

**COURSE INFORMATION:**

**Water and Society**

**11:374:115**

**CONTACT INFORMATION:**

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**COURSE MATERIALS:**

All course materials are provided through the Canvas course site.

**COURSE DESCRIPTION:**

This course introduces students to fundamentals of water resources issues world-wide, and how they affect the development, design, evolution and sustainability of societies and economic viability.

Included will be discussion of case examples where conflicts over water allocations, drought limitations, water quality problems and catastrophic floods are damaging societies and international relations. Students will be exposed to and discuss current and developing methods for reducing such problems in support of more sustainable societies.

**LEARNING OBJECTIVES:**

Successful students will be able to describe, distinguish and compare how water issues mold and are created by societies in areas that are dry and humid, urban and agrarian, coastal and non-coastal, riparian and inland, including effects on the environment, economies and social equity. Students will be able to list and distinguish applicability of the basic tools for assessing water available, water quality, water demand and wastewater generation. They also will be able to identify and compare the major types of policies and organizations used to mediate water issues within and between nations. Finally, they will be able to discuss generally how water issues are related to other types of environmental issues such as food production, manufacturing and public health.

- **SEBS/SAS 21<sup>st</sup> Century Learning Objectives:**
  - b. Analyze a contemporary global issue from a multidisciplinary perspective.
  - c. Analyze the relationship that science and technology have to a contemporary social issue.
- **SEBS/SAS Historical Analysis Learning Objectives:**
  - h. Understand the bases and development of human and societal endeavors across time and place.
  - k. Explain the development of some aspect of a society or culture over time, including the history of ideas or history of science.
- **SEBS Governance and Regulation Analysis Objectives:**
  - 5. Use theory and evidence from the social sciences to analyze the decisions made by organizations that affect resource use, the environment, and health; including the organizations involved, the influences on those decisions, and the intended and unintended consequences that are likely to result.

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## ASSIGNMENTS/RESPONSIBILITIES & ASSESSMENT:

Class participation is critical to the learning process. Participation constitutes 25% of the grade (25 points). Attendance is a large part (20 points) of the participation score. In addition, each student will present a short summary of one class reading, which counts for 5 points. In-class attendance will be required in accordance with Rutgers University policies in place at the time. A student may have up to two unexcused absences without loss of participation credit, but **every additional unexcused absence triggers a deduction of 2 points**. Lateness also counts. If a student misses a substantial part of a class, partial credit will be given for attendance.

There will be short topical writing assignments for each topic addressed in the class, which will require the student to use information from the relevant lectures and assigned readings, along with additional research, to evaluate an issue or question on the basis of that information. The short assignments constitute the remaining 75% (75 points) of the grade. Lateness also counts here, at 0.3 points per day (and portions thereof) for a 5-point assignment, and 0.6 points per day for a 10-point assignment.

**There are no quizzes or exams.**

## OTHER INFORMATION:

Students will be responsible for adhering to the academic integrity policies found at <http://academicintegrity.rutgers.edu>.

It is important that students have the tools to succeed in this course. Please see the instructor as soon as possible with any difficulties or questions regarding the course materials. In addition, the Office of Student Affairs is available at <http://studentaffairs.rutgers.edu> for any other needs or concerns.

## Some favorite quotes:

We can know history, but we can't change it. We can't know the future, but we can change it! **DJVA**

"The opposite of division is not unity, it is collaboration." **Dar Williams**, singer/songwriter/author

"You must be completely ready to revise what you hold to be the truth; you always hold things provisionally." **Jocelyn Bell Burnell**, astrophysicist

"We've arranged a society based on science and technology, in which nobody understands anything about science and technology. This combustible mixture of ignorance and power, sooner or later, is going to blow up in our faces." **Carl Sagan**, astronomer

"Facts are stubborn things; and whatever may be our wishes, our inclinations, or the dictates of our passion, they cannot alter the state of facts and evidence." **President John Adams**

"People's minds are changed through observation and not through argument." **Will Rogers**

"Education is what remains after one has forgotten what one has learned in school." **Albert Einstein**

"Education is a progressive discovery of our own ignorance." **Will Durant**

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**Course Schedule and Readings**

The course schedule follows; modifications may occur as necessary during the semester. All readings or links to them are posted on Canvas.

