AFS Estuaries Section News

Newsletter Editors

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From The President

As I write this, summer is rolling into fall in the Northeast; yet fires rage in the Pacific Northwest and the drought continues in the Southwest. Although it's not over until it's over, as they say, this year is on track to be the warmest on record, according to NOAA. So for us in the Northeast, it's an anomaly that we can be grateful for.

Another thing to be grateful for is the terrific tenure of now Past-President Abigail Archer as she led the Estuaries Section. Her organization, leadership, and tremendous enthusiasm inspired the rest of us on the Executive Committee. She is a tough act to follow, and I am so glad that she is still on the Ex-Comm to provide advice and help. Abigail will be continuing to help with the newsletter and website.

We also welcome Lynn Waterhouse as our new President-Elect, and Geoffrey Smith as Secretary. Konstantine Rountos, who stepped in to fill the remainder of Anthony Overton's term as Treasurer, is now officially in for a full term himself. We are on firm financial footing and have a great group of colleagues.

As your new section President, I would like to welcome your participation in any way you'd like. An organization is as good as the input of its constituents. If you have ideas, suggestions, or just want to engage some more in the Estuaries Section, please send me an email (klimburg@esf.edu) and let's chat.

Members' ideas can produce some big results. After an incubation of several years, Lee Benaka and Lynn Waterhouse's, "Monsters of Stock Assessment" idea came to fruition, as a pre-conference workshop at the Portland AFS meeting this August. It was a "field of dreams" experience – Lee and others built it, and people came – in numbers! See the article about it in this issue, along with articles about our two symposia. Truly, "Monsters…" was the surprise success story of the conference.

I look forward to serving you over the next couple of years!

- Karin Limburg

From The Out-going President

Hello Estuaries Section Members,

I hope you all had a great summer. It was good to see so many of you in Portland. The Estuaries Section was on fire at this meeting! The "Monsters of Stock Assessment" workshop was a big success. Many thanks to Lee Benaka and Lynn Waterhouse for organizing the event, which is summarized in this newsletter.

Our Section also sponsored two symposia, which were well-attended and generated much discussion. The organizers for each symposia (also summarized in this newsletter) are working with presenters to publish the results.

On August 15th I represented the Section at the AFS Governing Board (GB) meeting. The GB voted on three motions. The first was to increase the number of years a member can be considered a, "Young Professional" after graduation from three to five. Reduced membership dues hopefully should improve the retention of Young Professionals to full members.

The GB also voted to more formally define the roles of the GB and the Management Committee. The GB now will decide on Society policies, approve the annual budget as presented by the Management Committee, lead strategic planning initiatives, and review business matters that need membership approval. The GB generally meets twice a year. The Management Committee meets monthly and handles general oversight of Society operations including budget approval, Executive Director activities, society-wide meetings, and communications with membership and external partners.

The GB also voted to send the Position Paper and AFS Policy Statement on Mining and Fossil Fuel Extraction to the membership for a vote at the Portland Business Meeting ,where it was ultimately approved. You can read more about it here: http://fisheries.org/policy-statement-on-mining

At the Section Business Meeting on August 16, I got to participate in my favorite activity – handing out student travel awards! We gave out two, thanks in part to a generous donation from The Nature Conservancy. You can read all about awardee Catherine Johnston's research on the next page.

Thank you for the opportunity to serve as your Section President. It's been fun and a nice way to meet colleagues from across the country. Serving as an officer is a great way to practice management and leadership skills – I highly recommend giving it a try. I now look forward to supporting the initiatives of incoming President Karin Limburg.

No rest for me though – AFS President Ron Essig drafted me to serve as Co-Chair of the Program Committee for the 146th annual meeting in Kansas City. The meeting's theme is "Fisheries Conservation and Management: Making Connections and Building Partnerships." There will be a focus on large river ecology. This meeting could provide an opportunity to learn from your colleagues who work upstream. Symposia proposals are due in January. Visit http://2016.fisheries.org/ for the latest updates.

Thank you,
Abigail Archer

Symposium: *Frontiers in Otolith Chemistry: Insights, Advances and Future Directions.*

"Otoliths are made of materials that come together in complex ways, and their formation is not completely understood."

Otoliths, the small, carbonate structures in the acoustico-lateralis system of teleosts, have become invaluable sources of information for fisheries scientists. Their time-keeping properties were discovered long ago, and today most stock assessments rely on ages estimated from otolith growth increments. However, increasingly otolith researchers are delving into chemical investigations, making new discoveries about natal origins, migrations, and environmental experiences.

