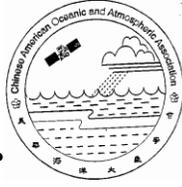


COAA Newsletter



美華海洋大氣學會

Chinese-American Oceanic and Atmospheric Association

P.O. Box 4948, Silver Spring, Maryland 20914-4948, USA

December 2000 <http://www.coaaweb.org>

Highlights in this issue:

1. *The President's Address*
2. *New Board of Directors*
3. *COAA Outreach*
4. *COAA News*
5. *Member's Activities*
6. *Announcements*
7. *Workshop Abstracts*

Merry Christmas & Happy New Year

From the President (Antony Liu)

Dear COAA members:

With the successful conclusion of the international conference, COAA-2000, our association is now marched in its eighth year. Considering the exciting activities have been accomplished in the last seven years, we have a very challenging task ahead for further promoting and enhancing the technical competency and professional prosperity of our members, especially for those young members from Mainland China. COAA will emphasize our unique character: we work together no matter where are you coming from. With this in mind, I would like to expand our membership more aggressively by recruiting new members. For the next year, Dalin Zhang will be the Vice President. The other Board members are as follows: Wilbur Chen (membership), Charles Sun (Secretary), Te-Jung (Henry) Wang (Treasurer), Julian Wang (Newsletter), S-K Yang (Publicity), E-N Yeh (Program - Ocean), and W-K Tao (Program - Atmosphere). Proposed and approved by the new COAA Board of Directors, we have asked all the former COAA Presidents to be a member of COAA's Advisory Committee to give us guidance, suggestions, and assistance on COAA's future activities. They may come to our Board of Directors' meeting, help us on program planning, and provide leadership for COAA's new activities. For next year, a major new activity is to organize a COAA Delegation to China in June 2001 for the preparation and discussion on Ocean-Atmosphere International Conference in 2003 at Beijing. If you are interested in joining the delegation, please let me know.

COAA is going to launch a new project to develop a database for publication in the areas of ocean and atmosphere authored by worldwide Chinese (first started with COAA members). Other activities such as Science Fairs or Essays competition for Chinese Language Schools is under consideration. We are also interested in joint efforts with the Chinese Atmosphere Young Scientist Association (AYSA) in Beijing as a sister association. Also, we try to link COAA home page to our members' web page. Please send your personal web page address to Dr. Charles Sun by e-mail at charles_sun@hotmail.com for linkage.

Before year 2000 slips away, I want to wish everyone the brightest holiday cheer and heartfelt appreciation for your efforts in supporting another successful year of COAA. The coming year offers equal if not more challenges to tackle. Your new ideas and suggestions to enhance COAA's activities and member's communication are always welcome.

Brief Biography for Members of 2001 COAA Board of Directors

Tony Liu:

Dr. Antony A. K. Liu was born in Taipei, Taiwan, and received a B.S. degree in 1970 from Taiwan National Chung-Hsing University and a Ph.D degree in 1976 from the Johns Hopkins University, majored in mechanics. After graduation, he worked at the Dynamics Technology, Inc. in Torrance, California for ten years, as a Research Scientist, Group Manager, and later a Section Head of Ocean Technology. Dr. Liu's current position is a senior scientist at the Oceans and Ice Branch, Laboratory for Hydrospheric Processes at NASA Goddard Space Flight Center. He is a Principal Investigator of many satellite projects of US, Europe, Canada and Japan. He is conducting and managing research in the air-sea-ice interaction with applications to sea-ice study, fisheries oceanography, internal waves, and coast watch using satellite data.

Eueng-Nan Yeh:

Dr. Eueng-Nan Yeh received his B.S. degree in Atmospheric Physics, National Central University, Taiwan, M.S. degree in Applied Sciences, College of William and Mary, Williamsburg, Virginia, and Ph.D. in Meteorology, University of Utah, Salt Lake City, Utah. He works in General Sciences Corporation of Science Applications International Corporation. He worked on Sea-viewing Wide Field-of-view Sensor (SeaWiFS) project, and Coastal Zone Color Scanner (CZCS) project. He is currently working on the Earth Observing System (EOS) Moderate-Resolution Imaging Spectrometer (MODIS) project for (1) test, implement and validate products and deliver the integrated software package to production operator; (2) as a simulation lead, maintain and update the MODIS and orbit simulator softwares to generate products for research communities.

