Appendix A. Memorandum of Agreement

MEMORANDUM OF AGREEMENT

Between the

National Oceanic and Atmospheric Administration,
United States Department of Commerce

And

Board of Regents of the University of Wisconsin System

Concerning the

COOPERATIVE INSTITUTE FOR METEOROLOGICAL SATELLITE STUDIES

Also known as

CIMSS

I. PURPOSE AND SCOPE

a. Purpose

This Memorandum of Agreement (MOA) reaffirms the shared interests of the U.S. Department of Commerce (DOC) National Oceanic and Atmospheric Administration (NOAA) and the Board of Regents of the University of Wisconsin System (UW) in establishing the Cooperative Institute for Meteorological Satellite Studies (CIMSS), a NOAA supported Cooperative Institute (CI). CIMSS will facilitate collaborative research and outreach activities in support of NOAA mission goals related to the following four thematic areas: Satellite Meteorology Research and Applications; Satellite Sensors and Techniques; Environmental Models and Data Assimilation; and Outreach and Education The University of Wisconsin-Madison (UW-Madison) enters into this MOA as the CIMSS lead institution and represents the team of UW academic members that committed to the CI in the proposal submitted in response to NOAA's Announcement of Federal Funding Opportunity appearing in the *Federal Register* on November 27, 2009

(74 FR 62283-62285).

b. Scope

Participation in CIMSS is open to all NOAA organizational elements. Engagement across NOAA line offices and with other entities is critical to enable CIMSS to meet its mission objectives outlined above. CIMSS' mechanisms for involvement will include outreach and public information via a CIMSS Web site, regional and extra-regional cooperation fostered by various thematic working groups and multi-disciplinary, multi-institutional and jointly funded projects among and between CIMSS and NOAA.

The range and task organization of administrative, research and development and outreach relationships between CIMSS and NOAA are set forth as follows:

1. Task I: Administrative Activities -- Activities that fall under this task are related to management of CIMSS, as well as general education, outreach and transition activities. Task I also may include, in consultation with NOAA, support for visiting scientists or postdoctoral activities not specifically working on Task II or Task III research projects.

2. Task II: Research activities involving on-going direct collaboration with NOAA scientists. The collaboration typically is fostered by the co-location of CIMSS and NOAA scientists.

3. Task III: Research activities that generally require only minimal direct collaboration with NOAA scientists. Projects that fall under this task would include research that is funded by other NOAA competitive grant programs, NOAA funding announcements administered through CIMSS, NOAA awards directly to CI scientists, as well as funding from other Federal agencies.

II. REFERENCES AND AUTHORITY

Nothing in this MOA is intended to conflict with current NOAA or UW policies, regulations, and statutes. If any terms of this Agreement are inconsistent with existing policies, regulations and statutes of any parties entering into this Agreement, those portions of this Agreement that are determined to be inconsistent shall be deemed invalid. Any terms and conditions not affected by any inconsistency shall remain in full force and effect. At the first opportunity after any inconsistency is found, all parties will meet to discuss and agree upon all the necessary changes that will be made by amending this Agreement.

Should disagreement arise on the interpretation of the provisions of this Agreement, or

amendments and/or revisions thereto that cannot be resolved at the operating level, the area(s) of disagreement shall be stated in writing by each party and presented to the other party for consideration. If agreement on interpretation is not reached within 30 days, the parties shall forward a written presentation of the disagreement to NOAA's Assistant Administrator for the National Environmental Satellite, Data, and Information Service (NESDIS) and to the Vice Chancellor for Research/Dean of the Graduate School at UW-Madison for appropriate resolution.

NOAA has authority to conduct research and to provide financial assistance for the research activities addressed in this MOA with CIMSS under 15 U.S.C. 1540, which provides authority to enter into cooperative agreements and other financial agreements with any nonprofit organization to aid and promote scientific and educational activities to foster public understanding of NOAA or its programs. Pursuant to 118 Stat. 71 (January 23, 2004) and under the cooperative agreement establishing the CI, NOAA may use CIMSS personnel, services, or facilities for research, education, training, and outreach to carry out NOAA's mission. Other relevant authorities are set forth in the NOAA cooperative agreement used to fund such research activities.

III. FINANCIAL ARRANGMEMENTS

This MOA does not constitute a financial commitment on the part of either party. Financial support for CIMSS shall be contingent upon the availability of funds appropriated by Congress and subject to the ordinary budgetary and administrative procedures of NOAA and UW-Madison, as applicable. NOAA funds shall not be obligated directly or indirectly without written approval of an authorized NOAA official. This MOA does not prohibit UW-Madison from soliciting funds solely for their expenses and activities under CIMSS from other Federal, state, and local agencies, international entities, and private sources. UW-Madison, however, is prohibited from accepting funds through CIMSS's from sources that are prohibited from conducting business with the United States government. Research conducted by each of the academic team members will be performed on a cost reimbursable basis.

IV. SUBSTANCE

a. Campus Location

CIMSS is housed in and administered by the Space Science and Engineering Center (SSEC) at UW-Madison. SSEC is located within the UW-Madison Graduate School, which oversees graduation education and a large sector of the campus research enterprise. The Director of CIMSS shall report to the Director of SSEC and the Dean of the Graduate School.

b. Composition

CIMSS Director - The Director shall be a non-Federal, senior scientist, PI, and member of the Department of Atmospheric and Oceanic Sciences, who is employed by the UW-Madison and subject to the policies, regulations and procedures of the University. The Director, who serves as the chief administrator of the Institute, shall be appointed by the Dean of the UW-Madison Graduate School.

The responsibilities of the Director include:

1. Scientific leadership through the development of research programs;
2. Engagement of local and visiting scientists in CIMSS activities;
3. Participation on and administrative support of the CIMSS Board of Directors;
4. Financial accountability of all funds supplied to CIMSS;
5. Presentation of an annual report of research results and other CIMSS activities to the Board of Directors; and
6. Negotiation of MOAs with agencies and organizations interested in becoming affiliated with CIMSS (in coordination with NOAA and UW-Madison).

CIMSS Board of Directors (Board of Directors) – The Board of Directors will consist of senior employees from NOAA and UW-Madison, who will provide, among other things, "One NOAA" oversight and direction to CIMSS, and communicate NOAA policies, priorities, coordination opportunities, and performance matters. The Board of Directors will meet at least once yearly to review the policies, research themes, and priorities of CIMSS, including budget and scientific activities. The Board of Directors will also provide for the periodic external review of the scientific activities of CIMSS. The Board of Directors will be responsible for approving the appointment of members to the Science Advisory Council. The Director of CIMSS or his designee shall serve as a non-voting member of the Board of Directors. The NESDIS Cooperative Research Program Director will serve as a special advisor to the Board in an *ex officio* status.

CIMSS Science Advisory Council (Science Council) - The Science Council will advise the CIMSS Director in establishing the broad scientific content of CIMSS programs, promoting cooperation among CIMSS, NOAA, NASA and other agencies, maintaining high scientific and professional standards, and preparing reports of CIMSS activities. The Science Council, which shall meet formally at least once yearly, shall consist of not less than one employee from all member agencies, and an equal number of University employees holding regular University appointments. All Science Advisory Council members shall be recommended by the Director of CIMSS for approval by the Board of Directors. In addition the Executive Director of SSEC or designee shall be a Council member. Council members shall serve three-year terms. Reappointment is possible for additional three-year terms pending approval by the Board. The number of Council members shall be set by the Board, provided the number of University members equal the total number of agency members. The Director of CIMSS will serve as the Chairperson of the Council. The NESDIS Cooperative Research Program Director will serve as a special advisor to the Council in an *ex officio* status.

CIMSS Staffing Structure - CIMSS research activities will be conducted by individuals serving as CIMSS Associates, in accordance with the terms of this MOA. Associates will have University appointments within SSEC, the host unit for CIMSS in the UW-Madison, and will be designated CIMSS Associates on the basis of their ability to contribute to the objectives of CIMSS. Their association will be at the recommendation of the Director of CIMSS. The categories of CIMSS Associates are the same as the University appointment categories of Faculty, Honorary Fellows, Visiting Scientists, Scientists, Research Associates, Research Assistants, and support staff. The UW-Madison assumes full responsibility for the management of all employees funded through CIMSS.

FACULTY: Faculty members are professional staff of the University of Wisconsin-Madison who may have concurrent appointments within CIMSS in order to provide a range of teaching, research, and services to assist in filling the objectives of CIMSS.

HONORARY FELLOWS: Honorary Fellows are scientists of established national or international standing and who are staff members in a CIMSS agency member.

VISITING SCIENTISTS: Visiting Scientists are scientists on leave from their home agency or organization who will reside at CIMSS and conduct research in support of CIMSS research objectives. Their association will be based on CIMSS program needs and scholarship. These appointments will normally be for one year.

SCIENTISTS: Scientists hold regular staff appointments in SSEC. They are responsible for conducting research on existing CIMSS programs as well as developing new research projects.

RESEARCH ASSOCIATES: Research Associates are post doctorate appointments which are aimed at providing training and research experience to the incumbent as well as producing significant research results for CIMSS. These appointments shall normally be for up to three years.

RESEARCH ASSISTANTS: Research Assistants are graduate students with the UW-Madison pursuing Master's and Ph.D. degrees. They conduct research work within CIMSS science programs, with their required theses an outcome of their participation.

SUPPORT STAFF: Support Staff hold regular staff appointments in SSEC and spend the majority of their time on CIMSS matters. They are responsible for providing technical and administrative support to other associates in CIMSS.

SSEC/CIMSS Administrative Staff - UW-Madison will be responsible for providing the administrative staff for grants and contracts management, human resource management, systems administration, procurements, and all necessary support staff roles for CIMSS activities at UW-Madison. CIMSS will actively promote undergraduate and graduate education through internships, cooperative experiences, graduate assistantships, and

fellowships. The UW-Madison assumes full responsibility for the management of all employees funded through CIMSS.

Organization

CIMSS may adopt such organizational arrangements, roles and responsibilities as the Director, in consultation with the Board of Directors and NOAA, deems necessary to meet its goals and carry out its programs.

Responsibilities of UW-Madison

UW-Madison shall

- Take full financial and administrative responsibility for its employees affiliated with CIMSS.
- Provide suitable space and office facilities for the administration of CIMSS.
- Provide space and office facilities for NOAA onsite scientists. This MOA does not replace the need for a permit or other agreement required to enable CIMSS or NOAA or other federal government agencies to accept designated space or office facilities.
- Exercise responsibility for the operation of CIMSS with regard to business and financial matters
- Provide through SSEC clerical, administrative, and technical assistance, and other auxiliary services, including accounting and personnel services, to the CIMSS Director. CIMSS will operate within SSEC.

Responsibilities of NOAA

NOAA employees will work collaboratively with CIMSS to conduct research and joint activities. Specifically:

- Include CIMSS in NOAA's CI activities, and work with CIMSS to ensure that management of CIMSS is consistent with NOAA's CI policies and procedures. NOAA shall convene an annual meeting of all CIs, including CIMSS.

- Facilitate one-NOAA oversight by ensuring applicable NOAA employees are represented on the CIMSS Board of Directors and Science Advisory Council.

- Identify potential NOAA programs that would benefit from collaborations with CIMSS.

- Coordinate a peer-review of CIMSS in the fourth year of the initial CIMSS cooperative agreement.

- Maintain a research group co-located with CIMSS in Madison, Wisconsin, and engaged in joint research activities. This group will consist of a minimum of 5 to a maximum of 15 members, and its residence costs, if any, will be covered in a separate agreement between the University of Wisconsin and NOAA.

c. Conduct of the research program

Research to be conducted by CIMSS addresses critical scientific challenges focusing on the three research themes and outreach theme that are relevant to NOAA's mission and to the mission of CIMSS. The Director of CIMSS is responsible for:

i. Developing annual research plans collaboratively with NOAA;

ii. Verifying research tasks are appropriate for CIMSS;

iii. Facilitating the execution of research tasks required to implement research plans; and

iv. Assessing and reporting performance to NOAA, the Board of Directors and the Science Advisory Council.

V. TERM

This Memorandum of Agreement is effective as of the date of signature and remains in effect until the end of the CIMSS Cooperative Agreement/Institutional Award, which is in effect until June 30, 2015.

VI. MODIFICATION/TERMINATION PROCESS

Either party may terminate this agreement unilaterally on six month's written notice. Proposals to modify the terms of the MOA can be initiated by either NOAA or UW-Madison and will be subject to approval by NOAA's Assistant Administrator for the National Environmental Satellite, Data, and Information Service and the Dean of the Graduate School at the UW-Madison. Such modifications to the MOA will have no effect on CIMSS's Cooperative Agreement/Institutional Award.

VII. PERFORMANCE REPORTS

In accordance with the terms of the new CIMSS Cooperative Agreement, CIMSS will submit an annual performance report that describes accomplishments associated with all activities during the award year, including any additional information requested by NOAA pertaining to the operation of CIMSS. The NESDIS Cooperative Research Program Director is responsible for monitoring CIMSS and shall coordinate a review of the Annual Performance Report and discuss such findings, including any deficiencies with CIMSS.

VIII. OTHER PROVISIONS

a. Equal Opportunity

All CIMSS participating institutions, as Equal Opportunity and Affirmative Action employers, will comply with applicable Federal and State laws prohibiting discrimination. All participating institutions agree not to discriminate against any applicant, employee or student on the basis of race, religion, color, creed, gender, age, national origin, sexual orientation, disability, or veteran status. Contracts and grants, or other agreements entered pursuant to this MOA shall contain appropriate provisions relating to Equal Opportunity, E.O. 11249.

b. Compliance

The University of Wisconsin-Madison and CIMSS shall comply with all applicable laws, regulations, rules and ordinances. This agreement is effective upon the date of signature of all parties.

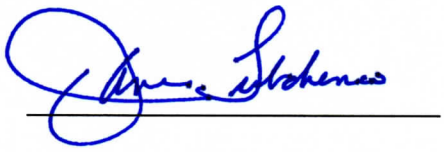
IX. POINTS OF CONTACT

Ingrid Guch, Director, NESDIS Cooperative Research Program, 301-763-8127, Ingrid.Guch@noaa.gov, 5200 Auth Road 701 Camp Springs Maryland 20746.

Dr. Steven A. Ackerman, Director, Cooperative Institute for Meteorological Satellite Studies, 608-263-3647, steve.ackerman@ssecwisc.edu, Space Science and Engineering Center, University of Wisconsin, Madison, WI 53706.

Execution

IN WITNESS WHEREOF, the parties have executed this Agreement the day and year written below.



