

COESSING 2021 Schedule



Explanation of terms:

- **Panel:** Held synchronously from 3-5pm GMT with a panel of speakers
- **Lab:** Computer programming or other exercises that you can walk through on your own time.
- **Tutorial:** Instructors will walk participants through labs. This is also a session for you to ask questions as the instructor steps through the lab.
- **Pre-recorded lecture:** Video on youtube of a lecture that has been recorded ahead of time that you can watch on your own time
- **Q&A:** Instructors will be available to answer participant questions about lectures or labs. Come to these sessions after you have watched the corresponding lectures or tried the corresponding labs.

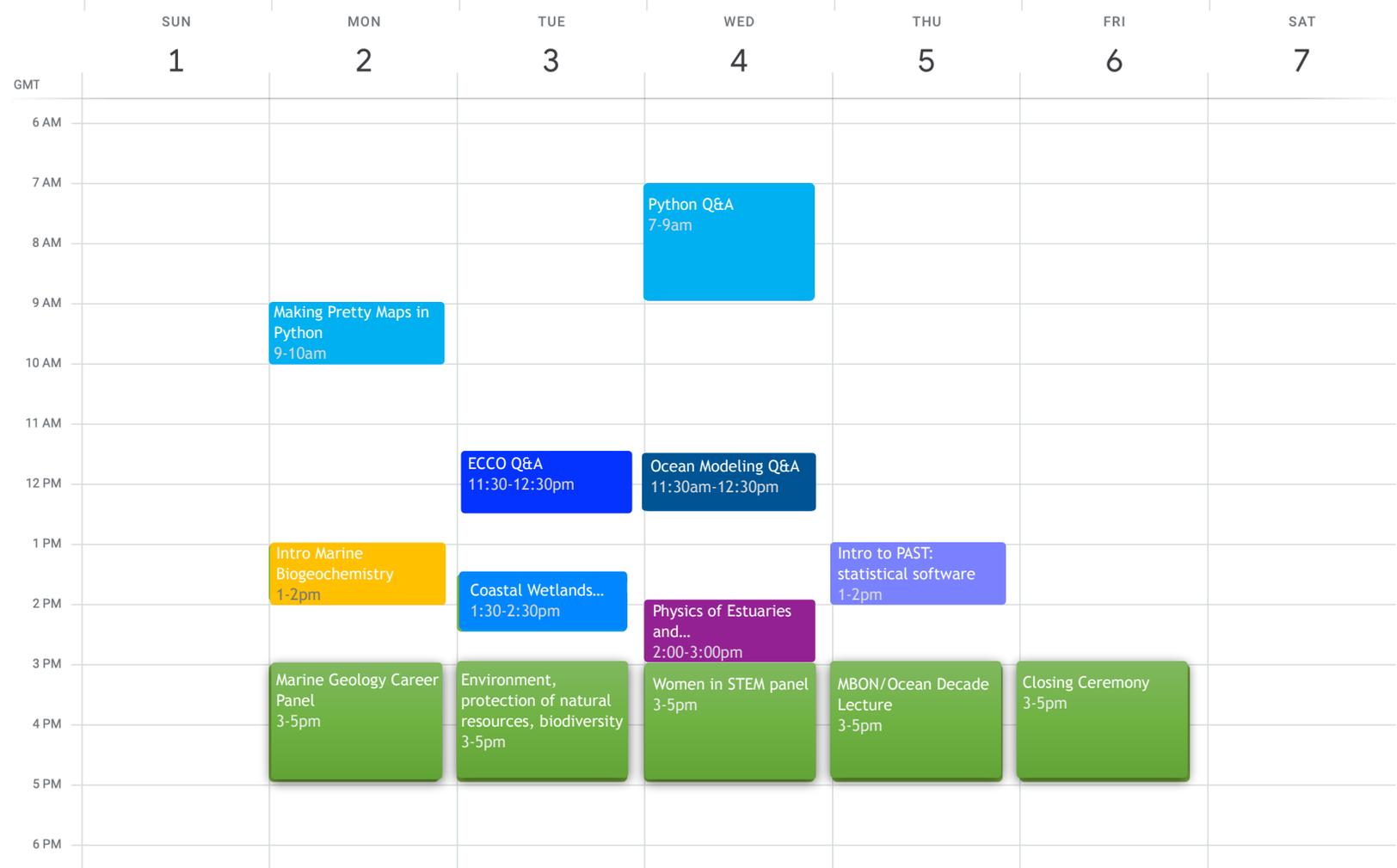
Python programming access:

All Python programming labs will be accessed through a website. This website is a JupyterHub that has been set up by 2i2c.org just for us! All you need to do is log in and you will have access to Python, Jupyter notebooks, and (very excitingly) cloud computing resources!

