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Data Systems to Enable Open Science: The Joint ESA-NASA Multi-Mission Algorithm and Analysis Platform's Data Ecosystem

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The scientific method within the Earth sciences is rapidly evolving. Ever increasing volumes require new methods for processing and understanding data while an almost 60 year Earth observation record makes more data-intensive retrospective analyses possible. These new methods of data analysis are made possible by technological innovations and interdisciplinary scientific collaborations. While scientists are beginning to adopt new technologies and collaborations to more effectively conduct data-intensive research, both the data information infrastructure and the supporting data stewardship model have been slow to change. Standard data products are generated at a processing system which are then ingested into local archives. These local archive centers then provide metadata to a centralized repository for search and discovery. Each step in the data process occurs independently and on different siloed components. Similarly, the data stewardship process has a well-established but narrow view of data publication that may be too constrained for an ever-changing data environment. To overcome these obstacles, a new approach is needed for both the data information infrastructure and stewardship models. The data ecosystem approach offers a solution to these challenges by placing an emphasis on the relationships between data, technologies and people. In this presentation, we present the Joint ESA-NASA Multi-Mission Algorithm and Analysis Platform's (MAAP) data system as a forward-looking ecosystem solution. We will present the components needed to support the MAAP data ecosystem along with the key capabilities the MAAP data ecosystem supports. These capabilities include the ability for users to share data and software within the MAAP, the creation of analysis optimized data services, and the creation of an aggregated catalog for data discovery. We will also explore our data stewardship efforts within this new type of data system which includes developing a data management plan and a level of service plan.