

SUMA K5701: WATER GOVERNANCE – SYLLABUS

Instructor: Dr. Michael J. Puma

Please contact me via e-mail. I will typically respond to you within 24 hours (with a delay on weekends). If you don't receive a response, please resend.

Office Hours: after class or by appointment.

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 fundamentals concepts of the hydrological cycle and environmental policy. Please contact me to discuss if you 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.

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).

Resources and Software Packages

Courseworks 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

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.

Class participation	15%
Discussion lead and summary	15%
4 Short-answer essays	25%
Term paper and presentation	45%

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

A group of two students will be responsible for leading a group discussion each week (starting from Class 3). A sign-up sheet will be available for you to select a time slot. Each week, a specific discussion topic will be assigned to the group. The goal is to facilitate the flow of comments among the students on the assigned topic. You do not necessarily need to interject your comments after each participant speaks, but you should periodically assist your colleagues with their contributions.

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 summary will be graded based on:

- Its clarity and how well it summarizes the class discussions;
- 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.

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

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 10. We will 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 or Group of Two)

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.

You have a choice on the term project. It can be done in a group of two people or can be done individually. For individual projects, the term paper should be 6-8 pages in length (double spaced, excluding figures and references). For group papers, the length should be 10-12 pages (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 judged 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.

Policies and Expectations

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 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."

Course Summary:

Details

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Week 1: Course Overview and Expectations

Lecture file: [K5701 WaterGovernance Lecture1 Fall2016.pptx](#)  

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> (Links to an external site.).

Recommended background readings:

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/> (Links to an external site.). 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. 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.

Week 2: The Centrality of Water and its Global Dimensions

[K5701 WaterGovernance Lecture2 Fall2016.pptx](#)  

Required readings:

- *Managing Water under Uncertainty and Risk, The United Nations World Water Development Report 4* (2012), Volume 1, Chapter 1, pp 22-42. [WWDR4_vol1to3.pdf](#)  
- 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. [Hoekstra 2011 global level approach.pdf](#)  
- Håkan Tropp (2007), Water governance: trends and needs for new capacity development, *Water Policy* 9 Supplement 2 19–30. [Tropp 2007 Water Governance trends and needs paper.pdf](#)  

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. [Lall watercrisis 2008.pdf](#)  

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

[K5701_WaterGovernance_Lecture3_Fall2016.pptx](#)  

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. [Engle 2011 IWRM AM Brazil-1.pdf](#)  
- Rhett Larson (2011). Panacea or Platitude: Integrated Water Resource Management – Conceptually Sound But Fundamentally Flawed, *The Sustainability Review*, Issue One, Volume 3. [Larson 2011 IWRM.pdf](#)  
- Hering, J. G., & Ingold, K. M. (2012). Water resources management: what should be integrated?. *Science*, 336(6086), 1234-1235. [HeringIngold 2012 IWRM.pdf](#)  
- Use the online tutorial for IWRM as a tool for adapting to a changing climate: <http://www.thewaterchannel.tv/tutorial/index.html> (Links to an external site.).

Recommended readings:

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. IWRM Research Report 110. [Lankford 2007 IWRM.pdf](#)  

World Bank, 2012. *Integrated urban water management: A summary note*. <http://siteresources.worldbank.org/INTLAC/Resources/257803-1351801841279/1PrincipallIntegratedUrbanWaterManagementENG.pdf> (Links to an external site.)

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> (Links to an external site.).

Week 4: Understanding Water Institutions

[K5701_WaterGovernance_Lecture4_Fall2016.pptx](#)  

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, 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 Dialogue: Government-Society-Science in Transition*. Berlin: Springer-Verlag. [Conca 2006 Freshwater Ecosystem Governance.pdf](#)  

- 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? [Megdal_2014_GWgovernance.pdf](#)  )
- Designing Effective Groundwater Sustainability Agencies, March 2016 Executive Summary: https://www.law.berkeley.edu/wp-content/uploads/2016/02/CLÉE_GroundwaterGovernance_ES_2016-03-08.pdf (Links to an external site.)

