



Koninklijk Nederlands  
Meteorologisch Instituut  
*Ministerie van Infrastructuur en Waterstaat*

# KNMI Data Platform (KDP)

API's and standards at KNMI

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# KNMI tasks

- Advises and warns society about risks in the field of weather, climate, seismology and space weather
- Conducts scientific research and is a knowledge center in these areas
- Makes observations and runs models for weather and climate (precipitation radar, measuring network, Cabauw measuring tower)
- Represents the Netherlands in international contexts (WMO, ICAO, etc)





# KNMI delivers

- weather information (basic forecasts and warnings) to:
  - the general public
  - various governments from ministries to water boards and municipality
  - aviation (LVNL, Schiphol, balloon flight)
  - shipping
  - traffic (Rijkswaterstaat)
  
- research results to:
  - Policy makers
  - International collaborations
  - Other researchers



# Delivery methods

- › Ready-made products via:
  - e-mail, FTP, telephone for certain user groups
  - Internet site for general public
  - Extranets for defined user groups (pilots, port services, water boards, etc.)
- › Raw data or semi-finished products such as radar data or weather or climate data via:
  - FTP
  - KNMI Data Platform



# API standards

- › OGC standards (e.g. WMS, WCS, OGC API - Features, OGC API – EDR) are offered through several services:
  - KNMI Data Platform
  - [geoservices.knmi.nl](https://geoservices.knmi.nl) (testing ground)
- › KNMI develops software that offers OGC services for weather and climate data: ADAGUC ([adaguc.knmi.nl](https://adaguc.knmi.nl))
- › KNMI also uses OGC standards in OpenGeoWeb ([opengeoweb.com](https://opengeoweb.com)), a visualization tool for weather and climate data, which is being developed in an international collaboration
- › KNMI tries to follow developments in OGC



# Open Data at KNMI

- › Weather, climate and seismology
- › Follow government Open Data Policy
- › **FAIR**-principle:
  - **F**indable
  - **A**ccessible
  - **I**nteroperable
  - **R**eusable
- › ~ 170 TB stored
- › ~ 10 TB downloaded each month
- › Available at KNMI Data Platform



# KNMI Data Platform

## Catalog

Data management system (CKAN)

- › Browse datasets
- › Search datasets
- › View metadata
- › Open Source



## API management & Gateway

API Management Platform & API Gateway (Tyk)

- › API keys
- › Quota & Limit
  - Fair use
- › Partially Open Source



## API's

- › API's that give access to data
- › Developed at KNMI
- › Mix of docker and AWS native technology



## Search data



**Climate**  
78 Datasets



**Precipitation**  
93 Datasets



**Seismology and  
Acoustics**  
10 Datasets



**Sunshine and  
Radiation**  
15 Datasets



**Temperature**  
36 Datasets



**Weather forecast**  
17 Datasets



**Wind**  
51 Datasets

## Popular datasets

### Meteo data - actual synoptic observations KNMI the Netherlands per 10 minutes

KNMI collects observations from 53 automatic weather stations situated in the Netherlands and BES islands on locations such as aerodromes and North Sea platforms. In addition,...


### Weather model - HARMONIE-AROME KEPS meteorological parameters, NL


Current operational HARMONIE ensemble information in gridded form (regular lat-lon) of near surface and boundary layer (up to 300 m) parameters from the KNMI HARMONIE-AROME Cy40...


# Meteo data - actual synoptic observations KNMI the Netherlands per 10 minutes

 Summary

 Access




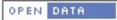
 Organization



Royal Netherlands  
Meteorological Institute  
*Ministry of Infrastructure  
and Water Management*

**KNMI**  
Koninklijk Nederlands Meteorologisch  
Instituut  
[read more](#)

 License

CC0 1.0 

## Abstract

KNMI collects observations from 53 automatic weather stations situated in the Netherlands and BES islands on locations such as aerodromes and North Sea platforms. In addition, wind data from 5 KNMI wind poles are included. The weather stations report every 10 minutes meteorological parameters such as temperature, relative humidity, wind, air pressure, visibility, precipitation and cloud cover. The number of parameters differs per station. Only stations which observations have been collected within 6 minutes after observation time are part of this dataset. Once an observation is written as a file to the dataset, it remains available for 60 days. After this period expires, the file is automatically removed.

