

Soil & Water Assessment Tool: A Proposed Study

SWAT, or Soil and Water Analysis Tool, is a computer-based method for investigating a variety of aspects of a watershed. At Cloudbridge, we are interested in a wide range of ecological and biological studies, and we invite volunteer researchers to consider undertaking two studies based on this tool.

Cloudbridge Nature Reserve lies in the Talamanca mountain range in south-eastern Costa Rica. The reserve, adjoining a UNESCO World Heritage national park, was established to preserve and reforest an important gap in the cloud forest on the slopes of Mt Chirripó, the highest mountain in Costa Rica.

Study 1 SWAT at Cloudbridge

The Study. Soil and Water Analysis at Cloudbridge Nature Reserve, at the confluence of two rivers: the Chirripo River and the Uran River. Many streams feed into these rivers.

Study Method. The researcher would employ the land use data, topographical information and our 5-year database of rainfall and temperature to investigate the before-and-after effects of converting cattle pastures into natural regrowth and native tree restoration. We hope to learn, among other things, the possible effects of the conservation effort on

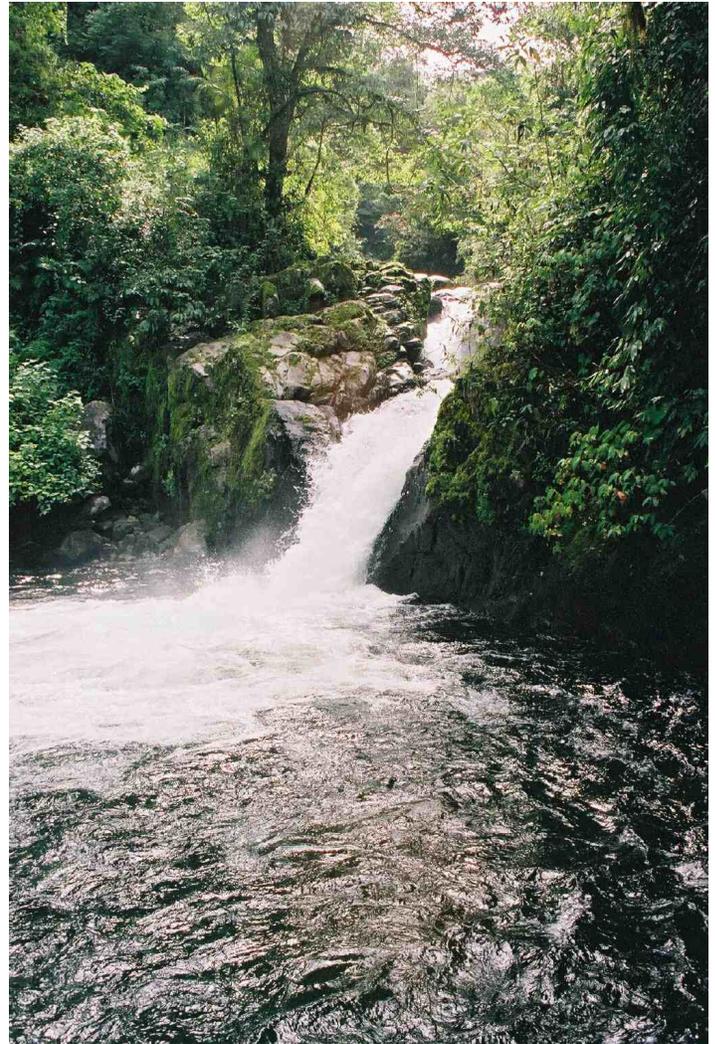
- water flow
- erosion
- river contamination

Some field work may be necessary, but the bulk of the study could be conducted without necessarily being at Cloudbridge. SWAT is a computer program that enables estimations of the flow at certain points of a river. Inputs to the model include maps of land use and topography, rainfall and temperature data, all of which we have at Cloudbridge.

References

www.brc.tamus.edu/swat/ (The program can be downloaded from this web site)

www.brc.tamus.edu/swat/downloads/doc/swat2005/SWAT%202005%20theory%20final.pdf (The manual)



Study 2

SWAT in San Gerardo de Rivas

As more and more land in the watershed is developed for farming and habitation, the flow and quality of the valley is inevitably affected. A comprehensive land use study has been conducted by one of the Cloudbridge research volunteers, Sebastian Culbreth. Building on this study, it would be useful to interpret the effect of different land uses on the flow and quality of the several rivers and streams that converge in this community. The SWAT technique offers the possibility of comparing the effects of agriculture, use of fertilizer and pesticides, household runoff, etc on the water and the soil.

SWAT can help identify:

- surface runoff, river flow
- nutrients like phosphorus and nitrogen
- bacteria
- erosion
- nutrient, pesticide, bacteria transport

Thanks to Kinnie de Beule for suggesting this study.

