



# **GEO Knowledge Hub to preserve and share EO Applications: Introduction and practice**

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**GEO Knowledge Hub team**

Date: 5th of October from 11:15 to 12:00

Where: Open Earth Monitor – Global Workshop 2023 (Bolzano / Italy)

# GEO Knowledge Hub team



**Paola de Salvo**



**Kalamkas  
Yessimkhanova**



**Felipe Carlos**

**We are not alone!** Our team thanks everyone who worked with us, especially Gilberto Camara, Douglas Cripe, Gilberto Queiroz, Florian Franziskakis, Hendrik Baeyens, and the InvenioRDM community

# Material availability

All the materials used during this workshop are available in the following GitHub repository:



[geo-knowledge-hub/geo-knowledge-hub-workshop](#)

# Group on Earth Observations (GEO)

**GEO** is a partnership of more than 110 national governments and in excess of 100 Participating Organizations



# Group on Earth Observations (GEO)

**GEO** envisions a future where **decisions** and **actions** for the benefit of humankind are **informed** by coordinated, comprehensive and sustained **Earth observations**



# Group on Earth Observations (GEO)



## GEO Data Sharing principles



23<sup>rd</sup> Programme Board Meeting – 21-22 June 2022

PB-23.12

### Revised GEO Data Sharing and Data Management Principles

*This document is submitted by the Secretariat to the Programme Board for decision.*

#### 1 INTRODUCTION

In 2015, the GEO Data Management Principles Task Force was tasked with defining a common set GEO Data Management Principles<sup>1</sup>. These principles address the need for discovery, accessibility, usability, preservation, and curation of data and related resources that are shared. Such resources also should be shared as open data in accordance with the GEO Data Sharing Principles<sup>2</sup>. The GEO Data Management Principles complement the FAIR Principles and TRUST Principles, which also are being adopted across research communities. The GEO Data Management Principles can be applied to the entire data management lifecycle,

## Open Knowledge Statement



21<sup>st</sup> Programme Board Meeting – 28-30 September 2021

PB-21.17

### GEO Statement on Open Knowledge

*This document is submitted by the Secretariat to the Programme Board for decision.*

#### 1 INTRODUCTION

This document presents a revision of the GEO Statement on Open Science (see Annex A) that was presented to the Programme Board at its 19<sup>th</sup> meeting in January 2021. Based on consultations with the GEO community, the Secretariat proposes that the statement be reformulated to focus on “Open Knowledge”. This concept, while inclusive of Open Science, is considered to be more closely aligned with the GEO Mission and Vision, which aim to support decision making and not only or primarily science.

# Group on Earth Observations (GEO)



Download the [GEO Work Programme 2023-2025 Summary Document](#), which contains short descriptions of each of the GEO Flagships, Initiatives, Pilot Initiatives and Regional GEOs that comprise the GEO Work Programme.



# GEO Knowledge Hub

The **GEO Knowledge Hub** is a digital library for the **GEO Community**

# GEO Knowledge Hub



# GEO Knowledge Hub



Helps the GEO Community to **share** EO Applications

# GEO Knowledge Hub



Helps the GEO Community to **share** EO Applications

**Preserves** materials from the EO Applications

# GEO Knowledge Hub



Helps the GEO Community to **share** EO Applications

**Preserves** materials from the EO Applications

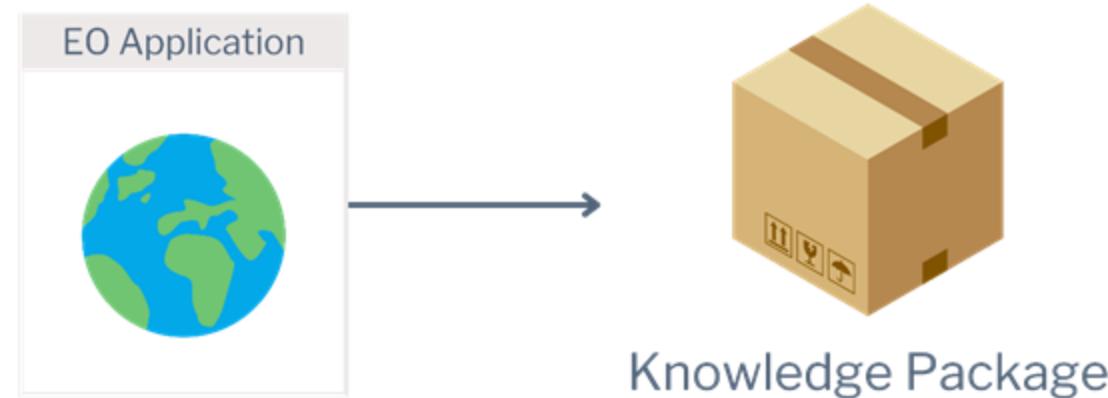
Helps the community to **find** and **access** EO Applications

