



ACTRIS EARLINET: Data Portal and API

Claudio Dema – claudio.dema@cnr.it

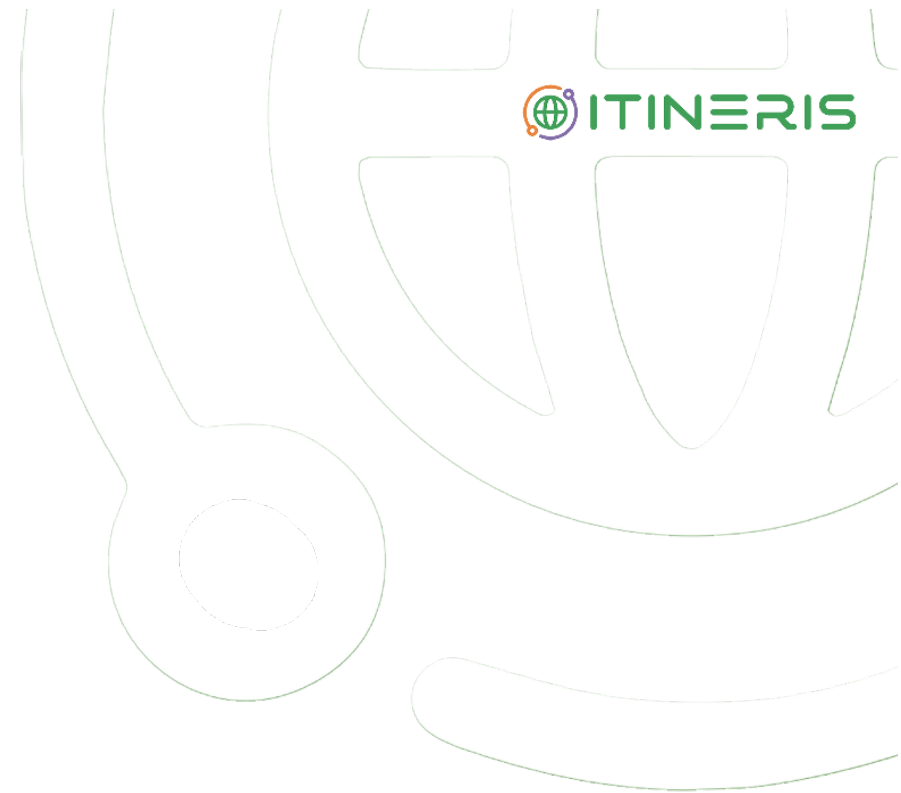
IR0000032 – ITINERIS, Italian Integrated Environmental Research Infrastructures System
(D.D. n. 130/2022 - CUP B53C22002150006) Funded by EU - Next Generation EU PNRR-
Mission 4 “Education and Research” - Component 2: “From research to business” - Investment
3.1: “Fund for the realisation of an integrated system of research and innovation infrastructures”



Agenda

 ACTRIS – EARLINET Data Portal

 ACTRIS – EARLINET API



ACTRIS – EARLINET Data Portal



<https://data.earlinet.org/>

ACTRIS-EARLINET Data Portal

Home

SEARCH DATA

DATASETS

QUICKLOOKS

ACTRIS-EARLINET DATABASE

Welcome to the ACTRIS-EARLINET database web portal. This is a publicly available system that allows scientists to search, download and visualize aerosol LIDAR optical products from the ACTRIS-EARLINET network.

All aerosol LIDAR (meta)data from the ACTRIS-EARLINET network can be also accessed (data download and metadata retrieval) via the ACTRIS-EARLINET REST API, whose schema is described here .

The ACTRIS-EARLINET REST API provides access to all aerosol LIDAR data from the ACTRIS-EARLINET network, including those products not yet available on this web portal.

