

Graduate Management:

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Thesis to get master's degree in the field of water engineering ,irrigation and drainage tendency.

The Sensitivity eraporation and transpiration to meteorolgy data in different climates of iran

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Winter 98

Abstract:

In Iran's climate variability, it is necessary to assess the sensitivity of current models of estimating evapotranspiration before selecting and introducing the most appropriate model. This study aimed to investigate the sensitivity of Hargreaves-Samani evapotranspiration, FAO Penman-Monteith and Priestley Taylor estimation models to meteorological parameters in four climates of Iran at 9 synoptic stations of Urmia, Shahrekord, Ahvaz, Bandar Abbas, Mashhad, Zahed, Mashhad, Monthly and annually in two different scenarios. The first scenario was changed by holding all parameters, each of the parameters of maximum temperature, minimum temperature, net radiation, wind speed separately at each station from + 20 °C to +20 °C ((with 5% steps) and The amount of ETo change was calculated. Also with 5 to 20 percent variation of the desired variables, monthly mean values of evapotranspiration sensitivity coefficient were calculated. Then the sensitivity coefficient of SC was calculated. In the second scenario, all the factors implemented in the first scenario, which were done separately, were combined for all stations. The method of Zhang et al was used to analyze the sensitivity of evapotranspiration to meteorological data. The results showed that at the annual scale, in the FAO Penman Monteith method, the maximum temperature had the highest effect and the least temperature had the least effect at all stations. In Priestley Taylor method in Bandar Abbas, net radiation had the highest effect and temperature had the least effect. In Mashhad, net radiation and maximum temperature had the greatest effect. In Ahwaz, Gorgan, Orumieh, Rasht, Sari, Shahrekord and Zahedan had the highest impact. In the Hargreaves method, the maximum and minimum temperatures affected evapotranspiration in all stations, respectively. In the study area at all stations, it was found that the role of maximum temperature and solar radiation was more important than other climatic parameters and had more influence on evapotranspiration. Understanding this, it can be inferred that if the maximum temperature or solar radiation intensifies at a given time, a sharp increase in reference evapotranspiration and consequently an increase in the water requirement of plants in the study area will be certain.

Keywords: Evapotranspiration, Sensitivity Analysis, Different Climate , Climate Variables