



**NASA Headquarters  
Science Mission Directorate**

**ADVANCING COLLABORATIVE CONNECTIONS FOR EARTH-SUN  
SYSTEM SCIENCE (ACCESS)**

SMD ROSES - NNH05ZDA001N  
Program Element A.26

Award Announcement – October 14, 2005

The ACCESS Cooperative Agreement Notice (CAN) solicits projects that provide strategic, near-term improvements in NASA's Earth science data and information systems by leveraging existing technologies. The specific goals of the 2005 ACCESS announcement are to enhance existing or create new tools and services that support NASA's evolution to Earth-Sun System Division science measurement processing systems and support NASA's Science Focus Area (SFA) community data system needs. A special focus on data system needs of the atmospheric composition SFA communities was included following the launch of the Aura satellite.

A total of 50 proposals were received for this announcement. All proposals were peer evaluated using a combination of mail and panel review. The Earth-Sun System Division of NASA's Science Mission Directorate selected 15 proposals for two-year awards pending satisfactory budget and work plan negotiations. Some of these awards will be partially funded. These projects will help NASA improve existing Earth-Sun System Division's heterogeneous and distributed data and information systems.

**Barry, Roger** University of Colorado

***Discovery, Access, and Delivery of Data for the International Polar Year (IPY) (DADDI)***

The National Snow and Ice Data Center, in collaboration with others, proposes to adopt the principles of Web Services architecture in order to develop and implement a portal for cryospheric data and related information. We will use a replicable methodology that builds from the specific science or application need, determines relevant existing data sources to meet that need, and then works with the designated community to redirect and/or enhance web services technology to enable effective acquisition, registration, and use of the data. Our intent is to develop a system to meet the needs of the specific science and application community related to arctic coastal processes. The system could then be extended to other user communities and data sources, especially as part of the International Polar Year.

**Bingham, Andrew** Jet Propulsion Laboratory

***Earth Science Datacasting: Informed Data Pull and Visualization***

The ability to automatically download only data that meets a predefined need and instantaneously visualize it on a local computer is a concept that has yet to be realized. Our solution of earth science datacasting solves this technology gap. Based on the popular concept of podcasting, which gives listeners the capability to download only those mp3 files that match their preference, earth science datacasting will give users control to download only the earth



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science data files that are required for a particular application. In essence, earth science datacasting is a simple, yet powerful informed pull and visualization mechanism. This capability directly addresses the "Data and Information Systems Support for Science Focus Areas and Applications" topic of the ACCESS NRA.

Earth science datacasting will be modeled on the server-client architecture used in podcasting and will leverage existing NASA capabilities. On the server side, the latest data granule is placed in an on-line store and an XML feed is created for the granule. The XML feed is based on the RSS 2.0 standard, with additional namespaces for earth science data. The namespaces are based on the Earth Science Markup Language (ESML). In addition, results from analysis and mining the data granule can also be included in the namespace (e.g., information pertaining to the signature of a hurricane or cloud-cover fraction). On the client side, an RSS 2.0 feed reader monitors the server for new feeds (note, feeds related to different types of data can come from multiple servers). The feed reader will be tuned by the user, via a graphical user interface (GUI), to examine the RSS 2.0 content and initiate a data pull after some criteria are satisfied. The criteria might be, for example, download sea surface temperature data for a particular region that have cloud cover less than 50% and during daylight hours. After the granule is downloaded to the client, the user will have the ability to visualize the data in the GUI.

Initially we will deploy an earth science datacasting system at the NAS/JPL Physical Oceanography Distribute Active Archive Center (PO.DAAC) to provide ocean related satellite data. This provides a good demonstration for illustrating how different types of data (raster, vector and point, respectively) can be visualized. Looking into the future, we believe earth science datacasting has the potential to significantly increase the utilization of earth science by non-traditional communities. We already see the use of RSS-based technology for delivering news and services to mobile phones and PDAs. We envisage an exciting future where earth science information are also made available in this manner.

