



Message from the President **Defining the Foundations Future**

Dr. Tyler Koschnick, SePRO Corporation

During this time of year, most of AERF sponsors are fully engaged in projects, many of which took many months or years of planning. Recently, I read an article in *Aquatics* (Spring 2017) by Andy Fuhrman, President of the Florida Aquatic Plant Management Society, that appropriately highlighted some concerns about the future. With any profession and industry, change is inevitable and the future is uncertain. It is how change is managed and future visions planned that become critical components of any organization. The AERF was initially formed to enhance research funding for the coalition of federal research scientists, natural resource agencies, academic institutions, and private sector interests for studying and managing nuisance aquatic plants. One of the key components of the Foundation was the Cooperative Research and Development Agreement with the US Army Corps of Engineers (USCE). While the mission of the Foundation hasn't changed, significant cuts to the USCE aquatic plant research programs has challenged the Foundation to consider its priorities and operations.

The current Board of Directors has been diligently working to plan for the future. They are focused on considering such impacts and strategies to continue to advance science based solutions to restore and maintain sustainable water resources. Although many aquatic managers have adjusted to the realities of NPDES permits and the definition of waters of the US (WOTUS), uncertainty remains about the outcome of those regulations. Looking forward, many believe the Endangered Species Act (ESA) could have broader implications and strongly advocate for being fully prepared to engage in that process. This is likely for good reason, as there should be contention. One could debate that there would be greater habitat loss without invasive plant management. Threatened or endangered species would be even more threatened or endangered if non-native species were left unmanaged. There is likely a lot of anecdotal information to support such position, but that likely won't be a popular opinion without the science to back it up.

Several key initiatives are being considered that should greatly benefit our sponsors and continue to advance AERF. These include increased research on impacts of non-native plant introductions, benefits of management to endangered species and habitat, and continued subject matter expert interactions with federal agencies involved with the management of invasive aquatic plants, such as the US Environmental Protection Agency (USEPA). In the near term, the AERF Scientific Advisory Committee is making plans to sponsor two field tours with officials from USEPA, and other resource agencies, to demonstrate the impacts of aquatic weeds and the outcome of management programs. Further, the Board, with the support of others, nominated our Executive Director, Carlton Layne, to EPA's Pesticide Program Dialogue Committee (PPDC), which is a federal advisory committee for pesticide policy issues.

Further, we are also pursuing a series of grey literature publications that highlight the value and benefit of aquatic plant management, including one specific to property values and other economic impacts and another on harmful algal blooms. Topics for additional papers are being considered, including recreation, fisheries, limnological and ecological benefits of management. Plus, the Foundation continues to be an advocate for strong student support and involvement. We recently completed funding for an assessment led by Dr. Lauren Pintor from Ohio State University entitled: Ecological effects of aquatic invasive macrophytes: a meta-analysis of their effects on native plant, macroinvertebrate and fish

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populations and diversity. Her graduate student will be presenting her paper at the annual Aquatic Plant Management Society Meeting in July.

AERF remains strong and is transitioning to a period where its resources will likely be more focused on generating science-based information related to the value of aquatic plant control. This effort is aimed at trying to further describe the benefits of what our sponsors do that is critical to the future conservation of our water resource. What AERF is doing is imperative and, if done correctly, should benefit everyone working in the discipline of aquatic resource management. New threats and challenges will emerge, and no one else is likely poised to defend the science or industry better than AERF working alongside its sponsors and partners. We appreciate your continued support, as now, maybe more than ever, that support is needed to continue to advance the Foundation into the future.

2,4-D Assessment

The 2,4-D preliminary ecological risk assessment has been released for public comment. The review can be found at <http://www.regulations.gov/#!docketDetail;D=EPA-HQ-OPP-2012-0330>

Clean Water Act Rule

EPA announced the upcoming publication of a rule to rescind the 2015 Clean Water Act (CWA) rule and its definition of “waters of the U.S.”

The rule rescinds the 2015 rule and recodifies the previous version of the rule until EPA and the Army Corps of Engineers can conduct a reevaluation of the “waters of the U.S.” definition. At that point, they will issue a new proposed rule for public comment.

EPA will open a 30-day public comment period for the rule to rescind the 2015 CWA rule and recodify the status quo CWA rule. We will submit comments in support of this action once the notice is published in the Federal Register.

