Congress Themes and Sessions

Forests for People

Forests, woodlands and agroforests play a vital role in the lives of people in both rural and urban communities, supporting livelihoods, food and energy security, human health and wellbeing, and culture. This Theme, which focusses on social, cultural and economic aspects of the management and use of forest resources, covers a broad set of topics such as: human health and wellbeing, urban forestry, small-scale and community forest management, rural development, nature-based recreation and tourism, landscape planning and management, conservation and forest ethics, forest history, traditional knowledge and culture, forest policy, governance and tenure issues, communications and education.

63 Forests and human wellbeing: Life satisfaction and behavioral approaches

Organizers: Shashi Kant (University of Toronto, Canada), Sen Wang (NRCan-Canadian Forest Service), Martin Hostettler (Cycad Inc., Switzerland) & Peter Deegen (Technische Universität Dresden, Germany)

This session will examine new economic approaches to analyze the role of forests in human wellbeing including social, cultural, forest use, education, employment, health, and recreation domains.

169 Forests and human health: The role of research towards evidence-based practice

Organizers: Takahide Kagawa (Forestry and Forest Products Research Institute, Japan) & Liisa Tyrväinen (Finnish Forest Research Institute)

This session will focus on research methodologies and recent findings on the effects of forests on human health, and the application of these findings into medical practices, landscape planning, recreational use of forests, and nature-based tourism.

192 The value and challenges of integrating food and medicinal forest products into forest management

Organizers: James Chamberlain (U.S. Forest Service), Carsten Smith-Hall (University of Copenhagen, Denmark) & Tytti Sarjala (Finnish Forest Research Institute)

This session will explore the state of knowledge on how forests around the world provide products and services that maintain and improve human health and well-being, and the values and challenges of integrating the forest resources that supply these products and services into forest management

88 Resilience and Identity with urban forests: A landscape system approach

Organizers: Wybe Kuitert (Seoul National University, Republic of Korea), Cheng Wang (Chinese Academy of Forestry), Giovanni Sanesi (University of Bari, Italy) & Amila Brajic (FOPER-University of Sarajevo, Bosnia-Herzegovina)

This session will examine recent research on the historical, cultural and natural landscape systems underlying urban areas and their potential to enhance resilience and identity of cities through appropriate planning, development, and management of urban forests.

62 **Challenges and opportunities in forest management and utilization in rapidly changing Asian economies**

Organizers: Ajith Chandran, Lianzhen Xu, Weiye Wang & Monika Singh (University of British Columbia, Canada)

This session will examine recent research combined with rural community-based forest management experiences, highlighting the value of learning from a diverse knowledge base and the importance of effective communication strategies in Asian economies.

252. **Forest-dependent community development**

Organizer: Tuija Sievanen (Finnish Forest Research Institute)

This session will focus on research of rural communities in which forests are an important asset for livelihoods, incomes, subsistence, health and culture.

105 **The social outcomes of community forestry: What do we know and how do we know it?**

Organizers: Susan Charnley (U.S. Forest Service) & Rebecca McLain (Portland State University, USA)

This session examines the social benefits of community forestry projects in Africa, Asia, and Latin America; the methods used to monitor and assess these benefits; and the policy and institutional barriers to creating positive social outcomes from community forestry.

108 **Small-scale and community forestry for people, biodiversity and ecosystem services**

Organizers: John Herbohn (The University of Queensland, Australia), Gun Lidestav (Swedish University of Agricultural Sciences), Gary Kerr (UK Forestry Commission), Jessica Leahy (University of Maine, USA) & Christoph Hartebrodt (Forest Research Institute Baden-Württemberg, Germany)

This session will address the complex and multidimensional nature of small-scale and community forestry systems, with a focus on the economic, institutional and policy issues; uneven-aged and mixed species silviculture of small-scale and community forestry; forest land ownership in change and its significance for management and policy; and the links between attitudes and behaviors of small-scale forest landholders.

168 **Communities, forests, forest industries and the Social Licence to Operate**

Organizers: Peter Edwards (Swedish University of Agricultural Sciences), Justine Lacey & Kieren Moffat (CSIRO, Australia)

This session will include presentations on a variety of aspects related to how the forest industry earns and maintains the informal approval and acceptance that communities and other stakeholders grant to a company or industry engaged in forest resource use and management.

239 **Establishing social institutions for co-management of public forest lands**

Organizers: Jamie Barbour (U.S. Forest Service), Cassandra Moseley (University of Oregon, USA) & Susan Charnley (U.S. Forest Service)

Presentations in this session will examine the socioeconomic and sociopolitical constraints on establishing co-management of public lands worldwide and the potential biophysical benefits from different management approaches.

39 **American Indian forestry**

Organizer: Donald Motanic (Intertribal Timber Council, USA)

This panel discussion will explore the perspectives and forest stewardship practices used by Indian tribes in the U.S. to address contemporary challenges such as forest health, climate change, and declines in forest products processing infrastructure.

174 **Participatory protected area management at the human needs and sustainable wildlife conservation interface**

Organizers: C.A.M. Sylvestre Djagoun (Université d'Abomey-Calavi, Benin), Hugues Akpona (National Forest Office, Benin), Edward D. Wiafe (Presbyterian University College, Ghana) & Achille Assogbadjo (Université d'Abomey-Calavi, Benin)

This technical session will highlight experiences and best practices in participatory wildlife management involving local communities in protected areas throughout the world, with a particular focus on Africa.

212 Innovative planning and managing approaches for sustainable tourism in forests and natural areas

Organizers: Taylor Stein (University of Florida, USA), Peter Fredman (Mid Sweden University, Sweden), Nobuhiko Tanaka, Tokai University, Japan) & Liisa Tyrväinen (Finnish Forest Research Institute)

This session's objectives are to address the multiple dimensions associated with tourism in forests and natural areas including positive outcomes to society and local people.

251. Integrating landscape protection, nature-based recreation and tourism, and rural development

Organizer: Tuija Sievanen (Finnish Forest Research Institute)

This session deals with research, planning and management of protected areas in rural communities, highlighting research on integration of local communities with the parks to enhance local community and visitor benefits, and conflict resolution.

253. Global changes and nature-based recreation and tourism

Organizer: Tuija Sievanen (Finnish Forest Research Institute)

This session will discuss environmental and societal changes and trends affecting nature-based recreation and tourism services and protected area management.

103 The future of recreation in forests and other nature areas

Organizers: Peter Fredman (Mid-Sweden University), Frank S. Jensen (University of Copenhagen, Denmark), Tuija Sievänen (Finnish Forest Research Institute) & David Edwards (Forest Research UK)

This session will look at outdoor recreation trends in different countries around the world including also new approaches to monitoring and qualitative observations of new activities, places and contexts.

28 Ethics and values in relation to forest, wildlife and recreation management

Organizers: Christian Gamborg & Frank Søndergaard Jensen (University of Copenhagen, Denmark)

This session will explore approaches for handling human-wildlife relations as well as conflict situations arising in forest, wildlife and recreation management.

4 The role of science in sustaining wilderness places and human relationships with wilderness

Organizer: Alan Watson (Leopold Institute-U.S. Forest Service)

This session will explore the contributions of wilderness science to wilderness and protected area management over the 50 years since the U.S. passed the Wilderness Act in 1964.

189 Linking landscape, forests and people: The historical roots of biocultural diversity

Organizers: Mauro Agnoletti (University of Florence, Italy), Jinlong Liu (Renmin University of China) & Steven Anderson (Forest History Society, USA)

This session will explore the historical development of biodiversity patterns associated with "natural" and "cultural" landscapes, including local and landscape-level traditional forest management practices and uses of biodiversity, and the evolution of policies affecting biological and cultural diversity and heritage.

190 Value of traditional knowledge for sustainable forest management

Organizers: Yeo-Chang Youn (Seoul National University, Republic of Korea), Jinlong Liu (Renmin University of China), William Armand Mala (University of Yaounde I, Cameroon) & Ronald Trosper (University of Arizona, USA)

This session will focus on the relevance of traditional knowledge, practices and social/governance institutions in the conservation, management and restoration of forests and sustainable use of forest biodiversity.

5 Wood and forest culture: merging the past with the present

Organizers: Howard Rosen (U.S. Forest Service) & Woo Chun Young (Kookmin University, Republic of Korea)

This session will examine the historical, religious, artistic and other social values of wood and forest culture, emphasizing the economic, environmental, and scientific impacts to different regions of the world.

