

GLY 199 – Water and Civilization

UB Seminar - 3 credits

MWF 11:00 - 11:50, Cooke 434 (in-person)

Instructor Name: Richard Marinos, Assistant Professor of Geology

Office: 428 Cooke Hall

Office Hours: Friday 12-1, or by appointment.

Email: rmarinos@buffalo.edu

Course Description:

The fate of humans is forever linked to the provision of our most basic need: water. In Mesopotamia, the annual floods of the Tigris and Euphrates rivers gave rise to the first human civilization. Droughts have destroyed powerful civilizations within decades, including the pyramid-builders of Egypt, the Classical Maya, and the Khmer Empire. Today, the world's seven and a half billion people are putting unparalleled stresses on our global water resources. These stresses have led to famines and wars in modern times, and these crises are only likely to accelerate with global climate change. In this course, we explore the past and the future of humans' relationship with water. The first month of the class focuses on the science and the history of pre-modern civilizations' relationship, while the latter part of the class focuses on the science, geopolitics, and policy behind contemporary water resource challenges, both globally and in New York State. Discussion on contemporary challenges will focus on issues of both water quantity and quality: intensified droughts and flooding driven by climate change, unsustainable withdrawals of groundwater, pollution from agricultural and urban sources, and the provision of clean drinking water.

Student Learning Outcomes:

Having completed a UB Seminar, students will be able to:

Learning Outcomes	Student Achievement of this Learning Outcome will be Assessed by:
1. Think critically using multiple modes of inquiry.	Homeworks, in-class discussion participation, literature synthesis project
2. Analyze disciplinary content to identify contexts, learn fresh perspectives, and debate and discuss problems in the field.	In-class discussion participation, literature synthesis project
3. Understand and apply the methods of close reading, note taking, analysis, and synthesis.	Quizzes, literature synthesis project
4. Recognize and debate ethical issues and academic integrity in a variety of settings.	In-class discussion participation, successful completion of all assignments in accordance with UB's Academic Integrity Policy
5. Demonstrate proficiency in oral discourse and written communication.	The short-form article of the literature synthesis projects, participation in in-class discussion
6. Develop essential research and study skills such as time management.	Timely completion of all sequential components of the literature synthesis project, quizzes
7. Use an ePortfolio for at least one assignment.	The short-form article of the literature synthesis project
8. Understand the academic expectations pertaining to student at the University at Buffalo and to higher learning at a research university.	Homeworks

Course Materials:

All course materials are available online, either through UB libraries or freely available.

The links below are provided for reference only. For the class readings, please use the copies of the articles provided on Blackboard. The Blackboard copies have been annotated to explain unfamiliar concepts, note which detail sections in an article you can skip, etc.

