

Amazon-PIRE 2009 Course: SCHEDULE

TRAVEL

Thursday, July 16

MORNING

11:55: Students arrive in Belém, transport to Hotel Formule-1

AFTERNOON, EVENING

Free

Friday, July 17

MORNING

Free

AFTERNOON

16:00: Depart hotel in Belém for dock

17:00: Leave Belém in commercial passenger boat, overnight in cabins

Saturday, July 18

MORNING

10:00: Commercial boat arrives Portel

11:00: Transfer to the *Mendes Leal*, depart for Caxiuanã

AFTERNOON

12:00: Lunch on board

EVENING

18:00: Arrival in Caxiuanã

19:00: Dinner/Jantar

20:00: Lecture: Staying safe in the forest & what to do in an emergency (Antonio Lola)

DAY 1 (Sunday, July 19) Introduction & Overview

MORNING

07:00: Breakfast/Café da manhã

08:00: Introduction to Amazon-PIRE (Scott Saleska & Plinio de Camargo)
Individual introductions and background (Students & Instructors)

09:00: Overview of course: [Themes and topics \(Scott Saleska\)](#)

10:00: Lecture series: Introduction to the Amazon Basin (Plinio de Camargo)

Part 1: [History of the Amazon](#)

Part 2: [Geomorphology of the Amazon Basin](#)

11:00: [Introduction to the flora of the Amazon Basin and Caxiuanã \(Leandro Valle Ferreira\)](#)

AFTERNOON

12:00: Lunch/Almoço

13:30: Lecture: [Measuring trees: A primer for obtaining biomass, height, and crowns of tropical trees \(Joost van Haren\)](#)

14:00: Students break into 5 groups for making measurements

14:30: Field Session: Forest inventory measurements in Caxiuanã forest (5 groups)
-- van Haren, Metcalfe, Cattanio, Camargo, Lola, Stark; Botanist Ferreira moves among groups

EVENING

19:00: Dinner/Jantar

DAY 2 (Monday, July 20)

MORNING

07:00: Breakfast/Café da manhã

08:00: Lecture series: Drought and Amazon Forests

1. [ESECAFLOR Project \(Antonio Lola\)](#)
2. [Why focus on drought? The dry-down experiment and effects on vegetation dynamics \(Dan Metcalfe\)](#)
3. [Soils, soil water, and nutrient dynamics \(Joost van Haren\)](#)

AFTERNOON

12:00: Lunch/Almoço

13:30 Field Session: Divide into two groups, go to one station (reverse order on day 3)

Group 1. Sampling and analyses methods for soil properties, water content, and trace gas fluxes (van Haren, Camargo, and Cattanio)

Group 2. Visit seca (drying) experiment and eddy flux towers, including field examination of important Caxiuanã tree species (Metcalf, Saleska, Lola, Ferreira)

EVENING

19:00: Dinner/Jantar

4. [Drought effects on soil respiration and carbon cycling \(Henrique Cattanio\)](#)

DAY 3 (Tuesday, July 21)

MORNING

07:00: Breakfast/Café da manhã

08:00: Field Session: Divide into two groups, go to *reverse station from previous day*

Group 2. Sampling and analyses methods for soil properties, water content, and trace gas fluxes (Joost, Plinio, and Henrique)
(see methods references listed on Day 2, the previous day)

Group 1. Visit seca (drying) experiment and eddy flux towers, including field examination of important Caxiuanã tree species (Lola, Dan, Saleska, Leandro)

AFTERNOON

12:00: Lunch/Almoço

14:00: Lecture series: The Problem of Scaling: Forest Light Environments and Forest Structure

[Scaling 1: Applying a general approach to leaf production \(Scott Stark\)](#)

[Scaling 2: Gap dynamics, size distributions, and carbon fluxes \(Scott Saleska\)](#)

EVENING

19:00 Dinner/Jantar

DAY 4 (Wednesday, July 22)

MORNING

07:00: Breakfast/Café da manhã

08:00: Field/Lab Session: Divide into two groups, go to one station (reverse order on day 5)

