14th Annual Meeting

In January 2013, the NEAPMS conference will be held in the state of Connecticut for the first time. The meeting will be held at the Water's Edge Resort in Westbrook, Connecticut. Please mark your calendars and plan to join us for our 14th Annual Meeting.

Like last year, we are planning to start out with Tuesday afternoon workshop offerings. Please note that dinner is on your own on Tuesday evening, but we will be having a social hour that evening with a cash bar in the exhibit area immediately following the workshops. A listing of local eating establishments will be sent out to registrants shortly before the meeting to aid in your planning.

Wednesday's program includes a line up of technical presentations on various aspects of aquatic plants and their management, similar to past years. The day wraps up with the Annual Awards Banquet in the evening, a raffle, and entertainment from a live local band. On Thursday morning we will continue with technical presentations through the morning, ending our meeting with a luncheon from noon to 1pm. Recertification credits will again be available for the workshop and technical session attendees.

Your conference registration includes the Tuesday afternoon workshops, technical presentations, breakfast, lunch and coffee breaks on Wednesday and Thursday; and the dinner banquet on Wednesday evening.

Registration

Register online at www.neapms.net using a credit card, or print and complete the 2013 Registration Form from www.neapms.net and mail it and a check to: NEAPMS, PO Box 142, Chester, NJ 07930. *Note: NEAPMS will refund conference registration fees, less the NEAPMS membership portion ($40), for cancellations made prior to January 10, 2013. For cancellations made after this date, NEAPMS will refund registration fees less the NEAPMS membership portion and a $50 late cancellation fee. If you need a state agency personnel waiver please contact the Jim Sutherland, NEAPMS Treasurer at jwsinack@comcast.net as soon as possible for details.*

Accommodations

A room rate of $99 + tax (sgl or dbl occupancy) per night is available at the Water's Edge Resort. *After January 7, 2013, we cannot guarantee room rate or availability, so please do book by the deadline.* More information on the venue can be found online by visiting the hotel website at *www.watersedgeresortandspa.com.* Hotel reservations can be made by calling the Water's Edge Resort *by January 7, 2013* at 1-800-222-5901.

Northeast Aquatic Plant Management Society
P.O. Box 142
Chester, NJ 07930

Register today!

NORTHEAST AQUATIC PLANT MANAGEMENT SOCIETY

PRELIMINARY CONFERENCE PROGRAM

January 22-24, 2013

Water's Edge Resort
Westbrook, Connecticut

www.neapms.net

Tuesday January 22, 2013

1:00 – 5:00 PM **Registration Table Open**

2:00 – 3:30 PM **Aquatic Plant Mapping Workshop**

Plants and Pixels: Developing Predictive Models of SAV Using Satellite Imagery in the Currituck Sound, NC.
Brett M. Harris, NC State

Evaluation of SONAR Based Survey Method on Kerr Lake Over Two Years
Justin Nawrocki, NC State

Wisdom of the Crowd: Innovations in Citizen-Based Aquatic Plant Mapping
Ray Valley, Contour Innovations, LLC.

3:30 – 5:00 PM **Plant/Algal Identification Workshop**
Bob Johnson, Cornell University
Robynn Shannon, West Virginia State
Chris Doyle, Allied Biological

5:30 – 6:30 PM **Cocktail Hour**
Cash Bar in Exhibit Area

6:30 – 9:00 PM **Free Time and/or Dinner on Your Own**
The Water's Edge Resort has a nice dining room and lounge if you wish to stay on site. A separate list of local eateries will be sent via email to attendees.

9:00 – Wee hours **NEAPMS Hospitality Suite**

Wednesday January 23, 2013

8:30 – 9:30 AM **Continental Breakfast**

8:15 – 9:45 AM **Registration/Exhibits**

9:45 – 10:00 AM **Welcome**
John McPhedran, NEAPMS President

10:00 – 10:30 AM **Phenology of Monoecious Hydrilla Over Three Years**
Sarah True Meadows, NC State

10:30 – 11:00 AM **Current Research on Monoecious Hydrilla Tuber Biology and Implications for Management**
Rob Richardson, NC State

11:00 – 11:30 AM **Eradication of Monoecious Hydrilla from the Cayuga Inlet, Ithaca, NY: Actions Taken and Challenges Ahead**
Bob Johnson, Cornell University, Retired

11:30 – 12:00 PM **Control of Monoecious Hydrilla in the Cayuga Inlet**
Glenn Sullivan, Allied Biological and Mark Heilman, SePRO Corporation

12:00– 1:00 PM **Lunch**

Wednesday January 23, 2013, continued

1:00– 1:30 PM **Industry Updates**

1:30 – 2:00 PM **Management of Two Invasive Aquatic Plants in Saratoga Lake, New York**
Mark Heilman, SePRO Corporation

2:00 – 2:30 PM **Research to Operational Use: Update on Field and Research Results with Clipper Herbicide for Aquatic Vegetation Management**
Jim Petta and Jill Callabro, Valent USA

2:30 – 3:00 PM **Herbicide Resistance and Resistance Management in an Aquatic Environment**
Cody Gray, United Phosphorus, Inc.

3:00 – 3:30 PM **Break/Exhibits/Posters**

3:30 – 4:00 PM **Three Seasons of Applying Physical Methods to Control Hydrilla in Mystic Lake on Cape Cod**
Robert Nichols, Indian Pond Association

4:00 – 4:30 PM **DASH: Suction Harvesting Fanwort**
Matthew Vogt, New England Aquatic Services, LLC

4:30 – 5:15 PM **NEAPMS Business Meeting/APMS & AERF Updates**
John McPhedran/NEAPMS BOD Members, Terry Goldsby (APMS) and Carlton Layne (AERF)

5:15 – 6:00 PM Free Time

6:00 – 7:00 PM **Attitude Adjustment Hour/Cash Bar**

7:00 – 9:30 PM **NEAPMS Awards Banquet, Raffle, and Live Band**

9:30 – Wee hours **NEAPMS Hospitality Suite**

Thursday January 24, 2013

7:30 – 8:30 AM **Continental Breakfast**

8:30 – 9:00 AM **Oxygenation and Circulation: Lessons Learned**
Kenneth J. Wagner, Water Resource Services, LLC

9:00 – 9:30 AM **60+ Years of Aeration**
John Baylor, Aquatic Eco-Systems

9:30 – 10:00 AM **Lake Restoration Using Aeration and Alum: A Florida Case Study**
Josette LaHee, Vertex Water Features and Aquatic Systems, Inc.

