OCN 390: Field Methods

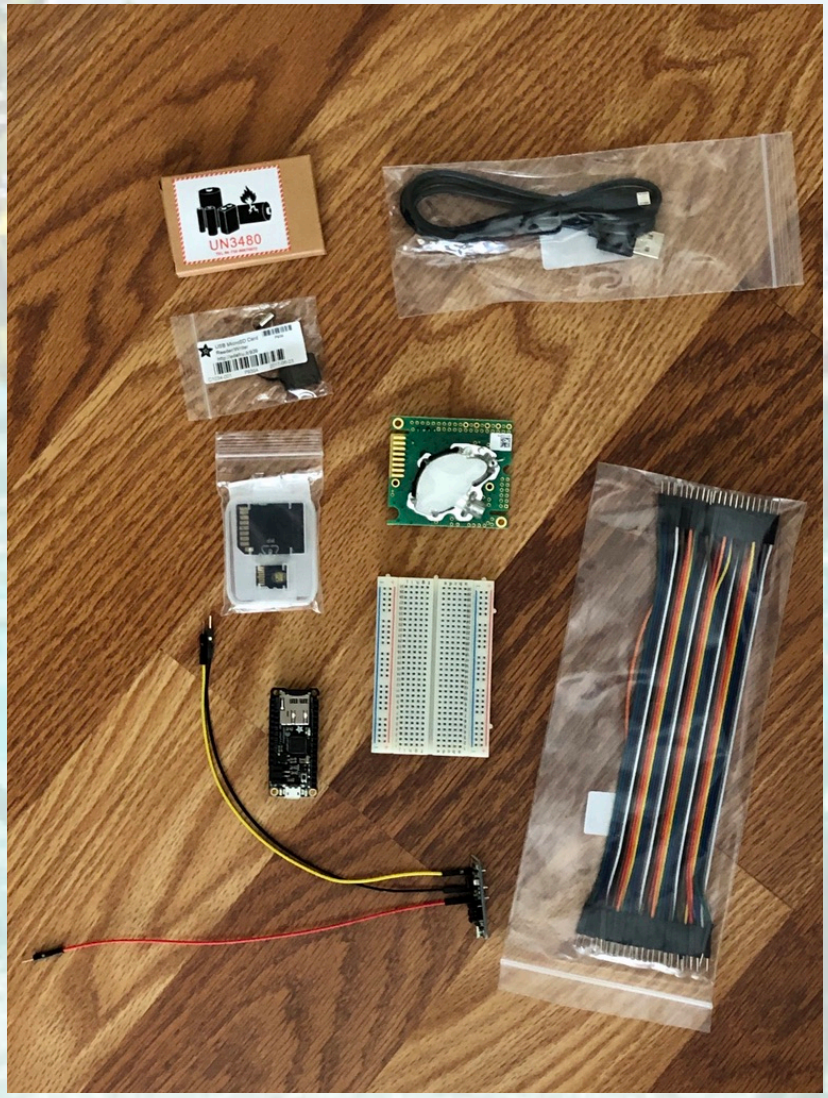
Week 8

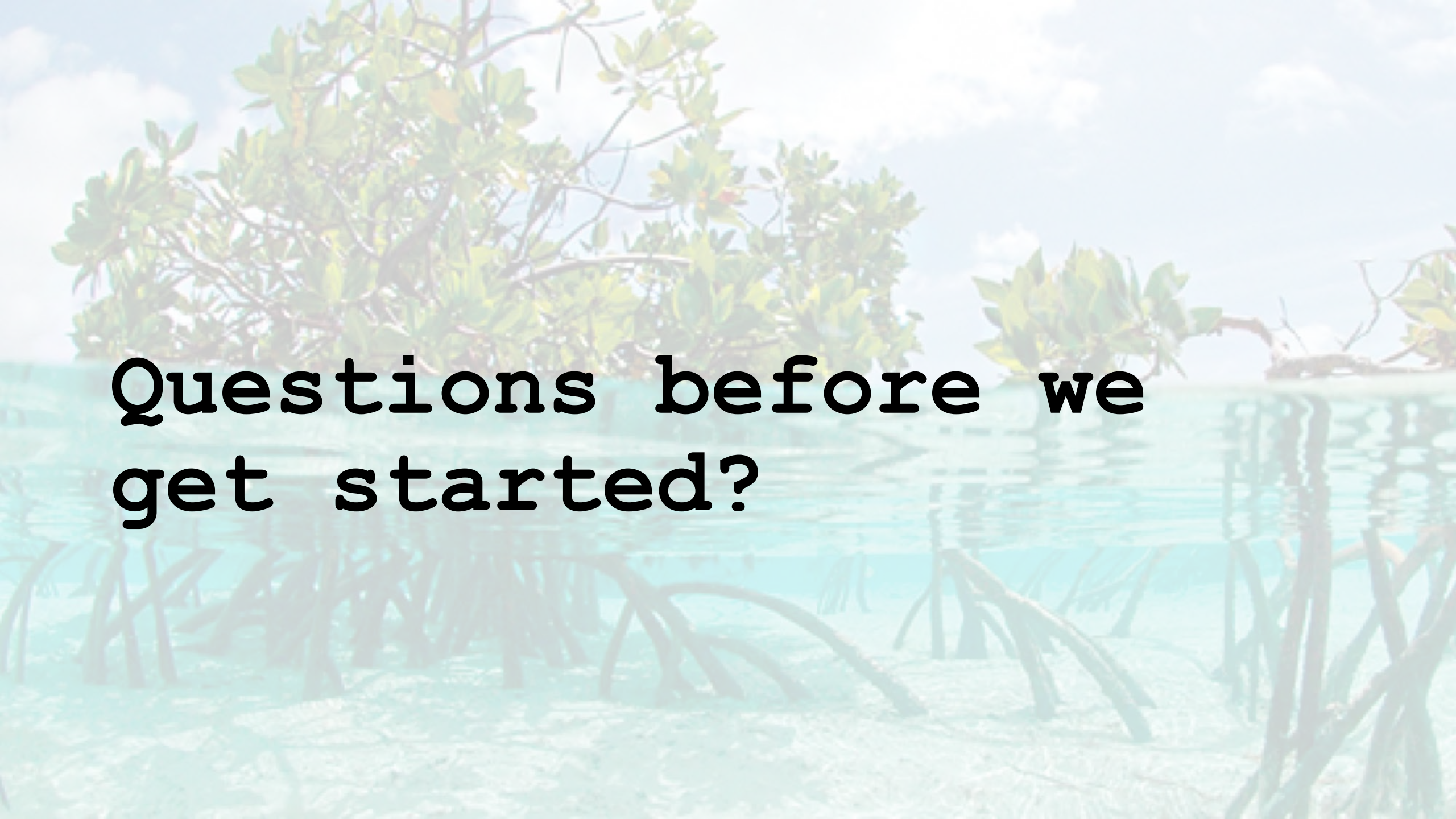
Conducting Fieldwork, Analyzing Data, and Communicating Results


Note to self: record!

