South Carolina Aquatic Plant Management Society

SCAPMSNEWS

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The South Carolina Aquatic Plant Management Society 2018 40th Annual Meeting – Myrtle Beach,

Hello South Carolina APMS Vendors, Exhibitors, and Members –

With less than 1 month away from the South Carolina APMS meeting in Myrtle Beach, South Carolina!!!

Meeting Registration and Hotel Reservation Deadlines are approaching quickly.

Please note that by registering as an exhibitor, you get 2 registrations, a booth space, sustaining membership, annual membership dues, as well as admission to all sponsored events (excluding the Scholarship Golf Outing, fishing trip and other special events). We feel that this is the best value for your organization.

Please see links below to register and book your hotel.

2018 South Carolina APMS Registration www.scapms.org

Hotel Reservations **Ocean Drive Beach & Golf Resort—98 N. Ocean Blvd, North Myrtle Beach, SC 29582 (855) 516-1090**

South Carolina APMS wants to remind you all to **get registered, get your hotel reservations, and to please REMEMBER TO SPONSOR**.

Without your sponsorship, there can't be an annual meeting and without your sponsorship there is no funding of Scholarships for the students who are the future of Aquatic Management. Without Sponsorships there is no President's Reception, Banquet, meals or breaks.

We ask you to continue your tradition of sponsorship to maintain the quality of the SCAPMS conference.

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"Weeds of Down Under: A glimps at New Zealand's Aquatic Pest Plant Management"

Andrew Howell—Graduate Student
North Carloina State University
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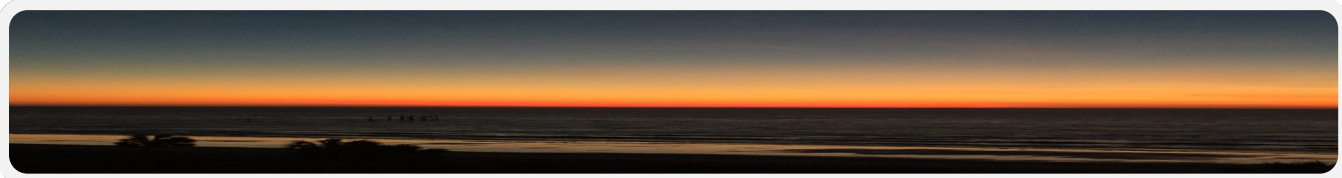
Snorkeling for submersed plants at Lake Wakatipu to provide material for a plant display during the 15th International Symposium of the Aquatic Plants in Queenstown. Here Andrew is searching for one of the several native pondweeds Potamogeton cheesemanii which is growing within a bed dominated by Isoetes alpinus

Often when People imagine New Zealand, they recall scenes from Peter Jackson's *The Lord of the Rings* film set. Others may envision the stunning views which feature lush green bush, volcanic landscapes, or the glacially formed crysta-blue waterbodies. However, the water resource managers likely have a different perspective, because amongst the spectacular settings and dynamic scenery reside a host of invasive species issues, several of which directly affect aquatic environments.

Although New Zealand is a distant island in the South Pacific, it has not remained exempt from the invasion of exotic species, particularly aquatic pest plants. Unfortately, New Zealand has ben gifted a plethora of exotic macrophytes since the early 1900's— many species of which were introduced as nursery stock or established throught the aquarium trade. Several endemic submersed plants often found across the US, have now become recognized invasive species in New Zealand, North American plants, elodea (Elodea canadensis) and coontail (Ceratopyllum demersum) can be found obstructing waterways and drainages in both the North and South Islands.

Coontail, commonly refeered to as 'hornwort' in the shoughtern hemisphere, is a significant weed for water resource managers, as free-moving "rafts" regularly hinder New Zealand's number one utility resource, hydropower. Still the US and New Zealand share several macrophytes which require management in both countries, such as Brazilian elodea (Egeria densa). However, one pest plant in particular which is absent in North America has become one of the most environmentally devastating oxygen weeds in New Zealand, lagarosiphon (Lagarosiphon major).