Air temperature10 cm

Atmospheric conditions

Dewpoint temperature

Dynamic

Inspire dataset

Maximum temperature

Meteorological geog...

Minimum temperature

Open data

Popular

Precipitation

Precipitation duration

Precipitation rate

Pressure

Radiation

Relative humidity

Sunshine

Temperature

Visibility

Weather code

Wind direction

Wind gust


Wind speed

## Metadata

Dataset name	Actuele10mindataKNMIstations
Status	onGoing
Last metadata update	February 16, 2023, 2:23 PM (UTC+01:00)
Update frequency	continual
License	https://creativecommons.org/publicdomain/zero/1.0/
North bound latitude	55.7
East bound longitude	7.4
South bound latitude	50.6
West bound longitude	2.8
<a href="#">Show more</a>	

## Resources

 **XML ISO-19115 metadata**  
View XML metadata in ISO-19115 metadata

 Explore

# Meteo data - actual synoptic observations KNMI the Netherlands per 10 minutes

Summary

Access

## Access dataset via API











The dataset can be downloaded via an API, more about this on the [Developer Portal](#). Use the following API endpoint for access to this dataset:

https://api.dataplatform.knmi.nl/open-data/v1/datasets/Actuele10mindataKNMIstations/versions/2/files

Copy

## Browse dataset

Browse through the files of this dataset. To retrieve a specific file, we recommend to use the API.

Filename		Last Modified	Timestamp	Size
KMDS__OPER_P__10M_OBS_L2_202212102330.nc		5 months ago	2022-12-11T00:05:59+00:00	185 KB
KMDS__OPER_P__10M_OBS_L2_202212102340.nc		5 months ago	2022-12-11T00:15:57+00:00	185 KB
KMDS__OPER_P__10M_OBS_L2_202212102350.nc		5 months ago	2022-12-11T00:27:47+00:00	185 KB
KMDS__OPER_P__10M_OBS_L2_202212110000.nc		5 months ago	2022-12-11T00:36:36+00:00	185 KB
KMDS__OPER_P__10M_OBS_L2_202212110010.nc		5 months ago	2022-12-11T00:46:21+00:00	185 KB
KMDS__OPER_P__10M_OBS_L2_202212110020.nc		5 months ago	2022-12-11T00:55:52+00:00	185 KB
KMDS__OPER_P__10M_OBS_L2_202212110030.nc		5 months ago	2022-12-11T01:05:47+00:00	185 KB
KMDS__OPER_P__10M_OBS_L2_202212110040.nc		5 months ago	2022-12-11T01:15:58+00:00	185 KB
KMDS__OPER_P__10M_OBS_L2_202212110050.nc		5 months ago	2022-12-11T01:25:48+00:00	185 KB
KMDS__OPER_P__10M_OBS_L2_202212110100.nc		5 months ago	2022-12-11T01:36:40+00:00	185 KB
Rows per page: 10 1-10 of more than 10 < >				



# KNMI Developer portal

The place to connect to the clouds

[API Catalogue »](#)

## News

The platform and its community are being continuously improved and further developed together with the community. Learn here about new features and updates.

[Find out more »](#)

## Get started

Learn how to work with our APIs - read our comprehensive documentation.

