



International Tundra Experiment

Update-December 1991

The Purpose of ITEX

ITEX is a coordinated international program designed to observe and measure responses of selected arctic species populations to changing environmental conditions. Specifically, the overall objective of ITEX is to monitor on a circum-arctic basis the performance of selected species in undisturbed habitats with and without various environmental manipulations. In addition to standardized phenological and site observations, manipulations of the environment will be employed to compare species responses to variables relevant to global change (i.e., soil temperature, duration of snow cover). ITEX encourages involvement of scientists and students at existing and new sites throughout the circumpolar arctic tundras. (See attached ITEX resolution dated December 5, 1990.)

Relationship to MAB/NSN

The Northern Sciences Network (NSN) of the UNESCO Man and the Biosphere (MAB) program was established in 1982 to help stimulate national and international MAB-type interests in northern regions. All northern countries are participants in the NSN. The MAB/NSN Secretariat is based in Rovaniemi, Finland, at the Arctic Center, University of Lapland. The NSN meets periodically and publishes an international newsletter. At its 25-27 September 1990 meeting in Rovaniemi, the NSN recommended that MAB committees in all countries with expertise in tundra research should identify experts who could contribute to, and support, the development of ITEX. Furthermore, ITEX would become a MAB international pilot project and that the U.S. MAB program should, within their High Latitude Ecosystems Directorate, coordinate planning for ITEX. This endorsement for an international program culminated in the U.S. sponsorship of the December 1990 ITEX workshop. MAB/NSN newsletters and the report of the NSN meeting are available from the NSN Secretariat, P.O. Box 122, 96101 Rovaniemi, Finland.

Progress to Date

It has been a year since the first ITEX workshop was held at the W. K. Kellogg Biological Station in Hickory Corners, Michigan. This is our first formal communication, although many of us have been in direct contact since. We are pleased to report to all participants that considerable progress has been made in many national projects. The following summarizes highlights of some first year activities of ITEX.

United States: As agreed upon at the ITEX workshop, several approaches to soil warming were undertaken by U.S. collaborators. Giles Marion (Cold Regions Research and Engineering Laboratory, Hanover, N. H.) evaluated several cold frame greenhouse configurations and covering materials and recommended an acrylic fabric (Reemay) that allowed rainfall and reasonable light penetration. Pilot experiments and actual field tests by Christina Wegener and Ann Marie Odasz (Norway) and Walt Oechel indicate the applicability of the approach in the field. Mean, maximum and minimum temperatures generally were increased when compared to the controls. Steve MacLean (University of Alaska, Fairbanks), with U.S. National Park Service support, developed and field-tested a vent-controlled, portable greenhouse with various fabric covers such as clear plastic, fiberglass, Ayla and Reemay. Reemay resulted in the largest increase in thaw depth and had little effect on light quality. Clear plastic and Reemay were recommended for use, with the Reemay preferred, where light quality effects might be a concern. Details can be obtained from both MacLean and Marion. In addition to the soil warming experiments and as part of the Niwot Ridge LTER program, Marilyn Walker gathered considerable information on alpine plant phenology.

Canada: Several field parties undertook initial ITEX observations; Sylvia Edlund at Hot Weather Creek, Ellesmere Island; Joseph Svoboda, Alexandra Fjord; and Larry Bliss, Devon Island, with Soviet collaborators Nadya Matveeva and Yuri Chernov. Additional ITEX sites are being proposed for Churchill and Inuvik-Tuktuaktuk for boreal forest-tundra transition and treeline sites and Baker Lake as an inland, mid-arctic tundra.

Progress to Date continued . . .

United Kingdom: Terry Callaghan proposed in May 1991 to ITEX National Coordinators the collection at each site of 50 specimens of *Hylocomium splendens*, *Huperzia selago*, and *Cassiope tetragona* for retrospective analyses of plant growth. These would be analyzed by Callaghan using available climate data to determine growth responses extending back in time for up to 20 years. Several collaborators have already sent material to him. The new U.K. Arctic Terrestrial Ecology Program had a successful first season in Svalbard including projects on photosynthetic and respiratory response to temperature, a study of phenotypic and genotypic capacity of species to temperature and length of growing season.

