

Innovations in Invasive Species Prevention, Early Detection, & Management Summit

Monday July 9th, 2018

Tannery Pond Community Center, North Creek

Register at <https://tinyurl.com/APIPPSummit2018>

Continuing Education Credits Available (Pending Approval):

NYSDEC Pesticide Applicator

Certified Nursery & Landscape Professional

Society of American Foresters

NY Logger Training

Program Agenda - Morning Session

Advancements in Biological Control & Host Resistance for Invasive Species Management

- 10:00 – Welcome & Introductions (*Brendan Quirion – Adirondack Park Invasive Plant Program*)
- 10:15 – Biological Control of Emerald Ash Borer in New York (*Michael Jones – SUNY ESF*)
- 10:40 – Swallow-wort Biocontrol: What's Happening? (*Dr. Lindsey Milbrath – USDA-ARS*)
- 11:05 – Biological Control for Hemlock Woolly Adelgid in New York (*Dr. Mark Whitmore – NYS Hemlock Initiative*)
- 11:30 – The Quest to Restore American Elms: Nearing the Finish Line (*Gus Goodwin – TNC Vermont*)
- 11:55 – Panel Discussion
- 12:15 – Lunch (Provided)

Program Agenda - Afternoon Session

Advancements in Remote Sensing & New Technologies for Invasive Species Prevention & Early Detection

- 1:00 – Woolly Bully: Monitoring the Impending Hemlock Woolly Adelgid Infestation (*Ariel Walcutt – NASA DEVELOP*)
- 1:25 – Using Landsat Time Series to Characterize Forest Insect Invasions: Case Studies from Southern New England (*Dr. Valerie Pasquarella – University of Massachusetts Amherst*)
- 1:50 – New Technologies & Approaches for Remote Sensing of Forest Pests (*Dr. Rich Hallett – US Forest Service*)
- 2:15 – Automated Cloud Processing Technologies for the Mapping of Aquatic Plants (*Ray Valley - C-Map*)
- 2:40 – Catching a “Unicorn”: Using Partnerships to Help Tackle Aquatic Invasive Species (*Dr. Edgar Rudberg - CD³*)
- 3:05 – Panel Discussion
- 3:30 – Closing Remarks/Depart



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Presentation Descriptions

Biological Control of Emerald Ash Borer in New York - Michael Jones – Emerald ash borer (*Agrilus planipennis*), an invasive wood-boring beetle native to northeastern Asia, was introduced to the United States through solid wood packing material used in international trade. The insect has decimated forests across the Northeast and Midwest killing millions of white, green, and black ash trees. In 2017 it was confirmed in St. Lawrence County, just north of the Adirondack Park. Regulations on firewood transport and tree removal have had some success in slowing the insect's spread, but an effective control mechanism, beyond pesticide treatments to individual trees, has not been found. Biological control represents the best opportunity for widespread control and the State University of New York – College of Environmental Science and Forestry has been researching, rearing, releasing, and monitoring a suite of parasitic wasps as potential biological control agents. A summary of this research and progress to date will be presented.

Swallow-wort Biocontrol: What's Happening - Dr. Lindsey Milbrath – Black and Pale Swallow-wort (*Cynanchum sp.*), also known as dog-strangling vine, is an invasive perennial vine native to Europe that was introduced to the United States as a horticultural plant. It has spread across the Northeast, outcompeting native vegetation, degrading sensitive ecosystems and habitats, and impeding utility and road right of way maintenance activities. A handful of localized infestations have been documented within the interior Adirondacks. Selective herbicide treatments can be effective in controlling small infestations, but an effective control mechanism for infestations that are already widespread has not been identified. Biological control represents the best opportunity for widespread control and the United States Department of Agriculture – Agriculture Research Service has been researching a moth (*Hypena opulenta*) as a potential biological control agent. A summary of this research and progress to date will be presented.

Biological Control for Hemlock Woolly Adelgid in New York - Dr. Mark Whitmore – Hemlock woolly adelgid (*Adelges tsugae*) is an invasive adelgid native to Japan that was introduced to the United States through infested hemlock nursery stock. It has spread across the Southeast and Northeast killing millions of hemlock trees. In 2017 it was confirmed in the Adirondack Park on Prospect Mountain near Lake George. Pesticide treatments to individual hemlock trees can be effective in controlling small, localized infestations, but an effective control mechanism for infestations that are already widespread has not been identified. Biological control represents the best opportunity for widespread control and Cornell University's New York State Hemlock Initiative has been researching, rearing, releasing, and monitoring a silver fly (*Leucopis argenticollis*) and beetle (*Laricobius nigrinus*) as potential biological control agents. A summary of this research and progress to date will be presented.

