Hadjimichael Lab Manual

Welcome to the Lab!

As a member of the Hadjimichael lab group, you'll learn a lot, pick up new skills, make new friends, and have a lot of fun. This lab manual provides some background on our group and how we do research. We will update this document as a team regularly and welcome suggestions at any time.

Mission and Values

The Hadjimichael Lab is a team of interdisciplinary scientists investigating complex human-Earth systems. In particular, many of us focus on water resources and deeply uncertain systems.

We will work together to mold the lab mission and values to something that represents all of us.

Onboarding

First steps After Joining the Lab

Complete these onboarding steps when you start work in the lab:

- Read the Hadjimichael Lab Manual (here!)
- Request access to lab tools (if you don't have it already):
    - Slack
    - OneDrive
    - Outlook Calendar
    - Meeting Calendar
    - Github
    - Powerpoint Slides
- Reach out to the website manager to add your picture and bio to the site
- Meet with Antonia to discuss initial research steps
- Create a list of personal and/or professional goals to be reviewed with Antonia.

Slack

We have a group Slack channel that we use to stay in touch, both on work projects and social. It is especially important to be active on Slack as this will be our primary day-to-day mode of building community and communication. We use Slack for quick day-to-day communication. If you need feedback from Antonia on something or have a document for review, sending it via Slack is often the fastest way to receive feedback.

OneDrive (Here)

The OneDrive is a shared drive where all important lab documents are kept. You can share documents with Antonia here, keep your weekly meeting slides here, and access past trainings here.

Group Outlook Calendar

The calendar is where we track when lab members will be out of town or working remotely. We also track when Antonia is gone. This calendar will be shared to your outlook- please reach out if you have not received it.

Group Meeting Calendar (Here)

The lab meeting calendar helps us keep track of what will be discussed in the weekly lab meetings. We also list discussion ideas and brief notes about who is leading the meetings.

Github (Here)

Github is where we maintain the lab manual. If you aren't yet familiar with github, we have trainings to help you learn. Everyone will help keep the lab manual updated.

Lab Slides (Here)

In the Hadjimichael lab, we believe strongly that visual communication tools are an important part of being an effective scientist. We strive to have our work look and feel clean, organized, and professional. As such, we have a slides template that helps share out cohesive identity. Additionally, this makes sharing and reusing slides easier.

Lab Administration and Roles

All members of the lab are expected to pitch in on a day-to-day basis to support the function of our lab activities and infrastructure. Formal lab roles may include the following and assignments will be made and updated here on an annual basis. However, everyone is also expected to pitch-in informally as necessary. Furthermore, the Lab Manual (here) is a living document and everyone must pitch in to keep it up to date.

Github manager: Alex

- The website manager is responsible for keeping the lab website up to date.

Website manager: Ava

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Social event coordinator: Maddie

- The social event coordinator organizes regular lab activities (lab lunches, happy hours, birthday celebrations, etc.), and special events (e.g. lab dinners, game nights, at least once a quarter).
- The social event coordinator will coordinate time (via when2meet), gather resources (could assign tasks to other lab members for assistance).

Lab meeting Zoom setup: Maddie
The Zoom setup coordinator is responsible for coming to the lab meeting room early to set up any necessary Zoom equipment in the case that someone is joining remotely.

- Those joining remotely must add to the lab calendar the dates they will be remote, specifying in advance (not the day of lab meeting).
- This role allows for lab meetings to start promptly and optimize lab meeting events.

Equipment and Office Space

Office Space: Every student with a desk in an office gets a key to that office. It is important to always lock the office door when the office is empty, as your office mates may have left their laptop or other precious items in the office. If extra keys to one office are available, it is good practice to place them in another office that belongs to the lab. This way, if you are accidentally locked out, other lab members may be able to help you.

If you would like to change offices, talk with other members of the lab. Desks usually open up at the end of the Spring semester.

Equipment: Everyone in the research group must have a functional computer capable of performing intensive computational modeling work. If you do not have a computer which meets that criteria, please reach out to Antonia and she will arrange to provide you with a working computer - please don't be shy about this! If you do already have a computer you can continue to use, that will help the lab's resources go farther.

Meetings and Communication

Weekly Individual Meetings

At the beginning of each semester, we will set a time for weekly meetings. Meetings are typically 45 minutes, once a week. Early-stage PhD students should keep these meetings every week. More senior lab members can feel free to cancel meetings, but we should touch base at least every other week.

