**GEOL 220 Oceanography Project 1: An Abrupt Global Climate Change Event in Earth History- Evidence from the Ocean**

**Poster Due: March 17 (Monday lab), March 18 (Tuesday lab); Worth 10% of your grade for the course**

**A. Project Description**

You and a partner will examine an important event in Earth History where a rapid and dramatic change in climate occurred. Perhaps the best evidence of this event comes from ocean sediments. In this project, you will use the marine geological tools we have been working on over the first few weeks of the course to explore and complete a paleoceanographic story for this interesting time interval. You will work in teams of 2-3 on small sections from five sites drilled on a scientific expedition in the South Atlantic Ocean west of South Africa. You and your partner(s) will produce a high-quality research poster that shares your interpretation of the various data along with key imagery.

***Goals:***

* Building skill at applying a variety of marine geological data to reconstruct Earth history.
* Building skill and comfort using GeoMapApp, Adobe Photoshop, and Illustrator which are used by professionals in the sciences and beyond.
* Building skill producing technical posters, a routine format for presentation at scientific meetings from the local to international level.

***Your Tasks:***

1. Examine modern core sedimentary characteristics from the sites. First, Use GeoMapApp and the portal to the Integrated Ocean Drilling Program database to examine recent sediments from the drilling sites to explore recent to modern sedimentation there. ***I would like you to do this individually as a pre-lab homework over the weekend.***
2. Analyze and interpret the paleoceanographic data. ***In lab next week, I will help you get started working with the paleoceanographic data*** using GeoMapApp and the portal to the Integrated Ocean Drilling Program database and an additional data set that I supply to carefully analyze selected core logs, photos, and datasets and use them to draw inferences to important changes in past ocean conditions for the period of interest.
3. Compile your research poster. Work with your partner to prepare appropriate text and figures and build your poster using Adobe Photoshop and Adobe Illustrator. Use GeoMapApp to make high-quality map images (map view, 3-D views, profile view) to be included with your poster.

**\*\*Details on what is expected for steps 2 and 3 and grading are given on the following pages.\*\***

**B. Analyzing and interpreting the paleoceanographic data**

As mentioned above, you will examine data from 5 ocean drilling sites collected on one expedition. As you work, please remember that the data from each site all span roughly 3-4 meters depth in a core and represent the same ~50,000 year time interval. Data to be accessed, analyzed, and interpreted from each of core sections is listed in Table 1 below:

1. Core logs (previously completed visual core descriptions)
2. Core photos
3. Calcium Carbonate (CaCO3, given in weight %)
4. Carbon isotopic values (δ13C, given in ‰ relative to the vPDB reference standard) \*Note: The first two data sets will be accessible using a portal on GeoMapApp. The remaining two data sets will come from a separate source that I will provide.

***Table 1.*** *Information on the core sections to be investigated in this project.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Expedition/Leg** | **Site** | **Hole** | **Core** | **Tool** | **Section** |
| 208 | 1262 | A | 13 | H | 5 |
| 208 | 1262 | A | 13 | H | 6 |
| 208 | 1263 | C | 14 | H | 1 |
| 208 | 1263 | C | 14 | H | 2 |
| 208 | 1263 | C | 14 | H | CC |
| 208 | 1265 | A | 29 | H | 6 |
| 208 | 1265 | A | 29 | H | 7 |
| 208 | 1266 | C | 17 | H | 2 |
| 208 | 1266 | C | 17 | H | 3 |
| 208 | 1266 | C | 17 | H | 4 |
| 208 | 1267 | B | 23 | H | 1 |
| 208 | 1267 | B | 23 | H | 2 |
| 208 | 1267 | B | 23 | H | 3 |

**C. Poster requirements**

***Dimensions:*** Landscape format 36” high, 60” long; Text size: 28 pt. font. For normal text, larger (48 -90 pt.) for poster Title, Authors.

