BRIX-2: Second Biomass Retrieval Intercomparison eXercise

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What is BRIX-2?

- BRIX-2 represents a CEOS WGCV task to **intercompare algorithms** specifically **for biomass mapping** using current and future spaceborne missions. It will be coordinated by ESA and NASA

- These objectives shall be achieved by making available **standardised test cases** (based on airborne campaign and spaceborne simulated data), inviting the scientific community to **develop and apply retrieval algorithms** based on this test case, and finally **compare and evaluate the performance** of submitted results.

- For the purpose of an objective algorithm evaluation, the exercise will be base on the **ESA-NASA MAAP**.

The objectives of BRIX-2 are:

1. Provide an **objective, standardized comparison and assessment** of biomass retrieval algorithms developed for the **BIOMASS, NISAR and GEDI** missions, and fusion of these mission datasets.

2. Establish a forum to **involve scientists** in the development of retrievals that **have so far not been part of the biomass** community.

3. The **adoption of vetted validation standards and methods** to compare biomass estimates to **reference datasets** (e.g. field plots or airborne lidar biomass maps).

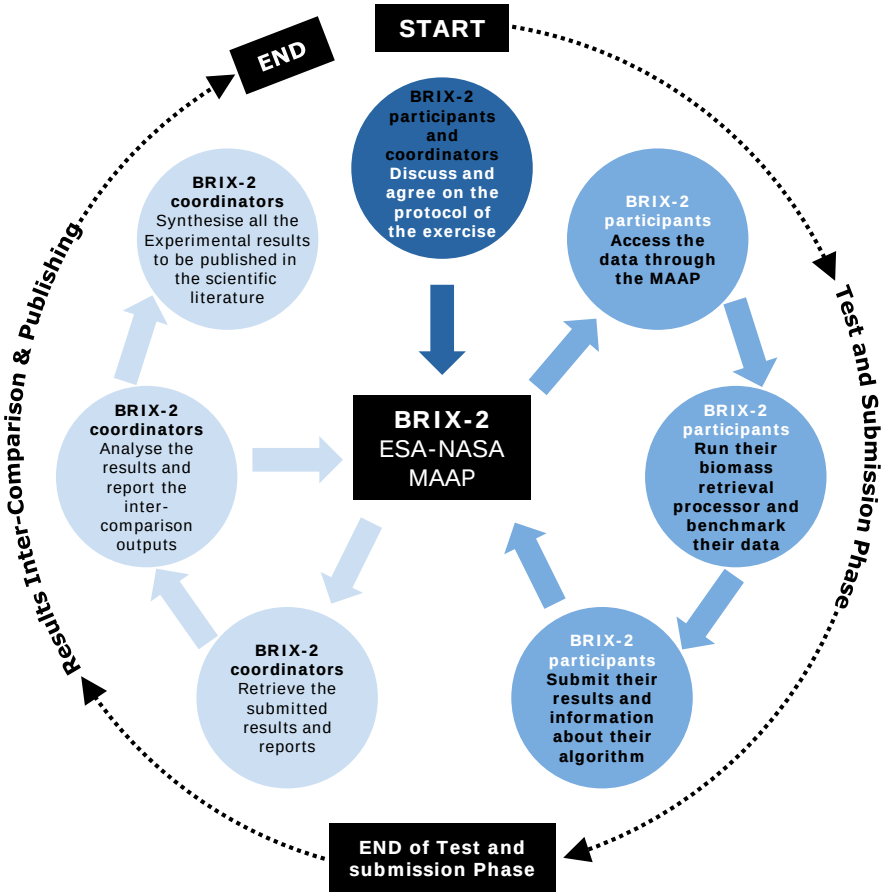
4. **Collect inputs** from the biomass user and scientific community on data formats and characteristics towards the generation of **Analysis Ready Data**.

What BRIX-2 is not!