Topic	Readings
1. Water: Cycles and Sheds	<ul style="list-style-type: none"> <li>• Mooney. 2015.03.23. Global warming is now slowing down the circulation of the oceans. Washington Post.</li> <li>• NRCS. How to Read a Topo Map and Delineate a Watershed</li> <li>• USGS. 2000. <u>A Hydrologic Primer for New Jersey Watershed Management</u> (esp. pp. 10-33)</li> <li>• WQED. What Is Groundwater? (Not in Files) <a href="https://www.youtube.com/watch?v=oNWAerr_xEE">https://www.youtube.com/watch?v=oNWAerr_xEE</a></li> <li>• Our Groundwater Connection. (Not in Files) <a href="https://www.youtube.com/watch?time_continue=85&amp;v=gxENTkMmyEE&amp;feature=emb_logo">https://www.youtube.com/watch?time_continue=85&amp;v=gxENTkMmyEE&amp;feature=emb_logo</a></li> </ul>
2. Water for Life	<ol style="list-style-type: none"> <li>1. Fowler. 2020. “Just Water: Funding for water infrastructure in tribal communities.”</li> <li>2. Rosenberg. 2010. “The Burden of Thirst.”</li> </ol>
3. Water and Transportation	<ol style="list-style-type: none"> <li>3. Patel and Fountain. 2017.05.03. “As Arctic Ice Vanishes, New Shipping Routes Open.”</li> <li>4. Panama Canal-A brief history. (Not in Files) <a href="https://www.youtube.com/watch?v=hitvIsDnxeg">https://www.youtube.com/watch?v=hitvIsDnxeg</a></li> </ol>
4. Water and Urban Areas	<ol style="list-style-type: none"> <li>5. Derks. 2021.02.15. “An Inside Look at Cuba’s Constant Struggle for Clean Water.”</li> <li>6. Russell. 2020.07.14. “Threats of ‘Day Zero’ Water Scarcity Multiply”.</li> <li>7. Watts. 2017.11.28. “The Amazon effect: how deforestation is starving São Paulo of water.”</li> </ol>
5. Wastewater	<ol style="list-style-type: none"> <li>8. Cairncross. 2018. “The public health benefits of urban sanitation in low and middle income countries.”</li> <li>9. Wildman. 2021. “The Shitovation Fund: Water for People.”</li> </ol>
6. Water and Illnesses	<ol style="list-style-type: none"> <li>10. Adelodun et al. 2021. “Assessment of socioeconomic inequality based on virus-contaminated water usage in developing countries: A review.”</li> <li>11. World Health Organization. 2007. Combating waterborne disease at the household level.</li> <li>12. World Health Organization. 2021. Cholera (Not in Files). <a href="https://www.who.int/news-room/fact-sheets/detail/cholera">https://www.who.int/news-room/fact-sheets/detail/cholera</a></li> </ol>
7. Wetlands and Estuaries	<ol style="list-style-type: none"> <li>13. Gaskill. 2021. “Turning the Tide of Mangrove Loss.”</li> <li>14. Kibria. 2014. “Sea-level rise and its impact on wetlands, water, agriculture, fisheries, aquaculture, public health, displacement, infrastructure and adaptation.”</li> <li>15. Smith. 2021. “African Oasis: The Okavango Delta”</li> </ol>
8. Water Pollution and the Environment	<ol style="list-style-type: none"> <li>16. Parker. 2021. “Plastic gets to the oceans through over 1000 rivers.” Also review The Ocean Cleanup, <a href="https://theoceancleanup.com/">https://theoceancleanup.com/</a></li> <li>17. Wildfire Sedimentation of Water Supplies (two articles)</li> </ol>