10:00 – 10:30 AM **Break/Exhibits/Posters**

10:30 – 11:00 AM **Integration of a Novel Phosphorus Inactivation Solution (Phoslock) in Water Resource Management Programs**
West Bishop, SePRO Corporation

11:00 – 11:30 AM **Life in the Under[water]world: Physiological Challenges and Constraints for Aquatic Plants**
Robynn Shannon, West Virginia State

Thursday January 24, 2013, continued

11:30 – 12:00 AM **Climate Change is Enhancing Primary Production in Lake George, NY**
Mark Swinton, Rensselaer Polytechnic Institute

12:00 – 1:00 PM **Lunch and Silent Auction Announcements**

1:00 PM **Adjourn**

1:15 PM **NEAPMS Board of Directors Meeting**

Technical Posters

Controlling the Invasive Aquatic Plant European Frogbit using Two Management Techniques: Hand Pulling and Shading.
Bin Zhu, University of Hartford.

The Aquatic Flora of New Jersey
Chris Doyle, Allied Biological

What We Can Learn From Wetlands: The Significance of Wetland Ecosystems and the Response of Wetland Plants to Anthropogenic Nutrients.
Bianca M. Pier, Darrin Fresh Water Institute, Rensselaer Polytechnic Institute

Need More Information?

- For sponsorship and exhibitor information, please contact Glenn Sullivan at *glenn@alliedbiological.com*
- For local arrangements/hotel information, please contact Amy Smagula at *Amy.Smagula@des.nh.gov*
- For presenter information/program information, please contact Marc Bellaud at *mbellaud@aquaticcontroltech.com*
- For information on the Silent Auction please contact Ann Bove at *ann.bove@state.vt.us* or John McPhedran at *john.mcphedran@maine.gov*
- For information on registration please contact Amy Smagula at *Amy.Smagula@des.nh.gov* or Jim Sutherland at *jwsinack@comcast.net*

ABSTRACTS AND BIOGRAPHIES FOR PRESENTATIONS
AT THE
14th ANNUAL CONFERENCE
OF THE

22-24 JANUARY 2013

WATER'S EDGE RESORT
Westbrook, Connecticut

Abstracts and biographies are listed in order of presentation at the conference

ABSTRACTS
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3	Ray Valley	Contour Innovations, LLC	Wisdom of the Crowd: Innovations in Citizen-Based Aquatic Plant Monitoring
5	Sarah True Meadows, Ph.D. candidate	North Carolina State University	Phenology of monoecious hydrilla in North Carolina over three years
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7	Robert L. Johnson	Cornell, retired	Eradication of Monoecious Hydrilla from the Cayuga Inlet, Ithaca, NY: Actions Taken and Challenges Ahead
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11	Cody J. Gray, Ph.D	United Phosphorus, Inc.	Herbicide Resistance and Resistance Management in an Aquatic Environment
12	Robert Nichols	Indian Ponds Association	Three Seasons of Applying Physical Methods to Control Hydrilla in Mystic Lake on Cape Cod
13	Matthew Vogt	New England Aquatic Services, LLC	Suction Harvesting Fanwort
14	Kenneth J. Wagner, Ph.D, CLM	Water Resource Services, Inc.	Oxygenation and Circulation: Lessons Learned
15	John Baylor	Aquatic Eco-Systems	60+ Years of Aeration
16	Josette M. LaHée	Vertex Water Features and Aquatic Systems, Inc.	Lake restoration using aeration and alum: A Florida case study
17	West M. Bishop	SePRO Corporation	Integration of a Novel Phosphorus Inactivation Solution (Phoslock) in Water Resource Management Programs
18	Robynn K. Shannon, Ph.D.	West Virginia Wesleyan College	Life in the Under[water]world: Physiological Challenges and Constraints for Aquatic Plants
19	Mark Swinton, Ph.D. candidate	Rensselaer Polytechnic Institute	Climate Change is Enhancing Primary Production in Lake George, NY
20	Bin Zhu, Ph.D.	University of Hartford	Controlling Invasive Aquatic Plant European Frogbit Using Two Management Techniques - Hand Pulling and Shading

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Brett M. Hartis, Ph.D. candidate

North Carolina State University

Plants and Pixels: Developing Predictive Models of Submerged Aquatic Vegetation using Satellite Imagery in the Currituck Sound, NC

Abstract: In regions with extensive, non-linear water bodies, large scale submerged aquatic vegetation (SAV) surveys are rarely done due to logistical difficulties and high costs. Our study examines whether remote sensing can be used for regional monitoring of SAV in the Currituck Sound of North Carolina. Currituck Sound once supported a diverse assemblage of SAV which provided food and habitat for wintering waterfowl. In the past 30 years, SAV has rapidly decreased. Our study attempts to determine if levels of SAV cover, species or growth forms can be detected using high-resolution satellite sensors, and to determine if predictions of SAV abundance and distribution can be improved by including sediment type or measures of water clarity. The Currituck sound was sampled during peak plant biomass (June – September 2010). Quickbird, Worldview II, and LANDSAT-5 images were acquired between June and September, 2010 to coincide with *in-situ* sampled data. The littoral zone of the Sound was mapped using a geographic information system (GIS) and overlain with points which represented survey points. Plant cover was assessed at each point for an area of 10m x 10m. A number of variables were measured at each point and plant composition was assessed by recording plant presence and plant cover. Plant cover was split into four levels 0 (0–20% plant cover), 1 (21–40% plant cover), 2 (41–80% plant cover), and 3 (81–100% plant cover). Binomial and multinomial logistic regression models were developed to examine relationships between SAV measures and spectral reflectance. Initial results suggest that secchi depth plays a significant role in detection of SAV within the Sound. Thus far, Worldview-II derived models have demonstrated significant ability to detect SAV presence, especially that of Eurasian Watermilfoil. Development of models from other sensors has been hindered by overwhelming amounts of sun glint and cloud cover within images. Remote sensing shows promise for water bodies with moderate to high amounts of SAV.

Speaker Biography: I received an M.S. in Fisheries, Wildlife and Conservation Biology from NC State University and am currently in final year of the doctoral program in the same program. I received a degree in Biology from East Carolina University in Greenville, NC with a concentration in coastal resources management. I recently took the position serving as the Aquatics Extension Associate for Lake Gaston and surrounding areas in NC and VA. Prior to accepting this position, I worked as a Research Assistant quantifying aquatic vegetation in the Currituck Sound of North Carolina. I have various skills in geospatial technology including remote sensing, global navigation satellite systems, and geographic information systems.