To access the Hub, fill out this [Google form](#) with your Google email, and you will then be added as an authorized user of the Hub, and you will use this email to log in to the Hub. Please fill out the form as early as possible, as there can be up to a 24-hour delay to add users to the Hub. Everyone is welcome and encouraged to use the JupyterHub! More details and links on the [last page](#) of this schedule.

Synchronous content

Note: all times are GMT (Ghana local time)



Asynchronous content

Intro to Marine Biogeochemistry & ODV Pre-recorded lecture & lab Winn Johnson	MBON ocean satellite session prep-work Pre-recorded lecture Enrique Montes	Coastal wetlands and nearshore processes Lab Maddie Foster-Martinez	ECCO: Estimating the Circulation and Climate of the Ocean Pre-recorded lecture & lab Dimitris Menemenlis, Paige Martin	How to run python at COESSING 2021: intro to cloud computing Lab Paige Martin
Introduction to Fluid Dynamics and Physical Oceanography Lab Aline Cotel, Emily Shroyer	Ocean Drilling: History of the science of IODP Pre-recorded lecture Ingrid Hendy, Sydney Hemming	Physics of Estuaries and River Plumes Lab Jim Lerczak	Ocean Modeling Pre-recorded lecture & slides Joseph Ansong/Riccardo Farneti	Data analysis and visualization in python Lab Paige Martin
Hydrography Pre-recorded lecture Stephan Howden	Touring the NSLS-II synchrotron, context for spectroscopy lecture Pre-recorded lecture Sarah Nicholas, Paul Northrup	Natural resources Pre-recorded lecture & lab Adam Simon	Satellite Oceanography/Microplastics Pre-recorded lecture & lab Eben Nyadjro	Making pretty maps from your data Lab Josué Martinez-Moreno

How to read this schedule:

1. Each colored box is a clickable link to a page in this document with more details and Zoom links.
2. Colors signifies a connection between the content. E.g. the yellow color on the graphical schedule is a tutorial for the lab in yellow shown in "Asynchronous content" above. All green boxes are (or are associated with) synchronous 3-5pm content.
3. All content shaded in blue (within the blue outline) has a lab that uses the cloud computing hub and can be accessed via JupyterHub.

Week 1: 3-5pm synchronous events

Opening ceremony

Description: Join Brian Arbic, Edem Mahu, Johnson Adjete and the rest of the instructors for a welcome ceremony to COESSING 2021!

Link:

Ocean Drilling: History, Organization and African examples (Paleo-Agulhas Current History)

Sidney Hemming, Laurel Childress, Ingrid Hendy

Link:

Pre-recorded lecture: Ocean Drilling: History of the science of IODP [International Ocean Discovery Program]: How deep sea drilling changed how we view Planet Earth

Description: An introduction to IODP (International Ocean Discovery Program) with an asynchronous lecture on the history of the program from the 1960s through the Deep Sea Drilling Program (DSDP) through to current operations. There will be a synchronous tour of the Research vessel the JOIDES Resolution and a tour of the Texas A&M Core Repository.

Link: <https://youtu.be/6RNF-bmssLg>

Ocean Acidification

Alexis Valauri-Orton / Edem Mahu

Description: The new Building Capacity in Ocean Acidification Monitoring in the Gulf of Guinea (BIOTTA) project will develop an integrated and sustainable OA observing system in the GoG and create a platform to facilitate collaboration among and incorporate the expertise of researchers in the GoG region to identify, understand and design solutions to improve research on OA. The panel session will feature the BIOTTA project, the state of ocean acidification research in the Gulf of Guinea, and how to become involved.

Featuring BIOTTA focal points from five countries, this panel session will focus on our current understanding of ocean acidification (OA) in the Gulf of Guinea, regional priorities to advance ocean acidification research and action, and challenges to achieving regional goals. Panelists will also discuss the opportunity for government engagement and policy dimensions as well as the socio-economic dimensions of OA. Finally, the panel will also provide a preview of the upcoming training opportunities and equipment distribution fund offered through the BIOTTA project.

