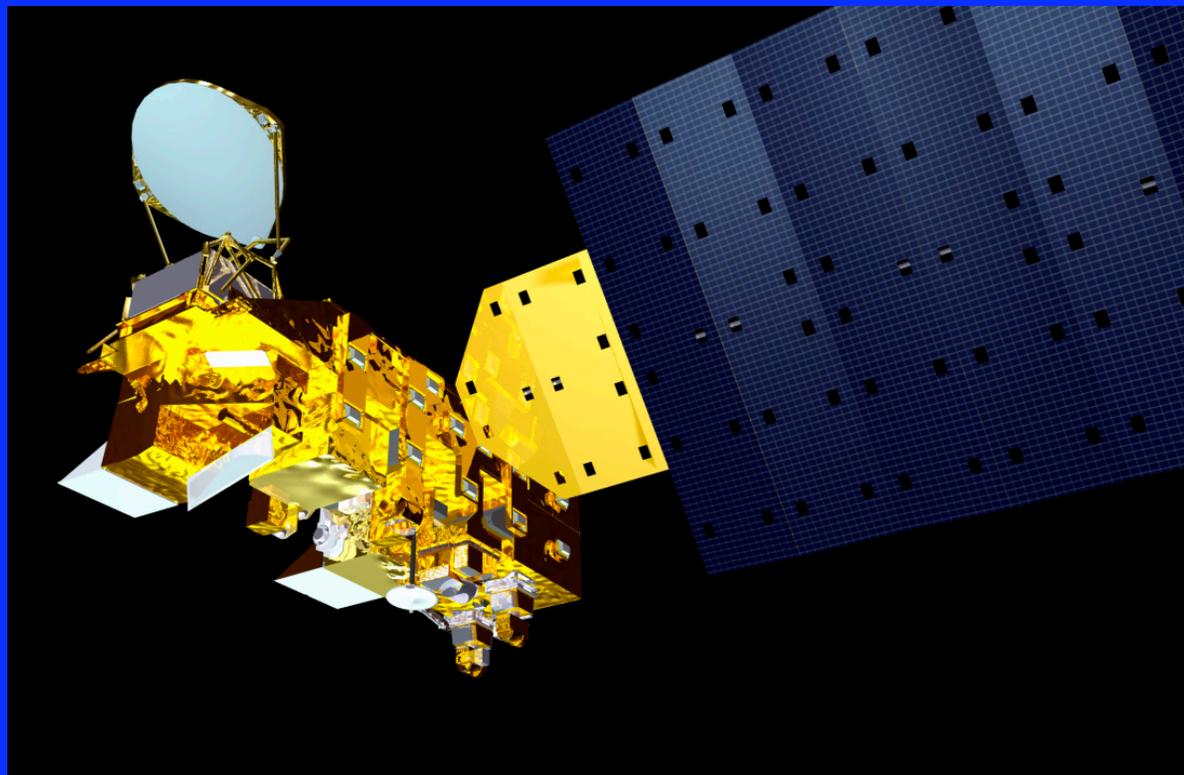




State of CERES



Norman G. Loeb, NASA LaRC

CERES Science Team Meeting April 26, 2011, Newport News, VA

NASA Earth Science

- **NASA Administrator is Charles Bolden, Jr.**
- **AA for Space and Earth Science is Ed Weiler.**
- **Head of Earth Science is Mike Freilich.**
- **Jack Kaye is Associate Director for R&A.**
- **David Considine is NASA HQ Modeling lead and CERES Program Scientist.**
- **Hal Maring remains Radiation Sciences program lead.**
- **Steve Volz is the Earth Science Deputy for Missions.**

CERES Team Leads

- **Principal Investigator: Norman Loeb**
- **Project Scientist: Kory Priestley**

CERES Working Groups:

- **Instrument: Kory Priestley**
- **ERBElike: Takmeng Wong**
- **Clouds: Pat Minnis**
- **Inversion: Wenying Su (**New**)**
- **SOFA: David Kratz**
- **SARB: Tom Charlock**
- **TISA: David Doelling**
- **FLASHFlux: Paul Stackhouse & David Kratz**
- **Data Management: Jonathan Gleason**
- **ASDC: John Kusterer**

CERES News

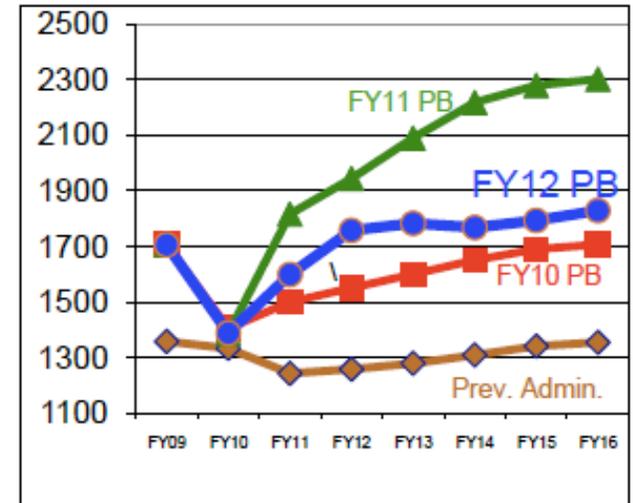
- **NASA Senior Review**
 - **Proposals (Terra & Aqua) submitted March 4th.**
 - **Panel review May 3 (Terra) and May 4 (Aqua).**
 - **June: Publication of the panel's report.**
 - **July: New budget guidelines and instructions to projects.**
 - **August: Projects revised implementation plans to ESD.**
- **NASA-PCMDI (Program for Climate Model Diagnosis and Intercomparison) Effort**
 - **NASA initiative to provide observational datasets to the Earth System Grid for CMIP5 model-data comparison.**
 - **CERES TOA LW & SW radiation datasets were identified by PCMDI and NASA as being desirable for this initiative.**
 - **First contribution due in June 2011.**
- **COVE Update: City of VA Beach still considering purchase**
- **CERES FM5 Official Launch: Oct 25, 2011**
- **NPP spacecraft and ground system confidence test**

