

# Wetlands (Bio 471/571)

## Fall 2022



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### Instructor info:



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Ph: 610-436-2396

Office hours by appointment:

Mon 8:30-10 am, Wed 4-5:30 pm &  
 Thu 10 am-noon;  
 on Zoom or in person (SSN 380)

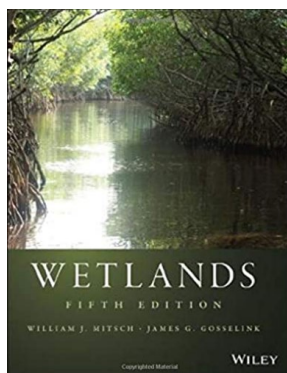
### At-a-glance Lecture: Mon & Wed 11-11:50 (SSN 192), Lab: Wed 1-3:50 (SSN 381)

#### Broad topics:

- Wetland types, distribution, and ecology
- Wetland function and ecosystem services
- Degradation of wetlands
- Restoration, construction, and conservation of wetlands

#### Textbook:

Wetlands by William J. Mitsch and James G. Gosselink



Earlier editions are also okay!  
 Please talk to the instructor if cost is an issue; I can steer you toward low-cost or free options!

#### Assessment:

You will earn your grade in this course based on a combination of:

- Written responses about readings, field visits, and lab activities
- Take-home exams with opportunity for corrections
- Wetland case study (group project)
- Preparation and participation

See "Grading breakdown" on pages 4-5 for more information

## Course description and learning outcomes

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This course will deepen your knowledge of freshwaters, integrating the physical, chemical, biological, and social aspects of these unique and important ecosystems.

Students who engage with the course material will be able to:

- Define and identify different types of wetlands and their boundaries
- Explain physical, chemical, and biological components of wetlands and how they contribute to ecosystem services
- Understand and evaluate how historical and current pressures and disturbances that affect wetlands
- Explain and analyze how US laws define and affect wetlands

This course will also deepen skills and knowledge that are transferable beyond ecology. Specifically, students will be able to:

- Visualize data and recognize and describe patterns in the data
- Find and understand relevant and appropriate scientific evidence

Over the semester, the course will follow the following broad arc: 1) Wetland types, distribution, and ecology, 2) Wetland function and ecosystem services, 3) Degradation of wetlands, and 4) Restoration, construction, and conservation of wetlands. In addition to fieldwork, you will be asked to collect, interpret, visualize, and analyze data to build knowledge. Data literacy is important in and beyond ecology and environmental science, and we will practice and deepen these skills in the context of wetlands. Because of ongoing and difficult positions that wetlands occupy within the legal and regulatory framework in the US, we'll also expand our scope to analyze legal definitions of Waters of the United States and how they affect wetlands. In this course, we will rely on diverse viewpoints from a variety of readings and resources, the instructor, and one another. As your instructor, I have put a great deal of thought into the course design and I strive to lead the course using evidence-based techniques and principles. If it is not clear why or how we are doing something, please always feel free to ask!

## Norms, values, and expectations

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In this class, we will be working together to achieve the learning goals described above. We need to collaborate to create a classroom community in which all of us feel safe to learn and share knowledge.

Each of us learn differently. If there are aspects of this course that prevent you from learning or exclude you, please let me know as soon as possible. Together we'll develop strategies to meet both your needs and the requirements of the course.

People of all ethnicities, genders, religions, ages, sexual orientations, disability statuses, socioeconomic backgrounds, immigration statuses, regions, and nationalities are welcomed and safe here.

### What you can expect from me

- Respect
- Constructive feedback on your work
  - You can expect the feedback I give you to help you learn how you can improve your work.
- Timely answers and feedback
  - You can expect a response to your email within one business day.
  - You can expect feedback on work submitted on or before the deadline within one week of the posted deadline.
- Reasonable accommodations
  - Life happens. If you are experiencing a major life disruption, please let the instructor know as soon as you can. We will work together to come up with modifications and accommodations.
  - If you have a disability that requires accommodations, please contact the instructor as early as you can so that I can support your success.
  - For more information, please see the policy section that begins on pg 6.
- Connection to the tools and resources you need
  - One of my roles as instructor is to curate and provide you what you need to learn and be successful.

