EVR1001L is the companion laboratory course for EVR1001 (lecture version) and EVR1001 (online version). Instead of a physical laboratory space, EVR1001L will use the “Second Life” virtual reality environment to give you access to “realities” that we cannot provide in a physical laboratory.

This Syllabus is subject to change and you will be notified via Announcements on the course Blackboard web site and by your FSU email, so check your FSU email every day. You are responsible for everything in this Syllabus, and for keeping track of the lab schedule and lab report due dates.

First Day Attendance Policy: Because this is an online-only course, and because people will add the course during the first week of the semester, we cannot use The First Day Attendance procedure. If you decide you do not want to take the course, you must drop the course yourself during the Drop/Add period.

Instructor   Office       Office Hours  Phone    Email
Prof. William Landing  325 OSB     T, Th 2:00-4:00PM     850-644-6037                   wlanding@fsu.edu

TAs: The TAs serve as your “designated mentors” for this course. They are standing by to help you get the most out of this course. They will also be grading your lab reports and offering suggestions for improvement to get a better score. The list of TA-student assignments is posted under the Bb Syllabus link.

<table>
<thead>
<tr>
<th>EVR1001 Spring 2017 TAs</th>
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<tbody>
<tr>
<td>Ioana Bociu</td>
<td><a href="mailto:lb09@my.fsu.edu">lb09@my.fsu.edu</a></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Natalie Geyer</td>
<td><a href="mailto:nbyars@fsu.edu">nbyars@fsu.edu</a></td>
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</tr>
<tr>
<td>Erin Canter</td>
<td><a href="mailto:ejc15b@my.fsu.edu">ejc15b@my.fsu.edu</a></td>
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<tr>
<td>Casey Luzius</td>
<td><a href="mailto:cri11g@my.fsu.edu">cri11g@my.fsu.edu</a></td>
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<tr>
<td>Matthew Ware</td>
<td><a href="mailto:mw15w@my.fsu.edu">mw15w@my.fsu.edu</a></td>
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<tr>
<td>Xiaolin Zhang</td>
<td><a href="mailto:Xz12j@my.fsu.edu">Xz12j@my.fsu.edu</a></td>
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Computer Competency: EVR1001L is a fully online course, requiring you to register and complete the course using a computer. The laboratory modules are completed in the virtual environment known as Second Life. There are 8 lab modules, each requiring slightly different data collection and recording tasks. You will enter your data to create data tables and data plots using spreadsheet software (like Excel or Google Docs). You will perform calculations using Excel, including means and standard deviations and statistical tests. You will merge your own data with existing data sets to evaluate trends and patterns in long time series environmental data. You will generate various types of graphs (bar, line, scatter). You will create relatively short lab reports explaining what you did in each lab, what calculations were conducted, and include your data tables and graphs.

This course has been approved as meeting the requirements for Computer Competency. Computer competency is evaluated, and accounts for 40% of the grade, for each lab module. For each lab module, there are instructions and videos posted in the Assignments tabs that explain how to create the data tables, how to perform the necessary calculations, and how to make the graphs. Your TAs will make comments on (and grade) your data tables and graphs, and you are expected to work with them to obtain a higher score on your revised reports. In order to receive a C- or better in the course, you must earn at least a C- on the computer competency component of the course. If you do not earn a C- or better on the computer competency component of the course, you will not earn an overall grade of C- or better in the course, no matter how well you perform in the remaining portions of the course.

Liberal Studies For The 21st Century:
The Liberal Studies for the 21st Century Program at Florida State University builds an educational foundation that will enable FSU graduates to thrive both intellectually and materially and to support themselves, their families, and their
communities through a broad and critical engagement with the world in which they live and work. Liberal Studies thus offers a transformative experience. This course has been approved for the Liberal Studies disciplinary requirement of Scientific Method and Reasoning and thus is designed to help you become a critical appraiser of theories and the facts that support them. As required by Florida State University, students must earn a course grade of C- or higher to meet the Liberal Studies 1-credit Natural Science laboratory requirement.

**Purpose/Objectives. At the end of this class, in combination with the EVR1001 course content, students:**
1. Will be able to describe the relationships between components of the natural world and the effect of the built world upon it.
2. Will be able to analyze environmental problems and identify the risks caused by them.
3. Will have a basic knowledge of hazardous materials.
4. Will investigate and report on basic concepts of air and water pollution, especially nutrient pollution.
5. Will be able to describe solid and liquid waste disposal and treatment issues.

