

GEO Cloud Credits Programmes

PB-17 Meeting - June 2020

GEO Secretariat

GEOAWS

- \$1.5 million in AWS cloud credits over 3-yr period
 - \$60K/ \$100K credits per project
 - €300K Sentinel Hub credits offered by Sinergise for same period
- Call for proposals: 18 December 2018 / Submission Deadline: 12 April 2019
- 26 proposals received
- 2 reviewers from PB + Secretariat
 - K. Fontaine
 - K. Wilson
 - G. Camara
 - D. Cripe
- 20 proposals selected with 1 July launch date
 - 15 active and using credits

Initial Results

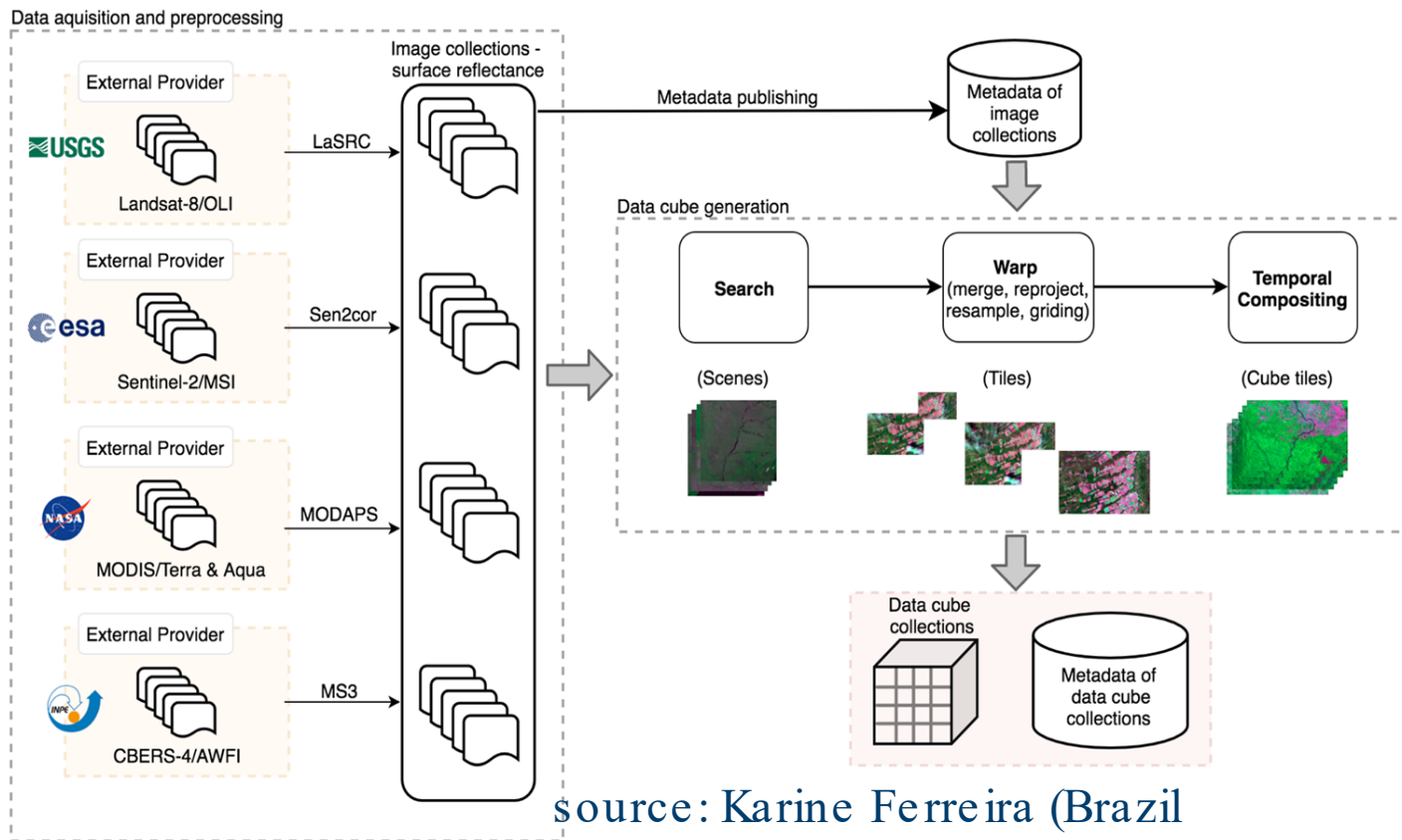
- Brazilian data cube - automated deforestation monitoring application for illegal deforestation.
- Costa Rica - integration of diverse data streams to inform ecosystem management.
- Ukraine - successfully installed and deployed open-source Open Data Cube (ODC) from Swiss Data Cube application developed for crop classification and vulnerable habitats, in support of SDG achievement (11, 15).
- India data cube - groundwork being laid to monitor human settlements, environmental impacts.
- Iraq/Iran - machine learning algorithms tested for monitoring changes of Houralazim wetland using S1 and S2 data.

