



# GGY480/592 WATER RESOURCES POLICY

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**INSTRUCTOR: Dr. NARCISA PRICOPE**, Assistant Professor of Geography

DEPARTMENT OF GEOGRAPHY AND GEOLOGY, UNIVERSITY OF NORTH CAROLINA WILMINGTON

**TIME: Monday and Wednesday 2 to 3:15 PM, DeLoach Hall 125**

## REQUIRED TEXTBOOK:

***Principles of Water Resources: History, Development, Management, and Policy*** by Thomas Cech. John Wiley and Sons Publishing. [Third Edition](#)

**Recommended additional references (more readings will be available on Blackboard weekly, as needed):**

*Water Resources Engineering*: Larry W. Mays, John Wiley and Sons.

*Environmental Hydrology*: Ward and Elliot, CRC-Lewis Publishers.

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## COURSE DESCRIPTION:

*The world's water has been recycled many times over for millennia. The challenge we face to maintain a sustainable resource is to have the appropriate quality, in sufficient quantity, at the right place, at the right time.*

We will use a multi-disciplinary approach to better understand how to manage the most precious resource on the planet. This class explores the historical context of simple-to-complex water resource issues; the natural processes of water by focusing on the hydrosphere; what constitutes water quality – from the scale of ecosystems to human health; the impact of water project construction and management; the roles that water agencies play in water resource management, the environmental impact issues of water quality, water quantity, and water resource management issues; and issues in water law, allocation, economics and conflict resolution.

## COURSE OBJECTIVES:

- Understand, analyze and communicate broad water resources issues as they pertain to different scales, locales and contexts both in the United States and internationally.
- Develop in-depth, bi-weekly 'explorations' of specifically group-assigned basins using existing online tools, databases and documents and synthesize this applied research into .
- Explain the interplay between the physical and social systems embodied by watersheds, and regional development and environmental issues.
- Recognize and describe the management implications of hydrologic, geomorphic, chemical and biological processes.
- Describe how integrated water resources management (IWRM) and specifically adaptive management interacts with water resources and how they can be used to minimize adverse impacts of agriculture, urbanization, timber harvesting, road construction, water withdrawals, and other development activities.

## GENERAL CLASS OUTLINE AND EXPECTATIONS:

- Students will be expected to be on time and prepared to participate actively in class discussions, as well as complete your watershed exploration assignments. This is YOUR time to explore water resources. Make the most of it!
- Reading assignments should be completed PRIOR to the scheduled lecture or class discussion. Read the syllabus!



- There will be periodic quizzes, often at the start of class. There will be one major written assignment: a **team term paper** accompanied by an in-class presentation (described below and more details to follow) and a **series of in-class weekly team-led discussions/presentations**.
- Though lectures will generally follow text chapters, they will be expanded upon, providing real-world knowledge and experience. You are responsible for information provided in the text as well as lectures, guest speakers and field trip.
- I encourage those of you who have had experiences relevant to a given topic to share those experiences with the class. Please let me know ahead of time so that we might incorporate your experience into the curriculum.

### GRADING AND ORGANIZATION

More broadly speaking, the course is organized around a case studies format. Students will be assigned to a specific **Watershed Explorations Group** that will study a watershed in depth during the semester. The watersheds to be studied include a variety of scales and geographic locations. It is expected that, at the end of the course, students will have a detailed understanding of the physical, biological, and social organization, management issues, management structures and any potential conflicts in each watershed. Students are expected to become familiar with “their” watersheds in a comprehensive and broad way, something that will entail obtaining adequate information of various kinds via a series of six structured ‘explorations’, followed by a comprehensive report and presentation. The overall course grading scheme is detailed below.

**GRADING CATEGORIES-** based on class participation, assignments, a midterm, final, and papers. Tentative percentages:

1. <b>In-class chapter discussions and participation</b>	<b>15%</b>
2. <b>Watershed Exploration Assignments (6)</b>	<b>15%</b>
3. <b>Midterm</b>	<b>20%</b>
4. <b>Final</b>	<b>20%</b>
5. <b>Term paper/poster &amp; presentation</b>	<b>30%</b>
<b>Total</b>	<b>100 %</b>

### MAIN GRADE CATEGORIES:

#### 1. **In-class weekly chapter discussions and participation**

When not responsible for a class team presentation (see details below), you will be assessed for your participation in the discussions led by the presenting team (under item 1 in Grading, worth 15%).

