

Chile: Climate Change and Land Management in a Country of Contrasting Landscapes

Q&A with Dean Indy Burke and Professor William K. Lauenroth, Yale School of the Environment

WHAT ARE YOU MOST EXCITED TO SHOW PEOPLE ON YOUR UPCOMING TRIP TO CHILE?

Indy: Chile's expansive natural resources, open spaces, and wildlife—especially the birds. Patagonia is just so gorgeous, and this trip also covers all of the major regions in the country from the capital city of Santiago to the Pacific Coast, as well as the desert in the North and the volcanic area in the South. In a landscape that moves from mountains to plains and transitions from high precipitation to low, it's astounding to observe the unique soil organisms, wildlife, and birds that have adapted to these varied regional climates.

Bill: The Atacama Desert and Patagonia—helping people understand that even though there aren't trees or many of the usual things we expect to see in an ecosystem, these areas are still fascinating. For example, in the Atacama, one of the driest places on earth, there is a large cold current that comes close to shore and shelters the desert, blocking moisture from the Pacific Ocean. As you move south into a zone of winter precipitation, the ocean influences that as well, and further south, it changes to a very wet climate before transitioning to a dry, cold climate. So, on this trip, we will go from The Atacama Desert, one of the driest places on earth in the North of Chile, to Patagonia, one of the coldest and driest places on earth in the South.

WHAT CAN PEOPLE WHO ARE INTERESTED IN ECOLOGY AND CONSERVATION LEARN ON A TRIP TO CHILE?

Indy: The remote areas of Chile—with a long history of sustainable land management—make the country a fascinating case study. One of the things that I find most interesting when studying other countries is comparing different continents in terms of how people navigate the challenges they have faced for centuries in their environments. For example, ranchers in both Chile and the U.S. Rocky Mountain West are faced with similar issues with regard to balancing wildlife and domestic livestock.



WHAT ARE SOME OF THE SUCCESSES AND CHALLENGES OF LAND MANAGEMENT IN CHILE?

Bill: Most of the ranches in Chilean Patagonia are owned by people living in Santiago. They rely upon on-site managers, some of whom are terrifically talented, but others may be very inexperienced. There's a price to be paid for absentee ownership because poor decision-making by the on-site manager can result in catastrophic losses to the livestock herd. When the person who has the largest economic stake is not the one making the day-to-day decisions, the impact on the well-being of the organization can be perilous. And yet, absentee ownership seems to be the rule for Chilean and Argentinian ranches.

Indy: In terms of cultural heritage and human land management, it's interesting to look at the similarities between the U.S. and Chile. Instead of cowboys, they have gauchos. They raise sheepdogs in almost exactly the same way we do; to protect from the same kinds of dangers that concern us here. The real threat of invasive species and the competition between wild and domestic herbivores is another point of interest.

At the same time, there is a lot to learn from the preservation stories behind many of Chile's national parks. It's been incredible to witness the come-back of the guanaco, a South American mammal in the camel family, which was nearly wiped out at one point—and to observe enormous flocks of flamingos, whereas at home, we're only accustomed to seeing them in someone's yard on a stick.

The history of Chile's indigenous population being removed from their native lands is all too familiar, and it's one that's important to understand. When studying the country's ecology and wildlife, we have to remember that the first land managers in this part of the world maintain a perspective built over millennia of co-existing with the environment. I'm looking forward to meeting some of the indigenous groups in Chile on this trip and hearing their insights about conservation and land management.

WHAT KIND OF PROJECTS HAVE YOU DONE IN CHILE?

Bill: We've taken students to expose them to land management practices by working on sheep farms. They were astonished after experiencing how much work it was to be a rancher and surprised by how much fun it was to work that closely with the animals. They got enormous satisfaction out of that activity. For many of them, I know they will cherish it for their entire lives.



2023 Land Preview

CHILE

Land of Contrasts

JANUARY 19–FEBRUARY 3, 2023

16 DAYS FROM: \$11,995

On a true journey of adventure, traverse the full range of the southernmost country on the globe. Visit the Atacama Desert, the driest place on Earth. In the thriving Lake District, encounter a landscape dotted with active volcanoes and roaring waterfalls before heading into the untamed wilderness of Patagonia, where you will encounter extraordinary colonies of birds and animals in one of the most geologically diverse places on our planet.

HOW WOULD YOU DESCRIBE LEARNING OBJECTIVES FOR THIS TRIP?

Indy: Patagonia is perhaps one of the best places in the world to study the effects of climate change on water availability and to delve into complicated ecosystems that are strongly controlled by water. Increases in the evaporative demand of the atmosphere will have huge impacts there. Forest management in Patagonia is another great topic to explore. For example, what happens when you replace native species with plantations?

This landscape is extremely vulnerable to both shifts in the atmosphere and direct human alteration. Anything that changes the precipitation, the length of the growing season, or the availability of water will have massive effects in the future, and that's what makes it so interesting to study right now. As the climate gets warmer, the growing season will get longer. Certain species can make it, and others won't survive; in some cases, invasive species will overtake the native ones.

Bill: During our travels, we will bring in some of the projections about climate change across the range of environments that we'll visit. Temperatures and rainfall are the key variables that determine where ecosystems are located, and those same factors will drive climate change over the next half a century.



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Dean Indy Burke and Professor William K. Lauenroth are the Yale study leaders for Chile: Land of Contrasts, January 19–February 3, 2023.