



GC33C-1240: Impact of surface water withdrawals on water storage variations under a changing climate

Wednesday, 14 December 2016

13:40 - 18:00

📍 *Moscone South - Poster Hall*

Quantitative evaluation of water storage variations in large river basins is an important element of water management, especially in a climate change. In addition, human water use has developed into another strong driver of water storage changes especially in densely populated semiarid and arid areas. In this study, we estimate the normalized human outflow of the thirty main basins in Iran during the past three decades. Then, we investigate the individual and combined effects of climate variability and human water withdrawals on surface water storage in the 21st century in four major basins (Urmia, Karkheh, Karun and Jarrahi) located in semi-arid areas of Iran. These basins are selected because they experienced medium to high human-induced water demand in last decades. We use bias-corrected historical simulations and future projections from 26 General Circulation Models (GCMs) and three climate change scenarios RCP2.6, RCP4.5, RCP8.5). The results show that humans have strongly impacted the water balances of most basins in Iran, dominating potential climate change impacts in the historical period. In fact, the main reason for water scarcity in these regions appears to be due to the increased anthropogenic water demand resulting from substantial socio-economic growth in the past three decades. Furthermore, by the end of the 21st century, the compounding effects of increased irrigation water demand and precipitation variability may lead to severe local water scarcity in these basins. Our study highlights the need to improve our understanding of the hydrologic responses to anthropogenic perturbations, and local water resource management decisions.

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