PASI: Adaptive Water-Energy Management in the Arid Americas

Program

Sun. 23 June	**Arrivals, evening reception** Reception: 8:00-10:00pm

Participants:

- Belize Lane, University of California Davis, USA
- Candida Dewes, University of California Santa Barbara, USA
- Claudia Lardizabal, National Autonomous University of Honduras, Honduras
- Colin McKenzie, University of Arizona, USA
- Cristobal Reveco, Earth System Governance Project, Chile
- Dangela Fernandes, Itaipu Binacional, Brazil
- David MacPhee, San Diego State University, USA
- Diego Ponce, University of California Berkeley, Mexico
- Elvin Delgado, Central Washington University, USA
- Gricelda Herrera, Escuela Superior Politecnica del Litoral, Ecuador
- Heather Lee, Texas A&M University, USA
- Ismene Rosales, Universidad Nacional Autonoma de Mexico, Mexico
- Janaina Pasqual, Itaipu Binacional, Brazil
- Jenna Kromann, University of Texas, USA
- Jhim Terrazas, Sociedad de Ingenieros de Bolivia, Bolivia
- Lauren Herwehe, University of Arizona, USA
- Liber Martin, Consejo Nacional de Investigaciones Cientificas y Tecnologicas (CONICET), Argentina
- Luis Metzger, Servicio Nacional de Meteorologia e Hidrologia del Peru, Peru
- Marina Recalde, Fundacion Bariloche, Argentina
- Mathew Kilanski, University of Texas, USA
- Pilar Roman, Food and Agriculture Organization (FAO), Chile
- Roxana Borquez, Universidad de Chile, Chile
- Ruben Dario, Instituto de Hidrología, Meteorología y Estudios Ambientales, Colombia
- Ryan Lee, Udall Center for Public Policy Studies, USA
- Sandra Mejia, Delegacion Union Europea, Nicaragua
- Sarah Kelly, University of Arizona, USA
- Shimelis Setegn, Florida International University, USA
- Tess Russo, Columbia University, USA

Website:
http://aquasec.org/pasi2013_mainpage

Mon. 24 June	**Program overview: water-energy nexus and global-change adaptation**	
AM Session 1 (9:00-11:00 AM)	Speaker/s:	Dr. Christopher Scott, University of Arizona, USA Mr. Guido Soto, CAZALAC
	Exercise/ Outcome:	- Ice-breaker activity – participants meet-and-greet in pairs, then introduce each other to the full group as means to forge group objectives and teamwork. - Instructions on submitting blog responses. - Conduct pre-training evaluation (document trainees' expectations, which will also be assessed periodically during the training).
	Model:	Water-energy nexus 'conceptual model' (inter-linked resource assessment)
	Reference Materials:	Scott, C.A. 2011. The water-energy-climate nexus: resources and policy outlook for aquifers in Mexico. *Water Resources Research* 47, W00L04, doi:10.1029/2011WR010805. [pdf]
11:00-11:15 AM	**BREAK**	
AM Session 2 (11:15-1:00 PM)	Speaker/s:	Dr. Asfaw Beyene, San Diego State University, USA
	Exercise/ Outcoe:	Review of previous PASI program on Energy, Water, and Global Climate Change.
	Model:	'Priority-setting' through speaker - participants interaction
	Reference Materials:	Beyene, A., W. Oechel, D. MacPhee. 2010. Energy, Water and Global Climate Change as a Regional Agenda of the Americas. Report to NSF PASI Program. San Diego State University, San Diego, CA. [pdf]
1:00-2:00 PM	**LUNCH**	
PM Session 1 (2:00-4:00 PM)	Speaker/s:	Dr. Asfaw Beyene, San Diego State University, USA
	Exercise/ Outcome:	Review of previous PASI program on Energy, Water, and Global Climate Change.
4:00-4:15pm	**BREAK**	
PM Session 2 (4:15-6:00 PM)	Topic - **Integrated resource management: what is it and why it is important for safe-operating space and water and energy security**	
	Speaker/s:	Dr. Francisco Meza, Pontificia Universidad Católica de Chile
	Exercise/ Outcome:	Identification of climatic and hydrological change processes and variability related to water and energy resource use and management. Strengthen participant-based interaction
	Model:	'Safe operating space' approach to sustainability and resilience; resource use considering planetary and societal boundaries.
	Reference Materials:	Bambach, N., F.J. Meza. 2009. Recursos Hídricos, Estacionalidad y Cambio Climático: Un desafío para la agricultura Chilena. *Agronomía y Forestal U.C.* 37: 12-18. [pdf] Rockström, J. et al. 2009. A safe operating space for humanity. *Nature* 461, 472-475 (24 September 2009). [pdf]

