

Query Builder and Swagger UI - User guide

Version 1.0

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The Knowledge Centre for Biodiversity (KCBD) Global Biodiversity Data Services (GBDS) - formerly the Digital Observatory for Protected Areas (DOPA) - processes open-access global reference datasets to generate harmonised metrics and indicators on biodiversity and its associated pressures. These outputs are distributed through the GBDS web services, which support a range of web applications, including the Query Builder and Swagger UI.

This document presents a practical guide on how to use the Query Builder and Swagger UI front-end tools, tailored to different user profiles.

For a full description of the GBDS data distribution architecture, see the technical report: [JRC Global Biodiversity Data Services \(GBDS\): Data Distribution Architecture, REST API and Query Builder](#).

1. Disclaimer

Use of the GBDS web services requires full understanding and acceptance of the following terms:

1. The GBDS web services provide metrics and indicators calculated using datasets from third-party sources. The original datasets are not distributed through the GBDS web services and remain available from their respective providers.
- Use of the data may be restricted for commercial purposes.
 - Proper citation of sources is required when using the data.
 - Users are encouraged to consult the authoritative reference sources before applying the data.
 - Frequent users of the services are encouraged to inform the JRC of their activities.

Accessing and using data via Query Builder or REST API implies explicit acceptance of these terms.

2. Query Builder

Query Builder's main purpose is to list and describe functions available in the GBDS, providing access to the wide range of biodiversity metrics and indicators precomputed by the KCBD. A non-exhaustive list of features offered by Query Builder is the following:

2. List available GBDS versions and functions
- Filter available functions
 - Retrieve a detailed list of a function's sources
 - Filter output parameters (indicators) and reduce the volume of output
 - Filter input parameters
 - Navigate the results withing the interface
 - Extract results as CSV, HTML
 - Generate URL for the specific combination

Step 1: Accessing the Query Builder via the EU Login account

Access to the Query Builder requires an EU account, the EU Login.

For users who do not yet have an account, register at: <https://webgate.ec.europa.eu/cas/eim/external/register.cgi>

You will further need to request access to the Query Builder to ensure end-users are agreeing with the various underlying data licenses.

Step 2: Requesting access to the Query Builder

Follow this step if you are not an already registered user:

1. Log in with your EU Login credentials and navigate to: <https://dopa.jrc.ec.europa.eu/restapi/ui/welcome>
2. Select the “REGISTER” option (Fig. 1, point 1). A pop-up form will appear.
3. Enter a short description of your intended use and the name of the organisation, institution, or other entity with which you are affiliated (Fig. 1, point 2). The “SUBMIT” button (Fig. 1, point 3) activates once this field is filled.
4. Submit the form. If your request is approved, you will receive an automated confirmation email from the KCBD functional mailbox. If needed, the KCBD team will contact you directly.

Once your registration has been approved, you can access the Query Builder by clicking the “PROCEED TO QUERY BUILDER” button.

Figure 1. Query Builder – registration form

The screenshot shows a web interface for the Query Builder registration process. At the top, a grey banner reads "Getting Started" followed by the text: "Access to the Query Builder requires an EU Login account and registration. Once approved, you can start querying data directly through the interface. Register below to request access." Below this is a white "Register" form. The form contains a "Description" text area (marked with a red circle 2) and an "Affiliation" text area (marked with a red circle 3). Below the form are "SUBMIT" and "CANCEL" buttons. At the bottom of the page, a grey footer contains an information icon (marked with a red circle 1), a paragraph of text, and three buttons: "REGISTER", "PROCEED TO QUERY BUILDER" (highlighted in green), and "PRIVACY STATEMENT".

Getting Started
Access to the Query Builder requires an EU Login account and registration. Once approved, you can start querying data directly through the interface. Register below to request access.

Register CANCEL

Please briefly describe your intended usage of our services.
Our team will review your request and get back to you.
Thank you,
JRC KCBD Development Team

Description

Affiliation

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1 SUBMIT CANCEL

1 In order to proceed to Query Builder, please use the button below to **register**.
You may reach out for further inquiry by [e-mail](#)

REGISTER PROCEED TO QUERY BUILDER PRIVACY STATEMENT

Source: Query builder

Step 3. Selecting a data version

Once logged in, select the version of the GBDS you want to work with (Fig. 2, point 1). The latest stable version is preselected by default. Available functions will load on screen, displayed in green (Fig. 2, point 2).

