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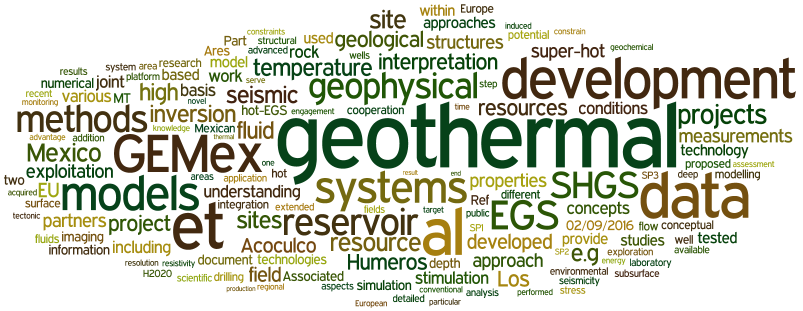
GEMex

The Open Access Database of the GEMex H2020 project

E. Trumpy,

GeoNode Summit 2020 – 07th December 2020



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www.gemex-h2020.eu

Overview

- **GEMex**: Cooperation in Geothermal energy research **Europe-Mexico** for development of Enhanced Geothermal Systems (EGS) and Superhot Geothermal Systems (SHGS)
- **GEMex** is a complementary effort of a European and Mexican consortium on unconventional geothermal systems
- **GEMex** focusses on

Resource Assessment → Reservoir Characterization → Concept Development

- GEMex has selected two sites in the Transmexican Volcanic Belt - Acoculco for EGS development and Los Humeros as a superhot resource.

Partners

GEMex

Europe

GFZ Helmholtz Centre Potsdam

ÍSOR Iceland GeoSurvey

uniResearch

Technische Universität Darmstadt

OGS

KIT Karlsruhe Institute of Technology

TNO innovation for life

National Research Council of Italy

BGS 1835 British Geological Survey Natural Environment Research Council

КАПЕ CRES

Roma Tre Università degli Studi

ENEA

Università degli Studi di Bari Aldo Moro

RWTH Aachen University

Hochschule Bochum Bochum University of Applied Sciences

Universiteit Utrecht

IGA Service Company

Państwowy Instytut Geologiczny Państwowy Instytut Badawczy 1919

Mexico

brgm Géosciences pour une Terre durable

Institute for Energy Technology

Università degli Studi di Torino

EGEC Geothermal

Helmholtz Centre for Environmental Research – UFZ

Istituto di Management Scuola Superiore Sant'Anna

Universidad Michoacana de San Nicolás de Hidalgo

Universidad Nacional Autónoma de México

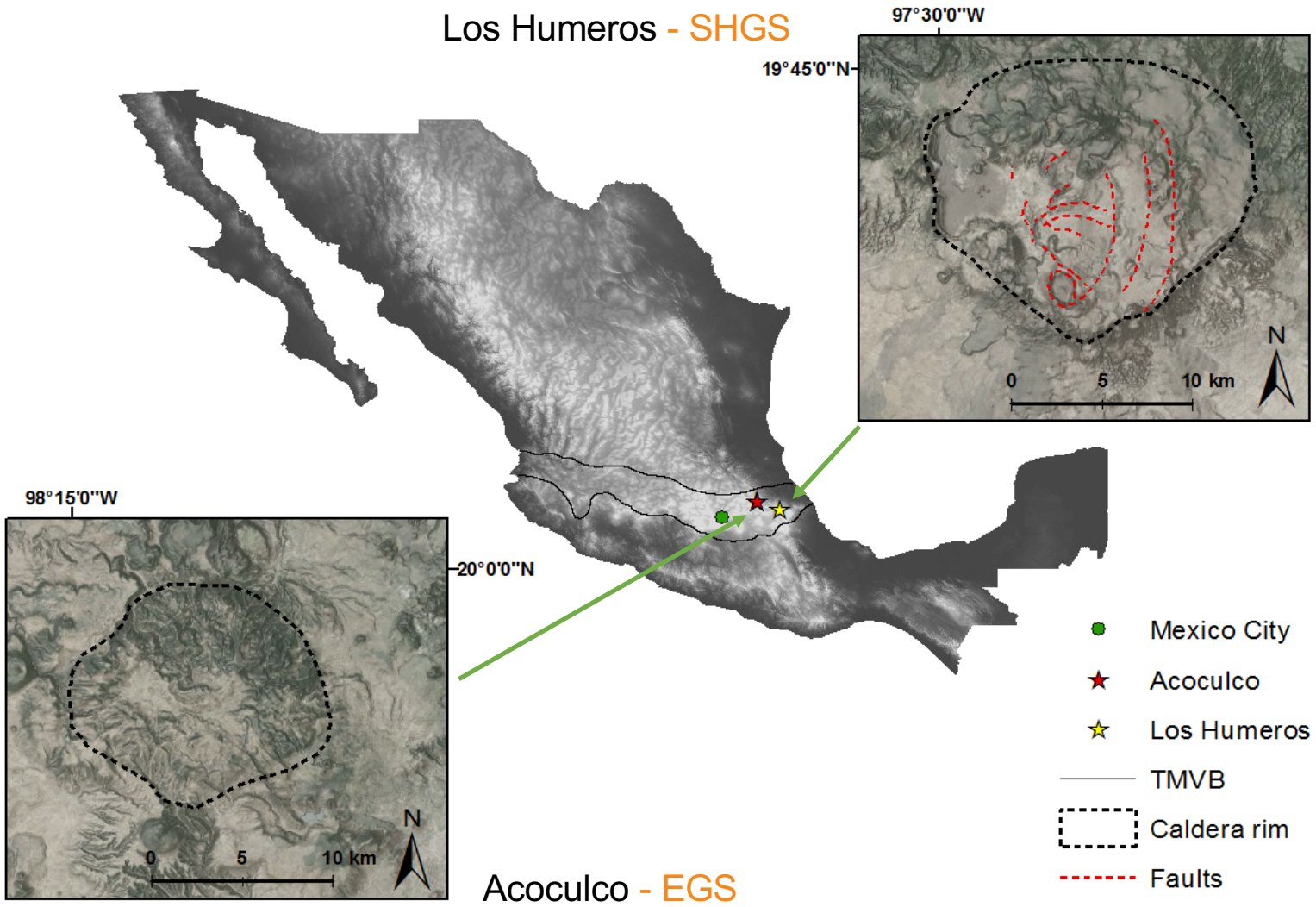
Instituto de Investigaciones Eléctricas

Geominco Geología, Minería y Consultoría, S.A. de C.V.

