

STAGES



Newsletter of the
Early Life History Section
of the American Fisheries Society

Volume 37, Number 2

Audrey J. Geffen & Cindy J.G. van Damme, Editors

June 2016

40th Annual Larval Fish Conference Solomons, Maryland, USA

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The 40th Annual Larval Fish Conference was celebrated in honour of Professor Ed Houde and held at the Chesapeake Biological Laboratory. The conference was attended by 104 participants. A list of participants with affiliations can be found at <http://hjort.cbl.umces.edu/LFC2016.html>.



Group photo LFC 2016. Full size is available on the website <http://hjort.cbl.umces.edu/LFC2016.html>.

ELHS Back Then

5 years ago: The first all-electronic version of STAGES was distributed

15 years ago: Art Kendall becomes president of the Section

25 years ago: 15th Annual Larval Fish Conference held in Los Angeles - 2 part "Advances in the early life history of fishes." published 1993 in *Bulletin of Marine Science*.

30 years ago: We remember Sally L. Richardson, who passed away in May 1986 while travelling to the 10th Annual Larval Fish Conference. The fund established in her name supports the best student paper awards at the LFC

President's Message



Oh the times they are a changin. Two years have passed in a hurry – it isn't much time to learn the position and potentially implement changes. Luckily, the section was in good shape when I entered office and, I'm happy to write that, it is still strong today. During the last two years, we established the Grace Klein MacPhee travel grants, we have established an Early Career Committee, and we are (still) in the process of establishing our new, combined website. My hope is that the latter will facilitate "one-stop shopping" to learn about ELHS activities and to facilitate registration to future Larval Fish Conferences, etc. Finally, during the last two years, our total membership has remained more-or-less constant but there has been an increase in the number of affiliate members offsetting a decrease in full members. We would like to see a reversal in this trend. An important difference between affiliate and full members is that the latter can vote. Become a full member so that your voice is heard!

During my two-year term as president of our ELHS section, I have been constantly reminded about the importance of volunteerism. The strength and vibrancy of any professional society are maintained through the dedication and service of the society's members. In this outgoing President's Message, I would like to thank all of the dedicated volunteers that have helped our

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Deadline for material
to be included in the
next issue of **Stages**:

September 1, 2016

News from the Regions



Pacific Rim Region

Akinori Takasuka

Early life biology in the Humboldt Current system in a Japan–Peru collaboration project

In some ecosystems, early life biology has not received much attention despite substantial progress in oceanography and fisheries science. The promotion of the early life biology in such ecosystems would facilitate comparative analysis on the early life traits among different ecosystems in the future.

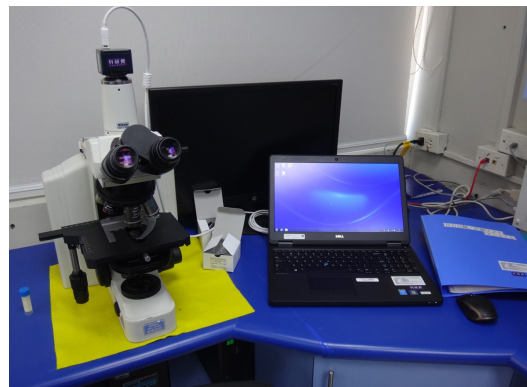


Workshop at IMARPE December 2012.

In the northern Humboldt Current system, monitoring surveys of fish eggs and larvae and zooplankton have

been conducted by Instituto del Mar del Peru (IMARPE) since the early 1960s. The egg and larval data set has been used to examine changes in distribution patterns of eggs and larvae of small pelagic fish (e.g. Peruvian anchovy *Engraulis ringens*) and demersal fish (e.g. hake *Merluccius gayi peruanus*) in response to climate changes. The IMARPE has extensively contributed to progress in fisheries oceanography (e.g. a special issue of *Progress in Oceanography*, Vol. 79, Issue 2–4, 2008). Yet, the early life biology of fish has been a bottleneck in understanding mechanisms of population dynamics of fish in this current system.

In October 2012, the IMARPE and National Research Institute of Fisheries Science, Japan Fisheries Research and Education Agency (NRIFS, FRA) formally exchanged a memorandum of understanding to launch a collaboration project on “Comparative study on biological processes of species alternations in the Kuroshio and Humboldt Current systems”. “Species alternations” are the phenomena of out-of-phase population oscillations between anchovy (*Engraulis* spp.) and sardine (*Sardinops* spp.) at multi-decadal scales in response to climate change. The patterns of species alternations have been synchronous between the Humboldt and Kuroshio Current systems (off Peru and Japan,



Otolith microstructure analysis system at IMARPE.

respectively) across the Pacific. The objective of the project is elucidating the biological mechanisms of species alternations based on comparative analyses of the spawning habitat, spawning biology, and population dynamics of small pelagic fish in relation to environmental factors in the Humboldt and Kuroshio Current systems. This is a multidisciplinary project which includes topics of early life biology, fisheries biology, zooplankton dynamics, oceanography, and modelling. The studies have been conducted mainly through workshops at IMARPE and NRIFS based on Grant-in-Aid for Scientific Research (A) (KAKENHI No. 26252031) from Japan Society for the Promotion of Science.

To proceed with the topic of early life biology, a study group of Patricia Ayon started otolith microstructure analysis on Peruvian anchovy larvae. In January 2016, an otolith image

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Section Officers

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HELP KEEP STAGES INTERESTING...

Send us a report of your research activities.



Western region

Dan Margulies

ELH “gauntlets” for commercially and ecologically important fish species in the Gulf of Alaska

The Gulf of Alaska Project <http://www.nprb.org/gulf-of-alaska-project> was a multi-disciplinary study examining interactions between physical and biological oceanography to understand how the environment influences the survival and recruitment of early life stages of select commercially and ecologically important groundfish species. More than 50 scientists from 11 institutions took part in the \$17.6 million ecosystem study funded by the North Pacific Research Board from 2010 to 2014 to examine “gauntlets” faced by the focal species during their first year of life as they are transported from offshore spawning areas to nearshore nursery areas. The Ichthyoplankton Component of the Project, composed of a team of scientists from the Alaska Fisheries Science Center, proposed key early life history “gauntlets” for survival and recruitment of the focal species: Walleye Pollock *Gadus chalcogrammus*, Pacific Cod *Gadus macrocephalus*, rockfish (predominantly Pacific Ocean Perch *Sebastes alutus*), Sablefish *Anoplopoma fimbria*, and Arrowtooth Flounder *Atheresthes stomias*.

