

THE ONLINE INFORMATION BULLETIN OF THE GLOBAL FOREST SCIENCE NETWORK

Adaptations of Forests to Climate Change: A Multidisciplinary Review

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Over the past decade several reports have been produced that deal with the possible threats to forest environments in different parts of the world. At the same time, multidisciplinary reviews addressing adaptations of forests to climate change are rare. The present review published as IUFRO Occasional Paper 21 briefly summarizes the pertinent points of existing scientific papers and reports, and provides further details and references more closely aligned with the topic 'Adaptations of Forests to Climate Change'. It also extends prior reviews by combining the physical science review with discussion of economic and social impacts.

Effects of Climate Change

Forests around the world are widely expected to face significant pressures from climate change over the coming century. Although the magnitudes of the projected temperature rises and precipitation changes are still uncertain, modeling based on mean figures shows that ecological, economic and social disruptions are likely. Ecological effects range from phenological changes and extensions of growing seasons to widespread forest structural changes, species migrations and extinctions. Warmer climates are overall expected to have a positive influence on the wood products industries, although some regions are predicted to benefit more than others and some may be disadvantaged. The social effects of climate change are highly uncertain, and projects to strengthen community resilience and reduce vulnerability are recommended. By developing suitable responses to adaptation, harmful effects of climate change on forests and trees can be moderated and beneficial opportunities for people and nature can be exploited.

Interrelations between Forests and Other Sectors

The adaptations of forests to climate change will interact with several other sectors, including agriculture, tourism, legal/regulatory, industry, energy and conservation. This interaction may take three forms; competition for resources, synergies in mitigation/adaptation measures or negative consequences of pro-forest policies. Cases of resource competition, for instance, are competition for land



Photo by Alexander Buck, Hustai National Park, Mongolia

between forestry and agriculture or between forestry and residential use. The increasing areas of biofuel plantations can also be expected to add to resource-use conflicts. Depending on management goals, the increase of forest area may potentially benefit conservation and biodiversity, timber production, recreational opportunities and ecosystem services such as clean water supplies. Yet there are also cases where policies that promote new forests for carbon sequestration, for example, may have negative consequences for biodiversity. Therefore, recognizing the interconnectedness of forests with other sectors can lead to better policy outcomes.

Policy Considerations

Although the global economic consequences for forests from climate change are broadly optimistic, much of this advantage is predicated on a high level of intervention in natural systems, through salvage harvesting, species replacement and plantation establishment. Environmental policies aimed at ensuring maximum biodiversity and the survival of species may also need a high level of management intensity, through changing vegetation structures and communities or altering disturbance regimes.

This multidisciplinary review serves as background document for the [Expert Panel](#) on Adaptation of Forests to Climate Change assembled by IUFRO in the framework of the Collaborative Partnership on Forests' [Joint Initiative](#) on Forest Science and Technology. The Expert Panel held its first meeting on 11-12 February 2008 in New York, USA. The full report of the Panel as well as a summary for policy makers will be available in spring 2009.

* The author spent an internship at the IUFRO Secretariat, Vienna, from 8 October to 14 December 2007.

International IUFRO Plantation Certification Symposium 2007: Impact of Certification on Plantation Forestry

A successful International Plantation Certification Symposium, arranged and hosted by the Department of Forest and Wood Science, was presented in Stellenbosch from 18 to 21 September 2007. IUFRO Divisions 1 and 5 co-sponsored the meeting. The objective of the meeting was to establish the effect of forest certification on the sustainability of plantation operations. The Symposium was attended by 90 delegates from eleven countries. The symposium program included presentations by 22 speakers, an informative field trip, sponsored by MTO Forestry and Scanwood Solutions, and a full day workshop where the marketing of certified timber in South Africa was discussed.

Forestry is no longer just about trees, it is about people, their demands and needs; and the impact it all has on the biological and social environment. There are approximately 109 million ha of plantations in the world that serve as important sources of wood and fiber for timber, pulp and paper processors. While these man-made resources contribute significantly to the global timber supply, they are often criticized for their impact on the environment. It is therefore within the realm of forestry certification that efforts are made to limit and bring into perspective the potential effects of timber plantations on sustainable development.

It is commonly accepted that the demand for timber will increase with global population growth and the increase in wealth in certain quarters. This demand will need to be



Delegates visited harvesting operations in the Jonkershoek plantation of MTO Forestry

met and it will depend on the consumer if the source is sustainable or not, bearing in mind that there is already a movement to import timber into South Africa from countries such as China where less emphasis is placed on sustainability.

For more information, contact Cori Ham, Stellenbosch University, at [coriham\(at\)mweb.co.za](mailto:coriham(at)mweb.co.za) or visit the meeting [website](#).