# Knowledge Packages



Knowledge Package

# Knowledge Packages



# Knowledge Packages

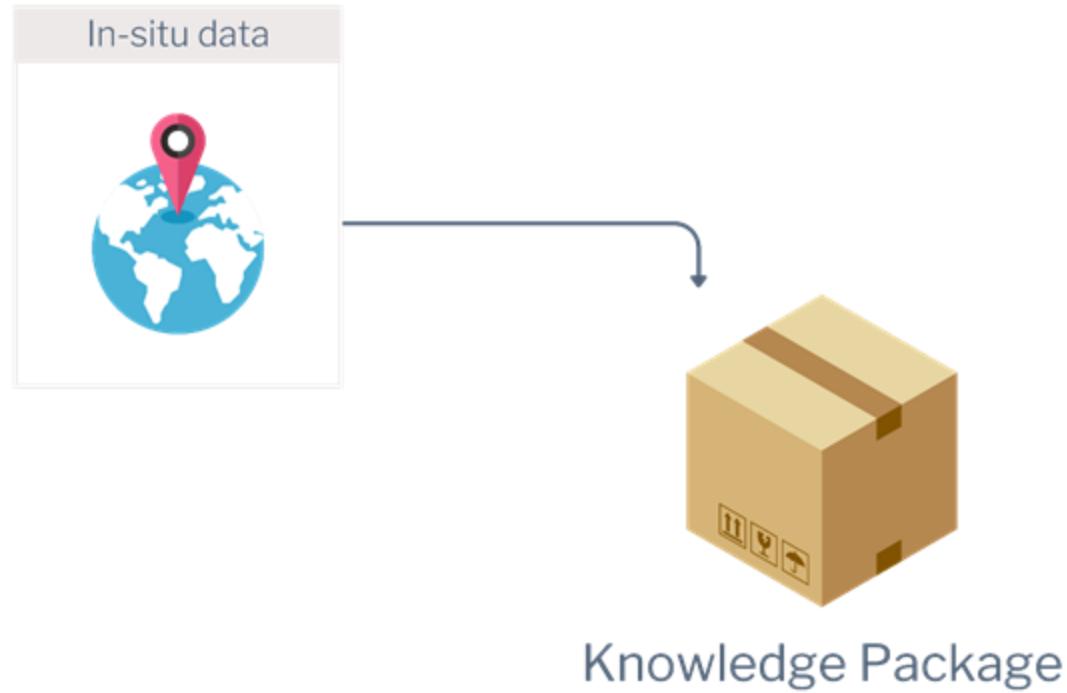


# Knowledge Packages

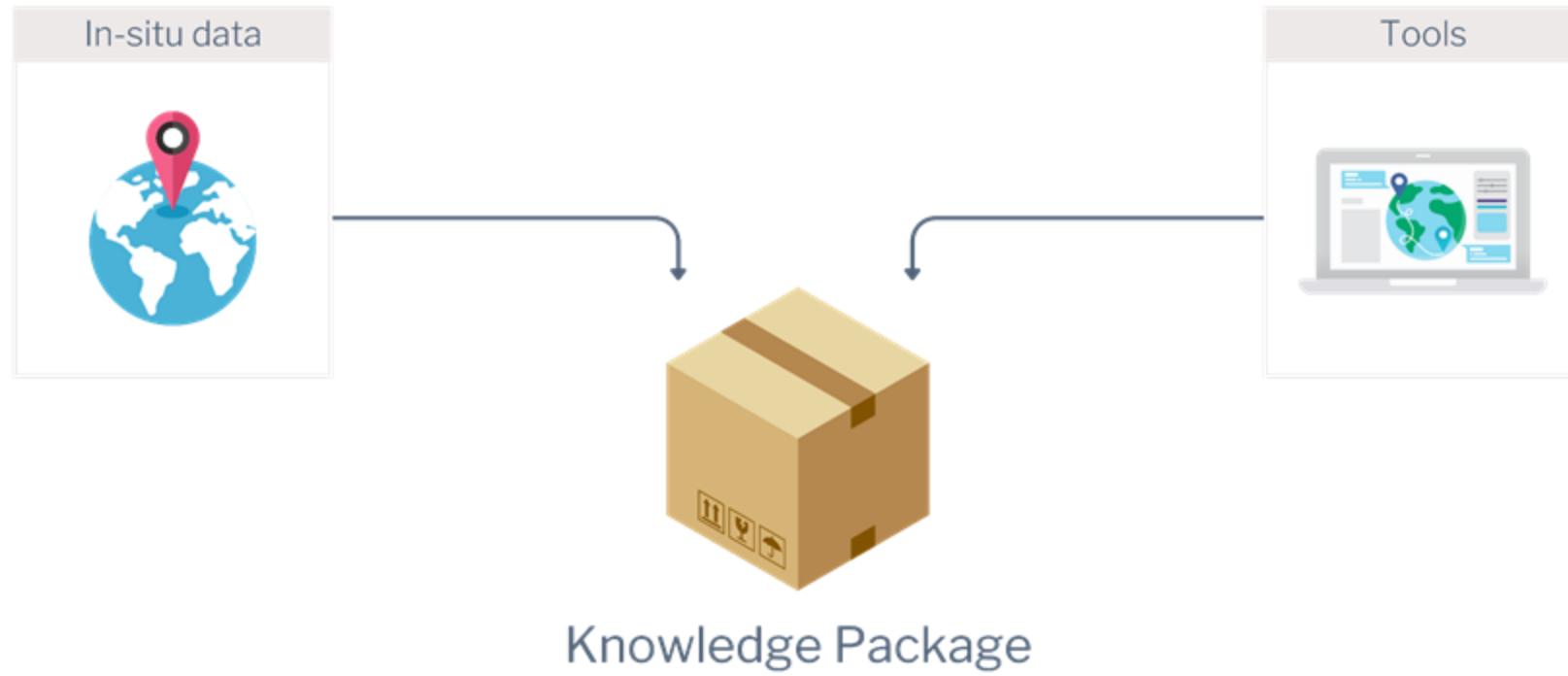


Knowledge Package

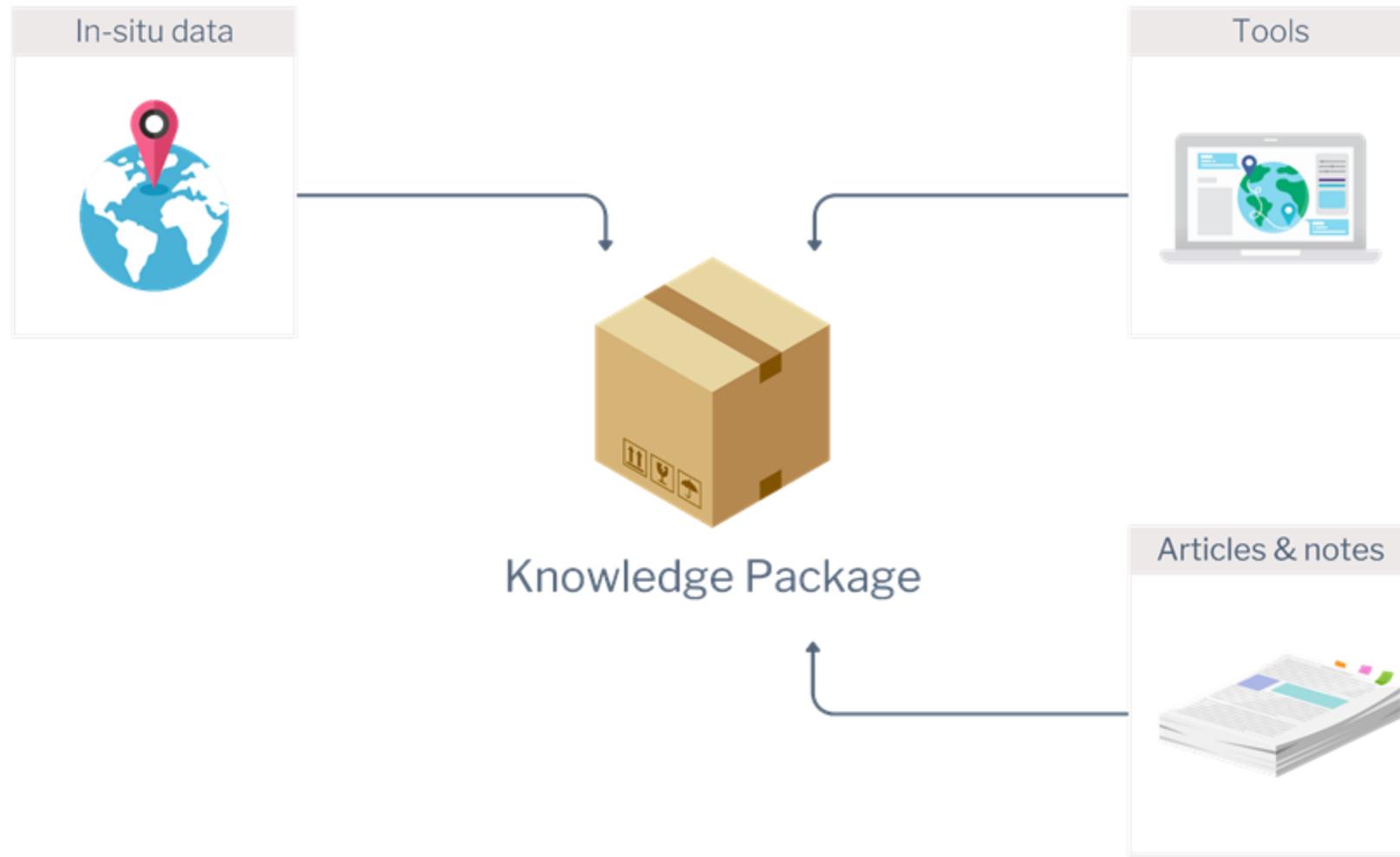
# Knowledge Packages



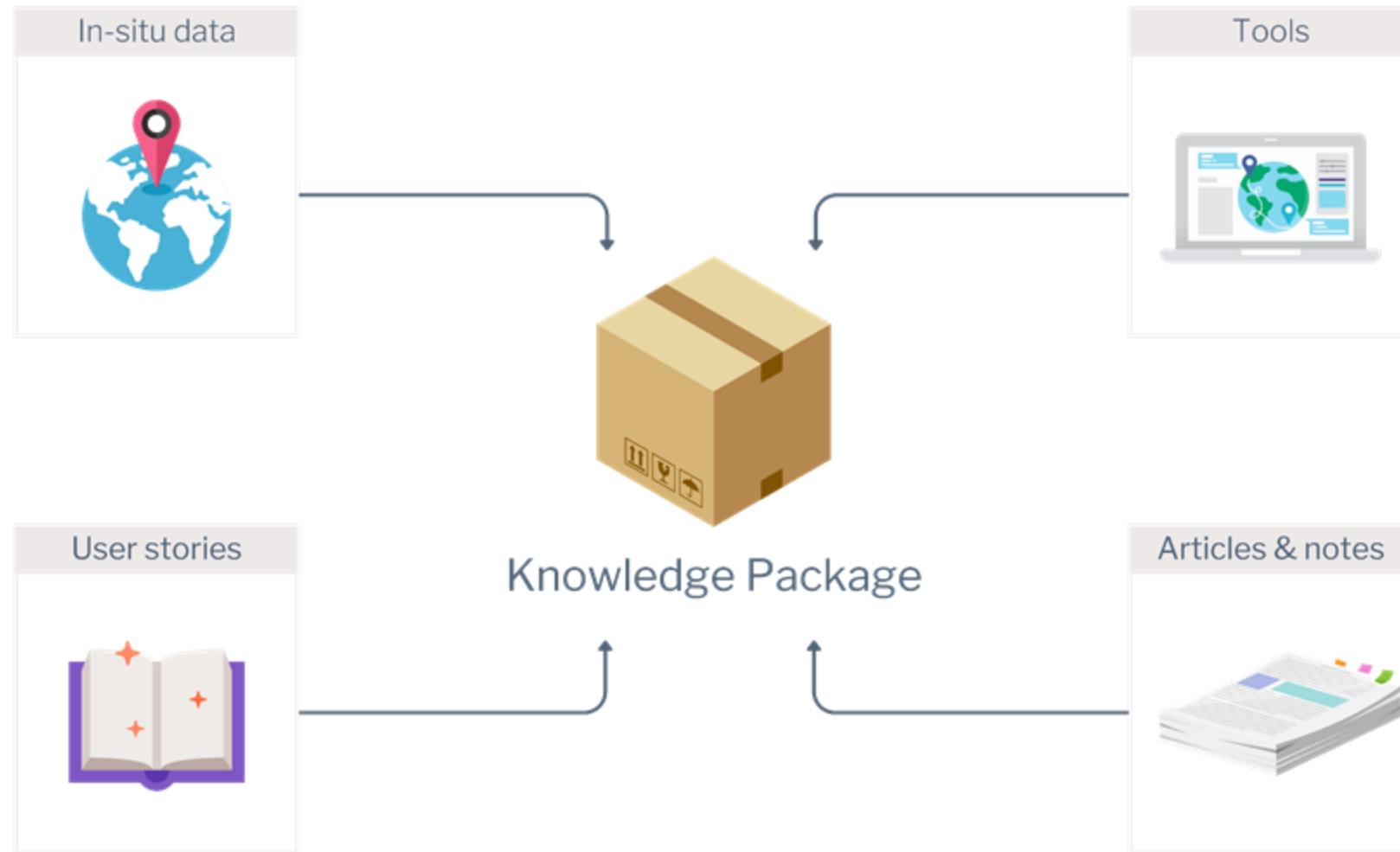
# Knowledge Packages



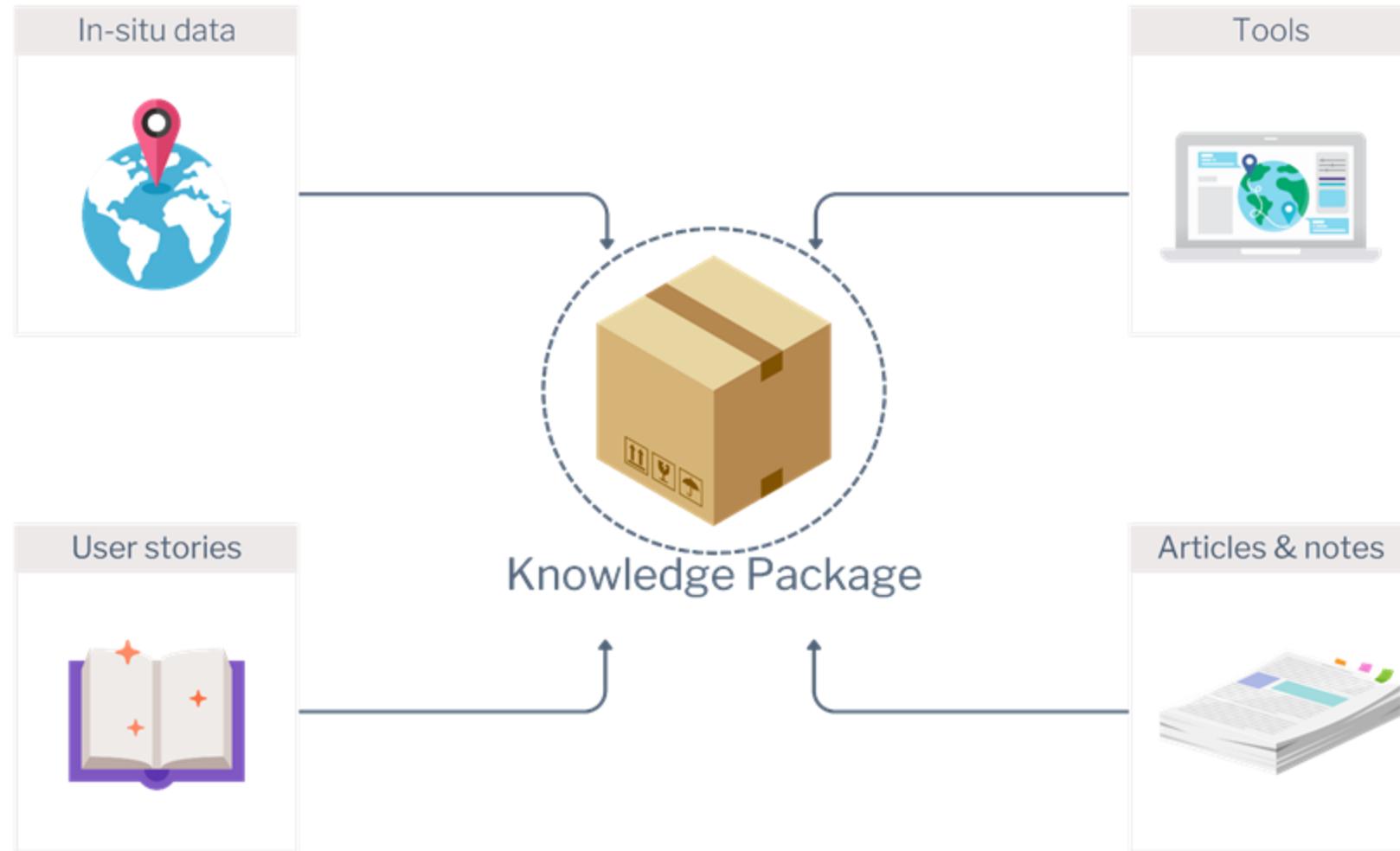
# Knowledge Packages



# Knowledge Packages



# Knowledge Packages



# Knowledge Packages



Knowledge Package

# Knowledge Packages

Define metadata



Knowledge Package

# Knowledge Packages



Knowledge Package

Define metadata

Upload files

# Knowledge Packages



Knowledge Package

Define metadata

Upload files

Link external resources

# Knowledge Packages



Knowledge Package

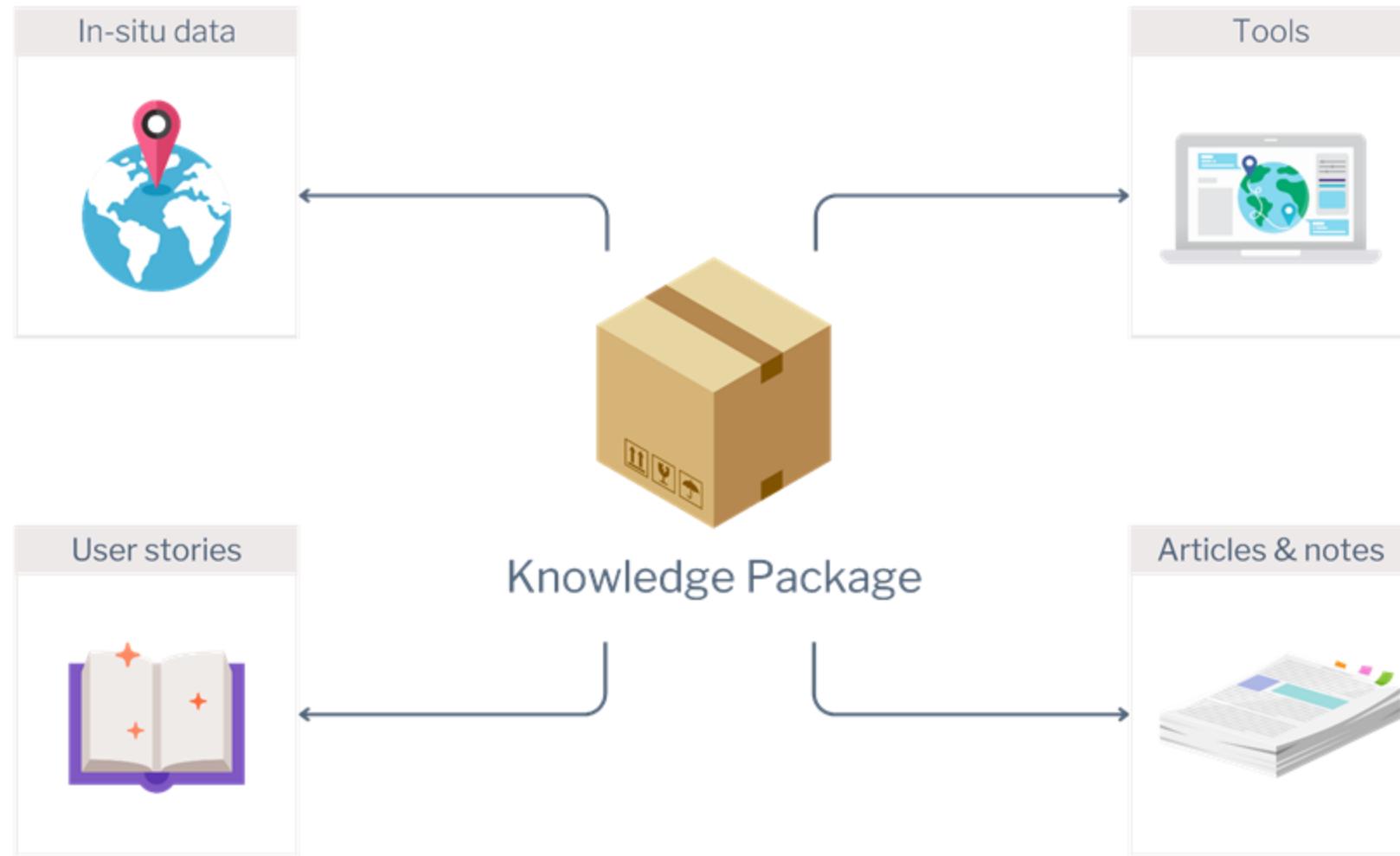
Define metadata

Upload files

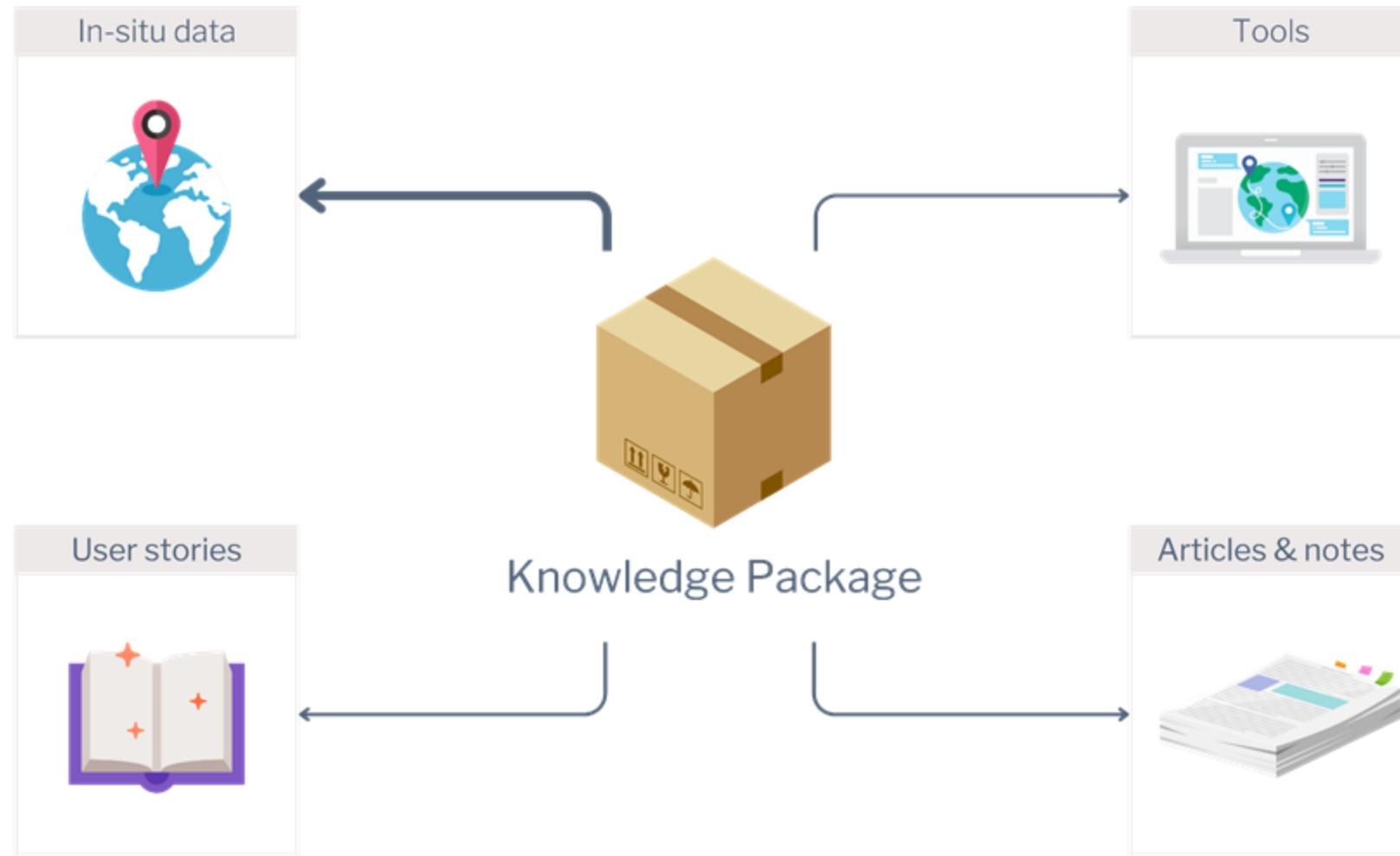
Link external resources

Associate/Create DOI

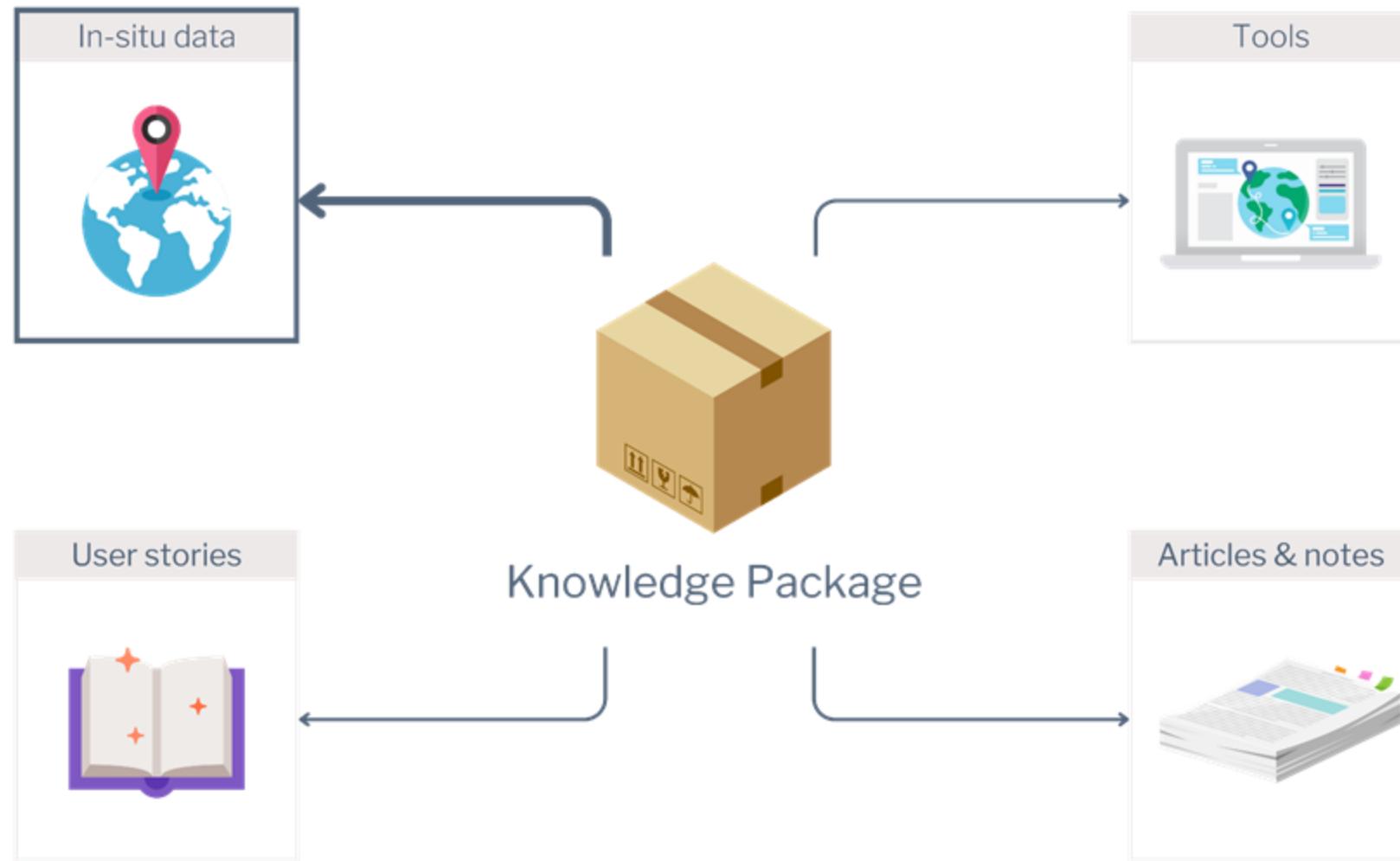
# Knowledge Packages



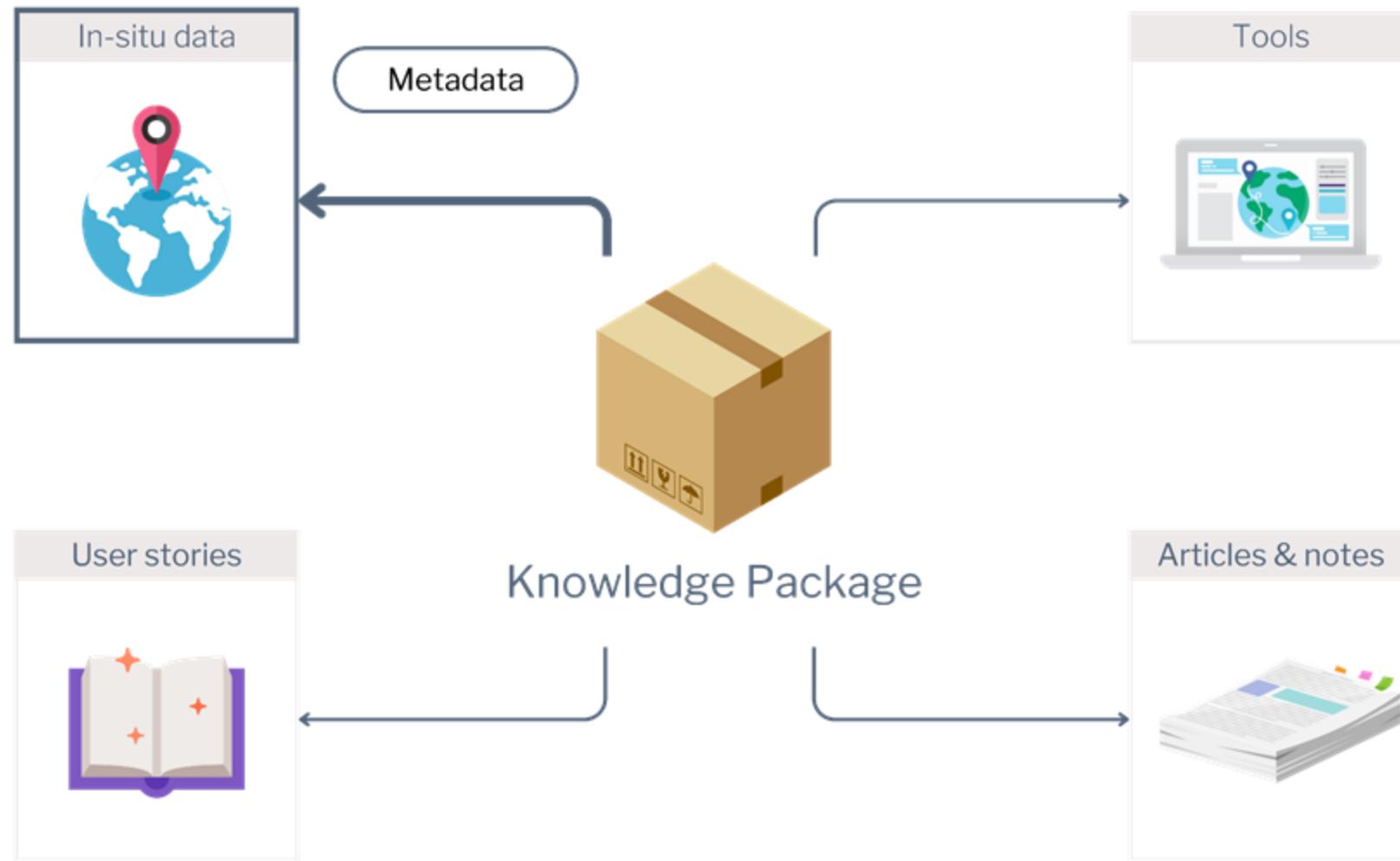
# Knowledge Packages



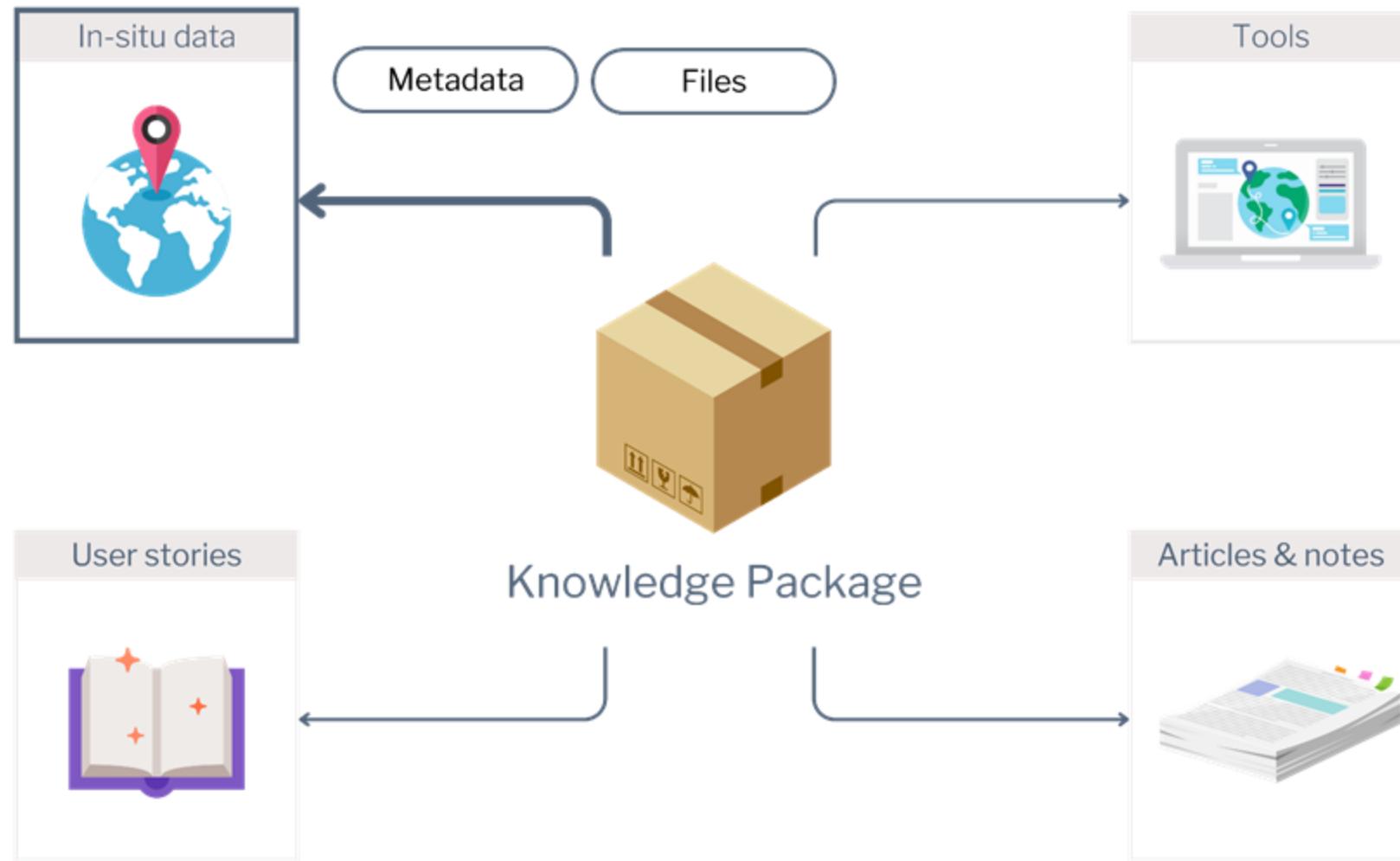
# Knowledge Packages



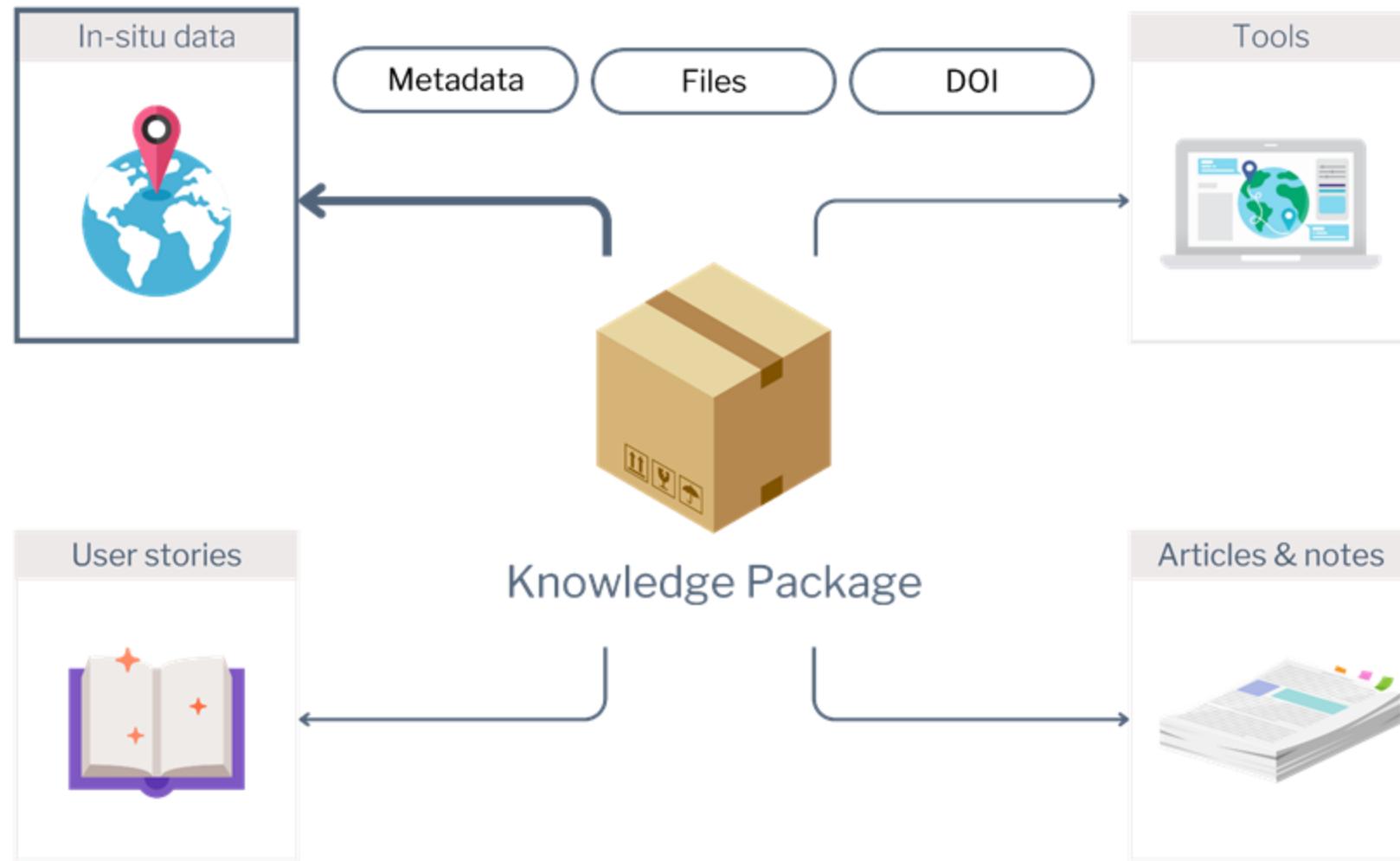
# Knowledge Packages



# Knowledge Packages



# Knowledge Packages



# Knowledge Package example



**Digital Earth**  
**AFRICA**

# Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube

# Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube

The screenshot shows a knowledge package page from the GEO Knowledge Hub. At the top, there's a header with the GEO logo and 'Knowledge Hub'. Below it, a navigation bar includes 'Published July 20, 2022 | Version v1', 'DE-AFRICA' (which is highlighted in blue), 'Knowledge Package', and an 'Open' button. The main title of the package is 'Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube'. A sub-section below the title is 'Digital Earth Africa [DEA](#)'. The page is divided into several sections: 'Citation' (with a style dropdown set to APA), 'Description' (with a 'What it is about' section containing detailed text about the application's purpose and methodology, mentioning the use of Sentinel-2 data and Jupyter Notebooks, and noting that analysis parameters can be changed for other regions), 'Elements of the Knowledge Package' (listing categories: Dataset, Publication, Software, and Other, each with a count of resources and a corresponding icon), and a large orange open cardboard box icon at the bottom right.

Published July 20, 2022 | Version v1

DE-AFRICA Knowledge Package Open

## Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube

Digital Earth Africa [DEA](#)

### Citation

Style APA

Digital Earth Africa. (2022). Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube. <https://doi.org/10.5072/47d02-ykk63>

### Description

**What it is about**

Digital Earth Africa's (DEA) Monitoring Mangrove Extent application uses data derived from Sentinel-2 in combination with Jupyter Notebooks, to produce a time-series-analysis that identifies a change in mangrove extent over time. The analysis parameters for this notebook have been set using a central pair of coordinates along the coastline of southwestern Guinea-Bissau, Africa. **This notebook allows for easy replication of analysis across Africa, through simply changing the analysis parameters.** The user guide provides an overview of the analysis, resources used/supplied and directions on how to reproduce the analysis.