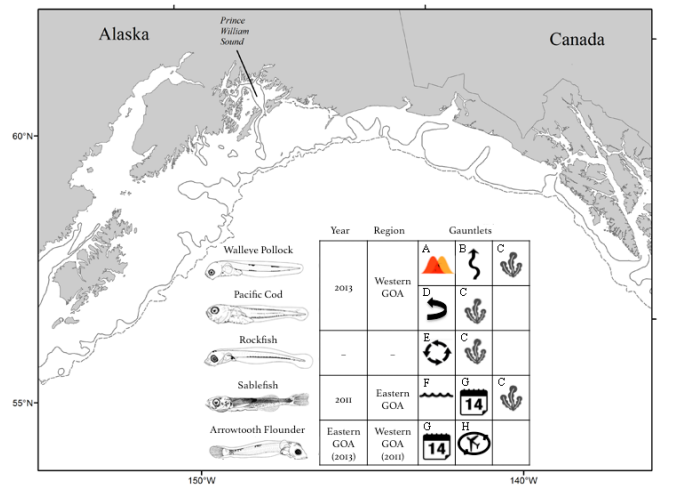
Sampling was conducted along survey grids in 2011 and 2013 in the eastern and western (east and west of Prince William Sound, respectively) Gulf of Alaska (GOA) to resolve interannual and regional patterns of abundance. Regional comparisons highlight the influence of water currents, eddies, and topography on larval transport to juvenile settlement habitat. In the eastern GOA, the narrow shelf south of Cross Sound and eddies in the Alaska Current lead to high levels of on-shelf flow of slope water and off-shelf flow of coastal water, which greatly influences larval transport. The

bloom starts and peaks earlier in the eastern GOA relative to the western GOA. In the western GOA, the Alaska Coastal Current is a continuous, well-defined system along the coast from the western side of Prince William Sound to the Aleutian Islands.

The focal species display distinct ecological niches and have disparate strategies in response to early life history sources of mortality. Walleye Pollock and Pacific Cod larvae were more abundant in

2013 and in the western GOA. Walleye Pollock survival and recruitment success depend in part on the transition to first feeding and overlap with preferred prey sources, as well as transport and the transition to suitable nearshore juvenile habitat. Pacific Cod have benthonic eggs and more limited dispersal therefore transport to suitable nursery habitat is key. Both gadoids employ a retention strategy, but recruitment strength may be set later in the juvenile stage for Pacific Cod after the fish have settled out to juvenile habitat. Rockfish larvae were ubiquitous throughout the study region, with no significant differences in abundance between years or regions. Larval rockfish have been observed in association with large mesoscale eddies (100–200 km) that propagate along the shelf break in the GOA, and especially in the eastern GOA. Larvae entrained in currents surrounding the eddy while the eddy is close to the shelf could be delivered back to the shelf; larvae found in the eddy interior would likely be transported away from the shelf. Sablefish, however, were more abundant in 2011 and in the eastern Gulf of Alaska. The prolonged larval duration and neustonic strategy leave Sablefish vulnerable to multiple sources of mortality. The association

with mesoscale eddies in the eastern GOA is thought to facilitate transport of larvae onto the shelf from the basin. The narrow shelf in the eastern GOA means larvae are closer to coastal nursery habitats, which may result in increased survival and recruitment. The early ontogeny and energy allocation strategy of Arrowtooth Flounder may help explain their success in the GOA, including spawning in deep and cold water to help avoid predation and lower metabolic demands. Arrowtooth



Map of the study area showing the location of Prince William Sound. Inset shows key early life history gauntlets for the five focal species as follows: (A) overlap with prey resources, (B) larval transport, (C) suitable juvenile habitat, (D) circulation speed, (E) eddies, (F) neustonic distribution, (G) pelagic duration, and (H) “holding pattern”.

Flounder are able to withstand variable environmental and/or prey conditions by employing a “holding pattern” strategy during their prolonged pelagic larval phase.

--E.C. Siddon¹, D.M. Blood², A.C. Matarese²

¹NOAA/Alaska Fisheries Science Center, 17109 Pt. Lena Loop Rd., Juneau, AK 99801

²NOAA/Alaska Fisheries Science Center, 7600 Sand Point Way, Seattle, WA 98115 §



North East Region

Katey Marancik

42nd United States – Poland Joint Fishery Ecology Studies Project Agreement signed in Narragansett, RI

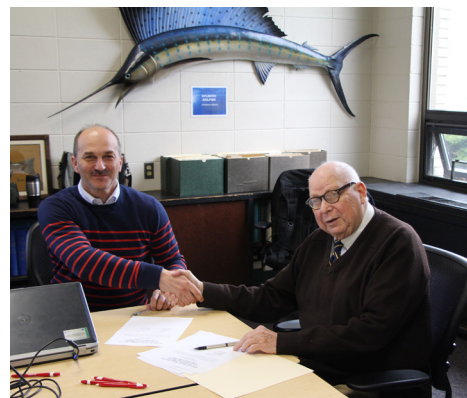
In April 2016, the Northeast Fisheries Science Center's Narragansett Laboratory hosted the 42nd United States – Poland Joint Fishery Ecology Studies Project Advisory meeting. The panel included staff from the Morski Instytut Rybacki (MIR) in Gdynia and Szczecin; the Northeast Fisheries Science Center in Narragansett, RI and Woods Hole, MA; the Alaska Fisheries Science Center in Seattle, WA; and the Southeast Fisheries Science Center in Pascagoula, MS, and Beaufort, NC. Both MIR and NMFS attendees reiterated their interest in further developing collaborative research, reviewed previous joint efforts, and discussed projects for 2016 and 2017.

The Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (DOC NOAA NMFS) has been joined in cooperative marine fisheries research with MIR since 1974 through the U.S. – Poland Joint Fishery Ecology Studies Project. Over its 42 years of operation, the joint project has cooperated in the support of the

ZSIOP in Szczecin and Gdynia, which has evolved into a prominent institution in fisheries ecology, embracing a wide range of plankton studies directed to improving an understanding of the biological and physical processes controlling natural productivity of marine fisheries resources. The broad-scope of knowledge and experience on the role of ichthyoplankton and zooplankton in LMEs developed through the cooperative work is unparalleled in the international fisheries scientific community. Further, the taxonomic expertise of the staff is exceptional and contributes to long-term efforts to study marine plankton biodiversity. While the specific research has focused on the LMEs of the U.S., the data and understanding are applicable to fisheries assessment and management in all 64 LMEs around the world, within which 80 percent of the annual global fishery yields are produced.

The agreement with MIR is the longest continuous international bilateral agreement for joint fisheries studies in the U.S. Department of Commerce. The Joint Studies Project serves as an important source of zooplankton and ichthyoplankton taxonomy, ecology, and biodiversity data in support of fish stock recovery and sustainability efforts as we move forward during the 21st century and the 42nd year of Poland – U.S. cooperation in fisheries ecology. The staff of MIR is making a notable and unique contribution to the knowledge of marine plankton ecology and biodiversity

during a period of global climate change. This record is of importance to studies of the changing states of LMEs and their goods and services, and is a fundamental building block for integrated ecosystem assessments (IEAs) and implementation of the NOAA Climate Science Strategy.