ACTRIS-EARLINET STATIONS



DATA SEARCH

Date Minimum (YYYY-MM-DD) 2024-10-31	Date Maximum (YYYY-MM-DD) 2024-11-07	Daytime Minimum	Daytime Maximum
Stations	Emission Wavelengths	File Types	Levels

ADVANCED SEARCH

SEARCH

ACTRIS – EARLINET Data Portal



<https://data.earlinet.org/>

ACTRIS-EARLINET Data Portal

Home

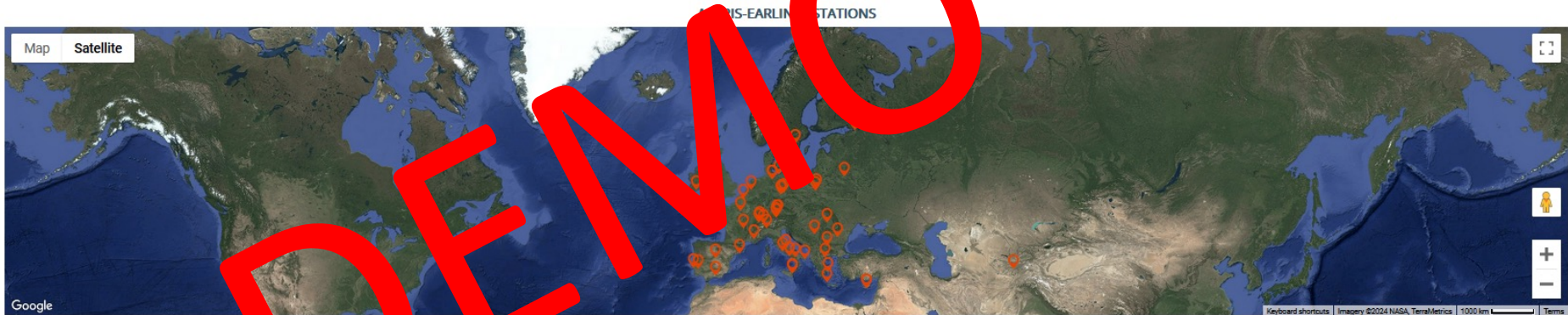
- SEARCH DATA
- DATASETS
- QUICKLOOKS

ACTRIS-EARLINET DATABASE

Welcome to the ACTRIS-EARLINET database web portal. This is a publicly available system that allows scientists to search, download and visualize aerosol LIDAR optical data from the ACTRIS-EARLINET network.

All aerosol LIDAR (meta)data from the ACTRIS-EARLINET network can be also accessed (data download and metadata retrieval) via the ACTRIS-EARLINET REST API. The schema is described here .

The ACTRIS-EARLINET REST API provides access to all aerosol LIDAR data from the ACTRIS-EARLINET network, including those products not yet available on the web portal.



DATA SEARCH

Date Minimum (YYYY-MM-DD) 2024-10-31	Date Maximum (YYYY-MM-DD) 2024-11-07	Daytime Minimum	Daytime Maximum
Stations	Emission Wavelengths	File Types	Levels

ADVANCED SEARCH

ACTRIS – EARLINET REST API



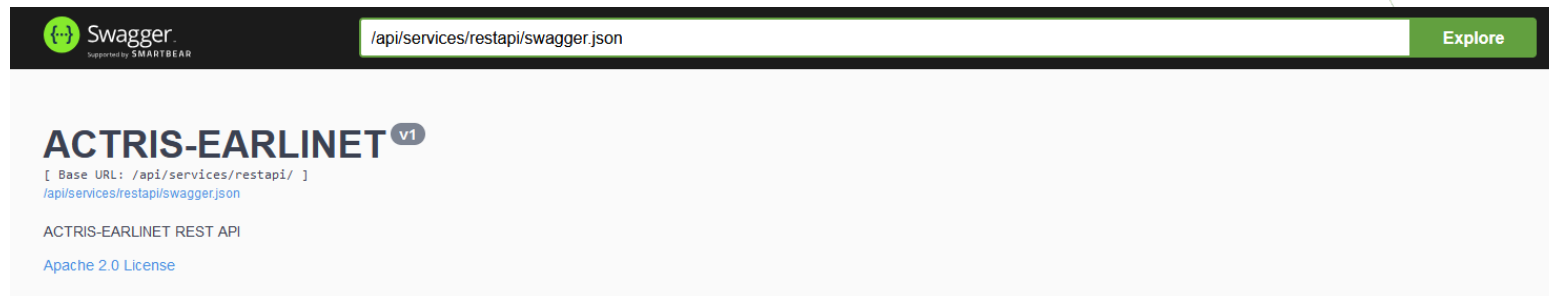
 **Schema:** <https://data.earlinet.org/api/services/restapi? wadl>

```
</method>
</resource>
-<resource path="products/downloads">
  <method name="GET">
    <request>
      <param name="kind" style="query" repeating="true" type="xs:string">
        <option value="cloudmask"/>
        <option value="eldec"/>
        <option value="elic"/>
        <option value="elpp"/>
        <option value="hirelpp"/>
        <option value="optical"/>
        <option value="garrlic"/>
      </param>
      <param name="fromDate" style="query" type="xs:string"/>
      <param name="toDate" style="query" type="xs:string"/>
      <param name="stations" style="query" type="xs:string"/>
      <param name="measurementId" style="query" type="xs:string"/>
    </request>
    <response>
      <representation mediaType="application/octet-stream"/>
    </response>
  </method>
</resource>
+<resource path="products/downloadsGarrlic"></resource>
```

