

**NASA's future earth science missions for global observations and societal benefit:
Vision and technological challenges**

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The National Research Council in its report in 2005 has stated: "Understanding the complex, changing planet on which we live, how it supports life, and how human activities affect its ability to do so in the future is one of the greatest intellectual challenges facing humanity. It is also one of the most important challenges for society as it seeks to achieve prosperity, health, and sustainability." The Earth system science recognizes that changes to the Earth result from interactions among its components: the atmosphere, hydrosphere, biosphere, and lithosphere, as well as human activities. The complex interactions among the Earth system components give rise to the need for a systems approach to understanding the linkage, dependencies, and interactions among the components.

NASA is at forefront in developing active and passive remote sensing technologies and unique capabilities towards space-based observations for understanding the complexities and interactions among Earth system components. The world is facing significant environmental challenges and a robust, integrated, and flexible system of observations and models are needed for understanding the short-and long term impact on the Earth system. A fundamental challenge for the coming decade is to ensure that space-based observations, analyses, better interpretive understanding, enhanced predictive models, broadened international community participation, and improved means for information assimilation and disseminations are well coordinated to realize the full economic, societal, and security benefit of Earth science. This presentation will provide an overview of NASA's future vision for Earth science missions for global observations, technical challenges and the challenges associated in applying them for societal benefit.