

The Water SWITCH-ON, Spatial Information Platform (SIP)



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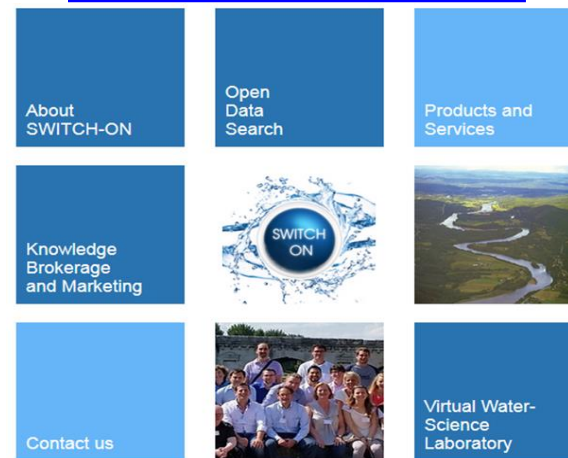
- **Project context**
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 - Design principles
 - Agile software development approach
 - Component and layer driven development
- **Software architecture**
 - Components and relationships
 - Components and functionalities
 - BYOD (Browse Your Open Dataset)
 - ODR (Open Data Registration) tool
 - REST interfaces and Catalogue
 - SIP Expert tool
 - Catalogue and data model
- **Documentation and code**
- **Conclusions**

Project context

- SWITCH-ON is a project using **Open Data** as a vehicle for innovations, with the aim to use water resources in a sustainable way for a safe society and to advance hydrological sciences.
- We are building bridges between policy makers, water managers, information producers and scientists.
- EU research project running **Nov 2013 – Oct 2017** within the **FP7**.
- 15 collaborating **partners** (5 Universities, 2 Governmental institutes, 8 SMEs).



www.water-switch-on.eu



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Design principles

“As hydrological modeller, I would like to find different data types (like meteo and discharge), which are spatially correlated (in other words, in the same catchment), so I can directly see if all the data for my model is available.”

Remko Nijzink (TU Delft)

- Main search/discovery/access objectives and design principles:
 - **Spatial** search for water-related datasets (**Polygons** work better than simple bounding boxes).
 - **License-based** search and terms of use per dataset.
 - Combined **keywords** search both free-text, generic (**INSPIRE** topic categories) and domain specific (**X-CUAHSI** keywords, hydrologic ontology).
 - Access should be **directly** accessible (no registration) and **links** should be verified.
 - Catalogue of datasets should be **harvestable** by other big projects such as GEOSS.

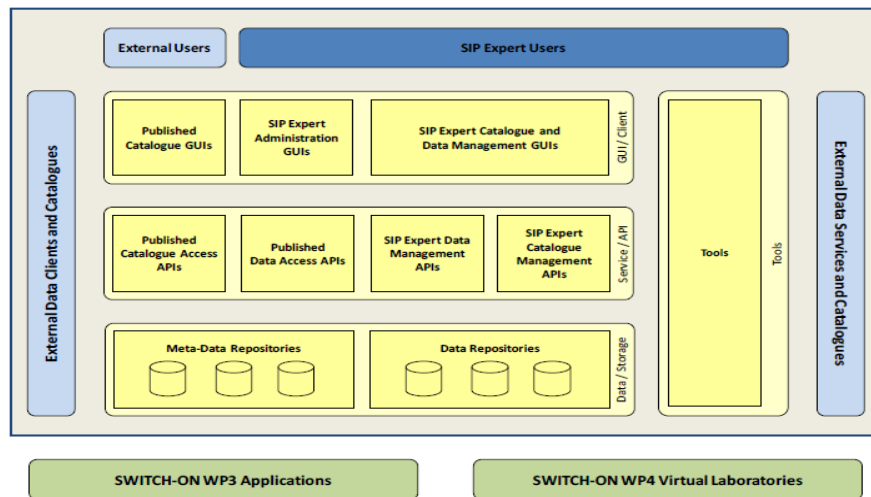
Agile Software development approach

- Correcting an initial IT development approach based on existing GIS tools within the consortium.
- **User story** driven development via GitHub issues (**iterative** process, refinement).
- **Use cases** written by scientists, technical solution led by IT professionals.
- Interactive sessions with both **developers** and **scientists** led to better Graphical User Interfaces.