Dr Ken Sherman and Dr Emil Kuzebski shake after signing the 2016 Agreement for joint studies between the US and Poland

Samples to be processed by MIR-ZSIOP during 2016-2017 period will support the core fisheries ecology and fisheries oceanography programs in the following LMEs: Gulf of Alaska, Eastern Bering Sea, Gulf of Mexico, Northeast U.S. Shelf, Chukchi Sea, and Baltic Sea. The Joint U.S.-Poland research is focused on marine environmental protection, conservation, and management. The Project supports stock assessments, as well as the development of ecosystem-based approaches to fisheries management in the United States, Poland, and elsewhere around the globe. The Joint Studies Project is also contributing new information regarding the Arctic and will contribute to an international project to develop a distributed biological observatory in the Arctic. The agreement also led to the discovery of a new Atlantic Bluefin Tuna spawning ground, a finding which is reshaping our understanding of the ecology and life history of this important species. The Project is also contributing to NOAA's efforts to understand the effect of climate change and variability on marine fisheries and ecosystems.

--Katey Marancik §



Participants of the 42nd US-Poland Joint Studies Project Agreement meeting in Narragansett, RI, 25-28 April 2016.

Southern Region

Introducing the Deepwater Horizon Plankton Assessment Archive

Glenn Zapfe of the NOAA/Southeast Fisheries Science Center/Mississippi Laboratory would like to announce the launch of the Deepwater Horizon Plankton Assessment Archive (DWHPAA).

On April 20, 2010, Deepwater Horizon Macondo oil well drilling platform exploded off the coast of Louisiana in the Gulf of Mexico (GOM) starting the largest marine oil spill in U.S. history. The spill lasted for 87 days resulting in millions of barrels of oil being released into the Gulf of Mexico. In response to the spill, the National Oceanic and Atmospheric Administration (NOAA) and its trustees launched the National Resource Damage Assessment (NRDA) to tackle the spill and assess the damage caused. Extensive sampling of the northern Gulf of Mexico began immediately after the spill and continued on through 2011. Samples were taken across the GOM with the majority taken near the wellhead. Gear types used for sampling include bongo nets, neuston nets, manta nets, and the Multiple Opening/Closing Net and Environmental Sensing System (MOCNESS). Plankton samples were processed for ichthyoplankton, fish eggs, and decapod larvae according to protocols based on gear type. Specimens were identified to the lowest taxonomic level possible based on the currently available literature. Measurements were also taken of

all target specimens per protocols. Debris and larger zooplankton (jellyfishes, salps, etc....) were also removed but not identified.

What is the DWH Plankton Assessment Archive?

The DWHPAA is the culmination of the plankton research conducted under the National Resource Damage Assessment (NRDA) Water Column project in response to the Deep Water Horizon oil spill in 2010. At the end of the NRDA project, as a result of the BP settlement, the samples were signed over to the custody of the NOAA NMFS Mississippi Laboratory, where they are archived in a storage facility at the Stennis Space Center for long term storage and use. The storage facility provides a centralized gulf coast location while also being protected from damage that can occur during hurricanes.

The DWHPAA houses the entirety of the NRDA Plankton project which contains over 130,000 samples from 19 different surveys. In addition to the NRDA plankton samples, the DWHPAA also houses samples from the NRDA Sargassum project (~4,500 samples) and a portion of the NRDA Nekton project (~2,500 samples). The samples cover over 1,000 different taxa for both ichthyoplankton and decapods.

Our goal is to provide specimens and data to researchers for furthering the understanding of the zooplankton community in the northern Gulf of Mexico. We will loan out specimens to



researchers as requests are submitted. Requests can include specific taxa, locations (station, lat/long, and area), time of day/month/year, and sampling method and/or preservative. The loan request must include information on any destructive or damaging analysis of the specimens that may be used for research purposes (i.e., clearing/staining, otolith removal, tissue sample for molecular work, stomach analysis). This request will then be shared with the DWHPAA loan committee for discussion on whether or not the specimens should be used for the analysis. Because many of the collections were made in deep GOM water, there are rare specimens not normally collected by zooplankton researchers. Value of destroying such specimens will be discussed by the committee before the loan will be authorized.

Please feel free to contact the archive at nmfs.sec.mslabs.dwhpaa@noaa.gov with any questions or sample requests!

--Glen Zapfe §

Pacific Rim

...cont'd from p. 2

analysis system, which is composed of a transmitted light microscope and video camera connected to a monitor and computer (RATOC Systems Inc.), was brought from Japan and was set up in the laboratory. A strong advantage of this system is allowing measuring otolith on live image with focus being adjusted. We now expect progress in otolith analysis to analyze early growth rate of Peruvian anchovy larvae.

--Akinori Takasuka¹, Patricia Ayón², Miguel Ñiquen², Jorge Tam², Luis



Otolith of Peruvian anchovy larva.

Vasquez², Hiroshi Kuroda¹, Takeshi Okunishi¹, Yoshioki Oozeki¹

¹Japan Fisheries Research and Education Agency (Japan)

²Instituto del Mar del Peru (Peru) §

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European Region

Thermal tolerance and thermal performance of early life stages of marine fish

During the past couple of years, one research goal of the Peck Lab has been to estimate thermal tolerance and thermal performance curves (TPC) of marine fish early life stages. Initial results were reported by Marta Moyano during the 40th Annual LFC at the Chesapeake Biological Laboratory (Solomons, Maryland, USA). Gaining this basic knowledge in thermal physiology is fundamental if one hopes to make mechanistic (and hopefully robust) projections of how climate change will impact fish performance and, subsequently, abundance and distribution. Despite the fact that early life stages are thought to have a narrower thermal tolerance than other life stages (Fig. 1), relatively few studies have explored thermal limits of larvae. This is in contrast to the larger body of literature reporting results on larger juveniles and adults. The lack of data on larvae is likely related to the absence of standard protocols for estimating these thermal endpoints in these early life stages. A basic goal of our ongoing work is to develop standard protocols for estimating upper and lower thermal limits, namely critical thermal maximum (CT_{max}) and minima (CT_{min}), in fish larvae.

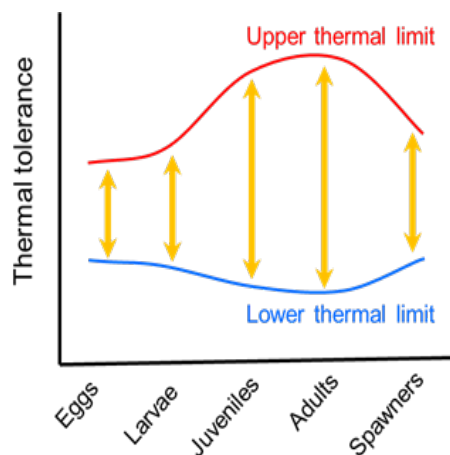


Fig. 1. Expected variability in thermal tolerance across life stages.

