**The World Environment Situation Room**

**Technical Documentation on API & Interoperability**

Aim of this document

This document is a Technical Annex II for document “**Guidelines for Interoperability of the WESR CCA with Regional Knowledge and Data Hubs and other Platforms**”, available at [WESRCCAG.pdf (unep.org)](https://wedocs.unep.org/bitstream/handle/20.500.11822/35187/WESRCCAG.pdf?sequence=1&isAllowed=y)

The World Environment Situation Room (WESR) is the UNEP data, information and knowledge platform. It includes more than 1500 statistics datasets, 1700 geospatial datasets and more than 11,000 publications. WESR is still under development, currently the APIs used for WESR were developed by various entities in UNEP, resulting in a complex access. We have planned in 2023 to produce a broker which will provide users with a single interface.

Meanwhile, we are providing this catalogue of APIs. This technical document is intended for data scientists with experience in using APIs. It provides an inventory of current services provided through web services and APIs in the frame of the WESR. It identifies and categorises the typology of those services.

General introduction



# API definition

An Application Programming Interface (API) is an intermediary that allows for applications to access the features or data of another application or system. API allows the user to programmatically integrate external data into their own applications.

Keywords: interoperability, centralised/decentralised infrastructure

Benefits:

1. Discover available data.
2. Access data in a standard or customised way.
3. Use functions and services from an external application.

Well-known examples of APIs are the Google Maps API, etc.

# Context and needs

## Current situation

Different levels of interoperability supported by related web services and APIs exist and function at the level of the different components of the WESR platform.

Although most of them meet the common standards, they are not easily accessible, sometimes poorly documented, and in several cases rather 'generic'. There is currently a need for a shared vision and to know where we are headed.

# Case study: API strategy

## Broker solution

A possible strategy could be to develop a data broker that would allow discovering data in various formats and from various sources and exposing them in a standard way. There are several options.

* A data broker can be developed into any organisation to federate its sources.
* An external data broker can be developed for navigating into different organisations.

WESR specific context



# Geospatial datasets

## Introduction

Most of the services provided under the WESR are compliant with the Open Geospatial Consortium standards ([OGC API](http://opengeospatial.github.io/e-learning/ogcapi-features/text/basic-main.html)). It is a multi-part standard that offers the capability to create, modify, and query spatial data on the web and specifies requirements and recommendations for APIs that want to follow a standard way of sharing geospatial data.

## Catalogue Services

Catalogue services support the ability to publish and search collections of descriptive information (metadata) for data, services, and related information objects. Metadata in catalogues can be queried and presented for evaluation and further processing by both humans and software.

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| **Service name** | **GRID Datacore Catalogue** |
| **Description** | Main engine of GRID-Geneva for geospatial data. |
| **Standard or typology** | OGC-CSW (catalogue service for the web) |
| **URL** | <https://datacore-gn.unepgrid.ch/geonetwork/srv/eng/csw> |
| **WESR sections** | Geospatial  |
| **Provider** | UNEP/GRID-Geneva |
| **Notes** | Swagger page for built custom API: <https://datacore-gn.unepgrid.ch/geonetwork/doc/api/index.html> |

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| **Service name** | **MapX search tool API** |
| **Description** | Search tool API (full-text search on the MapX public catalogue) |
| **Standard or typology** | [MeiliSearch](https://www.meilisearch.com/)[[1]](#footnote-1) |
| **URL** | <https://github.com/unep-grid/map-x-mgl/wiki/Search-tool-API> |
| **WESR sections** | Geospatial |
| **Provider** | UNEP/GRID-Geneva |
| **Notes** | Provides access to 1’700 geospatial public datasets (as of October 2022). Fully interoperable with the WESR Search Engine from where it is possible to search geospatial datasets by keyword, location and date. |

## Visualisation Standard

The “Map Service” Interface Standard defines a set of interfaces for requesting map images over the Internet. They make it easy for a client to request images on demand defining parameters such as size and coordinate reference systems. A map service server provides information about which maps are provided by the service, it returns a list of maps (or one specified map) and responds to specific queries about the content and properties of a map.

