

Wetlands Ecology and Conservation in the Pantanal **COURSE SYLLABUS**

COURSE DESCRIPTION AND RELEVANCE

This course is a field seminar focusing on wetlands ecology and conservation in the largest and one of the most important wetlands in the world: The Pantanal. The Brazilian Pantanal will serve as our laboratory and classroom. We will examine both the unique features of the Pantanal as well those features which are generalizable to other wetlands. A significant aspect of the course will be our ability to travel to the Pantanal to explore the themes of the course. Key points in the class will be underscored by appropriate field trips, guest lectures, student presentations, and discussions.

COURSE THEMES

Although many other issues will arise, bear in mind that the overriding theme of the course is ***Wetlands***. We will consider wetlands in the perturbed and unperturbed state, on various time scales, in different seasons, across various dimensional scales, and from an array of viewpoints and interests.

Within the context of wetlands, we will look at issues of ***ecology*** – including the individual components that make up the ecological milieu, but most importantly the complex interactions between those components. As noted above, we will consider ecological relationships both in the equilibrium state and in the perturbed state – including natural and human causes.

COURSE DIRECTOR

Robert Siegel
(650) 678-8728

chickenpox@gmail.com

Dr. Siegel is a Professor at Stanford with appointments in the Department of Microbiology and Immunology, The Program in Human Biology, the Center for African Studies, and the Woods Institute for the Environment. He is Course Director of the Infectious Disease component of the required preclinical curriculum. His courses focus on virology and infectious disease, on genetics and molecular biology, on global health and development, on photography, on ecology, and on Darwin. He has led BOSP overseas seminars to Tanzania, England, and Madagascar. He has led Stanford Travel Study trips to Tanzania, Papua New Guinea, and the Galapagos. Dr. Siegel has won numerous teaching awards including the Walter Gores Award, The Henry Kaiser Award, and the ASSU Teaching Award. He has served in an advisory capacity for numerous

international NGOs, organizations, and projects including Wonderfest, FACE AIDS, Support for International Change, Ocean Medicine Foundation, Free the Children, and Teach AIDS. He is also a docent at Jasper Ridge Biological Preserve and at Año Nuevo State Park. He is also an avid photographer, dish walker, traveler (to seven continents), and jumper.

Additional information can be found on his web site:

<http://www.stanford.edu/~siegel/>

Samples of his photographic work can be found at

<http://www.stanford.edu/~siegelr/photo.html>

A short travel blurb can be found at

<http://www.stanford.edu/~siegelr/travelblurb.html>

His Pantanal web site can be found at

<http://stanford.edu/~siegelr/brazil/pantanal2011.html>

COURSE ASSISTANT

Emma Lassiter
(540) 560-0740

emmalassiter@gmail.com

“I am a recent graduate of Dr Bob's Photographing Nature continuing studies class. My connection to Brazil lies in my British-Brazilian heritage, and a childhood spent in Rio de Janeiro. On a recent return visit, a trip to the Pantanal made a great impression on me, and reaffirmed my growing interest in both the natural world and photography. I pursue these interests through travel, hiking, scuba diving, and adult education classes in science, to fill the educational gaps left by a liberal arts degree.” At present, most of her time is occupied as a stay-at-home mum to her 2 year old son, Charlie.

BACKGROUND

Wetlands represent some of the most fragile yet critical ecological zones in the world. Though somewhat cliché, it is still true that “water equals life.”

The Pantanal is the largest wetland in the world! Despite the vast oceans, fresh water is often short supply. Wetlands are a critical international resource, but most of the significant freshwater wetlands are extremely fragile and are currently imperiled by issues of land development, population pressures, pollution, globalization, and climate change. The Pantanal is a unique laboratory to study wetland issues because of its size (74,000 square miles), its high levels of biodiversity, and the important ways in which these lands have been managed for human use while keeping many of the critical features of the watershed intact. Even though parts of the Pantanal are protected as national park lands, the

majority is privately owned.

The United Nation Educational, Scientific, and Cultural Organization (UNESCO) lists a mere 962 as World Heritage Sites. Of these, only 188 are identified as natural as opposed to cultural or mixed. An even smaller proportion comprise critical wetlands such as The Pantanal.

