GPS horizontal coordinate time series have to date not been used to provide insight into ice-mass changes in Greenland. The horizontal data, however, can be very useful. Vertical crustal displacements at a location are insensitive to the azimuth of the load with respect to that location. Horizontal displacements are critically dependent on the azimuth of the load. For example, an increase in a concentrated load to the south or the east of a station would result in a positive displacement of the site to south or the east, respectively. In this presentation, we analyze changes in the horizontal velocities of GPS stations located on bedrock locations around the southern third of the Greenland ice sheet 1) to validate accelerations observed in GPS vertical and GRACE determined mass change rates and 2) to attempt to partition the mass loss into surface mass balance changes and changes in glacial dynamics.