***Written text sections:* Your poster text should be clear and concise but capture significant details.**

1. Objectives for the project: What question(s) did you attempt to answer in this project?
2. Results: What are the key results from your examination of the each of the datasets? Just the facts here.
3. Interpretation and Discussion: What do the results suggest about changes in ocean conditions and therefore sedimentation at each site at the time of this major climate episode? When you compare the data across the five sites, how did these changes vary with depth? Suggest one or more possible causes that can be supported with the available data.

***Figures:***

1. Labeled maps showing location of the drilling sites and other reference locations and/or features of interest. Where possible, each map should have reference scales in addition to any labels. Make sure to include at least 3 different map views including:

1. A 2-D map with all coring sites labeled
2. A 3-D map with all coring sites labeled
3. A profile map following a line that includes (intersects or comes near) all sites.

2. Composite downcore photos of the core sections of interest from each site, with data (calcium carbonate, magnetic susceptibility, and δ13C) plotted next to the core images at stratigraphically correct depths (use mbsf depths for all data). These images and datasets should be neatly labeled and an appropriate figure caption should be included. I will describe this in more detail before you begin to construct this figure.

***\*Please note: You will not be required to print the poster. I will evaluate a digital copy.***

**D. Grading:** This project is worth 10% of your overall grade for the course. Grading breakdown for the project is given below along with some guiding questions to help you understand what I will be evaluating. My grading rubric is given on the next page.

1. ***Poster: Quality of the figures and text (35%):*** Were figures carefully crafted with attention to detail and good resolution? Were important details labeled clearly for the reader? Is poster text, clear, concise, and well-written? Are figures appropriately referenced in the text to guide the reader’s attention?
2. ***Strength and accuracy of your observations and interpretations (35%***): Are your observations accurate? Are your interpretations supported by the available paleoceanographic evidence (data) for the project? How deeply did you explore the available data?
3. ***Poster design and organization (10%)*:** This is about poster layout. Is your design clean, crisp, and laid out in a logical fashion?
4. ***My assessment of your level of effort and attitude*** ***(10%)*** From my viewpoint: Were you on task, positive, and actively contributing to the effort with your partner?
5. ***Self assessment and Peer evaluation (10%)***: What was your personal level of contribution and how did your partner(s) contribute to the project? Was work divided in a fair way? Do you feel like your group completed this project successfully?

**Grading rubric for Oceanography project 1 Name:**

|  |  |  |
| --- | --- | --- |
| **Grade** | **Score** | **Grade description** |
| Exceptional | 5 | *Your work on this aspect of the project was much better than I expected.* **Examples:** Your analysis and interpretation of the data were well-supported by the evidence and particularly insightful, showing depth of thought and exploration. You remained positive about your work throughout the project and produced a professional-quality poster with high attention to detail. Such work could immediately be displayed in the department or at a local meeting. |
| Excellent | 4 | *Your work on this aspect of the project was strong*. **Examples:** Your analysis and interpretation of the data were well-supported by the evidence and showed some insight in addition to this. You remained positive about your work throughout the project. Your poster is high-quality work that shows attention to detail, but would require minimal editing/correction before display.  |
| Good | 3 | *Your work in this aspect of the project meets my expectations for the project.*  **Examples:** Your analysis and interpretation of the data were, in most cases but not always, well-supported by the evidence. You remained positive about your work throughout the project. Your report and presentation was good quality work that, in some areas, might lack full attention to detail and require some editing/correction before it would be ready for display.  |
| Needs Improvement | 2 | *Your work on this aspect of the project needs improvement*.  **Examples:** Your analysis was weak in some areas and your interpretation of the data did not clearly link to the available evidence. Nothing about your poster particularly stands out as it is now, but it could be displayed with a major edit. |
| Poor | 1 | *Your work for this aspect of the project is far below our expectations and was a disappointment.*  **Examples:** Your analysis was minimal and the interpretation lacks supporting evidence. You had a poor attitude about the project and lacked focus. Your poster shows a number of deficiencies and could not be considered for display.  |

**Quality of the poster figures and text (35% of grade):**

**Strength and accuracy of your observations and interpretations (35%):**

 **Poster design and organization (10%):**

**My assessment of your level of effort and attitude (10%):**

**Self-assessment and peer evaluation (10%):**