Shi-Keng YANG:

Dr. Yang is a Senior Research Scientist and the Project Leader of Research and Data Systems Corporation at Climate Prediction Center/NCEP/NWS/NOAA. He has closely worked with NCEP/NWS, NASA/Langley and ORA/NESDIS on the cloud/radiation related researches, including model diagnosis, remote sensing and data analysis. He also collaborates in SBUV /TOVS blended ozones analysis. He has served in NASA/CERES and ERBE science teams. Dr. Yang received his Ph.D in Atmospheric Science from the University of Michigan, 1984.

Wei-Kuo TAO:

Wei-Kuo Tao (Mesoscale Atmospheric Processes Branch at NASA Goddard Space Flight Center) has 20 years of experience in cloud physics and modeling mesoscale convective systems. He graduated from National Central University at Taiwan. He has M.S. and Ph.D. degrees in Atmospheric Sciences from U. of Illinois. He also has M.S. in Computer Science from The Johns Hopkins University. He is the primary developer of the Goddard Cumulus Ensemble (GCE) model and the leader of Goddard Mesoscale Modeling and Dynamic Group (consists of 16 Scientists). He is the member of TRMM Science Team since 1991. He received a NASA Exceptional Scientific Achievement Medal (1992). Tao was a member of AMS Committee on

Mesoscale Processes (1996-1999), a member of Scientific Steering Committee for GEWEX Cloud System Study (GCSS) - Precipitating Convective Cloud Systems since 1994. He will be the Editor of the Journal Atmospheric Science from 2001-2003. He is elected as a Fellow of America Meteorological Society. He is the Fellow of Royal Meteorological Society. Tao is a member of the NCEP/NCAR Weather Research and Forecast (WRF) Science Board (2000-). Tao has more than 90 (40 since 1997) in referred literature and 100 conference presentations, on tropical cloud systems and modeling, applications of cloud resolving model to understand air-sea interaction, convective-stratiform interaction, cloud-radiation interaction, cloud-chemistry interaction, and cloud-large-scale environment interaction, to develop latent heating and surface rain retrieval using satellite data.

L. Charles Sun

Ph.D. in Physical Oceanography from North Carolina State University, 1982; Chief Scientist and Deputy Chief in the Data Base Management of the National Oceanographic Data Center (NODC), NOAA (1999-present); Senior Oceanographer in NODC (1997-1999); Research scientist and modeler in the National Ocean Service, NOAA (1990-1997); assistant oceanographer, University of Hawaii (1985-1990); visiting scientist at Harvard University (1985-1986, working with Prof. Robinson on the issues of open ocean modeling and data assimilation); visiting researcher at the U.S. Coast Guard Research and Development Center (Summer 1986, working with Dr. David Paskusi on optimal interpolation of oceanic fields). He has numerous publications and experience in: numerical modeling of estuaries and coastal oceans, data quality assurance, data assimilation, and scientific visualization and animation.

Te-Jung WANG:

Te-Jung Wang was born in Chongqing, Sichuan during World War II. His mother is from Yingcheng, Hubei and his father is from Zhenjiang, Jiangsu. He received the BS and PhD degrees from Columbia University and the MS degree from Stanford University, all in mechanical engineering. He did his research work at the David Taylor Model Basin, Bethesda, MD and the Naval Research Laboratory, Washington, DC. He also was a visiting professor at Oregon State University and taught at the University of Maryland. His main areas of research were in the analysis of potential, viscous, and free surface flows; the behavior of cable systems; the motions of directional wave buoys; hydrodynamic modeling of ship and ocean waves; physics of breaking waves; and the remote sensing characteristics of the above waves. He is now retired from government service.

