

Daily water consumption fluctuations in response to heat waves and dust storms in the city of Riyadh, Saudi Arabia

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Paucity in potable water applies great deal of stress on planning water resources and water use for development sustainability. The ongoing migration from rural areas to urban centers created nodes of high freshwater demands all over the country of Saudi Arabia. As the demand for more fresh water continues to increase in the city of Riyadh focus is turned on better and more effective management of this vital resource. However, the marked difference between escalating demand and shrinking supplies illustrates that progress towards sustainable management falls short of adequacy. Riyadh is one of the fastest growing and most prosperous cities in the world, located in hyper arid center of the Arabian Peninsula. The need for water is ever increasing having lead to the digging for water in remote dessert, desalinating and pumping sea water, and recycling sewage water. Understanding people's behavioral response to meteorological variables such as heat waves and dust storms will help create a short-term forecasting model of urban water consumption. And will help city management educate people and guide them to a more conservative response to naturally imposed conditions. Aggregate analysis of city daily water consumption vs. daily maximum temperature and the occurrence of dust storms during the period 1/1/2009 to 1/6/2012 are presented in this paper. Ambiguity on the correlation between heat waves and dust storm events in one side and fluctuations in daily water consumption on the other is probably owing to the water supply delivery system the city water management adopted and the common installation of underground water storage tanks for each household. Nevertheless, significant correlations were observed when weekly and monthly consumptions were considered. The correlation is found to be stronger in wealthier neighborhoods, with 3-5 days lag behind dust storms.

Biography

Assaf Alhawas has completed his Ph.D from Indiana University in 1989. He is a faculty member in the department of geography at King Saud University, in Riyadh. He has published several papers in hydrology and GIS applications, served as a member in the editorial board of the Arabian Journal of GIS.

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