LCLUC Abstract

A Comparative Study of Forest Mapping Methods/ algorithms: Towards Optimal Solutions for Operational Global Forest Mapping/ Monitoring

With the growing concern over an alarming rate of deforestation and loss of forest biodiversity worldwide, the need for accurate and up-to-date accessible information both at regional and global levels has been recognized by the ESE LCLUC (NASA's Earth Science Enterprise Land Cover and Land Use Change) Program and the Pilot Projects on Global Observations of Forest Cover (GOFC) initiated by the Committee on Earth Observation Satellites (CEOS). Among pilot project themes identified by the GOFC, mapping of forest cover characteristics and change is considered as the most critical but challenging of the proposed themes, and the need for developing operational forest cover monitoring techniques and algorithms is acknowledged.

The major goal of the proposed project is to compare the different forest mapping and change detection algorithms and methods adopted by LCLUC Science Teams including the spectral angle classifier developed by the investigator of the proposed project. The mapping and change detection results generated using the different methods and approaches by the LCLUC Science Team members (NRA-99 selectees) from Africa, US, Southeast Asia, China, and Russia will be compared and evaluated. Evaluations of the different mapping/monitoring algorithms and methods will be based on the accuracy of mapping results, operational efficiency for forest monitoring at regional scales, and the robustness of the mapping algorithm. Based on these evaluation results, the weaknesses and strength of different algorithms/methods and the technical issues involved will be addressed, and optimal solutions for implementing global monitoring systems will be presented.

The results of this inter-project comparison will significantly enhance our understanding of different forest mapping algorithms and methods, and how these algorithms can be effectively utilized for mapping and monitoring different forest characteristics in different ecoregions through collaborative work among LCLUC Science Team members. The evaluation results of the proposed project will: (1) contribute to NASA's ESE LCLUC Program and NASA's effort for developing operational forest monitoring systems at regional and global scales, and (2) demonstrate the unique role of Landsat TM data in mapping and monitoring forest cover characteristics. With new Landsat 7 TM data (with its Enhanced Thematic Mapper Plus (ETM+) and a panchromatic band with 15m spatial resolution) available to users, this project will provide timely experimental results to the remote sensing and global change research community.

The proposed project will be performed in close collaboration with the LCLUC NRA -99 Science Team members. The duration of the project will be total 36 months beginning July 1, 2000.