
WP23_25: Open Earth Alliance

1504,211

Basic Information

Full title of the Initiative

Open Earth Alliance

Short Title or Acronym

OEA

Current category in the 2020-2022 GWP

Community Activity

Proposed category in the 2023-2025 GWP

Pilot Initiative

Points of Contact

First Name	Last/Family Name	Email
Sanjay	Gowda	gowda@ama-inc.com
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Purpose

Objective

As a GEO Pilot Initiative, the Open Earth Alliance (OEA) will support global sustainability and understanding through the use of open technology solutions (e.g. Open Data Cube), open algorithms, and open earth observation data.

Please provide a short description of the Initiative

As a GEO Pilot Activity, the Open Earth Alliance (OEA) will support global sustainability and understanding through the use of open technology solutions (open geospatial data infrastructures, open earth observation data, and open algorithms and analytics). In short, the Open Earth Alliance seeks to close the gap that exists between open EO data and end-user.

To achieve its goals, the Open Earth Alliance will focus on the following three key activities:

1. Development and deployment of Data Cube solutions
2. Creation of an Algorithm Hub providing a centralized repository of algorithms and software codes
3. Creation of Analysis Hub supporting user collaboration and shared analysis

In addition, the OEA will also support the following activities:

- Development support of the Open Data Cube open source software project
- Development and delivery of capacity building and training for the Open Data Cube initiative.
- Support efforts toward building a Knowledge Hub supporting knowledge sharing of EO data applied to sustainable development problems.
- Creation of a Storytelling Hub allowing users to immerse themselves in EO data, information, and knowledge with the goal of providing better understanding and communication.

Why is this Initiative needed?

In recent years, the explosion of freely available Earth Observation (EO) Satellite data has presented significant opportunities and challenges for society, researchers, and industry. The opportunity to leverage free and open satellite data for public good is balanced by the technical challenge of properly storing, processing, and analyzing this invaluable big data. While there has been some emphasis placed on the management the data, less emphasis has been placed on the end-user. An opportunity exists to add value to the entire decision-making value chain from data to user experience. The Open Earth alliance is focused on providing technology solutions with the end-user in mind.

What evidence is there to support this need?

Multiple regional and large scale Open Data Cubes have been created (e.g., Digital Earth Australia, Digital Earth Africa, Digital Earth Pacific), and more are planned (e.g., Digital Earth Americas, Digital Earth USA).

Is this Initiative open to participation by representatives of any GEO Member, Participating Organization, and GEO Associate?

Yes

Are you aware of other projects or initiatives at a global or regional scale (both in GEO and externally) that provide similar products or services?

No

Please identify the most important actual and/or intended outputs (products, services, etc.) produced by the Initiative, along with their intended and/or actual users. This list does not need to be comprehensive but should identify the outputs which are most used and are expected to have the greatest potential impact.

Output	Status	Users	Additional info
Development and deployment of Data Cube solutions	In development	Global / Regional / Local stakeholders	
Creation of an Algorithm Hub providing a centralized repository of algorithms and software codes	In development	Global userbase	
Creation of Analysis Hub supporting user collaboration and shared analysis	In development	Global userbase	

If needed, please provide additional comments or explanation to accompany the outputs table

Though our long-term vision is to be technology and platform agnostic, we will heavily leverage the Open

Data Cube in the near-term (opendatacube.org). Members of the Open Earth Alliance are also founding partners of the Open Data Cube initiative.

What kinds of decisions are the outputs of this Initiative primarily intended to support?

This initiative, with its emphasis on creating open science platforms, supports a broad range of decisions. These decisions range from support of United Nations Sustainable Development Goals (UN SDGs) to local users needs related to agriculture, food security, deforestation, urbanization, and water access.

How will these decisions benefit from the outputs of this Initiative?

These decisions will benefit from true data-driven decision making enabled by the systems we design and create. Benefits also include traceability and provenance.

What kinds of impacts (for example, reduced loss of life, monetary savings, conservation of biodiversity, etc.) are anticipated as a result of the use of the outputs of this Initiative?

Impacts are also broad. These impacts range from improved quality of life (e.g., water quality), monetary savings (agriculture planning), and conservation (e.g., deforestation).

Has this Initiative been asked to provide specific information (for example, reports, data, services) on an ongoing basis to an international convention, organization, or other multilateral body?

No

Technical Synopsis

Please provide a brief description of the methods used by the Initiative to produce its (actual or planned) outputs.

The Open Earth Alliance team leans on its successful relationships with global organizations, universities, government space agencies, and big tech. The OEA team has significant experience working together on the Open Data Cube initiative (opendatacube.org). OEA consists of a team of highly talented and motivated scientists, engineers, computer scientists, with heavy international experience. The team has significant experience with the deployment of open data cube solutions around the world. Through these successful deployments, strong relationships have been built with global organizations including: CEOS, GEO, UN, and the UN Foundation. Additionally, partnerships have been formed with big tech including Google, Amazon, and Microsoft, providing both computing infrastructure and technical guidance.