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| **Service name** | **GRID-Geneva Datacore Catalogue** |
| **Description** | Main GeoServer at GRID-Geneva |
| **Standard or typology** | OGC-WMS |
| **URL** | <https://datacore.unepgrid.ch/geoserver/wms> |
| **WESR sections** | Geospatial |
| **Provider** | UNEP-GRID/Geneva |
| **Notes** | Provide a list of all geospatial layers hosted at GRID Geneva. Not all are included in the WESR platform. |

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| **Service name** | **MapX Data Sharing Manager** |
| **Description** | Enables users to create and customise links to MapX features (i.e., geospatial data layers, story maps, workspaces containing a series of data layers of the same environmental topic); and to share them as simple URLs or on social media. |
| **Standard or typology** | iFrames/social networks |
| **URL** | <https://github.com/unep-grid/map-x-mgl/wiki/Sharing-Manager>  |
| **WESR sections** | Geospatial, Climate Change, WESR-CCA, EC-country fiches |
| **Provider** | UNEP-GRID/Geneva |
| **Notes** | Each data layer or group of data layers can be embedded into an external web page. |

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| **Service name** | **MapX OGC Services (WMS, WFS, WCS)** |
| **Description** | 1. Makes any MapX geospatial layer discoverable and accessible from external applications that are able to integrate WMS (web map service - data display), WFS (web feature service - vector download) and WCS (web coverage service - raster download).2. Inversely, makes any WMS/WMTS layer exploitable from MapX. |
| **Standard or typology** | OGC-WMS, OGC-WFS, OGC-WCS |
| **URL** | <https://github.com/unep-grid/map-x-mgl/wiki/Sources#managing-sources> |
| **WESR sections** | Climate change, WESR-CCA, Geospatial, EC-country fiches |
| **Provider** | UNEP/GRID-Geneva |
| **Notes** | WMS-WFS-WCS can be activated on demand, e.g., if the data licence authorises data to be downloaded. |

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| **Service name** | **MapX Software Development Kit (SDK)** |
| **Description** | The MapX SDK package facilitates the integration of MapX into external systems. It features a simple way to interact with MapX data and functions within a static web page or from a full featured application. |
| **Standard or typology** |  |
| **URL** | <https://github.com/unep-grid/map-x-mgl/tree/master/app/src/js/sdk/>  |
| **WESR sections** | Climate change, WESR-CCA, Geospatial, EC-country fiches |
| **Provider** | UNEP/GRID-Geneva |
| **Notes** | --- |

# Per country statistics and SDG

## This section includes so-called statistical data, which generally refer to a specific country or group of countries (regional aggregations). The time connotation (time series) is generally an important element. SDG indicators, but not only are part of this category. It must be noticed that for these categories the set of standards is more heterogeneous than in the case of geospatial data where the OGC has been able to prevail as a globally accepted and used standard.

## Catalogue services

As for geospatial data, this section presents the web services that give an overall information of the data set collection.

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| **Service name** | **GRID BI dashboards and charts (Superset) catalogue** |
| **Description** | Lists dashboards and charts available at UNEP/GRID-Geneva. |
| **Standard or typology** | REST API Following OpenAPI specification |
| **URL** | <https://dash.unepgrid.ch/dashboard/api/read>https://dash.unepgrid.ch/chart/api/read |
| **WESR sections** | Climate change, WESR-CCA, Geospatial, EC-country fiches |
| **Provider** | UNEP/GRID-Geneva |
| **Notes** | Swagger page for built custom API: <https://dash.unepgrid.ch/swagger/v1> |

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| **Service name** |  **UNEP SDGs** |
| **Description** | the API provides data for SDG indicators under UNEP custodianship |
| **Standard or typology** | REST API, Web based |
| **URL** | https://unepliveservices.unep.org/nsiws/rest/categoryscheme/unep/unep/1.10?references=dataflow |
| **WESR sections** | SDG Indicators |
| **Provider** | Science Division, CDIB, SDG and Environment Statistics Unit  |
| **Notes** | To be replaced by SDG Data Catalogue API based on .STAT Suite |

## Visualisation Standard

In this section, we would like to group services that allow the reproduction / integration of visualisation (charts, dashboards) within an external website.

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| **Service name** | **GRID BI dashboard (Superset) embedded** |
| **Description** | Dashboards include a set of dynamic visualisations (charts, maps, text) organised by theme (e.g. climate change, emissions by countries). |
| **Standard or typology** | iFrames |
| **URL** | https://dash.unepgrid.ch/superset/dashboard/59/?standalone=2 |
| **WESR sections** | Climate change, WESR-CCA, Geospatial, EC-country fiches |
| **Provider** | UNEP-GRID/Geneva |
| **Notes** | --- |

## Data access standards

Allows access to the raw data (grouped or not).

