

How to use the
REXUS Observatory



Structure

Dataset: The REXUS Observatory's data publishing unit is known as "dataset," which refers to a parcel of data. It might, for example, be the temperature values for a certain location at a particular time. A dataset is made up of "metadata" and a number of "resources" that contain the actual data. CSV and Excel files, as well as graphics and linked data in RDF format, are examples of data formats. Last, but not least, a dataset might either have a high or low amount of resources in it.

Metadata: A loose term of metadata is "data about data". Metadata identify and explain all characteristics of a given dataset (i.e., the who, why, what, when and where) that allow the physical format, content and context of the data to be understood. All datasets are accompanied with metadata, which are provided via the Data collection protocol.

Pilots: All datasets provided via the Observatory are related to one of the pilots of the REXUS project, i.e., the [Nima-Amaime Subwatershed](#), [Spain National Territory](#), [Isonzo river basin](#), [Pinios river basin](#) and [Lower Danube river basin](#). In the first version of the observatory, indicative datasets from all pilots are successfully collected.

Sectors: Several sectors are introduced in order to better categorize the datasets in the Observatory. A dataset can belong to more than one sector. Multiple sectors have been defined for the 1st version of the repository, but only three are populated with data so far: Water, Climate change and Pilot data. These sectors provide a straightforward method for users to find and access data based on their interests.

Administrator: The repository has an administrator who is in charge of maintaining the content and users, as well as assigning authorization rights to users.

User: The repository can be accessed only from the partners of the REXUS project. These users can view the uploaded datasets and access them through the interface

Welcome Page

The welcome page of the REXUS Observatory introduces you to the Observatory and allows you to login with your credentials, in order to access the datasets. The welcome page contains a small description of the project and the Observatory, along with statistics showing (i) the number of pilots, (ii) the available datasets and (iii) the sectors provided in the tool (Figure 1).

When the login is complete, you will be redirected to your "Dashboard", where you will be able to see activity from items you are following, i.e., Pilots, Sectors and Datasets. At the top of the page, there is a menu for allowing you to easily navigate to the Datasets page, the Pilots page, the Sectors page and the About page (Figure 2).

