

Format for Biennial Reports by UNESCO's Water-related Centres on activities related to the IHP in the period (June 2014 – May 2016)

1. Basic information on the centre

Name of the Centre		International Center for Integrated Water Resources Management
Name of Director		Robert A. Pietrowsky
Name and title of contact person (for cooperation)		William S. Logan
E-mail		Will.logan@usace.army.mil
Address		7701 Telegraph Rd, Casey Building
Website		www.iciwarm.org
Location of centre		Alexandria, Virginia 22315 USA
Geographic orientation *		<input checked="" type="checkbox"/> global <input type="checkbox"/> regional
Region(s) (for regional centres)		
Year of establishment		2007
Year of renewal assessment		2022
Signature date of most recent Agreement		October 29, 2009
Themes of activities during reporting period	Focal Areas ·	<input type="checkbox"/> groundwater <input checked="" type="checkbox"/> urban water management <input checked="" type="checkbox"/> rural water management <input checked="" type="checkbox"/> arid / semi-arid zones <input type="checkbox"/> humid tropics <input type="checkbox"/> cryosphere (snow, ice, glaciers) <input checked="" type="checkbox"/> water related disasters (drought/floods) <input type="checkbox"/> Erosion/sedimentation, and landslides <input checked="" type="checkbox"/> ecohydrology/ecosystems <input type="checkbox"/> water law and policy <input type="checkbox"/> social/cultural/gender dimension of water <input checked="" type="checkbox"/> transboundary river basins/ aquifers <input checked="" type="checkbox"/> mathematical modelling <input type="checkbox"/> hydroinformatics <input type="checkbox"/> remote sensing/GIS <input checked="" type="checkbox"/> IWRM <input checked="" type="checkbox"/> Watershed processes/management <input checked="" type="checkbox"/> global and change and impact assessment <input type="checkbox"/> mathematical modelling <input checked="" type="checkbox"/> water education <input type="checkbox"/> water quality <input type="checkbox"/> nano-technology <input type="checkbox"/> waste water management/re-use <input checked="" type="checkbox"/> water/energy/food nexus <input checked="" type="checkbox"/> water systems and infrastructure <input type="checkbox"/> other: (please specify) _____
	Scope of Activities ·	<input type="checkbox"/> vocational training <input checked="" type="checkbox"/> postgraduate education <input checked="" type="checkbox"/> continuing education <input checked="" type="checkbox"/> public outreach <input checked="" type="checkbox"/> research <input checked="" type="checkbox"/> institutional capacity-building <input checked="" type="checkbox"/> advising/ consulting <input checked="" type="checkbox"/> software development <input type="checkbox"/> data-sets/data-bases development <input type="checkbox"/> other: (please specify) _____

* check on appropriate box
 · check all that apply

Support bodies ¹	US Army Corps of Engineers
Hosting organization ²	USACE Institute for Water Resources
Sources of financial support ³	Mostly US government agencies
Existing networks and cooperation ⁴	ICIWaRM itself is designed as a network of US government, academic institutions, professional organizations, and other non-governmental organizations. We have MOUs with many of the other Category 2 Centers.
Governance	<input type="checkbox"/> director and governing board <input checked="" type="checkbox"/> other: (please specify) Director and Advisory Board. X Link to election of board members to the IHP Intergovernmental Council (IGC) and hosting country IHP National Committee Frequency of meetings: once every 2 years <input checked="" type="checkbox"/> Existence of UNESCO presence at meetings
Institutional affiliation of director	USACE Institute for Water Resources
Number of staff and types of staff	total number of staff (full-time, or equivalent) : _____4_____ number of staff who are water experts: _____4_____ number of visiting scientists and postgraduate students: ____3_____
Annual turnover budget in USD	~ US\$ 2 million

2. Activities undertaken in the framework of IHP in the period June 2014 – May 2016

2.1 Educational activities (i.e., those with accreditation) that directly contributed to the IHP-VIII (Appendix 1) and WWAP
Please include here those activities which led to accreditation of degrees, or those held in formal school settings.

