Methyl chloride (CH₃Cl), the largest natural source of stratospheric chlorine, currently accounts for about 16% of chlorine-catalyzed ozone destruction in the stratosphere. Its importance is expected to increase, however, as emission controls alter the relative contributions from natural and anthropogenic halogen sources. Thus a quantitative understanding of the CH₃Cl distribution and variability will be valuable in enhancing our prognostic capability for ozone layer stability. The Microwave Limb Sounder (MLS), launched as part of NASA’s Aura mission in July 2004, measures vertical profiles of temperature, cloud ice, and an extensive suite of trace gases in the middle atmosphere. With the recent release of the version 3 (v3.3) data set, Aura MLS now provides the first daily global observations of CH₃Cl. The unprecedented scope of the multi-year MLS data set makes it uniquely suited to studying the spatial, seasonal, interannual, and longer-term variations in the distribution of CH₃Cl at the tropopause and in the lower stratosphere. Here we summarize results from detailed validation studies to substantiate the quality of the v3.3 MLS CH₃Cl measurements and their scientific utility. A global climatology of CH₃Cl in the upper troposphere / lower stratosphere will be shown. Observed patterns will be contrasted with those of stratospheric tracers such as O₃, HNO₃, and HCl also measured by MLS. Investigations will include analyzing the data in tropopause- and jet-based coordinate frameworks.

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