

OVERVIEW

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The Arctic Terrain Research Program is one of several projects undertaken by the Terrestrial Sciences Laboratory. In general, the objective of arctic terrain research is to add to our store of knowledge in order that man and machine can perform more intelligently and efficiently in the harsh arctic environment. During this planning session, we hope to evaluate results of the 1959 field program, discuss preliminary plans for 1960, explore possibilities for joint participation with sister services and our Allies, solicit guidance from Air Force customers, and prepare a preliminary logistics plan for 1960.

Field investigations are undertaken by a small Laboratory staff, supplemented by a much larger group of contractors. Major contractors in our field program during 1959 were the U. S. Geological Survey, the Arctic Institute of North America, Lamont Geological Observatory of Columbia University, Massachusetts Institute of Technology, and Dartmouth College.

Through the Arctic Institute of North America, scientists from ten other universities also participated in the field program, including McGill University (Canada) and the University of Hokkaido (Japan). Joint participants in field programs during the past year were the Geophysics Branch, Defence Research Board (Canada) and the Royal Greenland Trade Department, Ministry of Greenland (Denmark). The Terrestrial Sciences Laboratory also engaged in joint investigations with the Office of Naval Research (USN), Civil Engineering Research Laboratory (USN), Underwater Sound Laboratories (USN), Naval Electronics Laboratory (USN), Snow, Ice and Permafrost Research Establishment (U. S. Army), Waterways Experiment Station (U. S. Army), and the Quartermaster Research and Engineering Center (U. S. Army). Logistics support of field parties to include airlift, equipment, vehicles, rations, fuel, and camping gear is largely provided by the Air Force.

We encourage publication of results of field investigations in appropriate scientific journals as early as practicable. We also highly recommend that investigators present papers at scientific gatherings whenever possible. At the conclusion of field projects, comprehensive results are usually documented in Geophysics Research Directorate publications.

In the past year, we undertook investigations on two Arctic Ocean Drift Stations - Fletcher's Ice Island, T-3 and Station Charlie; the Ellesmere Shelf, NWT, Canada; Polaris Promontory, North Greenland; East Greenland; Mt. Chamberlin Area, Alaska; and Pt. Barrow, Alaska. Some studies were also conducted in the Climatic Projects Laboratory, Eglin AFB, Florida; Keeweenaw Bay, Houghton, Michigan, and at the Naval Electronics Laboratory, San Diego, California. A total of 84 personnel participated in field investigations, including personnel from the Laboratory, contractors, joint participants, and Air Force observers. Investigations

included regional, glacial, and engineering geology; geomorphology; physical and biological limnology; permafrost; soils engineering; geophysics (seismology, gravity, magnetics, electrical resistivity); physical, chemical, and biological oceanography; micrometeorology and meteorology; hydrology; glaciology; fresh and sea ice physics; as well as ice and snow engineering. Field investigations on the drift stations were of a continuing nature, while other field programs were of shorter duration.

In 1960, we propose to continue present research programs on the Arctic Ocean Drift Stations; largely conclude the Ellesmere Shelf project; resume ice-free land studies in Pearyland and Centrum Lake areas, North Greenland, as well as on Hold With Hope Peninsula, East Greenland; continue studies on a reduced scale in the Mt. Chamberlin area, Alaska; and expand ice engineering studies at Pt. Barrow, Alaska, and at Eglin AFB, Florida.

A number of changes affecting the Laboratory have occurred during the past year. In the summer, a small detachment was established at Thule Air Base to support all arctic projects of the Geophysics Research Directorate. In May, a ski-equipped C-130 "Hercules" aircraft was assigned to Air Force Cambridge Research Center for support of arctic terrain research. We hope soon to equip the aircraft with airborne radiometer, gravity meter, magnetometer, and cameras. In September, the Terrestrial Sciences Laboratory moved from Boston to the former Murphy General Hospital in Waltham, Massachusetts. Dr. A. P. Crary, Chief of the Exploration Branch, returned from two years' residence in Antarctica, and continues on loan to the National Science Foundation, where he serves as Chief Scientist for Antarctic programs.