Coordinating and integRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East and Balkans and Developing Links with GEO related intiatives toward GEOSS

GEO-CRADLE:

Fostering regional cooperation and roadmap for GEO and Copernicus implementation in North Africa, Middle East and Balkans

Funded under H2020 - Climate action, environment, resource efficiency and raw materials
ACTIVITY: Developing Comprehensive and Sustained Global Environmental Observation and Information Systems
CALL IDENTIFIER: H2020 SC5-18b-2015
Integrating North African, Middle East and Balkan Earth Observation capacities in GEOSS
Project GA number: 690133
Total Budget: 2,910,800.00 €

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Improved Food Security – Water Extremes Management Pilot

Alexia Tsouni
NOA

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Thematic Areas

linked with the UN SDGs

Adaptation to Climate Change (ACC)

13 CLIMATE ACTION
3 GOOD HEALTH AND WELL-BEING
11 SUSTAINABLE CITIES AND COMMUNITIES
15 LIFE ON LAND

Improved Food Security – Water Extremes Management (IFS-WEM)

2 ZERO HUNGER
12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Access to Raw Materials (ARM)

1 NO POVERTY
2 ZERO HUNGER

Access to Energy (SENSE)

7 AFFORDABLE AND CLEAN ENERGY
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

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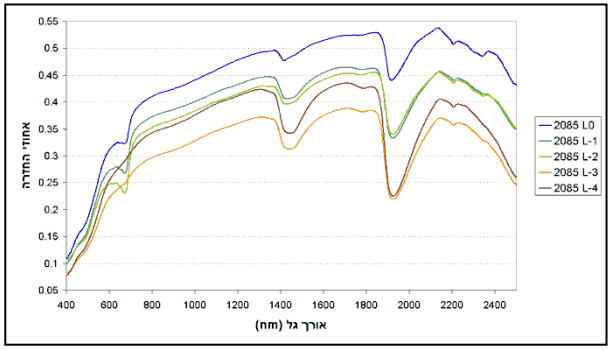
Improved Food Security (IFS) – Water Extremes Management (WEM) T4.2

Soil Spectral Library (Task 4.2 – IFS)



Prediction (spectral based) models of field moisture and clay content

Property	SEC, SEP, SEL	R^2_m	Prediction equation	Assignments
Soil Field Moisture (SFM)	0.045, 0.14, 0.016 0.027@	0.645 0.847@	wl_0.739*0.378179 + wl_1.65*0.389602- wl_0.689*0.184370 + 0.062336	1.65 μm-reflectance slope 0.688 μm-reflectance slope 0.739 μm-reflectance slope/chlorophyll
Organic Matter	0.003. 0.015. 0.002	0.827	wl 0.722*0.135211 + wl 2.328*0.034358-	0.722 μm-chlorophyll remaining

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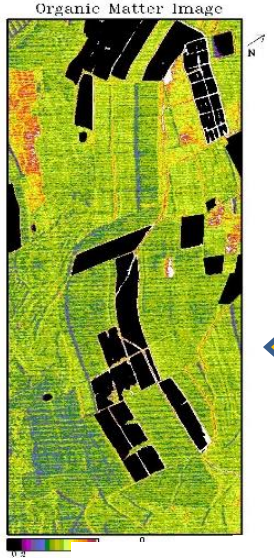
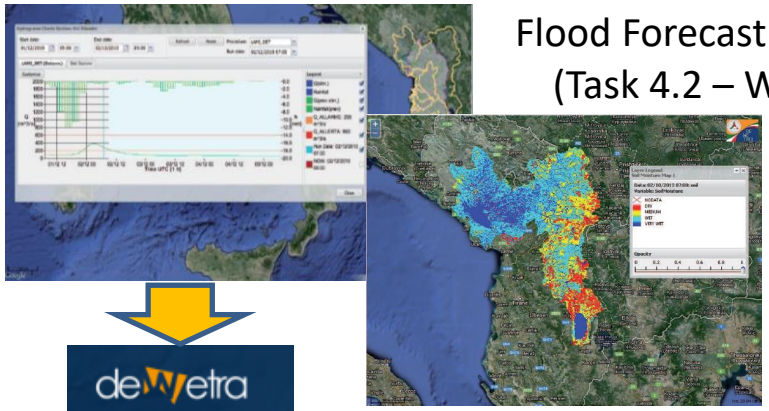



Sentinel-2 Satelllite

Pixel by pixel map on Sentinel-2 data using the prediction models

Flood Forecast Model (Task 4.2 – WEM)



dewetra

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Improved Food Security (IFS)

Soil sample collection




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Soil sample analysis

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Water Extremes Management (WEM)

DEWETRA is a real-time integrated system of risk forecasting, monitoring and prevention developed by CIMA Research Foundation on behalf of the Italian Department for Civil Protection. The system is technically and operationally certified.