[Find out more »](#)

## Frequent asked questions

Everything you need to know to use this portal a pro

[Find out more »](#)



# Data Platform API's

## Open Data API

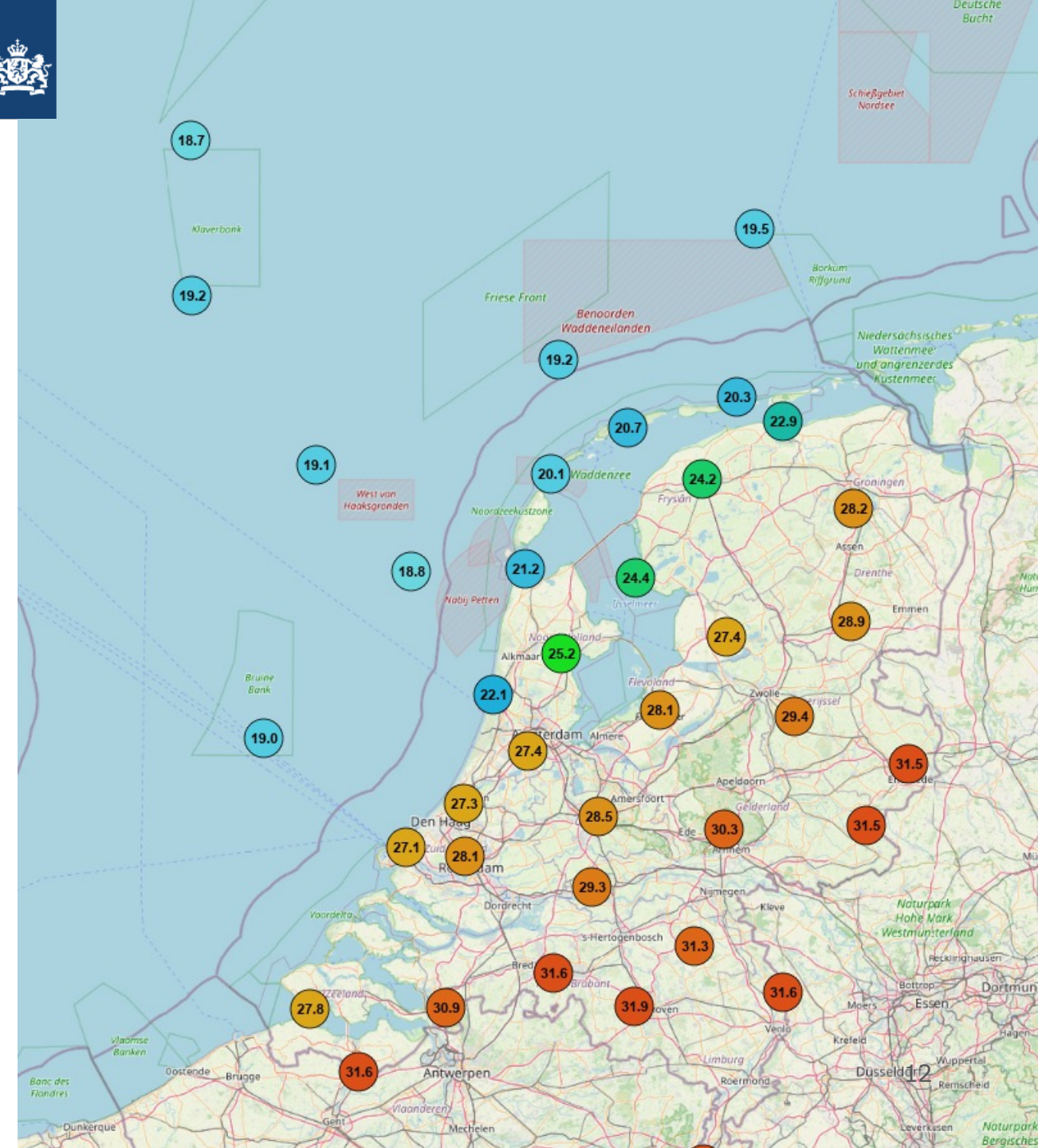
File based

## WMS

Web Map Service

## EDR API

Environmental Data Retrieval



