



## **HYdrological Model for Karst Environment (HYMKE)-Application to the Hermon Mountain (North of Israel)**

**A. Rimmer**

Israel Oceanographic & Limnological Research Ltd. The Yigal Allon Kinneret Limnological Laboratory (E-mail: alon@ocean.org.il ; fax: +972-4-6724627)

The main sources of the Jordan River are located to the south of the Hermon Mountain, an elongated anticline of mostly karstic limestone with thickness  $>2000$  m. Only seven percent of the range (55 km long and 25 km wide) lies in Israel while the rest is divided equally between Syria and Lebanon. The summit, 2814 meters ASL, is in Syria. The Hermon high regions receive an annual precipitation  $<1300$  mm, restricted to the wet season from October to April. Snow usually falls on the elevated areas from December to March, and persists above 1400-1900 m until March-June. Rainfall and snowmelt of Mt. Hermon recharge the main tributaries of the Jordan River: Dan (255 Mcm annually), Hatzbani (118 Mcm) and Banias (107 Mcm). A system approach, daily precipitation-stream flow model was developed for both the base and the surface flow components, of large-scale karst basins. Long-term stream flow data were separated to base and surface flow using the "recursive digital filter" method, which provides time series for model calibration. The HYdrological Model for Karst Environment (HYMKE) includes attributes to large-scale preferential flow that recharge the groundwater and solve the problem of uncorrelated base- and surface flow in a karst environment. HYMKE was applied simultaneously to the three major tributaries of the Jordan River. It was verified by comparing the calculated surface and base flow with the daily time series of the base flow separation procedure, and demonstrated good agreement of both the surface and base flow components of each stream.

**ACKNOWLEDGMENT:** This research is part of the GLOWA - Jordan River Project funded by the German Ministry of Science and Education (BMBF), in collaboration with the Israeli Ministry of Science and Technology (MOST).