This knowledge package includes the necessary data, computational resources and instructions required to reproduce the methodology used in Digital Earth Africa's 'Monitoring Mangrove Extent' Jupyter Notebook.

The [User's Guide](#) provides an overview of the application.

### Elements of the Knowledge Package

Dataset 1 resources   Publication 0 resources   Software 2 resources   Other 2 resources   [...](#)

# Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube

The screenshot displays the GEO Knowledge Hub interface for the specified application. At the top, there's a header with the GEO logo and 'Knowledge Hub'. Below it, the application title is shown: 'Published July 20, 2022 | Version v1' and 'DE-AFRICA Knowledge Package Open'. The main content area is titled 'Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube'. It includes sections for 'Citation' (with a style dropdown set to APA) and 'Description'. The 'Description' section contains detailed text about the application's purpose, data sources (Sentinel-2 and Global Mangrove Watch), and methodology. At the bottom left, there's a 'Elements of the Knowledge Package' section with categories: Dataset (1 resources), Publication (0 resources), Software (2 resources), Other (2 resources), and a '...' button. A large orange cardboard box icon is positioned at the bottom right of the main content area.

## Knowledge Resources

# Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube

The screenshot shows the GEO Knowledge Hub interface for the specified application. At the top, there's a header with the GEO logo and 'Knowledge Hub'. Below it, the application title is displayed: 'Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube'. The page includes sections for 'Citation', 'Description', and 'Elements of the Knowledge Package'. The 'Citation' section provides a reference in APA style. The 'Description' section details the application's purpose, data sources (Sentinel-2 and Global Mangrove Watch), and methodology. The 'Elements of the Knowledge Package' section lists resources: Dataset (1 resource), Publication (0 resources), Software (2 resources), Other (2 resources), and a '...' button. A large orange cardboard box icon is positioned at the bottom right of the page.

## Resources content

### Knowledge Resources

# Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube

The screenshot shows a knowledge package page on the GEO Knowledge Hub. At the top, it says "Published July 20, 2022 | Version v1" and has tabs for "DE-AFRICA", "Knowledge Package", and "Open". The main title is "Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube". Below the title, there's a "Citation" section with a "Style" dropdown set to "APA" and a "Description" section. The "Description" section contains detailed text about the application's purpose, data sources (Sentinel-2 and Global Mangrove Watch), and analysis parameters. At the bottom, there's a "Elements of the Knowledge Package" section with categories: Dataset (1 resource), Publication (0 resources), Software (2 resources), Other (2 resources), and a "..." button. A large orange cardboard box icon is positioned at the bottom right of the page.

