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# International Tundra Experiment

## Update - May 1996 (No.8)

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### Chairman's column

#### Report from the 7th ITEX Workshop, Copenhagen, 25-29 April 1996

ITEX is going from strength to strength. There is no doubt at the recent workshop in Copenhagen was a great success, both scientifically and socially (and special thanks to Thomas Berg, Per Mølgaard and Karen Christensen for all their hard work as workshop convenors and organisers). One particularly striking feature of the proceedings was the exceptionally high degree of active participation from all ITEXers, whether in formal presentations (both oral and in the excellent poster displays), working groups or even in social functions. Ulf Molau, however, must surely take the prize for the sheer range of input, to the extent that he entertained the 58+ dinner guests to an expert demonstration of both soprano sax and vocals skills (although not, admittedly, at the same time: that would have taken talent!) at the Sjælland Ferry in Copenhagen Harbour. What a swan-song Ulf (see news item below)!

In the Chairman's note Ulf highlighted the continuing global expansion of the ITEX network to incorporate four Japanese sites on Honshu Island (contact: Gaku Kudo) and we now even have representation in the Southern Hemisphere in Australia (contact: Catherine Pickering): this could soon be supplemented with a site in the Bolivian Andes. Ulf was also able to report that Greg Henry has now submitted the manuscripts for the special issue of *Global Change Biology* devoted to ITEX: this will undoubtedly raise our international profile even further and should act as a catalyst for

the addition of new expertise to the ITEX team.

With all these developments it is important to remember the programme's 'roots' and, as 'founding father', Pat Webber reminded us of Ulf's concluding remarks from the Ottawa Workshop: we need to ensure that the passive warming manipulations are maintained in the longer term (the scientific value of the basic ITEX experiments will grow disproportionately with increasing duration). We should, however, always be pragmatic in our approach to these experiments and Pat outlined some of the key questions that we need to ask ourselves: do the OTCs produce a realistic warming; can we identify any common trends in response to the manipulations (both in the short- and the longer-term); where next (but also, are we doing our current job right, e.g. in terms of the creation and maintenance of data-bases)?

Since ITEX is underpinned by concerns over the potential ecological impacts of environmental change into the next millennium it was entirely appropriate that the opening paper of the workshop (by Claus Hammer: Niels Bohr Inst.) was about past environmental changes back to the last, Eemian, interglacial. Claus presented a fascinating insider view of GRIP, the GRenland Ice core Project, which has contributed dramatically to a high resolution palaeorecord of climate changes and alterations in atmospheric chemistry. GRIP, together with the North American equivalent, (GISP2, have produced data which challenge traditional views on both the rates and magnitudes of change, and also highlight potential thresholds and instabilities in the high latitude climate system.

The remainder of the workshop was organised around a series of progress reports from individual ITEX sites together with the formation of several working groups to consider key topics/themes in more detail. These working groups provided an excellent catalyst for identifying key issues, developing testable hypotheses and initiating a timetable for practical implementation via updates of the ITEX Manual. Each working group has also identified 'responsible individuals' to ensure that the development process continues. A brief outline of the working groups follows (my apologies if I misrepresent anything, but please feel free to rectify this over the ITEX e-mail lists) both to remind those ITEXers at Copenhagen of their obligations (!) and to keep those unable to attend reasonably well informed of progress. Readers should note that these are in no specific order of priority.

**Circumpolar synthesis:** Marilyn Walker and Michael Hunt Jones have been successful in obtaining funds from the National Center for Ecological Analysis and Synthesis (NCEAS, Santa Barbara) to hold a collaborative workshop for synthesis of ITEX data later this year. This represents a really excellent opportunity for ITEX investigations to be scaled-up and interpreted on a truly circumpolar basis via ecological meta-analysis: it also raises the profile of ITEX considerably as one of the first large research programmes to work with the help of NCEAS (NCEAS was recently established to "carry out collaborative research on the major fundamental and applied problems facing ecology, as defined by ecologists"). Marilyn gave a briefing presentation in Copenhagen - as a first stage in the NCEAS workshop - and emphasised that we need to go to Santa Barbara with our key hypotheses already clearly identified (I would suggest that readers also refer to the Abstract of Marilyn's presentation, which is available in the Book of Abstracts: non participants will be able to get hold of a copy from Thomas Bjørneboe Berg, ITEX Secretariat). With

this in mind the ITEX participants in Copenhagen were divided into smaller working groups to 'brainstorm' the major issues and come up with two or three key hypotheses that can be explored at NCEAS. The whole exercise proved extremely productive and has laid strong foundations for the NCEAS. Further details, and information on contributions to the NCEAS Workshop, from Marilyn (marilyn.walker@colorado.edu).