- Altaweel, M. 2019. Southern Mesopotamia: Water and the rise of urbanism. *WIREs Water* 6:e1362.
- Betz, E. 2020, November 10. Who Were the Ancient Sumerians? *Discover Magazine*.
- Brannan, S. 2009. Striped Invaders: Lake Erie's 20-Year Battle with Zebra Mussels. *Twinline*. Ohio Sea Grant Communications.
- Buckley, B. M., K. J. Anchukaitis, D. Penny, R. Fletcher, E. R. Cook, M. Sano, L. C. Nam, A. Wichienkeeo, T. T. Minh, and T. M. Hong. 2010. Climate as a contributing factor in the demise of Angkor, Cambodia. *Proceedings of the National Academy of Sciences* 107:6748–6752.
- Chislock, M. F., E. Doster, R. A. Zitomer, and A. E. Wilson. 2013. Eutrophication: Causes, Consequences, and Controls in Aquatic Ecosystems. *Nature Education Knowledge* 4.
- Deming, D. 2020. The Aqueducts and Water Supply of Ancient Rome. *Groundwater* 58:152–161.
- Denchak, M. 2018. Flint Water Crisis: Everything You Need to Know.
<https://www.nrdc.org/stories/flint-water-crisis-everything-you-need-know>.
- Hansson, S. O. 2021. Science and Pseudo-Science. Page in E. N. Zalta, editor. *The Stanford Encyclopedia of Philosophy*. Fall 2021. Metaphysics Research Lab, Stanford University.
- Haug, G. H., D. Günther, L. C. Peterson, D. M. Sigman, K. A. Huguen, and B. Aeschlimann. 2003. Climate and the Collapse of Maya Civilization. *Science* 299:1731–1735.
- Historic England. 2022. The Great Stink - A Victorian Solution to the Problem of London's Waste | Historic England.
<http://historicengland.org.uk/images-books/archive/collections/photographs/the-great-stink/>.
- Johnson, K. 2022. I speak for the fish: How the round goby changed the Great Lakes, twice. *GreatLakesNow*, 18 April 2022.
- Jones, C., W. E. Murray, and J. Overton. 2017. FIJI Water, water everywhere: Global brands and democratic and social injustice. *Asia Pacific Viewpoint* 58:112–123.
- Lustgarten, A. 2015. Use It or Lose It Laws Worsen Western U.S. Water Woes.
<https://www.scientificamerican.com/article/use-it-or-lose-it-laws-worsen-western-u-s-water-woes/>.
- Lustgarten, A. 2021. 40 Million People Rely on the Colorado River. It's Drying Up Fast.
<https://www.propublica.org/article/40-million-people-rely-on-the-colorado-river-its-drying-up-fast?token=MXX1IlmPWCcCwUNwUmGqOoUsYmxDqE3A>.
- McSweeney, R. 2019, August 6. Explainer: Desertification and the role of climate change.
<https://www.carbonbrief.org/explainer-desertification-and-the-role-of-climate-change>.
- Newitz, A. 2017, September 1. Plumbing discovery reveals the rise and fall of the Roman Empire.
<https://arstechnica.com/science/2017/08/plumbing-discovery-reveals-the-rise-and-fall-of-the-roman-empire/>.
- Oki, T., and S. Kanae. 2006. Global Hydrological Cycles and World Water Resources. *Science* 313:1068–1072.
- Pearce, F. 2024, August 12. Desertification was supposed to be the “greatest environmental challenge of our time.” Why are experts now worried about greening?
<https://thebulletin.org/2024/08/desertification-was-supposed-to-be-the-greatest-environmental-challenge-of-our-time-why-are-experts-now-worried-about-greening/>.
- Plumer, B. 2015, April 14. California's water problems go way deeper than almonds.
<https://www.vox.com/2015/4/14/8407155/almonds-california-drought-water>.
- Santucci, R. J., and J. R. Scully. 2020. The pervasive threat of lead (Pb) in drinking water: Unmasking and pursuing scientific factors that govern lead release. *Proceedings of the National Academy of Sciences* 117:23211–23218.
- Seligson, K. 2019. Misreading the story of climate change and the Maya.
<http://theconversation.com/misreading-the-story-of-climate-change-and-the-maya-113829>.

Sterk, G., and J. J. Stoorvogel. 2020. Desertification—Scientific Versus Political Realities. *Land* 9:156.

Stone, R. 2006. The End of Angkor. *Science* 311:1364–1368.

Tulchinsky, T. H. 2018. John Snow, Cholera, the Broad Street Pump; Waterborne Diseases Then and Now. *Case Studies in Public Health*:77–99.

Water Education Foundation. 2020, June 22. Water Use: Virtual Water.
<https://www.watereducation.org/post/water-use-virtual-water>.

Weiss, H., M.-A. Courty, W. Wetterstrom, F. Guichard, L. Senior, R. Meadow, and A. Curnow. 1993. The Genesis and Collapse of Third Millennium North Mesopotamian Civilization. *Science* 261:995–1004.

Course Requirements:

Literature Synthesis Project – Students will perform an independent research project on a topic of their choosing related to contemporary challenges in water resources. These projects will synthesize popular media, literature from the natural and social sciences, and other sources of information to create a compelling short-form popular science article, such as may be published in *Scientific American*, the *New York Times*, or similar publications. Students will also make a short (4 minute) presentation to the class about their topic. Assignments that will be due as part of the project include a project proposal, annotated bibliography, rough draft, final draft, and class presentation.

Quizzes – There will be nine unannounced, short quizzes at the beginning of each class that check for basic preparation for that day's class. If you did the required readings/homework for the class, you should get full credit for these quizzes. I will drop the lowest three quizzes from your grade.

Homework – There will be four short homework assignments throughout the course of the semester.

Participation – In a seminar class, we're all responsible for discussing and developing the ideas explored in the class, so active participation in class discussion is expected of all students. I find it helpful if there are some student "thought leaders" for each discussion who have thought deeply about the reading and who can move the conversation along when it drags. Each student will sign up to be a thought leader for four classes during the semester, for the classes labeled "Content". The sign-up sheet will be provided on UBLearns. On the days you have signed up to be a thought leader, you will have to fill out a short form with guided questions that will help hone your perspective on the readings. You will be assessed on thoughtful completion of this short form and adequate participation in discussion.

