



ESTABLISH THE CONNECTION OF CITIZEN OBSERVATORIES RESOURCES WITH CENTRAL CATALOGUE

Dubrovnik INSPIRE Hackathon 2020 – Challenge Final Report

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Earth Observation + Citizen Science =
Empowered Society



Overview & process

The goal of this challenge was to enable the integration of datasets provided from Citizen Observatories as well as from other citizen-science related projects and initiatives, with the [NextGEOSS catalogue](#) as an approach to connect citizen science into GEOSS.

The demonstration of such integration was conducted for the resources provided from the [SCENT Citizen Observatory](#). More specifically, a data harvester was implemented aiming to facilitate the ingestion of metadata from a part of the data collected in the context of SCENT citizen-science campaigns related to the following thematic areas: land cover / use information, soil measurements (i.e. soil moisture and air temperature) and river parameters (i.e. water velocity).

The undertaken activities involve the following main steps:

- ❖ Analysis of existing infrastructure and endpoints that enable machine-to-machine access to resources. This involves analysing of the data model (i.e. data attributes and types), assessing the querying and filtering capabilities of the provided endpoints and, finally and, compiling the descriptive information to be included in the catalogue.
- ❖ Compilation of a template /online questionnaire for documenting data and resources involving community-based environmental monitoring citizen science projects. The online questionnaire is accessible here: <https://docs.google.com/forms/d/e/1FAIpQLScLC3VwrOXXzMW00ZiNeR8cfAdRYX9CKYhZSomdEuM5Rj4R-Q/viewform?vc=0&c=0&w=1>. It is conformant with the metadata fields needed according to the Dublin Core model, and thus enabling the collection of information in a standardised way. The online questionnaire was also communicated to the participants of the challenge towards the collection of information about other existing citizen-science datasets.
- ❖ Implementation, testing and deployment of the data harvester aiming to constitute a prototype for the ingestion of citizen-science resources into a centralised catalogue. The implemented harvester is also available in github: <https://github.com/NextGeoss/ckanext-nextgeossharvest/wiki/17.-Harvesting-Scent-products>

Results

A part of SCENT Citizen Observatory datasets are now available through the NextGEOSS Catalogue. The SCENT project was also added as a Data Provider in NextGEOSS and can be found by searching for "scent" in the Data Providers page (<https://catalogue.nextgeoss.eu/provider>).

Data Providers

NextGEOSS engages the main providers of earth observation data, including Copernicus Collaborative Ground Segments and Core Services. The data hub draws upon resources provided by public, commercial, and research institutions working with satellite, aerial, and in situ measurements.

The following data providers are currently integrated in the NextGEOSS system:

27 data providers found Order by: Name Ascending ▾





 SCENT 16462 Datasets	 SIMOcean 670 Datasets	 Static EBVs 2 Datasets	 USGS 53601 Datasets
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FIGURE 1: SCENT CITIZEN OBSERVATORY IS LISTED AS DATA PROVIDER IN THE NEXTGEOSS CATALOGUE

The Data Connector, created during this challenge to collect a part of the SCENT datasets in the NextGEOSS Catalogue, is cataloguing datasets for the following collections:

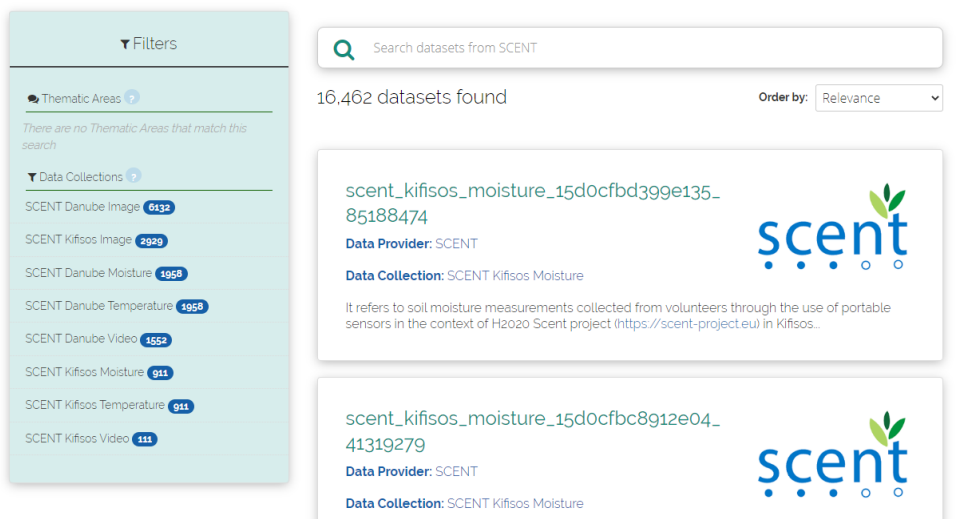
- ❖ **SCENT Danube Image:** *It refers to metadata (textual descriptions) of images of Land Cover/Land Use (LC/LU) elements and/or of river parameters (i.e. water level) collected from volunteers in the context of H2020 Scent project (<https://scent-project.eu/>) in Danube Delta, Romania during 2018-2019. This dataset has been initially collected through the use of Scent Explore application while being enriched by other components of the Scent toolbox such the Scent Intelligence Engine and Scent Collaborate (<https://scent-project.eu/scent-toolbox>).*
- ❖ **SCENT Danube Video:** *It refers to metadata (textual descriptions) of videos, containing a pre-defined floating object (i.e. tennis ball) moving on the surface of a water body, collected from volunteers in the context of H2020 Scent project (<https://scent-project.eu/>) in Danube Delta, Romania (2018-2019). The metadata contain water surface velocity measurements that have been extracted from the videos via the Water Velocity Calculation Tool consisting of innovative video processing algorithms (<https://scent-project.eu/scent-toolbox>).*
- ❖ **SCENT Danube Moisture:** *It refers to soil moisture measurements collected from volunteers through the use of portable sensors in the context of H2020 Scent project (<https://scent-project.eu/>) in Danube Delta, Romania during 2018-2019. Scent Measure application (<https://scent-project.eu/scent-toolbox>) has been used in tandem with portable sensors for the collection of this dataset.*
- ❖ **SCENT Danube Temperature:** *It refers to air temperature measurements collected from volunteers through the use of portable sensors in the context of H2020 Scent project (<https://scent-project.eu/>) in Danube Delta, Romania during 2018-2019. Scent Measure application (<https://scent-project.eu/scent-toolbox>) has been used in tandem with portable sensors for the collection of this dataset.*

- ❖ **SCENT Kifisos Image:** *It refers to metadata (textual descriptions) of images of Land Cover/Land Use (LC/LU) elements and/or of river parameters (i.e. water level) collected from volunteers in the context of H2020 Scent project (<https://scent-project.eu/>) in Kifisos river basin, Greece during 2018-2019. This dataset has been initially collected through the use of Scent Explore application while being enriched by other components of the Scent toolbox such the Scent Intelligence Engine and Scent Collaborate (<https://scent-project.eu/scent-toolbox>).*
- ❖ **SCENT Kifisos Video:** *It refers to metadata (textual descriptions) of videos, containing a pre-defined floating object (i.e. tennis ball) moving on the surface of a water body, collected from volunteers in the context of H2020 Scent project (<https://scent-project.eu/>), in Kifisos river basin, Greece (2018-2019). The metadata contain water surface velocity measurements that have been extracted from the videos via the Water Velocity Calculation Tool consisting of innovative video processing algorithms (<https://scent-project.eu/scent-toolbox>).*
- ❖ **SCENT Kifisos Moisture:** *It refers to soil moisture measurements collected from volunteers through the use of portable sensors in the context of H2020 Scent project (<https://scent-project.eu/>) in Kifisos river basin, Greece during 2018-2019. Scent Measure application (<https://scent-project.eu/scent-toolbox>) has been used in tandem with portable sensors for the collection of this dataset.*
- ❖ **SCENT Kifisos Temperature:** *It refers to air temperature measurements collected from volunteers through the use of portable sensors in the context of H2020 Scent project (<https://scent-project.eu/>) in Kifisos river basin, Greece during 2018-2019. Scent Measure application (<https://scent-project.eu/scent-toolbox>) has been used in tandem with portable sensors for the collection of this dataset.*

SCENT



SCENT is a European Union research project funded under the Horizon 2020 programme. The project runs between 2016 and 2019 and comprises 10 partner organisations across 6 countries. The project demonstrates the huge potential of citizen observation and monitoring of the environment. A people-led online observation movement captures land-cover use and changes through user-friendly tools and technologies. The Scent Toolbox, The Scent Toolbox is a crowd-sourcing platform, gaming applications, an authoring tool, an intelligence engine and numerical models, allows citizens, policy makers and other users to freely use Scent technologies to contribute to the aims of the project.



