Data Resources Guide

June 23-29, 2021

PLEASE SEE THE ADDENDUM AT THE BOTTOM OF THIS DOCUMENT (ADDED ON JUNE 25, 2021).

This guide is intended for participants of the Earth Observation (EO) Dashboard Hackathon. The instructions contained in this document require users to be signed up and registered for this specific event at eodashboardhackathon.org.

Please note that some of the images used in this guide are samples from previous hackathons and are not exact replicas of the platform that will be used for the EO Dashboard Hackathon.

For more information:

If you have questions that are not addressed in this guide or in the other guides located on eodashboardhackathon.org/about, contact the organizing team at info@eodashboardhackathon.org.

For technical assistance with any of the content in this document, email web@eodashboardhackathon.org with a specific description of your problem.

Document last updated: June 24, 2021

Introduction

The purpose of the EO Dashboard Hackathon is to get participants engaged with the Earth Observing (EO) Dashboard, so they can use it and other Earth observation data from NASA, ESA, and JAXA to solve one of 10 challenges. While each of the challenge pages contain links to data resources in the "Resources" tab, this guide is meant to serve as an overview of the data resources that are available to you. It also contains critical information about how to access some of the data resources.

Once you are working on your project, please also see the companion guide -- the *Dashboard Technical Background and Integration Guide* -- which is located on eodashboardhackathon.org/about. That guide contains technical details about the Earth Observing (EO) Dashboard, which you will need in order to ensure that your project can be successfully integrated into the Dashboard.

Overview

All the data in Earth Observing (EO) Dashboard is open and can be accessed directly.

In the table below, participants can find:

- What indicator categories are available in the EO Dashboard as well as in other dashboard instances developed by NASA and ESA
- What information each indicator gives
- Examples of how the indicators are visualized on the different agencies' dashboards
- How to access the data, either through APIs or by linking to the csv files in GitHub

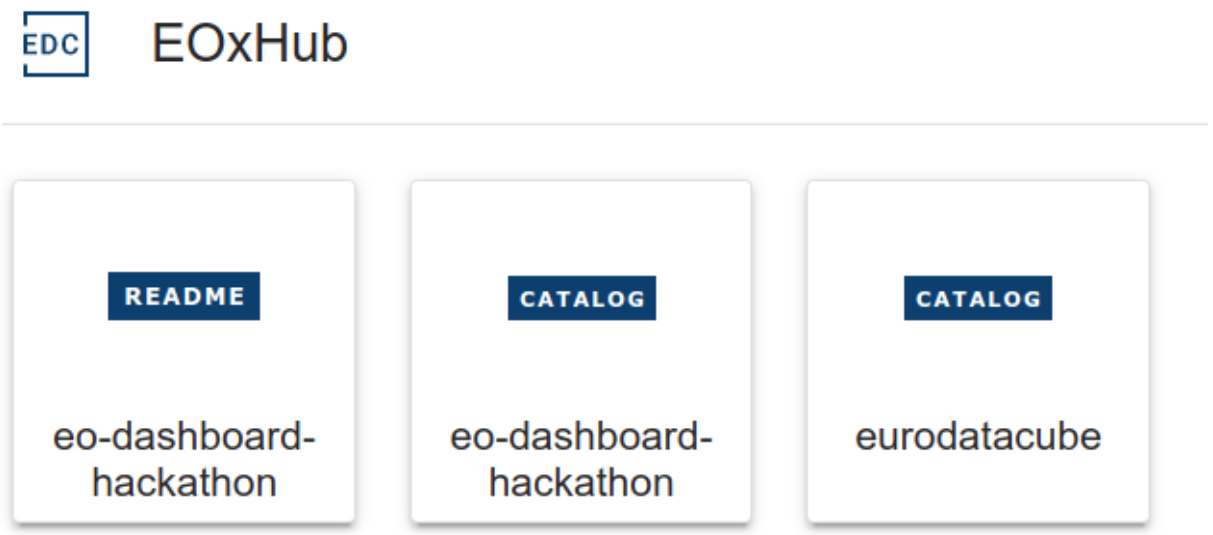
EuroDataCube

Some of the data resides in the EuroDataCube (*EDC* tag in the API column in the table below). The list of EDC data collections tailored for the hackathon is available at the EuroDataCube Catalogue https://collections.eurodatacube.com/tag/dashboard-hackathon/.