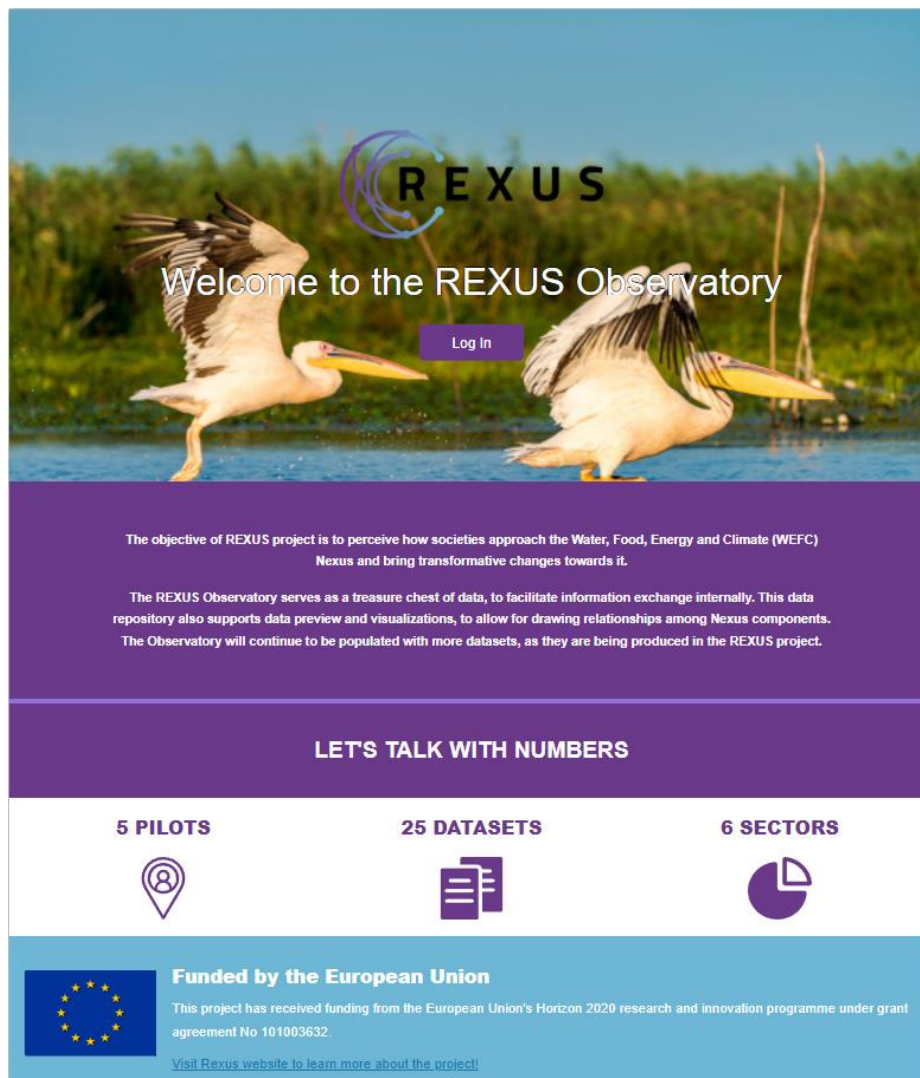


Figure 1: Welcome page of the REXUS Observatory

The image shows the REXUS dashboard landing page. At the top, there is a navigation bar with the REXUS logo on the left and a search bar on the right. The search bar contains the text "Search" and a magnifying glass icon. Below the navigation bar, the main content area is titled "Dashboard". It features a sub-navigation bar with four tabs: "News feed", "My Datasets", "My Pilots", and "My Sectors". A "Profile settings" button is located on the right side of this sub-navigation bar. The "News feed" tab is active, displaying a message: "News feed Activity from items that I'm following". Below this, there is a notification: "REXUS signed up 4 days ago". A dropdown menu on the right of the news feed is set to "Everything". At the bottom of the page, there is a footer section. On the left, it says "CKAN API" and includes the European Union flag logo. To the right of the flag, it states: "This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101003632." On the right side of the footer, it says "Powered by" and features the CKAN logo.

Figure 2: Landing page after Login

Login

At the welcome page you are provided with a login button. In order to have access to the Observatory you should login to the REXUS account that is shared among consortium partners. (Figure 3)

Log In

REXUS Datasets Pilots Sectors About Search

Home / Login

Need an Account?
Then sign right up, it only takes a minute.
[Create an Account](#)

Forgotten your password?
No problem, use our password recovery form to reset it.
[Forgot your password?](#)

Login

Username:

Password:

Remember me

[Login](#)

CKAN API
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101003632.

Powered by ckan

[Rexus Website](#)
[Rexus Twitter](#)
[Rexus LinkedIn](#)
[Rexus Facebook](#)

Figure 3: Login page

Pilots

You can navigate to the Pilots page of the Observatory by selecting “Pilots” from the menu (Figure 4). Each pilot has a dedicated page, where you can find information about the pilot (tab “About”) and look at the latest activities relating to the datasets of the specific pilot (tab “Activity Stream”) (Figure 5).

The screenshot shows the REXUS website's 'Pilots' page. At the top, there is a navigation bar with the REXUS logo on the left and menu items 'Datasets', 'Pilots' (highlighted), 'Sectors', and 'About' on the right. A search bar is also present in the top right. Below the navigation bar, the page title is 'Pilots'. On the left side, there is a sidebar with a section titled 'What are Rexus Pilots?' containing a brief description of REXUS's mission. The main content area features a search bar for pilots, a dropdown menu set to 'Order by: Name Ascending', and a list of five pilot cards. Each card includes a landscape image, a title, a short description, and the number of datasets associated with that pilot.

Pilot Name	Description	Number of Datasets
Isonzo River Pilot Case	The Isonzo River originates in Val di Trenta with its springs at an altitude of...	4 Datasets
Lower Danube Pilot Case	The Danube River is the second-longest river in Europe, running through 10...	4 Datasets
Nima-Amaime Subwatershed	The Nima River is a tributary of the Amaime River that drains into the Cauca...	4 Datasets
Peninsular Spain & Jucar River Basin	Peninsular Territory of Spain is 505,990 km ² , with a population of 47...	9 Datasets
Pinios River Basin	The Pinios River Basin (PRB) is in central Greece, and it is one of the most...	4 Datasets

Figure 4: Pilot page



Isonzo River Pilot Case

The Isonzo River originates in Val di Trenta with springs at an altitude of 935 m and flows into the Adriatic, near Monfalcone, where it forms a delta that tends, over time, to...

[read more](#)

Followers **0** Datasets **4**

[Follow](#)

Pilots

Isonzo River Pilot ... **4**

Sectors

Climate projections **3**

Pilot data **1**

[Datasets](#) [Activity Stream](#) [About](#)

4 datasets found

Order by:

PRIVATE Climate projections: Potential Evapotranspiration - Isonzo

•Climate variables: Potential evapotranspiration (mm) •Spatial Resolution: 0.11° (~12.5 Km) •Models: Ensemble of 6 different Global and Regional Climate Models combination...

[CSV](#) [ZIP](#)

PRIVATE Climate projections: Precipitation - Isonzo

•Climate variables: Total precipitation (mm) •Spatial Resolution: 0.11° (~12.5 Km) •Models: Ensemble of 9 different Global and Regional Climate Models combination •Scenarios:...

[CSV](#) [ZIP](#)

PRIVATE Climate projections: Temperature - Isonzo

•Climate variable: Mean temperature (°C) •Spatial Resolution: 0.11° (~12.5 Km) •Models: Ensemble of 9 different Global and Regional Climate Models combination •Scenarios: Two...

[CSV](#) [ZIP](#)

PRIVATE Isonzo river basin study area

The Isonzo River originates in Val di Trenta with springs at an altitude of 935 m and flows into the Adriatic, near Monfalcone. The Isonzo catchment basin subtends a total area...

