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Earth Observation Data Management Systems (4)

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INTERNATIONAL COOPERATION FOR THE MANAGEMENT OF CLIMATE DATA AND SERVICES

Abstract

With almost four decades of consistent data provision, Earth observation satellites are an invaluable asset for monitoring climate change and for understanding its impact. Fully aware of their tremendous potential and contributions to climate studies, on 3 April 2016, many of world's space agencies officially committed to enhance their efforts to strengthen the role of space in these fields in support of the political decisions taken at the COP21 in Paris. This declaration, known as the New Delhi Declaration, marked an important milestone in uniting the international space community's efforts to tackle climate change. In particular, the declaration calls for evolving space-based operational tools combining in-situ measurements and the increased computing resources offered by Big Data. To this end, space agencies will need to develop new technologies and encourage their research community to contribute actively with novel models. Some satellites are already paving the way like GOSAT for JAXA and OCO-2 for NASA, and in the near future TANSAT for China, the Copernicus programme's Sentinel series and of course MERLIN for CNES and DLR, and MicroCarb for CNES. However, success will depend above all on dedicated international efforts for sharing, recalibrating and reprocessing large quantities of data, extracting climate records, and making them available to scientists, decision-makers as well as downstream applications developers. Eventually, in order to exploit the full potential offered by space- and ground- data systems, the all-round development and delivery of climate services, in synergy with weather services, will be required. Drawing on extensive research combining technical and policy perspectives, this paper provides a comprehensive assessment on international mechanisms for ensuring an optimal management systems for global climate-related data. The paper elaborates more specifically on the transition from the provision of climate related-data to the implementation of fully fledged and sustainable climate services. Particular attention is devoted to the prospected creation of climate services of the future within the Global Framework for Climate Services (GFSC) recently established by the World Meteorological Organisation (WMO). The paper also assesses the challenges faced by such international mechanisms as the Committee on Earth Observation Satellites (CEOS), the Group on Earth Observations (GEO), and the Global Climate Observing System (GCOS), and explore the necessary steps to facilitate the access and utilisation of reliable climate services by national and international policymakers alike.