**Intersite monitoring** (Chair; Gus Shaver; Rapporteur: Esther Lévesque)- ITEX affords an excellent opportunity to conduct simple, rapid and standardised measurements which can be integrated over several ITEX sites (and they do not necessarily have to be repeated annually). The kinds of activities envisaged include the establishment of reference plots for repeated observation of e.g. numbers of flowers (including proportion of aborted flowers) and fruits, and the density of stems, ramets and plants per plot. Other intersite monitoring could include maintaining standardised records of, for example, the first arrival of migratory birds. Intersite monitoring should, of course, always be underpinned by integrative climate measurements (e.g. growing degree days with a baseline at 0°C, thaw depth/permafrost table). The contact point for this working group is Esther Lévesque (e-mail: levesque@tuzo.erin.utoronto.ca) and we anticipate that, following the identification of research activities above, there may be some updating on the ITEX Manual in time for the 1997 field season.

**Soils and below ground processes** (Chair: Bill Heal; Rapporteur: Greg Starr): the major focus of ITEX to date has been on aboveground plant development, growth and reproductive phenology/output. This working group was established in response to a growing consensus amongst existing ITEXers that more attention now needs to be focused on processes in the rhizosphere and the decomposition subsystem in order to support the ongoing work on ITEX plant species and communities. One of the very

real problems identified by this group was how to conduct meaningful and rigorous measurements in the absence of in situ laboratory analytical facilities and expensive field gear. At present we have to adopt a pragmatic approach to these studies, using robust and straightforward field techniques to quantify root development, mycorrhizal ecology, decomposition processes and nutrient mineralization. These activities should be supported by routine monitoring of soil physical properties (e.g. including thermal regime and water status) and a general one-off description of soil characteristics. The participants of this group will work to produce protocols for the Manual in time for the 1997 field season: the contact points are Greg Starr (gstar01@servax.fiu.edu) and Phil Wookey (p.wookey@rhbnc.ac.uk).

**Community and landscape:**(Chair: Marilyn Walker; Rapporteur: Lisa Walker): this group was established in recognition of the next phase in ITEX activities: moving from studies of individual key species - and their responses to warming and interseasonal variability - to plant communities and tundra landscapes. The ITEX manual currently contains guidelines, prepared by Marilyn, on community measurements at ITEX sites but an additional goal, identified by the working group, is the construction of a model for describing/predicting community responses, and the sustainability of such responses. The group will also be establishing committees (exact acronyms yet to be defined!) to oversee the following activities: community data archiving (Marilyn Walker, Lisa Walker, Volodya Raszhivin, Christian Bay, Sydonia Bret-Harte, Borgthór Magnusson and Ørjan Totland), community/biodiversity definitions (Ulf Molau and other: already known as the ITEX DC - Definitions Committee!) and methodology (Jarle Holten, Marilyn Walker, Nadya Matveyeva, Ulf Molau, Ingibjörg S. Jónsdóttir and Sydonia Bret-Harte). Further details available from committee members.

**Plant genetics, transplant experiments and seed banks** (Chair: Phil Wookey; Rapporteur; Kent Schwaegerle): this working group recognises that the underlying ITEX goal (to understand the response of tundra plant communities to environmental change) must incorporate a consideration of the genetic variability upon which selective pressures operate, and the potential for longer-term evolutionary responses to change. A specific goal of the working group is to seek an answer to the following question: do genetic differences among individuals and populations represent any form of adaptation to differing environments? At present ITEX Manual contains a chapter by James McGraw on transplants and common garden experiments: an action plan of the working group is to reinforce this type of investigation and to prepare a set of protocols for a chapter on evolutionary responses. This has recently been drafted by Kent Schwaegerle (ffkes@aurora.alaska.edu), who will also act as the contact point for this group: the time scale for addition of this chapter into the ITEX Manual is within the next month. The group would also particularly like to encourage participation from scientists who can make use of the extensive ITEX network for the collection of plant material for more specialist investigations such as isozyme analysis.