200 On farm trees: towards the promotion and development of a traditional or local silviculture in tropical and subtropical forest regions

Organizers: William Armand Mala (University of Yaounde, Cameroon), Jinlong Liu (Renmin University of China). Steven Anderson (Forest History Society, USA) & Yeo-Chang Youn (Seoul National University, Republic of Korea)

In this session presentations will focus on the status of on-farm trees research and discuss the integration of traditional silviculture and local ecological knowledge on multipurpose trees for the design of small scale forestry practices.

113 Coppice forests – a tradition with future

Organizer: Gero Becker (Albert-Ludwigs-University Freiburg, Germany)

This interdisciplinary session will discuss historical and contemporary coppice forests and their management, including such topics as traditional and advanced products, protection functions, biodiversity, climate change adaption, traditional versus modern short rotation systems, and governance regimes.

66 Forests under pressure: Prerequisite conditions for forest-related sustainable development

Organizer: Pia Katila (Finnish Forest Research Institute)

This session will present the main findings of the IUFRO-WFSE book "Forest under Pressure: Local Responses to Global Issues", focusing on 'prerequisite conditions' that foster progress towards sustainable forest management and forest-related sustainable development.

101 Transitions to sustainable forest management: Economic, social and cultural parameters

Organizers: Jinlong Liu (Renmin University of China), Wil de Jong (Kyoto University, Japan), Yeo-Chang Youn (Seoul National University, Republic of Korea) & De Lu (Asia-Pacific Network on Sustainable Forest Management and Rehabilitation, China)

This session will examine recent studies that shed new light on the comprehensive and dynamic interrelationship between forest transition and economic, social, cultural and political changes and discuss the implication for forest policy and related environmental and climate change policies.

82 Smallholders and forest landscape transitions: Locally devised development strategies of tropical America

Organizers: Benno Pokorny (University of Freiburg, Germany) & Wil de Jong (Kyoto University, Japan)

This session will focus on responses of peasant communities to development-challenges in forest landscapes of tropical America to identify environmental and socio-economic improved alternatives to dominant development policies.

16 Reforming forest tenure and governance for mitigating climate change and improving people's livelihoods

Organizers: Runsheng Yin (Michigan State University, USA) & Shashi Kant (University of Toronto, Canada)

This session addresses the knowledge gaps and policy challenges encountered in implementing forest tenure and governance reforms, based on the experience of China, India, and Eastern Europe, and the advances of institutional economics.

91 Impact of tenure arrangements on forests, livelihoods and gender dynamics

Organizers: Maria Ojanen (CIFOR, Indonesia), Purabi Bose (CIAT, Colombia), Bimbika Sijapati Basnett (CIFOR, Indonesia) & Priyanka Bhalla (Lee Kuan Yew School of Public Policy, Singapore)

This session examines the implications of forest and land tenure reforms (in Asia, Africa and Latin America) with emphasis on local institutions, governance, livelihoods, and gender dynamics.

26 International to local forest governance: taking stock of political theories, methodologies and research findings

Organizers: Lukas Giessen (University of Goettingen, Germany), Bas Arts (Wageningen University, Netherlands), Florian Kraxner (International Institute for Applied Systems Analysis, Austria) & Constance McDermott (University of Oxford, UK)

This session aims at taking stock of innovative theoretical, methodological and empirical achievements in forest governance research, from the local to the global level.

188 **Ineffective international forest policy? The role of forest information, international law and politics**

Organizers: Lukas Giessen (University of Goettingen, Germany), Georg Winkel (University of Freiburg, Germany), Christoph Kleinn & Peter-Tobias Stoll (University of Goettingen, Germany)

The session will include contributions from political science, international law, forest information and monitoring, and other disciplines providing innovative insights into factors influencing the effectiveness of international forest policy.

136 **The knowledge that counts – analyzing science policy interactions in forest policy**

Organizers: Michael Böcher (Georg-August-University Goettingen, Germany) & Georg Winkel (University of Freiburg, Germany)

This session will focus on the interactions between scientific research and forest policy making and practices, including problems and prospects for scientific knowledge transfer in forest policy and assessment of long term trends of the science-policy interface.

37 **Achieving policy integration across fragmented domains: Forest policy perspectives**

Organizers: Karl Hogl (University of Natural Resources and Life Sciences, Austria) & Daniela Kleinschmit (Swedish University of Agriculture Sciences)

This session will review the state of the art in policy coordination and integration literature for describing and analyzing the evolving relationships within and between a number of substantive resource policy sectors, in particular taking a forest policy perspective.

42 **Innovative forest and environmental legislation for better diversity**

Organizers: Peter Herbst (Villach, Austria) & Rastislav Sulek (Zvolen Technical University, Slovak Republic).

This session will examine contributions, effects and conflicts between specific forest and other environmental legislation in addressing the challenges and manifold threats to forest biodiversity.

220 **Richer economies, better environmental policies? Analyzing the "environmental question" in forest policy in OECD countries**

Organizers: Georg Winkel (University of Freiburg, Germany), Cassandra Moseley (University of Oregon, USA) & Metodi Sotirov (University of Freiburg, Germany)

This session will assess environmental conflicts in forest policy and responses by forest policy makers (e.g., policies and governance arrangements and their effects) with an emphasis on OECD countries.

131 **Forestry education serving science and practice**

Organizers: Piotr Paschalis-Jakubovicz (Warsaw University of Life Sciences, Poland), Siegfried Lewark, University of Freiburg, Germany) & Yemi Adeyeye (IFSA/Bangor University, UK)

In this session new as well as proven and tested ideas on ways of improving higher forestry education will be discussed, including new approaches to distance education, technology and didactics of e-learning, and the movement towards Open Education Resources (OER) as well as the growing role of universities in continuing education.

72 **The social education of foresters**

Organizers: Lisa Hansen (IFSA/University of British Columbia, Canada) & Louise Fortmann (University of California at Berkley, USA)

This technical session examine the importance of, and challenges for, integration of social sciences into forestry curricula, emphasizing the changes in learning outcomes that are needed to meet the needs of tomorrow's foresters.

209 **From data to knowledge, geospatial tools and information access**

Organizers: Carla Heister (Yale University, USA), Dave Vanderzanden (U.S. Forest Service), Gillian Petrokofsky (Oxford University, UK) & Kevin Megown (U.S. Forest Service)

This session will focus on forest web/database research and applications for supporting the collection, management, storage and updating of enterprise information and geospatial data for retrieval and access by researchers, land managers, and public end users.

227 Knowledge exchange and communication of forest research for human and community well-being

Organizers: Cynthia Miner (U.S. Forest Service), Jurij Begus (Slovenia Forest Service), Guy Smith (NRCan-Canadian Wood Fibre Centre) & Alejandra Real (National Forestry Corporation, Chile)

The session will focus on the processes used to implement research findings in policies, programs and practices in maintaining and enhancing human health and community well-being, with an emphasis on the human dimensions of sharing and using knowledge.

68 How to make forest science available for all? Publishers', editors', and authors' challenges

Organizers: Pekka Nygren (Finnish Society of Forest Science) & Eeva Korpilahti (Finnish Forest Research Institute)

The session will provide a forum for the exchange of ideas on how to ensure access to high-quality forest information for all interested users in the era of rapidly changing publishing procedures and platforms.

Forest Biodiversity and Ecosystem Services

The conservation and sustainable use of forest biodiversity is essential for the maintaining the full range of environmental, economic, social and cultural goods and services provided by forests. Sessions within this Theme will consider: the role of biodiversity in the provision of ecosystem services; the effects of deforestation, forest degradation, natural disturbances and human management activities on forest ecosystems, habitats and species and provision of ecosystem services at different spatial and temporal scales; assessment and valuation of forest ecosystem services; strategies for forest biodiversity conservation and restoration; and challenges in achieving a balance between biodiversity conservation and management of forests for a variety of ecosystem services.

139 The future of ecosystem services from forests

Organizers: William Nikolakis & John Innes (University of British Columbia, Canada)

The session will focus on how the emergence of forest ecosystem services will re-shape forests and forest research, with particular focus on the design of such systems and their effect on human communities and the landscape.

145 Urban forest diversity and ecosystem services

Organizers: Rachel Leibowitz (International Society of Arboriculture, USA) & David Nowak (U.S. Forest Service)

This session will focus on species diversity in cities across the globe, ecosystem services provide by urban trees, how the urban forest composition and species diversity affects various ecosystem services and values, and how the urban forest composition and species diversity are and likely will change in the future.