Attendance - While I don't require attendance for classes I'm leading, I will expect you to attend the sessions for our guest lecturers, as I don't want to disrespect their time after they have volunteered it to come talk to y'all. I will take attendance during guest lectures five minutes after class begins, for all-or-nothing credit. I will drop your three lowest attendance grades, no excuse needed.

Academic Content:

I WILL UPDATE THE CLASS CALENDAR LINKED ON UBLearnS AS NECESSARY.
DO NOT USE THE CALENDAR BELOW. IT IS ONLY ACCURATE AS OF THE BEGINNING OF THE SEMESTER.

Date	Topics	Assignments (<i>italics</i> = assigned, bold = due)	Readings Due	LOs
Unit 1: Introductions to the Course and to College				
26-Aug-24	Class Overview	<i>Homework #1: Science Literacy Pre-assessment assigned; Literature synthesis project assigned</i>		
28-Aug-24	Discussion: Why are <u>you</u> at UB?	Homework #1: Science Literacy Pre-assessment due		
30-Aug-24	Content: What is science literacy? Science vs. pseudoscience vs. non-science		Hansson 2021	1,2,3
2-Sep-24	No Class: Labor Day			
4-Sep-24	Content: The hydrologic cycle and the global distribution of water resources		Oki and Kanai 2006	1,2,3
6-Sep-24	Skills: Using the UB Libraries (<i>Location: Meet by the circulation desk at Silverman Library; Guest: Fred Stoss, UB Libraries</i>)			6
Unit 2: The Hydrologic Rise and Fall of Civilizations				
9-Sep-24	Content: Mesopotamia - The hydrologic origins of civilization		Betz 2020; Altaweel 2019	1,2,3
11-Sep-24	Skills: Computing in college - Getting the software, resources and help you need to succeed - bring laptops! (<i>Guest speakers: Mike Canfield and Mark Ferguson, UBIT</i>)			6,8
13-Sep-24	Content: Drought and collapse of the Mesopotamian empire of Akkad		Weiss et al. 1993	1,2,3
16-Sep-24	Skills: Finding high-quality sources through the library and citing them properly - bring laptops! (<i>Guest: Erin Rowley, UB Libraries</i>)			6,8

18-Sep-24	Content: The Khmer Empire and building resilience to drought	Synthesis project proposal due	Stone 2006; Buckley et al. 2010	1,2,3
20-Sep-24	Skills: Interpreting scientific figures	<i>Homework #2: Figure Interpretation assigned</i>		3,6
23-Sep-24	Content: Romans and the engineering of water		Deming 2019, Newitz 2017	
25-Sep-24	Skills: Recognizing and resolving issues of academic integrity (Guests: Maria Disorbo and Academic Integrity Student Ambassadors)	Homework #2: Figure Interpretation due		4
27-Sep-24	Content: The mystery of the Classical Maya		Seligson 2019; Haug et al. 2003	1,2,3
30-Sep-24	Skills: Plotting your course at UB with academic advising services (Guest: Lia Hallett, Academic Advising)			8
2-Oct-24	Content: Sanitation and the birth of epidemiology		Historic England 2022, Tulchinsky 2018	1,2,3
4-Oct-24	Skills: Developing a thesis			5
Unit 3: Contemporary Global Water Issues				
7-Oct-24	Skills: Time management and tutoring resources at UB (Guest: Lindsay Masters, Tutoring and Academic Support Services)			6
9-Oct-24	Content: Trading virtual water		Water Education Foundation 2020, Graham et al. 2020	
11-Oct-24	Content: The law and disappearing water in the Western USA		Lustgarten 2015, Lustgarten 2021	
14-Oct-24	No Class: Fall Break			
16-Oct-24	Skills: Learning outside the classroom (Guest: UB Experiential Learning Network rep)	<i>Homework #3: Time Management assigned</i>		
18-Oct-24	Content: Water and the profit motive		Jones et al 2017, Plumer 2015	

