



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
4	5	6	7	8	9	10
<p><b>Week 1</b> Intro to Ecosystems Science</p> <p><b>Noon: Picnic Welcome &amp; Orientation</b> 14:30 Starr 209 (classroom) Pick up books, lab, field gear Introduction to MBL Computer Network</p>	<p>8:30 Starr 209 Intro to Core Course</p> <p>08:45-10:00 Giblin Earth as an Ecosystem: 4 Billion years of Biogeochemistry</p> <p>10:30–17:00 Lb 208 Neill <b>Field Day:</b> Forest Biomass</p>	<p>8:30-10:00 Melillo How Humans are Altering the Earth as an Ecosystem: The Global Carbon Cycle</p> <p>10:15-noon Elective</p> <p>13:30-17:00 Neill Lb 208 <b>Lab Forest Biomass Analysis</b></p>	<p>8:30 Ducklow Effects of Climate Change in the Antarctic</p> <p>10:30–17:00 Foreman Lb 208 <b>Field Day; Aquatic Biomass Lab</b></p> <p>Return Optional field trip selections form to SES office</p>	<p>8:30 Shaver The Ecosystem Concept &amp; Major Themes of Ecosystem Studies</p> <p>10:15-noon Elective</p> <p>13:30–17:00 Foreman Lb 208 <b>Aquatic Lab Biomass Analysis</b></p>	<p>8:30-12:00 Shaver Foreman <b>Biomass Calculation discussion &amp; synthesis.</b></p> <p><b>Students introduced to Center staff at Donuts. Distribute lab report guidelines Wks 1-3)</b></p> <p>14:30-15:30 <b>Library Orientation</b></p> <p>15:30-16:30 <b>Safety Lecture MBL J. Marcello (Starr 209)</b></p>	<p><b>WHALE WATCH (SAT OR SUNDAY)</b></p>  <p>Depart SWOPE 09:00 for Provincetown, noon cruise return for dinner</p>
11	12	13	14	15	16	17
<p><b>Week 2</b> Ecosystem Primary Production</p>	<p>08:00 Wk 1 Biomass problem set due</p> <p>08:30-10:00 Shaver Carbon Balance: Photosynthesis and Primary Production in Land based Ecosystems</p> <p>10:30-17:00 Shaver- <b>Field Day:</b> Leaf level CO<sub>2</sub> flux measurements from FSTP forest</p>	<p>08:30 Foreman Aquatic Primary Production</p> <p>10:15-noon Elective</p> <p>13:30-17:00 Shaver - <b>Lab:</b> NPP from tree cores; leaf areas and data work up</p>	<p>08:30 Shaver Ecosystem &amp; Net Primary Production at regional to global scales – controls on carbon balances</p> <p>10:30–17:00 Shaver <b>Terrestrial Field Day; FWTP Tour and Orientation</b></p>	<p>08:30-10:00 Liles - <b>Writing Seminar</b></p> <p>10:15-noon Elective</p> <p>13:30 –17:00 Shaver- <b>Data work-up; NPP &amp; GPP Calculations</b></p> <p>Return Wk 1 Problem Set</p>	<p>08:30–noon Neill/ Foreman <b>Student led Presentations:</b> Terrestrial &amp; Aquatic Ecosystem Primary Producer Biomass</p> <p>Distribute problem set on terrestrial Primary Production</p> <p><b>DSS</b> Scott Doney, WHOI Ocean Acidification</p>	
18	19	20	21	22	23	24