The screenshot shows the Digital Earth Africa Data Cube interface. The left panel displays the "Monitoring Mangrove Extent Data" application with its citation information. The right panel shows a detailed view of the application's components, including "Analysis required by DE", "Data required by DE", and "Temporal Asset". The bottom panel shows a "Global" section with a note about including a DE point in the analysis.

## Knowledge Resources

## Resources content

The screenshot shows an executable notebook titled "Monitoring Mangrove Extents". It includes sections for "Background", "Description", and a flowchart illustrating the process of creating a mangrove extent map from Sentinel-2 data using the DE Data Cube.

## Executable Notebook

# Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube

The screenshot shows a knowledge package page on the GEO Knowledge Hub. At the top, it says "Published July 20, 2022 | Version v1" and has tabs for "DE-AFRICA", "Knowledge Package", and "Open". The main title is "Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube". Below the title, there's a "Citation" section with a "Style" dropdown set to APA, and a "Description" section with detailed text about the application's purpose and data sources. A large orange "Open" button is at the bottom. On the right, there's a 3D rendering of an open cardboard box.

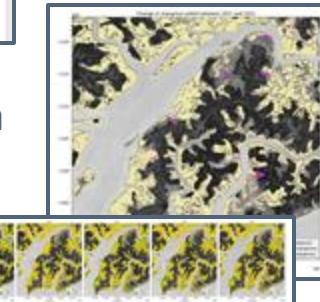
This screenshot shows the "Monitoring Mangrove Extent Data" application within the Digital Earth Africa Data Cube interface. It includes sections for "Citation" (with a "Style" dropdown), "Description" (with detailed text about the application's purpose and data sources), and "Analysis required by DE Africa". The interface is designed for a mobile device.

## Knowledge Resources

## Resources content

This screenshot shows an executable notebook titled "Monitoring Mangrove Extents". It includes sections for "Background" (describing the goal of the notebook), "Description" (explaining the process), and a flowchart illustrating the data processing steps.

## Executable Notebook



## Auxiliary data and files

# Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube

The screenshot shows a knowledge package page on the GEO Knowledge Hub. At the top, there's a header with the GEO logo and 'Knowledge Hub'. Below it, the title 'Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube' is displayed, along with a 'Published July 20, 2022 | Version v1' timestamp. A 'DE-AFRICA' button, a 'Knowledge Package' link, and an 'Open' button are also present. The main content area includes sections for 'Citation' (with a style dropdown set to APA), 'Description' (with a 'What it is about' section), 'Elements of the Knowledge Package' (listing Dataset, Publication, Software, and Other resources), and a large image of an open cardboard box.

This screenshot shows the 'Monitoring Mangrove Extent Data' application interface from Digital Earth Africa. It features a sidebar with tabs for 'AFRICA', 'Data Cube', and 'Mangroves'. The main panel displays a detailed description of the data products used, including Sentinel-2 and Global Mangrove Watch datasets, and their analysis parameters. It also includes a 'Background' section with a flowchart illustrating the methodology.

## Knowledge Resources

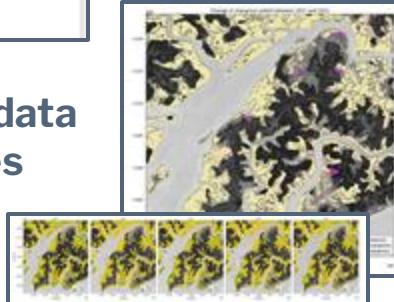
## Resources content

This screenshot shows a Jupyter Notebook titled 'Monitoring Mangrove Extents'. It includes a 'Background' section with a diagram of the workflow, a 'Description' section, and a code cell containing Python code.