ACTRIS – EARLINET REST API

Some info (1/2)

- No authentication required
- Swagger UI: <https://data.earlinet.org/api/swagger-ui/#/>

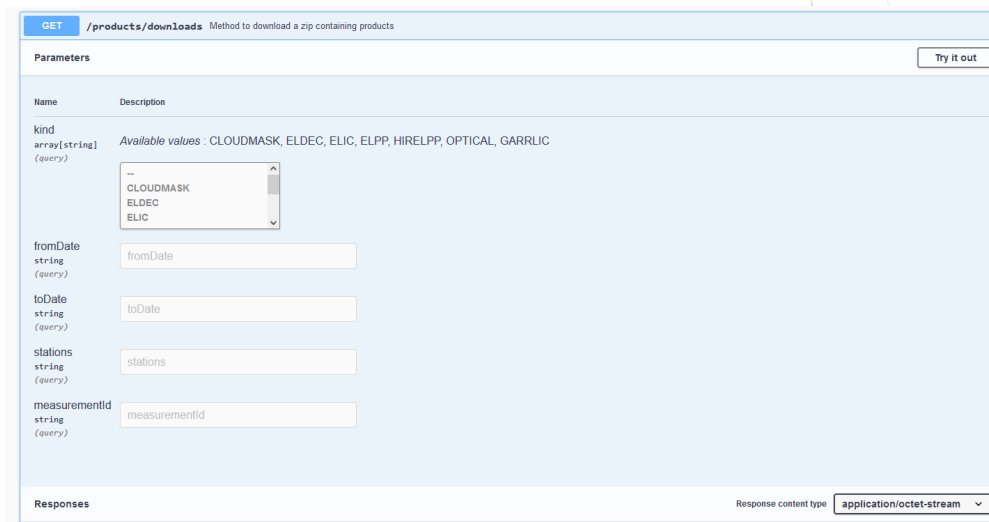


ACTRIS – EARLINET REST API



Some info (2/2)

- Access to all aerosol LIDAR (meta)data, including those products not yet available on the ARES Data Portal and via the ACTRIS Metadata Catalogue
 - data download
 - metadata retrieval



The screenshot shows a web-based interface for the ACTRIS REST API. The top bar indicates the method is GET and the endpoint is /products/downloads, with a description: "Method to download a zip containing products". Below this is a "Parameters" section with a "Try it out" button. The parameters are listed in a table-like format:

Name	Description
kind array[string] (query)	Available values : CLOUDMASK, ELDEC, ELIC, ELPP, HIRELPP, OPTICAL, GARRLIC
fromDate string (query)	fromDate
toDate string (query)	toDate
stations string (query)	stations
measurementId string (query)	measurementId

