Nuclear masses can be used to identify changes in nuclear structure by observing changing trends in the two-neutron separation energy and are necessary for accurate modeling of extreme astrophysical environments. Beyond the limit of known masses, theoretical predictions are relied upon, however these predictions often disagree. For example, in the region of $^{62}$Ti, where an island of inversion is predicted, theoretical mass predictions disagree by several MeV. The Time-of-Flight Magnetic Rigidity (TOF-Bρ) method provides a way to measure the masses of nuclei far from the valley of beta-stability with sufficient precision to map general features in nuclear structure and substantially reduce nuclear physics uncertainties in astrophysics simulations. We recently performed a TOF-Bρ mass measurement at the National Superconducting Cyclotron Laboratory where significant progress has been made on the neutron-rich side of stability in the Sulfur to Zinc region. Preliminary data and details of the analysis procedure will be discussed.