Other News

- Glory launch failure. Total solar irradiance (input used by CERES) and Aerosol Polarimetry Sensor (APS).
- CLARREO passes MCR but soon after told it will be held in pre-formulation phase through 2016.
- Government shutdown...or not.
- Passing of AIRS Science Team Leader Mous Chahine (March 24, 2011).
- **Cloudsat:**
 - Experiencing serious problems with the spacecraft battery that led to the spacecraft entering emergency hold April 18.
 - Priority #1 is to restore enough charging on the spacecraft battery to enable the ops team to restore other spacecraft functions that have been disabled (GPS, reaction wheels, etc.).
 - Recovery of radar operations will be next (~1 month later).
 - Cloudsat drifting away from CALIPSO towards Aqua.

Earth Science Budget Overview

- The FY12 budget removes \$1.2B from the \$2.1B FY11 proposed Climate Initiative in the years FY12-15
- Explicit Administration-directed **cuts for some very important activities**: GMI-2/GPM LIO cancelled; CLARREO held in pre-formulation through FY2016; DESDynI-Lidar cancelled (full int'l provision required); DESDynI-Radar deferred until affordable; planned augmentations to non-flight (R&A, Applied Science, ESTO) reduced



- **The budget does support many extremely important activities**: Glory, Aquarius, NPP launches in CY2011; Venture-class solicitations/funding as planned; continued operation of on-orbit missions; LDCM launch in 12/2012; OCO-2, GPM launches in 2013; SMAP (11/2014); SAGE-III on ISS (2014); ICESat-2, GRACE-FO, OCO-3 MoO (2016); PACE, SWOT, ASCENDS (2019-2020); \$234M **increase** from FY10 budget plan for non-flight activities (R&A, ASP, ESTO) for FY12-15
- Explicit direction to ESD to continue working with NOAA and OSTP to address approaches for providing sustained spaceborne climate measurements within the overall budgetary constraints
- **The content that was directed to be removed is commensurate with the directed resource reductions**

Upcoming Conferences & Meetings of Interest

CFMIP/GCSS/EUCLIPSE Meeting on Cloud Processes and Climate Feedbacks

- June 6-10, The Met Office, Exeter, UK.

Gordon Research Conference (Radiation and Climate)

- July 10-15, Colby College, Waterville, Maine.

EUMETSAT Meteorological Satellite Conference:

- September 5-9, 2011, Oslo, Norway.

Fall CERES Science Team Meeting:

- October 4-6. LLNL, Livermore, CA. (Plz: Sign up now!).

