Green Transition Information Factory (GTIF) – Demonstrator for Austria – Consolidation Activity

Technical Handbook

DEL03 Handover Package

"EUROPEAN SPACE AGENCY CONTRACT REPORT"

The work described in this report was done under an ESA contract. Responsibility for the contents resides in the author or organisation that prepared it.

Prepared by EOX IT Services GmbH

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1 INTRODUCTION

1.1 BACKGROUND

The **Green Transition Information Factory (GTIF)** is an ESA initiative designed to demonstrate the added value of Earth Observation (EO), cloud computing and advanced analytics in addressing the information needs of the Green Transition and the European Green Deal. Its objective is to make a wide range of EO-based products accessible to non-technical stakeholders, helping them better understand and act on Green Transition relevant topics.

This is done by providing **"GTIF Capabilities"**, i.e. geospatial indicators, scientific narratives and intuitive interactive tools that enable users to explore information products and derive from these actionable insights tailored to their priorities. A fundamental aspect of GTIF is its active and continuous stakeholder engagement, ensuring that developments evolve in alignment with the practical needs of Green Transition implementers across different sectors such as:

- Carbon Accounting
- Energy Transition
- EO Adaptation Services
- Mobility Transition
- Sustainable Cities.

Austria served as the **first GTIF demonstrator**, initiated in spring 2022 and developed through several activities with Austrian companies and organizations under a strongly user-driven approach. Austria was selected because of its ambitious green transition targets such as, for example, to reach 100% renewable electricity by 2030. Moreover, its size variation in terrain makes it suitability to develop national-scale monitoring solutions. Developed in close collaboration with the Austrian Federal Ministry for Innovation, Mobility and Infrastructure (BMIMI) and supported by the Austrian Research Promotion Agency (FFG), the demonstrator explores Austria's Green Transition challenges across five thematic domains. The first public release of the GTIF Austria demonstrator was released in early 2023 at www.gtif.esa.int.

Following this release, ESA and BMIMI organised a major stakeholder workshop in Vienna, gathering over 125 participants from more than 40 organisations across public authorities, industry, academia and civil society. Participants provided feedback on existing functionalities and identified new opportunities for the evolution of GTIF Austria, also confirming a strong demand for EO-based analytics to support decision-making and implementation of the Green Transition.

The input collected during the workshop led both to opportunities of refinement of existing Capabilities and to the identification of new requirements to expand GTIF support to additional use cases. These were analysed, consolidated and prioritized for implementation in close coordination with BMIMI and FFG, steering GTIF activities in Austria towards full national adoption and governance under the **GTIF – Demonstrator for Austria - Consolidation Activity (GTIF-AT C)**.

In parallel, building on the lessons and successes of the Austrian demonstrator, ESA has launched three **additional GTIF activities** that implement the concept to new regions, demonstrating scalability and addressing additional Green Transition priorities:

1. Baltic GTIF (https://gtif-baltic.info) for Lithuania, Germany, Poland, Estonia, Latvia
2. Cerulean GTIF (https://cif.eox.at) for Denmark, Canada, Northern Atlantic
3. UKIF GTIF (https://gtif-ukif.github.io/gtif-ukif-client) for United Kingdom, Ireland, France

At the same time, the ESA strategy for the **overall GTIF initiative** has further evolved and can be summarised as having the following objectives:

1. User driven Capability development, also responding to identified Capability gaps
2. Operationalisation of EO value-adding algorithms and supporting Providers with commercial offerings
3. Building effective and intuitive decision support tools
4. Showcasing and promoting these Capabilities to non-geospatial communities such as policy makers

1.2 Scope of Document

The present Handbook serves as one of the handover elements of the **GTIF AT C** project.

Under this ESA contract, the consortium of Austrian organization has been tasked to address a set of requirements which have been co-specified by BMIMI and ESA and, accordingly, review, update, and extend the first GTIF demonstrator operated for ESA.

As a deliverable of this contract, a **new instance of GTIF Austria** has been created, accessible at https://gtif-austria.info (Figure 1) with the aim to prepare a transfer of governance from ESA to Austria.

Figure 1 GTIF-Austria Web landing page (December 2025)

In October 2023, the Austrian Research Promotion Agency (FFG) launched a call "**Digital Twin Austria**" which included the invitation for RTD proposals related to GTIF. Nine initiatives have been awarded the funding to implement GTIF Capabilities in different domains and have been invited to deliver demonstration services on the newly implemented GTIF-Austria in the 2025/2027 timeframe.

The present Handbook shall serve **Providers of Capabilities** on the GTIF Austria Platform as starter information package and as reference guide to more detailed documentation.

The Handbook also contains documentation and provides engineering insights about the Platform architecture and its open-source software building blocks.

1.3 Document Structure and Intended Readership

The intended readers of the present document are the **Providers of "GTIF Capabilities"** (section 2.1). They may either be users of the tools provided by the **GTIF Platform** or they may want to get insights into how the GTIF Platform is constructed and which open-source software is used.

This section relates the document structure with the type of readers for whom the chapters and sections have primarily been written.

Table 1 Document Structure and Intended Readership

Chapter/Section	Readers in Provider's team
1 Introduction	Everyone
2 GTIF Overview	Everyone
3 GTIF Platform	Everyone
4.1 Documentation for Providers	EO Engineers/ Data Managers
4.2 Publishing on GTIF-Austria	EO Engineers/ Data Managers
4.3 Developing and Running Code on the GTIF Platform	Developers / Software Engineers / Operators
5 GTIF Public Data and Software	Developers / Software Engineers

1.4 Acronyms

Table 2 Acronyms

Tag	Description
API	Application Programming Interface
BMIMI	Bundesministerium für Innovation, Mobilität und Infrastruktur (Federal Ministry of Innovation, Mobility and Infrastructure)
CDSE	Copernicus Data Space Ecosystem
DestinE	Destination Earth
DESP	DestinE Service Platform
EO	Earth Observation
ESA	European Space Agency

FFG	Österreichische Forschungsförderungsgesellschaft (Austrian Research Promotion Agency)
GIS	Geoinformation System
GTIF	Green Transition Information Factory
GTIF-ATC	Green Transition Information (GTIF) – Demonstrator for Austria – Consolidation Activity
GUI	Graphical User Interface
JSON	JavaScript Object Notation
STAC	Spatio-Temporal Asset Catalog
UI	User Interface

2 GTIF OVERVIEW

2.1 GTIF USERS

This section introduces the users of GTIF Platform Services. Figure 1 shows the stakeholders performing different tasks supported by the tools provided by this Platform.