CICESE

Energía

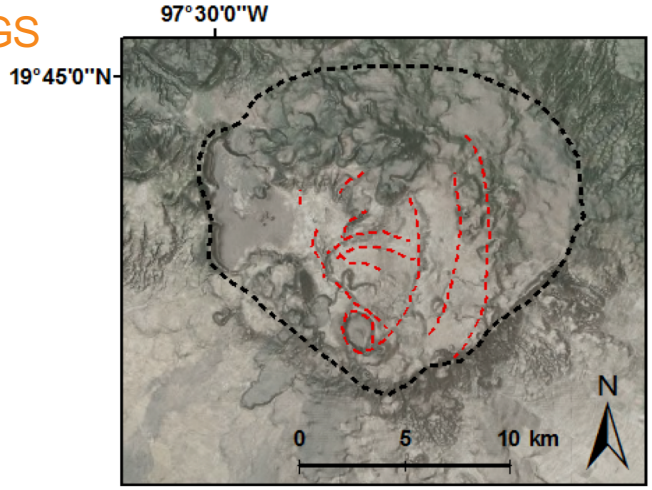
Geothermal sites



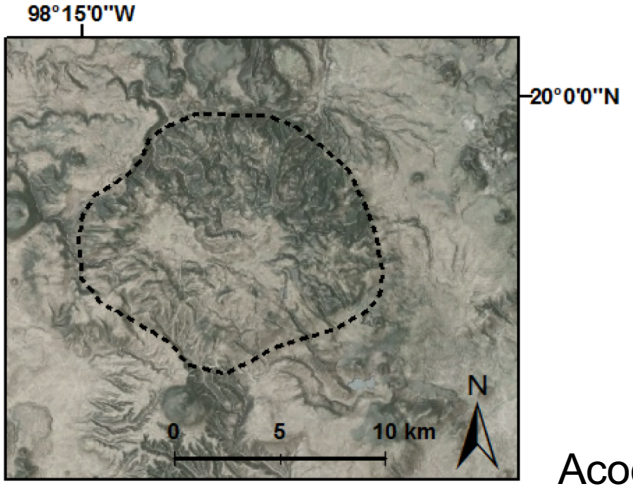
Figures: Anna Jentsch, GFZ

Geothermal sites

Los Humeros - SHGS



- site already developed: > 40 wells, > 94 MWe installed capacity
- formations with > 380°C, but highly acidic fluids

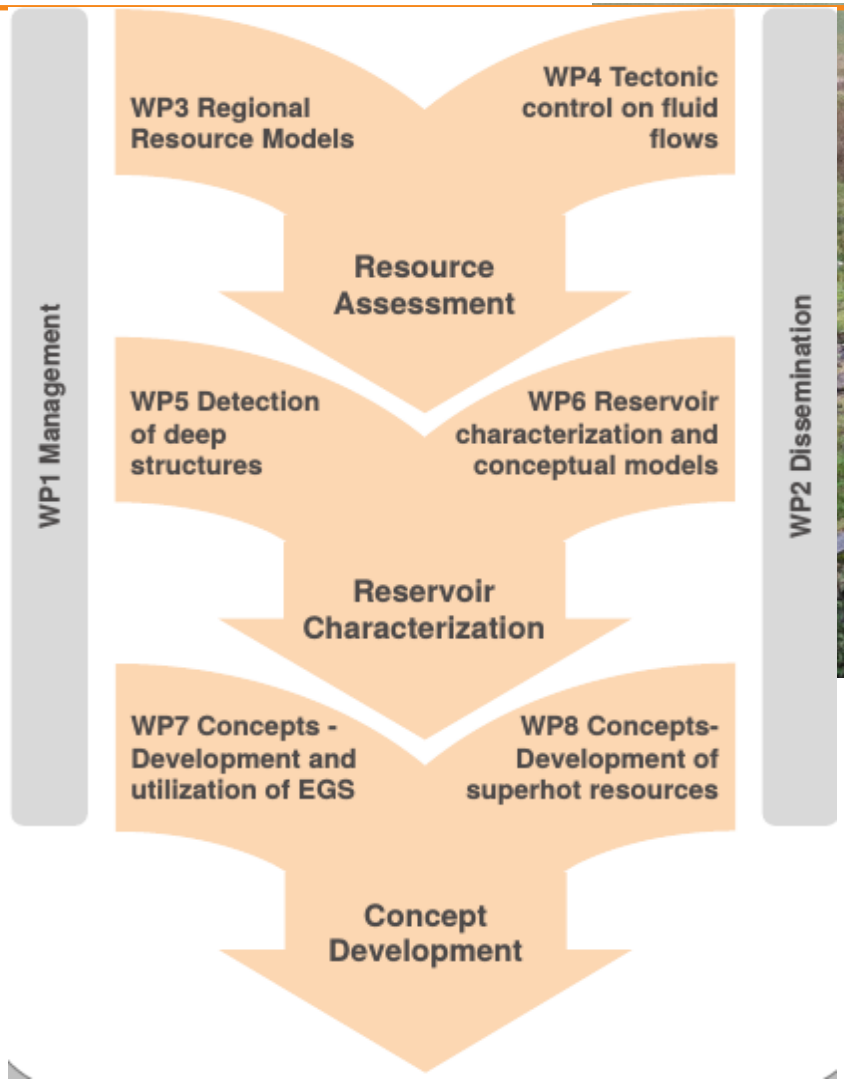


- under exploration
- 2 wells found high temperatures (~300°C at 2km depth) but no fluids
- stimulation currently planned