Dr. Jane Lubchenco
Under Secretary of Commerce for Oceans and Atmosphere

Dr. ~~Carolyn Martin~~ David Ward
Interim **Chancellor, University of Wisconsin – Madison**

Appendix B. Personnel Summary

CIMSS PERSONNEL SUMMARY: (143 Associates) August 2013

CIMSS	Steve Ackerman	Director
ADMINISTRATION	Wayne Feltz	Associate Director
AND TECHNICAL SUPPORT (4):	Maria Vasys	Associate Outreach Specialist
	Leanne Avila	Editor/Webmaster

UNIVERSITY PRINCIPAL INVESTIGATORS: (28)

(Steve Ackerman	Professor, AOS	Clouds / Aerosols)
(Wayne Feltz	Associate Scientist	Aviation Weather)
Bryan Baum	Associate Scientist	Cloud Microphysics
Ralf Bennartz	Professor, AOS	Microwave / Radiative Transfer
Mike Foster	Assistant Researcher	Cloud microphysical properties
Tom Greenwald	Associate Scientist	Microwave / Data Assimilation
Liam Gumley	Instrument Innovator	Direct Broadcast and Data Analysis
Mathew Gunshor	Researcher	Calibration/Validation
Bob Holz	Assistant Scientist	NPOESS / Lidar
Allen Huang	Distinguished Scientist	Retrieval Science / Hyperspectral
Bormin Huang	Assistant Scientist	Data Compression / Retrieval Science
Bob Knuteson	Associate Scientist	Hyperspectral Instruments / Data Analysis
Matthew Lazarra	Assistant Scientist	Antarctic Research
Jun Li	Senior Scientist	Retrieval Science / Hyperspectral
Colleen Mouw	Associate Researcher	Ocean and fresh water remote sensing
Paul Menzel	Senior Scientist	Clouds and Climate / Instrumentation
Jason Otkin	Assistant Scientist	Data Assimilation
Ralph Petersen	Senior Scientist	NWP / Nowcasting
Grant Petty	Professor, AOS	Microwave / Rainfall
Elaine Prins	Contracting Scientist	Biomass Burning / Aerosols
Chris Rozoff	Associate Researcher	Tropical Cyclones
Hank Revercomb	Senior Scientist	Hyperspectral Instruments/Data Analysis
Dave Santek	Assistant Scientist	Polar Winds / Data Assimilation
Chris Schmidt	Senior Researcher	Biomass Burning
Bill Smith Sr.	Senior Scientist	Hyperspectral Instruments/Data Analysis
Kathy Strabala	Assistant Scientist	Direct Broadcast and Data Analysis
Dave Tobin	Associate Scientist	Radiative Transfer
Chris Velden	Senior Scientist	Satellite Winds / Tropical Cyclones
Elizabeth Weisz	Associate Scientist	Hyperspectral Instruments/Data Analysis
Anthony Wimmers	Researcher	Tropical Cyclones / Aviation Weather

NOAA SCIENTISTS: (9)	Jeff Key	ASPB Team Leader
	Robert Aune	ASPB
	Andrew Heidinger	ASPB
	Mike Pavolonis	ASPB
	Brad Pierce	ASPB
	Tim Schmit	ASPB
	Gary Wade	ASPB
	Jim Kossin	NCDC
	Robert Rabin	NSSL

UNIVERSITY SCIENTIFIC AND PROGRAMMING STAFF (66)	Paolo Antonelli	Researcher
	Scott Bachmeier	Researcher
	Kaba Bah	Assistant Researcher
	Eva Borbas	Associate Scientist
	Lori Borg	Associate Researcher
	Denis Botambekov	Assistant Researcher
	Jason Brunner	Associate Researcher
UNIVERSITY SCIENTIFIC AND PROGRAMMING STAFF	Corey Calvert	Researcher
	John Cintineo	Assistant Researcher
	Lee Cronce	Associate Researcher
	Geoff Cureton	Asst. Instrument Innovator
	Jim Davies	Associate Researcher
	Ralph Dedecker	Emeritus
	Russ Dengel	Sr. Instrumentation Tech
	Dan DeSlover	Researcher
	George Diak	Emeritus
	Rich Dworak	Associate Researcher
	Joleen Feltz	Assistant Researcher
	Richard Frey	Researcher
	Ray Garcia	Instrument Innovator
	Pat Heck	Researcher
	Derrick Herndon	Associate Researcher
	Mike Hiley	Research Intern
	Jay Hoffman	Associate Researcher
	Brett Hoover	Assistant Researcher
	Tommy Jasmin	Sr. Systems Programmer
	Joo Hyeon Kim	Associate Researcher
	Ralph Kuehn	Assistant Researcher
	Mark Kulie	Assistant Researcher
	Yong-Keun Lee	Associate Researcher
	Allen Lenzen	Sr. Instrumentation Tech
	Jinlong Li	Researcher
	Zhenglong Li	Associate Researcher
	Scott Lindstrom	Sr. Instrument Technician
	Yinghui Liu	Researcher
	Graeme Martin	Associate Instrument Technician
	Jarno Mielikainen	Assistant Innov Researcher
	Scott Mindock	Associate Instrument Innovator
	Szu-Chia Moeller	Assistant Researcher
	Chris Moeller	Researcher
	Christine Molling	Associate Researcher
	Sarah Monette	Assistant Researcher
	Margaret Mooney	Sr. Outreach Specialist
	Fred Nagle	Researcher
	Jim Nelson	Researcher
	Sharon Nebuda	Associate Researcher
	Tim Olander	Assistant Innov Researcher
	Erik Olson	Researcher
	Min Oo	Associate Researcher
	Youri Plokhenko	Assistant Scientist

	Greg Quinn	Instrument Technician
	Tom Rink	Assistant Innov Researcher
	Mark Rogal	Assistant Researcher
	Patrick Rowley	Associate Outreach Specialist
	Todd Schaack	Researcher
	Eva Schiffer	Associate Instrument Technician
	Tony Schreiner	Researcher
	John Sears	Assistant Researcher
	Justin Sieglaff	Associate Researcher
	Nadia Smith	Assistant Researcher
	Dave Stettner	Associate Researcher
	William Straka	Associate Researcher
	Xuanji Wang	Researcher
	Steve Wanzong	Associate Researcher
	Tom Whittaker	Researcher
	Hong Zhang	Associate Instrument Tech
POST DOCTORS: (3)	Agnes Lim	Research Associate
	Aronne Merrilli	Research Associate
	Yue Li	Research Associate
STAFF AT OTHER SITES: (4)	Chad Gravelle	NWS Training Center
	Jim Jung	NCEP/Assistant Scientist
	Amanda Terborg	NCEP/AWC
	Tony Wimmers	U.Calgary/Associate Researcher
VISITING SCIENTISTS (4)	Waad Ibrahim	Syria
	Mohammad Satria	Indonesia
	Xianyun Wu	China
	Jie Zhang	China

GRADUATE STUDENTS: (16)

Student	**Degree**	**Science Advisor**	**Academic Advisor**
Michelle Feltz	M.S.	Knuteson	Ackerman
Jordan Gerth	M.S.	Ackerman	Ackerman
Amanda Gumber	M.S.	Foster	Ackerman
Kyle Hosley	M.S.	Pierce	Ackerman
Aaron Letterly	M.S.	Key	Ackerman
Brent Maddux	Ph.D.	Ackerman	Ackerman
Willem Marais	M.S.	Gumley	Ackerman
(Michael Pavolonis	Ph.D.	Heidinger	Ackerman)
John Rausch	M.S.	Bennartz	Bennartz
Ilya Razenkov	M.S.	Eloranta	Ackerman
Jacola Roman	Ph.D.	Knuteson	Ackerman
Alexa Ross	M.S.	Holz	Ackerman
Walter Sessions	Ph.D.	Holz	Ackerman
William Smith, Jr.	Ph.D.	Ackerman	Ackerman
Gary Wade	M.S.	Menzel	Ackerman
Pei Wang	Ph.D.	Jun Li	Ackerman

UNDERGRADUATE STUDENT EMPLOYEES (9)
Carissa Bunge
Britta Gjermo
Zach Murphy
Kevin Oliva
Erik Price
Louis Schiff
Tom Slattery
Nick Weber
Akira Wong

Appendix C. CIMSS Board of Directors and Science Council

CIMSS Board of Directors

The Board of Directors meets formally approximately once a year to review the policies, research themes, and priorities of CIMSS, including budget and scientific activities. The Board is also responsible for approving the appointment of members to the Science Advisory Council. The most recent Board of Directors meeting was held in June 2011. Current Board of Directors members include:

Martin Cadwallader, Chair	Dean, Graduate School, UW-Madison
Steven A. Ackerman	Director, CIMSS, UW-Madison
Henry E. Revercomb	Director, SSEC, UW-Madison
Grant Petty	Chair, Department of Atmospheric and Oceanic Sciences, UW-Madison
Mary Kicza	Assistant Administrator for Satellite & Information Services., NOAA/NESDIS
Alfred Powell	Director, Center for Satellite Applications and Research, NOAA/NESDIS
Jeff Key	Chief, Advanced Satellite Products Branch, NOAA/NESDIS
Jack Kaye	Associate Director for Research, NASA
Peter Hildebrand	Director, Earth-Sun Exploration Division of the Sciences and Exploration Directorate, NASA Goddard Space Flight Center
Lelia Vann	Director, Science Directorate, NASA Langley Research Center

CIMSS Science Advisory Council

The Science Advisory Council advising the CIMSS Director in establishing the broad scientific content of CIMSS programs, promoting cooperation among CIMSS, NOAA, and NASA, maintaining high scientific and professional standards, and preparing reports of CIMSS activities. The Science Council normally meets every 1-2 years; however, the last Council meeting was held in November 2009. Science Council members include:

Allen Huang	Distinguished Scientist, CIMSS
Chris Velden	Senior Scientist, CIMSS
Trina McMahon	Professor, College of Engineering, UW-Madison
Annemarie Schneider	Professor, SAGE, UW-Madison,
Tristan L'Ecuyer	Professor, Department of Atmospheric and Oceanic Sciences, UW-Madison
Christopher Kummerow	Director, Cooperative Institute for Research in the Atmosphere, and Professor, Department of Atmospheric Science, Colorado State University
Bob Ellingson	Professor, Department of Earth, Ocean, and Atmospheric Science, Florida State University
Steve Goodman	GOES-R Senior Scientist, GOES-R Program Office
Ingrid Guch	Chief, Atmospheric Research and Applications Division, NOAA/NESDIS/ORA
Pat Minnis	Senior Research Scientist, NASA Langley Research Center
Steve Platnick	Acting EOS Senior Project Scientist, NASA Goddard Space Flight Center

Appendix D. Project List

NOAA - CIMSS Cooperative Agreement Proposal Summary for FY2013		
#	**Proposal Title**	**CIMSS PI**
	CIMSS Task I Support	Steve Ackerman
1	SARP: Climate Extreme Event Preparedness and Communication	Margaret Mooney
2	Conducting a Teacher Workshop at the 2013 ESIP summer conference	Margaret Mooney
3	CIMSS Collaboration with the NOAA Aviation Weather Center	Wayne Feltz
4	CIMSS Collaboration with the NOAA National Weather Service Training Center	Wayne Feltz
5	GOES-R Education Proving Ground and Super Rapid Scan Animations for Science on a Sphere	Steve Ackerman
6	CIMSS Participation in the GOES-R Algorithm Working Group (AWG) for 2013	Allen Huang
7	CIMSS Participation in the Development of a GOES-R Proving Ground	Wayne Feltz
8	SSEC/CIMSS Research Tasks in Support of the SuomiNPP and Joint Polar Satellite System (JPSS) Program 2013	Henry Revercomb
9	SSEC/CIMSS Cloud Research in Support of the SuomiNPPand Joint Polar Satellite System (JPSS) Program	Steve Ackerman
10	Science and Management Support for Suomi NPP VIIRS Snow and Ice EDRs in 2013	Yinghui Liu
11	The Development of a Community Satellite Processing Package (CSPP) in support of Suomi NPP/JPSS Real Time Regional Applications for 2013	Allen Huang
12	SSEC/CIMSS Participation on the JPSS Algorithm Development Library Team for 2013	Liam Gumley
13	Implementation of Advanced Satellite Data Assimilation Techniques, Maintain JCSDA R2O / O2R capabilities and Perform Observing System Experiments in support of the JPSS.	James Jung
14	Support for the GOES-R Program	Steve Ackerman
15	CIMSS Participation in the Product Systems Development and Implementation (PSDI) for 2013	Steve Ackerman
16	CIMSS HIGH IMPACT WEATHER STUDIES WITH GOES-R AND ADVANCED IR SOUNDINGS	Jun Li
17	CIMSS Cal/Val Activities in Support of the Calibration Working Group	Matthew Gunshor
18	CIMSS Participation in the GOES-R Risk Reduction Program for 2013	Steve Ackerman
19	Sea Ice Thickness from Aqua and Terra Data: Generation, Evaluation and Applications	Xuanji Wang
20	Implementation of GCOM-W1 AMSR2 Snow Products	Yong-Keun Lee
21	Improving very-short-range forecasts for the NWS Alaska Region using objective tools designed to optimize the retention of Hyperspectral Infrared and Microwave Moisture LEO Soundings	Ralph Petersen
22	CIMSS Participation in the 2013 GOES Improved Measurements and Product Assurance Plan (GIMPAP)	Steve Ackerman
23	Consistent Cloud Thematic Climate Data Records From Historical, Current, and Future +NOAA POES Sensors	Mike Foster
24	CIMSS Participation in SHyMet for 2013	Steve Ackerman

25	Proposal for an Upgrade to the NOAA NESDIS Supercomputer for Satellite Simulations and Data Assimilation Studies (S4) at the Space Science and Engineering Center, University of Wisconsin-Madison.	Liam Gumley
26	CIMSS Infrastructure Support for Product Development, Demonstration, and Operational Transition	Steve Ackerman
27	CIMSS Studies on Advanced IR Sounder for Geostationary Orbit with Regional OSSE	Jun Li
28	Climate Data Records to NCDC Climate Data Records to NCDC	Yinghui Liu
29	Development, Generation, and Demonstration of New Ice Products in Support of a National Ice Center JPSS Proving Ground and Risk Reduction Activity	Yinghui Liu
30	CIMSS Participation in Improved Cyclone Tracking and VIIRS Cloud Products Using DNB the JPSS Risk Reduction Program for 2013	Steve Ackerman
31	Application of JPSS Imagers and Sounders to Tropical Cyclone Track and Intensity Forecasting	Christopher Velden
32	Hyperspectral Retrievals from Polar-Orbiting Sounders for Use in NWS Alaska Region Forecasting Applications	Elisabeth Weisz
33	UW Scanning-HIS participation in the NPP/JPSS Aircraft field campaigns	Hank Revercomb
34	2013-2014 JPSS Algorithm Continuity Proposal	Steve Ackerman
35	Ongoing Investigations in Support of the JPSS Program Office	Steve Ackerman
36	Contributions from NSSL to the Observing System Simulation Experiment (OSSE) Testbed	Jason Otkin
37	JAFIIR (JPSS Analysis Facility for Instrument Impacts on Requirements)	Mathew Gunshor
38	Development of a Geostationary Community Satellite Processing Package (CSPP)	Liam Gumley
39	Network of Direct Broadcast Antenna Systems to Provide Real-Time Infrared and Microwave Sounder Data to NOAA for Numerical Weather Prediction	Liam Gumley
40	GOES-R Calibration/Validation Field Campaign Support (Year 2)	Wayne Feltz

Appendix E. Collaborations

CIMSS Current Collaborations with Cooperative Institutes and NOAA Laboratories										
CIMSS Scientist(s)	Collaborator(s)	Topic	CIRA	CIRES	CREST	CICS	CIMMS	NSSL	ESRL	AOML
Velden, C. Wanzong, S.	Lindsey, D.	GOES-RRR	x		x					
Rozoff, C.	Knaff, J. DeMaria, M.	Tropical cyclone structure (GOES-RRR)	x							
Liu, Y.	Tschudi, M.; Romanov, P.	VIIRS snow and ice EDRs		x	x					
Lee, Y-K.	Kongoli, C.	GCOM-W1 AMSR2 cryosphere products				x				
Wang, X.	Tschudi, M.	NPP science team support of cryosphere products		x						
Kossin, J.	Schreck, C.	Kelvin waves in tropical cyclogenesis				x				
Kossin, J. Rozoff, C. Velden, C	DeMaria, M.	Improvements to SHIPS rapid intensification index	x							
Li, J.	Zupansky, M.	Utililty of GOES-R instruments for hurricane data assimilation and forecasting	x							
Schmit, T Gunshor, M.	Lindsey, D. Grasso, L.	10.35 micron window on GOES-R ABI	x							
Velden, C.	DeMaria, M.	JPSS	x							
Otkin, J.	Grasso, L.	Proxy radiance data testbed (GOES-RRR)	x							
Nelson, J.	Lindsey, D.	Supplied data	x							
Pavolonis, M. Sieglaff, J.	Lindsey, D.	Probabilistic nearcasting of severe convection using GOES convective cloud properties, NEXRAD, NWP	x							
Schmidt, C.	Schroeder, W.	Active fire and hot spot characterization (FIRE)				x				
Schmidt, C.	Brummer, R.	Active fire and hot spot characterization (FIRE)	x							
Ackerman, S. Mooney, M.	Buhr, S. Lynds, S.	On-line climate change course for undergraduates		x						
Ackerman, S. Mooney, M.	Arkin, P.	Weather and Climate connections for 3D spherical displays				x				
Walther, A. Heideinger, A.		GIMPAP: Fusing GOES obs and sky cover analysis products		x						
Wimmers, A.	Lindsey, D.	Enhanced downslope windstorm prediction w/GOES warning indicators	x							

