

FAO – SEPAL

System for Earth Observation Data Access, Processing and Analysis for Land Monitoring

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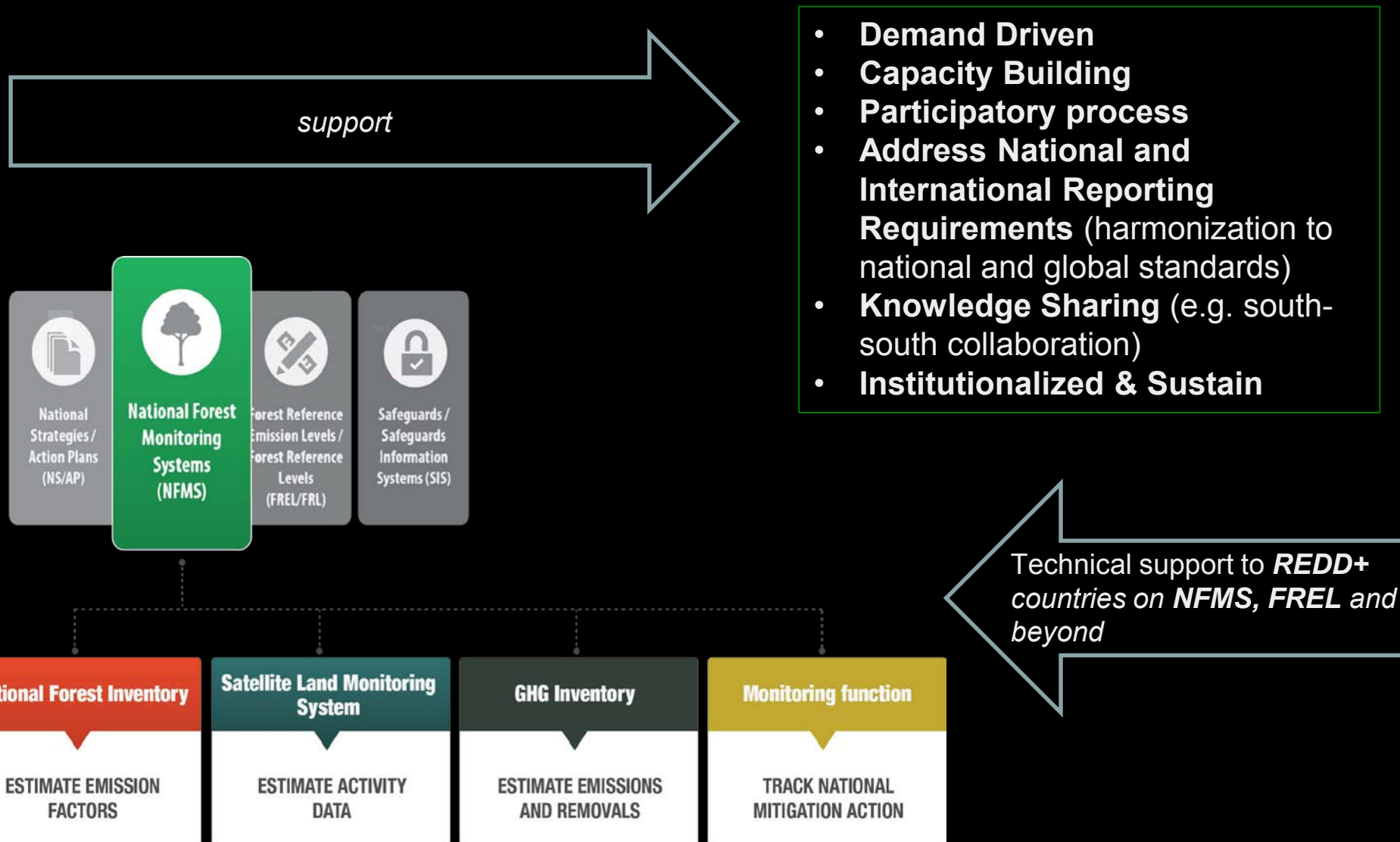
OPENFORIS

ESA Phiweek, Frascati (IT)