- ICIWaRM partner Oregon State University (OSU), UNESCO's Institute for Water Education (UNESCO-IHE) and the United Nations-chartered University for Peace (UPEACE) in Costa Rica have jointly developed a new Master programme on Water Cooperation and Peace. It was jointly launched on April 14, 2015 at the 7th World Water Forum in the Republic of Korea. This program has been endorsed by UNESCO's "From Potential Conflict to Cooperation Potential" (PCCP) programme. ICIWaRM funded several students to help with curriculum design at the OSU part of the degree program.
- Dr. Eugene Z. Stakhiv teaches graduate level courses on water management and climate change adaptation at Johns Hopkins U. and is on the committee of several masters and PhD students.
- Dr. Richard A. Meganck, whom ICIWaRM partially supports at Oregon State University, is on PhD committees.
- Dr. Aleix Serrat Capdevila (University of Arizona and now World Bank) is on the committee of several masters and PhD students.

2.2 Research activities that directly contributed to the IHP-VIII activities
Please include research/applied projects outputs such as publications that directly contributed to the IHP-VIII and WWAP objectives

¹ please specify bodies that cover the operational costs of the centre, and other essential costs such as salaries and utility bills, and that provide institutional support to ensure centre's sustainability

² if different from support bodies

³ please specify sources of main budgetary and extrabudgetary funds to implement projects

⁴ please write international networks, consortiums or projects that the centre is part of, or any other close links that the centre has with international organizations or programmes, which are not already mentioned above

- As G-WADI secretariat, supported multiple research efforts to advance satellite precipitation applications in water resources management. Provided funding and initiated collaborations between researchers and ICIWaRM team members at the University of Arizona, Princeton University, and University of California, Irvine.
 - o Team members from the U of A are developing monitoring tools and real-time streamflow forecasting applications for the Mara, Tekeze and Zambezi basins in Africa. Using rainfall estimates from the most recent satellite observations and near-term weather forecasts as inputs to hydrologic rainfall-runoff models, they are working on providing publicly available experimental streamflow forecasts with a lead time of 7 to 10 days.
 - o Princeton's Land Surface Hydrology Group developed a drought and flood monitor for operational and research use over Latin America using available satellite remote sensing and in-situ information and a hydrologic modeling platform and accompanying web-based user interface. This monitor was adapted from the African Flood and Drought Monitor, which ICIWaRM also help fund the development of.
 - o The Center for Hydrometeorology & Remote Sensing at UC Irvine developed a variety of new products associated with the PERSIANN (Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks) system, which uses neural network functions classification procedures to estimate rainfall rates at each 0.25° x 0.25° pixel of the infrared brightness temperature image provided by geostationary satellites.
 - o Co-sponsored a regional G-WADI meeting in Windhoek in May 2015 ("Meeting of the Sub-Saharan Africa regional network of G-WADI") to review a) the African Drought Early Warning System Expansion to Southern Africa and b) the G-WADI/International Drought Initiative (IDI) Africa Expert Group.
 - o Co-sponsored a Training Workshop on: "Advances in Water Resources Management in Arid and Semi-Arid Areas: A G-WADI approach" in Khartoum, Sudan in February 2016. This was followed by a one-day meeting of the G-WADI advisory committee.
 - o Sponsored a session at the 2015 GSA Annual Meeting in Baltimore, Maryland, USA (1-4 November 2015) titled "70 Years of Geoscience at UNESCO: Past, Present, and Future".
 - o Along with the US National Committee for IHP, sponsored a session at the Fall 2015 annual meeting of the American Geophysical Union titled "Advances in Global Water Resources and Drought Management through UNESCO's International Hydrological Programme Posters".
- ICIWaRM has a leadership role in the Alliance for Global Water Adaptation (AGWA), an international consortium developing practical guidance for decision making in planning and design under climate uncertainty. ICIWaRM's Director is on AGWA's Steering Committee, and we provide major financial support for the Secretariat Coordinator.
- Within the AGWA framework, we have been working with many AGWA partners throughout this biennium on a so-called "bottom-up" approach to water resources planning. A major publication called "Water Resources Planning and Design for Future Uncertainties: Climate Risk Informed Decision Analysis (CRIDA)" is planned for mid-2016.
- Dr. Richard Meganck, who has been partially supported by ICIWaRM, is International Program Leader for the Institute for Water and Watersheds of Oregon State University. He participates in courses at OSU and serves on the PhD committee of Ms. Carla Portugal, who is

