International Pacific Research Center
April 2012 – March 2013 Report

School of Ocean and Earth
Science and Technology
University of Hawai'i at Mānoa

CONTENTS

THE INTERNATIONAL PACIFIC RESEARCH CENTER

Conceived under the "US–Japan Common Agenda for Cooperation in Global Perspective," the International Pacific Research Center (IPRC) was established in 1997 within the School of Ocean and Earth Science and Technology at the University of Hawai'i at Mānoa. The IPRC mission is "To provide an international research environment dedicated to improving mankind's understanding of the nature and predictability of climate variations and change in the Asia-Pacific region, and to developing innovative ways to utilize knowledge gained for the benefit of society." The core support for the IPRC comes from the State of Hawai'i through the University and from the principal supporting agencies: the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), NASA and NOAA. Financial support for our research is also provided by other government agencies in the US and abroad. The IPRC now has an annual budget of roughly 7 million dollars.

Asia and the Pacific region are home to over half the world's people, all of whom are affected by variations in the climate system. IPRC researchers conduct modeling and diagnostic studies to document these variations and understand their causes, whether such causes are purely natural or have a human component. Through advances in basic research, the IPRC contributes to improving environmental forecasting for the Asia-Pacific region. One focus of IPRC investigations is the understanding of key phenomena rooted in the tropics, such as the El Niño-Southern Oscillation of the ocean-atmosphere system, monsoon circulations, interannual variability in the Indian Ocean, intraseasonal oscillations of the tropical atmosphere, and tropical cyclones. Other examples of important issues for IPRC study include the nature of decadal variability in the extratropical North Pacific Ocean, the dynamics of the very strong Kuroshio and Oyashio ocean currents in the western North Pacific and the role of marginal seas in the climate system. Concerns about climate change are addressed through modeling studies of past climate and through assessment of model predictions for future trends in climate.

国際太平洋研究センター

国際太平洋研究センター（IPRC）は、「地球的展望に立った協力のための日米共通課題」のもと、1997年にハワイ大学マノア校の海洋地球科学技術学部内に設立されました。その使命は、「国際色豊かな研究環境を創り、アジア・太平洋地域の気候変動及び変化について、その性質と予測可能性に対する人類の理解を向上させ、そして得られた知見を社会に役立てるために活用する革新的な手段を生み出すこと」です。IPRCの研究費は主に、ハワイ大学を通してハワイ州から、また主要支援機関である海洋研究開発機構、NASA、NOAAから支援されています。内外のその他の政府機関からも支援を受けており、現在およそ七百万ドルの年間予算により運営しています。

アジア・太平洋地域は世界人口の半分以上が居住する地域で、気候系の変動はこれらの人々すべてに影響を及ぼします。そのような気候変動には純粋な自然現象であるものも人類活動が関係したものもありますが、IPRCでは、それらを記述し原因を探るため、モデルによる研究や診断的研究を実施しています。このような基礎研究を進展させることでアジア・太平洋地域の環境予測の改善に大きく貢献しています。現在IPRCでは、エルニーニョ・南方振動、モンスーン循環、インド洋の経年変動、熱帯大気の季節内振動、そして熱帯低気圧といった、熱帯起源の現象に注目して研究を行っています。その他の重要な課題として、北太平洋亜熱帯域における十年規模変動の性質、西部北太平洋の強い海流である黒潮・親潮の力学、気候系での縁辺海の役割に関する研究を行っています。さらに、過去の気候のモデル研究やモデルによる将来予測の評価により、気候変化に関する様々な課題に取り組んでいます。

FOREWORD

This report summarizes the activities of the International Pacific Research Center for the period April 1, 2012–March 31, 2013. The IPRC performs research to enhance understanding of the nature and mechanisms of climate variability and change and to improve the tools for modeling and forecasting the climate system.

The IPRC now has a scientific staff of over 50 including faculty, researchers, postdoctoral fellows, and long-term scientific visitors. IPRC faculty also supervise several graduate students in the Meteorology and Oceanography departments of the University of Hawai'i at Mānoa. In addition, through our Asia-Pacific Data Research Center (APDRC), the IPRC operates a web-based server system that makes data resources readily accessible to IPRC researchers, the international climate community, and the wider public.