## Executable Notebook



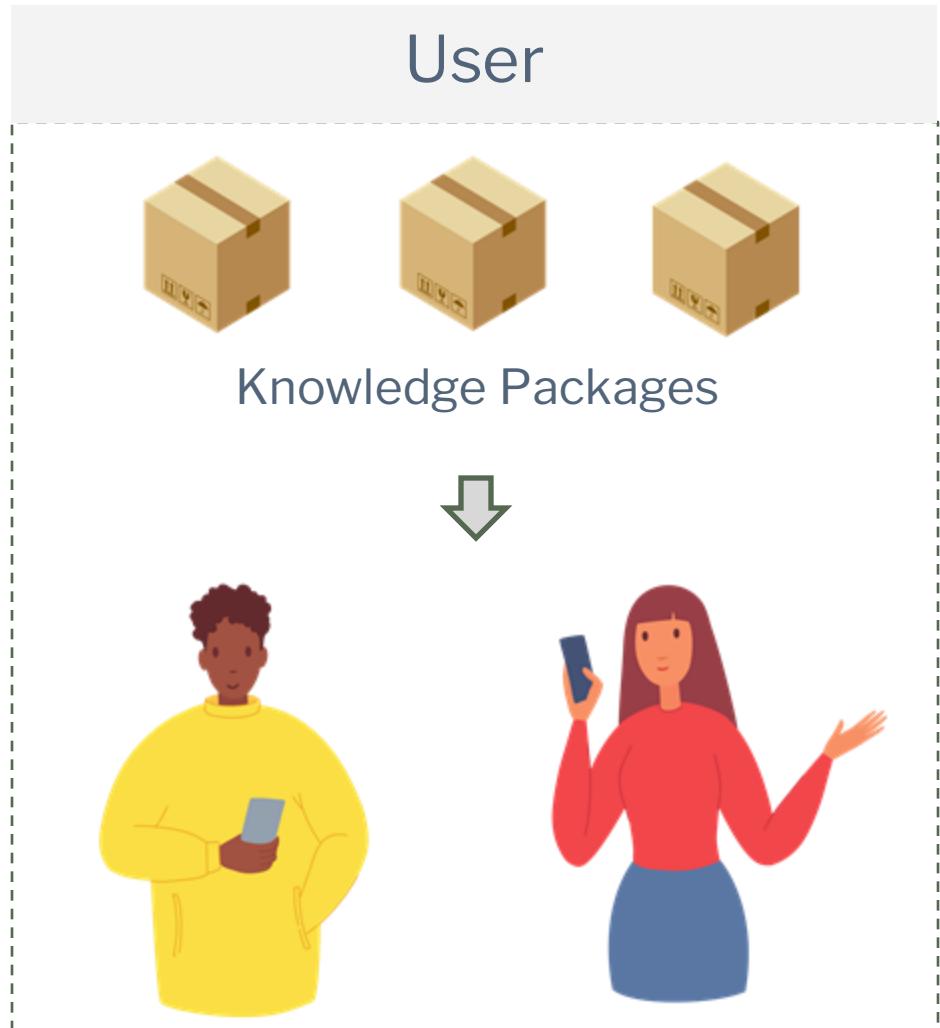
## Auxiliary data and files



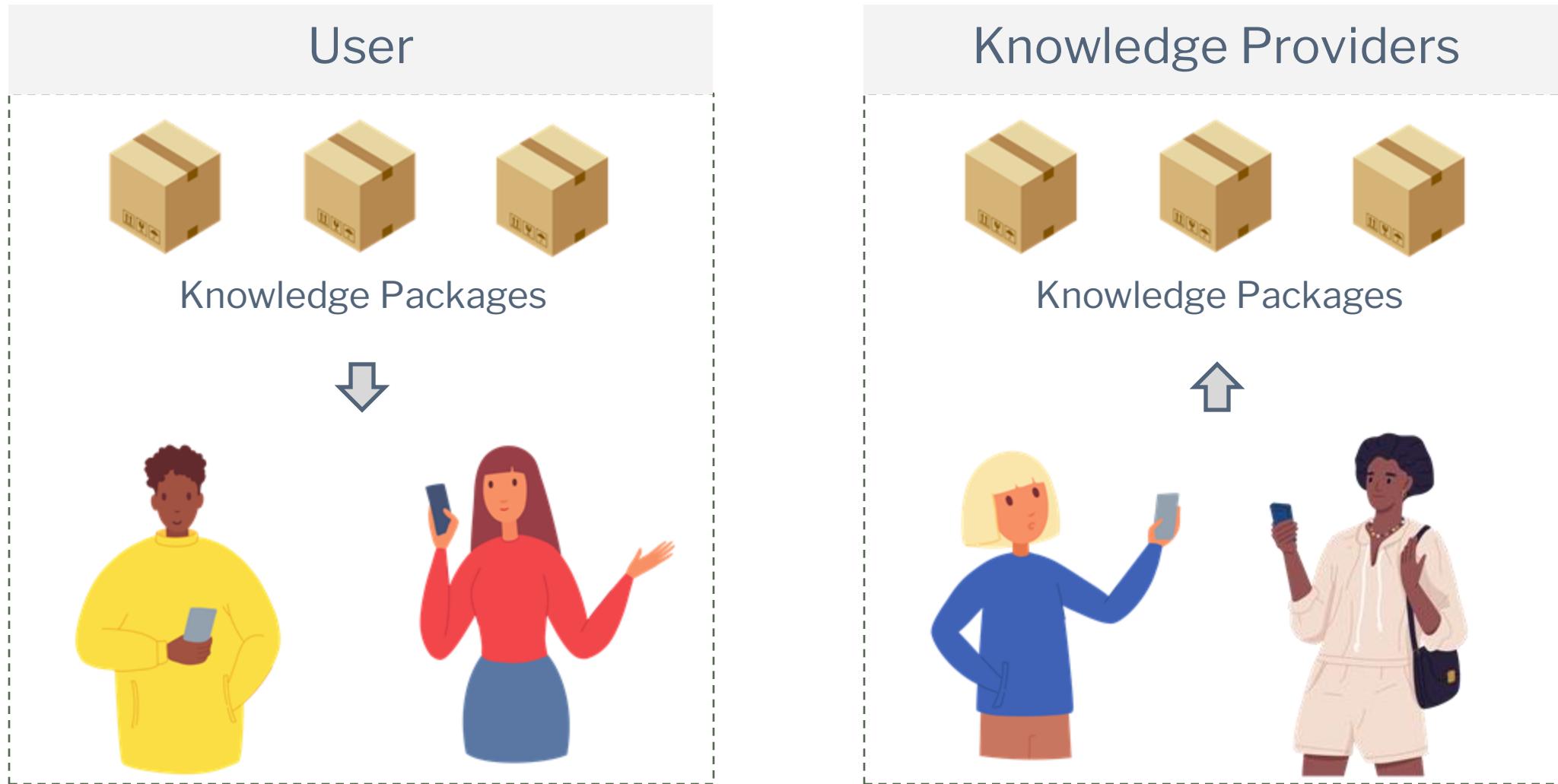
## Description documents

# Users

# Users



# Users



# We build **together** with the community





## Communities

Engage with open, reproducible sharing communities curated by Earth Observation experts



## Spatial and Thematic search

Search for applications using spatial locations and Global framework like SDGs, Sendai Framework and Paris Agreement as criteria



## Application management

Manage content and users of EO Applications using Knowledge Packages and high-level dashboards



## Real-time exchange

Share Knowledge with the GEO Community in real-time using interactive chat and feedback forms



## Interoperability

Access the published materials using well-known standards such as OAI-PMH



## Rest API

Access and ingest data using a rich Rest API



## Preservation friendly

Persistent identifiers (DOI) by default and execution of continuous data consistency validation



## Based on GEO Principles

Created based on GEO Data Management and Sharing principles

# Thematic Search



# Thematic Search



Engagement priorities



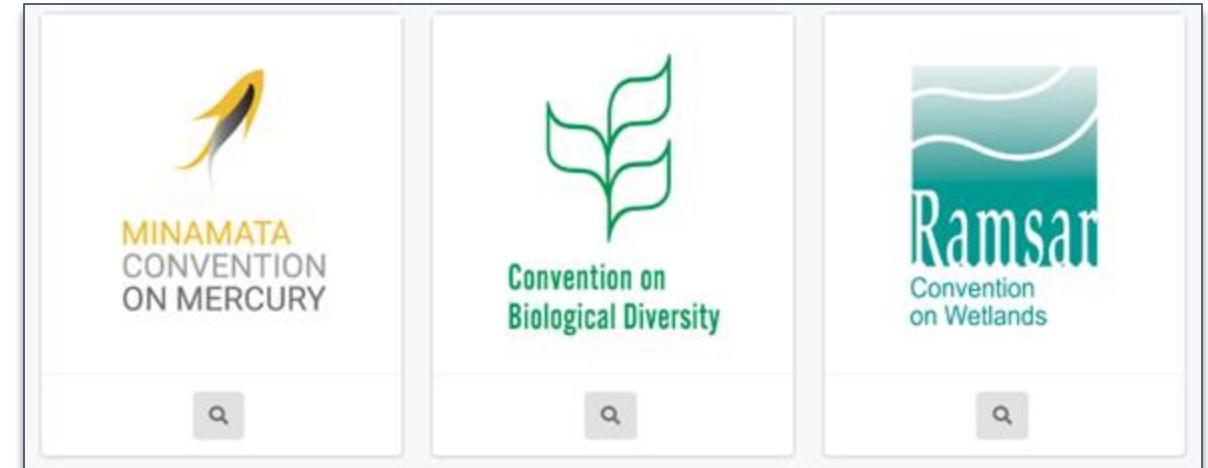
# Thematic Search



Engagement priorities



Conventions



# Spatial Search



# Spatial Search



Search filter

Basic properties Spatial extent

Geometry

Leaflet | Tiles © Esri — Source: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand). TomTom, 2012.

Geometry

Leaflet | Tiles © Esri — Source: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand). TomTom, 2012.

# Communities



# Communities





**GEOGLAM**  
Global Agricultural Monitoring

**GEOGLAM**  
The purpose of Group on Earth Observations Global Agricultur...



**Digital Earth**  
AFRICA

**Digital Earth Africa**  
Digital Earth Africa exists to improve the lives of people...



**e-shape**

EuroGEO Showcases: Applications Powered by Europe

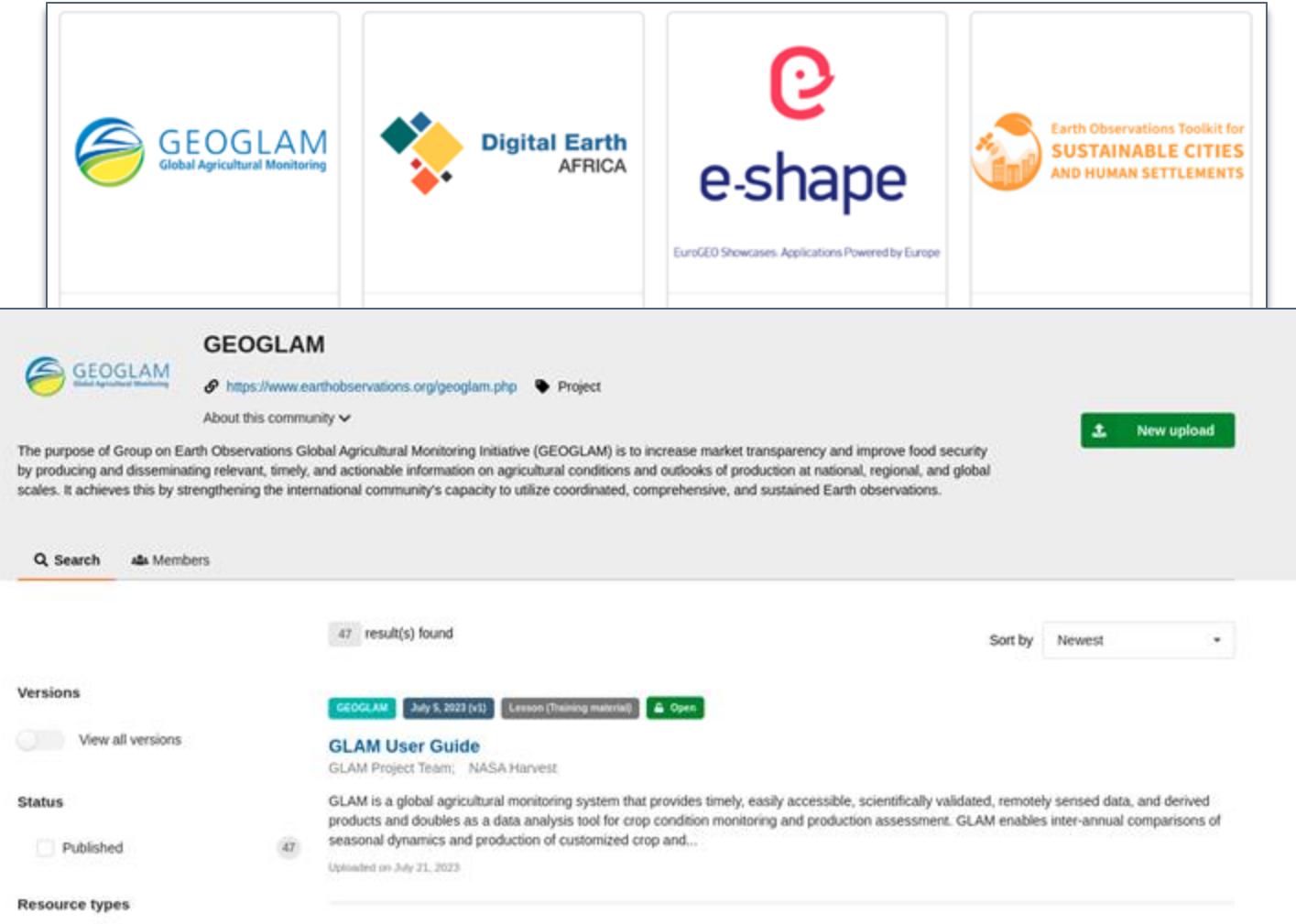
**e-shape**  
e-shape is a unique initiative that brings together decades o...