118 Providing ecosystem services under climate change: Community of practice of forest decision support systems

Organizers: Harald Vacik (University of Natural Resources and Life Sciences, Austria), Jose Borges & Jordi Garcia-Gonzalo (Technical University of Lisbon, Portugal) & Lujsk-Ola Eriksson (Swedish University of Agricultural Sciences)

The session will explore how Decision Support Systems (DSS) are currently designed and applied for a sustained provision of ecosystem services under climate change, including case studies and overviews on models, methods, techniques and frameworks.

170 Long-term forest research on forest ecosystem management

Organizers: Hosang Kang (Seoul National University, Republic of Korea), Xingguo Han (Institute of Applied Ecology, Chinese Academy of Sciences) & Björn Hånell (Swedish University of Agricultural Sciences)

This session will provide a forum for scientists engaged in long-term interdisciplinary forest research to sharing their experiences and to promote cross-site research collaboration and networking to examine key research questions at larger scales.

59 **The benefits of introducing the ecosystem service concept in forest management and planning at different spatial scales**

Organizers: Sandra Luque (IRSTEA, France) & Christine Fürst (ZEF Uni Bonn, Germany)

This session will examine how the distribution of ecosystem services and their monetary and non-monetary values can be influenced by changing scenarios (land use, climate) at different spatial scales, and the development of methodologies for mapping indicators that can be directly related to environmental policies assessments.

217. **Research and management implications of the economics of ecosystem services**

Organizers: Donald Hodges (University of Tennessee, USA), Donald Grebner (Mississippi State University, USA) & Runsheng Yin (Michigan State University, USA)

This session will include presentations focused on research and management related to the economic and accounting aspects of ecosystem services, including the effects on management decisions.

210 **Silvicultural practices to facilitate forest restoration**

Organizers: Byung Bae Park (Korea Forest Research Institute, Republic of Korea), Palle Madsen (University of Copenhagen, Denmark) & Bryan Finegan (CATIE, Costa Rica)

This session will examine current research and practical experiences on silvicultural methods used to facilitate forest restoration, ranging from regeneration establishment to harvesting systems.

64 **What future for tropical silviculture?**

Organizers: Robert Nasi (CIFOR, Indonesia) & Plinio Sist (CIRAD, France)

This session will present experimental data on the sustainability of selective logging and plantation management in the tropics, with an emphasis on the impact of tropical silviculture on biodiversity, biomass production and ecological processes in natural and planted forests.

219 **How does biodiversity help to manage high-value timber species, and vice-versa?**

Organizers: Sheila Ward (Mahogany for the Future, Puerto Rico/USA), Emmanuel Opuni-Frimpong (Forest Research Institute of Ghana) & Nicholas Brokaw (University of Puerto Rico)

This session will explore diverse means by which a biodiverse environment positively impacts management of high-value timber species, and, conversely, how management for high-value species helps conserve biodiversity.

122 **Forest management in montane communities.**

Organizers: Pil Sun Park (Seoul National University, Republic of Korea), Raffaele Cavalli (University of Padua, Italy), Roberto Tognetti (University of Molise, Italy) & Karl Stampfer (University of Natural Resources and Life Sciences, Austria)

This session will focus on scientific findings of montane ecosystems and forest practices that contribute to the sustainable management of mountain resources and landscapes and socio-economic development of mountain communities.

247 **Oak regeneration to maintain biodiversity around the world**

Organizers: Kurt Gottschalk & Brian Lockhart (U.S. Forest Service), Aytekin Ertas (Istanbul University, Turkey) & Eduard Hochbichler (University of Natural Resources and Life Sciences, Austria)

This session will examine oak regeneration around the world in the context of different silvicultural systems and practices to sustain oak forests and their values.

52 **Ecosystem services provided by planted forests**

Organizers: Peter Freer-Smith (Forest Research, UK), Eckehard Brockerhoff (Scion, New Zealand) & Jean-Michel Carnus (National Institute for Environmental and Agricultural Science and Research, France)

This session will present new research from around the world on the range of ecosystem services provided by planted forests, on the valuation of ecosystem services and on their relevance to forest management and policy.

48 **Forest ecosystem services contributing to agriculture**

Organizers: Kimiko Okabe (Forestry and Forest Products Research Institute, Japan) & Ian Thompson (NRCan-Canadian Forest Service)

This session will examine the role of forests in sustaining agricultural livelihoods and the role of landscape management planning to address the social and economic drivers of deforestation in agricultural landscapes and optimize provision of forest ecosystem services to agricultural communities.

178 **Contribution of genetics and genomics to conservation and sustainable management of forests under changing environmental conditions**

Organizers: Om Rajora (University of New Brunswick, Canada) & Wickneswari Ratnam (Universiti Kebangsaan Malaysia)

The session will explore the impacts of and future directions for forest genetics and genomics research on the conservation and sustainable management of forest genetic resources and understanding adaptation in forest trees and their responses to climate and environmental change.

13 **Salamanders: World icons of aquatic biodiversity in forests**

Organizer: Deanna Olson (U.S. Forest Service)

This session will present recent research on population ecology and reserve designs, effects of forest and riparian buffer management, climate envelope models, and emerging genetic tools to gauge species occurrence (e-DNA) and habitat connectivity across forest landscapes.

142 **Ecology and dynamics of dead wood dependent species at multiple trophic levels – Promoting natural pest control in managed forests or increasing hazards?**

Organizers: Stephen Pawson (Scion, New Zealand), Kimiko Okabe (Forestry and Forest Products Research Institute, Japan) & Antoine Brin (University of Toulouse, France)

This session will discuss the full spectrum of saproxylic species, highlighting the functional importance of deadwood across multiple trophic levels within managed forest ecosystems.

104 **Forests, roots and soil carbon**

Organizers: Cindy Prescott (University of British Columbia, Canada), Douglas Godbold (University of Natural Resources and Life Sciences, Austria), Heljä-Sisko Helmisaari (University of Helsinki) & Shalom Daniel Addo-Danso (FORIG, Ghana & University of British Columbia, Canada)

This session will present new insights on root contributions to soil carbon, particularly linked to forest management, climate change, biodiversity, and ecosystem services.

56 **Dynamics of lava forest ecosystem**

Organizers: Jung-Hwan Park & Hyung-Soon Choi (Korea Forest Research Institute, Republic of Korea) & Waimun Ho (Forest Research Institute of Malaysia)

This session will present current research on vegetation structure and dynamics of lava forest ecosystems, their often unique floral and faunal biodiversity, as well as their provision of environmental (including cultural) cultural services.

77 **Radioactive contamination in forest ecosystems and safe uses of forest products**

Organizer: Masamichi Takahashi (Forestry and Forest Products Research Institute, Japan)

This session will present current research on the impacts and long-term dynamics of radioactive fallout on forest ecosystems and countermeasures for rehabilitation of affected forest ecosystems and safe utilization of products derived from them.

Forests and Climate Change

Understanding and anticipating the impacts of climate change on forest ecosystems and the services they provide to people are critical to efforts to develop and implement effective policies and management strategies for climate change mitigation and adaptation. Sessions within this Theme will consider climate change effects on forest ecosystem structure and function; interactions with other natural disturbance and forest management regimes; land-use and land cover change; monitoring and modeling of forest condition, biomass, carbon and climate change-related impacts on forest ecosystems, landscapes, and communities; and environmental, social and economic implications of forest-based climate change adaptation strategies and mitigation opportunities (such as REDD+).

71 **Climate Change: A driver for land-use change and adaptive forest management on six continents**

Organizers: JP Skovsgaard (Swedish University of Agricultural Sciences), Jean-Michel Carnus (National Institute for Environmental and Agricultural Science and Research, France), Ronald E. McRoberts (U.S. Forest Service) & Tod Ramsfield (NRCan-Canadian Forest Service)

Presenting examples from six different continents, this session aims to contrast impacts of climate change on land-use and adaptive forest management.

193 **From understanding drivers to gaining leverage at the tropical forest margins: 20 years of ASB Partnership**

Organizers: Peter Akong Minang & Elizabeth Kahurani (World Agroforestry Centre, Kenya)

This session will discuss the evolution of theories and approaches to addressing the complex drivers of deforestation and forest degradation and the experiences of the ASB Partnership in order to draw lessons and define questions for further research.