The Pantanal is home to an amazing array of birds and other creatures including the hyacinth macaw, the largest member of the parrot family. Although the Pantanal lacks significant numbers of endemic species, it hosts unmatched profusions of many of its species. We are likely to see profusions of capybara (the largest rodents) and caiman, There is even a possibility of seeing giant anteaters, river otters, and jaguars, especially in the Porto Jofre area.

LOGISTICS

Students will fly into Cuiabá in Mato Grosso. To get a wide perspective on the region and the course themes, we will travel along the Transpantaneira “Highway” (a two lane dirt road in places with many narrow wooden bridges) to different areas of the Northern Pantanal. We will make our way south to Porto Jofre on the Cuiabá River. We will also make excursions to Pantanal Matogrossense National Park and Chapada dos Guimarães – the source of the Pantanal. Every day will include both outings into the field and “classroom activities”.

The course will be head in August 2014. Although this is the dry season, it is also the best time to see wildlife and an important part of the seasonal cycle for the biota of the Pantanal. In this sense we will see the largest dry wetlands in the world.

SELECTED COURSE ISSUES redux

NB – Many of the lists below may look familiar as they are based on those from the prefield syllabus and the course spreadsheet.

Issues addressed in the seminar will include the following:

- wetland management
- human animal interactions
- the cowboy culture of the Pantanal
- evolutionary considerations of wetland ecosystems
- food webs
- predation

- symbiosis
- ecosystem succession
- land and water conservation
- impacts of climate change and global warming
- recycling of organic materials
- conservation of imperiled species
- globalization of organisms
- comparisons with and implications for other wetlands
- animal locomotion
- animal behavior

FORMAT

The seminar will examine the ecology and conservation of wetlands using an immersive (so-to-speak) approach to learning using the Overseas Seminar format to go in the field and examine explore the themes of the course first-hand.

The class will meet every day from Wednesday August 9 to August 30, 2014. Class will consist of lectures, discussion, field trips, and other activities. Limited scheduled free time will be included.

PREREQUISITES

The prerequisites for the course are

- 1) willingness to engage in all aspects of the course
- 2) willingness to demonstrative initiative with regard to the success of the course,
- 3) willingness to work to the well-being of the group
- 4) successful completion of the prefield course in winter quarter
- 5) preparation of your field presentation prior to arriving in Brazil

TEACHING PHILOSOPHY

The course is intended to be interesting, educational, useful, and fun. This will work best if each student contributes to the structure of the course and tries to function as a self-motivated scholar. It is hoped that each student will surprise themselves with what they are able to accomplish. It is also hoped that the students in the class will form a community of scholars and friends that will persist through their college career and beyond.

GRADING PHILOSOPHY

The course will be graded on a Satisfactory/No Credit basis. Students are expected to produce high quality work with emphasis on academic scholarship. A great deal of credit will be given to those students who show independent initiative.

FEEDBACK, SUGGESTIONS, CONCERNS:

Seminar suggestions are most welcome. Given the foreign (literally and figuratively) and intensive nature of the learning environment in this course, problems and concerns can quickly amplify. Please let the instructor know of any personal, interpersonal, or academic concerns as soon as possible. I will try to implement appropriate remedies.

FIELD SEMINAR REQUIREMENTS:

There are several required assignments. It is my sincere hope that you will view all these assignments eagerly, as a way to enhancing your experience, both in the short run and long term.

1) Seminar participation in all activities – 20%

Students are expected to be active participants in all phases of the program and work cooperative with their fellow students. This includes content discussions, participation in field trips, and consideration of others in the various living situations. It also means that potential concerns should be raised with the seminar leaders at the earliest possible moment.

Exceptions will be made for health-related reasons.

2) Oral presentation – 30%

During the seminar, each student will on a topic of their choice. Topics may be based on an organism or a course theme. (Anyone who has already given two organism presentations will need to choose a thematic topic. Please get approval on your topics prior to proceeding.

The presentations should resemble the prefield presentations in terms of length and organization. However, they should build upon what has already been covered.

As noted in prefield, these presentations will serve several purposes:

- Get you thinking generally about the trip
- Get you engaged in a specific aspect of the biosphere of the Pantanal.
- Help to prep the rest of us on a topic of relevance.