November 2018



FAO country support for forest monitoring



Context: FAO geospatial tools

Collect Collect Mobile Collect Earth Calc Geospatial Toolkit

<http://www.openforis.org>

Cloud-based Processing

Food and Agriculture Organization of the United Nations

SEPAL

SYSTEM FOR EARTH OBSERVATION DATA ACCESS, PROCESSING & ANALYSIS FOR LAND MONITORING

<https://sepal.io/>

FAO resources

- FAOSTAT**: FAO Corporate Statistical Database ([faostat.fao.org/#data](http://faostat.fao.org/))
- FRA**: Forest Resources Assessment (faostat.fao.org/forest-resources-assessment)
- NFMS web portals**: National Forest Monitoring Systems (sims4redd.org/wordpress)
- Open Foris**: Open Foris, a set of free and open-source software tools on data collection and analysis: openforis.org
- SEPAL**: System for earth observations, data access, processing and analysis for land monitoring is a cloud computing platform for geographical data processing: sepal.io
- E-learning**: Building a sustainable national greenhouse gas inventory for Agriculture, Forestry and Other Land Use: The national greenhouse gas inventory for agriculture: fao.org/elearning/446/courses/423/423.html
- AFOLU**: AFOLU Emissions Analysis tools, a set of tools that can support countries in addressing UNFCCC reporting requirements: fao.org/in-action/nmicca/resource/tools/ghg
- FREL/FRL for REDD+**: Emerging approaches to Forest Reference Emission Levels and/or Forest Reference Levels for REDD+. The UN-REDD Programme: fao.org/3/a-14846e.pdf
- Technical considerations for Forest Reference Emission Level and/or Forest Reference Level construction for REDD+ under the UNFCCC**: The UN-REDD Programme: fao.org/3/a-14847e.pdf
- GlobAllomeTree**: Platform to share and provide free access to tree allometric equations, wood densities, biomass expansion factors and raw data: globallometree.org
- GFOI**: Global Forest Observations Initiative, a set of methods and guidelines for estimating carbon stocks to support countries in their effort to build NFMS: gfoi.org/methods-guidance
- LCCS**: Land Cover Classification System Classification concepts and user manual: www.glcrc.org/otf_1_en.jsp
- Map Accuracy Assessment & Area Estimation**: Map Accuracy Assessment and Area Estimation: A Practical Guide: fao.org/3/a-15601e.pdf
- WCA**: World Programme for the Census of Agriculture: fao.org/economic/ess/wca
- Voluntary guidelines on national forest monitoring**: Voluntary guidelines on national forest monitoring: Forthcoming
- NFMS for REDD+ MRV**: National Forest Monitoring Systems for REDD+ Measurement, Reporting and Verification: Forthcoming
- REDD+ under the UNFCCC**: From Reference Levels to Results Reporting - REDD+ under the UNFCCC: Forthcoming.

OpenFORIS: suite of geospatial modules

- Collect(mobile), Collect Earth, Collect Earth online

- OpenSAR toolKit

Command line tools for quasi-fully automatic preprocessing of nationwide SAR mosaics

Up to date: ALOS Palsar FBD data, 30m output resolution

Output Stack: Backscatter values, Ratio, Texture measures, DEM + aspect + slope

Nice example of integration with SEPAL

SEPAL Objectives

Improve data access, processing, and delivery of satellite data and information products to enable autonomous land monitoring capacity.



What is it?

SEPAL is a cloud-based catalyst for autonomous land monitoring

Open source

Easy query, access and processing of earth observation data



What is it?

Reduce time from innovation to adoption

Remove fear of making mistakes; fail fast

Enable collaboration - Run BEEODA, PyCCD, Datacube in a common platform, branded, in cloud

Break barriers to: analysis ready data (ARD), Supercomputing, Maintenance and Dependencies



What is it?

Improve training consistency

Fit into existing processing methodology



SEPAL

Bring the people to the data
(and algorithms, software and recipes)