Component and layer driven development

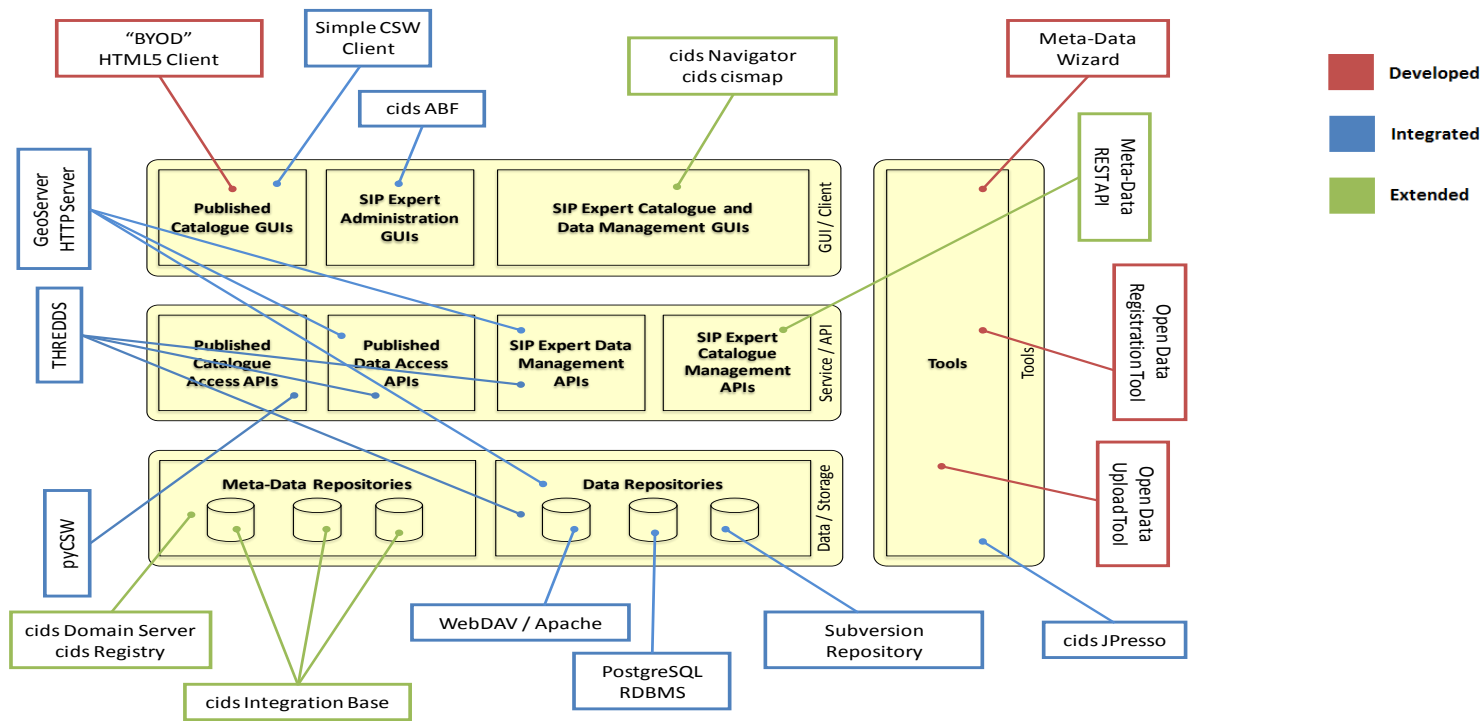
- Divide and conquer approach: Multiple software components communicating via **REST** services.
- Metadata **ISO standards + OGC protocols** used to serve external services and catalogues.
- Components divided in 3 layers (**Data/Storage**, **Service/API**, **GUI/Client**)



