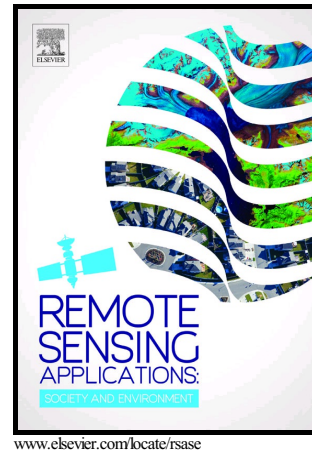


# Author's Accepted Manuscript

Environmental change in the equatorial Andes:  
Linking climate, land use, and land cover  
transformations

Santiago López, Christopher Wright, Paulette  
Costanza



PII: S2352-9385(16)30039-8  
DOI: <http://dx.doi.org/10.1016/j.rsase.2016.11.001>  
Reference: RSASE42

To appear in: *Remote Sensing Applications: Society and Environment*

Received date: 6 May 2016  
Revised date: 30 October 2016  
Accepted date: 3 November 2016

Cite this article as: Santiago López, Christopher Wright and Paulette Costanza  
Environmental change in the equatorial Andes: Linking climate, land use, and  
land cover transformations, *Remote Sensing Applications: Society and  
Environment*, <http://dx.doi.org/10.1016/j.rsase.2016.11.001>

This is a PDF file of an unedited manuscript that has been accepted for  
publication. As a service to our customers we are providing this early version of  
the manuscript. The manuscript will undergo copyediting, typesetting, and  
review of the resulting galley proof before it is published in its final citable form.  
Please note that during the production process errors may be discovered which  
could affect the content, and all legal disclaimers that apply to the journal pertain

Environmental change in the equatorial Andes: Linking climate, land use, and land cover transformations  
Santiago López<sup>a\*</sup>, Christopher Wright<sup>a,b</sup>, Paulette Costanza<sup>a</sup>

<sup>a</sup>University of Washington Bothell

<sup>b</sup>Sno-King Watershed Council.

cslopez@uw.edu

wright.christop@gmail.com

pcostanza@outlook.com

\*Corresponding author. University of Washington Bothell, School of Interdisciplinary Arts and Sciences, 18115 Campus Way NE, Bothell, WA 98011-8246. Tel.:+001 (425) 352 3393.

## Abstract

Global climate change is implicated in major socio-ecological transformations across a range of locations and geographic scales. Recent research has shown that climate change will be more pronounced in high-elevation mountain sites with consequences that may be felt much sooner and directly affect millions of people. In this study, we follow a land change science approach based on remote sensing, downscaled climate modeling, and regression analyses to investigate the connections between land use and land cover transformations and climate variation in the Cotopaxi National Park and its buffer zone in Ecuador. Results show an overall reduction of native grasslands between 1987 and 2013 and a significant glacier extent loss on the Cotopaxi volcano between 1976 and 2013. Decadal altitudinal shifts of main land cover types, specifically herbaceous vegetation, denuded soils, glacier, and upper montane evergreen vegetation are finely attuned with decadal changes in temperature. Results confirmed that decadal surface area changes of major land cover types in the region may be weakly associated with decadal changes in precipitation and moisture. If climate change and current land use practices continue to affect both the vertical and horizontal distribution major ecotypes, we could expect an overall restructure of the landscape across the latitudinal, longitudinal, and altitudinal dimensions in the short term. Resource users may need to adapt their land use systems to these new environmental conditions and search for resource management strategies that will enable them to sustain their livelihoods in the long term.

**Keywords:** Climate change; land use and land cover; remote sensing; Cotopaxi; Ecuador; tropical Andes

## 1. Introduction

Changing climatic conditions worldwide are affecting the global hydrological cycle with severe repercussions on land use and land cover (LULC) of major watersheds (Göncü and Albek, 2007). Recent

Download English Version:

<https://daneshyari.com/en/article/8866391>

Download Persian Version:

<https://daneshyari.com/article/8866391>

[Daneshyari.com](https://daneshyari.com)