Justin Nawrocki, Ph.D. candidate **North Carolina State University**

Evaluation of SONAR Based Survey Method on Kerr Lake Over 2 Years

Abstract: A cornerstone of integrated aquatic plant management is an accurate survey to assess the location and abundance of weedy species as well as desirable plant species. Survey protocols historically focused on point intercept or diver based surveys, which may be time consuming and thus limit the number of points that can be surveyed on large systems. Aerial imagery is also used but estimating submersed plant acreages can be difficult especially in murky water or if the plants are low growing in the water column. Recently a new survey method has evolved out of an inexpensive SONAR depth finder (Lowrance ™). This unit was used by North Carolina State University to map aquatic vegetation on Kerr Lake (20,200 ha). A complete SONAR survey of the littoral zone of Kerr Lake was performed in the fall of 2011 and was followed up by a partial SONAR survey as well as a complete point intercept survey in 2012. The unit continuously recorded depth data at a rate of roughly one point per second. The effective area of coverage from the transducer is dependent on the water depth however the beam angle from the transducer is 20°. The data was then transferred for post-processing to a private company [Contour Innovations (CI), LLC] which was able to output variables such as water volume calculations, bathometric maps, vegetation bio-volume heat maps, and vegetation bio-volume statistical analysis. This data was calculated using custom algorithms and is centrally processed and stored providing “cloud” access. Data is continuously available on a web based platform that allows users to compile and catalog multiple survey trips. This is useful for tracking changes in vegetation over time or changes that result from active management. The true utility of a system like this is the ability to collect large amounts of data passively from either single outings or multiple outings over time. Water resource managers can install this equipment and collect vegetation data on every outing without deviating from their true purpose to be out on the lake.

Speaker Biography: Justin was born and raised in Grand Rapids, MI. He completed his B.S in Environmental Studies from the University of Idaho and then joined on with a private lake management company back in MI. After working several seasons in Michigan he relocated to NC and began working on Lake Gaston. After working 2 seasons he signed on as a graduate research assistant under Dr. Richardson at North Carolina State University. Justin completed his M.S studying monoecious hydrilla in 2011 and is currently working on a PhD.

Ray Valley **Contour Innovations, LLC**

Wisdom of the Crowd: Innovations in Citizen-Based Aquatic Plant Monitoring

Abstract: Natural Resource Managers and Climatologists have long recognized the critical importance of observer networks and volunteer citizen monitoring. With citizen monitoring networks, Managers and Scientists acquire useful data for making more informed predictions and management decisions, while involved citizens gain an ownership stake in building the knowledgebase about the condition of ecosystems and the climate.

Citizen protocols for water quality (e.g., Secchi clarity) and meteorology (e.g., rainfall) data collection are largely objective and are becoming increasingly standardized throughout the nation. As a result, comprehensive datasets are being merged at large geographic scales to assess the current status and trajectory of water resource and climate conditions. Despite well-intentioned citizen programs to map and monitor aquatic plants in several US states, most are subjective and non-standardized. Consequently, results will differ across surveyors, systems, and geographic regions. This strongly limits the power and usefulness of data collected from these programs. This is unfortunate because of the importance of aquatic plants for fish habitat and water clarity, and the vulnerability of lakes to invasive aquatic plants.

Homeowner groups and government agencies recognize the urgency of proactively protecting lakes from harm but have lacked tools to evaluate the effectiveness of their aquatic plant management efforts. I will present how an automated cloud-based aquatic vegetation mapping system would be a tool for cooperative and objective citizen monitoring of aquatic plants. Automated and centralized processing (Cloud processing) would change the way citizens can participate and contribute to a larger database of habitat data.

Speaker Biography: I am Chief Aquatic Biologist for Contour Innovations LLC, a firm that automates the processing of crowd-sourced sonar data with cloud-based software. Previous to joining CI in April 2012, I was a Fisheries Research Biologist and Long-term Lake Monitoring Coordinator at the Minnesota Department of Natural Resources. Over my previous 10-year career with MN DNR, I researched techniques for mapping aquatic plant abundance in lakes with hydroacoustics, fish and aquatic plant interactions, indirect effects of herbicide applications on habitat and fish populations, lake and watershed ecosystem ecology, and co-founded a cooperative long-term lake monitoring program. I have co-authored 11 peer-reviewed papers related to this work. I am now focusing my attention on developing, refining and enhancing features of ciBioBase for widespread implementation by professionals and citizens across the globe. I graduated with Fisheries degrees from University of Minnesota (B.S.) and Michigan State University (M.S.)

Hands-On Plant Workshop

Presented by NEAPMS Experts:

Robynn K. Shannon, Ph.D., University of Connecticut, rndshannon@cox.net
Robert L. Johnson, Cornell University, rlj5@cornell.edu
Chris Doyle, Allied Biological, Inc., doyle@alliedbiological.com

Back by popular demand! The hands-on plant workshop is always a popular event at NEAPMS meetings. This year's plant workshop will be team-taught by three experts in the field of aquatic plant identification who each provide their own level of expertise based on backgrounds in taxonomy, ecology and management.

A brief slideshow will kick off the workshop to highlight key species and/or issues to be aware of. Plenty of time will be incorporated to allow the workshop attendee to either self-explore plant specimens on display, or to interact with one of the three instructors for first-hand instruction on how to identify species or about the problems they pose.

Live and preserved specimens will be on hand…..and there may just be a quiz to test your skills at plant identification.

Sarah True Meadows, Ph.D. candidate

North Carolina State University

Phenology of monoecious hydrilla in North Carolina over three years

Abstract: Monitoring stations were established in April 2010 to determine monoecious hydrilla growth and life stage as correlated to water temperature and light intensity. Five spatially separated locations were established on Lake Gaston, NC and VA to enable sampling across a gradient of conditions. Another study location as established on Lake Raleigh, North Carolina. All six locations were selected to avoid herbicide applications for hydrilla management. At Lake Gaston, fenced exclosures were built at the sample points, to allow hydrilla to mature without herbivory from grass carp. No grass carp have been historically stocked in Lake Raleigh, therefore, an exclosure was not necessary. Temperature and light pendant data loggers were placed at each location to record water temperature and light intensity values every six hours throughout the year. All sites were monitored biweekly from April 2010 until late fall 2010, after hydrilla senesced. Data collected included hydrilla life stage, hydrilla turion density, and hydrilla shoot length. Soil cores were collected and sifted to determine the number of tubers and turions. In addition, tuber or turion sprouting was noted and length of sprout was measured. Stations were reestablished at the same points in 2011 and 2012, and monitoring continued until late fall 2012. On Lake Raleigh, monoecious hydrilla tubers were found sprouting from March through July, with mean water temperature 28.1ºC for sprouting. Newly formed tubers were found in September through mid-October in 2010, at mean water temperature 23.4ºC, and no newly formed tubers were found in 2011. On Lake Gaston, at the westernmost study location, monoecious hydrilla tubers were found sprouting from April through July, with mean water temperature 20.8ºC. Newly formed tubers were found in mid-August through October, at mean water temperature 25.4ºC.