Link:

Graduate school paths panel

Eben Nyadjro, Edem Mahu, Riccardo Farneti

Description: Guide to applying to graduate schools home and abroad

Link:

Spectroscopy/Spectromicroscopy: Introduce the African Light Source?

Sarah Nicholas, Paul Northrup, Ben Bostick

Link:

Week 2: 3-5pm synchronous events

Marine Geology career panel

Ingrid Hendy, Edem Mahu, Tina Nielson, and Anne Fitzpatrick

Description: Industry panel (petroleum person, remediation person, academic) on applications of sediment coring (marine, estuarine, lacustrine, riverine) in different careers.

Anne Fitzpatrick (Anne's passion for sailing and anything on the water led to an environmental career in contaminated sediment management and remediation. Over 26 years ago, she started as a field geologist with Hart Crowser located in Seattle Washington, then became a Vice President at RETEC/ENSR/AECOM, and recently joined Geosyntec Consultants Inc. in 2016 as a Senior Principal. She has in-depth experience managing high-profile investigation and remediation projects under a variety of regulatory programs with oversight from regulators, media, and the public. Hands-on experience includes sediment coring, sediment trap designs, radioisotope profiling, CERCLA cleanup goal negotiations, sustainability metrics, and interpretation of site conceptual models with physical, chemical, and biological components. She has led or participated in regulatory negotiations for 9 sediment CERCLA sites nationwide. In 2009, she was awarded Best Paper at the national ABA conference for Developing Long-Term Sustainable Management Strategies for Complex Contaminated Sediment Projects and has been called upon as a technical expert in sampling techniques to oversee controversial investigation projects. She has chaired several sessions at national sediment conferences, and was part of a technical expert panel tasked with revising the Washington State regulations for contaminated sediments. She is a University of Michigan graduate (BS 1986) and has an MS in marine science/toxicology from Western Washington University.)

Tina Nielsen (the Associate Director of the Great Lakes Bioenergy Research Center (GLBRC). Housed at the University of Wisconsin-Madison, GLBRC is one of four Department of Energy funded centers dedicated to the advancement of lignocellulosic biofuels and chemicals through basic science research. Prior to joining the GLBRC, Tina spent over 5 years at BP specializing in deep-water sedimentology and leading recruiting efforts at the University of Michigan and University of Wisconsin-Madison. Prior to returning back to UM for her MS, Tina was a science teacher at Marysville (MI) Intermediate School. She holds a BS ('95), Secondary Teaching Certificate ('97) and MS ('03-Department of Geological Sciences) from the University of Michigan in addition to a PhD ('08-Department of Geology and Geophysics) from the University of Wisconsin-Madison. Her graduate research focused on marine sedimentology and geochemistry.)

Link:

Environment, protection of natural resources, biodiversity

Richmond Kennedy Quarcoo

Description: Data use in natural resources, biodiversity and environmental protection.

Link:

Women in STEM panel

Lailah Gifty Akita, Tashiana Osborne

Link:

MBON/Ocean decade lecture

Enrique Montes Herrera, Frank Muller-Karger

Description: In this lecture participants will learn about the Marine Biodiversity Observation Network (MBON) as a framework in support of the Marine Life 2030 program (ML2030) of the UN Decade of Ocean Sciences.

This session will also provide participants with R code and hands-on exercises to access, download, visualize, and analyze satellite data to evaluate ocean conditions in selected regions of interest.

Link:

Pre-recorded lecture: MBON ocean satellite session prep-work - this pre-recorded lecture walks through software installation, a sample script, and powerpoint file. It is advised that participants watch this pre-recorded lecture asynchronously before the synchronous panel on 5th August from 3-5pm.

Link: <https://coessing.files.wordpress.com/2021/07/mbon.zip>

Closing Ceremony

All instructors

Description: Join us for the closing ceremony for COESSING 2021, including feedback about this year's school, and instructions for final surveys and certificates.

Link:

Python programming content

Intro to Python Programming/Cloud Computing Tutorial

Instructor: Dr. Paige Martin

Description: This tutorial will walk participants through the basics of Python and Jupyter, and how to log in and use the JupyterHub. *It is recommended you attend at least one of these sessions at the start of the school if you are interested in any Python content.*

Lab: Self-led, step-by-step instructions walk you through the basics of Python, Jupyter, and the cloud computing JupyterHub.

