Earth Science and Environmental Assessment Problem-Solving With Advanced Remote Sensing Technology

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Key Participating units: College of Engineering (Texas A&M Engineering Experiment Station)
                                           College of Geosciences
                                           College of Science
                                           College of Agriculture and Life Sciences (AgriLife Research)
                                           Texas A&M (Corpus Christi)
                                           Texas A&M (Galveston)

Anticipated Request Amount: $840K

Executive Summary:

There is an urgent global need to better understand the impact of anthropogenic forcing and environmental change on the sustainability of the Earth's critical zone that regulates water quality and availability, soil and agricultural productivity and yield, ecosystems and wildlife habitat conditions, and landscape stability and hazard potential. Scientists, planners, managers, educators, and government and industry stakeholders need access to geospatial data and accurate information that can be used to solve a variety of earth science issues. Unfortunately, decision support capabilities to address this need are not well developed. ***This is due to a lack of fundamental data and information that can only be acquired using advanced remote sensing technologies.***

Texas A&M University can take a leading role in addressing these complex issues at the state, national and global scales by applying technology solutions that address the challenges that make earth science and environmental problem solving so difficult. We propose to develop and implement an advanced remote-sensing data acquisition, processing, and distribution facility that supports earth science and environmental assessment and decision making. It will be widely useful across many science and engineering domains, and will be available to researchers across the entire TAMU research community via a web-portal.

Unmanned air systems will collect geospatial data using novel advanced sensors. A massive Petabyte storage system will be used to house the data, and high-performance computing will be used to extract biophysical information. The data and information will then be available to stakeholders via the web-portal. Funding is requested to obtain three different custom designed and built sensors that together provide a complete scientific and engineering picture that is beyond the state- of-the-art with current sensors. These sensors will be used with the new data storage, and information extraction technologies that are already part of the TAMU Center for Geospatial Science, Applications and Technology. As cost sharing the team will provide a hyperspectral camera (80K), two multispectral cameras (10K), all UAS vehicles and infrastructure, and data access capabilities.