- **myDewetra implementation at Basin scale:**
  - Identify basin "test-case"
  - Select the time period for hydrological forecast
  - Generate a Regional Soil Spectral Library
  - Resample the models into Sentinel-2 spectral configuration
  - Predict soil attributes (field moisture and clay content) using spectral based models
  - Apply the models on a pixel by pixel basis on Sentinel-2 (reflectance) data to create soil moisture and clay content maps
  - Ingest the thematic maps to the DEWETRA platform for floods (into the Continuum hydrological model)
  - Apply the thematic maps into the flood models; run and compare the results from hydrological modeling with and without soil moisture and clay content maps
  - Assess the added value / accuracy obtained from the suggested concept
  - Publish and share the results by myDewetra and connect to GEO-CRADLE Data Hub
- **myDewetra implementation at Regional scale:**

  Weather forecast model outputs global scale (e.g. GFS), satellite based rainfall observation (e.g. GPM) and global scale flood risk hazard (e.g. GAR2015 hazard maps), Hydroshed –USGS, Gadm (administrative boundaries).

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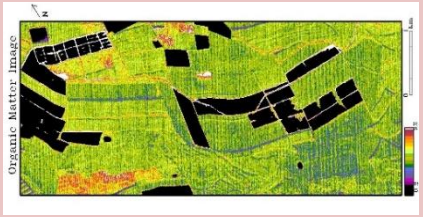
Water Extremes Management (WEM)

