

The International Union of Forest Research Organizations (IUFRO) is a non-profit, non-governmental international network of forest scientists, which promotes global cooperation in forest-related research and enhances the understanding of the ecological, economic and social aspects of forests and trees. IUFRO's 125th Anniversary Congress was held in Freiburg, Germany, 18-22 September 2017.

IUFRO is "the" global network for forest science cooperation. It unites more than 15,000 scientists in almost 700 Member Organizations in over 120 countries, and is a member of the International Council for Science (ICSU). Scientists cooperate in IUFRO on a voluntary basis.

IUFRO's field of scientific activity is spread over nine Divisions covering key forest research fields: Silviculture; Physiology and Genetics; Forest Operations, Engineering and Management; Forest Assessment, Modelling and Management; Forest Products; Social Aspects of Forests and Forestry; Forest Health; and Forest Policy and Economics.

Each of those Divisions is broken into units that focus on specific aspects that fall under the divisional umbrella.

**Five of the nine Divisions held all-division meetings in conjunction with the IUFRO 125th Anniversary Congress. At the all-Division meetings, researchers were brought up to date, through a number of presentations, on issues and findings pertinent to them.**

"Our Division's work was very well reflected in this Congress," he said. "We held our All-Division meeting as part of this 125th anniversary. And, during the Congress, 16 technical sessions and a subplenary were devoted to Division 3.

**"But, what was incredibly important was that our all-Division meeting provided the opportunity for Division members – from all over the world – to meet each other.**

"The Congress brought all forestry disciplines together, and so presented a unique opportunity for our Division members to be exposed to other disciplines. Our members learned something new in this way, and could then relate their research to other disciplines. That's a major benefit of IUFRO Congresses – not only this one, but also IUFRO World Congresses in general," he said.

"The theme of this Congress was *interconnecting forests, science and people*. It's aim was to provide a platform for the exchange of scientific knowledge across the full range of forest and forest-related topics and scientific disciplines.

"Forest science is not a single, isolated player. We have the same goal to achieve. Classic forestry, for example, is represented by Divisions 1, 3, and 5," Dr. Chung said.

"While Division 3 does promote interdisciplinary research within and beyond the field of forest sciences – we learn from other disciplines, and create synergy and innovations by bringing new perspectives and new solution approaches into our discipline – I'd like to see more cooperation between Division 3 members and members of the other Divisions – like with silviculturists in Division 1 and forest products specialists in Division 5," he said. "We are the core focus areas of forestry.

*Division 3 – Forest Operations, Engineering & Management includes all aspects of forest engineering (including forest infrastructure, machinery, and operational methods in all forestry practices and in all types and ages of forests); operations in forest nurseries; operations related to silvicultural activities; operational planning, management, modelling, information systems, and control; work study, payment methods and labour productivity; ergonomics, including health and safety; operations related to small-scale forestry; harvesting and in-woods utilization of both timber and non-timber forest products; logistics; and the interface between forest operations and environmental protection, including site impacts.*

*The units within Division 3 look into: Harvesting and transportation engineering; stand establishment and treatment; Forest operations ecology; Forest operations in mountainous conditions; Forest operations in the tropics and Small-scale forestry.*

**Dr Woodam Chung of Oregon State University, USA, and Coordinator of Division 3, elaborated on his Division's work:**





"I'd like us to build better linkages between these areas, especially in light of the new technologies on the horizon, to find better ways to manage forests for social, environmental, and other needs. It's time for us to apply what we know with these emerging technologies and partners," he added.

"Our Division believes that **thinking outside-the-box and bringing new innovations are necessary** to revive our research and profession. We are facing great challenges, but we believe these challenges offer great opportunities, the opportunity to bring ourselves to the next level," he said.

**Among the challenges Dr Chung sees are the loss of forest engineering research and education capacities; reduced student interest in traditional forestry programs; the aging forest workforce; decreased academia-forest industry collaboration, and reduced technology transfer across the globe.**

"Furthermore," he said, "diminishing visibility and recognition of forest engineering research outputs, and their vital importance to the larger forest science world have become a serious challenge. All of these challenges are linked together and could have long and deep impacts on the future of our discipline and profession.

**"Division 3 has been putting great efforts into addressing these challenges," he said. "We identified emerging research fields that can contribute to the resolution of the pressing challenges. Those include forest biomass utilization, supply chain management, precision forestry, and human factors.**

"Increasing demands on renewable energy and bio-based products challenge our profession to develop new technologies for handling and using forest biomass. Holistic approaches are needed to measure environmental performance of forest harvesting and transportation systems. Innovative approaches are necessary to tackle complex and challenging forest supply chains. Control systems engineering, big data mining and collaborative supply chain management all demand our attention and expertise," he added.

"Applied engineering in precision forestry holds great promise for improving management of forest grounds and vegetation, but still needs substantial development of practical applications. Likewise, human factors engineering needs to expand its research boundaries to include more human-machine interfaces and work systems design."

Dr. Chung believes innovations in the above-mentioned fields (i.e., woody biomass utilization, precision forestry, and machine-human interactions) can attract the next generations of students and research scientists. It can also help develop new courses and research programs for forestry education. Innovations in forest practices through research in human factors engineering, machinery design and precision forestry could also provide a new solution to the issues related to decreasing and aging workforces in forestry.

**What it all comes down to, he said is that "forest operations and engineering is really where the rubber hits the ground. All the ideal theories and concepts can be realized only when they are applied to the ground. This is exactly what we in Division 3 do."**

And, looking at the Congress outcomes, Dr. Chung said: "This Congress provided us with a glimpse of the future—new technologies, new innovations that are on the horizon. These technologies or innovations may not be in practice yet, but are coming. **This forum has given us an opportunity to see the future of forest engineering.**"

*Visit the [IUFRO Anniversary Congress website](http://iufro2017.com/) for an overview of the program and for photos. Videos of the live-streamed sessions will be available on: <http://iufro2017.com/>*



*Pictures: Woodam Chung (page 1; 3rd and 4th from the top on page 2); FVA/Klaus Polkowski (top on page 2); IUFRO (forest biomass); Pixabay (logs, page 1)*