



FUNDACION CENTRO DE ESTUDIOS INTERAMERICANOS, CEDEI
ENV 301 Environmental Studies of the Andes

The Andes are the longest mountain range on earth, rich in mineral resources, scenic beauty and unique biodiversity. This region boasts the world's driest desert, its wettest rainforest, its highest active volcanoes, deepest gorge and highest navigable lake. Only within the Andean range do we find snowfields on the Equator and glaciers at sea level - in fact almost every major natural habitat in the world is found within the borders of the Andean countries and the Tropical Andes region is considered the single richest and most diverse of the planet's globally recognized biodiversity hotspots. This is also a region that has been inhabited by human communities for thousands of years. We will examine the ecology of the major habitat types of the Andean region, the ways in which human cultures have impacted the landscape and ecology and the efforts that are being made to conserve biodiversity and encourage sustainable development in this region.

Throughout the term, students will carry out an original investigation on a topic of their choice in their own time, this will be written up and handed in at the end of the course and each student will prepare a presentation of their project for the final class. During the course there will also be several assignments that consist of preparing presentations for a following class.

Course Objectives

1. Describe the physical geography and geological history of the Andean region (including the Amazon basin and the Galápagos Islands).
2. Identify the climates and ecological zones of the Andean region
3. Understand the basic ecology and natural history of each of the major ecosystems of the region, and the importance of these in terms of biodiversity conservation, water provision and climate change mitigation.
4. Identify the major environmental changes that have taken place in the region due to the arrival of humans, pre-Columbian civilizations, the Spanish conquest, Agrarian reforms and the environmental challenges of the 21st century.
5. Understand the main social and environmental issues of the region, especially with regard to Indigenous and rural poor communities.
6. Compare extractivism with more sustainable options for economic development in the region.
7. Examine the roles of the International community, national governments, NGOs and local communities in the conservation of natural resources and ecosystem services.

Reading material:

Selected readings from:

Borsdorf, A and Stadel C. 2015 *The Andes, A Geographical portrait*, Springer

Additional articles.

Exams and grading

1. Mid-term exam 30%
4. Assignments / class work 10%
5. Final exam 30%
6. Term Project 25%
7. Oral presentation of project 5%

Class 1.

Introduction to the course and ideas for student investigations
(slide show)

Class 2.

Formation of the Andes, influence on climate and biogeography, arrival of humans, Spanish conquest, recent environmental issues, climate change.

Class 3.

Andean Geography - Diversity of climates and ecosystems
The Southern Andes - Patagonia

Class 4.

The Tumbes-Chocó- Magdalena hotspot: - Tropical dry forests, Mangroves, Chocó rainforests, threats and conservation issues (**student presentations**).

Class 5.

The Andes and the Humboldt Current. South America's paradoxical Pacific coast.
Documentary: BBC - Paracas and the Billion Dollar Birds.
Ancient civilizations of Peru's Pacific Coast.

Class 6.

Rainforest ecology. BBC Andes to Amazon. Amazon Jungle. Rainforest structure and diversity.

Class 7.

Human activities in the Amazon - Petroleum industry, Logging, Cattle ranches, Cash crops, hydroelectricity, mining (**Student presentations**)

Class 8.

Introduction to the high Andean ecosystems.
cloud forest ecology

Class 9.

Cloud forest ecology continued.
Exam revision

Class 10.

Mid term exam.

Class 11.

Exam review. Páramo ecology

Class 12.

Páramo ecology cont.
The Central Andes.
Puna ecology

Class 13.

Humans in the páramo and puna ecosystems. Mining in the Andes

Class 14.

Iconic animals of the Andes – Andean condor, the camelids, spectacled bear, guinea pigs etc. People wildlife conflicts - Spectacled bear – Shadows in the Forest.
Environmental education.

Class 15.

Iconic plants of the Andes - Visit to Ecuagenera orchid centre – CITES convention, endemism, business and biodiversity in the Andes.

Class 16.

Protected areas and sustainable development in the Andes region:
Payment for Ecosystem services, camelid farming in the páramos, ecotourism, improving pastures, raising guinea pigs. (**Student presentations**)

Class 18

The Galápagos Islands –video
Climate, ecology and Evolution

Class 17

The Galapagos Islands conservation issues – documentary film and discussion

Class 18

Final Exam

Class 19

Student research project presentations