



**Comprehensive Remote Sensing, Volume 9: Applications for Societal Benefits.** Editor in Chief: Shunlin Liang, Volume Editor: Stephen J. Walsh. Elsevier, Waltham, MA 02451, USA. 2018. xxiv + 385 pages. Price: Not mentioned.

Remote sensing (RS) refers to the science of sensing an object without being in physical contact with it. This is achieved by placing sensors onboard a spacecraft, aircraft, a balloon or an unmanned aerial vehicle, which detect reflected and/or emitted radiation from objects/earth surface features in different spectral regions. Data thus obtained are analysed to identify and characterize the earth surface features. The basic premise is that every object/earth surface feature reflects and/or emits electromagnetic radiation differently at different wavelengths. Space-borne RS began almost five decades ago with the launch of LANDSAT 1 by USA in 1972. Since then, many RS satellites carrying sensors operating in different parts of the electromagnetic radiation (visible, infrared, microwave), at different spatial resolution and frequency of observation have been launched by several countries. Data obtained by these satellites have been extensively used to map the entire earth surface, study natural resources such as agriculture, forestry, water resources, coastal zone, snow and glaciers, land forms, etc. for weather prediction and ocean state forecasting. Data obtained at different time intervals have allowed us to study how the resources have changed

over a period of time and also to evolve measures for their conservation and sustainable development.

This book is the last of a series of volumes devoted to different aspects of RS. The current volume addresses applications of RS and geographic information system techniques to various areas of societal benefit. It comprises 24 articles and is an important contribution to bring home the usefulness of RS for societal benefits to a larger audience illustrated through a few case studies.

Articles cover a range of studies related to mapping, monitoring changes, impact of these changes on sustainability aspects and their relation to social issues. The article on land cover classification with fine resolution data has comprehensively discussed different classification schemes, pixel-based, in comparison to object-based. It also emphasizes on the need to adopt parallel processing while dealing with very high-resolution data, data volumes being very huge. On the other hand, identification of agricultural crops, estimating their growth stages and yield require analysis of data obtained at different time intervals of the crop calendar.

Requirement of atmospheric correction, geometric registration and radiometric normalization of data for such application has been highlighted in another article. How RS data are used to study extent of forest cover, its fragmentation and conversion of some of the forest land to agriculture or other land uses, and in assessing biodiversity at different scales has been shown through some case studies. A number of articles deal with the use of RS data, particularly of high spatial resolution in studying different aspects of urban land use, identifying tree-covered areas within urban complexes, agricultural lands within urban and peri-urban areas, settlement patterns, etc. How RS data are used to estimate population of a given region has also been illustrated in one of the articles. Role of RS data in identifying habitats suitable for the genesis and spread of vector-borne diseases and invasion of

tsetse has been described in separate articles. Islands, in view of their unique and fragile ecosystem, occupy a special place in environment conservation and sustainable development. How RS data have been used in studying natural landscape of the islands and evolving models for their sustainable development and conservation is described in a couple of articles. Use of very fine resolution digital elevation model derived using lidar data in understanding beach vulnerability is also discussed. Impact of climate change in terms of sea-level rise, extreme events of precipitation, higher temperatures on livelihood activities and how to mitigate have been dealt in some studies. Ethical, social and legal aspects of RS data have been discussed in the last article.

Overall, the articles provide a comprehensive view of technical aspects of RS data, different methods of analysis and these data are actually used in a number of studies of societal relevance. Research scholars, professionals working in this area, academics and managers of parks/protected areas should find the volume useful as reference/illustrative material in their sphere of work. Obviously, it is not exhaustive. It does not have examples related to snow and glaciers, desertification, disasters, etc. There is also a bit of repetition of material related to basic RS principles and methods of analysis, since articles are stand-alone and written by different authors. Articles are also too narrative. Most of the examples are drawn from the US, a few from Africa and China. India has done extremely well in the area of application of RS data in natural resources survey, monitoring, conservation and sustainable development. The volume would have been richer with inclusion of these studies. Nonetheless, it is a useful addition to the literature on the subject.

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