[ZIP](#) [PNG](#)

Figure 5: Page of Isonzo River Pilot Case

Sectors

In the Observatory, you will find different sectors related to the certain thematic aspects of the five pilots of REXUS pilots, by selecting “Sectors” in the menu bar (Figure 6). Each sector has a dedicated page, where you can search within its datasets (tab “Datasets”) and look at the latest activities relating to the datasets of the specific sector (tab “Activity Stream”) (Figure 7).

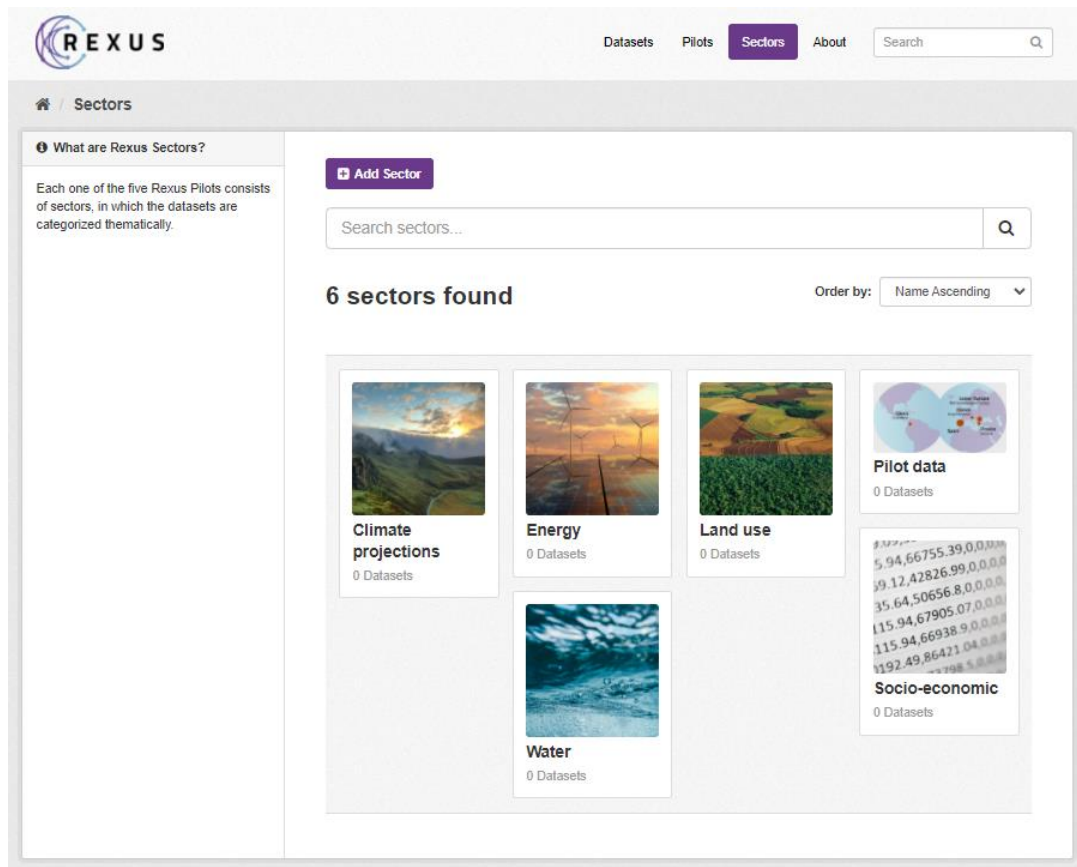


Figure 6: Sectors page



Climate projections

Followers: 0
Datasets: 15

[Follow](#)

Pilots

Isonzo River Pilot ... 3

Lower Danube Pilot ... 3

Nima-Amaime Subwate... 3

Peninsular Spain & ... 3

Pinios River Basin 3

Sectors

Climate projections 15

[Datasets](#) [Activity Stream](#) [About](#)

15 datasets found

Order by: Relevance

PRIVATE **Climate projection: Potential Evapotranspiration - Nima-Amaime**
•Climate variables: potential evapotranspiration (mm) •Spatial Resolution: 0.44°(48 Km) •Models: Ensemble of 3 different Global and Regional Climate Models combination...
[CSV](#) [ZIP](#)

PRIVATE **Climate projections: Precipitation - Nima-Amaime**
•Climate variables: Total precipitation (mm) •Spatial Resolution: 0.2° (25km) •Models: Ensemble of 2 different Global and Regional Climate Models combination •Scenarios: Two...
[CSV](#) [ZIP](#)

PRIVATE **Climate projections: Temperature - Nima-Amaime**
•Climate variables: Mean temperature (°C) •Spatial Resolution: 0.2° (25km) •Models: Ensemble of 2 different Global and Regional Climate Models combination •Scenarios: Two...
[CSV](#) [ZIP](#)

PRIVATE **Climate projections: Potential Evapotranspiration - Peninsular Spain & Jucar**
•Climate variables: Potential evapotranspiration (mm) •Spatial Resolution: 0.11° (~12.5 Km) •Models: Ensemble of 6 different Global and Regional Climate Models combination...
[CSV](#) [XML](#) [ZIP](#)

Figure 7: Page of Climate projections sector

Search for datasets

To find datasets in the Observatory, you can type any combination of words (e.g., “water footprint”, “temperature”, etc.) in the search box on any page. The Observatory will then return all corresponding search results as a list (Figure 8).

