Comings and Goings

Overview

We welcome Troy Anthony, the new Chief of Science and Policy and Dr. Xianli Wang, fire research scientist. We also wish entomologist Dr. Barry Lyons all the best in his retirement.

Troy joined the GLFC Planning and Operations team in June 2015 as Chief, Science and Policy. He was formerly with the Ontario Ministry of Natural Resources and Forestry (MNRF), where he was responsible for running the provincial independent forest audit program and provincial reporting. Troy will be leading policy and liaison functions at GLFC, including forest policy analysis and facilitation of communication and dialogue among scientists and policy makers. He will also lead collaborative ventures and partnership projects with government, industry, and other forest sector organizations at regional, national, and international levels. Please contact Troy for science-policy matters at the GLFC.

Xianli joined the fire research team in December 2015 as a research scientist. He came from the University of Alberta and has research experience in landscape ecology, fire science, forest ecology, and global change ecology. While at GLFC, Xianli's research will be focused on fire and climate change, spatial fire prediction, and fire ecology/behaviour.

Barry published extensively on numerous forest pests and most recently was the spokesperson for matters related to the emerald ash borer (EAB). His research on this pest involved the release of a Chinese parasitoid into Canada for testing as a potential biological control agent. He also co-authored a best practices manual for management of EAB urban environments. He published over 60 papers (http://cfs.nrcan.gc.ca/authors/read/12709) during his career with the CFS.

New insect named after former GLFC researcher

Overview

Former GLFC entomologist Peter de Groot, who passed away in 2010, recently had an insect named after him. The Xeris degrooti is a wood wasp (or horntail) in the Siricidae family.

The insect was named after Peter to reflect the contribution he made toward better understanding the Siricidae family of insects and for his efforts in collecting numerous live and preserved specimens.

Peter was a research scientist in Applied Insect Ecology. During his career, he carried out research on numerous insects and his contributions to the science of forest entomology were numerous and diverse. He published journal articles on all five of the newest alien invasive species that currently plague Canadian forests: the larger pine shoot beetle, brown spruce longhorn beetle, emerald ash borer, Asian longhorned beetle, and Sirex woodwasp, which he studied most recently. At the time of his death, he was co-editing a book on the insect.

During his distinguished career, Peter received many accolades. He published 69 scientific papers in refereed journals, 7 books, 12 book chapters and many publications in conference proceedings, government publications and reports, among a long list of accomplishments.

Innovative method developed for hemlock woolly adelgid (HWA) sampling

Overview

New sampling methods that allow for sampling higher in the canopy improve the chances of detecting HWA in the early stages of an infestation.

HWA is an alien invasive pest that that is causing decline and mortality of eastern and Carolina hemlocks in the United States and is a threat to hemlock trees in Canada. HWA now infests all five American states that share a border with eastern Canadian provinces, so the detection and delineation of new infestations is increasingly important. Currently, ground-based (visual) detection surveys are carried out, whereby surveyors follow a pre-specified path in hemlock stands and examine foliage with the naked eye or binoculars. This type of survey may be sufficient to detect a light infestation, (1-4 trees per hectare) and allows managers to take action before tree damage becomes unacceptable. It also requires little equipment and is relatively rapid. Some limitations are that the visual survey is limited to foliage within 6 m of the ground. An infestation high in the crown of a tall tree may go unnoticed for several years. Meanwhile, the infestation can spread to neighbouring trees and stands.

Current research efforts at GLFC (in partnership with colleagues at Cornell University) are focused on the development of two sampling methods, both of which offer the possibility of detecting HWA throughout the crown of a tree, irrespective of its height.

Wool or ball sampling is an active technique that targets the ovisacs and has the surveyor launch Velcro®-covered racquetballs with a sling shot into tree crowns to snag HWA wool. The other is a passive sampling technique that involves laying a sticky trap under a tree for HWA crawlers to land on. A single trap has the potential to cost-effectively sample a much larger area than either visual surveying or wool sampling and is particularly useful in difficult terrain. The use of these techniques could improve detection and delineation of new HWA introductions/arrivals in Canada and might prove useful for monitoring how its distribution changes over time.

