Activities Report: 1 July 2006 - 30 June 2007

General Description of HRC

The Hydrologic Research Center (HRC) is a publicly-supported non-profit research corporation. HRC was established in July of 1993 in San Diego, California. In October 1998, the Internal Revenue Service affirmed the non-profit status of HRC beyond the advanced ruling period of 5 years. HRC’s purpose is to advance the science and engineering of hydrology through research and science cooperation, and to provide technology transfer and hydrologic training services. The National Science Foundation and the National Oceanic and Atmospheric Administration have served as HRC's Oversight Agencies.

HRC realizes its purposes:

By performing basic and applied research in areas of hydrology, water resources, hydrometeorology and hydroclimatology.

By designing and implementing prototype hydrologic projects for technology transfer and science cooperation and by offering hands-on training for field personnel.

By publishing research and development results in technical reports, refereed journal papers, monographs, books, and written accounts of technical national and international meetings.

By organizing short courses, workshops, and summer schools on hydrologic topics for Government Agencies, graduate and undergraduate University students, and teachers of Science.

By providing research training for graduate and undergraduate students of collaborating Universities.

By offering post-doctoral research positions for advanced training of new Ph.D.'s.

By accepting visiting scholars, and establishing collaborative research and exchange programs with hydrologic research organizations in the U.S. and abroad.

HRC's Board of Directors consists of:

Dr. Konstantine P. Georgakakos  HRC and Scripps Institution of Oceanography, University of California, San Diego

Professor Witold F. Krajewski  Department of Civil and Environmental Engineering and IIHR-Hydroscience and Engineering, The University of Iowa.

Professor Anastasios A. Tsonis  Department of Mathematical Sciences, University of Wisconsin - Milwaukee
Areas of research, development, and technology transfer include:

**Hydrologic Science and Engineering**
- (a) Floods, Flood Warning and Flood Control
- (b) Droughts
- (c) Processes of the Global Hydrologic Cycle
- (d) Remote Sensing of Hydrologic State Variables and Fluxes
- (e) Hydrology of Environmental Pollution and Restoration
- (f) Energy Production by Hydrologic Systems
- (g) Hydrologic Applications of Artificial Intelligence

**Hydrometeorology**
- (h) Precipitation and Surface-Runoff Processes

**Hydroclimatolgy**
- (i) Land-Surface/Atmospheric Interactions
- (j) Hydrology of the Interaction of Land and Ocean
- (k) Hydrologic and Water Resources Impacts of Climate Variability and Change

**Disaster Management Protocols**

**Ocean Wave Modeling and Prediction Systems**

**Personnel**

Dr. Konstantine P. Georgakakos, Managing Director and Senior Research Scientist

Mr. Robert Jubach, General Manager

Dr. Nicholas E. Graham, Climate Applications Manager, and Senior Research Scientist

Dr. Eylon Shamir, Research Specialist, Engineer, Hydrologic Modeling and Prediction

Dr. Jianzhong Wang, Research Specialist, Atmospheric Modeling

Ms. Theresa Carpenter, Ph.D. Candidate and Hydrologic Engineer

Mr. Jason A. Sperfslage, Systems Administrator and Software Engineer

Mr. Eric Meins, Software Engineer through 12/31/06.

Ms. Barbara Hansen, Administrative Associate

Mr. Cristopher Spencer, Computer Programmer/Analyst I

Mr. Steven Taylor, Ph.D. Candidate and Hydrologic Scientist thru 12/31/06, Visiting Post-Doctoral Scientist 1/1/07 – 4/15/07, and Contractor 4/16/07 to present.
Ms. Debra Champagne, HRC Senior Accountant (contractor) through 9/30/06.

Ms. Sheila Ragan, Ocean Point Financial Systems, HRC Senior Accountant (contractor) beginning 10/3/06.

Projects Funded

ACP, Autoridad del Canal de Panama: Maintenance 2007, 1/22/07 – 9/30/07.

ACP, Autoridad del Canal de Panama: Analysis of Extreme Precipitation over the Panama Canal Watershed, 3/5/07 – 7/31/07.

ACP, Autoridad del Canal de Panama: Water Resources Advisory Committee Oversight of the Flood Frequency Estimation, 5/10/07 – 5/30/07.


Barons Advanced Meteorological Systems, LLC (BAMS) / Lockheed Martin: Destructive Waters (DESWAT) – Hydrological Model Calibration and Validation for Romania, 05/01/05 – 11/08.

Bermuda Weather Service: Regional Wave Model for Bermuda, 10/30/06 – 4/30/07.


CALFED (w/GWRI): Integrated Forecast and Reservoir Management Demonstration for Northern California Water Resources, 6/1/03 – 5/31/06.


NASA: Seasonal Climate Predictions and Water Resources Management Theoretical and Numerical Research, 4/15/04 – 04/14/08.


U.S. National Oceanic and Atmospheric Administration, Climate Program Office, Constraining the Tropical Pacific’s Role in Low-Frequency Climate Change of the Last Millennium, 5/31/06 – 5/31/09.


University of California San Diego: **Evaluation of an Operational Regional Wave Model for the Southern California Bight**, 10/1/06 – 9/30/07.


University of Cantabria (Spain): **General Consulting (N. Graham)** 5/2/07 – 6/5/07.

Waterway Research Institute, Sejong University, **Development and Application of a State Estimator for a Distributed Storage Function Hydrologic Model of the Nakdong River Basin**, 6/15/07 – 9/30/08.