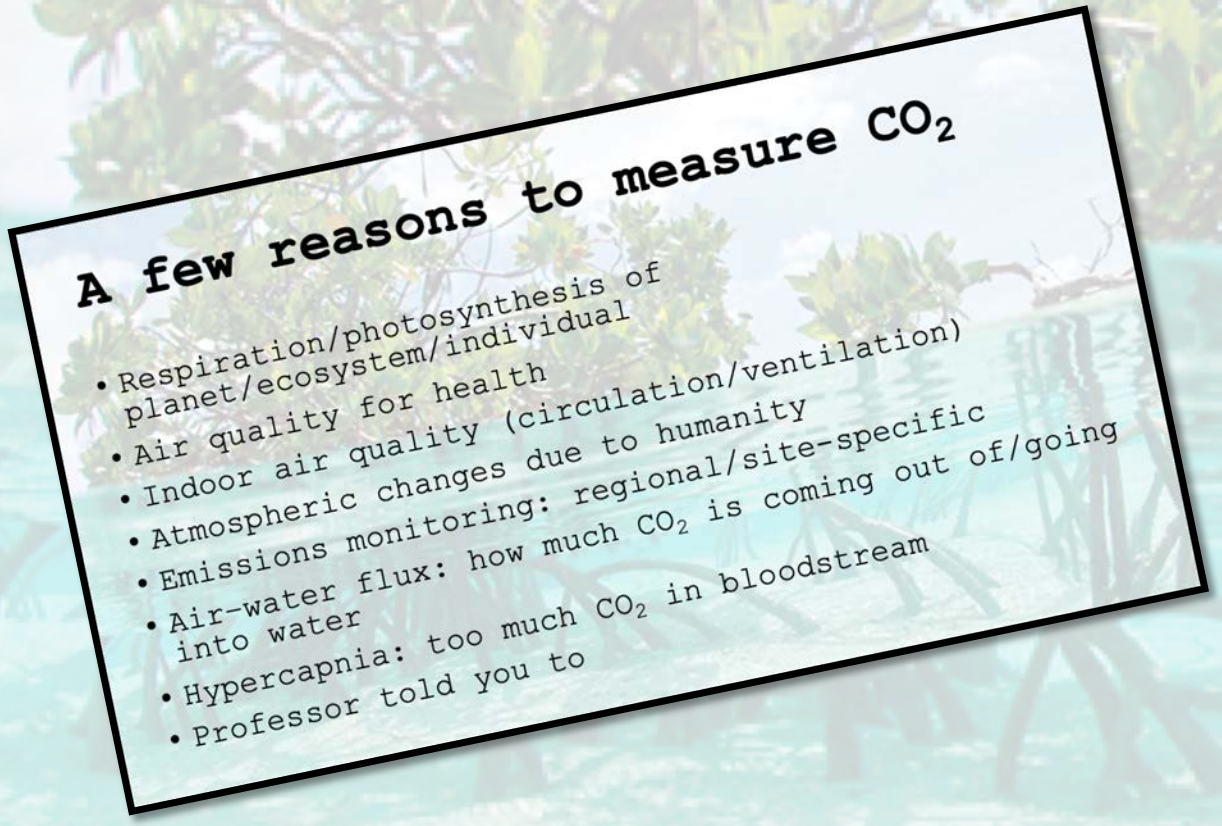
Announcements

- Please take advantage of reaching out to me and Jack as early in the week as possible so that we can offer guidance!
- Rotate who is the keeper of the components
- Rotate who submits the group assignment
- CC your teammates on emails to me or use the Canvas groups for communicating




Questions before we get started?

4. Three ranked ideas (one paragraph of > 4 sentences each) for your group's proposed field study



- Consider:
  - Staying in one place and observing changes over time—indoors/outdoors/greenhouse
  - Monitoring changes from place to place—different ecosystems, different times of day?
- Each paragraph must outline:
  - What phenomenon you are proposing to study
  - Why it is important
  - How you would execute study
  - How would you collect necessary (meta)data
  - 1 extra credit point added to final grade for references to peer-reviewed literature; you must cite it in context by providing a couple sentences describing the cited study and why it is relevant to your proposal. Provide first author, year of publication, article name, and link to article. Peer reviewed lit will be required for final report.

covid safety is #1 priority

- Do not gather in any way that could jeopardize your health or safety

Quiz

(Write your name on top of page/send me email of photo in < 10 mins)

1. **BLOCK DIAGRAM**
   Draw a block diagram containing the four physical components other than the breadboard and indicating all connections necessary for stable functioning of the device.
   Draw each part as a labeled rectangle and label all connections clearly, differentiating voltage levels as needed on power lines.
   Ensure that any crossing wires carefully show whether they are connected or not using previously discussed notation.
   Note: Only one rectangle should be used for the Adalogger/microcontroller combination; these do not count as two of the four, just one component.

2. **FIRMWARE**
   Assuming you have the CO2 concentration stored in a variable named “CO2” and that at the time of code execution, CO2 = 702, write the lines of Arduino code required to print to your serial monitor the following:
   The current CO2 concentration is 702

Preparing for Fieldwork

Field Study Design Considerations: Example Simple Checklist

- ❑ Always start with the question: "why am I planning this field study?" What do you hope to get out of it?
- ❑ Check weather, tides, map out area
- ❑ Alert others you are going; go with someone else (covid complicates this)
- ❑ What do you need to bring?
  - ❑ Personal protective gear (gloves, safety/sunglasses, hat, sunscreen)
  - ❑ Communication equipment (phone, extra phone battery, radio, EPIRB if remote work)
  - ❑ Work clothes
  - ❑ Work shoes/boots
  - ❑ Water/food if long expedition
  - ❑ Tools for fieldwork:
    - ❑ Sensors/analyzers
    - ❑ Power for the above (batteries, fuel)
    - ❑ Bottles or other storage containers for samples
    - ❑ Hand/power tools
    - ❑ Rope, cable
    - ❑ Survey tools (tape measure, depth finder, quadrat, etc.)
- ❑ What else?

