OPEN EARTH
ALLIANCE

Open Earth Alliance | Concept Overview

The OEA can be viewed as the logical "next step" for the Open Data Cube (ODC) vision as progress was limited by the contributions of the "Partner" organizations.

Australian Government
Geoscience Australia

CE♁S

CSIRO

≋USGS
science for a changing world

caTAPULT
Satellite Applications

Background & Motivation

- In 2017, The **Open Data Cube** initiative was started by six institutional partners (GA, CEOS, USGS, CSIRO, Catapult, AMA) dedicated to the idea of helping the world better manage satellite data for societal benefit. The Open Data Cube is an Open Source software project (based on Australia's AGDC) aimed at creating a Geospatial Data Management and Analysis Platform.

- As of 2020, The Open Data Cube has proven successful (globally):
  - ✓ 10+ countries have operational data cubes
  - ✓ 15+ countries are developing (or planning to develop) data cubes,
  - ✓ 30+ countries have expressed interest,
  - ✓ The African Regional Data Cube (ARDC) (led by GPSDD/CEOS) has expanded the ODC to 5 African countries.
  - ✓ Digital Earth Africa (led by GA) will significantly expand ODC deployment ($20M investment)
  - ✓ Other regional deployments of the ODC are in incubation (e.g., Digital Earth Latin America)
  - ✓ The Open Data Cube has been deployed in support of UN Sustainable Development Goals

- Unlike other open source software projects, the ODC requires a multidisciplinary skillset to deploy and operate effectively. Especially for developing countries, finding the relevant technical skills and IT infrastructure is nontrivial. Our experience is that even developed countries (and the development community at large) would also benefit from technical support.

- The interest in the Open Data Cube has grown significantly with no cohesive plan (and associated mechanism) to foster this initiative, beyond the significant efforts by the partner institutions.

- While this model served the community well during formulation (2017 – 2019), the Open Data Cube has transformed into a project that needs better organization and resources, which will enable it to reach its full potential (as a globally "linked" set of data cubes, and eventually as a global Digital Earth Platform).

- We believe alignment with the SDGs is both critically important and strategically advantageous for growth of the ODC user base and to generate adequate funding to mature the ODC technical platform. The SDGs provide a common language that helps place ODC in the proper context for growth and affect real benefit for society.

- We also believe that though the ODC is a proven solution, a broader, more technology-agnostic approach will best allow the Open Earth Alliance to fulfill the vision of supporting global sustainability and understanding through the use of open solutions (technology, data, and algorithms). The OEA will be a forward looking technology group.

Open Earth Alliance – Vision and Mission

Vision & Mission: Support global sustainability (SDGs) and understanding through the use of open solutions (technology, data, and algorithms).

1. **Impact society through the use of Open Source EO technology, algorithms, and data**
    - ➢ Facilitate understanding of global climate change, help inform/improve policy & decisions, and support UN Sustainable Development Goals.
    - ➢ Support users solving problems at various scales (global, continental, regional, country, state, city) in a technology agnostic manner. Provide integrated end-to-end solutions.
    - ➢ Align with leading global organizations (e.g., GEO, UNF to provide real technology solutions).

2. **We believe ODC is a leading technology, and as such, we hope to help sustain the ODC and its users** - Sustain the Open Data Cube project as a leading data cube solution and foster a thriving and dynamic community that utilizes best-in-breed architecture & technology (ODC Roadmap). In the near-term, our focus will be ODC based-solutions.

3. **Promote Leadership & Partnership** - Support open data and standards. Support open software and open analysis. Provide reusable solutions (e.g., a framework of solutions to address SDGs). Partner with organizations with a similar vision and mission (e.g., GEO, UNF, GPSDD, Radiant Earth).

4. **Grow Industry** - Be part of the solution creating jobs and new industries around open geospatial data and technology.

5. **Grand Challenge** - Create an Open Digital Earth Platform. As a first step, we seek to facilitate a globally "linked" set of data cubes and work toward a SDG Knowledge Hub.

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Where the Open Earth Alliance will help the ODC

1. **ODC Capacity Building** & Country implementation support:
   - Foster capacity development, training, and an operational managed sandbox.
   - Help countries plan an Open Data Cube Road Map – strategic implementation vs. prototype.
   - Have organizational capacity to support operations and maintenance.
   - Establish preferred vendors, SMEs, and service providers

2. **Centralization**:
   - Provide a centralized mechanism for funding. Provides a common brand, a central place to contact. Right now, the responsibilities are unclear.
   - Coordinate Relationships – E.g., Partner with the major cloud providers (and even secondary) to provide cloud credits (Amazon, Google, Microsoft, DIAS providers). For example, the Open Earth Alliance could help manage the activities like the GEO credits initiative.

