CLASS PROJECTS
Global Change – Sustainability

In this class you will choose a class project to be done in a group of three people from your lab section. The project is a way for you to investigate and learn about topics in Global Change and Sustainability that most interest you. There are three main parts to the project, which will be done in a progression through the semester: The Project Proposal, the Project Draft, and the Final Presentation and Paper. There will be two lab periods during the semester dedicated to working on your projects in groups.

I. Project Proposal:
    1. Names and email addresses of all group members
    2. What topic you will explore in your final group project
    3. Tentative title of your project
    4. What research question you will answer with your project
    5. What your predicted answer is to the research question you have posed
    6. Draw a *conceptual model* (similar to a Stella model) of your topic
        • Consider the scale of the project, the variables that interact, and the causal relations (causes and effects)
    7. Include an annotated bibliography of at least 3-5 literature sources you will use
        • This should be set up like a reference section, with 1 sentence after each source explaining how it will be used in your project
        • Use only original research published in peer-reviewed journals (*see below for more guidance on this).
    8. Only one person in your group should turn in the assignment on Canvas

* Note: Look at the [citation guide](#) for help and instructions and formatting.

II. Project Draft
Your group's assignment is to develop a draft paper on your approved topic for your term project. Your group's work should be focused around one main hypothesis or question. This main assertion may be partially guided by your opinions, which you will need to support with relevant examples and findings from your research. In this draft, you should include a title, an objective or question, a hypothesis, and background information. Your objective or question needs to be narrow enough so that it can be answered by your research and your Stella modeling. Your hypothesis is a statement of what you expect to find, and it should be based on the background information that you provide through your research on the topic your group has chosen.

This paper will be worth 25 points. *Only 1 member of your group should submit this assignment through your Group on Canvas as a Word document, 2-page minimum (4-page maximum) single-spaced, size 12 font, excluding images and references.* Your paper must include the following headings and content.

• **Introduction** - Why is this project important? What is the context of this project to the bigger picture? What is your hypothesis or question? What is your prediction? Why have you predicted this?
    o Think about the upside-down triangle, start broad and get narrow.

- o EXAMPLE: Globally amphibians are declining…. (Large part of the triangle) In the US, this is happening…. (Middle) Our case study will explore…. (Narrow)
- **Methods** – How and where did you get your information? How does the model complement your project theme? How are the variables in your model pertinent to the problem studied? Describe the general relational structure between variables. What were the assumptions for your model (e.g. how well are the physical mechanisms represented by your model)? Include a screenshot of your model.

- **Results and Discussion** - Discuss the evidence you have found to support or discredit your hypothesis. What have others found? Which side of the argument do you favor? What evidence do you have to support your take? This is the section for original analysis and critical thinking.
- **Implications** - Now that we know what's going on with our research topic, why is it important, what does it mean, and how might it relate to issues of sustainability? Why do we care?
- **Solutions** - What types of things could be done to solve the problem?
- **Conclusions** - Recaps what you have found, how it relates to your hypothesis and the overall take away point.

The draft paper will be graded on the structure and content described above, and considering the following:

- **Formatting**
    - Essay, paragraph and sentence structure
    - Spelling and grammar
    - Formatting: no broken links or images, font should be legible
    - Heading requirements see above (Introduction, Methods…)
    - Include your names, E-mail addresses, and section number on title page
- **Complete Draft Stella Model and explanation**
    - Functional model
    - Results of initial model runs
    - Identified problems with your model and plans on how to resolve them
- **Supporting Information**
    - Include 1+ informative images, diagrams, or tables that support your research (in addition to a results graph)
    - These data can later be used in your presentation
- **Citations**
    - Use 3-5 high-quality citations, with AT LEAST 3 from original research published in peer-reviewed journals (see below).
    - Consistently adhere to standard rules of citing references in a separate reference section, and use in-text citations.
    - References should support the project's purpose and arguments.
    - Sources of information and formatting of citations should follow the citation guide.

ANY PAPER WITH EVIDENCE OF "CUT AND PASTE" FROM THE WEB WILL BE GIVEN A ZERO, unless it is a direct quote that is properly cited. This will be checked. See LSA's Academic Integrity Guide for more information.

