

RADAR REMOTE SENSING FOR TROPICAL RAINFOREST ASSESSMENT

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ABSTRACT:

One of the important applications of remote sensing is the quantitative assessment of forest resources and their rate of depletion. However, accomplishment of this task in tropical environments is often hampered by persistent cloud cover. According to some estimates, the probability of acquiring a cloud-free image in the visible part of the electromagnetic spectrum is nearly zero, and it is a linear function of the percentage of cloud cover. The consequences of inaccurate results can be extremely damaging, considering that these types of data are used for many kinds of climate modelling applications. In the present paper, a radar remote sensing method, based on synthetic aperture radar interferometry for forest inventory, is presented. Two features make this method indispensable for forest inventories, especially in the tropics: (1) the method has all-weather and day-night capabilities; and (2) it has the ability to deliver both the horizontal extent of forest cover and also its density. Numerous tests were carried out over a forest in Brunei. This method is able to deliver a much more accurate picture of the forest cover in any tropical environment. It also allows a far more precise study of forest ecosystems, because of the extremely high temporal and spatial resolution of the data; for example, that obtained from TerraSAR-X. One of the limitations of the method is that it cannot be used during the leaf-off state in boreal forests. Some additional issues related to the effects of intense precipitation on X-band data will be discussed.

TOPIC: Land cover classification

ALTERNATIVE TOPIC: Remote sensing applications