This Annual Report omits the extended narratives on individual projects that had been a feature of earlier reports. Note that selected IPRC **research highlights** are reported quarterly on our web site. Also, starting in 2012, the **list of publications** on our web site has links for easy access to each paper's abstract. Finally the IPRC's semiannual newsletter, ***IPRC Climate***, includes brief reports on highlights of ongoing research projects and other activities at the IPRC. Issues of the *IPRC Climate* are available online.

The IPRC celebrated our fifteenth anniversary in October 2012. IPRC scientists have now published almost one thousand refereed papers. Total extramural funding over the last 5 years has exceeded $40 million. The IPRC has contributed significantly to the education and professional development of over 100 young scientists mainly from Japan and other Asian nations who have come as graduate students, postdoctoral fellows, researchers, other scientific employees or long-term visitors. The IPRC "alumni" are now populating the universities and research institutes of Asia, the US and elsewhere in the world. IPRC has become the "crossroads of the Pacific" in climate science by serving as the temporary home for a diverse international group of scientists (graduate students, postdoctoral fellows, employees, visitors) and by organizing and hosting numerous international meetings that have brought thousands of researchers to Hawai'i for scientific exchanges.

The IPRC is now an important and, widely-known international center for climate science. In an ever more globalized scientific community the IPRC has established a unique role as a leader in establishing deep and long-lasting US–Asia research collaborations focusing on issues with practical importance for the people of the entire Asia-Pacific region.

The staff of the IPRC are grateful to our principal supporting agencies JAMSTEC, NASA and NOAA, and to the State of Hawai'i for its sponsorship of the IPRC through the University of Hawai'i. We look forward to many more years of fruitful international collaboration as we address critically important challenges in climate science.

Kevin P. Hamilton
Director

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Books and Book Chapters

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THE YEAR'S WORKSHOPS AND CONFERENCES

DATE	TITLE
June 13 – 15, 2012	Joint Symposium on Ocean, Coastal, and Atmospheric Sciences
September 11 – 12, 2012	NASA Ocean-Mixing Project Meeting
October 15 – 19, 2012	NSF U.S.-Japan Workshop on the Tropical Tropopause Layer: State of Current Science and Future Observational Needs
November 19, 2012	IPRC Annual Symposium
January 24 – 25, 2013	The 5th OFES International Workshop: Ten-year Progress of GCMs for the Earth Simulator and Future Strategic Perspective
March 5 – 6, 2013	NASA Ocean-Mixing Project Meeting

THE YEAR'S SEMINARS

DATE	SPEAKER	AFFILIATION	TITLE
**March 21, 2013	Andrei Natarov	IPRC and Dept. of Oceanography, UHM	*Persistent presence of small vertical scale velocity (SVS) features during three-dimensional equilibration of equatorial inertial instability*
*March 20, 2013	Jerry Meehl	National Center for Atmospheric Research, Boulder, CO	*Decadal climate prediction in the Pacific region*
March 20, 2013	Yasumasa Miyazawa	Japan Agency for Marine-Earth Science and Technology, Yokohama, Japan	*Japan downscaled ocean modeling based on coupling among ocean circulation, tides, and surface waves*
March 19, 2013	Bruce Cornuelle	Scripps Institution of Oceanography, UCSD, La Jolla, CA	*State estimates and forecasts of the Loop Current in the Gulf of Mexico using the MITgcm and its adjoint*
*March 13, 2013	Pedro DiNezio	IPRC	*Weaker Walker Circulation during the Last Glacial Maximum due to reduced sea level*
#March 11, 2013	William Chameides	Duke University, Durham, NC	*Dealing with climate change: Are we flying blind?*
March 1, 2013	Tommy G. Jensen	Naval Research Laboratory, Stennis Space Center, MS	*COAMPS simulation of the MJOs during DYNAMO*
February 20, 2013	Tomoya Kataoka	National Institute for Land and Infrastructure Management, Tsukuba, Japan	*Web-camera monitoring of quantity and movement of beached marine debris*
February 19, 2013	Toru Miyama	Japan Agency for Marine-Earth Science and Technology, Yokohama, Japan	*Case studies of precipitation/cloud formation over the Kuroshio/Kuroshio Extension using the IPRC atmospheric regional model*
*February 6, 2013	In-Sik Kang	Seoul National University, Seoul, Korea	*Essential moisture dynamics of the MJO*
*January 30, 2013	Kazuyuki Miyazaki	IPRC Visiting Research Scientist from Japan Agency for Marine-Earth Science, Yokohama, Japan	*Satellite chemical data assimilation for the Composition and Lighting NOx Emissions*

