Geophysical Research Abstracts
Vol. 20, EGU2018-6626, 2018
EGU General Assembly 2018

ESA-NASA multi-Mission Analysis Platform for improving global aboveground terrestrial carbon dynamics

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With the launch of new satellite missions and growing understanding of the complexity of ecological processes, the scientific community is faced with a unique and immediate need for improved data sharing and collaboration. This is especially evident in the Earth sciences and carbon monitoring community with the launch of the NASA-ISRO SAR (NISAR) mission [1], the NASA Global Ecosystem Dynamics Investigation (GEDI) mission [2], and the ESA Biomass mission [3]. While these missions and the corresponding research leading up to launch, which includes airborne, field, and calibration/validation data collection and analyses, provide a wealth of data and information relating to global biomass estimation, they also present data storing, processing and sharing challenges. The NISAR mission alone will produce around 40 petabytes of data per year. Due to the constraints of existing organizational infrastructures, these large data volumes will place accessibility limits on the scientific community and may ultimately impede scientific progress.

In this context, the concept of ESA-NASA multi-Mission Analysis Platform dedicated to the NISAR, GEDI and Biomass missions is proposed. This analysis platform will be a virtual open and collaborative environment. The goal is to bring together data centre (Earth Observation and non- Earth Observation data), computing resources and hosted processing, collaborative tools (processing tools, data mining tools, user tools, . . .), concurrent design and test bench functions, application shops and market place functionalities, accounting tools to manage resource utilisation, communication tools (social network) and documentation.

The goal for the MAP is to establish a collaboration framework between ESA and NASA to share data, science algorithms and compute resources in order to foster and accelerate scientific research conducted by NASA and ESA scientists.
The objectives of the MAP are to:
1) Enable researchers to easily discover, process, visualize and analyze large volumes of data from both agencies;
2) Provide a wide variety of data in the same coordinate reference frame to enable comparison, analysis, data evaluation, and data generation;
3) Provide a version controlled science algorithm development environment that supports tools, co-located data and processing resources;
4) Address intellectual property and sharing issues related to collaborative algorithm development and sharing of data and algorithms.

This platform will give the opportunity, for the first time, to build from a community of user of this new Earth Observation mission around this innovative concept.

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