Impact of warming rate on CT_{max}

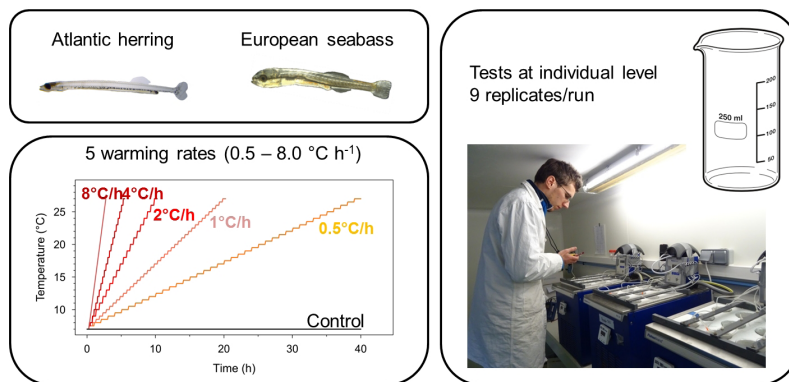


Fig. 2. Diagram on the experiments testing the impact of warming rate on CT_{max}, showing the two species, setup, warming rates used and Yannick Ruhbaum performing a CT_{max} trial.

Warming rate is one of the methodological factors that is known to impact critical thermal limits measured in laboratory experiments, however, to the best knowledge, the influence of warming rate on larval fish CT_{max} has never been reported. We conducted two experiments to explore the impact of warming rate (from 0.5 to 8 °C h⁻¹) on CT_{max} (using dynamic protocols) in larval fish of two temperate marine species, Atlantic herring *Clupea harengus* and European seabass *Dicentrarchus labrax*. These experiments were conducted by two students: Caroline Candebat (BSc) and Yannick Ruhbaum (MSc) (Fig. 2). The work on seabass was done in collaboration with researchers from IFREMER (Brest, France) in the frame of the German-funded FITNESS project. Results for herring suggest that slower warming rates (<2 °C h⁻¹) lead to a lower CT_{max} likely due to an accumulation of heat damage. However seabass larvae showed the opposite trend with slower warming rate (1.5 °C h⁻¹) leading to a significantly higher CT_{max}. Given the species-specific differences observed, developing a standard protocol that employs one warming rate is not advisable. We recommend a fast screening of the impact of different warming (cooling) rates on CT_{max} (CT_{min}) before starting to work with any species.

It has been challenging to compare our results on larvae of herring and seabass with results reported for other life stages of these species. There are large differences in the methods employed and some of the work has been conducted on different

populations. Nevertheless, there are clear differences in stage-specific patterns between the two species. Whereas all life stages of Atlantic herring appear to be eurythermal, the eggs of seabass appear to have a narrower thermal tolerance compared to later life stages. For both species, no information is available on the thermal limits of the spawners, a knowledge gap that should be filled. Compilations such as this will help us identify the potential stage-specific bottlenecks (the most vulnerable stages) to climate change.

An important advance in knowledge will be to understand how extreme events (e.g. cold snaps and heat waves) might impact fish populations. This will require additional information on the time dependency of survival at different, sub-optimally cold or warm temperatures. Furthermore, once standard protocols are available to examine thermal limits in larvae, additional, interacting stressors (pH, pCO₂, hypoxia) can be included to better understand which aquatic (marine and freshwater) habitats may be unsuitable in the future. The ultimate goal would be to build TPC for all life stages and incorporate them into physiological, biophysical models to project climate impacts. Using these models we would gain a “cause and effect” understanding of the responses of organisms to climate-driven changes in key environmental factors by resolving the underlying physiological mechanisms.

--Marta Moyano and Myron Peck §

An introduction to fish larvae identification workshop

2nd - 4th November 2016, Plymouth, UK

A practical 3 day workshop focusing on both commercial and most abundant species found in north east Atlantic waters, covering:

- Introduction to fish larvae and egg identification
- Lifecycle and development
- Sampling and preservation methods
- Key identification features
- Relevant literature and available resources
- Fish policy in the UK

Delivered by Nalani Schnell (Muséum national d'Histoire naturelle, Paris) and Cindy van Damme (IMARES, The Netherlands)

For further information and how to register, please visit <http://www.shafos.ac.uk> or contact sahfos@sahfos.ac.uk

Place limited to 20 participants, £450 per person, registration closes 5th August 2016.



Flatfish Biology Conference

December 6-7, 2016

Westbrook, CT

<http://nefsc.noaa.gov/nefsc/Milford/flatfishbiologyworkshop.html>



Meeting of the ICES Working Group on Atlantic Larvae and Egg Surveys (WGALES)

A description of the WG can be found here: <http://ices.dk/community/groups/Pages/WGALES.aspx>

Location: School of Biology, Aristotle University of Thessaloniki, Thessaloniki, Greece. Dates and times: 1400h 17 October 2016 – 1200h 21 October 2016.

The meeting will be in two sessions:

1. General Presentations concerning egg and larvae surveys

2. The specialist theme of the Workshop: Parameter estimation for and from egg and larvae surveys: evaluation of methodologies and its applicability for assessments.

a. **Egg and larvae issues**

b. **Adult parameter issues**

For further information contact Richard.nash@imr.no or mmangelico@ipma.pt. Important dates: submission of Abstracts (oral/poster): Friday 22nd July 2016; acceptance of Abstracts: Monday 5th September 2016.



Pacific Rim ...cont'd from p. 2

VIMS Hosts Larval Fish Workshop

The Virginia Institute of Marine Science is currently hosting a two-week Larval Fish Workshop aimed at introducing students, collection managers, research scientists, and volunteers to the study, identification, and care of larval fish specimens (see advertisement in the last issue of STAGES). We have thirteen participants from six different countries who are sorting through ichthyoplankton samples collected in Antarctica, the Amazon River Plume, the Sargasso Sea, Belize, the Chesapeake Bay, and the Gulf of Maine. Guest instructors include Drs. Jeff Leis (University of Tasmania, Australia), William Watson (NOAA Southwest Fisheries Science Center), Dave Johnson (National Museum of Natural History, Smithsonian Institution), Nalani Schnell (Institut de Systématique, Évolution, Biodiversité, Paris, France), and Peter Konstantinidis (VIMS).