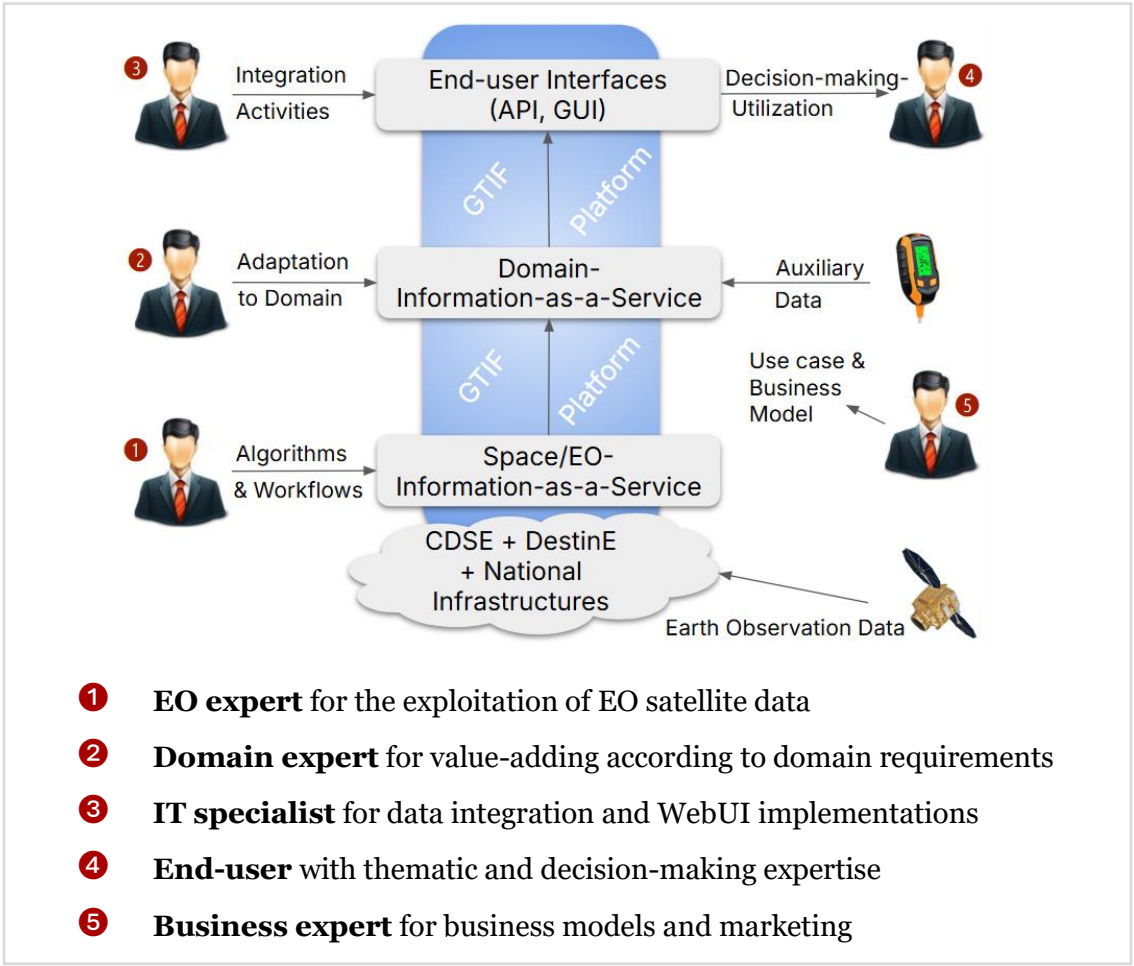

Figure 2 GTIF Stakeholders

❹ GTIF **End-users** are:

- Decision-makers to assess and monitor the effectiveness of policies and evaluate political objectives and outcomes using GTIF-provided data, indicators and interactive exploration tools.
- Citizens to engage and understand the needs for their actions through interactive exploration tools and captivating scientific narratives across key Green Transition domains.

❶ ❷ ❸ ❺ GTIF includes a **model for industry** to develop novel solutions to foster the Green Economy, supported by EO technologies, and connect to relevant national and international stakeholders. The different roles of industrial stakeholders are illustrated in Figure 2. In numerous

examples, different experts are working together as **GTIF Providers** to jointly establish workflows (section 3.1) and deliver end-to-end service chains.

2.2 PUBLIC DEMONSTRATION AND PROMOTION

This section introduces the GTIF elements which are visible to consumers, or End-users, of GTIF.

2.2.1 Narrative Gallery

Initial entry points into the wealth of information are the "**Data Stories**" or Narratives, i.e., multimedia descriptions and interactive demos of the offered services ("Capabilities"). These Narratives are written in a generally understandable style and have a promotional character for the Providers' services.

The collection of Narratives is shown in the "Narrative Gallery" Web page showing clickable thumbnail images for the individual entries. The list of entries can be searched by keyword and filtered by thematic domain.

The example of the Narrative Gallery of GTIF-Austria is shown in Figure 3.

The following information should be typically contained in a Narrative:

- **Problems and needs**: A statement which explains why the GTIF Capability is offered, which typical users are addressed by the Capability and which of their requirements can be met; often reference to reporting directives and regulations is made here too
- **Solution Capability**: A brief specification of the information product (thematic map, indicator, etc.) and a summary description of the input data and algorithm(s) which are used to generate the information product; information and data about quality aspects and assurance measures
- **Storytelling Information**: An explanation of more details illustrating the thematic importance of the information product or a scenario description how the information product may be embedded into larger information contexts.
- **Delivery Process**: A descriptions of the channels or services offered for the delivery of the information product to the end user; this may contain a link to the GTIF Explore Data dashboard (WebGIS functionality), a specification of an Application Programming Interface (API) for machine-to-machine exchange, any other download or delivery mechanisms; and a description of the operation mode of the Capability, e.g. for on-demand delivery
- **About**: Information about the Capability Provider and business background references
- **Subscription information**: The price and sales conditions applicable to the information product.

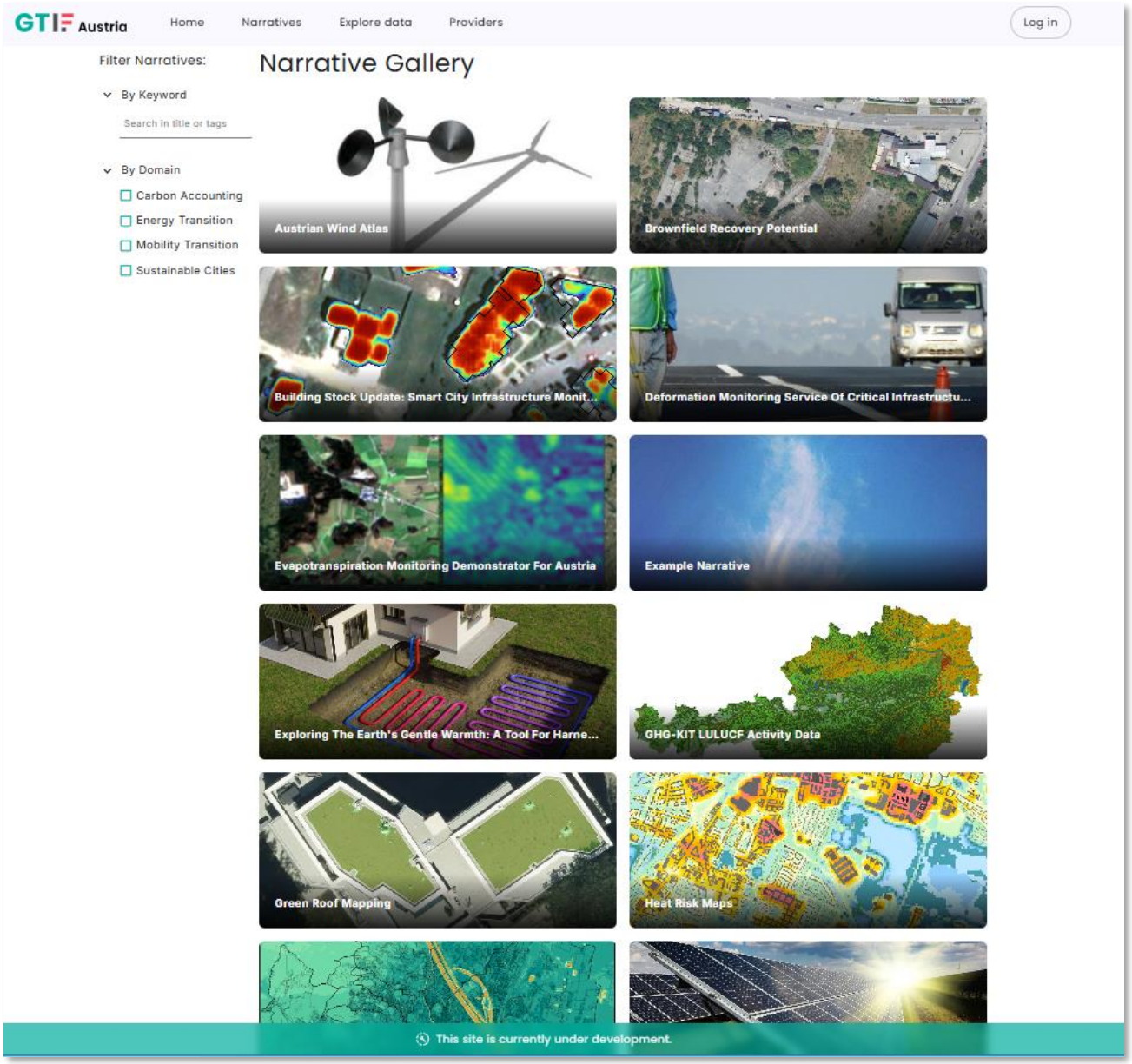

Figure 3 GTIF-Austria Narrative Gallery (December 2025)

2.2.2 Explore Data Dashboard

The GTIF information products are shown on the Explore Data dashboard page i.e. a graphical expert interface (WebGIS) for the visual analysis of geospatial indicators and time series.

The GTIF Explore Data dashboard typically presents geospatial information through an interactive map combined with a set of configurable controls (Figure 4, Figure 5, Figure 6. Users can explore different indicators by selecting datasets, adjusting layer properties, and navigating through time using sliders or date selectors. Each layer includes a legend and visual styling that updates instantly when parameters change.

Many dashboards also support selecting areas or drawing regions on the map to display contextual charts, statistics, or time series. In more advanced views, users can compare two indicators side-by-side, switch between scenarios, or change metrics to analyse variations across space and time. Together, these tools enable users to interactively investigate Earth-observation datasets, compare outcomes, and derive insights directly from the visual and analytical components of the dashboard.

