'Data', 'Maps', 'Apps', and 'About'. A search bar and a 'Sign in' button are also present. The main content area features a map of a city grid with various colored parcels. To the right of the map is a 'Metadata Detail' panel with a 'View Map' button. Below the map, there are buttons for 'Info', 'Share', 'Ratings', and 'Comments'. The metadata section includes the following information:

Title	Planeamiento urbano
License	Public Domain (PD) ⓘ
Abstract	Mapa con diversas capas basadas en el código de planeamiento urbano del partido de Tres de Febrero
Publication Date	Aug. 11, 2023, 3:44 p.m.
Category	Planning Cadastre ⓘ

At the bottom right of the screenshot, the URL <https://geoportal.tresdefebrero.gob.ar> is displayed.



The screenshot shows the ADDFerti Map interface. The main map displays two areas: Grandplane and Mortier. Various data points are overlaid on the map, each labeled with a 'uni-gent' ID and a numerical value representing soil moisture. The values range from 0.0 to 49.29. The map includes a search bar at the top, a layer filter on the left, and a metadata panel on the right. The metadata panel shows coordinates (Lat: 50.992, Long: 2.536) and a table of application parameters.

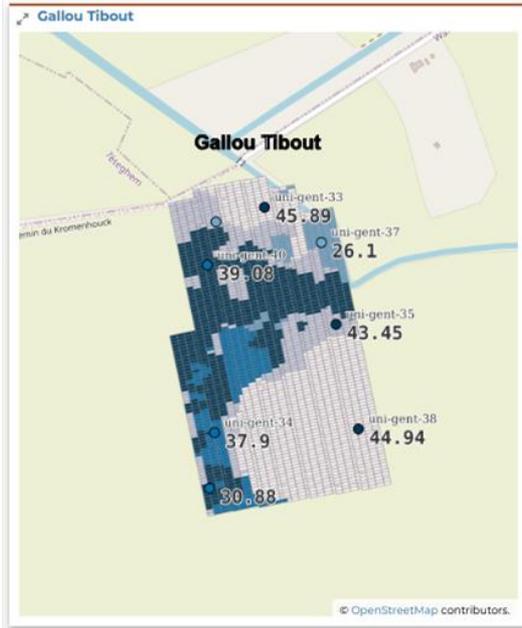
irr_l_ha:	500000
irr_mm:	117504
row:	27
column:	4
field_id:	5

There are no features for the following layers: Annotations, current_ugent_soil_moisture, galloutbout_application_map, mortier_application_map

Applikationskarten + aktuelle Bodenfeuchte der Felder in Belgien

- Datenquellen
 - Layerkatalog
 - Kartenkatalog
- Dashboard-Elemente
 - Tabellen
 - Diagramme
 - Karten
 - Text
- Beispiel:
 - Bodenfeuchtemonitor
 - Unfallstatistiken
 - Corona-Fallzahlen





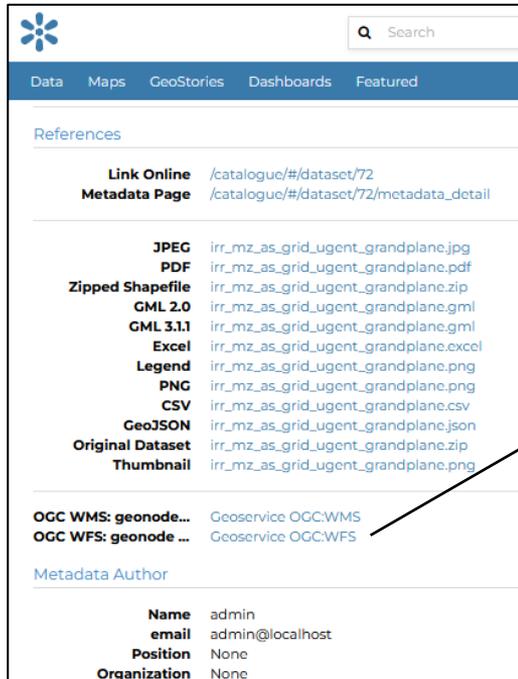
- mortier_application_...
 - >= 18.924 and < 37.384
 - >= 37.384 and < 42.804
 - >= 42.804 and < 44.904
 - >= 44.904 and < 55.424
 - >= 55.424 and <= 55.425
- grandplane_applicati...
 - >= 34.444 and < 51.056
 - >= 51.056 and < 67.668
 - >= 67.668 and < 84.28
 - >= 84.28 and < 100.892
 - >= 100.892 and <= 117.504
- galloutibout_applicati...
 - >= 20.884 and < 28.66
 - >= 28.66 and < 36.436
 - >= 36.436 and < 44.212
 - >= 44.212 and < 51.988
 - >= 51.988 and <= 59.764
- current_ugent_soil_m...
 - 100%