working on integrated watershed management models for application in Brazil (2014-2017).

- An ICIWaRM team member spent three months in 2014-15 as an Embassy Science Fellow at the US Mission in Beijing, China; among other tasks, he assessed water management challenges and activities that the US and China could collaborate on.
- Assisted the UNECE/OECD working group for the project "Reducing vulnerability to extreme floods and climate change in the Dniester river basin" and the beginning of a new project on "Climate Change and Security in the Dniester River Basin". ICIWaRM team members attended various meetings for this working group, titled: "Climate Change and River Basin Management in the Dniester River Basin" in Moldova and Ukraine. ICIWaRM is combining modeling with bottom-up water management approaches for reducing vulnerability of the Dniester river basin to extreme floods and climate change.

2.3 Training activities that directly contributed to the IHP-VIII and WWAP objectives

- Water Management, Climate Change Adaptation and Collaborative Planning
 - o Scenario and Shared Vision Planning Principles. Santiago de Caballeros, Dominican Republic, 25 March 2015. This was a teleconferenced session at the "Conversation on Future Water Supply for Santiago 2050" that is leading into a series of future meetings to assist the city of Santiago with their IWRM and planning, including climate change adaptation and stakeholder engagement.
 - o Scenario and Shared Vision Planning activities in Thailand: Phuket & Udon Thani, October 2014 and January 2015. ICIWaRM delivered basic training and collaboration roadmap with a core working team who will be engaging key agencies to refine decision model and develop climate resilience strategies. The purpose is to introduce and implement Scenario and Shared Vision Planning for options for meeting urban visions that are resilient to climate change. Decision models will be built in collaboration with stakeholders in order to evaluate resilience strategies in the context of climate change and rapid growth.
 - o Inter-Municipal Flood Risk Reduction Strategy Dialogue, Udon Thani, Thailand, 24-25 September 2015. In response to a request by the deputy Provincial Governor of Udon Thani, Inter-Municipal Flood Risk Reduction strategy dialogue using Scenario and Shared Vision Planning was held.
 - o Hue, Vietnam: Similar activities were underway during 2014 and 2015 for the city of Hue, Vietnam. This led to a May 2015 workshop which did training for the core team there on some of the techniques for climate change adaptation that are being developed elsewhere in SE Asia.
 - o Shared Vision Planning Workshop, Ulan Bator, 9-11 June 2014. This was a three-day workshop for training and decision support on model development for the Selenge and Tui Rivers. It engaged approximately 20 technical practitioners and academics. It introduced Shared Vision Planning techniques through practical exercises that illustrate collaborative modeling for decision-making. Participants developed a preliminary framing of problems and opportunities, identified modeling requirements and evaluation metrics, and set-up robust evaluation requirements for climate adaptation and water security strategies in a select watershed in Mongolia. UNESCO Beijing was engaged in this event.

