CLOUD SEEDING EXPERIMENT

2. Data Collection

The goal of the experiment is to establish the cause-and-effect relationship between cloud seeding and precipitation. However, the conclusions we are going to reach about the relationship do not depend on the data only, but also on the experiment design and the way the data were collected.

The detailed analysis of data collection in the experiment is beyond the scope of the study case. However, we will discuss the most important features of the data collection in the experiment.

The values in our data file show the total seeded and unseeded rainfalls for the entire post-seeding cloud times until merger or dissipation. At the time of cloud selection, the researchers on the ground were informed of cloud location. They immediately began monitoring the cloud to obtain the needed data. Moreover, the aircraft monitored the cloud top, following it up as it grew.

The observed response variable in the case study is the total rain volume falling from cloud base. This variable was measured by unique modified radar. The research gave some indication that the radar was in fact underestimating rainfall. Thus, the results of the case study about the effect of seeding on rainfall would be stronger rather than weaker if the errors of the rainfall evaluations could have been avoided.

This study is concerned primarily with the rainfall results, and the total rain volume is of interest as the response variable. In fact, there were many more response variables observed in the actual experiment like the vertical or horizontal cloud size (seeding leaded to explosive growth) or the cloud lifetime.

The data were collected on days with fair weather, that is no strong wind shear or rain. The research showed that rainfall increases from seeding averaged very large on fair days, while they were zero or negative when the weather was naturally disturbed and rainy.

The visual examination of the data indicates that the rainfall tended to be larger on the seeded days. Moreover, the variability of observations in both groups is very large.

The data collection in the experiment is treated in detail by Simpson, Woodley, Miller and Cotton in the paper *Precipitation Results of Two Randomized Pyrotechnic Cumulus Seeding Experiments* published in *Journal of Applied Meteorology*, Vol. 10, 1971, pp.526-544. The first phase of the research project is described in the paper: *1968 Florida Cumulus Seeding Experiment* by J. Simpson and V.Wiggert published in *Monthly Weather Review*, Vol.99, Number 2, Feb. 1971, pp. 87-117.