

ACTIVITIES REPORT: JANUARY 1 – DECEMBER 31, 2019

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.D.s.
- 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 Adjunct Professor Scripps Institution of Oceanography, University of California, San Diego
Mr. Ray Ban	Managing Director Ban and Associates, LLC
Mr. Robert Hartman	Robert K. Hartman Consulting Services
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Professor Anastasios A. Tsonis	UWM Emeritus Distinguished Professor Department of Mathematical Sciences, University of Wisconsin – Milwaukee

HRC's Officers of the Board:

- Mr. Jason Sperfslage, 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

Personnel

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

Mr. Robert Jubach, General Manager

Mr. Randall Banks, Computer Programmer/Analyst I

Mr. Douglas Bennett, Computer Programmer/Analyst I (voluntarily terminated 4/5/2019)

Dr. Zhengyang Cheng, Postdoctoral Associate

Dr. Rochelle Campbell, Meteorologist III

Ms. Barbara Hansen, Administrative Associate

Dr. Theresa Modrick Hansen, Hydrologic Engineer II

Mr. Robert Hetrick, Scientist/Engineer I (hire date 11/16/2019)

Dr. Eylon Shamir, Hydrologic Engineer III

Mr. Cristopher Spencer, Computer Programmer/Analyst II

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

Ms. Sheila Ragan, Ocean Point Financial Systems, HRC Senior Accountant (contractor) beginning 10/3/2006.

Projects Funded or Ongoing 2019

ACP, Autoridad del Canal de Panama: *Regular Maintenance 2018-2021*.

City of Nogales, AZ: *Hosting and maintenance of the Santa Cruz Active Management Area (SCAMA), Water Resources and Climate Assessment Tool (WARCAT)*, 8/1/2019 – 7/31/2020.

Department of Infrastructure, Ports and Energy, Government of Saint Lucia, *Saint Lucia Flash Flood Guidance System*, 10/24/2019 – 5/7/2020 (maintenance through 4/30/2021).

NSF, Hydrologic Sciences, in collaboration with the Laboratory of Tree Ring Research, University of Arizona: *Tree ring signal for interannual and seasonal variability of snow pack in the Sierra Nevada*, 5/1/2015 – 4/30/2020.

UCAR: *Advancing Impact-based Forecasting and Warning Services in El Salvador and Costa Rica*, 4/1/2017 – 3/31/2020.

UCAR: *Advancing Impact-based Forecasting and Warning Services in Guatemala*, 12/4/2017 – 3/31/2020.

UCAR: *Advancing Impact-based Forecasting and Warning Services in the Republic of South Africa*, 3/9/2017 – 12/31/2019.

UCAR: *Global Flash Flood Guidance Implementation Tasks*, 3/1/2018 – 6/30/2021.

UCAR: *Global Flash Flood Guidance Program Support Tasks*, 3/1/2018 – 6/30/2020.

UCAR: *WRN Program Support Tasks*, 9/12/2018 – 6/30/2020.

UCAR: *Impact-based Forecasting and Warning Services: Indonesia*, 1/19/2018 – 8/31/2020.

U.S. Bureau of Reclamation: *Technical Consulting Services for Weather Generator for the Lower Santa Cruz River Basin Study*, 10/1/2018 – 9/30/2020.

U.S. Bureau of Reclamation, Upper Colorado Regional Office (8/14/19): *Software Tool Development to Generate Stochastic Hydraulic Simulations using HEC-RAS*, 8/14/2019 – 12/30/2021.

WMO: *Development and Implementation of International Regional Flash Flood Guidance and Early Warning Systems*, (Phase II), HRC Work Plans I – IX, 7/24/2012 – 12/31/2020 and *Flash Flood Guidance System with Global Coverage*, (Phase III), HRC Work Plan I, 7/8/2019 - 12/31/2021.

Publications

Research Papers in Journals

Cheng, Z. and G. Constantinescu, 2019: “Near and Far Field Structure of Shallow Mixing Layers between Parallel Streams,” *Journal of Fluid Mechanics*.

Cheng, Z. and G. Constantinescu, 2019: “Stratification Effects on Flow Hydrodynamics and Mixing at a Confluence with a Highly Discordant Bed,” *Environmental Fluid Mechanics*, doi:10.1007/s10652-019-09725-6.