- Integrated Water Resource Management Workshop, Ulan Bator, Mongolia, 23-26 September 2014. The purpose was to finalize a draft IWRM decision sketch and model for the Tuul River Basin, and to present the draft results to decision-makers for consideration in future water-related planning activities. Forty participants from over 10 different Mongolian water organizations participated in the workshop, and produced a draft decision sketch and model to support funding prioritization of activities listed in the Tuul River Basin Authority IWRM plan.
- Ecohydrology and Environmental Flows
 - Environmental Flow Assessment Workshop, Arlington, VA, 20-22 January, 2015. Co-sponsored by USAID, its primary purpose of the workshop was to introduce tools, methods, and approaches for conducting EFAs within a variety of contexts. While the participants were from USAID, US State Dept. and other agencies, we are examining ways to make the materials available to a broader, global audience.
 - Training course on Reservoir Environmental Flows Modeling, August 2014, La Plata, Argentina. Drs. John Hickey and Stan Gibson from the USACE Hydrologic Engineering Center (HEC) conducted a four day training course and workshop for ~45 attendees from six countries at The National University of La Plata (UNLP), Argentina. The primary objective was to build capacity in modeling related to environmental flows. The course involved advanced training in the River System Analysis Model (HEC-RAS) and HEC's Ecosystem Functions Model (HEC-EFM). The instructors worked on HEC-RAS models the participants had brought with them, during lunch, breaks and in the evening.
- Hydraulic, Hydrologic, and Reservoir Modeling Training
 - Working Meetings in the Ukraine and Moldova on Multi-Reservoir Modeling of the Dniester River. 22-24 October 2014 (Kiev) and 28-30 October 2014 (Chisinau). This is part of ICIWaRM's contribution to UNECE-OSCE program on "Climate Change and Security in Eastern Europe, Central Asia and the Southern Caucasus". Our goal is to develop a risk-informed decision framework for water resources adaptation to climate change. IWR has developed a multi-reservoir operating model for the Dniester River basin, containing reservoirs in both Moldova and Ukraine, to evaluate climate adaptation strategies for reservoir management.
 - Training course on Reservoir System Analysis, 12-16 May 2014, Dominican Republic. Two hydrologists from HEC conducted a five day training course and workshop at the National Institute of Water Resources (INDRHI), Santo Domingo, Dominican Republic. The course was co-organized and co-sponsored by INDRHI and its UNESCO-affiliated Centre for the Sustainable Management of Water Resources in the Caribbean Island States (CEHICA). USAID also sponsored the event. The primary objective was to build capacity for integrated water resources management and planning, specifically for reservoir system studies. The ~30 attendees were mostly from INDRHI, but also from the Bahamas, St. Lucia, and Trinidad/Tobago.
 - Groundwater Modeling for the Tuul River Basin, Mongolia, March 30-Apr 3 2015. Run by the USGS on behalf of ICIWaRM, the workshop focused on technical training and capacity building among water resources professionals using the program MODFLOW. It built on the outputs to the Shared Vision Planning/IWRM prioritization model for the Tuul