DATE	SPEAKER	AFFILIATION	TITLE
*January 23, 2013	Yuqing Wang	IPRC and Dept. of Meteorology, UHM	*What controls the interannual variability of tropical cyclone genesis frequency over the western North Pacific?*
January 22, 2013	Matthew England	University of New South Wales, Sydney, Australia	*The Southern Ocean: Trends, variability and its role in the global climate system*
**January 17, 2013	Megumi Chikamoto	IPRC Visitor from Japan Agency for Marine-Earth Science and Technology, Yokohama, Japan	*Temperature-induced marine export production during the glacial period*
*January 16, 2013	Bin Wang	IPRC and Department of Meteorology, UHM	*Subtropical-high predictability establishes a promising way for monsoon and tropical storm predictions*
**January 10, 2013	Claude Frankignoul	Université Pierre et Marie Curie, Paris, France	*The atmospheric response to the Atlantic meridional overturning circulation variability*
*January 9, 2013	Kevin Hamilton	IPRC and Department of Meteorology, UHM	*Surviving in nature's casino – A meteorologist's view of market-based weather risk management*
December 17, 2012	Emmanuel Witrant	Université Joseph Fourier, GISPA-lab, Grenoble, France	*New methods for modeling atmospheric scenarios from ice core measurements*
December 11, 2012	1. Prabir Patra 2. Ryu Saito 3. Kazuyuki Miyazaki	Scientists from RIGC, Japan Agency for Marine-Earth Science and Technology, Yokohama, Japan	*1. Atmospheric CO_2 and CH_4:* *2. Atmospheric CO_2 modeling and observation* *3.(GOSAT)Atmospheric CO2 data assimilation*
November 30, 2012	Tom Russon	University of Edinburgh, Edinburgh, UK	*The extent of unforced ENSO changes over the last millennium*
**November 27, 2012	Miho Ishizu	IPRC	*The relationship between oxygen and other biogeochemical parameters in the world ocean based on potential temperature*
November 16, 2012	Sosuke Mihara	Graduate School of Environmental Science, Hokkaido University, Sapporo, Japan	*The North Pacific STCC under seasonal forcing in an idealized Ocean GCM*

DATE	SPEAKER	AFFILIATION	TITLE
November 15, 2012	Zuojun Yu	IPRC and Department of Oceanography, UHM	*Deoxygenation in the tropical Indian Ocean during the past 60 years: Spatial distribution and implication for better prediction*
****November 13, 2012	1) Nikolai Maximenko 2) Axel Lauer 3) Henry Carson 4) Oleg Melnichenko 5) Jan Hafner	1), 2), 4), 5) IPRC 3) Marine Science Department, UH Hilo,	*Case studies of marine debris in Hawaii:* *1) Why Hawaii?* *2) The Kamilo Beach drifter experiment* *3) Tracking the sources and sinks of local marine debris in Hawai'i,* *4) The hidden plastic of Hanalua beach* *5) Tsunami Debris in Hawaii*
**November 1, 2012	Tobias Friedrich	IPRC	*Can we reconstruct past large-scale ocean circulation changes from seawater neodymium isotopic composition?*
**October 30, 2012	Jessica Benthuysen	CSIRO Marine and Atmospheric Research, Hobart, Australia	*The Leeuwin Current: The roles of topographic trapping, mixing, and advection in a buoyancy-driven eastern boundary current*
*October 24, 2012	Bin Wang	IPRC and Department of Meteorology, UHM	*Cause of the recent intensification of tropical cyclones over the Arabian Sea*
October 23, 2012	Shota Katsura	Atmosphere and Ocean Research Institute, The University of Tokyo, Tokyo, Japan	*The variation of North Pacific Tropical Water in its formation region*
*October 17, 2012	Matthew Widlansky	IPRC	*Spotlight on the South Pacific Convergence Zone: How will Pacific rainfall bands respond to a warming climate?*
October 12, 2012	Aiko Voigt	Max-Planck Institute for Meteorology, Hamburg, Germany	*Compensation of hemispheric surface albedo differences by tropical clouds*
*Thursday, September 27	Kyung-Il Chang	Seoul National University, Seoul, Korea	*Long-term direct velocity measurements at a choke point of the southwestern East/Japan Sea*
*September 19, 2012	Kevin Hamilton	IPRC and Department of Meteorology, UHM	*Dynamical meteorology of the Martian atmosphere*
**September 6, 2012	Jim Potemra	APDRC, IPRC, and Hawaii Institute of Geophysics, UHM	*Accessing data and information from the Pacific Islands Ocean Observing System*