1. Data Cube Solutions: Open Earth Alliance plans to support existing and future global data cube initiatives including Digital Earth Americas and Digital Earth USA.

2. Algorithm Hub: Open Earth Alliance will develop an Algorithm Hub to facilitate analysis:

- a. Work with the community to develop a common set of hub requirements
- b. Prototype the Algorithm Hub and deploy. Initially, we will prototype the system with focus on the ODC platform and then expand it to other data cube technologies.
- c. Work toward production system supporting a broad range of data cube technologies. The Open Earth Alliance Algorithm Hub seeks to be technology agnostic.

3. Analysis Hub: Open Earth Alliance will continue to develop an Analysis Hub to facilitate shared analysis:

- a. Work with the community to develop a common set of hub requirements
- b. Prototype the Analysis Hub and deploy. Initially, we will prototype the system with focus on the Open Data Cube platform.
- c. Work toward a production system focused on the Open Data Cube global deployments. This model may be expanded to other data cube platforms and may be taken up by other groups.

If you would like to provide further details on the technical methods, you may upload one or more documents here.

- no supporting documents provided -

Are there any significant scientific or technical challenges that need to be resolved by the Initiative during the 2023-2025 period?

No

Does the Initiative expect to complete any key new outputs, improvements to existing outputs, or improvements to the methods of producing outputs, in the 2023-2025 period?

Yes

Please describe these new outputs or improvements.

Further development of the three products listed (Data Cube Solutions, Algorithm Hub, Analysis Hub). Ideally, depending on the level of funding we are able to achieve, all these products will be fully operational by 2025.

Please identify the key tasks that must be implemented to ensure delivery of these changes, with target dates for completion.

- no answer given -

Resources

Have all resources required to implement the Initiative's planned work in the 2023-2025 period been secured?

- Gap in financial resources

What is the estimated funding gap for the 2023-2025 period?

We have ambitious goals and are actively fund raising. Our activities are global in their reach and naturally open-ended. Our progress is

What actions is the Initiative taking to obtain the required resources?

We are actively seeking funds from many sources including federal, state, big tech, commercial, and philanthropic organizations. We have various funding sources lined up but not yet finalized. We will hold off on listing them below until complete.

Please list all financial and non-financial contributions to the Initiative (other than in-kind, voluntary participation by individual contributors) having a value of more than USD 50,000.

Contributing Organization	GEO Status	Type of Resource	Value	Currency
Analytical Mechanics Associates	United States	Financial	\$250,000	
CEOS SEO	CEOS - Committee on Earth Observation Satellites	Other	TBD	
CSIRO	Austria	Other	TBD	

Lessons from the 2020-2022 Period

Were all planned activities for the 2020-2022 period implemented as expected?

Yes

Were there any key challenges faced by the Initiative in the 2020-2022 period?

Yes

Please describe.

COVID slowed activities. We plan to accelerate efforts given the improved pandemic state.

Were there any impacts or changes to operations due to COVID-19?

Yes

Please describe.

Fund raising activities slowed dramatically. Collaboration opportunities were difficult, but progress was made.

Please describe the key changes proposed for the 2023-2025 period, for example, new projects, new areas of focus, or adjustments to the activity governance.

Recently, we have been proposing the development of Digital Earth USA. This is an exciting initiative that will provide a powerful university research platform. There is broad interest across universities.

Does the Initiative have outputs (products, services, etc.) available to users now, even if only on a pilot or testing basis?

Yes

Please provide any available information describing this usage (for example, user statistics, results of user testing) and/or feedback from users (for example, user comments, evaluations).

Yes, we have developed an Open Earth Alliance Sandbox. Feedback from users has been positive.

The Open Data Cube (ODC) Google Sandbox is a free and open programming interface that connects users to Google Earth Engine datasets. The open source tool allows users to run Python application algorithms using Google's Colab notebook environment. This tool demonstrates rapid creation of science products anywhere in the world without the need to download and process the satellite data.

URL: <https://www.openearthalliance.org/sandbox>

Please provide supporting documentation if available.

- no supporting documents provided -

Do you have evidence of any impacts that have occurred in part as a result of using the outputs of the Initiative (for example, policy decisions taken, behaviour changes by users, risks mitigated)?

Yes

Please provide examples, with evidence where available.

There has been increased interest in the Open Data Cube with the ease of access afforded by the ODC Sandbox. The ODC Sandbox has reduced the barrier to entry to understanding and using the satellite data. What previously took days to setup can now be completed in minutes.

Please provide supporting documentation if available.

- no supporting documents provided -

Have there been any internal or external reviews or evaluations of the Initiative since 2019?