Tue. 25 June	Topic - **Climate change/variability, water and energy, and adaptation**	
AM Session 1 (9:00-11:00 AM)	Speaker/s:	Dr. Alfredo Ribeiro, Universidade Federal de Pernambuco, Brazil
	Exercise/ Outcome:	Web-based, computer user-interface identification of regional hydroclimatic processes. Link resource use with impacts and adaptation pathways.
	Model:	Regional climate models – overview
	Reference Materials:	Ribeiro Neto, A., Montenegro, S.M.G.L., Silva, L.P.E., Cirilo, J.A. 2011. Impacts of Climate Change in Surface Runoff Using Regional Climate Model in Pernambuco State - Northeast of Brazil. Proceedings of XIV World Water Congress, Porto de Galinhas-Brazil, 2011. **Portuguese:** [pdf]
11:00-11:15 AM	**BREAK**	
AM Session 2 (11:15-1:00 PM)	Speaker/s:	Dr. Alfredo Ribeiro, Universidade Federal de Pernambuco, Brazil
	Exercise/ Outcome:	Web-based, computer user-interface identification of regional hydroclimatic processes. Link resource use with impacts and adaptation pathways.
1:00-2:00 PM	**LUNCH**	
PM Session 1 (2:00-4:00 PM)	Topic - **Adaptive systems, land and water use, social priorities**	
	Speaker/s:	Dr. Elma Montaña, Universidad Nacional Cuyo – CONICET, Argentina Mr. Jorge Nuñez, CAZALAC, Chile
	Exercise/ Outcome:	Stakeholder priorities and engagement.
	Model:	'Science-policy dialogue' as formal interaction mechanism for researchers, stakeholders, and decision-makers.
	Reference Materials:	Montaña, E. 2008. Central Andes Foothill Farmers Facing Global Environmental Change. *IHDP Update* 2: 36-40. International Human Dimensions Programme on Global Environmental Change. [pdf]
4:00-4:15pm	**BREAK**	
PM Session 2 (4:15-6:00 PM)	Topic – **La Serena Region Stakeholder Roundtable**	
	Speaker/s:	Mr. Guido Soto, CAZALAC, Chile
	Exercise/ Outcome:	Preparation for Day 3 field visit; in-class visit by stakeholders from La Serena region (to be determined by CAZALAC). Orient participants towards real-world, practical challenges.
	Model:	'Science-policy dialogue' in practice
	Reference Materials:	Case-study material on La Serena to be assigned.

Wed. 26 June	Topic - **Field exposure: water-energy nexus**	
9:00 AM-6 PM	Speaker/s:	Mr. Guido Soto, CAZALAC, Chile
	Exercise/ Outcome:	Field visit. Orient participants towards real-world, practical challenges including communicating with decision-makers and stakeholders: 1) foster communication between young scientists with end-users/decision-makers; 2) how end-users' needs can flow into research agenda and how scientific output can be useful to decision makers; 3) how to engage into effective communication strategies?
	Model:	'Water-energy operational system'
	Reference Materials:	Case-study material on La Serena to be assigned.
Itinerary: 1) Aguas del Valle, Coquimbo, Elqui watershed: Potable water plant 2) Elqui watershed: Rural potable water committee of Altovasol 3) Embalse Puclaro: hydroelectric plant		

Thu. 27 June	Topic - **Renewable energy, land and water**	
AM Session 1 (9:00-11:00 AM)	Speaker/s:	Dr. Suzanne Pierce, University of Texas-Austin, USA Dr. Silvia Muylaert, Universidade Federal do Rio de Janeiro, Brazil
	Exercise/ Outcome:	Renewables and biofuels as future 'wild cards' for water-energy nexus. Highlight water and land implications of biofuel expansion.
	Model:	Water-use coefficient analysis of wind, solar, and biofuels.
	Reference Materials:	Muylaert de Araujo, M.S., M.A. Freitas. 2008. Acceptance of renewable energy innovation in Brazil - case study of wind energy. *Renewable & Sustainable Energy Reviews* 12: 584-591. [pdf] Gomes, M.S., M.S. Muylaert de Araujo. 2009. Bio-fuels production and the environmental indicators. *Renewable and Sustainable Energy Reviews* 13: 2201–2204. [pdf]
11:00-11:15 AM	**BREAK**	
AM Session 2 (11:15-1:00 PM)	Speaker/s:	Dr. Suzanne Pierce, University of Texas-Austin, USA Dr. Silvia Muylaert, Universidade Federal do Rio de Janeiro, Brazil
	Exercise/ Outcome:	Renewables and biofuels as future 'wild cards' for water-energy nexus. Highlight water and land implications of biofuel expansion.
1:00-2:00 PM	**LUNCH**	
PM Session 1 (2:00-4:00 PM)	Topic - **Tools: Water Evaluation and Planning System (WEAP)**	
	Speaker/s:	Dr. Francisco Flores, Stockholm Environment Institute, Davis, CA (USA)
	Exercise/ Outcome:	Parameterize river-basin water system using WEAP model. Participants will assess energy and carbon implications of water uses through application of WEAP and WTA models
	Model:	WEAP
	Reference Materials:	Yates, D., Sieber J. et al. 2005. WEAP21--A Demand-, Priority-, and Preference-Driven Water Planning Model: Part 1, Model Characteristics," Water International, 30 (2005), pp. 487-500. [pdf] Yates, D., Purkey, D., et al. 2005, WEAP21--A Demand-, Priority-, and Preference-Driven Water Planning Model: Part 2, Aiding Freshwater Ecosystem Service Evaluation," Water International, 30 (2005), pp. 501-512. [pdf] Stockholm Environment Institute. 2013. WEAP Water Evaluation And Planning System Tutorial: A collection of stand-alone modules to aid in learning the WEAP software. [pdf] PASI 2013 Training Institute on Adaptive Water-Energy Management in the Arid Americas, La Serena, Chile – Workbook of WEAP and LEAP Training Modules. **English:** [pdf] **Spanish:** [pdf] Full list of publications at http://www.weap21.org/index.asp?action=216

