Welcome to the Whitman lab! We are so happy you are going to be part of our team. This manual is designed to orient you to how our lab operates, so you can become a happy, productive member as quickly and easily as possible. We are constantly looking to improve how we do things, so if you have an idea, don’t hesitate to bring it up.

**Soils Department**

As a lab member, you aren’t just part of the lab, but also are part of the Department of Soil Science. Terri Busby will go through the departmental onboarding process, including reviewing a comprehensive document detailing what you need to know about the Department of Soil Science.

**Open Science**

Our lab is committed to Open Science. Theoretically, this means we strive for 1) transparency in project design, data collection, and data analysis, and 2) making scientific methods, data, code, and research findings publicly available. Practically, this means we post manuscript pre-prints on BioRxiv, make data publicly available in repositories such as Dryad or figshare, make nucleic acid sequence data publicly available in NCBI’s Genbank, make code publicly available on GitHub, and publish in open-access journals.

**Project Management**

We will use [Asana](https://app.asana.com/) for general lab communication. This includes conversations about projects, lab meetings, and other lab events. This allows us to keep the conversation surrounding a given issue all in one place, with appropriate links to relevant documents from the lab Box, without having a massive email chain. We will also use Asana for general task management, such as organizing projects, equipment maintenance schedules, or lab onboarding.

**Lab Supply Management**

We manage all the *things* that are in our lab using [Quartzy](https://www.quartzy.com). Quartzy is where all our supplies are logged, requested, and ordered. We will also use it as a database to log our samples, primers, plasmids, reagents and their locations. You should set up an account with your wisc.edu email address, and request to join the Whitman Lab group, where you will be able to request orders. All orders will be approved and submitted by the lab manager or the PI, and the PI will approve orders over $250. Make sure to double-check, both in the inventory system and in the physical lab, that we are, indeed, out of the required reagent or supplies before ordering it. All purchases must be approved in advance – never pay for something out of pocket expecting to be reimbursed!

**Code Management**

All code used within the lab is archived and version-controlled on GitHub. Lab members will keep their repositories up-to-date. Consider using [RStudio](https://www.rstudio.com/) or [Jupyter notebooks](https://ipython.org/notebook.html) to organize your code.

**Lab Notebooks and Data Management**

All our lab’s work is stored in a collaborative, online-accessible [Box folder](https://uwmadison.app.box.com/files/0/f/9040968878/WhitmanLab). Each lab member has access to the general lab Box folders (protocols, SOPs, and lab information), and each lab member has their own sub-folder within the lab Box.

All lab members will keep their work (data, scripts, lab notebooks, manuscripts) in a sub-folder within the shared Whitman Lab Box. This folder will be accessible remotely from anywhere, so you can sync your computer at work, at home, or while travelling.

Lab members are expected to maintain a lab notebook. Maintaining a lab notebook is an essential part of good science. Although soil ecology is really exciting, intellectual property and legal issues are a little less critical in our lab than in medical or industrial labs. So, we don’t require you to sign, date, and witness your notebooks or daily progress, but you should be aware that other labs do operate this way, and if you end up in industry, this will likely be expected. Still, lab notebooks are a critical way of recording your progress and organizing your thoughts and research. Take a look at the overview of best practices for lab notebooks from [Rice](http://www.ruf.rice.edu/~bioslabs/tools/notebook/notebook.html), but here are a few key points: (1) Keep an index at the beginning of your notebook. When you start a new notebook, skip the first few pages, and use these to write your index/table of contents. Every time you start a new entry, note down in the index what you were working on and the page number. (2) Never modify or destroy your notes. This means don’t tear out pages and don’t scratch out or erase anything. If you want to omit something you wrote, draw a line through it so you can still read it. Standard lab practice dictates you should write in pen, so your work can’t be changed. However, if your notebook will be in the field or other potentially wet situations, pen may run, so pencil is acceptable. (3) Record all relevant data. This includes the lot number on the chemicals you use, whether samples were kept on ice or at room temperature, interesting observations about the weather at your field site that day, whether a certain plot was wetter than the others – everything and anything you might find useful later. (4) Lab notebooks really shouldn’t leave the lab – not day-to-day, and not when you leave! They are a key record and should be kept in the lab at all times.

Our lab encourages the use of electronic lab notebooks. They provide for much more seamless integration of data, images, protocols, and lab activities, and are easy to back up automatically. If you would like to use [Findings](http://findingsapp.com/) as your lab notebook, the lab will pay for a license. UW Madison also pays for a subscription to [LabArchives](http://labarchives.com/). If you would like to use LabArchives, we have a Whitman Lab account. If you use Findings, you can import all our lab’s protocols from the lab Box account. You should export your notebooks on a monthly basis to your lab Box folder, to save as a record of your progress. If you use LabArchives, records of your notebooks are kept automatically.

We are actively trying out different systems to see what works well for the lab, and are looking for your feedback on what works well and what does not!

**Safety Training**

Safety training is what keeps us safe and healthy! Our lab works with chemicals that can cause serious harm or death, as well as environmental damage. Managed properly, though, they can be safe. Take care to follow the correct safety procedures at all times; if you aren’t sure, stop what you are doing and ask – no experiment or deadline is worth a serious accident; and don’t hesitate to talk to another lab member if you notice them doing something you think is unsafe. Sharing a workspace, we are all responsible for each others’ safety. The PI and lab manager have an additional layer of responsibility to look out for the safety of lab members – please help make their jobs easy. Lab members must complete the required training courses outlined on the Asana onboarding document before they begin work in the lab.

*SOPs*

Before you perform a new procedure, you must read, understand, and sign off on the lab’s Standard Operating Procedure (SOP) for that task. If no SOP exists, you are responsible for creating one before you proceed.

