

## News in This Quarter



### JCSDA Partner Agencies: Focus on NASA's Global Modeling and Assimilation Office

The Global Modeling and Assimilation Office (GMAO) is located at NASA's Goddard Space Flight Center in Greenbelt, MD, and is actively pursuing research in modeling and innovative data assimilation methods, particularly with the aim of improving the utilization of data provided by sensors flying on NASA research satellites. The GMAO was recently formed from the merger of the Data Assimilation Office (DAO) and the NASA Seasonal to Interannual Prediction Project (NSIPP) and has a total staff of 124 scientists and support personnel. The DAO participated in the JCSDA from its inception, and during its 10-year history the office pioneered the use of several new observation types in global data assimilation systems. Among the new data first explored by the DAO in assimilation mode were scatterometer winds, precipitation measurements from TRMM, ozone profile and column measurements from SBUV and TOMS, polar winds from MODIS, and feature tracking winds from MISR.

In addition to strengthening the modeling and climate aspects, the GMAO continues to build on the data utilization legacy of the DAO and to investigate new satellite observations as they become available. Recently, the GMAO and NCEP have initiated collaboration on the development of the next-generation global analysis package, beginning with the joint implementation of the Grid-point Statistical Interpolation (GSI). Current plans call for the GSI to become operational both at the GMAO and at NCEP in late 2004. The JCSDA deserves a large part of the credit for this collaboration which is in turn expected to provide a significant return to the center in greatly facilitating the transfer of data and technology from research (NASA) to operations (NOAA). (Lars Peter Riishojzaard, GMAO)

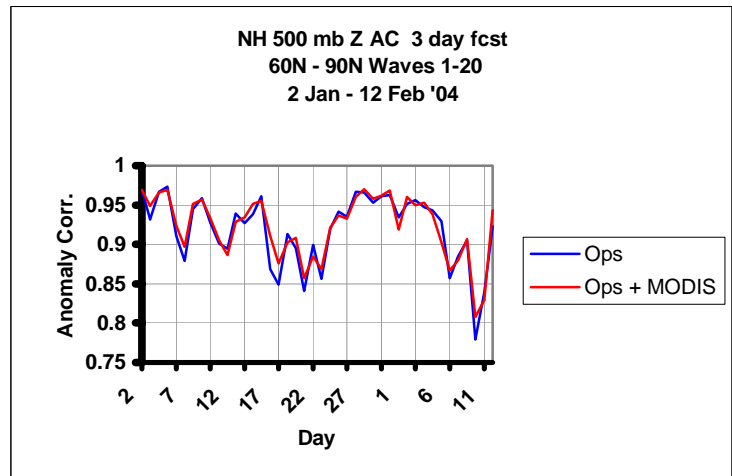
### Science Update: MODIS Wind Tests Show Improved Global Forecasts

Winds generated by NOAA/NESDIS using observations from the MODIS instrument on the AQUA Satellite have been assimilated into the NCEP (3DVAR) Global Forecast Model and have been shown to have positive impact on forecasts. Winds are produced in polar regions by tracking cloud and

water vapor features in successive orbits. The period examined was during the International MOWSAP (MODIS Winds Special Acquisition Period), namely January and February 2004.

This has been an important test for the NESDIS system used to generate these winds, as this system will provide these data operationally via the GTS for the international community. The test has also demonstrated these data can improve NCEP's forecasts. The test was undertaken using MODIS wind data up to the forecast time minus 6 hours, because this mimics the current operational availability of the wind data. This work has also been corroborated by independent tests at the NASA GMAO.

Further quantification of this impact is continuing and it is anticipated these data will be included in the Operational Forecast Suite during the next system upgrade at NCEP. A diagram showing the impact (i.e., higher Anomaly Correlation) of the wind data on Global Model Forecasts of 500 hPa geopotential height at three days is seen below. It shows most benefit occurs where the extra wind data ameliorate the problem of poor forecasts (i.e. reduces the extent of the downward pointing spikes (forecast busts).



### FY 2005 Announcement of Opportunity Released

The JCSDA FY 2005 Announcement of Opportunity has just been published in the Federal Register and can be viewed at <http://www.fedgrants.gov/Applicants/DOC/NOAA/GMC> by clicking on the NESDIS file in the listing.

