

Biol. 463
Global Ecology
Fall 2024
Exam II

Readings & associated study questions

Broecker 1997
West et al. 2006

Melillo et al. 1993

Textbook chapters

Chapters 4, 5, 9 (pages 176-182)

Web sites & associated study questions

None

Lecture materials from hydrosphere through the biosphere (inclusive)

Handouts available as PDF & PowerPoint files on class web site.

Lecture recordings 9-24 available in shared Google Drive folder

Items of special note (not a comprehensive list):

Hydrologic cycle	Importance of transpiration
Paired watershed experiments	Mean residence time & characteristic response time (including the math)
Structure & circulation of the ocean	Net reactions for photosynthesis & aerobic respiration
Links between climate and ocean structure & circulation	Productivity terms and estimation methods
Atmospheric circulation patterns and mechanisms	Spatial patterns in NPP
Atmospheric reactions creating tropospheric ozone (and how hydrocarbons (VOCs) can contribute)	Spatial and temporal patterns in NPP, True Increment, and NEP
Atmospheric reactions that create acid precipitation	Decomposition and litter quality
Types, sources, and roles of aerosols	NPP in the Ocean

Useful terms to know (not a comprehensive list):

Transpiration	Heterosphere	C ₃ Plants
Evapotranspiration	Trace gases	A ₀ Curve
Stomates & guard cells	Aerosols	Net photosynthesis
Net precipitation	Deflation weathering	Light compensation point
Dynamic equilibrium	Sulfate aerosols	Gross Primary Productivity
Mean residence time	Condensation nuclei	Net Primary Productivity
Characteristic response time	High Nutrient, Low Chlorophyll (HNLC) regions	True Increment
Watershed	NO _x	Net Ecosystem Productivity
Thermal stratification	Hydroxyl radical	Net Biome Productivity
Thermocline	Homogeneous reactions	NDVI
Sea spray salts	Ozone	Q ₁₀
Gyres	Acid deposition	Mean-Value Method
Coriolis Effect	Thermal meridional circulation (Hadley cells)	Process-based Model
Ekman Drift	Cyclone	Regression-based Model
Thermohaline circulation	Anticyclone	Light Use Efficiency (LUE)
Atlantic meridional overturning circulation	Geostrophic	Leaf Area Index (LIA)
Downwelling	Adiabatic cooling/warming	Solar Induced Fluorescence (SIF)
Upwelling	Biome	Fluorescence Yield
Atmospheric pressure	RUBISCO	Litter Quality
Troposphere	Light Dependent Reactions	
Stratosphere	Light Independent Reactions	

Exam time, location, & structure

Time of the exam: March 20th; 6:30-8:30 PM

Location: In person in 3306 LSB

Structure of exam: The exam will consist of three parts: answer 4 out of 5 term explanations (10 pts each); answer 3 out of 4 multiple choice (5 pts each); and answer 3 out of 4 in depth questions (15 pts each).

No questions will be from the homework problem sets.

No questions will be from material covered only in textbook, but the textbook should reinforce/clarify information in lectures and other readings.

Detailed answers expected for term explanations & in-depth questions!

This is a **closed book exam**, meaning that **no outside sources of information are to be used during the exam (books, internet, notes, other people, etc.)**.