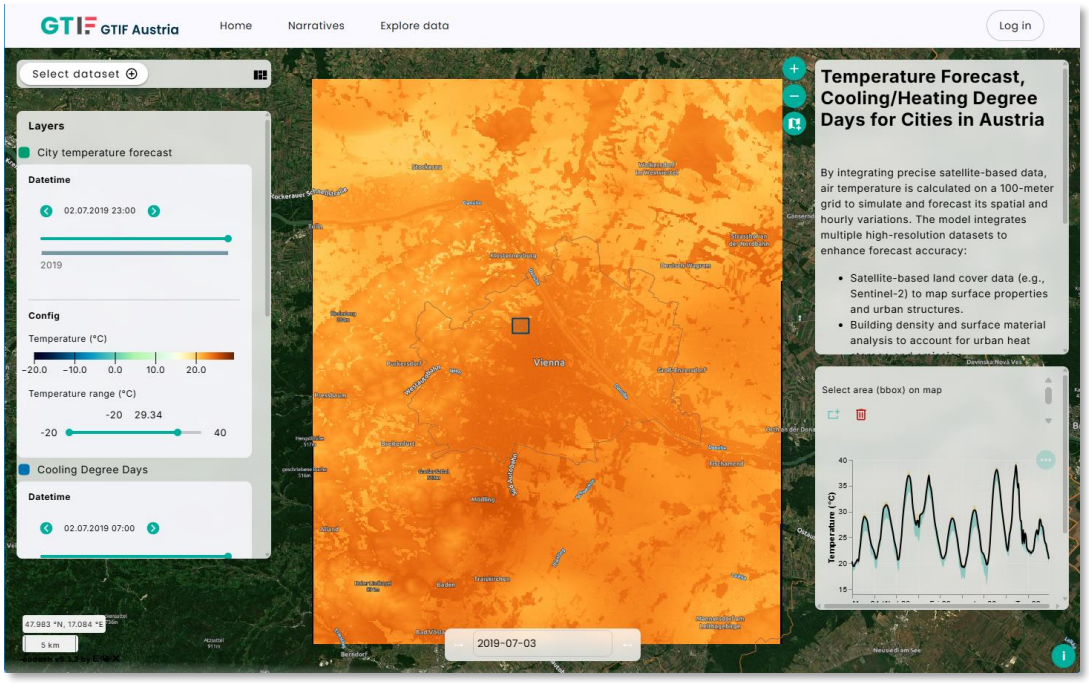

Figure 4 GTIF Austria Explore Data dashboard. The shown Capability example is provided by GeoSphere Austria

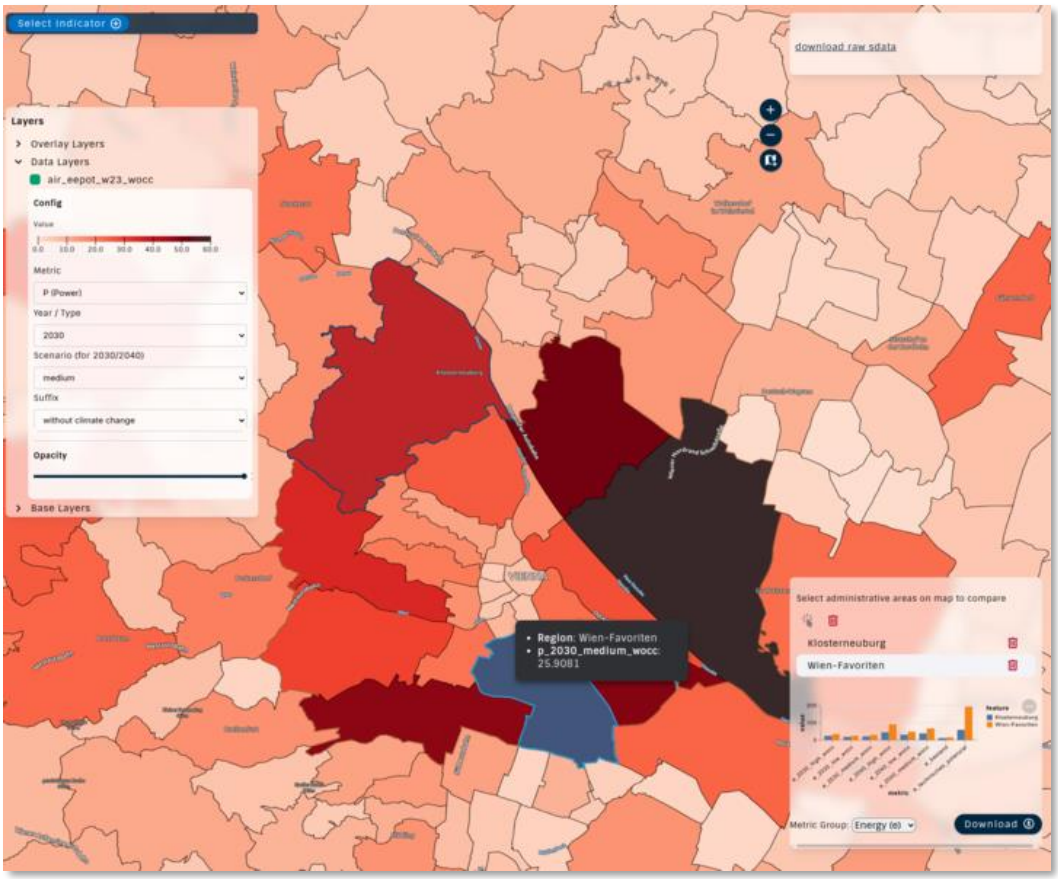

Figure 5 GTIF Austria Explore Data dashboard. The shown Capability example is provided by Austrian Institute of Technology (renewable energy data generated for Austrian Climate and Energy Fund)

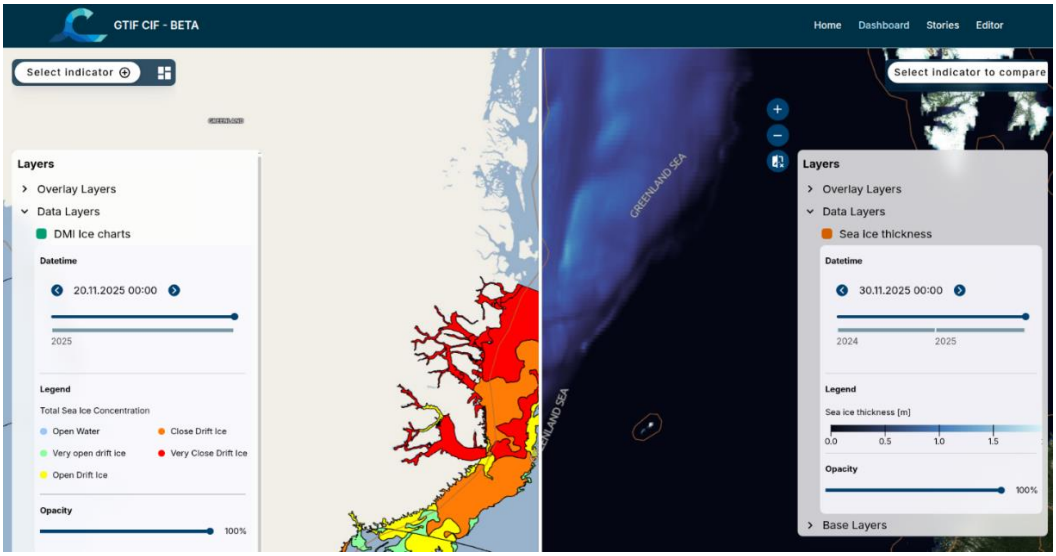

Figure 6 The Capability example shown is provided by PolarView (data generated in ESA Cerulean GTIF project)

2.2.3 Providers Page

For each organization which contributes to GTIF, a Provider Card is available (Figure 7). These cards are collected in the “Providers” page accessible from the menu bar on top of the GTIF home page.

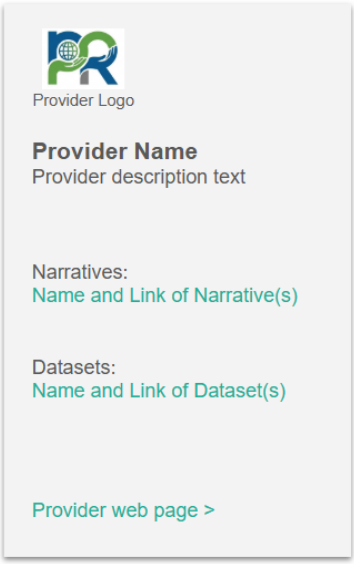

Figure 7 Schema of Provider Card

Each card includes a brief profile of the respective organization and offers quick navigation possibilities directly to the Narratives and the Datasets provided by this organization to GTIF.

2.3 FROM DEMONSTRATIONS TO SUSTAINED SERVICES

This section introduces how the GTIF concept is beneficial to the realization of sustained services beyond the public GTIF Demonstrator.