We will form groups of 2 to 3 students at the beginning of class who will work together throughout the term on the final term paper/poster, your watershed assignments and on the weekly presentations to the class (items 1, 2 and 5 of your grading rubric). Every week starting with WEEK 4, for a total of 6 topics/weeks (following the topics presented weekly below), each group will be responsible for leading a class discussion based on the questions at the end of each chapter and/or any additional questions you would like to explore during the Monday class period. For the weeks where 2 chapters are listed, the team responsible for that week will talk to me at the end of class the week before to determine exactly what parts of the chapters you will be covering and which parts I will be responsible for.

On Wednesdays, I will lecture based on the same chapters/topics and focus primarily on the more difficult concepts, additional case studies, concepts and theories that you can expect to see on the midterm and final exam and/or invite guest speakers to augment the content of the chapter/s being discussed.

Everyone in the class is responsible for reading the chapter/s before the Monday meeting time; failure to do so and to participate fully in the discussions initiated by the lead-team will affect the first 10% of your grade based primarily on participation. Overall, your participation during discussions together represents 15% of your final grade!



<b>0</b>	Absent
<b>1</b>	<ul style="list-style-type: none"> <li>• Present, attentive.</li> <li>• Tries to respond when called on but does not offer much.</li> <li>• Demonstrates very infrequent involvement in discussion.</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>• Demonstrates adequate preparation: knows basic case or reading facts, but does not show evidence of trying to interpret or analyze them.</li> <li>• Offers straightforward information (e.g., straight from the case or reading), without elaboration or very infrequently (perhaps once a class).</li> <li>• Does not offer to contribute to discussion, but contributes to a moderate degree when called on.</li> <li>• Demonstrates sporadic involvement.</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>• Demonstrates good preparation: knows case or reading facts well, has thought through implications of them.</li> <li>• Offers interpretations and analysis of case material (more than just facts) to class.</li> <li>• Contributes well to discussion in an ongoing way: responds to other students' points, thinks through own points, questions others in a constructive way, offers and supports suggestions that may be counter to the majority opinion.</li> <li>• Demonstrates consistent ongoing involvement.</li> </ul>
<b>4</b>	<ul style="list-style-type: none"> <li>• Demonstrates excellent preparation: has analyzed case exceptionally well, relating it to readings and other material (e.g., readings, course material, discussions, experiences, etc.).</li> <li>• Offers analysis, synthesis, and evaluation of case material, e.g., puts together pieces of the discussion to develop new approaches that take the class further.</li> </ul> <p>Contributes in a very significant way to ongoing discussion: keeps analysis focused, responds very thoughtfully to other students' comments, contributes to the cooperative argument-building, suggests alternative ways of approaching material and helps class analyze which approaches are appropriate, etc.</p> <p>Demonstrates ongoing very active involvement.</p>

**2. Watershed Exploration Assignments and Team Term Paper and Presentation (45% of final grade together)**

You will complete the 6 watershed exploration assignments (they will become available to you on Blackboard in order) and your term project in a team of two to three members. Your final deliverable will be a report on a U.S. watershed of your choice. The goal of the project is to identify and synthesize the status of a river and watershed of your choice, and discuss major water problems in the watershed. The reports should be about 12-15 pages of text (double-spaced), plus graphics. The report will be graded on writing as well as content based specifically on the elements presented below. Most of the research can be done on the web, but some use of printed materials will be necessary. I will provide you with links for material relevant for the term projects and you will have to get quite adept at using a variety of sources to address each topic in your watershed explorations.

The six watershed exploration assignments listed in blue on the schedule page below involve finding information to prepare you for your term project. Together, these 2 items make up 45% of your final grade!



## TERM PAPER STRUCTURE

**Overview & Presentation (15%)**- Attractive and neatly presented. Effective, insightful document. Original and energetic approach.

**Ideas (20%)** - Excels in responding to assignment. Interesting, demonstrates sophistication of thought. Central idea/thesis is clearly communicated, worth developing; limited enough to be manageable. Paper recognizes complexity of its thesis; may acknowledge its contradictions, qualifications, or limits and follow out their logical implications. Understands and critically evaluates its sources, appropriately limits and defines terms. Impressive depth of insight/analysis. Well developed.

**Organization & coherence (20%)** - Uses a logical structure appropriate to paper's subject, purpose, audience, thesis, and disciplinary field. Sophisticated transitional sentences often develop one idea from the previous one or identify their logical relations. It guides the reader through the chain of reasoning or progression of ideas. Clear, readable, coherent & mature. Avoids empty & pretentious language. Avoids ambiguities-abstractions.