For this project we have assembled a team of investigators and collaborators with expertise in earth science data systems, science, applications and outreach, as well as advanced computing and visualization of complex data sets.

**Bock, Yehuda** Scripps Institution of Oceanography, UCSD

### *Modeling and On-the-fly Solutions in Solid Earth Science*

This project, "Modeling and On-the-fly Solutions in Solid Earth Sciences" (MOSES), is a collaboration of researchers representing three ongoing NASA-sponsored projects. Together, we will develop a unified on-the-fly, Web Services-based observation/analysis/modeling environment for geophysical modeling and natural hazards research, a plug-in service for early warning systems and transfer of rapid information to civilian decision makers and the media, and an educational tool. By doing so, this project will support the NASA objectives to conduct a research and technology program to advance Earth observations from space, improve scientific understanding, and demonstrate new technologies for future operational systems. Formal linkage of the projects will also serve to improve NASA's capability to communicate its



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research and development accomplishments to the public in a more timely and comprehensive manner. The three NASA-sponsored projects are related to the Earth Surface and Interiors focus area and each includes the component blocks of the proposed unified system. The projects are:

- 1) SCIGN-REASoN (2004-2008) - Combination, validation, archive and delivery of high-level data products and data mining capabilities from space geodetic measurements, specifically continuous GPS (CGPS) observations.
- 2) QuakeSim (2002-2006) - Development of linked Web Service environments for supporting high performance models of crustal deformation from a variety of geophysical sensors, including GPS and seismic instruments.
- 3) SENH-Applications GPS/Seismic Integration (2003-2005) - Development of a prototype real-time GPS/seismic displacement meter, for use by local agencies responsible for seismic hazard mitigation and monitoring of critical infrastructure.

The primary research objective of this proposal is in the area of "Data and Information Systems Support" for the Earth Surface and Interiors Science Focus Area (ESI). This project will align and expand the IT and Web Services developments of SCIGN-REASoN and QuakeSIM to streamline the access to data products for modelers, and leverage the real-time components of the SENH applications project to create an on-the-fly interactive research environment that links real-time data streams and products from GPS and seismic sensors in an environment where data products can be rapidly accessed, comprehended, and manipulated. The system will be designed using modern IT tools and principles in order to be extensible to any geographic location, scale, natural hazard, and combination of geophysical sensor and related data. We will accomplish this by building upon open Geographical Information System (GIS) standards, particularly those of the Open Geospatial Consortium (OGC). We will use the principles of Web Service-based Service Oriented Architectures to provide scalability and extensibility to new services and capabilities.

In addition, MOSES will also contribute to the "Support for Evolution to Science Measurement Processing Systems" area through enabling greater interoperability and data flow between the GPS and deformation data products developed and delivered to Solid Earth Science users. Programming interfaces will be developed for web-enabled services for handling data access, processing and exchange between products generated under the SCIGN-REASoN and SENH projects and data processing and simulation tools developed under the QuakeSIM project.

**Braverman, Amy** Jet Propulsion Laboratory

### *AMAPS: An Aerosol Measurement and Processing System*

The aerosol community does not presently have a unifying framework in which to access, store, distribute and analyze its current or expected, new assets. Many good sources of data exist: satellite observations, ground-based networks, aerosol and chemical transport models with or



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without data assimilated into them to name just a few. However, researchers wishing to do even simple cross comparisons among data sources are stymied by the myriad of formats, contents, resolutions, storage locations, and methodologies used to derive these data sets. In this project, we adapt and meld a set of existing technologies to create an aerosol measurement and processing system: AMAPS. AMAPS will use SciFlo, a semantically-enabled distributed dataflow execution environment already being used for science analysis in a REASoN funded project at JPL, along with well-known, modern technologies including Simple Object Access Protocol (SOAP), XML (Extensible Markup Language), and OpenDAP (Open Data Access Protocol). AMAPS will provide query and data access services for the following aerosol science data sources: MISR, MODIS, AERONET, ACE-Asia field campaign data, and output from the IMPACT aerosol transport model. AMAPS will also provide services for data fusion and reduction, derived from statistical principles. Finally, we include services for basic, exploratory data analysis of the fused and/or reduced data. The system will be developed and demonstrated in a science investigation to assess and improve the performance of the IMPACT model by comparing it to observations from the data sources listed above.

