SUBMARINE WATER DISCHARGE DETECTION, NEAR URBAN AREAS IN GREECE USING ASTER AND LANDSAT IMAGES.

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In this paper, we investigate the contribution of satellite image processing in submarine springs detection in certain karst areas in Greece. Aster and Landsat images of possible or identified coastal and submarine springs in karstic areas have been processed and analyzed. The results have been compared and presented here. The regions that have been selected as research areas are Eastern Korinthia and Eastern Crete.

Both regions that were chosen for this research are similar in geological and hydrogeological conditions (karstic environment) and in both there have been problems of sea water intrusion and ground water salinization, which are major problems not only for drinking water supply quality but also for the agriculture and tourism, which are the main financial resources of both areas. By identifying the ground water discharge into the sea water, the sea water intrusion areas are also identified.

Combined with geologic and hydrogeologic data and with in situ research, Remote Sensing can provide useful information about the positions and the size of submarine springs. Thermal channels and/or sensors onboard of satellites such as LANDSAT 7 or ASTER can provide more accurate information on temperatures contrasts.
Landsat 7 ETM + was used for the Eastern Korinthia area and Aster was used for Eastern Crete area.The date of the Aster image is 26-11-2001 and the date of the Landsat 7 image used in this research is 5-4-2002 . Various image processing techniques were applied on the Landsat and Aster images, including thermal band processing, selected RGB composites, band ratios and principal components analysis. Thermal band processing and was proven to be the most helpful and suitable method in submarine springs detection, by identifying thermal anomalies on the sea. ER Mapper (version 7.0) is the image processing/GIS software that was used in this research. The best image processes are displayed in this poster presentation.