This study will enable the generation of a 'story' of the monoecious hydrilla life cycle throughout the year. A predictive model will be generated to allow lake managers to better time management practices to the hydrilla life cycle based on environmental conditions. This information will be crucial in creating monoecious hydrilla management plans in North Carolina and elsewhere.

Speaker Biography: Sarah True Meadows grew up in Wilmington, NC. She received her B.S. degree in Biological Sciences from North Carolina State University, with a minor in Environmental Science. While completing a coastal management summer internship, she realized the need for control of invasive plant species in order to conserve native species. She went on to work towards a Masters degree in Weed Science under Dr. Rob Richardson. During her graduate career, Sarah has been involved in multiple Aquatic Plant Management societies as well as Weed Science societies. Sarah is continuing her education in aquatic plant management through a PhD program under Dr. Rob Richardson.

Robert J. Richardson, Ph.D.

North Carolina State University

Current Research on Monoecious Hydrilla Tuber Biology and Implications for Management

Abstract: Subterranean turions (tubers) are the primary obstacle to long term monoecious hydrilla management. Research has been conducted at North Carolina State University to identify key biological features of monoecious hydrilla tubers. Field trials have indicated that tuber densities at a specific location may exceed 3,000 per square meter. These tubers can remain viable for at least 5 years during intensive and successful management operations. Recent research has also identified preformed axillary buds within hydrilla tubers that can resprout following clipping of the terminal shoot after sprouting. Recently sprouted tubers may survive and elongate for at least 56 days in the complete absence of light. Young shoots can also withstand short term exposure to high salinity and long term exposure to low salinity levels. Management programs must overcome these biological challenges in order to reduce hydrilla infestation levels to low densities, or more rarely, eradicate monoecious hydrilla from a water body.

Speaker Biography: Rob Richardson is an Assistant Professor and Extension Specialist at North Carolina State University with responsibilities in aquatic and non-cropland weed management. He currently oversees a research technician, two graduate students, and an undergraduate employee at NCSU. Rob received a Ph.D. in Weed Science from Virginia Tech and worked as a Research Associate at Michigan State University for three years before moving to North Carolina.

Robert L. Johnson **Cornell, retired**

Eradication of Monoecious Hydrilla from the Cayuga Inlet, Ithaca, NY: Actions Taken and Challenges Ahead

Abstract: In August 2011, the monoecious biotype of *Hydrilla verticillata* was found growing in the Cayuga Inlet, a major tributary to Cayuga Lake in upstate New York. In an attempt to halt the spread from this area to other Finger Lakes and to the wider Great Lakes region, a quick response by Ithaca and the New York State DEC was initiated. A fall herbicide treatment with Endothall limited possible late season spread to the lake and beyond. In late June 2012, the entire Inlet received an Endothall treatment followed by an application of Fluridone from July 12 to October 31. Intense activities of local public outreach, the State and local Hydrilla Task Force groups, permitting of management activities, monitoring, research and on-going adaptive management decisions continued year-round. Early on, we engaged experts on hydrilla management from across the US and continue dialog as we proceed on a path to eradicate the plant from the Cayuga Inlet. A major complicating factor is that the hydrilla found in the Cayuga Inlet is the little-studied monoecious biotype, particularly within the Northeast. Observations and monitoring of the Cayuga Inlet's hydrilla growth and ongoing treatment suggests total eradication is possible, contrary to scientific community wisdom. Rapidly depleting hydrilla tuber densities in Inlet sediment and no further evidence of hydrilla growth in 2012 that could produce additional tubers are encouraging signs. However, a major challenge to the eradication effort is that it is expected to last at least eight to ten years, and this protracted effort will be difficult to sustain in Ithaca and New York State.

Speaker Biography: Bob retired from Cornell University four years ago after managing the Cornell Research Ponds for 44 years where he provided outreach on aquatic plant growth in New York State. Bob's research interests are ecology of aquatic plant communities and in particular control of the non-native Eurasian watermilfoil by insect herbivores. As a member of the Northeast Aquatic Plant Management Society since its beginning, he presents research information on aquatic plant management regularly at their meetings and other venues. Presently as a private consultant, he continues similar survey and research interests and is a member of the Hydrilla Task Force working on the invasion of hydrilla into the Cayuga Inlet in Ithaca, NY.

Control of Monoecious Hydrilla in the Cayuga Inlet

Presented by:

Glenn Sullivan, Allied Biological, Inc.
Mark Heilman, Ph.D., SePRO Corporation

Mark Heilman, Ph.D. **SePRO Corporation**
Marc Bellaud **Aquatic Control Technology, Inc.**
Sarah Miller **SePRO Corporation**

Management of Two Invasive Aquatic Plants in Saratoga Lake, New York

Abstract: The granular aquatic herbicides Renovate® OTF (10% a.e. triclopyr) and Clearcast® 2.7G (2.7% a.i. imazamox) have documented past success for selective control of Eurasian watermilfoil (*Myriophyllum spicatum* or EWM) and curly-leaf pondweed (*Potamogeton crispus* or CLP) respectively as part of various northern lake management projects. The auxin-mimic mode of action of Renovate provides selective control of invasive milfoil, while the ALS (acetolactate synthase) inhibitor mode of action of Clearcast has good selective activity on CLP. The combination of these modes of action is a patent-pending method that has shown great promise in laboratory and initial field evaluations for simultaneous management of EWM and CLP. In 2012, the first operational, partial-lake treatment utilizing concurrent application of Renovate OTF and Clearcast 2.7G for EWM and CLP management was performed on Saratoga Lake (4,028 acres) in New York State. May 23rd application along the south shore of the lake of 0.5 ppm Renovate OTF to a 100-acre block and 50 ppb Clearcast 2.7G to 50 acres within the OTF block provided effective control of both target species. In the combination-treated area, complete control of CLP biomass was achieved at 4 weeks post treatment (June 18) while healthy CLP remained in the area treated only with Renovate. Integration of biomass measurements and point-intercept presence/absence results indicated at least 97% reduction in EWM at 10 weeks post treatment. Strong native diversity and biomass was also documented with *Elodea*, several *Potamogeton* spp., and *Vallisneria* as dominant post-treatment species. Evaluation results will be presented in detail with perspectives on this multiple mode-of-action protocol for future management.