The GTIF Demonstrator is a promotion platform for the Capabilities. Through its open access policy and free of charge provision of demonstrational information the Demonstrator is a tool supporting the dialogue of Providers with interested stakeholders. It is a showcase for discussing on practical grounds the detailed service content and the features a stakeholder would be interested in. It is a marketing instrument for Providers to promote their service offers and to explain the business conditions under which these services are provided.

The information conveyed via the Explore Data dashboard of the open Demonstrator typically are time- or area-limited examples of the products that can in principle be generated by the Capability also for other places and/or times. The related Narratives explain the conditions which apply should a customer wish to order a bespoke data service from the respective Provider. For example, the city temperature forecast service demonstrated by the Provider GeoSphere over the City of Vienna for a few exemplary hot summer days in the past (shown in Figure 4) is offered also for other cities in Austria and as a real-time forecast at current dates.

GTIF is therefore not only a promotional website but also an ecosystem for establishing businesses and for operating sustained services.

The promotional value for a Provider is enhanced through the "marketplace" nature of GTIF, the presence of multiple Providers attracting a wide audience, and the fact that the presence of GTIF is announced via many channels (not the least via ESA and FFG's Digital Twin Austria Programme).

3 GTIF PLATFORM

3.1 WORKFLOWS

This section introduces the value-added workflows which are supported by the "**GTIF Platform** services".

For each GTIF Capability a workflow must be implemented by the Capability Provider. Such a workflow (see Figure 8) is fed by EO data as well as other data sources and includes the necessary integrated steps for generating information products demanded by customers.

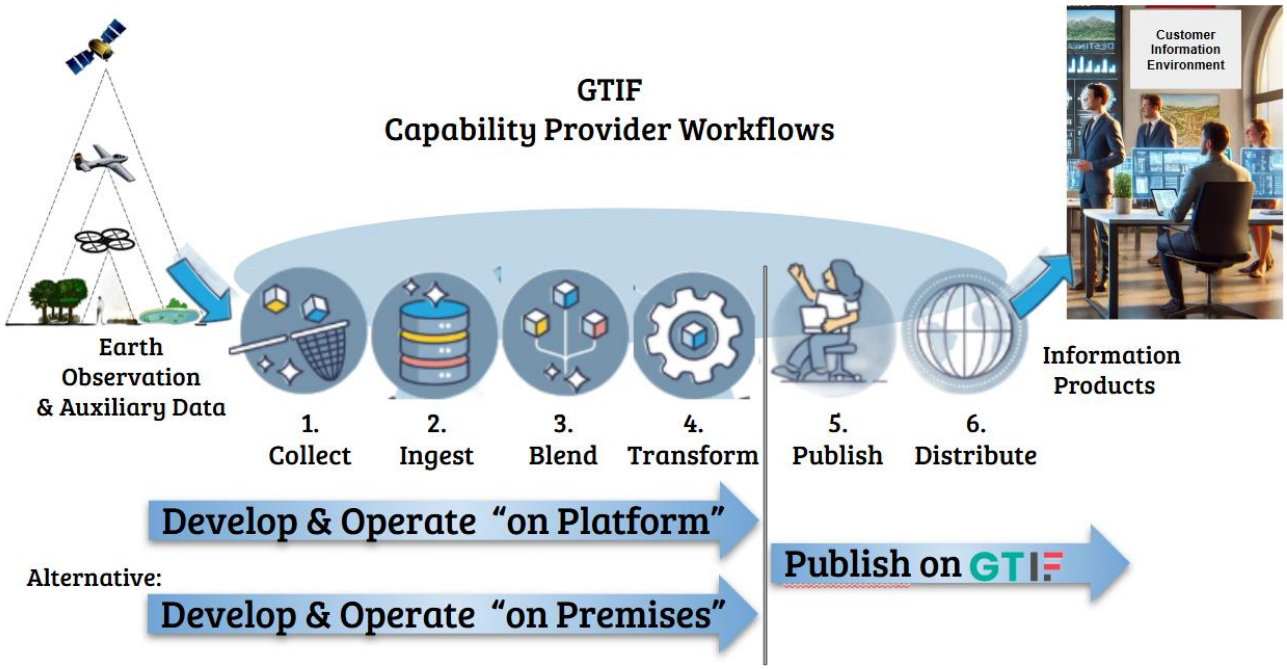

Figure 8 GTIF Capability Provider Workflows

The **workflow steps** shown in Figure 8 are explained in the following:

1. **Collect**: Identification and definition of the needed input data
2. **Ingest**: Loading these data into local storage and registration in catalogue, or configuration of streaming interfaces for requesting data on-the-fly
3. **Blend**: Pre-processing (geocoding, co-registration, super-resolution generation, data cubing, quality checking of pre-products, etc.)

4. **Transform**: Application of algorithms on the pre-processed/prepared data, i.e. generation of the Capability's information products; quality assurance of these products
5. **Publish**: Configuration of the Explore Data dashboard for the given information products and the details of how they shall be presented; editing of Narratives; checking pre-release previews of the appearance on the GTIF WebGUI
6. **Distribute**: Release to end-users of the information products and Narratives on GTIF

The services which are provided by the GTIF Platform for supporting steps 1 through 4 are further explained in section 4.3. The GTIF Platform support for steps 5 and 6 is explained in section 4.2.

For the **development and operations** of the workflow, there are two implementations possible:

1. Baseline: Entire workflow is implemented based on services and resources provided by the GTIF Platform
2. Alternative: The workflow uses GTIF Platform services only for publishing and distribution of information products and related Narratives, whereas the generation of the products is performed using infrastructure on the Provider's premises

The baseline is a typical use of GTIF by data scientists, i.e. Providers who are focusing on algorithmic aspects within the transformation step and who expect a managed services which cater for the end-to-end hosting of their algorithm.

The alternative is the typical case of a Provider who has an already implemented Platform and processing solution but still wishes to utilize GTIF for its publishing functions and for the distribution of information products and related material via the GTIF channels.

Depending on the customer needs, GTIF Capabilities can run in different **operational modes**:

- Schedule-driven e.g., recurring, quarterly production
- Data-driven, i.e. based on changes in input or control data
- End-user-driven, i.e. based on commands via the graphical user interface (GUI) or an Application Programming Interface (API)

See section 4.3.1 to learn more about workflow management, orchestration and operations supported by the Argo Workflow tools available for Providers on the GTIF Platform.

3.2 ARCHITECTURE

This section provides an overview of how GTIF is technically constructed.

GTIF is implemented as the layered cloud-based architecture shown in Figure 9.

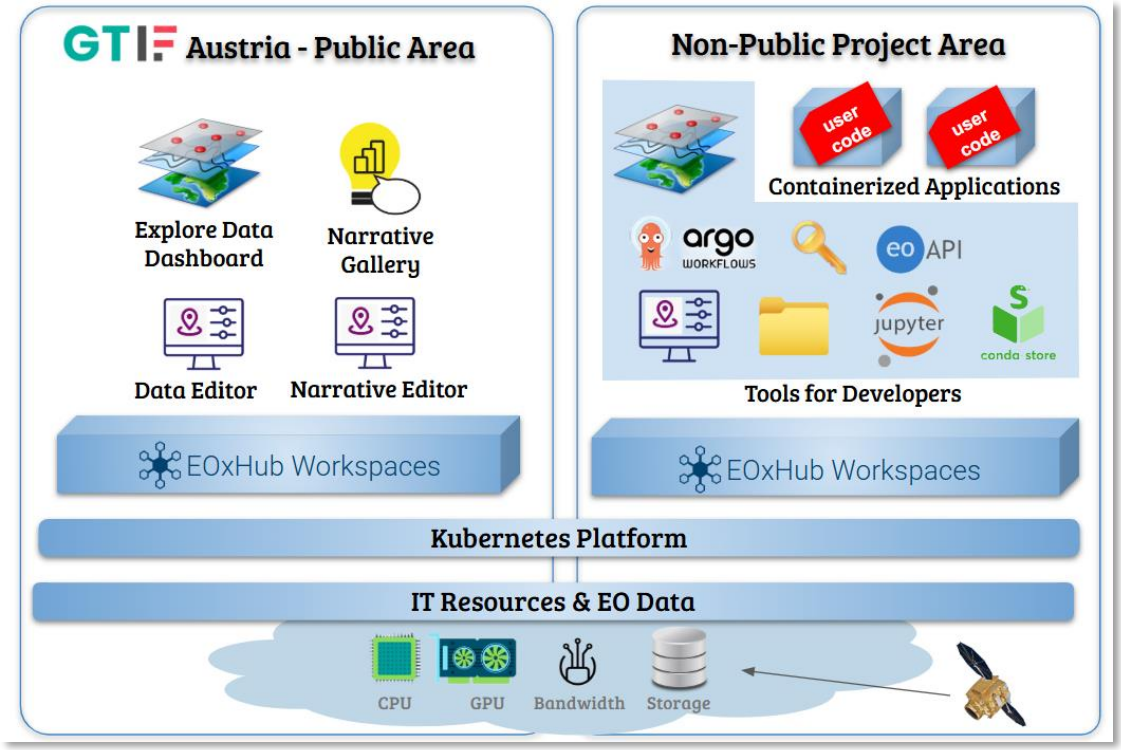

Figure 9 GTIF Architecture

At the bottom of the diagramme the computing platform resources are shown which are available as commodities to GTIF including Kubernetes services (https://kubernetes.io/) which are used for managing container-based applications. The EOxHub Workspaces layer (https://hub.eox.at) contains platform services which host several tools that are made available to GTIF Capability Providers and end-users.

