



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9/3 Week 1 Intro to Ecosystems Science Noon: Picnic Welcome & Orientation 14:30 Starr 209 (classroom) Pick up books, lab, field gear	9/4 8:30 Starr 209 Intro to Core Course 08:45-10:00 Giblin Earth as an Ecosystem: 4 Billion years of Biogeochemistry 10:30-17:00 Lb 207 Neill Field Day: Forest Biomass 19:30 (Starr 209) Bonnie Kwiatkowski - Computer Orientation & Problem Solving	9/5 8:30-10:00 Melillo How Humans are Altering the Earth as an Ecosystem: The Global Carbon Cycle 10:15-noon Elective 13:30-17:00, Lb 207 Security Orientation Neill Lab Forest Biomass Analysis, leaf area measurements, etc.	9/6 8:30-10:00 Cardon Ecosystem Concept: Energetic and Stoichiometric Perspectives Physical Forcing: Climate, Micro-climate and Energy Balance 10:30-17:00 Foreman Lb 207 Field Day; Aquatic Biomass Lab By 17:00 Return Field Trip selection form to SES office	9/7 8:30 Cardon The Fates of Energy: Water Cycling, Photosynthesis 10:15-noon Elective Lunch – Foreman Project Discussion 13:30-17:00 Foreman Lb 207 Aquatic Lab Biomass Analysis	9/8 8:30-12:00 Neill Foreman Biomass calculation discussion & initial synthesis. Students introduced to Center staff at Donuts. 13:30-15:00 Liles Science Journalism (Starr 209) 15:00-16:00 Library/IT Orientation 16:00-17:00 Chemical /Radiation Safety (Starr 209)	9/9 WHALE WATCH (SAT OR SUNDAY)  Depart SWOPE 09:00 for Provincetown, noon cruise return for dinner
9/10 Week 2 Ecosystem Primary Production	9/11 08:00 Wk 1 Biomass problem set due 08:30 Cardon Photosynthesis and Primary Production on Land 10:30-17:00 Heskell Field Day: Leaf level CO ₂ flux measurements from forest & Grassland sites	9/12 08:30 Cardon Ecosystem & Net Primary Production at Regional to Global Scales 10:15-noon Elective 13:30-17:00 Heskell Lab: NPP from tree cores; leaf areas and data work up	9/13 08:30-10:00 Shaver Disturbance, Environmental Variation and Feedbacks– Controls on Carbon Balances 10:30 McHorney / Foreman Terrestrial Field Day; FWTP <i>Tour & Orientation</i> Pack Wk 1 CN filters	9/14 08:30-Foreman Aquatic Primary Production 10:15-noon Elective 13:30-17:00 Heskell <i>Data work-up; Forest NPP & GPP</i> Return Wk 1 Prob Set	9/15 08:30-noon Neill/Foreman (Starr 209) Student-led Presentations: Terrestrial & Aquatic Primary Producer Biomass DSS 15:00-16:30 – Dr. Heidi Sosik WHOI (Lillie Auditorium)	9/16
9/17 Week 3 Fate of Organic Matter Produced on Land and Water 	9/18 08:00 Terrestrial Primary Prod. Prob. Set due 0800-noon Lb 208 Foreman Aquatic Lab / Field Day Primary production. Collect incubate & fix initial water samples Extract Chl a; Run CN filters from Week 1 biomass Lab	9/19 08:30-10:00 Gribble Harmful Algal Blooms & use of Molecular Methods in Phytoplankton Ecology 10:15-noon Elective 13:30 Foreman Aquatic Primary Production Lab. Measure ΔO ₂ in BOD bottles; Chl a in carboy H ₂ O; Start calculations	9/20 08:30 Melillo Litter Decomposition & Fate of Organic Matter on Land. 10:30 – noon Liles Science Journalism Foreman Primary Production Lab Calculate daily rates of GPP, R, NCP; Scale to pond / bay. Finish data work-up.	9/21 08:30 Giblin Decomposition, Aerobic / Anaerobic Respiration, Redox Chemistry. 10:15-noon Elective 13:30 Lab work-up Data: Complete calculations & prepare presentations Aquatic Primary Production	9/22 08:30-noon Heskell / Foreman (Starr 209) Students present & discuss results of Primary Production Lab, contrast P/B on Land and Water 14:30 Depart for Plum Island Field Trip (overnight PIE field station)	9/23 PIE FIELD TRIP (OPTIONAL) <i>Return Saturday mid-afternoon</i>