Dalin ZHANG:

Da-Lin Zhang is a professor in the Department of Meteorology, University of Maryland at College Park. His research interests include the modeling and understanding of fundamental processes taking place in squall lines, mesoscale convective complexes, hurricanes and heavy rain- (or snow-) storms, tropical and extratropical cyclones, gravity waves, frontal circulations and topographically generated weather phenomena. His research involves the development and improvement of the planetary boundary layer and cumulus parameterization techniques, cloud

representations in mesoscale numerical models, and the improvement of warm-season quantitative precipitation forecasts and severe weather warnings.

Julian X.L. Wang:

Dr. Julian Wang is a senior research meteorologist working at Air Resources Laboratory of NOAA in Silver Spring. He graduated from the Nanjing Institute of Meteorology in Nanjing, China. He has M.S. and Ph.D. degrees in Meteorology from University of Hawaii. His research interests include climate changes, global warming, ENSO and decadal variability, regional climate modeling, assessments, and impacts, Arctic Oscillation and its interaction with mid-latitudes, and climate impacts on human and environmental health.

Wilbur Chen:

Dr. Wilbur Chen is a senior meteorologist with the Climate Prediction Center, which is a component of the National Centers for Environmental Predictions of NOAA. His current research interests include: coupled ocean-atmosphere system, climate variability and predictability, and the climate factors affecting the seasonal activity of the tropical cyclones.

COAA Outreach

(1) Summer Camp through S'COOL

In this presentation, organizing a summer camp by COAA for the students who are participating S'COOL is proposed. S'COOL is an educational outreach program of NASA's CERES (Cloud and Earth Radiant Energy System)/EOS. Within this program, the volunteered students would do the cloud observation at the time of satellite overpasses. Their observations would be used by CERES as a ground truth for validating products from the cloud retrieval algorithms. The program has been gaining popularity since its inception in 1996. At the last count in October, there were 674 schools from 48 nations registered. Currently, one school from Beijing and 6 high schools from Taipei are participating. Taiwan's Central Weather Bureau adopts S'COOL as its educational outreach program, and helping facilitates the activities. Students have been performing cloud and meteorological observations since summer. In the meantime, they also establishing a Chinese website at <http://www.fg.tp.edu.tw/scool>.

To extend student activities, a summer camp is proposed. The objectives of this science camp are to reward student's participation; to interact with scientists/projects; to promote students entering meteorology; and to broaden students' horizons. It also provides opportunities for COAA to enhance visibility; to outreach; to apply professional expertise; and exercise team work. An assessment of COAA capability shows this is a very doable project.

(2) Sister Organizations

At the recent COAA board of directors' meeting, a proposal to establish a sister- organization relationship with the Atmospheric Young Scientist Association (AYSA) of Academy of Science in China has approved to promote and enhance the relationship and academic communication

between COAA members and worldwide Chinese scientists in the areas of atmosphere and ocean. The objectives of AYSA are: (1) to unite young atmospheric scientists and to advance atmospheric and oceanic sciences; (2) to develop innovation system; (3) to establish and promote international cooperation; and (4) to establish relationship and friendship with related domestic and overseas organizations. Dr. Bin Wang is the president of AYSA board, and Dr. Jianping Li is the vice-president. The AYSA is going to co-sponsor the third ocean- Atmosphere International Conference in 2003 (COAA-2003) in Beijing, and to provide helps for the local logistics. The AYSA information will soon be available on the COAA web page.

Member's Activities

(1) Professor Cho-Teng Liu of Institute of Oceanography, National Taiwan University will be visiting with Professor Frank Pao at The Catholic University of America during January and February of 2001. Professor Liu will carry out a study to establish a relationship between fast changing SST fronts and tuna catch in the tropical Pacific. Dr. William Tseng of NOAA/NESDIS and Dr. Tony Liu of NASA/GSFC will also be the collaborators for the study. The daily satellite SST pattern along with fish catch will be correlated and studied. Professor Cho-Teng Liu is a member of COAA.

