

ACTIVITIES REPORT: JULY 1, 2010 - DEC 31, 2011

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 utilized the following methods of performing its mission:

- Publishing research and development results in technical reports, refereed journal papers, monographs, books, and written accounts of technical national and international meetings, and through the internet.
- Developing and participating in demonstration projects concerning science-based prototype observation and prediction systems in collaboration with universities, government agencies, and private industry.
- Organizing short courses and workshops on hydrologic and meteorological topics for government agencies, graduate and undergraduate university students and teachers of science.
- Providing research training for graduate and undergraduate students of collaborating universities.
- Offering post-doctoral research positions for advanced training of new Ph.Ds.
- Accepting visiting scholars from U.S. institutions and other countries, and establishing collaborative research and exchange programs with research institutions in the U.S. and abroad.

HRC's Board of Directors:

Dr. Konstantine P. Georgakakos	HRC and Scripps Institution of Oceanography, University of California, San Diego
Mr. Richard Kennedy, PMP	RJK Consulting Berlin, MA
Professor Witold F. Krajewski	Department of Civil and Environmental Engineering and IIHR-Hydrosience and Engineering, The University of Iowa.
Professor Anastasios A. Tsonis	Department of Mathematical Sciences, University of Wisconsin - Milwaukee

HRC's Officers of the Board:

Mr. Jason Sperflage, Treasurer
Mr. Robert Jubach, Secretary
Dr. Konstantine P. Georgakakos, President

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

Hydroclimatology

- (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, Director and Senior Research Scientist

Mr. Robert Jubach, General Manager

Dr. Theresa Carpenter, Hydrologic Engineer II

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

Dr. Rochelle C. Graham, Meteorologist II

Ms. Barbara Hansen, Administrative Associate

Mr. Michael Murphy, Jr., Assistant Project Scientist

Dr. Eylon Shamir, Hydrologic Engineer II

Mr. Cristopher Spencer, Computer Programmer/Analyst I

Mr. Jason A. Sperflage, Computer Programmer/Analyst II

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

HRC Office Space

In May 2011, HRC moved its offices from 12780 High Bluff Drive to 12555 High Bluff Drive. The move was done to take advantage of lower rents and to consolidate the staff into a single suite. Though the square footage of the new space is similar to that of the old, the layout is much more comfortable and efficient. The move also presented the opportunity to implement a dedicated and efficiently climate-controlled server room needed for HRC's expanding programs.

Projects Funded or Ongoing July 1, 2010 – December 31, 2011

ACP, Autoridad del Canal de Panama, *PMF Gatun Inflow*, 3/19/10

ACP, Autoridad del Canal de Panama, *Regular Maintenance 2010 and Migration of MM5 to Cluster at WRS/ACP*, 10/1/09 – 9/30/10

ACP, Autoridad del Canal de Panama, *Regular Maintenance 2011, User Dashboard Upgrade and MM5 to WRF Upgrade*, 10/1/10 – 9/30/11

ACP, Autoridad del Canal de Panama, *Regular Maintenance 2012*, 10/1/11 – 9/30/12

ACP, Autoridad del Canal de Panama, *Development of Rule Curves for Gatun Dam*, 12/23/11 – 4/25/12

ACP, Autoridad del Canal de Panama, *Projections of Extreme Storm Events for the Panama Canal Watershed*, 11/25/09 – 8/18/10

ACP, Autoridad del Canal de Panama, *Risk Study 2010*, 1/10/10 – 8/31/10

ACP, Autoridad del Canal de Panama, *Risk Study II*, 6/8/10 – 9/30/10

ACP, Autoridad del Canal de Panama, *Risk Study III*, 5/16/11 – 9/30/11

Barons Advanced Meteorological Services, LLC (BAMS) (subcontract from Lockheed Martin Corporation), *Support to the Romania DESWAT Project, Flash Flood Guidance Task, Revised FFP*, 5/05 – 11/08

California Energy Commission, *INFORM II*, 5/25/09 – 8/31/12

California Institute for Energy and Environment (CIEE), *Climate Change and California Coastal Sea Level Rise: Vulnerability and Adaptation Study for California*, 6/15/10 – 12/31/11

Jet Propulsion Laboratory, *Algorithm Improvement and Computation of Ocean Wave-Wave Interactions*, 2/1/10 – 7/31/11

LEN Technologies, *Zambezi River Basin Flood Forecasting and Early Warning Strategy*, Task 1, 8/15/11. Task 2, 9/30/11.