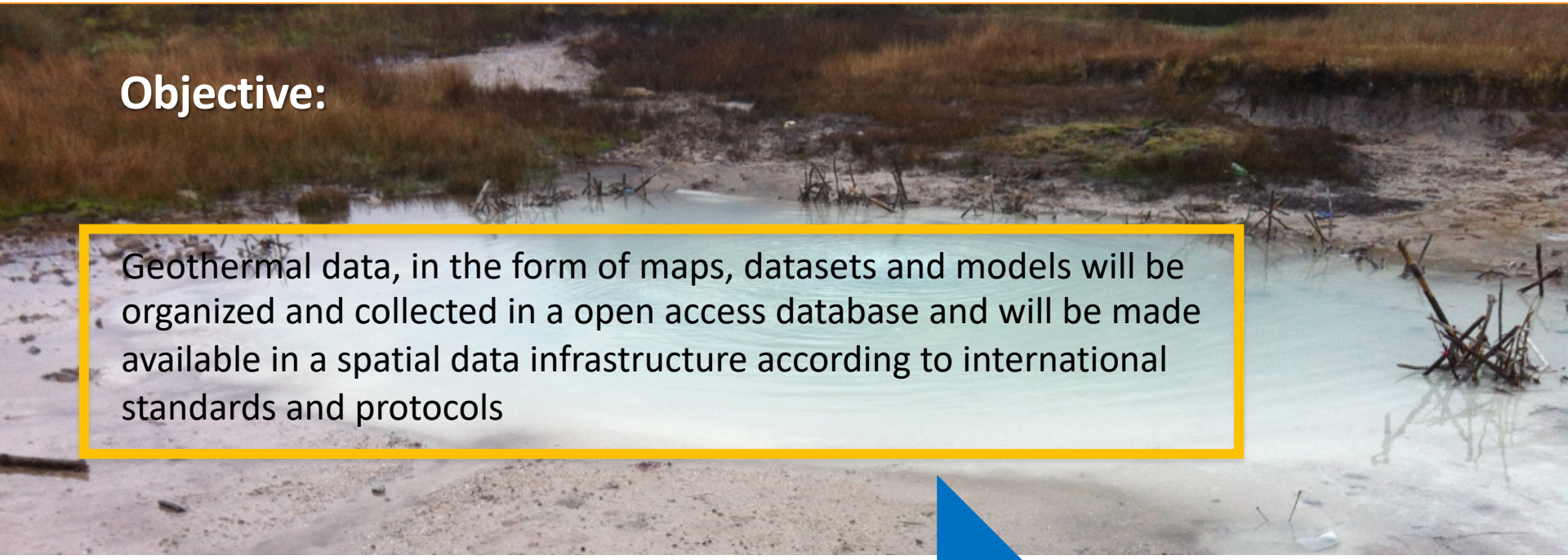
Acoculco - EGS

Figures: Anna Jentsch, GFZ

Structure

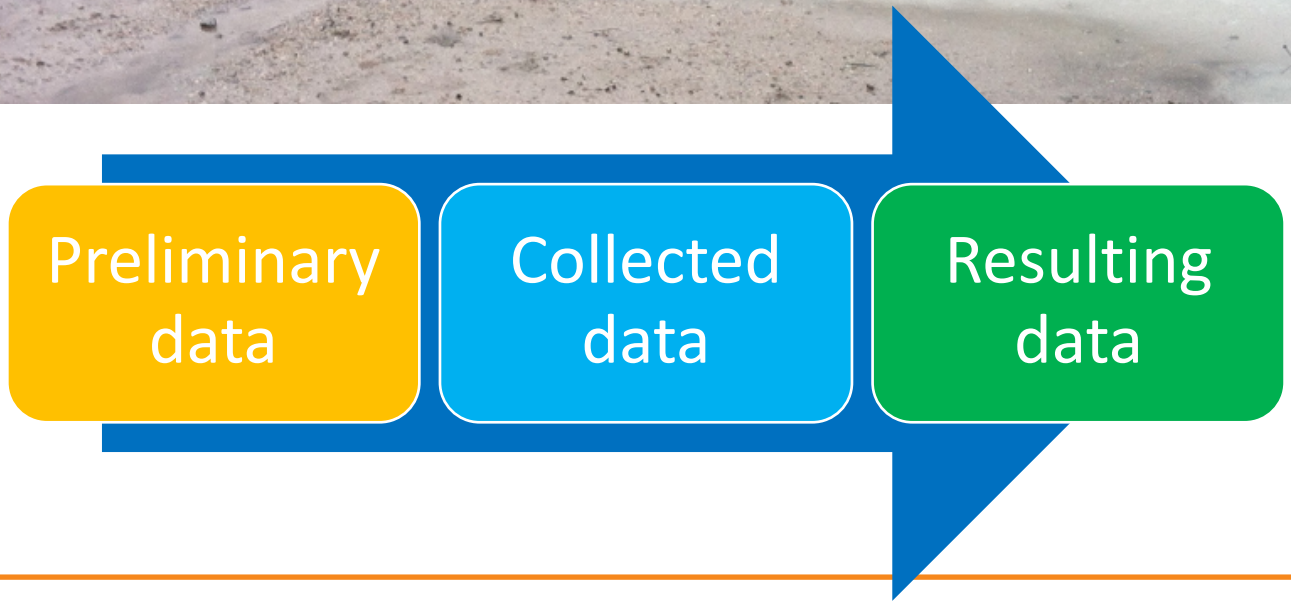

WP1 Management
WP3 Regional Resource Models
WP4 Tectonic control on fluid flows
Resource Assessment
WP5 Detection of deep structures
WP6 Reservoir characterization and conceptual models
Reservoir Characterization
WP7 Concepts - Development and utilization of EGS
WP8 Concepts- Development of superhot resources
Concept Development
WP2 Dissemination

Task 2.3: Open Access DB



Objective:

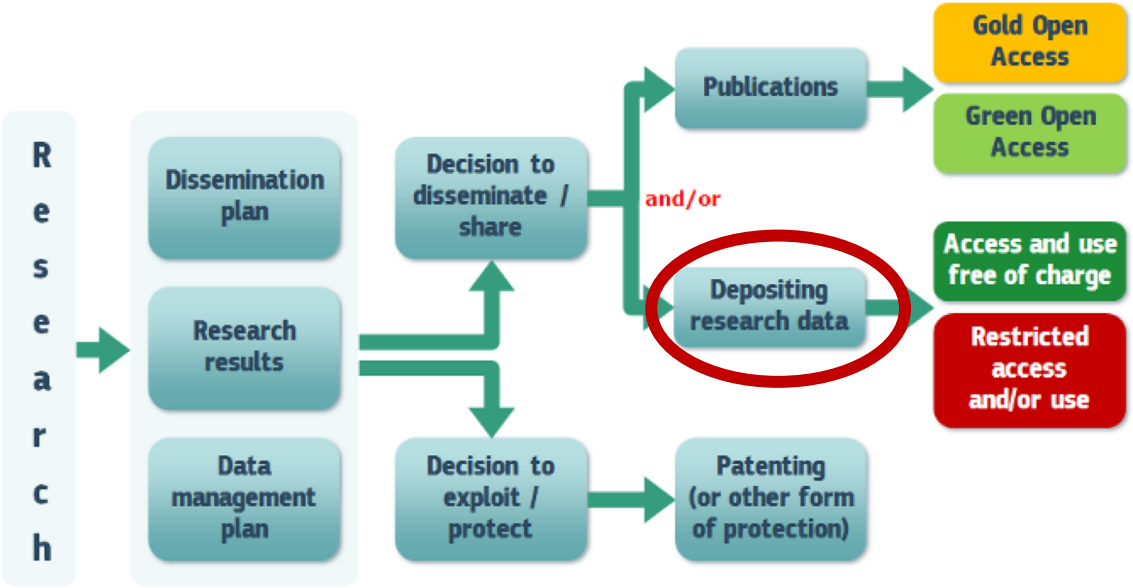
Geothermal data, in the form of maps, datasets and models will be organized and collected in a open access database and will be made available in a spatial data infrastructure according to international standards and protocols



EC vs Open Data

- Horizon 2020 rules on open access to scientific publications is an obligation
- open access to research data, where opting-outs are possible, and research data management

Research data: statistics, results of experiments, measurements, observations resulting from fieldwork, survey results, interview recordings and images. The focus is on research data that is available in digital form.