The screenshot shows the REXUS website's 'Datasets' page. The top navigation bar includes the REXUS logo, a 'Datasets' button, and links for 'Pilots', 'Sectors', and 'About'. A search bar is located in the top right. The main content area is titled 'Datasets' and features a left-hand navigation menu with categories: Pilots (9 items), Sectors (15 items), and Tags (15 items). The main search area contains a search box with the text 'Search datasets...', a search button, and an 'Order by' dropdown menu set to 'Relevance'. Below the search box, it displays '25 datasets found'. The first four results are listed, each with a 'PRIVATE' label and a 'ZIP' or 'RAR' download button. The results are: 1. 'Provisional Water Accounting (WA) - Mancha Oriental' with a 'DOCX' button. 2. 'Water Footprint (WF) - Mancha Oriental'. 3. 'Crop Water Use (CWU) - Mancha Oriental'. 4. 'Net Irrigation Requirements (NIR) - Mancha Oriental' with a 'RAR' button.

Figure 8: Datasets page

On the search result page, you can sort the results based on relevance, name, modification date or popularity by selecting “Order by”. You can also limit the results using the filters on the left column (Pilots, Sectors, Tags, Formats). You can combine filters, selectively adding and removing them, and modify and repeat the search within existing filters still in place.

Additionally, you can select “Pilots” from the menu in order to view the five pilots and then select the one you are more interested in and be directed to that specific pilot’s page. By typing a search query in the main search box on the page, the Observatory returns search results as described above but restricted to datasets from the specific pilot (Figure 9). Apart from typing in the search box, you can explore the datasets in that specific

pilot. Respectively, you can select "Sectors" from the menu and follow the same process to explore the datasets thematically.

The screenshot displays the REXUS website interface. At the top, the REXUS logo is on the left, and navigation links for 'Datasets', 'Pilots', 'Sectors', and 'About' are on the right, along with a search bar. Below the navigation, the breadcrumb path reads 'Home / Pilots / Isonzo River Pilot Case'. The main content area is divided into a left sidebar and a right main panel. The sidebar contains a large image of a river, the title 'Isonzo River Pilot Case', a brief description, a 'read more' link, and a 'Follow' button. Below this, there are sections for 'Pilots' (showing 'Isonzo River Pilot ...' with a count of 3), 'Sectors' (showing 'Climate projections' with a count of 3), and 'Tags' (showing 'Climate', 'RCP4.5', and 'RCP8.5', each with a count of 3). The main panel features a search bar, a '3 datasets found' notification, and a filter bar with 'Climate projections' and 'Isonzo River Pilot Case' selected. Below the filters, three dataset cards are listed, each with a 'PRIVATE' label, a title, a description of variables and models, and download options for 'CSV' and 'ZIP'.

Figure 9: Datasets in the pilot's page with applied filters

Dataset

Once you find a dataset you are interested in and select it, the Observatory will display the dataset page (Figure 10). On the overview page of a dataset, you will be able to see three tabs: "Dataset", which shows the data and resources belonging to this dataset as well as additional information (metadata), "Sectors", which shows the sectors this dataset belongs to and "Activity stream", which shows the history of recent changes to the dataset. On the left part is a static column that displays the title of the dataset and the pilot that it relates to.

The screenshot shows the REXUS website interface. At the top, there is a navigation bar with 'Datsets', 'Pilots', 'Sectors', and 'About' links, along with a search bar. The breadcrumb trail indicates the current location: 'Pilots / Peninsular Spain & Jucar... / Climate projections:...'. The main content area is divided into three tabs: 'Dataset' (selected), 'Sectors', and 'Activity Stream'. The dataset title is 'Climate projections: Potential Evapotranspiration - Peninsular Spain & Jucar', marked as 'PRIVATE'. It shows '1 views (1 recent)'. Metadata includes: 'Climate variables: Potential evapotranspiration (mm)', 'Spatial Resolution: 0.11* (~12.5 Km)', 'Models: Ensemble of 6 different Global and Regional Climate Models combination', and 'Scenarios: Two Representative Concentration Pathways - RCP4.5 (intermediate) & RCP8.5 (business as usual)'. It notes that files are spatial, with mean daily values for 2031-2090 and a reference period of 1986-2005. A link to 'Check D3.9 Report «Fit-for-Nexus climate projections»' is provided. The 'Data and Resources' section lists nine files with 'Explore' buttons: 'evap 45 spain CSV', 'evap 85 spain CSV', 'evap hist spain CSV', 'evap 45 spain XML', 'evap 85 spain XML', 'evap hist spain XML', 'evap spain 45 TIFF', 'evap spain 85 TIFF', and 'evap spain hist TIFF'. Below this is a filter bar with 'Climate', 'Evapotranspiration', 'RCP4.5', 'RCP8.5', and 'Scenarios' buttons. The 'Additional Info' section contains a table with the following data:

Field	Value
Last Updated	December 17, 2021, 12:15 PM (UTC+02:00)
Created	December 17, 2021, 11:25 AM (UTC+02:00)
Data timespan	1986-2005 (Reference period) and three 20-year future periods within 2031-2090
Data update frequency	N/A
Organization	DRAXIS S.A.
Source data used	Retrieved from ESGF portal https://esgf-data.dkrz.de/search/cordex-dkrz/ and then further processing is applied
Time interval	daily mean per year

Figure 10: Dataset overview page

On the “Dataset” tab you can see all the information of the dataset including the title, the description, the list of data and resources, the keywords associated with the dataset and the additional info. The “Explore” button on the right of each resource offers the following options:

- **More information** – which shows the page of the resource including additional information
- **Download** – which downloads the file directly

The list of keywords and the additional information presents the metadata of the dataset, provided through the data collection protocol (Figure 11).