9/24 Week 4 Fate of Organic Matter in Ecosystems & Secondary Production	9/25 0800 Aquatic Primary Prod. Lab Report due 8:30-10:00 Deegan Secondary Production Ecological Efficiency. 10:30-17:00 Deegan/Roberson Field Day Trophic / Community Structure in Aquatic Systems: collect Biota West Falmouth Harbor, Waquoit, Johns Pond	9/26 08:30 Deegan Use of Isotopes to Study Ecosystems. 10:15-noon Elective 13:30-17:00 Deegan/Roberson Lab Day Sorting, identifying & counting organisms from Aquatic Sites	9/27 08:30 Hobbie Plant-Microbe Interactions and Decomposer Organisms 10:15-noon Elective 13:30-17:00 Deegan/Roberson Lab Day Finish sorting, ID and faunal counts; begin calculations.	9/28 08:30-Tang Energy Balance and Soil Respiration in Terrestrial Systems 13:30 Deegan Lab -Prepare isotope samples, complete trophic pyramids of numbers, biomass, and production.	9/29 8:30-noon Deegan/Roberson Student-led discussion Secondary Production and Trophic Pyramids. Synthesis of data on food webs; choose samples for Isotope Analysis 13:30 SES Class Photo DSS 15:00-16:30 – Dr. Shahid Naeem Columbia University (Speck Auditorium)	9/30

SES PROGRAM CALENDAR – OCTOBER 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
10/1	10/2	10/3	10/4	10/5	10/6	10/7
Week 5 Ecosystem Stoichiometry and Biogeochemistry	08:00 Lab Rpt Due Trophic Pyramids 08:30-10:00 Giblin The Nitrogen Cycle 10:30-17:00 Tang Terrestrial. Field Day – Soil pits and profiles, soil respiration,	08:30 Giblin The Phosphorus Cycle 10:15-noon Elective 13:30-17:00 Tang Terrestrial. Lab - Prepare soil for C/N, pack wood and foliage, extract soils for estimate of N-mineralization	08:30 Giblin Ecosystem Stoichiometry 10:30-17:00 Giblin Aquatic Field Day Collect W. Falmouth Harbor & Waquoit Bay sediment cores; Siders Pond / Johns Pond water column profiling. Distribute Midterm Study Questions	08:30 Conte Decomposition and Fate of Organic Matter in the Sea 10:15-noon Elective 13:30 Giblin Aquatic Lab Day Core incubations. Analyze Pond samples. Prepare sediments & soils for C/N analysis	08:00 –12:00 McHorney/ Giblin Lab Analysis of nutrients (NO ₃ , NH ₄ , PO ₄) in samples of water and soils (KCL) extracts 13:30 –15:00 Complete nutrient lab analysis/workup	
10/8	10/9	10/10	10/11	10/12	10/13	10/14
Week 6 Nitrogen and Phosphorus Cycling & Budgets	DAY OFF COLUMBUS DAY 	8:30 Giblin Acid Deposition, Ion Exchange & Charge Balance 10:15-noon Elective 13:30–17:00 Foreman/ Tang LAB: Run CHN on foliage, wood, soils; Begin to calculate soil respiration.	08:30 Foreman Coastal Nutrient Loading and Eutrophication 10:30-noon Foreman, TA's Discuss project ideas 13:30-17:00 Giblin Calculate core fluxes, sediment CHN & water column nutrients	8:30 –10:00 Liles Science Journalism (Heather Goldstone) 10:15-noon Elective 13:30-17:00 Tang Calculate N & C stocks in soils, trees & litter; Soil Respiration and Nitrogen Mineralization	08:00 – 1 st Project Concept Paper Due 08:30-Noon OPTIONAL Q & A for Midterm exam; review problems	