OADB

GEMex Open Access Database:

- Platform for management and publication of spatial data (SDI)
- Open Source Platform
- Allow non-specialized users to share data and create interactive maps
- **Data management tools**, metadata implementation and map visualizations
- Guideline to prepare the data
- Hosted by CNR

- 2D data:
  - ✓ Points (point of samples, boreholes, …)
  - ✓ Lines (faults, alignments, cross-sections traces…)
  - ✓ Polygons (areas of alteration, geological formations, …)
  - ✓ Maps (as georeferenced images)
  - ✓ Grid maps resulting from 3D modellings and numerical simulation

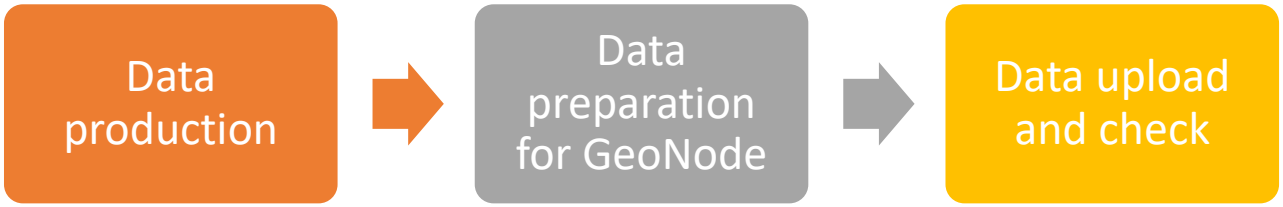
GeoNode

Old instance (2016 – 2020)

- Technical details
  - ✓ 4 single core QEMU virtual cpu
  - ✓ 8 Gb RAM
  - ✓ Ubuntu 14.04.6 LTS
  - ✓ Apache 2.4.7
  - ✓ Tomcat 7.0.52
  - ✓ OpenJDK 1.8.0_222
  - ✓ Geoserver 2.9
  - ✓ Postgresql 9.3.24
  - ✓ **GeoNode 2.4 – multi site**

New instance (2020 – 2022)

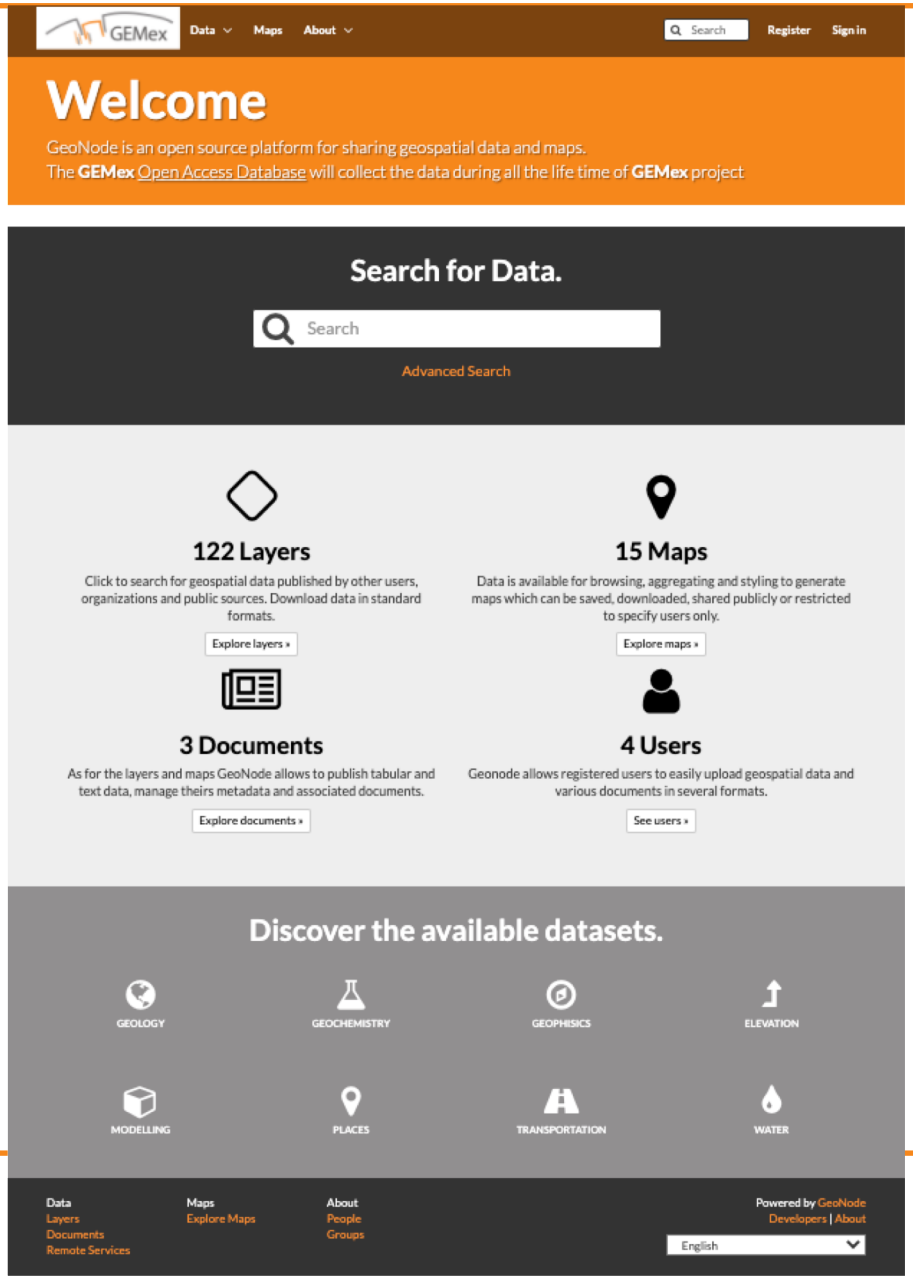
- Technical details
  - ✓ 4 single core QEMU virtual cpu
  - ✓ 8 Gb RAM
  - ✓ Ubuntu 18.04.5 LTS
  - ✓ Apache 2.4.29
  - ✓ Tomcat 9.0.16
  - ✓ OpenJDK 11.0.9
  - ✓ Geoserver 2.16.2
  - ✓ Postgresql 10.14
  - ✓ **GeoNode 3.1**



Guidelines to deliver (spatial) datasets on Open Access DataBase

1. File format (SHP, geotiff)
2. File description
   - ❑ **title** (e.g. rocks_sampling_location_all_20180528)
   - ❑ **abstract** (i.e., describing each dataset contents)
   - ❑ **purpose** for which you created the datasets
   - ❑ any possible other **supplemental information** (e.g., the background data to create the map if any, the accuracy, the used methodology to create the map, …)
   - ❑ declaration on the **data quality**
   - ❑ **keywords**

OADB – GeoNode landing page



Features:

- Landing page look & feel customization
- **122** layers
- **15** maps

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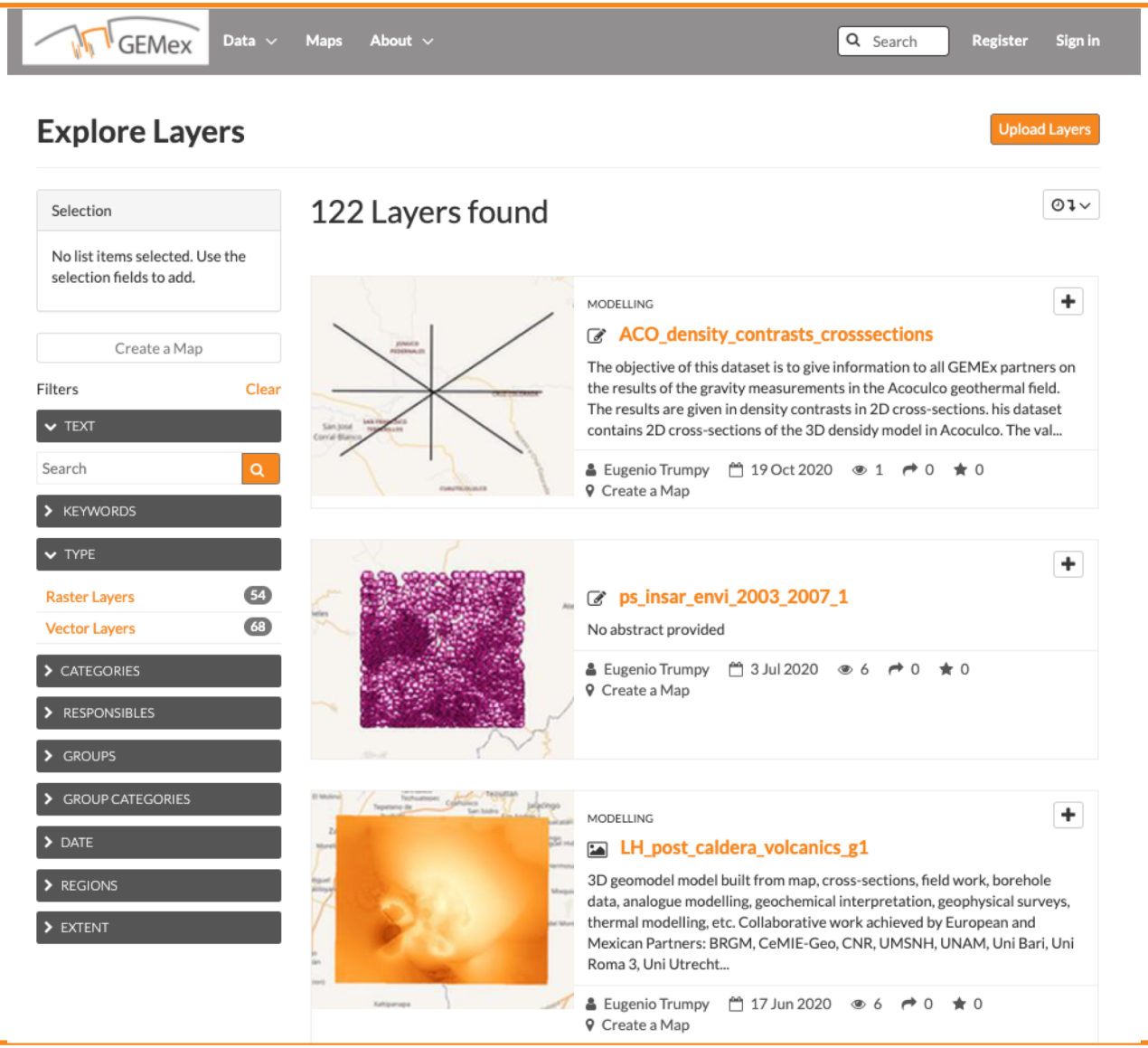
OADB – GeoNode list of layers



- **68** vector
- **54** raster

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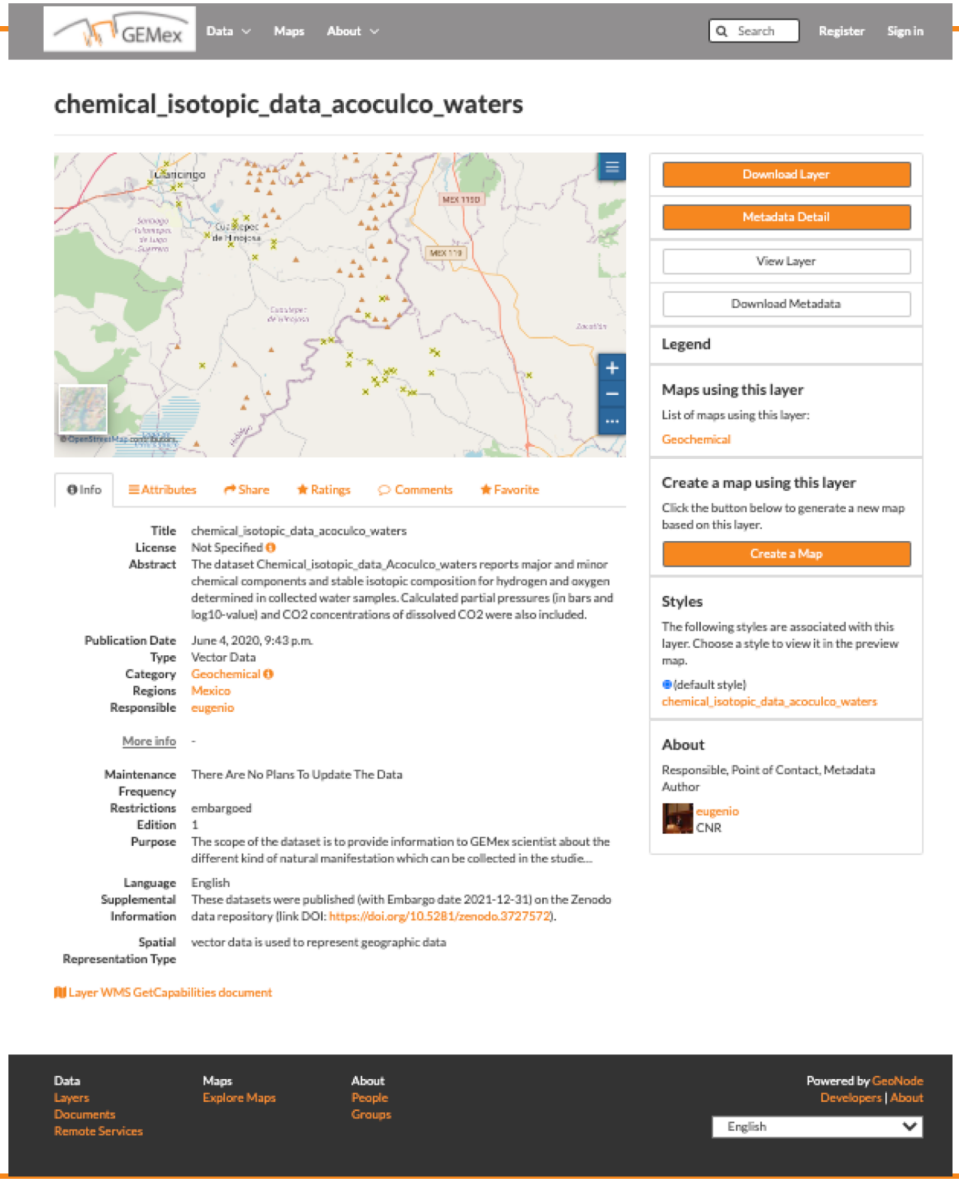
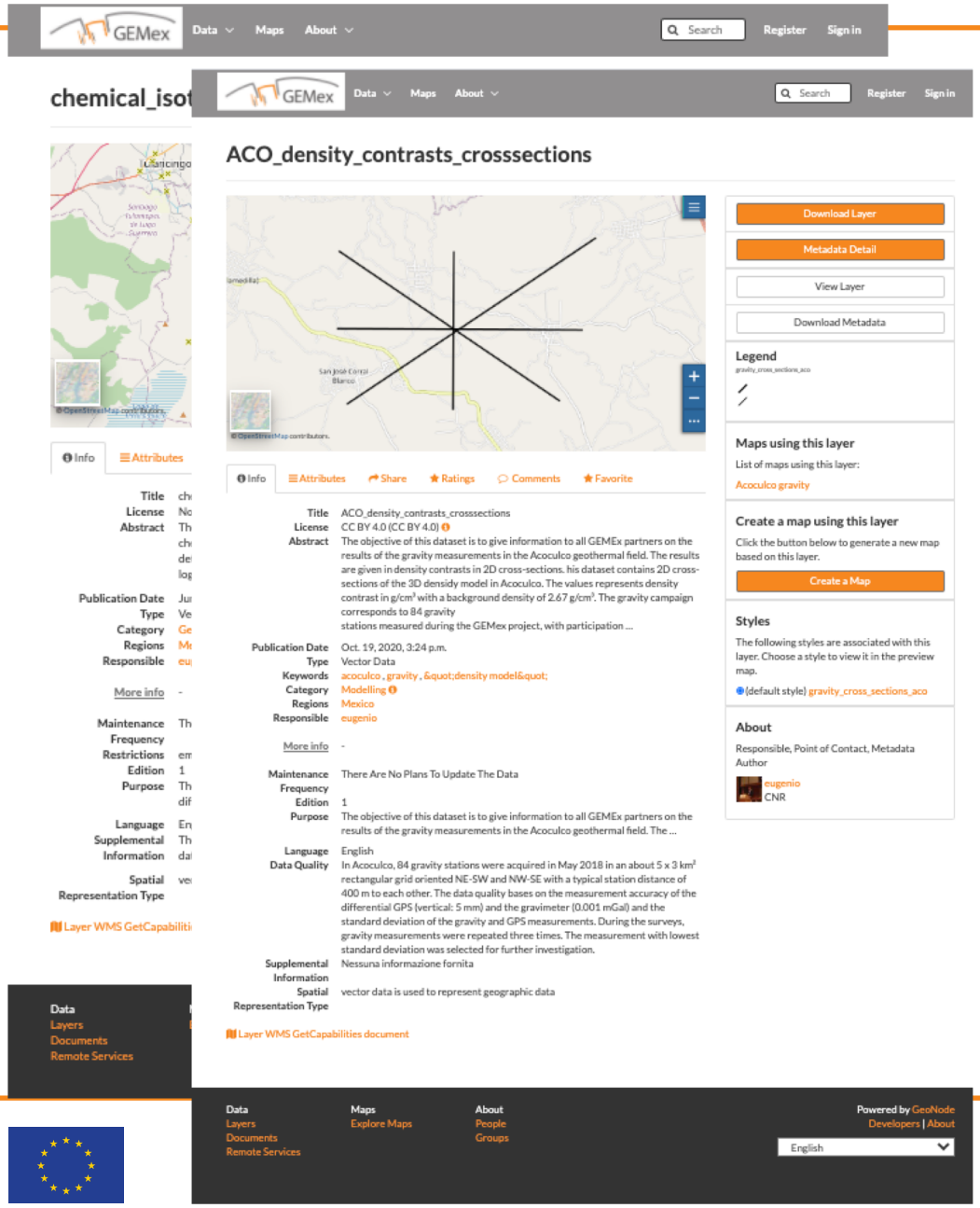
OADB – GeoNode layer details