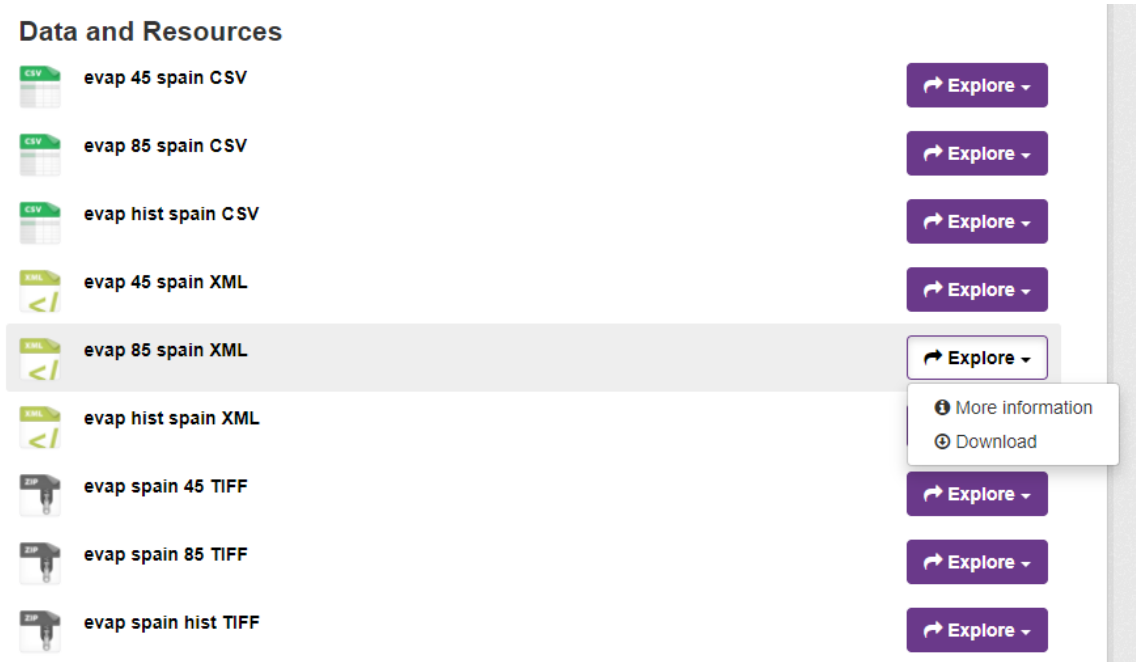


Figure 11: Download Data and Resources

Data preview and visualization

In the resource page, information for the specific file is presented and you have several preview options. The type of the file is presented on top, along with a link to its original source and the description of the dataset (Figure 12). Files in the format of CSV and XLS spreadsheets are previewed in a grid view, with map (after definition of the coordinate data fields in the file) (Figure 14) and graph views also available if the data is suitable.

evap 45 spain CSV Download Data API

URL: https://rexus-observatory.draxius.gr/dataset/7bf37479-4731-4c40-aebd-f7bd70cc9b0f/resource/1b52599c-a4c4-4b54-87fd-27580165ba7b/download/evap_45_spain.csv

Dataset description:

- Climate variables: Potential evapotranspiration (mm)
- Spatial Resolution: 0.11° (~12.5 Km)
- Models: Ensemble of 6 different Global and Regional Climate Models combination
- Scenarios:...

Source: Climate projections: Potential Evapotranspiration - Peninsular Spain & Jucar

Grid Graph Map

3000 records

-

id	OID	lat_list	lon_list	evap
1	0	36.7983...	-2.17843...	3.69888...
2	1	36.0445...	-5.67263...	3.26240...
3	2	36.0786...	-5.54619...	3.12829...
4	3	36.7547...	-2.86264...	3.91896...
5	4	36.7849...	-2.73354...	3.98871...
6	5	36.8150...	-2.60432...	4.00587...
7	6	36.8449...	-2.47498...	4.02955...
8	7	36.8746...	-2.34553...	3.97752...
9	8	36.9041...	-2.21596...	3.94484...
10	9	36.933505	-2.08628...	3.93173...
11	10	36.9626...	-1.95648...	3.62071...
12	11	36.1144...	-5.84237...	3.55541...
13	12	36.1488...	-5.71587...	3.44382...
14	13	36.1829...	-5.58923...	3.15006...
15	14	36.2169...	-5.46247...	3.25177...
16	15	36.2508...	-5.33559...	3.36462...
17	16	36.7372...	-3.41745...	3.51997...
18	17	36.7682...	-3.28860...	3.65845...
19	18	36.7991...	-3.15963...	3.76725...
20	19	36.8297...	-3.03055...	3.75350...

