



STC Team Continues Support to NOAA NESDIS Satellite Data Operations

Consumers around the world rely heavily on processed satellite data for their activities in weather forecasting and emergencies, climate study, and many other environmental applications. STC, as a subcontractor to Computer Sciences Corporation and part of a highly integrated team of contractors, has provided support to the National Environmental Satellite, Data, and Information Service's (NESDIS) Information Processing Division (IPD) since 1996. Located at the



Back Row (left to right): Atmospheric Soundings - Alex Pozniak (Porting), Bruce Whistler, Gayle Surette, Tianxu Yu; Ozone - Joel Selekof, Vaishali Kapoor; Environmental Products - David Donahue (STC Project Manager/Product Systems Team Leader), Jill Wemmer, Nian Zhang; Product Systems Development - Charles (Tom) Jobson, George Goodreau; Polar Images - Reginald Ready. Front Row (left to right): SAA/CLASS - Martha Watkins, Roy Jacox, Tao Gu, Kathy Moore, Jeremy Throwe (STC deputy); LRIT Development - Jeff Manning (STC deputy); EOS Development - Paul Haggerty, Kristina Sprietzer; MetOp Development - Kambiz Fakhrai; Product Preprocessing - Xiaoping Bao, Raj Ayachit. Not present - Sushma Gupta (SAA/CLASS)

Suitland Federal Center in the Maryland suburbs of Washington, DC, IPD is responsible for ingesting, processing, and disseminating environmental satellite data to users throughout the world. The STC Team of 24 employees, headed by **David Donahue**, perform the bulk of scientific software maintenance and development that supports the current suite of IPD satellite products that steadily flow to the NESDIS customers. Over the past 7 years at IPD, the STC team has established a reputation for scientific and technical excellence. This reputation is expected to serve us well in the future as we team with CSC again for continued scientific and technical software support for NESDIS.

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STC Supports NASA LaRC External Affairs

The External Affairs Support Contract at NASA Langley Research Center supports the Office of External Affairs, headed up by Mike Finneran; the Office of Public Affairs, Head, Marny Skora; and the Public Services Office, Head, Dr. Karen Credeur. Donna Lawson is the contract COTR. STC won the competitively bid award and was sole contractor for 1995-1999, then became the subcontractor (bidding criteria change prevented STC from bidding as a prime) for another 5 years. STC personnel make significant contributions to the contract in a number of important areas, as exemplified below.

Andrea Carden is STC's onsite Project Manager and Conference Manager. She has been with STC for 5 years and, based at NASA Langley's Reid Center, has taken on many duties. The conference facilities consist of approximately 28,000 sq ft of meeting space within four buildings, and are a full service operation for hosting NASA events. Andrea has overall responsibility for ensuring that the events organized within the facilities are fully supported to the

(Continued on page 2; see **EXTERNAL AFFAIRS**)

Honors and Awards

Deepak and Rahman Win Holloway Award

On August 11, 2003, NASA's Paul F. Holloway Award was presented to **Chand Deepak** and to **Dr. Zia-ur Rahman** as members of the Retinex Commercialization Team for "Outstanding technical contributions in non-aerospace technology transfer." The Holloway award recognizes technical contributions for the development of new technology, participation in technology transfer processes, and the significance of the technical contributions or participation. The Retinex digital image enhancement algorithm was invented by Dr. Zia-ur Rahman and two NASA employees, who also received the Award. Chand Deepak is the Executive Vice President & COO for STC and Dr. Zia-ur Rahman was with STC at the time

of invention and is now Vice President - R&D for STC's subsidiary, TruView Imaging Company. This is the second time NASA has recognized Retinex with an award; it won the NASA Space Act Award for a top invention in 1999. STC has patented Retinex, and TruView has developed image enhancement software called PhotoFlair®, featuring Retinex. PhotoFlair® is now being successfully marketed online worldwide (see www.truview.com).



Zia-ur Rahman (left picture) and Chand Deepak (right picture) receive award from Delma C. Freeman, former Director, NASA Langley Research Center (left) and Roy D. Bridges, Jr., Director, NASA Langley Research Center (right).