GTIF-Austria – Public Area: The services for GTIF-Austria are provided as public resources (see section 4.2) accessible for anyone who wishes to publish "Narratives" (stories or factsheets related to information products and data) or wishes to expose data for demonstration purposes in the "Explore Data" dashboard under the GTIF-Austria label. In this area, information is made available without restrictions to the public for demonstration and promotion of GTIF Capabilities.

Non-public Project Area: Projects (including GTIF projects) that - in an access-protected and resource-controlled way - develop and/or run code for generating value-added information products use the tools and IT resources which are provided as managed services (see section 4.3). In the non-public area, commercial Capabilities are prepared and furnished (see section 2.3).

A Capability Provider may use the open and the project areas in a combined way as follows:

- Capabilities are promoted on the public GTIF Platform free of charge via product information (Narratives) and by providing interactive data demonstrations over limited geographic area and time on GTIF's WebGIS (Explore Data dashboard)

- For commercialization purposes, Capabilities are scaled up in the project area. For each customer or customer group a dedicated project area instance can be created with minimum effort.

3.3 IT RESOURCES AND EO DATA

This section briefly explains the integration with IT Resources and the access to EO Data which are shown at the bottom of Figure 9.

The **Copernicus Data Space Ecosystem (CDSE)** is a "native" hosting environment for the GTIF Platform. In brief, CDSE provides full integration with Copernicus EO data archives via well-defined API services. In addition, IT cloud resources can be rented from the providers of CDSE and utilized via Kubernetes services (Figure 9) either via free or commercial service plans.

Generally, any infrastructure which provides Kubernetes services can be selected as hosting environment for a GTIF Platform instantiation, for example, the **Destination Earth (DestinE) Service Platform (DESP)**.

The GTIF Platform supports various ways of uploading and/or integration of EO data into workflows as described for example in sections 4.3.1 and 5.9.

4 USING GTIF

4.1 DOCUMENTATION FOR PROVIDERS

This section introduces the documentation which is available for the Providers of GTIF Capabilities.

GTIF Platform services are provided via the EOxHub Workspaces services. Correspondingly, the documentation for Providers of GTIF Capabilities can be found at https://documentation.hub.eox.at/.

The documentation is structured to guide users through a variety of resources and examples, including:

- Use Case Descriptions:
  Real-world scenarios and problem statements that the Platform services are designed to address. These will help you understand the expected applications and Capabilities of the service
- Tutorials and Walkthroughs:
  Step-by-step guides to help new users get started and experienced users explore advanced features
- Argo Workflow Templates:
  Templates and patterns to automate and orchestrate geospatial processing workflows

What follows are guides through the documentation for the use cases relevant for GTIF:

- Publishing on GTIF-Austria (section 4.2)
- Developing and Running Code on the GTIF Platform (section 4.3)

The readers are invited to check back regularly as the documentation content is being expanded with new features, examples, and integrations.

4.2 PUBLISHING ON GTIF-AUSTRIA

This section introduces the free-of-charge tools which are available to the Providers for promoting their Capabilities on the GTIF Platform.

The publishing of information products and Narratives on GTIF-Austria is open to everyone. The Platform provides the necessary resources free of charge to anyone who wishes to describe (via the “Narrative Gallery”) and demonstrate (via the “Explore Data” dashboard) a Capability which is within the scope of GTIF. The content of the public GTIF-Austria pages is not thematically or scientifically moderated. It is up to the publishers, i.e. Capability Providers, to design proper information, only a check for inadequate content is executed.

To publish externally generated indicators on GTIF i.e. for uploading data to GTIF and for configuring the appearance and interaction of indicators on the WebGUI users must login into GTIF-Austria using their GitHub credentials find their “workspace” and therein the “applications” needed to perform the publishing steps.

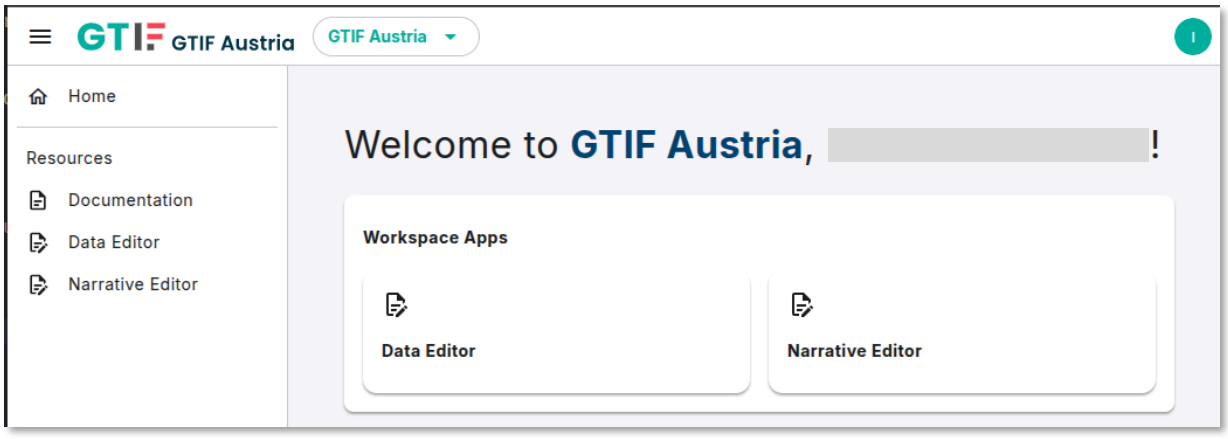

Figure 10 Public GTIF Austria Workspace

4.2.1 Narrative Editor

The Narrative Editor (Figure 11) is a content editor for creating and publishing structured Narratives combined with EO content. The documentation pages at https://documentation.hub.eox.at/narrative-editor/ provide an overview of its architecture, key features and functionality.

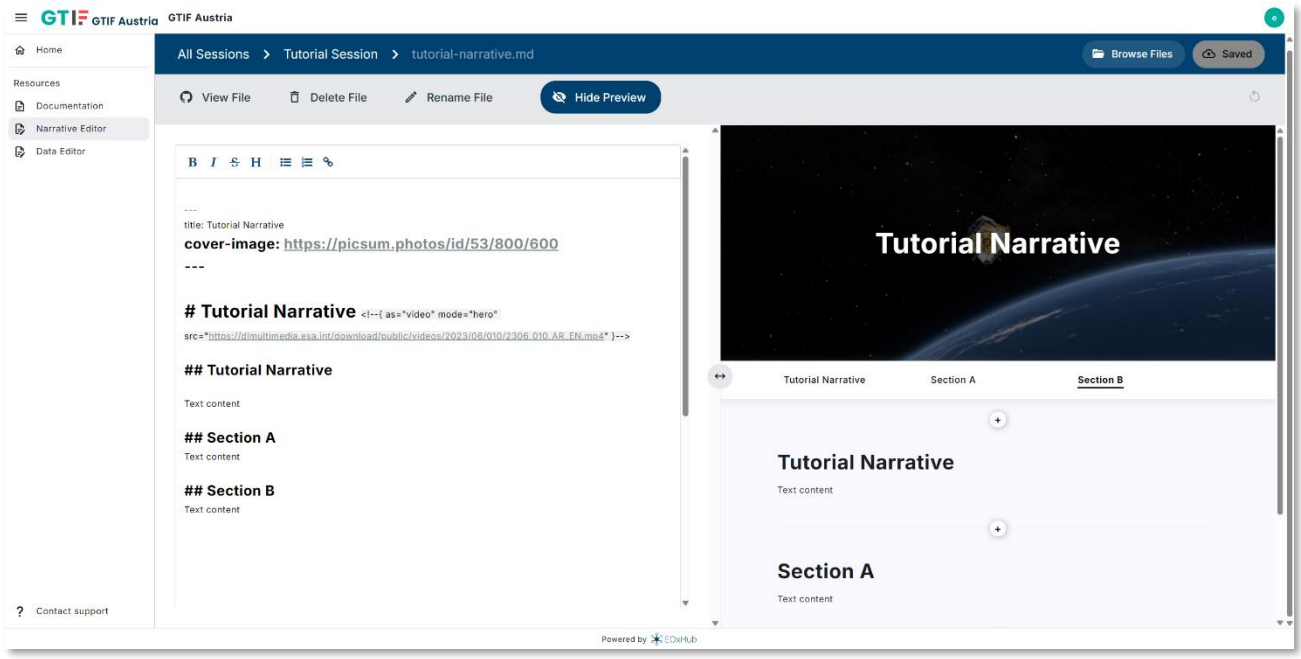

Figure 11 Web interface of the GTIF-Austria Narrative Editor

A **step by step Tutorial** introducing the Narrative Editor can be found here: https://documentation.hub.eox.at/introduction-narrative-editor/. Additional tutorials on the practical use of the editor are available for “storytelling” and for creating “tours”.