DATE	SPEAKER	AFFILIATION	TITLE
**August 23, 2012	Michael Sarnthein	University of Kiel, Kiel, Germany	*Deglacial CO_2 rise driven by North Pacific Deepwater formation*
July 10, 2012	Sally Langford	Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, CO	*How well can we predict the Indian Ocean Dipole teleconnections?*
**June 27, 2012	Helen Phillips	University of Tasmania, Hobart, Australia	*Observations of the velocity structure of the Antarctic Circumpolar Current and the South Indian Ocean*
June 26, 2012	Steven Feldstein	The Pennsylvania State University, University Park, PA	*Teleconnections and the MJO: Intraseasonal and interannual variability*
June 25, 2012	Sukyoung Lee	The Pennsylvania State University, University Park, PA	*Does tropical convection drive polar amplification and poleward jet shift?*
June 8, 2012	Zong-Liang Yang	Center for Integrated Earth System Science & Earth System Sciences, University of Texas at Austin, Austin, Texas	*Achievements, challenges and opportunities in modeling land surface processes*
June 8, 2012	Qiuzhen Yin	Université Catholique de Louvain, Louvain, Belgium	*Individual contributions of insolation and CO2 to the interglacial climates of the past 800,000 years*
June 7, 2012	Young Ho Kim	Korea Ocean Research & Development Institute, Ansan, Korea	*Development of a regional framework for the Korean ocean forecast system based on GFDL MOM4p1*
***June 6, 2012	André Berger	Université Catholique de Louvain, Louvain, Belgium	*Astronomical theory of climate: A review*
May 14, 2012	Bruce Cornuelle	Scripps Institution of Oceanography, La Jolla, CA	*Green's functions for western boundary transport at the NEC bifurcation latitude*
*April 30, 2012	Paolo Antonelli	Cooperative Institute for Meteorological Satellite Studies, University of Wisconsin, Madison, WI	*On the use of three-dimensional atmospheric fields of temperature and moisture, inferred from hyperspectral infrared space-borne observations, for short-term forecasting of convection occurrence*

DATE	SPEAKER	AFFILIATION	TITLE
April 30, 2012	Christina Karamperidou	Columbia University, New York, NY	*The interacting dynamics of tropical and extratropical climate: A "reduced-space" perspective*
April 19, 2012	Kohei Takatama	IPRC	*Mechanisms of the surface-layer wind response to the Gulf Stream in a regional atmospheric model*
April 17, 2012	Arthur Miller	Scripps Institution of Oceanography, La Jolla, CA	*Isolating mesoscale coupled ocean-atmosphere interactions in the Kuroshio Extension region*

IPRC Annual Lecture in Climate Science

* IPRC – Meteorology Joint Seminar

** IPRC – Oceanography Joint Seminar

***IPRC – Meteorology – Oceanography Joint Seminar

****IPRC – University of Hilo Joint Seminar

IPRC VISITING SCHOLARS

The IPRC has a visiting scholar program. From April 2012 to March 2013, the following scholars visited the IPRC for one week or longer.