**Caron, Bruce** New Media Studio

### *Data and Information Application Layer (DIAL): Enabling Rapid NASA Data-Rich User Software Application Development*

#### Data and Information Application Layer (DIAL)

Collaborative connections between Earth-Sun science communities and their attendant applications and educational user communities have been hampered by the lack of nimble user application authoring tools that A) access and visualize/analyze subsetted NASA data and B) offer minimal learning curves to end users. The commercial software solutions to data access and use (e.g. IDL and ArcGIS) have found widespread acceptance within the science community, but are far too complicated for most other users. Open-source (mostly Java-based) tools offer valuable, but often very limited, capabilities for data access and manipulation. At the same time, commercial multimedia application authoring tools (e.g. Macromedia/Adobe Director and Flash) offer rapid graphical user interface (GUI) building capabilities, and easy deployment to user computers (Windows and MacOS), but these cannot handle NASA data resources.

The DIAL project provides NASA with a proven plug-in bridge between a commercial off-the-shelf (COTS) data tool (IDL) and a commercial GUI authoring tool (Macromedia/Adobe Director). Our proposed effort will articulate the use of this technology for the products of NASA Earth-Sun science. The DIAL project will demonstrate robust, inexpensive (in time and dollars) NASA data-rich user software applications as well as application authoring technologies for NASA education efforts. These applications and authoring technologies can be easily ported for use within other user communities (such as resource/regional planners and decision makers).

The DIAL solution is more than a collection of model user applications. DIAL builds a NASA-data centric software authoring system that leverages COTS software resources and innovative



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plug-in technology developed in-house that can be used by any NASA program to build data-rich applications for their most valued end-user communities: applications simple enough for a middle-school child and yet powerful enough for an emergency response decision maker or the congressional committee aide.

The DIAL project proposes to demonstrate how this available technology can access a variety of important NASA Sun-Earth science data types and formats (e.g., MODIS data in HDF-EOS or geoTIFF, OPeNDAP). The project will also extend its plug-in technology to access runtime ESRI software code (ArcEngine and ArcObjects). For the first time, a single user application will be able to handle raster data arrays (with runtime IDL) and GIS information (with ArcEngine). DIAL brings real data ACCESS to support education and decision management systems. DIAL offers NASA programs new capabilities for building software solutions to manage and distribute data resources.

The DIAL authoring solution will be demonstrated and disseminated at ESIP Federation technology workshops, and the DIAL project code will be maintained on the content versioning system of the National Science Digital Library.

**Fox, Peter** National Center for Atmospheric Research

### *Semantically-Enabled Scientific Data Integration*

We propose to form a collaboration between GEOsciences Network (GEON), Semantic Web for Earth Environment Technologies (SWEET) and Virtual Solar-Terrestrial Observatory (VSTO) to develop and integrate a suite of ontological representations for the Sun-Earth System and apply them to: Scientific Data Integration. The developed search and retrieval data integration capabilities would provide scientific value-added access to specific datasets spanning geological records, climate records, and solar records with a unifying theme of quantifying forcings for climate variability and change. Our baseline data sets include data from vulcanology (rocks), micro, regional and global climate indicators such as temperature and precipitation records, and space-based, ground-based and theoretical constructions of solar irradiance. This fully functional demonstration of the connection or collaboration of existing discipline-specific science and data domains using formal semantic representations of the science terminology (as distinct from attempting to interoperate at a much lower data terminology level) will then enable the connection to be re-used and applied between other NASA research focus areas, i.e. specific scientifically related disciplines that heretofore have been unable to rapidly and effectively exchange science data without the willing participation of experts.

