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Applications of Spaceborne Remote Sensing to Archaeology

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Spaceborne remote sensing data have been underutilized in archaeology for a variety of reasons that are slowly but surely being overcome. Difficulties have included cost/availability of data, inadequate resolution, and data processing issues. The orbital perspective provides global coverage and regional views difficult to obtain from airborne instruments. Until recently, spatial resolution from space has been adequate for regional surveys but not for local detailed work, however this is now changing. Satellite systems providing data with substantially improved spectral and spatial capabilities will soon be available. Digital image data with 5 meter pixels are becoming available now from IRS (Indian Remote Sensing satellite), and multiple satellites which can provide 1 meter digital data will be launched very soon. Such data will permit local surveys and analysis at scales approaching airphoto resolution. In addition to improvements in spatial resolution, spaceborne data provide coverage for spectral regions accessible only with specialized airborne instruments. The Landsat thematic mapper system records data to 2.35 micrometers, and many landscape features are more distinctive at these longer than visible wavelengths. Radars such as the SIR (Shuttle Imaging Radars) and JERS (Japanese Earth Resources Satellite) operating at wavelengths as long as 20-25 cm have demonstrated potential to image shallow subsurface features in certain arid terrains. Satellites with laboratory spectrometer like capabilities, and covering the thermal infrared region will also be launched in the near future. Finally, dealing with satellite image data is becoming much easier due to the dramatic increases in computing power of inexpensive desktop computers, and the availability of image processing and GIS software for such machines.