View the rule to rescind at https://www.epa.gov/sites/production/files/2017-06/documents/wotus_prepublication_version.pdf

Join us at the 57th Annual Meeting of the Aquatic Plant Management Society at the Hilton Daytona Beach Resort Ocean Walk Village – July 16-19, 2017.



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Message from the Executive Director

Carlton Layne

Almost 6 months into the Trump administration, we can see definite progress toward our multiyear goal of bringing a modicum of reason into the way the U.S. Army Corps of Engineers (CoE) and the Environmental Protection Agency (EPA) enforces the Clean Water Act – at least as it concerns the aquatic plant management community. The mechanism that has affected apm operations directly has been the National Pollution Discharge Elimination System (NPDES). The jurisdiction of the Clean Water Act is established by the prevailing definition of Waters of the United States (WOTUS). It is this definition that triggers NPDES permitting requirements. So – where are we?

With 47 co-sponsors – including 4 Democrats, Representative Bob Gibbs (R-OH), on February 7, 2017, introduced for the third time the **Reducing Regulatory Burdens Act**, H.R. 953. It passed the House, also for the third time, and was forwarded to the Senate on May 25, 2017. Also on February 7, 2017, Senator Mike Crapo (R-ID), with 18 co-sponsors – including 2 Democrats, introduced S. 340 **The Sensible Environmental Protection Act** of 2017. Both bills are currently assigned to the Senate Committee on Environment and Public Works chaired by Senator John Barrasso (R-WY). Both bills seek to clarify Congressional intent regarding the regulation of the use of pesticides in or near navigable waters and thus would remove pesticide applications in, near or over waters of the United States from NPDES requirements provided the pesticides are used in accordance with label directions. We are watching these bills closely because the removal of the NPDES requirement for aquatic plant management activities essentially moots the WOTUS definition for most of our purposes. There is little doubt that should a bill pass the Senate President Trump will sign it, but passage in the Senate is not a given.

Meanwhile, there has been activity on the WOTUS rule. On February 28, 2017, just in time for the Midwest Aquatic Plant Management Society annual meeting, President Trump issued an Executive Order No. 13778, 82 F.R. 12497, **Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the "Waters of the United States" Rule**. The title of the Order alludes to the critics of the rule's arguments that the WOTUS Final Rule 1.) Exceeded the authority of the EPA and the CoE by amending the Clean Water Act and thus assuming power reserved to Congress, 2.) Usurped jurisdiction of waters rightfully resting with the various states, and 3.) Stifled economic growth. The order was a scant two pages long but is far-reaching in its potential consequences. It ordered the Administrator of the EPA and the Assistant Secretary of the Army for Civil Works to:

"[R]eview the final rule entitled "Clean Water Rule: Definition of 'Waters of the United States,'" 80 Fed. Reg. 37054 (June 29, 2015)...and publish for notice and comment a proposed rule rescinding or revising the rule...[and]

In connection with the proposed rule described in section 2(a) of this order, the Administrator and the Assistant Secretary shall consider interpreting the term "navigable waters," as defined in 33 U.S.C. 1362(7), in a manner consistent with the opinion of Justice Antonin Scalia in *Rapanos v. United States*, 547 U.S. 715 (2006).

By March 6, 2017, the EPA Administrator and The Assistant Secretary of the Army for Civil Works published the following in the Federal Register:

In accordance with a Presidential directive, the U.S. Environmental Protection Agency (EPA) and the Department of the Army (Army) announces its intention to review and rescind or revise the Clean Water Rule.

Then, to assure that all interested parties are on the same page, on June 17, 2017, the Administrator and the Assistant Secretary of the Army filed a pre-publication of a Federal Register notice entitled "**Definition of 'Waters of the United States' – Recodification of Pre-existing Rules**" which proposes reset the clock on the WOTUS definition that existed prior to 2015.

For those of us regulated by the EPA, we're no worse off than before the last WOTUS rule was published. If the Senate can get either of the two bills currently in committee passed, then life would be good because NPDES would go away for most of us. States may elect to keep a state version of it if they wish.