### What I expect of you

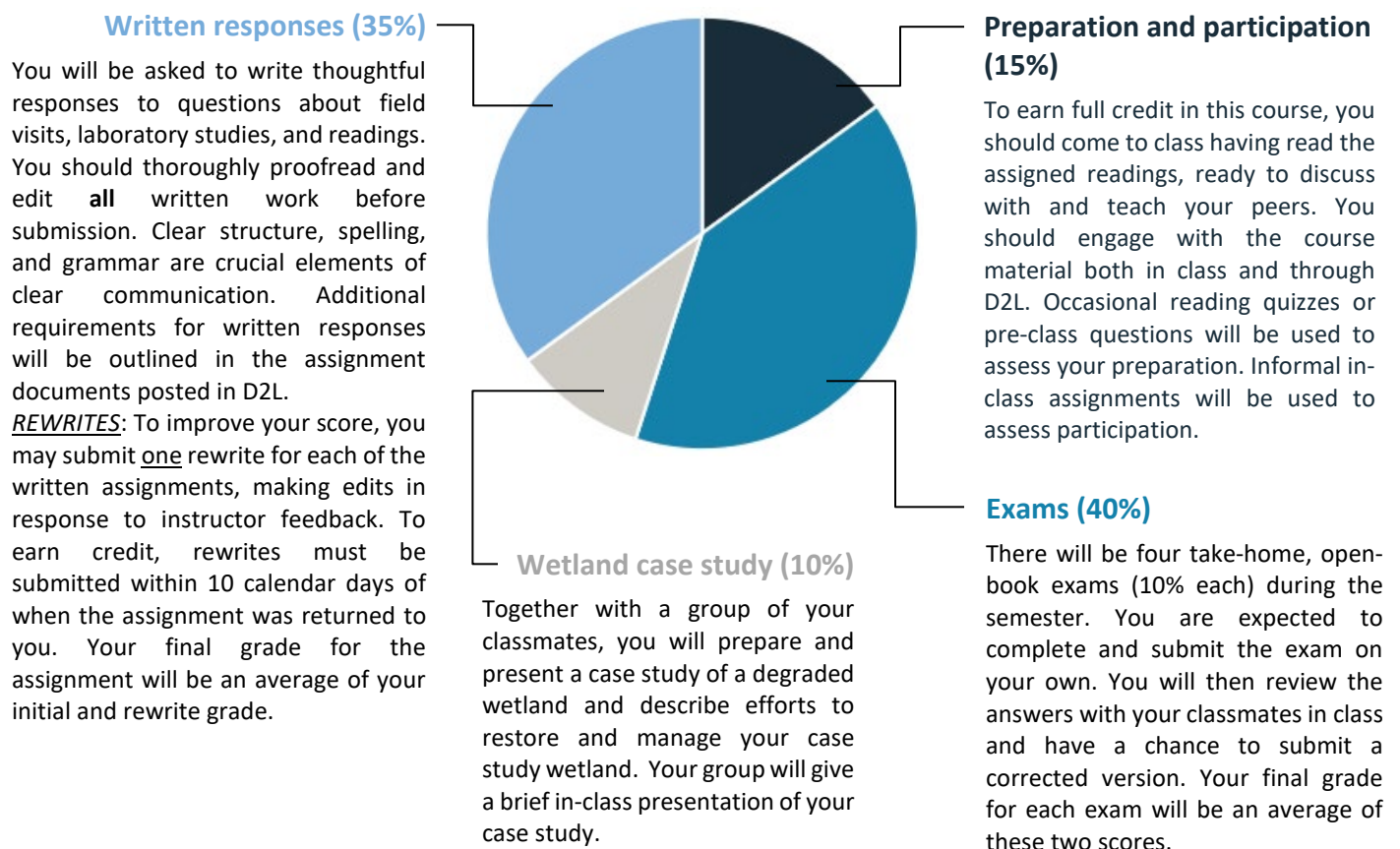
- Respect
- Academic integrity
  - Engaging in your work with integrity is vital to your success in this course and in your future. If you cheat, you rob yourself of the opportunity to learn skills and knowledge designed to help you in your coursework and future career.
  - For more information, please see the policy section that begins on pg 6.

