



Photo adopted from GoogleEarth

El Teleférico (The Gondola):

The gondola “El Teleférico” ascends from Quito to the shoulders of Rucu Pichincha. On a clear day, the Inter-Andean Valley and the volcanoes Cayambe, Antisana, Cotopaxi, Illiniza, Chimborazo and Guagua Pichincha can be seen from the top of the lift. We recommend starting any trip here. We prefer to get students on the gondola on their first full day in Quito. Plan to leave early in the morning to beat the clouds (the first chairs leave the base station at 9 AM).



Painting the big picture: At the summit, have your group take out a map of the Inter-Andean Valley, orient it, and locate your position. Once the students have a clear understanding of their location, introduce the regional geology. A list of papers pertaining to the regional geology can be found below:

SUGGESTED PEER_REVIEWED LITERATURE:

Aspden, J.A. and Litherland, M. (1992). The geology and Mesozoic collisional history of the Cordillera Real, Ecuador. *Tectonophysics* 205: 187–204.

Gutscher, M.-A., Malavieille, J., Lallemand, S., Collot, J.-Y. (1999). Tectonic segmentation of the North Andean margin: impact of the Carnegie Ridge collision. *Earth and Planetary Science Letters* 168: 255–270.

Hall, M.L. and Mothes, P. (2008). Volcanic impediments in the progressive development of pre-Colombian civilizations in the Ecuadorian Andes. *Journal of Volcanology and Geothermal Research Special Volume on Archaeology and Volcanism* 177: XX-XX.

Hall, M.L., Samaniego, P., Le Pennec, J.L., Johnson, J.B. (2008). Ecuadorian Andes Volcanism: A review of Late Pliocene to present activity. *Journal of Volcanology and Geothermal Research* 176: 1-6.

GUAGUA PICHINCHA HAZARD MAPPING EXERCISE



Guagua Pichincha's proximity to the city makes it a great candidate for the beginning or end of your tour. Arrange to spend the night in Lloa, a quaint rural pueblo situated an hour and a half's drive from downtown Quito. Before the sun rises, start the sinuous four-wheel-drive ascent to the crater's rim; without any unanticipated delays, it should take approximately forty-fives minutes (a detailed map is available on our website). You must leave early to beat the clouds. If the morning is fair and visibility is good, the views will knock your socks off. Consider bringing along a map of the Inter-Andean Valley and its volcanoes to keep students aware of their location on a regional scale. You should also bring lunch, plenty of water, toiletries and warm clothes (hat, raincoat, fleece, gloves, etc.) for when the clouds roll in.

Unfortunately, exposures along the road are mediocre. Perhaps you can stop at one of the meter-thick sections to let everyone stretch their legs. If the weather is favorable when you reach the refugio, a bright yellow building 200 meters shy of the summit, pile out of the vehicles and head directly to the rim. Do not waste anytime at the refugio if the summit is clear. It is likely that it will be socked in within the hour. Allow 30-45 minutes for all of the students to ascend these 200 meters, given the altitude.

Once at the summit, if the weather cooperates, you may be able to see 1999-2001 dome and 1981 crater inside the amphitheater. Given the sector collapse scarp, domes, craters and pyroclastic deposits, there is more than enough geology to have a lively conversation, particularly about potential hazards posed by the volcano. Be sure to warn students not to venture down into the crater, where phreatic explosions occur sporadically and without warning.



Now for the intellectual activity: After visiting the summit, take the group into the refugio. The caretaker, one of a number of gentlemen employed by Ecuador's Civil Defense, will welcome your presence and encourage the use of the facilities. Provide each student with a topographic map that includes the amphitheater of Guagua Pichincha and Quito. Using the discussion at the summit about hazards, their observations from the refugio (and en route up, which is why it's important to have some clear weather), and the topographic maps, ask students to map the hazard zones around Guagua Pichincha. It is particularly



helpful for students learning how to read topographic maps and make hazard assessments to see the topographic barriers between Guagua Pichincha and Quito (Rucu Pichincha), clearly visible to the east of the refugio. The identification of these barriers and their role regarding hazards are essential to the successful completion of this project. You can obtain topographic maps of the region from the Instituto Geográfico Militar (Senlorges s/n y Gral. T. Paz y Miño, 2522 066, igm@uio.satnet.net). Topographic and hazard maps will soon be available on this site for large-format printing.

Now for the adventure: Arrange with your guide to have mountain bikes available and let the students ride them down to Lloa. Make sure the guides have plenty of extra tires, chains and bikes on hand. The road is tough on the gear and the body. Ask the guides to stay behind the group in their vehicles to pick up anyone uncomfortable with the steep slopes or who might grow weary of the ride.



Where to stay in Lloa: Dinner & lodging at Casa y Campo
Phone: (593-2) 265-0849 or (593-98)154-489

SUGGESTED PEER-REVIEWED LITERATURE:

Barberi, F., Ghigliotti, M., Macedonio, G., Orellana, H., Pareschi, M.T., Rosi, M. (1992). Volcanic hazard assessment of Guagua Pichincha (Ecuador) based on past behavior and numerical models, *Journal of Volcanology and Geothermal Research*, 49: 53-68.

Canuti, P., Casagli, N., Catani, F., Falorni, G. (2002). Modeling of the Guagua Pichincha volcano (Ecuador) lahars. *Physics and Chemistry of the Earth*, 27: 1587-1599.

For a comprehensive list of Guagua Pichincha publications see the website.