**Graves, Sara** University of Alabama, Huntsville

### *Deployable Suite of Data Mining Web Services for Online Data Repositories*

This project proposes to create a suite of specialized deployable data mining services designed specifically for NASA data, leveraging the Algorithm Development and Mining (ADaM)



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toolkit as the basis. The ADaM toolkit is a robust, mature and freely available science data mining toolkit that is being used by different research organizations and educational institutions worldwide. These deployable services will give the scientific community a powerful and versatile data mining capability that can be used to create higher order products such as thematic maps from current and future NASA satellite data records with methods that are not currently available. The specialized data mining, pattern recognition, image processing and data preparation algorithms in ADaM are specifically geared towards satellite imagery, making these tools a perfect fit for NASA satellite data. In addition to providing specialized deployable data mining services, the suite will also include the Earth Science Markup Language (ESML) giving users the power to handle a variety of heterogeneous data formats seamlessly. ESML is another proven technology that, like ADaM, is in use by organizations worldwide. The deployable package of mining and related services will be developed using web services standards so that community based measurement processing systems can access and interoperate with them. The maturation of web services standards and technology sets the stage for a distributed "Service-Oriented Architecture" (SOA) for NASA's next generation science data processing. This architecture will allow members of the scientific community to create and combine persistent distributed data processing services and make them available to other users over the internet. Two operational sites will be used for demonstrations of the proposed mining services in an SOA: the Distributed Information Services for Climate and Ocean Products and Visualizations for Earth Research (DISCOVER) passive microwave data pool at the Global Hydrology Resource Center (GHRC) and the Goddard Earth Sciences Data and Information Services Center (GES DISC). The ADaM web services will also be deployed for use in the SERVIR data repository and decision support system in the third year, if funding is available.

**Kempler, Steven** Goddard Space Flight Center

### *A-Train Data Depot: Integrating Atmospheric Measurements Along the A-Train Tracks Utilizing Data from the Aqua, Cloudsat and Calipso Missions*

The succession of US and international satellites that follow each other, seconds to minutes apart, across the local afternoon equator crossing is called the A-Train. The A-Train consists of the following satellites, in order of equator crossing: OCO, EOS Aqua, CloudSat, CALIPSO, PARASOL, and EOS Aura. Flying in such formation increases the number of observations, validates observations, and enables coordination between science observations, resulting in a more complete "virtual science platform". (Kelly, 2003) The goal of the project is to create the first ever A-Train virtual data portal/center, the A-Train Data Depot, to process, archive, access, visualize, analyze and correlate distributed atmosphere measurements from various A-Train instruments along A-Train tracks. The A-Train Data Depot will enable the free movement of remotely located A-Train data so that they are combined to create a consolidated vertical view of the Earth's Atmosphere along the A-Train tracks. Once the infrastructure of the A-Train Data Depot is in place, it will be easily evolved to serve data from all A-Train data measurements: 'one stop shopping'. The innovative approach of analyzing and visualizing atmospheric profiles along the platforms track (i.e., time) will be accommodated by reusing the GSFC Atmospheric Composition Data and Information Services Center (ACDISC)