- Attendance, preparation, and engagement in class
  - Science is a team endeavor. Not only does your own success depend on you being prepared and engaged, your classmates will rely on you to work with and teach them.
  - If you cannot attend class because of a religious observance or university event, please contact the instructor as soon as possible so we can work together to find a fair alternative. If you have a full schedule of such events, please submit it at the beginning of the semester. If you miss class for whatever reason, remember that you are responsible for meeting the academic requirements of the course.
- Communication
  - I expect you to take an active role in your own learning. Part of this requires you to communicate with me about concerns or problems you have. There are a variety of ways to contact the instructor (email, office hours, phone, after class). Please take advantage of them.

## Grading breakdown

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You will earn your grade in this course based on the following deliverables. Additional information and guidance will be provided for each.



More information on each of these parts of the grade will be available in D2L. Because of the flexible grading policies and opportunities for formative feedback detailed above, extra credit will not be offered in this course.

**Graduate students** have an additional responsibility to successfully complete the course. Twice during the semester, graduate students will choose a paper that touches on one of the topics from class, prepare an annotated version for their fellow students, and lead a discussion or activity about that paper in class.

Because of this additional requirement, the grading breakdown is slightly different for graduate students: Paper discussions/activities (10%), Wetland case study (10%), Exams (36%), Written responses (30%), Preparation and participation (14%).

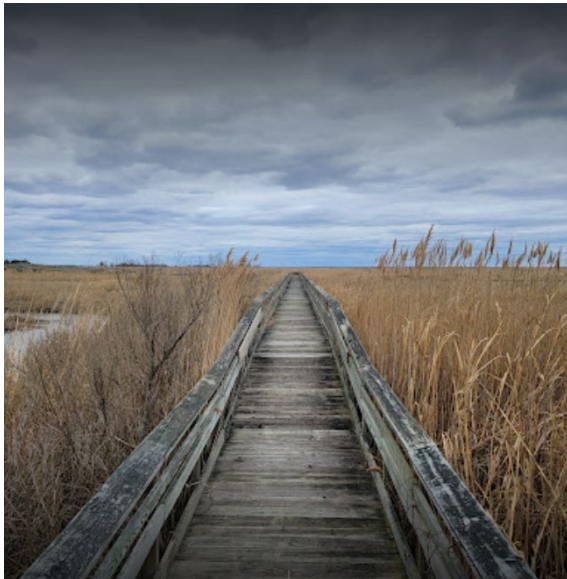
## Field labs

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During the semester, we will have several labs outdoors. These are denoted by a double star (\*\*) and **bold text** on the course schedule (pages 10-11). For field labs, we will take a shuttle to the location of the lab – meet in our normal lab classroom.

For your safety in the field, please dress appropriately for the weather. The instructor will bring waterproof boots for you to wear while conducting fieldwork. It is suggested that you wear long pants, even when it's hot. Bring water to drink and consider bringing a snack. If you are allergic to stings from bees or wasps, please bring your EpiPen and alert the instructor. Ticks are common in our area and can transmit diseases to humans – when you return home from the field, please check yourself for ticks.

Be alert and follow instructions to keep yourself and your classmates safe.



*Photos of some of the wetlands we will visit as part of this course, the Delaware Estuary (left) and one of the riparian wetlands in the Gordon Natural Area (right).*

## Policies

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### Safety

The safety, health, and well-being of our colleagues and neighbors are our primary concern. We must work together with respect, responsibility, and care for one another mitigate risks to ourselves and those around us.

As part of this course, you will conduct fieldwork. **Dress appropriately for the weather, bring water/snacks, and stay with the group** (see Field Labs section of previous page for additional details). Your instructor will provide high-visibility vests and ask you to wear them when you are working in the field.