NAME	AFFILIATION	DATES
Karamperidou, Christina	Columbia University, New York, NY	4/30/12 – 5 /4/12
Kim, Young Ho	Korea Institute of Ocean Science and Technology, Ansan, Korea	5/30/12–6/12/12
Berger, André	Université Catholique de Louvain, Louvain, Belgium	6/4/12–6/14/12
Phillips, Helen	University of Tasmania, Hobart, Australia	6/24/12–7/3/12
Velez, Pedro	Instituto Espanol de Oceanografia, Santander, Spain	6/30/12–7/12/12
Kawatani, Yoshio	JAMSTEC, Yokohama, Japan	7/23/12–8/10/12
Xu, Haiming	Nanjing University of Information Science and Technology, Nanjing, China	7/25/12–8/29/12
Armenio, Vincenzo	Doctorate School of Environmental and Industrial Fluid Mechanics, Trieste, Italy	8/6/12–8/17/12
Kawamura, Akira	Tokyo Metropolitan University, Tokyo, Japan	8/9/12–9/17/12
Sarnthein-Lotichius, Johann Michael	University of Kiel, Kiel, Germany	8/20/12–8/31/12
Panteleev, Gleb	International Arctic Research Center, Fairbanks, AK	9/26/12–11/30/12
Kolar, Cynthia	U.S. Geological Survey: Ecosystems, Reston, VA	10/9/12–12/31/12
Miyazaki, Kazuyuki	JAMSTEC, Yokohama, Japan	10/9/12–3/28/13
Kim, Young Ho	Korea Institute of Ocean Science and Technology, Ansan, Korea	10/18/12–10/29/12
Kawatani, Yoshio	JAMSTEC, Yokohama, Japan	10/29/12–11/7/12
Benthuysen, Jessica	CSIRO Marine and Atmospheric Research, Hobart, Australia	10/29/12–11/9/12
Weijer, Wilbert	Los Alamos National Laboratory, Los Alamos, NM	11/14/12–11/23/12

Mihara, Sousuke	Hokkaido University, Sapporo, Japan	11/15/12–11/21/12
Dubois, Nathalie	Woods Hole Oceanographic Institution, Woods Hole, MA	11/26/12–11/30/12
Russon, Thomas	University of Edinburgh, Edinburgh, United Kingdom	11/28/12–12/5/12
Taguchi, Bunmei	JAMSTEC, Yokohama, Japan	12/11/12–12/18/12
Ray, Pallav	Florida Institute of Technology, Melbourne, FL	12/12/12–12/31/12
Chen, Lianshou	China Meteorological Administration, Beijing, China	12/16/12–1/15/13
Li, Richard	City University of Hong Kong, Hong Kong, China	12/16/12–2/15/13

IPRC RESEARCH SUPPORT

GRANT TITLE	P.I. NAME	CO-P.I.	FUNDING AGENCY	PROPOSAL AMOUNT	CONTRACT YEARS
Pacific Islands Climate Science Center	K. Hamilton		DOI / USGS	3,580,235	3/1/12 - 2/28/17
Near-Surface Measurements and Analysis of Temperature, Salinity, Wind Speed, and Rainfall in SPURS: the Maintenance of Subtropical Salinity Maximum	N. Maximenko		Univ. of Washington	139,741	3/1/11 - 2/28/14
Monitoring the North Pacific Marine Debris Through the Content of Ship Engine Filters	N. Maximenko		EPA	15,000	2/1/12 - 4/30/13
Organizing, Setting up, and Sponsoring the CMIP5 workshop	K. Hamilton		CSIRO	10,000	12/1/11 - 6/30/12
Detectability of Changes in the Walker Circulation in Response to Global Warming	P. DiNezio		NSF	29,951	1/9/12 - 3/31/13
Global Monsoon Climate Change: Understanding, Prediction, and Adaptation	B. Wang	J.Y. Lee, J. Fu, K. Kikuchi, J.Y. Moon	Pusan National University	136,364	12/14/11 - 7/31/17
Collaborative Project: Ocean-Atmosphere Interaction From Meso-to Planetary-Scale: Mechanisms, Parameterization, and Variability	N. Schneider		DOE	241,876	7/1/11 - 6/30/14
Analysis and High-Resolution Modeling of Tropical Cyclogenesis during the TCS-08 and TPARC Field Campaign	T. Li		ONR	188,486	4/1/11 - 12/31/13
Application of DYNAMO/AMIE…	J. Fu		NOAA	232,942	9/1/11 - 8/31/14
JAMSTEC Year 16	K. Hamilton		JAMSTEC	2,051,000	4/1/12 - 3/31/13
Collaborative Research: Downstream Impacts of the South Pacific Tropical Water	T. Qu		NSF	439,893	10/1/11 - 9/30/14