- developed in September. UNESCO-Beijing and the Mongolian Hydrologist's Association were co-sponsors.
- Hydrogeologic Training and Use of MODFLOW Groundwater Model for Water Security in the Tuul River Basin, Mongolia, 14-19 September 2015. In a follow-up to the previous event, the Mongolia Ministry of Environment, Green Development, and Tourism (MEGDT) and ICIWaRM, in collaboration with UNESCO and the Fresh Water Institute, held a training course delivered by experts from the US Geological Survey (USGS) on advanced groundwater modeling and monitoring. The Tuul River Basin was used as a case study application. The interim model products were presented to decision-makers for consideration in future water-related planning activities.
 - Training in Hydrologic and Hydraulic Modeling, Colombo, Sri Lanka, January 3-6, 2016. Hydrologic Engineering Center (HEC) engineers taught two, full-day short courses in hydrologic and hydraulic modeling at the ASCE-EWRI "8th International Perspective on Water Resources and the Environment" Conference. The courses described the River Analysis System (HEC-RAS) and its applications to hydraulic modeling studies, and the Hydrologic Modeling System (HEC-HMS) and its applications to precipitation-runoff modeling. Most participants were Sri Lankan students and educators.
- Satellite Precipitation Estimation and Drought and Drought Forecasting
- About 50 water scientists and engineers attended a technical training session on "Satellite-based Rainfall (PERSIANN) for Planning and Management for Natural Disasters in Monsoon Asia". The session was held on 29 January 2015 during the Thai Hydrologist Association's (THA) 2015 conference. The session leadership included scientists from the Asian G-WADI Secretariat at the Chinese Academy of Sciences, Chulalongkorn University, University of California – Irvine, UNESCO's Asia and Pacific Regional Bureau for Education, and UNESCO-IHP. The session mainly focused on PERSIANN's Cloud Classification System (PERSIANN-CCS) system, but also introduced two new precipitation products developed from PERSIANN.
 - On 1-2 October 2015, a follow-up Technical Training Workshop on the potential benefit of satellite-based rainfall applications in ASEAN countries was organized by the ASEAN Academic Network and UNESCO at Chulalongkorn University in Bangkok. The meeting took place in association with the ASEAN-UNESCO Workshop for Disaster Risk Reduction in SE Asia. Ten researchers from Indonesia, Cambodia, Viet Nam, Lao PDR, Indonesia, Malaysia, Brunei, and Philippines and another 10 from Thailand participated in this two-day technical training on various PERSIANN products. These included PERSIANN-CDR, which contains a record of climate data on precipitation of over 30 years, the near real-time G-WADI PERSIANN-CCS GeoServer, and PERSIANN-CONNECT, a searchable database of global extreme precipitation events with various climate characteristics.
 - Workshop on the Princeton University Latin-American-Caribbean Flood and Drought monitoring system (LAC-FDM), Santiago de Chile, November 17-19, 2014. The workshop was organized to provide an introduction to, and training in, the LAC-FDM, developed in collaboration with UNESCO-IHP/G-WADI and ICIWaRM, and to solicit feedback from participants on capacities and needs in monitoring and forecasting

drought. Participants included representatives of national meteorological and hydrological services.

3. Collaboration and linkages

- 3.1 Participation in major international networks, programmes, partnerships with other UN or other International Agencies, media and professional bodies

North American Network of Basin Organizations (NANBO): Attended Annual meeting June 2014 and ICIWaRM Director is a member of the NANBO Board of Directors.

ICIWaRM Director is on Steering Committee of the Alliance for Global Water Adaptation.

Close relationships with U.S. Water Partnership, American Society of Civil Engineers, American Water Resources Association, Stockholm International Water Institute, Global Water Partnership and World Water Council.

- 3.2 Participation in meetings related to the IHP and UNESCO (e.g. the UNESCO General Conference, the UNESCO Executive Board, the IHP Intergovernmental Council and/or other meetings organized by IHP)

Participated in the 21st Session of the Intergovernmental Council (2014). ICIWaRM Deputy Director addressed the Council in his role as co-rapporteur of the Working Group on the Implementation of the IHP Phase VIII Strategic Plan. He also co-organized and presented at the G-WADI side event on "IHP Data and Products to Address Water Challenges".

Participated in IHP Category 2 Center meeting to Discuss Strategy and Collaboration, December 15-16, 2014, Koblenz, Germany. The event was held at the Global Centre for Water Resources and Global Change of the Federal Institute of Hydrology in Koblenz, and was co-hosted by the German Ministry of Foreign Affairs.

Attended and presented at IHP's "Addressing Water Security: Climate Impacts and Adaptation responses in Africa, Asia and the Americas" inception meeting, Paris, February 8-9, 2015.

Participated in the XI Meeting of National Committees and Focal Points, Category 2 Centres and UNESCO Chairs for IHP-Latin America and the Caribbean (Region 3), Santiago, Chile, 26-30 October, 2015).