Please note: While the data in EuroDataCube can be openly discovered in the Catalogue, accessing other EuroDataCube resources requires registration.

To use the Euro Data Cube resources, such as the JupyterLab Workspace, participants need to register for a free account here. Complete the form, accept the Terms and Conditions, and click the "Participate" button. Please be patient after registering while your workspace is being tailored for the hackathon. You will get a notification via email once it is available. *Please note: Do NOT create an account from the public EuroDataCube site because it will not be tailored to the hackathon. In particular, it will not have the hackathon resources available. The *Dashboard Technical Background and Integration Guide*, which can be found on eodashboardhackathon.org/about/, provides instructions for how to do this.

In the EDC JupyterLab Workspace, the different EDC resources can be accessed from the Launcher page (see figure below).



Participants have access to a series of Tutorial Notebooks to get started with the EDC and learn how to access the different Earth observation data and indicators, as well as how to generate simple maps and graphs similar to those showcased on https://EODashboard.org.

If you're unsure how to reach the workspace, watch the video Getting started with the EDC.

Data Resource Table

There are a number of different datasets you can make use of for your project. You may also incorporate external data, as long as you note that you must demonstrate use of some of the data provided in the EO Dashboard and provided here by the space agencies in order to be eligible for an award. Subject-Matter Experts can answer questions about the data in the chat channels.

IMPORTANT: Data in the EO dashboard comes from 2 sources: the NASA Covid API (url: https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1) and the EDC. The table below contains example API queries to access each of the EO Dashboard's data products programmatically. Note that most data products in the EO Dashboard are served by either the NASA Covid API **or** the EDC, but some, such as water quality products, can be found in both. See this document for a more in-depth explanation of how to use the NASA Covid API to discover available data and construct valid queries.. See the *Dashboard Technical Background and Integration Guide* for more information on how to utilize the resources provided by Euro Data Cube (EDC). Resources provided by the EDC are denoted with: ***EDC***.

Indicator	**Data**	**Dashboard Example**	**API (SEE IMPORTANT NOTE ABOVE)**	**Source Data**
Agriculture	Crop conditions worldwide	https://earthdata.nasa.gov/covid19/explore/global?map=26.1107%2C-8.3623%2C3.79&layers=agriculture&date=2021-04-01 https://eodashboard.org/?poi=W6-N6	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/3/4/4@1x?url=s3://covid-eo-data/agriculture-cropmonitor/CropMonitor_202104.tif&resampling_method=nearest&bidx=1&color_map=custom_cropmonitor	s3://covid-eo-data/agriculture-cropmonitor/CropMonitor_<YYYYMM>.tif
Agriculture	Productive Area	https://www.eodashboard.org/?indicator=E10a1	***EDC*** GeoDB via JN Database = eodash Table name = E10a1_tri	https://github.com/eurodatacube/eodash/blob/master/app/public/data/trilateral/E10

				a1.csv
Agriculture	Activity Indicator	https://www.eodashboard.org/?indicator=E10a2	***EDC*** GeoDB via JN Database = eodash Table name = E10a2_tri	https://github.com/eurodatacube/eodash/blob/master/app/public/data/trilateral/E10a2.csv
Agriculture	Productive area change	https://www.eodashboard.org/?indicator=E10a3	***EDC*** GeoDB via JN Database = eodash Table name = E10a3_tri	https://github.com/eurodatacube/eodash/blob/master/app/public/data/trilateral/E10a3.csv
Agriculture	Harvesting evolution over time	https://www.eodashboard.org/?indicator=E10a6	***EDC*** GeoDB via JN Database = eodash Table name = E10a6	https://github.com/eurodatacube/eodash/blob/master/app/public/data/trilateral/E10a6.csv
Agriculture	Harvesting activity: cumulative harvested area	https://www.eodashboard.org/?indicator=E10a8	***EDC*** GeoDB via JN Database = eodash Table name = E10a8	https://github.com/eurodatacube/eodash/blob/master/app/public/data/trilateral/E10a8.csv
Agriculture	Planting activity	https://www.eodashboard.org/?indicator=E10c	***EDC*** GeoDB via JN Database = eodash Table name = E10c_tri	https://github.com/eurodatacube/eodash/blob/master/app/public/data/trilateral/E10c.csv