- BRIX-2 should **not** be **a competition** where the best performing algorithm wins. The exercise should be a **scientific experiment** with a focus on the **inter-comparison of algorithms** by validating derived biomass maps against in-situ reference measurements.

- BRIX-2 allows an increased understanding of **strengths** of the next generation of active remote sensing datasets, with a focus toward **algorithm fusion**. This is not intended as an algorithm competition, but **how we can combine lesson learned from the strengths of a range of algorithms**.

Different steps and corresponding schedule

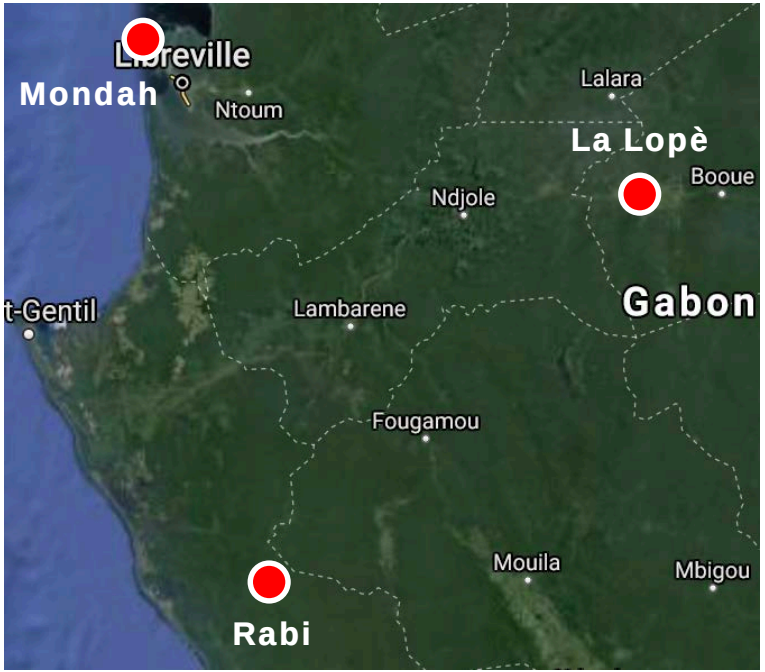


Milestones

- Experiment call (September 2020)
- Registration Deadline (November-December 2020 in Europe)
- **First Workshop** (end of January 2021)
- Results Submission Deadline (May 2021)
- Results Evaluation Report (September 2021)
- **Second workshop** (October-November 2021 in the US)

Remote sensing and in-situ data

- **Develop a biomass retrieval** based on the data that has been acquired during the **ESA-NASA AfriSAR campaign** for the La Lopé, Mondah and Rabi super sites.



Datasets from the MAAP that will be used:

- **P-band** fully polarimetric interferometric SAR images and related additionnal information (incidence angles, DEM, etc.)
- **L-band** fully polarimetric interferometric SAR images and related additionnal information (incidence angles, DEM, etc.)
- **ICESat-2** global photon counting lidar data, **GEDI** global data, **LVIS** L1-L4 data and derived biomass maps, discrete return lidar biomass maps and discrete return lidar DEM.

- The retrieval will be evaluated over the three sites with existing forest plot data and lidar estimates of **biomass and forest height**.

Evaluation of Results & Publication

- The evaluation will be done by ESA/NASA, following standards from the CEOS LPV protocol. This should guarantee a **fair evaluation**. ESA/NASA will release a **report to the participants summarising the evaluation results**.

- After the experiment has been closed we will make the **evaluation scripts available on the MAAP**. This allow people to **repeat the experiment** and **compare their results** against the published ones.

- ESA/NASA **commit not to distribute the outcome** of the exercise **without prior consent** of the participants.

- The results should easily be adapted for publication as a **peer reviewed article co-authored by all participants** who wish to publish the outcomes of the activity.

Requirements for the MAAP

- **24 users** (maximum) during **6 months** (~8 users per mission).

➔ All the required datasets and functionalities are already there!