Attended and presented at IHP's meeting on "Climate Services for improved Water Resources Management in vulnerable regions to climate change in Latin America and the Caribbean: Addressing Current Gaps and Needs, Brussels, Belgium, February 24-25, 2016.

Attended first UNESCO Category 2 Centres Science Coordination Meeting, 16 to 18 May 2016 in Beijing, China.

Participated in the IHP Region 1 Meeting of National Committees and Category 2 Centres, Koblenz, Germany, 24-25 May, 2016).

- 3.3 Collaboration and networking with other UNESCO category 1 or 2 institutes/ centres

3.3.1 cross-appointment of directors of the category 1 or 2 institutes or centres on the governing board

ICIWaRM director is on the board of the Global Centre for Water Resources and Global Change, Koblenz, Germany.

ICIWaRM Deputy Director is on the board of the Water Center for Arid and Semi-Arid Zones in Latin America and the Caribbean (CAZALAC)

UNESCO-IHE has representation on the Advisory Board of ICIWaRM.

3.3.2 exchange of information on activities such as training/educational materials, and funding opportunities

Two ICIWaRM professionals participated in the International Sediment Initiative (ISI) Strategic Planning Workshop on 25 – 28 May, 2015 in Beijing, China. The workshop was hosted by the International Research and Training Center on Erosion and Sedimentation (IRTCES), a category 2 center. About 25 experts and practitioners from government agencies, academia, UNESCO centers and offices across the world attended this workshop. They exchanged ideas for the future ISI programme and opportunities for collaborative projects within the ISI framework.

3.3.3 exchange of staff, most notably professionals and students

Until Brazil's recent financial issues have compromised HidroEx, Dr. Richard Meganck had been functioning essentially as a liaison between ICIWaRM and HidroEx, working in part for each center.

3.3.4 implementation of joint activities, such as workshops, conferences, training programmes, joint projects, field visits, software and data sharing, knowledge exchange and publications

The South East European G-WADI Network was launched in collaboration with a UNESCO International Drought Initiative expert group meeting on 'Data tools and methodologies to address floods and droughts in the Member States' on 17-18 December 2014 in Belgrade, Serbia. The meeting was held at the "Water for Sustainable Development and Adaptation to Climate Change" (WSDAC) category 2 center, housed at the Jaroslav Černi Institute for the Development of Water Resources.

ICIWaRM staff attended and presented at a special plenary session regarding the International Flood Initiative (IFI), organized by ICHARM, at the 6th International Conference on Flood Management (ICFM6), 16-18 Sept 2014, São Paulo, Brazil.

Plus meeting co-organized with UNESCO centers: Water Center for Arid and Semi-Arid Zones in Latin America and the Caribbean (CAZALAC, La Serena, Chile), Regional Centre on Capacity Development and Research in Water Harvesting (Khartoum, Sudan), International Research and Training Center on Erosion and Sedimentation (IRTCES, Beijing, China), Centre for the Sustainable Management of Water Resources in the Caribbean Island States (CEHICA, Santo Domingo, Dominican Republic), and UNESCO-IHE. All of these were described in earlier sections.

3.4 Relationships with the UNESCO field and regional office whose jurisdiction covers the country of location

In this biennium, we have co-organized training courses and workshops in collaboration with UNESCO offices in Chile, Uruguay, Namibia, Kenya, Cairo, Bangkok and China.

We also hosted Dr. Flavia Schlegel, the Assistant Director-General (ADG) for the Natural Sciences Sector of UNESCO, on a two day visit to

Washington DC on April 27-28, 2015. In addition to her visit to ICIWaRM, we arranged for visits to The US State Department (International Organization Affairs and Office of the Science and Technology Advisor) as well as the US Geological Survey. A NASA scientist also participated.