For those doing work in or near wetlands, while it is true that the CoE will revert to the definition they were using prior to 2015, it is also true that that definition is significantly different from the EPA definition and is pretty much the same as that which prompted the *Rapanos* case. For example, a California farmer was recently fined \$2.8 million on an old 2012 interpretation by an engineer who determined the farmer was tilling the soil too deeply, 4-7 inches.

See <http://www.foxbusiness.com/politics/2017/06/01/farmer-fined-2-8m-for-farming-on-own-land.html>. When writing his opinion in the *Rapanos* case, Justice Scalia said of the CoE's definition:

In applying the definition to "ephemeral streams," "wet meadows," storm sewers and culverts, "directional sheet flow during storm events," drain tiles, man-made drainage ditches, and dry arroyos in the middle of the desert, the Corps has stretched the term "waters of the United States" beyond parody. **The plain language of the statute simply does not authorize this "Land Is Waters" approach to federal jurisdiction** [emphasis added].

Justice Scalia defined "Waters of the United States" as follows:

"...relatively permanent, standing or continuously flowing bodies of water" traditionally recognized as "streams, oceans, rivers and lakes" that are connected to traditional navigable waters.

In addition, he would also authorize federal regulation of wetlands abutting these water bodies if they contain a continuous surface water connection such that the wetland and water body are "indistinguishable."

Obviously, this is a definition with which we all can live. Couple it with the dissolution of the NPDES requirement for most states and all our efforts of the past several years will have been worth it. Watch for the new proposed definition to be published later this year or early next year. We may also need your involvement if the Senate needs a push on the Gibbs/Crapo bills.

The AERF will be shifting its resources to the Endangered Species Act and in particular the interface with the EPA and the Office of Pesticides Programs and how pesticide registrations will be impacted by the Endangered Species Act implementation under the Section 7 consultation between EPA, the Fish & Wildlife Service and the National Marine Fisheries Service. Stay tuned.

Thank you for your continued financial support of the AERF. We rely 100% on your generosity for our income. Without your donations, which are tax-deductible, we simply would be unable to function and would cease to exist. Please keep us in mind when considering donations to non-profit organizations. If you haven't donated in a while, please think about coming back. We need your help.

Table Top Displays

The AERF is distributing sponsorship recognition blocks to our Gold, Silver and Bronze Sponsors who actively exhibit at national and regional meetings. Each block is 6x4.5x1 inches, and is laser engraved. The first of these will be distributed at the upcoming APMS meeting in Daytona Beach, FL. Others will be shipped sometime afterwards. We ask that each recipient display this on your exhibit table to show your support for the AERF. Additional blocks may be purchased if you wish to have one for your office or other use. The AERF Board will evaluate providing these to Associate and Affiliate Sponsors at a later date.



UF Weed Scientist to Lead Aquatic Invasives Center

A University of Florida weed scientist has been named director of the Center of Aquatic and Invasive Plants, a unit that develops environmentally sound techniques to manage invasive weeds.

Jason Ferrell, an agronomy professor at the UF Institute of Food and Agricultural Sciences, was named to the position by Jack Payne, UF senior vice president for agricultural and natural resources.

“Dr. Ferrell has been through UF/IFAS leadership programs has shown expertise in controlling invasive plants that affect our ecosystems, so he was the ideal choice to lead the center,” Payne said.

Ferrell, who’s worked at UF/IFAS since 2004, enjoys his work as a scientist but, as he worked with his lab staff and students, he realized he wanted to spread his wings into a leadership position.

Among his many goals, Ferrell hopes to work with state agencies and UF/IFAS Extension faculty to bridge the knowledge gap among some clientele. Some of those clients seem to have qualms about such invasive control techniques as pesticides or herbicides, Ferrell said.

“CAIP is not a ‘this is what you spray’ group,” Ferrell said, referring to herbicide or pesticide treatment of invasive aquatic plants. “It is a management entity that looks at every piece of the puzzle and tries to figure out how we can link them together to develop a management plan.”

Ferrell has outlined several other goals for when he starts his new position in July.

He would like to increase communication among the multidisciplinary faculty members at the center so that their research and Extension activities into invasive aquatic plants overlap more.

From there, he’d like the center’s voice to grow with regional and national groups that study and conduct outreach on invasive aquatic plants.