21-Oct-24	Skills: Finding and keeping the money you need to attend UB (<i>Guest: Christina Horner, Financial Aid</i>)	Synthesis annotated bibliography due		8
23-Oct-24	Skills: Revising your writing (<i>Guest: Rhonda Reid, Center for Excellence in Writing</i>)	Homework #3: Time Management due		5,6
25-Oct-24	Content: Desertification or global greening?		McSweeney 2019, Pearce 2024, Sterk and Stoorvogel 2020	1,2,3
28-Oct-24	Skills: Focused writing with the Pomodoro Method			
30-Oct-24	Skills: Turning your degree into a career (<i>Guest: Ed Brodka, Career Design Center</i>)			
1-Nov-24	Content: Water and geopolitical strife		TBD	
Unit 4: Contemporary Water Issues in New York				
4-Nov-24	Content: Clean water in Rust Belt cities		Denchak 2018, Santucci and Scully 2020	1,2,3
6-Nov-24	Skills: Maintaining your physical and mental wellbeing in college (<i>Guest: Jackie Piciulo, Student Health and Wellness</i>)			6
8-Nov-24	Content: Algae in the Great Lakes		Chislock et al. 2013	
11-Nov-24	Skills: Broadening your perspective with education overseas (<i>Guest: Anna Biuso, UB Education Abroad</i>)			6,8
13-Nov-24	Content: Mending Buffalo's urban waterways (<i>Guest: Jennifer Fee, Buffalo Niagara Waterkeepers</i>)			1,2,3
15-Nov-24	Content: Indigenous water rights in NY		TBD	
18-Nov-24	Skills: Using (and not abusing) artificial intelligence in your coursework (<i>Guest: TBD</i>)	Synthesis Rough Drafts Due, Homework #4 Peer Feedback assigned		4,6,8
20-Nov-24	Content: Invasive species in NY waterways		Brannan 2009, Johnson 2022	1,2,3
22-Nov-24	Content: Threats to the Hudson (<i>Guest: New York Power Authority Rep</i>)			1,2,3
25-Nov-24	Skills: Drop-in writing workshop	Homework #4: Peer Feedback due		

27-Nov-24	No Class: Thanksgiving Recess			
29-Nov-24	No Class: Thanksgiving Recess			
2-Dec-24	Symposium: Literature synthesis presentations			
4-Dec-24	Symposium: Literature synthesis presentations			
6-Dec-24	Symposium: Literature synthesis presentations			
9-Dec-24	No Class: Prof. Marinos at conference			
11-Dec-24	No Class: Final exams period			
13-Dec-24	No Class: Final exams period	Final synthesis articles due @ 11:59 PM		7

Grading Policy:

The primary aim of this course is to help students develop the critical thinking and writing skills that will allow them to succeed in college, whatever their major. Students are not expected to be scientists, and some unfamiliarity and confusion with the disciplinary material presented in the class is likely. If students complete all assignments and demonstrate basic critical thinking, professional writing, and (high-school level) scientific literacy skills, they can expect to get at least a B in the class.

Students are advised of the grading policy at the beginning of the course, and continued enrollment in the course constitutes acceptance of the grading policy as outlined here. Accommodations of the grading policy can be made for students who find themselves in exceptionally challenging circumstances. Such accommodations are much more likely to be made if a student notifies the instructor as soon as such a circumstance arises, rather than after an assignment is due. As a condition of accommodations, the instructor may require that he and the student jointly develop an individualized plan to get the student back on track.

- There will be no make-up quizzes given in the class. Instead, each student's lowest three quiz grades will be dropped.
- Late homework will earn a maximum of 75% credit, and will be accepted up to two weeks after the original due date. (Exception: Homework #4 cannot be turned in late for credit.)
- All literature synthesis project components will be evaluated based on a rubric provided to the student at the time of assignment. Any late component of a literature synthesis project will be accepted up to four days after it was due, and will earn a maximum of 90% credit.
- Students who can not complete all coursework in a timely manner may ask the instructor for an incomplete grade, in accordance with the undergraduate policy for incomplete grades, found here: <https://catalog.buffalo.edu/policies/explanation.html>. Incomplete grades are at the discretion of the instructor.

Weighting	Assessment / Assignment
50%	Literature Synthesis Project 5% - project proposal 10% - annotated bibliography 10% - rough draft 20% - final draft 5% - class presentation
20%	Quizzes
10%	Homework
10%	Participation
10%	Attendance for Guest Lectures

Final Grades:

Grade	Quality Points	Percentage
A	4.0	93.0% - 100.00%
A-	3.67	90.0% - 92.9%
B+	3.33	87.0% - 89.9%
B	3.00	83.0% - 86.9%
B-	2.67	80.0% - 82.9%

Grade	Quality Points	Percentage
C+	2.33	77.0% - 79.9%
C	2.00	73.0% - 76.9%
C-	1.67	70.0% - 72.9%
D+	1.33	67.0% - 69.9%
D	1.00	60.0% - 66.9%
F	0	59.9 or below

Academic Integrity:

Students must be familiar with and abide by the University's policies and procedures on the [Academic Integrity website](#).

I take a very dim view on academic dishonesty, especially since a good portion of this class is spent discussing standards of academic integrity. Students can expect that willful examples of academic dishonesty will result in no credit for the particular assessment *at a minimum*, and egregious examples (e.g. plagiarism in the literature synthesis project) will likely result in failure of the course.