Filters

Thematic Areas

There are no Thematic Areas that match this search

Data Collections

- SCENT Danube Image 6132
- SCENT Kifisos Image 2929
- SCENT Danube Moisture 4958
- SCENT Danube Temperature 4958
- SCENT Danube Video 4552
- SCENT Kifisos Moisture 911
- SCENT Kifisos Temperature 911
- SCENT Kifisos Video 411

Search datasets from SCENT

16,462 datasets found

Order by: Relevance

scent_kifisos_moisture_15d0cfbd399e135_85188474

Data Provider: SCENT

Data Collection: SCENT Kifisos Moisture

It refers to soil moisture measurements collected from volunteers through the use of portable sensors in the context of H2020 Scent project (<https://scent-project.eu/>) in Kifisos...

scent_kifisos_moisture_15d0cfbc8912e04_41319279

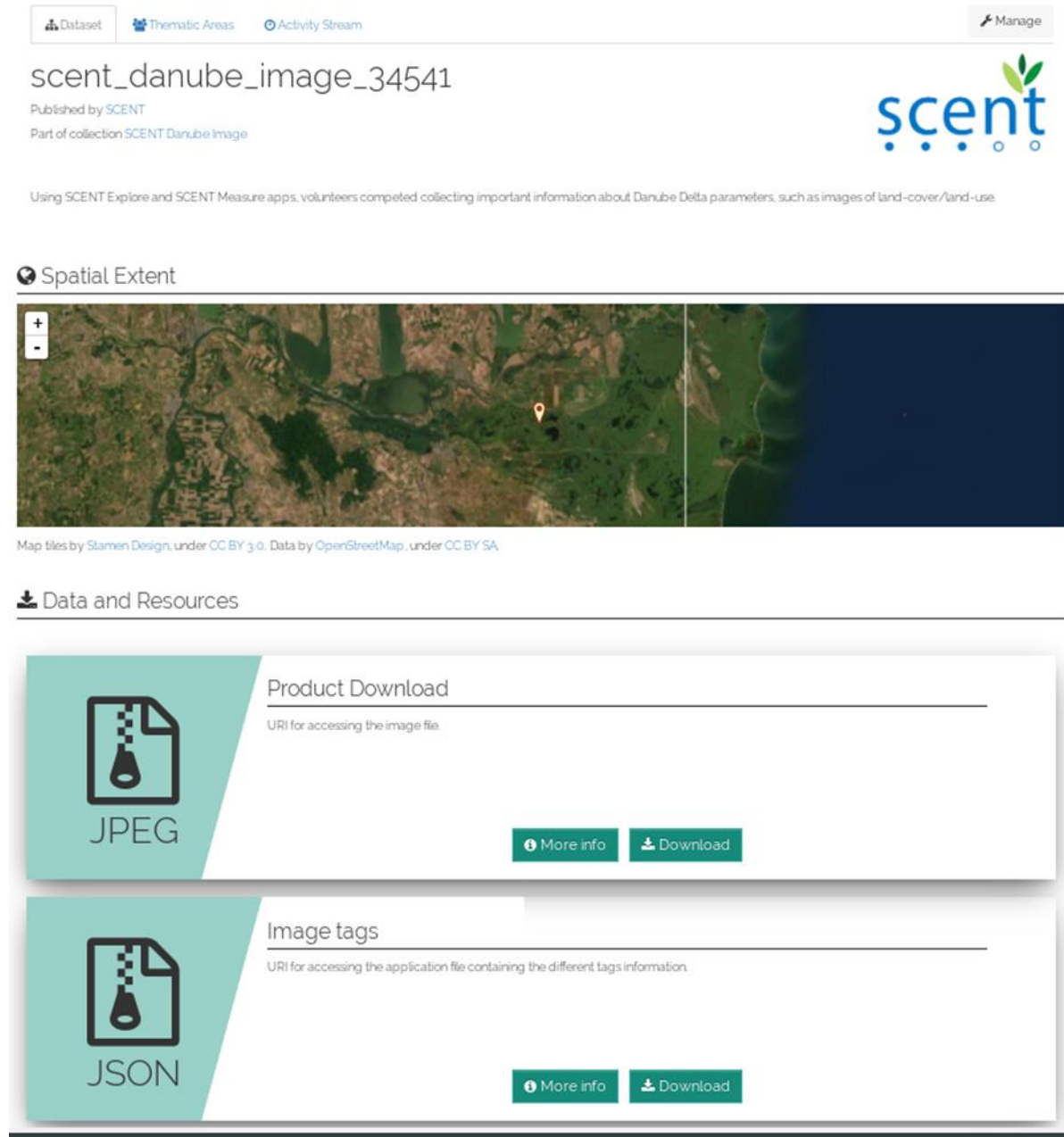
Data Provider: SCENT

Data Collection: SCENT Kifisos Moisture

FIGURE 2: OVERVIEW OF THE SCENT DATA COLLECTIONS IN NEXTGEOSS CATALOGUE

All the datasets, organized by collection can be found when accessing the Data Provider page in the NextGEOSS Catalogue: <https://catalogue.nextgeoss.eu/organization/scent>. It is also possible to select individual Data Collections to filter the results.

Considering all the data collections, more than 16.000 datasets were catalogued, containing metadata and resource links to download the corresponding files associated to each dataset (e.g. images, videos, json files).



The screenshot shows a dataset page for 'scent_danube_image_34541'. At the top, there are navigation tabs for 'Dataset', 'Thematic Areas', 'Activity Stream', and 'Manage'. Below the title, it says 'Published by SCENT' and 'Part of collection SCENT Danube Image'. The SCENT logo is on the right. A descriptive sentence follows: 'Using SCENT Explore and SCENT Measure apps, volunteers