Recommended readings:

Saleth, R. M., & Dinar, A. (2005). Water institutional reforms: theory and practice. *Water Policy*, 7, 1-19. [Saleth_2005_WaterInstitutionReform.pdf](#)  

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. [MacDonnell_1995_colorado.pdf](#)  

Week 5: Understanding Water Rights

[K5701_WaterGovernance_Lecture5_Fall2016-1.pptx](#)  

[K5701_WaterGovernance_IRprimer_Fall2016.pptx](#)  

Required readings:

- Hodgson, S. (2006). Modern water rights: Theory and practice (Vol. 92). Food & Agriculture Organization. pp. 1 to 30. [Hodgson_2006_water_rights_FAO.pdf](#)  
- Sophocleous, M. (2012). Conserving and Extending the Useful Life of the Largest Aquifer in North America: The Future of the High Plains/Ogallala Aquifer. [Sophocleous_2012_Ogallala.pdf](#)  
- 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> (Links to an external site.)
- 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> (Links to an external site.)

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*. [Lynch_2012_PeruWaterRights.pdf](#)  

- *Colorado River Compact from a legal perspective*: Robison, J., & Kenney, D. (2012). Equity and the Colorado River Compact. *Environmental Law*, 42. [Robison_2012_ColoradoRiverEquity.pdf](#) 
- *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 (Links to an external site.)
- *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> (Links to an external site.)

Week 6: Water Pricing and Markets

Lecture Slides:

[K5701_WaterGovernance_Lecture6_Fall2016-1.pptx](#) 

Discussion Lead:

[Water Pricing_Discussion Lead.pptx](#) 

[Water Pricing_Discussion Lead City Model.xlsx](#) 

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/> (Links to an external site.) [Walton_2016_WaterPrice.pdf](#) 
- *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.) (Article but no figures: [Schwartz_2015_WaterPricinginTwoThirstyCities_NYT.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](#) 

Recommended readings:

- 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](#) 
- 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](#) 

Week 7: Water Privatization

[K5701 WaterGovernance Lecture7 Fall2016.pptx](#) 

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 (Links to an external site.)
- **Pro-privatization for Flint:** Moore (2016). *Here's How to Fix Flint's Water System: Privatize It.* [Moore 2016 FlintPrivatize.pdf](#) . <http://reason.com/archives/2016/02/01/heres-how-to-fix-flints-water-system-pri/> (Links to an external site.)
- **Anti-privatization for Flint:** Herzog (2016). *No, privatization is not the way to prevent the next Flint.* [Herzog 2016 FlintPrivatize.pdf](#) . <http://grist.org/living/no-privatization-is-not-the-way-to-prevent-the-next-flint/> (Links to an external site.)
- Bakker, K. (2013). Neoliberal Versus Postneoliberal Water: Geographies of Privatization and Resistance. *Annals of the Association of American Geographers*, 103(2), 253-260. [Bakker 2013 water privitization.pdf](#) 

Recommended readings:

- Wall Street Journal (2012). Are We Better Off Privatizing Water? [WSJ 2012 AreWeBetterOffPrivatizingWater.pdf](#) 
- 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. [Schultz 2009 Cochabamba.pdf](#) 
- [Molle 2009 waterprice.pdf](#) 

Week 8: Corruption and Preventing 'Poor' Governance

Lecture Slides

[K5701 WaterGovernance Lecture8 Fall2016-1.pptx](#) 

Preliminary Project Presentations

[WaterGov2016 PrelimPresentations.pptx](#) 

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. [Davis 2004_watercorruption.pdf](#) 
- 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. [Klopp 2011_MauForest.pdf](#) 
- Kozacek (2016). *Water Sector Corruption Impedes Sustainable Development*. [Kozacek 2016_CorruptionSusDevGoals.pdf](#)  . <http://www.circleofblue.org/2016/water-management/water-sector-corruption-impedes-sustainable-development/> (Links to an external site.).

Recommended readings:

- 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) [WGF 2011_WaterIntegrity.pdf](#) 
-  Campos, J. E., & Pradhan, S. (Eds.). (2007). *The many faces of corruption: tracking vulnerabilities at the sector level*. World Bank Publications. [Campos 2007_Corruption.pdf](#) 
- Hesslerová, P., & Pokorný, J. (2011). Effect of Mau forest clear cut on temperature distribution and hydrology of catchment of lakes Nakuru and Naivasha: Preliminary study. In *Water and Nutrient Management in Natural and Constructed Wetlands* (pp. 263-273). Springer Netherlands. [Hesslerová 2011_KenyaMauForest.pdf](#) 

Week 9: Experiences in the Mekong and Indus Basins

[K5701_WaterGovernance_Lecture9_Fall2016.pptx](#) 

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. [Dore 2012_Mekong_Framework.pdf](#) 
- Bagla, P. (2010). Along the Indus River, saber rattling over water security. *Science*, 328(5983), 1226-1227. [Bagla 2010_IndusRiver.pdf](#) 
- Briscoe, J. (2010). Troubled waters: Can a bridge be built over the Indus. *Economic and Political Weekly, Bombay*, 45(50), 28-32. [Briscoe 2010_IndusRiver.pdf](#) 

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.)