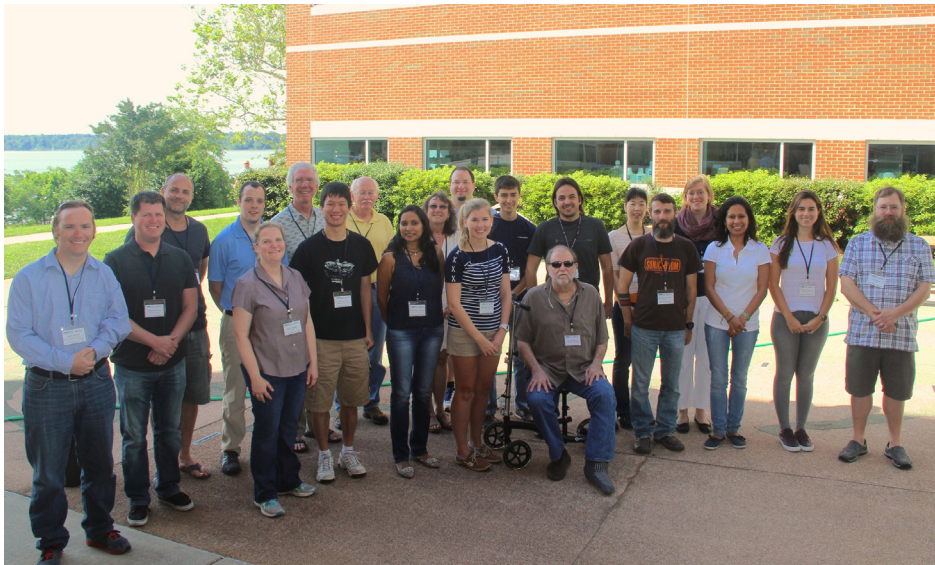
After only six days of the 10-day workshop, students have identified over 1,200 lots of larval fishes! In addition to learning about larval fish taxonomy and characters for identification,

participants are also gaining hands-on experience imaging larval fishes and clearing and staining larval fishes. We will also have presentations on curation of larval fish collections at the Australia Museum, VIMS, and the Museum of Comparative Zoology at Harvard University by Jeff Leis and Sarah Huber (VIMS). Two remote lectures are planned with Tammy Cullins, a former workshop participant and collection manager for the SEAMAP larval fish collection, and Katherine Maslenikov, collection manager at the

Burke Museum at the University of Washington, who will discuss curation and organization of these larval fish collections.

This workshop was made possible by a grant from the National Science Foundation's Collections in Support of Biological Research (NSF DBI-1349327).

--Sarah K. Huber, Virginia Institute of Marine Science (VIMS) Nunnally Ichthyology Collection §



Participants in the 2016 Larval Fish Workshop.

New officers, representatives and social media responsables



Dear Colleagues, it is a great pleasure stepping in as secretary for the ELH Section! I realize that keeping the membership well informed is key for the vitality of the Section, and I am committed serving you by maintaining the contact list up to date and rapidly transferring any relevant information. I would like to thank Fred Scharf for his great work in the position and encourage you to contact me if you have any relevant information to share, announcements to make or positions to offer.

--Dominique Robert

Starting this month, Katey Marancik will take over as the Northeast United States representative for the Early Life History Section.

Katey received her Master's degree at East Carolina University in 2003, where she studied the larval fish assemblages of the Georgia Bight. During her Master's studies, and for a few years after, Katey was a contractor at the NOAA laboratory in Beaufort North Carolina. In 2006 she moved to the Narragansett Laboratory of the Northeast Fisheries Science Center, where she has continued as a contractor to this day. At the Northeast Fisheries Science Center



she is responsible for a wide variety of the data management, sample management, and larval identification verification tasks that are essential to keeping this 45 year time series running.

Katey's research interests include various aspects of larval fish ecology and taxonomy. She has worked on a number of projects improving descriptions of larval fishes of a wide range of taxa including Serranidae, Scombridae, Phycidae, and Bregmacerotidae from the Northeast U.S. continental shelf, Southeast U.S. continental shelf, and Gulf of Mexico. Much of this work has made use of genetically identified voucher specimens to evaluate the morphological criteria. Katey has also been involved in projects describing the abundance, spatial, and temporal distribution patterns of larval

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Section Business ...cont'd from p. 8
 fishes; and examining relationships between larval fish and their physical and biological environments.

As a long-time member of the Early Life History Section, Katey is excited to join the ranks of contributors who make Stages such an informative newsletter.

Ed Roseman, at the USGS Great Lakes Science Center, Ann Arbor Michigan, is the new North Central Regional Representative. His main work is on the ecology of larval fishes in the Great Lakes and their connecting channels. Over the last 5 years he has led a team of researchers assessing habitat restoration in the St Clair and



Detroit Rivers. His email address is eroseman@usgs.gov, and he will be looking to collect news on ELH activities in the Great Lakes and beyond.

Todd Clardy, assistant professor at King Fahd University of Petroleum and Minerals, is studying the ichthyoplankton of the Red Sea and Arabian Gulf. He has agreed to represent the section in the social media world. He's taking on responsibility for the Facebook page (www.facebook.com/earlylifehistory)

where he'll keep things updated – especially with information on jobs, workshops, and highlighting early life history research. The section twitter account (@AFS_ELHS) will finally be activated, and Todd will be curating it. News about new publications, presentations, new grants and job notifications are all welcome there. Plus any other information you want to distribute through either mode, as well as the newsletter, of course. §



Business meeting report 2016

Status of Committee's Activities in 2015-16:

Following from discussions within the Executive Committee and at the 2008-10 ELHS Business Meetings, the Committee sought to identify potential LFC hosts that accommodated the following idealized 4-yr pattern of venue locations while including opportunities for both stand-alone LFCs and joint meetings (e.g., with AFS, JMIH).

- US/NA east coast or Gulf of Mexico
- US/NA internal continental or Gulf of Mexico
- US/NA west coast
- International (outside of North America)

We have been successful in securing offers to host LFCs for the next 2-3 years, and have undertaken discussions with additional candidate hosts for the out-years that follow the above scheme.

FUTURE LFCs
 2017 July 12-16 Austin, TX, USA Lee Fuiman, Dept. Marine Science, Integrative Biology,

University of Texas; Chris Chambers, NOAA / NEFSC, Highlands NJ
 Status: Offer with presentation to ELHS Business Meeting at LFC2016

Details: Joint meeting with JMIH

2018 Victoria, BC, Canada John Down and Francis Juanes, University of Victoria, and Pierre Pepin, DFO St. Johns, NFLD
 Status: Offer with to ELHS Business Meeting at LFC2016

Details: Solo LFC Late June 2018

2019 (1) (Considerations) Palma de Mallorca, Spain, Ignacio Catalan & Patricia Reglero, Mediterranean Inst. for Advanced Studies, Out-year opportunity; Joint Meeting w/ LBS?

2019 (2) The Netherlands, Cindy van Damme & Tinka Murk, Inst. for Marine Resources & Ecosystems and Wageningen University
 Out-year opportunity; Joint Meeting w/ LBS4(?)

2020 (Considerations)

(1) Avery Point, CT, USA, Hannes Baumann, U Conn-Avery Point
 Status: HB opportunity

(2) Great Lakes USA Region TBD
 Out-year opportunity

2021 (Considerations)

(1) Great Lakes USA Region TBD
 Out-year opportunity,

(2) La Jolla, CA, USA, TBD (NMFS / Scripps UCSD)
 Out-year opportunity; Joint Meeting w/ LBS4(?)

