

Master of Science in Sustainability Management

Water Governance - PS5701

3 Credits

Instructor: Dr. Michael J. Puma

Course Overview

Water is widely recognized as the most essential natural resource for both society and Earth's ecosystems. Yet the relationship between society and water is complex. While water is critical for livelihoods, it is also frequently a hazard that threatens lives. Floods, droughts, and contaminated water are formidable threats to human well-being. To deal with this dual nature of water, people have long modified the water cycle through engineering schemes like dams, reservoirs, irrigation systems, and interbasin transfer systems as well as through land use and land-cover change.

Yet we need more than just technical solutions. Society needs a clear and robust plan to manage and govern water given its intertwined relationship with this critical resource. In "Water Governance", we will explore the political, social, economic, and administrative systems that affect the use, development, and management of water resources. You will be introduced to current themes that influence water governance including sustainable development, integrated water resource management, water rights and pricing, corruption, and equity for marginal groups. These themes will be explored at the local, national, and international levels to provide you with a broad understanding of water governance issues.

Learning Objectives

The objective of this course is for you to understand the present-day challenges to effective governance and management of water resources. You will gain experience in discussing and crafting solutions to these challenges by assessing the needs of multiple stakeholders and analyzing water resources from a multi-sectoral perspective. When you complete this course, you will have gained experience in:

- Interdisciplinary research related to water, linking together information from various disciplines and sources;
- Clear and succinct communication of ideas and findings; and
- Debating water-governance issues at the local, national, and international levels.

Course structure

Each session is focused on a small number of key questions that are identified in the syllabus. Readings will be assigned for each session that expose you to various theories and practical examples related to these questions. Class will begin with a lecture, which will be followed by an extended discussion, led and facilitated by different groups of students each week. The lectures, together with interactive discussions, will develop both your understanding of the specified topics and your communication skills. Lastly, the term paper and presentation will help you hone your interdisciplinary research skills and provide you with experience in succinct communication of ideas and results.

Prerequisites

You should have familiarity with the fundamental concepts of the hydrological cycle and environmental policy. Please contact me to discuss if you are unsure, and we can determine if this is the right course for you. You should also be able to write clearly and effectively as most of the assignments involve essay writing.

Readings and Resources

Textbook and Readings

All readings will be posted on Courseworks in the 'Syllabus' section. You do not need to purchase a textbook for this class, although some of the recommended readings will be from books that you might want to purchase. Each session will have its own page, so please be sure to check there before each class for relevant readings and other announcements. You should read this material before each class (i.e. the readings should be done by start of lecture that it is associated with).

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Resources and Software Packages

Canvas will be used for communication of assignments, course material, and other information throughout the course. The Columbia University Libraries will be primary resources for course material.

Course Requirements and Evaluation

Class Participation

Each class consists of a lecture and discussion. You are expected to attend all classes, and your participation is expected in each discussion session. The goal of these discussions is to enhance our collective understanding of the session topics through the assigned readings. Therefore, comments should be related to each session's readings. If you find participation in discussions challenging, please let me know and we can work together to find a strategy so that you can participate successfully.

- Water governance news post: 1) At least once during the semester, you should post a news article that you have found related to water governance for your colleagues to discuss on Courseworks. 2) Also, you should comment on a news post from one of your classmates.

Grading: For each session (starting with Class 2), you will be evaluated based on your contributions to class discussion: check plus (outstanding), check (well done), check minus (poor effort).

Discussion Lead and Summary (Group)

A group of two or three students will be responsible for leading the group discussion each week (starting from Class 2). The goal is to facilitate the flow of comments among the students. You do not necessarily need to interject your comments after each participant speaks, but you should periodically assist your colleagues with their contributions. Further advice on facilitating the discussions can be found here:

http://brown.edu/Administration/Sheridan_Center/teaching/documents/10tipsfacilitatingdiscussion.pdf.

- Your group should prepare a 1-page (maximum) summary of the class discussions and submit it by the following session (i.e. one week later). This "Discussion Lead and Summary" component will be graded based on:
 - How well you facilitate the discussions. In particular, I would like your group to strive to integrate the ideas from the readings into the discussions.
 - The clarity of your 1-page summary (i.e., how well it summarizes the class discussions).

No PowerPoint slides will be allowed for the discussion lead. Also, you should have one of the group members take notes to help you with your discussion summary.

Grading: The 'Discussion Lead and Summary' component will be graded on a letter grade scale from A+ to F.

