Satellite snowfall rate retrieval is an emerging topic in satellite remote sensing. Passive microwave measurements at certain high frequencies are sensitive to the scattering effect of snow particles and can be utilized to retrieve snowfall properties. Some of the microwave sensors with snowfall sensitive channels are Advanced Microwave Sounding Unit (AMSU), Microwave Humidity Sounder (MHS) and Advance Technology Microwave Sounder (ATMS). A land snowfall rate algorithm has been developed using AMSU and MHS measurements and is running operationally at NOAA/NESDIS. The algorithm performs retrieval in three steps: snowfall detection, retrieval of cloud properties, and estimation of snow particle terminal velocity and snowfall rate. This algorithm has been validated against both in-situ ground snowfall observations and radar and gauge combined snowfall product. The validation results have shown that the algorithm performs well for different types of snowfall events. ATMS is the follow-on sensor to AMSU and MHS. Currently, an ATMS snowfall rate algorithm is under development and will mostly inherit the approach adopted for the AMSU/MHS algorithm.