



## NASA SBIR 2018 Phase I Solicitation

### S5.02 Earth Science Applied Research and Decision Support

Lead Center: GSFC

Participating Center(s): JPL, MSFC

Technology Area: TA11 Modeling, Simulation, Information Technology and Processing

The NASA Earth (<http://science.nasa.gov/earth-science/>) and Applied Science (<http://appliedsciences.nasa.gov/>) programs seeks innovative and unique approaches to increase the utilization and extend the benefit of Earth Science research data to better meet societal needs. The main focus of this subtopic is improving the pipeline from NASA Earth Science data and products to a range of end user communities to support decision making. To that end, one area of interest is new or improved decision support tools for a variety of applications areas (<http://appliedsciences.nasa.gov/sites/default/files/ar2014/index.html#/applications-areas>), including but not limited to, disaster response, agricultural and food security, water resource management, ecological forecasting, land surface modeling, air quality and health.Â Â

Under this subtopic, NASA also invites proposals from companies that provide innovative data science tools to extract new insights from applicable NASA Earth science dataset that can support emerging commercial activities. State-of-the-art geospatial data analytics such as automated image classification, feature extraction, or change detection deployed at scale can reveal new insights and drive increased utilization of publicly available NASA Earth science data. NASA Earth science data may be fused with non-NASA remote sensing data or even non-remote sensing data to provide context or other added value and unlock new information products. Areas of commercial focus (not all inclusive) include agricultural, financial services, transportation, logistics, oil, gas, resource extraction, land management, water resource management, and leisure industries.Â

This subtopic aims to connect and demonstrate the integration of NASA Earth science data and models into societal benefit areas and commercial applications. This solicitation encourages project teams to consider products from recently-launched NASA Missions, as well as simulated products from upcoming, planned missions (e.g., SMAP, GPM, Landsat, GRACE, GRACE-FO, IceSat-2, SWOT), and field campaigns or other observatories (e.g., Airborne Snow Observatory (<http://aso.jpl.nasa.gov/>), SnowEx (<https://snow.nasa.gov/snowex>)). Projects may consider connecting with NASA-sponsored activities including, but not limited to SPoRT (<http://weather.msfc.nasa.gov/sport/>) and NASA Earth Exchange- NEX (<https://nex.nasa.gov/nex/>). The NASA Applied Science Program sponsors several Capacity Building Programs, including SERVIR ([http://www.nasa.gov/mission\\_pages/servir/](http://www.nasa.gov/mission_pages/servir/)), DEVELOP (<https://develop.larc.nasa.gov/>) and ARSET (<https://arset.gsfc.nasa.gov/>); proposed projects may find it valuable to leverage resources and relationships with these capacity building activities. Proposed projects should also note that NASA hosts a broad range of modeling systems and related that have been highly valuable to operational and end user communities, including MERRA-2 (<https://gmao.gsfc.nasa.gov/reanalysis/MERRA-2/>), climate project information from GISS GCMs (<http://www.giss.nasa.gov/projects/gcm/>) and Land Data Assimilation Systems (LDAS (<http://ldas.gsfc.nasa.gov/gldas/>)).Â

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Currently, creating decision support tools (DST) that effectively utilize remote sensing data requires significant efforts by experts in multiple domains. NASA Earth Science data, while accessible, is massive in breadth and scope – a true “Big Data” problem. However, the formatting of the data is not easily accessed or readily usable beyond remote sensing experts and the research community, suggesting that application by commercial users is even more challenging. While the data has commercial use, it is underutilized due to accessibility and translation issues. This creates a barrier to the widespread use of Earth observations by state and local governments, businesses, and the public. This subtopic aims to democratize the creation of Earth science driven decision support tools and to unleash a creative explosion of DST development that significantly increases the return on investment for Earth science missions.Â Â

Specifically, this subtopic develops core capabilities that can be integrated to build multiple remote sensing driven DSTs customized to the requirements of different users in varied fields. Proven development and commercialization strategies will be used to meet these objectives. The goal of this solicitation is to directly link what is being done at NASA with the end user community to support decision making. The outcomes of this work could include new tools, integration systems, visualization interfaces, among others. Responsive proposals must include a clear identification of a data product(s), modeling tools, or NASA activities that will be used and a clear end user or business application to which the tools, systems, etc. are intended to support for applied research and decision support. Proposals should explain how the proposed capabilities will address an end user need, business opportunity or gap area in decision support capabilities. Proposals should also outline existing capabilities, including software, models, and data that are already implemented at NASA or through related NASA activities and how the proposed activities may leverage, complement, or expand from existing infrastructure. Projects must be mindful of NASA security restrictions in the development of new activities.Â Â

Ultimately, this subtopic aims to provide commercial analytics firms and other data-driven companies with improved access to, and translation of, NASA data. The subtopic supports research and technology focused on innovative data science tools and information products that will improve business productivity, reduce the cost of operations, and provide for better informed decision making. Research proposed to this subtopic should demonstrate technical feasibility during Phase I, and in partnership with Commercial customers, show a path toward a Phase II prototype demonstration, with significant communication with commercial stakeholders to increase the potential for non-governmental market penetration.