

Final Project and Presentation

2011 FIU Undergraduate Hurricane Research/Education Internship

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Project Overview:

Bring all of your newly learned Tropical Cyclone knowledge and research skills together by studying a specific storm and present your results to your colleagues in an 8-10 minute Power Point presentation.

First Step: Pick a storm. Do not go back any farther than 1998. Storms from 2006 onward will have the most data available. (If two of you want the same storm we will flip a coin)

Second Step: Using the skills learned in the first week of the internship, study the track and intensity of your storm. Follow the Scientific Method that we talked about last week:

1) Define a question (or questions):

-Examples: How did the structure of the TC evolve over time? Why did the TC go through Rapid Intensification? How did land interaction, wind shear, or eyewall replacement cycles affect the intensity of my storm? (see storm selection sheet for more questions)

2) Gather information and resources (observe):

-Learn the track and intensity of your storm well. Take advantage of the wealth of data sources on the Internet to learn more about the questions you asked in Step 1. Refine your questions or ask more specific questions based on what you discovered.

-Use external sources (textbooks, online guides, your classmates, Joe/Cheng) to learn more and get multiple opinions. Make sure to cite all sources.

3) Form an explanatory hypothesis:

-Example: Hurricane Katrina underwent rapid intensification in the Gulf of Mexico because the center of circulation passed over the warm loop current, upper level winds were favorable for development, and the lower level circulation was undisturbed after passing over South Florida.

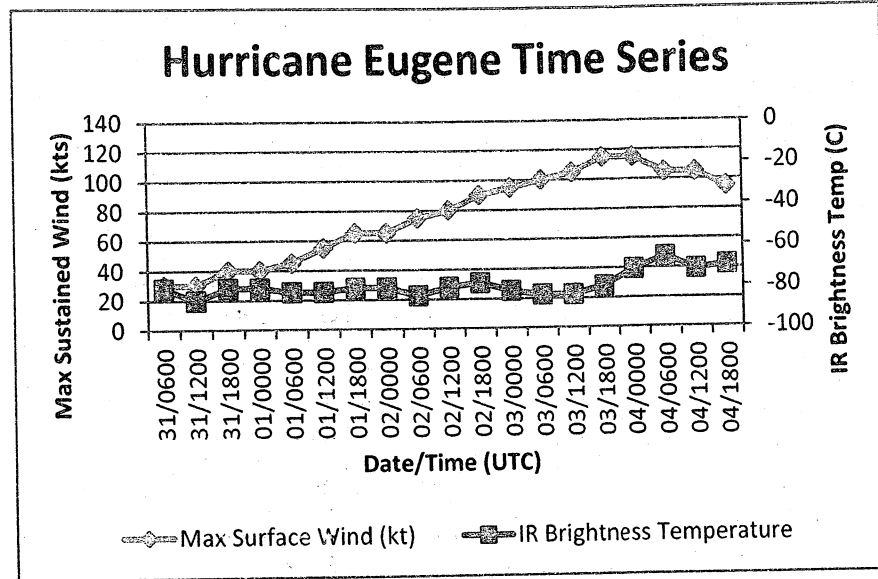
-You may have multiple hypotheses if there are several aspects of your storm worth studying and you have enough time.

4) Perform an experiment and collect data, testing the hypothesis

Examples:

-Find satellite images that support/refute your hypothesis. For example, if you think your storm weakened because it was undergoing an eyewall replacement cycle, search the microwave imagery for concentric eyewalls.

-Optional: Using MS Excel and online resources, create excel plots of your storm's intensity compared with relevant variables. Examples of variables to plot include minimum IR brightness temperature, storm relative wind shear, sea surface temperature, radius of TS or Hurricane force winds, or any other ideas that you have. Example below:



-Another option is to compare the model data to the forecasts and satellite (using archived model data). How did the model forecast intensity compare to the actual storm?

-We will go over how to use model data on Monday

5) Analyze the data, interpret the data and draw conclusions

-After you have interesting data and can make a good scientific argument, consider how to organize your results into a presentation.

Third Step: Create a presentation

-Time allotted: 8-10 minutes.

-A few minutes will be allotted for questions at the end (you will be asked at least one question). Try to anticipate what questions might be asked.

-Assume that you are speaking to an educated, scientifically minded audience, but do not assume that they will have experience with the images or data that you are showing. For example, if you are showing an IR satellite image, make sure to inform the audience that the image is showing the temperature of the cloud tops and show a legend that depicts the color of the warm and cold clouds.

-Do not try to fit too much into your presentations. It is better to explain a smaller number of your best plots/images in detail instead of showing lots of things too quickly.

Evaluation:

-The audience members will be given a brief form to add any comments on your presentations. We will also give you more detailed feedback (evaluation forms will be given in advance so you can look at them).

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Title and abstract (give to Joe by 3:00 PM Monday):

-An important part of any research presentation is choosing an appropriate title and an abstract. The title should be a short description of your work (no more than 15 words) such as, "Environmental conditions contributing to rapid intensification in Hurricane Katrina". The abstract should be a summary of your work, 300 words or less addressing the following points:

1) Motivation/problem statement: Why do we care about the problem? What are the practical, scientific, or theoretical implications of your research?

2) Methods/procedure/approach: What did you actually do to get your results? (e.g. analyzed microwave images)

3) Results/findings/product: As a result of completing the above procedure, what did you find?

4) Conclusion/implications: What are the larger implications of your findings, especially for the problem/gap identified in step 1?

Timeline:

-Friday August 10: Research and pick a storm and time, begin formulating hypothesis
Finalize your storm choice over the weekend!!!

-Monday August 13: Finish filling out selection sheet, discuss selection sheets and preliminary data with Joe and Cheng. Continue gathering images and data. Email presentation title and abstract to Joe by 3:00 PM.

-Tuesday August 14: Arrange PowerPoint slides, add any additional data or information from outside sources.

-Wednesday August 15: Practice and put finishing touches on presentations. We recommend that you practice your presentation or show your slides to Joe and Cheng in advance so you can get suggestions ahead of the final presentation.

-Thursday August 16: Final preparation in the morning, presentations begin at 1:00 PM!!!