Progress reports are a tool to help you to make productive use of your weekly meetings with Antonia. **You should plan to create a slide deck that you will use in the meeting to facilitate conversation about items you want feedback on.** These slides serve as a project management tool that allows you and Antonia to align and keep track of what you are working on, and agreed next steps

The slides may include:

- A meeting agenda
- Updates on what you worked on last week, including the status of any items you agree to work on in your previous meeting
- Slides on research content (or professional development content) that you want feedback on. For example, if you want feedback on choosing a research method, you should use your report to give Antonia background on: your research question, the status of current research design decisions, the specific methodological decision you want feedback on, proposed options you are considering, the pros and cons of each option etc.
- Proposed next steps for the following week

While your report does not need to be a polished presentation, it should be easy to follow as you talk through your research progress with Antonia. It is your responsibility to set the agenda, come prepared for each meeting, and lead the meeting. After the meeting, you may find it helpful to write out a short summary of the next steps you've agreed on so we don't forget what was discussed.

Weekly Lab Meetings

Weekly lab meetings (1 hour each) are meant to be a forum for us to learn collaboratively. In these weekly lab meetings, we rotate between 4 formats.

- In paper discussion weeks, one person will select a broadly applicable paper for everyone to read. This person will facilitate the discussion and guide the group in learning about the topic.
- In project update weeks, each person will contribute one or two slides about the status of their project to a combined deck. We will go around the room and remind everyone of our project purpose, and share where things currently stand. The slides template is here.
- We also have training weeks. In these meetings, one or more lab members will develop a training session on a topic of technical importance to our lab. The training session will help bring all members up to speed on typical computational, software, or data management tools which we commonly use.
- Lastly, we also have research talk weeks. In these meetings, one person will give a detailed presentation of their research and current progress. They will then receive feedback from the rest of the group. Projects at any level of completion (or even not yet started!) can benefit from being presented.

Each lab member is expected to present at least once a year, with more senior PhD students and postdocs presenting 2-3 times per year. Lab members are also expected

to attend every meeting (obviously, vacation, illnesses, doctor appointments, family issues, etc. are a valid reason for missing a meeting).

In these meetings, students from other labs and colleges are invited to join, and many come regularly! They broaden our group of research peers, strengthen our science communication skills, and help us learn about topics outside of our scope.

The lab meeting agenda is available here.

Behavior Expectations for Meetings

We strive to create an inclusive and growth-oriented lab environment that is welcoming for everyone. To achieve that goal, we ask all lab members to follow these guidelines for interaction during group meetings:

- Everyone should participate and, equally importantly, make space for others to participate
- Speak respectfully towards everyone
- Actively acknowledge/credit contributions from others
- Give positive feedback about research - the more specific the better
- Acknowledge our own limitations (e.g. lack of expertise on a particular topic)
- Push each other to do the best possible science
- Strive for a growth mindset
- Critique the science not the person - the more specific the better
- Be comfortable sharing intermediate results and receiving feedback
- Be comfortable asking for feedback and advice to other group members, and be helpful when someone asks you for advice

Work Time and Milestones

You should treat your position in the Hadjimichael Lab as a full-time job. For graduate students, this job is divided between research and coursework.

You are allowed to work remotely as needed, but you must still attend lab meetings by Zoom. You may take 3 weeks of paid time off each year, in addition to official university holidays. Please request time off in advance and put it on the lab calendar. Make sure that you meet any agreed-upon commitments before you leave, and discuss with me in advance if this is not feasible. School breaks (e.g., winter closure) are not automatic holidays, though you may choose to take your vacations during these times.

These guidelines are meant to create a sense of calm about taking time away from work. If you need additional time off for any reason, including due to mental health concerns, please reach out to Antonia.

Qualifying Exam

Our research group uses the qualifying exam process detailed in the Graduate Student Handbook. Currently, that structure includes two written thesis proposals and an oral proposal defense presenting the proposal to the Qualifying Exam committee. The Graduate Student handbook provides a guide to departmental requirements, forms and procedures including information on advancing to candidacy.

Research Progress

With regards to research progress, the main way that students get feedback are:

1) Regular meetings with Antonia
2) Group meeting presentations and check ins
3) Seeking out feedback from collaborators, labmates, and/or committee members

Literature Review

Staying up to date on scientific literature in your field is a critical part of scientific research. The following tools and practices can help.

Reference Managers

- Mendeley - Mendeley is a free citation manager and PDF reader/annotator. It is also owned by Elsevier and closely integrated with Elsevier's publishing for better (good integration with Elsevier Journals and Science Direct) and worse (giving information to a company in the scam that is academic publishing).
- Zotero - Zotero is an open-source freeware citation manager that allows you to manage your research library and take notes on the articles that you're reading. However, it does not have a built in PDF reader and annotator like the other two solutions.