- Stimulate discussion in-country.

Students are expected to have completed their presentation preparation prior to arriving in country

NB -

In addition to their presentations, students are expected to be our local experts on the topics of all three of their prefield and in-country presentations. During the trip each student should take pictures, conduct interviews, and otherwise delve more deeply into their presentations topics.

3) Journaling – 30%

You are expected to keep a daily directed journal as indicated below. (You are welcome to include other comments as well.)

In your journal, I would like to focus on your observational and analytical powers.

→5 written observations.

- Every day, I would like you to write down **5 written observations**. These can be single sentences. They can be related to assignments 1 and 2, but they do not have to be. (Think *Tweet*.)
- Every evening, I will provide further direction regarding the nature of the next day's observations.
- At least **three** of your daily observations **should relate to wetlands ecology and conservation**

→1 expanded observation.

- You will be expected to pick **one** observation per day (ideally related to the course theme) and **comment** upon it at greater length. (Think *blog post*.)

You might include the following.

Explain the observation in greater depth.

Explain the context in which it was made.

Comment on why you picked it.

Speculate on the antecedents, current significance, and future impact

Consider writing about something that surprised you.

→1 pictorial observation.

- Additionally, every day, each student will make **one pictorial observation** - photographic or drawn.

→Activity list

- **Activities** - List at least 8 things we did each day.

→ **Journaling refined for dossier**

- At the end of the seminar, you will be expected to type up and turn in your observations. I would like to combine these into a group resource.

(One side benefit of this assignment is that this material is great to include in letters to home, blogs, your personal journals, etc.)

4) Summarizer – 10%

Each evening one student will be expected to summarize the events of the previous day, put them in context, outline their significance and lead a group discussion.

5) Formulate a plan for the future – 10%

Formulate a plan for building upon your seminar experience and for sharing your experience with others.

This may include future research, web pages, scrap books, photo shows, personal letters, letters related to political action, starting your own NGO, etc.

We will discuss the assignments at greater length during the seminar.

In the meantime, you should bring one or more bound journals or lab notebooks for your journaling assignment.

6) Dossier

Students will not receive credit for the class until they submit an electronic copy AND a hard copy of their dossier – described below.

PRESENTATIONS:

Content - general:

Make sure you keep the themes of Wetlands Ecology and Pantanal in mind.

They should also outline areas of conflict or controversy in order to stimulate discussion.

We will try to weave the information in the presentations to our various outings.

You should also include an introduction as to why you chose your topic.

Content – organismal presentation:

- Why you chose the topic
- Etymology of scientific name
- Taxonomy and evolution
- Ecological niche
- Position in food web
- Reproduction
- Fun facts
- Cultural references and YouTube

Content – thematic presentation:

- Why you chose the topic
- Basic concepts
- Relevance to the seminar
- Generalizable principles
- Controversies and topics for discussion

NB – Some of the thematic presentation topics are better suited to be given during the prefield course and others will work better as in-country presentations.

Structure:

Presentations should be 15 minutes long. Longer is OK – as long as the content is good.

Format:

You may choose the format. Creativity is appreciated.

The length and structure of the field seminar presentations should be very similar to those in the prefield. In addition, you should

- 1) build upon content that was covered in prefield,
- 2) take into consideration comments made about presentation style, and
- 3) realize that presentation conditions will be far less than ideal. In fact you are more than welcome to avoid Powerpoint entirely. In this case we may be able to find an interesting outdoor venue for your presentation. For those that wish to rely on Powerpoint, that will be an option as well.

NB:

If you are planning to use Powerpoint, etc., please bring you presentation in at least two formats, e.g. – email it to me and bring it on a USB drive.

Timing:

The presentations will be spaced through the seminar. We will try to coordinate them with the field trips.
They should be prepared before you leave for Brazil.

Sources:

There are a number of good books on wetlands ecology and on Pantanal. In addition, the use of online resources will be invaluable. This is especially true for those of you who do not have good library access over the summer.

Use reliable, credible (or at least interesting) sites.

You may want to start with sites from Wikipedia, UNESCO, Brazil government sites, CIA, etc.

Also consider NGO sites.

If anyone finds a great site send it to the group.