83 **Boreal at risk: Integrative science as a strong foundation for public policy development**

Organizers: Deepa Pureswaran, Werner A. Kurz, Louis De Grandpré (NRCan-Canadian Forest Service) & Philip G. Comeau (University of Alberta, Canada)

Global change and forest disturbances (fires, insects and pathogens) affect circumpolar boreal forest dynamics and this session will present results and policy implications of integrated research.

138 **Forests, fire and climate change dynamics**

Organizers: Bill de Groot (NRCan-Canadian Forest Service), Ainuddin Nurrudin (Univesiti Putra Malaysia), Susan Conard (International Boreal Forest Research Organization, USA) & Pieter van Lierop (UN-FAO, Italy)

Presentations in this session will focus on the latest scientific understanding of climate change and future global fire regimes, feedback to the global carbon balance, expected human and environmental impacts, and potential management strategies to mitigate negative impacts.

110 **Managing forest for fire in a changing climate**

Organizers: Cristina Aponte, Helen Vickers & Thomas Fairman (University of Melbourne, Australia) & William Elliot (U.S. Forest Service).

This session will focus on the effectiveness of fuel management practices to minimize wildfire risk and the impacts of these practices on forest ecosystems services such as water supply, carbon sequestration and biodiversity.

232 **Vegetation zone shifts in response to climate change**

Organizers: Constance Millar (U.S. Forest Service) & Pavel Cudlin (Global Change Research Centre, Academy of Sciences of the Czech Republic)

The aim of this session is to compare model results with critically assessed field and observation data from representative mountain regions on soil, climatic, and ecologic conditions in response to climate change, focusing on opportunities and barriers to adaptation.

143 **Forest resistance and resilience in the face of natural hazards**

Organizers: Alexia Stokes (National Institute for Environmental and Agricultural Science and Research, France), Frank Telewski (Michigan State University, USA) & Thierry Fourcaud (CIRAD, France)

The session will explore how natural, plantation and urban forests can withstand weather and geomorphological hazards, as well as the mechanisms of ecosystem resilience and failure after disturbance.

250 **New developments and use of the UN-sponsored Global Forest Resource Assessment**

Organizers: Gregory Reams (U.S. Forest Service) & Ken MacDicken (UN-FAO, Italy)

Presentations in this session will synthesize results from recent FAO GFRA and other current data sources on: forest area change, changes in forest production, protective functions and selected ecosystems services, biodiversity and forest conservation, forest disturbance, progress toward sustainable forest management, forest-related economics and livelihoods, and future projections.

58 **Quantifying uncertainty in forest measurements and models: Approaches and applications**

Organizers: George Gertner (University of Illinois, USA), Bogdan Strimbu (Louisiana Tech University, USA), David Paré (NRCan-Canadian Forest Service) & Peter Clinton (Scion, New Zealand)

This session will present approaches to analyzing uncertainty in forest measurements and give examples of applications of uncertainty analysis in above- and belowground estimates of forest biomass, carbon, and nutrient pools and fluxes, and other ecosystem attributes.

9 **Forest biomass and carbon inventory on successive occasions**

Organizers: Bianca Eskelson (Oregon State University, USA), Cris Brack (Australian National University) & Teresa Fonseca (University of Trás-os-Montes e Alto Douro, Portugal)

Speakers in this session will discuss national successive inventory designs that integrate factors such as biomass and carbon, and the challenges that arise when dealing with re-measurements, focusing on the importance of research in the development of methods.

117 **Remote sensing in carbon balance evaluation and monitoring**

Organizers: Tomasz Zawila-Niedzwiecki (Forest Research Institute, Poland), Mathias Schardt (Joanneum Research, Austria) & Radomir Balazy (Forest Research Institute, Poland)

This session will explore innovative methods for carbon assessment that are based on airborne or satellite remote sensing data.

49 **Using multi-source remotely sensed data and nearest neighbor techniques to improve inference for natural resource applications.**

Organizer: Temesgen Hailemariam (Oregon State University, USA)

This session will bring together research scientists and practitioners to exchange ideas related to some of the challenges and opportunities in using multi-source remotely sensed data and nearest neighbor techniques to improve inference for sustainable forest management.

226 **Implementation of silvicultural treatments and their effects into forest growth models**

Organizers: Margarida Tomé (Technical University of Lisbon, Portugal) & JP Skovsgaard (Swedish University of Agricultural Sciences)

This session will explore how silvicultural treatments effects, such as those associated with thinning, regeneration, and fertilization, are incorporated into current forest growth models and how these may be improved to better support forest management decisions.

248 **National forest sector greenhouse gas inventories following IPCC guidance and guidelines: Requirements, methods, and national examples**

Organizers: Werner A. Kurz (NRCan-Canadian Forest Service), Gregory Reams (U.S. Forest Service) & Thelma Krug (National Institute for Space Research-INPE, Brazil)

National greenhouse gas inventories following IPCC guidance are established in many countries and this session will report on requirements, experiences and challenges with particular emphasis on acquisition of land cover and land use data required for greenhouse gas reporting.

253. **Complying with the IPCC Good Practice Guidance for tropical carbon stock inventories**

Organizer: Ronald E. McRoberts (U.S. Forest Service)

The session will address methods for complying with the two IPCC Good Practice Guidance estimation criteria: (1) neither over- nor under-estimation (bias), and (2) uncertainties are reduced as far as is practicable (precision).

74 **Advances in forest carbon measurements and monitoring for building REDD+ MRV systems**

Organizers: Yasumasa Hirata (Forestry and Forest Products Research Institute, Japan) & Andrew Lister (U.S. Forest Service)

This session aims to exchange scientific knowledge on forest carbon measurement and monitoring for building the REDD+ MRV systems, including topics such as forest inventory development, forest carbon measurement protocols, uncertainty analysis, integration of forest inventory and remote sensing data for estimating forest carbon stocks, and related works.

107 **Forest management for adaptation to climate change**

Organizers: Rodney Keenan (The University of Melbourne, Australia), Carina Keskitalo (Umea University, Sweden), Kalame Fobissie (WWF Central Africa, Cameroon) & Guangyu Wang (University of British Columbia, Canada)

This session will focus on options for adaptation to climate change in forest management from ecological, social, economic and policy perspectives including decision tools for adaptation to climate change and best practice case studies in building adaptive capacity from tropical, temperate and boreal biomes.

75 **Adaptive forest management under climate change – networking from local to global scales in the temperate zones**

Organizers: Andreas Bolte (Thünen Institute of Forest Ecosystems, Germany), John Stanturf (U.S. Forest Service) & Palle Madsen (University of Copenhagen, Denmark)

Topics to be discussed in this session will include native and non-native species and provenance suitability under climate change, adaptive management options to assist forest adaptation and effective knowledge diffusion among different scales, researchers, politicians and practitioners.

222 **Forest management options to tackle climate change**

Organizers: Hubert Hasenauer (University of Natural Resources and Life Sciences, Austria), Frits G. Mohren (University of Wageningen, the Netherlands) & Jean-Luc Peyron (Ecofor, France)

The session will discuss forest management strategies in mitigating potential climate change effects, including adaptation options, carbon sequestration issues, fossil fuel substitution potentials, and life cycle assessment strategies.

27 **Forest owners and climate change adaptation**

Organizers: Robert Jandl (Research and Training Centre for Forests, Natural Hazards and Landscape, Austria), Ulrike Pröbstl (University of Natural Resources and Life Sciences, Austria), Anatoly Shvidenko (International Institute of Applied System Analysis, Austria) & Sandra Luque (National Institute for Environmental and Agricultural Science and Research, France)

This session will discuss the consequences of a changing structure of forest land owners under the conditions of climate change for development and implementation of appropriate forest management adaptation measures and risk management.

79 **Sustainable management of spruce dominated ecosystems in response to climate change**

Organizers: Phil Comeau (University of Alberta, Canada), Bill Mason (Forest Research, UK), Ulf Johannson & Bjorn Hanell (Swedish University of Agricultural Sciences)

This session will include discussion of the potential impacts of climate change on the distribution, growth and dynamics of natural and planted spruce forests and silvicultural, policy and planning options that may be available for sustainable management of spruce forests.