For more information on HWA and the threat to Canadian hemlock forests, refer to Frontline Technical Note 114 and for more information on these sampling methods, refer to Frontline Technical Note 116 or contact Jeff Fidgen or Jean Turgeon.

Medicinal properties of northern Ontario plants

Overview

Natural products chemist Mamdouh Abou-Zaid recently published an article on the antibacterial and antifungal properties of some northern Ontario plants and their extracts.

There is an increasing interest in the medicinal properties of plants, particularly with reported multidrug resistant microorganisms on the rise, which is an emerging global health crisis. In this study, the antimicrobial activities of selected natural plant products from the flora of northern Ontario were assessed.

First Nations Peoples of Canada used a vast number of plant species as medicine and conifers were the most widely used group. Over 400 species have been documented and analysis has shown 105 plants were effective based on phytochemical constituents. This study showed that certain plant extracts exhibited antimicrobial or antifungal properties. The most notable were extracts of four plant species: Prince's Pine, (also known as Umbellate Wintergreen or Pipsissewa - a small perennial flowering plant found in dry woodlands or sandy soils), white birch, staghorn sumac and green ash as well as six compounds from white birch.

Dr. Abou-Zaid currently has his office at the University of Western Ontario, where he is an adjunct research professor. He can be contacted at mamdouh.abouzaid@canada.ca.

Ash regeneration capacity after emerald ash borer (EAB) outbreaks

Overview

Scientists examined sites formerly occupied by ash near the epicentre of the EAB outbreak in Canada and found abundant ash regeneration present in the area.

EAB has killed millions of ash trees in North America since its detection in 2002. GLFC researchers organized a field investigation to examine ash regeneration and infestation ten years after EAB was detected in Canada. The area studied was in Essex County, Ontario, the epicentre of the Canadian EAB outbreak. Results showed abundant ash regeneration after mature tree mortality, but on close examination under the bark of these seedlings, many were found to be already infested with EAB, even in stems as small as 2 cm in diameter. While the likelihood of these stems reaching maturity appears low, the resprouting from dead ash trees represented an important proportion of new ash growth. This suggests that ash could potentially persist in the landscape, at least as a low shrub with rapid regeneration/death cycles. When combined with knowledge of ash ecology, we believe that ash is unlikely to maintain its previously important functional role within the ecosystem. This work improves our understanding of the effects of EAB on ash populations, and allows us to suggest practical management steps consistent with ash ecology.

For more information on this project, read the full article, or contact Isabelle Aubin.

Recycling bioenergy ash in forests: hiccups and hurdles

Overview

Paul Hazlett presented a webinar on January 26 about his work with wood ash as a soil amendment.

A by-product of energy production from woody biomass is ash. Thus, increased bioenergy use creates challenges related to ash storage, disposal and usage which may affect the deployment of forest bioenergy as a renewable energy supply. Forest land application of wood ash could improve soil fertility, divert materials from landfills and close a loop in the cycling of nutrients in managed forest systems. However, before widespread use of ash as a soil amendment is approved in forest management it must be demonstrated that its use is environmentally beneficial to the forest and economically viable from an operational perspective. This webinar provided an overview of wood ash physical and chemical properties and some of the possible benefits and drawbacks of applying ash to forests. The early results of a recently funded Program of Energy Research and Development (PERD) project "Amelioration of biomass harvested sites with wood ash waste: improving Canadian forest productivity and sustainability through an alternative approach to bioenergy waste management" were presented. The overall objective of this project is to provide potential producers and consumers of wood ash, and regulators and forest managers responsible for the disposal and usage of wood ash, with the scientific, techno-economic and policy-relevant knowledge required to develop environmentally sustainable forest management policies for forest ash applications. Results from an ongoing ash application field trial at a boreal forest site near Chapleau, Ontario examining the effects of ash on soil properties and processes were also presented. The slide presentation and audio recording for this and previous webinars are available for download at ftp://ftp.nrcan.gc.ca/cfs/glfc/.

Robust management of non-native pest invasions with a scenario-based approach

Denys Yemshanov presented a webinar on January 26 about a scenario-based optimization model that incorporates uncertainty about the spread of an invader and optimizes the deployment of survey and mitigation efforts.