This year's Program Priorities and Technical Points of Contact are: Radiative Transfer Models (Al Gasiewski, NOAA/OAR), Advanced Instruments (Dan Tarpley, NOAA/NESDIS), Clouds and Precipitation (John Derber, NOAA/NWS), Climate and Oceans (Michele Rienecker, NASA/GMAO), and Aerosol, Ozone and Trace Gas (Nancy Baker, DoD/NRL). Letters of Intent to propose are due by August 2, 2004, and full proposals must be submitted by October 1, 2004. Review of full proposals will be completed by January 31, 2005, and funding is expected to begin June 1, 2005. It is expected that total funding will be \$1,000,000 with an average grant of \$100,000.



## JCSDA Visitor: Anthony Weaver

Anthony Weaver of the European Center for Research and Advanced Training in Scientific Computation visited the JCSDA during the week of June 14. In addition to presenting a formal seminar on Development of a Variational Data Assimilation System for the Global Ocean, Anthony engaged in informal discussions with a number of JCSDA scientists. Discussions with Dave Behringer, Sudhir Nadiga, and Yan Xue focussed on a comparison of recent results from the NCEP and CERFACS assimilation systems and the different approaches for constraining the ocean salinity field during data assimilation, in the absence of direct observations of salinity. Discussions with John Derber, Michele Rienecker (NASA), Christian Keppenne (NASA), and James Carton (U. Maryland) centered on key issues in ocean data assimilation: covariance modelling, balance, and model bias detection and correction.

Anthony met with Jim Purser and Dave Parrish to review the latest work on numerical aspects of flow-dependent, anisotropic correlation modelling for atmospheric and ocean data assimilation. Carlos Lozano, Tsann-Wang Yu, and Heinrich Tolman gave Anthony an overview of current and planned developments at NCEP in modelling, prediction and data assimilation for coastal, mesoscale, and wave applications.

## Meeting Summaries

**2nd Annual JCSDA Workshop on Satellite Data Assimilation:** The 2<sup>nd</sup> Annual Workshop on Satellite Data Assimilation of the JCSDA was held at the NOAA Science Center in Camp Springs, MD, on April 15-16, 2004. The purpose of these Workshops is to bring together scientists supported by the JCSDA to review ongoing and planned scientific development and to plan and coordinate future efforts. Some 50 scientists and JCSDA staff discussed 30 funded JCSDA projects in the high priority research areas of the Center: radiative transfer, clouds and precipitation,

advanced instruments, land surface applications, and ocean applications

Of particular note were advances in: developing tools for assimilating Global Positioning System (GPS) data from the Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC), scheduled for launch in December 2005; fast radiative transfer models for clouds and precipitation; and direct assimilation of infra-red radiances for sea surface temperature information. Particular emphasis this year was placed on defining the path from research to operations and developing coordination mechanisms among investigators working in the same area. The JCSDA supports scientific development work with proposal based, internally directed funds and with external grants through a community-wide Announcement of Opportunity.

## Second Meeting of the JCSDA Science Steering Committee:

The JCSDA Science Steering Committee (SSC), at its second annual meeting, noted that the JCSDA had made good progress, and made a number of detailed recommendations. It suggested that the staff be enhanced: to help the new director in his science investigations, to liaise with the research community, and to transfer progress into operations (especially in the land data assimilation and ocean data assimilation areas). The SSC recommended keeping focus (and hence critical mass) on the top three or four science priorities and sustaining that focus until significant progress had been demonstrated. The SSC also noted the importance of expanding the computer cycles available for research runs of the operational models; it noted a ratio of 5 research runs to 1 operational run has fostered accelerated forecast improvements at other centers in the past decade. In addition the SSC indicated that the JCSDA should ensure that sufficient attention is given to NWP model physics and its representation within the data assimilation system. Finally the SSC encouraged the JCSDA to start considering a path toward time and space variational assimilation of satellite measurements and products.

The SSC (P. Menzel, U. WI (chair), J. Eyre, UK Met Office, C. Chouinard, Canadian Meteorological Center, G. Kelly, ECMWF, C. Bishop, NRL, T. Schlatter, NOAA/OAR, R. Atlas, NASA/GSFC, R. Peterson, CIMMS, and A. Busalacchi, ESSIC) met at NOAA, Silver Spring, Maryland, between the 20<sup>th</sup> and 21<sup>st</sup> of April 2004. The task of the Science Steering Committee (SSC) is to provide scientific guidance to the Director of the JCSDA. A summary of the SSC Meeting can be found on the JCSDA web site at <http://www.jcsda.noaa.gov> under MEETINGS. The Committee was provided with a vision statement for JCSDA, a summary of accomplishments in 2003/2004 and progress reports on JCSDA activities in relation to Radiative Transfer, Cloud and Precipitation Assimilation, Advanced Instruments and Impact Studies, and Land Surface and Ocean Data Assimilation. It was also provided with a summary of data assimilation and associated activities at JCSDA related Centers.