SEPAL

Create composites / mosaics of Landsat and Sentinel

Process RADAR data

Classification and change detection

Image segmentation



SEPAL

Time-series analysis

Sample-based area estimation

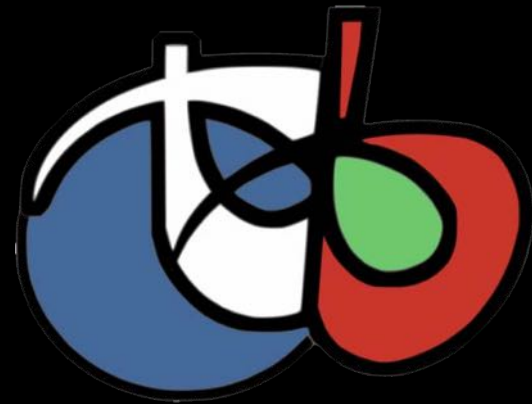
Integrate user-supplied imagery

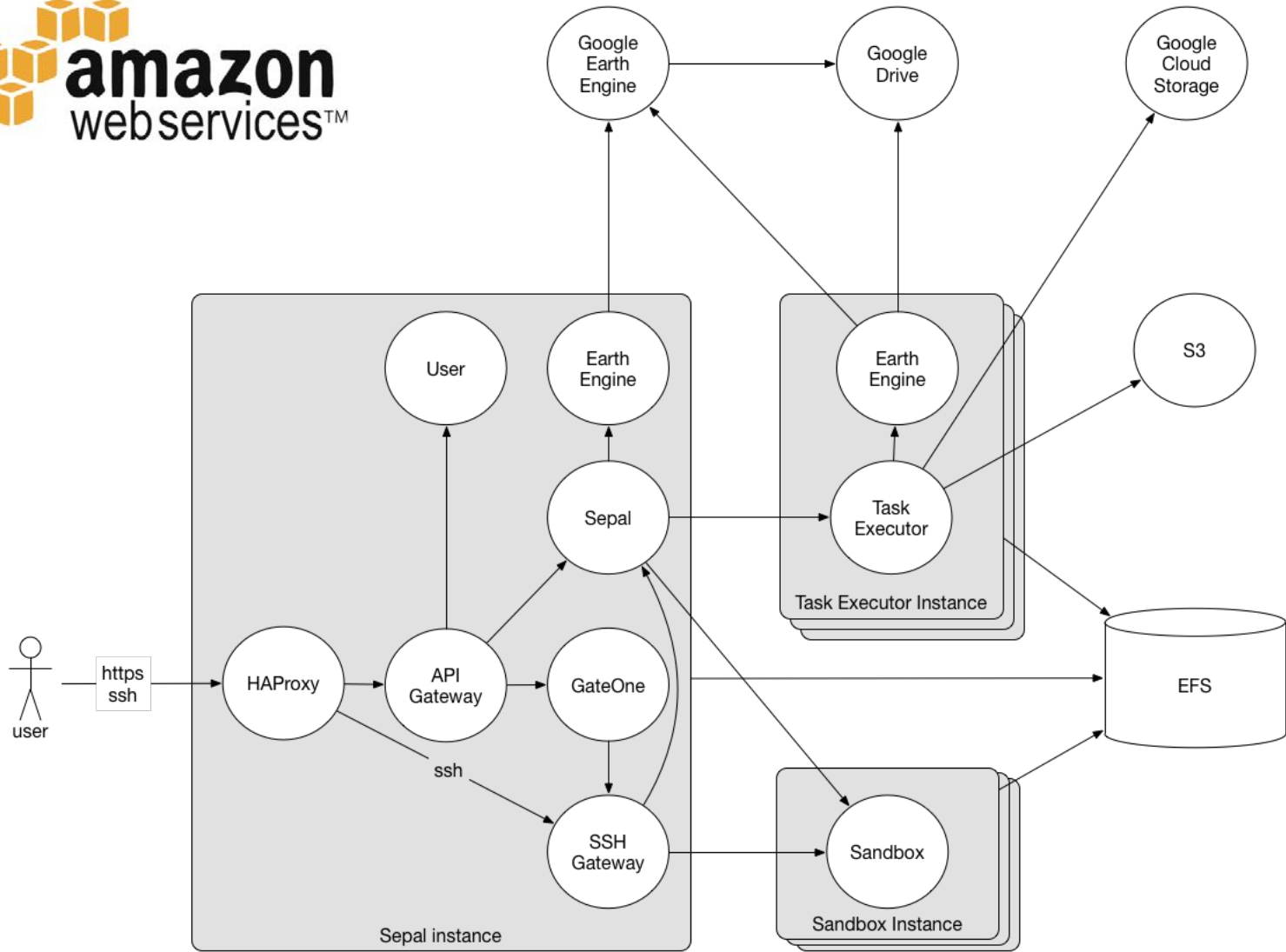
Compliant with GFOI Methods and Guidance