Figure 2. Query Builder – filters on available data versions

Query Builder

The Query Builder allows users to explore and retrieve a broad range of pre-calculated, consistent and comparable metrics and indicators at multiple reporting levels and thematic areas.

The [User Guide](#) provides step-by-step guidance on using the tool. For detailed technical documentation of the indicators available in each Global Biodiversity Data (GBDS) version, please refer to the corresponding [indicator factsheets](#).

Available Versions

Latest stable version is preselected

GBDS indicators version
5.0

1



Beware that different versions of GBDS indicators might be using different input datasets. Always check the [Function details](#) section.

Available function list



Use multiple filter words split by space. Example: `country lcc esa`
Use the predefined switches for groups of functions

Report Level

Function Theme

Data sources

Filter functions

Function Name

2

Function Description

GET_DOPA_COUNTRY_ALL_INDS

Returns all indicators related to countries. This service makes use of dataset available for non-commercial use only. For commercial use of these data, visit <https://www.ibat-alliance.org>

More info

GET_DOPA_COUNTRY_LCC_ESA

Returns absolute cover of ESA LC CCI classes, aggregated by level 1 (4 classes) which changed within first and last epoch. By country.

More info

GET_DOPA_COUNTRY_LCC_ESA_PERCENT

Returns percentage and absolute cover of ESA LC CCI classes which changed within first and last epoch. By country.

More info

GET_DOPA_COUNTRY_LC_COPERNICUS

Returns percentage and absolute cover of Copernicus Land Cover classes for a given country. Aggregation levels 0 (original Copernicus LC classes) and 2 (DOPA) are available.

More info

Source: Query builder

Note that there is a fair usage rate limit on a per minute basis. If the user makes excessive requests, then no results will be delivered. You can request a higher rate limit through the KCBD functional mailbox (biodiversity-KC@ec.europa.eu). The authentication can happen with EU Login for web browser navigation or with API key for programmatic access.

Step 4. Filtering functions

Use the filter bar to narrow down the list of available functions (Fig. 7, point 1). You can filter based on:

- Report level (Fig. 3, point 2): filter by the geographic or administrative level at which metrics are calculated (e.g., country, protected area).
- Function theme (Fig. 3, point 3): filter by thematic category (e.g., species, land degradation).
- Data sources (Fig. 3, point 4): filter by the underlying global datasets used to compute the indicators.
- Function's name (Fig. 3 point 5): search for a specific function by name.

You can select the available pills for each category (green outline on grey background) and apply immediately that filtering option (Fig. 3).

Click on a function's name (Fig. 3, point 6) to load its details.

Figure 3. Query Builder - filters on available functions

Available Versions

Latest stable version is preselected

GBDS indicators version
5.0

 Beware that different versions of GBDS indicators might be using different input datasets. Always check the [Function details](#) section.

Available function list

 Use multiple filter words split by space. Example: `country lcc esa`
Use the predefined switches for groups of functions

Report Level  Function Theme  Data sources 

Q Filter functions 

Function Name	Function Description
<code>GET_DOPA_COUNTRY_ALL_INDS</code> 	Returns all indicators related to countries. This service makes use of dataset available for non-commercial use only. For commercial use of these data, visit https://www.ibat-alliance.org
<code>GET_DOPA_COUNTRY_LCC_ESA</code>	Returns absolute cover of ESA LC CCI classes, aggregated by level 1 (4 classes) which changed within first and last epoch. By country.