Link to lab activity: Link to JupyterHub. If you haven't yet, you will need to request access to the JupyterHub by filling out this Google form with your Google account email address.

Tutorial: Paige will walk through the lab during this tutorial and explain each step. This is a chance for participants to ask questions about the basics of Python, Jupyter, and cloud computing.

Dates: 26 July 2021, 7-8:30am & 27 July 2021, 8-10am

Zoom link:

Slack channel: #python-2021

Data Analysis and Visualization Python Tutorial

Instructor: Dr. Paige Martin

Description: Learn some basics of data analysis and plotting in Python, using libraries including Pandas and Matplotlib.

Lab: Self-led, step-by-step instructions walk you through some data analysis and plotting techniques on the cloud computing JupyterHub.

Link to lab activity: Link to JupyterHub. If you haven't yet, you will need to request access to the JupyterHub by filling out this Google form with your Google account email address.

Tutorial: The instructor will walk through the lab during this tutorial and explain each step. This is a chance for participants to ask questions about data analysis and plotting in Python.

Date: 28 July 2021, 9-11am

Zoom link:

Slack channel: #python-2021

Satellite oceanography/Microplastics

Instructor: Dr. Eben Nyadjro

Description: Introductory satellite oceanography.

Lab: Applications of satellite data to understand and solve environmental issues

Link to lab activity: Link to JupyterHub. If you haven't yet, you will need to request access to the JupyterHub by filling out this Google form with your Google account email address.

Pre-recorded lecture:

Link: <https://youtu.be/bxjWBCr2kBc>, slides: https://coessing.files.wordpress.com/2021/07/ebenezer_ug2020_lec-1.pdf

Ocean Modeling

Instructor: Dr. Joseph Ansong / Dr. Riccardo Farneti

Description: Introduction to ocean modeling

Lab:

Link to lab activity: Link to JupyterHub. If you haven't yet, you will need to request access to the JupyterHub by filling out this Google form with your Google account email address.

Pre-recorded Lecture:

Links: A series of videos on introduction to ocean modeling by Joseph can be found here: <https://coessing.org/coessing-2020-physical-oceanography/>

Pdf slides by Riccardo on ocean circulation and modeling (an overview) can be found here:

https://coessing.files.wordpress.com/2021/01/ocean_models_ghana2020.pdf

Tutorial: Check out the ECCO python tutorials on the next page.

Q/A: Live session for participants to ask questions on ocean modeling lectures

Dates: 28 July 2021, 11:30am-12:30 pm, GMT, 4 August 2021, 11:30a-12:30 pm,

Zoom link:

Python programming content (continued)

ECCO: Estimating the Circulation and Climate of the Ocean

Instructor: Dr. Dimitris Menemenlis, Dr. Paige Martin

Pre-recorded lecture: What is ECCO? Learn all about ECCO in this pre-recorded lecture by Dr. Ian Fenty.

Link: <https://youtu.be/bds6qjBnP14>, slides: <https://coessing.files.wordpress.com/2021/07/ecco.pdf>

Lab: Self-led, step-by-step instructions walk you through the basics of Python, Jupyter, and the cloud computing JupyterHub.

Link to lab activity: Link to JupyterHub. If you haven't yet, you will need to request access to the JupyterHub by filling out this Google form with your Google account email address.

Tutorials: The instructor will walk through the lab during these tutorials and explain each step. This is a chance for participants to ask questions about ECCO data analysis in Python.

Dates: 29 July 2021, 7-8:30am & 30 July 2021, 8-9:30am

Zoom link:

Q&A: Come with questions for Dr. Dimitris Menemenlis about ECCO! We recommend that you have watched the pre-recorded lecture on ECCO before attending this session. Participants interested in this session should also aim to attend the Ocean Modeling Lecture.

Date: 27 July 2021, 11:30am-12:30pm

Zoom link:

Date: 3 Aug 2021, 11:30am-12:30pm

Zoom link:

Slack channel: #ecco-python-2021

Coastal Wetlands and Nearshore Processes

Instructor: Dr. Maddie Foster-Martinez

Description: Introduction to coastal wetlands, emphasizing the ecosystem services they provide.