# Open Data API

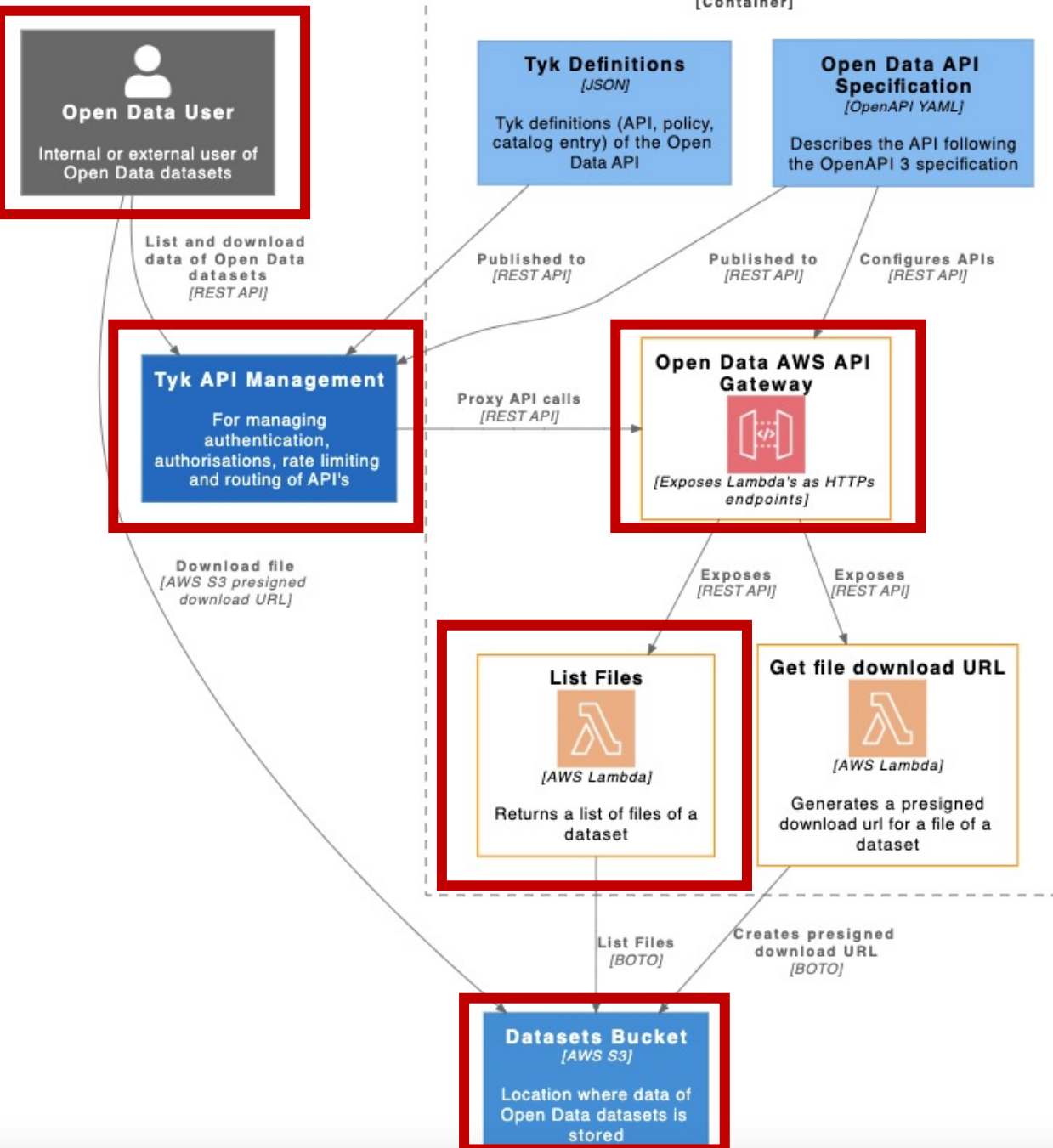
- > File based
- > Different formats – NetCDF, HDF5, ...
- > Two endpoints
  - List files
    - `/v1/datasets/{datasetName}/versions/{versionId}/files`
  - Get file
    - `/v1/datasets/{datasetName}/versions/{versionId}/files/{filename}/url`