Continued-



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Like many invaded reservoirs and waterbodies found amongst the mid-south and southeast regions of the US, the *Hydrocharitaceae* family plagues the similarly featured waterways in New Zealand. Why hydrilla (*Hydrilla verticillata)* has existed within four North island lakes in the past, management programs implementing herbicide and grass carp have led to successfully eradicating of hydrilla in one lake, with solid progres to wards eradication (zero hydrilla over the last 2 -years) in the remaining three lakes. However, lagarosiphon (South African oxygen weed) and Brazilian elodea remaiin significant weeds with wider national distributions. Both lagarosiphon and Brazilian elodea can be found in recreational or utilitarian waterbodies, as well as flowing water systems containing interantionally prized trout fisheries. Often displacing native submersed paecies, pest plants like lagarosiphon form dense columnar beds which shade out native pondweeds and the revered charophyte meadows. Non-native emergent vegetation, such as common reed (*Phragmites australis*), alligatorweed (*Alternanthera philoxeroides*), and parrotfeather (*Myrophyllum aquaticum*) are also notable pest plants in New Zealand. While exotic floating species, such as giant salvinia (*Salvinia molesta*) and water jyacinth (*Eichhornia crassipes*) are documented, these populations are eradicated when found. In general, free floating and floating-leaved pest plants account for only a small portion of aquatic plant control when compared to the US.

Example of the pest plant lagarosiphon which is found throughtout New Zealand's North and is in several South Island lakes. At first glance lagarosiphon mimcs monoecious hydrilla, but after quick inspection the recognizable recurved leaves and closely packed apical shoots reveal the true classification.

New Zealand's unique waterbodies include Coastal dunes, glacier melts, calderas, landslide-formed and peat lakes as well as manmade reservoirs. Unlike the typically turbid waters found amongst the southern regions of the US, Secchi depths of 6-10 m are not uncommon in New Zealand's waterbodeies are generally mesotrophic or oligotrophic although in the past few decades, etrophic waterbodies have been present nearby havily grazed paddocks or highly productive agricultural land. However, these point-source issues are being addresed through fencing, riparian plantings and best management incentives. Continued...

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While the US aquatic plant industry may seeem to have a limited portfolio of registered herbicides, New Zealand regulations currently limit managers to a selection fo just two labeled chemistries, endotholl and diquat for aqutic use. While a 'restricted use' category controls the application of other chemistries (imazapyr, metsulfuron methyl, trclopyr triethyl amine, haloxyfop) for national or tegionally significant weeds around water (e.g. alligator weed, *Xixania latifolia,* (Manchurian, wild rice) or *Lythrum salicaria* (Purple loosestrife)). Aquatic plant management often occurs as an integrated approach of chemical, biological, and physical control methods. By and large, management and survey programs often parallel North American tactics, still there are several distinct strategies. One of the more obvious is the use of manned diving surveys to monitor and map incursions. For those further interested in mapping with divers in New Zealand, check out the National Institute of Water and Atmospheric Research (NIWA) lake SPI Submerged Plant diver scheme (https://lakespi.niwa.co.nz).

New Zealand has been an eye-opening experience. Not only because of the exeptional landscapes and lingering views which would make any outdoorsman jealous, but also the opportunity to step away from the accustomed pest plants and survey techiques commonly found in the States. Since arriving in New Zealand in early January, I've recognized the importance of continually developing management strategies, both domestic and abroad, to meet the challenges of aquatic pest plants. Likewise, New Zealand has been an empowering experience, highlighting the critical importance of biosecurity, native habitat preservation, and the effectiveness of early detection, rapid response. Much like the US, it is public outreach systems, cush as "Check, Clean, Dry", that lend a hand in the success of reducting the spread of invasive weeds amon the waterways. Continued…

