Geophysical Research Abstracts
Vol. 15, EGU2013-9127, 2013
EGU General Assembly 2013

Monitoring drying up of Urmia lake with satellite altimetry

Shirzad Roohi (1,2) and Nico Sneeuw (1)
(1) Institute of Geodesy, University of Stuttgart,Germany, (2) Islamic Azad University South-Tehran Branch, Tehran,Iran

Urmia lake is a UNESCO protected area with more than a hundred small rocky islands. It is home to several species of birds and animals. Located in northwestern Iran, it is the largest lake in the Middle East and the third largest salty water lake on earth. It has a surface area of approximately 5200 km^2, and an average depth of 16 m.
Unfortunately during the recently years Urmia lake has been shrinking. If the drought process continues at the current rate it would be disappear in the near future. The main factors that speeds up the drought rate of the lake, are dam construction on the main rivers which feeds the lake, evaporation and lack of precipitation during recent years as well as irrigation. The construction of a causeway in the middle of the lake also affects the natural ecosystem of the lake.
The case of Urmia lake and similar cases in other parts of the word emphasize the role of new technology such as satellite altimetry in better management of water resource and monitoring such critical situations. In this research we show the current situation and recent past of the lake from processing 10 years of Envisat satellite radar altimetry data. For internal validation of the result, water level time series were built from ascending and descending tracks separately and for external validation in-situ gauge measurements were used. Internal and external comparisons indicates the result are consistent, i.e there is no bias and systematic error in Envisat data. The RMSE between ascending and descending tracks is several centimeters and between satellite and gauge data is 1m. Water level time series analysis shows that there is a declining rate of 0.3 m/year in the water level but after 2005 it seems to have accelerated. This rate increases the salinity of lake and expands receding shoreline rapidly so the lake bed will reveal fast because the lake is shallow especially in the south part.
Following this research we are investigating to find the best re-tracker in monitoring water level of the lake and validate it against in-situ gauge measurements to determine water level more precisely.

Key words: Error estimates, re-tracking algorithm.