

DEVELOPMENT OF WATER RESOURCES IN NORTH AMERICA

Winter 2011

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Grading

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| 1. Team research & presentation | 50% |
| by major basin, overview of water resources development and issues | |
| preliminary outline by week 5 | 25% |
| presentation in week 9 or 10 | 25% |
| 2. Final examination | 50% |
| questions based on topics in weeks 11-13 | |
| answers to draw upon weeks 1-8 and team project | |

Week Lecture topic

Physical Basis

- 1 Introduction to the course
Hydrology & water resources of North America
 Climate regions
 Hydrology by basins
 Geographic patterns of water use
 Areas of stress

Political Ecology of Water Governance

- 2 Canada
 U.S.A.
 Mexico
 First Nations

Trans-boundary Disputes and Agreements

- 3 Great Lakes and the International Joint Commission
 U.S.-Mexico (Rio Grande; Colorado River)
- 4 North America Free Trade Agreement (NAFTA)
 bulk water issues
 virtual water trade

Management Approaches

- 5 Supply-side management—history
 U.S. history (Tennessee Valley; Mississippi River; Western dams)
- 6 Supply-side management—big dreams
 major hydrological modifications
 North America Water & Power Alliance (NAWAPA)
- 7 Demand-side management
 regulatory & economic tools
 does efficiency produce conservation?
- 8 Soft-path approach
 what do we want water for? what kind? how much?
 water for ecosystems

Student Team Presentations

9

10

Outstanding Issues

- 11 Challenges to Transboundary Agreements
 - Chicago diversion
 - Devil's Lake
 - Colorado delta
- 12 Governance by Government and Non-government
 - Conservation districts and source-water protection
 - Public good versus privatization
 - Water markets and trade
- 13 Challenges on the Horizon
 - Population & economic growth
 - Climate change

Reading Material

As much as possible, readings will be available on the Internet.

The following two texts may be recommended:

K. Bakker, ed. 2006. *Eau Canada: The Future of Canada's Water*. University of British Columbia Press.

M. Black & J. King. 2009. *The Atlas of Water: Mapping the World's Most Critical Resource*. Earthscan & University of California Press.

Others may be identified in advance of the final version of the syllabus.

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Reading List (Preliminary Version)

- K. Bakker, ed. 2006. *Eau Canada: The Future of Canada's Water*. University of British Columbia Press.
- M. Black & J. King. 2009. *The Atlas of Water: Mapping the World's Most Critical Resource*. Earthscan + University of California Press.
- D.B. Brooks, O. M. Brandes & S. Gurman, eds. 2009. *Making the Most of the Water We Have: The Soft Path Approach to Water Management*. Earthscan.
- P.H. Gleick, et al. 1998 et seq. *The World's Water: The Biennial Report on Freshwater Resources*. Island Press.
- There are many chapters of topical nature that span specific regional focus in these biennial volumes. These volumes are supplemented by the Pacific Institute website (see below). Among those with specific North American focus are:
- M. Cohen, "Managing across boundaries: the case of the Colorado River delta", 2002-2003, chapter 6.
- P.H. Gleick et al., "Urban water conservation: a case study of residential water use in California", 2004-2005, chapter 5.
- P.H. Gleick et al., "Urban water conservation: a case study of commercial and industrial water use in California", 2004-2005, chapter 6
- M. Kiparsky & P.H. Gleick, "Climate change and California water resources", 2004-2005, chapter 7
- H. Cooley & P.H. Gleick, "Urban water use efficiencies: lessons from United States cities", 2008-2009, chapter 6
- Fischhendler, I. 2005. The formation and viability of a non-basin water management: the US-Canada case. *Geoforum* 36(6): 792-804.
- Fischhendler, I. 2003. Spatial adjustment as a mechanism for resolving river basin conflicts: the US-Mexico case. *Political Geography* 22(5): 557-583.
- S. Bakenova. 2008. Making a policy problem of water export in Canada: 1960-2002. *Policy Studies Journal* 36(2): 279-300.
- R.R. Hearne. 2007. Evolving water management institutions in the Red River basin. *Environmental Management* 40(6): 842-852.
- J.L. Ivey et al. 2006. Planning for source water protection in Ontario. *Applied Geography* 26(3-4):192-209.
- F. El Ayoubi & J. McNiven. 2006. Political, environmental and business aspects of bulk water exports: a Canadian perspective. *Canadian Journal of Administrative Sciences* 23(1): 1-16.
- S.A. Changnon & J.M. Changnon. 1996. History of the Chicago diversion and future implications. *Journal of Great Lakes Research* 22(1): 100-118.
- H.F. Diaz & B.J. Morehouse, eds. 2003. *Climate and Water: Transboundary Challenges in the Americas*. Kluwer.
- R.R. Boyce. 2004. Geographers and the Tennessee Valley Authority. *Geographical Review* 94(1): 23-42.
- C. Coate. 1995. The biggest water fight in American history—Stewart Udall and the Central Arizona Project. *Journal of the Southwest* 37(1): 79-101.

L. Barr. 1975. NAWAPA—continental water development scheme for North America. *Geography* 60(267): 111-1199.

Important Websites

UN Water, <http://www.unwater.org>

Pacific Institute, <http://www.pacinst.org>

Water Footprint Network, <http://www.waterfootprint.org/>

Environment Canada Water, <http://www.ec.gc.ca/eau-water/>

POLIS Project on Ecological Governance, Water Sustainability Project,

<http://poliswaterproject.org/>

Ecology and Society, "New methods for adaptive water management",

<http://www.ecologyandsociety.org/issues/view.php?sf=31>

Program on Water Governance, University of British Columbia,

<http://www.watergovernance.ca/index.htm>

Tennessee Valley Authority, <http://www.tva.gov/>

Central Arizona Project, <http://www.cap-az.com/>

U.S. Bureau of Reclamation, <http://www.usbr.gov/>

Council of Great Lakes Governors, <http://www.cglg.org/>

Great Lakes Commission, <http://www.glc.org/wateruse/wrmdss/finalreport.html>

International Joint Commission, http://www.ijc.org/en/home/main_accueil.htm

NAFTA Secretariat, <http://www.nafta-sec-alena.org>

Foreign Affairs and International Trade Canada, "Canada and the North American Free

Trade Agreement", [http://www.international.gc.ca/trade-agreements-accords-](http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/nafta-alena/index.aspx)

[commerciaux/agr-acc/nafta-alena/index.aspx](http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/nafta-alena/index.aspx)

Office of the United States Trade Representative, "North American Free Trade

Agreement", [http://www.ustr.gov/trade-agreements/free-trade-agreements/north-](http://www.ustr.gov/trade-agreements/free-trade-agreements/north-american-free-trade-agreement-nafta)

[american-free-trade-agreement-nafta](http://www.ustr.gov/trade-agreements/free-trade-agreements/north-american-free-trade-agreement-nafta)