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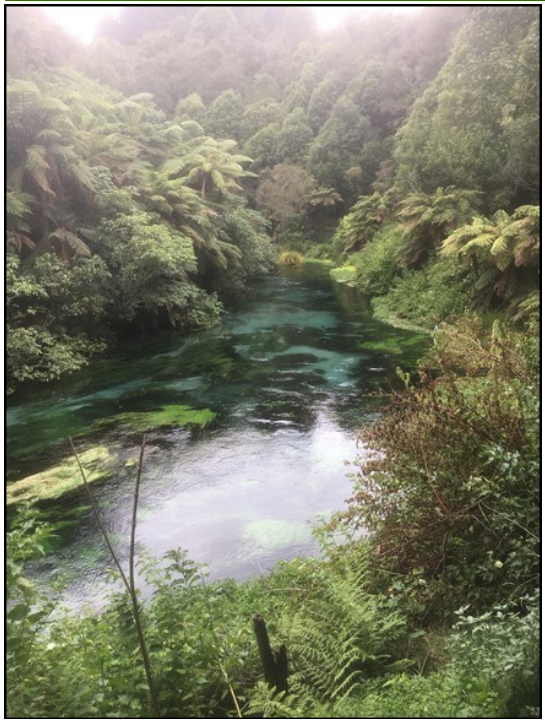
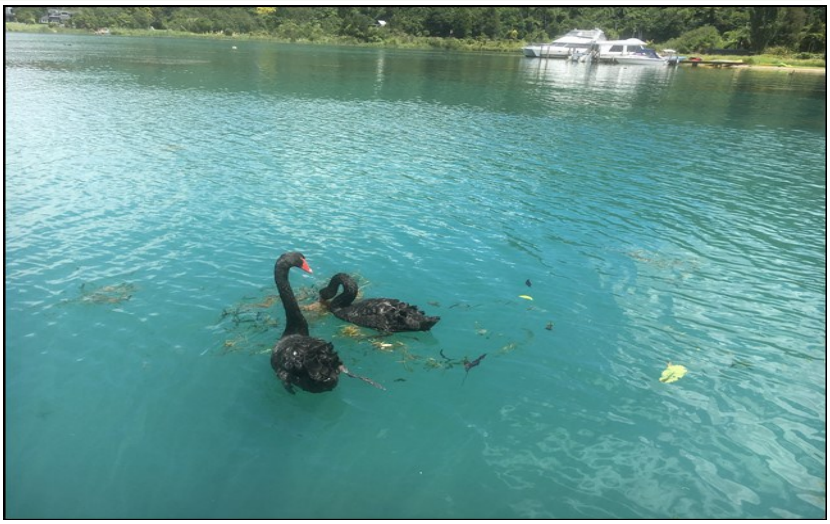
Intersting New Zealand Facts

- When you land for the first time in Auckland International airport, you instantly realize that New Zealand's unique biodiversity has ministry officials and non-governmental organizations taking biosecurity risk seriously. Prompt and efficient luggage checks for those traveling with outdoor and recreational equipment occurs consistently, as the concern for introducing pest plants and unpleasant diatoms like didymo (*Didymosphenia geminate)* is high.
- Unlike many areas in the US, the temperate zones of New Zealand do not witness annual senescence of submersed vegetation. Therefore, management efforts occur throughout the year.
- As far as diversity of the waterbodies is concerened, New Zealand definitely has greater species richness amongst the aquatic plant assemblages than most people in the mid-south and southeast are accustomed to viewing. Some communities of native SAV can be found co-occurring at 15+ species!
- Perhaps the most "precious" resource in New Zealand is not the ring forged at Mt. Doom (Mt. Ngauruhoe), but rather the preservation of the native waterways and the essential element of life-water.





Left: An example of a New Zealand spring fed river.

Above: A couple of Australian black swans fragmenting lagarosiphon

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Graduating Student Biography: Erika J. Haug, PhD