Lepley, K., Meko, D., Touchan, R., Shamir, E., Graham, R., and D. Falk, 2019: “Snowpack Reconstruction Using Coniferous Tree Rings for North Fork American River Watershed, Sierra Nevada, California,” *Holocene*.

Muste M., Lee, K., Kim, D., Bacotiu, C., Rojas Oliveros M., Cheng, Z. and F. Quintero, 2019: “Revisiting Hysteresis of Flow Variables in Monitoring Unsteady Streamflows,” *Journal of Hydraulic Research*.

Shamir, E., Halper, E., Modrick, T., Georgakakos, K.P., Chang, H.-J., Lahmers, T.J. and C. Castro, 2019: “Statistical and dynamical downscaling impact on projected hydrologic assessment in arid environment: A case study from Bill Williams River Basin and Lake Alamo, Arizona,” *J. of Hydrology X*, doi:10.1016/j.hydroa.2019.100019.

Shamir, E., Meko, D., Touchan, R., Lepley, K., Campbell, R., Kaliff R. and K. P. Georgakakos, 2019: “Snowpack- and Soil Water Content-Related Hydrologic Indices and Their Association with Radial Growth of Conifers in the Sierra Nevada, California,” *Journal of Geophysical Research – Biogeosciences*, doi:10.1029/2019JG005331.

Shamir, E., Meko D., Touchan, R., Lepley, K., Kaliff, R. and K.P. Georgakakos, 2019: “Tree ring radial growth dependence on climatological spatial variability in the Sierra Nevada,” *Journal of Geophysical Research – Biogeosciences*.

Tapia, M.E., Shamir, E. and S.B. Megdal, 2019: “Impact of variable climate and effluent on the transboundary Santa Cruz aquifer,” *Journal of American Water Resources Association*.

Yona, M.B., Rimmer, A., Shamir, E. and I. Litaor, 2019: “Hydrologic response in the karstic and basaltic hydro-geological units of Lake Kinneret Watershed,” *Journal of Hydrology* (in press)

Other Abstracts

Shamir, E. 2019: “Basin scale snowpack and soil moisture variability inference from inter-annual tree-ring chronologies in the Sierra Nevada,” American Meteorological Society Annual Meeting, Phoenix, AZ, 1/7-10/2019.

Other Presentations

Georgakakos, K.P., 2019: “Predicting Flash Floods; What Tools Do We Have?” World Bank BBL (Resilience and Disaster Risk Management, Global Solutions Group), Washington DC, 2/13/2019.

Georgakakos, K.P., 2019: “Operational Gauge-Adjusted GHE-Based Precipitation Estimation and Its Application for Flash-Flood Occurrence Prediction Worldwide,” NOAA/NESDIS, STAR Science Series Seminar, College Park, Maryland, 2/14/2019.

Georgakakos, K.P., 2019: “Enhancing Resilience of the Energy and Water Sectors Management through Integrated Management and the Use of Probabilistic Forecasts,” California Energy Commission IERP Lead Commissioner Workshop on Climate Adaptation in California’s Energy Sector, Sacramento, California, 7/8/2019.

Shamir, E. 2019: “Basin scale snowpack and soil moisture variability inference from inter-annual tree-ring chronologies in the Sierra Nevada” and “Impact of climate model “downscaling” on projected water resources in arid basins, two case studies from Arizona,” American Meteorological Society Annual Meeting, Phoenix, AZ, 1/7-10/2019.

Shamir, E., 2019: “A comparison of precipitation downscaling procedures to guide studies of climate change impacts on flooding and water resources,” Bureau of Reclamation Science and Technology Program, 3/14/2019.

Shamir, E., 2019: “High-resolution land surface model to simulate site-specific inter-annual variation of conifers’ earlywood and latewood ring width,” European Geophysical Union General Assembly, Vienna, Austria, 4/7-12/2019.