**Scientific Method and Reasoning. Students will demonstrate the ability to:**
1. Think critically and cogently about causal relationships with scientific reasoning.
2. Assess previous experimentation and published scientific results.
3. Critically examine and evaluate scientific observation, hypothesis or model construction,
4. Articulate a variety of issues created by the complex interactions among science, technology, and society.
5. Use scientific perspectives to evaluate contemporary problems facing society.
6. Explain the process of scientific reasoning and apply scientific principles inside and outside of the laboratory or field setting.
7. Systematically evaluate data for accuracy, limitations, and relevance, and identify alternative interpretations of the data.
8. Design and conduct experiments to make observations and test hypotheses, as well as to analyze and interpret data using quantitative and appropriate technological tools.

For the EVR1001L component, these competencies will be evaluated through your completion of 8 laboratory modules that are aligned with the EVR1001 course content. Pre and post-laboratory exercises and the lab module activities will be completed within the FSU Bb and the Second Life virtual reality systems.

**Course Web Sites:** All materials for the laboratory modules, including reading and examination materials will be presented through the FSU Bb system, the Pearson Mastering Environmental Science web site, and the Second Life virtual reality environment.

**Required Textbook and Online Access Code:**
If you are also enrolled in EVR1001, any of these purchases will fulfill the textbook requirements for both courses!

- **You must purchase an access code directly from Pearson or from the FSU Bookstore.** Other products (with different ISBN numbers) that are available through Amazon are not the same! They will not have access to the Second Life labs.
  1. Buy direct from Pearson: When you first try to access the Pearson Mastering Environmental Science link from the FSU Bb system, we recommend that you take the 14-day free trial since the system will prompt you to buy the necessary access code at the end of the 14-day free trial.

**Computer and Internet Requirements:** When you register with CNDG for Second Life (instructions below), you will be prompted to install the Second Life software. The program will run well on an Ethernet (wired) internet connection, but
not very well on a slow, shared Wi-Fi connection (like at Starbucks). After you complete your registration with CNDG, there are dozens of computers in Strozier and Dirac libraries that are already set up to run the Second Life software where you can log into your Second Life account. You will also need word processing software and spreadsheet software. MS Word and Excel, or Google DOCS programs will both work. If you are not familiar with using spreadsheet software to plot data, you should practice making graphs during Week 1 and Week 2. See the Week 1 Assignment in Bb. There are also postings for each lab module (in the Assignments tab) that explain and instruct you on how to create the data tables (in Word or Excel) and graphs (in Excel) for each lab. As you work on each lab module, your TAs will be available to assist you if you have trouble understanding the data tables and graphing requirements.

Week 1 -- Registering for Mastering Environmental Science: During the first week, you will need to register first with Pearson/Mastering and then with CNDG (for the Second Life system). This is two separate registrations, and you have to register with Pearson first. Make sure you have a good internet connection because even momentary Wi-Fi interruptions will interfere with the registration. An Ethernet cable internet connection is the best option.

- Open the course Bb web site via campus.fsu.edu.
- Click the Mastering Environmental Science link on the left-side menu.
- Scroll down and select the Mastering Environmental Science Course Home link and follow the instructions to get registered. We recommend taking the 14-day free trial; they will bill you for the access code, which includes access to the e-text and the Second Life virtual lab modules.
- You will get an email from Pearson/Mastering when you complete your registration properly.

Week 1 – Registering with CNDG for Second Life: After you receive the email from Pearson saying that your registration for Mastering Environmental Science has been completed, you must now register with CNDG for a Second Life account. The steps for registering with CNDG and Second Life listed below are also posted in the Syllabus tab on the Bb site. Make sure you have a good internet connection. An Ethernet cable internet connection is the best option.

- Open the course Bb web site via campus.fsu.edu.
- Click the Mastering Environmental Science link on the left-side menu.
- Scroll down and select the Mastering Environmental Science Course Home link
- Select the Second Life Virtual Field Trips link in Mastering.
- Follow the instructions to set up your CNDG and Second Life accounts (you can use your same FSU email and FSU username, and the same password for both accounts). Choose your preferred lab session (see table of lab sessions below). Each lab session will be “closed” after the first 20 students register, so make your choice and get registered as soon as possible after registration opens. CNDG Registration will open Monday Jan. 9, 2017 at 08:00AM.
- You can select an avatar “style” and an avatar name. We recommend that you use your real name so that we know who you are inside the labs.
- Once you are properly registered with CNDG and have the necessary software installed on your computer, you will be invited to do an Orientation inside Second Life during your lab session time interval.

