
Water Quality: Current Trends and Expected Climate Change Impacts (Proceedings of symposium H04 held during IUGG2011 in Melbourne, Australia, July 2011) (IAHS Publ. 348, 2011). 45-50

The effects of hydrological drought on water quality

KAZEM NOSRATI

Department of Physical Geography, Faculty of Earth Sciences, Shahid Beheshti University, Tehran, Iran
k_nosrati@sbu.ac.ir

Abstract Management and conservation of water resources are critical to human welfare. The high demands for water of an increasing world population have focused our attention on water resources quality and quantity management. Climate change is likely to have significant effects on hydrological regimes (i.e. low flows and high flows), affecting both water quantity and water quality. Although climate change impacts on water quantity are widely recognized, little is known about the impacts during low flow periods (i.e. hydrological drought). The objective of this study was to assess the effects of hydrological droughts on the water quality in Mazandaran Province, Iran, based on analysis of the low flow index and existing water quality data. In view of this, 1-day low flows, as a measure of hydrological drought, were calculated for 15 water years (1991–2006) at six monitoring stations. Eleven water quality parameters were extracted during the low flows from the water quality data. Water quality during these droughts was investigated and compared to water quality during high flows. The pattern and magnitude of the statistically significant responses (t-test, $p < 0.05$) varied among sites, i.e. Cl^- and HCO_3^- at Sefidchah, Ca^{2+} at Gelvard, sodium adsorption ratio (SAR), Na^+ and SO_4^{2-} at the Abloo station, Mg^{2+} , Ca^{2+} , HCO_3^- and total dissolved solids (TDS) at Darabkola, and SAR, Cl^- , Na^+ , electrical conductivity (EC) and TDS at Rig Cheshmeh. We can conclude that data regarding other environmental changes, such as land use, will be needed to further elucidate the response of water quality to droughts.

Key words hydrological drought; low flow index; water quality; Mazandaran province, Iran