Shamir E., co-authored three presentations presented at the AGU Fall Meeting 12/9-13/2019 in San Francisco:

- Meko, D. M., Morino, K., Shamir, E., Edwards, J.A., Touchan R. and R. Campbell: “Snowpack Signal in Cell Anatomy of Sierra Nevada Tree Rings”
- Touchan, R., Shamir, E., Hughes, M.K. and D.M. Meko: “New Insights on Hydroclimate Signal in Giant Sequoia Tree-Ring Growth”
- Gangopadhyay, S., Bearup, L.A., Verdin, A., Pruitt, T., Halper, E. and E. Shamir: “A collaborative stochastic weather generator for climate impacts assessment in the Lower Santa Cruz River Basin, Arizona”

HRC Technical Reports

Limited Distribution Reports

Cheng, Z., Banks, R., Spencer, C., Sperflage, J. and K.P. Georgakakos, 2019: “Harsit Riverine Routing Forecast System (HRRFS) User’s Guide,” *HRC Limited Distribution Report No. 59*, Hydrologic Research Center, San Diego, CA, 25pp.

Cheng, Z., Banks, R., Spencer, C., Sperflage, J. and K.P. Georgakakos, 2019: “Jakarta Urban Flash Flood Warning System (UFFWS) User’s Guide,” *HRC Limited Distribution Report No. 58*, Hydrologic Research Center, San Diego, CA, 25pp.

Cheng, Z., Banks, R., Spencer, C., Sperflage, J. and K.P. Georgakakos, 2019: “Istanbul Urban Flash Flood Warning System (UFFWS) User’s Guide,” *HRC Limited Distribution Report No. 57*, Hydrologic Research Center, San Diego, CA, 25pp.

Spencer, C., Sperflage, J., Banks, R., Georgakakos, K.P., Modrick, T., Shamir, E., Graham, R. and R. Jubach, 2019: “Pakistan Afghanistan Regional Flash Flood Guidance (PARFFG) System User’s Guide,” *HRC Limited Distribution Report No. 56*, Hydrologic Research Center, San Diego, CA, 143pp.

Spencer, C., Sperflage, J., Banks, R., Georgakakos, K.P., Modrick, T., Shamir, E., Graham, R. and R. Jubach, 2019: “South Asia Flash Flood Guidance (SAsiaFFG) System User’s Guide,” *HRC Limited Distribution Report No. 55*, Hydrologic Research Center, San Diego, CA, 143pp.

Spencer, C., Sperflage, J., Banks, R., Georgakakos, K.P., Modrick, T., Shamir, E., Campbell, R., and R. Jubach, 2019: “Southeastern Asia-Oceania Flash Flood Guidance (SAOFFG) System User’s Guide,” *HRC Limited Distribution Report No. 54*, Hydrologic Research Center, San Diego, CA, 161pp.

Spencer, C., Sperflage, J., Banks, R., Georgakakos, K.P., Graham, R., and R. Jubach, 2019: “Haiti and Dominican Republic Flash Flood Guidance (HDRFFG) System User’s Guide,” *HRC Limited Distribution Report No. 52*, Hydrologic Research Center, San Diego, CA, 141pp.

Spencer, C., Sperflage, J., Georgakakos, K.P., Graham, R., and R. Jubach, 2018: “Mekong River Commission Flash Flood Guidance (MRCFFG) System Version 2018 User’s Guide,” *HRC Limited Distribution Report No. 51*, Hydrologic Research Center, San Diego, CA, 137pp.

Spencer, C., Sperflage, J., Georgakakos, K.P., Graham, R., and R. Jubach, 2019: “Central Asia Flash Flood Guidance System (CARFFG) User’s Guide,” *HRC Limited Distribution Report No. 50*, Hydrologic Research Center, San Diego, CA, 141pp.

Spencer, C., Banks, R., Georgakakos, K.P., Sperflage, J. and R. Jubach, 2017: “Viet Nam Analysis Flash Flood Guidance System (VNAFFG) User’s Guide,” *HRC Limited Distribution Report No. 48*, Hydrologic Research Center, San Diego, CA, 96pp.

Spencer, C., Sperflage, J., Georgakakos, K.P., Graham, R., Banks, R. and R. Jubach, 2017: “Viet Nam Operational Flash Flood Guidance System (VNOFFG) User’s Guide,” *HRC Limited Distribution Report No. 47*, Hydrologic Research Center, San Diego, CA, 144pp.

Technical Report Series

Georgakakos, K.P., Modrick, T., Shamir, E. and Z, Cheng, 2019: “Verification Guidelines for the Flash Flood Guidance System Component Products and Derivative Warnings,” *HRC Technical Report Series No. 102*, Hydrologic Research Center, San Diego, CA, 113pp.