4:00-4:15pm	**BREAK**	
PM Session 2 (4:15-6:00 PM)	Speaker/s:	Dr. Francisco Flores, Stockholm Environment Institute, Davis, CA (USA)
	Exercise/ Outcome:	Parameterize river-basin water system using WEAP model. Participants will assess energy and carbon implications of water uses through application of WEAP and WTA models

Fri. 28 June	Topic - **Tools: Long-Range Energy Alternatives Planning (LEAP)**	
AM Session 1 (9:00-11:00 AM)	Speaker/s:	Mr. Nicolás Di Sbroiavacca, Fundación Bariloche, Argentina
	Exercise/ Outcome:	Assess coupled water and energy resource uses and management of alternatives
	Model:	LEAP
	Reference Materials:	Fisher, J. and F. Ackerman. 2011. The Water-Energy Nexus in the Western States: Projections to 2100. Stockholm Environment Institute, Somerville, MA. [pdf] Stockholm Environment Institute – U.S. Center. 2012. Long-range Energy Alternatives Planning System (LEAP) TRAINING EXERCISES. **English:** [pdf] **Spanish:** [pdf] Di Sbroiavacca - Presentacion La Serena - Long range Energy Alternatives Planning (LEAP) [pdf]
11:00-11:15 AM	**BREAK**	
AM Session 2 (11:15-1:00 PM)	Speaker/s:	Mr. Nicolás Di Sbroiavacca, Fundación Bariloche, Argentina
	Exercise/ Outcome:	Assess coupled water and energy resource uses and management of alternatives
1:00-2:00 PM	**LUNCH**	
PM Session 1 (2:00-4:00 PM)	Speaker/s:	Mr. Nicolás Di Sbroiavacca, Fundación Bariloche, Argentina
	Exercise/ Outcome:	Assess coupled water and energy resource uses and management of alternatives
4:00-4:15pm	**BREAK**	
PM Session 2 (4:15-6:00 PM)	Speaker/s:	Mr. Nicolás Di Sbroiavacca, Fundación Bariloche, Argentina
	Exercise/ Outcome:	Assess coupled water and energy resource uses and management of alternatives

Sat. 29 June	Topic - **Tools: WEAP-LEAP Synthesis** **NOTE:** 9:00 – 14:00; Lunch at 14:00	
AM Session 1 (9:00-11:00 AM)	Speaker/s:	Dr. Sebastian Vicuña, Pontificia Universidad Católica de Chile Mr. Nicolás Di Sbroiavacca, Fundación Bariloche, Argentina
	Exercise/ Outcome:	- Assess coupled water and energy resource uses and management of alternatives
	Model:	Coupled model development for scenario exploration
	Reference Materials:	WEAP and LEAP modules
11:00-11:15 AM	**BREAK**	
AM Session 2 (11:15-2:00 PM)	Speaker/s:	Dr. Sebastian Vicuña, Pontificia Universidad Católica de Chile Mr. Nicolás Di Sbroiavacca, Fundación Bariloche, Argentina
	Exercise/ Outcome:	Assess coupled water and energy resource uses and management of alternatives
2:00-3:00 PM	**LUNCH**	

Sun. 30 June	Topic – **Ecological field trip** **NOTE:** 13:00 – 17:00	
PM Field Trip (1:00-5:00pm)	Speaker/s:	Jorge Nuñez, CAZALAC, Chile
	Exercise/ Outcome:	Field visit.
	Model:	
	Reference Materials:	