Data vs. Metadata

- Data:
  - A measurement (from a sensor, analyzer, a ruler, etc.)
  - Observations, including numbers and words
  - **LOCATION: could be data or metadata, depending on how study is conducted**

- Metadata
  - Data about the data
  - How were data collected?
  - What was the instrument?
  - When was it last calibrated?
  - What are its calibration coefficients?
  - Who made the measurement?

This Week's Assignment

1. Nature journal
2. Time-Series Plot of CO2 data vs. date/time
   - Must have clear title, axis labels, and correct data from a single study.
3. I HIGHLY encourage you to get started on your Story Maps which are due (GROUP ASSIGNMENT) on Sun., Mar. 28 (WITH DATA FROM YOUR PRELIMINARY FIELD WORK) to the class on Mon., Mar. 29.
   - Start writing text and taking photos/videos

   Note: I will accept submissions as late as the following Sunday (Sun., Apr. 4) but note that the following weekend is a holiday weekend here.

Time-Series Plots in Excel

Excel walkthrough

Data Processing (CO_2)

1. Download CO_2 data from CO_2 sensor/Adalogger
2. Process CO_2 data using Excel (first rename file as CSV)
3. Right-click and open with Excel
4. Add headers and start time to file
5. Add new column of actual time (as opposed to "elapsed time")
6. Select columns of actual time and CO_2 concentration and insert scatterplot
7. Ensure CO_2 is on y-axis and actual time is on x-axis
8. Label axes, add title
9. Look for questionable data and resolve as necessary
10. Begin a simple statistical analysis (e.g., mean, standard deviation, etc.)