WCRP Open Science Conference: Climate Research in Service to Society

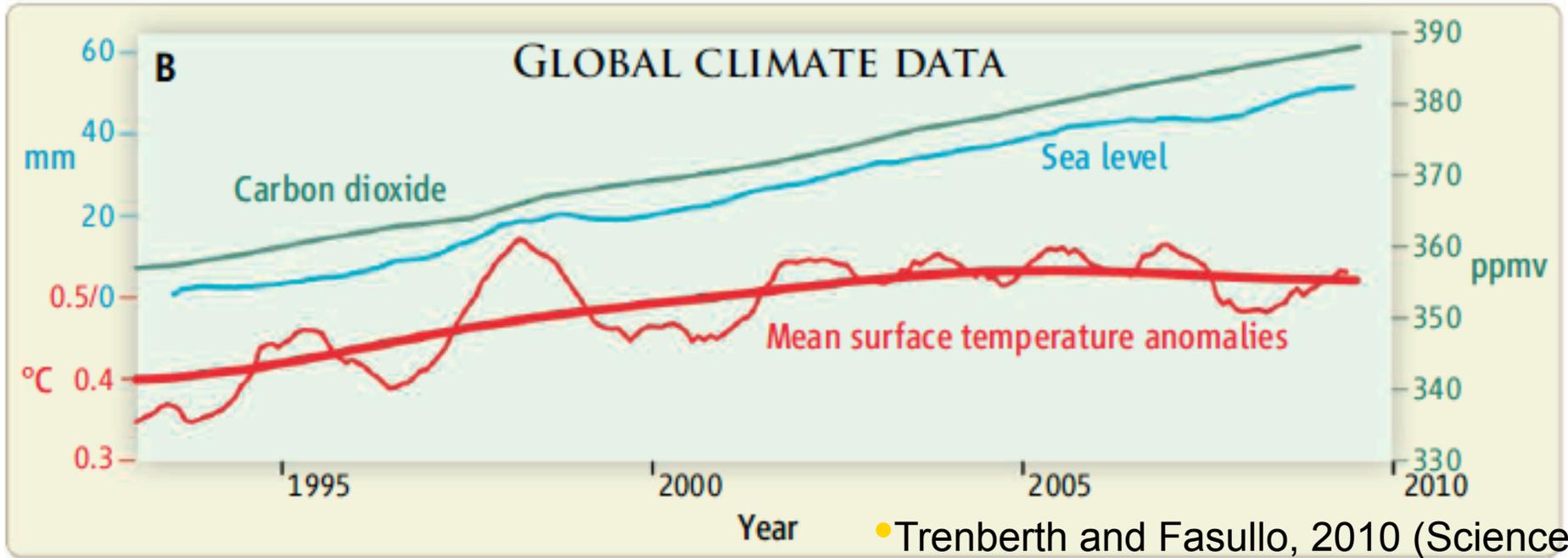
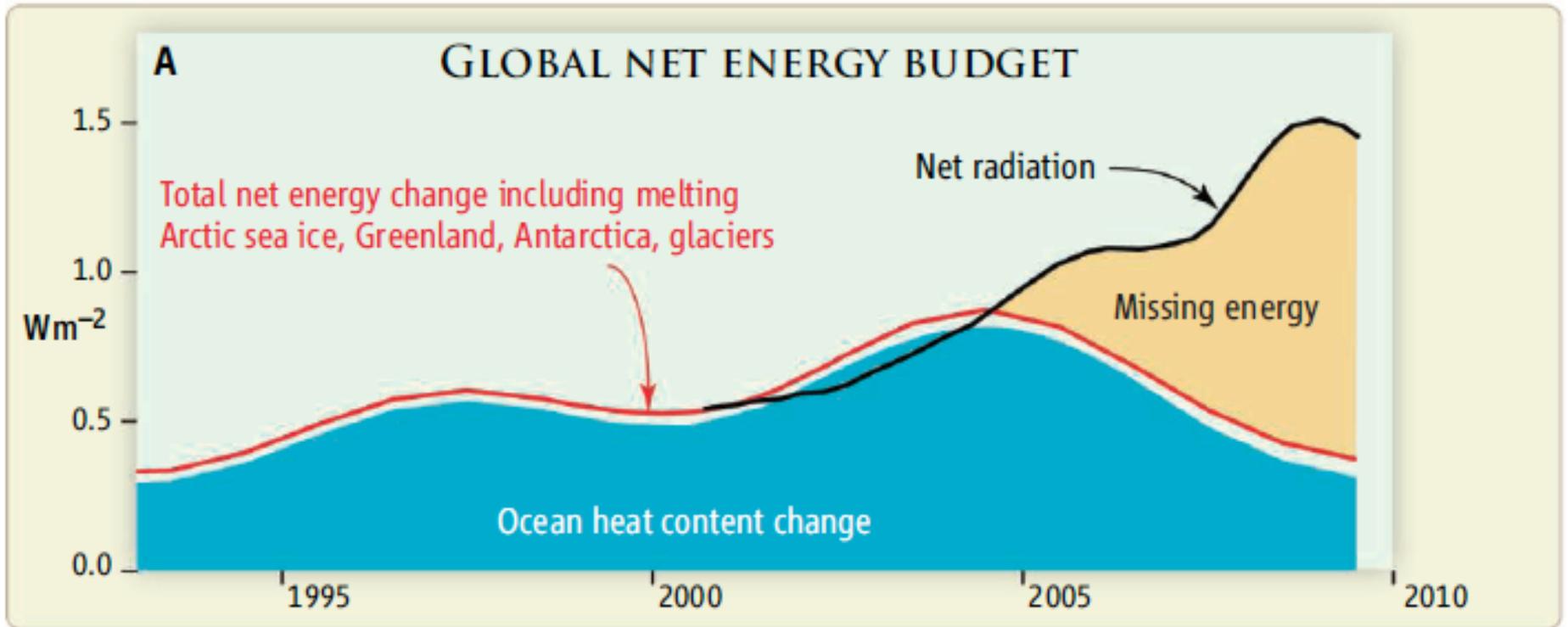