<p><b>Week 3</b> Fate of Organic Matter Produced on Land and Water</p> 	<p>0800–Noon Lb 208 Foreman <b>Aquatic Lab / Field Day</b> Primary production. Collect incubate &amp; fix initial water samples Extract Chl a; Pack CHN from biomass Lab (Wk 1)</p> <p>17:00 <b>Terrestrial Primary Prod. Prob. Set due</b></p>	<p>08:30 Shaver Environmental Variation, Ecosystem Distribution &amp; Feedbacks</p> <p>10:15-noon Elective</p> <p>13:30 Foreman <b>Aquatic Primary Production Lab.</b> Titrate bottles; Start calculations; Pack CHN, Measure Chl a</p>	<p>08:30 Melillo Litter Decomposition &amp; Fate of Organic Matter on Land.</p> <p>13:30 Foreman <b>Aquatic Primary Production Lab</b> Calculate daily rates of GPP, R, NCP; Scale to pond / bay. Run CHN on filters; finish data work-up.</p>	<p>08:30-Tang Measuring soil respiration &amp; energy balance in soil/plant systems</p> <p>10:15-noon Elective</p> <p>13:30 <b>Lab work-up Data:</b> Complete calculations &amp; presentations Aquatic Primary Production</p>	<p>08:30 –11:45 Shaver/Foreman (Starr 209) Students present &amp; discuss results of Primary Production Lab, Contrast P/B on Land and Water</p> <p>14:00 – 15:30 Liles <b>Writing Seminar</b></p>	<p><b>PIE FIELD TRIP (OPTIONAL)</b></p> <p>Depart for Plum Island Friday afternoon, return Saturday late afternoon/ evening</p>
25	26	27	28	29	30	1
<p><b>Week 4</b> Fate of Organic Matter in Ecosystems &amp; Secondary Production</p>	<p>0800 <b>Aquatic Primary Prod Lab Report due</b></p> <p>8:30-10:00 Deegan Secondary Production &amp; Ecol. Efficiency.</p> <p>10:30–17:00 Deegan <b>Field Day</b> Trophic structure in Aquatic systems: collecting biota WFH, Waquoit, Johns Pond</p>	<p>08:30-10:00 Peterson Use of Isotopes to Study Ecosystems.</p> <p>10:15-noon Elective</p> <p>13:30-17:00 Deegan <b>Lab Day</b> sorting, identifying &amp; counting organisms from Aquatic sites</p>	<p>08:30 Hobbie Decomposer Organisms</p> <p>13:30-17:00 Deegan <b>Lab Day</b> Finish sorting, ID and counts; begin calculations.</p>	<p>08:30 Conte Decomposition &amp; Fate of Organic Matter in Aquatic Systems</p> <p>10:15-noon Elective</p> <p>13:30 <b>Deegan Lab</b> Grind samples for isotope analysis, complete trophic pyramids of numbers, biomass, production. Rosh Hashona</p>	<p>8:30-noon Deegan Student-Led Discussion &amp; Synthesis Secondary Production &amp; Trophic Pyramids. Choose samples for Isotope Analysis</p> <p><b>DSS</b> Ed DeLong, MIT Genomes to Biomes</p>	

**SES PROGRAM CALENDAR – OCTOBER 2011**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
2	3	4	5	6	7	8
<b>Week 5</b> <b>Ecosystem Stoichiometry and Biogeochemistry</b>	<b>08:00 Lab Rpt Due Trophic Pyramids</b> <b>08:30-10:00 Giblin</b> Decomposition, Aerobic / Anaerobic Respiration, Redox Chemistry. <b>10:30-17:00 Tang Terrestrial. Field Day</b> – Soil pits, soil respiration, collect N-mineralization bags	<b>08:30 Giblin</b> The Nitrogen Cycle <b>10:15-noon</b> Elective <b>13:30-17:00 Tang Terrestrial. Lab -</b> Prepare soil for C/N, pack wood and foliage, extract soils for N-mineralization estimate <b>Distribute Mid term Study Questions</b>	<b>08:30 Giblin</b> The Phosphorus Cycle <b>10:30-17:00 Giblin Aquatic Field Day</b> Collect W. Falmouth Harbor & Waquoit Bay sediment cores; Siders Pond /Johns Pond water column profiling.	<b>08:30 Giblin</b> N vs P limitation; element cycle feedbacks <b>10:15-noon</b> Elective <b>13:30 Giblin Aquatic Lab Day</b> Run core incubations. Analysis of Pond samples. <b>Prepare sediments &amp; soils for C/N analysis</b>	<b>08:30 –12:00 Foreman / Giblin</b> Lab nutrient analysis (NO <sub>3</sub> , NH <sub>4</sub> , PO <sub>4</sub> ) on water samples and soil (KCL) extracts <b>13:30 –15:00 Liles</b> Writing Seminar	