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EXTERNAL AFFAIRS (continued from page 1) satisfaction of the customer, and interacts with NASA employees on all planning aspect. While at NASA, Andrea has overseen the renovation of the main conference facility, the Reid Center, and has increased services offered to the clientele. The conference facilities are the location for most of Langley's noteworthy events and have hosted speakers such as aviation experts, astronauts, congressional representatives, and various other celebrities. Last year the conference facilities hosted 987 functions with 60,896 attendees. Andrea holds an M.S. in Management from Troy State University and a CMP certification (Certified Meeting Professional), an internationally recognized industry accomplishment.

Dale "Chris" Christensen is the part-time Conference Coordinator. Chris has worked at NASA Langley Research Center since 1983 with a 6-year break from 1992-1998. From 1983-1992, he worked the Aero Van, a mobile traveling exhibit that went all over the country to air shows, schools, and other events promoting NASA Langley's efforts in Aviation. In 1998, he joined STC working at the conference center where he supports Andrea Carden in coordinating the many aspects of onsite conferences and meetings. Chris also provides occasional support in the Public Inquiries Center. His long background with NASA Langley brings some valuable insights and adds a distinctive edge to his role at the conference center.

The newest member on the STC contract is **Matthew Thompson**, Conference Support Coordinator, joining STC after a 21-year career with the Air Force where he primarily worked with Chaplain Services and as an Air Force recruiter. Within that arena, he had the opportunity to work on many conferences and events. Matthew provides onsite support at the Reid Center by coordinating the meeting room configurations, setting up audio-visual requirements, preparing for catering events, setting up the marquee, and handling reservations and many other details.

The tabloid-sized *Researcher News* is a familiar sight to NASA Langley Research Center's employees, retirees, and other persons interested in NASA's work. STC's **Jim Roberts** has served as editor of the Center's biweekly newsletter and its companion Web site, *Researcher News Online*, for the last 4 years. Jim works closely with the Office of External Affairs and is responsible for selection of topics, interviewing relevant researchers and other Center staff,



(Left to right) Jeff Caplan, Andrea Carden, Harmony Hunter, Jim Roberts, Chris Christensen, Matthew Thompson, Joan Lehman. Not present - Diana Blanchard-Gross

writing and editing stories, reviewing layout, and ensuring the on-time publication of the newsletter.

Jeff Caplan has been with STC for 6 years working as NASA Langley's Public Affairs Photographer. Jeff's work can be seen throughout the *Researcher News*, local papers, aviation publications, NASA Langley promotional material and much more. Jeff takes a very creative approach to his work, and can be found balancing precariously in a wind tunnel or shooting from NASA's research planes, finding that precise angle that gives his work a unique and recognizable signature. In addition to his work for STC, Jeff maintains a freelance business that consists of shooting for the Associated Press, Reuters, AFP, Bloomberg News and several other wire services.

Harmony Hunter has two roles on the contract. She is a Public Information Assistant working with the Freedom of Information Act and the Special Events Coordinator. Harmony is also known as the resident MAC and database expert. Under FOIA, she handles all aspects of responding to information requests and is currently working on scanning historical and current documents for availability on the FOIA website. Additionally, she works with NASA events such as Day of Caring, Combined Federal Campaign, State Fairs, and various luncheons and receptions including local, state, and national dignitaries.

Joan Lehman also has several roles on the contract and is known for her wealth

of NASA knowledge as she has worked at Langley for almost 20 years. Joan works as a Public Information Assistant, as the primary contact for the NASA Langley Speakers Bureau (she recruits volunteers to address civic, professional, educational, and other non-profit organizations), and is the point of contact for the NASA Colloquium/Sigma Lecture Series. She has been recognized numerous times for her contributions in all of these areas. Joan is a native of Minnesota but has made Virginia her home for 30 years.

