

[Home](#)

[Online Library HESS](#)

- Recent Final Revised Papers
- [Volumes and Issues](#)
- Special Issues
- Full Text Search
- Title and Author Search

[Online Library HESSD](#)

[Alerts & RSS Feeds](#)

[General Information](#)

[Submission](#)

[Review](#)

[Production](#)

[Subscription](#)

[Comment on a Paper](#)

Journal Metrics



IF 2.462



5-year IF 2.670

SCOPUS[®] SNIP 0.856

SCOPUS[®] SJR 0.099

[Definitions](#)

ARCHIVED IN



PORTICO

[Volumes and Issues](#) [Contents of Issue 12](#) [Spec](#)

Hydrol. Earth Syst. Sci., 14, 2415–2428, 2010

www.hydrol-earth-syst-sci.net/14/2415/2010/

doi: 10.5194/hess-14-2415-2010

© Author(s) 2010. This work is distributed under the Creative Commons Attribution 3.0 License.

The use of remote sensing to quantify wetland loss in the Choke Mountain range, Upper Blue Nile basin, Ethiopia

E. Teferi^{1,3}, S. Uhlenbrook^{1,2}, W. Bewket⁴, J. Wenninger^{1,2}, and B. Simane³

¹UNESCO-IHE Institute for Water Education, P.O. Box 3015, 2601 DA Delft, Netherlands

²Delft University of Technology, Department of Water Management, P.O. Box 5048, 2600 GA Delft, The Netherlands

³Institute for Environment, Water and Development Studies, Addis Ababa University, P.O. Box 2176, Addis Ababa, Ethiopia

⁴Department of Geography and Environmental Studies, Addis Ababa University, P.O. Box 2176, Addis Ababa, Ethiopia

Abstract. Wetlands provide multiple ecosystem services such as storing and regulating water flows and water quality, providing unique habitats for flora and fauna, and regulating micro-climatic conditions. Conversion of wetlands for agricultural use is a widespread practice in Ethiopia, particularly in the southwestern part where wetlands cover large areas. Although there are many studies on land cover and land use changes in this region, comprehensive studies on wetlands are still missing. The extent and rate of wetland loss at regional scales is unknown. The objective of this paper is to quantify wetland dynamics and estimate wetland loss in the Choke Mountain range (area covering 17 443 km² in the Upper Blue Nile basin, a key headwater region of the river Nile). Therefore, satellite remote sensing imagery of the period 1986–2005 is considered. To create images of surface reflectance that are radiometrically consistent, a combination of cross-calibration and atmospheric correction (Vogelman-DOS3) methods was used. A hybrid supervised/unsupervised classification approach was used to classify the images. Overall accuracies of 94.1% and 93.5% and Kappa Coefficients of 0.908 and 0.913 for the 1986 and 2005 imagery, respectively were obtained. The results show that 607 km² of seasonal wetland with low moisture and 22.4 km² of permanent water are lost in the study area during the period 1986 to 2005. The current situation in the wetlands of Choke Mountain is characterized by further degradation which calls for wetland conservation and rehabilitation efforts through incorporating wetlands into watershed management.

[Final Revised Paper](#) (PDF, 3839 KB) [Discussion Paper](#) (HESSD)

Citation: Teferi, E., Uhlenbrook, S., Bewket, W., Wenninger, J., and Simane, B.: The use of remote sensing to quantify wetland loss in the Choke Mountain range, Upper Blue Nile basin, Ethiopia, *Hydrol. Earth Syst. Sci.*, 14, 2415–2428, doi: 10.5194/hess-14-2415-2010, 2010. [Bibtex](#) [EndNote](#) [Reference Manager](#) [XML](#)