Short-Answer Essays (Individual)

You must complete four short-answer essays by the end of the course. You may submit up to six (6) essays; the highest 4 essays will then count towards your grade.

The goal is to reinforce the basic concepts presented in class and to ensure that students master the main concepts. These essays will consist of 3 questions. Answers to each question should be no longer than a paragraph (approximately 5 sentences). For example, you may be asked: What are the main impacts of international trade on national water scarcity as discussed by Hoekstra? The objective is to gain experience concisely identifying key concepts and arguments.

Grading: The 'Short-Answer Essays' component will be graded on a simplified scale: check plus (outstanding), check (well done), check minus (poorly answered or incomplete). You must submit at least 2 by the end of the week of October 22. We will

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create a discussion thread each week, and you should submit your essays there by Monday at 12 pm (i.e., noontime the day before class). This will give your colleagues the opportunity to read over your discussions before class.

Term Paper and Presentation (Individual)

The term paper is a semester-long assignment on a case study in water governance. You should select a topic that is both interesting to you and will help you in developing your career. For example, you may choose to analyze governance policies of a region or nation (e.g. western United States, India) with recommendations on possible improvements to these policies. As another example, you may decide to analyze water governance issues in a particular river basin, looking at upstream versus downstream issues or even the impacts of large dam construction within a river basin. You may even focus on global water governance, analyzing the virtual water trade (associated with one or more commodities) and its relationship with local-scale water availability. A handout with more examples will be posted on Courseworks early in the semester. Also, I will be available to discuss your interests with you.

The term paper should be about 8 pages in length (double spaced, excluding figures and references).

In the middle of the semester, everyone will briefly present a progress report on their projects. During the last session, you will present your findings in a Powerpoint (or equivalent) presentation. You should prepare a maximum of 5 slides (not including the title) and should plan to speak for 5 minutes maximum. Your presentation will be judge by how well you communicate your findings. You should practice your presentation, making sure not to exceed the time limit. The goal of the time limit is to train you to present research findings in a clear and succinct manner. Grading: The ‘Term-paper and Presentation’ component will be graded on a letter grade scale from A+ to F.

Relative Contribution of Assignments and Final Grade

The relative contribution of each of the assignments to your total grade for the course is as follows:

ASSIGNMENT	% Weight
Class participation	15%
Discussion lead and summary	15%
4 Short-answer essays	20%
Term paper and presentation	50%

The final course grade will be computed using a weighted average of ‘class participation’, ‘discussion lead and summary’, ‘4 short-answer essays’, and ‘term paper and presentation’. This grade will then be scaled into a letter grade scale from A+ to F.

Course Policies

Attendance and Late Assignments

Students are expected to attend and participate in class discussions. Assignments should be submitted in a timely manner, so that students will be able to understand and benefit from course content. Late assignments will be penalized 10% per day of lateness. Extenuating circumstances should be brought to the attention of the Professor and will be handled on a case-by-case basis.

Academic Integrity and Community Standards

The School of Continuing Education does not tolerate cheating and/or plagiarism in any form. Those students who violate the Code of Academic & Professional

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Conduct will be subject to the Dean's Disciplinary Procedures. In “Water Governance”, I am particularly strict with regard to plagiarism. If evidence is found that a student has committed plagiarism, he or she will receive zero points on a given assignment and incident will be reported to Columbia University.

Students are required to comply with the School’s policies related to Academic Integrity and Community Standards (details can be found at <http://ce.columbia.edu/node/217>). An excerpt is as follows: “Columbia University expects that its students will act with honesty and propriety at all times and will respect the rights of others. It is fundamental University policy that academic dishonesty in any guise or personal conduct of any sort that disrupts the life of the University or denigrates or endangers members of the University community is unacceptable and will be dealt with severely.”

School Policies

Copyright Policy

Please note—Due to copyright restrictions, online access to this material is limited to instructors and students currently registered for this course. Please be advised that by clicking the link to the electronic materials in this course, you have read and accept the following:

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials. Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of "fair use," that user may be liable for copyright infringement.

Academic Integrity

Columbia University expects its students to act with honesty and propriety at all times and to respect the rights of others. It is fundamental University policy that academic dishonesty in any guise or personal conduct of any sort that disrupts the life of the University or denigrates or endangers members of the University community is unacceptable and will be dealt with severely. It is essential to the academic integrity and vitality of this community that individuals do their own work and properly acknowledge the circumstances, ideas, sources, and assistance upon which that work is based. Academic honesty in class assignments and exams is expected of all students at all times.