Erika Haug has been working in the field of invasive aquatic plant management on the east coast of the US for the last 13 years. She grew up playing on the shores of a small pond in rural New Hampshire. Her love of lakes led her to study biology with a minor in environmental science at McGill University in Montreal, Canada. During her time at McGill, she interned under the direction of Ms. Amy Smagula at the New Hampshire Department of Environmental Services and developed a passion for invasive aquatic plant management. She continued her studies of aquatic plant management under the direction of Dr. Sylvie DeBlois, studying aspects of the expansion of *Phragmites australis* haplotype-M on Réserve nationale de faune du Lac-Saint-François. Following graduation with great distinction for a BS from McGill University in 2008, Erika immediately began work as an aquatic plant biologist and applicator for Aquatic Control Technology, LLC (now Solitude) in Sutton Massachusetts. At the 2013 Northeast Aquatic Plant Management Society meeting, Erika and Dr. Rob Richardson began talks about graduate school. One year later, she packed up her life in Massachusetts and moved to North Carolina to begin her PhD under the direction of Dr. Richardson. In May of 2017, Erika completed a graduate certificate in Geospatial Information Science. In May of 2018, she completed her PhD in Fisheries, Wildlife and Conservation Biology with a focus on invasive aquatic plant biology and management. Her PhD research focused on specific aspects of the physiology and biology of crested floating heart (*Nymphoides cristata*) and monoecious Hydrilla (*Hydrilla verticillata*) as well as some of the preliminary research on efficacy and absorption of the new aquatic herbicide florpyrauxifen benzyl (Tradename: Procellacor). Erika received two first place student presenter awards at the annual SCAPMS meetings in Myrtle Beach, SC (2014 and 2017). She has always enjoyed the SCAPMS meetings and is grateful for all of the opportunities provided to students at these meetings. Following her PhD, she plans to continue to work for North Carolina State University as a full-time researcher. Erika looks forward to continuing to study invasive aquatic plant management and sharing her research at future SCAPMS meetings.

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Pond Management: What Are You Putting In My Pond?

Herbicides and algaecides, as their names suggest, are used to manage plants and algae in aquatic ecosystems. They are an important tool for aquatic resource management, and often offer the most efficient and cost effective solution for managing undesirable plant and/or algae growth in a waterbody. Despite widespread use, aquatic herbicides and algaecides are highly regulated. All U.S. EPA approved aquatic-use pesticides are subject to extensive testing to evaluate their effectiveness on target and non-target organisms, persistence in the environment and threats to public health. To achieve EPA registration, aquatic herbicides must meet rigid environmental and toxicology criteria. Required testing for aquatic pesticide registration is considerably more rigorous than their terrestrial counterparts, requiring evaluation of roughly 150 unique tests. Due to strict testing requirements, registration generally takes years of research before a new chemical compound can be approved by the EPA. Currently, there are only 14 EPA approved active ingredients that can be used in aquatic herbicides and algaecides. Various formulations and concentrations of these 14 ingredients constitute all approved aquatic herbicides and algaecides available for use in the US. If you have unwanted vegetation in your lake or pond, it is likely that at some point you will consider using an herbicide to help manage the undesirable growth. The decision to use one herbicide formulation over another is influenced by a variety of factors including: target vegetation to be controlled, size and configuration of treatment area, water flow, potential non-target impacts, water uses and cost. Active ingredients and formulations are not equal and improper application can lead to undesirable results, so you should always consult with a professional lake and pond manager to ensure that your management goals are reached. Similar to aquatic herbicides, there are a variety of available aquatic algaecide formulations that can be used to control nuisance microscopic and macroscopic algae in your lake or pond. Although algaecides are formulated from two primary active ingredients, copper and hydrogen peroxide, different formulations and concentrations can be used to address specific problems within each unique waterbody. Both herbicides and algaecides are designed to target chemical pathways specific to vegetation and pond algae and therefore do not typically risk non-target impacts to fish, birds, invertebrates or other aquatic fauna. Advanced formulations also allow for species selectivity, where necessary, helping to establish and maintain more desirable plant growth in your pond. Contact your local lake and pond management professional to see what can be done to help improve conditions in your waterbody.

Written by Industry Expert, Michael Lennon, Senior Biologist and Territory Leader Aquatic, Solitude Lake Managment

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In Memoriam...

John Charles Grant, of Moncks Corner and Supervisor of Vector Management at Santee Cooper, passed away on July 10th, 2018.

A graduate of Mississippi State University, John obtained a Masters Degree in Wildlife and Fisheries and was a member of the South Carolina Mosquito Control Association of which he was president multiple times. He was honored last year with SCMCA's highest award, the L.A. Williams, Jr. Award.

John was also a member of the South Carolina Aquatic Plant Management Society and attended meetings annually.

John's greatest joy was spending time with his family. He embodied the phrase "Laugh Often, Live Well, Love Much!" He loved everything baseball but was especially fond of the St. Louis Cardinals. Please keep his family in your thoughts.

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