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The USSR and China, the two most active countries in weather modification research, are planning significant increases in their programs in this field.

USSR-China: Weather Modification Research



Both the USSR and China have begun research that may lead to attempted modification of major storms, such as typhoons—experiments previously conducted only by the US. The quality of the Soviet research is excellent, but that of China is difficult to judge. Computer support for meteorological programs, in the past deficient in both countries, is now the focus of considerable attention.

Soviet Program

The Soviet program began in the early 1950s and is now several times larger in funding and personnel than the US civilian and military weather modification research programs combined. It is broad in scope and very competently staffed. Its expansion and improvement are likely to accelerate following the recent upgrading of the Hydrometeorological Service to state committee status.

In its early years, the Soviet program concentrated on clearing fog and clouds from airports and then on hail suppression. The Soviets are currently exploring such areas as precipitation enhancement, thunderstorm dissipation, and lightning suppression.

What is probably the largest Soviet project is intended to raise the level of Lake Sevan in Armenia by increasing rainfall over the watershed. In addition to standard cloud-seeding techniques, the Soviets will employ a novel device called a meteotron, which uses several jet engines to create convection currents that carry moisture upward, creating clouds.

Experimental design and instrumentation appear to be the weakest areas of the

Soviet program and probably will receive the greatest additional emphasis. The employment of better statistical methods to devise experiments and analyze the results would help alleviate the experimental design problem and improve verification techniques. The planned purchase of Western equipment, along with improvements in Soviet-designed instruments, will help solve the instrumentation problem.

In recent years, the Soviets have begun an intensive study of typhoons, and they may be seriously considering a typhoon-modification project similar to the US Project Stormfury, which was aimed at altering hurricanes in the Atlantic. This is the only major weather modification area in which the Soviets have not been active.

Typhoons are not a major threat to the USSR, but research on the modification of these storms is of high current interest in weather modification research and development.

Chinese Program

Chinese experiments in weather modification started in the late 1950s and had become extensive by the 1970s. China recently established a new academy that includes the world's first known institute devoted solely to research on artificial weather changes, thus adding to other indications that the Chinese plan a significantly larger, more centralized, and more scientifically based program.

China's new weather modification research institute will be part of the new Academy of Meteorological Sciences, and a research program extending to 1985 was developed at a recent national conference on weather modification. The program

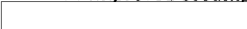
will include rainmaking, hail cloud and fog dispersal, and typhoon moderation.

The new weather modification research institute will have a modern cloud and fog physics laboratory, centralizing research previously conducted at a variety of institutes, some under military control. Research on typhoon modification may be supported by ships collecting data in the Pacific.

Early Chinese experiments in weather modification were limited mostly to efforts to improve weather conditions unfavorable for agriculture. By the 1970s, Chinese field experiments reportedly involved several million individuals throughout the country.

Most of these experiments have been attempts to control or moderate drought and hail conditions using fireworks, crude rockets, cannon, networks of anti-aircraft artillery, and aircraft, including radio-controlled model airplanes.

Chinese military aircraft and ground units have often taken part in these agriculturally oriented weather experiments. The country's National Defense Scientific and Technical Commission reportedly took over the control and funding of all weather modification research in 1969 and has a program of research at several military weather institutes.

The Chinese have claimed significant success in modifying the weather, but they have published no supporting data and there has been no verification by non-Chinese experts. There has probably in fact been little precise scientific control or monitoring of the Chinese experiments. China now appears to be planning a more scientific approach with improved seeding and test devices 

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