**Inaugural Meeting of the JCSDA Advisory Board:**

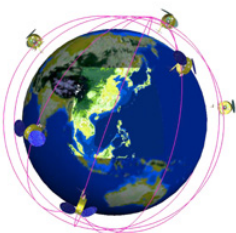
The JCSDA Advisory Board (T. Hollingsworth, ECMWF, T. Vonder Haar, CSU, ( co-chair), P. Courtier, Meteo-France, E. Kalnay, U. MD., R. Anthes, UCAR, J. Purdom, CIRA (co-chair), and P. Rizzoli, MIT), met at the Earth System Science Interdisciplinary Center (ESSIC), University of Maryland on 18 June 2004. The role of the Advisory Board is to advise the Management Oversight Board of the JCSDA on all activities of the JCSDA. It includes scientists and scientific managers from a broad spectrum of national and international organizations.

Tony Busalacchi, Director, ESSIC, welcomed the members of the Advisory Board, the Management Oversight Board, the Executive of the JCSDA, and other attendees to the University of Maryland for the meeting. JCSDA Director John LeMarshall briefed the Advisory Board on the current status and future direction of the JCSDA. Deputy Director Steve Lord summarized accomplishments in 2003/2004. Center representatives reported on data assimilation and associated activities at JCSDA affiliated centers. Louis Uccellini, Chair, JCSDA Management Oversight Board, provided final comments after which the Advisory Board’s deliberations commenced. The Advisory Board will provide its final report to the Management Oversight Board of the JCSDA in the next few weeks.

**Recent Seminars**

Recent seminars included talks by Ron Errico, NASA Goddard Global Modeling and Assimilation Office, on Issues Regarding the Assimilation of Precipitation Observations, and Anthony Weaver (see JCSDA Visitor, this issue). Suggestions for speakers and topics are always welcome: please send them to [george.ohring@noaa.gov](mailto:george.ohring@noaa.gov).

**Cosmic Corner**



The deployment of six COSMIC global positioning system radio occultation (GPSRO) sounders from a single United States Air Force vehicle remains on schedule for December 2005, or possibly January 2006. The Interagency Advisory Group (IAG)

for the Constellation of Satellites for Meteorology, Ionosphere, and Climate (COSMIC) met in Silver Spring, MD, on June 16. Representatives of the University Corporation for Atmospheric Research (UCAR), the executor for COSMIC in the United States, presented status summaries for aspects of the mission, including system integration, launch preparation, and occultation receiver development and technology transfer. J. Yoe (NESDIS/OR) described NOAA’s preparations to use COSMIC and subsequent GPSRO observations for improved atmospheric sounding and

satellite data validation and for assimilation in numerical weather prediction.

Senior representatives of contributing agencies, including NOAA, the National Aeronautic and Space Administration, the Department of Defense, and the National Science Foundation met in executive session to discuss possibilities to extend COSMIC beyond its nominal two-year lifetime. COSMIC and Meteorological Operations Platform/GPS Radio Atmospheric Sounder will be the first operational radio occultation sensors with potential to impact numerical weather prediction as well as enhancing the capability to monitor climate. (Jim Yoe, NESDIS)

**Outlook for Next Quarter**



**Upcoming JCSDA Seminars**

7/21/04	Catherine Prigent	Observatoire de Paris	Tentative title: Microwave Land Emissivities
9/15/04	Liang Xu	NRL	Four-Dimensional Variational Data Assimilation at the Naval Research Laboratory

**Directed Research Announcement**

The annual JCSDA funded announcement for proposals for Directed Research in satellite data assimilation will be released in mid-August. The Directed Research program supports Internal Investigators including NESDIS cooperative institutes and other JCSDA partners conducting research on near-term payoffs in transition of research to operations. Currently, 17 projects are supported under this program.

Please submit news items 2 weeks prior to the end of each quarter to [george.ohring@noaa.gov](mailto:george.ohring@noaa.gov)