Remote Sensing and GIS Center

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By Andy Kwarteng - Remote Sensing and Geographic Information Systems (GIS) have emerged as invaluable technologies for ecosystem analysis, evaluation and monitoring. Remote sensing which involves the use of satellite imagery continues to be an integral part of projects dealing with mineral and petroleum exploration, pollution detection, weather prediction, commercial fishing, rangeland monitoring, crop forecasting, urban development and management studies and many more. The spectrum of remote sensing technology, however, is broad and invariably requires careful tailoring of response to the problem. A major challenge to users of remote sensing is how to match the appropriate technology to the problem at hand. GIS entails database analysis, description, explanation, pattern prediction and processes at geographic scales.

The Remote Sensing and GIS Center at SQU coordinates remote sensing and GIS activities and research projects within SQU, and between the University, ministries, industry, and institutions outside the Sultanate. The centre also provides technical support and guidance to national user agencies and the community at large in order to enhance co-operation, in addition to organising training courses, workshops, seminars and conferences relating to remote sensing and GIS at the national and international levels. The centre is equipped with a state-of-the-art image processing laboratory for teaching, short courses and research. The image processing and GIS software consist of the most recent versions PCI Geomatica, ENVI, ArcGIS, and other complimentary software.

The centre has collaborated with scientists at SQU in executing the following research projects since 2002:

• Assessment and modelling of the oil spill fate in the coastal region of Sultanate of Oman.
• The use of GIS and remote sensing to monitor and analyse urban growth in the Greater Muscat
• Coastal erosion along Al Batinah
• Al Jabal Al Akhdar Initiative-conservation and sustainable development in a fragile arid mountain ecosystem
• Bar Al Hikman Pleistocene to modern carbonate system
• Diamond potentiality in the kimberlitic of the Batain Nappes, Eastern Oman

The centre teaches undergraduate and graduate courses in remote sensing and GIS at the Department of Earth Sciences and the Department of Civil and Architectural Engineering. The centre also supervises MSc and PhD thesis in these departments. The Department of Civil and Architectural Engineering, in collaboration with the Department of Electrical and Computer Engineering and the Remote Sensing and GIS Center have created an MSc Programme in Geomatics Engineering.

The World Meteorological Organization (WMO) in conjunction with the world’s producers of operational meteorological satellites have established Centres of Excellence (CoE) worldwide for maximum utilisation of satellite data for environmental applications, research and strong and continuous training programmes. There are currently 12 of such centres in the world. The WMO Centre of Excellence, Muscat, was inaugurated at SQU in February 2006 as the 7th of such centre in the world, and is co-ordinated by the Directorate General of Meteorology and Air Navigation (Civil Aviation Affairs) and the SQU Remote Sensing and GIS Center. The CoE’s activities are well supported by European Organization for the Exploitation of Meteorological Satellites (EUMETSAT). Some 150 weather forecasters and environmental scientists from the Arab and southwest Asian countries have been trained since the establishment of the CoE in Oman. The CoE actively participated in the High Profile Training Event (HPTE), the first global training event through the Internet, which was organised by the WMO together with the other partners in October 2006. Among some of the CoE activities is a yearly two weeks workshop on EUMETSAT Satellite Applications sponsored by EUMETSAT. The centre recently participated in the Internet-based training on Detecting/Nowcasting/Forecasting Dust Clouds using Satellite Data that was organised by EUMETSAT in the first week of March 2010.