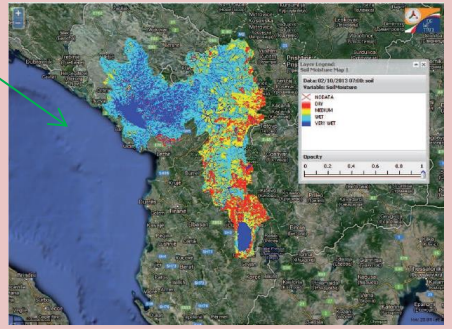
The connection - DeMetra

Field moisture and clay content

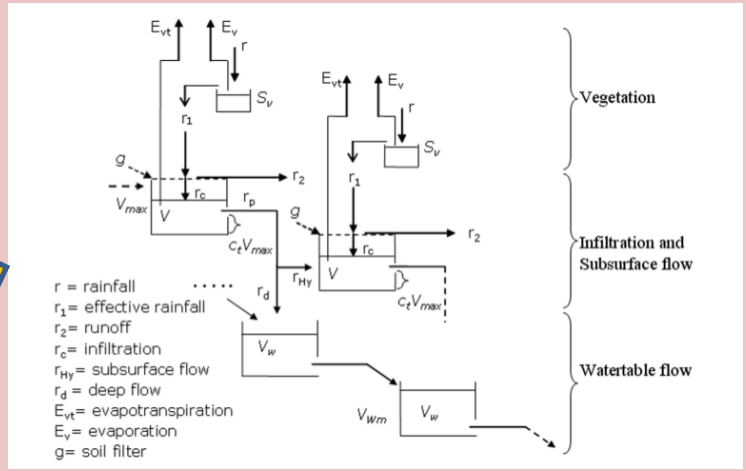


DRIN-BUNA basin in Albania

Output Layers

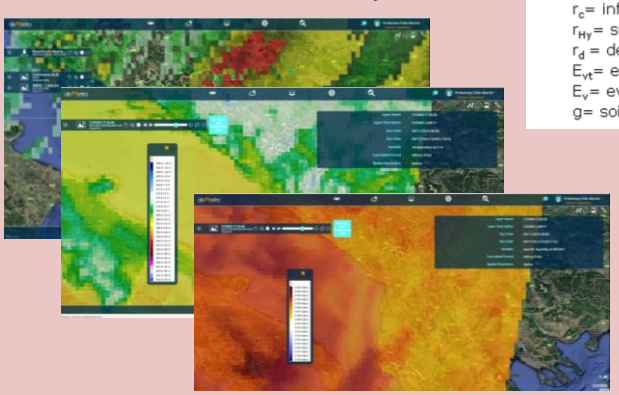


CONTINUUM Hydrological model

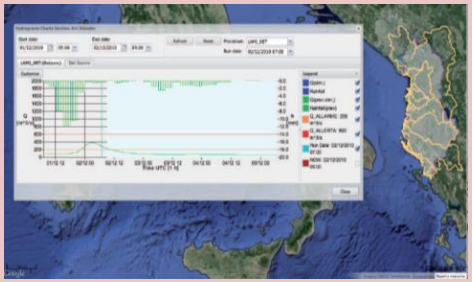


DATA HUB

Input Layers



Output Layers



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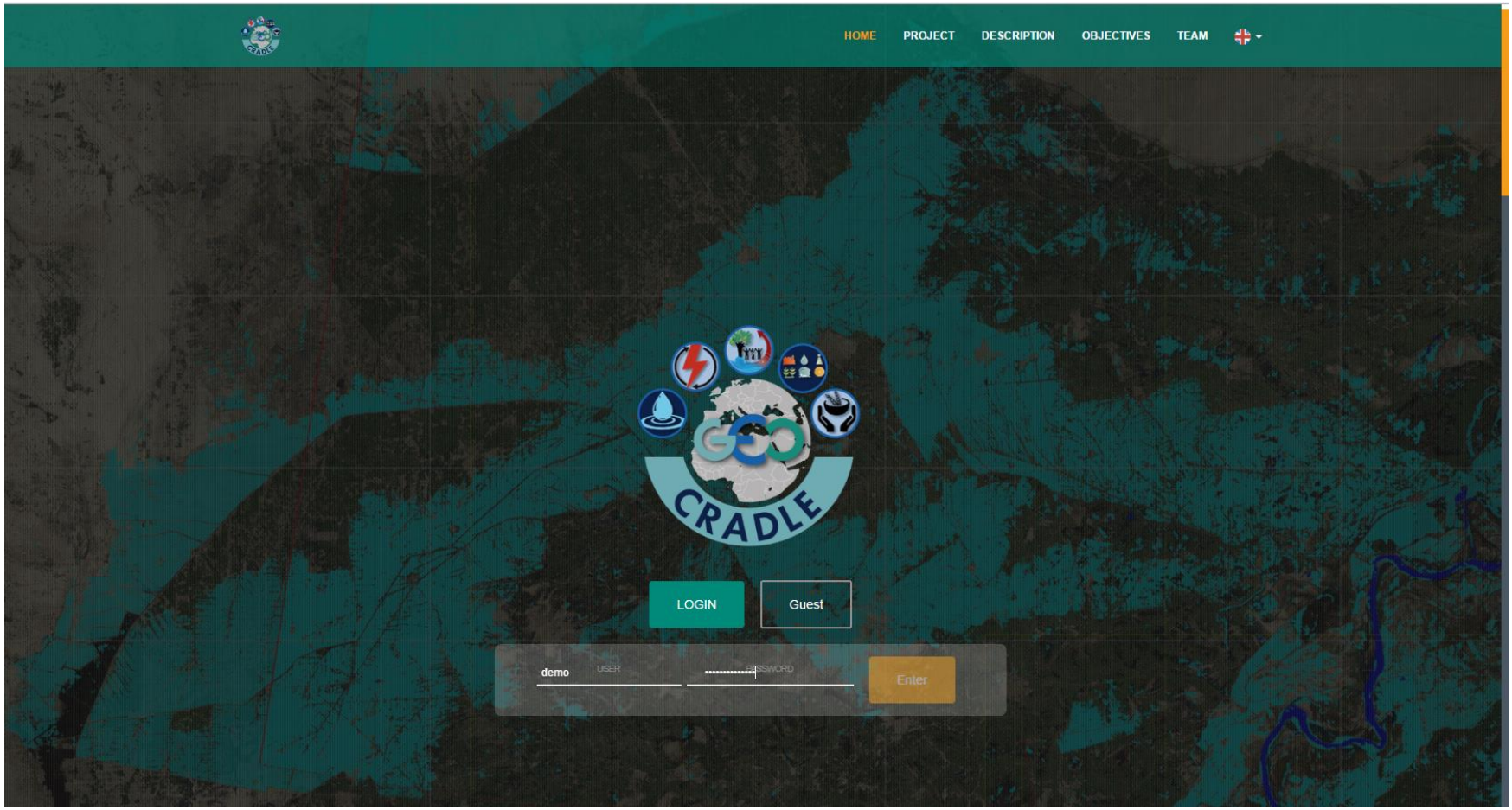
Water Extremes Management (WEM)