SPS holds each member of its community responsible for understanding and abiding by the SPS Academic Integrity and Community Standards posted at <http://sps.columbia.edu/student-life-and-alumni-relations/academic-integrity-and-community-standards>. You are required to read these standards within the first few days of class. Ignorance of the School's policy concerning academic dishonesty shall not be a defense in any disciplinary proceedings.

Accessibility

Columbia is committed to providing equal access to qualified students with documented disabilities. A student’s disability status and reasonable accommodations are individually determined based upon disability documentation and related information gathered through the intake process. For more information regarding this service, please visit the University's Health Services website: <http://health.columbia.edu/services/ods/support>.

Course Schedule/Course Calendar

The course includes thirteen sessions (1 hour 50 minute each). These sessions are listed below:

1. Course Overview and Expectations

Required readings:

- Please read the syllabus in detail prior to the first class. Also, read the definition of water governance at: <http://www.watergovernance.org/whatiswatergovernance>.

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Recommended background:

- Hydrology: Having a background in the physical processes will help you in this course, especially when discussing sustainable solutions. A good entry level book on hydrology Tim Davie's Fundamentals of Hydrology. However, a free, online alternative is available at the USGS website: <http://ga.water.usgs.gov/edu/>.
- Environmental Policy: To have an understanding of fundamental issues in environmental policy, I recommend Green Planet Blues: Four Decades of Global Environmental Politics by Ken Conca and Geoffrey Dabelko.
- Water & Society: In term of the understanding the interactions between people and water, a good read is Fred Pearce's When the Rivers Run Dry: Water, the Defining Crisis of the Twenty-First Century.

2. The Centrality of Water and its Global Dimensions

Required readings:

- Managing Water under Uncertainty and Risk, The United Nations World Water Development Report 4 (2012), Volume 1, Chapter 1, pp 22-42.
- Hoekstra, A.Y. (2011), The Global Dimension of Water Governance: Why the River Basin Approach Is No Longer Sufficient and Why Cooperative Action at Global Level Is Needed, Water , 3, 21-46; doi:10.3390/w3010021.
- Håkan Tropp (2007), Water governance: trends and needs for new capacity development, Water Policy 9 Supplement 2 19-30.

Recommended readings:

- Lall U., T. Heikkila, C. Brown and T. Siegfried (2008), Water in the 21st century: Defining the elements of global crises and potential solutions, Journal of International Affairs, 61(2), 1-17.

3. Integrated Water Resources Management (IWRM) and Other Approaches for Water Management

Required readings:

- Engle, N. L., Johns, O. R., Lemos, M. C., & Nelson, D. R. (2011). Integrated and adaptive management of water resources: tensions, legacies, and the next best thing. Ecology and society, 16(1), 19.
- Rhett Larson (2011). Panacea or Platitute: Integrated Water Resource Management – Conceptually Sound But Fundamentally Flawed, The Sustainability Review, Issue One, Volume 3.
- Bruce A. Lankford, Douglas J. Merrey, Julien Cour and Nick Hepworth, 2007. From Integrated to Expedient: An Adaptive Framework for River Basin Management in Developing Countries. IWMI Research Report 110.
- Use the online tutorial for IWRM as a tool for adapting to a changing climate: <http://www.thewaterchannel.tv/tutorial/index.html>.

Recommended readings:

- United Nations Environment Programme (UNEP), 2014. Towards Integrated Water Resources Management. International experience in development of river basin organisations.
- World Bank, 2012. Integrated urban water management: A summary note. <http://siteresources.worldbank.org/INTLAC/Resources/257803-1351801841279/1PrincipalIntegratedUrbanWaterManagementENG.pdf>
- Have a look through the World Bank's selection of urban case studies at: <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/LACEXT/0,,contentMDK:23322236~pagePK:146736~piPK:146830~theSitePK:258554,00.html>.

4. Understanding Water Institutions (clean water act?????)

Required readings:

- WWDR (2012) The United Nations World Water Development Report 4: Managing Water under Uncertainty and Risk
- Volume 1, Chapter 5, pp 141-156

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- Note: pp. 138-141 discuss IWRM and AM from last class.
- Ken Conca, 2006. "Transnational Dimensions of Freshwater Ecosystem Governance," in A.R. Turton, J. Hattingh, G.A. Maree, D.J. Roux, M. Claassen, and W.F. Strydom, eds., *Governance as a Trialogue: Government-Society-Science in Transition*. Berlin: Springer-Verlag.
- Megdal, S. B., Gerlak, A. K., Varady, R. G., & Huang, L. Y. (2014). Groundwater Governance in the United States: Common Priorities and Challenges. *Groundwater*. (Water Institutions should address GW governance?)