Second Life Lab Sessions: During CNDG Registration, you can choose any available lab session to attend the Orientation and the online laboratory modules. The lab sessions listed below are when Prof. Landing and/or one of the course TAs will also be in the lab to answer questions. You are expected to do the labs in that same session every week. You will be grouped with up to 20 of your fellow students; you can work with other students within Second Life but this is not a requirement. You can complete the labs during any of the times the labs are available, but you will have lower priority if you log in during other sessions. You can also complete the labs on evenings and weekends but there may not be a TA/mentor in the environment to answer questions. Staff from CNDG will also be in the labs every weekday to help. Due to required maintenance, the Second Life labs will not be available from 00:00-12:00 Monday and 00:00-12:00 Tuesday (midnight to noon).

EVR1001L Spring 2017 Lab Time Sessions

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<th>Monday</th>
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<tr>
<td>Lab Time</td>
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Week 2 – Second Life Orientation: You cannot continue into the laboratory modules until you complete the short Orientation to Second Life. Log into your Second Life account during your lab session interval and you will be prompted to complete the Orientation.

Week 3 – Lab 1: Easter Island: The first lab module on population growth and deforestation on Easter Island will be available after 12:00 noon on Monday Jan. 23, 2017. You will need to read the pre-lab study materials, then pass a short quiz before starting the lab (90% score required). The reading assignments, quiz questions, and a lab report template are posted in the Bb Assignments tab for each module. Your report for Lab 1 is due by midnight Sunday Jan. 29, 2017. Your revised report is due by midnight Sunday one week later.

You must complete the lab modules and submit your lab reports according to the schedule below. Because of technical limitations, each lab will only be available for the one or two week period shown in the schedule below. A missed laboratory will result in a zero score. **No Make Up labs will be offered.** You must contact the instructor or your TA in advance if you will miss a laboratory so that we can try to make alternative arrangements. If you get sick, get arrested, wreck your car, have to go out of town, become hospitalized, etc. contact your TA or the Instructor by email or phone before you miss a lab!! Do not tell us AFTER you miss a lab; tell us BEFORE you think you will miss a lab! If you miss a lab without an excused absence and without telling us in advance, you will get a zero.

### EVR1001L-0001 Laboratory Module Schedule: Spring 2017

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Monday</th>
<th>Tuesday</th>
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<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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<td>9-Jan-17</td>
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<td>12-Jan-17</td>
<td>13-Jan-17</td>
<td>14-Jan-17</td>
<td>15-Jan-17</td>
<td>Register for Mastering via Bb web site</td>
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<td>17-Jan-17</td>
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<td>19-Jan-17</td>
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<td>22-Jan-17</td>
<td>Complete Second Life orientation</td>
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<td>Lab 2: Ice Cores and Climate Change</td>
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<td>6-Feb-17</td>
<td>7-Feb-17</td>
<td>8-Feb-17</td>
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<td>Lab 3: Ocean Acidification</td>
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<td>Lab 4: Invasive Species -- Lion Fish</td>
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<td>25-Feb-17</td>
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<td>Lab 5: Frogs and atrazine - ecotoxicology</td>
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<td>28-Feb-17</td>
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<td>4-Mar-17</td>
<td>5-Mar-17</td>
<td>Lab 6: Nutrient use on a farm</td>
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<td>10-Mar-17</td>
<td>11-Mar-17</td>
<td>12-Mar-17</td>
<td>Lab 7: Nutrient effects on a watershed</td>
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<td>17-Mar-17</td>
<td>18-Mar-17</td>
<td>19-Mar-17</td>
<td>Lab 8: Green building - carbon footprint</td>
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<td>26-Mar-17</td>
<td>Lab 9: Environmental science</td>
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<td>31-Mar-17</td>
<td>1-Apr-17</td>
<td>2-Apr-17</td>
<td>Lab 10: Renewable energy</td>
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<td>7-Apr-17</td>
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<td>9-Apr-17</td>
<td>Lab 11: Water quality</td>
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<td>5-May-17</td>
<td>6-May-17</td>
<td>7-May-17</td>
<td>Lab 15: Environmental science</td>
</tr>
</tbody>
</table>
### Submitting Lab Reports
There will be two Turnitin “assignments” for each lab. The first assignment link will be for your original submission. The TAs will grade your reports and offer ways to get a better score if you want to revise your reports. The 2nd assignment link will be for your revised report. The Due Dates will be strictly enforced.