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| **Service name** | **GRID BI charts (Superset) data access** |
| **Description** | Connect and retrieve the data for each chart included in a dashboard. |
| **Standard or typology** | Json API |
| **URL** | Curl example for a specific chart |
| **WESR sections** | Climate change, WESR-CCA, Geospatial, EC-country fiches |
| **Provider** | UNEP-GRID/Geneva |
| **Notes** | Needs to be customised for easy access. |

# Documents repository

# SCP-HAT

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| **Service name** | **SCP-HAT API** |
| **Description** | It provides the data used in SCP-HAT, mainly environmental pressure and impact indicators. |
| **Standard or typology** | Rest API |
| **URL** | 116.203.139.184:3001 |
| **WESR sections** | Sustainable Consumption and Production, WESR-CCA, Interactive Country Fiches. |
| **Provider** | Vienna University of Economics and Business (WU Vienna) |
| **Notes** | Right now it just allows retrieving data exactly as stored in the database without any user-friendly join-operations making life easier. A new version in the future will make this API useful. |

## Catalogue services & data access

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| **Service name** | **Knowledge Repository** |
| **Description** | Knowledge products from the UNEP digital library |
| **Standard or typology** | REST API, JSON |
| **URL** | https://wedocs.unep.org/rest/ |
| **WESR sections** | Publications |
| **Provider** | UNEP Library Unit |
| **Notes** | Remapping will need to be done once retagging is done in the Knowledge Repository |

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| **Service name** | **InforMEA** |
| **Description** | The purpose of the InforMEA API is to establish a communication protocol between InforMEA database and its data providers, the MEAs. |
| **Standard or typology** | Rest API, JSON |
| **URL** | https://odata.informea.org/ |
| **WESR sections** | decisions, meetings |
| **Provider** | United Nations Information Portal on Multilateral Environmental Agreements |
| **Notes** | Pending datasets: treaties, national reports, national action plans |

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| **Service name** | **UNEP GIS Hub** |
| **Description** | WESR ArcGIS hub datasets |
| **Standard or typology** | Rest API, JSON |
| **URL** | https://hub.arcgis.com/api/v3/ |
| **WESR sections** | Geospatial datasets (indicators, themes) |
| **Provider** | World Environment Situation Room ArcGIS Hub |
| **Notes** | - |

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| **Service name** | **UNEP World Conservation Monitoring Centre** |
| **Description** | Explore nature action resources by theme from UNEP-WCMC |
| **Standard or typology** | Rest API, JSON |
| **URL** | https://resources.unep-wcmc.org/products/WCMC\_RT235/ |
| **WESR sections** | Datasets by theme |
| **Provider** | UNEP-WCMC |
| **Notes** | - |

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| **Service name** | **GPML Digital Platform** |
| **Description** | Provides technical information on how to query feature layers from feature services and/ or OGC services available in the GPML Data Hub using the available programming interface API |
| **Standard or typology** | Rest API, JSON |
| **URL** | <https://datahub.gpmarinelitter.org/pages/api-explore>https://digital.gpmarinelitter.org/api/browse?topic=event&upcoming=true&limit=3https://digital.gpmarinelitter.org/api/browse?featured=true&limit=3 |
| **WESR sections** | Indicators, upcoming events, featured initiatives/products |
| **Provider** | UNEP Global Partnership on Marine Litter |
| **Notes** | Partially implemented, awaiting confirmation to use digital.gpmarinelitter in WESR |

# Standards description

### OGC-CSW

Catalogue Service for the Web (CSW), is a standard for exposing a catalogue of geospatial records on the Internet (over HTTP).

Catalogue services support the ability to publish and search collections of descriptive information (metadata) for data, services, and related information objects. Metadata in catalogues represent resource characteristics that can be queried and presented for evaluation and further processing by both humans and software.

### OGC- WMS

One fundamental component of the web map is the map image. The Web Map Service (WMS) is a standard protocol for serving georeferenced map images generated by a map server. In short, WMS is a way for a client to request map tiles from a server. The client sends a request to a map server, then the map server generates an image based on parameters passed to the server in the request and finally returns an image.

It is important to note that the source material from which the image is generated does not need to be an image. The WMS generates an image from whatever source material is requested, which could be vector data, raster data, or a combination of the two.

### MeiliSearch

The **MapX Search tool API** was built on top of [MeiliSearch](https://www.meilisearch.com/), an open source ([MIT License](https://github.com/meilisearch/MeiliSearch/blob/release-v0.21.0/LICENSE)) search-engine.

Meilisearch is a RESTful search API. It aims to be a ready-to-go solution for everyone who wants a fast and relevant search experience for their end-users. Meilisearch works out-of-the-box with default settings that meet the needs of most projects. However, searching is still highly customizable.

# References

<https://git.unepgrid.ch/wesr/portal/wiki/API>

1. Meilisearch is a RESTful search API. It aims to be a ready-to-go solution for everyone who wants a fast and relevant search experience for their end-users. Meilisearch works out-of-the-box with default settings that meet the needs of most projects. However, searching is still highly customizable. [↑](#footnote-ref-1)