There are also risks associated with the ongoing global COVID-19 and monkeypox pandemics. You are likely aware that masks are now optional on campus. If you have not done so, you are strongly encouraged to get vaccinated against COVID-19. Vaccines are widely available without an appointment. More information about the vaccine can be found here: <https://www.chesco.org/4822/COVID19Vaccine>

### Attendance

I recognize that medical and mental health needs may sometimes prevent you from attending class. Please do not attend class or other on-campus events in person if you are ill. Instead, email me about your absence as soon as you are able so that we can find appropriate arrangements for you to meet the expectations (e.g., remote participation or an alternative assignment). However, please note participation in group discussions and active learning activities are important aspects of this course, so it is expected you will attend if you are healthy and able.

We have one Saturday field trip in this course on Saturday, October 22nd. Please do your best to attend this field trip since it will be our only opportunity to see coastal wetlands in person. **If you are not able to attend on Oct. 22, let the instructor know by Wednesday, Oct. 19 to receive an alternate assignment.**

### Due dates

The due dates for written work listed in the course schedule below are designed to keep you on track and ensure the instructor will be able to provide feedback. I recognize that things come up and you may not always be able to submit work on time. You may submit any written assignment up to 72 hours (3 days) after the listed due date, no questions asked. After this grace period, 10% of the potential score will be deducted per day, such that assignments more than 13 days late will receive a score of 0. Additional extensions may be granted on a case by case basis, but only if you **communicate with me before the due date**. This policy does not apply participation activities or assignments, which must be completed on the listed due date.

## Statements common to all WCU syllabi

### Academic & personal integrity

It is the responsibility of each student to adhere to the university's standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work, that involves misrepresentation of your own work, or that disrupts the instruction of the course. Violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another's work and/or using ideas of another and presenting them as one's own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Integrity at West Chester University of PA, students are encouraged to refer to the [Department Undergraduate Handbook](#), the [Undergraduate Catalog](#), the [Ram's Eye View](#), and the University website at [www.wcupa.edu](http://www.wcupa.edu).

### Students with disabilities

If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University's Services for Students with Disabilities (OSSD), please visit them at 223 Lawrence Center. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is [ossd@wcupa.edu](mailto:ossd@wcupa.edu), and their website is at <https://www.wcupa.edu/universityCollege/ossd/>. In an effort to assist students who either receive or may believe they are entitled to receive accommodations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, the University has appointed a student advocate to be a contact for students who have questions regarding the provision of their accommodations or their right to accommodations. The advocate will assist any student who may have questions regarding these rights. The Director for Equity and Compliance/Title IX Coordinator has been designated in this role. Students who need assistance with their rights to accommodations should contact them at 610-436-2433.

### University excused absences policy

Students are advised to carefully read and comply with the excused absences policy, including absences for university-sanctioned events, contained in the WCU Undergraduate Catalog. In particular, please note that the "responsibility for meeting academic requirements rests with the student," that this policy does not excuse students from completing required academic work, and that professors can require a "fair alternative" to attendance on those days that students must be absent from class in order to participate in a University-Sanctioned Event.

### Reporting incidents of sexual violence

West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to comply with the requirements of Title IX of the Education Amendments of 1972 and the University's commitment to offering supportive measures in accordance with the new regulations issued under Title IX, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University Protection of Minors Policy. Information regarding the reporting of sexual

violence and the resources that are available to victims of sexual violence is set forth at:  
<https://www.wcupa.edu/admin/diversityEquityInclusion/sexualMisconduct/default.aspx>

### **Inclusive learning environment & anti-racist statement**

Diversity, equity, and inclusion are central to West Chester University's mission as reflected in our Mission Statement, Values Statement, Vision Statement and Strategic Plan: Pathways to Student Success. We disavow racism and all actions that silence, threaten, or degrade historically marginalized groups in the U.S. We acknowledge that all members of this learning community may experience harm stemming from forms of oppression including but not limited to classism, ableism, heterosexism, sexism, Islamophobia, anti-Semitism, and xenophobia, and recognize that these forms of oppression are compounded by racism.