### Evaluation/Grading Procedure
There are no exams. Your lab report scores for the 8 Second Life lab modules will be averaged in order to determine your letter grade. Final Grades will be rounded off from the 2nd decimal place to the 1st decimal place. For example, 93.95 is rounded up to 94.0 (A); 93.94 is rounded down to 93.9 (A-). 90.45 is rounded up to 90.5 (A-); 90.44 is rounded down to 90.4 (B+).

<table>
<thead>
<tr>
<th>Example</th>
<th>Tables, Graphs, and Data Analysis*</th>
<th>Lab Report text</th>
<th>Combined Score</th>
<th>Grading Scale</th>
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<tbody>
<tr>
<td>Lab 1</td>
<td>40/40</td>
<td>55/60</td>
<td>≥94.0</td>
<td>A</td>
</tr>
<tr>
<td>Lab 2</td>
<td>35/40</td>
<td>45/60</td>
<td>≥90.5</td>
<td>A-</td>
</tr>
<tr>
<td>Lab 3</td>
<td>35/40</td>
<td>50/60</td>
<td>≥87.0</td>
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<td>≥83.5</td>
<td>B</td>
</tr>
<tr>
<td>Lab 5</td>
<td>35/40</td>
<td>55/60</td>
<td>≥80.0</td>
<td>B-</td>
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<tr>
<td>Lab 6</td>
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<td>≥76.5</td>
<td>C+</td>
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<td>≥73.0</td>
<td>C</td>
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<tr>
<td>Lab 8</td>
<td>40/40</td>
<td>45/60</td>
<td>≥69.5</td>
<td>C-</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>≥66.0</td>
<td>D+</td>
</tr>
<tr>
<td></td>
<td>Average Score: 85.0% B 290/320=90.625%</td>
<td>390/480=81.25%</td>
<td>680/800=85.00%</td>
<td>≥62.5 D</td>
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<td></td>
<td>≥59.0 D-</td>
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<td>&lt;59.0 F</td>
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*Computer Competency Components: (CCC):
The rubric for the CCC for each lab are shown in Appendix 3.

**Data Tables:** In your lab reports, tables of the data you collect in each lab module are worth 10 points. These tables must include a caption describing what is being presented (4 points). The columns of data must each have a heading (3 points) and must specify the units for each parameter (3 points).

**Data Graphs:** Graphs of the data you generate for each lab module are worth 10 points each. Each graph must include a caption describing what is being presented (4 points), properly scaled and labeled axes (2 points each), and a legend that indicates which symbols correspond to which set of data (2 points).

**Data Analysis:** Calculations that are done with the data are worth 10 points. This includes calculated data in your data tables (for example calculating the population density on Easter Island as a function of time) and other calculations such as the statistical calculations (means, standard deviations, and t-values).

### University Attendance Policy
Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

### Academic Honor Policy
The Florida State University Academic Honor Policy outlines the University’s expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to “…be honest and truthful and...[to] strive for personal and institutional integrity at Florida State University.”

* (Florida State University Academic Honor Policy, found at http://fda.fsu.edu/academic-resources/academic-integrity-and-grievances/academic-honor-policy.)

### Americans With Disabilities Act
Students with disabilities needing academic accommodation should:
(1) register with and provide documentation to the Student Disability Resource Center; and

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(Revised: 10APR2017)
(2) bring a letter to the instructor indicating the need for accommodation and what type.
Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate
verification from the Student Disability Resource Center has been provided. This syllabus and other class materials are
available in alternative format upon request.
Student Disability Resource Center
874 Traditions Way, 108 Student Services Building
Florida State University, Tallahassee, FL 32306-4167
(850) 644-9566 (voice); (850) 644-8504 (TDD); sdrc@admin.fsu.edu; http://www.disabilitycenter.fsu.edu/