CIMSS Scientist(s)	Collaborator(s)	Topic	CIRA	CIRES	CREST	CICS	CIMMS	NSSL	ESRL	AOML
Sieglaff, J.	Lakshmanan, V.	Daytime enhancement of UWCI/CT algorithm in areas of thin cirrus					x			
Otkin, J.	Jones, T.	Data assimilation					x			
Feltz, W.	Stumpf, G. Kuhlman, K.	GOES-R PG HWT testbed					x	x		
Feltz, W. Pavolonis, M. Sieglaff, J. Cintineo, J.	Lakshmanan, V. Smith, T.	Satellite WDSS-II object tracking, convective nowcasting fusion					x	x		
Otkin, J. Cintineo, B.	Jones, T. Stensrud, D. Koch, S. Kain, J.	GOES-R satellite NWP data assimilation					x	x		
Line, B.	Kuhlman, K.	GOES-R HWT satellite liaison					x	x		
Feltz, W. Pierce, B.	Turner, D. Coniglio, M. Koch, S.	Uplooking remote sensing mobile facility deployments					x	x		
Ackerman, S. Pierce, B. Feltz, W.	Klockow, K.	Social science					x	x		
Li, J.	Xie, Y.	Application of GOES moisture information in LAPS							x	
Li, J.	Birkenheuer, D.	Validation of GOES operational TPW with GPS-Met measurements							x	
Li, J.	Atlas, R.	Simulation of GEO advanced IR sounder data for OSSE								x
Otkin, J.	Lindsey, D. Coniglio, M. Kain, J.	Visualizing model output using synthetic satellite observations; produced synthetic satellite data for NSSL-WRF model						x		
Otkin, J.	Turner, D.	Data assimilation						x		
Li, J. Li, Z. Nelson, J. Dworak, R. Petersen, R. Schreiner, A.	Gutman, S. Holub, K. Birkenheuer, D. Allegrino, A. Daniels, J. Sharma, A. Nguyen, T. Schmit, T. Wade, G. Aune, R.	Implementation of updated GOES sounder retrieval algorithm within NESDIS operations	x						x	
Otkin, J.	Lakshmanan, V.	Developed and tested method to generate synthetic visible satellite imagery using numerical model output					x			

Appendix F. Research Topics of Current CIMSS Graduate Students and Post-Doctors

NOAA Funded Graduate Students

Barbara Arvani

Ph.D. research: Working with Dr. Brad Pierce and other CIMSS scientists on linking particulate matter (PM) measured at ground with satellite Aerosol Optical Depth (AOD) retrievals within the Po Valley, Italy and implementation of the IDEA-International aerosol forecasting system at the University of Modena and for air quality assessments/forecast.

Kaba Bah

Ph.D Thesis topic: This study will focus on using nested global-to-regional air quality forecast and chemical data assimilation models, satellite, airborne and ground based insitu and remote measurements to interpret air quality in the Denver, CO region during the NSF sponsored Front Range Air Pollution and Photochemistry Éxperiment (FRAPPÉ) field campaign (July 2014). CIMSS, in collaboration with the LASP at the University of Colorado- Boulder will be deploying ground based remote sensing instruments during FRAPPE including the SSEC Automated High Spectral Resolution Lidar (AHSRL), Atmospheric Emitted Radiance Interferometer (AERI), and LASP Solar Spectral Flux Radiometer (SSFR) which will be used to provide continuous measurements of clouds, aerosols, ozone, carbon monoxide, and atmospheric temperature and water vapor. These measurements will be assimilated within nested RAQMS/WRF-CHEM.

Jordan Gerth

M.S. Thesis title: "Improving Cloud and Moisture Representation by Assimilating GOES Sounder Products into Numerical Weather Prediction Initial Conditions" This study clarifies the impact of observations, in the form of retrievals, from the Geostationary Operational Environmental Satellite (GOES) Sounder on 12, 24, and 36-hour WRF model forecasts of precipitable water, low-level relative humidity, precipitation, and sky cover. Two experimental analyses are built from a CIMSS Regional Assimilation System (CRAS) pre-forecast spin-up. The CRAS assimilates precipitable water and cloud products derived from the GOES Sounder. An experimentation period between late September and early October 2011 found that the majority of impact in the experimental simulations compared to the control is recognized in the total precipitable water field over the first 12 hours. In some cases, this resulted in an improved precipitation forecast.

PhD Thesis title: "Relating Multi-source Cloud Observations to Numerical Model Output via Optimization." A sky cover product comprised of in-situ and remote observations is under development. A framework to develop a mathematical and physical relationship between the new sky cover product and existing forecast model cloud variables is proposed. The intended result is to produce better forecasts of sky cover for the general public and weather-sensitive industries, such as the aviation and energy sectors.

Caitlin Hart

M.S. Thesis title: "Interpretation of Small Particle Signatures in Satellite Observations of Convective Storms." Strong updrafts in mid-latitude convective storms eject supercooled water droplets into the tropopause and lower stratosphere (Wang, 2003). These droplets flash freeze at very low temperatures, causing them to be significantly smaller than the particles in the glaciated anvil top. Using the Daytime Cloud Optical Microphysical Properties (DCOMP) retrieval (Walther, et al., 2012) applied to GOES-East data, discrete minima are observed in the vicinity of the updraft core of severe thunderstorms in the effective radius retrieval. Several thunderstorms were analyzed for small particle signatures, which were compared to 30 dBZ NEXRAD echo to heights. An example from June 27, 2008 over Illinois of an

effective radius retrieval using MODIS data indicates several particle signatures that were not observable in GOES retrievals. This example demonstrates the importance of spatial resolution in correctly identifying updraft-related small particle regions.

Erik Janzon

M.S. Thesis title: "Data Assimilation of a Network of Ground-Based Boundary Layer Profilers: Changing the Horizontal Density of the Observations." The OSSE (Observing System Simulation Experiment) was conducted to assess the impact a network of ground-based remote sensing profilers would have when assimilated into a NWP model. Current research using the OSSE dataset has been conducted in order to assess the effect of the assimilation on mid-level frontogenesis during a wintertime convective event.

Yue Li

Post Doc Research: We studied the diurnal variations of land surface emissivities (LSE) using geostationary satellite data observations. Better understanding of LSE change can improve the retrieval accuracy from satellite observations and reduce uncertainties in number weather predictions. So the aim of this study is to investigate the magnitude and factors resulting variations of the LSE change.
b. We assessed the quality of CrIMSS post-launch EDR product. This assessment is important to report possible biases and deficiencies prior to the official release of CrIMSS product.

Agnes Lim

PhD Thesis title: "Assimilation of AIRS Radiances of Short Term Regional Forecasts using Community Models." The aim of this project is to assess the forecast impact brought by assimilation of clear sky AIRS radiances on short term regional forecasts. This study uses community model to carry out data assimilation and numerical weather prediction. Conclusions drawn from these study are non-operational systems need to be tuned prior to running experiments and that the assimilation of clear sky AIRS radiances is slightly positive for short term regional forecasts.
Post Doc Research Topic : Geo hyperspectral data OSSE. The aim of this project is to assess the potential forecast impact benefit brought by assimilating geostationary hyperpectral data whose spatial and temporal resolutions are much higher than the current low earth orbit hyperspectral sounders.

William Line

M.S. Thesis title: "Using Isentropic Techniques to Improve the Utility of GOES Moisture Observations." The CIMSS NearCasting model is a lagrangian trajectory model that dynamically projects GOES sounding observations of temperature and moisture forward in time to provide detailed, hourly updated information about the moisture and stability structure of the pre-convective environment 1-9 hours in advance. This study seeks to develop an improved version of the model by computing trajectories in an isentropic framework, since the GOES IR retrievals are made under clear sky conditions, where flow is primarily adiabatic. In addition to providing more accurate stability and shear information, the isentropic NearCasting model allows for the depiction of lift and total isentropic layer moisture, improving forecasts of the timing, location, and type of convection that may occur.

Chian-Yi Liu

Ph.D. Thesis title: "Remote Sensing of the Upper Tropospheric State of Storms Using Space-Borne High Spectral Resolution Infrared Measurements". This study addresses the use and handling of clear and cloudy high spectral resolution AIRS IR radiances, and the application of retrieved atmospheric profiles before the genesis of convective storms. The cloud-removal technique, alone with both clear and cloudy sounding retrievals algorithms in AIRS single field-of-view spatial resolution is developed to increase the algorithm capability in pre-storm environment. It is found that a tropospheric low stability is frequently occurred 3- to 6-hour before the convective storm developing, and the use of brightness temperature difference for detecting of tropospheric penetrating convection is effective in detection of deep convection.

Sarah Monette

M.S. Thesis title: "Tropical Applications of a Satellite-based Objective Overshooting Top Detection Algorithm." Research examines operational uses for an objective overshooting top detection algorithm including the employment of an objective overshooting top detection algorithm to various stages of a tropical cyclone, mainly genesis and intensification. In addition, the algorithm has been applied to the likelihood of an airplane experiencing turbulence.

Kathryn Mozer

Research involves the PATMOS-x satellite dataset (1982-2009) created by Andrew Heidinger and comparing low cloud fraction (over the eastern South Pacific) from PATMOS-x, NCAR/ CCSM3.0 (20th century and SRESa1b experiments),and GFDL/CM2.0 (20th century and SRESa1b experiments)to lower tropospheric static stability as described in Klein and Hartmann 1993, calculated from the models and NCEP Reanalysis data. The goal is to determine how well the models compare to the satellite and if LTS is indeed an appropriate diagnostic for low cloud in this region.

Michael Pavolonis

Ph.D. Thesis title: "Satellite retrievals and analysis of volcanic ash cloud properties." Volcanic clouds impact climate, biogeochemical processes, cloud physics, human health, and aviation (airborne volcanic ash can severely damage aircraft). While all of these impacts are important, the primary motivation behind this dissertation is to utilize satellite data to improve the accuracy and timeliness of the volcanic ash cloud guidance that is operationally provided to the aviation community through improved understanding of the physical behavior of ash clouds. The main objectives of the research are:
-Develop and validate a robust physically based methodology for determining the dominant composition of clouds using weather satellites, with the primary goal of objectively identifying volcanic ash clouds.
-Develop and validate a physically based methodology for retrieving the height, mass loading (mass per unit area), and effective particle radius of volcanic ash clouds using satellite-based infrared measurements commonly available on weather satellites.
-Utilize the satellite-derived ash cloud properties and numerical weather prediction model fields to characterize the macro-physical, micro-physical, and dynamical properties of airborne volcanic ash in space and time, within the context of the background atmospheric state.

Jacola Roman

M.S. Thesis title: "Climatological Analysis and Assessment in Global Climate Models and Observations of Precipitable Water Vapor (PWV) and Sea Surface Temperature (SST)". This study examines regional monthly mean and seasonal trends in PWV using ground-based GPS measurements as well as satellite (AIRS and AMSR-E) observations and reanalysis (NARR). Additionally, the study examines the simulations of the GCMs of SST for two different scenarios (decadal run 1980 and decadal run 2000). A comparison to observations will be done, in an attempt to show which scenario best stimulates the observations from 2000-2010. Once a scenario is distinguished, the assessment of GCMs at simulating the PWV observations will be examined and evaluated, similar to the analysis done on the observations.

Matthew Sitkowski

Ph.D. Thesis title: "Investigation and Prediction of Hurricane Eyewall Replacement Cycles". This study develops a probabilistic model that determines the likelihood of hurricane secondary eyewall formation and subsequent eyewall replacement cycles. The model incorporates environmental and satellite-based features that are used to identify when conditions are favorable for the formation of a secondary eyewall. Flight-level aircraft data are utilized to determine the intensity and structure changes associated with eyewall replacement cycles. In addition, the role of the decaying inner eyewall, or relict inner eyewall circulation, on the evolution of the inner-core structure, intensity, and pressure-wind relationship of the storm near the end of and following an eyewall replacement cycle is examined.

Pei Wang

Ph.D. Thesis topic: Research interest is using high spatial and temporal resolution satellite data to understand hurricane evolution. Both WRF/3DVAR and WRF/GSI data assimilation system are used in the research. Hurricane Ike has been simulated with AIRS retrieval data using WRF/3DVAR, and Irene with AMSU-A and AIRS radiance data using WRF/GSI. It is found that AIRS temperature retrieval data has positive impacts on Ike simulation, especially for the results of hurricane track. The AIRS moisture retrieval data has few impacts than temperature data. The further step is to find out the effects of AIRS retrieval data on hurricane Irene using WRF/GSI. The expected year of graduation is about four years.

Students Funded on other projects than NOAA

Mike Hiley

M.S. Thesis title: "Triple Frequency Radar Reflectivity Signatures of Snow: Observations and Comparisons to Theoretical Ice Particle Scattering Models." This study utilizes aircraft data from the 2003 NASA Wakasa Bay AMSR Precipitation Validation Campaign to reduce uncertainties in the active microwave remote sensing of frozen precipitation. The main goal is to compare the latest theoretical modeling of scattering properties of complex aggregate snowflakes to actual radar reflectivity observations. These new models exhibit a distinct behavior when Ku-Ka band Dual Frequency Ratio (DFR) is compared to Ka-W band DFR. This unique signature leads to the potential for ice habit discrimination when radar observations at all three of these frequencies are available. The Wakasa Bay dataset is particularly applicable to this study because observations at all three frequencies of interest are available from the same aircraft. The initial results provide observational confirmation of the distinct triple frequency behavior of complex aggregate scattering models and provide insight for future single and dual frequency snowfall retrievals.

Burcu Kabatas

M.S. Thesis title: "Quantification of Saharan Dust on Anatolian Peninsula via RAQMS Modeling." Summarized the results of collaborative research using the Real-time Air Quality Modeling System (RAQMS) model to explain the possible effects of Saharan dust transport on high levels of surface PM10 measured in the Anatolian Peninsula during April 2008. Comparison between RAQMS dust forecasts and ground observations suggest a significant contribution of Saharan dust to the surface PM10, which is consistent with MODIS Terra and Aqua aerosol optical depth measurements which range from 0.6 to 0.8 during the period of highest PM10. The vertical distribution of CALIPSO aerosol extinction measurements suggest that the dust cloud extended up to 6km during the period from April 11 to 18, 2008.

Brent Maddux

Ph.D. Thesis title: "Analyses of the MODIS Global to Regional Cloud Properties and Uncertainty." This study analyzes the MODIS global and regional cloud property data records. Cloud property histograms and statistics are utilized to characterize the global cloud property fields and attribute systematic errors and biases to their source. In conjunction with the GEWEX Cloud Climatology Comparison working group, this effort will help characterize the MODIS data records for future improvement and potential merger with other satellite data records.

Willem Marais

MS. Thesis title: "Feature extraction in developing an AIRS cloud mask." Cloud and clear-sky detection is a crucial part in the analyses of AIRS (Atmospheric InfraRed Sensor) measurements. Currently cloud detection is done using spectral tests, which are based on well understood properties of the atmosphere.