Figure 12: Dataset explore page, preview of data in grid

The “Graph” option allows you to create diagrams of five different types and select which fields of the file you wish to display on the two axes of the

graph (Figure 13). As a result, you are able to dynamically create any combination of data and get valuable insights for the dataset.

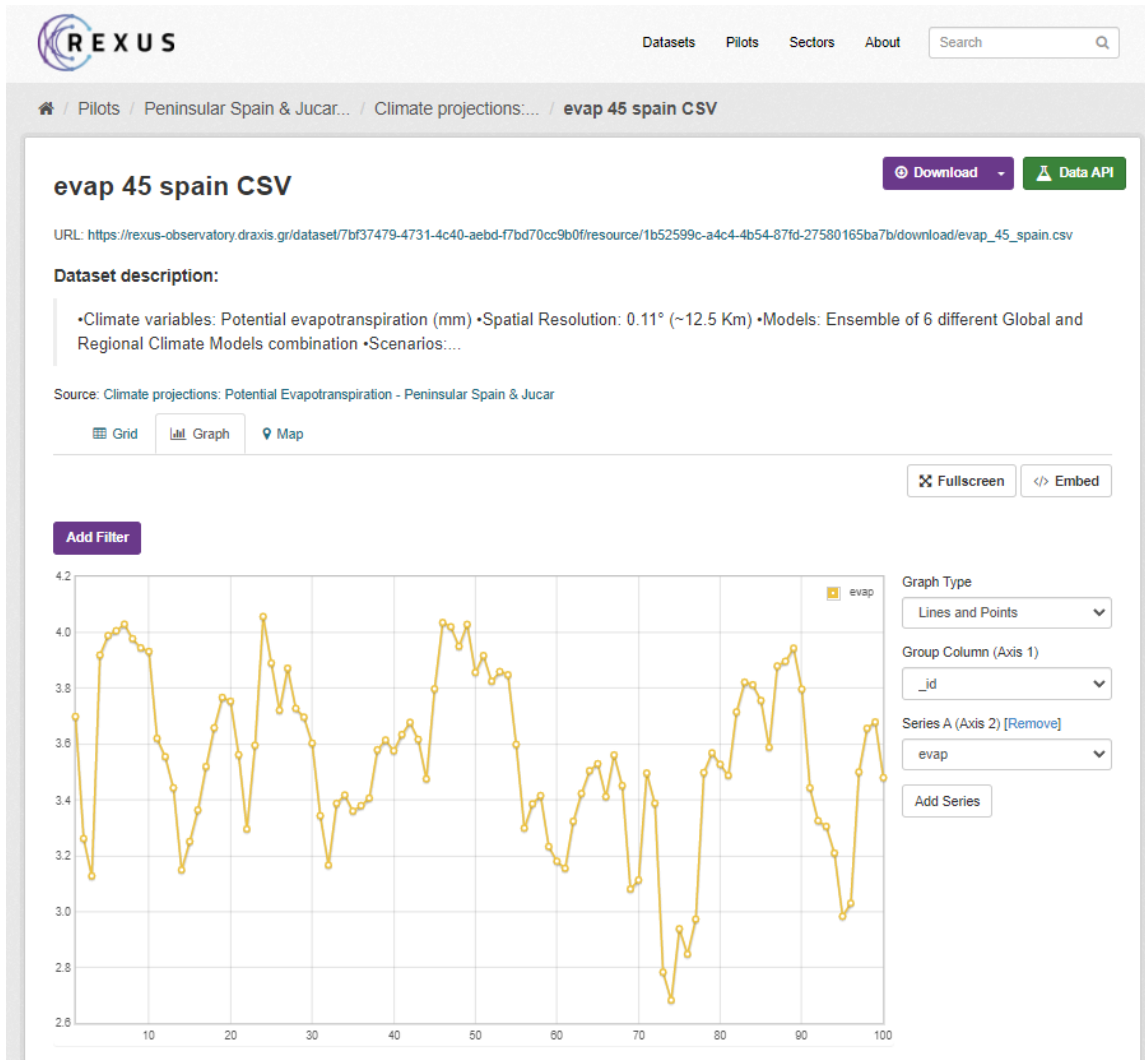


Figure 13: Dataset explore page, preview of data in a line graph

evap 45 spain CSV

Download

Data API

URL: https://rexus-observatory.draxis.gr/dataset/7bf37479-4731-4c40-aebd-f7bd70cc9b0f/resource/1b52599c-a4c4-4b54-87fd-27580165ba7b/download/evap_45_spain.csv

Dataset description:

•Climate variables: Potential evapotranspiration (mm) •Spatial Resolution: 0.11° (~12.5 Km) •Models: Ensemble of 6 different Global and Regional Climate Models combination •Scenarios:....