81 **Tropical forest wetlands, climate, and land-use change: Adaptation and mitigation opportunities**

Organizers: Richard Birdsey & Randall Kolka (U.S. Forest Service), Daniel Murdiyarso (CIFOR, Indonesia) & Boone Kauffman (Oregon State University, USA)

This session will present recent research on carbon stocks and greenhouse gas emissions from intact and converted wetland forests and associated land uses, ecosystem C dynamics modeling tools ,and roles of tropical wetlands in climate change adaptation and mitigation strategies.

19 **Novel Ecosystems and intervention: Adaptation to climate change**

Organizers: John Stanturf (U.S. Forest Service) & Palle Madsen (University of Copenhagen, Denmark)

This session will explore current perspectives on restoring forests under the simultaneous pressures of land use change, trade globalization and climate changed.

46 **Understanding the relationships among biodiversity, carbon, and people for REDD+ forests: The importance of environmental and social safeguards**

Organizers: Ian Thompson (NRCan-Canadian Forest Service), Kimiko Okabe (Forestry and Forest Products Research Institute, Japan), Jae Soo Bae (Korea Forest Research Institute, Republic of Korea) & John Parrotta (U.S. Forest Service)

This session will examine the important relationships that exist among biodiversity, carbon storage and people in REDD planning, with a particular emphasis on formulation and application of environmental and social safeguards.

242 **Addressing the drivers of deforestation: Exploring synergies between REDD+ and forest policy**

Organizers: Michael Obersteiner (International Institute for Applied Systems Analysis), Austria, Gilberto Camara (National Instititute for Space Research-INPE, Brazil); Martin Tadoum (The Central African Forestry Commission-COMIFAC, Cameroun) & Valarie Kapos (UNEP World Conservation Monitoring Centre, UK)

This session aims at presenting and discussing the latest research on tropical deforestation and degradation drivers, public and private sector efforts addressing these and the identification of effective future invention options based on forest and land-use policies.

92 **Gender, participation and climate change**

Organizers: Bimbika Sijapati Basnett, Esther Mwangi (CIFOR, Indonesia), Peter Cronkleton (CIFOR, Peru) & Terry Sunderland (CIFOR Indonesia)

This panel will focus on challenges, opportunities and outcomes of securing women's participation in forest governance and link this with issues and experiences in climate change adaptation and mitigation with the aim of providing suggestions for how to strengthen women's meaningful participation in decisions and benefits, improve policy targeting and mitigate risks in climate change.

163 **Desertification, land degradation and drought**

Organizer: Hoduck Kang (Dongguk University, Republic of Korea)

This session will focus on desertification, land degradation and drought in arid or semi-arid areas with presentations of recent research, operational experiences and lessons learned on rehabilitation of degraded lands and combating desertification.

Forest and Water Interactions

An understanding the linkages between forests and forested wetlands and hydrological processes is essential for managing ecosystems at watershed or landscape scales to sustain the availability and quality of water resources critical for human well-being. Sessions within this Theme will examine the influence of land cover and land use, large-scale natural and human-induced disturbance (including climate change), and forest management on watershed hydrology, biodiversity and provision of water-related ecosystem services, as well as the latest findings from long-term watershed research, studies of mangrove and riparian forests, and adaptation of trees and forests to drought.

127 Land Use/Land Cover Change and hydroecology: Consequences at variable spatial scales.

Organizers: Latif Kalin (Auburn University, USA), Yusuf Serengil (Istanbul University, Turkey), Xiaohua (Adam) Wei (University of British Columbia, Canada) & Amy Daniels (U.S. Forest Service)

This session will focus on hydrologic and ecologic issues in watershed at various spatial scales, as affected by spatial mosaic of land use (and associated water use and management practices), and multiple stress factors such as urbanization, climate change, and air pollution.

257. Long-term watershed studies: What have we learned about eco-hydrological functioning

Organizers: Shirong Liu (Chinese Academy of Forestry) & Xiaohua Wei (University of British Columbia, Canada)

This session will focus on the value of tong-term watershed studies as sources of baseline information on how ecosystems and hydrologic systems function, with a particular emphasis on their importance for assessing impacts of, and adaptation to, climate change.

18 Hydroecological studies in the Mediterranean region

Organizers: Yusuf Serengil (Istanbul University, Turkey), Xiaohua Wei (University of British Columbia, Canada) & Ferhat Gokbulak (Istanbul University, Turkey)

The objective of this session is to evaluate long- and short-term studies in the Mediterranean region on hydrology– ecosystems interaction to better understand the effects of anthropogenic stressors in the regions.

256. Managing forests and forest uses to protect and provide clean water

Organizers: Jean-Michel Carnus (National Institute for Environmental and Agricultural Science and Research, France) & Richard Harper (Murdoch University, Australia)

This session will examine the linkages between forests and forest watershed management and water quality for rural and urban water users and consumers.

86 Role of disturbance in maintaining and stimulating aquatic biological diversity in temperate forest ecosystems

Organizer: Robert Danehy (National Council for Air and Stream Improvement, USA)

This session will focus on the impacts of two natural disturbances (fire and debris flows), and one anthropogenic (clear-cut logging) on aquatic biota and the relationship between disturbance severity and recovery period and possible recovery trajectories.

36 Impacts of forest roads on water resources and aquatic habitat

Organizers: Charles Luce (U.S. Forest Service) & Artemio Cerdà (University of València, Spain)

This session reviews the latest science on runoff generation, surface erosion, mass wasting and gully formation, sediment delivery, mitigation treatment effectiveness, and how these affect aquatic habitat.

238 Sustaining riparian biodiversity and ecosystem services in a changing climate

Organizers: Kathleen Dwire (U.S. Forest Service), Michael Pollock (National Oceanic and Atmospheric Administration, USA) & Chris Frissell (University of Montana, USA)

This session will focus on innovative approaches to restoration and maintenance of biological diversity and essential ecosystem services in riparian forests.

255. Ecology and management of coastal forests and mangroves

Organizers: Ariel E. Lugo (U.S. Forest Service) & Daping Xu (Chinese Academy of Forestry)

This session will focus on current research on mangroves and other coastal forest ecosystems, and their importance as habitat for marine and estuarine biodiversity and provision of other ecosystem services.

80 Conceptual frames and research strategies for integrated studies of adaptation to drought

Organizers: Philippe Rozenberg (National Institute for Environmental and Agricultural Science and Research, France), Anne Griebel & Gregor Sanders (University of Melbourne, Australia).

The session will focus on ecophysiological, genetic, and dendrochronological studies that shed light on xylem adaptive potential to drought in experimental trials as well as in natural populations, including studies of population variation within species as affected by climatic conditions

Forest Biomass and Bioenergy

The rapidly growing use of wood and biomass sources for bioenergy, biofuels, and bio-based products requires the development of innovative production systems, more efficient use of material from plantations based on end-user, raw material and processing requirements, and management of competition for biomass from planted and natural forests for energy *vs* other forest products and environmental services. Sessions within this Theme will explore these issues as well as current research on genomics, biotechnology, and breeding and selection of trees to meet changing biomass and bioenergy objectives; and life-cycle analyses and 'eco-efficiency' of forest bioenergy production systems and technologies.

50 **Sustainable biomass for energy and industrial raw materials**

Organizers: Viktor Bruckman (Commission for Interdisciplinary Ecological Studies, Austrian Academy of Sciences), Sanjeev Kumar Chauhan (Punjab Agricultural University, India) & Robert Jandl (Federal Research and Training Centre for Forests, Natural Hazards and Landscape, Austria)

This session aims at disseminating state-of the art knowledge of sustainable woody biomass production from common woodland management systems, such as conventional forestry, short rotation forestry and agroforestry with a focus on sustainability in context of changing climate, carbon sequestration and trading, and social benefits.

106 **Biobased products and bioenergy.**

Organizers: Jianchun Jiang & Fuxiang Chu (Chinese Academy of Forestry), Dominique Lachenal (Grenoble INP-Pagora, France) & Jingxin Wang (West Virgina University, USA).

This session will feature current scientific developments on biomass materials and derived products, technologies for converting biomass into useful products and energy, including techniques under development to produce pure cellulose for dissolving pulp (textile) and for higher value cellulosic polymers and materials.

137 **Forest biomass supply chains: Practice, economics, and carbon balance**

Organizers: Nate Anderson (U.S. Forest Service), Gustaf Egnel (Swedish University of Agricultural Sciences) & Woodam Chung (University of Montana, USA)

This session will cover a wide range of forest biomass supply chain studies from around the world; topics include feedstock production, operations research, conversion technologies, logistics management, economics, and carbon balance associated with forest biomass utilization.