Yes

Please provide a copy of the report, if available.

- no supporting documents provided -

Please indicate any GEO Work Programme activities with which you have ongoing collaboration.

- AQUAWATCH - AquaWatch
- DE-AFRICA - Digital Earth Africa
- DE-PACIFIC - Digital Earth Pacific
- OEA - Open Earth Alliance

Please indicate any additional GEO Work Programme activities with which you would like to establish new collaborations.

Stakeholder Engagement and Capacity Building

Are there specific countries or organizations that your Initiative would like to engage?

Yes

Please list these countries, regions or organizations.

At a high-level, users in South and Central America.

What are your plans to engage them?

We have an existing network that engages with interested and prospective users. We have colleagues who are working at the country level to engage users through relevant institutions.

Does your Initiative engage users in the work of the Initiative (for example, consultation, testing, co-design)?

Yes

Please briefly describe the Initiative's approach to engaging users.

With our global ODC efforts, we have a network of colleagues and users for the systems we develop.

Does the Initiative have a user engagement strategy or similar kind of document?

No

Are there categories of users that are not represented at this time, but you would like to engage?

No

Does the Initiative have a documented capacity development strategy?

No

Please describe the approach to capacity development that is being implemented by the Initiative?

- no answer given -

Are there any commercial sector organizations participating in this Initiative?

No

Are there opportunities for commercial sector uptake of the outputs of the Initiative?

Yes

Please describe these opportunities.

Though our products are open source, strong commercial opportunities exist to leverage these open efforts for commercialization.

Is there already commercial uptake occurring?

Yes

Please describe the nature of this uptake and the relevant commercial sector organizations.

Yes, commercial organizations (e.g., Boeing) are leveraging our open source solutions to support data management.

Are there opportunities for further commercial sector participation in the Initiative?

Yes

Please describe these opportunities.

Though our products are open source, strong commercial opportunities exist to leverage these open efforts for commercialization.

Does the Initiative have a plan for commercial sector engagement?

No

Governance

Please describe the roles of each of the key leadership positions, as well as any team structures involved in day-to-day management.

Executive Director: Sanjay Gowda, PhD, Analytical Mechanics Associates

Innovation & Implementation Lead: Oguz Yetkin, PhD, Analytical Mechanics Associates

Operations Lead: Josh Baptist, joshua.r.baptist@ama-inc.com

The OEA will be organized into two teams:

1) Advisory team:

a. Advisory Council: Senior level officials charged with advocacy and relationship building. This council will also represent input from the Open Data Cube Advisory Board:

- Geoscience Australia
- Committee on Earth Observation Satellites
- Commonwealth Scientific and Industrial Research Organisation
- United States Geological Survey

b. Technology Council – Provides technology advice and infrastructure support. Includes partners such as Amazon, Google, and Microsoft.

2) Implementation team:

a. Executive Director: The Open Earth Alliance will be led by an Executive Director with mandate to successfully execute key activities and work together with partners to support secondary activities.

b. Fundraising: The OEA will have a fundraising team focused on bringing in financial resources and partners to help support the OEA visions and goals.

c. Operations – Operations, solution development, product development

d. Administration – The OEA administration team will leverage the GEO/WMO administrative and financial team to execute work.

e. Preferred vendors and SMEs – Trusted network of support organizations

Is there a steering committee or other governance bodies that advise the Initiative but are not involved in day-to-day management?

Yes

Please describe the roles of each body. If there are multiple governance bodies, please describe the relationships among them (such as through a governance structure diagram).

See above and attached.

- no supporting documents provided -

What methods does the Initiative use to communicate with its participants?

- Email / e-newsletters
- Regular conference calls

Please describe the key risks that could delay or obstruct the completion of the planned activities and outputs of the Initiative, along with any actions taken to mitigate these risks.

- no answer given -

What methods are used by the Initiative to monitor its effectiveness?

- Informal discussions with users / beneficiaries
- Website statistics

Would the Initiative be interested in assistance from the GEO Secretariat for developing an impact plan?

Yes

How are the results of the monitoring and evaluation activities shared with participants and the wider GEO community?

N/A.

Are any monitoring or evaluation activities required by funders/contributors?

No

Participants

Please list the active individual participants in the Initiative

First name	Last name	Email address	Member	Org
Alex	Held	alex.held@csiro.au	Australia	CSIRO - Commonwealth Scientific and Industrial Research Organisation
George	Dyke	george@symbiosco mms.com	Australia	

Other information

Please provide any other comments or information that was not included in the previous sections, but you would like to appear in the Implementation Plan.

Significant work has been accomplished under the GEO OEA Community Activity, some of which is attached.

We appreciate the opportunity to work with GEO and look forward to continued collaboration.

- oea_progress.pptx ([link](#))

Co-Editor Management

List of co-editors for this initiative

- no answer given -