Agriculture	Cropped area - regional	https://www.eodashboard.org/?indicator=E10d	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/6/32/30@1x?url=s3://covid-eo-data/Togo/togo_cropland_v7-1_cog_v2.tif&resampling_method=bilinear&bidx=1&rescale=0%2C1&color_map=inferno	s3://covid-eo-data/Togo/togo_cropland_v7-1_cog_v2.tif
	ALOS-2 PALSAR-2 ScanSAR for Agriculture (licence conditions apply)		***EDC*** Euro Data Cube Public Collections	
CO2 (Diff)	Changes in CO2 during lockdown compared to previous years	https://earthdata.nasa.gov/covid19/explore/global?map=-66.8837%2C39.8583%2C1.42&layers=co2-diff&date=2020-12-15 https://eodashboard.org/?poi=W5-N2	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/1/1/1@1x?url=s3://covid-eo-data/xco2-diff/xco2_16day_diff.2020_12_15.tif&resampling_method=bilinear&bidx=1&rescale=-0.000001%2C0.000001&color_map=rdbu_r	s3://covid-eo-data/xco2-diff/xco2_16day_diff.<YYYY_MM_DD>.tif
CO2 (Avg)	Average CO2 concentration in 2020	https://earthdata.nasa.gov/covid19/explore/global?map=-76.0967%2C41.0496%2C3.23&layers=co2&date=2020-12-15 https://eodashboard.org/?poi=W5-N2	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/3/1/2@1x?url=s3://covid-eo-data/xco2-mean/xco2_16day_mean.2020_12_15.tif&resampling_method=bilinear&bidx=1&rescale=0.000408%2C0.000419&color_map=rdylbu_r&color_formula=gamma%20r%201.05	s3://covid-eo-data/xco2-mean/xco2_16day_mean.<YYYY_MM_DD>.tif

Greenhouse Gases	CO2 time series	https://www.eodashboard.org/?indicator=N2&poi=JP01-N2	***EDC*** GeoDB via JN Database = eodash Table name = N2_tri	https://github.com/eurodatacube/eodash/blob/master/app/public/data/trilateral/N2.csv
Greenhouse Gases	Carbon dioxide (CO2) and methane (CH4) partial column density of lower (approx. 0-4 km)and upper (approx. 4 -12km) troposphere (LT and UT, respectively)	https://eodashboard.org/?indicator=N2&poi=JP01-N2 (access from EO Data button)	***EDC*** Euro Data Cube Public Collections	
Facebook Population Density	30x30 meter population density tiles	https://earthdata.nasa.gov/covid19/explore/global?map=-74.0197%2C40.8648%2C8.88&layers=fb-population-density&date=2020-12-15	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/10/301/384@1x?url=s3://covid-eo-data/dataforgood-fb-population-density/cog.tif&rescale=0,69&resampling_method=nearest&color_map=ylorrd	s3://covid-eo-data/dataforgood-fb-population-density/cog.tif
Population	Gridded Population of the World (v4)	https://earthdata.nasa.gov/covid19/explore/global?map=-73.7862%2C40.7023%2C5.93&layers=gibs-population&date=2020-12-15 https://eodashboard.org/?poi=W6-NASAPopulation	https://gibs.earthdata.nasa.gov/wmts/epsg3857/best/GPW_Population_Density_2020/default/2020-05-14T00:00:00Z/GoogleMapsCompatible_Level7/6/23/19.png	