Global Change: Draft Paper Grading TOTAL 25 points

Introduction (5)	
• Broader context of project	
• Project importance	
• Question or hypothesis (objective)	
• Prediction and justification	
Methods & Model Explanation (5)	
• How did you get your information?	
• Where did you get your information (reputable, relevant sources)?	
• How the model complements your project theme	
• How the variables in the model are pertinent to the problem studied	
• A description of the general relational structure between variables	
• What were the assumptions for your model (e.g. how well are the physical mechanisms represented by your model)? ***Be thorough!***	
• *A screen shot of the current model* (may not be functioning properly yet)	
Results and Discussion (5)	
• ***Results of model runs*** (include graphs even if your "results" don't make sense yet because your model isn't fully functioning yet)	
• Discussion of evidence to support/discredit hypothesis	
• What have others found?	
• Which side of the argument do you favor?	
• What evidence do you have to support your take?	
• ***Reflection on how well your model worked and related to the real-world problem***	
• 1+ informative images, diagrams, or tables to support your research (in addition to a results graph)	
• Original analysis and critical thinking	
Implications (2)	
• Why are the research topic and results important (i.e., why do we care?)	
• What do the results mean?	
• How do results relate to the issues of sustainability?	
Solutions (2)	
• Discussion of the types of things that can be done to solve the problem	
Conclusions (2)	
• Summarize results and how they relate to the hypothesis	
• Overall take away point	
Formatting (2)	
• Essay, paragraph, sentence structure	
• Proper spelling and grammar	
• Includes title, heading requirements, group member names/email addresses, section number, single-spaced, 12 size font, max 4 pages text, max 4 pages references/images, images explained in text	
• No broken links/images, font legible	
Citations (2)	
• Minimum of 3 peer-reviewed, high-quality citations that support the project's purpose and arguments	
• Proper citation of references within text	
• Proper formatting of references section	
Total:	**/25**

III. Final Presentation and Paper

On the last day of lab sections, each group will present their research and turn in a final draft of your research paper, which will include all the elements of your draft paper and will integrate your final model results and discussion of how the model helps you understand and explain your global change topic.

The final paper will be graded on the structure and content described in the draft paper instructions (Introduction, Methods, Results, Implications, and Conclusion) and considering the following:

- **Formatting**
  -Essay, paragraph and sentence structure
  -Spelling and grammar
  -Formatting: no broken links, font should be legible
  -Heading requirements see above (Introduction, Methods…)
  -Include your names, E-mail addresses, and section number on title page

- **Complete Draft Stella Model and explanation**
  -Include the following for your model description and results:
    - How the model complements your project theme
    - How the variables in the model are pertinent to the problem studied
    - Include a description of the general relational structure between variables
    - What were the assumptions for your model (e.g. how well are the physical mechanisms represented by your model)?
    - A screen shot of the final model.
    - A summary of the model results, and finally the citations.
    - Functional model
    - Results of final model runs – only include runs which illustrate an important result or conclusion
    - Reflection on how well your model worked and related to the real world problem

- **Supporting Information**
  Include one or more informative images, diagrams, or tables that support your research.

- **Citations**
  -Use 3-5 high-quality citations, with AT LEAST 3 from original research published in peer-reviewed journals (see below).
  -Consistently adhere to standard rules of citing references in a separate reference section, and use in-text citations.
  -References should support the project's purpose and arguments.
  -Finding sources of information and formatting of citations should follow the citation guide.

ANY PAPER WITH EVIDENCE OF "CUT AND PASTE" FROM THE WEB WILL BE GIVEN A ZERO, unless it is a direct quote that is properly cited. This will be checked. See LSA's Academic Integrity Guide for more information.

Global Change: Final Paper Grading TOTAL 50 points

Introduction (10)	
• Broader context of project	
• Project importance	
• Question or hypothesis (objective)	
• Prediction and justification	
Methods & Model Explanation (10)	
• How did you get your information?	
• Where did you get your information (reputable, relevant sources)?	
• How the model complements your project theme	
• How the variables in the model are pertinent to the problem studied	
• A description of the general relational structure between variables	
• What were the assumptions for your model (e.g. how well are the physical mechanisms represented by your model)?	
• A screen shot of the final model.	
Results and Discussion (10)	
• Results of final model runs (only include runs which illustrate an important result/conclusion)	
• Discussion of evidence to support/discredit hypothesis	
• What have others found?	
• Which side of the argument do you favor?	
• What evidence do you have to support your take?	
• Reflection on how well your model worked and related to the real world problem	
• 1+ informative images, diagrams, or tables to support your research (in addition to a results graph)	
• Original analysis and critical thinking	
Implications (4)	
• Why are the research topic and results important (i.e., why do we care?)	
• What do the results mean?	
• How do results relate to the issues of sustainability?	
Solutions (4)	
• Discussion of the types of things that can be done to solve the problem	
Conclusions (4)	
• Summarize results and how they relate to the hypothesis	
• Overall take away point	
Formatting (4)	
• Essay, paragraph, sentence structure	
• Proper spelling and grammar	
• Includes title, heading requirements, group member names/email addresses, section number, single-spaced, 12 size font, max 4 pages text, max 4 pages references/images, images explained in text	
• No broken links/images, font legible	
Citations (4)	
• Minimum of 3 peer-reviewed, high-quality citations that support the project's purpose and arguments	
• Proper citation of references within text	
• Proper formatting of references section	
Total:	**/50**

The final presentation will be graded following the below guidelines:

_____ General (15 points)

• Logical order of presentation

• Appropriate amount of information (enough to understand, not confuse)

• Talk fit well into allotted time

• Slides strong and easily read

• Strong deliveries (much eye contact; few "ums" and "ers")

• Literature referred to appropriately (citations listed on each slide, where appropriate)

_____ Introduction (10 points)

• Good, focused Introduction (why is this an interesting topic or question?)