Our core commitment as an institution of higher education shapes our expectation for behavior within this learning community, which represents diverse individual beliefs, backgrounds, and experiences. Courteous and respectful behavior, interactions, and responses are expected from all members of the University. We must work together to make this a safe and productive learning environment for everyone. Part of this work is recognizing how race and other aspects of who we are shape our beliefs and our experiences as individuals. It is not enough to condemn acts of racism. For real, sustainable change, we must stand together as a diverse coalition against racism and oppression of any form, anywhere, at any time.

Resources for education and action are available through WCU's Office for Diversity, Equity, and Inclusion (ODEI), DEI committees within departments or colleges, the student ombudsperson, and centers on campus committed to doing this work (e.g., Dowdy Multicultural Center, Center for Women and Gender Equity, and the Center for Trans and Queer Advocacy).

Guidance on how to report incidents of discrimination and harassment is available at the University's Office of Diversity, Equity and Inclusion.

### **Emergency preparedness**

All students are encouraged to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information, visit [www.wcupa.edu/wcualert](http://www.wcupa.edu/wcualert). To report an emergency, call the Department of Public Safety at 610-436-3311.

### **Email policy**

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.



## Resources

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WCU has resources available to help you be happy, healthy, and successful.



If you or someone you know has been a victim of sexual misconduct, there are [several resources available](#) to help.



If you are struggling with mental health, there are confidential [counseling and psychological services](#) available.



[Student Health Services](#) are available for a wide range of clinical care, with in-person and telehealth appointments.



The [Office of Services for Students with Disabilities](#) can help provide resources to ensure equity and accessibility in the classroom, housing, etc.



The [Learning Assistance & Resource Center](#) provides tutoring, coaching, workshops, and other resources to help you achieve academic success.



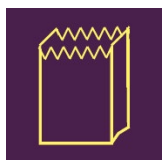
WCU's [Writing Center](#) can help you with writing, editing, and using citations in your written work.



The [WCU student Ombuds](#) can help you make informed decisions and handle conflicts in a variety of issues and concerns.



The [Center for Trans and Queer Advocacy](#) is here to make WCU a place where people with trans and queer identities are safe and supported.



For students facing financial difficulties, [the Resource Pantry](#) helps provide food, clothing, school supplies, and other resources.



The [Dowdy Multicultural Center](#) provides a safe space for and promotes the success of Students of Color.



Find additional resources in the [Rams' Guide to Success](#)

## Course schedule

This schedule is a living document and will be updated throughout the semester – the most up-to-date version will be posted on D2L and you will be notified of updates. If you have any questions or confusion, please contact the instructor!

Assigned readings from the textbook are denoted by “M+G”. For the first several weeks, scanned versions of textbook readings will be posted in D2L. Reading assignments that are not from the textbook will also be posted in D2L.

Unless otherwise noted, you should complete readings and submit assignments before the start of class on the date that they are listed.

Major Theme	Date	Lecture topic	Assignments and readings	Lab activity (** = field lab)
Wetland types, distribution, and ecology	Monday 29-Aug-22	Course overview and introduction	Everyone: -Read syllabus  -Syllabus quiz (in class)	
	Wednesday 31-Aug-22	What defines a wetland?	Everyone: -Read M+G Chp 2	<i>No lab in the first week of class</i>
	Monday 5-Sep-22	<i>No class - Labor Day</i>		
	Wednesday 7-Sep-22	Wetland characteristics part 1	Everyone: -Read M+G Chp 4	National Wetlands Inventory and wetland classification
	Monday 12-Sep-22	Wetland characteristics part 2	Everyone: -Read M+G Chp 5 & Chp 7 (stop at “Wetland succession”)	
	Wednesday 14-Sep-22	Wetland types and ecohydrology	Everyone: -Read annotated version of Åhlén et al.  -Submit Lab 1 write up	<b>Wetland walk – GNA**</b>
	Monday 19-Sep-22	In class review of exam 1	Everyone: -complete Exam 1 on D2L	
	Wednesday 21-Sep-22	World wetland tour	Everyone: -prepare and add your 2 slides to the world wetland tour slideshow (present in class)  -Submit Lab 2 worksheets	Winogradsky columns - set up