The Quest to Restore American Elms Gus Goodwin – Dutch elm disease (*Ophiostoma ulmi*), an invasive pathogen native to Asia and spread by elm bark beetles has nearly extirpated American Elm (*Ulmus americana*) from North America's forests. Suspected to be resilient elm trees remain on the landscape but have been rendered functionally extinct. Developing, propagating, and planting resistant strains of elm is now the only option for reintroducing American elm to the landscape. The Vermont chapter of The Nature Conservancy has been collecting, propagating, and planting material from residual elm trees across Vermont and New York to reestablish resistant elms to floodplain forest ecosystems. A summary of this research and progress to date will be presented.

Woolly Bully: Monitoring the Impending Hemlock Woolly Adelgid infestation - Ariel Walcutt – In 2017 Hemlock woolly adelgid (*Adelges tsugae*) was identified in the Southeastern Adirondacks on Prospect Mountain near Lake George. The Adirondack Park contains the highest number and density of hemlock trees of anywhere in the contiguous United States, highlighting the severity of potential impacts and representing a challenge for managers in attempting to locate and respond to incipient infestations. The National Aeronautics and Space Administration's DEVELOP program utilized existing hyperspectral remote sensing data (AVIRIS) for the Adirondacks to demonstrate how the data could be used to map and prioritize individual hemlock stands to help guide future hemlock woolly adelgid early detection efforts. A summary of this pilot project will be presented.

Using Landsat Time Series to Characterize Forest Insect Invasions - Dr. Valerie Pasquarella – Hemlock woolly adelgid (*Adelges tsugae*) and gypsy moth (*Lymantria dispar dispar*) are two invasive insects that have caused widespread defoliation and mortality events across forests of the Southeast and Northeast. Defoliation and mortality captured by satellite imagery and can be used to document spread and severity of impacts. The University of Massachusetts at Amherst has been leading this research and will provide a summary of the Landsat data analysis approach used and progress to date.

New Technologies & Approaches for Remote Sensing of Forest Pests - Dr. Richard Hallett – Remote sensing is an ongoing priority for research and can be used to document declines in forest health, map forest composition, and detect incipient infestations of forest pests and pathogens. The United States Forest Service and National Aeronautics and Space Administration have been leading this research and this presentation will showcase the latest remote sensing sensors/technologies (ex. AVIRIS & G-LiGT) and approaches (ex. automation & machine learning) being utilized as well as their capabilities.

Automated Cloud Processing Technologies for the Mapping of Aquatic Plants - Ray Valley – Mapping of aquatic vegetation has largely relied on top-water or SCUBA assisted surveys to date. Both mapping techniques can be extremely laborious and expensive to implement and mapping accuracy is limited. The introduction of sonar based mapping technologies (Biobase) that utilize automated cloud processing software provides an opportunity to not only efficiently and accurately conduct vegetation mapping, but also depth profile and sediment hardness mapping. An overview of the Biobase mapping platform as well as its integration with sonar and satellite imagery to create high resolution aquatic vegetation maps will be presented.

Caching a "Unicorn": Using Partnerships to Help Tackle Aquatic Invasive Species - Dr. Edgar Rudberg – The steps of Clean, Drain, & Dry (CDD) are widely recognized as the most effective means to prevent the spread of aquatic invasive species transported on recreational watercraft from one waterbody to the other. Empowering boaters to take these steps has largely relied on manning boat launches with educational stewards and deploying voluntary or mandatory boat washing programs. Providing staffing for these activities can be expensive and logistically demanding. An unmanned boat inspection, cleaning, and data collection system (CD³ boat cleaning systems) that also promotes public awareness of CDD, provides an opportunity to empower boaters to take these necessary steps while significantly reducing cost and oversight. An overview of this new boat cleaning system will be presented.

Speaker Biographies

Michael Jones - Michael is PhD candidate in entomology at SUNY ESF, in the Department of Environmental and Forest Biology under the direction of Dr. Melissa Fierke. He will be defending his thesis in August and intends to pursue a career in forest health protection and public service. His research focus is on management and ecology of emerald ash borer and its introduced biological control parasitoids in the northeast. His research goal is to help enhance the efficacy of the national emerald ash borer biological control program. Prior to graduate school he worked for the USDA Forest Service, Forest Health Protection for three years in southern California, where he studied endemic and invasive forest pests, including developing management tools for the invasive gold-spotted oak borer. He obtained his B.S. in Environmental Biology and Management at UC Davis and worked with a lab group that studied sudden oak death.