competed collecting important information about Danube Delta parameters, such as images of land-cover/land-use'. The 'Spatial Extent' section features a satellite map with a location pin and a zoom control. Below the map is a copyright notice: 'Map files by Slamen Design, under CC BY 3.0. Data by OpenStreetMap, under CC BY SA'. The 'Data and Resources' section contains two download cards. The first card is for a 'JPEG' file, with a description 'Product Download' and 'URI for accessing the image file'. It includes 'More info' and 'Download' buttons. The second card is for a 'JSON' file, with a description 'Image tags' and 'URI for accessing the application file containing the different tags information'. It also includes 'More info' and 'Download' buttons.

FIGURE 3: A SCREENSHOT OF A DATASET PAGE, INCLUDING THE DATASET COORDINATES OVER THE MAP AND THE AVAILABLE DOWNLOAD LINKS

It is also possible to search for the SCENT collections in the NextGEOSS Catalogue via OpenSearch interface and filter them by collection, time interval and so on. Some examples of queries below:

- ❖ Collection SCENT_DANUBE_IMAGE:
https://catalogue.nextgeoss.eu/opensearch/search.atom?productType=SCENT_DANUBE_IMAGE
- ❖ Collection SCENT_DANUBE_IMAGE + Time interval:
https://catalogue.nextgeoss.eu/opensearch/search.atom?productType=SCENT_DANUBE_IMAGE&timerange_start=2019-06-01T07:16:00&timerange_end=2019-06-01T07:17:00
- ❖ Collection SCENT_KIFISOS_IMAGE:
https://catalogue.nextgeoss.eu/opensearch/search.atom?productType=SCENT_KIFISOS_IMAGE

A strong interaction between the NextGEOSS team and the Data provider was kept during the process in order to ensure that the Data would be catalogued and exposed through the NextGEOSS Catalogue according to the Data provider expectations.