Source: Climate projections: Potential Evapotranspiration - Peninsular Spain & Jucar

Grid Graph Map

Fullscreen

Embed

Add Filter

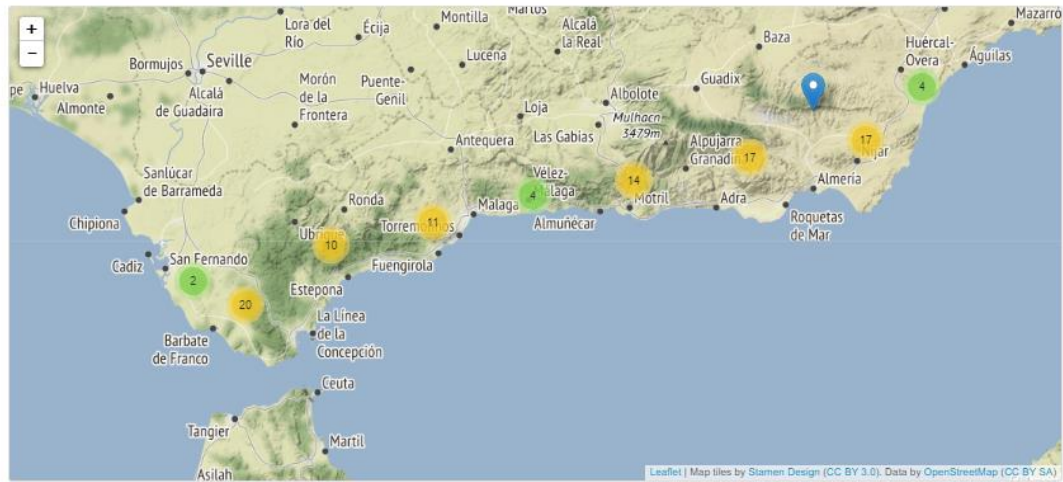
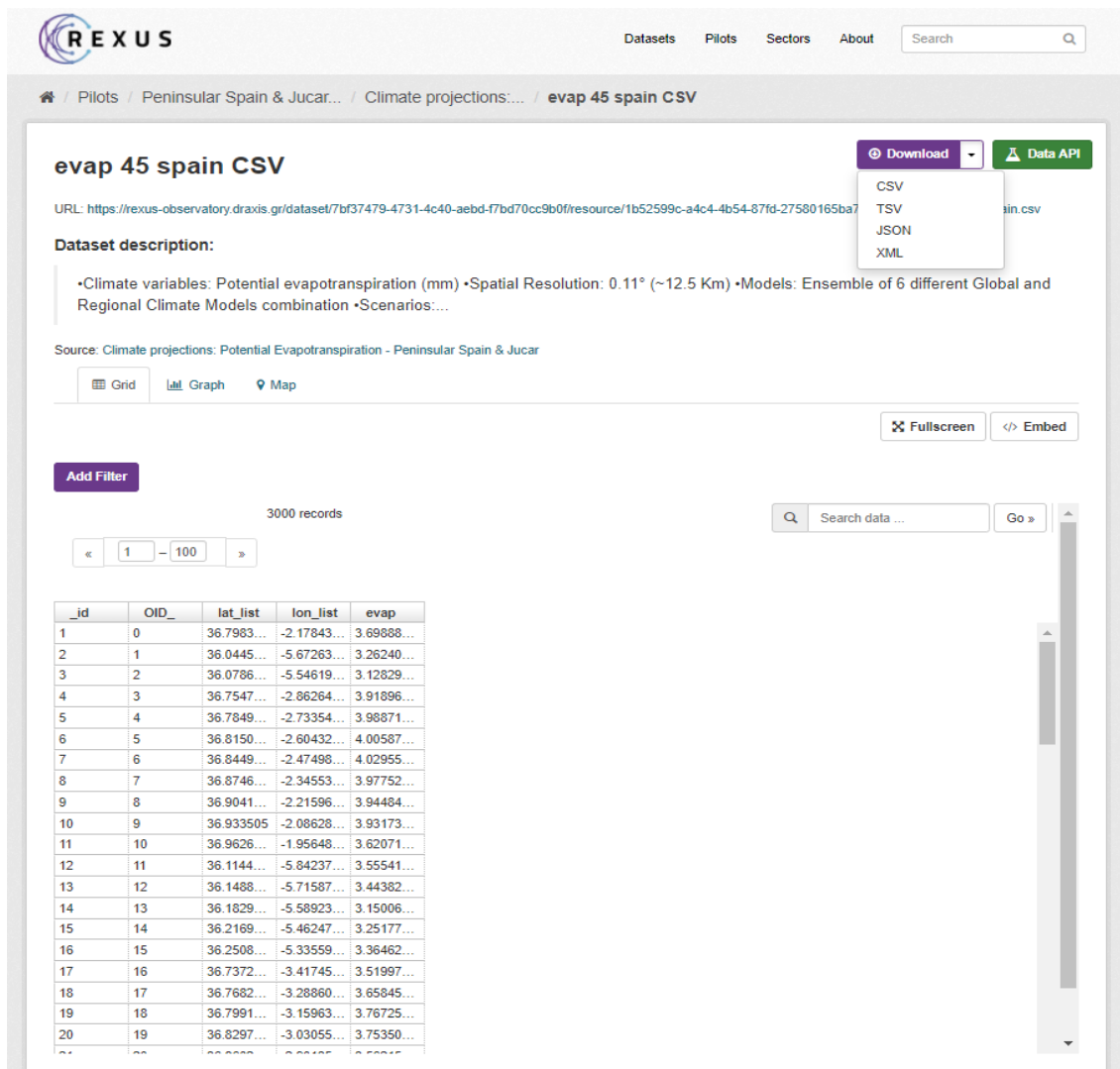