10/15	10/16	10/17	10/18	10/19	10/20	10/21
Week 7 Land-Water Interactions Note: Meet with project mentors during next two weeks	08:00-12:30 MID-TERM EXAM Afternoon SES Faculty Project Mentor Planning Meetings Prepare for Week 5-6 project presentations -WHOI Ship Tour afternoon	8:30 –10:00 Liles Science Journalism (Meet at NOAA Aquarium) 10:15-noon Elective 13:30-17:00 Giblin/ Tang (Starr 209) Student-led presentation discussion Week 5-6 Fate of Organic Matter and Ecosystem Stoichiometry	08:30 Neill The Hubbard Brook Watershed Story. 10:30-17:00 Foreman/McHorney Water & Nutrient Budget Lab Sample streams & ground-water, Massachusetts Alternative Septic System Test Center (MASSTC)	08:30 Neill Deforestation in the Tropics. 10:15-noon Elective 13:30 McHorney / Neill – Water & Nutrient Budget Lab Sampling soil solution-water at terrestrial sites.	08:30 -12:00 Hayn / Foreman H ₂ O / Nutrient Budget Lab - GIS/Nutrient Loading DSS 15:00-16:30 – Dr. Daniel Buckley, Cornell U.(Loeb G70) 17:00 Report due Stoichiometry / Fate of Organic Matter in Aquatic Ecosystems	
10/22	10/23	10/24	10/25	10/26	10/27	10/28
Week 8 What Species Do in Ecosystems	08:00 Report Due Terrestrial N-mineralization & Soil Resp. 08:30 Deegan What Species do in Ecosystems 10:30-Noon McHorney Nutrient Analysis – Detection Limit Standard Curve Exercise 13:30-1700 McHorney Nutrient Analysis –NO ₃ , NH ₄ & PO ₄ in soil water, rainfall, groundwater	08:30 Deegan Nutrient Transport by Animals 10:15 - Elective 13:30-17:00 Foreman/Neill Nutrient Analysis Discussion and Calculations	08:30-Noon Neill / McHorney Water & Nutrient Budget Lab AET and Water balance calculations 17:00 –2 nd Project Draft Proposal Due	08:30-10:00 Neill / Foreman Nutrient Loading and Budget Calculations 10:15- Elective 13:30-17:00 Applied Science Scenarios & Report Preparation	08:30-noon Neill / Foreman Water Nutrient Budget Lab Student discussion & presentations. DSS 15:00-16:30 – Dr. Galen McKinley, Columbia Univ. & Lamont Doherty (Speck Auditorium)	Cape Cod Marathon Relay Sunday 29th Students, Alumni vs. Faculty 

SES PROGRAM CALENDAR – NOVEMBER/DECEMBER 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<p align="center">10/29</p> <p>Week 9 Current Issues in Ecosystems Science</p> <p><i>Cape Cod Marathon Relay / Faculty Challenge Reunion Picnic</i></p> 	<p align="center">10/30</p> <p>08:00 Cross-System Flux Lab Report due.</p> <p>08:30 Deegan Ecosystems Assessment of Fisheries Exploitation</p> <p>13:30–17:00 Deegan/Otter Lab Isotopes and Food Web Data Work-up</p>	<p align="center">10/31</p>  <p>08:30 Roberson Coral Reefs and Global Change</p> <p>10:15-noon Elective</p> <p>13:30–17:00 Deegan/McHorney Lab Isotopes and Food Web Data Work-up and Discussion.</p> <p>Return Draft Project Proposal Comments.</p> <p>Happy Halloween</p>	<p align="center">11/1</p> <p>08:30 Giblin Human Alteration of Global Element Cycles</p> <p>Prep for Project Proposal Presentation</p> <p>Distribute Study Question for Final</p>	<p align="center">11/2</p> <p>08:30 Neill Loss of Ecosystem Services</p> <p>10:15-noon Elective</p> <p>13:30-17:00 Deegan: Lab/ Student Presentations & Discussion: Food Web / Isotope data and Management Scenarios</p>	<p align="center">11/3</p> <p>08:00-12:30 Students present project proposals and preliminary data</p> <p>14:00-17:00 Q&A, Final Exam Review (optional)</p>	<p align="center">11/4</p>