Story Maps for Scientific Storytelling

SCRIPPS INSTITUTION OF OCEANOGRAPHY
UC San Diego

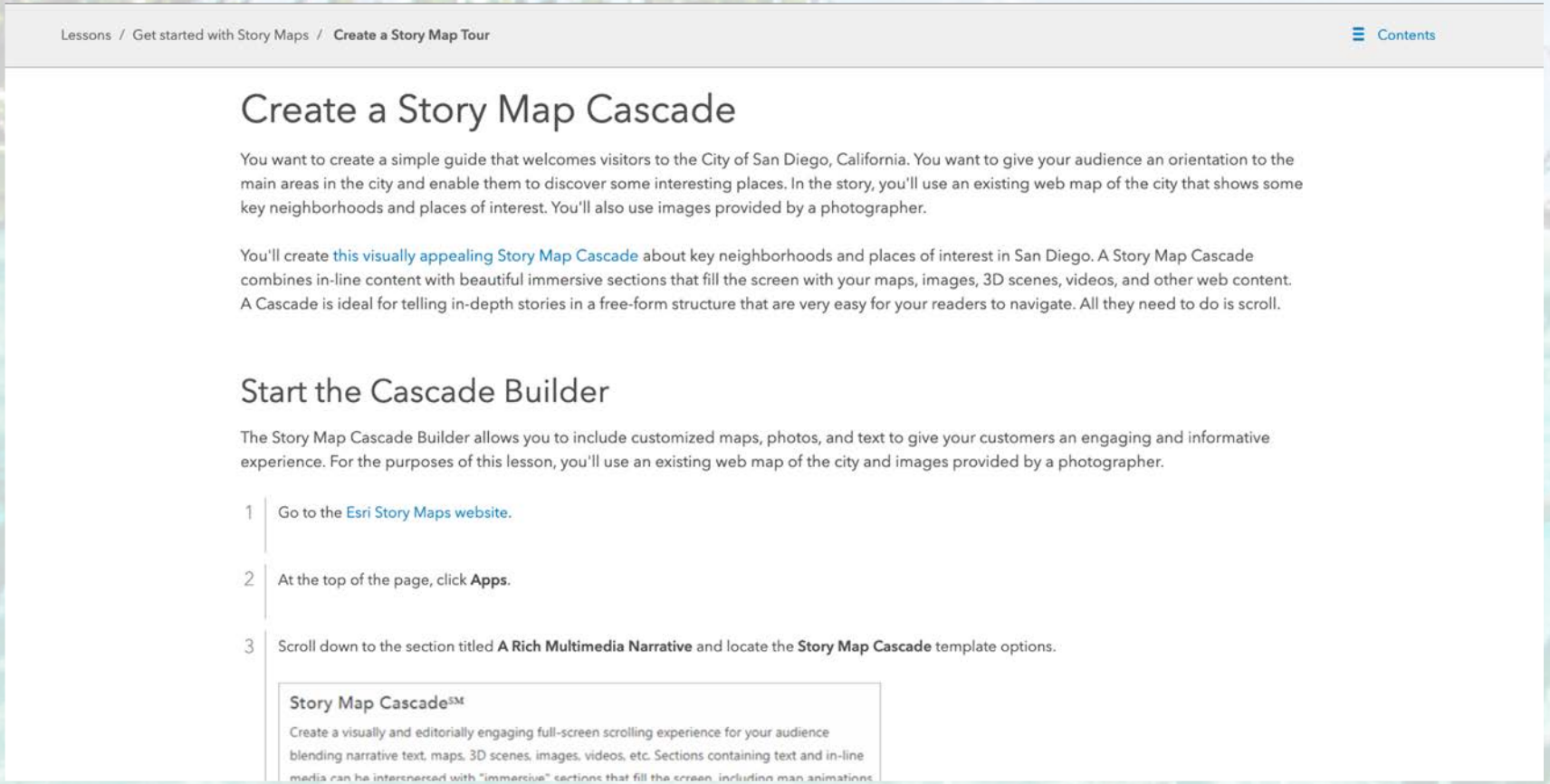
A Story Map

Surfing for Science and Stewardship

The Smartfin Project

How to start a Story Map

- https://learn.arcgis.com/en/projects/get-started-with-story-maps/#create-a-story-map-cascade



Lessons / Get started with Story Maps / **Create a Story Map Tour**

Contents

Create a Story Map Cascade

You want to create a simple guide that welcomes visitors to the City of San Diego, California. You want to give your audience an orientation to the main areas in the city and enable them to discover some interesting places. In the story, you'll use an existing web map of the city that shows some key neighborhoods and places of interest. You'll also use images provided by a photographer.

You'll create this visually appealing Story Map Cascade about key neighborhoods and places of interest in San Diego. A Story Map Cascade combines in-line content with beautiful immersive sections that fill the screen with your maps, images, 3D scenes, videos, and other web content. A Cascade is ideal for telling in-depth stories in a free-form structure that are very easy for your readers to navigate. All they need to do is scroll.

Start the Cascade Builder

The Story Map Cascade Builder allows you to include customized maps, photos, and text to give your customers an engaging and informative experience. For the purposes of this lesson, you'll use an existing web map of the city and images provided by a photographer.

1. Go to the Esri Story Maps website.
2. At the top of the page, click **Apps**.
3. Scroll down to the section titled **A Rich Multimedia Narrative** and locate the **Story Map Cascade** template options.

Story Map Cascade℠

Create a visually and editorially engaging full-screen scrolling experience for your audience blending narrative text, maps, 3D scenes, images, videos, etc. Sections containing text and in-line media can be interspersed with "immersive" sections that fill the screen, including map animations

Important Components of Your Story Maps

- Images and/or video of field site. Images of sensor. Other images from web (with citation) if it adds to story.
- Images of field journal, if it adds to the story and provides helpful context
- Image or written out version of your field checklist
- Preliminary data, nicely visualized (at least 1 map with your data and 1 time-series plot with your data)
- Text blocks explaining:
  - Why: what was the motivation for your study?
  - How: what were your methods and procedures?
  - What did you learn? Results? Provide both quantitative results and also how they fit into the context of your study.
  - What challenges did you face? How will you make improvements prior to final report? How would you recommend that others overcome those in future semesters? What other data will you collect? What other analysis/analyses will you perform?
  - Hyperlinked citations of peer-reviewed research described in context. Other hyperlinked references as needed.
  - Conclusion: tie it all together.
- Additional paragraph sent via Canvas (not in Story Map) describing your contributions to all aspects of

Additional Note

- Story Maps are not like Google Docs; you can’t have multiple people working on them simultaneously
- You can either create one account and each have a designated time to contribute and/or work on it together via zoom

