

“From Space Observations to Earth System Science ”

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Earth System Science provides an approach to understand the Earth’s system’s natural components, the interactions between them, the natural and human-induced variability that take place, and the implications of Earth system change – now and in the future – for all the world’s citizens. The observations made from satellites provide a unique way of viewing this complex and interdependent Earth system, especially because of their ability to repeatedly cover the whole planet with consistent, well-calibrated, and widely distributed results that can not only help advance our scientific knowledge of the Earth but to improve the quality of life for all the Earth’s inhabitants by providing accurate and timely information that can be used to inform policy and decision making, as well as forecasting and disaster response. NASA’s fleet of Earth Observing satellites is now providing a comprehensive view of the Earth, supporting discoveries based on new experimental approaches, long-term studies of Earth system evolution that come from creating multi-instrument/multi-platform data records (using data from both NASA and non-NASA satellites), and societal use of the data by individuals, governments, non-governmental organizations, and the private sector. In this talk, recent results from NASA’s fleet of orbiting Earth Science satellites will be providing, including the five missions (three free-flying satellites and two payloads to the International Space Station - ISS) launched during the time period from February, 2014 to January, 2015. Plans for NASA’s future launches, including those in 2016 and beyond, will be described in the context of the broader global effort in global Earth observations. The role of non-satellite observations in both complementing and supporting the calibration/validation of NASA’s satellite observations will also be presented, and the way satellite observations are incorporated into Earth system models will be presented.