Searching the Literature

- Google Scholar - Google Scholar is the quickest method for searching the literature based on keywords or authors. It also captures more articles than Web of Science., However, it is harder to filter and refine a search using Google Scholar.
- Web of Science Web of Science may not be as exhaustive a search engine as Google Scholar, but it is easier to filter articles on the basis of author, field, journal, year, and institutions.

Getting Alerts on Published Papers

- Google Scholar - On Google Scholar it is possible to set up email alerts for when certain people publish papers. This is useful for keeping track of what key people in the field are working on. You can also set up Alerts for key phrases as well
- Journal TOC Alerts - This service will email you the table of contents (TOC) whenever a journal you follow publishes new articles. Note that it is impossible to change your email once you've signed up. So if you want to keep these emails after you lose Stanford, sign up with your personal email.

Presentations and Posters

Learning to present is an important skill and helps increase the visibility of your work. You are encouraged to seek out opportunities to present your research. Be prepared to give a practice talk to the lab, ideally at least two weeks before your presentation. Practice talks will help you feel comfortable with your presentation, practice answering questions, and get feedback from the lab and implement changes well in advance of your real presentation. Reach out to other lab members for poster design ideas and to check over your first drafts. Antonia will review your poster before you print it.

All students should plan to present in the Penn State Graduate Student Colloquium, typically held in April.

Conferences

PhD students and postdocs are encouraged to attend 1-2 conferences per year, subject to funding availability. Keep an eye out for conference deadlines, which can occur six months or more in advance. Your conference strategy will depend on your specific research project and plans after graduation. It is a good idea to put your conference plans in your Individual Development Plan each year.

All lab members should get Antonia's approval on a conference abstract before submitting it and get Antonia's feedback on a poster or talk before giving it. Give her plenty of time to review it (see deadlines policy), especially when multiple lab members are attending the same conference and also need feedback.

There are several conferences that people in the lab typically attend:

- American Geophysical Union (AGU)
    - Fall Meeting
    - Hydrology meeting - new, starting 2021
    - Chapman meetings on focused topics
- ASCE Environmental and Water Resources Institute (EWRI)
- Society for Decision Making under Deep Uncertainty (DMDU)

Networking is an important part of the conference experience, and should be planned in advance. Set goals for yourself (e.g. specific people you would like to meet, events to go to, etc.). Discuss these goals with Antonia in advance; she can introduce you to people she knows, suggest people to meet, and help you figure out the best way to approach people she doesn't know.

Our lab admin can book your travel, flights, etc. for you and handle reimbursements. You will never have to fund a conference yourself. I expect you to be respectful of lab resources (i.e., travel as if it were with your own personal money). This means sharing lodging where reasonable and booking things well in advance to avoid high last-minute prices. Please run purchases by me or the relevant staff member first, since some airlines and types of lodging may not be eligible for reimbursement.

Scientific process and values

Integrity

We are committed to ensuring research integrity, and we take a hard line on research misconduct. We will not tolerate fabrication, falsification, or plagiarism. A big problem is why people feel the need to engage in misconduct in the first place, and that's a discussion that we can have. Also, think about the goal of science and why you are here: you're here to advance knowledge. Not only is research misconduct doing you a disservice, it's also a disservice to the field. And it risks your entire career. It is never right and never worth it. Don't do it.

Reproducibility

Reproducibility and open science are core values in our lab. For results to be reproducible, everything must be organized and well documented. You should take detailed notes on each step of your analysis. This means writing down how you did things every step of the way. Your code should also be commented clearly. We all know what it's like to sit down, quickly write a bunch of code to run an analysis without taking time to comment it, and then having no idea what we did a few months down the road.

Open Science

Fundamentally, good science is open science. Being open with your work and making it available has numerous benefits to you as a researcher and to society as a whole. We aim to make code for all our projects available upon publication.

Further readings:

- Examples of effective data sharing in scientific publishing.

Authorship

At the start of a new project, the student or postdoc taking on the lead role can expect to be first author (talk to Antonia about it if you aren't sure). Antonia will typically be the last author. Students and postdocs who help over the course of the project may be added to the author list depending on their contribution, and their placement will be discussed with all parties involved in the paper. If a student or postdoc takes on a project but subsequently hands it off to another student or postdoc, they will most likely lose first-authorship to that student or postdoc, unless co-first-authorship is appropriate. All of these issues will be discussed early and openly, and you should feel free to bring them up if you are not sure of your authorship status or want to challenge it.

References

This lab manual borrows heavily from excellent manuals created by Sarah Fletcher, Morgan Edwards, Meagan Mauter, Casey terHorst, Alex Konings, and Mariam Aly .