Last fall, the Estuaries Section co-sponsored the 5th International Otolith Symposium (IOS) which was held in Mallorca, Spain. The majority of presentations at the IOS involved otolith chemistry. Following up on that, the Estuaries, Marine, and Habitat sections of AFS jointly sponsored another symposium, this time in Portland just a few weeks ago. Because the IOS takes place only every 4-5 years, having "off-year" sessions is really helpful to the community. The Portland symposium also provided a forum for researchers and students who could not travel to Spain to share their latest work.

Our symposium in Portland started on Monday after the plenary session, and continued all day Tuesday. The session included 31 full presentations and 3 posters (including speed talks), covering a remarkably wide range of topics within what might appear to be a narrow slice of science. Otoliths are made of materials that come together in complex ways, and their formation is not completely understood. The interplay of genetic constraints, physiology, and environment is still being unraveled. Yet, enough is understood about the behavior of some chemical components, notably key isotopes such as strontium and oxygen, or ratios of bulk strontium or barium to calcium, to make interpretation of data moderately straightforward. Importantly, several presenters highlighted work with "non-traditional" elements that could provide insight into eco-toxicology (using selenium) or environmental stressors such as hypoxia (using manganese). Although further field and experimental validation is needed to continue expanding the chemical "toolbox" for otoliths, this type of work indicates one expanding frontier of the field.

See OTOLITHS, PAGE 4

Otolith Chemistry, cont'd

Other topics covered included the use of chemistry to trace provenance and movement, reinforcing the utility of these applications; statistical treatment of data; novel chemical investigations (e.g., a new method to analyze nitrogen stable isotope ratios, and possible markers of oil drilling); combinations of methods (e.g., otolith chemistry combined with tissue stable isotope analysis); novel methods of marking; strontium "isoscapes" and their application; and the transfer of otolith chemistry methods to investigate other hard structures, such as scutes, spiny rays, or scales, that don't necessitate killing a fish.

All together, the symposium was a comprehensive survey of the state of otolith chemistry and pointed to some exciting new directions in the field. Notably, the symposium was a balanced mix of seasoned and mid-career researchers with students and early-career workers. Numerous conversations about ideas and potential collaborations were overheard during coffee breaks, and several students expressed their appreciation at the chance to network with new people. A special issue featuring submissions from the symposium is currently being organized with the Journal of Fish Biology, with planned publication in 2016.

Reported by Karin Limburg and Benjamin Walther

Participants in the Frontiers in Otolith Chemistry Symposium in Portland, Oregon.

Spawning Potential for Shortnose Sturgeon (Acipenser brevirostrum) in the Penobscot River after Dam Removal: An Acoustic Telemetry and Habitat Suitability Study

Catherine Johnston
University of Maine, School of Marine Sciences

Shortnose Sturgeon. ESA Permit Number 16306.

"Shortnose sturgeon spawn in fresh water but migrate to salt water for growth and feeding."

Catherine Johnson holding a shortnose sturgeon. ESA Permit Number 16306.

The removal of dams on Maine rivers offers the potential to restore fish habitat and significantly affect populations of endangered species such as shortnose sturgeon (*Acipenser brevirostrum*). Two dams were removed on the Penobscot River in Maine in 2012 and 2013, opening up 14 kilometers of river and restoring 100% of the historic range of shortnose sturgeon in the river. Research is underway to consider how shortnose sturgeon respond to the dam removals, with a particular focus on whether they use the newly available stretches of river for spawning. Both increased access to habitat along with habitat quality are considered to better understand the potential for sturgeon populations to respond to the restoration activities.

Shortnose sturgeon spawn in fresh water but migrate to salt water for growth and feeding. Spawning activities in other river systems occur within a narrow range of water velocities, from 0.4 to 1.8 m/s, at depths ranging from 1.2 to 10.4 m, when water temperature ranges between 9 and 15°C. Cobble, gravel, boulder, and ledge have been classified as suitable substrates for spawning. Spawning occurs in the spring, after which shortnose sturgeon move downriver to the estuary to forage for the summer. When water temperatures cool in the fall, sturgeon move back up and aggregate at freshwater overwintering areas. In the spring when temperatures begin to warm they move farther upstream to spawning grounds.