Diana Blanchard Gross has been with STC since April 2002, as NASA Langley's Traveling Exhibits Coordinator. Diana brings an exceptional art background to the company. During her tenure at NASA Langley, she has developed interactive discovery kiosks, as well as increased the number of museum venues and outreach efforts through the exhibits program. Diana travels around the state to provide onsite support at various events. She holds an M.A. in Art History and Museum Studies from Virginia Commonwealth University. □

AMS/STC Scholarship Award

The American Meteorological Society named Andrew J. Bennett as the recipient of the AMS/STC Undergraduate Scholarship for 2002/2003. STC has been sponsoring this scholarship for the last 20 years. He is currently in his senior year at Plymouth State University, Plymouth, NH, majoring in meteorology. The scholarships, which are based on merit, are awarded for the junior and senior years and are designed to encourage outstanding undergraduates to pursue careers in the fields covered by the awards. Scholarship students in their senior year are invited to attend the AMS Annual Meeting, upcoming in Seattle, January 2004. Mr. Bennett will graduate in May 2004 and plans to go on to graduate school where he intends to focus on weather modeling and prediction, in particular of winter events. □



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Editor: Diana McQuestion
Layout: AnnaMaria Clack
(757) 766-5800/Fax (757) 865-1294
Web site address: www.stcnet.com

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HIGHLIGHTS FROM THE PAST 5 YEARS

Y2K

One of the biggest efforts since the last newsletter update in 1998 was preparing all of the IPD systems for Y2K. This was no trivial task. And, while there were a few minor hiccups, there were virtually no interruptions in the flow of products.

New Satellite Launches

Since 1998, there have been a number of new satellite launches with improved instrumentation and data resolution. This includes the entire NOAA-K, L, and M series of polar orbiters, as well as the geostationary satellites GOES I, J, and K. We are now preparing for the MetOp Era in which the U.S. and Europe will share the burden of providing global morning and afternoon polar satellite coverage.

Automation of Monitoring Procedures

Through the use of scripting and the Web, STC personnel have nearly completely automated daily monitoring of IPD product generation and distribution. This time-consuming process that once took up to several hours has now been reduced to just a few minutes.

Non-NOAA Products

NOAA and NASA Administrators challenged their respective communities to exchange satellite data to improve weather forecasting for high impact weather emergencies. The MODIS (Moderate Resolution Imaging Spectroradiometer) instrument aboard the Terra and Aqua satellite provides a new source of high resolution weather data. Using these data in near real time (NRT) increases the accuracy for weather forecasting and assessing natural disasters. Producing data in NRT is not a simple task, considering time dependencies on the receipt of various data sources and the hardware and software constraints when dealing with complex and large volume high resolution data. Through the efforts of STC contractors at IPD, the NOAA MODIS/NRT system is now providing NASA with all Level 0 data for their NRT efforts, Level 1B products to various DOD agencies for their weather forecasting bureaus, and Level 2 products to a variety of NESDIS groups processing up to two Terabytes of data each day.

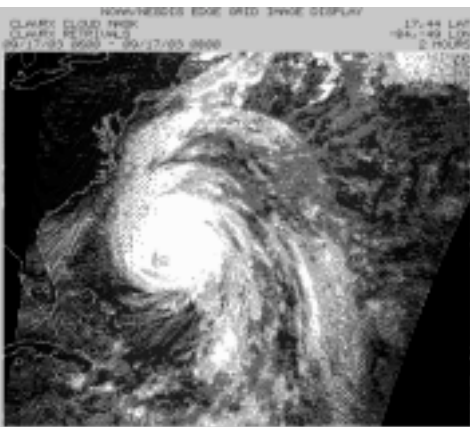
Migration of Legacy Atmospheric Soundings Software

The atmospheric soundings software has been running on hardware that has either exceeded or is near meeting its life expectancy. A software team headed by STC was set up in 2001 to port the soundings software from Unicos and MVS based systems to AIX based systems. They have implemented tracking mechanisms for soft-

ware porting and made massive real-time upgrades during the porting effort. ATOVS processing software has already been ported from a Cray (Unicos) to an IBM SP (AIX) using specially built software to compare the two outputs. Optimization has been applied on the SP that halves ATOVS processing time. AMSU-B orbital processing has also been ported which required a very different model than the MVS version. Maintenance testing of BUFR encoding software has been performed and the WMO GTS orbital formatters have been ported. STC completed exhaustive migration and testing, well in advance of NCEP's April 1, 2003 switch of its primary computational system hardware from a Cray to an IBM SP.