**Support (10%)** - Uses evidence appropriately and effectively, providing sufficient evidence and explanation to convince. Wide variety of well-researched, quality sources. Few if any non-reviewed internet sources. Clear consistent use of chosen referencing system. Few formatting errors. No missing sources.

**Style (10%)** - Chooses words for their precise meaning and uses an appropriate level of specificity. Sentence style fits paper's audience and purpose. Sentences are varied, yet clearly structured and carefully focused, not long and rambling. Clear sentences. Strong clear leads. Smooth transitions

**Mechanics (10%)** - Entirely free of spelling, punctuation, and grammatical errors.

**Graphics & tables, charts (15%)** - Properly placed and complementary, skillfully and attractively done with clear labels & descriptions. All figures are referenced in the body of the paper. If figures are previously published proper citations are given.

The individual contribution to the team term paper/poster will be peer graded using the peer evaluation form given above. For poster contributions, the criteria will be slightly modified with more weight given to visuals and organization over style or mechanics.

You will be evaluated by your peers on the following items: Individual contributions to your group assignments, team paper/presentation and the one-time team topical presentation.

Rate yourself and your peers (1 - 5 point scale)      5=superior, 4 = above average, 3 = average, 2=below average, 1=weak

Names (your name first followed by team members)	Name1	Name2	Name 3
Participated in group discussions or meetings			
Helped keep the group focused on the task			
Contributed useful ideas			
Quantity of work done			
Quality of work done			
Sum values			

Developed by Thomas G. Thompson, Director of Undergraduate General Business and Human Resource Management Programs, University of Maryland University College



## GGY 475/575 WATER RESOURCES ~ TENTATIVE SCHEDULE FALL 2014

### WEEK TEXT CHAPTERS and TOPICS (subject to modification and rescheduling, esp. guest lectures)

#### WEEK 1: CH 1: The historical perspective on water resources (Dr. Pricope at IGU, Krakow Poland on Wed., August 20, 2014)

- ✓ Introductions; course goals, objectives and scope (syllabus)
- ✓ Course logistics, format, texts, grading, and expectations

#### WEEK 2: CH 2 and 3: Surface water hydrology

- ✓ Hydrologic cycle – weather, climate and precipitation
- ✓ Watersheds, rivers, lakes, transport and deposition
- ✓ Floods and droughts
- ✓ Basic hydrologic concepts and calculations
  - **Watershed Exploration 1 assigned**

#### WEEK 3 and 4: CH 3 & 4: Surface hydrology continued and groundwater hydrology basics; **GROUP 1 LEADS DISCUSSION**

- ✓ Groundwater recharge, movement, and aquifers
- ✓ Measuring water – quantity and flow
  - **Watershed exploration 1: Finding a watershed DUE**

#### WEEK 5 (Sept. 15<sup>th</sup>-17<sup>th</sup>): CH 5 Water quality & management; **GROUP 2 LEADS DISCUSSION**

- ✓ Basic parameters, pollution defined
- ✓ Inorganic chemicals, organic chemicals
- ✓ Waterborne diseases
- ✓ Fate and transport, watershed protection
- ✓ GUEST LECTURE: Stan Harts, UNCW
  - **Watershed exploration 2: Streamflow data DUE**

#### WEEK 6 (Sept. 22<sup>nd</sup>-24<sup>th</sup>): CH 6 & 7: Municipal and Irrigation development, Dams; **GROUP 3 LEADS DISCUSSION**

- ✓ Municipal systems overview
- ✓ Irrigation systems overview, case studies
- ✓ Dams: Basics, Impacts, Operations
- ✓ Summary/Outline of proposed Term Project Due
  - **Watershed exploration 3: Physical and social information DUE**

#### WEEK 7 (Sept 29<sup>th</sup>- Oct 1<sup>st</sup>): CH 8: Water Allocation Law; **GROUP 4 LEADS DISCUSSION**

- ✓ Water allocation laws through time
- ✓ Groundwater doctrines, interstate compacts
- ✓ GUEST SPEAKER: water rights
  - **Watershed exploration 4: Water quality criteria and impaired waters DUE**

#### WEEK 8 (Oct 6<sup>th</sup>-8<sup>th</sup>): CH 9 & 10: Federal, multi-state, state, and local water management agencies;