Through acoustic telemetry, shortnose sturgeon have been documented foraging and wintering in the Penobscot River, but no indication of spawning has been seen since monitoring began in 2007. Monitoring for signs of spawning in the Penobscot River occurs each spring during the expected spawning season via acoustic telemetry and early life stage sampling. D-shaped ichthyoplankton nets are used to sample for larval shortnose sturgeon and egg mats are deployed on the river bottom to collect eggs. Since 2007, all acoustically tagged shortnose sturgeon have moved downstream after overwintering in the Penobscot River rather than upstream, counter to expectations if spawning occurred in the river. No larval shortnose stugeon or sturgeon

See SPAWNING POTENTIAL, Page 6

Spawning Potential for Shortnose Sturgeon, cont'd

eggs have been collected to date. Acoustic telemetry has revealed that many individuals make movements through the Gulf of Maine to the Kennebec River, where they have been detected on spawning grounds during the spawning season.

With the removal of the dams on the Penobscot River, there is increased availability of habitat for use by shortnose sturgeon, including for spawning. However, shortnose sturgeon have been reported to spawn under certain suitable habitat conditions so an objective of this study is to examine suitability of the newly available habitat. In concert with the efforts to document sturgeon behavior in the post-dam removal system, the distribution and abundance of suitable spawning habitat in the Penobscot River above the dam sites has been and continues to be assessed.

Using a two- dimensional hydrodynamic model called River 2D, suitable habitat for spawning has been identified in the upper Penobscot River both above and below the removed dam sites. Suitable spawning habitat was predicted to be present within the river at all discharges modeled and was primarily distributed along the margins of the river, especially at higher discharges. However, this model did not incorporate a crucial physical characteristic of spawning habitat, substrate type. Bottoms composed of substrate with large interstitial spaces, like cobble and boulders, have been described as key for spawning habitat by providing protection from currents, surface area for egg adhesion, and protection from predators.

The next step in determining spawning habitat suitability in the newly available reaches of the Penobscot River is to incorporate physical characteristics of the river bottom into the River 2D model. Spawning habitat suitability will be calculated for a range of spring discharge levels and will be analyzed to determine percent weighted usable area. The resulting habitat suitability maps can be used to identify locations for more detailed spawning sampling and can aid any future restoration efforts. Preliminary runs of the updated model predict that in the river reach upstream of the lower dam site (Veazie Dam), over 50% of the modeled area is suitable at a discharge of 1,308 cms. In addition, field collection of bottom substrate data indicates that the dominant substrate types within this reach are cobble and gravel, which are suitable for spawning. Considerations of habitat suitability are important as research continues to assess how the endangered shortnose sturgeon uses the Penobscot River after dam removals. If spawning commenced in the Penobscot River, this would have great implications for the health of the broader Gulf of Maine population of shortnose sturgeon and would represent a large step towards restoration of the species.

Symposium: *Eutrophication*

Konstantine Rountos
Treasurer, Estuaries Section
Symposium Organizer

"Although several intertwining factors were discussed in this symposium, it was clear that we are only beginning to scratch the surface of this complex issue ."

AFS scientists tackled a diversity of effects from anthropogenic eutrophication on our nation's fish and fisheries (Fig. 1). Although several intertwining factors were discussed in this symposium, it was clear that we are only beginning to scratch the surface of this complex issue. This well-attended symposium began with a thought-provoking keynote that explored if the Northern Gulf of Mexico ecosystem should be called the "fertile fisheries crescent" as opposed to the "dead zone", based on its sustained high productivity in spite of the hypoxic area. A major theme from this and many other presentations was that elucidating the trade-offs from eutrophication of aquatic ecosystems continues to be difficult and is not always straightforward. Researchers utilized a variety of new tools and experimental approaches to resolve these impacts, and there were several common threads related to where this discipline is headed. For instance, evaluating the impacts of hypoxia, acidification, harmful algal blooms or other stressors has largely shifted from traditional toxicological approaches to a focus on sublethal or behavioral effects to fish using realistic exposure periods and innovative experimental designs. Overall, scientists agreed that there is an urgent need for (1) more research on these impacts and (2) better integration into ecosystem modeling.

Figure 1: *Word cloud from the abstracts in the "Resolving the Multiple Impacts of Anthropogenic Eutrophication on Coastal Fish and Fisheries" symposium.*

Concert Review: *Monsters of Stock Assessment*

Well, it wasn't really a concert, but it did feature…Heavy metal music! Laser light shows! Big hair! Spandex! Terry Quinn in a Batman mask and wig!

The organizers would like to offer a big THANK YOU to everyone who participated in, attended, and contributed to the Monsters of Stock Assessment at the AFS meeting in Portland, OR. The workshop name was a play on the 1980s "Monsters of Rock" tours, which brought together the best heavy metal bands in the world to play together. We had well over 75 people in attendance and interesting and entertaining talks from seven fisheries professors from around the United States, as well as Rick Methot, NOAA Science Advisor for Stock Assessments.