Publications

IUFRO Occasional Paper 20 Communicating Forest Science: A Daily Task.

Proceedings of the Int'l Meeting of the IUFRO Task Force Communicating Forest Science in Freiburg, Germany, 2006: *Communicating through the media – why and how*

Editors: Kleinschmit, D., Krott, M., and Real, A.

Published: 2008

ISSN 1024-414X

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Forest communication experts from 14 countries met in Freiburg, Germany, in 2006 to discuss the most suitable instruments for communicating forest science and give recommendations for specific communication activities of IUFRO. Positive examples from around the world show that forest science has a potential to become part of the communication between stakeholders, the media and the public. However, success means that communication must become a daily task for forest science institutions and IUFRO.

New Journal:

Global Environment - A Journal of History and Natural and Social Sciences

This half-yearly journal intends to act as a link for ongoing researches on the environment and world history, with special regard to the modern and contemporary ages. It strives to provide a medium for communication and discussion between scholars from very distant – culturally as well as spatially – parts of the world seeking to highlight the relationship between global phenomena and local factors.

Number 1/2008: Mauro Agnoletti and Gabriella Corona: Editorial. Language: English. ISSN 1973-3739

Website: <http://www.globalenvironment.it>

Lesotho Atlas of Sustainable Development

By D.M Bohra

A few complimentary copies available!

ISBN 99911-645-02, December 2003, pp. Xxxvii + 480, size A4, Hb. For free distribution!

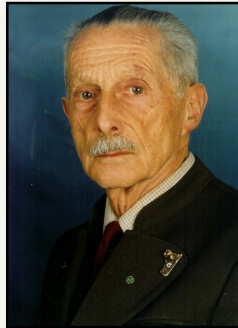
Contact: Prof. D.M. Bohra, Sustainable Development Analyst, Mahabar Marg, Barmer - 344001 (Rajasthan) India

Walter Bitterlich

Walter Bitterlich, who revolutionized forest inventory methods throughout the world with his pathbreaking discovery of "Winkelzahlprobe" ("angle-count sampling"), passed away on 9 February 2008 shortly before his 100th birthday.

Born on 19 February 1908 in Reutte in the Tyrol, Austria, he graduated from the University of Natural Resources and Applied Life Sciences, Vienna in 1930.

Initial ideas about the angle count method are documented in his diary as early as 1931. However, the need for gainful employment and the interruption of professional and scientific work by World War II meant that he would not be able to finish development and publication of his theories until 1948. This new method of determining basal area per unit area without direct measurement of either plot areas or tree diameters quickly spread around the



globe as it proved to be a highly efficient and economical inventory tool and it soon became regarded by many foresters as the "invention of the century".

In addition to his pioneering contributions to methods of forest sampling, Dr. Bitterlich was a prolific inventor who holds many patents. Since 1950, he had worked closely with FOB, now Relaskop-Technik, in Salzburg, Austria, to develop the appropriate tree measuring devices for his method of angle count sampling, such as the Spiegel-Relaskop and the Tele-Relaskop. These instruments are still state of the art and used worldwide for making forest measurements, especially inventory.

Since the 5th World Forestry Congress of the FAO in Seattle, USA, Prof. Bitterlich participated in nearly all World Forestry Congresses and IUFRO World Congresses as well as in numerous IUFRO Symposiums with invited papers and presentations of his instruments. The creative genius of Walter Bitterlich was rare and he was greatly admired throughout the forestry scientific community.

On behalf of IUFRO, we express our deep sympathy with his family and friends!

William E. (Ted) Hillis

Ted Hillis, prominent Australian researcher in the area of wood science and technology, died on 3 February 2008.

He was born in Geelong, Victoria, Australia, on 9 February 1921 and gained a Doctor of Science Degree in chemistry and biochemistry at Melbourne University. In 1947 he joined CSIRO, Australia, Division of Forest Products. In his scientific career he carried out important studies in biochemistry, wood physiology and wood anatomy with a remarkably holistic approach.



Ted Hillis started working in IUFRO in 1964 and served as Coordinator of IUFRO Division 5 from 1976 to 1983. He was awarded Honorary IUFRO Membership in 1986.

As Bob Youngs, one of his successors as Division 5 Coordinator, put it, Ted Hillis was a "Scientist's scientist". His long career at CSIRO resulted in many advances in knowledge of wood anatomy and wood chemistry. His concern was always for doing wood science well and sharing it effectively. He added much to the strength of IUFRO by his abiding concern that it bring together the best wood scientists to provide a firm scientific base for use of wood as a renewable natural resource.

Members of Division 5 in particular and of IUFRO in general sincerely condole with his family and friends!

