

Senior Thesis/Internship Opportunities with Karen Holl

Dear Prospective Senior Thesis/Internship students,

Doing a senior thesis or internship is a major undertaking for both you and me so I like to be clear on my expectations. Completing a senior thesis is an invaluable learning experience, particularly if you are interested in research and considering going to graduate school. Likewise, doing a senior internship is a great way to get experience working with and writing a professional document for an agency. Doing a senior thesis or internship, however, is a lot more work than either ENV 190 (capstone) or ENV 196 (senior seminar), which take one quarter. Senior theses and internships require a minimum of two quarters (and often more) commitment to have the time to design and complete an experiment/project, analyze/compile results, and write up your thesis/project.

They also require a high level of commitment and organization skills on your part as it is less structured than a class; you will need to set your timetable and meet it. But, like with anything, the more you put into, the more you get out of it.

Doing research or an independent project is exciting, but can also be extremely frustrating. These are research and restoration projects that have not been done before. You will inevitably have to push yourself into areas where you do not have experience, and at some point you will end up having to redo some work as you go through the learning process. But, this is all part of doing an independent project, and you will gain invaluable skills in the process. That said you need to have the background coursework to be able to do the project you propose, and I may suggest specific coursework for your project. For example, students who work on projects with an experimental or monitoring component should have taken at least one upper division course with an experimental laboratory component (e.g. Field Methods, Plant Ecology) or have some fieldwork experience.

Working with senior internship and thesis students is one of my favorite parts of my job, and I spend a great deal of time with each student. This means I have high expectations for you. I expect you to work independently, come to meetings prepared, and complete tasks by the times we agree upon. You should also be comfortable accepting constructive criticism. I make the time and energy to give you feedback to help you improve your scientific skills.

If you're interested in working with me on an independent project then make an appointment to come talk to me during my office hours. If you have your own ideas of a project that falls within my expertise that's great. If you don't (the case for most students), I prefer you work on a project related to some of my ongoing research projects or restoration projects with which I am involved, so you can build on an existing information base and your work will contribute to a larger effort. For 2011-2012, I have a few ideas for projects (see below) related to the coastal terrace mitigation/restoration project at Long Marine Lab. If you want to work with me on a tropical forest restoration study in Costa Rica during summer 2012, this requires extensive advance planning, the ability to speak Spanish, and raising/providing some of your own research funds.

To be able to devote sufficient time to each student, I sponsor a limited number of students, given my other time commitments. So, the sooner you talk to me the better. I have already committed to a few students for 2011-2012 so I will only sponsor a few more. I give first priority to those students who have done internships with me before and have demonstrated a strong work ethic and academic record.

Cheers,
Karen Holl

POTENTIAL SENIOR THESIS RESEARCH/INTERNSHIP TOPICS IN THE HOLL LAB

Please note that for these research projects the general questions are listed, but part of your project would be to do background research and refine the questions and experimental design. Because these projects are all part of larger research and restoration projects most of the supplies for them would be provided. The timing on these projects vary but most of them require some preparation/planning in the fall with data collection in winter/spring and data analysis and writing in spring/summer.

Grassland restoration senior thesis ideas – There is one potential student project related to my research with Dr. Grey Hayes on the effects of disturbance on California coastal prairie vegetation. To familiarize yourself with this research please search the Web of Science for K.D. Holl and G.F. Hayes and you'll find a few of our past papers on this work.

1. Effect of clipping on direct seeding as a strategy to restore coastal prairie diversity – We have a 12-yr long research project at three sites near Santa Cruz where we have studied the effect of clipping frequency on grassland composition to inform land managers about appropriate mowing regimes. We seeded out native forb species in fall 2009 and 2010. This project would entail monitoring number of individuals and cover of these seedlings in winter and early spring 2012 to determine the success of these restoration efforts. This person would need to have their own vehicle and to have some plant identification experience.

Senior internship/thesis ideas related to restoration of the Younger Lagoon Reserve (YLR) – UCSC will be expanding the marine campus at Long Marine Lab. This development is contingent on the UCSC restoring grassland, coastal scrub, and wet meadow habitat on the terrace at this site, which is managed by the University of California Natural Reserves staff, in particular Elizabeth Howard and Will Spangler. Dr. Holl is on the scientific advisory committee for this project. There are a few research projects that would be valuable to inform this restoration project.

2. Comparing weed control techniques and native grass growth in a grassland restoration study – During 2010-2011, two senior thesis students set up a project comparing soil scraping, tarping with black plastic (to shade out seedlings), and herbicide, along with mulching, to determine the most effective method for controlling exotic grassland plants and facilitating survival and growth of native grasses. They were only able to monitor the results through April of the first growing season. Students would continue monitoring reestablishment of exotic species and survival and cover of native species through spring 2012 to evaluate the success of these restoration approaches. Experience with plant identification would be helpful.
3. Groundwater well monitoring – The campus is required to monitor the ground water levels at different location throughout the reserve to determine the effect of development on the water levels. As student with an interest in hydrology could work with NRS staff on monitoring ground and surface water levels, and possibly soil moisture, throughout the reserve and comparing them in and outside of wetlands. This project requires a commitment from October-June 2011-2012 but would require a relatively small time commitment each week.
4. Insect monitoring – There are opportunities to monitor the insect communities either in the lagoon area or on the terrace. Some past insect identification experience would be helpful.
5. *Oxalis pes-caprae* biology and control – One of the problem weeds at Younger Lagoon for which control methods are not well known is *Oxalis pes-caprae* – an exotic perennial forb. The student would research the biology and past research on control methods for this species and then design and implement an experiment for the control of *Oxalis*. This would be ideal

for a student in their junior year who could design and set out the experiment during winter-spring 2012 and then continue monitoring the results during the following fall.

6. We are working to develop background materials for interns working on restoration projects at Younger Lagoon and on campus. We would like a few students to write background summary papers on relevant restoration topics that would be read by future interns – e.g. pros and cons of different methods for controlling widespread exotic grasses; seed collection, cleaning and germination techniques for species being planted at the reserve; different plant propagation techniques; a critical analysis of different approaches to irrigating plants in the field. These would be literature review projects and do not require prior field work experience.