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Components and relationships



Components and functionalities

Functionality	Switch-ON component	Technologies / Software packages
Search/View/Download	SIP HTML5 easy GUI (BYOD)	Html5/JS/AJAX, pyCSW, ncWMS
Interoperate/Discover	REST API / Simple CSW client	Swagger / pyCSW
Store	SIP Metadata Relational DB	PostgreSQL / PostGIS / SVN
Upload/Describe and generate DOI	Upload data and metadata tool	Flask/Python, THREDDS, GeoServer, Zenodo DOI REST API.
Edit / Delete / Maintain	SIP Expert GUI (Desktop)	Java Web Start (JavaWS)
Participate/Review	Protocol tool	Django/Python
Navigate	Project main website	WordPress CMS

BYOD (Browse your open dataset) – Map view

Free text search

Resources (6)

- Coastal water body shapes, ...
- MODIS Water Mask
- Surface water body
- Transitional water body shapes
- Waterbase - UWWTD: ...
- Waterbase - UWWTD: ...

Search Results

Spatial Preview

BYOD (Browse your open dataset) – List view

Selected keywords

Keyword groups

The screenshot shows the INSPIRE web client interface. At the top, there's a search bar with 'inlandWaters' entered. Below it, a dropdown menu for 'INSPIRE TOPIC Categories' is open, with 'inlandWaters' selected. The main content area displays a list of datasets with columns for 'Description' and 'Keywords'. The 'Keywords' column shows various tags like 'assessment', 'bathing', 'chemical', 'dataset', etc. The left sidebar contains filters for 'Data origin', 'License', and 'Access'. The 'Data origin' filter shows 'EA - Bathing Water Quality' and 'EA - Nutrients'. The 'License' filter shows 'citation needed', 'Conditions unknown', and 'Creative Commons'. The 'Access' filter shows 'download', 'information', 'link to order data', 'search', and 'service'. The right sidebar shows 'Keywords' for each dataset, with 'assessment' and 'bathing' being common tags.

Data origin

License

Access

ODR (Open Data Registration) tool - Upload



Data Upload Tool

[Upload Guide](#)
[Registration Guide](#)
[Virtual Water Science Lab](#)


Upload the dataset files. Drag & drop files from your desktop to this webpage or click on "Add files...". The maximum upload size (per file) is 3 GB.

Upload files for dataset Paulina Polder DEM

If you like to upload **shapfiles**, please zip (with a .zip extension) the shapfile before uploading. The tool will automatically create web services (WMS and WFS) for mapping and accessing the shapfile, as well as enabling a spatial search of the dataset. A dataset can contain only one zipped shapfile.

For **netCDF** (.nc) files, the tool will offer OPeNDAP web services for access. You can upload multiple netCDF files.

[+ Add file\(s\)...](#) [Zip selection](#) Select all

paulina_polder_dem_simplified_water_polygons.cpg	0.01 KB	<input type="checkbox"/>
paulina_polder_dem_simplified_water_polygons.dbf	75.06 KB	<input type="checkbox"/>
paulina_polder_dem_simplified_water_polygons.prj	0.85 KB	<input type="checkbox"/>
simplified_water_polygons.shp	29.74 MB	<input type="checkbox"/> Cancel

[Feedback](#)
[Next](#)

DATA UPLOAD

DATA SET DESCRIPTION

GEOGRAPHIC LOCATION

LICENSE AND CONDITIONS

SUMMARY



Open-Data Registration Tool

[UPLOAD GUIDE](#)
[REGISTRATION GUIDE](#)
[Virtual Water Science Lab](#)


Please provide a brief narrative summary of the content of the dataset. Use between 100 and 500 words.