3. **ODC Community**:
   - Facilitate User conferences, developer conferences (e.g., 2020 Users conference). Foster the ODC community by holding events, live and virtual Webinars.
   - Knowledge management (collect experiences), use-cases to ensure a strong ODC Community learns from itself. Provide long-tail support and bringing those experiences back into the ODC community.
   - Provides a sense of team that is needed vs. a collection of institutions with various stakeholder needs.

4. **Create user-friendly ODC products** that focus on UI/UX (User Experience):
   - Provide a full suite of solutions (including data and analysis management) for the data cube (e.g., provide an ESRI type product suite). Help develop a clear product vision, a clear vision for the open data cube.
   - Build an analysis hub (algorithm hub) where users can share analysis.
   - Build auxiliary tools and expand the market place for the Open Data Cube

5. **Flexibility**
   - Provides agility, a flexible mechanism to do work, void of large federal institution constraints.
   - Size and agility can be a big key.

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Open Earth Alliance – GEO Workplan

- Recently submitted as a new **GEO Community Activity** supporting open technology solutions (open data, open software) for improved end-user impact.

- The OEA will be focused on three key activities:
    1. **Data Cube solutions** (primarily ODC, though OEA is technology agnostic),
    2. **Algorithm Hub** (GitHub, training resources), and
    3. **Analysis Hub** (shared analyses and collaboration)

- The OEA till take advantage of improved flexibility and agility to respond to rapid technology changes while optimizing the impact of EO data.

- Donor funding will flow through the **WMO/GEO Trust Fund** to support task implementation and provide a collaborative connection to GEO initiatives.

Open Earth Alliance – What's happening now…

The Open Earth Alliance is working toward:

- **Landsat AWS Sandbox** - A new initiative to create an online cloud-based data cube "sandbox" to support the Landsat Collection-2 release (later 2020) using the ODC infrastructure and application algorithms. This will enable new opportunities for training and capacity building.

- **ODC on the Google Cloud** - collaboration with GPSDD to install the ODC and use Google Earth Engine datasets for analyses. This yields an alternative to Amazon while taking advantage of many unique datasets.

- **ODC Users forum** – Support a global users forum, fostering the next-level of engagement and information sharing for the growing ODC community.
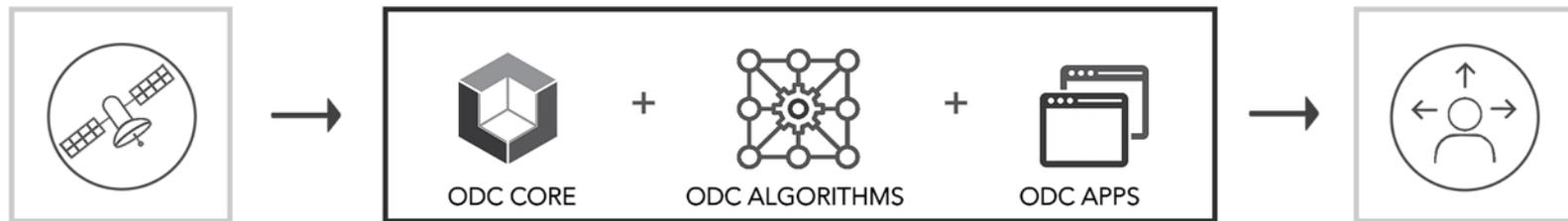
OPEN DATA CUBE

The Open Data Cube (ODC) is an Open Source Geospatial Data Management and Analysis Software project that helps you harness the power of Satellite data. At its core, the ODC is a set of Python libraries and PostgreSQL database that helps you work with geospatial raster data. See our GitHub repository here>>.

The ODC seeks to increase the value and impact of global Earth observation satellite data by providing an open and freely accessible exploitation architecture. The ODC project seeks to foster a community to develop, sustain, and grow the technology and the breadth and depth of its applications for societal benefit.

ODC ECOSYSTEM
GEOSPATIAL DATA MANAGEMENT & ANALYSIS SOFTWARE

ODC CORE + ODC ALGORITHMS + ODC APPS

SATELLITE DATA
Examples:
- Landsat
- Sentinel
- MODIS

FLEXIBLE DEPLOYMENT
Depending on your application, the Open Data Cube can be deployed on HPC, Cloud, and local installations. Typical installations run on Llnux, MacOS, and Windows.

INFORMED DECISIONS
Examples:
- Deforestation
- Water Quality
- Illegal Mining

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