4.2.2 Data Editor

The Data Editor application (Figure 12) provides a traceable review and approval path of collection configurations before data is published to the configured Spatio Temporal Asset Catalogue (STAC) which is used in the Publishing Dashboard which is based on eodash (section 5.3).

It is based on git-clerk - Open-Source Content Management System (section 5.4) based on Git workflows with a friendly file-editing GUI.

It enables workspace owners to describe their datasets using simple forms, validate them against JavaScript Object Notation (JSON) schema definitions, and commit them via Git-based sessions.

Documentation pages are at https://documentation.hub.eox.at/data-editor/.

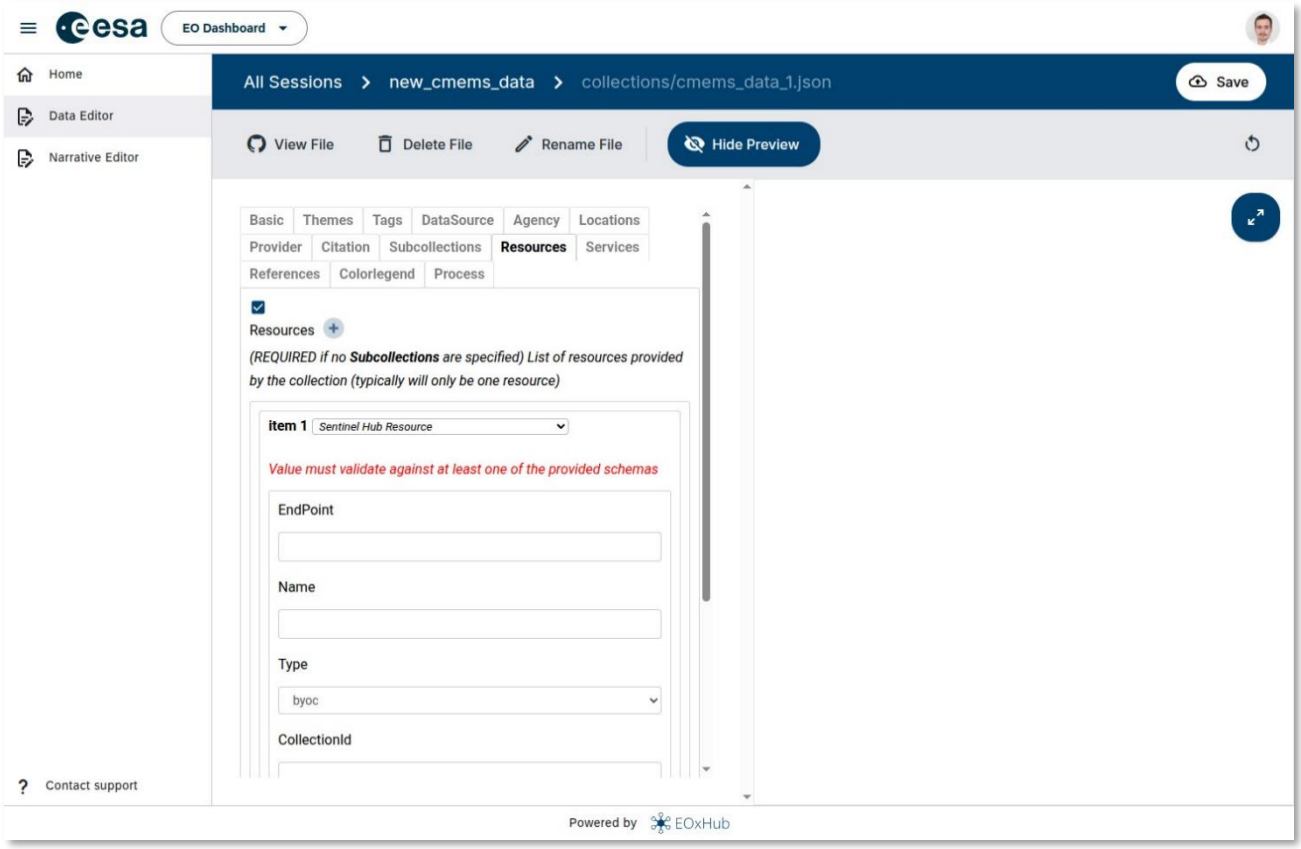

Figure 12 Web interface of the Data Editor

A step-by-step Tutorial for the "Publishing Data workflow" can be found here: https://documentation.hub.eox.at/publishing-workflow-tutorial/. It explains how the geo data files and style file must be prepared and how the GTIF WebUI can be configured to meet display and interactivity requirements. Additional Tutorials cover integration of WMTS data sources, and GeoJSON data into the WebUI.

4.3 Developing and Running Code on the GTIF Platform

This section introduces the tools which are available to Providers to develop and operate their Capabilities on the non-public project area (see section 3.2) of the GTIF Platform.

Providers must apply for their project's workspace resources and once these are made available, login into the non-public area using their GitHub credentials. They find their "workspace" (Figure 13) and therein the "applications" for developing, deploying and running their code on the Platform.

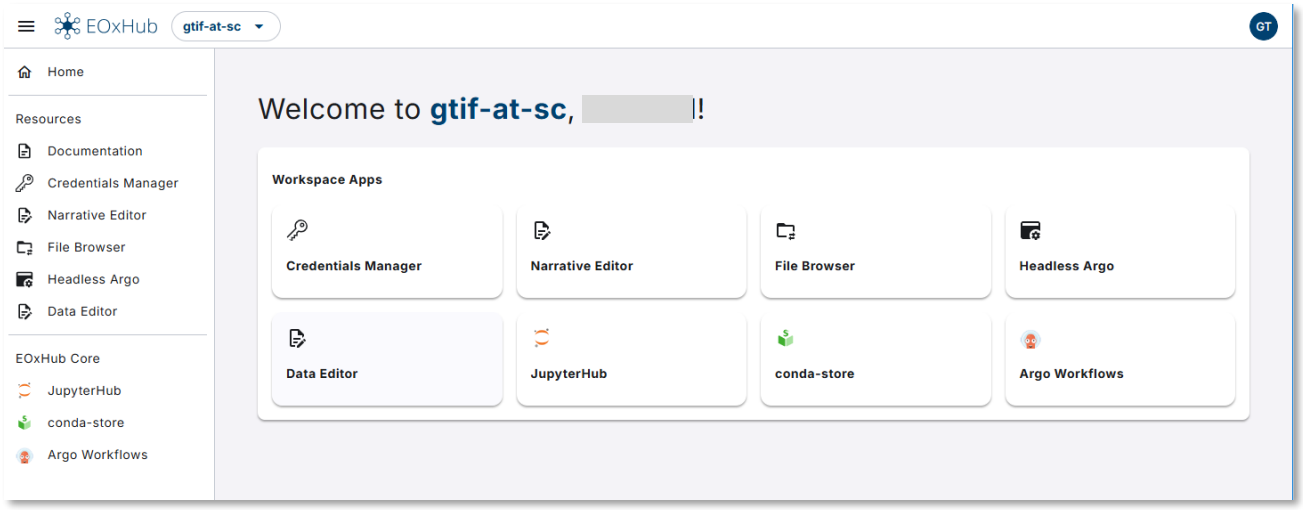

Figure 13 Non-public Workspace for Developers

4.3.1 File Browser

The File Browser is a web-based file management application integrated into the EOxHub Workspace, enabling users to efficiently upload, organize, and manage geospatial data assets. Built upon the Versioneer Tech Package-R, it offers a streamlined interface for interacting with datasets within the workspace. Documentation pages are at https://documentation.hub.eox.at/narrative-editor/.

4.3.2 Argo Workflow & Headless Argo

Argo Workflows (section 5.5) is the workflow orchestration tool on the Platform, providing a solution for defining and executing multi-step processing pipelines where each step runs in its own container. This enables scalable and repeatable execution of applications, supporting both simple tasks and complex, long-running jobs.

A web-based workflow editor (Figure 14) is included, offering operators an intuitive interface to design, manage, and visualize workflows.

Documentation is available under https://documentation.hub.eox.at/argo/.