Free Tutoring from FSU and Learning Assistance: On-campus tutoring and writing assistance is available for many
courses at Florida State University. For more information, visit the Academic Center for Excellence (ACE) Tutoring
Services' comprehensive list of on-campus tutoring options - see http://ace.fsu.edu/tutoring or contact tutor@fsu.edu.
High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to
courage the highest level of individual academic success while upholding personal academic integrity. The
TA/Mentors will be available by email and by appointment to discuss the course material or just to talk about
environmental science. You can email me and the TAs at any time to set up an appointment or with questions about the
labs. We are here to help you learn about environmental science. If you are having trouble with the class, please do not
wait until the end of the semester to ask for help.
Appendix
1. Easter Island Lab Report Template with grading scheme
EVR1001L-0001 Fall 2016
Lab 1: Easter Island: Carrying Capacity and Sustainability Lab Report

Materials and Methods (20 points): This section should answer the question: How was the experiment done? In paragraph form, state what you did and what materials you used in order to complete the laboratory. In addition, avoid using the first person (I, we). Instead use phrases like “a line transect was conducted...” or “a time machine was used...”. This is called passive voice, and it is traditionally found in many types of scientific writing.

Results (40 points): This section will include anything that was measured or calculated in the experiment. A template for the data table (10 points) has been provided below to get you started. Use Excel or another spreadsheet program to enter your data, to perform calculations on the density of trees and people (10 points), and to make charts of the data (10 points for each chart).

<table>
<thead>
<tr>
<th>Year</th>
<th>Mulberry Trees # counted</th>
<th>Palm Trees # counted</th>
<th>People # counted</th>
<th>Area of Transect km²</th>
<th>Area of Drone Survey km²</th>
<th>Mulberry Trees # / km²</th>
<th>Palm Trees # / km²</th>
<th>People # / km²</th>
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</table>

Data calculations (10 points). The highlighted data columns require you to perform calculations using the data in the data columns.

Area of Tree Transect:
- \(200 \text{m} \times 10 \text{m} = 2,000 \text{ m}^2\)
- \(2,000 \text{ m}^2 \times (1 \text{ km}/1000\text{m})^2 = 0.002 \text{ km}^2\)

If you counted 20 trees in your transect covering 0.002 km², then the overall tree density would be 20 trees divided by 0.002 km² = 10,000 trees per km².

Drone Survey: If you counted a total of 5000 people on the island (with an area of 162 km²), then the population density would be 5000 people divided by 162 km² = 31 people per km².

Also include separate graphs (10 points each) showing trees and population density (y-axes – dependent variables) over time (x-axis – independent variable). Remember to label your x and y axes as well as include a figure legend. Points can will be lost for failure to make the appropriate (assigned) graphs. Points (2 for each axis) can be lost for failure to label the axes or for failure to include a legend (2 points).

Discussion and Conclusions (40 points): This section should constitute the bulk of the report. Use this section to write a coherent essay about your major findings. You should tell a chronological story of what happened over the different time periods. Refer explicitly to your results (ex. In year 900, the tree population was high (A and B km²) and the human population was low (X people per km²)). Think back to your pre-laboratory reading material and try to address the carrying capacity of the island and what possibly happened to the islanders.
Lab 1: Easter Island: Carrying Capacity and Sustainability Lab Report

Materials and Methods: In order to conduct measurements from Easter Island in the years 900, 1200, 1400, 1500, 1600, and 1800 AD, it was necessary to use a time machine to transport to each different time period. Once transported to the respective time period, a line transect was conducted over 200 meters by 10 meters where Mulberry and Palm Trees were counted. This process was repeated for each of the six time periods. In order to count the population, a drone was used which flew over the civilizations on Easter Island in order to not disturb the population. Here, the population was totaled as well as the area in square kilometers. After the populations and trees were totaled, the raw data was entered in the terminal.

Results: Tables and Graphs:

<table>
<thead>
<tr>
<th>Year</th>
<th>Mulberry Trees (# counted)</th>
<th>Palm Trees (# counted)</th>
<th>People (# counted)</th>
<th>Area of Transect (km²)</th>
<th>Area of Drone Survey (km²)</th>
<th>Mulberry Trees (#/km²)</th>
<th>Palm Trees (#/km²)</th>
<th>People (#/km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>900</td>
<td>38</td>
<td>22</td>
<td>20</td>
<td>0.002</td>
<td>162</td>
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<td>0.002</td>
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<tr>
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<td>20000</td>
<td>0.002</td>
<td>162</td>
<td>0</td>
<td>0</td>
<td>12.35</td>
</tr>
</tbody>
</table>