Dataset Description

Name [Get Digital Object Identifier](#)

Link to Data

Description

Keywords [Land cover](#) [Land management](#) [soil depth](#) [Geology](#)

[Feedback](#)
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DATA SET DESCRIPTION

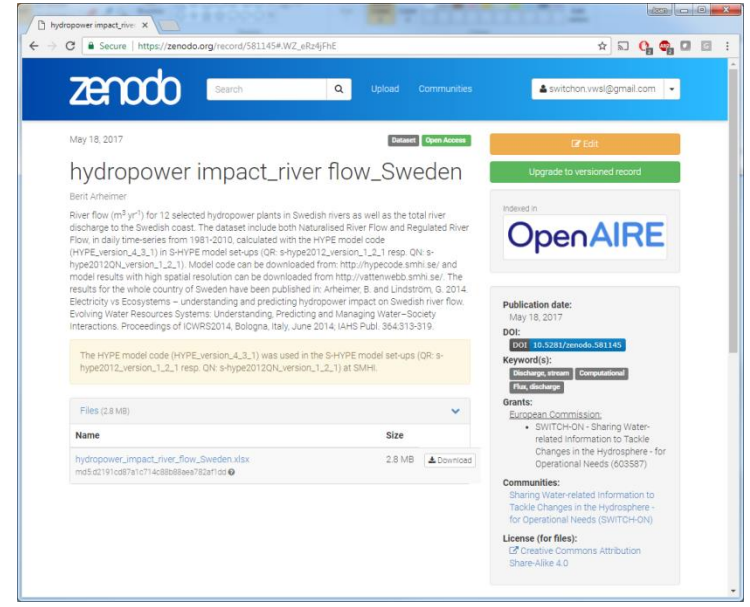
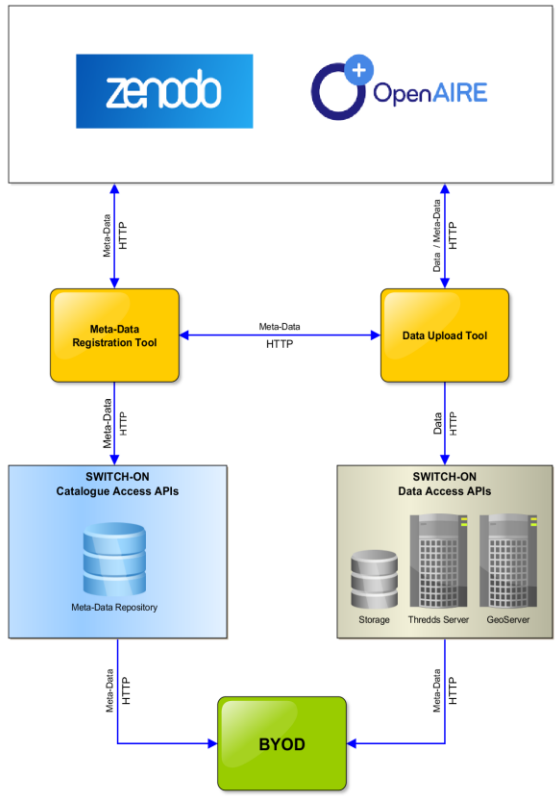
GEOGRAPHIC LOCATION

LICENSE AND CONDITIONS

SUMMARY

DOI (Digital Object Identifier)

The **OpenAIRE** project, in the vanguard of the open access and open data movements in Europe was commissioned by the EC to support their nascent Open Data policy by providing a catch-all repository for EC funded research.



ODR (Open Data Registration) tool - Describe



Open-Data Registration Tool

- UPLOAD GUIDE
- REGISTRATION GUIDE
- Virtual Water Science Lab



Select one or more countries that represent the spatial extent of the dataset.