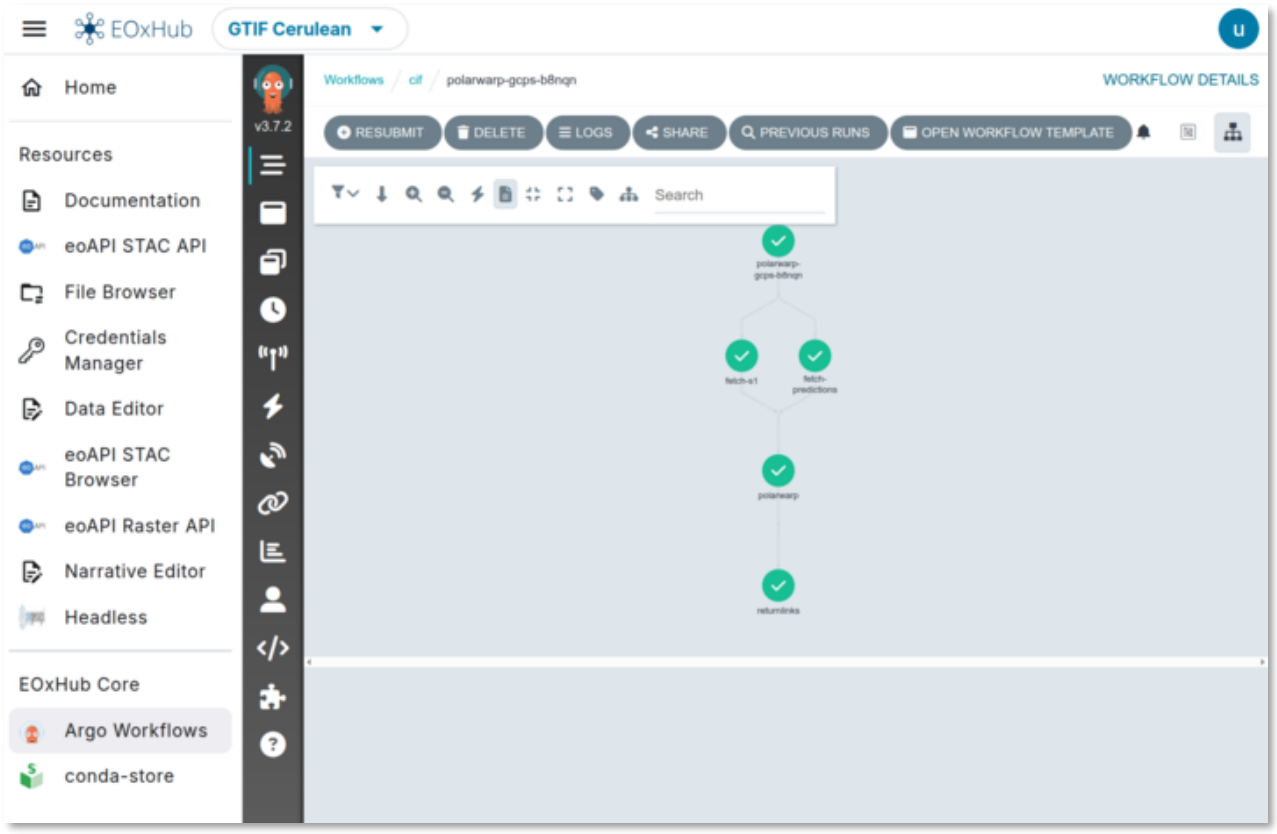

Figure 14 Web interface of the Argo Workflow Editor

Headless Argo extends this functionality by enabling workflows to be executed without requiring users to interact with the Argo UI. Instead, processing can be triggered directly from the GTIF dashboards or programmatically via API endpoints.

This feature provides a streamlined mechanism for running predefined workflows in a user-friendly way, allowing notebooks and analytical tasks to be executed automatically and reproducibly. It enables seamless integration with dashboards and other front-end tools, while also supporting API-driven triggers for automated or scheduled processing. Because headless execution uses controlled parameters and consistent environments, it ensures reliable results and makes the system accessible even for users without technical workflow expertise.

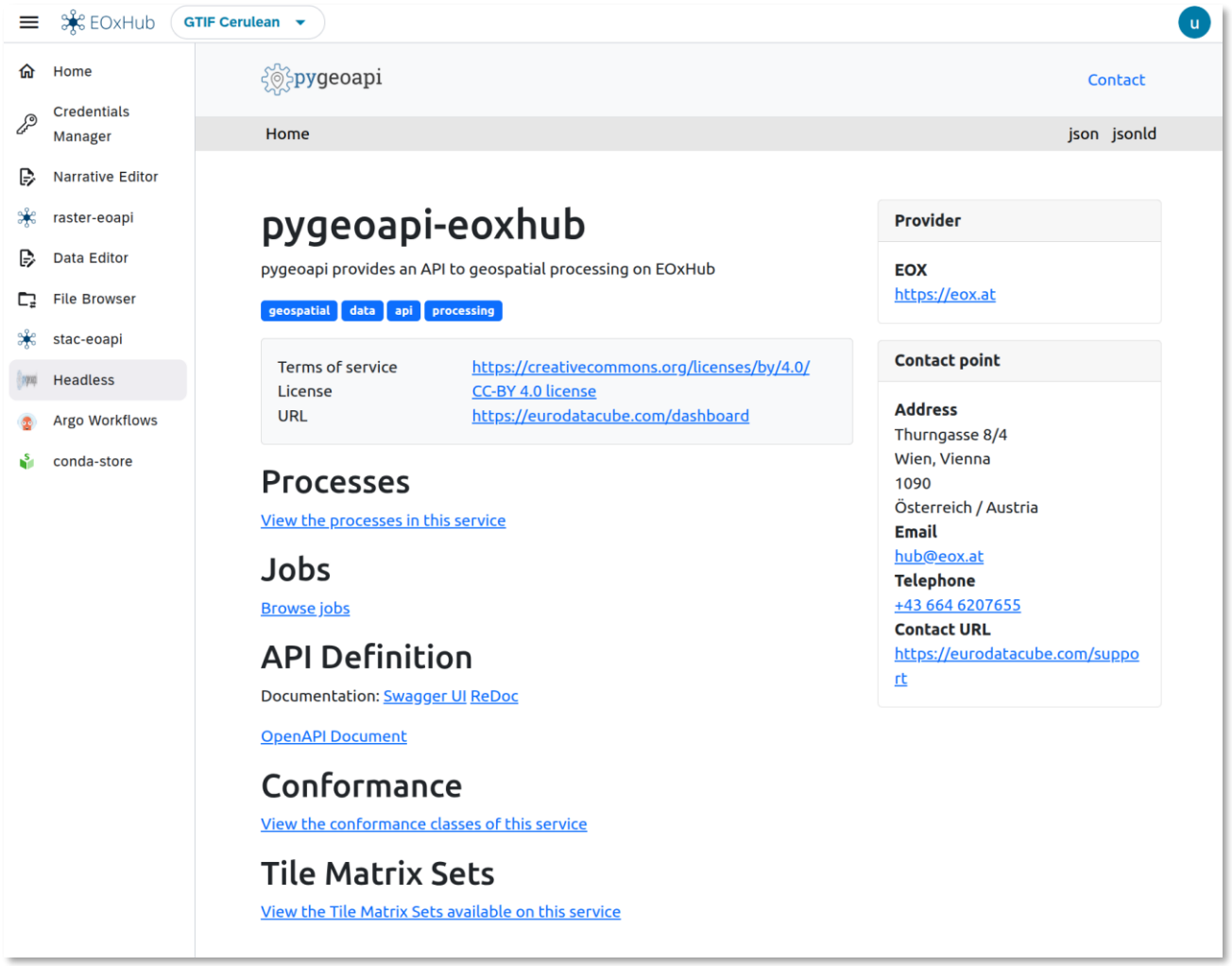

Figure 15 Web interface for the Headless execution feature

4.3.3 Jupyter Hub

Available in the workspace is JupyterLab (section 5.7) which provides a flexible, browser-based interface for interactive computing, data analysis, and algorithm development. It is the primary workspace for working with EO data, executing Python code, and building reproducible workflows using Jupyter Notebooks.

Documentation is available under https://documentation.hub.eox.at/jupyterlab/.