- Layer metadata
- Data and metadata download
- Link to publication in the ‘Supplemental info’

OADB – GeoNode layer details



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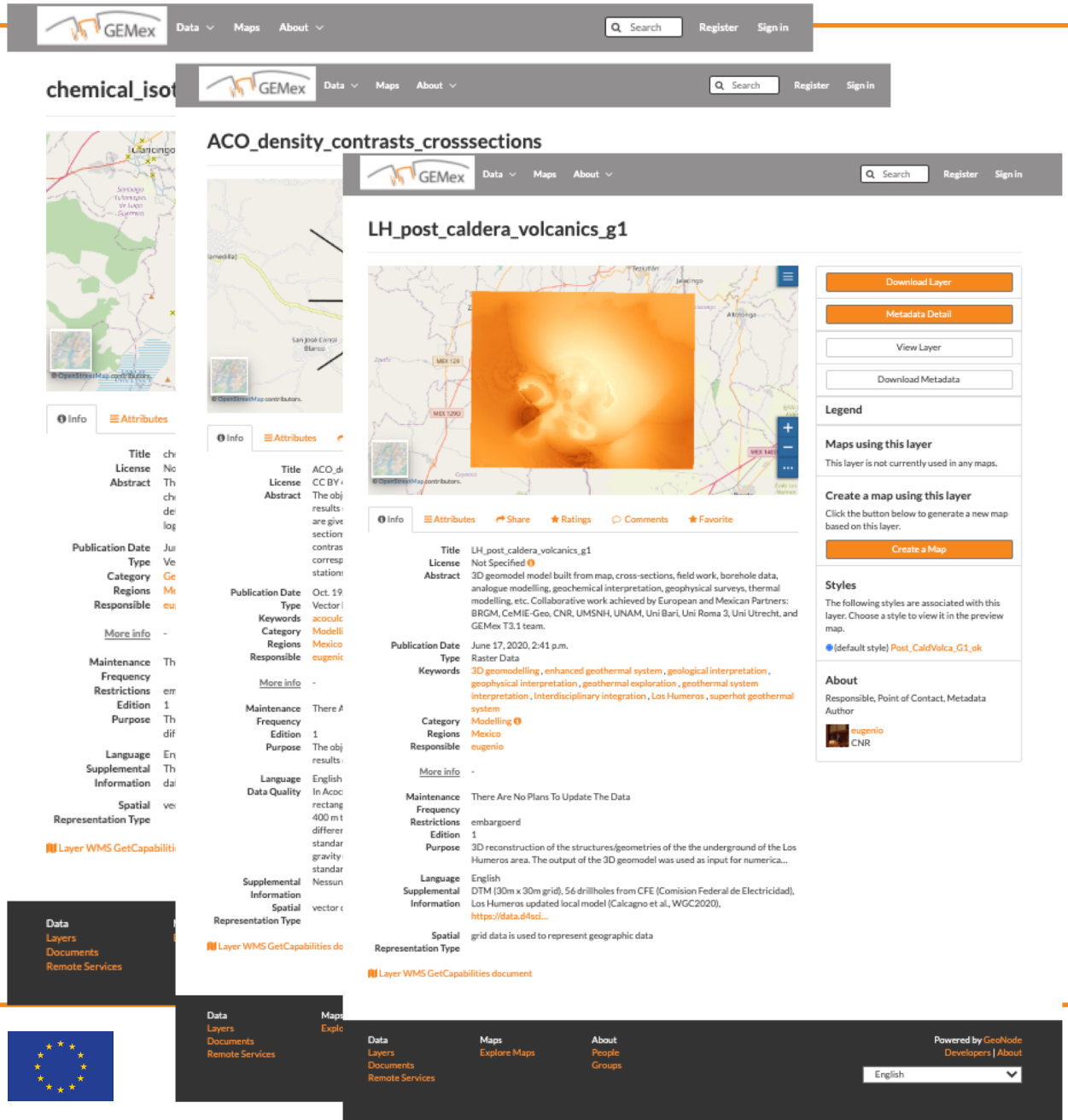