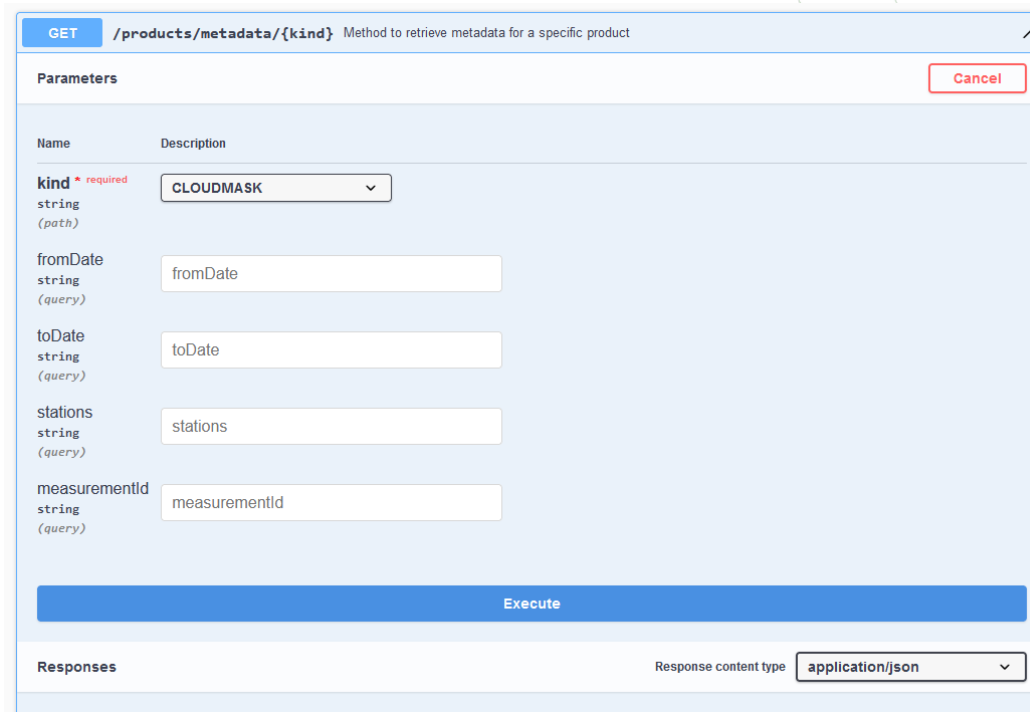
At the bottom, the "Responses" section shows the response content type as application/octet-stream.

ACTRIS – EARLINET REST API



Learn to use it! (1/2)

- Practice with the [Swagger UI](#)

A screenshot of the Swagger UI interface for the ACTRIS REST API. The interface shows a GET endpoint: `/products/metadata/{kind}` with the description "Method to retrieve metadata for a specific product". The "Parameters" section is expanded, showing a table of query parameters. The "kind" parameter is a required string (path) with a dropdown menu set to "CLOUDMASK". Other parameters include "fromDate", "toDate", "stations", and "measurementId", all of which are strings (query) with corresponding text input fields. At the bottom, there is an "Execute" button and a "Responses" section with a dropdown menu for "Response content type" set to "application/json".

Name	Description
kind * required string (path)	CLOUDMASK
fromDate string (query)	fromDate
toDate string (query)	toDate
stations string (query)	stations
measurementId string (query)	measurementId

ACTRIS – EARLINET REST API




Learn to use it! (2/2)

- Practice with the [ACTRIS VRE](#)

ACTRIS DC

Access ACTRIS Aerosol Remote Sensing data



The goal of this notebook is to provide guide on how to access aerosol remote sensing data.

Let's get started!

Import libraries

```
[17]: from pathlib import Path
import datetime

# Library for working with netCDF files
import xarray as xr

# Libraries for working with JSON files, making HTTP requests, and handling file system operations
import requests
import netCDF4
import numpy as np

# Library for plotting data
import matplotlib.pyplot as plt

# Library for working with zip files
import zipfile

from ipywidgets import IntProgress
from IPython.display import display
```

Download

We're going to use ARES REST API to search and download netCDF4 files. For more information, see <https://data.earlinet.org/api/swagger-ui/#>.

Let's download an optical product from Potenza in 2024. This product contains aerosol optical properties, like aerosol particle backscatter coefficient, aerosol particle light extinction coefficient, aerosol particle light extinction-to-backscatter ratio, and aerosol particle light backscatter linear depolarization ratio.



THANKS!

IR0000032 – ITINERIS, Italian Integrated Environmental Research Infrastructures System
(D.D. n. 130/2022 - CUP B53C22002150006) Funded by EU - Next Generation EU PNRR-
Mission 4 “Education and Research” - Component 2: “From research to business” - Investment
3.1: “Fund for the realisation of an integrated system of research and innovation infrastructures”



Finanziato
dall'Unione europea
NextGenerationEU



Ministero
dell'Università
e della Ricerca