The Legislature established the center in 1978. Faculty and staff at the center work extensively with the state’s water management districts and the Florida Fish and Wildlife Conservation Commission to control invasive plants. Two UF/IFAS faculty members work at the center on Millhopper Road in Gainesville, while several other faculty members in Gainesville and at UF/IFAS research and education centers around Florida contribute to the center’s mission.

Ferrell started at UF/IFAS in 2004 as an assistant professor of agronomy, specializing in weed science. Along the way, he’s received numerous honors and awards, including Outstanding Extension Specialist, Researcher of the Year by the Florida Cattlemen’s Association and Weed Scientist of the Year and Florida Weed Science Society.

He earned his bachelor’s and master’s degrees in plant and soil science from the University of Kentucky. He earned his doctorate in agronomy from the University of Georgia in 2003.

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*The mission of the **University of Florida Institute of Food and Agricultural Sciences** is to develop knowledge relevant to agricultural, human and natural resources and to make that knowledge available to sustain and enhance the quality of human life. With more than a dozen research facilities, 67 county Extension offices, and award-winning students and faculty in the UF College of Agricultural and Life Sciences, UF/IFAS works to bring science-based solutions to the state’s agricultural and natural resources industries, and all Florida residents. Visit the UF/IFAS web*

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Regulating Aquatic Herbicides (Part I): The Challenges of Modeling Exposure

David Campana and Cliff Habig, Compliance Services International

One of EPA's Office of Pesticide Programs (OPP) most important tasks during pesticide registration is to estimate a chemical's potential to adversely affect nontarget species or their habitat. Part of that process is predicting whether—and to what degree—non-target species are going to be exposed to chemical pesticide under different product use scenarios. This is done using exposure models that have primarily been developed for agricultural use scenarios to simulate what happens to the chemical as it comes off the treated fields as runoff or spray drift, under application scenarios that are often not representative of aquatic herbicide uses. Whatever concentrations are estimated for the waterbody are then compared to toxicity data for nontarget species, and a risk determination is made.

Since EPA OPP is mandated to protect the nation's ecological resources, its exposure modeling methods are initially focused on conservative application scenarios that result in upper-bound estimations of chemical concentration. This means that, subject to label requirements, an applicator is assumed to make as many applications of the chemical as possible, applied at the maximum label rate over an entire area, with the shortest interval between applications, using slowest chemical degradation rates, etc. The waterbody is often a conservative scenario: a small pond (1 ha surface area) 2 meters deep. Also, the sediment types and weather data that are used for modeling may reflect geographical areas that are different from where the product is intended for use.

One of the challenges that modelers of aquatic herbicides are presented with is how to reconcile the kind of model described above—one that is generally associated with agricultural pesticide applications—with the very different application methods and practices that are used in aquatic herbicide treatment. For example, aquatic herbicides are usually applied in a highly targeted way to control invasive species that would otherwise overrun the native vegetation. In contrast to agricultural uses in which 100% of a field is assumed to be treated homogeneously, aquatic herbicides are usually used on just a portion of a waterbody, presenting a scenario that current exposure models were not designed to address. Modeling concentration distributions from a targeted area would still require a highly simplified framework that would be difficult to parameterize for different aquatic environments such as lakes, rivers, and bogs—but it would be an improvement on the current EPA OPP models in which runoff and spray drift are considered the primary routes of exposure.

Over the years, EPA OPP has developed two models, "Tier I Rice Model" and the "Pesticide in Flooded Application Model (PFAM)," that use a conceptual model that is based on the intentional application of pesticide to a waterbody. However, these models were really designed to evaluate chemical use on rice and cranberry crops, and do not account for the targeted nature of aquatic herbicide application. The Tier I Rice Model is fairly basic and does not account for chemical degradation over time. PFAM is more mechanistic and does consider the fate of the chemical, but also assumes agricultural practices and "flooding events" that have no practical equivalent in aquatic herbicide use.

Another challenge posed to aquatic herbicide modelers is how to estimate application methods and quantities in a realistic way. The assumptions made for agricultural modeling—however conservative at times—are at least based on the reasonable premise that an agricultural producer, somewhere and for whatever reason, will employ the maximum use pattern to ensure they are being protective of their crop. However, in general, aquatic herbicides are not used for commercial production, but to improve the health of waterbodies and ecosystems. As a result, the environmental externalities that can result from aquatic herbicide use—such as changes in dissolved oxygen levels, pH levels, or adverse effects to species—put downward pressure on the amount of herbicide used. This, in addition to the economic constraints that also restrict chemical use on agricultural areas, is why it is generally inappropriate to use maximum labeled use pattern for a product in aquatic herbicide exposure modeling.