NSF, *Data Collection, Panama Flood of December 2010*, NSF Grant, 6/1/11 – 5/31/12

NWS, *Flash Flood Guidance Systems for Central America and Pakistan - Upgrade the Central American Flash Flood Guidance System (CAFFG) and Implementation of an Initial System for Pakistan*, 4/27/11 – 9/30/11

NWS, *Implementation of the Hydrologic Research Center River Regulation Scheme into NWS Operations*, 9/16/11 – 9/16/12

South African Weather Service, *Development and Implementation of a Flash Flood Warning System for the Republic of South Africa*, 8/1/08 – 9/30/10

U.S. Israel Binational Science Foundation, *Predicting Flash Floods and their Risk in a Dry Climate*, with Hebrew University – Jerusalem, 10/1/09 – 9/30/12

U.S. National Oceanic and Atmospheric Administration, *Operational Multiscale Forecast and Reservoir Management in Northern California*, 9/1/07 – 8/31/10

U.S. National Oceanic and Atmospheric Administration, *The Paleoclimate Reconstruction (PR) Challenge: A community program to benchmark methods used to reconstruct the last 1-2000 years*, 7/1/08 – 3/31/12

U.S. National Weather Service, subcontract through LEN Technologies, *Application of Flash Flood Guidance in Haiti*, 5/18/10 – 12/31/10

University Corporation for Atmospheric Research (UCAR), NOAA, *Black Sea and Middle East (BSME) Region Flash Flood Guidance (FFG) Study Tour*, one month April 2011

University Joseph Fourier, Grenoble, France, *Global Wave Modeling for Simulating Microseism Generation by Wave-Wave Interaction*, 5/3/10 – 2/15/12

University of Arizona, NSF, *Late Holocene Hydroclimate Variability*, 8/1/10 – 7/31/12, Mod 1

University of Arizona, *Development of Blue Intensity Chronology from Douglas fir Trees*, 1/11/12 – 6/30/12

World Meteorological Organization, *Development and Implementation of International Regional Flash Flood Guidance and Early Warning Systems (GFFG)*, 4/6/09 – 5/31/10 (Southern Africa). 6/1/10 – 5/31/14 (Middle East).

World Meteorological Organization, *El Salvador Flooding and Flash Flooding Disaster Prevention, El Salvador, during the period May 2011 – April 2012*

World Meteorological Organization, *Development and Implementation of a Flash Flood Early Warning System for the State of Chiapas, Mexico*, 10/22/10 to 12/31/12

World Meteorological Organization, financial support of the *RA III Expert Meeting on Flash Flood Forecasting, Santiago de Chile, Chile, 10/1/11 – 10/4/11*

Publications

Research Papers in Journals

Carpenter, T.M., and K.P. Georgakakos, 2011: "Regional bank-full geometry relationships for southern California mountain streams and hydrologic applications," submitted to *Geomorphology*, 4/2011, under revision.

Carpenter, T.M., and K.P. Georgakakos, 2011: "Small-Scale Precipitation Estimation in Mountainous Southern California," submitted to *J. Applied Met. Climat.*, 7/2011, under revision.

Georgakakos, K.P., N.E. Graham, F.-Y. Cheng, C. Spencer, E. Shamir, A.P. Georgakakos, H. Yao, and M. Kistenmacher, 2011: "Value of adaptive water resources management in northern California under climatic variability and change: Dynamic hydroclimatology," *Journal of Hydrology*, 412, 47-65.

Georgakakos A., H. Yao, M. Kistenmacher, K.P. Georgakakos, M.E. Graham, F.-Y. Cheng, C. Spencer, E. Shamir, 2011: "Value of adaptive water resources management in northern California under climatic variability and change: Reservoir Management," *Journal of Hydrology*, 412, 34-46.

Meixner T., E. Shamir and J. Duan, 2011: "Hydrologic connectivity in an arid climate: a case study of the Lower Santa Cruz River, Arizona," *Journal of River Research and Applications* (submitted).