Wetland function and ecosystem services	Monday 26-Sep-22	Chemical ecology and biogeochemistry	Everyone: -Read M+G Chp 6  -Submit any changes for Exam 1	
	Wednesday 28-Sep-22	Wetlands ecosystem services part 1	Everyone: -read M+G Chp 16  <i>Grad students:</i> -submit link to annotated papers	<b>Wetland delineation in GNA**</b>
	Monday 3-Oct-22	Wetlands ecosystem services part 2	Everyone: -read annotated version of Pal and Debanshi 2022	
	Wednesday 5-Oct-22	Grad student paper discussion/activity	Everyone: -Read grad student annotated papers  -Submit wetland delineation write up	Data nugget 1
	Monday 10-Oct-22	Mid-semester check in	Everyone: -Complete midterm review survey and written responses	
	Wednesday 12-Oct-22	In class review of Exam 2	Everyone: -complete Exam 2 on D2L  -Submit Data nugget 1 write up  -Submit reflections on grad discussion	No lab (potential make up day)
	Monday 17-Oct-22	<i>No class – Fall break</i>		
Degradation of wetlands	Wednesday 19-Oct-22	Wetlands in history	Everyone: -Read “History of Wetlands...” doc in D2L  -Submit any changes for Exam 2	<b>Constructed wetland visit at Stroud**</b>
	<b>SATURDAY 22-Oct-22</b>	<b>Delaware estuary field trip**</b> (meet in SSN 381 at 9 am) <i>(if you cannot attend this field trip, notify the instructor by Wednesday, October 19th to receive an alternate assignment)</i>		

	Monday 24-Oct-22	CWA and “no net loss”	Everyone: -read M+G Chp 15	
	Wednesday 26-Oct-22	WOTUS today	Everyone: -read three resources posted in D2L	Data nugget 2
	Monday 31-Oct-22	Disturbance ecology	Nothing to prepare or submit today!	
	Wednesday 2-Nov-22	Hydrologic modification of wetlands	Everyone: -read selection from M+G Chp 14  -Submit Data Nugget 2 write-up	Exploring hydrologic modification of wetlands
	Monday 7-Nov-22	Climate change and sea level rise (guest lecture: Dr. Emily Ury)	Nothing to prepare or submit today!	
	Wednesday 9-Nov-22	Chemical modification	Everyone: -read and contribute annotations for Galloway et al. 2008 and Anderson et al. 2022	Case study part 1
	Monday 14-Nov-22	Invasive species	Everyone: -Zedler and Kercher 2004  -Submit Delaware Estuary write-up or make-up	
	Wednesday 16-Nov-22	In class review of exam 3	Everyone: -complete Exam 3 on D2L	Case study part 2
Construction, restoration, and conservation of wetlands	Monday 21-Nov-22	<i>No class today, but make sure you still submit stuff!</i>	Everyone: -submit any changes for Exam 3  -Submit WOTUS & CWA reflection	
	Wednesday 23-Nov-22	<i>No class – Thanksgiving break</i>		

Monday 28-Nov-22	Wetland management and conservation	Everyone: -read selection from M+G Chp 14  <i>Grad students:</i> -submit link to annotated papers	
Wednesday 30-Nov-22	Wetland restoration	Everyone: -read M+G Chp 18, part 1	Winogradsky columns – final observations
Monday 5-Dec-22	Grad student paper discussion/activity	Everyone: -read grad student annotated papers	
Wednesday 7-Dec-22	Constructed wetlands – mitigation banking and treatment	Everyone: -read M+G Chp 18, part 2  -submit Winogradsky columns write-up	Case study part 3
Monday 12-Dec-22	In class review of Exam 4	Everyone: -complete Exam 4 on D2L +  -Submit reflections on grad discussion	

\*submit any changes for Exam 4 by 11 am on 17-Dec-22