myDewetra implementation at Regional scale

http://geocradle.mydewetra.org

User: demo Password: demo4geocradle



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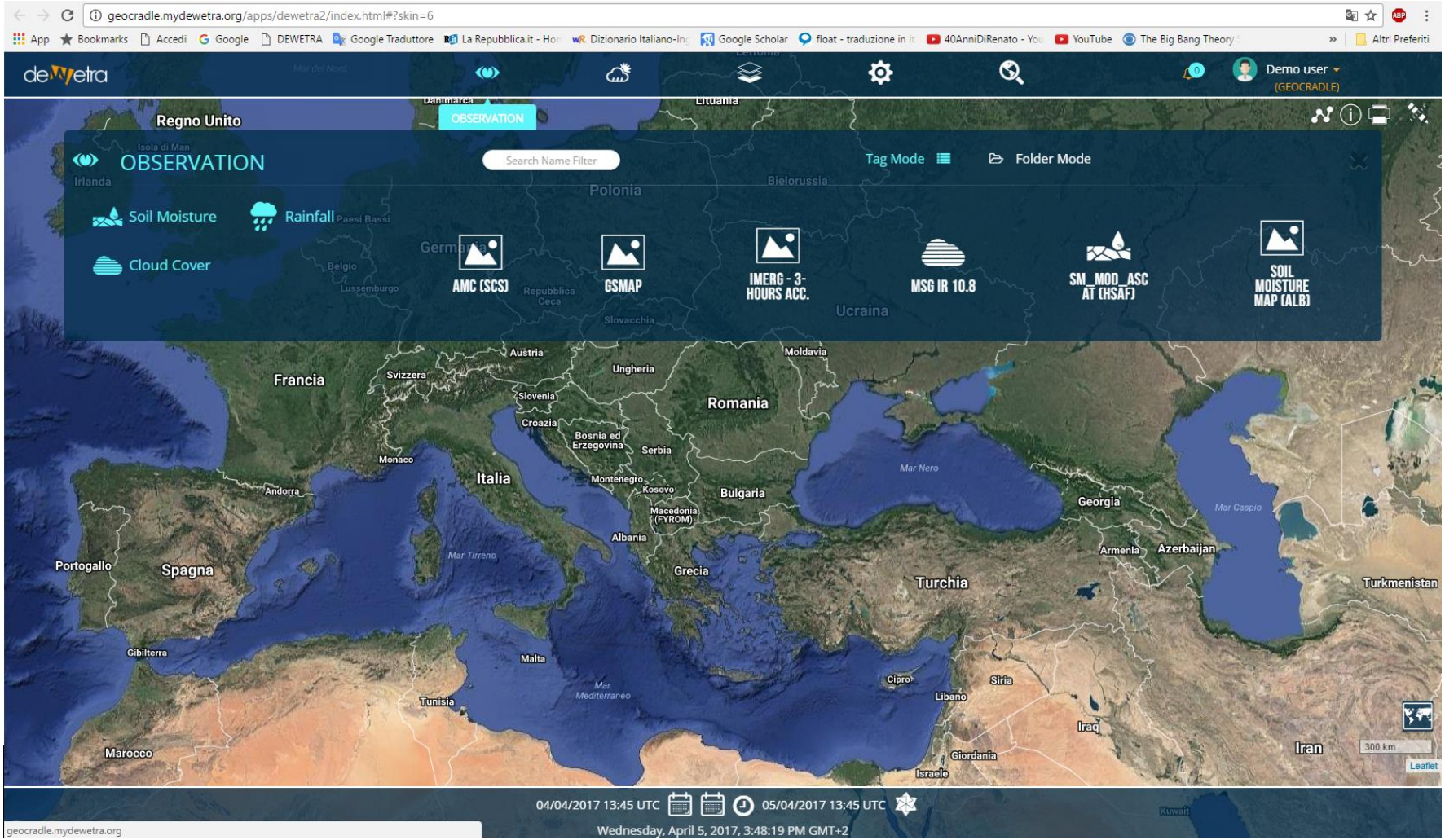