NO2 (Diff)	Changes in NO2 levels	https://earthdata.nasa.gov/covid19/explore/global?map=-81.5904%2C44.394%2C4.05&layers=no2-diff&date=2021-04-01 https://eodashboard.org/?poi=W2-N1	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/4/3/6@1x?url=s3://covid-eo-data/OMNO2d_HRMDifference/OMI_trno2_0.10x0.10_202104_Col3_V4.nc.tif&resampling_method=bilinear&bidx=1&rescale=-8000000000000000%2C8000000000000000&color_map=rdbu_r	s3://covid-eo-data/OMNO2d_HRMDifference/OMI_trno2_0.10x0.10_202104_Col3_V4.nc.tif
NO2	NO2 levels since Jan 2015	https://earthdata.nasa.gov/covid19/explore/global?map=-71.0453%2C44.4134%2C4.04&layers=no2&date=2021-04-01 https://eodashboard.org/?poi=W2-N1	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/4/5/6@1x?url=s3://covid-eo-data/OMNO2d_HRM/OMI_trno2_0.10x0.10_202104_Col3_V4.nc.tif&resampling_method=bilinear&bidx=1&rescale=0%2C1.5e16&color_map=custom_no2&color_formula=gamma%20r%201.05	s3://covid-eo-data/OMNO2d_HRM/OMI_trno2_0.10x0.10_202104_Col3_V4.nc.tif
NO2 city average	NO2 from Sentinel-5p TROPOMI: Spatial average over the city area of bi-weekly tropospheric nitrogen dioxide (NO2) concentrations	https://www.eodashboard.org/?poi=ES01-N1&indicator=N1	***EDC*** https://collections.eurodatacube.com/s5p-no2-tropno-daily-check/	
NO2	NO2 levels since 2019 from	https://www.eodashboard.org/?poi=W1-N1&indicator=N1	***EDC*** https://collections.eurodatacube.com/s5p-no2-tr	

	Sentinel-5p TROPOMI. 14 days average		opno-daily-check/	
Nightlights HD	Nighttime light activity processed to eliminate light sources such as moonlight (monthly)	https://earthdata.nasa.gov/covid19/explore/be?map=116.345%2C40.0142%2C8.61&date=2021-03-01&lState=nightlights-hd%7C0%7C0 https://eodashboard.org/?poi=W2-N1&indicator=N5	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/9/82/198@1x?url=s3://covid-eo-data/bmhd_30m_monthly/BMHD_VNP46A2_sf_202103_cog.tif&bidx=1&rescale=0,255&color_map=inferno	s3://covid-eo-data/bmhd_30m_monthly/BMHD_VNP46A2_<SPOTLIGHT_ID>_<YYYYMM>_cog.tif
Nightlights VIIRS	Nighttime light activity (non-corrected, daily)	https://earthdata.nasa.gov/covid19/explore/be?map=116.5729%2C40.0507%2C8.19&layers=nightlights-viirs&date=2021-03-01	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/9/82/198@1x?url=s3://covid-eo-data/bm_500m_daily/VNP46A2_V011_sf_2021_03_01_cog.tif&resampling_method=nearest&bidx=1&rescale=0%2C100&color_map=viridis	s3://covid-eo-data/bm_500m_daily/VNP46A2_V011_<SPOTLIGHT_ID>_<YYYY_MM_DD>cog.tif
Recovery Proxy Map	Darker areas show areas with increased car activity	https://earthdata.nasa.gov/covid19/explore/be?map=116.7214%2C40.1631%2C12.2&layers=recovery&date=2021-03-01 https://www.eodashboard.org/?indicator=N8	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/12/3376/1548@1x?url=s3://covid-eo-data/rpm/rpm-be.cog.tif&resampling_method=bilinear&bidx=1%2C2%2C3%24	s3://covid-eo-data/rpm/rpm-<SPOTLIGHT_ID>.cog.tif
Slowdown Proxy Map	Darker areas show areas with greater	https://earthdata.nasa.gov/covid19/explore/be?map=116.5077%2C	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/12/3373/15	s3://covid-eo-data/slowdown_proxy_map/

