Geophysical Research Abstracts
Vol. 20, EGU2018-5601, 2018
EGU General Assembly 2018

Preliminary investigation of topography and baseflow chemical characteristics in subtropical watersheds

Camyla Innocente, João Henrique Sá, Alondra Beatriz Perez, Pedro Ferreira Arienti, Debora Yumi de Oliveira, Paula Cunha David, and Pedro Luiz Borges Chaffe

Federal University of Santa Catarina, Florianópolis, Brazil (camylainnocente@gmail.com)

Many hydrologic processes are scale-dependent and we should use field data in order to relate those processes with different catchment structures. It is believed that drainage area and topography are the dominant controls of the chemistry and behavior of the baseflow. Most research about those controls has focused in temperate regions and here we explore hydrological processes in a coastal subtropical catchment. We did a preliminary investigation on the influence of topography on baseflow characteristics. The study area is located in Southern Brazil, which is characterized by sandy soils, a fractured bedrock and is covered by dense ombrophylous forest in the Atlantic forest biome. There were 21 different points of baseflow on Peri coastal lagoon watershed, with draining areas ranging from 0.02 to 5.42 km^2. We measured four different parameters (pH, electric conductivity, dissolved oxygen and temperature) in situ under baseflow conditions, totaling 60 samples measured in 8 different days between March and December of 2017. The discharge was measured using the dissolution method and the volumetric method. The topography characteristics, i.e. drainage area, elevation and topographic wetness index, were determined using digital elevation model with cell size of one meter. The main results were: i) positive correlation between drainage area and discharge (adjusted R Square = 0.84 and p-value < 0.01), the specific discharge was 14 Ls-1km-2; ii) negative correlation between electric conductivity and the logarithm of the height (adjusted R Square = 0.32 and p-value < 0.01) and the logarithm of discharge (adjusted R Square = 0.31 and p-value < 0.01) but this relationship is not strong with the logarithm of the drainage area (adjusted R Square = 0.18 and p-value > 0.1); and iii) positive correlation between drainage area and temperature (adjusted R Square = 0.26 and p-value < 0.05). The dissolved oxygen and pH were not significantly related with the drainage area (p-value > 0.01). The wetness topographic index had no correlation with other variables. Assuming that the electrical conductivity is directly related to the dissolved solids, as consequence of the interaction between water and soil - typical of the subsurface flow, we hypothesize that higher points (with lower discharges) have a higher proportion of subsurface flow in relation to lower points (with large discharges), and therefore the electrical conductivity is not necessarily related to the watershed area. Our intention is to continue this study by adding to the analysis other tracers such as isotopes, cations and anions.