200 OK 244 ms 1545 B Just Now

Preview Headers 9 Cookies Timeline

```
1 {  
2   "isTruncated": true,  
3   "resultCount": 10,  
4   "files": [  
5     {  
6       "filename": "INTER_OPER_R__TN1____L3__19610101T000000_19610102T000000_0002.nc",  
7       "size": 546980,  
8       "lastModified": "2019-12-17T09:57:06+00:00"  
9     },  
10    {  
11      "filename": "INTER_OPER_R__TN1____L3__19610102T000000_19610103T000000_0002.nc",  
12      "size": 547346,  
13      "lastModified": "2019-12-17T09:57:06+00:00"  
14    },  
15    {  
16      "filename": "INTER_OPER_R__TN1____L3__19610103T000000_19610104T000000_0002.nc",  
17      "size": 531035,  
18      "lastModified": "2019-12-17T09:57:06+00:00"  
19    },  
20    {  
21      "filename": "INTER_OPER_R__TN1____L3__19610104T000000_19610105T000000_0002.nc",  
22      "size": 545552,  
23      "lastModified": "2019-12-17T09:57:06+00:00"  
24    },  
25    {  
26      "filename": "INTER_OPER_R__TN1____L3__19610105T000000_19610106T000000_0002.nc",  
27      "size": 546096,  
28      "lastModified": "2019-12-17T09:57:06+00:00"  
29    },  
30    {  
31      "filename": "INTER_OPER_R__TN1____L3__19610106T000000_19610107T000000_0002.nc",  
32      "size": 547951,  
33      "lastModified": "2019-12-17T09:57:06+00:00"  
34    },  
35  ]  
36 }
```





# Open Data API

- › API Management:
  - › Tyk - API Management Platform & Gateway
- › AWS
  - API Gateway
  - Lambda: Runs code
  - S3 Bucket: Data storage