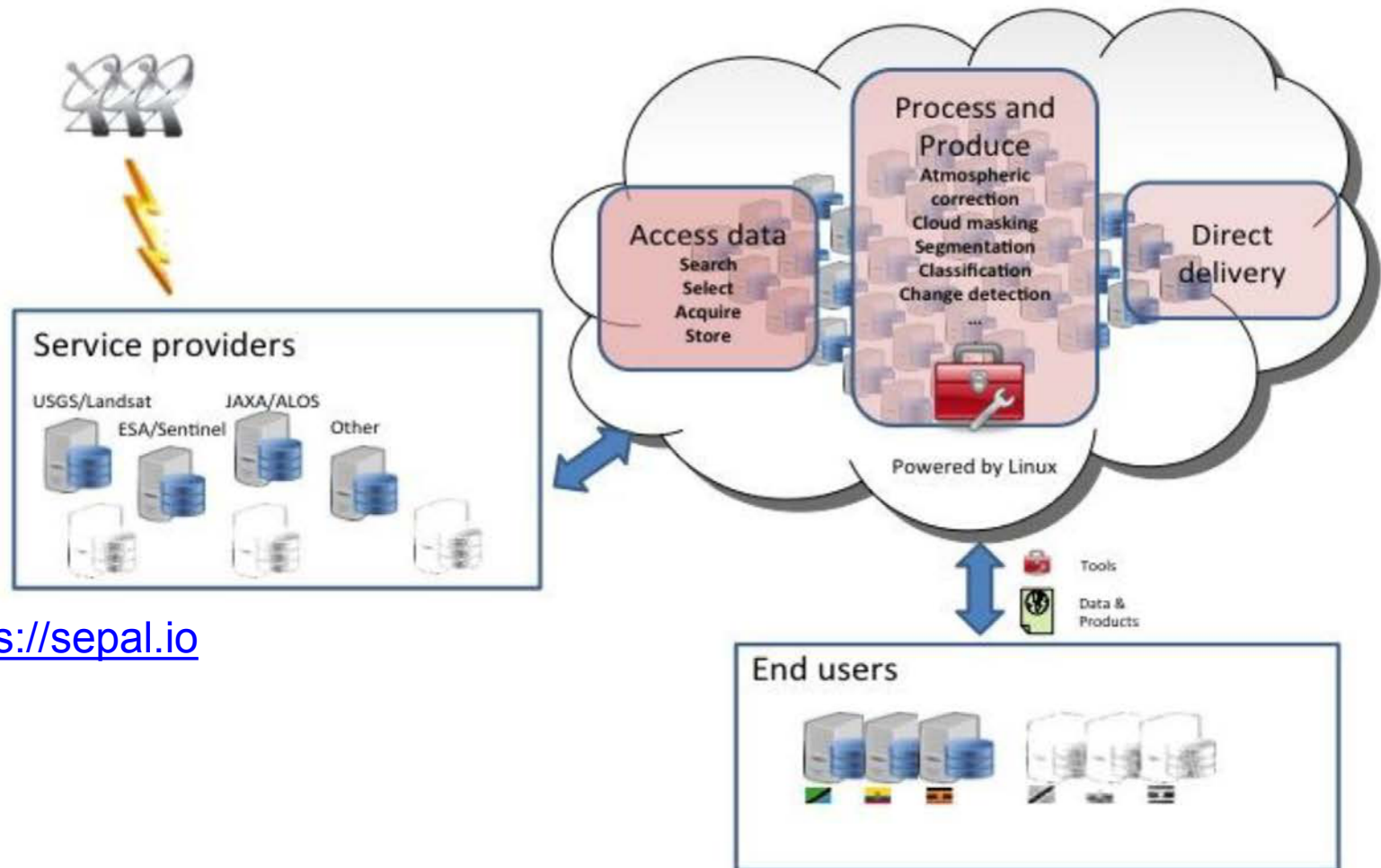
OPEN**FORIS**





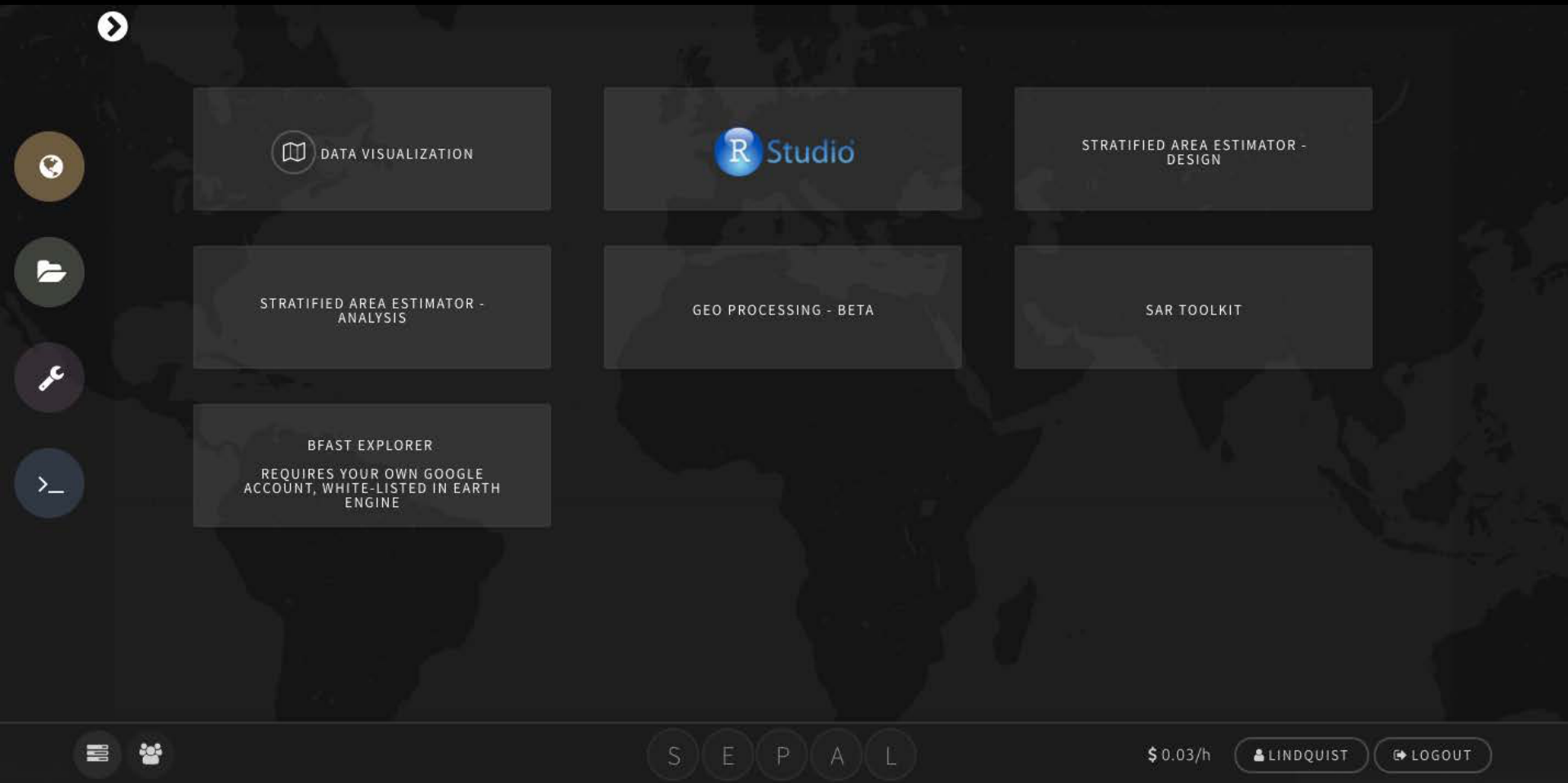
Cloud computing structure

System for Earth System and Analysis for Land Monitoring (SEPAL)



<https://sepal.io>

SEPAL - 2.0



SEPAL Modules for Extended Capacity and Collaboration

Stratified Area Estimation, Step-by-Step

SEPAL Stratified estimator

- Introduction
- Map input**
- Strata areas
- Strata selection
- Sampling size
- Sample allocation

- Source code
- Bug reports

Data type

First choose the type of data used for the stratification - the map
The map can be in raster or vector format. The map area will be calculated in the next tab.
The input map can represent a single time or multiple times change made from satellite images
It can also be any acquired from available map data of land cover or land use.

Missing input: Please select the map file

Download test data

Output folder

All products of the random stratified sampling design will be stored here: areas of the map, sampling sizes, point file

Manual selection of areas ?