Within our current regulatory framework, aquatic herbicides might be better managed with the development of a suite of exposure models and application scenarios that is distinct from agricultural and residential uses.

Predicted concentrations would still need to be weighed against toxicity endpoints for species and their populations in risk management. But estimating exposure concentrations using a framework tailored to the real-world use of aquatic herbicides would greatly improve regulation of these chemicals.

Alternatively, a promising workaround to the problem is the development of “net benefit” solutions in chemical regulation. In exchange for a broader and more workable pesticide regulation process, it may be possible to use financial contributions to new or existing programs aimed at improving ecosystem and species health to offset any perceived or potential impact to an ecosystem in a treated area. Such a workaround has the potential to give pest control operators better access to the tools needed to manage aquatic systems without getting hamstrung by the outcome of risk modeling driven by current limitations of exposure modeling. This approach was formally endorsed in two presidential memoranda published in 2015 and has garnered interest across government, private industry, and environmental groups. It is particularly important to examine this in aquatic settings, since habitat recovery is very often the motivation for an aquatic weed treatment.

If an exposure model is only as good as the questions that are asked of it, perhaps it is time to start compiling specific questions important to aquatic herbicides and using the answers to educate stakeholders—and then finding the right exposure models to assess aquatic herbicides in a more relevant setting than that being used now.

Invasive Aquatic Plants Damage More Than Lake Recreation, But They Can be Safely Managed

People love clear lakes.

We want to live near them, dive into them, float on them and cast our lines across them.

But lakes choked by invasive aquatic plants don't get much love – and for good reason.

Invasive aquatic plants – which include weeds like hydrilla, water hyacinth and others – are a living form of water pollution. If left unmanaged, they can dominate the ecosystem of a single lake, or even a chain of lakes. And because people and animals travel, and sometimes carry fragments or seed with them, they can spread to other bodies of water hundreds of miles away.

Although their impact on a lake's visual appeal should not be underestimated, the damage wrought by invasive aquatic plants is more than aesthetic. When a lake falls prey to them, the dominoes leading to a local economic downturn begin to fall. Swimmers find new beaches. Boaters trailer their craft to lakes where their propellers won't get clogged. Fishermen seek waters where their lines won't get snagged. Property values go down. And, as area businesses feel the impact, wages retreat and jobs are lost.

And if all that weren't bad enough, weed-infested lakes can become more prone to flooding – with the result that property and even lives are put at risk.

Scientific research confirms the impact

You don't have to be a scientist to intuit that a well-managed lake is better for recreation and other uses than one that's become home to invasive aquatic plants. Nevertheless, the intuition of the average layman has been confirmed by several scientific studies, which have proven when these plants come in, people leave – and take their money with them.

“A build-up in aquatic weed infestation over time will drive both residents around the lake and tourists to the lake to other lakes having less infestation,” writes Dr. Frederick W. Bell, of Florida State University, in his landmark study of the Kissimmee Chain of Lakes in Florida. The ultimate result: “Jobs and wages are lost from the community having the increasingly infested lake or lakes.”

H. William Rockwell, Jr., writing for the Aquatic Ecosystem Restoration Foundation, provides a compelling list of the havoc that invasive aquatic plants can inflict:

“Invasive aquatic plants affect aesthetics, drainage for agriculture and forestry, commercial and sport fishing,

drinking water quality, fish and wildlife habitat, flood control, habitats for other plants, human and animal health, hydropower generation, irrigation, navigation, recreational boating, swimming, water conservation and transport, and, ultimately, land values," he writes, in a paper that surveyed the results of several scientific studies.

The proven value of controlling invasive aquatic plants

Research conducted across the United States consistently documents up to a double-digit percent drop in property values with the presence of nuisance invasive plants. For example, as documented by Julian Olden and Mariana Tamayo in 2014, in the state of Washington, Eurasian watermilfoil presence caused mean property values to decrease by 19 percent. (What is also interesting is that none of the research documents an increase in value due to the presence of these plants!)