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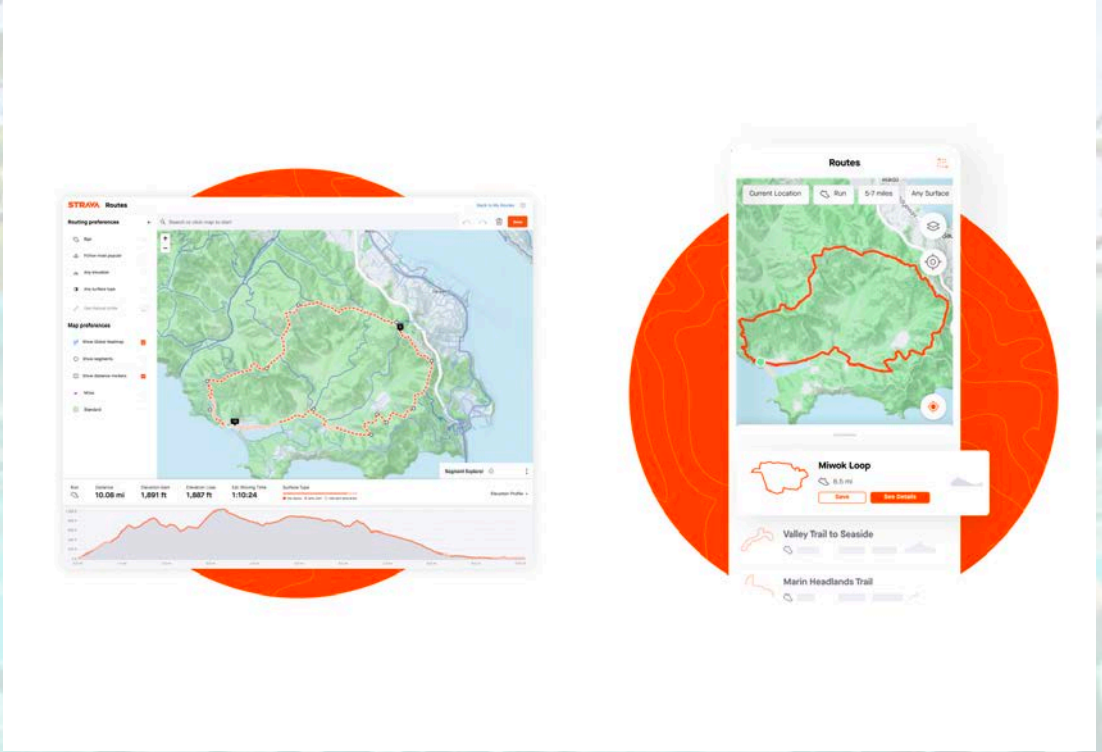
Today

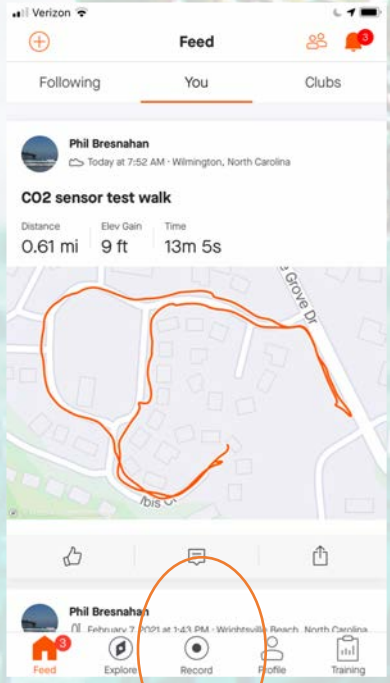
- Collecting indoor/outdoor data with GPS
- One person per team: download Strava app for your phone
- All heading outside
- Each team come talk to me one at a time to talk about proposed field study in greater depth