**Plant/animal interactions** (Chair: Ulf Molau/Thomas Berg; Rapporteur: Anne Tolvanen): Jens Böcher and Dean Morewood successfully highlighted the importance of invertebrates both as vectors for pollen and also as potentially significant herbivores (although the intensity may vary dramatically from year to year) This working group recognises the value of including some incisive work on plant/animal interactions and intends to establish a formal group entitled the Trophic Level Interaction Committee (TROLINC) to explore future initiatives (contact Anne Tolvanen [tolvanen@unixg.ubc.ca](mailto:tolvanen@unixg.ubc.ca)). At present the

working group has identified the need to quantify 'patterns' (e.g. identification of the major herbivores/pollinators at any particular site, and quantification of the impacts) and 'processes' (e.g. the potential longer-term impacts at all scales ranging from individual plants, through populations and communities to the whole landscape). These will be approached through two levels of activity: Level 1 consists of monitoring of natural dynamics, while Level 2 will incorporate experimental work on potential dynamics in response to environmental change.

**Ecological modelling:** (Bill Heal, Marilyn Walker, Jarle Holten): the ITEX programme is currently seeking to strengthen ecological modelling to ensure that information is used to its full potential for scaling-up spatially (perhaps up to a resolution of 10 x 10 km) and also temporally for predictive purposes. Incorporating modelling expertise within ITEX will also enable weaknesses in data sets and spatial coverage to be identified: on this basis we should be in a position to explore and implement ITEX ideas in more detail by means of transect studies incorporating intensive research sites. Action items for the working group are: the NCEAS Workshop in Santa Barbara later this year (co-ordinator: Marilyn Walker) which will provide a foundation for modelling, and (ii) the proposed affiliation (co-ordinator: Jarle Holten) between ITEX and the planned GCTE 'SCANTRAN' (Scandinavian Transect).

**ITEX WEB site** (Co-ordinators: Felix Gugerli, Thomas Bjørneboe Berg, Michael Hunt Jones, Marilyn Walker): plans are now well under way for the ITEX WEB site, and the structure of the home page is currently being designed by Felix Gugerli (fgugerli@systbot.unizh.). ITEX can benefit greatly from venturing into cyberspace: it provides a free opportunity to increase our visibility dramatically and we will each have the potential to cite the ITEX home page if colleagues wish to find out more. Felix would be glad to receive any suggestions or comments.

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## ITEX Chair - Ulf stands down

Those ITEXers who were unable to attend the workshop may not yet be aware that Ulf Molau has, after over 4 years serving as Chairman of ITEX, decided to resign. Ulf has given this a great deal of consideration (he made his intentions known to the ITEX community in April 1995 during the 6th Workshop) but has concluded that, due to teaching and administrative commitments imposed by his Professorship at Göteborg, the Chair should pass to another ITEXer. Ulf will, however, remain on the Steering Committee as an integral ITEX participant and, of course, the Latnjajaure field site remains fully operational. As the new Chairman will certainly be keeping in regular contact with Ulf and look forward to maintaining strong links in the future. Ulf's commitment, energy and drive will be exceedingly difficult to match and I join with the rest of the ITEX community in thanking Ulf for his excellent leadership: he has been a tremendous ambassador for ITEX in the international scientific community.

## The 8th ITEX Workshop, 1997

The United Kingdom will host the next ITEX Workshop, although it has not yet been decided whether England or Scotland will have the privilege! The potential venue in England is likely to be Royal Holloway, University of London, which is the home of the new chairman. This has the advantage of very close proximity (9 miles) from Heathrow airport, but is situated in beautiful grounds on the Edge of Windsor Great Park; central London is 35 minutes away by train, and Kew Gardens are within 20 minutes by train. The potential Scottish venue is most likely to be at a University campus within striking distance of the Cairngorm Mountains (where we hope, ultimately, to establish an ITEX site): possible candidates include Sterling, Dundee, St Andrew's or Aberdeen. Ideally we would try to get a venue in the Spey Valley but this may prove too expensive due to timing at the end of the

skiing season and the limited accommodation available. There are regular flights from London to Edinburgh or Aberdeen.

If you are planning to attend the 8th Workshop, and you have any suggestions or ideas on preferred locations, then now is the time to contact me (p.wookey@rhnbc.ac.uk): we will need to make some decisions in the next couple of months.

## Happy ITEXing in 1996!

All that remains to say now is 'good luck and happy ITEXing in 1996'. Incidentally, I shall be doing 'inspection' visits of both the Latnja and Toolik Lake ITEX sites in a few weeks: be warned, 'next time it could be you'!

