EARTHQUAKE RELATED DEWATERING USING MISR/TERRA SATELLITE DATA

This note is intended to draw the attention of the readers to an article entitled "Observing Earthquake-related Dewatering Using MISR/Terra Satellite Data" by Bernard Pinty and others in a recent issue of EOS Transactions, American Geophysical Union (v.84, no.5, 2003, pp.37-43).

This informative article shows that satellite data can be used to map and monitor the spatial distribution of earthquake-related dewatering in remote regions. The authors have made use of satellite data collected by Multiple Imaging Spectro Radiometer (MISR) onboard the Terra platform. These data are used to map and monitor the spatial distribution of earthquake-related dewatering due to liquefaction and/or crustal compression in areas far remote from the epicentre and also in otherwise inaccessible areas. This imaging is also useful to develop earthquake intensity-distance relation from the limited available data.

It may be recalled that on 26th January 2001, an M-8 earthquake occurred in Bhuj, Gujarat and claimed an estimated 20,000 human lives. It is also know to be the most destructive earthquake on the Indian soil, having inflicted economic losses close to Rs.50,000 crores. Over the last two years, over 20 reports and research papers have appeared describing this earthquake. It may be mentioned that in none of these reportings, details of liquefaction caused by the earthquake was addressed. In this interesting article, the authors have shown the distribution of water bodies 10 days before the earthquake, five days after the earthquake and 35 days after the earthquake which demonstrates that the number and size of mud-water pools increased substantially on the imager taken five days after the earthquake. The same diminished and went back to a level similar to that existed 10 days before the earthquake. In another interesting imagery, a colour composite map shows the change in near infrared reflectance between January 2001 and January 2002 over Rann-of-Kutch.

This article highlights yet another use of satellite imagery in estimating the soil liquefaction caused by earthquakes.

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AIRBORNE GEOPHYSICS IN LAND MANAGEMENT AND SALINITY PROBLEMS

The special publication no.4 (v.33, no.2, June 2002) of *Exploration Geophysics* deals with the application of airborne and ground geophysical methods to understand the root-zone soil salinity, land and catchment management in different irrigation locations of Australia. These surveys were carried out under the National Dryland Salinity Programme (NDSP), which provide insight into the structure and characteristics of saline landscapes. The papers in the volume report case studies in the agricultural regions of Tasmania, northern Victoria, western Tanzania, south Australia, Adelaide and northern-southern territory of Western Australia.

Airborne electromagnetic (AEM), radiometric and magnetic data in conjunction with other non-geophysical (surface, salinity, stream location, catchment boundary, surface drainage pattern, topographical contour, aerial photograph, interpreted geological lineament from satellite data, regional soil, landform pattern, vegetation growth, depth to groundwater table, saline scald, basement geology, regolith, hydrogeology, rainfall, evaporation etc) relevant maps were employed for insights into catchment evolution, regional hydrological processes, "salt-hazard" maps for salinity affected dryland agricultural areas. This information may be used by the land managers to design effective remediation strategies in dryland salinity. Authors have shown that a systematic approach using spatial analysis techniques implemented in a Geographical Information System (GIS) mode is advantageous to the conventional manual interpretation procedures. Geophysical data interpretation and data integration processes were carried out also in a GIS, using images, maps and overlays.

Images of airborne radiometrics were used to improve geology and key soil property differences more effectively and efficiently, leading ultimately to production of useful soil maps. Apparent conductivity images were prepared from the data obtained from both frequency and time-domain electromagnetic techniques. Conductivity features were interpreted in terms of fine grained units (clay mineral layer), which have low hydraulic conductivity and hence are able