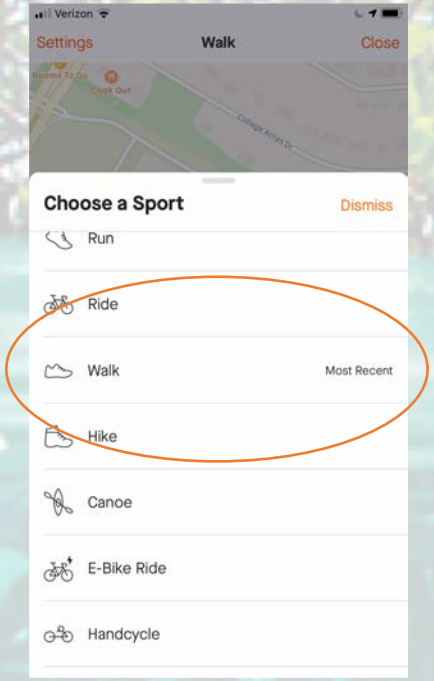


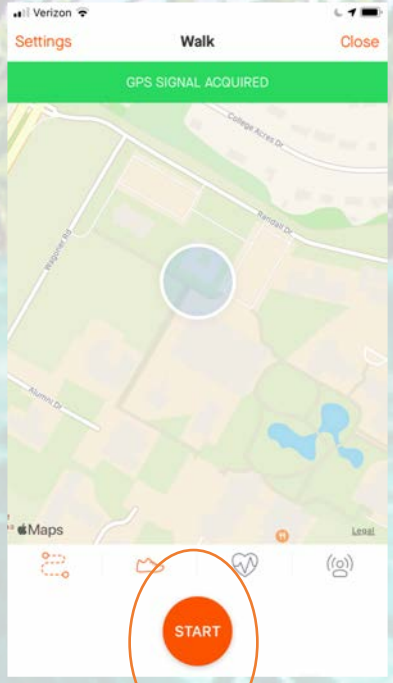
Today

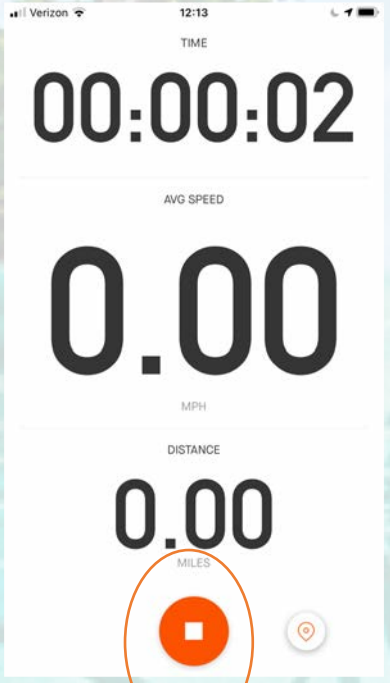
- Talk with your group about field plans for your main project
- Collect test data by walking around with CO2 sensor and GPS both activated

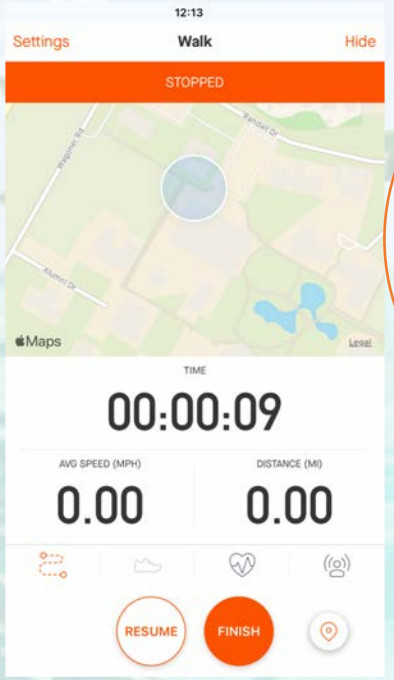
Strava Basics

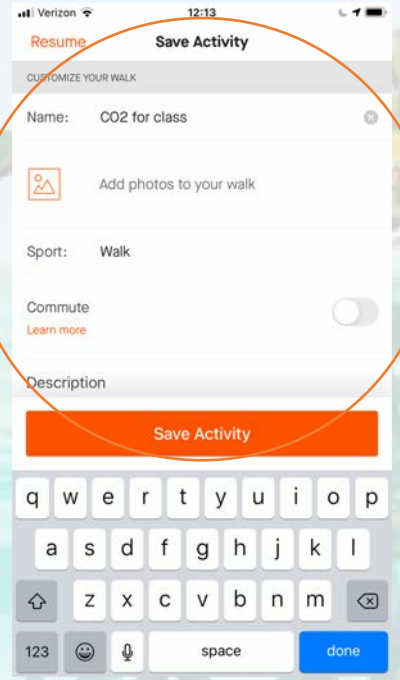












Next Week Data Processing (GPX)

1. Download GPX file from Strava
2. Process GPX file using https://www.gpsvisualizer.com/convert_input
3. Process GPX file further using Excel

Simple Map-Making

- If you have previously taken a GIS class here or elsewhere, feel free to use other techniques. This is a very basic getting-started guide designed to empower complete beginners to create interactive digital maps of their own data.
- Navigate to https://www.arcgis.com/home/index.html
- If you do not already have an ArcGIS account, create one; otherwise, sign in
- Click “Content” in navigation bar

Simple Map-Making

- Click "Add Item"