

NORTH AMERICAN LAND COVER SUMMIT: INTRODUCTION

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Land cover mapping, characterization, monitoring and forecasting are critical elements of many environmental monitoring and land management programs. Land cover data and information provide a direct, objective indication of the effects of land use impacts on natural resource conditions, environmental and human health, and the quality and quantity of water. While human modification of land cover is an inevitable aspect of modern society, human-induced changes in land cover have important implications for both society and the environment. Because the impacts of land cover change are not confined to national boundaries, there is an urgent need for accurate, consistent trans-boundary data on land cover condition and extent.

The North American Land Cover Summit (NALCS) was held from September 20-22, 2006 at the National Academy of Sciences, Washington, D.C., to assess national land cover monitoring efforts across the continent and identify areas of possible collaboration. Jointly sponsored by the U.S. Geological Survey (USGS), U.S. Environmental Protection Agency (USEPA), and the Association of American Geographers (AAG), the Summit was attended by scientists and administrators from Canada, Mexico, Australia, Germany, and the United States whose organizational affiliations included governmental agencies, universities, non-governmental organizations, and the United Nations. Summit participants assessed critical issues for improving land cover applications, identified institutional needs and gaps in technical capabilities, reviewed innovative uses of land cover information, and

noted opportunities for interagency and international collaboration.

This AAG Special Issue volume consists of selected papers presented at the Summit - with a few relevant additions – and summaries of the conference breakout sessions. This peer-reviewed compilation provides an overview of the land cover monitoring efforts and environmental assessments being performed across the North American continent, as well as examples of continental-scale monitoring efforts in Europe and Australia.

Anthony de Souza of the host National Academy of Sciences (NAS) provided welcoming remarks on the morning of the first day. The conference charge was then delivered by David Lehman, senior advisor to the U.S. Secretary of the Interior, followed by overviews on how the Canadian, Mexican and United States governments derive and manage land cover information. The morning ended with a keynote presentation from Lee Schwartz, Chief Geographer of the U.S. Department of State, who explained the role of land cover information in economic development and humanitarian missions.

Two presentation sessions were held in the afternoon. The first focused on national land cover monitoring programs and produced the papers by Collin Homer *et al.* and Francisco Jimenez in this publication. Homer's paper (pp. 5-12) discussed the National Land Cover Database (NLCD) of the U.S., while Jimenez's paper (pp. 13-20) described Mexico's vegetation mapping program. The second session featured presentations on cooperative approaches in governmental land cover analyses. Stephan Kleeschulte and Gyorgy Büttner (pp. 31-44) provided the European experience in creating and managing the CORINE land cover database, while Michelle Barson (pp. 45-74) discussed the collaborative approaches used in creating land cover maps of Australia. The first day ended with a poster session focusing on regional land cover monitoring activities and environmental assessments.

Presentations on the second day started with non-governmental organizations explaining their needs for land cover information. John Weins *et al.* (pp. 153-168) discussed how The Nature Conservancy (TNC) includes areas around its protected areas in its assessments so as to include the impacts of nearby land cover changes. The second session of the day focused on global and regional land cover programs. Roger Sayre *et al.* (pp. 131-152) described the role of ecosystem mapping in assessing

biodiversity and resource management, while John Latham (pp. 75-96) conveyed how the Food and Agricultural Organization (FAO) seeks to harmonize national land cover mapping efforts.

Afternoon sessions consisted of sessions examining land cover applications, such as community planning, biodiversity assessments, climate change impacts, wildfire management and resource management. Presentations published in this volume include K. Bruce Jones (pp. 215-250) on the importance of spatially explicit integration of data; Nathan Wood (pp. 169-180) on the use of land cover information for assessing the risk to coastal communities from tsunamis; and Yi Shi *et al.* (pp. 251-274) on the Midwest Spatial Decision Support System partnership that developed a web-based decision support tool for community planners. Also included is a paper by Mary White *et al.* (pp. 181-214) that describes a tool for evaluating an area's ecological condition for possible conservation efforts and a paper that assesses hydrologic responses to land cover change by William Kepner *et al.* (pp. 275-292). The final two papers from the second day focused on the use of land cover information on assessing forest resources. Michael Wulder *et al.* (pp. 21-30) discussed Canada's *Earth Observation for Sustainable Development of Forests* project, while Kurt Riitters and Gregory Reams (pp. 97-106) discussed the U.S. Forest Service's use of land cover information in formulating indicators of forest patterns.

Day Three continued the application sessions, focusing on land cover information in formulating alternative futures and assessing agro-ecosystems. This volume includes one paper from each session. Dreux Watermolen's paper (pp. 293-330) discussed how local governments in the state of Wisconsin can use land cover information in conducting community planning exercises. The paper by Rasim Latifovic and Darren Pouliot (pp. 107-130) assessed the need of inter-annual land cover maps for assessing agricultural production.

The remainder of the morning was devoted to breakout sessions that examined the potential for land cover monitoring and data sharing across the continent. Four thematic groups were formed, each focusing on a critical use of land cover information: indicators of environmental quality; ecosystem conditions; hazards identification and forecasting; and global change. Reports from all four groups are included in this volume as collections of the attendees' views on how collaborative, continental-scale land cover monitoring can promote national objectives for environmental quality and resource man-

agement. The Summit concluded with remarks from representatives from the three North American nations that recounted the lessons learned and outlined aspirations for the future.

The stated objective of the Summit was to pursue collaboration among institutions and government agencies across the continent in order to advance the development and application of comprehensive land cover information. A major outcome of the meeting was the establishment of the North American Land Change Monitoring System (NALCMS) which develops image mosaics and multi-scale land cover data products for the continent. The first products to be developed under this cooperative system are annual Moderate Resolution Imaging Spectroradiometer (MODIS) image mosaics and derived land cover classes that have been shared among the three countries. There are continuing discussions on conducting higher resolution land cover mapping activities in areas of interest to two, or all three countries, such as pathways for migrating birds and insects. It is hoped that this system is just the prelude to many other collaborations.