(2) At the end of January, 2001, Dr. Andrey N. Serebryany of N.N. Andreyev Acoustic Institute (AAI) in Moscow, Russian Federation will come to visit with Professor Pao to carry out a three-month cooperative research under the sponsorship of the U.S. Civilian Research and Development Foundation. The project is titled "Nonlinear Internal Waves and Solitons on a Shelf". Dr. Tony Liu will also be a collaborator for the project. Dr. Serebryany is a Senior Research Scientist at AAI. His areas of expertise are: physical oceanography, internal waves, acoustical oceanography and remote sensing. The project also calls for a return visit to Moscow by Frank Pao and Tony Liu. (Communicated by Frank Pao)

(3) Peter Chu visited the Second Institute of Oceanography (Hangzhou), the Institute of Plateau Atmospheric Physics (Lanzhou), and the Institute of Atmospheric Physics (Beijing) in October 2000 for developing joint research project. Peter Chu was appointed visiting research professor by the Second Institute of Oceanography. He will co-advise students with Profs. Jilan Su and Jiaping Xu. Guihua Wang from the Second Institute of Oceanography will be a visiting scientist at the Naval Postgraduate School for a year starting January 2001. Shihua Lu from the Institute of Plateau Atmospheric Physics will be a visiting professor at the Naval Postgraduate School for three months starting January 2001.

(4) Dr. Song Yang will receive the Editor's Award for the Journal of Climate from the American Meteorological Society at the 81st AMS Annual Meeting at Albuquerque, New Mexico, during 14-19 January 2001. The citation will read, "for providing multiple, prompt, comprehensive, and thoughtful reviews."

COAA News

(1) COAA Co-sponsored CAST2000 Conference

COAA is one of the co-sponsors of the 2000 US-China Conference on Science, Technology and Business during 17-19 November 2000 at Hilton McLean of Virginia. The conference, organized by the Chinese Association for Science and Technology (CAST-USA) and the University of Maryland, was held to improve information exchange and cooperation between the US and China (and among multiple disciplines) in science, technology, and business. The conference consists of two plenary sessions and several concurrent sessions that include E-Business, Venture Capital, Environmental Protection and Sustainable Development, Western China Development, WTO and Trade, Network and Software, and the session of Agriculture, Biotechnology and Medicine session. About 300 government officials, scientists, engineers, business managers, and other professionals attended the conference from China and various parts of the United States.

Several COAA members have made important contributions to the conference. They include William Lau who was invited to give a keynote speech to the opening plenary session, Tony Liu and Julian Wang who presented results to the Environmental Protection and Sustainable Development session, and Song Yang who was a member of the organizing committee of the conference. The conference committee also appreciated the participation of other COAA members that include Prof. Da-Lin Zhang and Drs. Ming Cai, Shou-Shan Fan, Joseph Huang, and others. The involvement of COAA in this conference has provided a good opportunity for the association to team up with other societies/associations in different disciplines. For more information about the conference or the CAST-USA, please contact Song Yang at 301-614-5844 or yang@climate.gsfc.nasa.gov

(2) COAA's new project

COAA is going to launch a new project to develop a database for publication in the areas of ocean and atmosphere authored by worldwide Chinese. Contact Dr. Wilbur Chen for details at (301)763-8000 x7520 or Wilbur.Chen@noaa.gov

(3) COAA's Web Page

Dr. Charles Sun have updated and fixed link problems for the COAA Web site (<http://www.coaaweb.org>). Please take a few minutes to read and provide him with your comments and suggestions at (301)713-3272 x111.

