

Weather Modification

Fresh water is an increasingly valuable resource, with the price of bottled drinking water often surpassing the price of similar amounts of gasoline. Efforts to artificially stimulate precipitation of fresh water, known as weather modification or cloud seeding, are increasingly widespread worldwide. A key to successful weather modification activity is the presence of liquid water. A water vapor radiometer is currently the only way to reliably detect integrated liquid water and liquid water profiles and is thus an invaluable weather modification tool.



Figure 1. Radiometrics MP-3000A Microwave Profiler directly detects liquid water (supercooled or above freezing) that is essential for weather modification.

As stated by the National Research Council¹: “In glaciogenic seeding the objective is to use a seeding agent (nuclei or dry ice) to convert tiny supercooled water droplets to ice crystals, which grow rapidly and precipitate out of the cloud. Thus, locating regions of high concentrations of supercooled liquid in natural clouds is of paramount importance. A promising tool for this “prospecting” work is the ... microwave radiometer, which retrieves the path integrated total amount of liquid water and water vapor along its beam by simultaneously measuring emissions from vapor and liquid Ground-based, unattended vertically pointing microwave radiometers have been used for monitoring aircraft icing conditions aloft These units, based on technology developed in the 1980s, are now commercially available, as are newer ones that monitor additional frequencies to provide coarse vertical profiles of cloud liquid water content and temperature.”

¹ ***Critical Issues in Weather Modification Research***, Committee on the Status of and Future Directions in U.S. Weather Modification Research and Operations, National Research Council, 2003.