*Emergencies*

In the case of an emergency, call 911. State that you are calling from UW Madison campus. In the case of biological or chemical accidents, we will contact EH&S for followup.

**Office and Lab Space**

Each lab member will have their own desk, either in rooms 201A, 204B, or in King Hall or Soils Hall. While the lab won’t be able to provide a personal computer for each student, we will make sure everyone has an external monitor and an ergonomic keyboard and mouse. With shared office space, while it’s nice for the office to be social, it’s important that the environment be conducive to working productively. Be courteous by limiting long conversations, taking phone calls outside, and finding an alternate location for Skype meetings, etc.. Consider whether your labmate needs to know about <https://www.badgerbadgerbadger.com/> right now or if it could maybe wait. Taking breaks is important, even for productivity! Stop by the Soils lounge to say hi to fellow department members, take a walk by the lake over lunch, or take a coffee break (but not in the lab; no food or drinks in the lab).

Lab bench space will be dynamic over time, according to each lab member’s needs, but we will establish dedicated bench and storage space for each lab member as necessary. In addition, much of lab space is shared. Be conscientious of future and past users and make sure that you leave communal equipment clean and ready for the next user. This means clearing up the areas you use by the end of each day and wiping surfaces down with 70% ethanol. Once a semester, we will get together for a lab cleanup/pizza party.

**Collaboration**

There are many opportunities for collaboration within and outside the lab. There will be days when extensive sampling efforts or elaborate experimental setups are required, when we will all work together.

**Lab Meetings**

We have lab meeting once a week during the semester. Our weekly activities will include reading and discussing papers, presenting our research, practicing talks or poster presentations, and hosting guest speakers. All members will present their research to the lab group at least once a semester. This could take the form of practicing a talk or poster for a conference, working on new project ideas or data, or discussing a manuscript draft. Discussion at lab meetings will be both constructive and supportive. By holding our own work to the highest standard internally, we can help ensure it is as robust as possible when the time comes to publish or present it.

**Social**

We will have an official lab get-together at least once a semester, and encourage lab members to take the initiative to organize more. The lab band’s name is *Microbial Annex*. Our flag is a blue rectangle (atmosphere, GHGs) over a green rectangle (biomass) over a brown rectangle (soils) with a white ring in the middle (microbes, biogeochemical cycles).

**Code of Conduct and Ethics**

The lab supports and celebrates diversity of all kinds, including racial, cultural, religious, sexual orientation, physical abilities, mental health, national origin, gender identity, marital status, political, age, and experience. Discrimination and harassment are unacceptable. Any problems with discrimination or harassment can be reported to members of the departmental contacts, who will ensure confidentiality. As of 2016, the contacts were Julie Garvin, Bill Hickey, and Thea Whitman. The [Ombuds office](http://ombuds.wisc.edu/index.htm) is also an impartial and confidential venue for conflict resolution.

Please review our lab’s code of ethics (Appendix I).

**Appendix I: Code of Ethics**

Honesty: Strive for honesty in all scientific communications. Honestly report data, results, methods and procedures, and publication status. Do not fabricate, falsify, or misrepresent data. Do not deceive colleagues, research sponsors, or the public.

Objectivity: Strive to avoid bias in experimental design, data analysis, data interpretation, peer review, personnel decisions, grant writing, expert testimony, and other aspects of research where objectivity is expected or required. Avoid or minimize bias or self-deception. Disclose personal or financial interests that may affect research.

Integrity: Keep your promises and agreements; act with sincerity.

Carefulness: Avoid careless errors and negligence; carefully and critically examine your own work and the work of your peers. Keep good records of research activities, such as data collection, research design, and correspondence with agencies or journals.

Openness: Share data, results, ideas, tools, resources. Be open to criticism and new ideas.

Respect for Intellectual Property: Honour patents, copyrights, and other forms of intellectual property. Do not use unpublished data, methods, or results without permission. Give proper acknowledgement or credit for all contributions to research. Never plagiarize.

Legality: Know and obey relevant laws and institutional and governmental policies.

Confidentiality: Protect confidential communications, such as papers or grants submitted for publication, personnel records, trade or military secrets, and patient records.

Responsible Publication: Publish in order to advance research and scholarship, not to advance just your own career. Avoid wasteful and duplicative publication.

Responsible Mentoring: Help to educate, mentor, and advise students. Promote their welfare and allow them to make their own decisions.

Respect for Colleagues: Respect your colleagues and treat them fairly.

Social Responsibility: Strive to promote social good and prevent or mitigate social harms through research, public education, and advocacy.

Non-Discrimination: Avoid discrimination against colleagues or students on the basis of sex, race, ethnicity, or other factors not related to scientific competence and integrity.

Competence: Maintain and improve your own professional competence and expertise through lifelong education and learning; take steps to promote competence in science as a whole.

Respect for Living Things: Minimise impacts on people, animals and the environment. Seek to minimize negative impacts of your research on the environment and look for ways your research can help mitigate humans’ negative impacts on the world. Show proper respect and care for animals when using them in research. Do not conduct unnecessary or poorly designed animal experiments. When conducting research on human subjects, minimize harms and risks and maximize benefits; respect human dignity, privacy, and autonomy; take special precautions with vulnerable populations; and strive to distribute the benefits and burdens of research fairly.

(Adapted from Shamoo A and Resnik D. 2015. [Responsible Conduct of Research, 3rd ed.](https://global.oup.com/academic/product/responsible-conduct-of-research-9780199376025?cc=us&lang=en&" \t "_blank) (New York: Oxford University Press))