STAGES

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

Volume 36, Number 3 | Lee A. Fuiman, Editor | October 2015

Inside this issue

ELHS Back Then

5 years ago: 2nd ELHS subvention for book publication bears fruit with publication of Ecology of Estuarine Fishes *by Ken Able & Mike Fahay.*

10 years ago: 29th LFC held at University Pompeu Fabra in Barcelona, with 160 participants, 99 papers, and 68 posters.

20 years ago: ELHS founder, Darrel Snyder, contributes a Perspectives column to STAGES: "To the millenium and beyond – A commentary on early life history research."

35 years ago: Newly elected President-Elect Ron Kernehan changes career and turns down the position. Dan Faber is appointed to the vacated position.

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

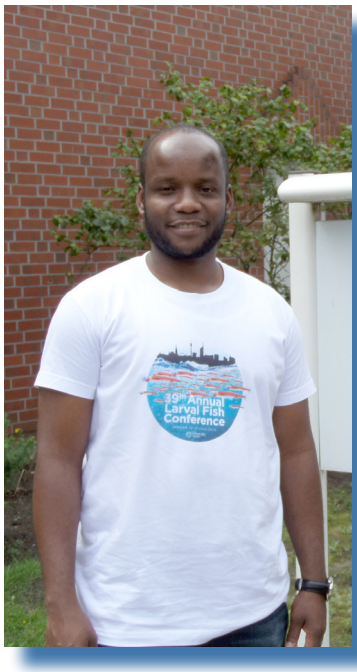
January 8, 2016

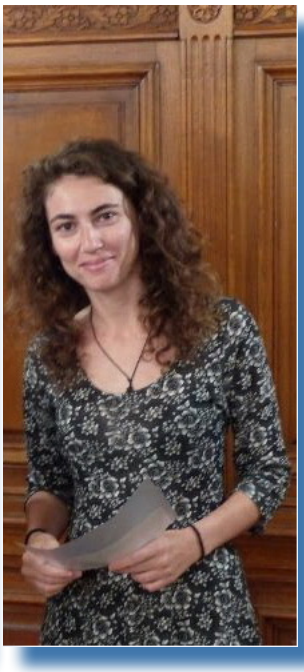
Student Award Winners

The winner of the Sally L. Richardson award for best student oral presentation at the 39th annual Larval Fish Conference was Rashid Imam (pictured left), from the Leibnitz Center from Tropical Marine Ecology for his presentation "*Metabolic enzymatic activity in early life stages of key fish species from the Northern Benguela upwelling system*."

The winner of the John H. S. Blaxter award was Liraz Levy (pictured right) from Tel Aviv University and the Inter-University Institute for Marine Sciences, for her poster "Characterizing spatial and temporal flow patterns in suction feeding fish larvae."

Congratulations to these talented young scientists!





President's Message

Greetings fellow early life history enthusiasts. I am taking a train (because of the Lufthansa airline strike) from Hamburg to the Frankfurt airport. It's a long (and particularly crowded) journey, which I hope will give me ample time to write this message to you. I am headed to Yokohama for 6 days, where Akinori Takasuka and colleagues have sponsored a symposium and workshop to discuss/debate and plan research to test the growth-survival paradigm. I am sure it will be an exciting symposium and a fruitful workshop. Separating the various agents of mortality acting on early life stages (aberrant drift/transport, poor/unsuitable prey fields, encounter with predators) is a daunting task. Moreover, properly depicting predators and their impacts on marine fish early life stages in predictive models appears to be a Herculean task – let's see what progress we can make next week. Hopefully we'll have some success to report in the next issue of STAGES.