Weather Les Moeres

date	rain	humidity	wind_speed	clouds	uvi	temp
2024-08-21	0	53	9.03	88	4.89	18.44
2024-08-22	0	45	10.03	54	4.87	22.1
2024-08-23	1.73	72	12.32	99	4.95	21.67
2024-08-24	7.84	89	5.87	100	3.44	15.7
2024-08-25	0	47	7.24	20	4.58	18.94

- Layer werden von GeoNode automatisch als WMS/WFS/WCS veröffentlicht



Search

Data Maps GeoStories Dashboards Featured

References

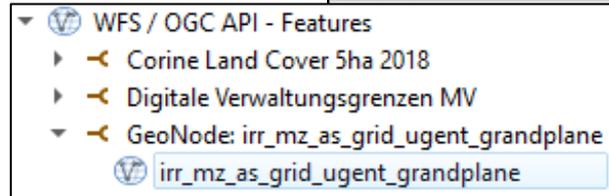
Link Online /catalogue/#/dataset/72
Metadata Page /catalogue/#/dataset/72/metadata_detail

JPEG irr_mz_as_grid_ugent_grandplane.jpg
PDF irr_mz_as_grid_ugent_grandplane.pdf
Zipped Shapefile irr_mz_as_grid_ugent_grandplane.zip
GML 2.0 irr_mz_as_grid_ugent_grandplane.gml
GML 3.1.1 irr_mz_as_grid_ugent_grandplane.gml
Excel irr_mz_as_grid_ugent_grandplane.excel
Legend irr_mz_as_grid_ugent_grandplane.png
PNG irr_mz_as_grid_ugent_grandplane.png
CSV irr_mz_as_grid_ugent_grandplane.csv
GeoJSON irr_mz_as_grid_ugent_grandplane.json
Original Dataset irr_mz_as_grid_ugent_grandplane.zip
Thumbnail irr_mz_as_grid_ugent_grandplane.png

OGC WMS: geonode... Geoservice OGC:WMS
OGC WFS: geonode ... Geoservice OGC:WFS

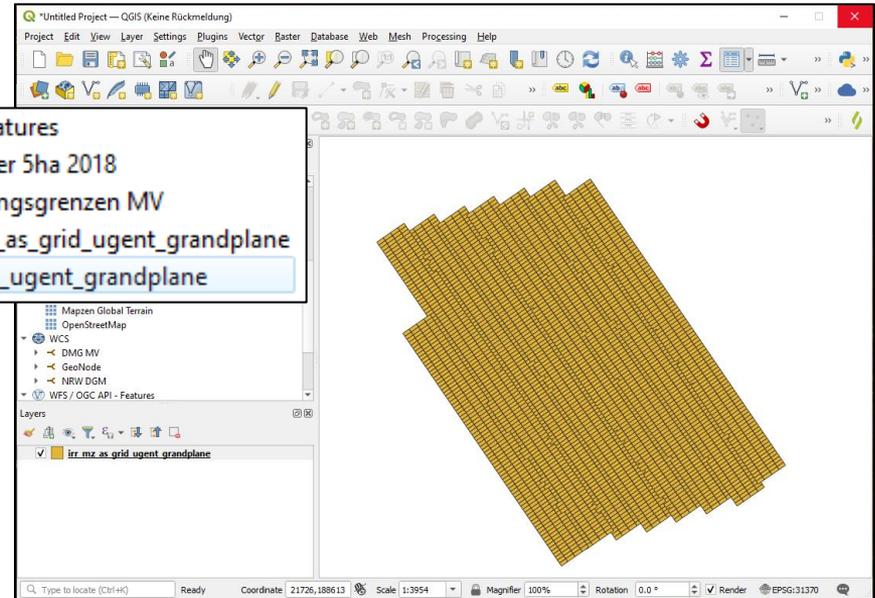
Metadata Author

Name admin
email admin@localhost
Position None
Organization None



WFS / OGC API - Features

- Corine Land Cover 5ha 2018
- Digitale Verwaltungsgrenzen MV
- GeoNode: irr_mz_as_grid_ugent_grandplane
- irr_mz_as_grid_ugent_grandplane



Untitled Project — QGIS (Keine Rückmeldung)

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Processing Help

Mapzen Global Terrain
 OpenStreetMap

WCS
 DMG MV
 GeoNode
 NRW DGM

WFS / OGC API - Features

Layers

- irr_mz_as_grid_ugent_grandplane

Coordinate: 21726,188613 Scale: 1:3954 Magnifier: 100% Rotation: 0.0° Render EPSG:31370



Fazit

- Ausgereiftes Open-Source-Softwareprojekt.
- Konsistente und benutzerfreundliche Oberfläche.
- Ermöglicht es Nutzern ohne Vorkenntnisse Geodaten auszutauschen und interaktive Karten zu erstellen.
- Durch offene APIs konnte der Up- und Download von Geodaten automatisiert werden.
- Durch Benutzer- und Rollenmanagement konnten für jeden Datensatz die Rechte genau bestimmt werden.
- Gute Lösung, um ad hoc eine Geodateninfrastruktur aufzubauen.





SPONSORED BY THE



Federal Ministry
of Education
and Research

FKZ 031B1098