Discussions with candidate hosts and venues for 2019 & 2021 include possibility of a joint meeting of LFC with Larval Biology Symposium (LBS) which has long been discussed by the ELHS. The LBS used to meet biennially (even yrs) but LBS skipped 2014. LBS will reconvene in 2017 in Hawaii with plans to meet biennially (odd yr) in future. One possible host for the LBS in 2019 was an offer by Dustin Marshall, School of Biological Sciences, Monash University, Melbourne, Australia. Chambers has been chasing this group for multiple years. Let's discuss again. §

President's Message...cont'd from p. 1
 section move forward and help the section serve its members. Two more volunteers have just started working for you as leaders of the section. Frank Hernandez and Dominique Robert took their offices as President and Secretary at the close of our business meeting.

This was an easy transition. They will realize (as I have), that there is a strong group of previous officers and members to support them. The stewardship of our section is in great hands.

We had a record-breaking attendance at the business meeting.

This may reflect increasing interest in how we administer the ELHS. The large attendance may also have been due to the inclement weather (it was fairly stormy outside...). However, I firmly believe that the packed room was due to the former. Several members

...continued on p. 14

AFS Early Life History Section Business Meeting Reports

Tuesday, July 21st, 2016,
Solomons, MD, USA

1) ELHS Secretary's
Report, Fred Scharf

1.1) Membership

As of June 10, 2016, there are 175 full members of the ELHS, and just shy of 50 affiliate members. For comparison, at the time of the 2015 LFC, the section had 203 full members, and 22 affiliate members. Total membership has been hovering around 225 members.

During the LFC in Vienna, it is recommended that membership is encouraged informally (e.g., during coffee breaks and conversations), as this was successful during the 2013 LFC in Miami. Often, many of the LFC attendees are not ELHS members (either full or affiliate), and they can quickly join as affiliate members. During the LFC, they can join using the website via PayPal or can simply provide money to a member of ExCom or local organizer which is forwarded to our Treasurer.

The secretary can send email reminders to past affiliate members that have not renewed their membership.

1.2) Grace Klein-MacPhee
student travel grants

For the 2016 LFC, we were able to provide student travel support to 10 graduate students (6 PhD, 4 MS) from five different countries.

The section also supported LFC attendance of three advanced undergraduate students in 2016, by providing funds to cover their registration fees (total = \$484.14).

For comparison, the section awarded \$5400 in 2014 (Quebec City) and the same amount in 2015 (Vienna) to support student travel grants to support travel of graduate students to of the 2014 LFC in Quebec City. Given the current financial resources of the section, student travel support should be stable in the range of \$3,000 - \$5,000 per annum for the foreseeable future.

2) ELHS Treasurer Report
2015-16, Jeff Buckel

I oversaw the transactions in five accounts during 2015-2016.

There are four accounts at First Citizens bank in North Carolina. They are: General Fund, Sally Richardson Fund, Blaxter Fund, and Grace Klein-MacPhee Fund. The debits and credits to those accounts are summarized in the detailed financial reports (see appendix 1)

2.1) The balance in the General Fund account remained level as the costs for LFC 2016 travel grants (\$4000) and undergraduate registration (\$484.14) were offset by income from AFS 2014 dues payments (\$3450) and surplus funds (\$1300) from LFC 2015 (Thanks Hubert and the rest of the LFC 2015 team!!!). The current balance in the General Fund is ~\$19,800 but the account will receive an additional ~\$3000 in 2015 dues payments from the parent society by the end of the calendar year.

2.2) The monies raised through raffles at LFC 2015 were split 2:1 between the Sally Richardson and Blaxter fund (\$480 to Richardson and \$240 to Blaxter). This decision was made because there was no flag auction at the 2015 LFC. The current balance of Blaxter fund is \$7,338 and current balance of Sally Richardson fund is \$15,079.

2.3) The Grace Klein-MacPhee fund has a current balance of \$2,060. These funds were intended for student travel grants but we've maintained use of the General Fund account to pay for travel grants.

2.4) The fifth account is our PayPal account. Sixteen affiliate members paid dues through PayPal over the last year for a total net income of \$226 (see income and PayPal fees below). The current balance in the PayPal account is \$1325.

I filed Form 990-N with the IRS in June 2016 for tax year 2015. The section has to file this form to maintain non-profit status.

The ELHS accounts are in good financial standing with a total balance of ~\$45,000. (~\$48,000 once 2015 AFS dues check arrives). A complete list of transactions and account balances is provided in Appendix 1.

3) ELHS Newsletter Editors' Report,
Audrey Geffen & Cindy van Damme

In the past year, we published two issues of STAGES: October 2015 (14 pages) edited by Lee Fuiman, March 2016 (11 pages). The June 2016 issue is due to appear during the LFC. The editorship was taken over in 2016 from Lee Fuiman by Audrey Geffen and Cindy van Damme. Due to this and the steep learning curve of the Adobe InDesign program in which the newsletter is created, the first 2016 issue appeared in March rather than February. The plan is to keep the STAGES publication dates in February, June and October each year.

STAGES continues to be an entirely electronic publication. Distribution is via email and the email list appears to be complete and with few errors.

A meeting with the representatives for STAGES will be held during the LFC meeting in Solomons, USA. We are looking for representatives from the Southern and North Central regions.

4) ELHS Time and Place Committee
Report 2015-2016, Chris Chambers

Following from discussions within the Executive Committee and at the 2008-10 ELHS Business Meetings, the Committee sought to identify potential LFC hosts that accommodated the following idealized 4-yr pattern of venue locations while including opportunities for both stand-alone LFCs and joint meetings (e.g., with AFS, JMIH).

- US/NA east coast or Gulf of Mexico
- US/NA internal continental or Gulf of Mexico
- US/NA west coast
- International (outside of North America)

We have been successful in securing offers to host LFCs for the next 2-3 years, and have undertaken discussions with additional candidate hosts for the out years that follow the above scheme. Status: Offer 1 with presentation to ELHS Business Meeting at LFC2016

Discussions with candidate hosts and venues for 2019 & 2021 include possibility of a joint meeting of LFC with Larval Biology Symposium (LBS) which has long been discussed by the ELHS.

The LBS used to meet biennially (even yrs) but LBS skipped 2014. LBS will reconvene in 2017 in Hawaii with plans to meet biennially (odd yr) in future. One possible host for the LBS in 2019 was an offer by Dustin Marshall, School of Biological Sciences, Monash University, Melbourne, Australia. Chambers has been chasing this group for multiple years. Let's discuss again

5) ELHS Historian Report, Jeff Govoni, ELHS Historian

The paper archives of the ELHS are maintained at the home residence of ELHS Historian Jeff Govoni, in Straits, outside of Beaufort, NC. Relevant electronic files are either transmitted to the ELHS Webmaster for posting on the ELHS Website if appropriate, or maintained as electronic files by the Historian.

The ELHS Historian has provided material for inclusion in the "ELHS Back Then" Column in Stages. This will be discontinued (due to a lack of material).

Contact with the ELHS Historian can be made through the following email address: JJGovoni@gmail.com.