Geographic Location

Please select one

- Define bounding box or polygon
- Select countries
- Enter bounding box coordinates

Geolocation options

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DATASET DESCRIPTION

GEOGRAPHIC LOCATION

LICENSE AND CONDITIONS

SUMMARY



Open-Data Registration Tool

- UPLOAD GUIDE
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Provide information on the sources used to create datasets. Links and citations can be included.

License and Conditions

Access Conditions: Creative Commons (CC BY)

License Statement: Additional conditions for accessing and using the data.

Contact Person: Joan Sala Calero | joan.salacalero@deltares.nl

Institution: Deltares | www.deltares.nl

Citation / DOI: Optional citation information or manually provided Digital Object Identifier (DOI)

Data Lineage: [Abn2 digital elevation model. For more information please visit: http://www.abn.nl/index.html](http://www.abn.nl/index.html)

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License conditions

DATASET DESCRIPTION

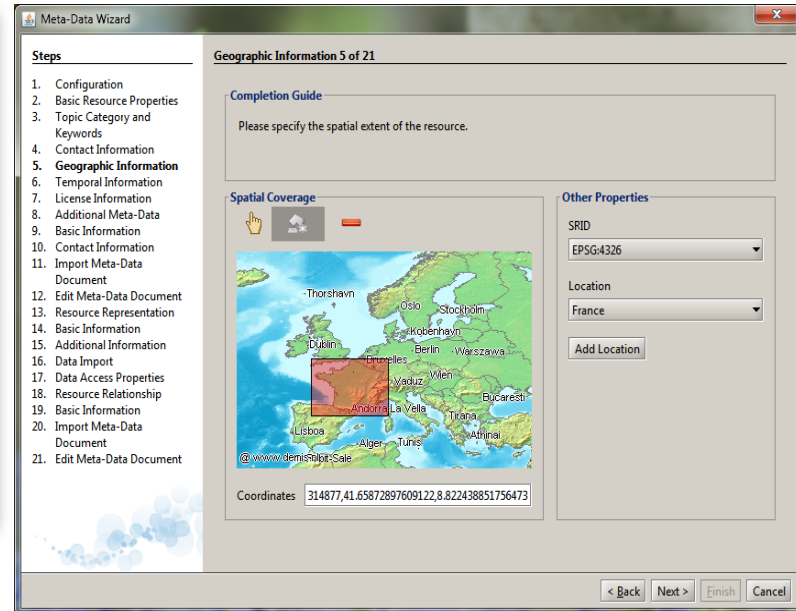
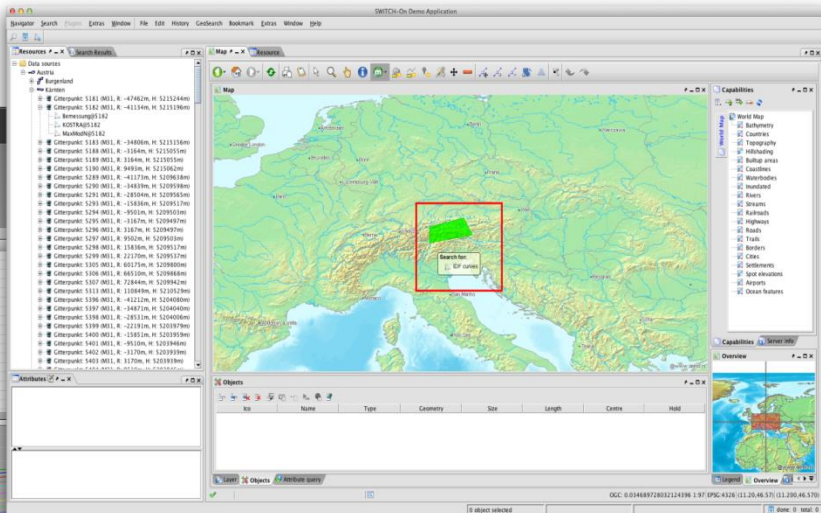
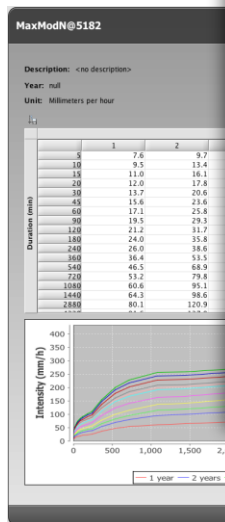
GEOGRAPHIC LOCATION