## WATER AND SOCIETY COURSE SYLLABUS

Version: 25 May 2022

Topic	Readings
9. Water and Agriculture	<p>18. World Ocean Review. 2010. Chapter 4: “Last stop: The ocean – polluting the seas.” pp. 76-81 “Over-fertilization of the seas.”</p> <p>19. Economist, 2019.05.23 “How climate change can fuel wars”</p> <p>20. IWMI. 2007. Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture (pp. 5-16).</p> <p>21. <u>Compare</u>: McMillion, Scott. 2012. “Watered Down: Can the mighty Colorado River reach the sea?”; with Isakowitz, 2019.08.01 “Restoring the Colorado River Delta.”</p> <p>22. Nature Conservancy. Accessed 2018.05.02. “The Weight of Water: Meet the women who are carrying Kenya's water from trees to taps.”</p> <p>23. Sustainable Agriculture Research and Education (SARE). (n.d.). What is Sustainable Agriculture?</p>
10. Hydro and Power	<p>24. Dieter et al. 2018. Estimated use of water in the United States in 2015. USGS. Read “Thermoelectric Power” (pp. 42-49)</p> <p>25. Lovgren. 2018.08.23. Southeast Asia May Be Building Too Many Dams Too Fast</p> <p>26. <u>Compare</u>: McCall and Orcutt. 2011. “Water Power”: with Spang. 2012. “A thirst for power: A global analysis of water consumption for energy production”</p> <p>27. Perspectives on Three Gorges Dam in China – compare the two articles.</p>
11. Water Scarcity	<p>28. Economist 2019.06.27 “The South Asian monsoon”</p> <p>29. Howe. 2021.01.03. “Wall Street Eyes Billions in the Colorado's Waters”.</p> <p>30. Jasechko and Perrone. 2021. “Global groundwater wells at risk of running dry”</p> <p>31. Zhang, Qingfeng, et al. 2012. Drying Up: What to do about droughts in the People's Republic of China. (Read at least the Executive Summary)</p>
12. The Power of Water	<p>32. Hallegatte, et al. 2013. “Future flood losses in major coastal cities.” Nature Climate Change.</p> <p>33. <u>Compare</u>: Krumwiede. 2020. “Great Lakes Water Levels and Coastal Impacts 2020”; Gardner. 2020. “Great Lakes high water is going to affect everyone in Michigan”; and Canadian Press 2014.06.26. “Great Lakes low water levels could cost \$19B by 2050”.</p> <p>34. Song and Peng. 2017. “Should We Leave? Attitudes towards Relocation in Response to Sea Level Rise”</p> <p>35. United Nations Environment Programme. 2017. Mine Tailings Storage: Safety Is No Accident. (Read at least to p.19)</p> <p>36. Urban Land Institute. 2013. After Sandy: Advancing Strategies for Long-Term Resilience and Adaptability. (Read at least “Introduction,” “Summary of Recommendations”)</p>
13. Ocean Resources	<p>37. Bale. 2016.08.29. “One of the World's Biggest Fisheries is on the Verge of Collapse: Major disputes in the South China Sea are putting critical habitat—and the food supply of millions—at risk.”</p> <p>38. Economist. 2017.05.27 “Getting serious about overfishing”</p> <p>39. Game et al. 2009. “Pelagic protected areas: the missing dimension in ocean conservation”</p>

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Topic	Readings
	40. Rust, et al. 2014. "Environmental Performance of Marine Net-Pen Aquaculture in the United States."
14. Water as a Weapon	41. Hipel, et al. 2013. "Strategic Investigations of Water Conflicts in the Middle East."
15. Water and Manufacturing	42. Becker 2016.10.24 "Researching water use in US manufacturing and mining." 43. Dieter et al. 2018. Estimated use of water in the United States in 2010. USGS. Read "Industrial" (pp. 36-41) 44. Schneider et al 2016.12.15 Stranded Assets: Water Stress Is Factor in Global Mining Slump
Summary	None