6) ELHS Early Career Committee (ECC), Alison Deary (co-chair)

The goal of the ECC is to create, plan, and execute professional development activities geared to early career researchers at our Annual Larval Fish Conferences in order to recruit, retain, and enhance the experience of new members to the Early Life History Section. At the 39th Annual Larval Fish Conference in Vienna (2015), we hosted our first early career event, which was a short workshop (~two hours) focused on strategies for preparing strong grant applications led by Drs. Myron Peck and lone Hunt von Herbing. The workshop was attended by approximately 50 participants, predominantly graduate students as well as researchers at various career stages. We have received positive responses from the participants of this workshop and seek to continue organizing professional development workshops at future Larval Fish Conferences. In the future, we also hope to couple these workshops with a mentoring luncheon to facilitate networking between early career and established researchers.

After the conference, we also sent out a survey, which was very similar to the 2014 survey, to prioritize professional development topics, gauge the conference experience of our participants, and understand the drivers behind fluctuations in conference attendance. Overall, many early career participants noted that they were able to easily network at the 2015 meeting because they felt comfortable with the other participants and the conference itself was of manageable size. The graduate students and postdoctoral researchers did comment that they would have preferred the conference to have a single session. In addition, over 90% of the graduate students (n=28) and the postdoctoral researchers (n=33) who completed the survey indicated that they would be interested in attending a professional development workshop at this year's conference. As a result, we have planned a short workshop focused on scientific writing for the 40th Annual Larval Fish Conference.

7) ELHS President's Report, Myron Peck

Our section is in a good financial situation and membership is holding steady. Relevant action items to be discussed at this business meeting include:

7.1) Elections

7.1.1) The ExCom has four voting members (President, Secretary, President-elect and Secretary-elect. Other non-voting members include the Treasurer and Webmaster. With a new President and Secretary starting their terms at the close of the 2016 Business Meeting, we need new elections to fill the president elect and secretary elect positions. This should be advertised in the June/July issue of Stages. Candidates need to be discussed / nominated / approached. On-line balloting can occur.

7.1.2) Stages has Regional Representatives. The Northeast Region David Richardson sent an email to the editors of Stages stating that Katey Marancik will be replacing him. A letter of motivation /explanation was provided. Regional representatives need to be elected and voted into

office. A North-central and Southern Region representatives are needed.

7.2) Website – We must find a new webmaster. AFS will not make updates to our site. In theory, having one site instead of two should reduce confusion and allow consistent, updated information to be presented. AFS created a site for us –

<http://earlylifehistory.fisheries.org/> or <http://elh.fisheries.org/>

Our previous website contained a registration portal for upcoming LFC and we should work with AFS to include this functionality. Due to changes in personnel, and potentially other, unknown reasons, it has been very challenging to work with AFS on aspects relating to our website (e.g. advertising this 2016 LFC, lack of a registration portal, etc.). Updates are needed and some errors need to be fixed. Our contact at AFS is Beth Beard (bbeard@fisheries.org). Recommendations / nominations are needed.

7.3) committees/service – a suggestion has been made to consolidate the number of people/ committees responsible for running our section – allowing more rapid decisions/actions. The four voting members of ExCom should be tasked with more responsibilities/duties such as the "Nominations and Mail Ballot Committee" which was formerly held by Jon Hare". This was discussed by the ExCom and it was agreed that the Nominations and Mail Ballot Committee duties should be included in the duties of the Secretary working in collaboration with other members of ExCom.



Appendix 1: Detailed Financial Report July 2015-2016

General Fund

BALANCE (July 1, 2015)	19,573.29
INCOME	
Dues payment by check	45.00
2014 Membership Dues from AFS	3450.00
Wire transfer of LFC 2015 raffle proceeds	735.61
Wire transfer of LFC 2015 surplus funds	1300.00
TOTAL INCOME	5530.61
EXPENSES	
Wire transfer fees (LFC 2015 raffle funds)	16.00
Wire transfer fees (LFC 2015 surplus funds)	16.00
Wire transfer fee (one student travel grant in 2015 was wire transferred)	45.00
LFC 2016 Student travel awards	4000.00
LFC 2016 undergraduate student registration fees	484.14
Move raffle proceeds to Richardson and Blaxter accounts	720.00
TOTAL EXPENSES	5281.14
BALANCE & INCOME – EXPENSES	19,822.76
ENDING BALANCE FOR THE GENERAL FUND AS OF June 16, 2016	19,822.76

Sally Richardson Fund

Beginning Balance (July 1, 2015)	15,199.30
INCOME	
Income (LFC 2015 Raffle)	480.00
Total Income	480.00
EXPENSES	
Student award, LFC 2015	600.00
Total Expenses	600.00
BALANCE & INCOME – EXPENSES	15079.30
ENDING BALANCE FOR THE SALLY RICHARDSON FUND AS OF June 16, 2016	15079.30

Blaxter Fund

Beginning Balance (July, 2015)	7,398.10
INCOME	
Income LFC 2015 raffle	240.00
Total Income	240.00
EXPENSES	
Blaxter award, 2015	300.00
Total Expenses	300.00
BALANCE & INCOME – EXPENSES	7,338.10
ENDING BALANCE FOR THE BLAXTER FUND AS OF June 16, 2016	7,338.10

Grace Klein MacPhee Fund	
Beginning Balance (July, 2015)	2002.00
INCOME	
Donations in memory of Grace	100.00
Total Income	100.00
EXPENSES	
Paper statement fee	36.00
Total Expenses	36.00
BALANCE & INCOME – EXPENSES	2066.00
ENDING BALANCE FOR THE KLEIN-MACPHEE FUND AS OF June 16, 2016	2066.00

PayPal Fund (dues payment account for affiliate members)	
Beginning Balance (July 8, 2015)	1098.33
INCOME	
Income (\$15 dues payment by 16 affiliate members)	240.00
Total Income	240.00
EXPENSES	
PayPal fees	
13.64	
Total Expenses	13.64
BALANCE & INCOME – EXPENSES	1324.69
ENDING BALANCE FOR THE PayPal account as of June 16, 2016	1324.69

Appendix 2

2015 ELHS Business Meeting – Vienna, Austria July 14, 2015

Too few full voting members of the section (11) were present at the business meeting for a quorum. Information was exchanged but no voting occurred. The President was the only member of ExCom in attendance. The Time and Place Committee chair was not in attendance and did not provide a report. Reports were provided by the Secretary (membership, GKM travel grants), Treasurer (5 accounts), Early Career Committee (online survey results) and President's (New Business) report. These and other reports by various committees were distributed to attendees. None of the reports were formally approved. §



Executive committee members of the ELHS in 1982.

President's Message...cont'd from p. 9
stepped up to serve our section (including two Regional representatives and a new webmaster) and we have hosts identified for the 41st, 42nd and 43rd Larval Fish Conference in 2017, 2018 and 2019. Importantly, we will need new elections soon (this fall) to fill the President-elect and Secretary-elect positions. This will give us a complete Executive Committee which is needed to make specific decisions. If you aren't a full member, please re-read the end of my first paragraph and take action. If you are already a full member, I encourage you to run for office, it is a great way to serve your community – a community that is always working hard to serve you.