Lab: Follow step-by-step coding blocks to plot and analyze wave height data collected at a salt marsh.

Link to lab activity: Link to JupyterHub. If you haven't yet, you will need to request access to the JupyterHub by filling out this Google form with your Google account email address. There is an accompanying documents with lab instructions that can be found [here](#).

Pre-recorded lecture: Wetland and Mangrove Ecosystem Services

Youtube or Zoom link: <https://www.youtube.com/watch?v=HxLEQER4uRA>

Q/A: Live session for participants to ask questions on the lab or lecture and generally discuss coastal systems. Join any time during the hour and stay for as long or as little as you like.

Dates: 27 July 2021, 1:30-2:30 pm GMT & 3 Aug 2021, 1:30-2:30 pm GMT

Zoom link:

Slack channel: #coastal-wetlands-and-waves-2021

Making Pretty Maps in Python

Instructor: Dr. Josué Martinez-Moreno

Description: Learn how to make quality maps in python

Lab: Self-led, step-by-step instructions walk you through how to make pretty maps of geospatial data using the Cartopy python library.

Link to lab activity: Link to JupyterHub. If you haven't yet, you will need to request access to the JupyterHub by filling out this Google form with your Google account email address.

Tutorial: Join for a synchronous walk-through of the lab with the instructor. This is a time to ask questions about plotting pretty maps in python.

Date: 2 August 2021, 9-10am

Zoom link:

Slack channel: #python-2021

Python Q&A

Instructor: Dr. Paige Martin

Description: Come and ask all of your python, cloud computing, or Jupyter questions

Lab: All python labs.

Link to lab activity: Link to JupyterHub. If you haven't yet, you will need to request access to the JupyterHub by filling out this Google form with your Google account email address.

Q&A: This session is time for anyone to join and ask questions about Python, Jupyter, cloud computing, or any python lab activity at the school.

Date: 4 August 2021, 7-9am

Zoom link:

Slack channel: #python-2021

Other mixed synchronous/asynchronous content

Introduction to Marine Biogeochemistry

Instructor: Winn Johnson (winnjohnson@gmail.com)

Description: Introduction to biogeochemical parameters measured in the ocean.

Lab: Follow step-by-step instructions to visualize biogeochemical datasets with the free software package Ocean Data View (ODV).

Link to lab activity: https://coessing.files.wordpress.com/2020/08/exploringmarinechemistrywithodv_lab_coessingaug2020.pdf

Pre-recorded lecture: Overview of ocean chemistry including salinity and nutrients.

Link: https://youtu.be/hqR0TJ5_CYQ

Tutorial: Walk through data visualization with ODV. Interactive with opportunities to ask questions as we go.

Date(s): 2 Aug 2021, 1-2pm GMT

Zoom link(s):

Slack channel: #biogeochem-2021

Introduction to Fluid Mechanics and Physical Oceanography

Instructor: Aline Cotel and Emily Shroyer

Description: Hands on Fluids Lab Handbook

Lab: Self-led labs for basic fluid mechanics principles

Link to lab activity: Materials can be found on the COESSING website [here](#); scroll down to “Labs: Hands-on fluid dynamics”

Hydrography

Instructor: Stephan Howden

Description: Introduction to the field of hydrographic science

Pre-recorded lecture: This asynchronous lecture will introduce the student to the field of hydrographic science, give an appreciation for the importance of the field, and give some resources to learn further.

Link: https://youtu.be/_qBwcoSDizw

Physics of Estuaries and River Plumes

Instructor: Jim Lerczak

Description: Prepared lecture notes on the basic ingredients that cause current motions in estuaries and river plumes (tides, freshwater discharge, and mixing) and on how these motions impact ecosystems and water quality in estuaries and the coastal ocean. This topic has connections with other topics (e.g., Coastal Wetlands and Nearshore Processes; Hydrography, Tidal Analysis, Measurements). It also have connections to the Fluids Labs (e.g., the Density Currents lab).

Lab: Please see the Density Currents self-led lab being developed by Aline Cotel and Emily Shroyer.

Tutorial: Discuss the lecture notes and more generally discuss students' observations of estuaries near them.