In a paper looking at Florida's Lake Istokpoga, Bell discusses an economic study that modeled the impact of invasive aquatic plants on property values. It found that "complete control of aquatic plants increased property values by 17 percent for developed lots and 35 percent for undeveloped properties."

Fortunately, invasive aquatic plants can be managed with the application of effective herbicides that have proven safe for humans, fish and wildlife. Although controlling them can be an expensive proposition for states with a significant number of recreational lakes and ponds, research conducted by Bell and others has shown that it is worth the investment: when you get rid of the weeds, people come back (along with their money) and property values rise – sometimes substantially. The bottom line: "There is an economic impact on the local region measured in terms of sales, wages, and jobs as well as additional recreational benefits maintained for lake users when invasive aquatic plants are kept to a minimum," according to Bell.

Common invasive aquatic plants

There are numerous species of invasive aquatic plants, but these are six that can cause the most problems in United States lakes:

Hydrilla (*Hydrilla verticillate*), also known as Florida elodea, water thyme, Indian star-vine. Hydrilla was likely introduced to the United States from Asia in the 1950s via the aquarium trade and is now common in the eastern part of the country. It crowds out native species, impeding irrigation and boating.

Water hyacinth (*Eichhornia crassipes*), also referred to as common water-hyacinth and floating water hyacinth. Water hyacinth is native to South America but has been present in the United States since the late 1800s, when it was introduced as an ornamental plant. It can form dense colonies that crowd out native species.

Eurasian watermilfoil (*Myriophyllum spicatum* L.), also known as spiked watermilfoil. Despite its name, Eurasian watermilfoil is native to Europe and North Africa as well as Asia. It is thought to have been introduced to the United States between the 1880s and 1940s, and is now one of the most widely distributed invasive aquatic plants on the continent. It can interfere with swimming, boating and fishing and crowd out native plants.

Curlyleaf pondweed (*Potamogeton crispus* L.), also called curly pondweed, is native to Eurasia, Africa and Australia. It was introduced to the United States in the mid-1800s, possibly inadvertently. It forms dense mats that inhibit growth of native species and impede recreational activities.

Phragmites (*Phragmites australis*), is also known as common reed. Although native to the United States, it's most invasive strains originated in Europe. Research indicates those strains may have arrived in the United States as ships ballast. It crowds out native species.

Flowering rush (*Butomus umbellatus*), is a Eurasian plant that has been sold for use in garden pools, although it is now illegal to buy, sell or possess the plant in some localities because it aggressively crowds out native species.

Your AERF Sponsorship is key to:

- ▶ maintaining critical efforts in education and outreach
- ▶ expanding partnerships with regulatory agencies
- ▶ building partnerships
- ▶ supporting high quality research
- ▶ attracting graduate students
- ▶ expanding an already diverse membership
- ▶ being a source for resource management agencies

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Biology and Control of Aquatic Plants



A Best Management Practices Handbook: Third Edition

Lyn A. Gettys, William T. Haller and David G. Petty, editors

Sponsorship

The AERF respectfully requests that you consider sponsorship. AERF will continue to work on your behalf, and as a member, you will greatly benefit from our work on regulatory and research aspects of aquatic plant management. With changes in the regulatory environment now and in the future, it is essential to be involved and to support all the hard work of your AERF associates.

Please contact Carlton Layne for information on how you can best participate.

The AERF Mission

The Aquatic Ecosystem Restoration Foundation is committed to sustainable water resources through the science of aquatic ecosystem management in collaboration with industry, academia, government and other stakeholders.

Strategic Goals

- Provide the public information concerning the benefits and value of conserving aquatic ecosystems including the aquatic use of herbicides and algacides in the aquatic environment.
- Provide information and resources to assist regulatory agencies and other entities making decisions that impact aquatic plant management.
- Fund research in applied aquatic plant management at major universities.

Upcoming Events

APMS	Jul 16-19, Daytona Beach, FL
MSAPMS	Sep 11-13, Birmingham, AL
SCAPMS	Oct 4-6, Myrtle Beach, SC
FAPMS	Oct 16-19, Lake Buena Vista, FL
TAPMS	Nov 27-29, San Antonio, TX

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