- Layer metadata
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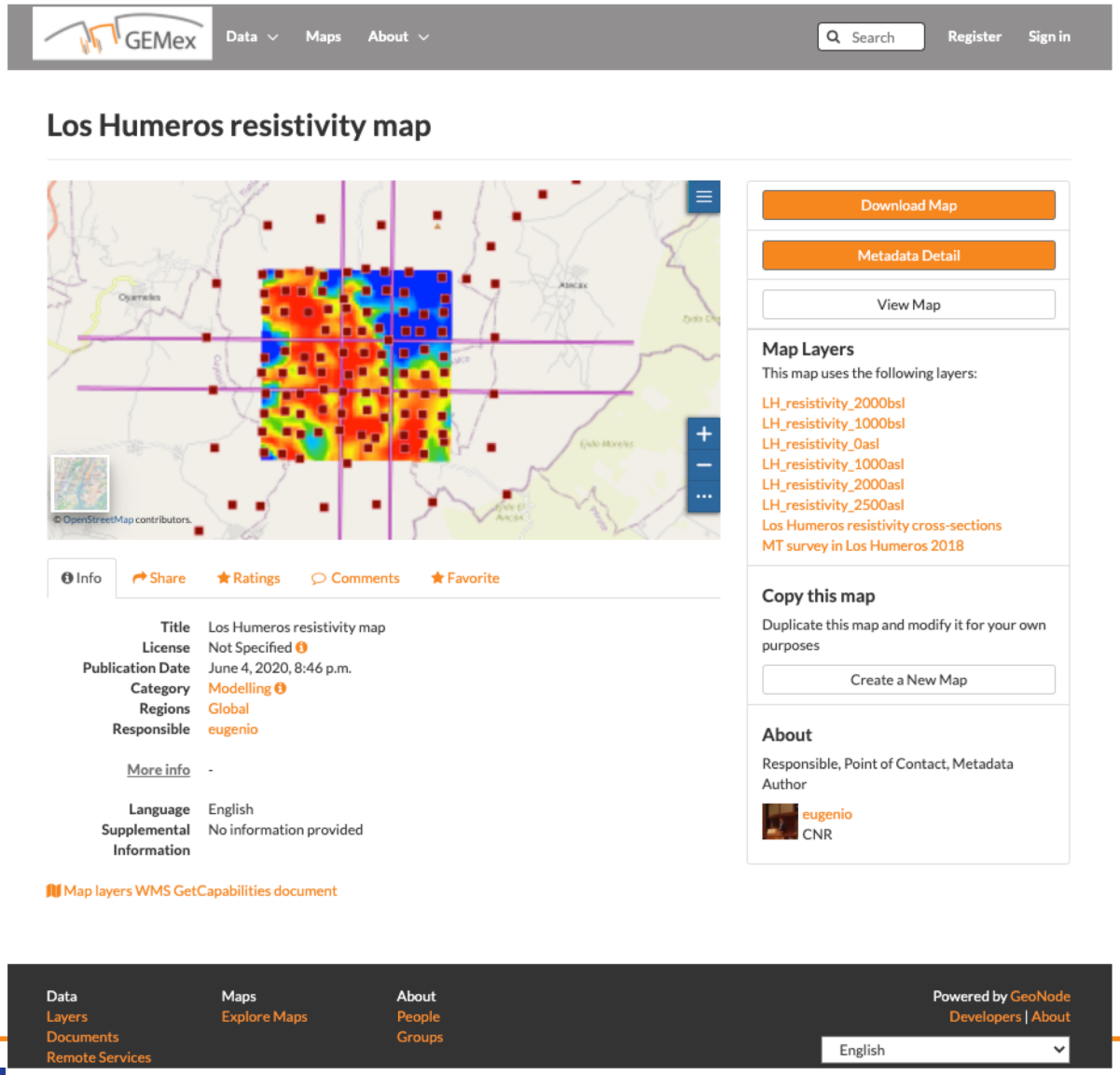
OADB – Geonode map description



- Map metadata (e.g. list of layers)

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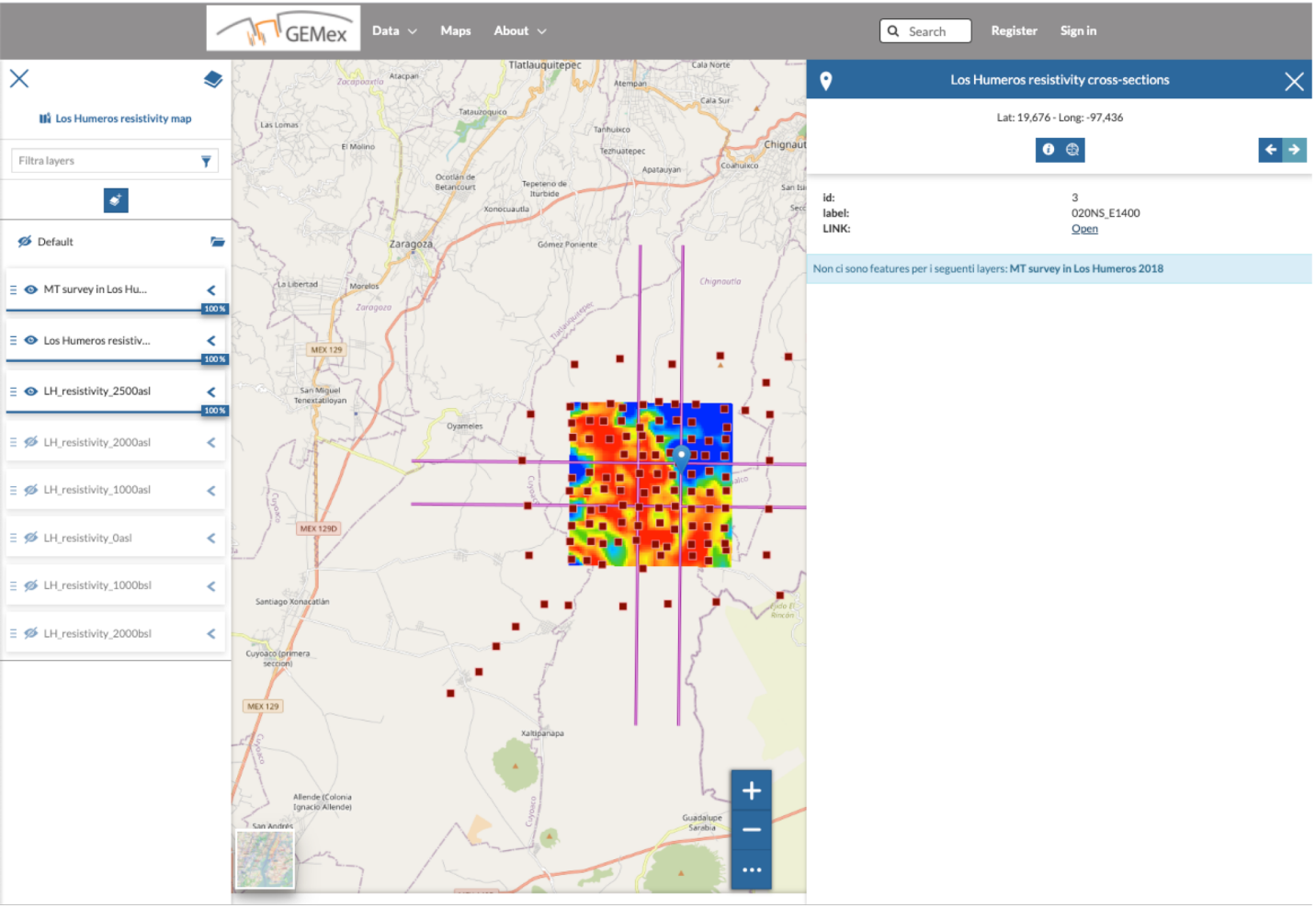
OADB GEONODE WebGIS user interface