- <http://www.chicagotribune.com/news/sns-wp-blm-indopak-water-9875641e-95e7-11e6-9cae-2a3574e296a6-20161019-story.html> (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.)
- <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.)
- Recent Mekong news articles:
 - <http://www.sltrib.com/home/4483938-155/mekong-effort-fails-after-years-of> (Links to an external site.)
 - http://www.development-today.com/renderSearchResults?search_string=cambodians (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.)
- 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.)

Week 10: The Water-Energy-Food-Climate Nexus

[K5701 WaterGovernance Lecture10 Fall2016.pptx](#) 

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. [Sanders 2014 WaterEnergyNexus.pdf](#) 
- 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. [Opperman 2011 Water Energy.pdf](#) 

Food:

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

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. [Tilman 2009 biofuels.pdf](#) 

Recommended readings:

- Sovacool, B. K., & Sovacool, K. E. (2009). Identifying future electricity–water tradeoffs in the United States. *Energy Policy*, 37(7), 2763-2773. [Sovacool 2009 Water Energy.pdf](#)
- 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) [WCD 2000 final report.pdf](#)
- Fearnside, P. M. (2014). Viewpoint–Brazil’s Madeira River Dams: A Setback for Environmental Policy in Amazonian Development. *Water Alternatives*, 7(1), 256-269. [Fearnside 2014 Madeira.pdf](#)
- 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*. [Vera Diaz soybean.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. [Sojamo 2012 WaterGovernanceAgribusiness.pdf](#)
- Visit the website <http://www.waterfootprint.org> (Links to an external site.) 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. [Searchinger 2008 biofuels.pdf](#)

Week 11: Do Nations Go to War Over Water?

[K5701 WaterGovernance_Lecture11_Fall2016.pptx](#)

Required readings:

- Rahaman, M. M. (2012). Water wars in 21st century: speculation or reality? *International Journal of Sustainable Society*, 4(1), 3-10. [Rahaman 2012 WaterWars.pdf](#)
- 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. [Kelley 2015 Syria.pdf](#)
- Barnaby, W. (2009). Do nations go to war over water? *Nature*, 458(7236), 282-283. [Barnaby 2009 WaterWars.pdf](#)
- Serageldin, I. (2009). Water: conflicts set to arise within as well as between states. *Nature*, 459(7244), 163-163. [Serageldin 2009 WaterWars.pdf](#)

Recommended readings:

Subramanian, A., Brown, B., & Wolf, A. (2012). Reaching Across the Waters: Facing the Risks of Cooperation in International Waters. World Bank Publications. [Subramanian 2012 InternationalBasins World Bank.pdf](#)

Wolf, A. T. (2008). Healing the enlightenment rift: Rationality, spirituality and shared waters. *Journal of International Affairs*, 51-73. [Wolf 2008 WaterHealingConflict.pdf](#)

Week 12: Water Governance Ahead

[K5701 WaterGovernance Lecture12 Fall2016.pptx](#)

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. [Gupta 2013 WaterGovernancePolicymakers.pdf](#)
- Rivas, M. G. (2012). Why do indigenous municipalities in Mexico have worse piped water coverage? *Development in Practice*, 22(1), 31-43. [Rivas 2012 MexicoWater.pdf](#)
- 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. [Gleick 2010 waterstrategies.pdf](#)

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. [Hoekstra 2009 watersecuritynations.pdf](#)

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> (Links to an external site.)

Conca, K. (2008). The United States and international water policy. *The Journal of Environment & Development*, 17(3), 215-237. [Conca 2008 USWaterPolicy.pdf](#)

[ClassPresentations WaterGovernanceFall2016.pptx](#)

Each person/group will present 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.