- October 24-28, Denver, CO.

Fall AGU:

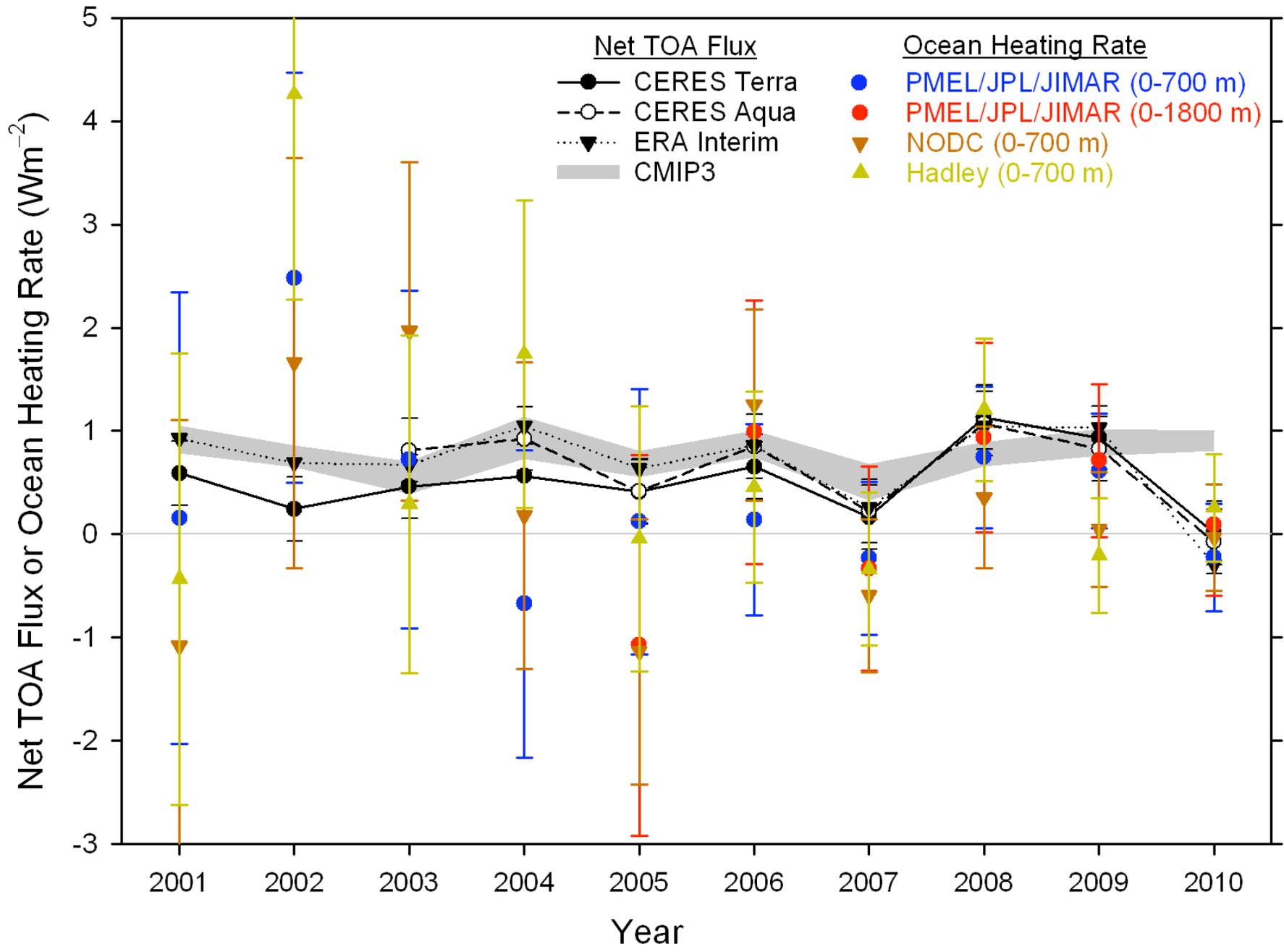
- Aqua@10 Union Session during fall AGU (Dec 5-9, 2011).
Abstract deadline: August 4, 2011.