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IUFRO Meetings

NOTE: The following list of meetings is just a selection!

For a full list of IUFRO events, please visit our online [calendar](#), or the [homepages](#) of IUFRO Units involved. Non-IUFRO meetings are also announced on the IUFRO [Noticeboard](#) on our web site.

16-20 March 2008

International Forest Biosecurity Conference

Rotorua, New Zealand

IUFRO [7.02.00](#), [7.03.00](#)

Contact: Andrew Liebhold, aliebhold@fs.fed.us

<http://www.ensiv.com/NewsEventsandPublications/>

5-9 May 2008

Symposium on "Entomological Research in Mediterranean Forest Ecosystems"

Oeiras/Sintra, Portugal

IUFRO [7.03.00](#)

Contact: medinsect2008@sapo.pt;

<http://www.efn.com.pt/medinsect.htm>

7-9 May 2008

10th International Symposium on Legal Aspects of European Sustainable Development

Sarajevo, Bosnia and Herzegovina

IUFRO [6.13.00](#)

Contact: Peter Herbst, hp@net4you.at

22-24 May 2008

International Symposium on Emerging Needs of Society from Forest Ecosystems

Ljubljana, Slovenia

IUFRO [4.05.00](#), [4.05.01](#), [4.05.02](#), Univ. of Ljubljana

Contact: Lidija Zadnik Stirn, lidija.zadnik@bf.uni-lj.si

<http://www.iufro405-08.si/>

26-30 May 2008

Forest Technology and the Environment (3rd FORTECHENVI Conference)

Brno and Prague, Czech Republic

IUFRO [3.05.00](#)

Contact: Alois Skoupy, skoupy@mendelu.cz

<http://www.icv.mendelu.cz/fortechenvi>

7-12 September 2008

23rd IUFRO Conference for Specialists in Air Pollution Effects on Forest Ecosystems Air Pollution and Climate Change at Contrasting Altitude and Latitude

Murten, Switzerland

IUFRO [7.01.00](#)

Contact: Marcus Schaub, marcus.schaub@wsl.ch

http://www.wsl.ch/iufro_ch_2008/index_EN?redir=1&

7-9 October 2008

8th Seminar on Remote Sensing and GIS Applications in Forest Engineering

Curitiba, Brazil

IUFRO [4.02.05](#)

Contact: Dr. Disperati, disperati@avalon.sul.com.br

<http://www.8seminarioflorestal.com.br/home/>

3-7 November 2008

Symposium on Sustainable Forest Management in Africa

Stellenbosch, South Africa

IUFRO [1.02.00](#)

Contact: Robert Nasi, r.nasi@cgiar.org

<http://academic.sun.ac.za/forestry/Symposium%202008/Symp2008Main.html>

17-20 November 2008

Forest Sector Modeling

Seattle, Washington, USA

IUFRO [6.09.00](#)

Contact: John Perez-Garcia, perjohm@u.washington.edu

Website: http://www.cof.orst.edu/cof/fr/research/tamm/Conference/FSM2008_MainFrame.htm

Other Meetings

2-5 April 2008

IV Congreso Forestal Latinoamericano

Mérida, Venezuela

Contact: Osvaldo Encinas, oencinas@ula.ve

<http://www.conflat.org>

13-15 May 2008

Small Wood 2008 and Bioenergy & Wood Products

Madison, Wisconsin

Forest Products Society

Contact: conferences@forestprod.org

<http://www.forestprod.org/confsmallwood08.html>

11-13 June 2008

EEESD '08 and 1st WSEAS on Landscape Architecture

Faro, Portugal

Contact: Thomas Panagopoulos, tpanago@ualg.pt

<http://www.wseas.org/conferences/2008/portugal/eesd/index.html>

2-4 September 2008

Forests and Forestry – Risks, Challenges, Solutions

Zvolen, Slovakia

Int'l Conference - 10th anniversary of the foundation of Forest Research Institute in Slovakia and 30th anniversary of lifelong learning in forestry in Slovakia (IUFRO Member)

Contact: Michal Vanèom, vanco@nlcsk.org

http://www.nlcsk.org/110_first_ann.htm

25-26 September 2008

REG-TRANSEKT

Glucholazy (Opole district, Poland),

Organized by Institute for Environmental Engineering, Zabrze; University Opole; Dresden Univ. of Technology

Contact: Christine Fürst, fuerst@forst.tu-dresden.de

http://boku.forst.tu-dresden.de/Boden//Boden_eng/index.htm

23-25 October

Celebration of 75th Anniversary of Forest Research and Management Institute (ICAS)

(IUFRO Member Organization)

Voluntari, Romania

Contact: icas@icas.ro