

Biogeochemistry of Global Change
BIOL-UA 66 or ENVST-UA 370
Instructor Dr. Anna Paltseva
Monday and Wednesday
2:00 to 3:15 pm
25W4 Room: C-3

Dr. Paltseva's Contact Information:

Office: 285 Mercer st., #902

Mailbox: Environmental Studies Dept., 285 Mercer st.

Email: ap198@nyu.edu

Office Hours: Monday 3:30-4:30.

Course description: Biogeochemistry is the study of biological controls on the chemistry of the environment and geochemical regulation of ecological structure and function. This course will introduce the fundamental principles of biogeochemistry. Additionally, we will utilize the scientific literature from peer-reviewed journals to explore specific case studies on the global change of biogeochemistry (e.g., acid precipitation, nitrogen deposition, eutrophication of the oceans, etc.) from the field of biogeochemistry.

Course goals: In addition to the learning the fundamentals of biogeochemistry, the goals of this course include:

- Critically reading scientific literature
- Leading a discussion of a scientific paper
- Develop research and presentation skills

Prerequisites:

Principles of Biology II or Environmental Systems Science

Grades: The final grade for the class will be calculated as follows:

Midterm -	25%
Final -	30%
Discussion -	10%
Annotated Bibliography -	15%
Presentation -	10%
Participation -	10%

Exams: An **unexcused** absence from an exam will be calculated as 0% for that particular test!

If you miss an exam and present a legitimate excuse, a make-up test will be made available to you. There will be only one opportunity for such an exam; it could be an essay test, and the appropriate instructors will grade it. This situation will be dealt with partly on an individual basis.

Academic Integrity: Students are expected to know and understand the policies on academic integrity, including University and CAS policies: <https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/academic-integrity-for-students-at-nyu.html> ; <https://cas.nyu.edu/content/nyu-as/cas/academic-integrity.html>.

If a student is caught cheating or plagiarizing, the Instructor may, at her or his discretion, give the student an academic sanction, which may include a warning and/or reduction of the grade on an assessment item (e.g. exam) or even the final course grade (in consultation with the Director of Undergraduate Studies, who may meet with the faculty and the student to discuss the nature of the offense). Depending on the severity of the infraction, this could even mean failure of the student in the course. The student may appeal any grade reduction to the Director of Undergraduate Studies. The departmental decision is final. In addition, any substantial case brought to the Director of Undergraduate Studies must be referred to the Dean's office for possible disciplinary action.

If you have any questions or uncertainties about these policies, please consult the Instructor, Director of Undergraduate Studies, or Dean's office.

Disability Disclosure Statement: Academic accommodations are available to any student with a chronic, psychological, visual, mobility, learning disability, or who is deaf or hard of hearing. Students should please register with the Moses Center for Students with Disabilities at [212-998-4980](tel:212-998-4980).

Required Texts and Readings: Schlesinger, W.H. and E.S. Bernhardt (2013) *Biogeochemistry: An analysis of global change, 3rd edition*. Academic Press, New York, NY. 672 pp

Downloadable from science direct: <http://www.sciencedirect.com/science/book/9780123858740>

Class schedule:

	Discussion Topics	Readings (to be completed before class)
Week 1 <i>Jan 27, 29</i>	Monday: Course Introduction and Introduction to Biogeochemistry Wednesday: The Global Water and Carbon Cycle	Schlesinger and Bernhardt, Chapter 1 Schlesinger and Bernhardt, 10 and 11
Week 2 <i>Feb 3, 5</i>	Monday: Global Cycles of N and P Wednesday: Sea level rise and ice sheets discussion	Schlesinger and Bernhardt, Chapter 12 Rignot et al. 2018 Wright et al. 2019

Week 3 <i>Feb. 10, 12</i>	Monday: Origins Wednesday: Human impacts of N cycle discussion	Schlesinger and Bernhardt, Chapter 2 Lassaletta et al. 2014 Shibata et al. 2017
Week 4 <i>Feb 17, 19</i>	Monday: No Class President's Day Wednesday: Lithosphere	Schlesinger and Bernhardt, Chapter 4
Week 5 <i>Feb 24, 26</i>	Monday: The Atmosphere Wednesday: Conservation Agriculture and Carbon	Schlesinger and Bernhardt, Chapter 3 Lal 2015 Kushwa et al. 2016 *1/2 Bibliography due 2/26
Week 6 <i>March 2, 4</i>	Monday: The Biosphere: The Carbon Cycle of Terrestrial Ecosystems Wednesday: Ozone hole recovery	Schlesinger and Bernhardt, Chapter 5 Solomon et al. 2016 Chipperfield et al. 2015
Week 7 <i>March 9, 11</i>	Monday: Midterm Wednesday: The Biosphere: Biogeochemical Cycling on Land	Schlesinger and Bernhardt, Chapter 6
Week 8 <i>March 16, 18</i>	Spring Break	

Week 9 <i>March 23, 25</i>	Monday: Wetlands Wednesday: Face experiments discussion	Schlesinger and Bernhardt, Chapters 7 Norby et al. 2010 Ainsworth and McGrath 2010 *Full Bibliography due 3/25
Week 10 <i>March 30, April 1</i>	Monday: Inland Waters Wednesday: Methane discussion	Schlesinger and Bernhardt, Chapter 8 Garnier et al. 2013 Kirschke et al. 2013
Week 11 <i>April 6, 8</i>	Monday: Oceans Wednesday: Dead zones discussion	Schlesinger and Bernhardt, Chapter 10 Diaz and Rosenberg 2011 Carstensen et al. 2014
Week 12 <i>April 13, 15</i>	Monday: Lead and arsenic contamination in NYC urban garden soils Wednesday: Pharmaceuticals in wastewater discussion	Paltseva & Cheng, 2019 Paltseva et al. 2020 Padhye et al. 2014 Schaider et al. 2014
Week 13 <i>April 20, 22</i>	Monday: Metals in urban agriculture discussion Wednesday: Lead discussion	Antisari et al. 2015 Säumel et al. 2012 Pieper et al. 2017 Kim et al. 2011
Week 14 <i>April 27, 29</i>	Monday: Presentations Wednesday: Presentations	*Annotated Bibliography Due 4/27
Week 15 <i>May 4, 6</i>	Monday: Presentations Wednesday: Presentations	
Week 16 <i>May 11</i>	Monday: Final Exam	