61 **Emerging technologies for forest resource assessment and genetic improvement**

Organizers: Xiping Wang (U.S. Forest Service), Jianxiong Lu (Chinese Academy of Forestry), Kyu-Suk Kang (Korea Forest Research Institute, Republic of Korea) & Marco Marchetti (Italian Academy of Forest Sciences)

This session will focus on assessment of wood and fiber properties of forest plantations for optimized wood utilization, development of geo-referenced wood property databases for resource management, and selection of superior clones in tree breeding operations.

160 **Genomics and biotechnology for improvement of woody energy crops**

Organizer: Carl Douglas (University of British Columbia, Canada)

This session will present current research on optimizing woody biomass plantations for bioenergy, natural variation in bioenergy and biomass traits, genetic and genomic approaches to tree domestication for bioenergy uses, and biotechnology for bioenergy biomass optimization.

11 **Environmental impacts of intensive management of forest soils for timber and bioenergy production.**

Organizers: Deborah Page-Dumroese (U.S. Forest Service), Peter Clinton (Scion, New Zealand), Liisa Ukonmaanaho, (Finnish Forest Research Institute) & Hailong Wang (Zhejiang Agricultural and Forestry University, China)

This session will address a range of biogeochemical and environmental consequences of timber harvesting or bioenergy production; topics will include intensive forest soil uses such as cultivation, fertilization, herbicide,

nutrient removals in biomass, acidification, leaching of DOC, replacement of soil nutrients via deposition and weathering, and alterations associated with the application of biochar.

53 **Evaluation of environmental Impacts of production and use of wood products and wood energy**

Organizers: Richard Bergman (U.S. Forest Service) & Adam Taylor (University of Tennessee, USA)

This session will use Life Cycle Analysis approaches and methodologies to evaluate forestry and forest products environmental performance issues related to carbon flows, emerging biomass-conversion technology(ies), and avoided GHG emissions by product substitution.

243 **Global and regional deployment of Biomass & CCS (BECCS): Reconciling top-down and bottom-up approaches and REDD+BECCS Nexus**

Organizers: Florian Kraxner (International Institute for Applied Systems Analysis, Austria), Sabine Fuss (Mercator Research Institute on Global Commons and Climate Change, Germany), Ruben Lubowski (Environmental Defense Fund, USA) & Nathalie Walker (National Wildlife Federation, USA)

This session aims at presenting and discussing the latest research on combining bioenergy with carbon capture and storage (BECCS), its important potential co-benefits as well as risks for e.g. the conservation of biodiversity, and to identify possible (funding) synergies and challenges from the REDD+/BECCS nexus.

Forests and Forest Products for a Greener Future

The future of forest management in the face of forest loss and ever-increasing demands for food, timber and wood fiber, water and other ecosystem services, and uncertainties posed by globalization and economic, social and environmental uncertainty, is a fundamental challenge for the forest sector and the forest research community alike. Innovation, including development of economically and socially sustainable and environmentally responsible production systems and end-products, will play an important role to meet these challenges. Sessions within this Theme will explore these issues as well as forest sector trends, new research developments in forest operations, forest management, innovations in wood-based and non-wood forest products development, and forest certification.

87 **Innovation in the forest sector: maximizing the sector's competitiveness**

Organizers: Eric Hansen (Oregon State University, USA), Erlend Nybakk, (Norwegian Forest and Landscape Institute), Lyndall Bull (Australian National University) & Gehard Weiss (University of Natural Resources and Life Sciences, Austria)

This session is designed to catalog the state-of-the-art in forest sector innovation research covering a diverse set of industry sectors including nature-based tourism, ecosystem services, wood manufacturing, and wood construction.

181 **The interface between quantitative forest sector modeling and policy analysis: What can be improved?**

Organizers: Birger Solberg (Norwegian University of Life Sciences), Daniela Kleinschmit (Swedish University of Agriculture Sciences) & Clark C. Binkley (International Forestry Investment Advisors, USA)

This session will explore the strengths and weaknesses of using forest sector models in policy analyses, recent methodological improvements and pending needs in forest sector modelling, and the scope for improvement in the interface between policy analyses and forest sector modeling.

41 **Intensive or ecosystem-based forest management – impact on yield, wood quality and economic return?**

Organizers: Pekka Saranpää (Finnish Forest Research Institute), Alexis Achim (Laval University, Canada), Robert Deal (U.S. Forest Service) & John Moore (Scion, New Zealand)

Presentations in this session will feature current research relevant to ways that forest management can maintain the integrity of natural ecosystem processes and improve the resilience of forests to global change, while enhancing forest productivity and profitability.

25 **Contributions of business and marketing to a greener future**

Organizers: Eric Hansen (Oregon State University, USA), Tom Hammett (Virginia Tech, USA) & Birger Solberg (Norwegian University of Life Sciences)

This session covers a wide range of business and marketing theory topics that address how products and markets (timber and non-timber) can be expected to contribute to a greener future.

90 **Gender and forestry value chains**

Organizers: Herry Purnomo & Bimbika Sijapati Basnett (CIFOR, Indonesia), Sola Phosiso (CIFOR, Kenya) & Pablo Pacheco (CIFOR, Indonesia)

Drawing on research carried out on a wide range of forest value chains from charcoal, teak to bush meat and wild vegetables, this panel will shed a light on the role of women in forest value chains in the face of forest loss and a range of uncertainties generated by ever-increasing demands for food, timber, and ecosystem services in a globalized world.

164 **Precision land-use management - state and perspectives**

Organizers: Hans R. Heinimann (ETH Zurich, Switzerland) & Woodam Chung (University of Montana, USA)

This session will explore principles, technologies and applications of precision land-use management, an emerging, engineering-driven concept based on the vision that future land-use management systems will be able to purposefully control and coordinate biological, technical and administrative processes in about real-time.

183 **Forest operations engineering and management - the way ahead**

Organizers: Hans R. Heinimann (ETH Zurich, Switzerland) & Woodam Chung (University of Montana, USA)

The session aims at bringing together regional perspectives of research and development in forest operations engineering and management, and setting an agenda of issues to be addressed collectively and internationally during the next 5 years.

55 **Planted forests: meeting future global forest product needs sustainably**

Organizers: Dave Cown (Scion, New Zealand) Jean-Michel Carnus (National Institute for Environmental and Agricultural Science and Research, France), Tim Payn (Scion, New Zealand), João Palma (Technical University of Lisbon, Portugal)

This session will examine the growing importance of planted forests and the potential for intensified production without adversely affecting the wider environment, and will focus on integrated or systems approaches recognizing the importance of interactions of all aspects of forest management.

140 **New uses for wood**

Organizers: William Nikolakis & John Innes (University of British Columbia, Canada)

This session is focused on how new and emerging products (including bio-products and advanced building systems) will re-shape forests and forest research, and how forest science can be adapted to meet the social, economic and ecological challenges facing forests and the potential trend towards using non-renewable wood based products.

259. **Applications of nanotechnology and biotechnology in forest products research**

Organizer: Andrew Wong (Universiti Malaysia Sarawak, Malaysia)

This session considers contributions from the fields of nanotechnology and biotechnology in the development of innovative forest products.

258. **Bio-based composite and engineered products from wood and non-wood forest resources**

Organizer: Andrew Wong (Universiti Malaysia Sarawak, Malaysia)

This session will include topics on recent advances in the innovation, processing and utilization of bio-based composites and engineered bio-based products from wood and non-wood forest resources linked to the efficient use of forest residues and plantation resources

159 **Emerging green and sustainable alternatives to classical wood preservative to protect forest products**

Organizers: Donatien Pascal Kamdem (Michigan State University, USA), Jöran Jermer (SP Technical Research Institute of Sweden), Andrew Wong (Universiti Malaysia Sarawak) & Nasko Terziev (Swedish University of Agricultural Sciences)

This session will explore recent research and technology used worldwide to improve stability and durability of wood products such as biological, chemical and physical modification and test methodologies to evaluate and predict their in-service performance in different applications.

186 **Recovery, reuse, and recycling of wood products for a greener future**

Organizers: Phil Araman (U.S. Forest Service), Robert Bush & Robert Smith (Virginia Tech, USA)

This session will present recent innovations to enhance recover, reuse and recycle construction waste, and end-of-use wood products.