PARTIAL LIST OF ORGANISMAL PRESENTATION TOPICS redux

- capybara
- giant anteater
- jaguar
- tapir
- giant river otter
- ring tailed coati
- collared peccary
- white-lipped peccary
- capuchin monkey
- giant armadillo
- marsh deer
- South American coati

- hyacinth macaw
- blue and yellow macaw
- red and green macaw
- black-faced parrots
- jabiru stork
- southern screamers
- toco toucans
- wood ibis
- crested caracara
- greater rhea
- wattled jacana
- great potoo

- rufescent tiger heron
 - king vulture
 - common piping guan
 - harpy eagle
 - bare-faced curassow
 - burrowing owl
 - red-crested cardinals
 - anhinga
 - hermit hummingbird
 - buff-necked ibis
 - guira cuckoos
 - striped owl
 - roseate spoonbill
 - crimson-crested woodpecker
 - savannah hawk
-
- Pantanal caiman
 - tegu lizard
 - red footed tortoise
 - yellow anaconda
 - pacu
 - dourado
 - piranha
 - jau (giant catfish)
-
- night flowering orchid
 - pink trumpet trees
 - strangler fig
 - mimosa
 - water hyacinth
 - cashew
 - passion fruit flower
-
- butterflies and moths
 - ants
 - vespids

Additional suggestions are welcome.

PARTIAL LIST OF THEMATIC PRESENTATION TOPICS

- the hydrogeography of the Pantanal
- geological history of the Pantanal

- wetland management
- the cowboy culture of the Pantanal
- the fazenda
- human animal interactions in the Pantanal
- evolutionary considerations of wetland ecosystems
- evolutionary gigantism
- food webs
- predation
- animal locomotion
- animal behavior
- symbiosis
- ecosystem succession
- land and water conservation
- impacts of climate change and global warming
- recycling of organic materials
- conservation of imperiled species
- the role of education with Pantanal conservation
- comparisons with and implications for other wetlands
- economics of the Pantanal
- Brazilian laws pertaining to wetlands
- International laws pertaining to wetlands
- The role of international organizations
- PCER
- Hidrovia Project
- Pantanal invasives
- Pantanal organismal exports
- Indigenous groups in the Pantanal – relationship with the environment

Additional suggestions are welcome.

DOSSIER

All students are required to keep a dossier of all their assignments and other work in the class. This should include copies of all your assignments and other work completed in conjunction with the course as well as photographs of all physical projects.

***Please turn in an **electronic and a hard version of your dossier**

The dossier should include:

- A cover page with your name, the date, the course, and a picture
- A list of all work / table of contents
- Course presentations and write-ups

- Journal of observations
- A list of notable course events
- A list of topics of particular interest in the course
- Extra credit assignments including debates, videos, songs
- List of any additional evidence of initiative and/or scholarship including articles or books you read.
- Plan for the future

Number the pages in your dossier.

Please turn the electronic copy of your dossier in by September 15, 2014.

Electronic copies should be mailed to **chickenpox@gmail.com**

Please turn the **hard copy** of your dossier in by the first day of autumn quarter, 2014.

The dossier is extremely useful in terms of potential letters of recommendation.

→Take pride in your work!

PERMISSIONS

The dossier is for evaluation (and possible recommendations). However, as you know, I sometimes use student presentations as demonstrations or as parts of my presentations - with attribution. As you saw, I try to maintain the student's formatting so it is obvious that it is not my work.

If you have any preferences regarding the possible use of your work, please let me know (especially emphatic no's or emphatic yes's). I will not use any work that you prefer not to share.

PREFIELD RESOURCES

Please refer to the prefield syllabus for information regarding:

- The coursework site
- The course web page
- The class account - thepantanalsafari@gmail.com.
- The course blog: thepantanalsafari.blogspot.com
- The course Twitter: @pantanalsafari

Unfortunately these will be difficult to access during the seminar.

GOOGLE DOC

Prior to leaving for Brazil, you are expected to review and update **all** pertinent information on the course google doc, especially but not restricted to information about your presentation topic and your travel plans.

TRIP ORIENTATION

After the entire group has arrived, there will be an in-country orientation. One component will be given by PCER. In addition, the instructor will go over a number of things regarding this course syllabus, course goals, class structure and assignments, trip expectations, health and safety, academic context, helpful travel hints, and photography.

