Seasonal snow cover is one of the largest stores of freshwater on Earth. Accurately quantifying snow water equivalent (SWE) - the amount of water that would result from completely melting a snowpack - is paramount for water resource managers and the communities they serve. SWE can be computed from snow depth and density measurements. However, these products are not available globally. The forthcoming NISAR satellite mission will provide an opportunity to use repeat-pass interferometry to estimate changes in snow depth. This work focuses on using NISAR-like data to estimate total snow depth using Machine Learning algorithms. Our findings could lead to the development of a global snow depth prediction system that provides valuable information for water resource management, flood forecasting, and avalanche hazard assessment, provided that accurate and representative training data is available.