Georgakakos, K.P., 2019: “Harsit River Reservoir Modeling,” *HRC Technical Report Series No. 101*, Hydrologic Research Center, San Diego, CA, 39pp.

Technical Communications

Cheng, Z., Posner, A. and K.P. Georgakakos: “Summary Proceedings of the First USBR, HRC and HEC Meeting for the Project: Develop Probabilistic Simulations in HEC-RAS Sediment Transport,” *HRC Technical Communication HECRAS20191211*, Hydrologic Research Center, San Diego, CA, 15pp.

Georgakakos, K.P., 2019: “A Flexible Executable Stand-Alone Version of the Flash Flood Guidance System Software for Training and Sustainability of Operations,” *HRC Technical Communication TC-20190208*, Hydrologic Research Center, San Diego California, 9pp.

HRC, 2019: “Development and Implementation of International Regional Flash Flood Guidance and Early Warning Systems Phase II (Work Plans III – VII), Final Summary Report,” *HRC Technical Communication GFFGSII-201903*, Hydrologic Research Center, San Diego, CA, 37 pp.

Jubach R., Campbell, R., 2019: “Roadmap for the Development and Implementation of Impact-based Forecasts and Warnings for High Impact Hydrometeorological Events, a Template” *HRC Technical Communication WRN01-201912*, Hydrologic Research Center, San Diego California, 15pp.

Training and Educational Course Material

Cheng, Z., Modrick T. and E. Shamir, 2019: Advanced River Routing and Advanced Meteorology. *HRC Video for On-line Course*.

Georgakakos, K.P., 2019: Elements of Characterizing Uncertainty in Hydrometeorological Forecasting. *HRC Video for On-Line Course*. Translated in 4 languages (English, French, Spanish, and Russian).

Shamir, E., 2019: Introduction to precipitation induced landslides warning. *HRC Video for On-line Course*.

Shamir, E., 2019: Soil Moisture and Snow Models. *HRC Video for On-line Course*.

Educational, Science Cooperation, and Technology Transfer Activities

January

- R. Campbell and E. Shamir attended the American Meteorological Society Annual Meeting in Phoenix, AZ, 1/5-8/2019.
- HRC hosted the Science Team Meeting, 1/17/2019.
- C. Spencer traveled to Jakarta, Indonesia to give FFG System Administration Training, 1/19-27/2019.

February

- HRC hosted the California State University San Marcos Group, 2/1/2019.
- R. Campbell traveled to Guatemala for a Weather Ready Nations (WRN) workshop, 2/2-6/2019.
- HRC celebrated 25 years of operation with a dinner at the AVANT restaurant in San Diego, 2/8/2019.
- Dr. Tihomir Kostadinov, CSU-SM gave a talk to HRC staff titled “Lidar and DTS Mapping of Snow in Montane Conifer Forests: Seeing the snow through the trees,” 2/11/2019.
- R. Campbell traveled to Indonesia for a Weather Ready Nations (WRN) workshop, 2/18-24/2019.
- R. Campbell traveled to South Africa for a Weather Ready Nations (WRN) workshop, 2/25-3/3/2019.

March

- Dr. Trent Biggs, Dr. Hilary McMillan, and Dr. Atsushi Nara from San Diego State University gave presentations at HRC on some of their current work, 3/15/2019.
- Delegation of engineers affiliated with the Three Gorges Dam operations in China visited HRC, 3/21/2019.
- R. Campbell attended the Barbados Workshop Forecaster Training, Barbados, 3/23-29/2019.
- E. Shamir gave a brown bag lunch seminar: “A comparison of precipitation downscaling procedures to guide studies of climate change impacts on flooding and water resources,” 3/26/2019.
- R. Campbell traveled to San Salvador for the Central America Regional Workshop, 3/30-4/5/2019.

April

- K. Georgakakos attended SEAFFGS Step 1 Training and Radar Meeting in Vietnam, 4/8-12/2019, and the Istanbul UFFWS Training, 4/16-18/2019.
- E. Shamir gave a presentation at the EGU, Vienna, Austria, 4/7-12/2019.
- R. Campbell traveled to Indonesia for a Weather Ready Nations (WRN) workshop, 4/18-26/2019.

