

mission dealt with a broader range of questions, its recommendations and those of the NAS panel were similar. For example, both groups recommended substantially greater government support for weather modification and the assignment of primary responsibility in this field to a single agency.

Funds appropriated for weather modification for fiscal 1966 total \$7.19 million. The MacDonald panel recommended increasing the appropriation to at least \$30 million a year by 1970, with commensurate increases for the supporting atmospheric sciences and for supporting research facilities, such as new computers and observational networks for simulating atmospheric circulation. The increase proposed by the NSF commission was of the same order.

The commission suggested that the development and testing of weather modification techniques might be assigned to the Environmental Science Services Administration (ESSA) of the Department of Commerce or to a new agency organized for the purpose. It proposed that, by expanding its support of research in the atmospheric sciences and continuing to maintain the National Center for Atmospheric Research, NSF should help provide the scientific basis for weather modification. In the commission's view, other agencies should continue to conduct or support such basic and applied research as is required for their missions (for example, research on precipitation augmentation should be supported by the Bureau of Reclamation for its reservoir system, and military applications, by the Department of Defense).

The MacDonald panel said that the Interdepartmental Committee for Atmospheric Sciences (of the Federal Council for Science and Technology) aids in policy coordination, but it added that an important need for *operational* coordination remains unmet.

"We conclude that the administrative division of the environmental sciences, according to the diverse social purposes of different federal agencies, has been rendered obsolete by the increased interdependence among the various areas of environmental research and engineering," the panel said. "The present fragmentation of effort in weather modification research and development is unusual in that many of the fragments are below critical size or quality needed for effective work. We believe that major responsibility for

AIBS Records Damaged in Fire

The American Institute of Biological Sciences has announced that many of its records were damaged during a recent fire in the building which houses its headquarters. Although none of the papers were destroyed, there was extensive water damage, which is causing a delay in processing materials for the forthcoming annual meeting, in membership mailing efforts, and in compiling the National Register.

weather modification should be centered in a single agency."

The panel said that it did not wish to propose a consolidation plan, but suggested that any group preparing such a proposal "should consider whether or not weather modification can sensibly be separated from the rest of the environmental sciences." Without actually saying so, both the MacDonald panel and the NSF commission seemed to favor ESSA as the appropriate agency to lead the weather modification program.

However, in mentioning handicaps of various agencies with respect to this assignment, the commission said the Weather Bureau (part of ESSA) lacks broad authority and experience in supporting basic research through grants and contracts. It added that the bureau's "in-house capability" has been improving and that its ties with outside researchers could be strengthened.

The commission dwelt at length on the need for federal regulation of weather modification. Commercial cloud seeding is carried on by 40 to 50 firms, whose activities may, in the absence of regulation, interfere with some of the experimental work sponsored or conducted by the federal government. Moreover, a baffling assortment of rules and jurisdictions is developing. Twenty-two states have enacted weather modification statutes, some of which impose licensing and qualification standards and demand proof of financial responsibility in the event damage claims arise.

A body of legal precedents, though still negligible, is developing. Rulings are likely to vary from jurisdiction to jurisdiction. According to the commis-

sion, five civil suits over weather modification have been litigated and decided. In two cases, relief was denied on the ground that no showing was made that flood conditions had been caused by weather modification practices. A third flooding case also was decided in favor of the weather modifier; the verdict meant that either no causal connection was established or no negligence was found.

Plaintiffs in the other two suits asserted property rights in the weather and asked the court to forbid weather modification practices. "In one, a suit by resort owners against the City of New York, the New York court held that the public interest in ending a prevailing drought outweighed the resort owners' interest in good weather," the commission said. "In another, the only decision against the weather modifiers, a Texas court granted an injunction against hail suppression activities carried on by farmers in favor of neighboring ranchers who wanted precipitation in any form, including hail."

The commission indicated that eventually federal law and regulation may have to preempt the field in order that weather modifiers won't be enshrouded by a legal fog. No federal regulation now exists except for a new requirement that NSF be given 30 days' notice of weather modification activities and that certain records be kept. The commission said the regulatory and the research and development functions should be kept separate, but that assigning them to different agencies within one department would be acceptable.

Since weather modification is still largely an undeveloped art, federal regulation should be limited to what is needed to permit federal programs to proceed without interference, the commission suggested. Activities in actual or potential conflict with federal programs should be stopped or delayed, and federal grantees or contractors should be indemnified against damage claims, it said.

"As the art develops, and as weather and climate modification activities increase, comprehensive regulation seems inevitable," the commission added. "Such regulation will probably require the setting of minimum standards of competence, and perhaps financial responsibility, for all operators and the establishing of some authority for deciding between competing claims for priority."

Noting that weather modification is