Speaker Biography: Dr. Mark Heilman is currently the Aquatic Technology Leader for SePRO Corporation. Dr. Heilman received both his BS in Biology (1992) and his Ph.D. in Aquatic Ecology (1998) from the University of Notre Dame. Dr. Heilman has been a research scientist with SePRO Corporation since 2002 and now leads SePRO's development of new technical solutions for management of aquatic invasive species, with an emphasis on aquatic invasive plants.

Jim Petta and Jill Calabro, Ph.D.

Valent USA Corporation

Research to Operational Use: 2012 Summary of Field and Research Results with Clipper (flumioxazin) Herbicide

Abstract: Flumioxazin, marketed under the trade name Clipper, has been available to aquatic plant managers since the Spring of 2011. As with any new plant management tool, of lot of research and field testing is required as we move from development to operational use patterns. During 2011 and 2012, Valent has worked with private applicators, researchers from the USACE and universities such as the University of Florida, FFWCC, and others to evaluate and develop use patterns which control invasive and nuisance species while conserving and protecting native species and systems. In addition, Clipper has been found to be highly effective against invasive species in Florida such as fanwort (*Cabomba caroliniana*), Limnophila (*Limnophila sessiliflora*), and Indian waterweed (*Hygrophila polysperma*). This paper will attempt to summarize this information into operational use patterns important to field applications and management programs.

Speaker Biography: Mr. Jim Petta received his BS degree in Entomology from Texas A&M University and his MS in Agriculture from California State University. Jim has served in various commercial and technical roles with Syngenta and most recently with Valent USA. Jim has been involved in aquatics for most of the last 20 years. However, during that time, Jim has also served in overseas assignments in Indonesia (2000) and more recently in Chile South America (2008-2010), where Jim was responsible for the implementation, building, and management of the newest research facility with over 100 research staff. Jim is a past president of the Aquatic Plant Management Society and remains involved with the various chapter meetings. Jim has been a speaker/presenter/instructor at various conferences and seminars including the annual Aquatic Weed Control Short Course at the University of Florida and the Cooperative Invasive Species Mgmt Areas Conference held in Kissimmee, Florida. Jim is also a former president and board member of AERF, and a former CAST (Council for Agriculture Science and Technology) board member representing APMS.

Speaker Biography: Jill Calabro is a Field Market Development Specialist with Valent USA, Professional Products Division. Dr. Calabro received her B.S. in Horticulture from Iowa State University, M.S. in Plant Pathology from the University of Minnesota, and her Ph.D. in Plant Pathology from Oregon State University. Her Graduate Research Assistant Studies at Oregon State University focused on the biology of sweet cherry powdery mildew caused by *Podosphaera clandestina*. Dr. Calabro's current role is to provide technical information and market support on Valent's turf and ornamental products in the Northeast territory, from Virginia to Maine. Design and coordinate research trials with key cooperators in the Northeast region of new and developing products, with an emphasis on issues relating to plant pathology.

Cody J. Gray, Ph.D **United Phosphorus, Inc.**

Herbicide Resistance and Resistance Management in an Aquatic Environment

Abstract: Terms such as herbicide resistant and herbicide tolerant have been used interchangeably for several years in the aquatic community; however, these terms cannot be used synonymously. In herbicide resistance, there is a change in the response of the weed population over time; it is no longer controlled by the herbicide at the recommended label rate. In herbicide tolerance, there is no change over time; the population has always been tolerant to the herbicide. This presentation will address how herbicide resistant populations occur and the basic principles of herbicide resistance. Additionally, we will discuss the types of herbicide resistance: single resistance, cross resistance and multiple resistance. Proactive resistance management tactics will be outlined discussing use across multiple seasons, sequentially throughout a single season and tank mixtures. We'll discuss problems encountered in an aquatic environment versus a terrestrial environment when considering proactive resistance management tactics. Finally, how can an aquatic applicator implement proactive resistance management in their aquatic management program?

Speaker Biography: Cody was raised on his grandfather's dairy farm near Ralston, OK. He received his Bachelor's degree in chemistry at Southwestern Oklahoma State University in 1998. He received his M.S. at Oklahoma State University in Weed Science in 2001. In 2005, Cody completed his graduate education with a Ph.D. in Weed Science at Mississippi State University. After completing his graduate education he accepted an Assistant Professor position with the University of Florida at the Fort Lauderdale Research and Education Center located in Fort Lauderdale, FL where his appointment included research on invasive aquatic plants, aquatic extension specialist for the southern half of Florida and taught a pesticide application course. Cody is currently employed by United Phosphorus, Inc. (UPI) as a Field Development Representative, in which, he oversees all aquatic herbicide and algaecide market development and research trials conducted in the United States, Canada, Australia, and New Zealand. Additionally, Cody is responsible for all UPI product development, including herbicides, insecticides, fungicides, and fumigants, for the following states: Oklahoma, Texas, New Mexico, Colorado, Kansas, and Nebraska. Cody is currently the Vice President of the Aquatic Plant Management Society, Vice President of the Western Aquatic Plant Management Society and the Aquatic Plant Management Society liaison to the Weed Science Society of America.

Robert Nichols **Indian Ponds Association**

Three Seasons of Applying Physical Methods to Control Hydrilla in Mystic Lake on Cape Cod

Abstract: This will be an update of a presentation made at the 2011 NEAPMS Conference which covered the original discovery of Hydrilla in Mystic Lake on Cape Cod and the initial first season remediation effort. The Indian Ponds Association has for the past three seasons battled this invasive using a range of physical methods. Confined raking, hand pulling, benthic barriers, and diver assisted suction harvesting have all been applied, but unfortunately have not prevented the spread of this invasive weed around much of the shoreline of this 149 acre lake. While the present approach is not on a path to eradication, it has greatly limited the growth and the plant has never come close to topping out anywhere in the lake. A more costly and efficacious approach will be required next season to gain ground.

Over these three seasons much has been learned about the behavior of monoecious Hydrilla in our northeastern climate. The effect of water clarity on growth patterns has been observed and the effectiveness of different benthic barrier materials has been evaluated. The growth habits, depth range, tuber production factors, and a blue-green algae that inhibits Hydrilla growth have been noted. Detailed GPS mapping of Hydrilla patches over the three seasons illustrates the progression of its spread around the lake.

