



# Detecting and controlling forest damage area caused by insects and diseases with Remote Sensing, GIS and GPS

(Research Report of the APEC Project)

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# **Detecting and controlling forest damage area caused by insects and diseases with Remote Sensing, GIS and GPS (Research Report of the APEC Project)**

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## Preface

There is currently much concern regarding recent anthropogenic effects on regional and global environments. Fossil fuel burning and tropical defoliation are largely responsible for dramatic year to year increases in atmospheric CO<sub>2</sub> and other greenhouse gas concentrations, and it is predicted that these increases will result in major global warming. Such a warming would differentially affect the vegetation in the various biomass but the types and magnitudes of these vegetation changes are currently open to speculation. Meanwhile, many of the forests in the world are undergoing serious decline. The damage or decline caused by forest diseases and insects is among the most serious forest hazards.

Remote sensing provides a means for obtaining regional and global perspectives on the status of the Earth's vegetation. It is generally assumed that remote sensing will play an important role in ascertaining the severity of forest change by forest diseases and insects on various forest communities, and will be important in monitoring any regional and global forest changes that might occur in response to global changes.

Geographic Information System (GIS) is a technical system which provides the functions supported by computer software and hardware to enter, store, update, inquire, manipulate, analyze, synthetically apply, display, map and output the data describing the real world. Therefore many users have taken GIS as important tools in forest management which can not only accomplish general data management, but also establish the professional model for growth, forecast, management and decision based on spatial attribute table and select the best management scheme through simulation, evaluation and comparison for all kinds of management process. If combined with GPS and RS technology, GIS can survey the forest resource dynamic change.

The more recent use of global positioning systems (GPS) offers the possibility of collecting, directly in the field and at reasonable cost, the exact coordinates of geographic positions. GPS now permits the establishment of a link between a map and a real, physical location on the Earth's surface, whether the location refers to an area, a moving object such as a plane, or a forest protection manager. The GPS + GIS + remote sensing combination thus permits flexible, effective, real-time management of forest resources at the landscape level.

Chinese government has been paying continuing attention to controlling the forest pest damages and spending much money in protecting our limited forest resources. Especially with the advanced development of remote sensing, GIS and GPS technology, many projects have been conducted to probe into effective monitoring method of forest pest damage. Our study has gained sound achievements, and we are sponsored by APEC to share results with other countries. The final objective is to protect our limited forest resources and earth environment, and to realize forest sustainable development.

Wu Honggan