- 3.5 Relationship with the UNESCO National Commission and the IHP National Committee in the country of location and with other organizations of other countries

We maintain strong relationships with our US National Committee for IHP. Our parent institution, the US Army Corps of Engineers, is one of the governmental members of the Committee, and ICIWaRM is represented at virtually every meeting. Likewise, we are active participants in the annual meetings of the US National Commission for UNESCO. In the December 2014 meeting, we were asked to present on ICIWaRM and the Category 2 Center network in Plenary Session. In December 2015, our project on "Groundwater Modeling for the Tuul River Basin, Mongolia" was also a featured presentation.

- 3.6 Relationship with other UNESCO-related networks, such as UNESCO Clubs, ASPnet, and UNESCO chairs

Our closest relationship to a UNESCO Chair in the US is with Bernhard T. Streitwieser, the UNESCO Chair in International Education for Development, The George Washington University, Washington, DC. In both academic years 2014-2015 and 2015-2016, we have lectured at a cross-cutting graduate course at GWU's Education & Communications / Engineering Departments called "UNESCO - Strategy for the 21st Century".

4. Communication

- 4.1 Communication and knowledge dissemination activities undertaken in the framework of IHP

We published three news articles on PERSIANN tools:

- "Web technologies help to tackle Climate Change effects on water resources" (UNESCO, March 2016; <http://en.unesco.org/news/web-technologies-help-tackle-climate-change-effects-water-resources>),
- "RainMapper: New Smartphone App Uses Remote Sensing to Provide Rainfall Totals Across Globe" on the Alliance for Global Water Adaptation (AGWA) news feed (<http://alliance4water.org/blog>), and
- "Real-time precipitation estimates in data-sparse regions" in all of the Ooska Newsletters of February 23, 2016 (https://www.ooskanews.com/story/2016/02/ooskanews-voices-real-time-precipitation-estimates-data-sparse-regions_170000).

We operate the websites of both ICIWaRM (iciwarm.org, or iciwarm.sites.usa.gov) and G-WADI (gwadi.org), the latter in collaboration with the University of Arizona.

The Namibia Hydrological Services of the Ministry of Agriculture, Water and Forestry uses precipitation estimates from the G-WADI PERSIANN-CCS GeoServer in their Daily Flood Bulletin.

Sponsored 'Women, Water, Wells' photography exhibit at World Water Forum Symposium, October 2014, Portland, Oregon, USA. This is a major photography exhibit highlighting the works of Mr. Gil Garcetti, UNESCO-IHE Cultural Ambassador. It tells a story of how clean water in villages in West Africa changes the lives, health, education, and opportunities of the people there, especially those of women and girls.

ICIWaRM Deputy Director serves on the Board of Directors of Aqua-LAC, the technical journal of the UNESCO Regional Office for the International Hydrological Programme for Latin America and the Caribbean.

4.2 Policy documents and advice

Published "Aspects of Governing Water Allocation in the U.S.". Report Prepared for Agência Nacional de Águas of Brazil, December 2014. Online at http://www.iwr.usace.army.mil/Portals/70/docs/iwrreports/2014-R-4_Aspects_of_Governing_Water_Allocations_in_the_US.pdf

Funded the workshop and publication of "U.S. Perspective on the Water-Energy-Food Nexus", Colorado Water Institute Information Series No. 116 for the US State Dept. and the Nexus Dialogue on Water Infrastructure Solutions. Online at http://www.cwi.colostate.edu/workshops/nexus2014/NexusReport_092314.pdf.

5. Update on Centre Operations

5.1 Membership of the Board of Governors between designated period

Hon. Jo-Ellen Darcy, Assistant Secretary of Army (Civil Works), U. S. Army Corps of Engineers (Board Chair, ex officio)

Ms. Kathie Bailey, Director, Board on International Scientific Organizations, The National Academies

Dr. Jerad Bales, Chief of Research & Science for Water, USGS, Reston, VA

Dr. Blanca Jiménez Cisneros, Secretary, UNESCO International Hydrological Programme (IHP) (represented at the 2015 board meeting by Dr. Anil Mishra, Programme Specialist, UNESCO, Paris, France)

