We study the climatic factors that control the seasonal and inter-annual variations of the mass balance and melt discharge of tropical Andean glaciers. In the dry season (June – August) the melt discharge remains low due to low atmospheric energy inputs. During the transition season (September to December) the discharge progressively increases to its largest annual values due to high solar irradiance and low glacier albedo. The frequent snowfalls in the wet season (January-mars) reduce the melt rate, which is nevertheless sustained by the large emission of long-wave radiation by convective clouds. The annual mass balance depends on the onset of the wet season, which interrupts the period of highest melting caused by solar radiation. Any delay causes a very negative mass balance due to reduced snow accumulation and very large ablation. This paper investigates the relations between the properties of the wet season to the melt discharge of two glaciers in distinct tropical climates: Cordillera Real of Bolivia and Cordillera Blanca of Peru. Different analyses of the daily rainy distribution were studied in order of determine the onset, the frequency and distribution during the year of the precipitation events. To distinguish the snowmelt to the rainy flow we applied different flows coefficients. The results show that climatic influences like “El Nino” events have a strong impact in the annual rainy distribution, causing a delay in the onset of rainy season leaving the glaciers unprotected against the strong solar radiation and causing large melt rates. Also the onset of the rainy season shows a strong interannual variability.