**Earth Observations Toolkit for SUSTAINABLE CITIES AND HUMAN SETTLEMENTS**

**Earth Observations Toolkit ...**  
Enables the use of Earth observations to advance...

# Communities

The screenshot shows the GEO Knowledge Hub interface. At the top, there is a horizontal banner featuring logos for four projects: GEOGLAM (Global Agricultural Monitoring), Digital Earth AFRICA, e-shape, and Earth Observations Toolkit for SUSTAINABLE CITIES AND HUMAN SETTLEMENTS.

The main area displays the GEOGLAM community page. It includes a search bar, a 'Members' button, and a summary of the community's purpose: "The purpose of Group on Earth Observations Global Agricultural Monitoring Initiative (GEOGLAM) is to increase market transparency and improve food security by producing and disseminating relevant, timely, and actionable information on agricultural conditions and outlooks of production at national, regional, and global scales. It achieves this by strengthening the international community's capacity to utilize coordinated, comprehensive, and sustained Earth observations." Below this, there are filters for 'Versions', 'Status', and 'Resource types'. A list of resources is shown, with the first item being the "GLAM User Guide" (Version 1, July 5, 2023, by NASA Harvest). The interface also includes a "New upload" button in the top right corner.

# Knowledge Package page

# Knowledge Package page

The screenshot shows a Knowledge Package page for a dataset titled "Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube".

**Header:** Digital Earth Africa logo and text "Published July 20, 2022 | Version v1". Navigation buttons include "DE-AFRICA", "Knowledge Package", and a green "Open" button.

**Title:** Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube

**Citation:** Digital Earth Africa (2022). Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube. GEO Knowledge Hub. <https://doi.org/10.60566/1f0cq-zc482>

**Description:**

**What it is about:**

Digital Earth Africa's (DEA) Monitoring Mangrove Extent application uses data derived from Sentinel-2 in combination with Jupyter Notebooks, to produce a time-series-analysis that identifies a change in mangrove extent over time. The analysis parameters for this notebook have been set using a central pair of coordinates along the coastline of southwestern Guinea-Bissau, Africa. **This notebook allows for easy replication of analysis across Africa, through simply changing the analysis parameters.** The user guide provides an overview of the analysis, resources used/supplied and directions on how to reproduce the analysis.

This knowledge package includes the necessary data, computational resources and instructions required to reproduce the methodology used in Digital Earth Africa's 'Monitoring Mangrove Extent' Jupyter Notebook.

**Right sidebar:**

- Need training?** (button)
- Versions:** Version v1 (Jul 20, 2022)
- Any question ?** (button) Ask the provider
- Feedback space:** Learn the community experience with this package
- Engagement Priorities:** (empty section)

# Knowledge Package page

The screenshot shows a Knowledge Package page for "Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube".

**Header:** Digital Earth Africa logo, Published July 20, 2022 | Version v1, DE-AFRICA, Knowledge Package, Open, Need training?

**Title:** Monitoring Mangrove Extent in Africa using Digital Earth Africa Data Cube

**Citation:** Digital Earth Africa

**Description:** What it is about: Digital Earth Africa's (DEA) Monitoring Mangrove Extent application Notebooks, to produce a time-series-analysis that identifies a character notebook have been set using a central pair of coordinates along t allows for easy replication of analysis across Africa, through an overview of the analysis, resources used/supplied and direction This knowledge package includes the necessary data, computation used in Digital Earth Africa's 'Monitoring Mangrove Extent' Jupyter

**Elements of the Knowledge Package:**

- Dataset (1 resources)
- Publication (1 resources)
- Software (2 resources)
- Other (1 resources)

Search for a record

**Monitoring Mangrove Extent Notebook:**  
Digital Earth Africa;  
Jul 20, 2022, DE-AFRICA, Jupyter Notebook, Open

**Digital Earth Africa Cloud Computing Environment:**  
Digital Earth Africa;  
Jul 8, 2022, DE-AFRICA, Computational Environment, Metadata-only

Page size: 3

# Real-time exchange



# Real-time exchange



 Ask the provider

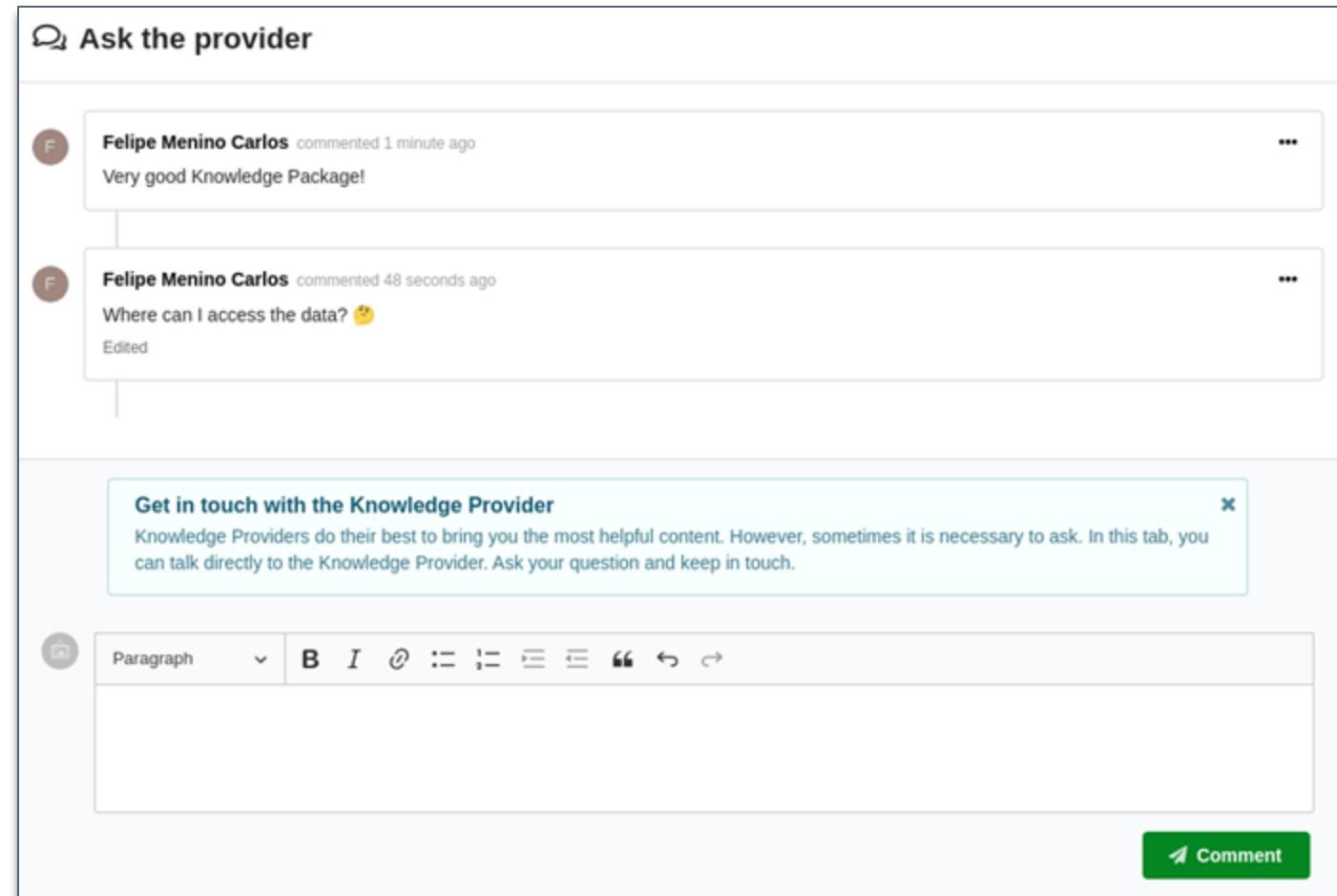
F Felipe Menino Carlos commented 1 minute ago  
Very good Knowledge Package!

F Felipe Menino Carlos commented 48 seconds ago  
Where can I access the data? 😊  
Edited

**Get in touch with the Knowledge Provider**  
Knowledge Providers do their best to bring you the most helpful content. However, sometimes it is necessary to ask. In this tab, you can talk directly to the Knowledge Provider. Ask your question and keep in touch.

Paragraph 

 Comment



# Real-time exchange



### Ask the provider

**F** Felipe Menino Carlos commented 1 minute ago  
Very good Knowledge Package!

**F** Felipe Menino Carlos commented 48 seconds ago  
Where can I access the data? 😊  
Edited

### Feedback space

Community feedback for **Land use and land cover classification in the Brazilian Cerrado biome using Brazil Data Cube**

**5/5**  
GENERAL RATING ▾

[Share your feedback](#)

**F** Felipe Menino Carlos commented 0 seconds ago  
The content of the Knowledge Package is very well organized.  
All the elements needed to understand and reuse the application are available.  
  
As a future recommendation, try to add other examples of how the application can be used.

CLARITY	USEFULNESS	REUSABILITY
5/5	5/5	5/5

[gkhub.earthobservations.org](https://gkhub.earthobservations.org)



# Practical demonstration

# Questions ?

# Knowledge Package creation page



# Knowledge Package creation page

GEOGLAM

Files

Basic information

Title \* ASAP - Anomaly Hotspots of Agricultural Production

Add titles

Publication date \* 2023-07-05

In case your upload was already published elsewhere, please use the date of the first publication. Format: YYYY-MM-DD, YYYY-MM, or YYYY. For intervals use DATE/DATE, e.g. 1939/1945.

Digital Object Identifier \* Do you already have a DOI for this upload?  Yes  No  
10.60566/v5xjs-bcm58

Go to resources

Published (1)

Save draft Preview Publish

Visibility \*

Full record

Public	Restricted
--------	------------

Files only

Public	Restricted
--------	------------

Public  
The record and files are publicly accessible.

# Knowledge Package creation page

The screenshot shows the GEOGLAM Knowledge Package creation interface. On the left, a sidebar contains fields for 'Basic information': Title (ASAP - Anomaly Hotspots of Agricultural Production), Publication date (2023-07-05), and Digital Object Identifier (10.60566/v5xjs-bcm58). The main area is divided into sections: 'Resources' (Dataset, Publication, Software, Others), 'Management' (Permissions, View), and 'Operations' (Import resources, Use). The 'Resources' section displays two items: 'Operation Applications, Open Data and Open Knowledge Workshop, 2023' (uploaded on July 4, 2023) and 'Crop Calendars' (uploaded on February 16, 2023).

**Basic information**

Title \* ASAP - Anomaly Hotspots of Agricultural Production

+ Add titles

Publication date \* 2023-07-05

In case your upload was already published elsewhere, please use the date of the first publication. Intervals use DATE/DATE, e.g. 1939/1945.

Digital Object Identifier \* Do you already have a DOI for this upload?  Yes  No  
10.60566/v5xjs-bcm58

**Resources**

Back to package

Search for resources inside the package

13 result(s) found

Sort by Newest

Dataset

Publication

Software

Others

Management

Permissions

Operations

Import resources

Operation Applications, Open Data and Open Knowledge Workshop, 2023

Group on Earth Observations

This Knowledge Resource corresponds to the session "Operation Applications" during Open Knowledge Workshop 2023, Geneva, Switzerland. In this interactive session, attendees learnt about the practical ways to reuse applications that GEO activities have produced. Through examples and demonstrations, attendees understood the potential of open data ...

Uploaded on July 4, 2023

Crop Calendars

Joint Research Centre

The national and sub-national crop calendars are based on FAO data and include only crops for which the original calendars match with the ASAP remote sensing based phenology. The file includes the start and end dekad (over the 36 dekads in a year) of the planting period (sos\_s and sos\_e), the start and end dekad of the growth period (sos\_e and e...)

Uploaded on February 16, 2023

# Digital Object Identifier (DOI) creation



# Digital Object Identifier (DOI) creation



## Knowledge Package

Published June 1, 2023 | Version 2023

DATA-WG Knowledge Package Metadata-only

### GEO Dialogue Series (2023)

GEO Data Working Group [@GEO](#)

#### Citation

Style

APA

GEO Data Working Group. (2023). GEO Dialogue Series (2023) (Version 2023). GEO Knowledge Hub. <https://doi.org/10.60566/2n6ja-2g648>

#### Description

GEO Dialogue Series 2023 is the second season of webinars organized by the [Group on Earth Observations \(GEO\)](#).

The GEO Dialogue Series 2023 focuses on the GEO Open Knowledge statement.

In the dialogue series, we discuss each component of Open Knowledge and how we can progress from open data sharing, supported by the GEO data management principles, to the FAIR, CARE, and TRUST principles, ultimately achieving open knowledge. Open

Versions

Version 2023  
(Jun 1, 2023)

Any question ?

Ask the provider

Feedback space

Learn the community experience with this package

Details

DOI

DOI: [10.60566/2n6ja-2g648](https://doi.org/10.60566/2n6ja-2g648)

[10.60566/2n6ja-2g648](https://doi.org/10.60566/2n6ja-2g648)

# Digital Object Identifier (DOI) creation



## Knowledge Package

Published June 1, 2023 | Version 2023

DATA-WG Knowledge Package Metadata-only

### GEO Dialogue Series (2023)

GEO Data Working Group

#### Citation

Style APA

GEO Data Working Group. (2023). GEO Dialogue Series (2023) (Version 2023). GEO Knowledge Hub. <https://doi.org/10.60566/2n6ja-2g648>

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[10.60566/2n6ja-2g648](https://doi.org/10.60566/2n6ja-2g648)

Versions  
Version 2023 (Jun 1, 2023)  
Any question ? Ask the provider  
Feedback space Learn the community experience with this package  
Details  
DOI [10.60566/2n6ja-2g648](https://doi.org/10.60566/2n6ja-2g648)

## Resources

Published June 5, 2023 | Version 2023  
DATA-WG Lesson (Training material) Open  
Versions  
Version 2023 (Jun 5, 2023)  
Any question ? Ask the provider  
Feedback space Learn the community experience with this package  
Details  
DOI [10.60566/zrnza-gh061](https://doi.org/10.60566/zrnza-gh061)

[10.60566/zrnza-gh061](https://doi.org/10.60566/zrnza-gh061)

# GEO Knowledge Hub Feed

# GEO Knowledge Hub Feed

## Welcome to the Feed

A place to keep updated about the GEO Knowledge Hub content

News

**Highlights from #ODOK 2023**

Post with highlights from the ODOK 2023

News

**Introducing the GEO Knowledge Hub Feed**

This post introduces the new tool available on the  
GEO Knowledge Hub ecosystem.