<p align="center">11/5</p> <p>Week 10 Current Issues in Ecosystems Science cont'd.</p> <p>DAYLIGHT SAVINGS TIME ENDS (GAIN HOUR)</p>	<p align="center">11/6</p> <p>08:00 Final Project Proposal Due</p> <p>15:30-17:00 Liles Science Journalism (Beth Daley guest)</p>	<p align="center">11/7</p> <p>08:30 Elective</p> <p>Project Work</p>	<p align="center">11/8</p> <p>8:00-12:30 FINAL EXAM</p> <p>Project Work</p>	<p align="center">11/9</p> <p>08:30 Elective</p> <p>Project Work</p>	<p align="center">11/10</p> <p>Project Work</p>  <p>Veterans Day Observed</p>	<p align="center">11/11</p> <p>Field Trip New England Aquarium / Boston</p>
<p align="center">11/12</p> <p>Week 11</p>	<p align="center">11/13</p> <p>Project Work</p>	<p align="center">11/14</p> <p>Project Work</p>	<p align="center">11/15</p> <p>Project Work</p>	<p align="center">11/16</p> <p>Project Work</p> <p>15:30-17:00 Liles Writing Seminar</p>	<p align="center">11/17</p> <p>Project Work</p>	<p align="center">11/18</p>
<p align="center">11/19</p> <p>Week 12</p>	<p align="center">11/20</p> <p>Project Work</p>	<p align="center">11/21</p> <p>Project Work</p> <p>15:30-17:00 Liles Science Journalism (Jarita Davis guest) Final Paper Due</p>	<p align="center">11/22</p> <p>Project Work</p>	<p align="center">11/23</p> 	<p align="center">Thanksgiving Break</p>	
<p align="center">11/26</p> <p>Week 13</p>	<p align="center">11/27</p> <p>Project Work</p>	<p align="center">11/28</p> <p>Project Work</p>	<p align="center">11/29</p> <p>Project Work</p>	<p align="center">11/30</p> <p>Project Work</p>	<p align="center">12/1</p> <p>Project Work</p> <p>17:00 Project Progress Report Due</p>	<p align="center">12/2</p>
<p align="center">12/3</p> <p>Week 14</p>	<p align="center">12/4</p> <p>Project Work</p> <p>4:00-5:30 – Liles Science Journalism</p>	<p align="center">12/5</p> <p>Project Work</p>	<p align="center">12/6</p> <p>Project Work</p>	<p align="center">12/7</p> <p>Project Work</p>	<p align="center">12/8</p> <p>Project Work</p> <p>08:30 Project DRAFT Report Due</p>	<p align="center">12/9</p>
<p align="center">12/10</p> <p>Week 15</p>	<p align="center">12/11</p> <p>Project Work</p>	<p align="center">12/12</p> <p>Project Work</p>	<p align="center">12/13</p> <p>Project Work</p> <p>17:00 Draft Project Report Returned</p>	<p align="center">12/14</p> <p>Project Work</p>	<p align="center">12/15</p> <p>Student Research SYMPOSIUM Oral Project Reports</p>	<p align="center">12/16</p>
<p align="center">12/17</p> <p>Week 16</p>	<p align="center">12/18</p> <p>Noon - FINAL Project Report Due (written & electronic Word, Powerpoint, Excel)</p>	<p align="center">12/19</p> <p>End of Course Check out</p>	<p align="center">12/20</p> 	<p align="center">12/21</p>	<p align="center">12/22</p> <p><i>Merry Christmas & Happy Hanukkah</i></p>	<p align="center">12/23</p>