Recommended readings:

- Saleth, R. M., & Dinar, A. (2005). Water institutional reforms: theory and practice. *Water Policy*, 7, 1-19.
- MacDonnell, L. J., Getches, D. H., & Hugenberg Jr, W. C. (1995). The law of the Colorado River: coping with severe sustained drought. *JAWRA Journal of the American Water Resources Association*, 31(5), 825-836.

5. Understanding Water Rights

Required readings:

- Hodgson, S. (2006). *Modern water rights: Theory and practice* (Vol. 92). Food & Agriculture Organization. pp. 1 to 30.
- Sophocleous, M. (2012). *Conserving and Extending the Useful Life of the Largest Aquifer in North America: The Future of the High Plains/Ogallala Aquifer*.
- Miller, J. (2014). California's sweeping new groundwater regulations (Same as it ever was?). *High Country News*. Retrieved from <https://www.hcn.org/issues/46.19/californias-sweeping-new-groundwater-regulations>
- Christian-Smith, J., & Abhold, K. (2015). *Measuring What Matters: Setting Measurable Objectives to Achieve Sustainable Groundwater Management in California* (Executive Summary (pg. 1-5)). Union of Concerned Scientists. Retrieved from <http://www.ucsusa.org/sites/default/files/attach/2015/09/measuring-what-matters-california-sustainable-groundwater-report.pdf>

Recommended:

- A case study in Peru: Lynch, B. D. (2012). Vulnerabilities, competition and rights in a context of climate change toward equitable water governance in Peru's Rio Santa Valley. *Global Environmental Change*.
- Colorado River Compact from a legal perspective: Robison, J., & Kenney, D. (2012). *Equity and the Colorado River Compact*. *Environmental Law*, 42.
- California groundwater from a legal perspective: Robinson, E. (2014). *California Mandates Groundwater Regulation Through Local "Sustainability Plans" Starting in 2020*. *Sacramento: California Real Property Journal* 32:4. Retrieved from http://www.kmtg.com/sites/default/files/files/ENR_CA%20Mandates%20Groundwater%20Regulation%20Through%20Local%20Sustainability%20Plans_2015%281%29.pdf
- *Groundwater Governance: Wijnen M., Augeard B., Hiller B., Ward C., Huntjens P. (2012) Managing the Invisible: Understanding and Improving Groundwater Governance. World Bank. Chapters 4, 6, and 7.* <http://water.worldbank.org/publications/managing-invisible-understanding-and-improving-groundwater-governance>

6. Water Pricing and Markets

Required readings:

- *Price of Water 2016: Up 5 Percent in 30 Major U.S. Cities; 48 Percent Increase Since 2010: Utilities respond to changes in water use and availability.* Circle of Blue, 2016. http://www.circleofblue.org/waterpricing/Walton_2016_WaterPrice.pdf (Links to an external site.)Links to an external site.
- *Finding the Right Price for Water*, Bourree Lam, 2015. [Lam_2015_WaterPriceWrong.pdf](#)
- *Water Pricing in Two Thirsty Cities: In One, Guzzlers Pay More, and Use Less.* Nelson Schwartz, 2015. <http://www.nytimes.com/2015/05/07/business/energy-environment/water-pricing-in-two-thirsty-cities.html> (Links to an external site.)Links to an external site. (Article but no figures: *Water Pricing in Two Thirsty Cities: In One, Guzzlers Pay More, and Use Less - The New York Times.pdf*)
- Grafton, R. Q., Libecap, G. D., Edwards, E. C., O'Brien, R. J., & Landry, C. (2012). Comparative assessment of water markets: insights from the Murray Darling Basin of Australia and the Western USA. *Water Policy*, 14(2), 175. [Grafton_2012_WaterMarketsUSAustralia.pdf](#)

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Recommended:

- Water markets: Easter, K. W., Rosegrant, M. W., & Dinar, A. (1999). Formal and informal markets for water: institutions, performance, and constraints. *The World Bank Research Observer*, 14(1), 99-116. [Easter_1999_waterinstitutions.pdf](#)
- Water pricing: Olmstead, S. M., & Stavins, R. N. (2007). *Managing Water Demand: Price vs. Non-Price Conservation Programs*. Pioneer Institute White Paper, (39). [Olmstead_stavins_2007_water_pricing.pdf](#)