Sade, R., A. Rimmer, I. Litaor, E. Shamir, A. Furman, 2011: "The sensitivity of snow-surface temperature equation to sloped terrain," *Journal of Hydrology* (in press).

Shamir E., B-J. Lee, D-H. Bae, and K. P. Georgakakos, 2010: "Flood Forecasting in Regulated Basins using the Ensemble Extended Kalman Filter with the Storage Function Method," *Journal of Hydrologic Engineering*, 15(12), 1030-1044.

Villalba, R. and co-authors (N. Graham), 2011: "Dendroclimatology from Regional to Continental Scales: Understanding regional processes to reconstruct large-scale climate variations across the western Americas," *Dendroclimatology, Progress and Prospects*, M. Hughes, S. Swetnam and H. Diaz, Eds., Springer, pp.175-230.

Abstracts, Presentations and Conference Proceedings

Carpenter, T.M., and K.P. Georgakakos, 2010: Changes in flash flood occurrence frequency for Southern California, Presentation O1.2, Hydrology Conference 2010, San Diego, CA, October 11-13, 2010.

Carpenter, T.M., and K.P. Georgakakos, 2010: Toward the estimation of flash flood threat for Southern California: An interdisciplinary modeling approach, Presentation O8.1, Hydrology Conference 2010, San Diego, CA, October 11-13, 2010.

Carpenter, T.M., and K.P. Georgakakos, 2010: Evaluating long-term simulations of orographically-driven precipitation over Southern California, Poster Presentation P1.07, Hydrology Conference 2010, San Diego, CA, October 11-13, 2010.

Georgakakos, K.P., Georgakakos, K.P., and N.E. Graham, 2011: Reservoir Management Decision Support: Probabilistic Hydrologic Forecasts to Reduce Vulnerability to Extreme Events, California Workshop on Vulnerability and Adaptation to Extreme Events in California in the Context of a Changing Climate: New Scientific Findings, UC San Diego, Scripps Institution of Oceanography, December 13, 2011. (Also, contribution to California Governors Report p. 14-15.)

Georgakakos, K.P., Graham, N.E., Georgakakos, A.P., and H. Yao, 2011: Integrated forecast and reservoir management for Northern California. American Geophysical Union Fall 2011 Meeting, Session H43, Invited Oral Presentation and Abstract, December 5-9, 2011.

Georgakakos, K.P., 2011: The Challenge of Regional Flash Flood Warning with High Resolution Worldwide. 2011 International Workshop on Typhoon and Flood, National Taiwan University, Taipei, Taiwan, June 23-24, 2011.

Georgakakos, K.P., N.E. Graham, F.Y. Cheng, C. Spencer, A.P. Georgakakos, H. Yao, et al, 2010: Climatic change impact assessment for Northern California water resources: the value of adaptive management based on hydroclimatic information, Presentation O2.4, Hydrology Conference 2010, San Diego, CA, October 11-13, 2010.

- Georgakakos, K.P., J.A. Sperflage, C. Spencer, T.M. Carpenter, E. Shamir, and R. Jubach, 2010: Building human forecaster capacity for generating flash flood warnings and communicating with disaster managers worldwide, Presentation O4.1, Hydrology Conference 2010, San Diego, CA, October 11-13, 2010.
- Graham, N.E., E. Wahl and K. Anchukaitis, 2011: The Paleo-Reconstruction Challenge Project, PAGES-2K 2nd annual meeting, Bern, Switzerland, July 2011.
- Graham, N., M. Hughes, and R. Campbell, 2010: The medieval California mega-droughts: reconstructing the Mono Lake low stands, Presentation O9.1, Hydrology Conference 2010, San Diego, CA, October 11-13, 2010.
- Murphy, M.J., J. Wang, and K. P. Georgakakos, 2010: Extreme precipitation in the Panama Canal region under present and predicted future climates. Poster Presentation P2.07, Hydrology Conference 2010, San Diego, CA, October 11-13, 2010.
- Murphy, M.J., and S. Businger, 2010: Orographic Influences on an Oahu flood. Poster Presentation P2.07, Hydrology Conference 2010, San Diego, CA, October 11-13, 2010.
- Shamir E. and R. Jubach Building, 2011: Human Forecaster Capacity for Generating Flash Flood Warnings and Communicating with Disaster Managers Worldwide, National Hydrologic Warning Council, May 11-12, 2011, San Diego, CA.
- Shamir E., 2011: Evaluation of the Haiti Flash Flood Guidance System Performance during Hurricane Tomas, National Hydrologic Warning Council, San Diego, CA, May 11-12, 2011.
- Shamir E. and K.P. Georgakakos, 2010: Hydrologic Simulation of Small Tropical Un-gauged Basins, Poster Presentation P2.21, Hydrology Conference 2011, San Diego, CA, October 11-13, 2010.

