

Use of Dendrochronology in Estimation of Creep Velocity and Its Dependence on the Bulk Density of Soils

Authors : Mohammad Amjad Sabir, Ishtiaq Khan, Shahid Ali, Umar Shabbir, Aneel Ahmad

Abstract : Creep, being the main silt contributor to the rivers, is a slow, downhill flow of soils. The creep velocity is measured in millimeters to a couple of centimeters per year and is determined with the help of tilt caused by creep in the vertical objects and needs at least ten years to get a reliable creep velocity. This project was devised to calculate creep velocity using dendrochronology and looking for the difference of creep velocity registered by different trees on the same slope. It was concluded that dendrochronology provides a very reliable procedure of creep velocity estimation if 'J' shaped trees are studied for their horizontal movement and age. The age of these trees was measured using tree coring, and the horizontal movement was measured with a conventional tape. Using this procedure it does not require decades and additionally the data reveals the creep velocity for up to 150 years and even more instead of just a decade. It was also concluded that the creep velocity does not only depend on bulk density of soil hence no pronounced effect of bulk density was detected.

Keywords : creep velocity, Galiyat, Pakistan, dendrochronology, Nagri Bala

Conference Title : ICDAM 2018 : International Conference on Dendrochronological Analysis and Methods

Conference Location : Dubai, United Arab Emirates

Conference Dates : November 19-20, 2018