Research was to investigate the use of a binary classification and feature extraction techniques to develop an AIRS cloud mask, where CALIOP (Cloud- Aerosol LIDAR with Orthogonal Polarization) observations were used as “oracle” data. The objective was to produce an AIRS cloud mask which is either on par or better than the MODIS (Moderate Resolution Imaging Spectro-radiometer) cloud mask. PhD topic: “Noise reduction on space-based lidar measurements.” The intended output of this research project, is the advancement of noise reduction techniques where the noise is non-Gaussian and non-Poisson, but is follows a compounded Poisson distribution. The direct application is noise reduction of space-based lidar measurements, especially on measurements of CALIOP (Cloud-Aerosol Lidar with Orthogonal Polarization). Space-based lidar sensors measure an attenuated backscatter signal, from which properties of the atmosphere can be deduced. Such sensors have power constraints and amplification of the return signal is required. The amplification induces noise into the measurements, and it follows a compounded Poisson probability distribution. The SNR after amplification could range from -24 dB to -30 dB, depending on the gain parameters. Currently noise reduction is done via averaging, which degrades the measured signal integrity. The goal would be to achieve a noise reduction technique that achieves better performance, whilst preserving signal integrity.

Aronne Merrelli

Ph.D. Thesis title: "Far Infrared Remote Sensing of Cirrus Clouds and Upper Troposphere Thermodynamic Properties." This research investigates the potential of high spectral resolution far infrared (FIR) radiance measurements (100 - 600 1/cm) for ice particle property retrievals and upper troposphere temperature and water vapor profiles. Line by line and discrete ordinates radiative transfer codes are used to model far infrared radiance spectra, for atmospheric columns including various amounts of water vapor and ice clouds. An optimal estimation algorithm is used to evaluate the retrieval and the information content of the radiance spectra. The FIR spectra show significant information in the upper troposphere, especially in the water vapor profile, and show a potential advantage over the state of the art mid infrared (MIR) measurements from satellites. In addition, the FIR spectra show increased sensitivity to ice cloud properties, especially for cases involving thick clouds where the ice spectral signature saturates in the MIR.

Jacob Miller

M.S. Research topic: This research is looking at the temporal and spatial extent of Arctic Leads, located north of Alaska. This is done by using MODIS retrieved data in an algorithm to detect the cloud cover, and find open "windows" with no clouds. In these windows another algorithm determines the coverage of ice and the orientation and width of leads based off a 95% threshold, which is then mapped, and later to be projected back on to a common grid. Currently the research involves case studies covering the time from Feb-April on selected years, in order to further improve/test the algorithms and research hypothesis.

Nate Miller

M.S. Thesis title: “Microwave Radiometer Observations of Surface-Based Inversions above the Greenland Ice Sheet.” A pair of Microwave Radiometers (MWRs) covering the spectral range from 22.2 to 150 GHz, are part of an integrated suite of remote sensing instruments deployed to Summit Station in central Greenland by a NSF funded project dubbed ICECAPS. Using calibrated brightness temperatures from the MWRs, retrievals of liquid water path, precipitable water vapor and temperature profiles are collected in this extremely cold and dry environment. Surface based inversions are a predominant feature across the Greenland ice sheet and monthly values of depth, intensity, and occurrence are shown for 2011. The atmospheric state is measured twice daily at Summit via radiosonde sounding, although the advantage of using the MWRs is headlined by their close-to autonomous data collection at high temporal resolution. Within a matter of a few hours the presence of a liquid bearing cloud leads to decay in the strength of the inversion thus changing the stability of the boundary layer. Hence a possible increase in cloud frequency or a change in cloud microphysics above the Greenland ice sheet would further inhibit inversions and lead to changes in the interaction between the atmosphere and ice.

Kathryn Mozer
Research involves the PATMOS-x satellite dataset (1982-2009) created by Andrew Heidinger and comparing low cloud fraction (over the eastern South Pacific) from PATMOS-x, NCAR/ CCSM3.0 (20th century and SRESa1b experiments),and GFDL/CM2.0 (20th century and SRESa1b experiments)to lower tropospheric static stability as described in Klein and Hartmann 1993, calculated from the models and NCEP Reanalysis data. The goal is to determine how well the models compare to the satellite and if LTS is indeed an appropriate diagnostic for low cloud in this region.

Kyle Nelson
MS project title: "Low-Level Liquid Cloud Surface Radiative Forcing over Greenland Using MODIS." The study seeks to diagnose and quantify the surface radiative forcing of low-level liquid clouds over Greenland using MODIS. This study builds upon results obtained by the ICECAPS field campaign with the goal to reproduce their findings using MODIS satellite data and expand the study to the entire Arctic and develop a 10-year climatology.

Ilya Razenkov
Ph.D. Research topic: “Atmospheric temperature profile measurements using a University of Wisconsin High Spectral Resolution Lidar.” Atmospheric temperature profile measurements using a University of Wisconsin-Madison High Spectral Resolution Lidar are proposed in this study. Doppler broadening of the backscattered light depends on the air temperature and pressure. This effect can be utilized to infer the information about the atmospheric temperature profile. A combination of the narrow bandpass Fabry-Perot etalon and molecular iodine absorption filter can be used to detect the temperature sensitive changes of the lidar returns.

John Rausch
Ph.D. Research Topic: “Improvement of MODIS Cloud Property Retrievals through an Adiabatic Method.” This work involves estimating MODIS cloud optical depth and multispectral effective radius retrievals for stratiform boundary layer clouds through the use of an adiabatic retrieval method rather than the vertically homogeneous method currently employed in the MODIS Cloud Product. The goal of this research is to provide a more realistic estimate of boundary layer cloud microphysical properties as well as establish a metric of the subadiabaticity of cloud liquid water content profiles.

John Sears
M.S. Thesis title: "Investigating the Role of the Upper-Levels in Tropical Cyclogenesis." Recent studies on genesis have been primarily focused on the lower portions of the troposphere. Utilizing a unique satellite wind data set from a recent field study, this research focuses on the upper level dynamics behind tropical cyclogenesis and seeks to determine the role of the upper levels in facilitating lower level development.

Mark Smalley
M.S. Thesis title: “Effects of spectral response function uncertainties on cloud height retrievals using CO2 slicing.” The 30 year record of HIRS and MODIS cloud heights has the potential to create a true cirrus cloud climatology. However, inter-instrument biases in retrieved cloud heights due to differing spectral response functions must be addressed when assessing trends or cycles throughout the cloud height record. To estimate these biases in cloud heights retrieved with CO2 slicing techniques, cloud heights for HIRS and MODIS instruments have been simulated using high spectral resolution measured radiances from AIRS.

William Smith, Jr.

Ph.D. Thesis title: "Using Satellite Data to Improve the Representation of Clouds and their Effects in Numerical Weather Analyses and Forecasts." New cloud products derived from CloudSat and CALIPSO data form the basis for a technique developed to retrieve the vertical distribution of cloud water from passive satellite observations. The technique is applied to GOES data over North America and adjacent oceans and the cloud products ingested into the NOAA Rapid Update Cycle (RUC) assimilation system. The impact of the satellite data on RUC model analyses and forecasts is assessed.

Kenneth Vinson

M.S. Thesis title: "Validation of Methane Products from the Atmospheric infrared Sounder (AIRS) during the Arctic Research of the Composition of the Troposphere from Aircraft and Satellites Mission." There is a great deal of methane stored in the Arctic, mainly in the form of underwater methane clathrate ices and in frozen peat bogs in areas with permafrost. Predicted warming trends may release a large amount of methane from these sinks. Elevated methane release in the Arctic may already be underway. Measurements from polar-orbiting satellites, in-situ stations, and aircraft campaigns will be used to evaluate recent trends in arctic methane release and to help constrain climate model predictions.

Tim Wagner

Ph.D. Thesis title: "A method for retrieving the cumulus entrainment rate from ground-based observations." An algorithm has been developed to retrieve the cumulus entrainment rate from observations taken by the suite of instruments at the ARM Southern Great Plains site. This enables the development of a robust dataset of entrainment rates that is unconstrained by the limitations of aircraft observations. Analysis shows that the entrainment rate tends to increase throughout the day.

Michelle Feltz, Undergraduate

Paper Title: "Methodology for the Validation of Temperature Profiles from Hyperspectral Infrared Sounders Using GPS Radio Occultation: Experience with AIRS and COSMIC."
This study is supported by JPSS EDR cal/val for the validation of CrIS/ATMS (CrIMSS) atmospheric vertical temperature profile (AVTP), a key requirement of the NOAA JPSS program. In preparation for the evaluation of the CrIMSS AVTP product, a methodology for comparison to GPS radio occulation profiles from the UCAR COSMIC processing center was developed using retrievals from the NASA Aqua AIRS sensor. The citation for a paper describing the methodology is given below. This study also has climate implications for detecting trends in upper tropospheric and stratospheric temperatures.

Post Doctors funded on NOAA Projects

Andi Walther
Agnes Lim

Post Doctors funded on other projects than NOAA

Giuseppe Baldassarre
Muhammad Teguh Satria
Xianyun Wu

CIMSS Undergraduate Students

Carissa Bunge (Earth Now), working with Margaret Mooney and Patrick Rowley
Britta Gjermo (CIMSS blogs), working with Scott Bachmeier and Bryan Baum
Zach Murphy (McIDAS and blogs), working with Scott Bachmeier and Bryan Baum
Kevin Oliva, working with Ray Garcia and Erik Olson
Erik Price, working with Bormin Huang and Jarno Mielikainen
Louis Schiff, working with Bormin Huang and Jarno Mielikainen
Tom Slattery (Earth Now), working with Margaret Mooney and Patrick Rowley

Nick Weber (Antarctic and blogs), working with Scott Bachmeier and Bryan Baum
Akira Wong, working with Allen Huang

New CIMSS Grad Students (incoming) and advisors

Michelle Feltz (MS Program), working with Bob Knuteson
Amanda Gumber (MS Program), working with Mike Foster
Kyle Hosely (MS Program), working with Brad Pierce
Aaron Letterly (MS Program), working with Jeff Key
Jacola Roman (PhD Program), working with Bob Knuteson
Alexa Ross (MS Program), working with Bob Holz
Walter Sessions (PhD Program), working with Bob Holz
Gary Wade (MS Program), working with Paul Menzel

New CIMSS Undergraduate Students

Nathan Loeb (CIMSS blogs), working with Scott Bachmeier and Bryan Baum
Marian Mateling (CIMSS blogs), working with Scott Bachmeier and Bryan Baum
Chris Scheele, working with Steve Ackerman

CIMSS Students and/or Staff hired by NOAA during this period

Jessica Staude, NOAA/NESDIS/ESRL (contractor)
Kathryn Mozer -Short & Associates (working for) Dick Reynolds on NOAA funded work

CIMSS GRADUATE STUDENTS

1979-1980
Michael Kalb MS (NOAA/NESDIS)
Tony Siebers MS (NWS)
Jim Block MS (private sector)

1980-1981
Jim Zandlo MS (private sector)
Roberta Marshment MS (private sector)

1981-1982
George Diak PhD (retired)
Roy Spencer PhD (NASA Marshall)
Chris Velden MS (CIMSS)
David Keller MS (Air Force)

1982-1983
John Bates MS (NOAA ERL)
Gin Rong Liu MS (Taiwan National U)

1984-1985
David Donahue MS (NESDIS)
Stacey Heikkinin MS
Martin Mlynczak MS (NASA Langley)

1985-1986
John Bates PhD (NOAA ERL)
Allen Huang MS (CIMSS)
Chris Moeller MS (CIMSS)
Craig Burfeind MS (private sector)

1986-1987
Louis Garand PhD (Environment Canada)
Gin-Rong Liu PhD (Taiwan National U)
Gary Jedlovec PhD (NASA Marshall)
Fred Wu MS (CIMSS and NOAA)
Maria Perrone MS (Rutgers University)
Tim Schmit MS (NOAA-CIMSS)

1987-1988
Nelson Ferreira PhD (INPE, Brazil)
Richard Frey MS (CIMSS)
Arlindo Arriaga MS (EUMETSAT)
Grant Carlson MS (NASA Marshall)

1988-1989
Hyosang Chung MS (Korea Met Agency)
Laurie Rokke MS (NOAA)
Liam Gumley MS (GSFC, CIMSS)
Kurt Brueske MS (Air Force)
Murty Divakarla MS (private sector)
Elaine Prins MS (CIMSS, private sector
Chris Scheuer MS (NASA Langley)

1989-1990
Allen Huang PhD (CIMSS)
Fred Wu PhD (CIMSS and NOAA)
Steve Nieman MS (CIMSS, private sector)
Walt McKeown MS (Navy)
Hai Yen Zhang MS (CSU)

1990-1991
Arlindo Arriaga PhD (EUMETSAT)
Peter Keehn MS (NASA Goddard)
Yanni Qu MS (NESDIS, private sector)

1991-1992
Robert Purser PhD (NOAA NCEP)
Kathy Strabala MS (CIMSS)

1992-1993
Daphne Zaras MS (NOAA/NSSL)
Chia Lee MS (CIMSS)
Rongrong Xie MS (NESDIS)
Jason Li MS (NASA Goddard)

1993-1994
Walt McKeown PhD (Navy)
Gilberto Vicente PhD (NASA, NOAA)
Xiaohua Wu PhD (Univ. of Chicago)
Wayne Feltz MS (CIMSS)
Tim Olander MS (CIMSS)

1994-1995
Yanni Qu PhD (NESDIS, private sector)
Susan Faust MS (NWS)
Lan Ge MS (NESDIS)
Ben Ho MS (NASA Langley)

1995-1996
Jack Dostalek MS (CSU CIRA)
Nick Nalli MS (NESDIS)
Brad Hoggatt MS (private sector)
Dan DeSlover MS (CIMSS)

1996-1997
Jay Heinzelman MS (SSEC)
Phil Politowicz MS (private sector)

1997-1998
Ben Ho PhD (NASA Langley)
Bormin Huang PhD (CIMSS)
Paul van Delst PhD (CIMSS, NOAA)
Gideon Kinyodah MS (Kenya Met Office)
Rose Shie MS (computer science)

1998-1999
Mike Friedman PhD (Oregon State, AMS)
William Badini MS (private sector)
Jason Dunion MS (NOAA AOML)
Rhett Grauman MS (NOAA/NWS)
Shaima Nasiri MS (CIMSS and TX A&M)

1999-2000
Erik Olson MS (CIMSS)
Chris Schmidt MS (CIMSS)
Nick Nalli PhD (CIMSS, NOAA)
Boyin Huang PhD (CIMSS)

2000-2001
Nick Bower PhD (from Curtin Univ)
Monica Harkey MS (UW, MATC)
Michael Pavlonis MS (CIMSS, NOAA)
Kurt Brueske PhD (Air Force)
Paolo Antonelli PhD (CIMSS)

2001-2002
Brian Kabat MS (Air Force)
Hong Zhang MS (CIMSS)
Sarah Thomas MS (CIMSS, private sector)

2002-2003
David Turner PhD (PNL, CIMSS, AOS)
Greg Gallina MS (CIMSS and NOAA)

2003-2004
Giulia Pannegrossi PhD (Italy)
Grag McGarragh MS (LaRC)
James Hawkinson MS (CIMSS)
Xuanji Wang PhD (CIMSS)
Mark Gray MS (GSFC)
Xuanji Wang PhD (CIMSS)

2004-2005
Amato Evan MS (CIMSS)
Fang Wang MS (CIMSS)
Nathan Uhlenbrock MS (CIA)
Shaima Nasiri PhD (CIMSS, TX A&M)
Michael Mores MS (CIMSS
Jason Brunner MS (CIMSS)

2005-2006
Robert Holz PhD CIMSS)
Jay Hoffman MS (CIMSS)
Michael Richards MS (Hebrew Univ, FAA)