197 **Forest resources assessment for non-wood forest products**

Organizers: Marco Marchetti (University of Molise, Italy); James Chamberlain (U.S. Forest Service), Pawel Staniszewski (Warsaw University of Life Sciences, Poland) & David Pettenella (University of Padua, Italy)

This session will explore the status and challenges of including non-wood forest products in national forest resource assessments.

162 **Greening society and non-wood forest product commercialisation: assessing the environmental, economic and social trade-offs**

Organizers: Luis Fontes (Technical University of Lisbon, Portugal), Jenny Wong (Wild Resources Ltd, UK), Robert Mavsar (European Forest Institute, Finland) & Marla Emery (U.S. Forest Service)

This session will explore trade-offs inherent in the sustainable provision of NWFPs and the possible consequences of globalization of demand for new products and services on the environment and on forest-dependent communities.

98 **Sustaining bamboo and rattan resources**

Organizers: Jinhe Fu (International Network for Bamboo and Rattan, China), Yan Yu (International Center for Bamboo and Rattan, State Forestry Administration of China) & Jinzhong Xie (Chinese Academy of Forestry)

This session will focus on basic and applied research surrounding the conservation and sustainable utilization of bamboo and rattan resources.

125 **Impact of forest certification on sustainable forest management**

Organizers: Wenming Lu (Chinese Academy of Forestry, China), Robert L. Deal (U.S. Forest Service) & John Innes (University of British Columbia, Canada)

This session will assess different aspects of forest certification, including impacts on forest management and timber markets, effects for forest workers and communities affected by certified forest management, quality of certification audits, and governance and authority of certification schemes.

241 **Forest governance and legality of timber: Challenges of legality in practice**

Organizers: Margaret Shannon (University of Freiburg, Germany), Mersudin Avdibegovic (University of Sarajevo, Bosnia-Herzegovina), Wenming Lu (Chinese Academy of Forestry) & Qiang Li (International Tropical Timber Organization, Japan)

This session will critically examine the expectation that forest governance can be improved by strengthening institutional and legal requirements for timber legality within a transnational legal context and with emerging national systems for legality assurance.

Forest Health in a Changing World

Healthy forests are foundational to the delivery of ecosystem goods and services, yet these benefits are under threat from sources ranging from climate change to globalization. Sessions within this Theme focus on trends in hazard occurrence (air pollution, responses to climate change, invasive species introduction, fire, and global trade pathways); vulnerability of forests (tree resistance, shifts in pest and host species relationships, and forest resilience); society and forest health (socio-economic impacts associated with forest health); mechanisms of risk

mitigation (pest management solutions, alternative forest management strategies, modeling); and global trade issues (surveillance strategies, forest pest incursion management, and phytosanitary protection).

8 **Modeling as a tool for improving the knowledge on forest vulnerability and risk exposure in a changing world**

Organizers: Alessandra De Marco (ENEA, Italy) & Salim Belyazid (Lund University, Sweden)

This session will explore various modeling approaches to assess the effects of climate change and air pollution on forest ecosystems.

124 **Impact and monitoring of forest pests and pathogens in a changing world**

Organizers: Maartje J. Klapwijk & Johanna Boberg, (Swedish University of Agricultural Sciences) & Jolanda Roux (FABI/University of Pretoria, South Africa)

This session will examine emerging pests and pathogens in relation to global change, the impact of these disturbance agents within the context of forest resilience and possibilities to monitor for critical changes.

191 **Monitoring emerging threats to forest health in North America across regional to national scales**

Organizers: Borys Tkacz (U.S. Forest Service) & Kevin Potter (North Carolina State University, USA)

This session will explore indicators of forest health trends from regional to national scales that are useful for monitoring change across the landscape.

184 **Forest health in changing landscapes: The roles of landscape patterns**

Organizers: Kurt Riitters (U.S. Forest Service) & Peter Vogt (European Commission Joint Research Centre, Institute for Environment and Sustainability)

This session is focused on the mitigation of forest health impacts induced by climate change through manipulation of landscape patterns.

180 **Air pollution as a factor affecting global forest health**

Organizers: Algirdas Augustaitis (Aleksandras Stulginskis University, Lithuania), Andrzej Bytnerowicz (U.S. Forest Service) & Robert Jandl (Research and Training Centre for Forests, Natural Hazards and Landscape, Austria)

The session will focus on global impacts of air pollution on forest health related to the relationships between climate change and air pollution effects.

14 **Ozone and forest health**

Organizers: Zhaozhong Feng (Chinese Academy of Sciences) & Elena Paoletti (National Research Council, Institute of Plant Protection, Italy)

The impacts of climate change on ozone formation and ozone damage to vegetation will be discussed.

85 **Critical loads for nutritional nitrogen deposition: Progress and problems**

Organizers: Sarah Jovan, Andrzej Bytnerowicz & Mark Fenn (U.S. Forest Service)

The session is focused on the concept of Critical Loads as a management tool for air pollutant loading and the development of science-based air quality policy that protects ecosystem health.

94 **Changes in distributional ranges in a changing world**

Organizers: Patrick Tobin (U.S. Forest Service) & Christelle Robinet (National Institute for Environmental and Agricultural Science and Research-URZF, France)

The session is focused on abiotic and biotic drivers of changes in species distribution ranges for both invasive and native species.

38 **Is climatic change modifying the characteristics of insect damage in forests?**

Organizers: Francois Lieutier (University of Orleans, France), Timothy Paine (University of California, Riverside, USA) & Rodney Keenan (University of Melbourne, Australia)

This session will focus on the effects of climate change and changing forest management systems on insect damage to trees across multiple forest types

69 **Mechanisms of tree defense across forest insect feeding guilds: Can a comparative approach help predict responses to climate change?**

Organizers: Barbara Bentz (U.S. Forest Service) & Ken Raffa (University of Wisconsin, USA)

This session will compare defense mechanisms utilized by various host tree species across multiple insect feeding guilds, forest types and environmental conditions.

15 **Societal impacts of invasive forest pathogen and pests**

Organizers: Matteo Garbelotto (University of California at Berkeley, USA), Giles Hardy (Murdoch University, Australia) & Paolo Gonthier (University of Turin, Italy)

This session will explore the social impacts related to the loss of native forests to exotic insects and disease.

166 **Global approaches to the biological control of invasive Eucalyptus pests**

Organizers: Simon Lawson (Queensland Department of Agriculture, Fisheries and Forestry, Australia),

Toni Withers (Scion, New Zealand) & Helen Nahrung (University of the Sunshine Coast, Australia)

This session focuses on biological control of eucalypt pests worldwide, including updates on biocontrol programs for long-established pests, recent invasions, and the selection of effective control agents..

153 **Consequences of changing trophic interactions on forest insect population dynamics**

Organizers: Aaron S. Weed, Carissa F. Aoki & Nina K. Lany (Dartmouth College, USA)

This session is focused on how climate change, nitrogen deposition, and land use change can influence forest insect abundance via effects on trophic interactions.

34 **The co-evolution of insects and fungi that form symbiotic relationships and kill forest trees**

Organizers: Mee-Sook Kim (Kookmin University, Republic of Korea) & Philip Cannon (U.S. Forest Service)

This session will focus on tree mortality that is the result of mutualistic symbioses between insects and fungi.

102 **Emerging invasive forest pathogens**

Organizers: Phil Cannon (U.S. Forest Service), JP Skovsgaard (Swedish University of Agricultural Sciences), Ned Klopfenstein (U.S. Forest Service) & Steve Woodward (University of Aberdeen, UK)

This session will highlight the emerging forest pathogens Puccinia psidii and Hymenoscyphus pseudoalbidus, which are causing significant disease in the southern and northern hemispheres respectively.

206 **Ecology and management of invasive wood boring pests in a changing world**

Organizers: Juan Carlos Corley (CONICET- INTA, Argentina), Massimo Faccoli (DAFNAE-Agripolis, Italy), Michael Smith (USDA-ARS, USA) & Brett Hurley (University of Pretoria, South Africa)

This session will focus on two specific groups of invasive insects, longhorned beetles and wood wasps, which are causing significant damage to forest ecosystems worldwide.

172 **Research on pathway risk management and phytosanitary policy to prevent invasions of forest insects and pathogens**

Organizers: Eckehard Brockerhoff (Scion, New Zealand), Andrew Liebhold (U.S. Forest Service) & Jolanda Roux (FABI/University of Pretoria, South Africa)

This session will cover a wide range of current research on pathway risk management and phytosanitary policy aimed at reducing the risk of pest and disease introduction associated with international trade.

