CARACTERIZATION OF THE VARIABILITY OF FLOWS IN THE SUB-BASIN OF CIRÍ GRANDE, UNTIL THE CAÑONES HIDROMETRIC STATION FOR THE PERIOD (1988-2017)

Omar Jesús Pérez Boutet
Universidad de Panamá, Chiriquí, Panamá
*Correspondence YP: ing.op12@Hotmail.com

Abstract The need of the Panama Canal Authority, to guarantee the existence of water resources for the operation of this global business, makes it necessary to deepen hydrological studies so that they allow a more precise knowledge of the contributions of all water sources available, for this reason the characterization of flow variability was carried out.
As results we can point out that for the 1988-2017 study period, the forest cover has been improved (%), and the water performance of the sub-basin of Cirí Grande is stable.

Keywords: Hydrology, Panama Canal Basin, Cirí Grande Sub-basin, Flow variability, Geomorphology.

Methods

The compilation of hydrometerological information to carry out this work was obtained from the database of the Operational Hydrology Unit, Water Resources Section, Vice Presidency of Water and Environment, Panama Canal Authority, which is based on the methodology of the Practical Guide of the World Meteorological Organization No. 168, and that of the United States Geological Survey.

Parameters and Variables to Analyse in the Hydrological Study are:

1. Basin Morphometry

1.1 General parameters of the Basin.
1.2 Basin shape parameters.
1.3 Relief parameters.
1.4 Drainage parameters
1.5 Flow analysis
1.6 Rainfall analysis

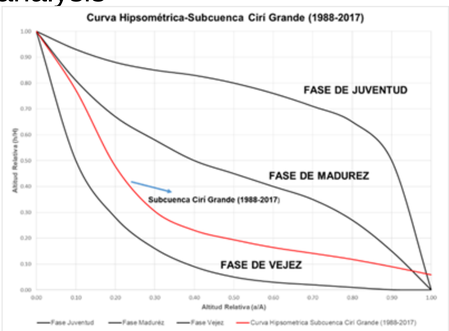

Figure 1:Hypsometric Curve

Results

Flow Duration Curve

For the realization of the flow duration curve, a data record from the Los Cañones Hydrometric Station was used, for the period 1988-2017, where the graph represents the percentage of time where the flow can be equaled or exceeded.

The calculations carried out show the percentage of time where the flow can be equaled or exceeded among them we have: 5% (25.14 m3 / s), 10% (20.41 m3 / s), 20% (15.41 m3 / s), 50% (8.29 m3 / s), 75% (3.20 m3 / s) and 95% (1.23 m3 / s).

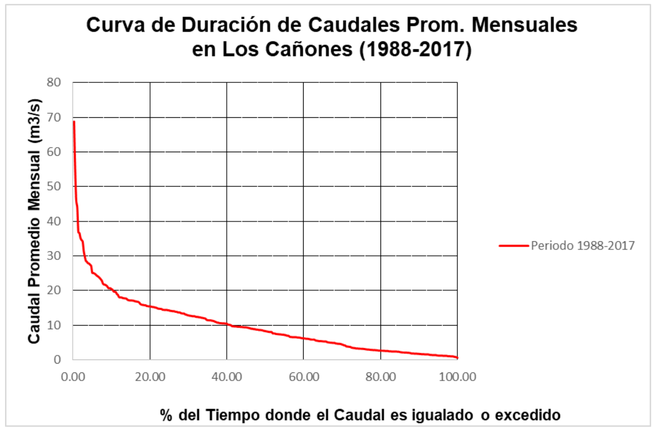

Figure 2: Flow Duration Curve Graphic.

Conclusions

According to the analyzed flow and rainfall data, they show that the Cirí Grande sub-basin is very stable in the hydrological part from the year 1988-2017.

It is a sub-basin with an elongated shape, where its concentration times are fast, which indicates that the water quickly infiltrates the subsoil, and the runoff occurs in the same fast way, continuing the entire process of the hydrological cycle.

Bibliography

ACP (Autoridad del Canal de Panamá, Panamá). 2010. Agua y Bosques en la Cuenca del Canal: Tendencias a Largo Plazo. Ciudad de Panamá, Panamá. 106 p.

Bermúdez, F. Díaz, A. (1987). Morfometría de Redes Fluviales: Revisión Crítica de los Parámetros más utilizados y aplicación al Alto Guadalquivir. Consultado: 29 de julio de 2019. Disponible en: https://revistas.um.es/geografia/article/view/42391/40741

CICH, 2008. Plan de Manejo de las Subcuencas Cirí Grande y Trinidad. Consultado: 5 de abril de 2019. Disponible en: http://www.cich.org/Publicaciones/05/vol-iii-plan-de-manejo-ciri-grande-2008.pdf