9	10	11	12	13	14	15
<b>Week 6</b> <b>Nitrogen and Phosphorus Cycling &amp; Budgets</b>	 <b>COLUMBUS DAY</b> <b>DAY OFF</b>	<b>08:30 Peterson</b> Ecosystem Stoichiometry <b>10:15-noon</b> Elective <b>13:30–17:00 Foreman/ McHorney</b> LAB: Run CHN on foliage, wood, soils, sediments; soil respiration calculations	<b>8:30 –10:00 Liles</b> Writing Seminar <b>10:30- 11:30 Foreman, TA's</b> Group discussion of project ideas <b>13:30-17:00 Tang</b> Calculate N & C stocks in soils, trees & litter; Soil Respiration and Nitrogen Mineralization;	<b>8:30 Giblin</b> Acid Deposition, ion exchange and charge balance <b>10:15-noon</b> Elective <b>13:30 Giblin</b> Calculations of core fluxes, sediment CHN & water column nutrients	<b>08:30-Noon OPTIONAL Q &amp; A for Midterm exam; review problems</b> <b>13:00 – Due 1<sup>st</sup> Draft Project Proposal</b> <b>DSS Bridget Emmett CEH, Bangor, UK Changing Soils &amp; Ecosystem Service</b>	
16	17	18	19	20	21	22
<b>Week 7</b> <b>Land-Water Interactions</b>  <i>Note: Meet with possible project mentors during next 2 weeks</i>	<b>08:00-12:00 MID-TERM EXAM</b>	<b>08:30 Foreman</b> Eutrophication & Coastal Nutrient Pollution <b>10:15-noon</b> Elective <b>13:30-17:00 Giblin/ Tang (Starr 209)</b> Student presentation/ discussion of results from Week 5-6 ecosystem stoichiometry and fate of organic matter Lab.	<b>08:30 Neill</b> The Hubbard Brook Watershed Story. <b>08:00 Report due Ecosystem Stoichiometry &amp; Fate OM</b> <b>10:30-17:00 Foreman/McHorney</b> Nutrient / Water Budget Lab Sample ground-water & streams, MASSTC	<b>08:30 Neill</b> Deforestation in the Tropics. <b>10:15-noon</b> Elective <b>13:30 Neill H<sub>2</sub>O / Nutrient Budget Lab</b> Sampling soil solution-water at FWTP.	<b>08:30 -12:00 Foreman H<sub>2</sub>O / Nutrient Budget Lab</b> Anthropogenic Loading (Land Use Mapping)  <b>13:30-15:00 Liles</b> Writing Seminar	
23	24	25	26	27	28	29
<b>Week 8</b> <b>Current Issues in Ecosystems Science</b>	<b>08:00 – Project 2<sup>nd</sup> Draft Proposal Due</b> <b>08:30 Giblin</b> Human Alteration of Global Element Cycles <b>13:30-17:00 Foreman/McHorney</b> Lab H <sub>2</sub> O Budget & Nutrients - analysis of NO <sub>3</sub> , NH <sub>4</sub> & PO <sub>4</sub> in precip., lysimeters, wellpoints, etc.	<b>08:30 Peterson</b> Surprises from Greenhouse Gas Buildup: Abrupt Climate Change and the Pan-Arctic Water Balance <b>10:15</b> Elective <b>13:30-17:00 Foreman/Neill</b> Nutrient Analysis Discussion and Calculations	<b>08:30 Neill</b> Loss of "Ecosystem Services". <b>13:30-17:00 McHorney / Neill – Water Nutrient Budget Lab –</b> Calculations of water balance	<b>08:30-10:00 Liles</b> Writing Seminar <b>10:15-</b> Elective <b>13:30-17:00 Neill / Foreman</b> Calculation of Nutrient Budgets Applied Science Scenarios	<b>08:30-noon Neill / Foreman</b> Water Nutrient Budget Lab Student discussion and presentations.  <b>DSS Kevin McCann U. Guelph, Canada Biodiversity &amp; Food Webs</b>	<b>Cape Cod Marathon Relay</b> <b>Sunday 30 Oct</b> <b>Students vs. Faculty</b> 