May

- R. Campbell traveled to Guatemala for a workshop, 5/6-10/2019.
- R. Campbell traveled to El Salvador for the Central America Regional Workshop, 5/10-14/2019.
- R. Campbell discussed her recent IDSS (Impact-based Decision Support System) work and prospects during a Brown Bag Lunch Seminar at HRC, 5/22/2019.
- E. Shamir attended meetings in Tucson, Arizona relating to the BoR Weather Generator Project, 5/23-24/2019.

June

- Z. Cheng conducted a HRC Brown Bag Lunch. His talk was titled “Evaluation of Flash Flood Mitigation Measures for Urban Communities, a Case Study for Tegucigalpa Honduras,” 6/5/2019.

- The HRC FFGS project was selected to be presented at the World Meteorological Technology Expo 2019 in Geneva, 6/5-6/2019.
- R. Campbell gave a presentation at a HRC Brown Bag Lunch on the IDSS work: Impact-based Decision Support System for Weather Events, 6/19/2019.
- K. Georgakakos traveled to Dakar, Senegal, South Africa to attend meetings with WMO, 6/23-28/2019.

July

- HRC celebrated 25 years in operation.
- HRC hosted the WMO Program Meeting, 7/1-3/2019.
- T. Modrick Hansen traveled to Suva, Fiji to participate in Fiji FFGS SCM1, 7/22-26/2019.

August

- Seven people from the Fiji Meteorological Service participated in Fiji FFGS Radar Hydrology Training for three weeks at HRC, 8/19-9/6/2019.
- R. Campbell traveled to Sri Lanka for an IBF Workshop, 8/8-22/2019.
- K. Georgakakos gave a presentation at the California Energy Commission, Resource Agency of California in Sacramento, 8/8/2019.

September

- R. Campbell traveled to Barbados for an IBF Workshop, 9/1-7/2019.
- R. Campbell traveled to Indonesia for a Weather Ready Nations (WRN) Workshop, 9/13-28/2019.
- J. Sperflage traveled to Vientiane Laos and Hanoi Vietnam for data collection, 9/27-10/7/2019.
- E. Shamir traveled to Vientiane Laos, Hanoi Vietnam, Phnom Penh Cambodia, and Bangkok Thailand for data collection, 9/27-10/11/2019.

October

- C. Spencer traveled to Phnom Penh Cambodia and Bangkok Thailand for data collection, 10/4-12/2019.
- WMO FFG CREWS FIJI Step 3 FFGS hands-on training at HRC, 10/7-11/1/2019.
- R. Campbell attended a management meeting at the NWS in Washington, D.C., 10/15-18/2019.
- K. Georgakakos and J. Sperflage attended the initial Radar Workshop in Croatia for SEE FFGS and BSME FFGS, 10/19-27/2019.

November

- K. Georgakakos, Z. Cheng, T. Modrick Hansen, and E. Shamir attended the Global Workshop on FFGS in Antalya, Turkey, 11/4-8/2019.
- K. Georgakakos traveled to Nadi, Fiji to participate in SCM2 and regional meetings for Fiji FFGS, 11/23-30/2019.
- R. Campbell traveled to San Salvador, El Salvador for a UCAR Central America Regional Workshop, 11/23-29/2019.
- R. Campbell traveled to Exeter, United Kingdom for a UCAR WRN Support SCM Steering Committee Meeting, 11/29 – 12/7/2019.

December

- WMO FFG CREWS SE ASIA Radar Hydrology Training at HRC, 12/2-20/2019.
- Z. Cheng and K. Georgakakos traveled to Davis, CA to attend meetings with representatives with HEC and BoR, 12/6/2019.
- K. Georgakakos attended a FFGS Program Meeting in Geneva, Switzerland, 12/7-13/2019.
- K. Georgakakos and J. Sperflage traveled to Saint Lucia for the Initial FFG Workshop, 12/14-20/2019.

Throughout the Year

- R. Graham is a member of the PAGES (Past Global Changes) working group NAM2K Tree-Ring Chapter. Her focus is on the assimilation of available data sources and exploration of spatiotemporal analysis tools with the goal of producing a high-resolution reconstruction of key North American climate variables.