# WMS Service

## 6 datasets via WMS available

Evaporation - gridded daily Makkink evaporation

Temperature - gridded daily maximum

Temperature - gridded daily minimum

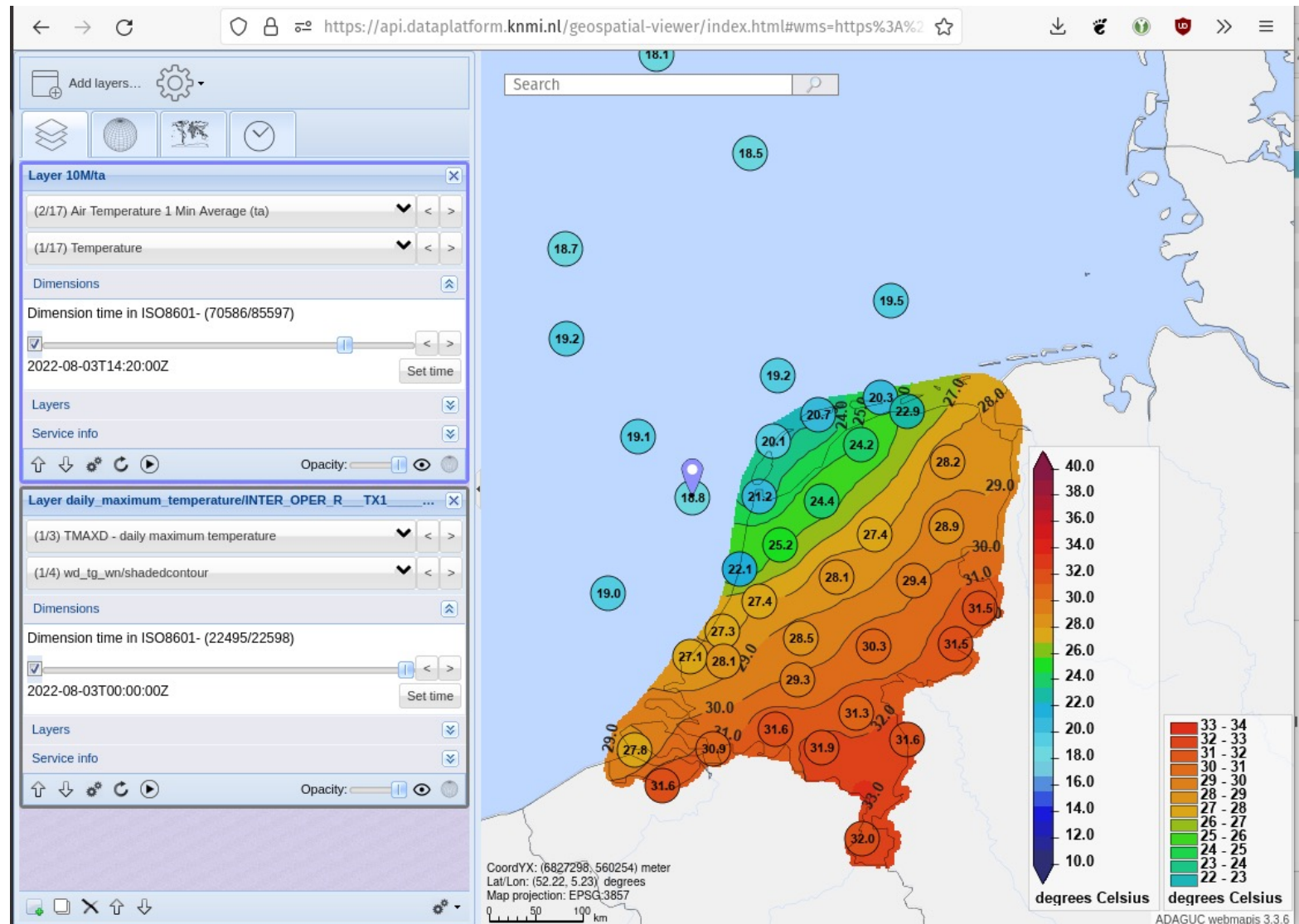
Temperature - gridded daily mean

WINS50 - wind at 10-600 meter height

Precipitation - daily precipitation sum

## Adaguc WMS viewer

<https://adaguc.knmi.nl/>





# Environmental Data Retrieval (EDR) API

- > Open Geospatial Consortium (OGC) standard
- > Query data in a spatio-temporal manner
- > Output in CoverageJSON
- > Easier to integrate in applications
- > Currently still in alpha

## Available collections in the KNMI EDR API

The following datasets are currently available in the KNMI EDR API

Collection	Instance	Corresponding file based datasets
observations	unvalidated (default)	<a href="#">Actuele 10 minuten data, bewolkingsgegevens, neerslaggegevens, vochtigheid_en_temperatuur, weer_en_luchtdruk, windgegevens, zonneschijnduur_en_straling</a>
Tg1	default	<a href="#">Temperature - gridded daily mean temperature in the Netherlands</a>
Tx1	default	<a href="#">Temperature - gridded daily maximum temperature in the Netherlands</a>
Tn1	default	<a href="#">Temperature - gridded daily minimum temperature in the Netherlands</a>
Rd1	default	<a href="#">Precipitation - gridded daily precipitation sum in the Netherlands</a>
Ev24	default	<a href="#">Evaporation - gridded daily Makkink evaporation in the Netherlands</a>
wins50	default	<a href="#">WINS50 - wind at 10-600 meter height for the Netherlands from HARMONIE-AROME as daily files</a>

More collections may be added in the future.