	reduction of car activity	40.0579%2C12.13&layers=slowdown&date=2021-03-01 https://eodashboard.org/?indicator=N7	50@1x?url=s3://covid-eo-data/slowdown_proxy_map/be.tif&resampling_method=bilinear&bidx=1%2C2%2C3%24	<SPOTLIGHT_ID>.tif
Water Quality Maps Maps	Chlorophyll-a concentration Algae growth. Red areas indicate increased algae growth and worst water quality, blue areas indicate decreased algae growth and improved water quality	https://earthdata.nasa.gov/covid19/explore/sf?map=-122.1461%2C37.575%2C10.32&layers=water-chlorophyll&date=2021-04-24 https://www.eodashboard.org/?indicator=N3a2&poi=Barcelona_ESA-N3a2	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/11/329/792@1x?url=s3://covid-eo-data/oc3_chla_anomaly/anomaly-chl-sf-2021_04_24.tif&resampling_method=bilinear&bidx=1&rescale=-100%2C100&color_map=rdbu_r **EDC*** https://collections.eurodatacube.com/tag/dashboard-hackathon/	s3://covid-eo-data/oc3_chla_anomaly/anomaly-chl-<SPOTLIGHT_ID>-<YYYY_MM_DD>.tif
Water Quality Maps Maps	Turbidity (total suspended matter) Amount of sediment or particles suspended in water. Lighter areas indicate less turbidity and clearer water	https://earthdata.nasa.gov/covid19/explore/sf?map=-122.1419%2C37.5501%2C10.99&layers=water-spm&date=2021-04-24 https://eodashboard.org/?poi=US04TSM-N3a2&indicator=N3a2	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/11/329/792@1x?url=s3://covid-eo-data/spm_anomaly/anomaly-spm-sf-2021_04_24.tif&resampling_method=bilinear&bidx=1&rescale=-100%2C100&color_map=rdbu_r **EDC*** https://collections.eurodatacube.com/tag/dashboard-hackathon/	s3://covid-eo-data/spm_anomaly/anomaly-spm-<SPOTLIGHT_ID>-<YYYY_MM_DD>.tif

Water Quality Time Series	Chlorophyll-a concentration anomaly	https://www.eodashboard.org/?indicator=N3b	***EDC*** GeoDB via JN Database = eodash Table name = N3b_tri	https://github.com/eurodatacube/eodash/blob/master/app/public/data/trilateral/N3b.csv
Water Quality Time Series	Total Suspended Matter concentration anomaly	https://www.eodashboard.org/?indicator=N3b&poi=JP05-N3b	***EDC*** GeoDB via JN Database = eodash Table name = N3b_tri	https://github.com/eurodatacube/eodash/blob/master/app/public/data/trilateral/N3b.csv
Photonic Zone Depth	Depth at which 1% of surface radiation remains	https://earthdata.nasa.gov/covid19/explore/gl?map=-82.9735%2C42.0762%2C8.21&layers=water-pzd&date=2020-05-20	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/8/68/95@1x?url=s3://covid-eo-data/pzd_anomaly/anomaly-pzd-gl-2020_05_20.tif&resampling_method=bilinear&bidx=1&rescale=-100%2C100&color_map=rdbu_r	s3://covid-eo-data/pzd_anomaly/anomaly-pzd-<SPOTLIGHT_ID>-<YYYY_MM_DD>.tif
Contrail Detections	Plane contrails detected on Modis imagery	https://earthdata.nasa.gov/covid19/explore/sf?map=-122.3382%2C37.0381%2C7.85&layers=detections-contrail&date=2020-05-08	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/detections/contrail/sf/2020_05_08.geojson	s3://covid-eo-data/detections-contrail/<SPOTLIGHT_ID>/<YYYY_MM_DD>.geojson
Airplanes	Grounded Airplanes detection on PlanetScope imagery	https://earthdata.nasa.gov/covid19/explore/sf?map=-121.9301%2C37.3658%2C14.23&layers=detections-plane&date=2020-10-31	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/detections/plane/sf/2020_10_31.geojson	s3://covid-eo-data/detections-plane/<SPOTLIGHT_ID>/<YYYY_MM_DD>.geojson