• Clear statement of objective and/or hypothesis

• Brief, clear outline of remainder of talk

_____ Body of talk (15 points)

• Clear description, appropriate detail

• Summarized main points and model results concisely

• A graph or table that that shows or compares results

• Main question or hypothesis addressed by data and resolved

_____ Summary/Conclusion (10 points)

• Clear summary reviewing thesis and findings

• Well-reasoned answers to questions

Primer on Designing Good Presentations

Advice for giving a good oral presentation (single or group)
• Limit your actual talk to ~75% of the allotted time. Limit yourself to 12 minutes to allow time for questions.

• Practice your talk numerous times, both alone in front of a mirror, and in front of critical friends. If it is a group talk, practice together, especially the transitions between speakers. • Tape record your talk and listen for "uhs" and "likes" and other repetitious and superfluous words, or have a friend listen to the talk and count the number of occurrences of these words.

• Know your talk well enough to give it without notes in easy-to-follow conversational sentences. If necessary, bring your notes to the podium for security, but if you know your talk well enough, you will present it automatically despite your fear. • Plan your talk carefully around a few "take-home messages" to provide focus for your talk. If you are in doubt about how many messages your audience can remember, think back to how much you can really remember from a talk or lecture...

• State the point of your talk and a summary of the main message in one or two sentences at the beginning of your talk. This gives the audience a "road map" as to where you are going, and it makes it easier for them to follow.

• Use a loud, clear, enthusiastic voice. If you don't seem to care about your topic, why should your audience?

• Avoid distracting mannerisms, such as waving the pointer or pacing.

Advice for producing good slides and graphics
• Do NOT put too much information on a slide. Avoid tables, but if they are necessary, simplify them by including only the data you will refer to and use rounded numbers. If there is some graphical way to present the same information, do so, because your audience will be more likely to grasp it in the short time it is on the screen.

• Make the titles of figures or tables descriptive - e.g., use "Nitrogen has increased over time" instead of "Plot of nitrogen versus time".

• If you can read an 8x11" piece of paper 8 feet away those in the rear seats will be able to see everything when it is projected. In general, use the largest type possible.

• Slides with light backgrounds (i.e., white) are more legible than slides with dark backgrounds, particularly if any room light is present.

• Include on each slide only information that you will discuss. Other information is distracting and confusing. Limit each slide to one main idea, and just a few sentences.

• If you refer to the same slide more than once, use duplicates (don't go backwards).

• Horizontal slides are best because the size of the screen may result in cropped vertical slides.

For more complete guidance, an excellent resource is "Strategy and checklist for effective scientific talks" by S.T.A. Pickett, B.E. Hall and M.L. Pace (Bull. Ecol. Soc. Am. 72:8-11, 1991).

How to Get an 'A' on the Final GC Term Project: tips and guidelines reiterating the above instructions and rubric

IN GENERAL:

- Have a great approved topic that is <u>relevant</u> to GC
- **<u>YOU MUST</u>** have an <u>obvious</u> hypothesis – question and prediction,
    - Be Specific. We are testing the hypothesis that…..
    - Give your hypothesis early in the essay.
- Show evidence of critical thinking and original analysis
    - We are interested in <u>your</u> take on things, not just a reiteration of others' ideas. Once you have researched all the angles, which side of the argument do you favor?
    - This should take the form of compiling or analyzing data from your sources in Excel or STELLA to support your argument.
- Use informative images, diagrams, or tables (properly cited)
    - We HIGHLY encourage using STELLA models and using Excel graphs where appropriate.
    - Need to reference tables and figures in text. Figures need figure descriptions, i.e. Table. 1: Compilation of xxx, yyy and zzz.
    - We would highly recommend that you **create an outline** of your project to help structure your thoughts.

FORMATTING:

- Proper essay, paragraph and sentence structure
- Correct spelling and grammar
- Paragraphs need a strong topic sentence. Make sure subsequent sentences in paragraph flow with the topic sentence.
- <u>Use headings</u> for your paper sections

REFERENCES:

- Use high-quality citations from original research.
    - This is a <u>science</u> course, and we think this is CRITICAL.
    - Your grade will suffer if your references are bad or are in the wrong format.
    - ASK if you don't know whether articles are peer reviewed
- Briefings and News articles should be used SPARINGLY. They <u>do not</u> count as peer reviewed articles.

Ways to drive your GSI nuts and get a poor grade on the project

- Don't use spell check
- Have sentence fragments or run-on sentences
- Use too many quotes
- Have broken links
- Have links to e-journals that we can't access because you got to it with your unique name and password – BROKEN LINKS
- Cite printed journals as e-journals
- Make us hunt for your hypothesis (Question and Prediction) or worse don't have one
- Use poor references like <u>High Times</u>, <u>Vegetarian Times</u>, or other random webpages from Joe Schmo.
- Copy other peoples' work