TRIP EXPECTATIONS

Among other things, students are expected to strive for excellence, look out for others and contribute to the well-being of the group, jump in to help without being asked, communicate problems *and* revelations, contribute ideas, and be respectful of the Brazilian people, biota, and nonliving environment.

ACCOMMODATIONS

Accommodations may range from budget hotels, to dormitories, to home stays, to camping. The facilities will **not** be up to the standards that you are used to. Please be *very* flexible, but let of know of any issues that may arise including issues of sanitation, water, bathroom facilities, and sleeping accommodations.

HEALTH AND SAFETY

Separate talks will be given on health and safety.

However, here are a couple of reminders:

- 1) Use bottled water until instructed otherwise. This includes tooth brushing.
- 2) Carry toilet paper and hand sanitizer
- 3) Be particularly wary of motor vehicles.
- 4) As much as possible, avoid getting bitten by mosquitos.
- 5) Do not go out on your own, especially at night.
- 6) Let me or Emma or Maha know ASAP if you are injured or ill.

I will give you a handy mnemonic from Jay Keystone to remind you of the key points.

For the latter two weeks of the course, we have the good fortune to be accompanied by S. V. Mahadevan, MD (aka Maha). Maha is an expert on international aspects of emergency medicine.

PANTANAL CENTER FOR EDUCATION AND RESEARCH (PCER)

Many of the trip arrangements were made in conjunction with Pantanal Center for Education and Research (PCER) as a BOSP subcontractor. PCER describes itself as “a rural community center and scientific research station based in the Northern Pantanal in Mato Grosso, Brazil”. Their web site notes:

“PCER offers biologists, anthropologists, engineers and others space to conduct studies in ecology, sustainable development (cultural and environmental impact), and sustainable technology design and testing, with:

- a research laboratory and space for researchers
- study and volunteer opportunities for foreigners and Brazilians
- a testing ground for new sustainable technologies that can be applied widely in the area”.

Our principal contact at PCER is Ethan Shirley who will be accompanying us through the duration of the trip.

GUEST SPEAKERS

The course will make use of guest speakers, who will be talking about their work and their personal experiences. Most of the speakers will be volunteering their time. Questions are welcome.

INTERVIEWS

Students are encouraged to interact with locals, particularly in safe settings. This included the possibility of interviewing locals regarding your presentation topics.

- What do they know about wetlands ecology and conservation?
- What are their opinions regarding these topics?
- Does their assessment agree with yours?
- What is their cultural or educational background and how might that influence their thinking?

PORTUGUESE

Although the course will emphasize ecology and conservation, a knowledge of Portuguese will greatly enhance your experience, especially in terms of interacting with the Pantaneiros and their role in conservation. A small amount of Portuguese will be covered in the prefield but you are encouraged to use other materials such as those provided by PCER.

FACEBOOK GROUP

The Facebook group “pantanal safari” has been created to share pictures and other materials. Along with the Twitter, and the blog, this will continue to be active following the course.

EMAILING FILES

In emailing or submitting electronic files, you should name them as follows:
Course – yourname - document title or subject key words - draft version - date

For example:

“Pantanal seminar - Siegel – capybara – final draft –September 1, 2014.doc”

Although this is longer and annoying, it is extremely helpful and descriptive.

→**Do not** name your file something like “siegel paper” or “final draft” or “presentation”.

If you are sending me a draft that is close in content to a previous draft, *please indicate the alterations* with the track changes command or comparable color annotation.

COOPERATION BETWEEN STUDENTS/WORKING TOGETHER

Students are encouraged to work together on most phases of the course.

EXTRA CREDIT

Students may augment their performance in the class by composing a thoughtful op-ed based on their experiences or their assignment research. Ideally this would be suitable to be submitted for publication.

POST FIELD SEMINAR

In addition to enrolling in the seminar, students may participate in a post-field seminar designed for students in this course. This will be a formal extension of assignment 5. The post-field seminar will discuss the many ways to build upon the in-country experience, including but not limited to, working on the online curricular project. This third phase of travel is a phase of travel that is too often neglected. We will also deal with issues of reverse culture shock. Students may also elect to participate in a project to create online learning materials pertaining to the Pantanal.