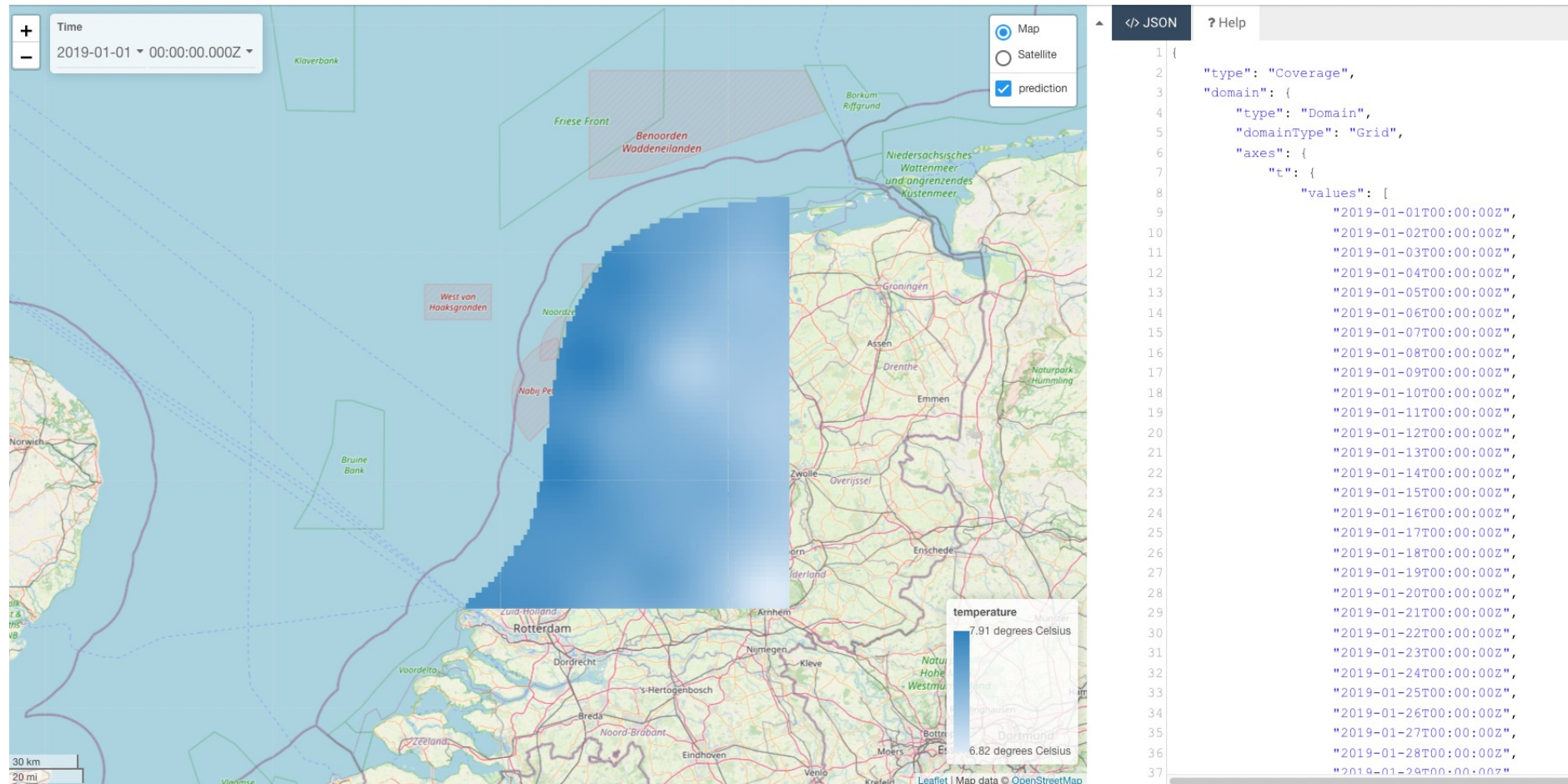


Name	Description
<b>collection_id</b> * required string (path)	<input type="text" value="observations"/>
<b>location_id</b> * required string (path)	<input type="text" value="06201"/>
<b>datetime</b> string (query)	<p>Either a date-time or an interval, open or closed. I</p> <p><b>Examples:</b></p> <div><b>Datetime</b> ▼</div> <div><input type="text" value="2022-07-22T04:10:00Z"/></div>
<b>parameter-name</b> string (query)	<p>comma delimited list of parameters to retrieve dat</p> <div><input type="text" value="parameter-name"/></div>

```
{
  "type": "Coverage",
  "domain": {
    "type": "Domain",
    "domainType": "PointSeries",
    "axes": {
      "x": {
        "values": [
          5.14527777777778
        ]
      },
      "y": {
        "values": [
          51.8577777777778
        ]
      },
      "t": {
        "values": [
          "2022-07-19T18:00:00Z",