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visualization and analysis tool, GIOVANNI (TRL7); data reduction tool, Simple, Scalable, Script-based Science Processor for Missions (S4PM) (TRL 9); On-line archiving for fast data access, Simple, Scalable, Script-based Science Processor for Archive (S4PA) (TRL 7); and the Cooperative Institute for Research in the Atmosphere (CIARA) Generic Auxiliary Data Processor (GEN-AUX) for subsetting (TRL 8). The integration of independently developed tools leverages NASA investments towards developing more advanced science driven products. Initial measurements utilized include CALIPSO lidar backscatter, CloudSat radar reflectivity, clear air relative humidity, water vapor and temperature from AIRS, cloud properties and aerosols from both MODIS and eventually PARASOL. This will be followed by including measurements from the Aura and OCO instruments, thereby rounding out the availability of the full suite of A-Tran instrument data products. The project's resulting visualizations and analysis illustrate the importance of managing data so that measurements from various missions can be combined to enhance the understanding of the atmosphere. This proposal aims to address the challenges of coordinating data management of data from various archives, originating from several instruments. A-Train data management coordination, as performed here, is extremely significant in facilitating the A-Train science of clouds, precipitation, aerosol and chemistry. At projects end, scientists associated with Atmospheric Chemistry, and Water and Energy Science Focus Areas (SFA) will have a clear connection with their data of interest by being able to access the specific subset (parameter, spatial, and temporal) of interest, and not large files of data which inhibited data access in the past.

**Leptoukh, Gregory** Goddard Space Flight Center

### *NASA Earth Sciences Data Support System and Services for the Northern Eurasia Earth Science Partnership Initiative*

The proposal objective is to provide the NASA data management for Northern Eurasia Earth Science Partnership Initiative (NEESPI) that is relevant to regional and global scientific and decision-making communities. Many types of remote sensing and ground data are needed and many models must be applied, adapted or developed for properly understanding the functioning of Northern Eurasia "cold" and diverse regional system. Mechanisms for obtaining the requisite data sets and models, and sharing them among the participating scientists are essential.

The proposed project targets integration of remote sensing data from polar-orbiting satellites, such as MODIS, AMSR-E, and other NASA instruments, AVHRR, customized data products from climatology data sets (e.g., ISCCP, ISLSCP), and model data (e.g., NCEP/NCAR) into a single, well-architected data management system. It will utilize four existing components developed by the NASA Goddard Earth Sciences (GES) Data and Information Services Center (DISC):

- Online archiving and distribution system (TRL 7), that allows collection, processing and ingest of data from various sources into distributed online archives. It includes various kinds of data preparation for seamless interoperability between measurements by different instruments.



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- User-friendly intelligent web-based online visualization and analysis system (TRL 7) that provides a suite of preloaded statistical tools for exploration.
- Web-based data search and distribution system (TRL 8), and
- Convenient web-based data mining system (TRL 6) with the ability to upload custom algorithms to mine through large volumes of data.

When integrated into a cohesive system, these components will provide convenient access to geophysical parameters measured in the Northern Eurasia region without any need to learn complicated remote sensing data formats, or to retrieve and process large volumes of NASA data.

Main focus of this project is on the following NASA Science Focus Areas (SFA): Carbon Cycle and Ecosystems, Climate Variability and Change, Atmospheric Composition and Water and Energy Cycle as applied to NEESPI. Initial implementation will concentrate on atmospheric data and surface data aggregated to coarse resolution to support collaborative environment and climate change studies and modeling, while at later stages, data from NASA and non-NASA satellites at higher resolution will be integrated into the system.

**Masek, Jeffrey** Goddard Space Flight Center

### *Building a Community Land Cover Change Processing System*

Characterizing land cover change has become a major goal for Earth observation science, with the Global Climate Observing System (GCOS) Implementation Plan calling for repeated observations of global land cover at 30-meter resolution every five years. Although we now have over 30 years of Landsat-class observations, the land science community still lacks the analysis infrastructure to meet the GCOS goal. In response, this project proposes to create the infrastructure for a distributed Land Cover Change Community-based Processing and Analysis System (LC-ComPS). The LC-ComPS environment is envisioned as a distributed network of processing centers, linked with data archives via Data Grid technology, to allow regional and continental-scale analysis land cover at high resolution. We will develop and distribute (i) software modules to generate consistent surface reflectance datasets from Landsat-type observations; (ii) software modules to support generalized change detection applications; and (iii) data grid implementation to allow access to multiple satellite data archives. Participants (GSFC, UMD) have already developed most of the components during previous projects; this effort will concentrate on assembling these pieces into a "user-friendly" processing environment that can be replicated at data centers worldwide.