2006-2007
Justin Sieglaff MS (CIMSS)
Brent Maddux MS (CIMSS)
Jessica Staude MS (CIMSS/SSEC)
Richard Dvorak MS (CIMSS)
Yinghiu Lui PhD (CIMSS)

2007-2008
David Santek PhD (CIMSS/SSEC)
Alex Harrington MS (private sector)
David Santek PhD (CIMSS/SSEC)
Matthew Lazzara PhD (CIMSS/SSEC)

2008-2009
Li Bi PhD (NRL)
Amato Evan PhD (Univ. Virginia)
Zhenglong Li PhD (CIMSS/SSEC)

2009-2010
Utkan Kolat MS (Turkey)
Mark Kulie PhD (CIMSS/SSEC)
Chang-Hwan Park MS (Korea)
Ilya Razenkov MS (SSEC)

2010-2011
Chian-Yi Liu PhD (Taiwan)
Sarah Monette MS (CIMSS/SSEC)
Kathryn Mozer MS (NOAA Contractor)
Mark Smalley MS (Returning for PhD)
Kenneth Vinson MS (CIMSS/SSEC)
Timothy Wagner PhD (Creighton University)

2011-2012
Jordan Gerth MS (Returning for PhD)
Nathaniel Miller MS (Returning for PhD)
Michael Pavolonis PhD (ASPB)
John Sears MS (CIMSS/SSEC)
Matt Sitkowski PhD (The Weather Channel)

2012-2013
Caitlin Hart MS (Exelis)
Agnes Lim (PhD) (CIMSS)
Bill Line (MS) (CIMMS in OK)
Aronne Merrelli (PhD) (CIMSS)
Jacola Roman (MS) (Returning for PhD)

Appendix G. List of Awards to Staff Members

Figure 1 - IASI Best Poster Award: Jacola Roman

2013

Jacola Roman: Best Poster, IASI International Conference (CNES/EUMETSAT)
Bormin Huang: SPIE Fellow
Dave Tobin: Appointed to the International Radiation Commission

2012

Christopher Velden: UW Chancellor's Award for Excellence in Research: Independent Investigator
Graeme Martin and Dave Tobin: Individual "Best Poster" awards at the International TOVS Study Conference (ITSC-18) in Toulouse, France.
Jacola Roman: Best Student Presentation, AMS Annual Meeting, New Orleans
Jordan Gerth: First place, Graduate Student Oral Presentation, National Weather Association 2012
Bill Line: First place, Graduate Student Poster Presentation, National Weather Association 2012
Jun Li and Zhenglong Li: Certificate of Recognition presented in appreciation for all of your hard work and dedication which contributed to the successful launch and commission of Suomi National Polar-orbiting Partnership satellite system.
Christopher Moeller and Dan LaPorte: NASA Group Achievement Award as members of the Suomi NPP Mission Development Team.
Tom Whittaker: Appreciation for Service as Co-Chair for the Committee on Environmental Information Processing Technology (formly IIPS)
Bill Line: 2012 Unidata Users' Workshop student stipend
Jordan Gerth: Wisconsin Space Grant Consortium Graduate Fellowship Award

2011

James Kossin: NOAA Office of Oceanic and Atmospheric Research's Gold Medal for excellence in research and data stewardship leading to a more confident assessment of the influence of human-induced climate change on hurricanes.
Timothy Schmit: Department of Commerce Silver Medal "For revolutionizing NOAA Science Tests for geostationary satellites, significantly reducing the likelihood of a single satellite configuration."
Scott Bachmeier, Wayne Feltz, Mathew Gunshor, James Nelson, Christopher Schmidt, Anthony Schreiner, Justin Sieglaff, David Stettner, William Straka III, Christopher Velden, and Steven Wanzong: NOAA-CIMSS Collaboration Award "For working with NOAA in revolutionizing NOAA Science Tests for geostationary satellites, significantly reducing the likelihood of a single satellite configuration"

Tim Schmit: The T. Theodore Fujita Research Achievement Award from the National Weather Association (NWA) “for excellence in promoting and extending the use of satellite data within the operational community currently and in the future”
Steven Ackerman: Elected Fellow of the Wisconsin Academy of Sciences, Arts and Letters
Jordan Gerth: Wisconsin Space Grant Consortium Graduate Fellowship Award
Andrew Heidinger: NOAA Employee of the Month for the first delivery of an externally-generated climate data record to NCDC as part of their CDR program
Justin Sieglaff: NOAA-CIMSS Collaboration Award "For providing near real-time volcanic ash information in the critical period following the eruption of the Eyjaafjallajokull volcano"
William Straka III: NOAA-CIMSS Collaboration Award "For developing an enhanced production system for satellite-based real-time radiation data from NOAA’s operational geostationary satellites"

2010

Thomas Achtor and Wayne Feltz: 2010 University of Wisconsin Police Department Community Service Award for Providing Weather Forecasts for Special Events in Camp Randall Stadium
Steven Ackerman: NASA Exceptional Public Service Medal
Steven Ackerman and Tom Whittaker: Finalist in NSF International Science and Engineering Visualization Challenge
Scott Bachmeier: NOAA Team Member of the Month for his efforts to improve public awareness of NOAA satellite applications, both for the general public and for NOAA
Kaba Bah: Best Poster Presentation at the 35th National Weather Association Annual Meeting for “Preparation for use of the GOES-R Advance Baseline Imager (ABI)”
Jordan Gerth: Wisconsin Space Grant Consortium Graduate Fellowship Award
Andrew Heidinger: Department of Commerce Bronze Medal: “For developing an enhanced production system for satellite-based, real-time radiation data from NOAA's operational geostationary satellites”
Michael Pavolonis: Department of Commerce Bronze Medal: “For providing near real-time volcanic ash information in the critical period following the eruption of the Eyjafjallajökull volcano”

Appendix H: SSEC Data Center

Overview

The SSEC Data Center mission is to create and maintain the facilities, human expertise and technology necessary to provide SSEC/CIMSS scientists and their collaborators with the highest quality geophysical data in a timely fashion, and to provide real-time data access, archive and retrieval services as necessary to support SSEC/CIMSS scientific programs.

Summary of Data Reception and Storage Capabilities

The Data Center has five L-Band antennas, one of which can automatically track high inclination geostationary satellites. The five antennas give us the ability to ingest and archive all four GOES satellites in situations where they are sending data simultaneously. We have three C-Band antennas, two of which are heated to allow reception through the heaviest of snows. We also have two polar satellite tracking antennas. One is an X-Band antenna for receiving EOS polar orbiting data. The other is a dual L/X band antenna for receiving Suomi NPP, EOS, METOP, and FY polar satellites. The antennas are able to cover nearly the entire 48 states and portions of Canada, Mexico and the Gulf of Mexico.

The Data Center has over 1,300 TB of disk space holding over 30 years of GOES data, and nearly 15 years of non-GOES geostationary satellite data. All projects combined have over 3 PBs of disk storage available.

Staffing

The SSEC Data Center is staffed Monday through Friday from 7:30 AM to 11:00 pm Central time. We have three FTE ~100% time: an Archivist & Computer Operator (1st shift), a Computer Operator (1st shift), and a Computer Operator (2nd shift).

The average experience ingesting, distributing, and archiving satellite data of our Data Center staff members is over 25 years. The experience of our staff ingesting, distributing and archiving satellite data is an important reason for the high quality of our data and products and the 99.9% success rate of receiving and archiving GOES data over the past decade.

We have five other experts providing various portions of their time, including the Program Manager, a System Programmer, a Data Base Programmer, a Research Specialist (PM assistant), and our Antenna/Communication technician. Finally, we employ two student programmers and two student data quality monitors.

Data Holdings and Services

The SSEC Data Center collects, quality controls, distributes and archives data from a number of geostationary and polar orbiting environmental satellites. Users of the data include SSEC/CIMSS and ASPB scientists in house, SSEC/CIMSS collaborators, the Unidata community (over 150 universities and

colleges), other government agencies (e.g., NTSB), and private sector companies. The following is a summary of the on-line and archived data holdings SSEC makes available to its scientists and other users.

Real-Time Data Availability

Dataset	Reception	Reception Formats	End user formats	Access
Geostationary Satellites				
GOES-East 75° W	Direct Broadcast in Real-time	GVAR	AREA, Netcdf, GEOtiff, Flatfiles	ADDE
GOES-West 135° W	Direct Broadcast in Real-time	GVAR	AREA, Netcdf, GEOtiff, Flatfiles	ADDE
GOES-Test 105° W	Direct Broadcast in Real-time	GVAR	AREA, Netcdf, GEOtiff, Flatfiles	ADDE
Meteosat at 0° E	Network Relay in Real-time	HRIT	AREA, Netcdf, GEOtiff, Flatfiles	ADDE
Meteosat at 57° E	DOMSAT Relay in Real-time	Open MTP	AREA, Netcdf, GEOtiff, Flatfiles	ADDE
FY2 at 86° E	Network ADDE Relay ~15-30 minute delay	McIDAS AREA	AREA, Netcdf, GEOtiff, Flatfiles	ADDE
FY2 at 105° E	Network ADDE Relay ~15-30 minute delay	McIDAS AREA	AREA, Netcdf, GEOtiff, Flatfiles	ADDE
Kalpana 74° E	Network ftp Relay ~45-120 minute delay	HDF	AREA, Netcdf, GEOtiff, Flatfiles	ADDE
COMS 128° E	Network ftp Relay ~15-30 minute delay	HRIT	AREA, Netcdf, GEOtiff, Flatfiles	ADDE
MTSAT at 145° E	DOMSAT in Real-time	HRIT	AREA, Netcdf, GEOtiff, Flatfiles	ADDE

Dataset	Reception	Reception Formats	End user formats	Access
Polar Orbiting Satellites				
NOAA-15	DOMSAT Relay in real-time and DDS network relay	Level-0, Level-1 GAC, LAC, & HRPT	AREA, Netcdf, GEOtiff, Flatfiles, Level-1	ADDE, FTP
NOAA-16	DOMSAT Relay in real-time and DDS network relay	Level-0, Level-1, GAC, LAC, & HRPT	AREA, Netcdf, GEOtiff, Flatfiles, Level-1	ADDE, FTP
NOAA-18	DOMSAT Relay in real-time and DDS network relay	Level-0, Level-1, GAC, LAC, & HRPT	AREA, Netcdf, GEOtiff, Flatfiles, Level-1	ADDE, FTP
NOAA-19	DOMSAT Relay in real-time and DDS network relay	Level-0, Level-1, GAC, LAC, & HRPT	AREA, Netcdf, GEOtiff, Flatfiles, Level-1	ADDE, FTP
Suomi-NPP	Direct Broadcast and network relay	Level-0, Level-1	AREA, Netcdf, GEOtiff, HDF Flatfiles, Level-1	ADDE, FTP
METOP A&B	DDS network relay	Level-1, FRAC, AMAX, DCSX, MHSX, HIRX, IASI	AREA, Netcdf, GEOtiff, Flatfiles, Level-1	ADDE, FTP
Landsat-8	Network Relay	Geotif	AREA, Netcdf, GEOtiff, Flatfiles, Level-1	ADDE, FTP, WMS
EOS-Aqua	Direct Broadcast and network relay as backup	Level-0, Level-1, Level-2	AREA, Netcdf, GEOtiff, Flatfiles, Level-0, Level-1	ADDE, FTP
EOS-Terra	Direct Broadcast and network relay as backup	Level-0, Level-1, Level-2	AREA, Netcdf, GEOtiff, Flatfiles, Level-0, Level-1	ADDE, FTP

Dataset	Reception	Reception Formats	End user formats	Access
Non-Satellite Data				
NOAAport Model Output	DOMSAT Relay automatically backed up via network using LDM IDD	GRIB1, GRIB2	McIDAS GRID, GRIB1, GRIB2	ADDE, THREDDS, FTP
NOAAport Text Observations and reports	DOMSAT Relay automatically backed up via network using LDM IDD	Raw Text, BUFR	Text, McIDAS MD	ADDE
NOAAport NEXRAD radar	DOMSAT Relay automatically backed up via network using LDM IDD	NIDS	McIDAS AREA, Netcdf, GEOtiff, Flatfiles	ADDE
CONDUIT (Hi-RES) Model Output	LDM via CONDUIT feed	GRIB2	McIDAS GRID, GRIB2	ADDE, FTP

Archive Data availability (all online)

Dataset	Period of Record
SMS-(1&2), GOES-(1-7)	1978-1996
GOES-(8-15)	1994-Present
Meteosat	1992-1995 (Atlantic/Eastern US coverage), 1999-Present (Europe, Indian Ocean Coverage)
GMS/MTSAT	1998-Present
FY2	2005-Present
Kalpana	2004-Present
COMS	2012-Present
Observational data	1976-Present
Model Output (GRIDs & GRIB)	1996-Present
WX Text	1996-Present

Besides the data reception, archiving and serving data, additional Data Center activities include:

Ingesting over 300 GBs of data per day, and archiving over 230GB online with tape backup, The PEATE project also ingests nearly 1.8 TBs of data per day and archives another 1.3 TB online archive with disk backup;
Providing data and maintaining the Unidata Local Data Manager (LDM) real-time broadcast to over 150 universities and colleges;
Generating and maintaining real-time data products for the SSEC Web site;
Assisting NOAA and SOCC with initial post-launch instrument and bit stream checkout with periodic check-ups during the instrument lifetime;
Providing satellite data to NOAA for data they do not receive (e.g., GOES-Test SRSO, COMS, India's Kalpana) and acting as a data backup to their system;
Processing user data requests and product generation for real-time and archived data;
Providing help desk support to users of the SSEC Desktop Ingestor (SDI);
Testing software changes for the SDI-104 and providing information for the user's manual; and
Acting as a focal point for satellite information.

Recent NOAA/SATEPs interactions include the following:
Provided NESDIS/STAR with all GOES-9 data from October 2004 – November 2005 ~5 TBs of data;
Provided NOAA NESDIS with GOES-14 SRSO data, during August 2012 1-minute testing via LDM in real-time;

Provided NOAA NESDIS with GOES-14 SRSO data, October 2012 during Hurricane Sandy via LDM in Real-time;
Provided NOAA NCDC CLASS with GOES-14 SRSO data, October 2012 during Hurricane Sandy for inclusion into the CLASS archive system;
Provided NOAA NHC with GOES-14 RSO data when GOES-13 outage occurred in May/June 2013;
Provided NOAA STAR with GOES-13 in June 2013 for calibration testing for return to operations.
Re-navigate and supply NOAA/ESPC with near real-time re-navigated Kalpana (India) geostationary satellite data;
Provides KMA COMS data to NOAA NESDIS;
Ingest, process, and relay NOAA POES polar products for NWS AWIPS systems;
Provide NOAA 1 minute imagery

169 GB	August 2012
407 GB	October 2012
186.3 GB	June 2013

Provide general ADDE data access to NOAA/ESPC (includes GOES, MSG, MTSAT, COMS, FY2, NOAAport, and Kalpana)

12.4 TB	2012
5.3 TB	2013 (January – July)

Challenges

Data Safety, which is broken down into two parts:
Data integrity: Ensuring that the bytes that were archived are accurately stored and retained, and that any problems are identified and remedied. As the size of archives increase, ensuring what is saved is preserved intact becomes more challenging.
Data backups: Data needs to be backed up and maintained in two locations in the event of catastrophic loss. This is time consuming, and expensive.
Data Formats: Ensuring data is in a format that can be used by as many software packages as practical, without compromising the integrity of the original data.
Data Serving: Providing the user with easy access to data (searching and retrieval) without the need of Data Center staff assistance.
Metadata Inventory: Improve methods for the user to search for the data that they need.
Data citation. Providing a stable referenceable location for journal citations.
Power and cooling: The Data Center plans to add another 72 KW UPS to its existing three 72 KW UPS. It also will expand its current inline rack cooling system.
Plans are underway to install a backup water chiller to provide cooling when campus chilled water temperatures rise.