Previous 1 Next

[gkhub.earthobservations.org/feed](https://gkhub.earthobservations.org/feed)

# GEO Knowledge Hub Feed

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## Introducing the GEO Knowledge Hub Feed

This post introduces the new tool available on the GEO Knowledge Hub ecosystem.



**GEO Knowledge Hub Team**  
Group on Earth Observations

Hello, dear GEO Knowledge Hub Community.

For some time now, we, the GEO Knowledge Hub team, have received several requests to assist the community in promoting new Knowledge Packages published on GEO Knowledge Hub. To support the community, we've added a new tool to the GEO Knowledge Hub ecosystem: The Feed.

# User Dashboard

# User Dashboard

The screenshot shows the User Dashboard of the GEO Knowledge Hub. The top navigation bar includes a globe icon, 'Dashboard' (highlighted in blue), a search bar, and a user profile for 'felipecarlos' with a green notification badge. The left sidebar has links for 'Existing Users', 'Stories', 'Actions', and 'Logout'. The main content area features a large 'Welcome to the User dashboard' heading with 'User dashboard' in blue. Below it is a descriptive paragraph and a 'Learn more' button.

Welcome to the User dashboard

The GEO Knowledge Hub User dashboard is where you can centralize information about the users of your applications. Doing this allows you to manage this data efficiently and never lose contact points again!

[Learn more](#)

# User Dashboard

Welcome to the User dashboard

The GEO Knowledge Hub User dashboard is where you can centralize information about the users of your applications. Doing this allows you to manage this data efficiently and never lose contact points again!

Learn more

- Dashboard
- Existing Users
- Stories
- Actions
- Logout

## Existing Users

NAME	COUNTRIES	ORGANIZATIONS	ACTIONS
Application user 002 user2@mail.org	Kenya	European Space Agency	
Application user 004 user4@mail.org	Kazakhstan	World Meteorological O...	
Application user 003 user3@mail.org	Portugal	World Meteorological O...	

# User Dashboard

The screenshot shows the main dashboard page. On the left, a sidebar menu includes 'Dashboard', 'Existing Users', 'Stories', 'Actions', and 'Logout'. The main area features a large, bold 'Welcome to the User dashboard' message in black and blue text. Below this, a paragraph explains the purpose of the dashboard: 'The GEO Knowledge Hub User dashboard is where you can centralize about the users of your applications. Doing this allows you to manage efficiently and never lose contact points again!'. A blue 'Learn more' button is located at the bottom of this section.

This screenshot shows the 'Existing Users' section. The sidebar on the left has 'Dashboard', 'Existing Users', 'Stories', 'Actions', and 'Logout'. The main content area is titled 'Existing Users' with a 'Create' button. It displays a table with columns: NAME, COUNTRIES, ORGANIZATIONS, and ACTIONS. Three user entries are listed:

NAME	COUNTRIES	ORGANIZATIONS	ACTIONS
A0 Application user 002 user2@mail.org	Kenya	European Space Agency	
A0 Application user 004 user4@mail.org	Kazakhstan	World Meteorological O...	
A0 Application user 003 user3@mail.org	Portugal	World Meteorological O...	

This screenshot shows the 'Actions' section. The sidebar on the left has 'Dashboard', 'Existing Users', 'Stories', 'Actions', and 'Logout'. The main content area is titled 'Actions' with a 'Create' button. It displays a table with columns: TITLE, TYPE, STATUS, USERS, and ACTIONS. Five tasks are listed:

TITLE	TYPE	STATUS	USERS	ACTIONS
Task 001	Activity	Done	Application user 001	
Task 002	Activity	Paused	Application user 004	
Task 003	Activity	Planned	Application user 003	
Task 005	Activity	In progress	Application user 001	

[gkhub.earthobservations.org](https://gkhub.earthobservations.org)



# Practical demonstration

# Questions ?

# Rest API

# Rest API



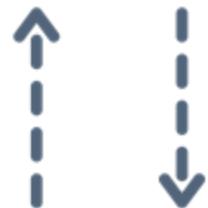
External systems

# Rest API



External systems

# Rest API



External systems

Bulk Package Loader

OGC/CSW Package Loader  
(Harvester)

# Using the Rest API

## Meet the e-shape legacy through the GEO Knowledge Hub

As a European flagship project contributing to EuroGEO, the e-shape project has linked with the [Knowledge Hub \(GKH\)](#) to support the promotion and the results dissemination of the 37 pilot showcases, which have been developed during the project life time.

The approach relies on the use of the webservice-energy GEO community catalogue to initiate the creation of one metadata record per pilot (<https://tinyurl.com/5dk34cks>). Metadata records, 19139 and/or INSPIRE Network Service profiles, have been created having the concept of the granule in mind. It means, beside the access to the given application, to provide a bucket of enriched metadata including, scientific communications, DOI, videos support presentations, Jupyter Notebooks, repositories, OGC Web Services GetCapabilities and output result datasets samples. A prime enriched metadata record is available here: <https://tinyurl.com/3bjd7ymu>

[tinyurl.com/e-shape-gkh](https://tinyurl.com/e-shape-gkh)

The screenshot shows the e-shape community page on the GKH platform. At the top, there's a header with the community name 'e-shape', its URL 'https://e-shape.eu/index.php/', and project details 'Project' and 'EuroGEO, Group on Earth Observations'. A 'New upload' button is also visible. Below the header, there are search and member navigation links. The main content area displays a list of 171 results found, sorted by 'Newest'. The results are categorized under 'Versions' and 'Resource types'. Each item in the list includes a thumbnail, title, author(s), date uploaded, and a brief description. For example, the first result is a video titled 'e-shape co-design presentation and pilot's testimonials - Video' by Barbier, Raphaëlle; Menard, Lionel, uploaded on June 1, 2023. The second result is a thesis titled 'Collective action for bridging digital and sustainability transitions: modelling and experimenting a new form of co-design between Earth-observation data providers and unknown users. (Doctoral thesis). Mines Paris, PSL University.' by Barbier, Raphaëlle, uploaded on June 1, 2023.

# Using the Rest API

The GEoss logo, consisting of the word "GEoss" in a bold, sans-serif font. The letters are colored in a gradient: teal for G, blue for E, green for O, and teal for ss. The letter "O" contains a small graphic of a world map.

# Using the Rest API

**Detecting deforestation using data cubes and deep learning**

# Using the Rest API

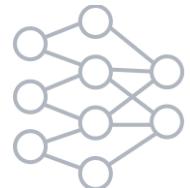
## Detecting deforestation using data cubes and deep learning



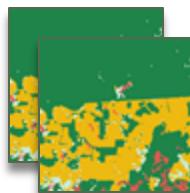
Processing scripts



Data Cube and samples



Machine Learning Model



Deforestation map



Processing environment



Complementary files



Usage workflow

# Using the Rest API

**Detecting deforestation using data cubes and deep learning**



Usage workflow

# Using the Rest API

**Detecting deforestation using data cubes and deep learning**

Using the **GEO Knowledge Hub Rest API**, in the **workflow** are available routines to **configure** and **execute** the **processing scripts automatically**



Usage workflow

# Documentation

# Documentation

The screenshot shows the homepage of the GEO Knowledge Hub. At the top, there is a navigation bar with links for 'GEO Knowledge Hub', 'Feed', 'User guides', 'Development', 'Releases', 'GitHub' (with a link icon), and a search bar. The main title 'GEO Knowledge Hub' is prominently displayed in large white letters on a dark blue background. Below it, a subtitle reads 'The open-source digital library for open, authoritative and reproducible knowledge'. There are two buttons: 'Explore now' and 'Learn more'. In the bottom left, there is a section titled 'EO Digital Library' with a description of what the GKH is. To the right of this text is a small illustration of a person standing next to a computer monitor displaying a globe.

**GEO Knowledge Hub**

The open-source digital library for open, authoritative and reproducible knowledge

Explore now   Learn more

**EO Digital Library**

The GEO Knowledge Hub (GKH) is a central cloud-based digital library providing access to Earth Observation (EO) Applications developed by the GEO Work Programme Activities.

[gkhub.earthobservations.org/doc](https://gkhub.earthobservations.org/doc)

# Documentation

The screenshot shows the GEO Knowledge Hub website. The top navigation bar includes links for 'GEO Knowledge Hub', 'Feed', 'User guides', 'Development', 'Releases', 'GitHub' (with a search bar), and a magnifying glass icon for search. The main content area features a dark blue header with the 'GEO Knowledge Hub' logo and the text: 'The open-source digital library for open, authoritative and reproducible knowledge'. Below this are two buttons: 'Explore now' and 'Learn more'. To the right, a large white box contains the title 'Creating a new Knowledge Package' in bold. A blue info box with a warning icon states: 'To create a Knowledge Package, your [GEO Knowledge Hub user](#) must have the [Knowledge Provider role](#). If you do not have this permission, [create an account](#) and [request the required role](#) for the [GEO Knowledge Hub team](#)'. Below this, a paragraph explains that sharing applications is done through Knowledge Package creation, and it lists three steps for creating a package. At the bottom, there's a 'Step-by-step' section with instructions.

## GEO Knowledge Hub

The open-source digital library for open, authoritative and reproducible knowledge

Explore now    Learn more

## EO Digital Library

The GEO Knowledge Hub (GKH) is a central cloud-based digital library providing access to Earth Observation (EO) Applications developed by the GEO Work Programme Activities.

Creating a new Knowledge Package

**INFO**

To create a Knowledge Package, your [GEO Knowledge Hub user](#) must have the [Knowledge Provider role](#). If you do not have this permission, [create an account](#) and [request the required role](#) for the [GEO Knowledge Hub team](#).

Sharing Earth Observation Applications in the [GEO Knowledge Hub](#) is done through Knowledge Package creation. This section presents how Knowledge Providers can use the features of the digital library to create these packages.

### Getting ready

The most important work, once as [Knowledge Provider](#) you decided to share your application in the [GEO Knowledge Hub](#) is to organize and document your application with the relative resources.

A checklist of actions is suggested:

1. Organize the material you want to share;
2. Describe all the materials you have in a document (e.g., [Title](#), [Authors](#), [Licenses](#), [Files](#) and so on);
3. Go to the [GEO Knowledge Hub](#) and follow the step-by-step guide to create a [Knowledge Package](#).

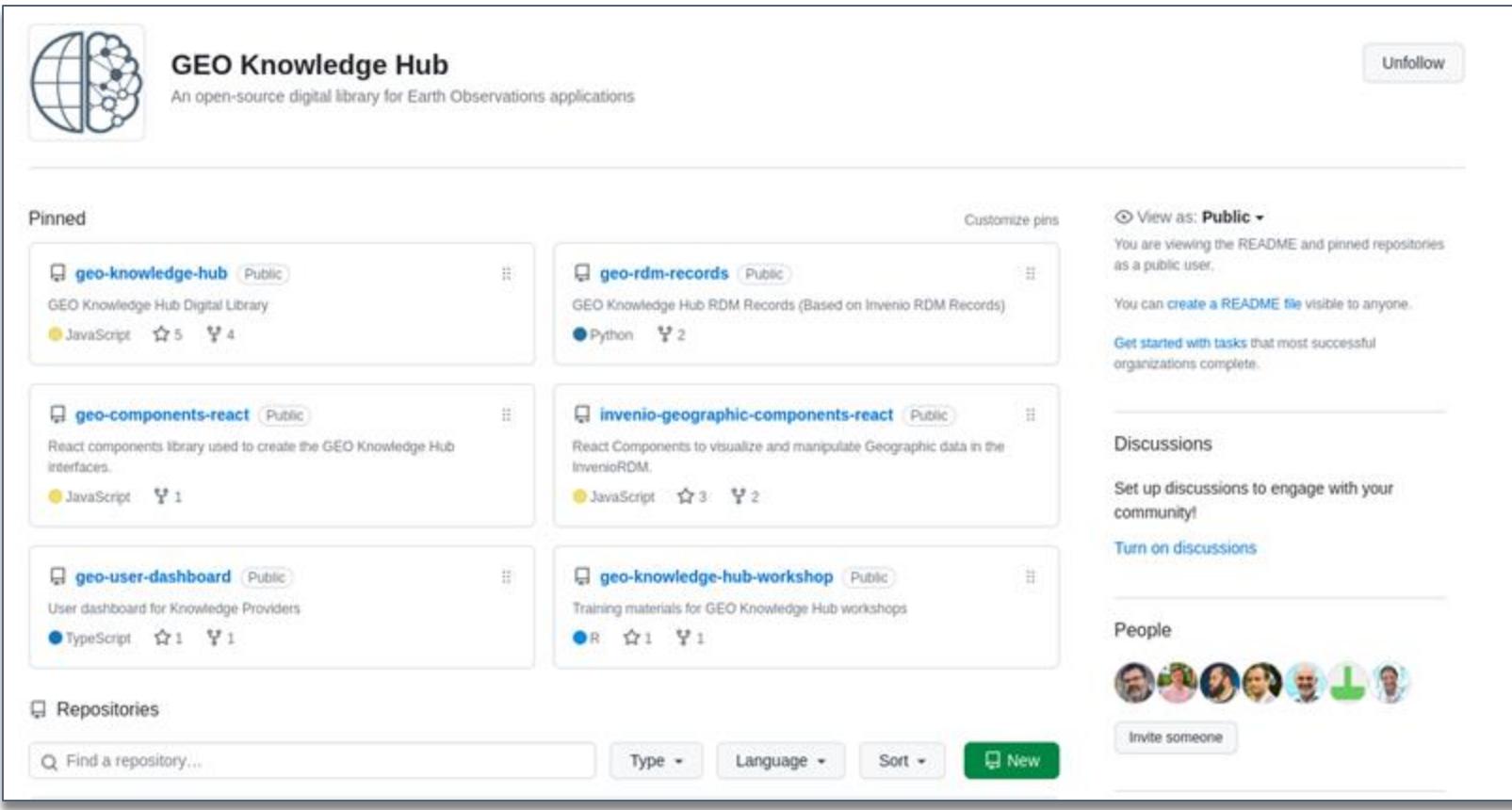
### Step-by-step

To create your [Knowledge Package](#), follow the step-by-step instructions on the following pages.