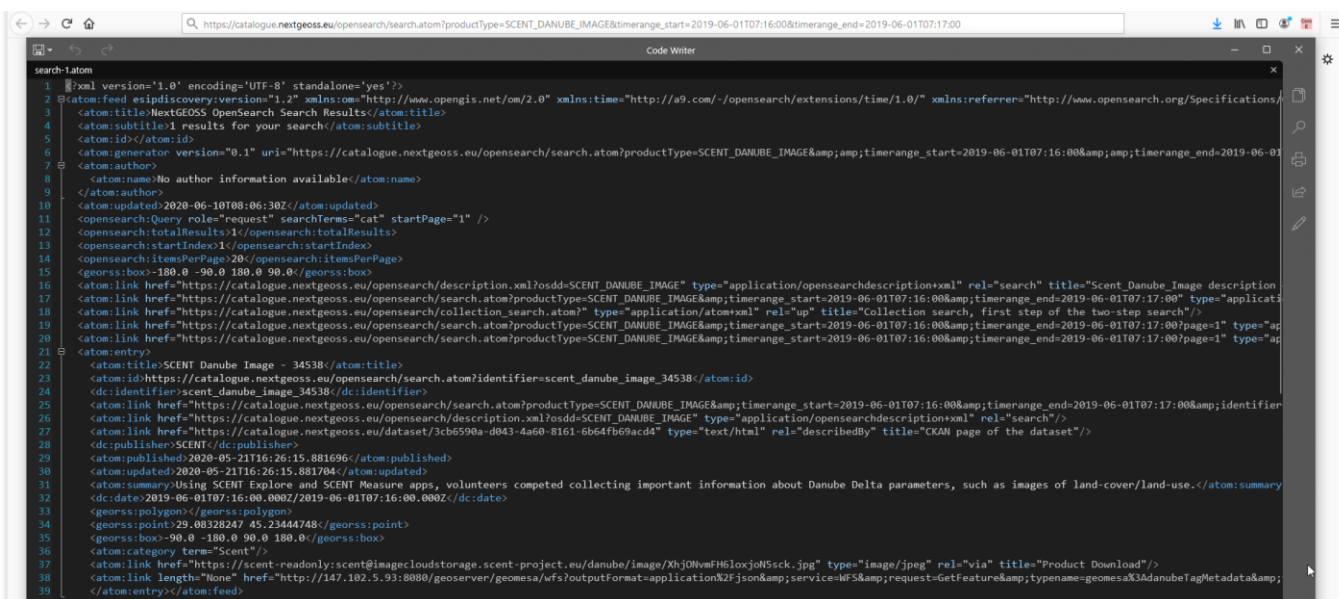


FIGURE 4: EXAMPLE OF THE RESULT FOR THE EXTRACTION OF LC/LU IMAGES VIA THE OPENSEARCH INTERFACE

Impact

Cross sectoral and boundary interoperability

The output of this challenge aims to maximise the value of citizen-science data by facilitating the discoverability (citizen-science data and all associated metadata are discoverable through a centralised catalogue) and usability (provision of all elements necessary to access, use, understand, and process, preferably via formal structured metadata based on international or community-approved standards).of the latter in the context of environmental related applications and according to the GEOSS data management principles. Further to this, the various citizen science initiatives and projects in place, have led to the creation of a rather fragmented landscape of repositories, having their resources available

under different models, frameworks and technologies. Leveraging the approach introduced in this challenge as well as GEOSS and its data management principles can act as a deterring factor towards creating silos of resources, while promoting the use of open solutions and common standards for data sharing.

Sustainable Development Goals (SDGs)

Citizen science constitute an important source of information that can contribute in different processes linked to the SDGs (i.e. monitoring progress and implementing action). In particular, during the last years there has been a rapid increase of citizen-generated knowledge that has been facilitated by the wider use of mobile devices and low-cost portable sensors. To enable their easy integration to existing models and systems as well as their utilisation in the context of new applications, citizen-science data should be easily discoverable, accessible and available for future use. The harvesting and cataloguing process implemented in this activity contributes to the realisation of this need, while also supporting the use of these resources as part of SDGs monitoring and implementation processes.

Contacts

In case you want to improve discoverability of your citizen-science resources following the harvesting and cataloguing principles employed in this challenge, feel free to contact: info@weobserve.eu | join.us@nextgeoss.eu

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