Clouds from AVHRR

In 2002, STC implemented the first operational application of Clouds from AVHRR (CLAVR) software, processing NOAA-16 data. The existing NOAA-KLM radiation budget software was modified to use CLAVR cloud codes in computing retrievals of outgoing longwave radiation and absorbed shortwave radiation. The software was further modified to create a second module that computes clear-sky retrievals using the CLAVR cloud mask information. Subtracting the clear sky from the all sky product produces a measure of cloud radiative forcing, which is important for studying climate. An improved CLAVR system,



CLAVR-x Cloud Product of Hurricane Isabel.

CLAVR-x, will soon be operational and replace the current system. CLAVR-x is capable of writing cloud mask information directly back to AVHRR orbital data records and will provide a high-quality/high resolution cloud product for input to any NOAA/POES product system.

LRIT

STC developed the Low Rate Information Transmission (LRIT) System, a digital service to replace the current Weather Facsimile service. STC was instrumental in getting the LRIT system ready for delivery.

STC developed the prototype product processing and distribution systems. The code is written in Java. STC was involved in most aspects of the project, including writing the requirements document and choosing a hardware vendor for the data ingestor. STC wrote and was responsible for IPD's portion of the Preliminary Design and Critical Design. STC was responsible for the development of the LRIT Product Processing System, including code development, configuration management, unit testing, integration testing, end-to-end testing, software delivery, and documentation. STC coordinated with data providers to incorporate various data types into the LRIT data stream. LRIT becomes operational in Fall 2003.

Satellite Active Archive Is a CLASS Act

NESDIS is responsible for the collection, archiving, and dissemination of environmental data collected by NOAA and by a number of its partners including NASA. To prepare for large increases in its data holdings, NESDIS initiated the planning and development for the Comprehensive Large Array-data Stewardship System (CLASS) to provide archive and access services for these data. CLASS will handle the data flow from current satellite-based systems, namely NOAA POES and GOES satellites as well as those of the Defense Meteorological Satellite Program. In addition, CLASS will support ground-based systems, specifically, the Next Generation Weather Radar, and *in situ* systems like the Automated Surface Observing System. CLASS is being structured to handle the large increases in data that will come from planned satellite launches including Meteorological Operational satellites (MetOp), National Polar-orbiting Operational Environmental Satellite System (NPOESS), and NPOESS Preparatory Project. The Satellite Active Archive (SAA) was chosen as the base-line for CLASS. CLASS incorporates the SAA team from Suitland, Maryland, as well as separate teams from West Virginia and Colorado. Five STC personnel contribute significantly to the development, maintenance and systems administration efforts within the SAA team. The CLASS user interface is located at <http://www.saa.noaa.gov>.

CEMSCS RECOMPETE

The current Central Satellite Data Processing Center contract at IPD ends on October 31, 2004. The new contract has been renamed Central Environmental Satellite Computer System (CEMSCS). The contract has a base duration of 5 years with a maximum possible duration of 10 years. We will, once again, be teaming with CSC for the recompile. □

Airborne Systems Development at NASA LaRC

Flight simulators, a Boeing 757-200 aircraft, and small General Aviation aircraft are all "hardware" in NASA Langley Research Center's research toolbox to improve various aspects of aircraft safety and efficiency.

STC Electronics Technicians **Paul Timbrell**, Senior Technician, and **Karen Cruz** support the Airborne Systems Competency, Systems Development Branch at NASA LaRC. These personnel are responsible for

facilitating the fabrication and verification of innovative Flight Research systems and providing the transition from the laboratory to the research aircraft. **Steve Sudik**, Software Engineer for STC, provides software support.

The two Boeing 757 Simulation-to-Flight laboratories referred to as the Research Systems Integration Laboratory (RSIL) and the Flight Systems Integration Laboratory (FSIL), provide two critical functions in the Center's development of Simulation-to-Flight Capability. The RSIL supports the operation of the flight simu-



Steve Sudik flies the Boeing 757 Simulator.

lators through hardware and software configurations, which can be transitioned to the aircraft. The FSIL enables the integration and checkout of research systems prior to integration on the aircraft.