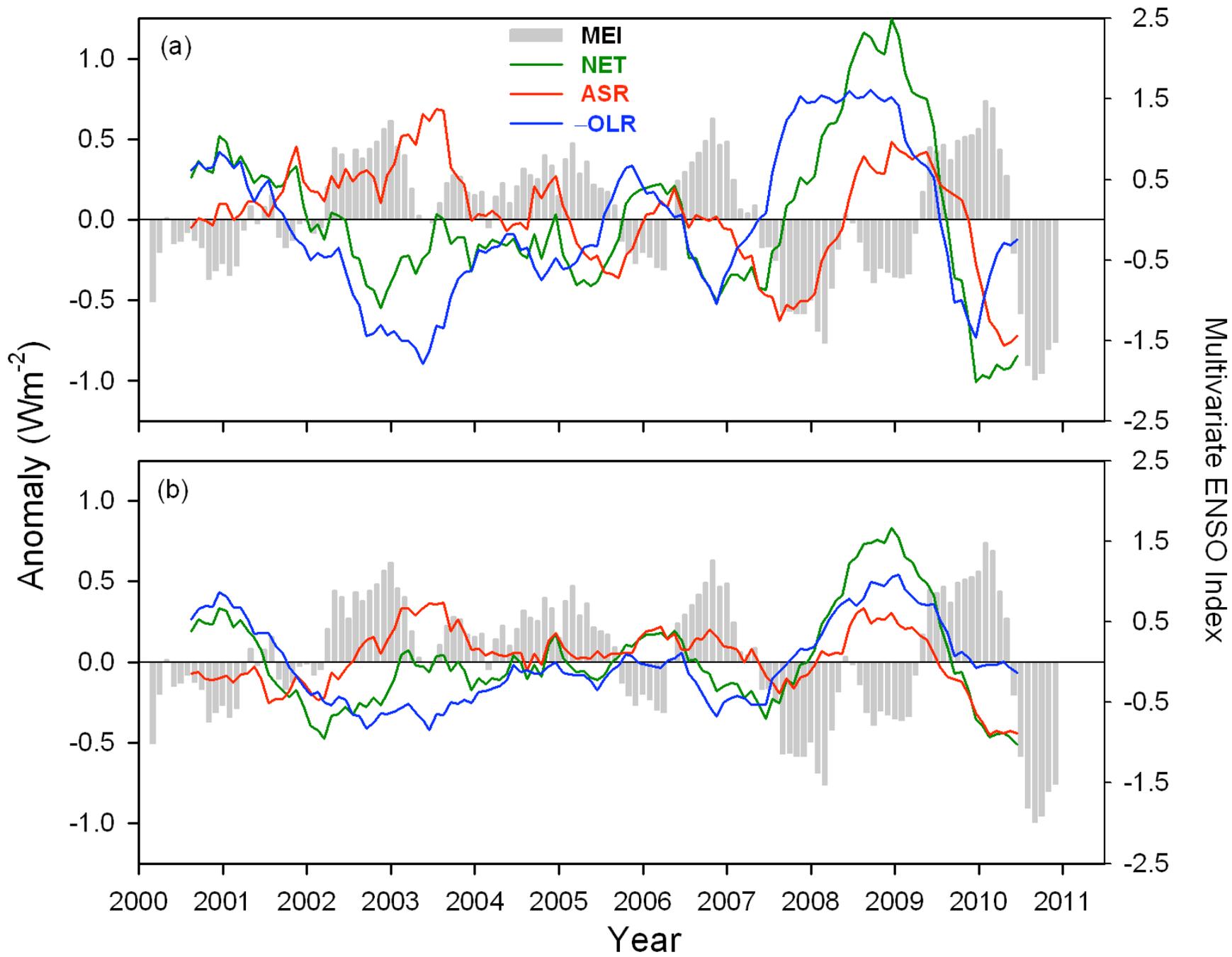
Tracking Earth's Energy

- Paper by Trenberth and Fasullo (2010) in Science (Perspectives Article entitled “Tracking Earth’s Energy”) highlights discrepancies between observing systems measuring different parts of Earth’s energy budget.
- Measuring net incoming and outgoing radiation at TOA indicates how much energy remains in the Earth system.
- Most of this excess energy (~90%) is absorbed in the ocean; rest goes into melting sea and land ice and heating the land surface and atmosphere.
- Satellite measurements (CERES) show an increase in net radiation associated with the 2008 La Niña.
- Ocean temperature measurements (Argo floats) from 2004 to 2008 suggest a substantial slowing of the increase in global ocean heat content.



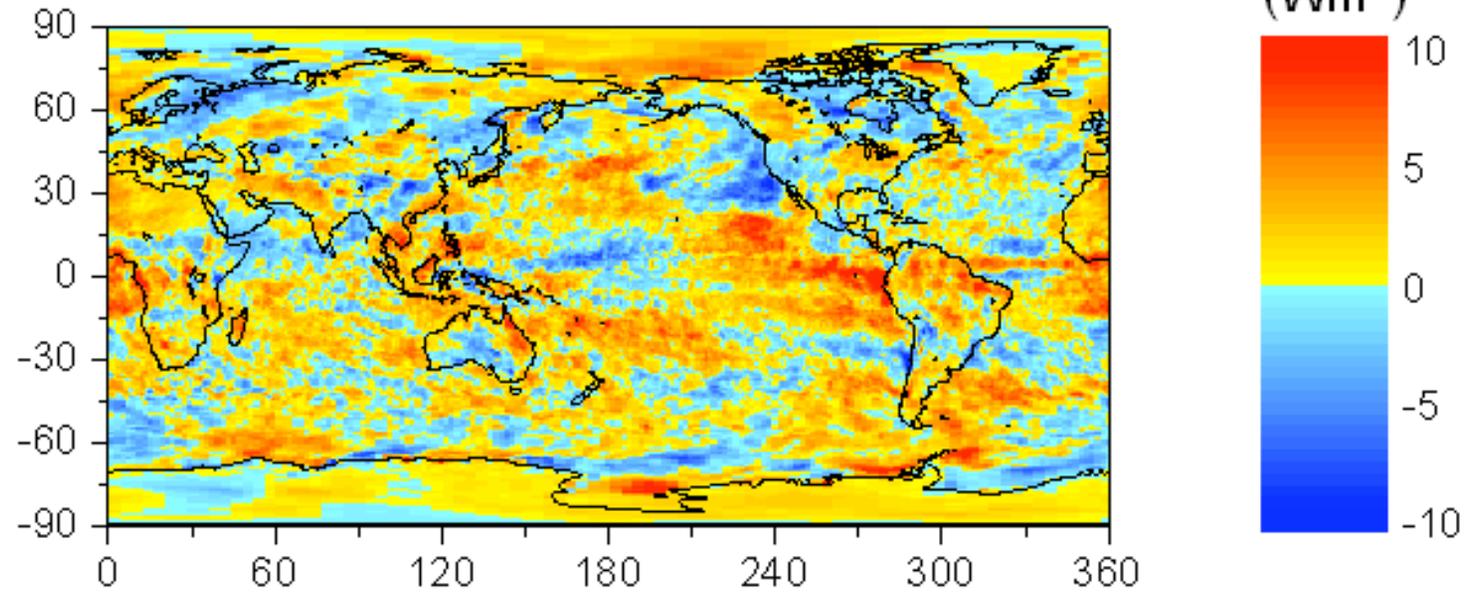
• Trenberth and Fasullo, 2010 (Science)



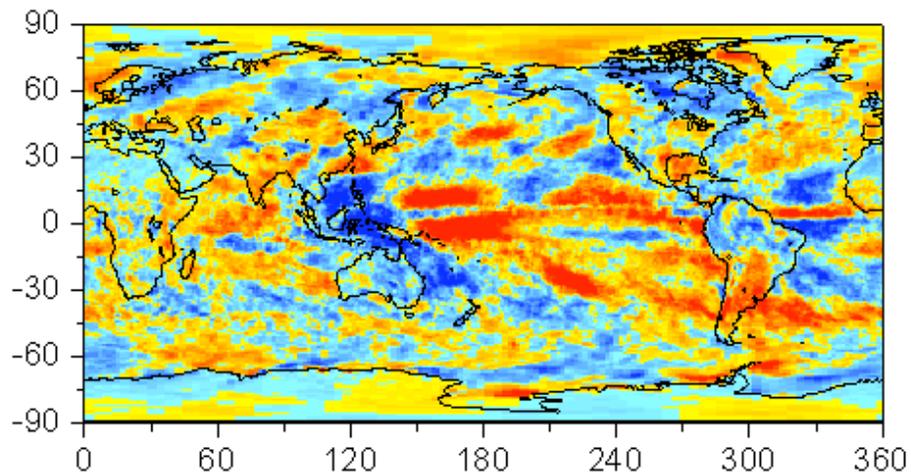


Net, Absorbed SW and -LW Anomalies (July 2008 – June 2009)