		https://www.eodashboard.org/?poi=US021-E13b&indicator=E13b		
	Grounded Airplanes detection on Sentinel-2 imagery	https://www.eodashboard.org/?poi=FR8-E13b&indicator=E13b	***EDC*** https://collections.eurodatacube.com/sentinel-2-l2a/	
	Flying Airplane detection on Sentinel-2 imagery	https://race.esa.int/?indicator=E13d	***EDC*** https://collections.eurodatacube.com/sentinel-2-l2a/	
Shipping	Ships detected on PlanetScope imagery	https://earthdata.nasa.gov/covid19/explore/sf?map=-122.3218%2C37.7334%2C11.66&layers=detections-ship&date=2020-05-21 https://eodashboard.org/?poi=US02-E13c&indicator=E13c	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/detections/ship/sf/2020_05_21.geojson	s3://covid-eo-data/detections-ship/<SPOTLIGHT_ID>/<YYYY_MM_DD>.geojson
	Ships detected on Sentinel-1 radar imagery	https://race.esa.int/?poi=ES7-E1_S2&country=ES	***EDC*** https://collections.eurodatacube.com/sentinel-1-grd/	
	Ships detected on Sentinel-2 imagery	https://race.esa.int/?indicator=E1_S2&poi=IT3-E1_S2	***EDC*** https://collections.eurodatacube.com/sentinel-2-l2a/	
Vehicles	Vehicles detected on planet scope imagery	https://earthdata.nasa.gov/covid19/explore/la?map=-118.391%2C33.9525%2C16.92&layers=detections-vehicles	https://8ib71h0627.execute-api.us-east-1.amazonaws.com/v1/detections/vehicles/la/2020_07_08.geojson	s3://covid-eo-data/detections-vehicles/<SPOTLIGHT_ID>/<YYYY_MM_D

		&date=2020-07-08		D>.geojson
Activity (cars/ containers)	Density of cars or containers estimated from ALOS-2 and Sentinel-1 imagery	https://eodashboard.org/?indicator=E9&poi=JP03-E9	***EDC*** GeoDB via JN Database = eodash Table name = E9_tri	https://github.com/eurodatacube/eodash/blob/master/app/public/data/trilateral/E9.csv
Economic activity	ALOS-2 PALSAR-2 Imagery (licence conditions apply)		***EDC*** Euro Data Cube Public Collections	
Health	Rainfall (GSMaP (GPM, GCOM-W, Himawari etc.),), Approx. 10km Short Wave Radiation(MODIS), Land Surface Temperature(MODIS, GCOM-C SGLI), Approx. 5km Aerosol Optical Thickness(MODIS, GCOM-C SGLI), Approx. 5km Normalized Difference Vegetation Index(MODIS,		JAXA's Public-health Monitor and Analysis Platform (JPMAP) License: https://earth.jaxa.jp/policy/en.html	

	GCOM-C SGLI) , Approx. 5km Soil Moisture Contents (AMSR-E/AMSR-2), Approx. 25km Altitude(ALOS PRISM), Approx. 30m			
Health	Variation of the total number of cases and the evolution of vaccinations.	https://eodashboard.org/?poi=CV-CV	https://ourworldindata.org/coronavirus	

ALOS-2 PALSAR-2 License Conditions:

ALOS-2 PALSAR-2 Strip Map (SM) data products usage conditions:

(i) JAXA does not guarantee any specific quality and the timely provision of the ALOS-2 PALSAR-2 data products and shall not be liable for any damage brought about using them.

(ii) The intellectual property rights, including but not limited to copyrights, of the ALOS-2 PALSAR-2 data Products belong to JAXA.

(iii) The user shall retain the ownership of value-added products (modified products with high-level processing which are irreversible to standard data. High-level data processing includes data analysis or combining multiple-ALOS-2 PALSAR-2 data Product, image processing based on external information, and physical quantity conversion).

(iv) When the user publishes and/or redistributes their-generated value-added products based on the ALOS-2 PALSAR-2 data Product, user will indicate: "the original ALOS-2 PALSAR-2 data products are provided by JAXA".