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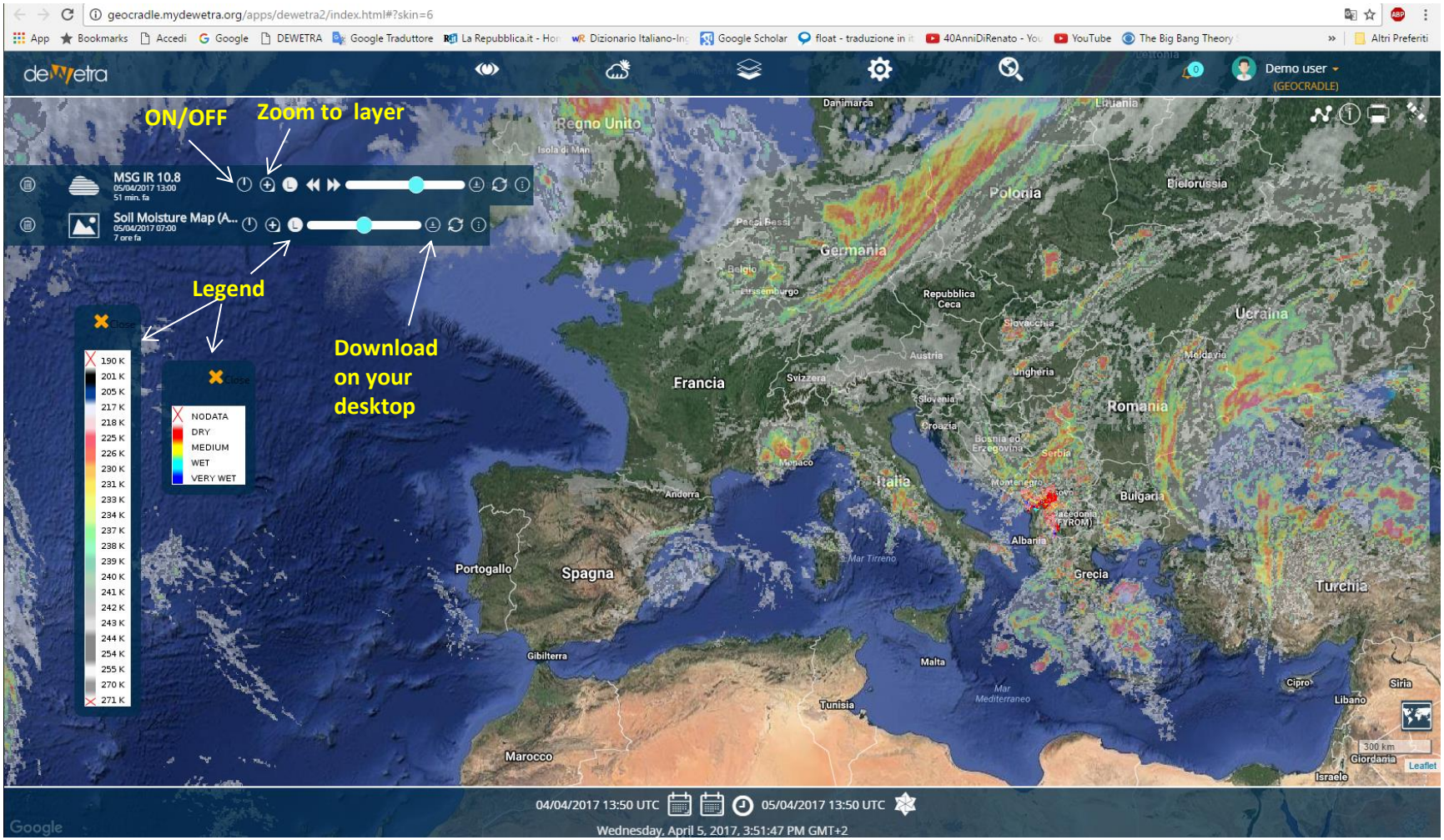

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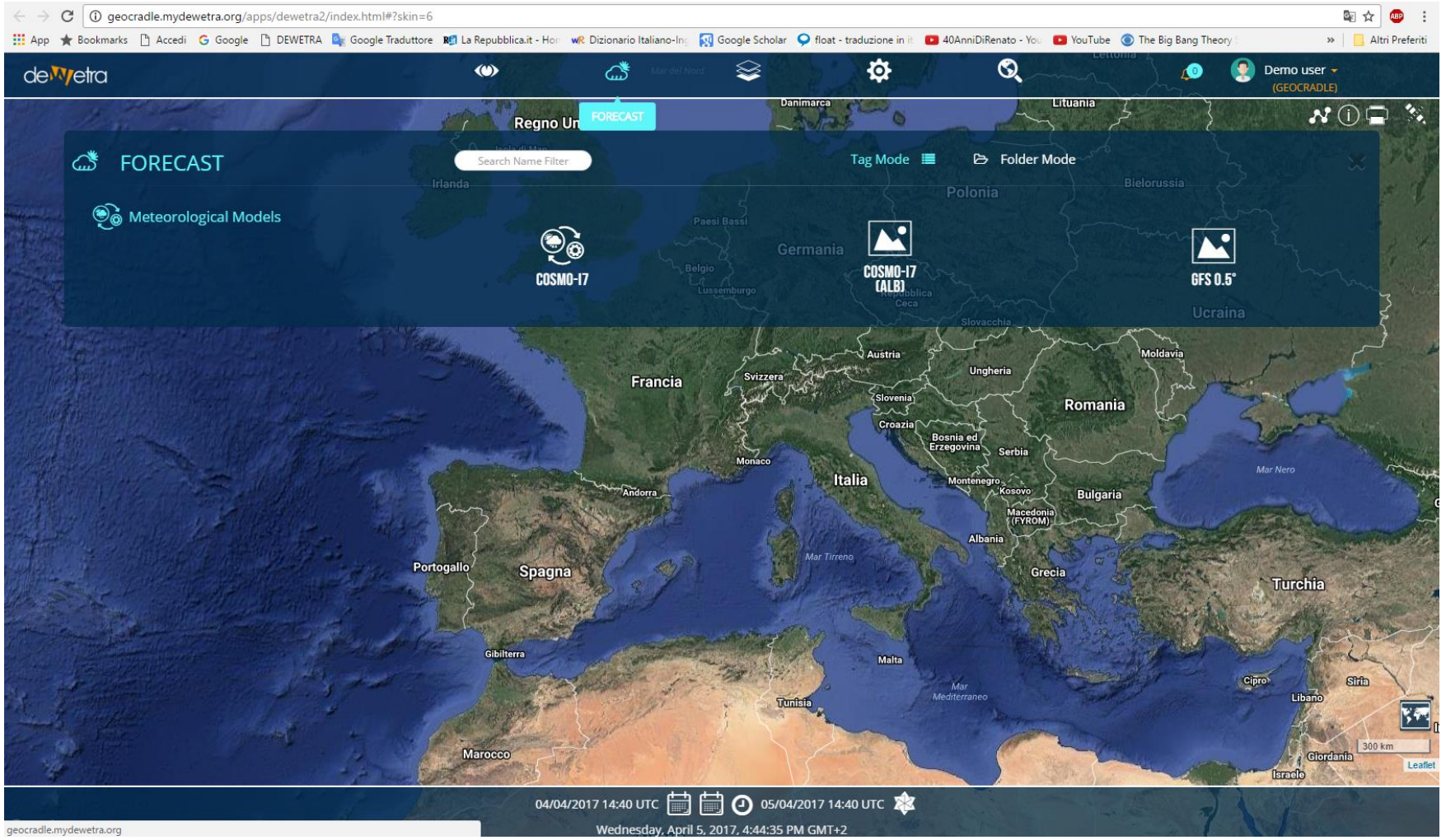