7. Water Privatization

Required readings:

- Finnegan, W., "Leasing the Rain," *The New Yorker*, 78(7): 43-53, April 2002, http://www.newyorker.com/archive/2002/04/08/020408fa_FACT1
- Shultz, J. (2009). The Cochabamba water revolt and its aftermath. *Dignity and Defiance: Stories from Bolivia's Challenge to Globalization*. U. of California, Berkeley, 9-34.
- Bakker, K. (2013). Neoliberal Versus Postneoliberal Water: Geographies of Privatization and Resistance. *Annals of the Association of American Geographers*, 103(2), 253-260.
- Wall Street Journal (2012). Are We Better Off Privatizing Water? <http://www.wsj.com/articles/SB10000872396390443816804578002280926253750>.

8. Corruption and Preventing 'Poor' Governance

Required readings:

- Davis, J. (2004). Corruption in public service delivery: experience from South Asia's water and sanitation sector. *World development*, 32(1), 53-71.
- Klopp, J. M., & Sang, J. K. (2011). Maps, Powers, and the Destruction of the Mau Forest in Kenya. *Geo. J. Int'l Aff.*, 12, 125.
- Brandt, P., Hamunyela, E., Herold, M., De Bruin, S., Verbesselt, J., & Rufino, M. C. (2018). Sustainable intensification of dairy production can reduce forest disturbance in Kenyan montane forests. *Agriculture, Ecosystems & Environment*, 265, 307-319.

Recommended readings:

- Campos, J. E., & Pradhan, S. (Eds.). (2007). *The many faces of corruption: tracking vulnerabilities at the sector level*. World Bank Publications.
- K Akumu, O. A. (2007). Toward effective governance of water services in Kenya. *Water Policy*, 9(5), 529.
- Water Governance Facility, *Training Manual on Water Integrity*, 2011. Focus on Modules 2 – 4 and 7 (See 'Table of Content' for pages in file [WGF_2011_WaterIntegrity.pdf](#))

9. Water Governance in Practice: Experiences in the Mekong and Indus Basins

Required readings:

- Dore, J., Lebel, L., & Molle, F. (2012). A framework for analysing transboundary water governance complexes, illustrated in the Mekong Region. *Journal of Hydrology*, 466, 23-36.
- Bagla, P. (2010). Along the Indus River, saber rattling over water security. *Science*, 328(5983), 1226-1227.
- Briscoe, J. (2010). Troubled waters: Can a bridge be built over the Indus. *Economic and Political Weekly*, Bombay, 45(50), 28-32.

Recommended Readings:

- Recent news articles on the Indus:
 - <http://timesofindia.indiatimes.com/india/Asian-Development-Bank-refuses-to-fund-Pakistan-dam-that-India-says-is-in-disputed-area/articleshow/55091968.cms> (Links to an external site.)Links to an external site.

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- <http://www.chicagotribune.com/news/sns-wp-blm-indopak-water-9875641e-95e7-11e6-9cae-2a3574e296a6-20161019-story.html> (Links to an external site.)Links to an external site.
- <http://www.cnbc.com/2016/10/05/india-could-use-indus-river-water-treaty-to-pressure-pakistan-over-loc-tensions.html> (Links to an external site.)Links to an external site.
- <http://www.deccanchronicle.com/nation/current-affairs/231016/india-to-fast-track-4-projects-in-indus-river-basin-to-irrigate-jk.html> (Links to an external site.)Links to an external site.
- Recent Mekong news articles:
 - <http://www.sltrib.com/home/4483938-155/mekong-effort-fails-after-years-of> (Links to an external site.)Links to an external site.
 - http://www.development-today.com/renderSearchResults?search_string=cambodians (Links to an external site.)Links to an external site.
 - <http://www.foxnews.com/world/2016/10/19/mekong-effort-fails-after-years-lavish-foreign-funding.html> (Links to an external site.)Links to an external site.
 - Resilience to climate change-induced challenges in the Mekong River Basin - the role of the MRC. <http://water.worldbank.org/node/83732> (Links to an external site.)

10. The Water-Energy-Food-Climate Nexus

Required readings:

Energy:

- Sanders, K. T. (2014). Critical review: Uncharted waters? The future of the electricity-water nexus. *Environmental science & technology*, 49(1), 51-66.
- Opperman, J. J., J. Royte, J. Banks, L. R. Day, and C. Apse. 2011. The Penobscot River, Maine, USA: a basin-scale approach to balancing power generation and ecosystem restoration. *Ecology and Society* 16(3):7.