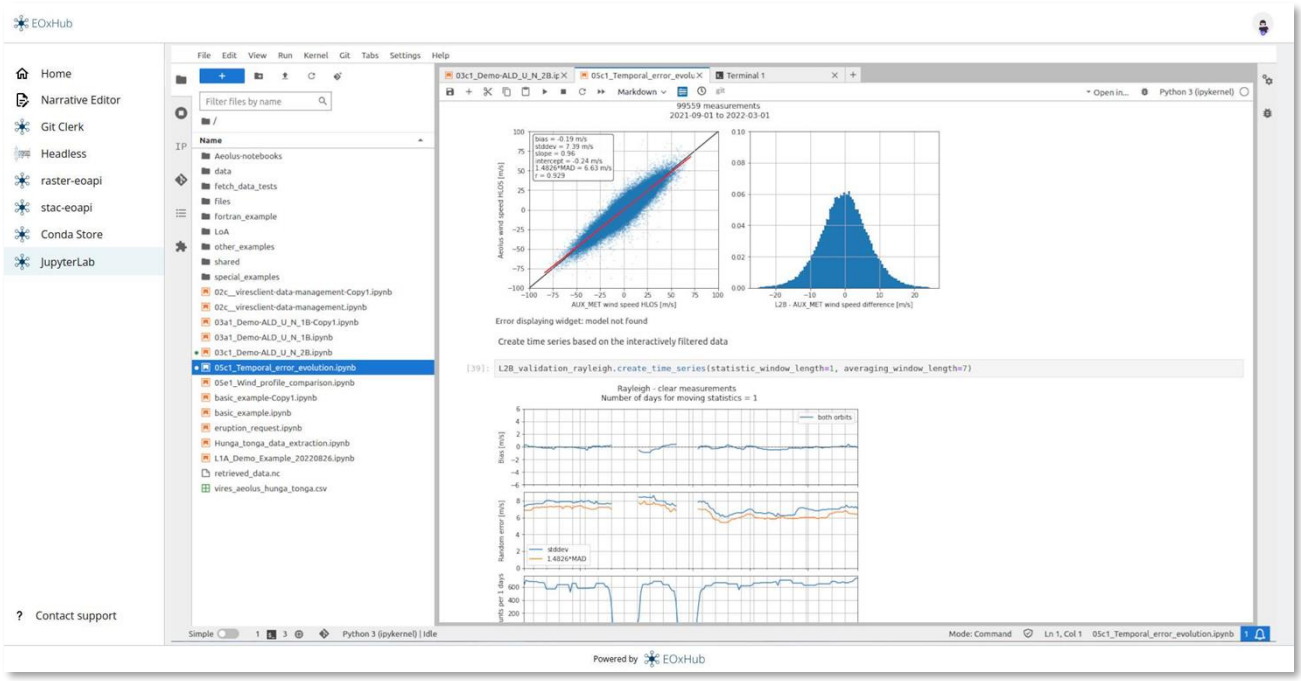

Figure 16 Web GUI of a Jupyter Notebook provided as managed service

4.3.4 Conda Store

Within each user workspace where JupyterLab is provided, also a dedicated Conda Store (section 5.8) is available.

Conda Store enables users to define and manage reproducible Python environments. This ensures consistent execution across sessions and allows developers to control the underlying libraries and dependencies for their workflows.

Documentation is available under https://documentation.hub.eox.at/conda-store/.

5 GTIF PUBLIC DATA AND SOFTWARE

This chapter provides the catalogue of all the information which is published via the GTIF-Austria Demonstrator. Furthermore, it references the GitHub open source repositories where the software can be found based on which GTIF has been built.

GTIF data and open-source software are publicly available on GitHub as described in the following sections. To access these, a user must be registered to GitHub (which is free of charge).

5.1 GTIF NARRATIVES REPOSITORY

Repository:

https://github.com/GTIF-Austria/public-narratives

The GTIF Narratives repository contains the active production Narratives published on GTIF-Austria. It includes:

- Full Narrative definitions used by the Platform
- Scroll-based storytelling configurations
- Connections to active indicators, styles, and datasets
- Narrative structure, layout, and localization files
- All assets required for deployment to GTIF-Austria

Users intending to publish new Narratives could use this repository as a reference for naming conventions, directory structure, and deployment expectations and all new contributions will be listed here as well.

Narratives are written in an extended version of Markdown, an open, lightweight, and widely adopted text format. This ensures that content remains easy to write, render, review, and version-control, while supporting transparent collaboration and long-term maintainability.

5.2 GTIF CATALOGUE REPOSITORY

Repository:

https://github.com/GTIF-Austria/public-catalog

The GTIF Catalog repository provides the live operational configuration of datasets displayed on GTIF-Austria Explore Data dashboard, including:

- Indicator configurations (metadata, STAC links, parameters)
- Raster and vector style definitions
- Layer and collection definitions used by Explore Mode
- Dashboard and widget configuration - this is also partially done inside the https://github.com/GTIF-Austria/public-website repository
- Folder structure corresponding to the GTIF production deployment process

The GTIF website is built using VitePress pages, which integrates eodash - the dashboard application itself as a web component to be embedded seamlessly into the site's structure. Any extra information pages utilizing markdown can be added as well as the Narrative gallery page.

5.3 GTIF EODASH REPOSITORY

Repository:

https://github.com/eodash/ - main eodash software repository

https://github.com/GTIF-Austria/public-website - GTIF Austria specific configurations of eodash software

The GTIF specific eodash repository hosts the live eodash-related configurations generated within GTIF-Austria and all special configurations. It contains:

- GTIF Austria landing page definition
- Style and brand definitions
- Special versions of GTIF components

This repository is the primary source for operators of the GTIF Platform, not relevant for GTIF data integrators.

5.4 GIT-CLERK

Repository:

https://github.com/EOX-A/git-clerk

Git-Clerk is an open-source content management system built on top of GitHub workflows. It provides a simplified, user-friendly interface for creating forks, branches, commits and pull requests without requiring users to interact directly with Git.
The tool automatically renders form-based editors from JSON Schemas, making it easy to create and update structured content such as metadata, configuration files, or Narrative components.

The repository includes:

- A lightweight GUI for editing files stored in Git
- Automatic PR/session handling (fork creation, draft PRs, commit tracking)
- JSON Schema–driven forms for easy data entry
- Support for Markdown, JSON, and YAML as open, human-readable formats
- Automation features for bootstrapping new content or multi-step edits
- Preview support and custom editor interfaces

For GTIF-Austria, Git-Clerk is used as a lightweight validation layer to ensure that all metadata contributions (datasets, indicators, styles) respect STAC conventions before being published on the Platform.

5.5 ARGO WORKFLOWS

Repository:

https://github.com/argoproj/argo-workflows

Argo Workflows is an open-source container-native workflow engine for orchestrating complex data processing pipelines on Kubernetes. It allows users to define multi-step workflows as YAML specifications, ensuring transparency, reproducibility, and portability across environments.

Argo Workflows provides:

- Step-based workflow execution
- Native Kubernetes integration with scalable, parallel task execution
- Support for containerized processing, volume management, and artifacts
- Reusable templates and parameterized tasks
- UI for monitoring workflow states and logs
- Human-readable workflow definitions in YAML

Within GTIF-Austria, Argo Workflows orchestrates data ingestion, transformation, and with combination with pygeoapi supports on demand processing. It enables reproducible EO processing chains, automates operational tasks, and supports platform-independent execution.

5.6 PYGEOAPI

Repository:

https://github.com/geopython/pygeoapi

pygeoapi is an official OGC-compliant server implementation used to expose geospatial data through modern web APIs such as OGC API Features, Records, Coverages, and Processes. GTIF-Austria uses pygeoapi to trigger on demand result computation, scheduled/daily data processing or execute jupyter notebook scripts.

5.7 JUPYTER NOTEBOOK AND JUPYTER LAB

Project website:

https://jupyter.org

Jupyter Notebook and JupyterLab are open-source, browser-based interactive environments used for analysis, visualization, and reproducible science.

In GTIF-Austria, JupyterLab is accessible to project users for running experiments, exploring datasets, building workflows, and documenting analysis steps.

Jupyter-based workflows ensure transparent, reproducible, and collaborative work.

5.8 Conda Store

Repository:

https://github.com/conda-incubator/conda-store

Conda Store is an open-source environment management system enabling shared, reproducible Conda environments across users and services.
GTIF-Austria uses Conda Store to provide stable runtime environments for workflows, Jupyter sessions, and data processing tasks in headless notebook execution.

It offers:

- Versioned, reproducible environment builds
- Centralized environment registry accessible via API
- Automatic environment locking and caching
- Integration with JupyterLab and Argo Workflows

This ensures consistent software stacks for all users and reproducible environments.

5.9 eoAPI

Repository:

https://github.com/developmentseed/eoAPI

eoAPI is an open-source ecosystem of components for cloud-native Earth Observation data processing and API exposure. It integrates STAC, processing workflows, tiling services, and raster/feature endpoints into a coherent platform.

For GTIF-Austria, eoAPI provides the foundation for exposing large EO datasets efficiently, enabling search, preview, analysis, and integration with Narratives and dashboards.

It includes:

- STAC API + STAC Browser components
- Raster & vector tiling endpoints

eoAPI ensures scalable, cloud-native access to satellite data for both human and machine users.