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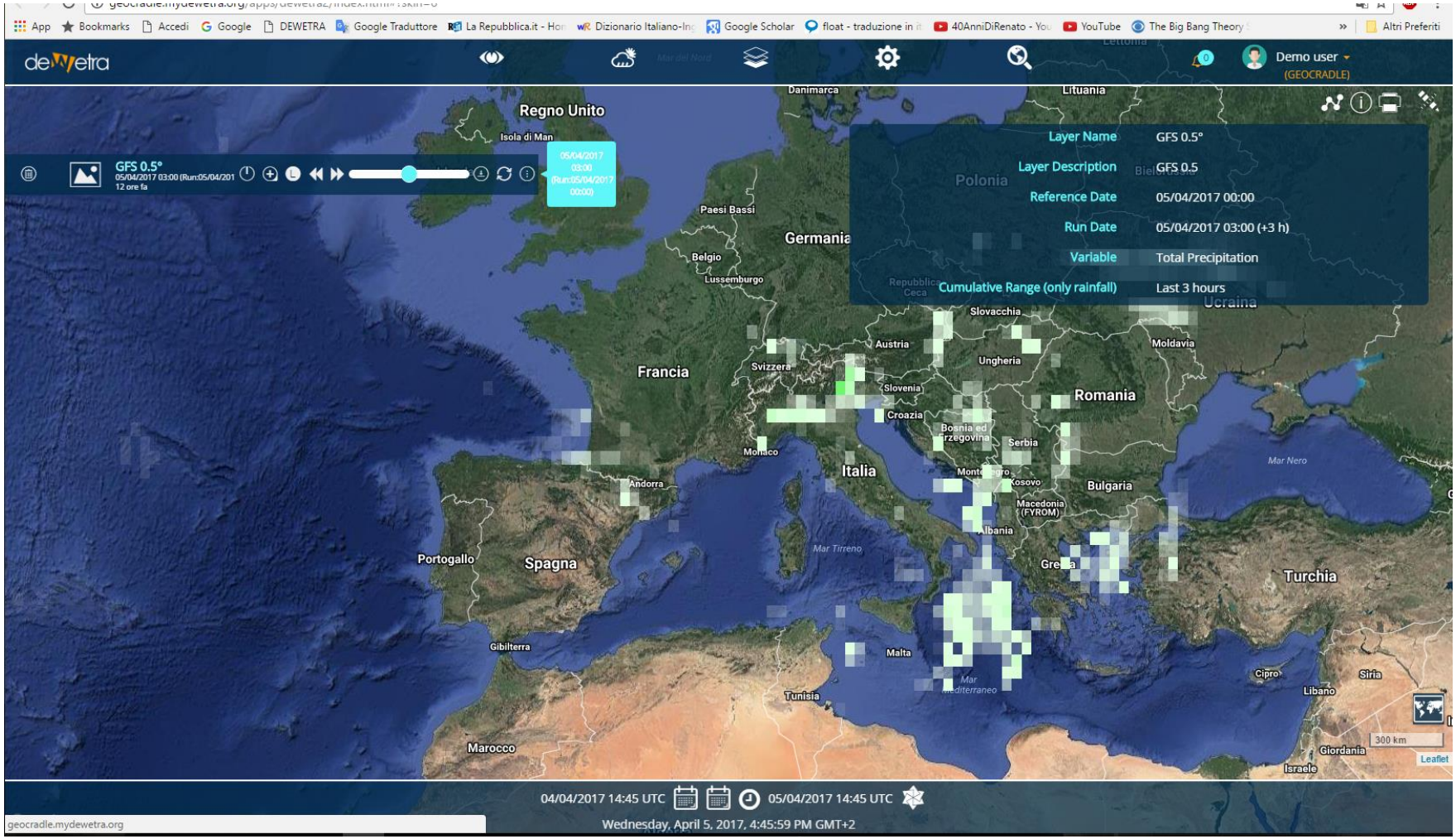