Phil Wookey, chair



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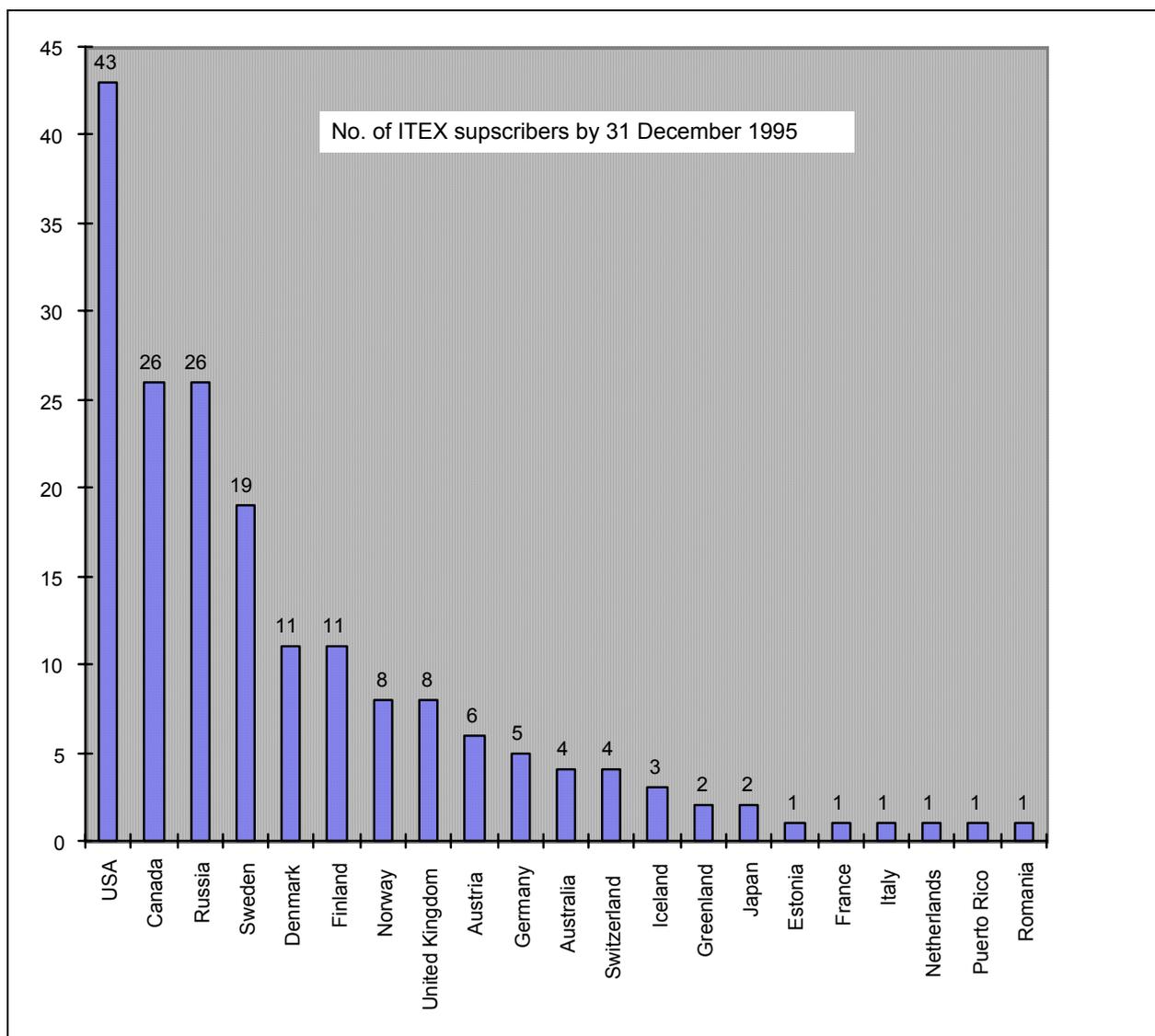
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## ITEX Statistics 1995



184 subscribers (individuals or institutions) from 21 countries received the ITEX Update in 1995. Around 1/4 of those attended the ITEX workshop in Copenhagen 1996.

Remember that you have to order the new edition of the ITEX Manual from the ITEX Secretariat in order to get it. Further more the ITEX Manual will be available on internet via the ITEX HomePage at the Danish Polar Center, address: <http://www.dpc.dk> some time during the summer 1996.



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