[gkhub.earthobservations.org/doc](http://gkhub.earthobservations.org/doc)

# Open-source platform

# Open-source platform



The screenshot shows the GitHub profile for the "GEO Knowledge Hub". The profile header features a brain icon and the text "GEO Knowledge Hub: An open-source digital library for Earth Observations applications". A "Unfollow" button is visible in the top right corner. The "Pinned" section displays five repositories: "geo-knowledge-hub" (JavaScript), "geo-components-react" (JavaScript), "geo-user-dashboard" (TypeScript), "geo-rdm-records" (Python), and "invenio-geographic-components-react" (JavaScript). Below the pinned section is a "Repositories" search bar with filters for Type, Language, Sort, and a "New" button. On the right side of the profile page, there are sections for "View as: Public", "Discussions", and "People", which lists several GitHub users.



[github.com/geo-knowledge-hub](https://github.com/geo-knowledge-hub)

# Open-source platform

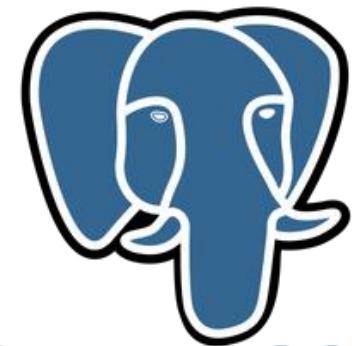
The screenshot shows the GitHub interface for the **GEO Knowledge Hub**. On the left, there's a sidebar with pinned repositories: **geo-knowledge-hub**, **geo-components-react**, **geo-user-dashboard**, and a search bar. The main area displays a pull request titled "services: adding mutable configurations for the records service". The pull request has 137 commits, 6 changed files, and 37 additions/deletions. It was committed by **M3nin0** on Feb 23. The code review shows a diff between two versions of the file `links.py` in the `geo_rdm_records/base/services` directory. The changes include additions for expanding objects and updating contexts.

```
diff --git a/geo_rdm_records/base/services/links.py b/geo_rdm_records/base/services/links.py
index 54,14..54,14 100 def __init__(self, links, types_registry, context=None):
54      self.types_registry = types_registry
55
56      def expand(self, obj):
57          """Expand all the link templates."""
58          # defining the object type
59          obj_type = self.types_registry.guess_type(obj, error=True)
60
61          # updating the context with the type
62          ctx = deepcopy(self.context)
63          ctx.update(dict(entity=obj_type))
64          ctx.update(dict(entity=obj_type, identity=identity))
65
66          # expanding links
67          links = {}
```



[github.com/geo-knowledge-hub](https://github.com/geo-knowledge-hub)

# Tech stack



Postgre~~S~~SQL



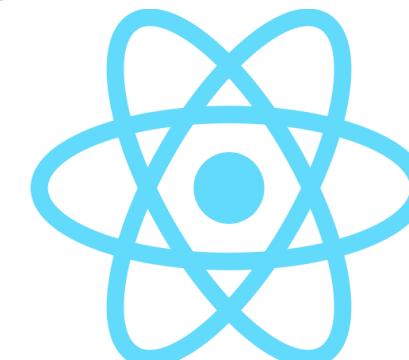
Docusaurus



Flask



Python



React



Semantic UI

# Infrastructure



1



GitHub Actions

2



HashiCorp

**Terraform**

- EC2** Amazon Elastic Compute Cloud
- S3** Amazon Simple Storage Service
- RDS** Amazon Relational Database Service
- Backup** Amazon Backup

# GEO Knowledge Hub content

108

Knowledge Packages

531

Knowledge Resources

# GEO Knowledge Hub content



Digital Earth  
AFRICA



GLOBAL OBSERVATION SYSTEM FOR MERCURY

EO4SENDAI  
Monitoring

GWIS

GEO ECO



EO4SDG



GLOBAL WATER SUSTAINABILITY



**GEO**  
Human Planet Initiative



GEOMIN

GEO Value

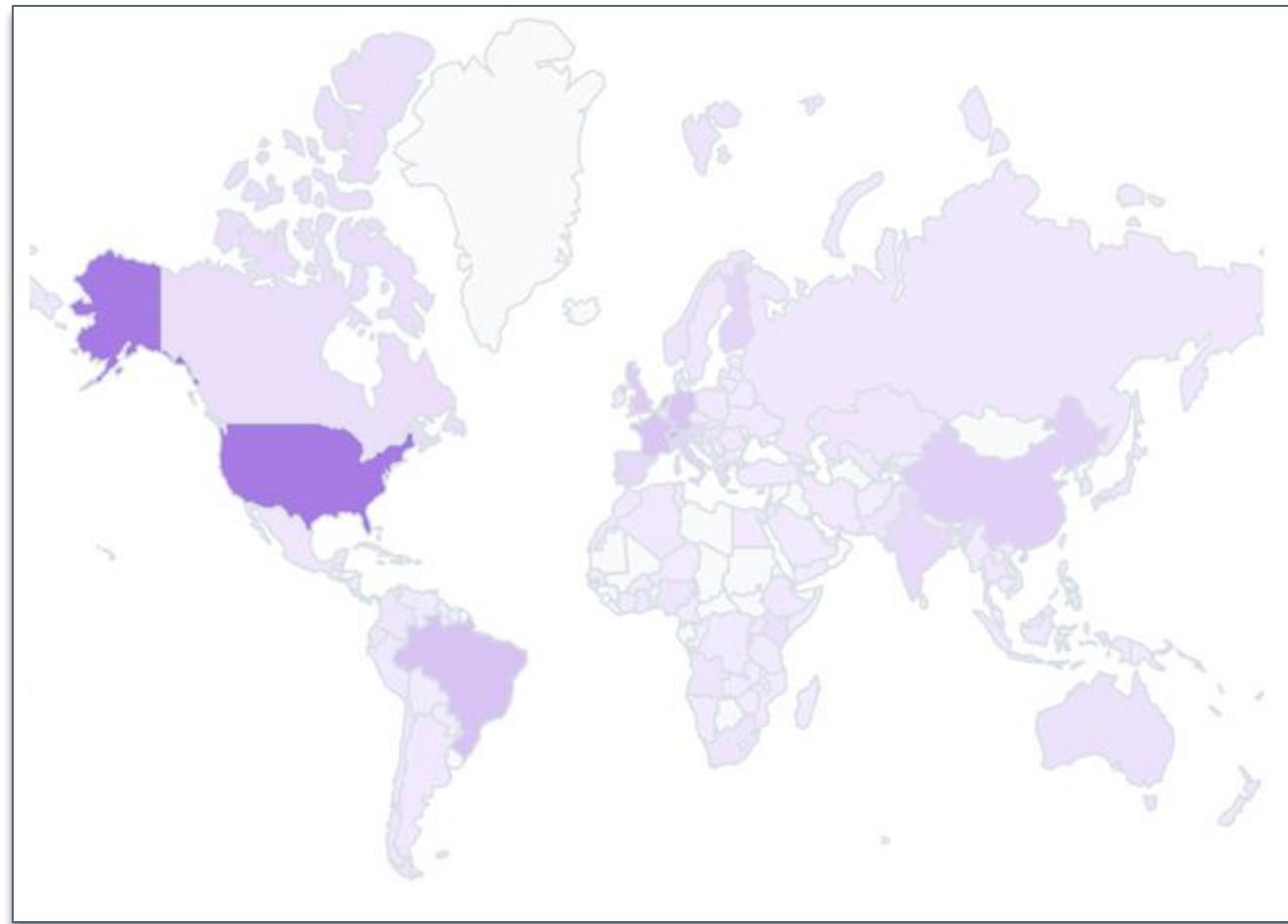


Data Working  
Group



# GEO Community access

~21.000 views  
(in the last 10 months)



Visitors by country  
**(Stronger color means more visitors)**

**Note:** Metrics are collected with Plausible, a privacy-friendly tool  
(GDPR, CCPA, PECR compliant tool)

# Future steps

# Future steps

**Engage** with GEO Work Programme activities not yet in the GEO Knowledge Hub

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**Engage** with GEO Work Programme activities not yet in the GEO Knowledge Hub

**Increase** the EO applications available in the digital library

# Future steps

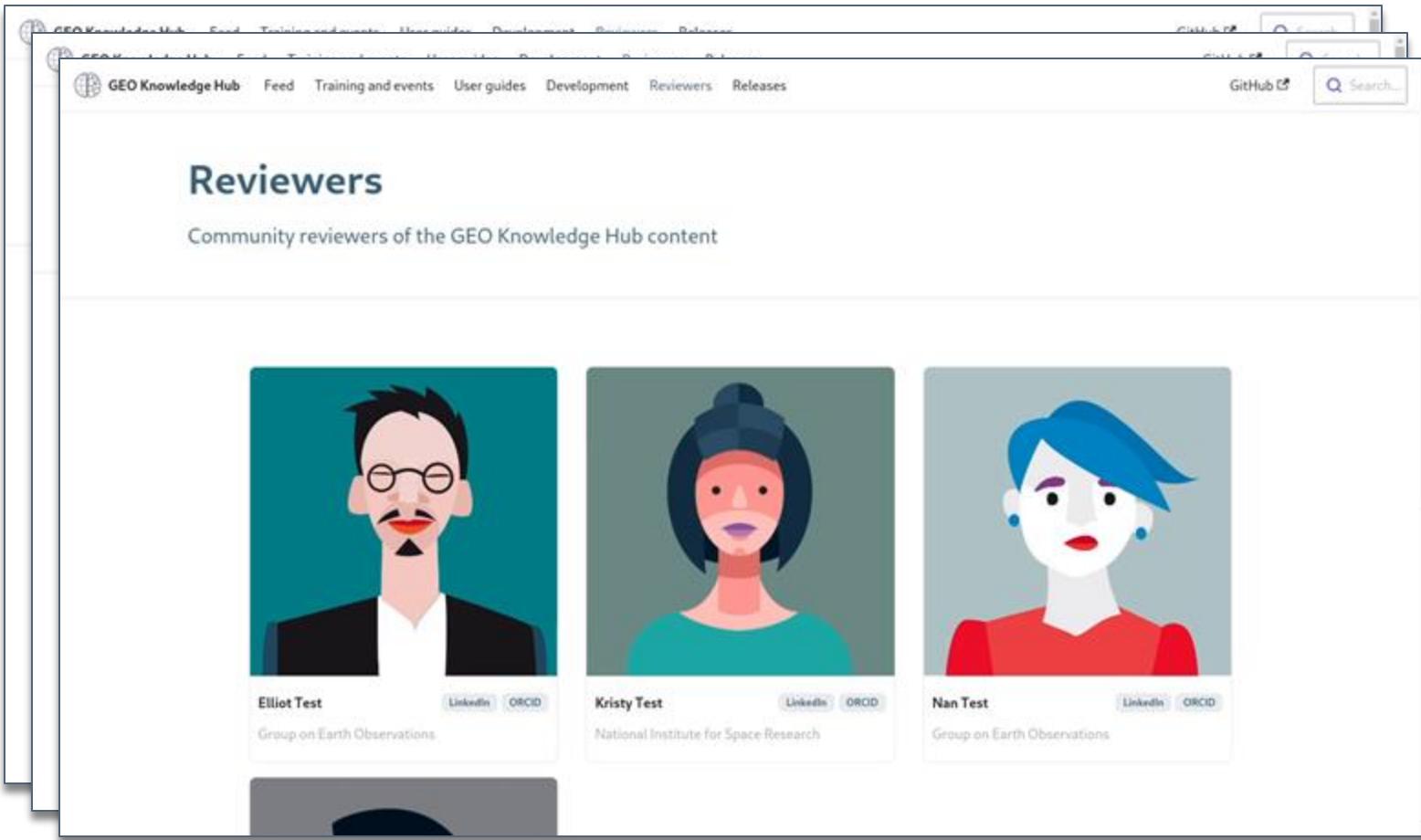
**Engage** with GEO Work Programme activities not yet in the GEO Knowledge Hub

**Increase** the EO applications available in the digital library

**Webinars** on available Knowledge Packages

# Future steps

Make new features available



# Thank you