135 **Multiple risk management in planted forests**

Organizers: Hervé Jactel (National Institute for Environmental and Agricultural Science and Research, France), Christophe Orazio (European Forest Institute, Finland) & John Moore (Scion, New Zealand),

The session is focused on biotic and abiotic risks to planted forests from the perspectives of hazard assessment, effects of management practices on vulnerability, economic impacts and multiple risks analyses.

151 **Wood Packaging Materials: Strategies to control exotic pests**

Organizers: Donatien Pascal Kamdem (Michigan State University, USA), Andrew Wong (Universiti Malaysia Sarawak) & Nasko Terziev (Swedish University of Agricultural Sciences)

This session will focus on science and technology on phytosanitary treatments and methods to control pests on wood materials packaging and the technical and regulatory issues related to implementation, monitoring and verification of treatment efficacy.

Special sessions for students and young scientists

The "IUFRO Incubator"

Organizers: JP Skovsgaard (Swedish University of Agricultural Sciences), other IUFRO Divisional representatives & IFSA (International Forestry Students Association)

*Five technical sessions will be organized for recently graduated students to present a summary of their BSc, MSc or PhD theses. In these sessions, each speaker is allowed only three minutes and one power point slide. **Further details will be available in early 2014.** Presentation title, abstract and an indication of the preferred session through may be submitted via the special registration system at http://iufro2014.com no later than 31 March 2014. Submissions that are not accepted for presentation will be offered a poster presentation. You can see examples of three-minute presentations at http://threeminutethesis.org/*

Sub-Plenary Sessions

Forests for people: Ecosystem services under pressure?

Organizers: Ulrike Pröbstl-Haider (University of Natural Resources and Life Sciences, Austria) & Perry Brown (University of Montana, USA)

This session will highlight the current state-of-knowledge on the direct contributions of forests to human well-being in rural and urban landscapes, including their role in supporting livelihoods, health, recreation and tourism, spirituality, culture, and education.

Cultural values, quality of life and forest landscapes

Organizer: Mauro Agnoletti (University of Florence, Italy)

This session will focus on the historical and current role of cultural values in shaping and conserving forest and woodland landscapes worldwide, including historical interrelationships between cultural and biological diversity, cultural landscapes and their management for tangible and intangible benefits, and the integration of cultural values in sustainable forest management.

Forest foods, medicines and human health

Organizers: Hannu Raitio (Finnish Forest Research Institute), James Chamberlain (U.S. Forest Service, USA), Carsten Smith-Hall (University of Copenhagen, Denmark) & Tuija Sievänen (Finnish Forest Research Institute)

This session will explore the state of knowledge on how forests around the world provide products and services that maintain and improve human health and well-being, and the values and challenges of integrating the forest resources that supply these products and services into forest management

Policy learning for multi-level governance

Organizers: Daniela Kleinschmit (Swedish University of Agricultural Sciences) & Ben Cashore (Yale University, USA)

This session will explore the potential and pitfalls of policy learning as a way to link scholarly and practitioner communities around problem solving, identify the types of problems policy learning might be able to address, and discuss the current scientific understanding of policy learning processes, and how policy learning can be fostered.

Resilience of forest ecosystem services to changing disturbance regimes

Organizers: Rupert Seidl (University of Natural Resources and Life Sciences, Austria) & Tom Spies, U.S.Forest Service)

The session will address questions of how forest disturbance regimes might change in the future, how vulnerable ecosystem services are to such changes, and how ecosystem management can foster resilience to changing climate and disturbance regimes.

The Importance of quantifying uncertainty in managing forests

Organizers: Ruth Yanai (State University of New York-ESF, USA), David Paré (Canadian Forest Service), Peter Clinton (Scion, New Zealand) & Bogdan Strimbu (Louisiana Tech University, USA)

This session will describe sources of uncertainty in estimates of forest carbon and nutrient pools and fluxes, including natural spatial and temporal variation, measurement error, model uncertainty, and model selection, and address how these uncertainties can guide monitoring designs and affect management and policy decisions.

Energy from trees: Technology, opportunities, and challenges

Organizers: Woodam Chung (University of Montana, USA) & Hans Heinimann (Swiss Federal Institute of Technology in Zurich, Switzerland)

This session will introduce the state-of-the-art technologies for forest biomass production and utilization for bioenergy, and discuss the technical, logistical, financial, social and environmental challenges and opportunities of biomass utilization for energy in the rapidly advancing bioeconomy.

Forest biodiversity, ecosystem services and human well-being – harnessing biodiversity for adaptation to global change

Organizers: Bryan Finegan (CATIE, Costa Rica), Robert Jandl (Research and Training Centre for Forests, Natural Hazards and Landscape, Austria) & JP Skovsgaard (Swedish University of Agricultural Sciences)

The session will explore the current state of knowledge regarding the role of taxonomic and functional diversity in the provision of various forest ecosystem services, the trade-offs often required for successful multi-functional management of forests for different ecosystem services, and associated management and policy challenges including governance at the territorial scale.

Integrating the economics of ecosystem services into sustainable forest management

Organizers: Donald Hodges (University of Tennessee, USA), Donald Grebner (Mississippi State University, USA) & Lidija Zadnik-Stirn (University of Ljubljana, Slovenia)

This session will examine specific ecosystem services and the state-of-the art in estimating their values. The session also will address how they have affected sustainable forest management globally - emphasizing issues/barriers to incorporating ecosystem services, identified research needs, appropriate scales for implementation, and innovative methodologies for measuring the inherent multifunctionality of ecosystem services.

Advances in large-scale forest inventories to support the monitoring and the assessment of forest biodiversity and ecosystem services

Organizers: Anna Barbati (University of Tuscia, Italy), Piermaria Corona (Consiglio per la Ricerca e la sperimentazione in Agricoltura, Arezzo, Italy), Frédéric Gosselin (Irstea, France) & Ronald E. McRoberts (U.S. Forest Service)

This session will explore recent progress in the development of indicators for monitoring the effects of forest management activities on ecosystem services provision, and cutting-edge inventory methods for the spatial estimation of biodiversity and ecosystem service indicators on multiple spatial scales.

Biodiversity and ecosystem services in planted forests

Organizers: Eckehard Brockerhoff (Scion/New Zealand Forest Research Institute), Hervé Jactel (INRA, France) & Peter Freer-Smith (Forest Research, UK).

This session will review a range of ecosystem services provided by biodiversity in planted forests, identify the state of knowledge for each area, and outline innovative measures by which the provision of ecosystem services from planted forests could be enhanced, at the stand, forest, and landscape scales.

Forests, water, and people

Organizers: Liu Shirong (Chinese Academy of Forestry); Ge Sun (U.S. Forest Service) & Tony Simons (World Agroforestry Centre, Kenya)

This session will review the state of knowledge on forest and water relations at multiple geographical scales, water availability for ecosystems and people under multiple global change stressors, and forest watershed management policies to meet increasing multiple needs and adapt to a changing world.

Forest health in a changing world

Organizers: Tod Ramsfield (NRCan-Canadian Forest Service) & Eckehard Brockerhoff (Scion/New Zealand Forest Research Institute)

This session will examine the role of global change on pest population dynamics, pathway management and global trade, science-policy interactions and forest resilience to promote sustainable forest ecosystems under changing conditions.

Stemming invasions of forest insects and pathogens: Research supporting pathway risk management and phytosanitary policy

Organizers: Andrew Liebhold (U.S. Forest Service) & Eckehard Brockerhoff (Scion/New Zealand Forest Research Institute)

This session will provide an overview of current research on pathway management and phytosanitary policy to reduce the risks of introduction of forests pests and diseases associated with international trade.

The future of our forests

Organizers: William Nikolakis & John Innes (University of British Columbia, Canada)

This session will examine the implications of globalization; the consequences from a growing reliance on plantations; the emergence of new products (such as bio-products and advanced building systems), and the development of forest ecosystem services and their impacts for forests, forest research, and forest dependent communities.

Historical responses of research to global forestry issues

Organizer: Jeffery Burley (University of Oxford, UK)

The session will comprise a leading paper reviewing the changes in the forestry sector since the 1980s, followed by responses given by four IUFRO Past-Presidents (1990-2010) showing how the research community responded to the challenges during their time in office.