Announcements

(1)	COAA 2001 new year luncheon is scheduled as following:

COAA 2001 New Year Luncheon

Date: January 27 2001 (Saturday)

Time: 11:30AM ~ 2:00PM

Location: Seven Seas Restaurant

1776 E. Jefferson Street

Rockville, MD 20852

(301)-770-5020

Cost: \$12 per person

Program:

11:30 ~ 12:00 Social and Registration

12:00 ~ 12:45 Luncheon

12:45 ~ 1:30 Keynote Address

Speaker - Professor Jin Wu

Topic - Cheng Ho's Ocean Voyage

1:30 ~ 2:00 Open discussion

2:00 ~ 3:30 Board meeting (open forum)

Please reserve your seats by Monday, January 22, 2001 from the following persons:

Eueng-Nan Yeh;(301) 352-2128

Wei-Kuo Tao;		(301) 614-6269

Antony Liu;		(301) 614-5714

Da-Lin Zhang;	(301) 405-2018

(2)	As an Editor of the journal of "Advances in Atmospheric Sciences (AAS)," I would like to bring to your attention that the AAS Editorial Board welcomes your submission of scientific papers in all fields of atmospheric and oceanic sciences. AAS is a peer-reviewed English journal that is jointly published by the China Committee for International Association of Meteorology and Atmospheric Sciences and the Institute of Atmospheric Physics of Chinese Academy. If interested, You just need to submit two copies of a manuscript(s), with the same format as that for AMS' journals, to any of the AAS Editorial Board members. The current Board members in the U.S. include Ferd Baer and myself (UMCP), C.-P. Chang and Peter Chu (Navy/NPS), Minfang Ding (Univ. of Illinois), Krishnamurti (FSU), N.-C. Lau (NOAA/GFDL), K.M. Lau (NASA/GSFC), Bin Wang (Univ. of Hawaii), Lian Xie (NCSU), and Yongkang Xue (UCLA). Once the manuscript(s) is accepted by the responsible Editor after receiving an anonymous favorable review, it will be sent directly to AAS' Executive Editor for publication. Based on the

current turn-around time, your manuscript could be published as fast as in 5 months from the date of acceptance. Please free free to contact me or the above-mentioned editorial members, if you need more detailed information. (dalin@metosrv2.umd.edu)

Papers

(From Fall Workshop)

Hindcast skill, probabilistic forecast, and decadal variation with CPCs new climate model

Wilbur Y. Chen, Climate Prediction Center, NCEP/NWS/NOAA

The Climate Prediction Center is currently undertaking a massive evaluation on the capacity of its new climate model in the long-lead climate prediction. One of the foci is to develop the probabilistic forecasts. Another is to evaluate the skill level of the model through massive hindcast experiments. The decadal variation capability is also under investigation.

For these purposes, and numerous others, three major categories of integration have been considered. The model experiments were carried out with T42L28 resolution. They are: (1) An ensemble of 10 AMIP 50-year long regular integrations. For examining the impact of model changes, several other 50-year long runs were also conducted. (2) An ensemble of 10 6-month long hindcasts (in concert with the forecasts cited below) for every of the last 21 years (1979 to 1999). The observed SST was used for these hindcasts. (3) An ensemble of 20 6-month long forecasts for every new month as time goes along.

Although the model still has systematic biases, the long-lead hindcasts do show substantial skills. In addition to short-term climate variability, the model also produces decadal variations - the super warming of the 80s and 90s. The skill

scores by anomaly correlation (AC) over the global extent are above 0.4 for each of the five decades considered. For the tropical Pacific sector, the AC scores are larger than 0.9, suggesting a strong association between the decadal variations with the tropical Pacific SST(|s decadal anomalies.

Assimilation of Water Level Data into a Coastal Hydrodynamic Model by an Adjoint Optimal Technique

Aijun Zhang, Bruce B. Parker, and Eugene Wei (Coast Survey Development Laboratory, National Ocean Service/NOAA)