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**McDonald, Kenneth** Goddard Space Flight Center

### *The Development and Deployment of a CEOP Satellite Data Server*

The Coordinated Enhanced Observing Period (CEOP) was initially motivated by the World Climate Research Program (WCRP) Global Energy and Water Cycle Experiment (GEWEX) international efforts focusing on the measurement, understanding, and modeling of water and energy cycles within the climate system. NASA is one of the agencies contributing to CEOP. One key objective of CEOP is to use the enhanced observations to better document and simulate water and energy fluxes and reservoirs over land on diurnal to annual temporal scales and to better predict these on temporal scales up to seasonal for water resource applications.

Data integration is essential to the CEOP community, as they need to access multiple types of data such as in-situ, satellite remote sensing and modeling output data from many sources. Data integration requires the co-registration of diverse data from multiple sources. Multiple tools and services are needed to perform data integration. Some of the data services needed for data integration include data search and access, format translation, reprojection and regridding, subsampling and subsetting, data interpolation, temporal interpolation, geometric rectification, and more detailed data comparisons. Currently the CEOP scientists lack the tools to access the satellite data with the data services needed to support inter-comparison of data.

The CEOP Satellite Data Server will take two existing technologies, the OGC Web Coverage Server and the OPeNDAP and interconnect them, leveraging the geospatial processing capabilities of the OGC Web Coverage Server with the transparent data access to OPeNDAP-enabled science data applications and analysis clients used by most of CEOP scientists. This will enable greater interoperability and data flow and access to distributed data sources of EOS L1B/L2 and higher-level processed products by existing science communities. The CEOP Satellite Data Server will provide an intelligent geo-rectification and re-gridding service, allowing remote processing and intelligent subsetting on the data and reducing the amount of data transferred over the network. The Server will provide reprojection, and resampling capabilities as well. The CEOP Satellite Data Server is based on an existing proof-of-concept prototype, leveraging existing information technologies in the OGC Web Services and OPeNDAP.

**McGrath, Robert** University of Illinois, Urbana-Champaign

### *Software to Access HDF5 Datasets via OPeNDAP's Data Access Protocol (DAP)*

**Morisette, Jeffrey** Goddard Space Flight Center

### *Improving Access to Land and Atmosphere science products from Earth Observing Satellites: Helping NACP Investigators Better Utilize MODIS Data Products*

MODIS products are being produced on regional and global scales to support research in land and atmospheric science using NASA Goddard Space Flight Center's MODIS Adaptive



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Processing System (MODAPS). This supporting algorithms run on a cluster of multi-mission processing systems supporting several research teams. Two recent extensions of MODAPS, which were developed for archive and distribution of MODIS products, are the Atmospheres Archive and Distribution System (AADS) and the Land Archive and Distribution System (LADS). The goal of this proposal is to leverage, extend, and tailor the functionality of these product ordering and distribution systems to serve the remote sensing needs of the North American Carbon Program as a "Data and Information Systems Support for Science Focus Areas and Applications". The purpose of these enhancements is to streamline access to MODIS data products, to reduce data volume by providing only those data required by the user, and to improve the utility of data products. The proposed work will provide NACP investigators with custom preprocessing of MODIS data that will allow for direct ingest into an investigators modeling framework. By reducing the burden associated with ordering and preprocessing of MODIS products, we will enable NACP investigator to focus on the information content in MODIS data and its contribution to understanding carbon budgets. We will serve key researchers within the NACP who have an urgent need for enhanced support of MODIS data. The needs of this group will be representative of the larger climate modeling community; and the tools developed for them can be implemented in an operational system to serve this wider community.

