

Foundations of Living Lab Research: Collaboration and Design in Forest Ecosystems *in Ecuador*

Field visits:

Amazon region

Tiputini Research Station – Universidad San Francisco de Quito (USFQ)

Established in 1994, TBS is located in the territory of the Amazonian Kichwa community of El Eden, within the Yasuní Biosphere Reserve, and adjacent to Waorani Territory and the Yasuní National Park—one of the most biodiverse regions on Earth. Operated by USFQ, the station hosts hundreds of students and researchers from Ecuador and around the world each year. This remote field station has a small land-use footprint and is surrounded by non-flooded and flooded forest ecosystems, offering a rich setting to study diverse flora and fauna.

Reaching TBS involves a multi-step journey from Quito. We will first travel from Quito to Coca by plane, which takes about 30 minutes. Coca is a small Amazonian city built in the 1960s for oil exploration and development purposes. We will travel downstream the Napo River for a couple of hours, in a canoe owned by USFQ, until we reach the oil site operated by PetroEcuador. We will cross the oil block in a local bus for about two hours, until we reach the Tiputini river. Then, we take another canoe downstream for about 2-3 hours until we reach TBS.

Cloud forest

This portion of the field course takes place a few hours northwest of Quito, reachable in about 1–2 hours by private bus or van. The area lies within the Chocó-Andino de Pichincha UNESCO Biosphere Reserve, designated in 2018. This reserve is globally significant for its extraordinary biodiversity and high levels of endemism. For instance, roughly 10,000 plant species have been recorded here, with approximately 25% being endemic. According to UNESCO (2018), “the region is considered a biodiversity hotspot gathering some 270 species of mammals, 210 reptiles, 200 bird species, and 130 amphibians.”

Tandayapa cloud forest station – Universidad San Francisco de Quito (USFQ)

Established in 2022, the Tandayapa Cloud Forest Station (TCS) is a research facility operated by the Universidad San Francisco de Quito (USFQ). Located approximately 1.5 hours from Quito within the Chocó Andino Biosphere Reserve, the station functions as a living lab for research, education, and innovation in one of the most biodiverse cloud forest regions of the Tropical Andes. The Chocó Andino provides an ideal setting to study the relationships among biodiversity conservation, ecosystem restoration, and sustainable development. TCS supports interdisciplinary research and training programs focused on understanding ecological processes,

monitoring species diversity, and developing science-based approaches that integrate conservation with community well-being.

Yunguilla Community

Situated about 80 km from Quito (around one hour by bus or van), Yunguilla is a mestizo community that has organized collectively to protect its surrounding cloud and Andean forests. Between 2010 and 2012, the Yunguilla Conservation and Sustainable Use Area (ACUS) was established to promote conservation and sustainable development. From this initiative emerged various community-led projects focused on agroecological systems, ecological restoration, and eco-tourism. In 2013, Yunguilla's ACUS—covering 3,000 hectares—was formally recognized and granted protection by Quito's Municipal Department of Environment. During our visit, you will learn about these community initiatives and spend one night in homestays, engaging directly with local residents. You'll also experience the surrounding forest on a hike along an ancestral trail (known locally as “culuncos”), used by ancient civilizations for transport and trade.

Reserva Intillacta

Located about 30 km from Mindo, Reserva Intillacta exemplifies private conservation efforts in Ecuador. Its owners have been deeply involved in the protection of the cloud forest and played a key role in establishing the Chocó-Andino UNESCO Biosphere Reserve. Our visit to Intillacta will be a day trip departing from the Tandayapa Cloud Forest Reserve.

Highlands and Páramo Ecosystems

This segment of the field course takes us 2–3 hours south and southeast of Quito. The páramo is a high-elevation ecosystem unique to South America, resembling alpine tundra. It occupies the zone above the Andean forest line and below the permanent snowline of surrounding volcanoes and mountains—typically between 3,000 and 4,500 meters above sea level. The páramo is a critical water source for millions of people and also serves as an important carbon sink, storing large amounts of carbon in its soils.

Cotopaxi National Park

Established in 1975, Cotopaxi National Park spans the Cotopaxi, Pichincha, and Napo provinces. It is most famous for the majestic, snow-capped Cotopaxi Volcano, Ecuador's second-highest peak at 5,897 meters above sea level. Since 2015, Cotopaxi has been experiencing a period of moderate volcanic activity and is currently classified as yellow by the Geophysical Institute of Ecuador—the second-lowest alert level, indicating changes in activity. An orange alert signals a high likelihood of eruption, while a red alert indicates that an eruption is imminent. We are monitoring updates closely through local news and official sources to ensure safety.

Aglomerados Cotopaxi Pine Plantations

Aglomerados Cotopaxi ranks among Ecuador's largest forestry companies, managing approximately 15,000 hectares of land. Of this area, 70% is used for timber production, while 30% is set aside for conservation. We will tour Aglomerados Cotopaxi operations—including its nursery and pine plantations—located within the buffer zone of Cotopaxi National Park. The company's forest management practices are certified by the Forest Stewardship Council (FSC).

Hacienda El Porvenir

Perched at 3,600 meters within the buffer zone of Cotopaxi National Park, Hacienda El Porvenir offers a compelling case of private conservation in Ecuador. Here, you will learn about one of the country's earliest Andean montane forest restoration efforts and ongoing projects to protect the Andean condor. If we are fortunate, we may witness condors soaring in their natural environment. We will spend one night at the hacienda during this part of the trip.