The workshop was a student travel award fund-raiser for the both the Estuaries Section and the Marine Fisheries Section of AFS. Including a donation from the American Institute of Fisheries Research Biologists (AIFRB, join here: http://www.aifrb.org/), t-shirt sales, and admission donations, the Sections raised about $1,500 total to help fund future student travel to AFS meetings.

If you weren't there, you missed Jim Bence reminding us of the importance of ecological interactions by showing in creative and slightly bloody ways how these interactions worked. You missed John Hoenig reviewing the basics of mean growth rates and championing the work of his students. And you missed Selina Heppell's list of the 10 most stupid things stock assessment scientist can say in public. The Estuaries Section hopes to make all of these fabulous talks available on its website, with a link for additional donations to support student travel. This fundraiser was at least 5 years in the making and it was great to have it come to fruition and for it to be such a success. If you would like to help organize a future fundraiser similar to this one, or suggest a topic idea, please contact Lee Benaka at lee.benaka@noaa.gov, or better yet, start a discussion on the Estuaries Section LinkedIn Page (https://www.linkedin.com/grps/Estuaries-Section-American-Fisheries-Society-7443198/about) or Facebook Page (https://www.facebook.com/EstuariesSectionAFS).

Until next time, we leave you with the immortal words of Joni Mitchell, as sung at the Monsters workshop by Terry Quinn and Steve Cadrin (in an attempt to communicate their motivation to continue to strive to answer questions in fisheries science):

I've looked at life from both sides now,
From win and lose and still somehow,
It's life's illusions I recall
I really don't know life at all.

See MONSTERS, Page 9

Monsters of Stock Assessment, Cont'd

Monsters of Stock Assessment by the numbers

3 hours, length of workshop

8 Monsters of Stock Assessment

75+ in attendance

1,500 amount raised for future student travel

1 epic performance by Terry Quinn (and Steve Cadrin)

Participants in the Monsters of Stock Assessment workshop .

Estuaries Section Treasurer's Report

submitted on 10/29/2015
by
Dr. Konstantine J. Rountos

Recent transactions:

Date:	Balance	Credit	Debit	Note:
7/29/2015	1,683.62			Treasurer's Report (AFS 2015)
8/12/2015	3,021.62	1,338.00		2014 Membership dues deposited
8/14/2015	3,321.62	300.00		TNC check to support C. Johnston's Travel Award. Pending Mobile deposit.
8/19/2015	2,821.62		500.00	Check #102 Travel Award for John Mohan
8/24/2015	2,901.62	80.00		2 checks from Monsters
8/24/2015	2,612.42		289.20	Check #103 Check to Lee Benaka for AV use for Monsters
8/25/2015	4,252.42	1,640.00		Deposit of cash from Monsters
8/26/2015	3,852.42		400.00	Check #101 Travel Award for Catherine Johnston
9/29/2015	3,802.42		50.00	Check #104 David Reeves - Best Student Presentation
10/8/2015	3,752.42		50.00	Check #105 Check to AFS for 9/23/2014 certificates (Smith/Overton)
10/9/2015	4,052.42	300.00		Check donation from "The Community Foundation of Utah" in recognition of Lynn Waterhouse
10/22/2015	4,052.42		(60.00)	Check #106 AFS Invoice 7766,7774, and 7782 (Plaques and Certificates for AFS 2015) Not cashed yet.
10/28/2015	4,052.42		(250.69)	Check #107 Check for Lynn Waterhouse for "Monsters" T-shirt Reimburse-ment. Not cashed yet.
10/29/2015	4,052.42 (3.741.73)			Current balance (Balance after checks are cashed)

Congratulations to the 2015 Estuaries Section Student Travel Award Winners!

Catherine Johnston, *University of Maine, Orono, Masters Candidate*
Presentation in Portland, OR: What Is the Spawning Potential for Shortnose Sturgeon (*Acipenser brevirostrum*) in the Penobscot River after Dam Removal? An Acoustic Telemetry and Habitat Suitability Study.

John Mohan, *University of Texas Austin, Ph.D.Candidate*

Presentation in Portland, OR: Linking Hypoxia Exposure to Fish Trophic Dynamics in the Northern Gulf of Mexico Using Otolith Elements and Tissue Isotopes.

Check us out online!

Website: http://estuaries.fisheries.org • Facebook: http://www.facebook.com/EstuariesSectionAFS

LinkedIn: https://www.linkedin.com/grps/Estuaries-Section-American-Fisheries-Society-7443198/about