No grade for any assignment in a freshman seminar course is worth your personal integrity. Really, your future job prospects will not hinge on whether you get a B or a C in a freshman seminar.

Use of Artificial Intelligence on Assignments:

I support the use of AI to make improvements on drafts of writing that you've composed yourself. Using AI to generate all or part of an essay that you have not written a draft of is cheating and falls under the academic integrity policy outlined above. It is your responsibility to ask what is permissible in edge cases. You must compose a statement attesting to the extent of use of AI in any writing work you submit for this class. I will be able to see version histories of your work to verify that these attestations are accurate.

Accessibility Resources:

I will make all efforts to make reasonable accommodations for students with disabilities.

Accessibility Resources coordinates reasonable accommodations for equitable access to UB for students with disabilities. Visit 60 Capen Hall, North Campus, call (716) 645-2608, or email at stu-accessibility@buffalo.edu. Additional information is located at the [Accessibility Resources website](#).

Available Resources on Sexual Assault:

Please note that I (Professor Marinos) am required to report any instances of sexual violence that I know about to the office of the Title IX Coordinator. I can make such reports without including names, if the victim asks to remain anonymous, and I will ask any victim before making such a report.

UB is committed to providing an environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic and dating violence and stalking. You may call [UB's Office of Equity, Diversity and Inclusion](#) at (716) 645-2266 for more information or [visit their website](#).

Counseling Services:

As a student you may experience a range of issues that can cause barriers to learning or reduce your ability to participate in daily activities. These might include strained relationships, anxiety, high levels of stress, alcohol/drug problems, feeling down, health concerns, or unwanted sexual experiences. Counseling, Health Services, and Health Promotion are here to help with these or other concerns. You learn can more about these programs and services by contacting:

- Counseling Services:
 - o 120 Richmond Quad (North Campus), phone 716-645-2720

- o 202 Michael Hall (South Campus), phone: 716-829-5800
- Health Services: Michael Hall (South Campus), phone: 716- 829-3316
- Health Promotion: 114 Student Union (North Campus), phone: 716- 645-2837

Controlled Enrollment Courses:

The UB Seminar is a [Controlled Enrollment Course \[CEC\]](#). Enrollment in a CEC is restricted by the available student positions, and self-registration for a CEC in any fall or spring semesters is available only to students taking that course for the first time. Repeat enrollment may be difficult or impossible in a fall or spring semester; a student seeking to repeat a CEC should plan to register for and do this in a UB summer session. Repeat enrollment is enrollment by a student who previously enrolled in the course at UB or transferred an equivalent course to UB and for which course the student has a grade of 'A', 'B', 'C', 'D', 'F' or qualified value thereof [e.g., 'A-', 'D+'], or a grade of 'P', 'S', 'U', 'I', 'J', 'N', or 'R'. A student may self-register to repeat a CEC in a fall or spring term only if the student's grade of record for the previous enrollment is 'W', i.e., administrative withdrawal. Students may petition for enrollment in such a designated spring course by the third week of the preceding fall semester, and in a fall course by the third week of the preceding spring semester.

UB Curriculum Capstone:

You are completing this course as part of your UB Curriculum requirements, therefore please select an 'artifact' from this course that is representative of your learning and upload it to your UBPortfolio account. Templates have been created for this purpose. Artifacts include homework assignments, exams, research papers, projects, lab reports, presentations, and other course materials. Your final UB Curriculum requirement, UBC 399: UB Curriculum Capstone, will require you to submit these 'artifacts' as you process and reflect on your achievement and growth through the UB Curriculum. For more information, see the [UB Curriculum Capstone website](#).

Attendance Policy:

Attendance roll will not be taken in the class, except during sessions when we have guest lecturers; undergraduate students are adults who are entrusted to appropriately prioritize their education. Do note, however, that non-attendance can impact one's participation grade, as noted above in the grading policy. Attendance will be taken for guest lecturers and will be on a credit/no credit basis. If a student will miss class for any of the following reasons, they may notify the instructor at least 24h in advance, and they will not be evaluated for participation on that day: religious observance, athletic commitments, university-sanctioned events, athletic commitments, unusual family or work obligations. If an emergency arises, students may notify me after the fact. No documentation is required; do not lie to me.

Assignments are still due by the beginning of class on a day that a student misses class, except in cases of emergencies.

Classroom Decorum:

I support using laptops for note-taking, paperless reading, etc. Please don't be obnoxious and watch Tik Tok videos during class. If I find you doing things on your computer that aren't class related, I will have a diminished opinion of you.