I would like to take us back a few months to July in Vienna where Hubert Keckeis and his posse provided everyone a splendid experience for our 39th annual Larval Fish Conference. I heard great talks and looked at posters reporting on fish early life research from all parts of the world – rivers in Brazil, coastal areas of the White Sea, the Benguela upwelling system,

...continued on p. 13

News from the Regions

Northeast Region

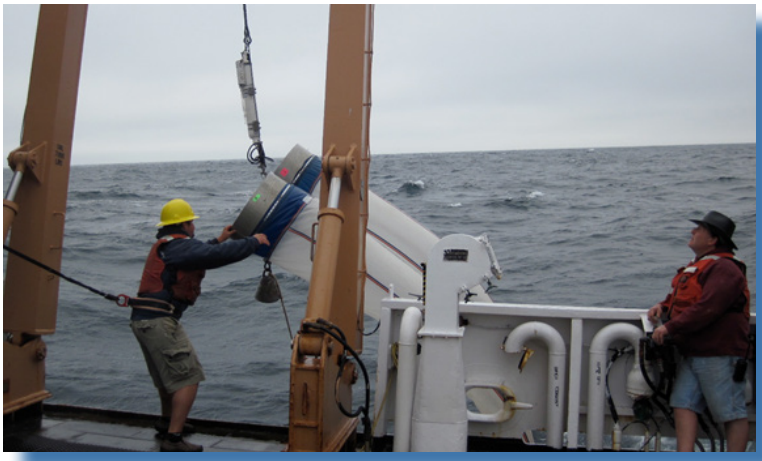
Dave Richardson

Importance of long-term datasets highlighted in recent publication

Numerous studies in the Northeast U.S. have shown that adult fish distributions are changing. A new study from the Northeast Fisheries Science Center (NEFSC) Oceanography Branch (Walsh et al. 2015) now shows that distributions and phenology of early life stages are changing too. Co-authors of the study included Dave Richardson, Katey Marancik, and Jon Hare.

NEFSC and its predecessors have collected ichthyoplankton in the Northeast U.S. shelf ecosystem since the early 20th century. They used larval data from the Marine Resources Monitoring, Assessment, and Prediction (MARMAP, 1977 - 1987) and Ecosystem Monitoring (EcoMon, 1999 - 2008) programs to document shifts in distribution of 43% of the larvae examined. Additionally, the timing of larval occurrence changed for about half the taxa. We also used long-term bottom trawl survey data to compare distributions of adults over the same time period. The adults of slightly more taxa (50%) shifted distributions. Shifts were predominantly northward for both life stages, which were expected given the warming ocean. However, almost half the taxa for which both life-stages were examined exhibited different shifts among larvae and adults. Supplemental material included with the manuscript includes results for 45 taxa of larvae and 40 taxa of adult fishes.

Mixed species collections from the Northeast Fisheries Science Center bottom trawl survey. (Photo credit NEFSC)



Bongo net deployment off the NOAA Ship Delaware II *on a spring Ecosystem Monitoring cruise in May 2010. (Photo credit Harvey Walsh, NEFSC)*

The consequences of the changes in distribution and phenology seen in the study for fisheries management need to be examined at a taxon-specific level, but an important first step was documenting that change is occurring. This study and similar publications

...continued on p. 5

Section Officers

HELP KEEP STAGES INTERESTING...

Send us a report of your research activities.

Pacific Rim Region

Akinori Takasuka

For the October issue, I am so happy to receive two news items from Iain Suthers, the former Pacific Rim Representative. I also appreciate an interesting article on coral-reef fish from Jack O'Connor also in Australia.

From: Iain Suthers, University of New South Wales (i.suthers@unsw.edu.au)

Tony Miskiewicz elected to the Hall of Fame of the Australian Society for Fish Biology

At the recent annual Australian Society for Fish Biology meeting at the University of Technology - Sydney (*asfbconf.asnevents.com.au*), Dr. Tony Miskiewicz was nominated to the ASFB Hall of Fame.

"Miskie" is well known around Australia and the world for his expertise in temperate larval fish taxonomy (e.g. Neira et al. 1998), but also heavy metals and toxicity research with Sydney's ocean outfalls. Many of us have benefited from his time and expertise, and he does not expect an authorship and sometimes he is only acknowledged. The nomination was based on the ASFB criteria, but our motivation in preparing this letter is that Miskie is remarkably generous in his time and authorships.