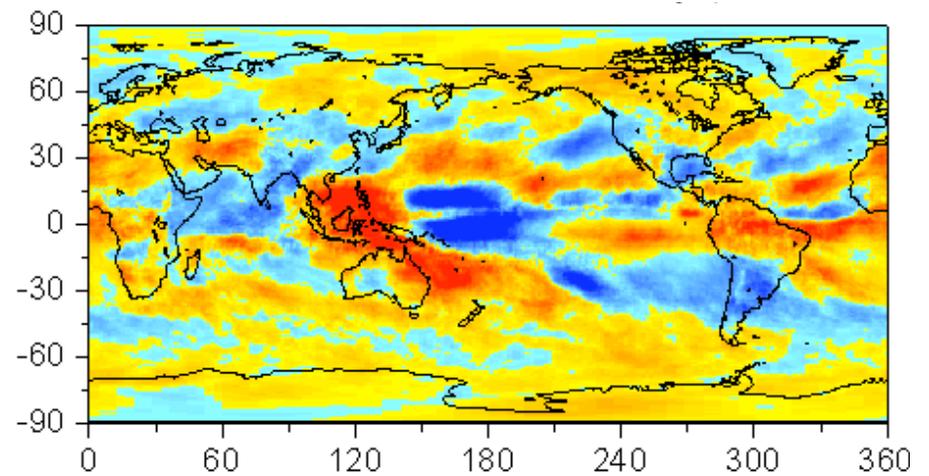
Net



Absorbed SW



-LW



Tribute To Jim Coakley on His Retirement

Jim Coakley: the NCAR Years

B.S. (1968) UCLA (Physics)

Ph.D. (1972) UC Berkeley (Physics)

NCAR Staff Scientist and Group Lead: 1972-1988

Journal Papers > 80

Citations > 4800

A Few Selected Highlights

- Coakley and Bretherton, JGR, 1982: The spatial coherence paper: 269 citations and still going strong....

This paper was a major advance in cloud detection and accounting for broken cloudiness in satellite observations.

- Coakley, Bernstein and Durkee, Science, 1987: The ship-track paper: 199 citations and still going strong....

This paper greatly expanded the interest in and evidence for the existence of aerosol indirect effects.

- Coakley, Cess, and Yurevich, JAS, 1983: Parameterizing the effect of aerosols on the radiation budget in climate models: 186 citations and still going strong...

A Few Selected Highlights, con't.

- Coakley and Chylek, JAS, 1975: Including the angle of incident radiation in the 2-stream approximation: 149 citations and still going strong....

Jims early career advanced radiative modeling of both the solar and infrared.

- Coakley and Cess, JAS, 1985: Response of the NCAR climate model to naturally occurring aerosols: 75 citations and still going strong....

Jim's career has spanned a wide range of research from radiative transfer to climate models to satellite, aircraft, and surface observations.

Some Perspectives

- Jim's publications show the diversity not only of his research interests but his collaborations with a wide range of other researchers: his reach has been very broad and has touched a very wide range of climate researchers
- Jim was also interested in satellite climate observing systems much earlier than others in the field: from his Letter titled "Weather Satellites and Climate Research" published in Science in 1983:

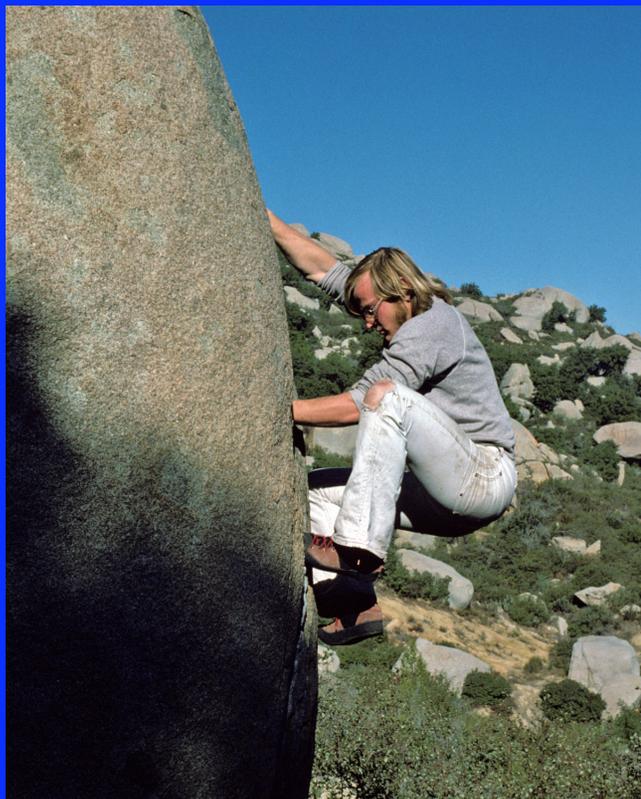
"Aside from rudimentary studies of time and space average, the data have yet to be exploited for climate studies.... One envisions, however, that just as we now turn to carefully preserved temperature and pressure records, future generations will turn to the satellite data now being collected to gain further insight into the dynamics of climate and climate change. With added experience and new technology, researchers will be able to gain the skill and ability to process the large volume of data. The value of these data, however, rests on three conditions: (i) that the observations continue; (ii) that they are carefully collected in archives; and (iii) that researchers are encouraged to develop the complex tools needed to explore the wealth of information provided by the data. Inasmuch as the government contributes to the well-being of its people, its job is to maintain standardized observations, to collect and preserve these observations, and to support research focused on their use."