Graph 1:

POPULATION DENSITY

0  20  40  60  80  100  120  140  160  180  200

0  20  40  60  80  100  120  140  160  180  200

PEOPLE PER SQUARE KM

YEAR

Revised: 10APR2017
Graph 2:

MULBERRY AND PALM TREE DENSITY

Discussion and Conclusion:

Easter Island, a once lush landscape abundant with diverse forest plants, experienced deforestation, lowered yields of crops, and an overall decline in resources due to the humans who inhabited the islands living outside of their means. In the year 900 AD, when Easter Island was first civilized, 20 people lived on the island with a copious amount of mulberry and palm trees per square kilometer. Mulberry trees on the island totaled 19000 per square kilometer and palm trees totaled 11000 per square kilometer. A visible abundance of trees and forestry existed at this time. Three hundred years later, 1200 AD, the population grew by 6300% to a total human population of 1280. Mulberry trees per square kilometer totaled 17500 and palm trees per square kilometer totaled 7500. There was a decrease in tree population and an increase in human population. The decrease in tree population was noticeable, but it was subtle. In the year 1400 AD, the population on Easter Island totaled 20480 people. This is approximately a 1508% increase from the population on the island in 1200 AD. Mulberry trees on the island totaled 6000 per square kilometer and palm trees totaled 3500 per square kilometer. When transecting through the forest, the decrease of mulberry and palm trees was very noticeable. According to the Pearson Pre-Reading materials, between 1400 and 1600 AD, the pollen levels on Easter Island decreased greatly and the charcoal found in the soil meant that the forest had been burned, thus corresponding with the visible decrease in trees. From the reading and video, the forest may have been cut down due to slash-and-burn farming which was necessary to move the gigantic statues up to 6 miles away from the quarry. Human population and tree population seem to be inversely related where an increase in human population leads to a decrease in tree population. One hundred years later, 1500 AD, there were 30000 people living on the island with a mulberry tree population of 1500 and a palm tree population of 500 per square kilometer. Again, the inverse
relationship between human population and tree population can be seen. The year 1600 AD proved to be a turning point for Easter Island. A human population of 20000 existed, a decrease of 33% from 1500 AD. However, the inverse relationship of population and trees was not seen here. It could be inferred that a decrease in population would lead to an increase in trees, however in 1600 AD, the mulberry and palm tree population totaled 0 trees per square kilometer. This suggests that the island reached its carrying capacity and through deforestation, the human population reached its peak and was now in decline due to the lack of natural resources available on the island. By the year 1800 AD, the human population dramatically decreased by 90% from 1600 AD with a total of 2000 people living on the island.

The tree population, both mulberry and palm trees, again totaled 0.

By looking at the raw data, one can see a relationship between the number of trees per square kilometer and people per square kilometer regarding the carrying capacity of the island. As the amount of people per square kilometer increased, the amount of trees per square kilometer decreased. However in year 1500 AD, the human population per square kilometer reached its peak at 185.19 people per square km, thus reaching its carrying capacity. By the next century, the human population per square kilometer began to decrease and the mulberry and palm tree population ceased to exist. Even when the population significantly decreased to 2000 in 1800 AD, the mulberry and palm trees did not replenish signifying that the island had reached its carrying capacity and could no longer sustain itself. As the tree population decreased, so did the pollen and amount of crops. This then led to a decrease in animal population and eventually led to the islanders dying off due to a lack of natural resources. It is important to live sustainably in one’s environment by not exceeded its carrying capacity to not deplete the environment of its natural resources.
Lab Report 1

GRADER MARK REPORT

FINAL GRADE  GENERAL COMMENTS

Instructor

95/100

- Comment 1
  
  Start with a sentence on the motivation i.e. why you are doing this experiment. Mention the area of drone coverage.

(-5)

- Comment 2
  
  Suggestion: You can make the graphs more compact by not starting the x-axis markings at zero. You can also join the points with a line.

- Comment 3
  
  Great job on the conclusion part!
3. Computer Competency Criteria for each lab module.

Lab 1: Easter Island (40 points)
Data Table: Tree and population survey data. 10 points total. Table caption (4 points). Column headings (3 points). Units (3 points).
Data analysis: 10 points total. Calculate the density of each type of tree and the density of people for each time period.
Graph 1: 10 points total. Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).
Graph 2: 10 points total. Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).