HRC Technical Reports

- Sperflage, J.A., C.R. Spencer, and K.P. Georgakakos, 2010: “*South Africa Flash Flood Guidance System (SAFFG) User’s Guide*,” HRC Limited Distribution Report No. 32, Hydrologic Research Center, San Diego, California.
- Georgakakos, K.P., E. Shamir, and C.R. Spencer, 2010: “*Risk-Based Analysis of Spillway Capacity Alternatives for the Gatun Lake in Panama*,” HRC Limited Distribution Report No. 33, Hydrologic Research Center, San Diego, California.
- Georgakakos, K.P., T.M. Carpenter, and N.E. Graham, 2010: “*Operational Multisite Forecast and Reservoir Management in Northern California*,” HRC Limited Distribution Report No. 34, Hydrologic Research Center, San Diego, California.
- Georgakakos, K.P., C.R. Spencer, M.J. Murphy, N.E. Graham, T.M. Carpenter, J.A. Sperflage, and E. Shamir, 2011: “*Integrated Forecast and Reservoir Management in Northern California, Phase II – Interim Report*,” HRC Limited Distribution Report No. 35, Hydrologic Research Center, San Diego, California.

Georgakakos, K.P., E. Shamir, and C.R. Spencer, 2011: “*Risk-Based Analysis of Gatun Spillway Capacity after the Extreme Rainfall of Year 2010*,” HRC Limited Distribution Report No. 36, Hydrologic Research Center, San Diego, California.

Spencer, C.R., J.A. Sperflage, and K.P. Georgakakos, 2011: “*Central America Flash Flood Guidance System (CAFFG) User’s Guide*,” HRC Limited Distribution Report No. 37, Hydrologic Research Center, San Diego, California.

Georgakakos, K.P., 2011: “*Landslide Hazard Assessment and Application to Flash Flood Guidance Systems*,” HRC Technical Note No. 41, Hydrologic Research Center, San Diego, California.

Murphy, M.J., J.A. Sperflage, and K.P. Georgakakos, 2011: “*Panama WRF Model Implementation – PANWRF*,” Technical Note No. 42, Hydrologic Research Center, San Diego, California.

Murphy, M.J., J. A. Sperflage, and K.P. Georgakakos, 2011: “*Central America WRF Model Implementation – CAWRF*,” Technical Note No. 43, Hydrologic Research Center, San Diego, California.

Educational, Science Cooperation and Technology Transfer Activities

- Theresa Carpenter completed her Ph.D. Degree at the Scripps Institution of Oceanography, UCSD under the support of the Hydrologic Research Center.
- Konstantine Georgakakos traveled to Washington, D.C. July 21-23, 2010 for meetings regarding NOAA TRACS and Upstream grants.
- Robert Jubach traveled to Washington, D.C. July 20-24, 2010 for Haiti meetings etc.
- Konstantine Georgakakos and Robert Jubach traveled to Martinique August 13-20, 2010 for Haiti FFG System training.
- Nick Graham traveled to Japan August 23-29, 2010 for the PAGES 2K workshop.
- Nick Graham traveled to Pasadena, CA August 18, 2010 for project meetings regarding Grenoble Waves and JPL Waves.
- Jason Sperflage traveled to INHGA offices in Romania in August 2010 for onsite training on ROFFG system.
- Jason Sperflage and Michael Murphy traveled to ACP in Panama in August 2010 to finish up the implementation of the high resolution parallelized MM5 on ACP's Aguila cluster and present the system to the staff. Michael presented the results of his research in the Panama Severe Storms Project to the ACP staff.
- Konstantine Georgakakos traveled to Panama September 5-8, 2010 to meet with the Panama Canal Authority regarding the Panama Risk project.
- Konstantine Georgakakos, Jason Sperflage and Cris Spencer traveled to Pretoria, South Africa in September 2010 for onsite installation, deployment, training, delivery, and workshop for SAWS technical staff for the SAFFG System. User guide development and finalization.
- Robert Jubach traveled to Washington, D.C. September 13-15, 2010 to visit USAID, NWS, and the World Bank.