This is a relatively short message for me – can you hear a the collective sigh of relief? - In short, I enjoyed serving the section as its president and working with Fred Scharf (outgoing secretary) and Jeff Buckel (our Treasurer). I am very excited about the future of our section and look forward to seeing friends and colleagues and making new friends and meeting new colleagues at next year's meeting in Austin, Texas!

--Myron Peck, Outgoing President §



Dear all,

I am honored to be writing my first message as incoming president of the Early Life History Section. It is truly an exciting opportunity for me, and I look forward to working with our new secretary, Dominique Robert, to serve our Section. Before I get too far along, I want to offer my sincere appreciation to outgoing president Myron Peck, and outgoing secretary Fred Scharf for a job very "well done". The ELHS owes a great debt to both of you for your service, and you certainly have made your mark with numerous achievements during the last two years, among which include the establishment of the Grace Klein-MacPhee student travel awards, the establishment of an ad hoc committee to recruit and retain students and early career scientists, and handing

over an internationally diverse and fiscally strong Section. Quite a legacy!

I write this inaugural message from the 40th Annual Larval Fish Conference in lovely Solomons, Maryland. We are enjoying an eventful and engaging week, and we have our hosts, Tom Miller and Dave Secor, to thank for organizing this meeting. They have taken great care in planning our scientific and social agendas for the week, and they are following a tried and true formula for success (i.e., LFC = gracious hosts + scenic location + ichthyoplankton + beer), and for that we thank you. Throughout the history of the ELHS, we have held meetings in conjunction with larger organizations (AFS, ASIH), and like this year, we have met as a Section. Both have their pros and cons. I have a certain fondness for our "stand alone" Section meetings, and our current meeting is reminiscent of the 23rd Annual Larval Fish Conference held in Beaufort, NC (1999). Similar in size, the Beaufort meeting allowed me as a PhD student to interact with many senior scientists, and I trust the graduate students in attendance are taking advantage of the opportunities this week for similar one-on-one interactions.

This meeting is also special in that it honors Ed Houde, one of the giants in our field, as he approaches "retirement". Many of us have referenced Ed's work in our presentations this week, as we honor his achievements, both as a researcher and as a teacher and mentor. And while we're at it, let's add modesty to his list of attributes. Ed told me this week he was preparing his application for Emeritus status and hoped his application would be "deemed meritorious"! I think I speak for all of us when I say "thank you" Ed for your inspiration, encouragement, continued service to the ELHS, and your amazing contributions to fisheries and early life history research.

Now, on to business. As your new president and secretary, one of the first orders of business for Dominique and me is to find our replacements. Already?! Yes, we will be recruiting members to run for the open Executive Committee (ExCom) offices of Secretary-Elect and President-Elect. We need to have elections for these

vacancies as soon as possible so that we have a full ExCom going forward to guide your ELHS for the next two years. Anyone interested in either of these positions, please contact me frank.hernandez@usm.edu or Dominique dominique.robert@mi.mun.ca. Information related to the duties associated with these offices can be found in our Section bylaws <http://earlylifehistory.fisheries.org/elhs-bylaws/>. Please consider nominating someone (including yourself!) for one of these positions. Having a complete ExCom is critical to the success of the ELHS. Along these lines, a special thank you to those who "answered the call" at the Business Meeting, including our new Northcentral Regional Rep (Ed Roseman), our new Northeast Regional Rep (Katey Marancik), and our new Webmaster (Klaus Huebert). Your enthusiasm and willingness to serve is greatly appreciated and I look forward to working with you.

One of the most anticipated moments of each Larval Fish Conference is our discussion about the time and place of the next Larval Fish Conference, and this year was no exception. So I am happy to announce that we can all look forward to meeting in Austin, Texas next year (2017) along with the Joint Meeting of Ichthyologists and Herpetologists. We last met with our ASIH colleagues in 2009 (Portland, Oregon). That was a great meeting, so mark your calendars for next year (July 12-16, 2017). And if your calendars stretch far enough, make a note that in 2018 (tentatively in late June) we will gather in beautiful Victoria, British Columbia, Canada for our annual meeting. A special thanks to Chris Chambers and Lee Fuiman (Austin) and John Downer, Francis Juanes and Pierre Pepin (Victoria) for their generous offers to serve as points of contact and local committees for these meetings. I look forward to seeing everyone these these wonderful venues.

In closing, I want to say again that Dominique and I look forward to serving the Section. Please let us know your thoughts and suggestions for improvements as we move forward.

--Frank Hernandez, President §

Newsletter Production Team

Stages is published in February, June, and October each year. It is assembled by the Newsletter Editor with contributions from several Regional Representatives and other individuals. Please send any articles, announcements, or information of interest to Early Life History Section members or affiliates to your local Regional Representative or to the Editor.

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Editors' Ramblings

Join ELHS

Membership in ELHS is open to all persons or organizations interested in furthering ELHS objectives, regardless of membership in the American Fisheries Society (AFS). If you are an AFS member, simply add ELHS membership when you pay your Society dues.

Affiliate membership is open to persons or organizations who are not members of AFS. Affiliate members are encouraged to participate in Section meetings, committee work, and other activities, but they cannot vote on official Section matters, run for or hold an elected office, or chair standing committees. All members receive **STAGES**.

ELHS has a PayPal account to receive affiliate membership dues. To join ELHS as an affiliate or to renew affiliate status online, go to: <http://earlylifehistory.fisheries.org/how-to-join/> or mail your name, institutional affiliation (if appropriate), mailing address, telephone and fax numbers, e-mail address, and dues (US \$15 per year) for the current and/or upcoming year(s) to the ELHS Treasurer (see page 2).

Please specify the membership year(s) for which you are paying dues. Make checks or money orders payable to "AFS-ELHS."



The sight of the editors putting the newsletter contributions together, plus the threats of withholding beer, certainly succeeded in a record number of prompt submissions of Stages material - and enable us to deliver this issue while the meeting is fresh in our minds. We have also included a link (on page 1) to the list of participants to the 40th Larval Fish Conference, with contact information so you can follow up on presentations and discussions. We'll have a complete report of the meeting and awards in our next issue (deadline for material Sept 1st). We'd like to join everyone in thanking Tom and Dave for a wonderful meeting, with the opportunity to honour Ed Houde's contributions and continuing influence in larval fish studies.

We look forward to pestering the new president for his newsletter contributions, and our new secretary will continue to keep Stages flowing into your inboxes with the minimum of "mail delivery failure" messages. Not that they will neglect their real work for the ELH Section, continuing the growth and promoting active membership.

We need to work to get in nominations as soon as possible to fill the President- and Secretary-Elect posts, and we are still looking for a new Southern Region representative.

So, to those heading out for vacation, and those heading out for a larval field season - best wishes and have a good summer! §