

PRACTICAL IMAGE ANALYSIS USING PERSONAL COMPUTERS:
THE CANADIAN EXPERIENCE

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ABSTRACT

Personal computers and remote sensing are technologies which have come of age in recent years after suffering through growing pains. Until recently personal computers lacked the computing power, resolution and storage capacity to serve as an effective business and research tool. This is no longer the case as PC's are finding acceptance and application widely throughout the world. Specialized software and hardware are becoming available to handle all manner of business and scientific requirements. The size and cost of these systems has made computers and their capabilities accessible to a new and much larger market of hands-on users. For many, PC's have demystified computers and computer technology to the extent that fear of computers need no longer be a stumbling block to innovators who have not had the benefit of specialized computer training. In locations where service and maintenance of larger computer systems is unavailable or costly, the advantages of simpler PC systems are quite obvious.

The cost and availability of advanced image analysis technology has limited access to the benefits of remote sensing. Much effort is now being devoted to the development of remote sensing-based methods and applications in which the emphasis is on appropriate technology. Adaptation of remote sensing so that the technology can be put to work wherever it is most needed around the world requires an understanding of real-world working conditions and operational user needs and capabilities. This implies the need to modify basic assumptions, approach and methods, and to adapt the tools themselves.

Landsat imagery is being used extensively throughout Latin America today. Access to digital image analysis facilities is still however limited. Since the capabilities of digital image analysis have been well demonstrated; encouraging wider access to these capabilities might be considered as the next priority to ensure continued growth in the level and productivity of remote sensing applications. Accessibility and cost of digital image analysis are now replacing user resistance as the more serious factors limiting the acceptance of remote sensing.

This paper seeks to demonstrate how, in the past year, the practical availability of image analysis has increased dramatically. Full digital image analysis capabilities, compatible with all current resource and meteorological satellite digital images are now available on PC-based image analysis systems. All of the image analysis techniques currently recommended by operational remote sensing users in Canada are available. PC systems now combine adequate throughput and performance with the advantages of low investment and maintenance costs. The systems are upwardly compatible and support highly flexible software, designed for hands-on use by resource professionals.

This paper provides examples of the advanced remote sensing applications which can be supported solely through the use of such a system. Comparisons with conventional image analysis systems are made in terms of productivity and working environment. The system used to carry out the demonstrations is a commercially available turnkey system requiring a minimum of support and operator training; at a cost which is nearly an order of magnitude lower than many conventional image analysis systems. The authors demonstrate that PC-based image analysis may be an effective solution for many operational resource management agencies which currently do not have direct or convenient access to digital image analysis facilities. The results presented justify optimistic conclusions concerning the impact on acceptance of remote sensing as a viable resource management tool.