

## Comments on "Reanalysis of 'Generalized Criteria for Seeding Winter Orographic Clouds' "<sup>1</sup>

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In a recent correspondence (Rangno and Hobbs, 1980) we pointed out that the data set from several cloud seeding experiments used by Vardiman and Moore (1978) showed evidence of bias in that the number of zero precipitation events in the non-seeded cases was 108 compared to only 35 for the seeded cases for the estimated cloud-top temperature group of  $-10$  to  $-30^{\circ}\text{C}$ . We therefore noted with particular interest that this same conclusion has

now been reported by Rottner *et al.* (1980), who also show that this bias had a major impact on the overall results of the Vardiman and Moore study. Since we did not have access to the raw data sets, we were unable to identify the nature of this bias; we assumed that it was natural, caused by a "bad draw" in the randomization. We were shocked to learn from Rottner *et al.*, in fact, that the bias was due to the inclusion in the data set of a large number of no-seed cases from Climax I and Climax II that were not within the strict randomized experiment.

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<sup>1</sup> Contribution No. 563, etc.

While we do not question the independence of the Rottner *et al.* (1980) study, it is necessary to clarify the chronology of the submissions since (due to an Editorial oversight) the original date of receipt (22 October 1979) was omitted from our published correspondence. The note by Rottner *et al.* was received by the Editor on 10 December 1979. Due to the vagaries of the review process, Rottner *et al.*'s note appeared in the JOURNAL before our correspondence.

## REFERENCES

- Rangno, A. L., and P. V. Hobbs, 1980: Comments on "Generalized criteria for seeding winter orographic clouds." *J. Appl. Meteor.*, **19**, 906-907.
- Rottner, D., L. Vardiman and J. A. Moore, 1980: Reanalysis of "Generalized criteria for seeding winter orographic clouds." *J. Appl. Meteor.*, **19**, 622-626.
- Vardiman, L., and J. A. Moore, 1978: Generalized criteria for seeding winter orographic clouds. *J. Appl. Meteor.*, **17**, 1769-1777.