He is a co-author of our bible "*Larvae of Temperate Australian Fishes: Laboratory Guide for Larval Fish Identification*" by Pancho Neira, Anthony G. Miskiewicz and Thomas Trnski (1998). He has a broad generalist knowledge of the morphology of all larval fishes – but he does have a particular interest in larval flatfish because "no one else is looking at them."

Miskie completed his BSc and Honours at James Cook University and completed his PhD at University of New South Wales on larval fishes in 1987, where there were no guides to guide him – he figured it out as he went. His skills were particularly important with ichthyoplankton around the deep water ocean outfall monitoring program off Sydney.

He has co-supervised many honours students over the past 3 decades, as well as the following luminaries of larval fish biology: Dr Kim Smith (UNSW, now WA Fisheries); Dr Augy Syahailatua (UNSW, now Director of the LIPI laboratory); Dr Thomas Mullaney (UNSW); Murdoch University – Dr Barbara Muhling (U. Miami, now Princeton U.); Dr David Holiday; and present PhD students Valquiria Garcia (UNSW), Steven Hawes (U. Sydney), Adam Schultz (Flinders U.).

Miskie with Lynnath Beckley's students Nick Breheny (Honours), David Holliday (PhD) and Natalie Millar (Honours) (Murdoch University).

Jeff Leis described Miskie as "a National Treasure"; Kim Smith (WA fisheries) said "He has been tireless in his support of AFSB, and especially the student members, for decades. He has also been extraordinarily generous over that period in the amount of time he has given to students and other researchers in all states sharing his expertise, usually at his own expense. And he has made an exceptional contribution to ichthyoplankton research in Australia."

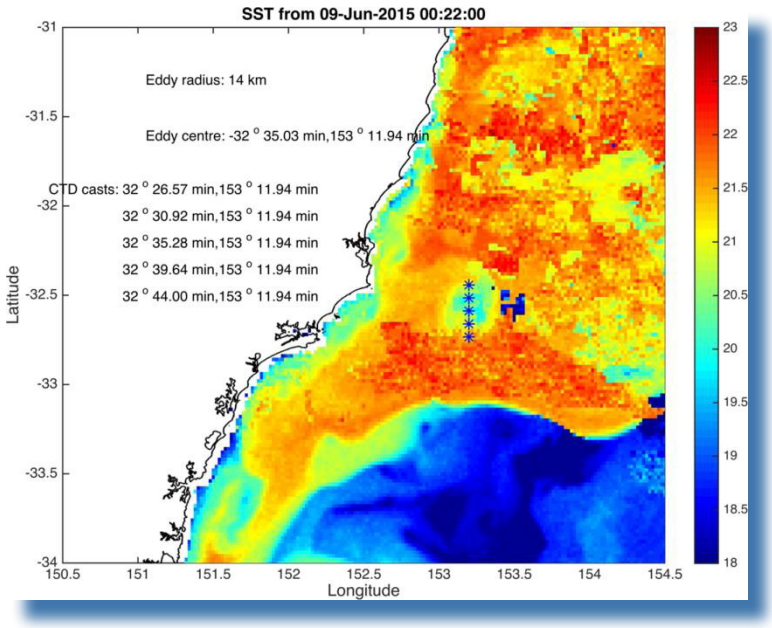
Miskie gazing out to sea on a recent voyage on the brand new RV Investigator. *in June 2015.*

Exploring frontal eddies of the East Australian Current (EAC)