Speaker Biography: Bob Nichols is Vice President of the Indian Ponds Association, which is the lake association for Mystic Lake, Middle Pond, and Hamblin Pond on Cape Cod. He has created detailed bathymetric maps of the ponds, performs periodic pond water testing, was involved in gaining agency approval for the Mystic Lake alum treatment, discovered hydrilla in Mystic Lake, and is leading the remediation effort. Bob has a Masters degree in Civil Engineering from Cornell and is retired from a career as a mechanical engineer in the petroleum industry.

Matthew Vogt New England Aquatic Services, LLC Suction Harvesting Fanwort

Abstract: Fanwort (Cabomba carolinana) is a non-native invasive plant that is spreading rapidly around Connecticut. New introductions present a significant challenge because the plant occurs at low density and may be spread over a large area making herbicide use impracticable. A promising rapid response method used in Connecticut is suction harvesting combined with hand-pulling. Projects targeting fanwort removal using these methods have contributed to our knowledge of how fanwort grows, and responds to treatments. This paper will present case history information on two recent suction harvesting removal projects in CT, Bantam Lake and Rogers Lake. Lessons learned about the seriousness of the threat to freshwater ecosystems posed by invading fanwort will be discussed including factors that contribute to its becoming rapidly established in lakes by stolons, winter buds, regeneration via fragmentation, and the speed at which it spreads. Speculation on the threat to lakes regionally, general response to treatments and how it is different than other invasive aquatic plants species will also be given.

Speaker Biography: Matthew Vogt is the Owner/President of New England Aquatic Services LLC, specializing in the process of Diver Assisted Suction Harvesting. Formerly the Vice President/Director of Operations for Water's Edge Restoration and Management LLC, in the past 4 years he has worked on multiple large scale invasive plant removal projects and remains actively involved in ongoing plant management efforts across the state of Connecticut. He is currently working towards a Bachelor's Degree in Biology and Ecological Sciences at Western Connecticut State University. He resides in New Milford, Connecticut.

Kenneth J. Wagner, Ph.D, CLM **Water Resource Services, Inc.**

Oxygenation and Circulation: Lessons Learned

Abstract: Oxygenation and circulation are two separate but overlapping techniques that can improve water quality in a lake and provide some control of algae. Examination of case histories as part of a Water Research Foundation project has illuminated multiple aspects of these techniques. Successful oxygenation depends on properly estimating oxygen demand, supplying an adequate quantity of oxygen, and distributing it to the needed areas; none of these key needs is as simple as it sounds. Use of air or pure oxygen can satisfy demand, but use of air increases oxygen demand and usually power and maintenance costs. Non-destratifying oxygenation methods include chambers in the lake, chambers outside the lake, or delivery of bubbles in such a way as to allow enough absorption to avoid major mixing events. Successful circulation requires moving the target water mass more often than once every three weeks, and preferably about once per week. Circulation of the whole lake must prevent stratification and development of poor deep water quality. Circulation of just the upper water layer can work if it creates a strong boundary between upper and lower water levels at greater depth than about 6 m. Circulation tends to reduce cyanobacteria but not overall algal abundance; shifts to greens and diatoms are most common. Overlap between oxygenation and circulation occurs when circulation is driven by air inputs, but the main mechanism of oxygenation during circulation is through contact of water of lower oxygen content with the atmosphere at the surface of the lake. Circulation using air should provide about 1.3 cfm per acre. All circulation systems should operate before stratification begins; breaking stratification is not nearly as effective as preventing it. Understanding the thermal structure of a lake is critical to both oxygenation and circulation strategies. Failure of oxygenation and circulation systems is most often linked to undersizing of systems or inadequate distribution. The report for WRF Project 4222 will provide detailed reviews and conclusions that should aid lake managers in selecting and applying oxygenation and circulation systems.

Speaker Biography: Dr. Wagner holds a B.A. in Environmental Biology from Dartmouth College and M.S. and Ph.D. degrees in Natural Resource Management from Cornell University. He had four years of experience with the New Jersey Department of Environmental Protection between his undergraduate and graduate degree programs, working primarily with the Division of Water Resources in lake and stream assessment and management. He has since gained 23 years of experience with northeastern US consulting firms, working on a variety of water assessment and management projects. Many lake assessment and management projects have been completed across the USA and abroad under his direction, including a wide variety of plant and algae management programs, extensive lake rehabilitation efforts, and lake creation projects. Dr. Wagner has presented many lectures on water resources assessment and management, has just completed his term as President of the North American Lake Management Society and is a member of the Aquatic Plant Management Society, American Fisheries Society, the American Water Works Association, and the American Society of Limnology and Oceanography. Dr. Wagner is also a Certified Lake Manager.

John Baylor **Aquatic Eco-Systems** **60+ Years of Aeration** **aeration**

Abstract: Data collected from water quality testing spanning over 60 years illustrates the beneficial effects of aeration in lakes. The study was performed on Lake Como of Orlando FL, and Park Lake of Orlando, FL. Data for these lakes shows an overall improvement in water quality over time and a general trending down in trophic state indices for both lakes. This reduction in nutrients has been beneficial in the control of nuisance vegetation within the lakes.

Speaker Biography: **John** is a Lakes Technician with 16 years of lake management service, working with county, state, HOA and golf course industries.

Josette M. LaHée | **Vertex Water Features and Aquatic Systems, Inc.**

Lake restoration using aeration and alum: A Florida case study

Abstract: Bahia del Mar is a 14 acre, 50 foot deep, man-made community lake located in St. Petersburg, Florida. The lake has a history of nutrient and organic matter loading that has resulted in an extreme case of hyper-eutrophication, the symptoms of which included algal blooms, extensive fish kills and persistent pungent odors. In January, 2012 a management strategy was devised to restore the lake to a healthy and stable state. The strategy incorporated the use of aeration for an extended period to improve lake water quality, followed by two alum treatments to reduce the extremely high levels of nutrients in the water column and increase the phosphorus binding capacity of the sediment. One day after aeration installation, stratification in the deepest part of the lake was completely eliminated. Over the next several weeks, oxygen levels increased while turbidity, BOD and nutrient levels decreased markedly. Once conditions in the lake stabilized, two alum treatments were applied, resulting in further drastic reductions in phosphorus levels and increases in water clarity. The results of this study will be presented along with a discussion of the importance of considering multifaceted treatment options for lake restoration and management.

Speaker Biography: Josette is currently the head of limnological research at Vertex Water Features Inc. in Pompano Beach, Florida. There she conducts research projects that investigate urban lake ecology, with a focus on the use of sustainable management techniques as tools for restoring impaired lakes and ponds.