Antenna Resources

Antenna Diameter	Type	Pointing Location	Uses
11 meter	C-Band	Fixed 87° W	Heated primary antenna for DOMSAT relay, MSG, Wallops relay
7.3 meter	L-Band	Fixed 75° W	GOES-East
7.3 meter	C-Band	Fixed 101° W	Backup to 7.3 meter and 11 meter antennas
4.6 meter	L-Band	Fixed 135° W	GOES-West
4.5 meter	L-Band	Fixed 105° W	GOES-test East Backup
4.5 meter	L-Band	Fixed 60° W (auto-tracking for high inclination orbits)	GOES-South America
4.4 meter	X-Band	180° elevation over 360° azimuth tracking capable	EOS (Aqua & Terra)
2.4 meter	X/L Band	180° elevation over 360° azimuth tracking capable	Suomi NPP, EOS (Aqua & Terra), FY1, FY3, NOAA, METOP
3.7 meter	L-Band	Fixed 90° W	Testing/Spare (not research quality)
6.3 meter	C-Band	Fixed 101° W	Heated primary antenna for DOMSAT relay MTSAT, Gilmore Polar relay, NOAAport

Appendix I. Communications Plan

Strategic Communications Plan for the Space Science and Engineering Center
August 2013

A cohesive SSEC Communications Plan will make the many and significant contributions of the Space Science and Engineering Center (SSEC) and the Cooperative Institute for Meteorological Satellite Studies (CIMSS) more visible: as educators of students of the state (of the world), as contributor to the state's economy, as generator of new information, research, and technologies that add to the quality of life of all residents, and as exemplifier of the Wisconsin Idea.

Both organizations exist to enhance understanding of the atmosphere of Earth and other planets, broadly serving society's needs for better weather forecasting capabilities. SSEC and CIMSS develop fundamental tools that advance knowledge and save lives but because this work is conducted with public funds, informing all of our audiences of these activities and their impact is vital to maintaining and growing our research and education capabilities, especially in this era of sharply reduced resources.

We must continually strive to inform all of our audiences of our accomplishments, but more importantly, how those accomplishments are relevant to them and why continued investment is important.

This communications plan aligns itself with SSEC's mission, defining complementary strategies, measures of success and outcomes. It provides a framework for SSEC to build on its mission and leadership role to serve and educate society by effectively sharing and communicating our research results.

SSEC Mission

To conduct atmospheric, oceanic, environmental and astronomical research using space or space-age techniques to discover and apply the physical properties of our universe for the benefit of humanity.

Communications Mission and Objectives

To support the research and education missions of the Space Science and Engineering Center by communicating across media to internal and external constituents with proactive, coordinated and consistent messaging to:

Provide information about SSEC and CIMSS research, goals, plans and progress, including the importance and impact of our research
Develop and maintain support, trust and credibility for SSEC/CIMSS and the work that we do
Increase, broaden and improve understanding and visibility of our scientific endeavors

Identified Audiences

Decision Makers	Scientific Communities	Education	Broad
Funding agencies	Internal/external collaborators	Students	
Interested public			
UW administrators	Scientific organizations and industries	Faculty	
State/Federal govt leaders	Individuals and groups	K-12 teachers	
	News media		

Messages

It is important develop clear and consistent messages for our identified audiences so that it is evident that public investment in our work is not only warranted but imperative, always with a positive message about the value and impact of our work.

SSEC and CIMSS messages:

Investment in atmospheric science and earth science is a public good
Our scientific contributions to the State of Wisconsin enhance quality of life and save lives
Our science can be trusted
We are serious about educating future scientists

Desired Outcomes

Sustained and increased funding/investment in scientific research:

Funding agencies are aware of accomplishments: As a publicly funded organization, we must effectively communicate results to the appropriate funding agency, and broadly, across audiences. Clear and consistent messages will demonstrate our important contributions to the State of Wisconsin and global communities.

Improved public awareness and understanding

Improved science literacy and educational outcomes

Current Tools and Activities

The table below represents the range of activities, programs and mechanisms already established within SSEC and CIMSS. Many, but not all, are delivered by the SSEC media team. Many others are delivered by SSEC and CIMSS scientists who blog, outreach specialists who develop education and public outreach (EPO) programming and the library, to name a few. Taking stock, not just of programs, but of trends, can be used to guide decision-making and tailor best practices for the unique perspectives of research and higher education.

Mechanism	Primary Audiences	Secondary Audiences	Format	Message	Frequency
Public inquiries	All audiences		Electronic		Continuous
Website	All audiences		Electronic	Promote science	
Social media	General	Scientists	Electronic	Latest developments, create awareness, encourage public engagement	Continuous
News channel (external)	News media, science-interested audiences, scientific communities, decision-makers		Electronic	Highlights and in-depth view of current research, developments and events, including EPO	Weekly+
Press releases	Media/other communications channels		Electronic	Important developments disseminated across media outlets	
News (internal)	Employees		Electronic	Build community, create awareness, deliver important messages from directors	Monthly
Federal Initiatives	Congressional leadership/state legislators		Print/electronic	Summarize research, highlights, impacts and concerns for next fiscal year	Annually
Metrics document	Decision makers	Science communities	Print/electronic	Demonstrate organizational and research mission, strengths and scope	
TtA news magazine	Scientists, decision makers		Print/electronic	Update recent research, news, announcements, publications, awards	Twice yearly
Booklet	Scientists, decision makers		Print/electronic	History of organization and comprehensive profile of research	Annually?
NOAA Cooperative Agreement Reports	Funding agency, scientists		Print/electronic	Demonstrate mission fulfillment	
SOC Annual address	Employees, university administration		Slide presentation	Status update of Center as a whole, all units represented, 'peprally'	Annually
Brochures	All audiences		Print/electronic	Broad overview of organization; lead-in to comprehensive SSEC Booklet	

Mechanism	Primary Audiences	Secondary Audiences	Format	Message	Frequency
Editorial support	Scientists, students		Print/electronic	Announcing/publishing new research results	Continuous
Meetings/conferences	Science groups		Oral/electronic	Facilitating distribution and discussion of research results	Continuous
Seminars	Scientists, students		Oral	Promotes discussion of current research	Continuous
Guest speakers (e.g. Uccellini)	All audiences, scientists		Oral	Focus on issues with broad implications; foster engagement	Occasional
Educational tours	Students		Oral/globe/roof	Demonstrate unique science that comes from SSEC/CIMSS; inspire students to pursue science careers	Continuous
Employee tours	Employees		Oral	Identify important offices/units; demonstrate SSEC as a great place to work	Continuous
All EPO events, e.g. student and teacher workshops, open houses, Science on a Sphere, collaborations with science organizations, social media	General public, educators, students	Decision makers, science groups	Oral	Promote/increase awareness; teach about SSEC/CIMSS science; inspire/encourage science exploration and careers	Continuous
NOAA displays	NOAA; scientists		Electronic	Promote and demonstrate new research and techniques coming from SSEC/CIMSS	Weekly
SSEC/CIMSS Lobby displays	Scientists, students, visitors		Print/electronic	Current meteorological conditions; current weather display	Continuous
Technical support	Scientists		Electronic	Support science research	Continuous
Library: e.g. workshops, digital collections, research/curricular support, databases, exhibits, special	Scientists, faculty, students	Collaborators, decision makers, public	Print/electronic/ oral	Support science research and education	Continuous

Mechanism	Primary Audiences	Secondary Audiences	Format	Message	Frequency
events					
Morning coffee gatherings	Employees, visitors			Increase awareness; promote collaborations	Occasional
AOSS poster session	Scientists, students, faculty			Increase awareness; promote collaborations	Annually

Future Tools and Activities

Videos: develop short scientist profiles in video format
Secure external funding to invite speakers, develop a speaker series, or host more town hall events similar to the Uccellini, Weather-Ready Nation Town Hall.
Develop more engaging displays in the lobby of AOSS Building, in conjunction with EPO, and including directory
Construct a more user-friendly and enhanced OWL display

Measurement and Evaluation

Measurement and evaluation in the communications area are relatively new activities for SSEC/CIMSS but in order to assess the effectiveness and reach of our media efforts we must develop a manageable monitoring program with the following objectives:
Monitor mentions of SSEC and CIMSS, programs and research in order to track trends and monitor the strength of image or brand with stakeholders/audiences
By comparing various media platforms, try to evaluate trends, identify strengths, shortfalls or errors
Assist in evaluating the effectiveness of SSEC and CIMSS media
There are a number of complementary ways to monitor media, through subscription services, for example. Initially, the SSEC media team will use no-cost tools to track media mentions and story reach by:

Creating a media log to track all requests coming into SSEC via our request forms. These will be stored in a database for ease of searching, sorting and analysis. Over time, this data will aid in identifying questions, concerns and or trends and can be used to enhance decision-making.

Subscribing to Google Alerts to track mentions of SSEC/CIMSS (and variant names) on the Web and search other proprietary news databases to track mentions of SSEC/CIMSS in traditional media markets.

Setting up a tracker spreadsheet to log story pickups, columns/editorials, follow-on stories, blog posts and mentions.

Setting up Google Analytics for social media outlets, Twitter, YouTube, FaceBook, in order to track followers, follower engagement, retweeting/link sharing, push media mentions/stories/announcements. Social media is a growing area. The media provides an opportunity to disseminate and promote news, programs, and publications to a broader audience.

Reporting

Initially, the media team will review data on a monthly basis, sharing observations with the SSEC and CIMSS directors at regular meetings. The team will write and submit an annual report to directors characterizing and describing work for the calendar year. The report will include an analysis of data collected and suggestions for future focus.

Summary

Research universities are leaders in the knowledge economy. This brings challenges – budgetary, intellectual, scientific, political – but it also brings opportunities. Given this unique and strategically important position in society, educational and research institutions – SSEC and CIMSS – require communications systems that are adept, current, and well-managed, and in keeping with the messaging and mission of the organization.

The communications strategies and mechanisms of today must match the needs and strengths of the audience to be reached. With a user community that is not only global, but sophisticated in its use of social media and networks, the Web, and technology, SSEC and CIMSS have an opportunity to analyze their current communications tools, adding new ones or removing those that are no longer effective while continuing to build effective and long-lasting relationships with their identified audiences.

Appendix J. The Schwerdtfeger Library

Overview

The Schwerdtfeger Library was dedicated in 1983 to support the research activities of the Space Science and Engineering Center, including the Cooperative Institute for Meteorological Satellite Studies (CIMSS), and the instructional programs of the Department of Atmospheric and Oceanic Sciences at the University of Wisconsin-Madison. The Library collects and preserves unique material and provides access to earth and space science research resources. The Schwerdtfeger Library's web site is developed with the research interests of CIMSS and SSEC scientists in mind.

Library staff use existing state of the art tools, both available from standard sources and developed in-house to efficiently meet current and anticipated client research needs. Services offered include, but are not limited to: extensive reference, research and technical services; teaching; access to print and electronic collections; participation in local and international information networks, interlibrary loan and digital resource construction.

Most research questions that the library addresses, are long-term, intensive projects, requiring committed staff with solid access to resources. The following examples illustrate a few of the ways the Schwerdtfeger Library concretely supports the varied research interests of CIMSS.

Capabilities: Research Support

Green Card Applicant Support

Five years ago, library staff offered to write letters of support, in addition to bibliography preparation and citation documentation, for green card applicants, many of whom are CIMSS researchers. Letters document the applicant's publishing history, but also provide an explanation of the importance of the scholarly journals chosen, their impact in the discipline, where they are indexed, and the import of conference papers. Recognizing the impact of these letters, the campus is now asking applicants to obtain a letter of support from a librarian, using ours as a model.

Research Support for Authors

During the summer of 2006, Erik Conway, historian at the Jet Propulsion Laboratory, visited the Schwerdtfeger Library to conduct research using Verner E. Suomi's personal papers and publications. His book, *Atmospheric Science at NASA: A History*, documents the important work of Suomi in the area of satellite meteorology. Library staff worked with Mr. Conway over the course of several weeks to provide access to our extensive collections. Mr. Conway's book, published in 2008 by the Johns Hopkins University Press, includes acknowledgement of our library staff.

Library staff work with researchers, from around the world, many of whom are CIMSS colleagues, who are gathering information to support their research. Many of these contacts are ongoing, over the course of years.

Bibliographies

The Schwerdtfeger Library creates and maintains subject bibliographies to support the ongoing research of CIMSS. For example:
The *GOES-R Bibliography* captures publications of the GOES-R Project Team:
http://library.ssec.wisc.edu/resources/goesr/goesr.php

The *FTIR Bibliography* is a comprehensive compilation of publications chronicling the history of CIMSS and SSEC scientists who study infrared radiances obtained from ground-based and airborne instrumentation: http://library.ssec.wisc.edu/resources/ftir/ftir.php
CIMSS Publications displays the publications of the Institute's scientists:
http://library.ssec.wisc.edu/resources/cimss/cimss.php#20052009
The Library also produces individual bibliographies for each scientist, many of whom use these listings on their personal homepages: http://library.ssec.wisc.edu/publications/affiliation.php
ITAR information tracks the history, policy development, legislation, and news about the International Traffic in Arms Regulations (ITAR): http://library.ssec.wisc.edu/resources/itar/

Electronic Journal Access
The Schwerdtfeger Library is one of several campus libraries that jointly fund electronic access to journals of the American Geophysical Union. These and many other electronic journals require partnerships to fund access, and are crucial to supporting the research interests of CIMSS scientists.

Additionally, the library monitors and purchases new publications or makes recommendations to the campus for materials that support on-going and new research interests of CIMSS scientists.

Journals can be accessed from the Schwerdtfeger Library Electronic Journals:
http://library.ssec.wisc.edu/resources/ejournals/

Using a Citation Analysis to Explore Mission Success: Paper Published in BAMS
Since 2004, the Schwedtfeger Library has compiled and reported metrics on publishing history and patterns of CIMSS authors that Steve Ackerman, its director, has utilized in annual and base funding reviews. Steve Ackerman and Jean Phillips received funding from Thompson Scientific and the CIMSS base grant to further the analysis. With the help of Dan Bull and Tom Achtor, they expanded the investigation to include additional parameters and trends.

The paper, *Using a Publication Analysis to Explore Mission Success*, was published in the October 2009 issue of BAMS. The paper examines the mission success of CIMSS by using bibliometric methods that include quantitative, descriptive and citation analyses. We developed a methodology to facilitate examination of patterns in research, publishing and collaborations, quantification and categorization of research partners, classification of topics, historical and emerging areas of research; and publishing venues. These patterns, over a 12-year period, were used to assess whether the Institute is achieving its mission goals of: 1) fostering collaborative research, 2) becoming a center of excellence, and 3) educating scientists and students.

Findings show that a self-study of publishing activities yields useful results about programmatic strengths and weaknesses and could be used as a first step of a larger study of federal government research and programmatic evaluation

Suomi Web Site
Schwerdtfeger Library staff developed an extensive web site devoted to the life and professional accomplishments of Verner E. Suomi, Father of Satellite Meteorology, and founder of CIMSS. The web site is being used extensively by researchers in-house and around the world who are interested in the broad work of this atmospheric science visionary.

The site includes Dr. Suomi's: Biography and general history, curriculum vitae, awards, professional publications, archive of personal papers, ATS image database, film loops (ATS imagery and others), and interactive timeline of significant events and achievements:
http://library.ssec.wisc.edu/SuomiWebsite/index.html

Assisting Authors with Copyright Decisions
Scholarly publishing is rapidly changing and many scholars are taking a more active role in managing their copyrights. Librarians are assisting them with these decisions, making them aware of their rights as an author. In 2007 the UW-Madison Faculty Senate passed a resolution encouraging faculty to control their copyright and recommended the use of an endorsed author addendum. Many other universities have made similar endorsements.