Community Outreach Activity

- HRC hosted the local chapter of the American Meteorological Society meeting, K.P. Georgakakos provided a talk on “Operational Gauge-adjusted Satellite Precipitation Estimation and its Application for Flash-Flood Prediction Worldwide” 5/14/2019.
- R. Campbell mentored students in Dr. Domingo’s lab at California State University San Marcos and Jaqueline Rivera in El Salvador.
- Cheng, Z. served as reviewer for Journal of Hydrology, Journal of Hydraulic Research, and Water.
- K.P. Georgakakos visited several funding agencies in Washington, D.C., 2/12-15/2019.
- K.P. Georgakakos advised a UCSD Ph.D. Candidate (Ms. Erica DeBiasio) who has been assigned to the Climate-Ocean-Atmospheric Program (COAP). HRC, through a donation, is providing financial support to Ms. DeBiasio for tuition and a stipend
- T. Modrick Hansen and K. P. Georgakakos visited the San Diego State University (SDSU) campus and met with faculty as a “re-introduction” of HRC activities to newer SDSU Faculty. Three people from the Geography Department (T. Bigg, H. McMillan, A. Nara) visited HRC and presented some of their research.
- T. Modrick Hansen and E. Shamir participated as invited guests in the SDSU Water Days, a one day conference which brought together various SDSU researchers with industry, consultant, government, and research leaders in the San Diego County water-related issues.
- E. Shamir participated in the Soroosh Sorooshian Hydrometeorology Symposium in Irvine, CA on 6/20/2019.
- E. Shamir reviewed a Ph.D. dissertation for the Hebrew University of Jerusalem.
- E. Shamir reviewed manuscripts for peer reviewed journals: Hydrology and Earth System Science, Environmental Research Letters, Journal of Hydrology, Journal of American Water Resources Association, Journal of Arid Environments, Water, Sensors, and an Elsevier Book proposal.
- E. Shamir served on the Technical Advisory Committee for the update of the San Diego Country Hydrology Manual.
- E. Shamir served on the academic committee for Matan Ben Yona who is pursuing a masters in Water Science at the Tel Hai College, Israel.

Visitors

February

- Tihomir Kostadinov, CSU-San Marcos, Physics Department

March

- Dr. Trent Biggs, Dr. Hilary McMillan, Dr. Atsushi Nara, SDSU Geography Dept.
- Delegation of engineers affiliated with the Three Gorges Dam operations in China: Xiao Ge, Tang Xufeng, Tang Zhengyang, Yang Xu, Xu Yang, Liang Zhiming, Huaming Yao

May

- HRC hosted the American Meteorological Society Meeting

June

- Aaron Lukas Moore

July

- HRC hosted the WMO Program Meeting
 - Paul Pilon, WMO
 - Hwirin Kim, WMO
 - Petra Mutic, WMO
 - Curt Barrett, USAID
 - Sezin Tokar, USAID
- Tara Torres, UCAR

August

- WMO CREWS FIJI Radar Hydrology Training at HRC
 - Swastika Devi, Fiji Meteorological Service
 - Aakeshey Asneal Kumar, Fiji Meteorological Service
 - Rovil Rynal Kumar, Fiji Meteorological Service
 - Stephen Meke, Fiji Meteorological Service
 - Orisi Naba, Fiji Meteorological Service
 - Viliame Vereivalu, Fiji Meteorological Service
 - Sakeasi Waibuta, Fiji Meteorological Service

October

- WMO CREWS FIJI FFGS Training at HRC
 - Swastika Devi, Fiji Meteorological Service
 - Stephen Meke, Fiji Meteorological Service
 - Orisi Naba, Fiji Meteorological Service
 - Viliame Vereivalu, Fiji Meteorological Service
 - Sakeasi Waibuta, Fiji Meteorological Service
 - Brandt Maxwell, NWS

December

- WMO FFG Phase III.1 SE Asia Radar Hydrology Training at HRC
 - Toan Minh Hoang, Aero-Meteorological Observatory (AMO), Viet Nam Meteorological and Hydrological Administration
 - Fatah Masthawe, Thai Meteorological Department, Thailand
 - Phetsakhone Misomphane, Department of Meteorology and Hydrology, Laos
 - Minh Hoang Nguyen, National Center for Hydro-Meteorological Forecasting, Viet Nam Meteorological and Hydrological Administration
 - Saleumsack Sidavong, Department of Meteorology and Hydrology, Laos
 - Somkuan Tonjan, Thai Meteorological Department, Thailand
 - Mai Tuyet Tran, National Center for Hydro-Meteorological Forecasting, Viet Nam Meteorological and Hydrological Administration