Theme **Source** **Reporting Level**

administrative carbon conservation coverage
 elevation global_forest_cover land_cover
 land_degradation land_fragmentation water

AGB CNTR_RG EEZ_RG GEBCO GFC
 GSOC GSW KBA LC_Copernicus_100m
 LC_ESA-CCI LPD MEOW_PPOW MSPA WDPA

country
 land mar

administrative land_cover
 CNTR_RG EEZ_RG LC_ESA-CCI
 country land

Source: Query builder

Step 5. Exploring a function and retrieving data

After selecting the desired function, the page area is divided into four parts:

1. Function details: description of the selected function and its original data sources (Fig. 4, point 1).
2. Function input parameters: it is possible to filter the return data based on the predefined parameters (Fig. 4, points 2 and 3). The most common parameter is the country code, which limits the return data to the selected country. A helper pop-up (Fig. 4, point 4) provides a reference table of country names with their ISO 2 and 3 codes.
3. Function output parameters: it is possible to reduce the function's return data/columns by selecting which columns to include in the results (Fig. 4, points 5 and 6).

Output and input function parameters might be an extensive list - in that case, the "filter on name" search bar feature might be helpful (Fig. 4, points 2 and 6).

Figure 4. Query Builder – function information

Function details

Each function utilizes a range of sources to perform its calculations. A comprehensive list of the sources relevant to the selected function is provided below. For the most current licensing information, please refer directly to each individual source.

Abbreviation	Version	Description ↑	Reference
CNTR_RG	01M_2020	Eurostat/GISCO, 'Countries - GISCO CNTR_RG'. Administrative boundaries: © EuroGeographics, © FAO (UN), © TurkStat. GISCO is the Geographic Information System of the Commission. It provides the European Commission with geographical information.	
WDPA	Jan 2025	The World Database on Protected Areas (WDPA), a joint project of IUCN and UNEP, is the most comprehensive global database on terrestrial and marine protected areas. It includes EEA Natura2000 Sites (2022 update).	UNEP-WCMC and IUCN, Protected Planet: The World Database on Protected Areas (WDPA). Cambridge, UK: UNEP-WCMC and IUCN.

Items per page: 10 1-2 of 2

Selected Function: get_dopa_country_pa_count

Function input filters

COUNTRY HELPER

Select the input filters and supply values to narrow the result set. Mandatory parameters (marked red) must be filled in before the function can be executed.

Filter function parameters

☐	Name	Compulsory	Type	Description
☐	iso3	false	text	ISO 3166 standard Alpha-3 country code, as reported by WCMC.
☐	status_multi	false	boolean	Either include or not in the report Disputed or Joint Managed territories.

Items per page: 10 1-2 of 2

Function output filters

Select the output parameters (columns / fields) you want the function to return. Unselected parameters are omitted from the response.

pa_count_o1

☐	Name	Description	Type
☐	pa_count_o1	Numero of PAs in target area with size over 1 km2	numeric

Items per page: 10 1-1 of 1

Source: Query builder

4. Function testing: the information of input and output parameters is formatted as a URL and displayed in the appropriate field, as shown in Figure 5.

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Figure 5. Query Builder - reactive URL creation

Function input filters

COUNTRY HELPER

Select the input filters and supply values to narrow the result set. Mandatory parameters (marked red) must be filled in before the function can be executed.

☐	Name	Compulsory	Type	Description	
☒	iso3	false	text	ISO 3166 standard Alpha-3 country code, as reported by WCMC.	^
More info about iso3					
iso3					
ITA					
☐	status_multi	false	boolean	Either include or not in the report Disputed or Joint Managed territories.	v

Items per page: 10 1-2 of 2 |< < > >|

Function output filters

Select the output parameters (columns / fields) you want the function to return. Unselected parameters are omitted from the response.

☐	Name	Description	Type
☐	pa_count_o1	Numero of PAs in target area with size over 1 km2	numeric

Items per page: 10 1-1 of 1 |< < > >|

Function testing

Selected Function: get_dopa_country_pa_count

Available formats
json

TEST Copy URL

HTTP Request
https://kcbd-proxy-main-kcbd.apps.ocbmt.jrc.cec.eu.int/restapi/api/dopa_50/get_dopa_country_pa_count?format=json&iso3=ITA

Source: Query builder

Click “TEST” (Fig. 6, point 1) to load the function directly into the page, i.e. to display the return data directly on the page. Use the copy URL button (Fig. 6, point 2) to copy the request URL to your clipboard. The URL is displayed on screen (Fig. 6, point 3) for debugging purposes. Different formats are available for data download - select your preferred output format from the dropdown menu (Fig. 6, point 4). The available data returned by the function is displayed below the controls described above (Fig. 6, point 5).