LICENSE AND CONDITIONS

SUMMARY

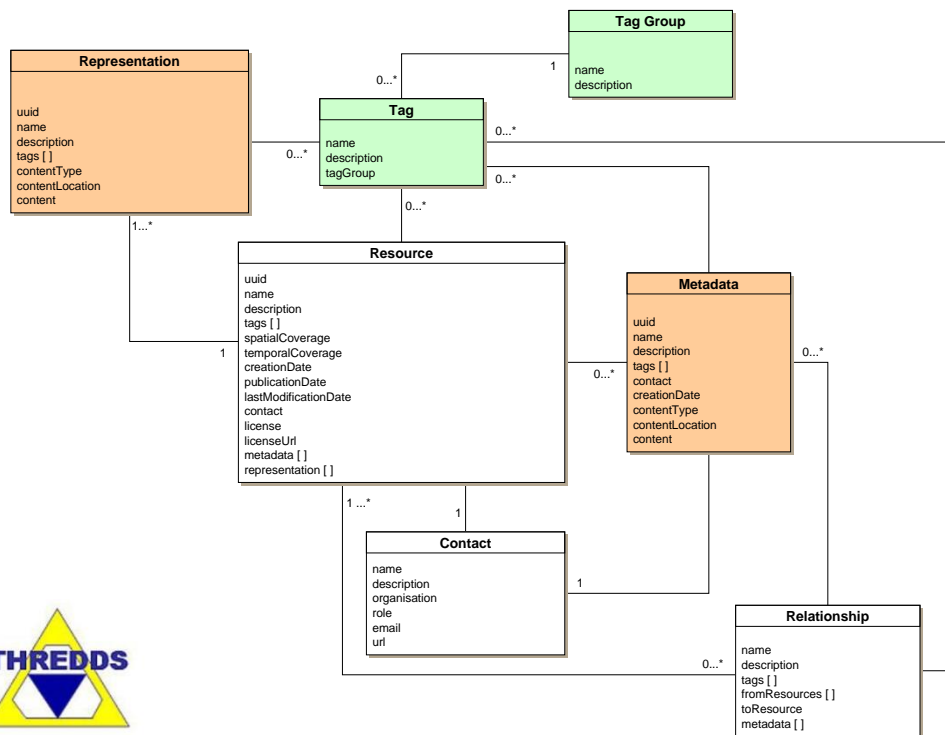
SIP Expert tool

- Data management tool used by **project administrators** users only.
- **Extended** metadata editing capabilities (ex: **delete** datasets).
- Desktop tool with **GIS** capabilities and data visualization and **validation**.



Catalogue and data model

- **Data** stored in Geoserver, Thredds, depending on the data type.
- **Metadata** Information stored in a Relational Database (PostGIS).
- Information fields can be easily mapped to standards such as **ISO 19115**.
- Simple CSW client instance configured to enable easy access to the catalogue.