**Rowlands, David** Goddard Space Flight Center

### *High Spatial and Temporal Resolution Continental Water Mass Anomaly Fields from GRACE: Improving Accessibility for Hydrological Research and Applications*

The GRACE (Gravity Recovery and Climate Experiment) mission has demonstrated the ability to synoptically monitor the temporal and spatial variations in total water content over continental areas, providing a key measurement which can improve our knowledge and understanding of the water cycle. Changes in terrestrial water storage especially with regard to ground water, are poorly known and sparsely sampled. These essential components of continental hydrology have been inaccessible to any form of synoptic remote sensing until recently. The GRACE mission provides the means to remotely sense gravity changes at regional scales. Through a unique and well tested solution formulation, our group proposes to provide sub-monthly measures of the change in continental water storage based on the GRACE intersatellite range-rate measurements. These anomalies will have a resolution of  $4^{\circ} \times 4^{\circ}$  and will be provided every 10 days over the period of the GRACE mission.

To date, GRACE has principally been used improve both stationary and monthly-resolved spherical harmonic models of the gravity field. Monthly harmonic models have been used as a proof of concept to demonstrate the resolving power of GRACE to monitor mass flux globally [Wahr et al., 2004; Tapley et al., 2004]. Although monthly gravity models have produced intriguing results, information at submonthly time scales is lost and spatial and temporal aliasing through the estimation of static global parameters has been a major stumbling block for the exploitation of the GRACE data. However, by using solutions restricted to local regions as an alternative and through the application of accurate forward models (to eliminate tidal and atmospheric pressure mass flux signals), we have developed a highly accurate technique for



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monitoring continental water mass storage. Our mass concentration (mascon) representation largely mitigates the spatial and temporal aliasing problems encountered with monthly GRACE solutions using Stokes coefficients.

We have produced 10-day estimates of  $4^{\circ} \times 4^{\circ}$  mass flux anomalies [Rowlands et al., 2005]. Upon eliminating atmospheric and tidal mass variations, detailed understanding of terrestrial water storage at scales comparable to medium to large aquifers, can be directly monitored. These estimates of terrestrial water storage are valuable for predicting biological and agricultural productivity, flooding, and the level of sustainability or depletion of ground water systems. These mass flux estimates will fill a critical gap in achieving a more complete understanding of the Earth's hydrological system. These mass anomalies will be provided along with comparable hydrological estimates (from GLDAS, Rodell et al., 2004).

**Tilmes, Curt** Goddard Space Flight Center

### *Atmospheric Composition Processing System (ACPS)*

We propose to transform our existing multi mission-oriented science data processing systems into a single measurement-based Atmospheric Composition Processing System (ACPS). This will extend services that are currently only available to members of the science teams we support to all members of the atmospheric composition community. We will leverage the data and information technologies developed for the TOMS Team, the OMI Science Team, and the NPP Science Team by extending the Ozone Monitoring Instrument Data Processing System (OMIDAPS) to provide public application interfaces. This will allow members of the atmospheric composition community to obtain data from a widely distributed set of sources and to process these data to generate Level 2 and 3 data. Community scientists will have access to current processing algorithms, will be able to run modified forms of these algorithms, or will be able to develop new algorithms either locally or on OMIDAPS itself. We will minimize development costs by utilizing elements of the already developed and proven OMIDAPS and the Ozone Mapping and Profiling Suite (OMPS) Product Evaluation and Test Element (PEATE). We will also minimize implementation costs for external scientists by ensuring that the system will run on Linux-based commodity systems using open standards and open source software. We will make our source code, coding standards, and developmental procedures available to the community, and we will incorporate additions from them that provide additional capabilities, tools, etc. The system will benefit atmospheric composition research by serving a similar function for this community that the Ocean Color Processing System (OCPS), and their SeaDAS application, serves for the ocean color community.