Mon. 1 July	Topic – **Water and Potential International Conflict in South America**	
AM Session 1 (9:00-11:00 AM)	Speaker/s:	Sigrid Andersen (Universidade Federal do Paraná – Brazil)
	Exercise/ Outcome:	Water, Energy and Geopolitics. Rivers as International Boundaries. Different governments with diverse interest in the use of waters.
	Model:	Group formation - game exercise: Confrontation or Negotiation?
	Reference Materials:	Fawcet, C.B, 1918. A Study in Political Geography, University Press, Oxford. [pdf] United Nations Environmental Program. 2007. Vulnerabilidad y Resistencia Hidropolíticas en Aguas Internacionales – América Latina y El Caribe. [pdf] Instructions for Session Exercise: Hydropolitics in International Waters [pdf]
11:00-11:15 AM	**BREAK**	
AM Session 2 (11:15-1:00 PM)	Speaker/s:	Sigrid Andersen (Universidade Federal do Paraná – Brazil)
	Exercise/ Outcome:	Water, Energy and Geopolitics. Rivers as International Boundaries. Different governments with diverse interest in the use of waters.
1:00-2:00 PM	**LUNCH**	
PM Session 1 (2:00-4:00 PM)	Topic - **Waste-energy Recovery, Distributed Energy Generation, Watershed Context**	
	Speaker/s:	Kleber Vanolli (Itaipu Binational - Brazil)
	Exercise/ Outcome:	Create a business modeling related to Distributed Energy Generation, based on your local reality
	Model:	Business modeling, agroenergy condominium
	Reference Materials:	
4:00-4:15pm	**BREAK**	

Tue. 2 July	Topic - **Agricultural water and energy management**	
AM Session 1 (9:00-11:00 AM)	Speaker/s:	Mr. Rodrigo Fuster, Universidad de Chile
	Exercise/ Outcome:	Agricultural water management assessment, identifying energy management options. Emphasis on agriculture as largest human use of water in most arid regions.
	Model:	'Agricultural water-energy management'
	Reference Materials:	Wester, P. 2008. When the pumps run dry: Arresting groundwater depletion in Guanajuato. In Shedding the Waters, pp. 173-207, Wageningen University, The Netherlands. [pdf]
11:00-11:15 AM	**BREAK**	
AM Session 2 (11:15-1:00 PM)	Speaker/s:	Mr. Rodrigo Fuster, Universidad de Chile
	Exercise/ Outcome:	Agricultural water management assessment, identifying energy management options. Emphasis on agriculture as largest human use of water in most arid regions.
1:00-2:00 PM	**LUNCH**	
PM Session 1 (2:00-4:00 PM)	Topic – **Water-energy nexus legal, regulatory, and policy challenges**	
	Speaker/s:	Dr. Carl Bauer, University of Arizona
	Exercise/ Outcome:	Highlight water-energy nexus as a policy tool.
	Model:	Emphasis on hydropower. Does electricity trump water in law and policy matters?
	Reference Materials:	Bauer, C.J. 2009. Dams and markets: rivers and electric power in Chile. *Natural Resources Journal* 49: 583-651. [pdf] Bauer, C.J. 2013. The experience of water markets and the market model in Chile. In: Water Trading and Global Water Scarcity: International Experiences. Ed: Maestu, J. RFF Press. [pdf]
4:00-4:15pm	**BREAK**	
PM Session 2 (4:15-6:00 PM)	Speaker/s:	Dr. Carl Bauer, University of Arizona
	Exercise/ Outcome:	Highlight water-energy nexus as a policy tool.

Wed. 3 July	Topic - **Decision support in action: a Chilean case study on drought risk management**	
AM Session 1 (9:00-10:30 AM)	Speaker/s:	Dr. Koen Verbist, UNESCO-IHP
	Exercise/ Outcome:	Insight in an operational decision support system and hands-on exercise on the use of the climate data library for tool development.
	Model:	Climate risk monitoring and decision support using the Climate Data Library
	Reference Materials:	Helmuth, M. 2011. A better climate for disaster risk management. Climate and Society No. 3, International Research Institute for Climate and Society. [pdf] Chilean Drought Monitor: www.climatedatalibrary.cl/UNEA/maproom/
10:30-10:40 AM	**BREAK**	
AM Session 2 (10:40-11:00 AM)	Topic – **PASI training program conclusion**	
	Speaker/s:	Dr. Christopher Scott, University of Arizona, USA Mr. Jorge Nuñez, CAZALAC, Chile
	Exercise/ Outcome:	Next steps, PASI dissemination plans. Strengthen group through inclusion in AQUASEC network
	Model:	'Group formation' – wrap-up exercise and post-training evaluation. Participants' reports collected and considered for submission as a journal special issue or other publication.
	Reference Materials:	http://aquasec.org
Midday Departures Check-out: 12:00pm		