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EARTH OBSERVATION SYMPOSIUM (B1)
Future Earth Observation Systems (2)

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ESA'S EARTH OBSERVATION MISSIONS: OUTLOOK ON CONCEPTS UNDER STUDY

Abstract

The Earth observation (EO) activities of the European Space Agency (ESA) were vastly expanded over the last two decades, along a user-driven strategy comprising two main pillars in terms of space missions: a line of research and demonstration (R&D) missions, the Earth Explorers (EE), aimed to advance the understanding of the different Earth system processes and including in-orbit demonstrations of associated new observing techniques; and a line of Earth Watch (EW) missions, i.e. prototype operational missions responding to operational applications-oriented needs. The latter was further distinguished through the type of partnership in: EW Service missions, implemented through wider partnership schemes with European user organisations as cost-efficient dedicated optional ESA programmes; and Private Initiative missions, in partnership with industry and/or a subset of participating ESA member states.

Important successes have been achieved in terms of EE missions, although at a reduced deployment pace, and even more in terms of EW Service missions, thanks to the consolidated partnership with EUMETSAT, for meteorological missions in low Earth orbit and geostationary orbit, and thanks to the novel partnership with the European Union (EU), which enabled a new and wide long-term programme of substained observations, namely Copernicus (formerly GMES: Global Monitoring for Environment and Security).

These successes have built on and exploited the cross-fertilization between research and applications, although with a lag somewhat longer than anticipated, i.e. the heritage of EW missions was much more from earlier R&D missions (ERS, ENVISAT) than from EE. For the latter, a stronger impact can be expected in the next generations of EW missions. This is one of the reasons why a sustained R&D effort in EO missions is essential for the future of the European EO programmes, other reasons being its crucial role of stimulus to innovation and competitiveness, as shown by the significant worldwide results of the European EO sector.

After recalling the latest additions to the European EO missions under development, examples of future EO mission concepts currently under study at ESA will be presented in order to illustrate the efforts being made to face the above challenge, against the background of a new ESA science strategy more attentive to societal needs and of a revised set of scientific challenges.