          "2022-07-19T18:10:00Z"
        ]
      }
    }
  },
  "ranges": {
    "t_dryb_10": {
      "type": "NdArray",
      "dataType": "float",
      "axisNames": [
        "x",
        "y",
        "t"
      ],
      "shape": [
        1,
        1,
        2
      ],
      "values": [
        33.3,
        32.6
      ]
    }
  }
}
```



CoverageJSON Playground Cookbook Tools Specification



<https://covjson.org/playground/>



## Future developments

- > High Value Datasets EU
  - More and better API's – EU wide
  - Reusable APIs for EU partners, same specification
  - Develop with EU partners
  
- > Stable release OGC EDR API (now Alpha)
  - Validation of historic observation data
  - Adhering to specification



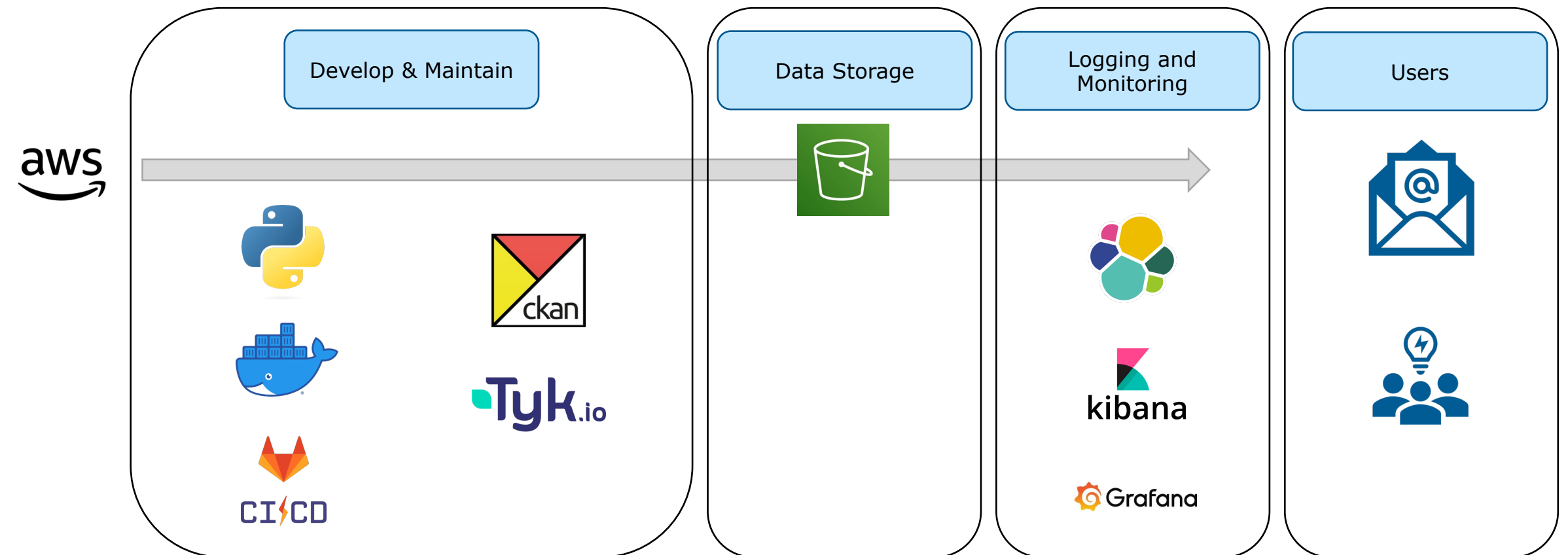
# Questions?

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## KDP DevOps Team – Activities





# Logging & Monitoring