**SES PROGRAM CALENDAR – OCTOBER/NOVEMBER/DECEMBER 2011**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	31	1	2	3	4	5
<b>Week 9</b> <b>What Species Do in Ecosystems</b>  <b>Faculty Challenge Reunion Picnic</b>	<b>08:00 Cross-System Flux Lab Report due.</b> <b>Return Draft Project Proposal.</b> <b>08:30 Deegan</b> What species do in Ecosystems <b>13:30-17:00 Deegan Lab</b> Isotopes and Food Web Data Work-up	<b>08:30 Deegan</b> Resource & Predation Controls on Production. <b>10:15 Elective</b> <b>13:30-17:00 Deegan Lab</b> Isotopes and Food Web Data Work-up. <b>Distribute Study Question for Final Cross-System Flux Lab Rpt Due;</b>	<b>08:30 Deegan</b> Nutrient Transport by Animals. <b>Report Preparation</b> <b>Project work</b>  <b>15:00-17:30 Liles</b> Writing Seminar	<b>08:30 Deegan</b> Ecosystems Assessment of Fisheries Exploitation <b>10:15 Elective</b> <b>13:30-17:00 Deegan</b> <b>Lab: Student Presentations &amp; Discussion</b> Isotope / Food Web	<b>08:00-12:30</b> Students present project proposals and preliminary data  <b>14:00-17:00</b> <b>Q&amp;A, Final Exam Review (optional)</b>	New England Aquarium Boston Field Trip (optional)
6	7	8	9	10	11	12
<b>Week 10</b> <b>Current Issues in Ecosystems Science cont'd.</b>  DAYLIGHT SAVINGS TIME ENDS	<b>8:00 Final Written Project Proposal Due</b>	<b>8:00-12:30 FINAL EXAM</b>	<b>Project Work</b> <b>10:15 Elective</b>	<b>8:30-10:00 Liles -</b> Writing Seminar <b>10:15 Elective</b> <b>Project Work</b>	<b>Project Work</b>  <b>Veteran's Day</b>	
13	14	15	16	17	18	19
<b>Week 11</b>	<b>Project Work</b>	<b>Project Work</b>	<b>Project Work</b>	<b>Project Work</b> <b>15:30-17:00 Liles</b> Writing Seminar	<b>Project Work</b> <b>DSS</b> <b>Robert Twilley</b> <b>U. Louisiana</b> <b>Wetlands &amp; Deltas</b>	
20	21	22	23	24	25	26
<b>Week 12</b>	<b>Project Work</b>	<b>8:30-10:00 Liles</b> Writing Seminar <b>Final Paper Due</b> <b>Project Work</b>	<b>Thanksgiving</b> 		<b>Break</b>	
27	28	29	30	1	2	3
<b>Week 13</b>	<b>Project Work</b>	<b>Project Work</b>	<b>Project Work</b>	<b>Project Work</b> <b>15:30-17:00 Liles-</b> Writing Seminar	<b>Project Work</b>	
4	5	6	7	8	9	10
<b>Week 14</b>	<b>Project Work</b> <b>13:00 Project Progress Rpt Due</b>	<b>Project Work</b>	<b>Project Work</b>	<b>Project Work</b>	<b>Project Work</b>	
11	12	13	14	15	16	17
<b>Week 15</b>	<b>Project Work</b> <b>08:30 Independent Project DRAFT Report Due</b>	<b>Project Work</b>	<b>Project Work</b> <b>17:00 Draft Project Report Returned</b>	<b>Project Work</b>	<b>Student Research SYMPOSIUM</b> Oral Project Reports	
18	19	20	21	22	23	24
<b>Week 16</b>	<b>09:00</b> <b>FINAL Project Report Due (written &amp; electronic Word, Powerpt, Excel files)</b>	<b>End of Course</b> <b>Check out</b>	<b>Merry Christmas &amp; Happy Hanukkah</b>			