



Earth & Environmental Sciences Seminar Series presents:

Dr. Amin Shaban

National Council for Scientific Research, Remote Sensing Center, Beirut, Lebanon

Thursday, December 7, 2006, 5:00 pm
Agriculture Building - Room 107

**Use of satellite images and aerial photos to monitor the water flow regime to the sea:
A case study from the Lebanese coast**

Many countries in the world are facing the problem of water shortage. This is especially pronounced in arid and semi-arid regions of the world. Therefore, when calculating the major elements of the water budget, an error exists. The reason for this discrepancy was unknown until the last decade when the development of new remote sensing techniques emphasized that a substantial volume of water is lost daily from land into the littoral zone. This occurs either as direct surface water run-off (i.e., rivers and streams), or as groundwater discharges as plumes, seeps and submarine springs into the sea. Some of these springs are large enough that the amounts of fresh water they carry could potentially be exploited for human needs (e.g., Shaban et al., 2005).

The study of this hydrologic phenomenon in the Middle East shows that the seeps are directly related to open geologic structures that act to channel the water to the sea, as well as surface wadis and streams. In addition, direct run-off from rivers was also considered since a huge amount of water is also lost to the sea.

This research shows thermal remote sensing data of moderate and high spatial resolution (e.g., MODIS, ASTER, Landsat ETM and radiometric aerial images). In this regard, we can detect freshwater discharges by the presence of *thermal anomalies* between groundwater and ambient saltwater. The size, distribution, time of occurrence and duration of these anomalies will be proposed and hydrologic measures could be obtained. In addition, the Tropical Rainfall Mapping Mission (TRMM) satellites were used to investigate the mechanism of water input/output (i.e. precipitated water on the catchment verses water flow to the sea). It provides essential information from remotely sensed techniques. This study will investigate the powerful use of these techniques in assessing different hydrologic properties of water flow into the sea, with a special emphasis to the Lebanese coastal zone.

All members of the professional, educational, and research communities are welcome. For additional information, please contact the Earth & Environmental Sciences department office at (559) 278-3086 or vengieb@csufresno.edu. Parking restrictions will be relaxed in Lots O and P (Barstow and Maple Avenues) between 4:30 and 7:00 pm for seminar participants. An online campus parking map is available at: <http://www.csufresno.edu/univrelations/map>.