In addition, librarians are actively talking with scientists about publishing venues, open access, and other copyright issues. See, for example,

What's New With Intellectual Property:
http://library.ssec.wisc.edu/resources/news/news.php?htm=2008-04.htm

Copyright Policies of Scientific Publishers:
http://library.ssec.wisc.edu/resources/news/news.php?htm=2006-03.htm

Faculty Senate Passes Resolution:
http://library.ssec.wisc.edu/resources/news/news.php?htm=2007-05.htm

Unique Materials
The Schwerdtfeger Library's physical collection includes thousands of items that are unique to the UW-Madison campus and in many instances, the Schwerdtfeger Library is the only source for the item nationally. Some of the collections include: German language research materials, V.E. Suomi papers, VAS materials, and ATS and other satellite photograph collections.

Resource for Grant Announcements
The Schwerdtfeger Library supports CIMSS scientists by filtering grant announcements in order to aid discovery of funding very specific to their research needs. In addition to grant announcements, the library has created and maintains a grants information page on its web site to assist researchers with other related needs: http://library.ssec.wisc.edu/grants/

Capabilities: Teaching and Outreach

Information Resources in the Atmospheric Sciences, Current and Historical
Schwerdtfeger Library staff develop and deliver lectures outlining tools that students and staff can use to uncover current or historical information in the atmospheric sciences. Lectures focus on specific subject databases, methods of information retrieval, search query constructions, discussion of peer-review and types of source material, and evaluation techniques.

Students use these new skills to support the research they are conducting with CIMSS, SSEC and other scientists.

2. The Suomi Science Museum
The Suomi Science Museum Committee is working to spread the word about the museum concept. The Committee has won approvals from the campus and the State of Wisconsin and is enumerated in the 2009-2011 State budget. The Committee, with Paul Menzel as principal investigator, received $100K from the National Oceanic and Atmospheric Administration.

Committee members are giving talks to local audiences to promote the idea and establish the importance of our noteworthy history in satellite remote sensing. One of the lectures, recorded by Wisconsin Public Television, is playing to audiences across the state: http://www.biotech.wisc.edu/webcams/Index.aspx

Additionally, the SSEC's weather globe was featured at the Madison Children's Museum, the UW Space Place and the Milwaukee Children's Museum, all in the past year. Rick Kohrs has programmed the globe to feature numerous types of data from the SSEC Data Center and built a touch-screen interface for museum visitors.

Work continues to raise awareness with industry partners and others. The museum committee has planned an exhibition and reception to commemorate the 50th anniversary of satellite meteorology and its roots at the University of Wisconsin.

Challenges for the Future

Intellectual property: Scholarly publishing is changing and publishing venues, open access, and other copyright issues will become more prevalent and need the guidance of information professionals.
Federal library closures: There have been many federal library closures and staff reductions in the past several years. There are numerous issues involved, not the least of which is maintaining access to federally supported scientific research, because this material is used by both federal and university researchers and whether the burden of research support will shift to academic libraries if federal libraries are de-funded.
Budget constraints at state and federal level: Libraries that are state-supported, and those that are not, are experiencing huge challenges in their ability to continue to provide materials, electronically and in traditional formats, to meet the education and research demands of their students and faculty. Demands for scholarly and other materials in electronic form will continue to increase. University of Wisconsin-Madison libraries are discussing staffing reductions and library consolidations as possible ways to deal with budget reductions.
Increasing research needs with static staffing levels: As the volume of information increases, so does the need for information filtering and verification. Experienced information professionals are able to search and analyze effectively because they know how to search, which tools are available to the subject area and which of those will yield the best results. Demands for these skills and services are increasing.
Restructuring of UW-Madison research and graduate education units: If the reorganization is implemented as proposed, it may negatively affect the provision of information services and research support.

Appendix K: Atmospheric and Oceanic Science Department Faculty

Prof. Steve Ackerman (Director, Cooperative Institute for Meteorological Satellite Studies) – Dr. Ackerman's research centers on remote sensing of clouds for satellite observations, emphasizing cloud detection, retrieving properties and analyzing trends in global cloud distributions. He is also involved in various education research projects. Ph.D. 1987, Colorado State University.

Prof. Larissa Back – Dr. Back's research interests are in tropical dynamics and deep convection. More specifically, she examines the climatology of tropical rainfall patterns, the link between precipitation extremes and the Earth's climate, and the theory and modeling of tropical circulation. Ph.D. 2007, University of Washington.

Prof. Ankur Desai – Dr. Desai studies biogeochemical cycles with the investigation into gaseous exchange between ecosystems and the atmosphere mediated by land cover, terrain, and forest management. In addition he focuses on the adequacy of climate/ecosystem models in regional carbon exchange as well as how variations in soil moisture and land cover affect the atmospheric boundary layer and the climate system. Ph.D. 2006, Pennsylvania State University.

Prof. Matt Hitchman – Dr. Hitchman's research interests include atmospheric dynamics, the general circulation of the atmosphere, transport and mixing, climate dynamics, volcanic aerosols, the ozone layer, climatologies of satellite constituents and dynamical fields, stratospheric and mesospheric research, and chemical transport modeling. Ph.D. 1985, University of Washington.

Prof. Tracey Holloway (Director, Center for Sustainability and the Global Environment) – Dr. Holloway's research examines air pollution chemistry and transport at both regional and global scales. Her research group is interested in the links between air quality and climate, energy, land use, health, and public policy. Ph.D. 2001, Princeton University.

Prof. Tristan L'Ecuyer – Dr. L'Ecuyer's research combines state-of-the art remote sensing, coordinated analysis of multi-sensor satellite datasets and numerical model output, and targeted regional field experiments to study global energy balance, high-latitude precipitation processes, and aerosol-cloud interactions in the climate system. Ph.D. 2001, Colorado State University.

Prof. Zhengyu Liu (Director of the Center of Climatic Research) – Dr. Liu's current projects address the modeling of the global climate system, ocean-atmosphere-land interactions, climate change, and climate variability in the past, present, and future as well as the modeling and dynamics of general oceanic circulation and of geophysical fluids. PhD. 1991, Massachusetts Institute of Technology.

Prof Jonathan Martin – Dr. Martin's research interests include the analysis of mid-latitude, synoptic-scale weather systems, dynamics and kinematics of fronts and frontogenesis, cyclogenesis, the structure and evolution of cyclones, energetics of the cyclone lifecycle, meso- and synoptic-scale dynamics, and precipitation production and distribution in mid-latitude and subtropical cyclones. Ph.D. 1992, University of Washington.

Prof. Galen McKinley – Dr. McKinley studies physical structures and biogeochemical processes in large water bodies influence carbon cycling and its temporal variability requiring an interdisciplinary approach

across a range of fields: from fluid dynamics to aquatic chemistry and ecology. Currently, projects underway address global trends in surface ocean pCO2, biological export of carbon from the surface to deep ocean, physical and biogeochemical changes since the late 1990s in the North Atlantic, and biogeochemical cycling in Lakes Superior and Michigan. Ph.D. 2002, Massachusetts Institute of Technology.

Prof. Michael Morgan – Dr. Morgan's work centers on the analysis, diagnosis, and prediction of tropical and extratropical weather systems. One main goal of his research is to understand the characteristics and sensitivity of 12 hour to one week numerical weather prediction forecasts and forecast errors. Ph.D. 1994, Massachusetts Institute of Technology.

Prof. Grant Petty – Dr. Petty's main interests lie in the fields of satellite remote sensing and atmospheric radiation. Specifically, his work focuses on the problem of estimating rainfall and snowfall from space using microwave remote sensors. He is also interested in theoretical and computational problems in atmospheric radiative transfer. PhD. 1990, University of Washington.

Prof. Greg Tripoli – Dr. Tripoli's research centers on the dynamics and microphysical processes underlying the growth of convective weather systems and modeling the scale interaction process. Of particular interest are warm core cyclone disturbances, extratropical mesoscale convective complexes, and extratropical warm core seclusions. He also studies the interaction of local convective phenomena with large-scale flow systems. Ph.D. 1986, Colorado State University.

Prof. Dan Vimont – Prof. Vimont's research focuses on three main areas: dynamics and thermodynamics of large-scale ocean atmosphere interactions, interactions between climate and weather, and regional climate change impacts. In researching these areas, Dr. Vimont's group uses observational analyses, designed experiments using global climate models and theoretical analyses. Ph.D. 2002, University of Washington.

Prof. Pao Wang – Dr. Wang studies the physical and chemical processes related to the formation and growth of cloud and precipitation particles and the interaction between clouds and their dynamical environments. His other projects center on processes such as atmospheric electricity, aerosol physics, air pollution problems, and interpretation of satellite observed thunderstorm features using cloud resolving models. Ph.D. 1978, University of California – Los Angeles.

Appendix L: List of Meetings

MEETING	DATES	ATTENDEES
Saturn Science Workshop	August 2014	~80
27th Satellite Educators Conference	30 July – 1 Aug 2014	~50
NOAA Satellite Virtual Meeting	10-14 March 2014	~50
GOES-R Communications	13-15 Nov 2013	~20
Geospacial Semantics	28-29 Oct 2013	~20
GOES-R Communications	7-9 Oct 2013	35
Intn'l Drillers Technical Workshop	9-14 Sept 2013	120
AIT Collaboration	21-22 Aug 2013	18
CoRP Symposium 2013	23-24 July 2013	60
CIMSS Workshop on Earth and Space Science	23-27 June 2013	17
CSPP/IMAPP Workshop	21-23 May 2013	55
IWSSM	6-8 May 2013	60
CIMSS Science Symposium	6 May 2013	120
STORM Team	25 April 2013	20
KMA Visitors	18-19 April 2013	20
AOSS Poster Reception	16 April 2013	230
Mehta/Goldberg Visit	26-Nov 2012	25
National Weather Association	6-11 Oct 2012	400
WMO-DAOS Meeting	19-20 Sept 2012	30
CIMSS Science Symposium	12 Dec 2012	125
CIMSS Workshop on Earth and Space Science	24-28 June 2012	18
Remote Sensing of Coastal and Inland Waters	20-22 June 2012	50
Air Quality Applied Sciences Team	13-15 June 2012	50
ASSFTS	22-24 May 2012	42
AOSS Poster Reception	14 May 2012	200
ITSC-18	21-28 March 2012	180
Cloud Retrieval Eval Workshop (CREW-3)	15-18 Nov 2011	100
Far IR	7-9 Nov 2011	40
Aviation Safety (Boeing)	2 Nov 2011	10
Goodman/Mandt Visit	13 Oct 2011	14
CLARREO	12-14 Oct 2011	44
CIMSS Workshop on Earth and Space Science	26-30 June 2011	18
AOSS Poster Reception	26 April 2011	180
ESIP	16-20 July 2011	100
IWSSM	30 Mar – 2 Apr 2011	50
JPSS ADL TIM	19-20 Jan 2011	18
SALT RSS-NIR Design Review	11-12 Oct 2010	31
AmericaView	10-13 Oct 2010	100
NPOESS Customer Forum	10-12 Aug 2010	50
GOES-R AWG	6-11 June 2010	130
VIIRS OAT Meeting	4-5 May 2010	60
ITSC-17	14-20 April 2010	150
GOES Users Conference	3-5 Nov 2009	400
50th Anniversary of 1st Met. Satellite Exper.	2 Nov 2009	350
CALIPSO/CloudSat Workshop	28-31 July 2009	150

Appendix M. CIMSS Publications 2013

2013 Papers Accepted for Publication

Anderson, M.C.; Hain, C.; Otkin, J.A.; Zhan, X.; Mo, K.; Svoboda, M.; Dulaney, W., and Pimstein, A. An intercomparison of drought inidcators based on thermal remote sensing and NLDAS-2 simulations with U.S. Drought Monitor classifications. Journal of Hydrometeorology, in press.

Cintineo, J.L.; Pavolonis, M.J.; Sieglaff, J.M., and Heidinger, A.K. Evolution of severe and non-severe convection inferred from GOES-derived cloud properties. Journal of Applied Meteorology and Climatology, in press.

Hoover, B.T.; Velden, C.S., and Majumdar, S.J. Physical mechanisms underlying selected adaptive sampling techniques for tropical cyclones. Early Online Release, Monthly Weather Review, 2013, doi:10.1175/MWR-D-12-00269.1.

Jones, T.A.; Otkin, J.A.; Stensrud, D.J., and Knopfmeier, K. Assimilation of simulated GOES-R satellite radiances and WSR-88D Doppler radar reflectivity and velocity using an observing system simulation experiment. Monthly Weather Review, in press.

Kossin, J. P., T. L. Olander, and K. R. Knapp, 2013: Trend analysis with a new global record of tropical cyclone intensity. Journal of Climate, in press.

Kozar, M. E., M. E. Mann, S. J. Camargo, J. P. Kossin, and J. E. Evans, 2013: Statistical modeling of Atlantic tropical cyclone counts. Journal of Geophysical Research, in press.

Lee, Yong-Keun; Li, Zhenglong; Li, Jun, and Schmit, Timothy J. Evaluation of the GOES-R ABI LAP retrieval algorithm using the current GOES sounder. Journal of Applied Meteorology and Climatology, in press.

Otkin, J.A.; Anderson, M.C.; Hain, C.; Mladenova, I.; Basara, J., and Svoboda, M. Examining flash drought development using the thermal infrared based Evaporative Stress Index. Journal of Hydrometeorology, in press.

Yi, B.; Yang, P.; Baum, B.A.; L'Ecuyer, T.; Oreopoulos, L.; Mlawer, E.J.; Heymsfield, A.J., and Liou, K.-N. Influence of ice particle surface roughening on the global cloud radiative effect. Journal of the Atmospheric Sciences, in press.

Yao, Z.; Li, Jun; Weisz, E., and Heidinger, A.K. Evaluation of single field-of-view cloud top height retrievals from hyperspectral infrared sounder radiances with CloudSat and CALIPSO measurements. Journal of Geophysical Research, in press.

2013 Reviewed Papers

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Chen, Ruiyue; Cao, Changyong, and Menzel, W. Paul. Intersatellite calibration of NOAA HIRS CO2 channels for climate studies. Journal of Geophysical Research v.118, no.2013, ppdoi:10.1002/jgrd.50447.

Cole, Benjamin H.; Yang, Ping; Baum, Bryan A.; Riedi, Jerome; Labonnote, Laurent C.; Thieuleux, Francois, and Platnick, Steven. Comparison of PARASOL observations with polarized reflectances simulated using different ice habit mixtures. Journal of Applied Meteorology and Climatology v.52, no.1, 2013, pp186-196.

Ding, Shouguo; Yang, Ping; Baum, Bryan A.; Heidinger, Andrew, and Greenwald, Thomas. Development of a GOES-R Advanced Baseline Imager solar channel radiance simulator for ice clouds. Journal of Applied

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Evan, Amato T.; Allen, Robert J.; Bennartz, Ralf, and Vimont, Daniel J. The modification of sea surface temperature anomaly linear damping time scales by stratocumulus clouds. Journal of Climate v.26, no.11, 2013, pp3619–3630.

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Hartung, Daniel C.; Sieglaff, Justin M.; Cronce, Lee M., and Feltz, Wayne F. An intercomparison of UW cloud-top cooling rates with WSR-88D radar data. Weather and Forecasting v.28, no.2, 2013, pp463–480.

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Mielikainen, Jarno; Huang, Bormin; Wang, Jun; Huang, Hung-Lung Allen, and Goldberg, Mitchell D. Compute Unified Device Architecture (CUDA)-based parallelization of WRF Kessler cloud microphysics scheme. Computers and Geosciences v.52, no.2013, pp292-299.