Food:

- Allan, J. A. (2003). Virtual Water-the Water, Food, and Trade Nexus. Useful Concept or Misleading Metaphor? *Water International*, 28(1), 106-113.

Energy & Food:

- Tilman, D., Socolow, R., Foley, J. A., Hill, J., Larson, E., Lynd, L., ... & Williams, R. (2009). Beneficial biofuels—the food, energy, and environment trilemma. *Science*, 325(5938), 270.

Recommended readings:

- Sovacool, B. K., & Sovacool, K. E. (2009). Identifying future electricity–water tradeoffs in the United States. *Energy Policy*, 37(7), 2763-2773.
- World Commission on Dams (2000). *Dams and Development: A New Framework for Decision Making*. London: Earthscan. (Chapter 2, pp. 37-69; part of Chapter 5, pp. 148-156; part of Chapter 9, pp. 258-263)
- Fearnside, P. M. (2014). Viewpoint—Brazil's Madeira River Dams: A Setback for Environmental Policy in Amazonian Development. *Water Alternatives*, 7(1), 256-269.
- Vera-Diaz, M. C., Reid, J., Soares-Filho, B., Kaufmann, R., & Fleck, L. (2007). Effects of energy and transportation projects on soybean expansion in the Madeira river basin. Conservation Strategy Fund. Disponível em: http://conservation-strategy.org/sites/default/files/field-file/Madeira_soy_final_draft2.pdf.
- Sojamo, S., Keulertz, M., Warner, J., & Allan, J. A. (2012). Virtual water hegemony: the role of agribusiness in global water governance. *Water International*, 37(2), 169-182.
- Visit the website <http://www.waterfootprint.org> and explore their efforts to understand the links between water use and food production.
- Searchinger, T., Heimlich, R., Houghton, R. A., Dong, F., Elobeid, A., Fabiosa, J., ... & Yu, T. H. (2008). Use of US croplands for biofuels increases greenhouse gases through emissions from land-use change. *Science*, 319(5867), 1238-1240.

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11. Do Nations Go to War Over Water?

Required readings:

- Kelley, C. P., Mohtadi, S., Cane, M. A., Seager, R., & Kushnir, Y. (2015). Climate change in the Fertile Crescent and implications of the recent Syrian drought. *Proceedings of the National Academy of Sciences*, 112(11), 3241-3246.
- Barnaby, W. (2009). Do nations go to war over water? *Nature*, 458(7236), 282-283.
- Serageldin, I. (2009). Water: conflicts set to arise within as well as between states. *Nature*, 459(7244), 163-163.

Recommended readings:

- Rahaman, M. M. (2012). Water wars in 21st century: speculation or reality? *International Journal of Sustainable Society*, 4(1), 3-10.
- Subramanian, A., Brown, B., & Wolf, A. (2012). *Reaching Across the Waters: Facing the Risks of Cooperation in International Waters*. World Bank Publications.

12. Water Governance Ahead

Required readings:

- Gupta, J., Akhmouch, A., Cosgrove, W., Hurwitz, Z., Maestu, J., & Ünver, O. (2013). Policymakers' Reflections on Water Governance Issues. *Ecology and Society*, 18(1), 35.
- Rivas, M. G. (2012). Why do indigenous municipalities in Mexico have worse piped water coverage? *Development in Practice*, 22(1), 31-43.
- Gleick, P. H., & Palaniappan, M. (2010). Peak water limits to freshwater withdrawal and use. *Proceedings of the National Academy of Sciences*, 107(25), 11155-11162.

Recommended readings:

- Hoekstra, A.Y. (2009), Water Security of Nations: How International Trade Affects National Water Scarcity and Dependency. In *Threats to Global Water Security*, 27–36.
- David Zetland, To centralize or not to centralize? *Aguanomics* blog, 11 April 2013, <http://www.aguanomics.com/2013/04/to-centralize-or-not-to-centralze.html>
- Conca, K. (2008). The United States and international water policy. *The Journal of Environment & Development*, 17(3), 215-237.

13. Term-Project Presentations

Each person will present his or her findings in a Powerpoint (or equivalent) presentation. You should prepare a maximum of 5 slides (not including the title) and should plan to speak for 7 to 8 minutes maximum, leaving 1-2 minutes for questions. Your presentation will be judge by how well you communicate your findings. You should practice your presentation, making sure not to exceed the time limit. The goal of the time limit is to train you to present research findings in a clear and succinct manner.