Some Perspectives

- Jim was a key member of one of the most impressive early climate research groups: that at NCAR in the late 1970s and 1980s:
 - V. Ramanathan
 - Jim Coakley
 - Bob Dickenson
 - Warren Wiscombe
 - Stephen Schneider
 - Richard Somerville
 - Stephen Warren
- Jim had just joined this group as an escaped physicist with a PhD fresh out of UC Berkeley with a lot of radiative transfer expertise that he started applying to climate science.
- They were all young climate pioneers who would dramatically impact the future of climate science, even as they spread out to different institutions.

Jim's First Graduate Student

- Jim's first graduate student was an escaped oceanographer, a bit unorthodox.... so he didn't exactly have top material to work with.....



The ERBE

- Jim was one of the founding ERBE Science Team members.....



The ERBE

- Jim was one of the founding ERBE Science Team members.....



**Jim Coakley: A friend and colleague for
roughly four decades**

On the occasion of his retirement

By Bob Cess

**Who has known Jim almost forever
Well, actually for nearly 40 years**



The two of us over the years

- **1970's: I first met Jim while visiting NCAR. This was a period when climate science was in its formative stages, and everyone was having a lot of fun trying to understand how the climate system worked. No IPCC Reports. No Climategate controversies. Those were the days!**
- **A few years later, while I was again visiting NCAR, Jim received Nimbus-6 data in a large box containing magnetic tapes. That is how data was once transferred (by UPS or FedEx).**
- **About the same time a fuzzy cheeked lad, by the name of Bruce Wielicki, arrived at NCAR as Jim's Ph.D. student.**

- **January 1980: Jim, I and others attended the first ERBE Science Team Meeting. In the early days of ERBE, each science team member received about 50 pounds of data (on magnetic tapes) per month.**
- **Jim and I, during these years, collaborated on a number of papers.**
- **Jim left NCAR, Ram left NCAR, and I stopped visiting NCAR.**

Jim,

It has been an honor and a pleasure to know you and to collaborate with you over these many years. It has been one of the highlights of my career.

Bob

Ramanathan

It was a pleasure to have interacted with you as your next door office mate at NCAR, while you were in the midst of discovering the spatial coherence technique...What a powerful technique...particularly for inferring cloud-radiative forcing. That work along with your follow-on work really brought rigor and sophistication to satellite retrievals of cloud properties. Thanks also for helping out with C4.



Jeff Kiehl

I first met Jim 33 years ago when I was a graduate student visiting NCAR. These were exciting times in terms of cloud and climate research. Jim was one of the first scientists to explore climate problems with energy balance models and radiative convective models. Much of what we still understand about the role of clouds in the climate system started with Jim's early work. What I remember most about Jim during these early days was his serious dedication to understanding a scientific problem. He had (and still has!) a tremendous depth of understanding concerning radiative transfer problems. I feel very lucky to have been around a scientist of Jim's caliber. Jim Coakley is the epitome of the gentlemen scientist.



Micheal King

I have enjoyed interacting with you on a wide range of topics over more than 30 years, with special fondness for our interaction during the early years of ship track discoveries. I especially recall our numerous discussions following the serendipitous opportunity that Larry Radke and I had to penetrate clouds modified by ship tracks off California in the FIRE I marine stratocumulus experiment back in 1987, and the subsequent analysis that the three of us did together that led to a fine paper in Science.



Jim Coakley: the OSU Years

- 1988-present
- Mentored over 25 graduate and post-docs

Courses Taught:

- Introduction to Atmospheric Sciences
- Atmospheric Radiation
- Physics of Climate
- Man's Impact on Climate
- Atmospheric Radiation and Remote Sensing
- Climate Dynamics

- Co-I on ERBE, CERES, MODIS, LITE, CALIPSO science teams. Chair of NPOESS Operational Algorithm Team; NRC Climate Research Committee; NRC Decadal Survey; INDOEX; Editor, J. Climate; AMS Committee on Atmospheric Radiation; Chair of NASA/NOAA AVHRR Atmosphere Pathfinder Science Working Group...
- And many, many more research results...

CERES

A Long Term Satellite-Based Study of
Clouds And The Earth's Radiant Energy System



A Few Selected Highlights

Earth Radiation Budget and Anisotropy Papers:

- Baldwin and Coakley, JGR, 1991: Consistency of Earth Radiation Budget Experiment Bidirectional Models and the Observed Anisotropy of Reflected Sunlight.

My first Jim Coakley paper as a graduate student.

- Ye & Coakley, JGR, 1996 Biases in Earth radiation budget observations .
 1. Effects of scanner spatial resolution on the observed anisotropy.
 2. Consistent scene identification and anisotropic factors.
- Coakley, Tellus ,1991: Reflectivities of Uniform And Broken Layered Clouds

Using AVHRR to explore the suitability of plane-parallel radiative transfer theory for remote sensing of marine stratocumulus

Aerosol-Cloud Interactions & Cloud Remote Sensing Papers

- Matheson, Coakley & Tahnk, GRL, 2006: Effects of threshold retrievals on estimates of the aerosol indirect radiative forcing.
 - Shows how *biases in threshold-derived cloud properties can be mistakenly interpreted as being evidence for the effects of aerosols on clouds. Stresses need to account for fractional cloud cover within an imager pixel .*
- Segrin, Coakley, & Tahnk, JGR 2007: MODIS observations of ship tracks in summertime stratus off the west coast of the United States
- Hayes, Coakley, Tahnk, JGR 2010, Relationships among properties of marine stratocumulus derived from collocated CALIPSO and MODIS observations.