Benefits

- Demonstration of zero download model which lowers barriers to access and analyze EO data:
 - Data is shared in a public cloud computing environment, researchers no longer have to worry about downloading or copying data before getting to work.
 - Data users can analyze massive amounts of data in minutes, regardless of where they are in the world or how much local storage space or computing capacity they can access.
- Common set of data to work from, bringing consistency to results
 - Reduce risk of 'stale' data
- Multiple benefits of open science approach
 - Promotes collaboration, serves as reality check
 - Enables broader uptake (especially for developing countries)

“At the current research phase of the project, access to AWS cloud infrastructure and services is critical because our institutional capabilities do not allow us to host and administer the necessary environment on our own.” Oleg Seliverstov, Illegal amber mining project, Ukraine

Data cube generation: the crucial step



source: Karine Ferreira (Brazil
Data Cube)

Cost to generate a Sentinel-2 data cube

Data Cube	Temporal extent	Spatial extent	Premise hardware (32 CPUs / 128 GB Ram)	AWS using ~ 260 Lambdas	AWS cost using ~ 260 Lambdas
Sen10m16d	1 year	1 tile of the Brazil data cube grid	1242 minutes = ~ 20 hours	5 minutes	US\$ 3,00 (without S3 cost)
Sen10m16d	1 year	All Brazilian territory (560 tiles of the Brazil data cube grid)	11592 hours = 483 days	2800 minutes = ~ 46 hours *	US\$ 840,00 (without S3 cost)

Sen10m16d = data cube of Sentinel-2 images with 10 m spatial resolution and 16 days temporal resolution

Issues

- Radio silence
- Personnel changes
- COVID-19
- Technical (infrastructure)
- Costs associated with tertiary software (GIS)
- Some groups have 'science' problems:
 - Ukraine (NASU-SSAU) group is asking for AWS + ODC training -> forum to be set up.
 - sen2agri, pixel overlapping on images (outside the scope of AWS to help)

GEOGEE

- 25 commercial grade ‘all you can eat’ licenses for unlimited use of GEE over 2-yr period
 - Technical support from EO Data Science (AUS)
- Call for proposals: 5 December 2019 / Submission deadline: 15 April 2020
- 52 proposals received
- 11 reviewers from GEO community + Secretariat
 - A. Craddock
 - K. Fontaine
 - E. Frazier
 - A. Gutierrez
 - A. Kabo-bah
 - SJ Khalsa
 - B. Killough
 - S. Marsh
 - A. Milne
 - A. Siqueira
 - F. Van den Bergh
 - G. Camara
 - D. Cripe
- Projected 1 July launch date

GEO Microsoft

- \$500K in Azure cloud credits and \$500K in funding over 1-yr period
 - \$100K max per project
- Call for proposals: 1 May 2020 / Submission deadline: 5 June 2020
- 60 proposals received
- Initial evaluation by GEO BON Implementation Committee
 - top 15 projects identified
 - selection committee composed of 2 GEO BON representatives, 2 representatives of Microsoft AI for Earth and **1-2 representatives of the PB**
 - top 4-5 projects selected (or more, depending on the funding requested) to be funded.
 - Criteria:
 - Tangible data products and cloud-based workflows and tools demonstrating the power of EBVs to increase relevance of biodiversity monitoring for policy support & management.
 - Potential for project deliverables to scale and be used by other GEO BON members and organizations.

And then...?

- The institutions involved can assess the value of using commercial cloud providers for period before making decisions on whether to buy services for them:
 - The value of the grants is significant and allows institutions to use cloud services for realistic projects.
 - Institutions involved in the programmes are developing open source, good quality software for using AWS which will be shared with the GEO community.
 - Collaborative open source development can provide substantial cost savings when using cloud computing (i.e. benefits outweigh costs).
- Secretariat committed to continued negotiations with with cloud services providers:
 - SEPAL/FAO: Financed by Norway, and provides access to GEE and AWS to institutions associated with GFOI and forest monitoring at no cost to them.
 - Digital Earth Africa.