Lab 2: Ice Cores and Climate Change (40 points)
Data Table: Ice core CO2 data from the last 1010 years. Table caption (4 points). Column headings (3 points). Units (3 points).
Data analysis: 10 points total. Merge ice core data from the last 1010 years with the data provided from the last 420,000 years. Use this web site to zoom into your city or town, and even to your own street, to see the effects of a 6-foot rise in sea level, then discuss what will happen to your hometown. Are there any other harmful effects for Florida from sea level rise? https://coast.noaa.gov/slr/
Graph 1: 10 points total. CO2 concentrations from the ice core for the last 1010 years. Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).
Graph 2: 10 points total. Ice core CO2 concentrations over time back to 420,000 years before present. Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).

Lab 3: Ocean Acidification (40 points)
Data Table: Coral mesocosm data including temperature, CO2 levels, and coral health indicators. 10 points total. Table caption (4 points). Column headings (3 points). Units (3 points).
Data analysis: 10 points total. Use the uploaded “CO2 sys” Excel spreadsheet in Blackboard (enable macros in Excel) to calculate the DIC (Dissolved Inorganic Carbon) concentrations and the saturation state (Ω calcite) values, and include these results in the data table.
Graph 1: 10 points total. Saturation state and pH as a function of CO2 added. Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).
Graph 2: 10 points total. Total DIC and carbonate ion concentrations as a function of CO2 added. Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).

Lab 4: Invasive Species (40 points)
Data Table: Predator and forage fish data from the transect surveys. 10 points total. Table caption (4 points). Column headings (3 points). Units (3 points).
Data analysis: 10 points total. Calculate the density of each fish species and the coverage of algae vs. coral for each time period and include those results in the data table.
Graph 1: 10 points total. Density of lionfish and prey fish as a function of time across the survey period. Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).
Graph 2: 10 points total. Coverage of algae and coral as a function of time across the survey period. Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).

Lab 5: Frogs and Atrazine (40 points)
Data Table: Frog sex and testosterone levels for each treatment. 10 points total. Table caption (4 points). Column headings (3 points). Units (3 points).
Data analysis: 30 points total. Follow the example given in the pre-lab instructions, and explain how you calculated the correct amount of atrazine to add to each Treatment aquarium. Calculate the means and standard deviations of the testosterone levels for the Control group and the Treatment group in Excel using the entire class data set (10 points each). Calculate the “t-test” value (using the equation given) to determine whether or not the testosterone levels are significantly different between the Control and the Treatment groups (10 points). Report and discuss these calculated results.
Graph 1: No graphs required for this lab.
Graph 2: No graphs required for this lab.

Lab 6: Nutrient use on a farm (40 points).
Data Table: Phosphorus added and sugar cane yield data. 10 points total. Table caption (4 points). Column headings (3 points). Units (3 points). Data analysis: 10 points total. Calculate the cost per hectare for the phosphorus fertilizer used for each treatment and include these results in the data table.
Graph 1: Sugarcane yield (per hectare) vs. P applied (per hectare). Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).
Graph 2: Sugarcane yield (per hectare) vs. Cost for P applied (per hectare). Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).

Lab 7: Nutrient runoff and watershed impacts (40 points).
Data Table: Data from 6 test watersheds (Phosphorus added, oxygen, nutrient, and chlorophyll concentrations). 10 points total. Table caption (4 points). Column headings (3 points). Units (3 points). Data analysis: none required for this lab.
Graph 1: 10 points. Dissolved oxygen (dependent variable) versus “P added” (independent variable). Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).
Graph 2: 10 points. Dissolved inorganic nitrogen and phosphorus (dependent variables) versus “P added” (independent variable). Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).
Graph 3: 10 points. Chlorophyll-a (dependent variable) versus “P added” (independent variable). Figure caption (4 points). Properly scaled and labeled axes (2 points each). Legend (2 points).

Lab 8: Green building (40 points).
Data Table: Data for modifications made to each room to improve energy efficiency. 10 points total. Table caption (4 points). Column headings (3 points). Units (3 points). Data analysis: 30 points. In your discussion, compare quantitatively (in CO2 footprint values) how each modification for each room improves (or not) the energy efficiency of the entire house. For example, changing the windows in the Lobby/foyer from double glazed to triple glazed resulted in better heat retention; less energy used for home heating (CO2 footprint dropped 4.2%).
Graph 1: Not required for this lab.
Graph 2: Not required for this lab.