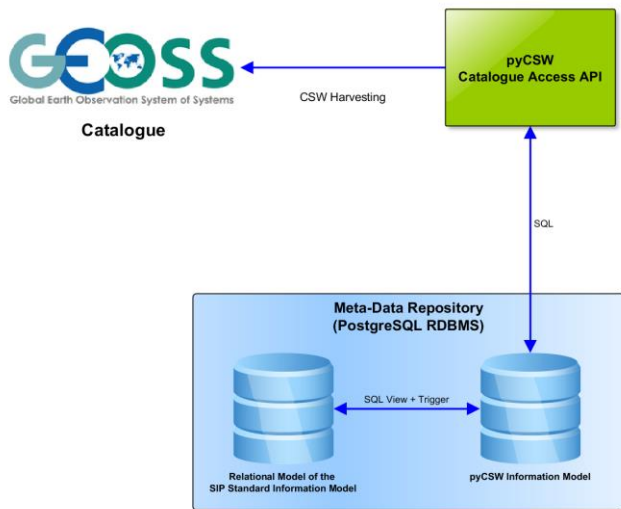


GeoServer



Catalogue and data model (GEOSS data provider)

- Aim: To gain more **visibility/exposure** of the project datasets.
- **OGC/CSW** protocol and **ISO 19115** metadata facilitates the exchange.



The screenshot displays the GEOSS Portal interface for the 'Water Switch-ON EU project'. Key elements include:

- Navigation:** 'Data providers' menu, search bar with 'switch' entered, and 'ORDER BY' dropdown set to 'Name Ascending'.
- Project Title:** 'Water Switch-ON EU project' with a registration date of 2017-05-15.
- Description:** A paragraph explaining the project's goal to use Open Data for innovation in water resources management.
- Metadata:** 'The GEO Affiliation: Non GEO', 'The Data Policy: GEO Data CORE', and 'The geographical coverage: Global'.
- Goals and Benefits:** 'The Sustainable Development Goals' (represented by 17 icons) and 'The Societal Benefit Areas' (represented by 7 icons).
- Footer:** 'Visible 1 · 1 of 1', 'Send Feedback', and 'Terms & Conditions'.

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Documentation (video tutorials)



SWITCH-ON ForecastBroker Version 2
8 visualizaciones • Hace 2 meses



SWITCH ON SafeTrip
30 visualizaciones • Hace 1 año



SWITCH ON RiverInfo.eu
88 visualizaciones • Hace 1 año



SWITCH ON NUTPRINT
55 visualizaciones • Hace 1 año



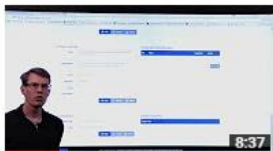
SWITCH ON ForecastBroker
77 visualizaciones • Hace 1 año



SWITCH ON BYOD Tool
234 visualizaciones • Hace 1 año



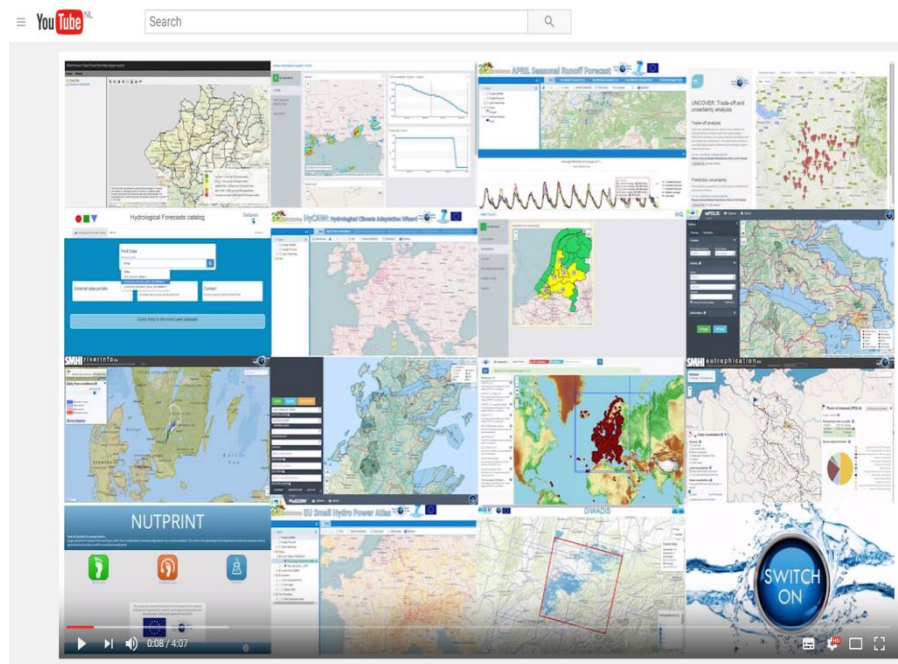
SWITCH-ON FFRM
18 visualizaciones • Hace 1 mes



