

STSE: a platform for reinforcing ESA contribution to major international scientific programmesDiego Fernandez Prieto[†];[†] European Space Agency (ESA), ItalyLeading author: diego.fernandez@esa.int

The Support To Science Element (STSE) is a programmatic component of the Earth Observation Envelope Programme (EOEP) of the European Space Agency (ESA). STSE covers scientific support for both future and on-going missions by taking a proactive role in the formulation of new mission concepts and of their scientific agenda as well as offering a multi-mission support to scientific use of ESA Earth Observation (EO) data and to the promotion of the achieved results. In this framework, one of the major objectives is to reinforce ESA's contribution to the major international scientific projects and initiatives such as those coordinated by the World Climate Research Programme (WCRP) or the International Geosphere-Biosphere Programme (IGBP). Accordingly, since 2008 a number of collaborative research and development activities have been initiated in partnership with major scientific groups to address key open questions in Earth system science where ESA data may play a fundamental role for improving the state of the art in a variety of applications. On the one hand, these science partnerships aims at bringing together EO experts, modellers and Earth system scientists to jointly address current global scientific challenges and priorities. On the other hand, they allow ESA to: ii) ensure ESA data contribution to major international scientific efforts; iii) foster the use of EO data among new Earth science communities; iv) maximise the scientific return of ESA EO missions on major Earth system science priorities; and v) ensuring programmatic coordination of STSE activities with main international scientific priorities. So far, intense and active collaboration has yet been established with iLEAPS and SOLAS (i.e., the land-atmosphere and ocean-atmosphere core projects of IGBP, respectively), as well as with GEWEX and CliC (i.e., the Global Energy and Water Experiment and the climate and Cryosphere project of the WCRP, respectively). As a result of the partnership with GEWEX, the WACMOS (Water Cycle Multimission Observation Strategy) project has been launched in 2009 to improve understanding, monitoring and forecasting of different water cycle components and their impacts on human activities. In particular, the project aims at developing novel and enhanced geo-information products focusing on evapotranspiration, soil moisture, clouds and water vapour. In 2010, the ALANIS (Atmosphere-LANd Interaction Study) activity has been initiated in collaboration with iLEAPS to advance towards the development of novel multi-mission products and their integration into suitable land-atmosphere coupled models. ALANIS focuses on boreal Eurasia and encloses three different projects aimed at: i) improving the characterization of lake and wetland dynamics for reducing uncertainties in related methane emissions; ii) improving the estimation of plume injection height of biomass burning events; and iii) discriminating natural from long-range transported anthropogenic aerosols. The partnership with CliC led in 2010 to the definition of the NorthHydrology project, whose goal is to exploit the use of EO technology, models and in situ data to improve the characterisation of river and lake ice processes and their contribution to the northern hydrology system.