



Forest genomics, climate change, and social science: Workshop explores opinions about forest



Janie Myers photo

Forest genomics—another tool that can assist in creating the type of future forest desired.

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FORREX was one of many organizations that was invited by a research team from the University of British Columbia to attend a workshop to “Explore Opinions about Forest Genomics and Climate Change Research Results.” At this October 14 workshop, participants were asked to provide their opinions on forest genomics and climate change research results.

However, before one can offer an opinion on forest genomics, it is important to understand what genomics is. This required learning some of the terms involved and some context around how genomics research can play a role in forest management in British Columbia.

First, some definitions. Genomics is the study of the structure, function, and sequence composition of the genome (all the genes and DNA in a cell or living organism). Primarily, this area of study investigates gene sequences to learn more about what they do, how they affect cell and organism function, and how they interact with the environment. Genomics usually involves looking at more than one gene at a time. In forestry, genomics research can look at how gene sequences and DNA in tree cells can make some individual trees resistant to drought or to attacks by insects and diseases.

Next, some context about genomic research. Much of the research around genomics is funded by Genome Canada—a not-for-profit organization established in February 2000—which was given the mandate by the Government of Canada to develop and implement a national strategy for supporting large-scale genomics and proteomics research projects for the benefit of all Canadians (www.genomecanada.ca/en/about/). In its strategy, six Genome Centres were created. One of these centres is Genome BC, a research organization that invests in and manages large-scale genomics and proteomics research projects and science and technology platforms focused on areas of strategic importance such as human health, forestry, fisheries, agriculture, bioenergy, mining, ethics, and the environment (www.genomebc.ca).

The workshop was organized by a team of UBC researchers from the Faculty of Forestry, who were successful in receiving funding from Genome Canada, Genome BC, and the Province of British Columbia for an interdisciplinary project. Their project is examining the genetic basis of weevil-resistance mechanisms in young spruce stands (research led by **Drs. Joerg Bohlmann** and **Kermit Ritland**, Department of Forest Science); the potential timber supply impacts of introducing such weevil resistant spruce in British Columbia (research led by **Dr. Gary Bull**, Department of



genomics and climate change research results

Forest Resources Management); and the genomic-related ethical, environmental, economic, legal, or social issues (GE³LS) associated with the genomic research and its potential use (research led by **Dr. Paul Wood**, Department of Forest Resources Management). This workshop was actually the third mechanism used to collect data. Prior to the event, the team had collected data from interviews with stakeholders and from an online public survey, which was advertised in various communities in British Columbia.

Being part of “the data” is an interesting experience for someone who has “collected data” as part of their professional career. It certainly gives one insights into some of the challenges of social science research. Workshop participants were divided into small groups and asked to develop reasons for and against selecting, propagating, and deploying weevil-resistant spruce. This process involved filling in and discussing (using flip chart paper on the wall) a matrix that looked at the ethical, environmental, economic, legal, and social reasons for and against the following choices:

- Selecting weevil-resistant spruce: Reasons for and against no selection
- Selecting weevil-resistant spruce: Reasons for and against visual selection
- Selecting weevil-resistant spruce: Reasons for and against genetic marker selection
- Propagating weevil-resistant spruce: Reasons for and against no propagation
- Propagating weevil-resistant spruce: Reasons for and against cloning
- Propagating weevil-resistant spruce: Reasons for and against tree breeding
- Deploying weevil-resistant spruce: Reasons for and against no deployment
- Deploying weevil-resistant spruce: Reasons for and against in semi-managed forests
- Deploying weevil-resistant spruce: Reasons for and against in intensively managed plantations

Unlike sampling soil or foliage, when humans are sampled and they don't fully understand the topic or its context, they tend to seek answers. This workshop was no exception. Due to the lack of experience or knowledge about many of the

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activities and principles involved in tree breeding by some of the invited participants, time was spent trying to answer questions and provide examples of how the tree breeding program functions in British Columbia. This information and clarification allowed participants to engage in the process more actively.

Once the matrix process was completed, the group was divided into another set of small groups to draft advice on how British Columbia might proceed regarding the selection, propagation, and deployment of weevil-resistant spruce. Participants were told that this “advice” would be forwarded to government as part of the GE³LS project summary report.

If the sentiment in the room in Vancouver at the end of the workshop is any indication, there is certainly a broad level of support for using genomic research to isolate DNA markers associated with weevil-resistant spruce. However, the cost of the technology, the legal issues around “who owns the markers,” and the potential lack of return on the investment make future use of this tool by the tree-breeding research community questionable. I certainly look forward to reading the results of the “data collection” once the reports have been finalized and made public, but until then, it was rather nice to be able to spend time providing an opinion, rather than collecting and synthesizing the opinions of others. For more information on this project, please visit www.treenomix.ca 