Dr. İbrahim Gürer, Professor, Department of Civil Engineering, Gazi University, Ankara, Turkey

Dr. Geza Jolankai, Professor, University of Debrecen, Hungary (retired)

Dr. Heng Liu, Professor, Director-General International Center on Small Hydropower, under the auspices of UNIDO and China's Ministry of Water Resources and Ministry of Commerce, Hangzhou, China

Dr. Michael E. McClain, Professor of Ecohydrology, UNESCO-IHE Institute of Water Education, Delft, The Netherlands

Dr. Ahmed Ali Murad, Vice Dean & Associate Professor of Hydrogeology, United Arab Emirates University, UAE

Mr. Dhesigen Naidoo, CEO, South African Water Research Commission, Pretoria, South Africa

Dr. Rubem La Laina Porto, Professor, Department of Hydraulics, University of Sao Paulo, Sao Paulo, Brazil

5.2 Key decisions made (attach minutes of meetings)

Minutes of April 2015 Advisory Board meeting attached.

6. Evidence of the Centre's Impacts

6.1 Science Impacts (Major contributions to the science, technology, education, and regional and/or international cooperation in the field of water)

Prince Sultan Bin Abdulaziz International Prize for Water: ICIWaRM academic partners Drew. Eric Wood and Dr. Justin Sheffield (Princeton University, USA) received one of the 2014 Prince Sultan Bin Abdulaziz International Prizes for Water for "Creativity". In their acceptance speech, they thanked "in particular at the UNESCO International Hydrology Program [and] the International Center for Integrated Water Resources Management (ICIWaRM)".

US National Academy of Engineering: Princeton's news item about Dr. Eric Wood's 2015 induction into US National Academy of Engineering notes that "among other accomplishments, Wood has led a team of researchers at Princeton in the development of a drought monitor capable of observing isolated regions not

served by other systems. Working with UNESCO, Wood and the members of his Terrestrial Hydrology Research Group have deployed research stations for the monitor at several locations in Africa and South America.”

20th Heinz Award (Public Policy category): ICIWaRM academic partner Dr. Aaron Wolf (Oregon State University) won the 2015 Heinz award, sponsored by the Heinz Family Foundation, for his work on international water conflict resolution. The foundation’s press release notes among his accomplishments the new “partnership among OSU, the UNESCO-IHE Institute for Water Education...and the University for Peace in Costa Rica for a joint Master’s degree program on water cooperation and peace.”

6.2 Knowledge Transfer Impacts (Major achievements in the dissemination of knowledge and technology transfer)

ICIWaRM has a major role in organizing a ten day, technical and cultural exchange program to the United States, for Water Professionals from Eastern Europe and Central Asia, conceptualized by the US Mission to UNESCO and the IHP Secretariat. Early career water researchers, scientists, system managers and practitioners from 10 countries in Eastern Europe and Central Asia participated. The program was designed to contribute to implementation of the eighth phase of the International Hydrological Program (IHP-VIII), “Water Security: Responding to Local, Regional, and Global Challenges”. The exchange program’s emphasis was on IHP-VIII’s theme IV, “Water for Human Settlements of the Future.”

6.3 Policy Impacts (advice sought by government and other bodies and evidence of inputs into policy arena)

ICIWaRM scientists give perhaps 20 lectures per year on topics related to policy, and participate in many US government interagency water working groups and committees.

7. Future activities that will contribute directly to IHP and/or to WWAP

7.1 Operational Plan (attach if available)

7.2 Strategic Plan linked with IHP-VIII (Appendix 1). Focal areas within IHP-VIII the centre plans to contribute to and specific actions the centre will undertake to align its activities with the strategic plan for IHP-VIII

8. Annexes

8.1 List of publications released by the centre (there can be overlap with those listed in 2.3 above)

8.2 List of training courses conducted (there can be overlap with those listed in 2.1 above)

See above.