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Appendix N: Acronyms

ABBA	Automated Biomass Burning Algorithm
ABI	Advanced Baseline Imager
ADT	Advance Dvorak Technique
AERI	Atmospheric Emitted Radiance Interferometer
AFWA	Air Force Weather Agency
AFWEX	Atmospheric Radiation Measurement First ISCCP Regional field Experiment Water Vapor Experiment
AIRS	Atmospheric InfraRed Sounder
AIT	Algorithm Integration Team
AMS	American Meteorological Society
AMSU	Advanced Microwave Sounder Unit
AMV	Atmospheric Motion Vectors
AniS	AnimationS applet
AO	Announcement of Opportunity
AOD	Aerosol Optical Depth
AODT	Advanced Objective Dvorak Technique
AOL	Atmosphere, Ocean, Land
AOML	Atlantic Oceanographic and Meteorological Laboratory
AOS	Department of Atmospheric and Oceanic Sciences
APP	AVHRR Polar Pathfinder
AQ	Air Quality
AQF	Air Quality Forecasts
ARM	Atmospheric Radiation Measurement
ASADA	Automated Smoke/Aerosol Detection Algorithm
ASAP	Advanced Satellite Aviation weather Products
ASCAT	Advanced Scatterometer
ASOS	Automated Surface Observing Station
ASPB	Advanced Satellite Products Branch
ASTER	Advanced Space-borne Thermal Emission and Reflection radiometer
ATBD	Algorithm Theoretical Basis Document
ATOVS	Advanced TIROS Operational Vertical Sounder
ATReC	Atlantic THORPEX Respond Campaign
AVHRR	Advanced Very High Resolution Radiometer
AWG	Algorithm Working Group
AWC	Aviation Weather Center
AWIPS	Advanced Weather Interactive Processing System
AWRP	Aviation Weather Research Program
BAMS	Bulletin of the American Meteorological Society
BAR	Bias-Adjusted Reordering
BRN	Bulk Richardson Number
BUFR	Binary Universal Form for the Representation
CA	Cooperative Agreement
CALIPSO	Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations
CAPE	Convective Available Potential Energy
CAPS	Center for Analysis and Prediction of Storms
CART	Cloud and Radiation Testbed
CATT BRAMS	Coupled Aerosol and Tracer Transport/Brazilian Regional Atmospheric Modeling System
CAVE	CIMSS Audio-Visual Environment
CCR	Center for Climatic Research
CCSDS	Consultative Committee for Space Data Systems
CD	Compact Disc
CDR	Climate Data Record
CEOS	Committee for Earth Observation Satellites
CGMS	Coordination Group for Meteorological Satellites
CI	Cooperative Institute

CICS	Cooperative Institute for Climate Studies (University of Maryland and North Carolina State)
CIMMS	Cooperative Institute for Mesoscale Meteorological Studies
CIMSS	Cooperative Institute for Meteorological Satellite Studies
CIRA	Cooperative Institute for Research in the Atmosphere (Colorado State University)
CIOSS	Cooperative Institute for Oceanographic Satellite Studies (Oregon State University)
CLARREO	Climate Absolute Radiance and Refractivity Observatory
CLAVR	Clouds from AVHRR
CMA	Chinese Meteorological Administration
CMC	Canadian Meteorological Centre
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COMET	Cooperative Program for Operational Meteorology Education and Training
COMS	Communication, Ocean, Meteorological Satellite (Korea)
CONUS	CONtinental (or CONterminus) United States
CORIOLIS	US Air Force/Navy meteorological science satellite
CoRP	Cooperative Research Program (STAR)
COS	Community of Science
CPHC	Central Pacific Hurricane Center
CPL	Cloud Physics Lidar
CPTEC	Center for Weather Forecasting and Climate Studies (Brazil)
CREST	Cooperative Remote Sensing Science and Technology Center (consortium of 8 universities)
CrIMSS	Cross-track Infrared and Microwave Sounder Suite
CrIS	Cross-track Infrared Sounder
CRTM	Community Radiative Transfer Model
CSBT	Clear-Sky Brightness Temperature
CSPP	Community Satellite Processing Package
CTH	Cloud Top Height
CUNY	City University of New York
CWB	Central Weather Bureau (Taiwan)
CWG	Calibration Working Group
DAAC	Distributed Active Archive Center
DB	Direct Broadcast
DC	Detector Controller
DNS	Domain Name System
DOD	Department of Defense
DOE	Department of Energy
DPI	Derived Product Imagery
DT	Dvorak Technique
DURIP	Defense University Research Instrumentation Program
DWD	Deutscher Wetterdienst (Germany's Meteorological Administration)
ECMWF	European Centre for Medium-Range Weather Forecasts
EDAS	Eta Data Assimilation System
ED	Department of Education
ED-A	Executive Director – Administration (SSEC)
ED-S	Executive Director – Science (SSEC)
EDR	Eddy Diffusion Rate
EDR	Environmental Data Record
EMC	Environmental Modeling Center
EnKF	Ensemble Kalman Filter
EOS	Earth Observing System
EPA	Environmental Protection Agency
EPO	Education and Public Outreach
ER-2	Earth Resources (airplane), #2
ERBE	Earth radiation budget experiment
ESI	Evaporative Stress Index
ESPC	Environmental Satellite Processing Center
EUMETSAT	EUropean organization for the exploitation of METeorological SATellites

FAA	Federal Aviation Administration
FDP	Federal Demonstration Partnership
FFO	Funds from Operations
FFY	Federal Fiscal Year
FGGE	First GARP Global Experiment
FIRE	First ISCCP Regional Field Experiment
FLAMBE	Fire Locating and Monitoring of Burning Emissions
FNMOC	U.S. Navy Fleet Numerical Meteorology and Oceanography Center
FOV	Field Of View
FPDT	Forecast Products Development Team
FPGA	Field-Programmable Gate Array
FTP	File Transfer Protocol
FTS	Fourier Transform Spectrometers
FY	Fiscal Year
GAC	Global Area Coverage
GARP	Global Atmospheric Research Program
GB	Gigabyte
GCM	General Circulation Model
GCOS	Global Climate Observing System
GDAS	Global Data Assimilation System
GEO	Geostationary
GEOCAT	GEOstationary Cloud Algorithm Test-bed
GEO-I	Geostationary Interferometer
GEO-R	Geostationary Radiometer sounders
GEOSS	Global Earth Observation System of Systems
GFS	Global Forecast
GIF	Graphics Interchange Format
GIFTS	Geosynchronous Imaging Fourier Transform Spectrometer
GIMPAP	GOES Improved Measurements and Product Assurance Plan
GINI	GOES Ingest and NOAAPORT Interface
GLERL	Great Lakes Environmental Research Laboratory
GLI	Japanese Global Imager
GMAO	Global Modeling and Assimilation Office
GMD	Grants Management Division (NOAA)
GMS	Geostationary Meteorological Satellite
GOCART	Global Ozone Chemistry Aerosol Radiation Transport
GOES	Geostationary Operational Environmental Satellite
GOFC/GOLD	Global Observation of Forest Cover / Global Observation of Landcover Dynamics
GOMS	Geostationary Operational Meteorological Satellite (Russia)
GOS	Global Observing System
GPS	Global Positioning System
GRAFIIR	GOES-R Analysis Facility Instrument for Impacts on Requirements
GS	Graduate School
GSFC	Goddard Space Flight Center
GSI	Gridpoint Statistical Interpolation
GSICS	Global Space-based Inter-Calibration System
GVAR	GOES VARiable data
GWINDEX-III	Global Wind Experiment
HDF	Hierarchical Data Format
HES	Hyperspectral Environmental Suite
HIRS	High-resolution Infrared Radiation Sounder
HIS	High-spectral resolution Interferometer Sounder
HR	Human Resources
HSR	High Spectral Resolution
HSRL	High Spectral Resolution Lidar
HU	Hampton University
HWRF	Hurricane Weather Research and Forecasting Model

HWT	Hazardous Weather Testbed
HYDRA	Hyper-spectral Data Research Application
IAPP	International ATOVS Processing Package
IASI	Infrared Atmospheric Sounding Interferometer
IDEA	Infusing satellite Data into Environmental Applications
IDV	Integrated Data Viewer
IGOS	Integrated Global Observing Strategy
IHOP	International H_2O Project
IMAPP	International MODIS/AIRS Processing Package
IMG	Interferometric Monitor for Greenhouse gases
INPE	Instituto de Pesquisas Espaciais
INR	Image Navigation and Registration
INSAT	Indian National Satellite
IP	Intermediate Product
IPO	Integrated Program Office
IPOPP	International Polar Orbiter Processing Package
IR	InfraRed
ISCCP	International Satellite Cloud Climatology Project
ISO	International Organization for Standardization
ITAR	International Traffic in Arms Regulation
ITPP	International TOVS Processing Package
ITS	Interferometer Thermal Sounder
ITWG	International TOVS Working Group
JAIVEx	Joint Airborne IASI Validation Experiment
JCSDA	Joint Center for Satellite Data Assimilation
JPDO	Joint Planning and Development Office
JMA	Japan Meteorological Agency
JPL	Jet Propulsion Laboratory
JPSS	Joint Polar Satellite System
JTWC	Joint Typhoon Warning Center
K	Kelvin
Km	Kilometer
LBA-DIS	Large-Scale Atmosphere-Biosphere Experiment in Amazonia
LDM	Local Data Manager
LEO	Low Earth Orbit
LES	Lake Effect Snow
LI	Lifted Index
LSU	Louisiana State University
M.S.	Master of Science
MAS	MODIS Airborne Simulator
MATC	Madison Area Technical College
MBCC	Midnight Blackbody Calibration Correction
McIDAS	Man computer Interactive Data Access System
MCR	Measurement Concept Review
MCST	MODIS Calibration Science Team
MERSI	Medium Resolution Spectral Imager
Meteosat	METEOrological SATellite
METOP	Series of polar orbiting meteorological satellites (EUMETSAT)
MIT	Massachusetts Institute of Technology
MIXCRA	Mixed-Phase Cloud Property Retrieval Algorithm
MLEV	Minimum Local Emissivity Variance
MMSD	Madison Metropolitan School District
MODIS	MODerate-resolution Imaging Spectroradiometer
MOU	Memorandum of Understanding
MSPS	Modern Sensor Processing System
MSG	Meteosat Second Generation
MSU	Microwave Sounding Unit

MTSAT-1R	Japan's geostationary imager
MURI	Multidisciplinary University Research Initiative
MW	Microwave
MWR	Microwave Radiometer
NAAPS	Navy Aerosol Analysis and Prediction System
NAOS	North American Observing System
NASA	National Aeronautics and Space Administration
NAST	NPOESS Airborne Sounder Testbed
NCAR	National Center for Atmospheric Research
NCDC	National Climatic Data Center
NCEP	National Centers for Environmental Prediction
NESDIS	National Environmental Satellite, Data and Information Services
NHC	National Hurricane Center
NIST	National Institute for Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NPN	NOAA Profiler Network
NPOESS	National Polar Orbiter Environmental Satellite System
NPP	NPOESS Preparatory Project
NSF	National Science Foundation
NSMC	National Satellite Meteorology Center (China)
NSSL	National Severe Storms Laboratory
NWP	Numerical Weather Prediction
NWS	National Weather Service
NWSFO	NWS Forecast Office
ODT	Objective Dvorak Technique
OFCCP	Office of Federal Contract Compliance Programs
OMB	Office of Management and Budget
OMI	Ozone Monitoring Instrument (Aura)
ORA	Office of Research & Applications
OSD	Office of Systems Development
OSDPD	Office of Satellite Data Processing and Distribution
OSE	Observing System Experiments
OSPO	Office of Satellite and Product Operations
OSSE	Office of Space Science Education
OT	Overshooting top
PACJET	Pacific Landfalling Jets Experiment
PALMS	Precision Agricultural-Landscape Modeling System
PATMOS-x	Pathfinder Atmosphere
PBL	Planetary Boundary Layer
PDT	Product Development Teams
PEATE	Product Evaluation and Algorithm Test Elements
Ph.D.	Doctor of Philosophy
PI	Principal Investigator
PM	Program Manager
POES	Polar Orbiting Environmental Satellite
PPVQ	Predictive Partitioned Vector Quantization
PSDI	Product Systems Development and Implementation
PV	Potential Vorticity
pyroCb	Pyrocumulus
QA	Quality Assurance
RAMMB	Regional and Mesoscale Meteorology Branch (CIRA)
RAMS	Regional Atmospheric Modeling System
RAOB	RAdiosonde OBservation
RAQMS	Regional Air Quality Modeling System
RSP	Research and Sponsored Programs
RT	Radiative Transfer
RUC	Rapid Update Cycle

SAB	Satellite Analysis Branch (OSDPD)
SAFARI	Southern African Regional Science Initiative
SAL	Saharan Air Layer
SATCON	Satellite Consensus
SCAR-B	Scientific Committee for Antarctic Research
SCSB	Satellite Climate Studies Branch (CICS)
SDAT	Satellite Data Assimilation for sTorm forecast
SDI	SSEC Desktop Ingestor
SDR	Sensor Data Record
SEVIRI	Spinning Enhanced Visible and InfraRed Imager
SFOV	Single Field of View
SFY	State Fiscal Year
SGP	Southern Great Plains
SHARP	Summer High School Apprenticeship Research Program
SHEBA	Surface Heat Budget of the Arctic Ocean
S-HIS	Scanning High resolution Interferometer Sounder
SHyMet	Satellite Hydrology and Meteorology
SMM	Science Museum of Minnesota
SNPP	Suomi National Polar-orbiting Partnership
SO_2	Sulfur dioxide
SOCC	Satellite Operations Control Center
SOI	Successive Order of Interaction
SOS	Science on a Sphere
SOW	Statement of Work
SPARC	SSEC Portable Atmospheric Research Center
SPC	Storm Prediction Center
SRF	Spectral Response Function
SSEC	Space Science and Engineering Center
SSM/I	Special Sensor Microwave/Imager
SST	Sea Surface Temperature
STAR	Satellite Applications and Research
STEM	Science, Technology, Engineering, Mathematics
TAP	Technical Advisory Panel
TB	Terabytes
TC	Tropical Cyclones
TCO	Total Column Ozone
TEMPO	Tropospheric Emissions: Monitoring of Pollution
THORPEX	The Observing system Research and Prediction Experiment
TIROS	Television InfraRed Observation Satellite
TNMC	The National Maritime Center
TOA	Top of Atmosphere
TOMS	Total Ozone Mapping Spectrometer
TOVS	TIROS Operational Vertical Sounder
T-PARC	THORPEX Pacific Asian Regional Campaign
TPC	Tropical Prediction Center
TPW	Total Precipitable Water
TRMM	Tropical Rainfall Measuring Mission
TROWAL	TROugh of Warm air ALoft
TXR	Thermal-Infrared Transfer Radiometer
UAH	University of Alabama–Huntsville
UPS	United Parcel Service
USDA	U.S. Department of Agriculture
UTC	Universal Coordinated Time or Universal Time Coordinated
UV	UltraViolet
UVB	UltraViolet B narrowband
UW	University of Wisconsin
VAS	VISSR Atmospheric Sounder

VCM	Vector Covariance Message
VIIRS	Visible/Infrared Imager and Radiometer Suite
Vis5D	Visualization of Five-Dimensional data
VisAD	Visualization for Algorithm Development
VISIT	Virtual Institute for Satellite Integration Training
VISSR	Visible and Infrared Spin-Scan Radiometer
WES	Weather Event Simulator
WF_ABBA	Wildfire Automated Biomass Burning Algorithm
WINCE	WINter Cloud Experiment
WISC-T2000	Wisconsin Snow Ice-Terra 2000
WFO	Weather Forecast Office (NWS)
WMO	World Meteorological Organization
WRF	Weather Research and Forecasting model
WRF-CHEM	Weather Research and Forecast (WRF) model coupled with Chemistry
WVIOP	Water Vapor Intensive Observing Period
WVSS	Water Vapor Sensing System