The map classes will be used as strata in the design of the sampling

View table data

Select columns to view in a data table.
The columns are read from the shapefile database or the CSV with the raster areas

Sample-based assessments - Training and Reference Data

Digital Globe

Export

Prev Next List

32

Charts

class

Select a value

Low High

Google

Map data ©2017 Google | Terms of Use | Report a map error

SCENES




MOSAIC



 AUTO-SELECT

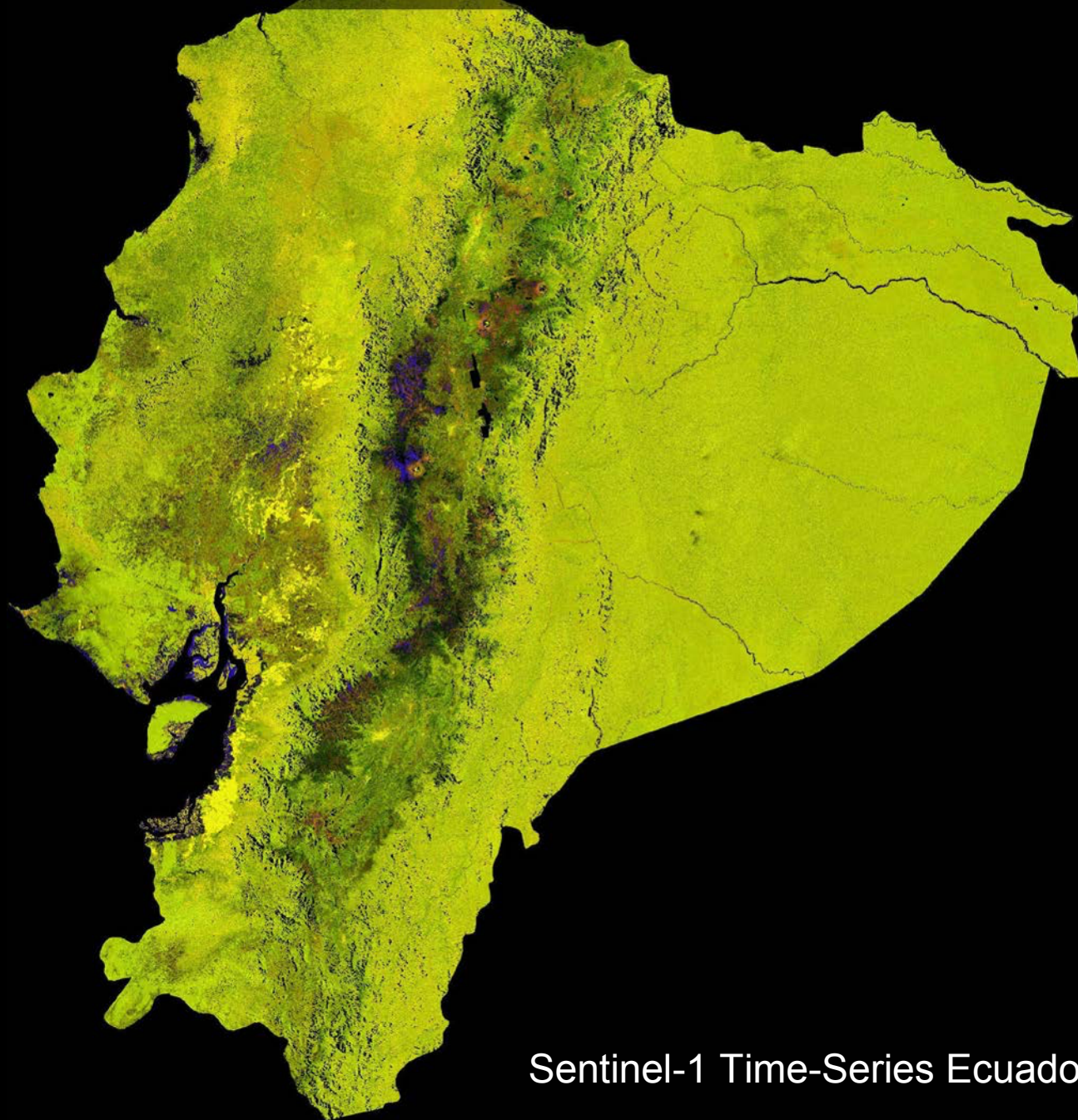
 REFRESH

 PREVIEW

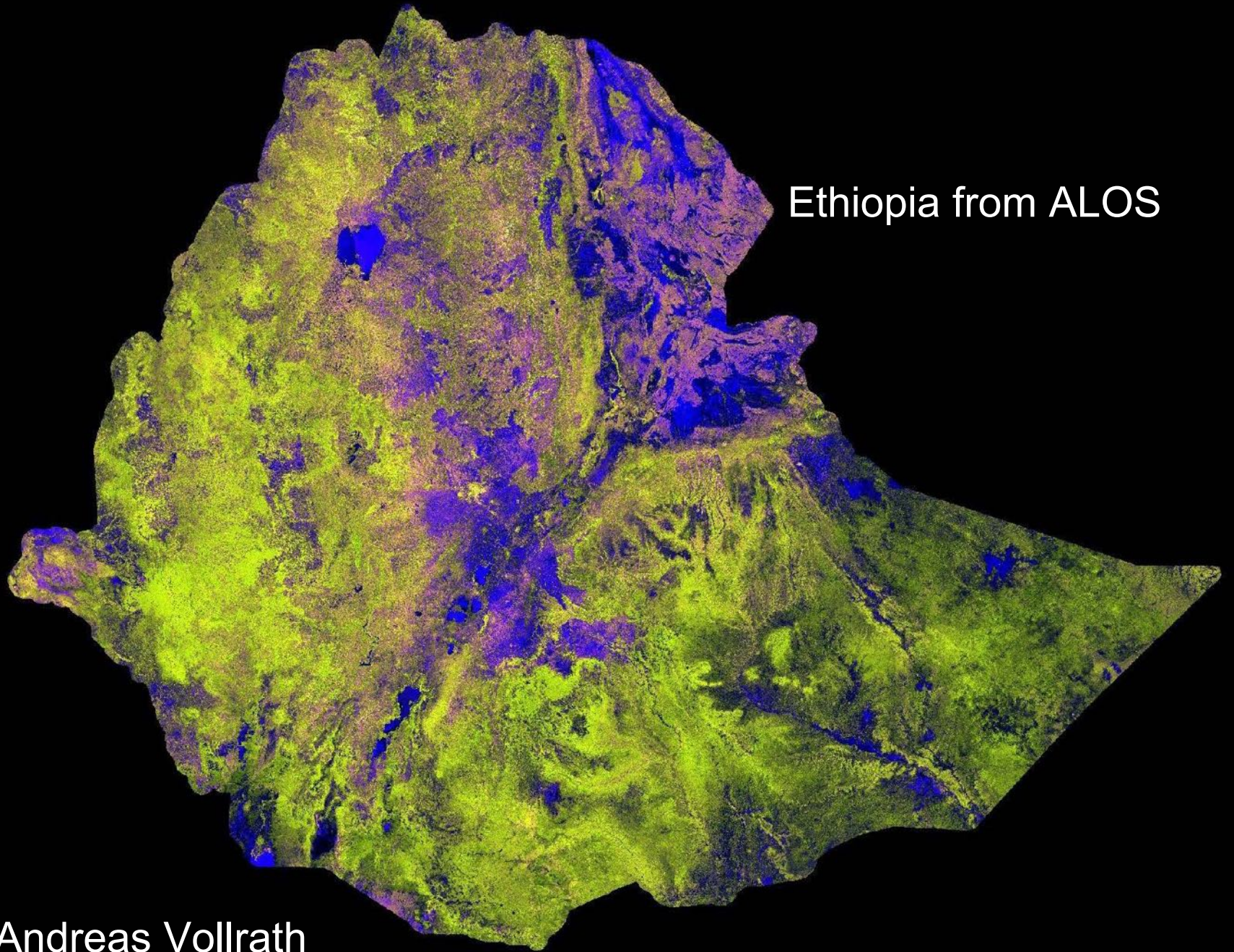
 REFRESH



Data from 07/05/2017 - 17/05/2017



Sentinel-1 Time-Series Ecuador 2017



Ethiopia from ALOS

Andreas Vollrath

SCENES