Dr. Lindsey Milbrath - Lindsey received his M.S. in entomology from Cornell University in 1992 and later a Ph.D. in Entomology from Kansas State University in 2002, where he investigated the direct and indirect interactions among musk thistle and two weevils imported for its biological control. He was then a post-doctoral research associate with the USDA-Agricultural Research Service in Temple, TX, developing a biological control program for the invasive shrub saltcedar. Starting in 2004, he has been a research entomologist with the USDA-ARS in Ithaca, NY. His research focuses on management of exotic and invasive weeds of the Northeast with an emphasis on biological control. For the last several years he has worked with the European swallow-worts, and recently initiated research on knapweeds.

Dr. Mark Whitmore – Mark works with professional land managers, state and federal agencies, government officials, and concerned citizens to understand the issues and strategies for minimizing the impact of forest insect pests, and in particular non-native invasive insects. He Initiates Cornell cooperative extension projects and provides leadership on issues relating to forest health and invasive forest pest issues in New York State. His current research focuses on impacts of non-native forest pests on forest stand dynamics and development and implementation of biological control strategies for hemlock woolly adelgid under the NYS hemlock initiative.

Gus Goodwin – Gus works as a Conservation Coordinator for The Nature Conservancy in Vermont. He previously worked for the Adirondack Chapter of The Nature Conservancy and has deep ties to the region. He shepherds various conservation projects related to land protection, stewardship, conservation science and planning. One of his current projects focuses on restoring American elm to Vermont's floodplain forests by developing disease resistant strains. Samples collected from residual elm specimens throughout the Adirondacks and Vermont were used to advance this research.

Ariel Walcutt – Ariel is a Geographic Information Systems professional with over 5 years of experience delivering custom geospatial solutions to organizations including NASA, USAID, and Esri. She is passionate about making science more accessible to broader audiences and advancing geospatial projects having a social impact –Including remote sensing, innovative technologies, and scientific communication. In 2017 she coordinated with a NASA Develop technical team to process Landsat, Sentinel-2, and AVIRIS hyperspectral satellite imagery in ENVI and TerrSet to map eastern hemlock stands in the Adirondacks.

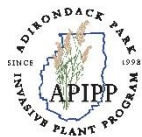
Dr. Valerie Pasquarella - Valerie works at the intersection of remote sensing and ecology, using time series of satellite imagery to improve mapping and monitoring of landscape dynamics. She completed a BA/MA in Environmental Science and Environmental Remote Sensing and GIS, as well as a PhD in Geography at Boston University, and is currently a Postdoctoral Research Associate with the DOI Northeast Climate Adaptation Science Center and the Department of Environmental Conservation at the University of Massachusetts Amherst. Having lived and worked in Southern New England for over a decade, Dr. Pasquarella actively collaborates with a number of local research groups and land management agencies, and her research has strong regional ties. Her current projects include using Landsat time series to identify both historic and ongoing gypsy moth and hemlock woolly adelgid outbreaks and impacts, as well as efforts to develop a new suite of forest composition products for the Northeast.

Dr. Richard Hallett - Dr. Hallett received his B.S. from the University of Wisconsin- Madison, and M.S. and Ph.D. from the University of New Hampshire. He has spent his career studying tree and forest health in the northeastern U.S., working towards earlier detection of tree stress caused by acid rain, exotic insects and diseases. His regional and landscape scale research has focused on sugar maple decline disease and using remote sensing technology to map Hemlock Woolly Adelgid and Emerald Ash Borer infestations. More recently he is beginning to think about mapping tree health in urban areas which are often epi-centers of new infestations. When he is not deeply engaged in the science of tree health you may find him judging Timbersports competitions around the world, downhill skiing, or sea kayaking.

Ray Valley - Ray Valley is an Aquatic Biologist and Product Expert for BioBase, a cloud-based aquatic mapping platform owned and operated by C-MAP USA, Inc. Ray holds his M.S. in Fisheries from Michigan State University and worked for 10 years at the Minnesota Department of Natural Resources in Fisheries Research prior to joining the small start-up that developed BioBase in 2012. Ray's interests and background has been aquatic habitat assessment and monitoring throughout his 20 year career.

Dr. Edgar Rudberg - As the third generation of his family in the boating industry, Dr. Rudberg has a passion for outdoor recreation and conservation. His Ph.D. in Natural Resources Science and Management blended communication and psychological theory to catalyze individuals' adoption of conservation behaviors on lakes. As an entrepreneur for over a decade, he has developed numerous conservation focused products which grew to national distribution. He is formally trained in qualitative and quantitative research methodologies, project management, and various behavioral metrics. He is an avid angler, bow fisherman, hunter and boater.

The Adirondack Park Invasive Plant Program is a partnership program of The Adirondack Chapter of The Nature Conservancy
For more information visit www.adkinvasives.com or www.keepinvasivespeciesout.com



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