- Nick Graham traveled to Lisbon September 20-24, 2010 for a symposium on the medieval warm period.
- Robert Jubach traveled to Ankara, Turkey October 9-13, 2010 for DRR Meeting.
- Robert Jubach traveled to Nanjing University in China October 14-19, 2010 for FFG meetings.
- Nick Graham traveled to Pasadena, CA October 12-14, 2010 for project meetings regarding JPL Waves..
- Robert Jubach traveled to Islamabad and Rawalpindi, Pakistan November 1-12 2010 in support of a WMO needs assessment after the Pakistan Floods of 2010.
- Robert Jubach traveled to Seattle, WA for NWS International Meeting, January 21-26, 2011.
- Konstantine Georgakakos traveled to UC, Irvine, CA on February 2, 2011 to give a seminar on flash flood for faculty and students.
- Robert Jubach traveled to Grand Cayman March 6-8, 2011 for Caribbean WMO DRR Meeting.
- Robert Jubach traveled to San Salvador and Tuxtla Gutierrez March 17-24, 2011 for NWS DRR meetings (through UCAR).
- Nick Graham traveled to Europe March 28 – April 13, 2011 for the EGU annual meeting.
- Eylon Shamir and Robert Jubach guided a tour April 3-13, 2011 to Washington, Atlanta, and Sacramento for a delegation from the Black Sea Middle East region.
- Konstantine Georgakakos traveled to Sacramento, CA on April 15, 2011 for INFORM II meeting.
- Eylon Shamir and Michael Murphy attended the 2011 National Hydrologic Warning Council Conference in San Diego on May 11-12, 2011.
- Konstantine Georgakakos and Robert Jubach traveled to San Jose, Costa Rica on June 5-9, 2011 for a CAFFG Upgrade program kickoff workshop.
- Konstantine Georgakakos traveled to Taipei, Taiwan, June 21-26, 2011 to attend the 2011 International Symposium on Typhoon Rainfall and Floods.
- Robert Jubach and Theresa Carpenter traveled to Washington, D.C. July 6-9, 2011 for a CAFFG Upgrade program review meeting.
- Nick Graham traveled to Bern, Switzerland July 19 – August 2, 2011 to attend INQUA Congress 2011 and PAGES 2K Network meetings regarding NOAA PALEO Climate project.
- Robert Jubach traveled to Washington, D.C. July 20-22, 2011 for a Zambezi River Flood Early Warning system project planning meeting.
- Robert Jubach and Theresa Carpenter traveled to Islamabad, Pakistan August 13-21, 2011 for a PAKFFG Operations workshop.
- All staff: MMFFG Training at HRC August 15 - September 9, 2011. Topics included FFG system technical background and operations.
- All staff: CAFFG Training at HRC August 29 –September 23, 2011. Topics included FFG system technical background and operations.
- Konstantine Georgakakos traveled to ACP in Panama September 6-9, 2011 for meetings with the Panama Canal Authority.
- Cris Spencer traveled to San Salvador, El Salvador and San Jose, Costa Rica September 19-30, 2011 to install the CAWRF and CAFFG servers.
- Jason Sperflage traveled to ACP in Panama September 22 - October 7, 2011 to implement the dashboard and MM5 to WRF upgrades.