Prior to joining Vertex, Josette was a research scientist at Florida International University, where she studied algal ecology in wetland systems in Florida, Mexico, Belize and Jamaica. She has also worked extensively in river, lake and marine habitats, and enjoys teaching biology, botany and ecology.

West M. Bishop **SePRO Corporation**

Integration of a Novel Phosphorus Inactivation Solution (Phoslock) in Water Resource Management Programs

Abstract: Phosphorus pollution can significantly impair freshwater resources due to correlations with nuisance algae types, densities and degraded water quality parameters (i.e. pH, biological oxygen demand, turbidity, total suspended solids). Though algaecides are routinely used to reactively control nuisance algae infestations, increased regulatory (NPDES permits) and application frequency limitations support the need for more proactive measures of managing a water resource. Strategies are needed to address eutrophication of waterbodies and the internal accumulation of phosphorus that promotes algae growth. Phoslock® is a phosphorus locking technology that provides an effective approach to mitigate in situ phosphorus accumulation in water resources, restore water quality and combat eutrophication. Data from mesocosm (North Carolina) and operational pond (Washington) applications of Phoslock will be reviewed to highlight enhancements of water resource integrity and functionality. Objectives of these evaluations included: 1) measure the change of phosphorus levels post-treatment, 2) measure levels of critical water quality parameters, and 3) identify algae types and densities through time. Results of mesocosm and field experiments documented a sustained reduction of phosphorus levels, improved water quality parameters and selection away from nuisance algae types and densities. Phoslock provides a new solution for water resource managers to mitigate the impacts of eutrophication and comply with water quality standards.

Speaker Biography: West Bishop received his BS from Western Michigan University in 2006 and MS from Clemson University in 2010. His graduate work was with Dr. John Rodgers and focused on aquatic toxicology and efficient management of problematic algae. West has presented at numerous professional conferences and published in esteemed journals. In January 2011, he took a position with SePRO Corporation as Algae and Aquatic Research Scientist with a continued research focus on scientifically defensible solutions for ecologically sound algae management and water quality improvement.

Robynn K. Shannon, Ph.D. **West Virginia Wesleyan College**

Life in the Under[water]world: Physiological Challenges and Constraints for Aquatic Plants

Abstract: The aquatic environment presents numerous physiological challenges and constraints for aquatic and wetland macrophytes, particularly those that grow mostly or completely submerged. Anaerobic sediments, reduced light levels, altered availability of carbon dioxide and nutrients, and lack of transpirational pull all require special adaptations for plants to live successfully in water. This talk will look at several of the adaptations that meet the challenges of life in water.

Speaker Biography: Robynn K. Shannon recently moved to West Virginia from Connecticut. She earned a Ph.D. in Plant Ecology from the University of Connecticut and an M.S. in Botany from the University of New Hampshire, and has been certified as an Ecologist by the Ecological Society of America. She served as a Peace Corps Volunteer in West Africa, and worked as a research assistant in the Smithsonian Institution's Department of Botany for several years. More recently, she has collaborated on a study of the aquatic plant genus *Najas* with Don Les (University of Connecticut) and has served as a Scientist Mentor for the Botanical Society of America. She loves "getting her feet wet" and considers herself fortunate to count both Garrett Crow and Barre Hellquist as aquatic plant mentors. She enjoys trail running in her free time.

Mark Swinton, Ph.D. candidate **Rensselaer Polytechnic Institute**

Climate Change is Enhancing Primary Production in Lake George, NY

Abstract: Climate change is increasing primary production in Lake George, NY by increasing the water temperature and nutrient supply. Climate change has meant that the annual precipitation around Lake George has increased 30% since the 1960's, mainly as larger precipitation events. Lake George is experiencing warmer winter temperatures with less snowfall and ice cover, all of which have resulted in warmer water temperatures and a longer growing season. Lengthening the growing season has allowed phytoplankton production to increase significantly in the spring and fall over the last 30 years. Increased summer rainfall has resulted in higher open-water phosphorus concentrations allowing significantly greater phytoplankton production compared to summers with minimal rainfall. The increased summer rainfall also elevates porewater phosphorus concentrations which have resulted in macrophytes increasing their tissue phosphorus making them no longer phosphorus limited. Enhancing primary production of an oligotrophic lake has management consequences that need to be addressed.

Speaker Biography: Mark has been part of DFWI since 2003 when he entered the doctoral program at RPI researching Eurasian watermilfoil. His research focused on availability of porewater nutrients within milfoil beds and native macrophyte dominated areas and their effects on tissue nutrients. Since he received his degree he has worked on assessing the quality and quantity of water entering Lake George through streams draining sub-watersheds of various land-use intensity. He has also been an integral part of writing the 30 year State Of The Lake book for Lake George.

Bin Zhu, Ph.D. **University of Hartford**

Controlling Invasive Aquatic Plant European Frogbit Using Two Management Techniques - Hand Pulling and Shading

POSTER

Abstract: European frogbit (*Hydrocharis morsus-ranis* L.) is a free-floating aquatic macrophyte that is invasive in North America. It is native to Europe and was first introduced to North America in 1932. Since then it quickly spread south into the Great Lakes region. Because it has the potential to be ecologically, economically, and socially costly, it is important to devise an effective management strategy for controlling its spread. Our study was conducted in Oneida Lake, NY to gauge the effectiveness of two direct control methods - hand pulling and shading, and to assess the impact of each method on a number of water quality parameters. Results showed that European frogbit in small coverage increased chlorophyll concentration and benthic invertebrate richness whereas dissolved oxygen, nitrates, and phosphorus were not affected. After applying the two control methods, shading removed 100% European frogbit but there was no significant effectiveness of hand pulling. These methods did not affect nutrients when compared with frogbit infested sites or frogbit free sites, probably due to well mixing of the experiment area. However, both shading and hand pulling improved growth of submerged plants compared to frogbit infested sites but plant growth was still the best in frogbit free sites. Our study suggested both hand pulling and shading could be viable options for controlling and eradicating invasive European frogbit. Hand pulling needs to be conducted more frequently to be more effective and shading may be refined in the future to become more environment friendly.

Presenter Biography: Dr. Bin Zhu is an Assistant Professor of Biology at the University of Hartford in Connecticut, USA. He received his Ph.D. in biology and Master of Public Administration from Syracuse University. Dr. Zhu was a post-doctoral associate at the Cornell University and a research scientist at the Finger Lakes Institute of Hobart and William Smith Colleges. His research interests focus on ecology and management of invasive species and water quality and he has published more than ten peer-reviewed articles in journals including *Aquatic Botany*, *Ecosystems*, *Fisheries*, *Journal of Aquatic Plant Management*, and *Journal of Great Lakes Research*. He is also an invited reviewer for a number of journals including *American Naturalist*, *Aquatic Ecology, Aquatic Ecosystem Health and Management, International Journal of Environmental Research and Public Health*, *Journal of Aquatic Plant Management*, *Journal of Ecology*, *Journal of Great Lakes Research,* and *Science of the Total Environment.* Dr. Zhu served on the Board of Directors of Northeast Aquatic Plant Management Society and received the honorable “Outstanding Member” award in 2011. He currently serves as the liaison officer at the Asian Ecology Section of Ecological Society of America.