The Boeing 757-200 aircraft is used to conduct research to increase aircraft safety, operating efficiency and compatibility with future air traffic control systems. The aircraft is part of the Transport Research Facilities (TRF). The TRF is a set of tools used in the simulation-to-flight concept. This concept incorporates common software and processes for both ground based flight simulators and the Boeing 757 aircraft.

STC Electronics Technician **Tom Feigh** supports the General Aviation aircraft work, including a Cessna 206H Stationair and a Lancair Columbia 300. The Cessna 206H Stationair is utilized as a testbed demonstrator for the application and integration

of newer technologies into a commonly available small aircraft design. The Lancair Co-



Boeing 757-200 research plane in hangar.

lumbia 300, which was certified after thousands of hours spent on design and testing and incorporates innovative applications of composites developed by NASA and industry, is used to develop and demonstrate new avionics and control systems applicable to present and future small aircraft transportation.

STC personnel have supported a variety of experiments ranging from commercial aircraft safety, such as Airborne Information for Lateral Spacing (AILS), Synthetic Vision and Runway Incursion to atmospheric experiments such as LIDAR and Gas and Aerosol Monitoring Sensorcraft (GAMS).□



Lancair Columbia 300 with Paul Timbrell.

Sue Crofts Retires

Twenty-seven years ago, **Marlene "Sue" Crofts** started a working relationship with **Dr. Adarsh Deepak** that became one of the central pillars of STC. On August 8, 2003, Sue retired to be at home with her already-retired husband, Darrell. Sue has often said, "I love being at home," but she loved being at STC as well and it was with very mixed emotions that she left.

Over 55 people attended Sue's farewell luncheon, which was held at the NASA cafeteria. From the longest-term employees, to NASA associates, to the very newest employees, and including Sue's husband and other family members, all attended out of love and respect for Sue. Famous for her cinnamon rolls, brownies, and other baked delights, but more importantly for her sincere caring for all the people she came in contact with, she was sometimes known as "Momma Sue" in the office, a characteristic she also conveyed to the newest employee. Sue selected the NASA cafeteria for the luncheon

because of the special friends she has there who have supported her many (and often last minute) requests for catering for STC. On this occasion, though, **Carol Lightner** handled all the logistics.



Dr. Deepak presents Sue Crofts with a plaque commemorating her many years with STC.

Dr. Deepak reminisced over many of the happenings during the years of his association with Sue—the conferences she organized, the proposal overnights she worked on (including a 3-day stint without going home), his respect for her opinion, her dedication and going the extra mile, and her cheerfulness and caring. He presented her with a plaque commemorating her years with the company, and the latest state-of-the-art sewing machine, which delighted her. **Carla Coombs**, representing the employees, made a speech of further humorous reminiscences and conveyed the feelings of the employees to Sue. There were additional gifts, including a vacation getaway, and a scrapbook of photos and personal messages from the employees, and Sue made a farewell speech, often teary-eyed, to end the occasion.□

STC Meeting Services International

• **International Symposium on Spectral Sensing Research (ISSSR) 2003**, Santa Barbara, CA, 2–6 June 2003

ISSSR 2003 was held at the Fess Parker's Doubletree Resort. Dr. John Ferriter, SBCCOM, chaired the Symposium, which focused on "Sensing from Land, Sea, Air, and Space." Despite the fact the Iraqi war situation somewhat impacted attendance, a full program was supported, including a poster session. Keynote presentations were made by BG Stephen V. Reeves, Joint Program Executive Officer for Chemical and Biological Defense; Dr. Salvatore R. Bosco, DTRA; Mr. Thomas S. Pagano, JPL; Dr. Stephen G. Ungar, NASA GSFC; and Dr. Richard B. Gomez, George Mason University, was the Dinner Speaker. Contacts with companies in the Santa Barbara area enabled attendees to take advantage of invitations to visit their facilities. During the week, discussions were held to lay the groundwork for ISSSR 2005 and a date was set for November 2005.

STC Meetings Services International, led by **Diana McQuestion**, handled the pre-conference logistics, onsite support, and publication of the proceedings on CD-ROM, under contract with SBCCOM and the Army Research Office.