GRANT TITLE	P.I. NAME	CO-P.I.	FUNDING AGENCY	PROPOSAL AMOUNT	CONTRACT YEARS
Developing the Pacific Islands Ocean Observing System (PacIOOS): Pacific Circulation Modeling	N. Maximenko		NOAA	27,170	6/1/11 - 5/31/16
Comparison of Structure and Evolution Characteristics of Boreal Summer and Winter Intraseasonal Oscillations Derived from Reanalysis Products and Sate	T. Li		NOAA MAPP Program	58,674	9/22/11 - 8/31/12
Upscale Feedback of Tropical Synoptic-scale Variability to Intraseasonal Oscillations	T. Li		NSF	370,034	9/1/11 - 8/31/14
Type 2-L02170124 Collaborative Research: Investigating Decadal Climate Predictability and Climate Impacts (IDCPI) on the Western US	A. Timmermann	N. Schneider	NSF	598,771	4/1/11 - 3/31/16
Assessing ENSO regime changes in a changing climate	F.F. Jin	A. Timmermann	DOE	617,272	1/1/11 - 12/31/13
Near-Surface Measurements and Analysis of Temperature, Salinity, Wind Speed, and Rainfall in SPURS: the Maintenance of Subtropical Salinity Maximum	S. Riser	J. Nystuen, N. Maximenko	NASA	2,203,608	1/1/11 - 12/31/13
A Study of OTEC Environmental Interactions	G. Nihous	K. Richards	Lockheed Martin Corp	149,392	1/1/11 - 3/31/12
Early Life Stage Dispersal of Yellowfin Tuna (Thunnus Albacares)	K. Richards		NOAA / PFRP	121,984	7/1/09 - 9/30/12
High Resolution Dynamical Projections of Climate Changes for Hawaii and other Pacific Islands	K. Hamilton		US Fish and Wildlife Service / Dept of Interior	130,026	10/1/10 - 9/30/13
Climate Adaption Partnership for the Pacific (CAPP)	K. Hamilton		E.W. Ctr / NOAA	706,623	9/1/10 - 8/31/15
Pacific Decadal Variability and Central Pacific Warming El Nino in a Changing Climate	N. Schneider		DOE	268,250	10/15/10 - 9/14/13

GRANT TITLE	P.I. NAME	CO-P.I.	FUNDING AGENCY	PROPOSAL AMOUNT	CONTRACT YEARS
Intraseasonal to decadal variability and role of eddies in the low-latitude western boundary current off the Philippines	T. Qu		NSF	398,318	10/1/10 - 9/30/13
Dynamics of the boreal summer Intraseasonal oscillation: Multi-scale interaction	B. Wang	X. Fu, K. Kikuchi	NSF	597,427	8/15/10 - 7/31/13
Improved Extended Range Prediction through a Bayesian Approach: Expoliting the Enhanced Predictability…	S.P. Xie		NOAA	74,000	8/1/10 - 7/31/13
Interannual variability of ocean vector winds near ocean fronts and coastal orography	S.P. Xie		NASA	556,370	7/22/10 - 7/21/14
Multi-model ensemble forecasts of Madden-Julian Oscillation	B. Wang	D. Waliser	NOAA / CTB	734,618	7/1/10 - 6/30/13
Collaborative Research: Mixing in the Equatorial Thermocline (MIXET)	K. Richards	G. Carter, E. Firing, A. Natarov	NSF	997,185	9/1/10 - 8/31/14
Climate Change Impacts on Critical Ecosystems in Hawaii and US Pacific Islands Territories	O. Elison Timm	Thomas Giambelluca	US Fish and Wildlife Service / Dept of Interior	232,233	9/24/10 - 12/31/12
Southern Hemisphere climate and carbon cycle response to orbital forcing during the last ~400,000 years	A. Timmermann		NSF	427,199	9/1/10 - 8/31/13
Dynamics of near-surface eastward flows in the South Indian Ocean	J. McCreary	R. Furue, J. Potemra	NSF	446,113	7/1/10 - 06/30/13
Initialization of Tropical Cyclone Structure for Operational Applications	T. Li		ONR	189,000	5/1/10 - 4/30/13
Sustaining rice production in a changing climate: Testing climate uncertainties and validating selected adaptation techniques on farmers fields	H. Annamalai		Norwegian Embassy	153,728	1/19/10 - 4/3/13
Basin-scale circulation and mesoscale dynamics of the Black Sea: implications for climate	N. Maximenko	A. Zatsepin	US CRDF	16,000	12/1/09 - 5/31/12