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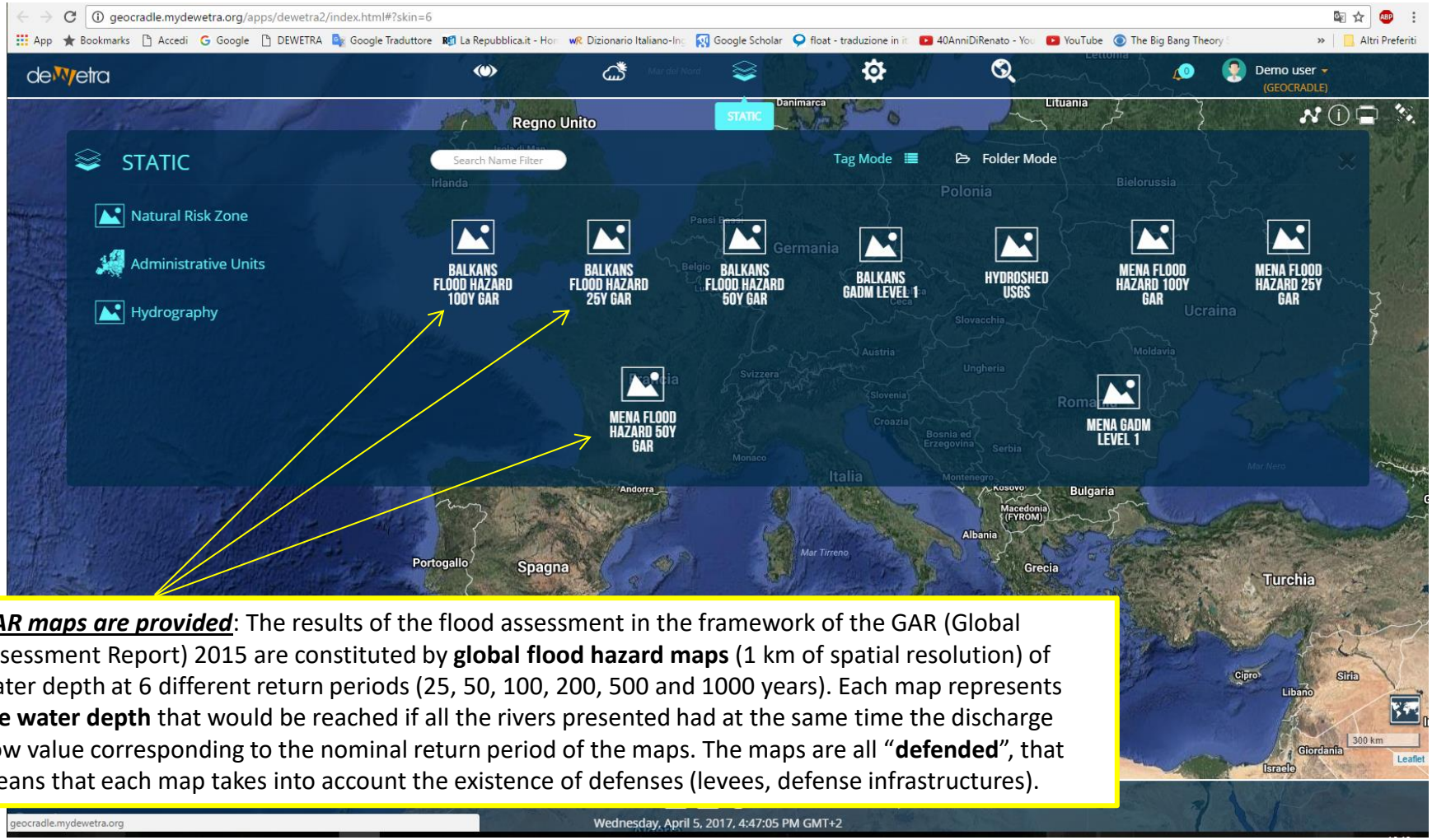