SWITCH-ON Protocol Tool
10 visualizaciones • Hace 2 meses



SWITCH-ON Open Data Registration and Upload Tool
23 visualizaciones • Hace 2 meses



https://www.youtube.com/channel/UCNbBe7iIT_HRekm3yFzui2g

Open Source code (GitHub)

SWITCH-ON
Sharing Water-related Information to Tackle Changes in the Hydrosphere - for Operational Needs

Europe <http://www.water-switch-...> switchon.wm@gmail.com

Repositories 12 | People 22 | Teams 3 | Projects 0

Search repositories... Type: All | Language: All

cids-custom-switchon-server
SWITCH-ON Server Customisations
● Java Updated 22 hours ago

sip-html5-protocol-tool
SIP HTML5 Protocol Tool
● HTML Updated 16 days ago

sip-html5-data-upload
SIP HTML5 Data Upload Tool
● Python Updated 17 days ago

sip-html5
SIP Catalogue Access GUI HTML5 Application
● JavaScript Updated 25 days ago

Top languages
● JavaScript ● Java ● HTML
● Python ● CSS

Most used topics
cids cismet docker fp7
research-project

People 22 >

switchonproject / switchon-tools

Code Issues 2 Pull requests 0 Projects 0 Wiki Insights

Protocol tool - VWSL #3
Open lornalittle opened this issue on May 12, 2016 • 42 comments

lornalittle commented on May 12, 2016 • edited

1. As a hydrological scientist, I need a tool to define a protocol for a new experiment so that it can be shared on the VWSL with other scientists. (Like the workflow below)

Preparation

- Start: Experiment idea to system hypothesis
- Partners consent, choose lead partner
- Lead partner coordinates: Protocol definition
- Physical design (data requirements, protocols, and hardware)
- Equipment (hardware, software, and formatting)
- Network topology and formatting
- Protocol evaluation
- Notify partners
- Submit parameters: Protocol evaluation
- Do the experiment (data collection and formatting)
- Do the experiment and data collection
- Notify partners
- Contribute partners: Data collection and formatting
- Database publication
- Database evaluation
- Notify partners
- Do the experiment and data collection
- Notify partners

Execution

- All partners: Experiment evaluation according to protocol
- All partners: Report results according to protocol
- Any new identified: Notify partners
- Notify partners
- Report results
- Release results to partners

Analysis

- Coordinate partners: Analyse experiment results
- Results: Release publication of experiment results
- Do you think experiment and/or hypothesis
- Report publication of experiment results

<https://github.com/switchonproject>

INSPIRE conference 2017, September 6-8, 2017, Strasbourg, France

SWITCH-ON is an EU FP7 Collaborative project (grant agreement No. 603587) under the Environment programme running from November 2013-October 2017

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Conclusions

- SWITCH-ON architecture is divided in several **OGC compliant** components instead of a single entity.
- The **agile development** approach was very successful.
- SWITCH-ON uses both **CUAHSI keywords** (extended) and **INSPIRE topic** categories to tag uploaded open data.
- **Zenodo API** allows users to make their data/work citeable (DOIs).
- Thanks to the usage of **OGC/CSW** protocol the datasets are **harvestable** by bigger catalogues such as the GEOSS system of systems.
- Code is open-source and available through **GitHub**
- There is documentation and online howto videos on the **switch-ON Youtube** channel

Thank you!



www.water-switch-on.eu