Figure 6. Query Builder – test selected function

Function output filters

Select the output parameters (columns / fields) you want the function to return. Unselected parameters are omitted from the response.

Filter function parameters

Name	Description	Type
☒ iso3	ISO 3166 standard Alpha-3 country code, as reported by WCMC.	text
☒ pa_count	Numero of PAs in target area	numeric
☒ pa_count_o1	Numero of PAs in target area with size over 1 km2	numeric
☒ pa_count_points	Number of point PAs in target area	numeric
☒ pa_count_points_o1	Number of point PAs in target area with size over 1 km2	numeric
☐ pa_count_polygons	Number of polygon PAs in target area	numeric
☐ pa_count_polygons_o1	Number of polygon PAs in target area with size over 1 km2	numeric
☐ pa_count_points_terrestrial	Number of terrestrial point PAs in target area	numeric
☐ pa_count_points_terrestrial_o1	Number of terrestrial point PAs in target area with size over 1 km2	numeric
☐ pa_count_points_marine	Number of marine point PAs in target area	numeric

Items per page: 10 1-10 of 33

Function testing

Selected Function: get_dopa_country_pa_count

TEST Copy URL

HTTP Request
https://kcbd-proxy-main-kcbd.apps.ocbmt.jrc.cec.eu.int/restapi/

Available formats
json
json
csv
html

Filter function results

Iso3	Pa_count	Pa_count_o1	Pa_count_points	Pa_count_points_o1
ITA	3944.00	3088.00	8.00	8.00

Items per page: 10 1-1 of 1

Source: Query builder

3. Swagger UI

The Swagger UI¹ offers a familiar way to programmers and technical users to list and experiment with the GBDS REST API. Below (Fig. 7) is a typical screenshot from the Swagger interface.

¹ <https://dopa.jrc.ec.europa.eu/restapi/swagger-ui/>

As with the Query Builder interface, access to the data via Swagger UI requires an EU Login account and explicit user registration via the registration process – if necessary, follow Steps 1 and 2 described in the Query Builder section above.

After registration approval, users can request programmatic access through API key by contacting the [KCBD functional mailbox](#). The requested API key will be sent to them manually – this last step will be automated in the future.

The Swagger interface is auto generated from the OpenAPI specification served from the GBDS REST API. Every version of GBDS has its own OpenAPI specifications, as there might be changes between releases. OpenAPI specification is well-known among technical users and is self-descriptive.

Swagger interface provides basic functionality to execute REST API queries to the GBDS back end. It serves a fixed default version of the GBDS. Users are generally advised to use the Query Builder, which allows better control and experimentation on the data actually available.

Figure 7. Swagger interface

The screenshot displays the Swagger UI interface for the GBDS REST API. At the top, the word "default" is shown with an upward arrow. The main section is titled "GET /restapi/api/latest/get_dopa_country_all_inds" with a downward arrow. Below this, a description states "Returns all indicators related to countries". A "Parameters" section is visible, featuring a "Try it out" button. The parameters table lists a required string parameter "country_code" with a description: "ISO2/3, UN_M49 country code (not case sensitive, accepts single values; eg: 'IT', 'fr' or 'It|FR'). Possible values listed by: get_dopa_region_country_list()". A text input field contains the value "country_code". The "Responses" section shows a table with a 200 status code and the description "Successful operation", with a "No links" note. Below the main entry, four other API endpoints are listed with expandable details: "GET /restapi/api/latest/get_dopa_country_ecoregion_all_inds", "GET /restapi/api/latest/get_dopa_country_filter", "GET /restapi/api/latest/get_dopa_country_iucn_species", and "GET /restapi/api/latest/get_dopa_country_iucn_threatened_animals".

Name	Description
country_code * required string (query)	ISO2/3, UN_M49 country code (not case sensitive, accepts single values; eg: 'IT', 'fr' or 'It FR'). Possible values listed by: get_dopa_region_country_list(). country_code

Code	Description	Links
200	Successful operation	No links

Source: Swagger UI