- ✓ **MIDTERM!** On October 8<sup>th</sup> 2014
- ✓ Federal water agencies
- ✓ State and regional water agencies

#### WEEK 9: (Oct 13<sup>th</sup>-15<sup>th</sup>): CH 13: The Economics of Water; **GROUP 5 LEADS DISCUSSION**

- ✓ The value of water and Water as a public vs. private good
- ✓ Water marketing and water banking
- ✓ Water conservation programs
- ✓ GUEST SPEAKER: Water conservation
  - **Watershed exploration 5: Threatened and endangered species DUE**



**WEEK 10: (Oct. 20<sup>th</sup>-22<sup>nd</sup>) CH 11: Drinking Water, Waste Water; GROUP 6 LEADS DISCUSSION**

- ✓ Historical perspectives on drinking water
- ✓ The drinking water treatment process

**WEEK 11: (Oct. 27<sup>th</sup>-29<sup>th</sup>) FIELD TRIP and ETEAL EXPERIENCE**

- ✓ Water management issues and water treatment in the Cape Fear River Basin (itinerary to be determined but stops will include water treatment plants, restoration sites, stormwater management sites, water reclamation efforts).

**WEEK 12: (Nov. 3<sup>rd</sup>-5<sup>th</sup>) CH 12: Water conflicts and cooperation;**

- ✓ Focus on area of study for conflict and cooperation
- ✓ Design and implement approach and deliverables (communication tools, policy briefs, Prezi website presentations, other multi-media deliverable)
- ✓ Begin work on small group project
  - **Watershed exploration 6: Emerging water issues and/or conflicts DUE**

**WEEK 13: (Nov. 10<sup>th</sup>-12<sup>th</sup>) Integrated water resources management (IWRM) and Adaptive management (AM) of watersheds; eTEAL experience**

- ✓ Water management paradigms and shifts
- ✓ eTEAL applied learning experience

**WEEK 14: (Nov. 17<sup>th</sup>-19<sup>th</sup>) Work on your final projects and publishable deliverable**

**WEEK 15: (Nov. 24<sup>th</sup>; no class Nov. 26<sup>th</sup>) Project work on Monday and Course Summary**

- ✓ FINAL REVIEW

**WEEK 16: (Dec. 1<sup>st</sup> and 3<sup>rd</sup>): Team Presentations**

**FINAL EXAM!** Wed., December 10<sup>th</sup>, 2014 from 3 to 6 PM.

**OTHER IMPORTANT COURSE NOTES:**

1. This course is an **applied learning experience** and thus part of the *ETEAL* program on UNCW's campus —*Experiencing Transformational Education through Applied Learning*. You will receive more information in class about the nature of the applied learning experience. One or more assignments/assessments for this course have been chosen for the purpose of assessing ETEAL. The assignment/assessment will be graded by your instructor as explained in the syllabus. Separate scoring of the assignment/assessment for the purposes of ETEAL assessment **WILL NOT** affect your grade in the course, or any other course work at UNCW. It will, however, help the university to identify potential ways to improve student learning in applied learning experiences. If your work is turned in electronically, we will remove all identifying information before it is read and scored. If a paper copy of your work is turned in, please do not put your name on your work. This cover sheet will be separated from your work before scoring, so confidentially will be maintained during the scoring and tabulation processes.
2. It is the policy of University of North Carolina at Wilmington that discrimination on the basis of race, color, religion, sex, sexual orientation, national origin, age, marital status or disability shall be prohibited. Neither will the University tolerate sexual misconduct or sexual harassment by students, faculty, or staff. If you feel the University policies regarding affirmative action or sexual misconduct have been violated, you are encouraged to contact the Dean of Student Affairs Office.
3. **Special considerations and Writing Support:** Students requiring special accommodations should contact the Office of Disability Services in Westside Hall (962-7555), or at <http://www.uncw.edu/stuaff/disability/>. All of the assignments will be worked on outside of class, so I don't foresee any need for special accommodations but if you need some help let me know and I will work with you. The **Writing Services** at the University Learning Center offers three ways to help with your writing: one-on-one appointments, online submissions, and a drop-in Writing Lab. Please make full use of this invaluable resource to ensure your written submissions to this class are of the highest quality.
4. **Plagiarism/cheating will not be tolerated.** In the first instance, a "zero" grade for the plagiarized work will be recorded. A subsequent instance will result in dismissal from the class and may result in further actions on the part of UNCW.