**Proposals Pending**


San Diego Unified Port District, Environmental District: **Hydrometeorological Study of the San Diego Bay Watershed Management Area**, 6/1/07 – 1/31/09

South African Weather Service: **South Africa Flash Flood Guidance Implementation**.


Publications and Presentations

Contributions to Books and Special Issues


Research Papers in Journals

Published and in Press


In Review


Abstracts, Presentations and Conference Proceedings


**HRC Technical Reports**


Sperfslage, Jason: “Central America Flash Flood Guidance (CAFFG) Administrator’s Guide,”

**Others**


**Educational, Science Cooperation and Technology Transfer Activities**

- As part of its educational program, HRC supported two Ph.D. candidates at UCSD: Ms. Theresa Carpenter and Mr. Stephen Taylor. Ms. Carpenter’s dissertation proposal on flash floods was accepted by her Ph.D. Thesis Committee. Mr. Taylor successfully defended his dissertation and completed all requirements to receive doctorate in Oceanography, “Northerly surface wind events over the eastern North Pacific Ocean: Spatial distribution, seasonality, atmospheric circulation, and forcing” at Scripps Institution of Oceanography, University of California at San Diego, 2006.

- In July 2006, Dr. Georgakakos visited the Russian Hydrometeorological Institute in Moscow, Russia, to present seminars and provide science cooperation and technology transfer activities for upgrading the Russia streamflow measurement network.

- Dr. Georgakakos contributed to the meeting of the North American THORPEX Societal and Economic Research and Applications (NAT SERA) Workshop held at the National Center of Atmospheric Research (NCAR) in Boulder, Colorado, during the period: August 14-16, 2006.

- Dr. Georgakakos contributed to the Water Utility Climate Change Summit, held in San Francisco during the period: January 31- February 1, 2007, and discussed assessments pertaining to urban climate change studies that HRC has been involved in.

- Dr. Georgakakos traveled to NOAA NESDIS and NOAA Office of Hydrologic Development (OHD) to present seminars and to discuss collaboration in the context of flash flood guidance system implementation in remote areas.

- Dr. Graham visited the University of Cantabria for wave modeling work and ocean wave extreme value study.
• Dr. Graham serves on the Steering Committee for the Coping with Drought on the Colorado Project – a cross-RISA project involving UCSD/Scripps, NOAA CDC Boulder, U. Washington, U. Arizona, and HRC. The project is designed to improve the understanding of why different modeling approaches give such different projections of present and future Colorado River flow.

• Dr. Graham serves on the Steering Committee for the Workshop on Climatic Changes in the Last 1500 Years: Their Impact on Pacific Islands, to be held at the University of Hawaii, Honolulu, November 13–15, 2007 (NOAA, IPRC sponsors).

• Mr. Jubach traveled to New Delhi, India for a project review meeting in support of USAID and NOAA for the USAID Disaster Management Support Project for the Government of India. Mr. Jubach made a presentation at the meeting regarding NOAA’s support activities on mitigating impacts of extreme hydrometeorological events.

• Mr. Jubach traveled to the American Meteorological Society annual meeting for discussions on the global Flash Flood Guidance System (FFGS) with NOAA management.

• Mr. Jubach and Dr. Georgakakos attended a meeting in Geneva, Switzerland with the World Meteorological Organization (WMO), U.S. National Weather Service, and USAID/Office of Foreign Disaster Assistance (USAID/OFDA) to discuss the concept of the FFGS and to solicit the support of the these organizations for the implementation of the FFGS globally.

• Mr. Jubach attended the Fifth Annual Flood Forum for the Mekong River held in Ho Chi Minh City, Vietnam in support of USAID/OFDA and NOAA. Mr. Jubach made presentation regarding the implementation of the FFG system for the Mekong River basin area and supported a poster session on this topic.

• Dr. Shamir attended a meeting at the Southern California Coastal Water Resources Project, Costa Mesa CA. together with Robert Jubach, to develop a prospectus for collaborative research.

• Dr. Shamir organized a session titled “Observations and Modeling of Snow Processes at the River Basin Scale” together with Hamid Moradchani and Jessica Lundquist at the American Geophysical Union, December 2006.

• Dr. Taylor Represented HRC on Graduate Study Panel for Earth and Environmental Sciences for the professional and graduate studies program at the UCSD career services center as part of Earth Week at UCSD.

• Dr. Wang visited the Bureau of Hydrology (Information Center of Water resources), Ministry of Water Resources of China. Jianzhong Wang also visited Fujian Province Meteorological Bureau of China and gave a presentation of HRC Flash Flood Guidance System.
Visitors

Workshop – NWS – RFS Parameter Estimation:
Marius Matreata, Romania National Institute of Hydrology and Water Management
Dali Amelia Pirvulescu, Romania National Institute of Hydrology and Water Management
Dan Ciobotaru, Romania National Institute of Hydrology and Water Management
Carmen Nedelcu, Romania National Institute of Hydrology and Water Management
Tom Burnet, BAMS
Jeff Vukovich, BAMS

A. Sezin Tokar, USAID/OFOA

Dick Paulson, NOAA/U.S. National Weather Service

Dr. Michael Butts, DHI, Denmark

Mr. Patrick Conroy, Water Resources Consultant, Canada

Michael Hart, ACP Panama

Nina Minka, USAID, New Delhi

Curt Barrett, U.S. National Weather Service

Dr. Philip Arkin, University of Maryland

Megan O’Connor, Producer/Director UCSD Media Teaching Lab

Lorraine Stiehl, volunteer fundraising consultant

Sharon Megdal, Director, Water Resources Research Center, The University of Arizona, Tucson