Chris Doyle, CLM **Allied Biological** ***The Aquatic Flora of New Jersey*** **POSTER**

Abstract: New Jersey, the most populated state in the country, is also the 4th smallest state with an area of 8,721 square miles. Despite its limited surface area, New Jersey boasts a diverse array of habitats and five distinct eco-regions: Northeastern Highlands, Northern Piedmont, Ridge and Valley, Atlantic Coastal Pine Barrens, and Middle Atlantic Coastal Plains. With 14.9% of the state considered water, numerous lakes and impoundments dot the New Jersey landscape, including over 200 public access water bodies. According to our research, the aquatic flora on a state-wide scale has not been examined since the early 1960's (Fairbrothers and Moul, 1963).

In 2012, we surveyed 60+ water bodies for the presence of aquatic macrophyte species. We used visual surveys in shallow littoral zones, and limited Point Intercept Aquatic Plant Mapping Methodologies developed by the U.S. Army Corps of Engineers (Madsen, 1999) and further modified by Cornell University (Lord and Johnson, 2005), in deeper sites. Recent historical records were also examined from other lakes for a final sample size of approximately 75 lakes, spread throughout several of the state's eco-regions. Using the aquatic macrophyte data, a modified Floristic Quality Index (using coefficient of Conservatism values from Bowman's Hill Wildflower Preserve Plant Stewardship Index developed for New Jersey) was calculated for each lake, and groups of lakes per eco-region. A summary of the project methods, results, and conclusions shall be presented in a Scientific Poster.

Presenter Biography: Chris graduated from Cook College, Rutgers University with a BS in Natural Resource Management with a focus on Fishery Science. Since graduating, he has over 18 years experience as an aquatic biologist, including 10 years experience working in an aquaculture laboratory. In 2005, Mr. Doyle joined Allied Biological, Inc., a full service lake management firm serving New Jersey, New York, and Pennsylvania. As the Senior Aquatic Biologist and Supervisor of Water Quality Programs, Mr. Doyle oversees a staff of field technicians conducting water quality assessments and serves as Project Manager for all fisheries studies, aquatic plant mapping, phytoplankton/zooplankton assessment studies, and is the author of numerous Aquatic Plant Management Plans.

Bianca M. Pier, Ph.D. candidate

Rensselaer Polytechnic Institute

What We Can Learn from Wetlands: The Significance of Wetland Ecosystems and the Response of Wetland Plants to Anthropogenic Nutrients

POSTER

Abstract: Wetlands are thought to be some of the most important and most productive ecosystems in the world. They have been dubbed "kidneys of the landscape" and "biological supermarkets;" epithets which speak to their astounding potential to remove contaminants, as well as to promote biodiversity. A large part of what makes these ecosystems successful are the plants that inhabit them, which are equipped to respond to environmental changes and stressors, even those brought on by anthropogenic impact. In this study, surface water chemistry, vegetation community structure, plant morphology, and plant tissue chemistry were measured at three variously impacted wetland sites in the Lake George Watershed. Prevalent plants *Nuphar luteum*, *Sparganium eurycarpum*, and *Lemna minor* were used for morphological and chemical measurements. We also investigate the hypothesis that *L. minor* from an impacted wetland will remove the nutrients nitrate and phosphate more readily than *L. minor* from an unimpacted wetland. We determined that the impacted wetland exhibits lower plant species diversity, the rootlets of its *L. minor* plants are significantly shorter ($p \leq 0.05$), its *N. luteum* plants located near the wetland inlet sequester significantly more nitrogen ($p \leq 0.05$), and its *L. minor* removes more phosphate at a faster rate when compared to those in the unimpacted wetland. Accruing knowledge about plant response to environmental stressors is necessary in order manage, monitor, and protect these important organisms. Such information also has the potential to lead to the design and management of more sophisticated phytoremediation systems to reduce the effects of anthropogenic impact.

Presenter Biography: Bianca Pier is a third year graduate student in the Biology Ph.D. Program at Rensselaer Polytechnic Institute in Troy, NY. She conducts her doctoral research under the Darrin Fresh Water Institute of Lake George, NY where she studies the response of wetland plants to anthropogenically-enhanced nutrients. After earning her Ph.D. Bianca plans to pursue post-doctoral work in plant biology and eventually become a professor at a small four-year college where she will share her love of plants with students and introduce them to the exciting world of field ecology.

Greg Bugbee, Jordan Gibbons and Jennifer Fanzutti

Connecticut Agricultural Experiment Station

Are These the Next Big Aquatic Plant Problems in the Northeast?

POSTER

Abstract: The Connecticut Agricultural Experiment Stations Invasive Aquatic Plant Program has been conducting aquatic plant surveys since 2004. We have found that several plant species seem to be on the verge of rapid expansion including; mosquito fern (*Azolla* sp.), Brazilian waterweed (*Egeria densa*), and Southern naiad (*Najas guadalupensis*). Mosquito fern is probably native to Connecticut. Prior to 2012, we rarely observed it and its low densities made mainly a curiosity. This past year, we were called out to look at several ponds in southwest and north central Connecticut with an unidentified aquatic plant problem. In each case mosquito fern completely covered the surface and control options for 2013 were requested. Brazilian waterweed is a common aquarium plant thought unlikely to become a problem in the northeast because of its tropical origin. In 2009, we found it in low abundance in a lake in southern Connecticut. We have monitored the lake each year, thereafter, and found a progressive increase in its area and abundance. In 2012, we found Brazilian waterweed in three additional lakes in central and northern parts of the State. Southern naiad was once a protected state listed species. As the population increased this designation was removed. Recently, it has become problematic in Lower Bolton Lake. Reasons for these changes are difficult to quantify. Recent warm winters and possible connections to climate change are possible. Other explanations include; genetic alteration, natural range expansion and variations in water chemistry.

Presenter Biography: Authors are principal investigator and research associates, respectively, in the Invasive Aquatic Plant Program, Department of Environmental Sciences, The Connecticut Agricultural Experiment Station, New Haven, CT.