- Theresa Carpenter, Konstantine Georgakakos, and Rochelle Graham traveled to San Salvador, El Salvador September 26-28, 2011, for the CAFFG Regional Operations Workshop.
- Konstantine Georgakakos and Robert Jubach traveled to Santiago, Chile for the international symposium on a regional Flash Flood Guidance System for South America, October 1-4, 2011.
- Robert Jubach traveled to Cambodia October 11-15, 2011 with NWS/OFDA, for MRC next phase meetings.
- Konstantine Georgakakos and Cris Spencer traveled to Sacramento, CA December 6, 2011 for a demonstration at the CNRFC for the NWS Upstream Regulation project.
- Konstantine Georgakakos traveled to San Francisco, CA December 6-8, 2011 to give a presentation of INFORM at the AGU Meeting (invited talk)
- Eylon Shamir traveled to Jerusalem, Israel December 9-16, 2011 to collaborate with Hebrew University researchers on the BSF grant.
- Eylon Shamir, Cris Spencer and Konstantine Georgakakos assisted USAID with flash flood forecasts for Haiti during Hurricanes Tomas and Emily.
- Eylon Shamir prepared an on-line internet class in collaboration with Dr. David Gonzales from the University of Concepcion, Chile. Class entitled "Frequency analysis of extreme hydrological events" Class will be advertised at the University catalog in October 2011.

Community Outreach Activity

- HRC initiated the publication of a newsletter, the Flash Flood Guidance Gazette. The inaugural edition was edited by Konstantine, Robert, Eylon, and Rochelle and published in April 2011. This is to be a semi-annual newsletter.
- Michael Murphy gave a short presentation to Brandt Maxwell, a forecaster from the San Diego NWS Weather Forecast Office on the CAWRF implementation.
- Eylon Shamir - Peer Review of more than 8 journal manuscripts for the Journal of Hydrology (Elsevier)
- Eylon Shamir was an active member of the Data Committee, National Hydrologic Warning Council (NHWC)
- Eylon Shamir was a member of the National Hydrologic Warning Council (NHWC) bi yearly conference organization committee for the conference that was held in San Diego, May 2011. Moderated and organized a session titled, Uncertainty in Precipitation Estimates.
- Eylon Shamir participated in several Technical Advisory Committee (TAC) meetings for the development of Hydromodification Management Plan (HMP) for the San Diego County.
- Eylon Shamir is planning to participate in the Technical Advisory Committee meetings for the upcoming revision of the San Diego County Hydrology Manual.
- Theresa and Eylon visited the San Diego Foundation on January 13, 2011.
- Jason Sperflage gave invited presentation at San Diego IEEE Consultants Network meeting discussing HRC and the nature of IT Staff challenges within a non-profit entity, to do research-based, operational implementations and technology transfer involving a variety of end user needs and varying levels of deployment infrastructures, especially in developing countries.

Visitors

Wolfgang Schmid (University of Arizona) and Randal Hanson (USGS San Diego) gave a presentation about incorporation of farm processes in groundwater modeling, July 2010

Abelardo V. Bal Renau, Panama Canal Authority, August 2010

Forrest Holly, August 2010

Efrat Morin Hebrew University of Jerusalem, October 2010

Edwin Welles, Deltares, March 2011

Professor Scott Hagen, University of Central Florida, August 24, 2011

MMFFG Training, 15 August – 9 September 2011: Yendi Alejandra Álvarez Chacón, CONAGUA, Chiapas, México, Gabriel López Espinosa, CONAGUA, Chiapas, México, and Guillermo Pérez Luna, CONAGUA, Del. Miguel Hidalgo, México

CAFFG Training, 29 August – 23 September 2011: Roberto A. Cerón Pineda, Ministry of Environment and Natural Resources, San Salvador, El Salvador; Juan Diego Naranjo Díaz, Instituto Meteorológico Nacional, San José, Costa Rica; Estuardo Jerez Santos, National Institute of Seismology, Volcanology, Meteorology and Hydrology (INSIVUMEH), Guatemala City, Guatemala

Brandt Maxwell, National Weather Service San Diego to meet with Michael Murphy re: WRF implementation in Central America and present NWS flash flood operations to the CAFFG trainees (two visits)

Six visitors from the Bureau of Hydrology, Zhejiang Province, China to discuss the flash flood guidance system, December 2011

Cheryl Dean, November 2011

Craig Herrera, on-air meteorologist, Channel10 ABC, San Diego, February 2012