Andy Ackerman

I met Jim about 20 years ago at the AMS Cloud Physics and Radiation conference in San Francisco, where I was giving my first public talk. I presented early results from a modeling study of ship tracks, work done with ample guidance from Brian Toon and the presentation having benefited from the ruthless, constructive criticism of Peter Hobbs. Jim came up after my talk, introduced himself and kindly offered very encouraging words, something along the lines of his being impressed by my progress. Now I can see that his doing so was in fact part of my training in how an accomplished scientist should act, by praising and encouraging younger scientists.

What Jim and his team have learned and published regarding ship tracks has strongly influenced my work ever since, most notably the Coakley and Walsh 2002 finding that near-IR ship tracks appear to typically contain less cloud water than the surrounding cloud decks. That finding flew in the face of the conventional wisdom prevailing at that time regarding the effects of aerosol-induced increases of droplet concentrations on warm stratocumulus. Sorting out that puzzle (with additional clues provided by subsequent studies by Jim and his group) has been and continues to be what I consider a productive vein of research with lasting implications for understanding the aerosol indirect forcing of climate.



Pat Minnis

I believe that I first met Jim back in 1981 when we had, what was probably the first, cloud algorithm shoot out, held in Ottawa at an ISCCP workshop. Jim had a very interesting approach to retrieving cloud properties that was unique among the various methods being compared. An adamant spokesman for his spatial coherence technique, Jim was in the thick of the shootout for most of the week, which was spent mostly listening to Bill Rossow. ISCCP would be using Bill's algorithm regardless of what happened in the faceoff.

For many years, Jim and I have crossed paths in the cloud algorithm business and had for a long time argued about the golden arches, whether they were showing thin clouds or thick broken clouds, and about which algorithm gave the better cloud fraction, etc. I have always thought it would be a great algorithm to include in a comprehensive cloud retrieval program, one that would merge spatial, temporal, and spectral radiance information to best unravel the cloud field in the imager's field of view over any part of the globe, day or night.

Jim has helped keep us honest in the CERES cloud working group, and his input has been much appreciated whether he knew that or not. Professor Coakley is a truly unique scientist. I will miss working with him.



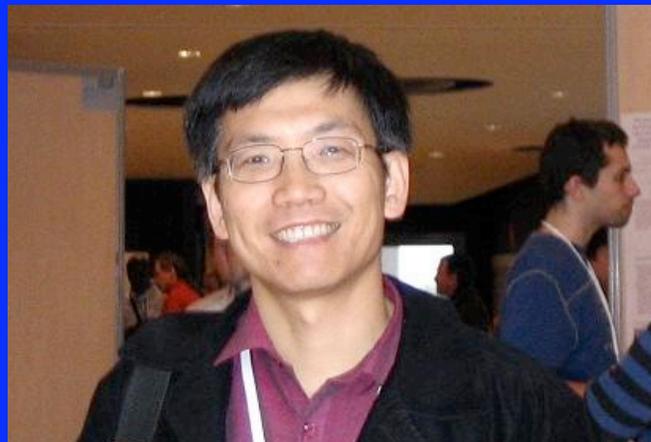
Steve Platnick

- Our many discussions and collaborations during the ASTEX field campaign and MAST ship track experiment are amongst the most enjoyable experiences of my career. Since that time, I have come to depend on your stratocumulus remote sensing studies to help provide a grounding for that part of my career. You have always been a valuable member of the MODIS cloud retrieval team - whether officially or not. So when you told me you were retiring, I was quite saddened. But at the same time I'm glad this is a "real" retirement that will allow you to more fully enjoy the other pleasures in life.
- Thank you for your friendship over the years - and the many insights you've provided along the way. All the best!



Fu-Lung Chang

- As his former MS and PhD graduate student, earlier back in the 1990s, Dr. Coakley played a very important role in my graduate life and my career in satellite remote sensing of cloud properties. Dr. Coakley probably didn't realize that he has influenced my life in many invaluable ways, especially that he kept me in positive thinking during my early PhD study when I almost decided to quit my PhD study and return to Taiwan. His influences on people around him are often profound.
- Dr. Coakley is very strong willed about what he believes to be the right thing to do. Dr. Coakley is also very personable and intellectual. I like to call him Dr. Coakley because I feel honored to be his former graduate student. Without his special training in satellite cloud remote sensing theory, I could have left the research field long time ago. I am always very grateful to him for teaching me in facing the challenges in both research and life.



Working with Jim as a Post-Doc

- *Prerequisites:*

- *Need to be ready to engage in intellectually stimulating discussions*
- *Must prefer diffuse solar radiation and light precipitation over direct solar radiation and fair weather cumulus*
- *Must read Strunk and White's *The Element of Style**
- *IDL please, no Mickey Mouse graphing packages*
- *Must eat/drink Brats & Beer*

- *Word of Advice:*

- *Don't ever begin a sentence with the following when discussing radiation with Jim:*

"I'll bet you a bottle of wine that..."

You will lose the bet...but you will learn a lot.

Same goes for BruceWielicki.

...Who Jim trained

.....and who drinks really expensive wine.

**Jim, it's been a pleasure having you as a mentor, colleague, and friend.
Happy Retirement!**

James A. Coakley, Jr. Congratulations on Your Retirement



It is spirit, drive and dedication like yours that have made CERES what it is today.

CERES Science Team

April 26, 2011

End

CERES News

CERES Ocean Validation Experiment (COVE) Site:

- Operates instruments from BSRN, AERONET, MPL.
- US Coast Guard wants to excess or auction off the Chesapeake Lighthouse platform.
- State and local (VA Beach) governments considering. VA Beach sent Coast Guard a letter of intent to take platform over. Not sure what they will use it for.
- If VA Beach changes it's mind, lighthouse will be auctioned off.
- Our goal is to continue observations regardless of who assumes responsibility for lighthouse.