Date: Aug 4. 2-3pm

Zoom link:

Touring the NSLS-II synchrotron, context for spectroscopy lecture

Instructor: Sarah Nicholas, Paul Northrup

Description: Very general introduction to synchrotron instruments and measurements with specific examples on marine samples

Pre-recorded lecture:

Link: 1) Full version (filmed 2020) <https://www.youtube.com/watch?v=FPtwKJtdg-A> 2) Brief version (several years old) <https://www.youtube.com/watch?v=JXOhDkEwtKU>

Natural Resources

Instructor: Adam Simon

Pre-recorded lecture:

Links: 5-part lecture: <https://youtu.be/ornHrm2N9N4>, <https://youtu.be/-A9c6zpddv4>, <https://youtu.be/uTGZ898KJOk>, <https://youtu.be/cxKGKh70Xpg>, <https://youtu.be/f9Vrn7CFO38>

Lab: Questions that accompany the 5-part lectures

Link: https://coessing.files.wordpress.com/2021/07/energy_resources_questions.pdf

Intro to PAST: statistical software

Instructor: Lailah Gifty Akita

Description: PAST (PAleontological STatistical) software. Basic introduction to PAST. It is a free statistical software for research data analysis.

Synchronous lecture/Q&A:

Link:

Lab material:

Links: https://coessing.files.wordpress.com/2021/07/past_software.zip

Other useful information

Slack workspace:

Slack is how we will all keep in contact and have lively scientific discussions during the two weeks of COESSING 2021! Take some time to browse all of the channels, and we hope to chat with you on Slack!

Join by clicking this link.

Channels:

- Browse all of the Slack channels (click the "Channel browser" link in the left-hand sidebar of your Slack window) and join the channels that you are interested in. You can join as many channels as you want!
- [#general](#): We will post school-wide announcements throughout the two weeks. Don't get confused by last year's posts, which are still in this channel.
- [#introductions-2021](#): Come say hi and introduce yourself, and meet other participants in this channel!
- [#help-desk-2021](#): Post here if you have any questions about the school in general or the Slack workspace.
- [#random](#): If you have something to share with the rest of the participants that is not directly related to COESSING, post it in the channel (e.g. for conference announcements or funny ocean memes!).

If you are new to Slack, you can watch [last year's Slack tutorial](#).

Python cloud computing: JupyterHub

Link to COESSING JupyterHub (If you cannot access the Hub, fill out this [Google Form](#) with your Google email address, and you will be added as a user to the Hub).

Link to JupyterHub demo: this is a screencast demonstration of how to log in and navigate the JupyterHub.

This year we are very excited to trial a state-of-the-art cloud computing interface: a [JupyterHub](#)! This Hub is accessible through a web link, and opens up a Jupyter instance (JupyterLab in this case) in your web browser that is connected to a cloud computing service (in our case, Google Cloud).

Exciting features of our JupyterHub:

- It removes the need to download and install Python and packages to your local computer (see below for instructions on how to do this).
- The Hub runs on the cloud, so we have a lot of computing power! This means that we can analyze larger datasets than we can on our local computers, without the hassle of setting up expensive computing hardware ourselves. Check out the [ECCO labs](#) and tutorials if you would like to try analyzing a large climate model!
- This Hub runs on Google Cloud, which means that we can easily access data that is stored on the cloud as well! This means that we have access to a lot of climate and other geospatial datasets. A list of datasets we have access to can be found on the [Pangeo Data Catalog](#).

This JupyterHub has been generously set up by a non-profit organization called [2i2c](#). They are an exciting new company, and we are so excited that they are partnering with COESSING this in this trial cloud computing service.

If you are interested in getting more involved in cloud computing and analysis of large climate datasets, there is a community called [Pangeo](#) that might be of interest. It is a welcoming group of computational geoscientists who strongly believe in open science (so supporting open-source software, promoting open data sharing, etc.). You can learn more at [their website](#), and get involved in the community if you are interested!

Instructions for downloading & installing Python

All of the Python labs this year are meant to be run on the JupyterHub described above. However, you may still want to download Python and libraries to your local computer. We recommend downloading and installing [Anaconda](#). Anaconda is a very convenient Python distribution, and includes Python and most of the libraries that you will want to use.

Some useful resources:

- [Website to download Anaconda](#) (make sure that you download for your correct operating system, e.g. 64-bit Windows)
- [Youtube tutorial](#) on how to download and install Anaconda on Windows
- More resources can be found on the [COESSING Resources webpage](#) under "Python and Jupyter Notebook Resources"