An adjoint data assimilation system has been developed to assimilate coastal subtidal water level data into a hydrodynamic model. In this system, a linear two-dimensional Princeton Ocean Model (POM) with an orthogonal curvilinear grid system is used as the forward model. The wind drag coefficient is used as the control variable. The cost function is defined in terms of the water level misfits between the observations and model outputs. The limited memory Broyden-Fletcher-Goldfarb-Shanno (BFGS) quasi-Newton method for large scale optimization is

implemented to minimize the cost function. Identical twin experiments with model generated pseudo-observations are performed to verify the data assimilation system, and the results show that the true solution of the control variable can be recovered efficiently by assimilating pseudo-observations into the model. The results from actual subtidal water level data assimilation experiments show that the simulated subtidal water levels with data assimilation are better than those without data assimilation even if only one control variable is used. The results from the case a spatially varying wind drag coefficient (with 16 control variables) demonstrate that the correlation coefficients are greater than 0.93, and RMS errors are less than 5.3 cm at 18 Atlantic Coast tide gauge stations that are used in the data assimilation process. The nowcast/forecast experiments demonstrate that the subtidal water level forecasts are improved by assimilating the observed subtidal water level at the tide gauge stations over the first 6 hours. The average RMS error of the forecasted subtidal water levels over the 18 tide gauge stations is reduced by 3 cm.

GPS activities in the National Geodetic Survey, NOAA

M. Miranda Chin (NOS/NOAA)

•The National Geodetic Survey (NGS) of the National Oceanic & Atmospheric Administration has extensively used the Global Positioning System (GPS) in defining the National Spatial Reference System (NSRS) ! the framework for latitude, longitude, height, scale, gravity, orientation, and shoreline through out the United States.

•By utilizing the Differential GPS technology, NGS has developed a National CORS network that enables the three-dimension positioning accuracies approaching a few centimeters in relative to NSRS. GPS also provides the Stand-alone positioning technology that has an accuracy of 6 to 11 meters today, 3 to 5 meters in year 2009, and 1 to 3 meters in year 2014. It is estimated that the communication and automotive industries alone will spend more than 8-billion dollars per year in producing equipment that makes the use of the GPS technology.

Numerical Simulation of Regional Climate with the Coupled MM5/SSiB Model

Weizhong Zheng, Department of Meteorology, University of Maryland College Park, MD 20742-2425

Clouds and precipitation play an important role in the global water and energy cycle. Despite significant progress in climate research, our ability to predict clouds and precipitation from diurnal to weekly and monthly scales is very limited. Previous modeling studies showed that the realistic simulation of cloud developments depends strongly on the land-surface processes interacting with cloud microphysics and larger-scale forcings. The representation of clouds/precipitation in atmospheric models depends on the grid resolution and relative significance of large-scale dynamics vs. local thermodynamic forcings, while the cloud developments depend strongly on surface heat and moisture fluxes, which in turn are mainly determined by vegetation and soil moisture storage. In this study, we investigate the weekly to monthly predictability of clouds and precipitation over the LSA-East, defined roughly by 33 - 43N. latitude and 78 - 89W. longitude (GCIP 1997), by coupling MM5 with the simplified Simple Biosphere (SSiB) model. The preliminary results have demonstrated that the model produces a realistic simulation of the climate conditions over the LSA-East. The simulated

climate variables are sensitive to the grid resolution and model physical processes. In general, the simulations with higher grid resolution are in better agreement with the observations.

Four-dimensional Variational Data Assimilation and Numerical Simulation of Hurricanes

Zhao-xia Pu, University of Maryland, Baltimore County NASA/Goddard Space Flight Center

Due to lack of conventional observations over the ocean, hurricane initialization becomes a challenge problem. This presentation summarizes some recent results in hurricane initialization with four-dimensional variational data assimilation (4-D VAR). The MM5 model and its adjoint system are used for the studies. First, the effectiveness of the 4-D VAR for creating "bogus" vortices in numerical simulations of hurricanes is evaluated. Numerical experiments show that 4-D VAR can produce a vortex that represents the actual intensity of the hurricane and results in significant improvements to forecasts of both hurricane intensity and track, provided the reasonable constraints are given to the system and the size of vortex can be well-resolved by model resolution. In addition, preliminary studies indicate that assimilation of satellite derived surface rainfall data can also result positive impact on hurricane simulations.

Chinese-American Oceanic and Atmospheric Association

P.O. Box 4948

Silver Spring, MD 20914-4948

U. S. A.