Uncertainty about future outcomes of ecological invasions has long been recognized as a major hurdle in the planning of pest management programs. The model accounts for program budget constraints and decision-maker's "slow-the-spread" aspirations.

We demonstrated the approach by allocating verification surveys for Asian longhorned beetle (ALB, Anoplophora glabripennis) in the Greater Toronto Area (GTA) of Ontario, Canada. ALB, which is one of the most threatening invasive forest insects in North America, was discovered in the GTA and a small area is currently under quarantine. We used data on historical ALB spread to generate a set of stochastic invasion scenarios that characterize the uncertainty of the pest's extent and impact in the GTA. We then used these scenarios in our optimization model to find the cost-effective deployment of surveys and tree removal aimed to stop the spread of the pest.

Our survey model produced a two-tiered pattern of survey locations, where the majority were allocated to high-risk sites in close proximity to the quarantine zone, and a smaller percentage to distant sites that could serve as potential hubs for spreading the insect elsewhere. Overall, the model helps guide the survey planning process by exploiting the following decision-making strategies: (i) surveying sites with the highest risk of pest arrival, (ii) minimizing the expected number of remaining susceptible host trees in the managed area, (iii) reducing the capacity of the pest to spread to uninvaded sites and (iv) minimizing the marginal costs of tree removal, by including sites with lower host densities. Our approach is generalizable and helps support management decisions regarding pest surveys when knowledge about a pest's distribution and spread is imprecise.

The slide presentation and audio recording for this and previous webinars are available for download at ftp://ftp.nrcan.gc.ca/cfs/glfc/.

State of Canada's Forests Report: Celebrating 25 years of reporting on Canada's forests

Since 1990, Canada has been using The State of Canada's Forests report to chronicle the country's progress towards sustainable forest management. This annual report is the only national snapshot of the social, economic and environmental status of forests and forestry in Canada. The 2015 edition of the report continues to demonstrate that the Government of Canada knows how valuable forests are to Canadians; they are as important today as they were 25 years ago. It features a series of infographics that highlight topics such as the global use of Canadian forest products, employment trends in the forest sector and innovative forest products.

Recent Publications

Aubin, I.; Cardou, F.; Ryall, K.; Kreutzweiser, D.; Scarr, T. 2015. Ash regeneration capacity after emerald ash borer (EAB) outbreaks: Some early results. Forestry Chronicle 91(3):291-298.

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MacQuarrie, C.J.K.; Scharbach, R. 2015. Influence of mortality factors and host resistance on the population dynamics of emerald ash borer (Coleoptera: Buprestidae) in urban forests. Environmental Entomology 44: 160-173.

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Mallon, E.E.; Turetsky, M.R.; Thompson, I.D.; Fryxell, J.M.; Wiebe, P.A. 2016. Effects of disturbance on understory succession in upland and lowland boreal forests and implications for woodland caribou Rangifer tarandus caribou. Forest Ecology and Management 364:17-26.

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Pedlar, J.; McKenney, D.; Lawrence, K.; Papadopol, P.; Hutchinson, M.; Price, D. 2015. A comparison of two approaches for generating spatial models of growing season variables for Canada. 2015. Journal of Applied Meteorology and Climatology 54(2):506-518.

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Undri, A.; Abou-Zaid, M.; Briens, C.; Berruti, F.; Rosi, L.; Bartoli, M.; Frediani, M.; Frediani, P. 2015. Bio-oil from pyrolysis of wood pellets using a microwave multimode oven and different microwave absorbers. Fuel 153:464-482.

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Venier, L.A.; Dalley, K.; Goulet, P.; Mills, S.; Pitt, D.; Cowcill, K. 2015. Benefits of aggregate green tree retention to boreal forest birds. Forest Ecology and Management 343:80-87.

Webster, K.; Hazlett, P. (compilers). 2015. Long-term ecological research at the Turkey Lakes Watershed: 35th anniversary of interdisciplinary, cooperative research, program booklet and workshop summary (http://cfs.nrcan.gc.ca/publications? id=36193). Natural Resources Canada, Canadian Forest Service, Great Lakes Forestry Centre, Sault Ste. Marie, Ontario. Information Report GLC-X-13, 25 p.