- Group 1: Ecophysiological measurements (Huxman and Souza)
- Group 2: Measuring leaf spectral reflectance and LAI (Huete and Chavana-Bryant)

AFTERNOON

12:00: Lunch/Almoço

14:00 Lecture series: Leaf-level ecophysiology_(Travis Huxman)

1: Plant Water Relations

Field demo: Ecophys measurement techniques (around basecamp)
(see references above for morning field session on ecophysiological measurements)

2: [Plant Photosynthesis](#)

EVENING

19:00: Dinner/Jantar

DAY 5 (Thursday, July 23)

MORNING

07:00: Breakfast/Café da manhã

08:00: Field/Lab Session: *Reverse groups* from previous day 4:

Group 2: Ecophysiological measurements (Huxman and Souza)

Group 1: Measuring leaf spectral reflectance and LAI (Huete and Chavana-Bryant)

(see methods references for each of these from day 4)

AFTERNOON

12:00: Lunch/Almoço

13:30: Lecture series: Biosphere-Atmosphere Exchange

1. [Ecosystem scale biosphere-atmosphere exchange of carbon, water and energy \(Steven Wofsy\)](#)
2. [Allocation and partitioning within ecosystems: trends across Amazonia \(Dan Metcalfe\)](#)
3. [Scaling biosphere-atmosphere measurements to region, continent, and globe \(Steven Wofsy\)](#)

EVENING:

19:00 -- Dinner/Jantar

20:00: Field Project Planning: Discussion and organization of group projects
(Mentors: Wofsy/Cattanio, Camargo/van Haren/Metcalfe, Saleska/Stark,
Huxman/Huete/Lola, Ferreira)

DAY 6 (Friday, July 24)

MORNING

07:00: Breakfast/Café da manhã

08:00: Start Work on Field Projects (in groups with mentors)

AFTERNOON

12:00: Lunch/Almoço

14:00: Lecture series: Scaling with remote sensing from leaf to canopy to region
(Alfredo Huete)

1: [Remote sensing basics and leaf and canopy spectral signatures](#)

2: [Remote sensing and biophysics/phenology](#)

EVENING

19:00: Dinner/Jantar

20:00: Project planning

Day 7 (Saturday, July 25) REST DAY

MORNING

08:30: Breakfast/Café da manhã

10:00: Depart on *Mendes Leal* to nearby beach

AFTERNOON

Barbeque on beach

EVENING

Return to field site on the *Mendes Leal*

Day 8 (Sunday, July 26)

Project fieldwork/data analysis

Day 9 (Monday, July 27)

Project fieldwork/data analysis

Day 10 (Tuesday, July 28)

Complete project data analysis for presentations

Day 11 (Wednesday, July 29)

MORNING

8:00: Breakfast/Café de Manhã

Finalize all presentations

AFTERNOON

12:00: Lunch/Almoço

14:00: Final student presentations (15 minutes each)

1. [Ecological and physiological responses to drought \(Survivor Caxiuanã\)](#)
2. [Spectral Analysis of vegetation-understanding vegetation-radiation interaction under rainfall exclusion \(Boi de Piranha\)](#)
3. [Vertical profile of canopy in Caxiuanã, Amazon \(La Vaca\)](#)
4. [Drought effects on soil respiration \(Relax\)](#)
5. [Effects of drought on forest structure: Esecáflor, FLONA Caxiuanã \(Sky Walker\)](#)

EVENING:

19:00: Dinner/Jantar

TRAVEL

(Thursday, July 30)

MORNING

06:00: Depart Caxiuanã for Portel on the *Mendes Leal*, breakfast and lunch on board

AFTERNOON

13:00: Transfer to commercial passenger boat departing Portel for Belém, overnight in cabins

(Friday, July 31)

MORNING

10:00: Commercial passenger boat arrives Belém, transfer to Hotel Formule-1

AFTERNOON/EVENING

Free time

(Saturday, August 1)

MORNING

Free time

AFTERNOON/EVENING

Return flights to U.S. (some students to extend stay in Brazil)

(Sunday, August 2)

Arrival in U.S.