(v) When the user intends to publish the results directly using or indirectly based on the ALOS-2 PALSAR-2 data products, the user will indicate owner of the Data Products as "(C)JAXA [year of acquisition]. All rights reserved."

ALOS-2 ScanSAR data products usage conditions:

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(v) When the user intends to publish the results directly using or indirectly based on the ALOS-2 ScanSAR data products, the user will indicate owner of the Data Products as "(C)JAXA [year of acquisition]. All rights reserved."

Addendum:

Important Recommendations Regarding Raw Data, "End Products"/Solutions, and EO Dashboard Integration

I am having trouble finding raw data to process in the *Data Resources Guide* and in the EO Dashboard. What should I do?

Go to the *Data Resources Guide* (eodashboardhackathon.org/about/) and start by creating a free EuroDataCube (EDC) account. You can register for a free account here. Complete the form, accept the Terms and Conditions, and click the "Participate" button. Please be patient after registering while your workspace is being tailored for the hackathon. You will get a notification via email once it is available. *Please note: Do NOT create an account from the public EuroDataCube site because it will not be tailored to the hackathon. In particular, it will not have the hackathon resources available. The *Dashboard Technical Background and Integration Guide*, which can be found on eodashboardhackathon.org/about/, provides additional instructions.

Once you have an account, you may use the Euro Data Cube resources, such as the JupyterLab Workspace. In the EDC JupyterLab Workspace, the different EDC resources can be accessed from the Launcher page. Participants will have access to a series of Tutorial Notebooks to get started with the EDC and learn how to access the different Earth observation data and indicators, as well as how to generate simple maps and graphs similar to those showcased on https://EODashboard.org.

Can I use data other than what is found on the EO Dashboard?

As long as your team uses some data from the Dashboard, you are welcome to add new outside data.

What kind of "end product" or solution should I be producing for my project?

The characteristics of your “end product” or solution will depend on the particular challenge you are solving, so please pay close attention to the description on the challenge page. You may also find additional details about what is expected in the challenge video for your challenge, all of which are located here.

Your end product could take a number of forms. It could simply fetch data, perform some clever processing -- potentially integrating or correlating it with some additional data -- and/or propose the results as a new indicator. If you plan to demonstrate a new indicator for a limited area or time period, you should also show how this indicator might be scaled to more places or even globally (and over longer time periods), including continuous updates. While you are welcome to propose new indicators, you may also choose to focus on improving the functionality of the Dashboard, for example by combining existing indicators in a clever way.

Is the “demo” required for project submission different from the “end product” or solution?

Yes. The demo you create (the 30 second video or 7 slides that is required as part of the project submission process) is not the actual “end product” itself. The demo is a high-level summary of your project (that the judges will review), where you can showcase your “end product.” See the question above to understand the different forms that your “end product” might take.

Please see the *Project Submission Guide* (eodashboardhackathon.org/about/) for details on how to submit your project on the website.

What do you mean when you say that the solution should be “ready for integration” into the EO Dashboard?

One aim of the hackathon is to identify ideas and solutions that could be integrated in the EO Dashboard. However, it is not a requirement that the solution you develop during the hackathon be ready for integration or already integrated. The integration step would come after the hackathon and will be done with the support from the Dashboard technical team to scale it and to integrate it in the Dashboard.

The *Dashboard Technical Background and Integration Guide* (https://www.eodashboardhackathon.org/about/) describes how the software powering the Dashboard can be run locally to test and verify the integration of new indicators. Being Open Source, the dashboard

software could potentially even be extended to support new functionalities that might be required for new indicators.

Is it necessary to code in vuejs for Dashboard integration purposes? Are there any specific language requirements?

Vuejs is mentioned in the *Dashboard Technical Background and Integration Guide* (https://www.eodashboardhackathon.org/about/) because the Dashboard itself is implemented using vuejs. If you want to extend the Dashboard software itself that would be done in vuejs. However, if you want to propose a new indicator, etc., you do not need to use vuejs.