GRANT TITLE	P.I. NAME	CO-P.I.	FUNDING AGENCY	PROPOSAL AMOUNT	CONTRACT YEARS
Assessing the Quality of Aquarius Sea Surface Salinity Measurements Using an Ocean State Estimation System	T. Qu		JPL / NASA	145,248	10/01/09 - 9/30/13
Aquarius salinity calibration error quantification, signal-to-noise analyses, and resolution studies	N. Maximenko	J. Potemra, P. Hacker	NASA	538,206	10/1/09 - 9/30/13
Collaborative Research: Eddy Dynamics and Impacts of Low-Frequency Variations in the California Current System (supplemental)	N. Schneider		NSF	382,619	8/19/09 - 2/28/13
Next generation aerosol-cloud microphysics for advanced high-resolution climate predictions	K. Hamilton		Univ. of Wisconsin / DOE	292,426	8/15/09 - 8/14/12
Mechanisms and effects of tropical Indian Ocean variability	S.P. Xie		NSF	525,408	8/15/09 - 7/31/13
Evaluation and Improvements of Cloud and Precipitation Physics in the Operational Hurricane WRF Model at NOAA/EMC	Y. Wang	V. Phillips	NOAA / JHT	184,547	8/1/09 - 7/31/12
Remote versus local forcing of intraseasonal variability in the IAS region: Consequences for prediction	S.P. Xie		NOAA/CPPA	132,174	7/1/09 - 6/30/13
Collaborative Research: Toward Improved Projections of Abrupt Response to Anthropogenic Forcing: Combining Paleoclimate Proxy and Instrumental Observations with an Earth System Model	A. Timmermann		NSF	228,675	6/15/09 - 5/31/13
Study of tropical cyclone intensity change and genesis with EOS observations and WRF model	B. Wang	H. Su, B Kahn	NASA	646,197	1/1/09 - 3/25/14
A Tropical Cyclone Genesis Forecast Model	T. Li		ONR	176,400	2/16/09 - 5/31/12
Dynamics of the descending branch of the Atlantic Meridional Overturning Circulation	J. McCreary	R. Furue, A. Timmermann	NSF	443,595	6/1/09 - 5/31/13
Toward reducing climate model biases in the equatorial Atlantic and adjacent continents	S.P. Xie	I. Richter	NOAA / CPO	342,124	7/1/08 - 6/30/13

GRANT TITLE	P.I. NAME	CO-P.I.	FUNDING AGENCY	PROPOSAL AMOUNT	CONTRACT YEARS
Changes of tropical Pacific climate variability during the last millennium	A. Timmermann	O. Timm	NOAA	191,850	7/1/08 - 6/30/13
Dynamics of anisotropic mean and time-varying structure of ocean circulation	N. Maximenko	E. Di Lorenzo, N. Schneider	NASA	719,963	10/1/08 - 4/30/13
Study of Processes Leading to Tropical Cyclone Structure and Intensity Changes	Y. Wang		NSF	398,016	4/1/08 - 3/31/13
Analysis and High-Resolution Modeling of Tropical Cyclogenesis during TCS-08 and TPARC Field Campaign	T. Li	M. Peng	ONR	231,243	1/1/08 - 12/31/13
Scale Interactions in the equatorial ocean	K. Richards	J. McCreary	NSF	595,444	5/1/08 - 4/30/13
Development of an Extended and Long-range Precipitation Prediction System over the Pacific Islands	H. Annamalai		NOAA	443,586	7/1/08 - 3/31/13
Understanding Annual Cycle-ENSO Interactions in Climate Change Simulations	N. Schneider	A. Timmermann	DOE	440,724	8/15/07 - 8/14/12
Collaborative Research: Impacts of ocean physics on the Arabian Sea oxygen minimum zone	J. McCreary	K. Richards, Z. Yu	NSF	385,570	10/01/07 - 09/30/12
Data-Intensive Research and Model Development at the IPRC	K. Hamilton	P. Hacker, S-P. Xie	NASA	5,250,000	3/01/07 - 2/28/13