Sweden: Ulf Molau, who has shown great initiative in organizing a Nordic board of ITEX (NORDTEX), reports from the Abisko site that permanent plots were established and that standard climate measurements are underway, in conjunction with observations on *Cassiope tetragona*, *Saxifraga oppositifolia* and other species. Reproductive ecology of *Saxifraga* was studied in detail. Snow-melt phenology was observed and snow was removed on a 1 X 35 meter strip to advance the snow-free period by 1-2 weeks. Finally, a visit to Disko Island, Greenland, was made to coordinate with other NORDTEX collaborators.

Other Countries: There have been active contacts with all other national teams. Norway and Finland began experimentation and observations in 1991 and, while the USSR and Iceland have not begun experimentation, they do hope to implement programs in 1992.

Future Activities:

In preparation for the 1992 field seasons, several meetings and workshops directly related to ITEX are planned:

4-6 February 1991, Copenhagen, Denmark. The Nordic Board of ITEX and NSN are convening a workshop to standardize methods and review 1991 progress. We should use this opportunity to review the organization of the interim ITEX coordination team and working group activities and responsibilities and relationships to other international organizations (IASC, IGBP, International Permafrost Association, etc.).

5-10 March 1992, Boulder, Colorado. In conjunction with the U.S. MAB-sponsored international workshop on classification of circumpolar arctic vegetation, there will be a one-day meeting of all participating ITEX scientists. The 22nd Arctic

Workshop sponsored by the University of Colorado is also linked with the vegetation/ITEX meetings (5-7 March). Contact Marilyn Walker for further details; INSTAAR, University of Colorado, Campus Box 450, Boulder, Colorado 80309-0450.

Other Meetings and News

Arctic Monitoring and Assessment Program (AMAP) will hold its first meeting in Tromsø, Norway, first week of December 1991. ITEX could provide useful input to terrestrial monitoring component of AMAP as well as coordinate on existing and future sites.

21-26 April 1992. The International Arctic Science Committee plans to convene a meeting in Reykjavik, Iceland on the role of global change in the Arctic. Contact: IASC Secretariat, P.O. Box 158, 1330 Oslo Airport, Norway.

3-8 May 1992. 14th Polar Libraries Colloquy, Columbus, Ohio. The theme International Sharing of Polar Information Resources will be of interest to all tundra scientists. Contact: Lynn Lay, Byrd Polar Research Center, Ohio State University, Columbus, Ohio 43210-1308. FAX: 614-292-4697.

4-6 May 1992. Circumpolar Symposium on Remote Sensing of Arctic Environments, Tromsø, Norway. Contact: Roald Amundsen Centre for Arctic Research, University of Tromsø, N-9000, Tromsø, Norway; FAX 47-83-80-705.

The U.S. MAB High Latitude Ecosystems Directorate represents many of our ITEX interests. The U.S. MAB is sponsoring a project to prepare a roster of biological field stations, research basins, experimental forests, Biosphere Reserves and other protected areas in the circumpolar North. To date the roster consists of 111 entries; thirteen Reserves, 24 sites in Fennoscandia, 30 Eurasia sites and 44 in North America. A draft roster and station record is available for review and revision by contacting Charles Slaughter, Institute of Northern Forestry, 308 Tanana Drive, Fairbanks, Alaska 99975.

We will circulate the next update in late spring 1992. Please mail project updates, including prospects for funding projects, to Patrick Webber, Kellogg Biological Station, Hickory Corners, Michigan 449060 or FAX 616-671-2351.

Please share this bulletin with others and tell them that they may contact Webber for information. ITEX encourages all tundra specialists and students to become involved.

