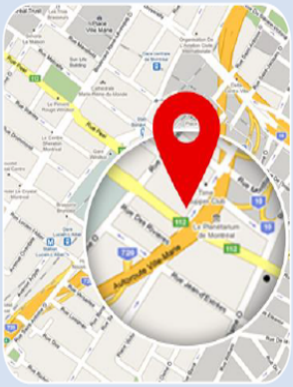
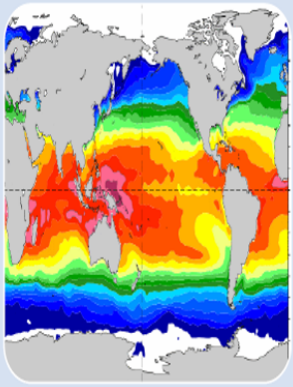
Final Project Course Page



The climate emergency and our response to it will define the lives of the world's younger and future generations. These changes began recently enough (and have continued) to be well documented, and as such have been able to be directly connected to anthropogenic impacts (ex. the **July 2021 extreme heat wave (https://esd.copernicus.org/preprints/esd-2021-90/)** in the Pacific northwest would not have been possible without human induced warming). The tools you learned in this class are the fundamentals of **attributing (https://www.climatechange2013.org/images/report/WG1AR5_Chapter10_FINAL.pdf)** small and large scale changes to human influence and predicting **future changes (https://www.researchgate.net/profile/Sina-Ayanlade/publication/362431678_Climate_Change_2022_Impacts_Adaptation_and_Vulnerability_Working_Group_II_Contribution_to_the_Sixth_Assessment_Report_of_the_Intergovernmental_Panel_on_Climate_Change/links/62ea52343c0ea87887793180/Climate-Change-2022-Impacts-Adaptation-and-Vulnerability-Working-Group-II-Contribution-to-the-Sixth-Assessment-Report-of-the-Intergovernmental-Panel-on-Climate-Change.pdf)** . Learning more about how regions are responding to climate change is invaluable for targeting responses and mitigating these impacts.

Students will prepare a scientific report based on climate or related measurements that demonstrate environmental changes due to human impact. In other words, we are asking you to evaluate one aspect of the climate emergency using time-series data and the data analysis tools you learned in this class (averaging, correlation, variance, co-variance, detrending, niche analysis…). Please see the guidance below on how to choose a good dataset, including links to data sources and potential questions that could be answered with these datasets.

NOTE: The final project is an important element of the course. To PASS the course, you must be able to prove participation in group work including the final presentation.

All elements that we have covered in this class, field sampling, sample analysis, and data analysis using Python, are united in this final project.

This final project is worth 25% of the total course marks and includes 4 deadlines (see your cohort schedule for due dates). Please follow the deadline hyperlinks below for details on the requirements and how to succeed in each stage of this project:

1. ***Deadline #1 (https://canvas.ubc.ca/courses/102559/assignments/1296360)*** **: Preliminary discovery of title, data, questions and proposed analysis, 2 marks.** (See cohort schedule. Due by 9am before class)
2. ***Deadline #2 (https://canvas.ubc.ca/courses/102559/assignments/1296361)*** **: Preliminary Results, 5 marks.** (See cohort schedule. Due by 9am before class)
3. ***Deadline #3*** **(https://canvas.ubc.ca/courses/102559/assignments/1296362) : Summary and Conclusions, 3 marks.** (See cohort schedule. Due by 9am before class)
4. ***Deadline #4*** **(https://canvas.ubc.ca/courses/102559/assignments/1296351) : Final project presentation, 15 marks.** (See cohort schedule. Due by 11:59pm day before presentation.)

Characteristics of the data set

The data you choose to evaluate can either be the measurements collected in class or data found online, or both. The data set must be neither too big (that will make analysis difficult) nor too small (that will mean you have poor resolution of the phenomenon or process). For a single variable time-series, the data set should consist of no fewer than 100 and need not be larger than 5000 data points. If the data reflect the co-variation of two or more quantities, the data set may be smaller than noted above.

Many data sets can be found through well-directed Google searches, using carefully chosen search keywords. The Science Reference Librarian will be very happy to help you search for a data set, as long as you have a fairly clear idea of what data you want. You could also try finding a data set by contacting a researcher who has published data of interest to you. We are focussing on time series of data in this class. Please do not choose spatial data i.e maps.

If you choose to use the class data, the analysis done may include an attempt to explain the class observations based on other local observations (e.g. observed changes in zooplankton species due to temperature changes), or a comparison/contrast of class observations and similar observations detailed in the literature in another part of the world. Alternatively you can use online data to investigate a climate related question. The analysis should employ some of the techniques covered in the EOSC 442 computer labs.

There are plenty of other sources for data. Please contact any Instructors if you have questions.

LIST OF DATA SOURCES AND POTENTIAL QUESTIONS
(https://canvas.ubc.ca/courses/102559/pages/sample-datasets-and-analysis-questions?wrap=1)

Characteristics of the analysis

The analysis must include but is not limited to techniques discussed in the computer labs such as: taking annual/seasonal averages; removing a trend or cycle of variability; analysis of residuals; and/or calculations of variance, co-variance or correlation.

NOTE: all analysis MUST be done in PYTHON. Points will be taken off for utilization of other analysis tools (especially Excel or Google Sheets etc.).

Learning Goals

Upon completion of this project student should be able to:

- Articulate a scientific research question
- Develop, execute and communicate an appropriate methodology to answer the research question
- Communicate science clearly and concisely both visually and orally
- Work effectively in a group

Feedback and Info for final project

(https://canvas.ubc.ca/courses/102559/files/21782369/download?wrap=1) ⬇ *(https://canvas.ubc.ca/courses/102559/files/21782369/download?download_frd=1)*

Final Project Presentation Examples (https://canvas.ubc.ca/courses/102559/pages/eosc-442-final-presentations-examples)