MOSAIC



AUTO-SELECT



RETRIEVE



PREVIEW

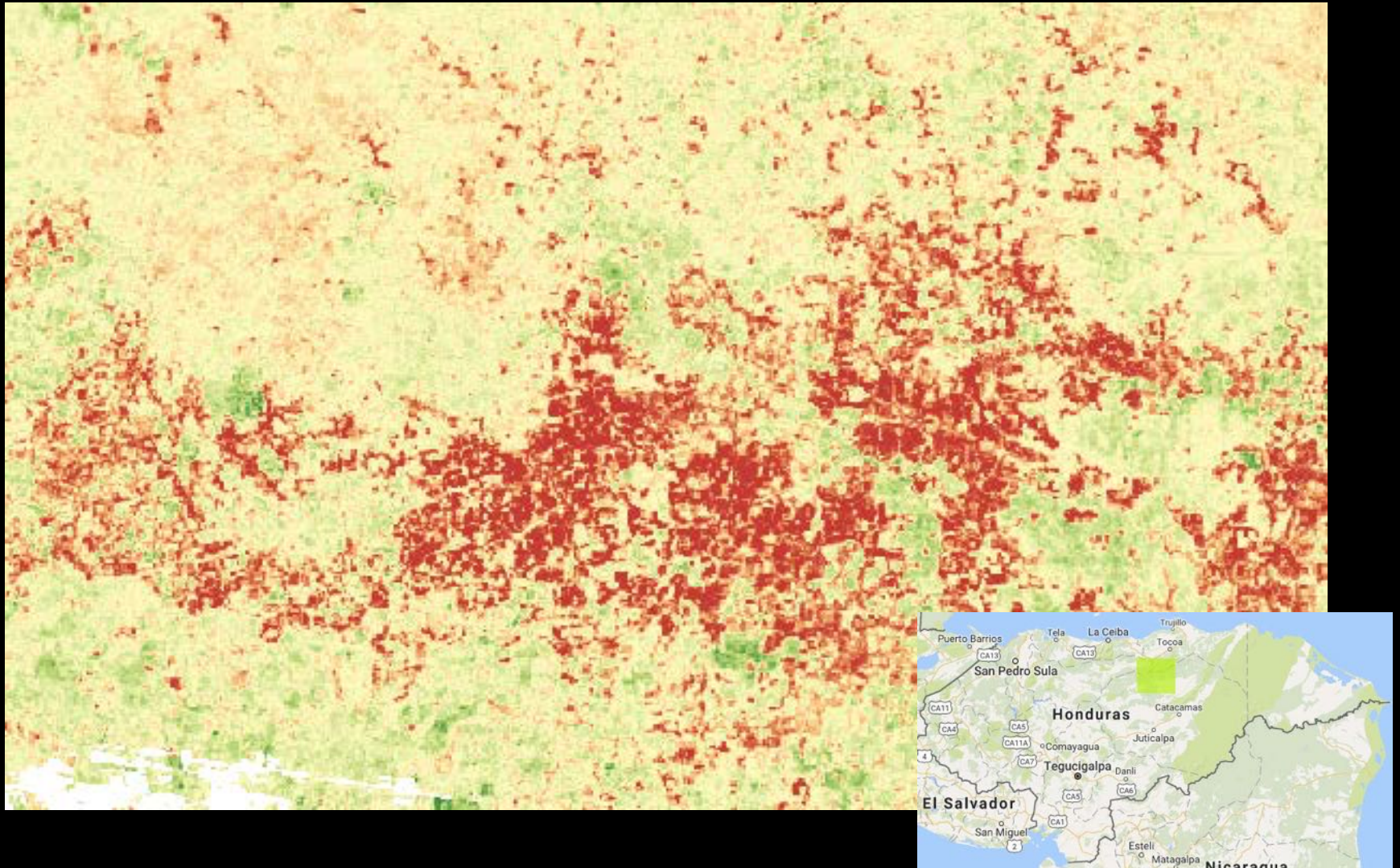


RETRIEVE



Sentinel 2, 2017

Landsat Time-series Analysis - Honduras Insect Damage



Every acquisition from 2010 - 2018 processed

SEPAL Conclusion

- Improve connection between data / users / information products for monitoring
- Increase production speed of products required for MRV
- Open, flexible system for rapid and standardized image processing
- Building capacity for autonomous creation of national statistics





OPENFORIS

tinyurl.com/fao-sepal

github.com/openforis/sepal

SEPAL Conclusion

First things first.



SEPAL Conclusion

github.com/openforis/sepal



Sign up for free SEPAL access

tinyurl.com/fao-sepal

<https://sepal.io>



Sign up for Earth Engine access

earthengine.google.org

gmail account required too



Sign up for NASA EarthData access

<https://urs.earthdata.nasa.gov/users/new>



Sign up for JAXA ALOS Palsar access

http://www.eorc.jaxa.jp/ALOS/en/palsar_fnf/registration.htm



Thanks!

Governments of Norway, Germany, Finland

European Commission

USGS, NASA, ESA

Google

Daniel Wiell, Cosimo Togna, Andreas Vollrath,
Roberto Fontanarosa, Remi D'Annunzio, Yelena Finegold,
Marieke Sandker, Till Neef, Inge Jonckheere, Danilo Mollicone,
Alfonso Paus-Diaz, Marcelo Rezende, Giulio Marchi,
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