GAR maps are provided: The results of the flood assessment in the framework of the GAR (Global Assessment Report) 2015 are constituted by **global flood hazard maps** (1 km of spatial resolution) of water depth at 6 different return periods (25, 50, 100, 200, 500 and 1000 years). Each map represents **the water depth** that would be reached if all the rivers presented had at the same time the discharge flow value corresponding to the nominal return period of the maps. The maps are all "**defended**", that means that each map takes into account the existence of defenses (levees, defense infrastructures).

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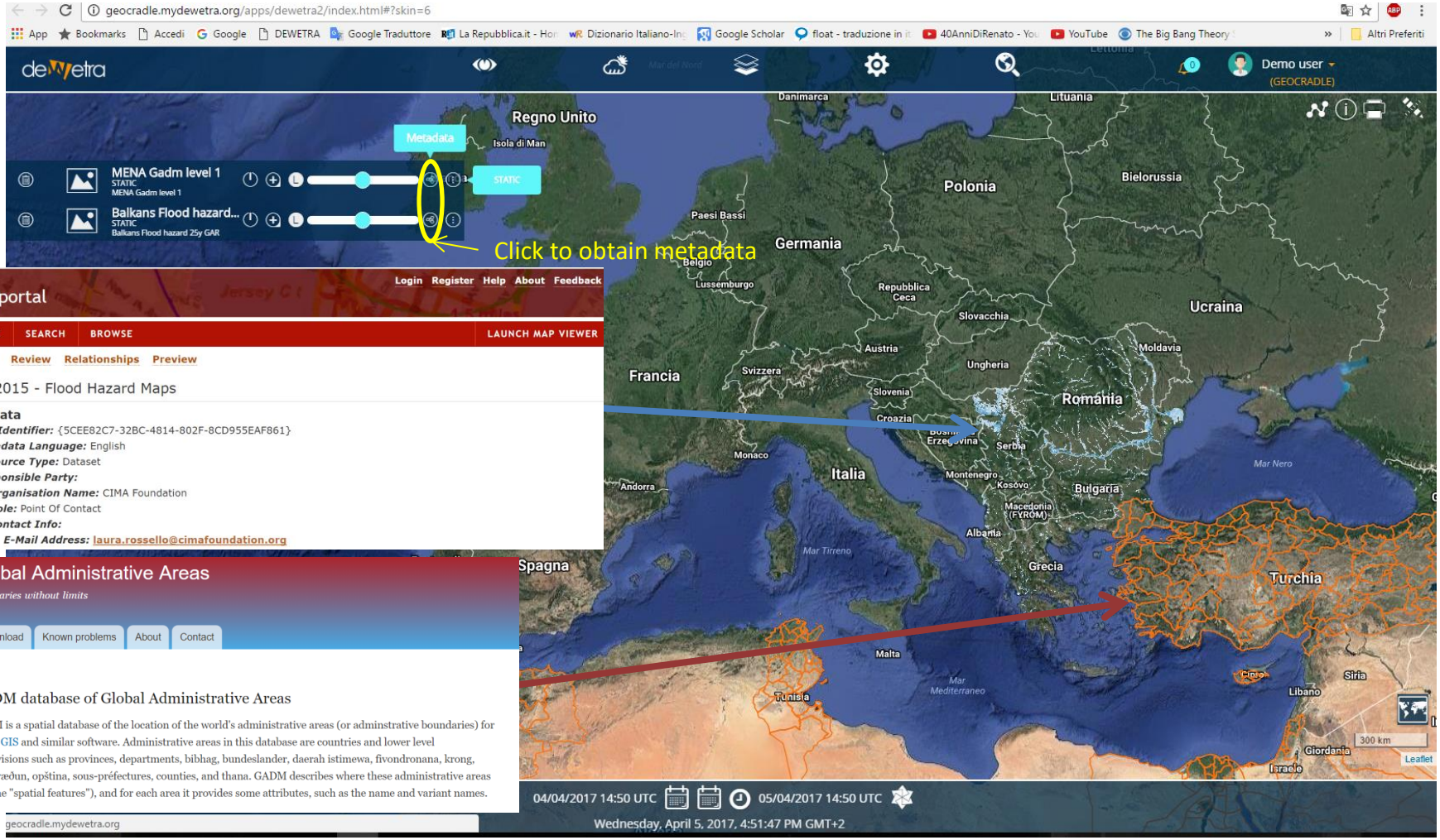

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thank you!

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