Figure 14: : Dataset explore page, preview of data in a map

Download and API

Apart from downloading a resource directly from the dataset page, you can navigate to the resource page where you are presented with more options. The download button is still available at the top of the page, where you can select the file format you want to download (Figure 15). Furthermore, the API option is available, which allows you to access the data directly for use in your solutions. By clicking on the “Data API” option, you are presented with a pop-up, where all the information for the API is available. More specifically, the available Endpoints are presented, along with several examples to guide you. Links to documentation are also included (Figure 16).



The screenshot shows the REXUS interface for the dataset 'evap 45 spain CSV'. At the top, there is a navigation bar with 'Datasets', 'Pilots', 'Sectors', and 'About' links, along with a search bar. The main content area displays the dataset title and a 'Download' button with a dropdown menu. The dropdown menu is open, showing options for 'CSV', 'TSV', 'JSON', and 'XML'. To the right of the dropdown is a 'Data API' button. Below the download options, there is a 'Dataset description' section with details about climate variables, spatial resolution, models, and scenarios. A 'Source' section provides the origin of the data. Below this, there are buttons for 'Grid', 'Graph', and 'Map'. Further down, there are 'Fullscreen' and 'Embed' buttons. A table of data is displayed, showing 3000 records. The table has columns for '_id', 'OID_', 'lat_list', 'lon_list', and 'evap'. The first 20 rows of the table are visible, showing a range of values for each column.

id	OID	lat_list	lon_list	evap
1	0	36.7983...	-2.17843...	3.69888...
2	1	36.0445...	-5.67263...	3.26240...
3	2	36.0786...	-5.54619...	3.12829...
4	3	36.7547...	-2.86264...	3.91896...
5	4	36.7849...	-2.73354...	3.98871...
6	5	36.8150...	-2.60432...	4.00587...
7	6	36.8449...	-2.47498...	4.02955...
8	7	36.8746...	-2.34553...	3.97752...
9	8	36.9041...	-2.21596...	3.94484...
10	9	36.933505	-2.08628...	3.93173...
11	10	36.9626...	-1.95648...	3.62071...
12	11	36.1144...	-5.84237...	3.55541...
13	12	36.1488...	-5.71587...	3.44382...
14	13	36.1829...	-5.58923...	3.15006...
15	14	36.2169...	-5.46247...	3.25177...
16	15	36.2508...	-5.33559...	3.36462...
17	16	36.7372...	-3.41745...	3.51997...
18	17	36.7682...	-3.28860...	3.65845...
19	18	36.7991...	-3.15963...	3.76725...
20	19	36.8297...	-3.03055...	3.75350...

Figure 15: Download files in resource page

The image shows a CKAN Data API modal window overlaid on a resource page. The resource page is for 'evap 45 spain CSV' and includes a table of data. The modal window provides information on how to access the data via a web API, including endpoints for Create, Update/Insert, Query, and Query (via SQL), along with example queries and links to JavaScript and Python examples.

CKAN Data API

Access resource data via a web API with powerful query support. Further information in the main CKAN Data API and DataStore documentation.

Endpoints »

The Data API can be accessed via the following actions of the CKAN action API.

Create	<code>https://rexus-observatory.draxis.gr/api/3/action/datastore_create</code>
Update / Insert	<code>https://rexus-observatory.draxis.gr/api/3/action/datastore_upsert</code>
Query	<code>https://rexus-observatory.draxis.gr/api/3/action/datastore_search</code>
Query (via SQL)	<code>https://rexus-observatory.draxis.gr/api/3/action/datastore_search_sql</code>

Querying »

Query example (first 5 results)
`https://rexus-observatory.draxis.gr/api/3/action/datastore_search?resource_id=1b52599c-a4c4-4b54-87fd-27580165ba7b&limit=5`

Query example (results containing 'jones')
`https://rexus-observatory.draxis.gr/api/3/action/datastore_search?resource_id=1b52599c-a4c4-4b54-87fd-27580165ba7b&q=jones`

Query example (via SQL statement)
`https://rexus-observatory.draxis.gr/api/3/action/datastore_search_sql?sql=SELECT * from "1b52599c-a4c4-4b54-87fd-27580165ba7b" WHERE title LIKE 'jones'`

Example: Javascript »

Example: Python »

Resource Page Data Table:

id	OID	lat_list
1	0	36.7983...
2	1	36.0445...
3	2	36.0786...
4	3	36.7547...
5	4	36.7849...
6	5	36.8150...
7	6	36.8449...
8	7	36.8746...
9	8	36.9041...
10	9	36.933505...
11	10	36.9626...
12	11	36.1144...
13	12	36.1488...
14	13	36.1829...
15	14	36.2169...
16	15	36.2508...
17	16	36.7372...
18	17	36.7682...
19	18	36.7991...
20	19	36.8297...

Figure 16: API available in resource page