- Save map
- Print map
- Query the map

- Measure distances and areas
- Style layers

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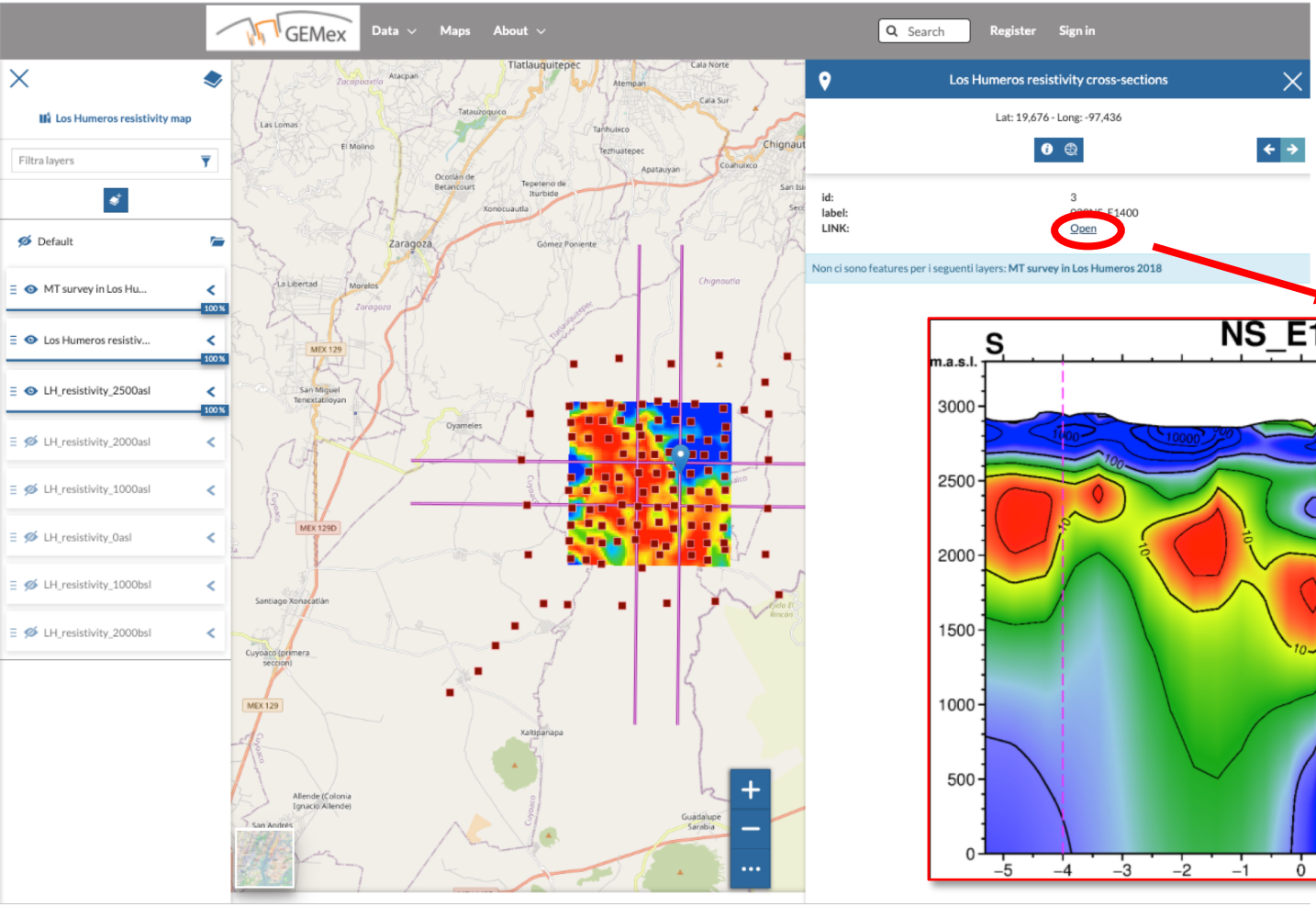
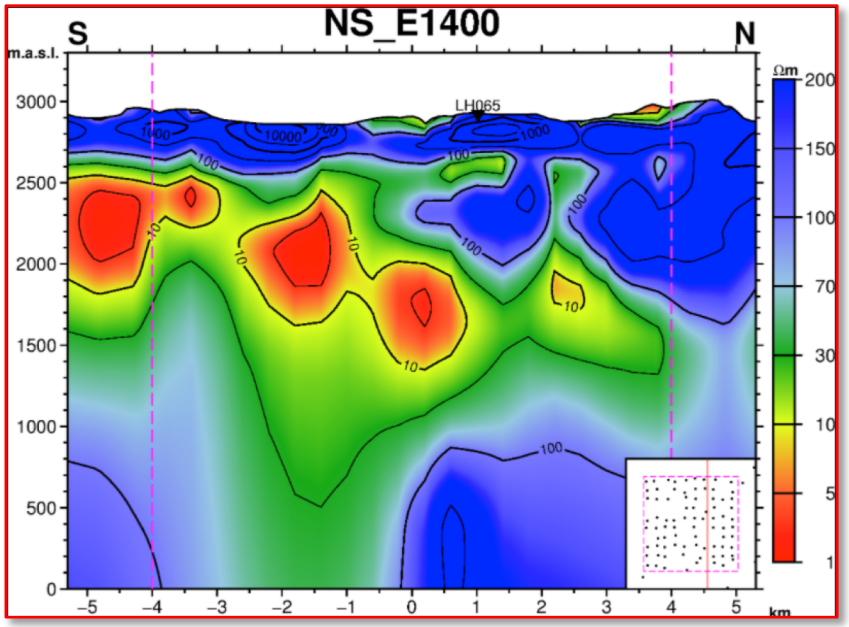
OADB GEONODE WebGIS user interface





- Save map
- Print map
- Query the map

- Measure distances and areas
- Style layers

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Conclusions & Considerations

- The Open Access Database will be maintained up to may 2022 (two years after the end pf the project)
- The GEMex OADB/**GeoNode** was largely used by researcher during the project…I suppose even now
- To get datasets was a hard exercise

- Conceptual issues

- EC require to share and make available research data from funded projects

- **Open Science principles**

Geonode Summit 2020 (Online) → GeoNode Summit 2016 (Rome) → GEMex project → **Geonode Summit 2020 (Online)**

http://gemex.igg.cnr.it

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