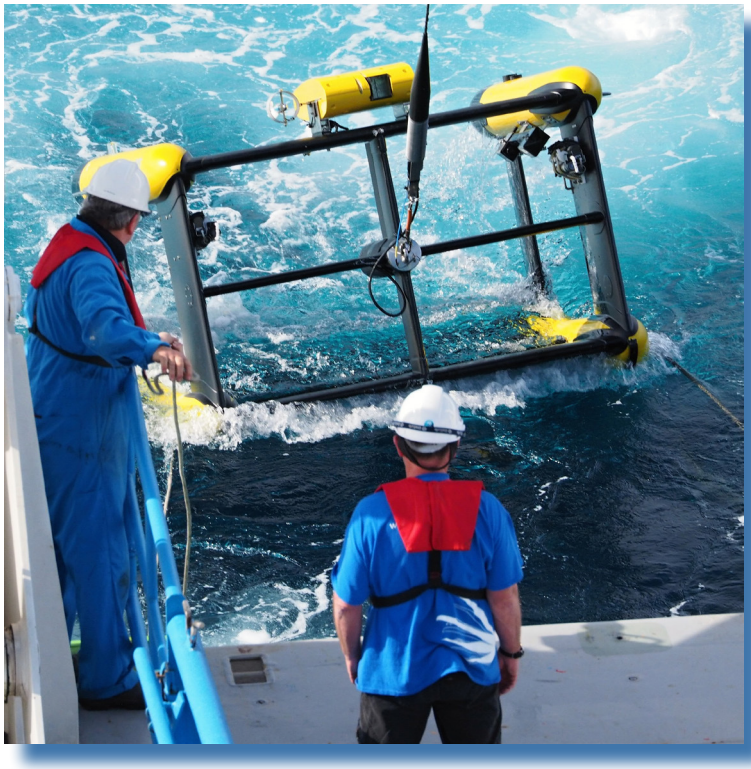
During the past winter, larval fish ecologists were fortunate to voyage for 16 days on Australia's brand new Research Vessel *Investigator*, to examine the hypothesis that small, frequent frontal eddies are offshore nursery grounds for larval fishes (Mullaney & Suthers 2013).

As many readers of *STAGES* will recall, the build in Singapore of the 94-m long, 6,000-tonne vessel seemed to drag on forever. Finally, it was delivered to Hobart in August 2014, and the first scientific trial using plankton nets for larval fishes and lobster occurred in November last year. Then in June 2015 Iain Suthers led the first multidisciplinary voyage, from Brisbane to Sydney, with 28 scientists, 12 support staff, and 20 crew. Over 5 universities and institutes were on board, and included Canadians (UBC),

...continued on p. 4



An SST image of the small frontal eddy (and CTD stations), which formed 8 days earlier off the coast at the EAC separation point.



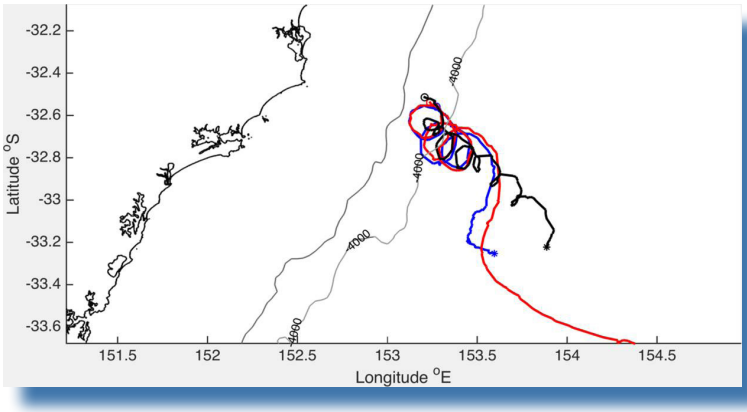
Retrieval of the Triaxus and the Laser Optical Plankton Counter.

Pacific Rim Region...cont'd from p. 3

Brazil (U. Santa Catarina), and kiwis (University of Auckland). Moninya Roughan (UNSW) led the physical oceanography, Martina Doblin (UTS) led the phytoplankton ecology.

We sampled 2 frontal eddies, one about 4 weeks old (which had fortuitously been sampled as it formed during mooring deployments by the previous voyage), and one just 7 days old (shown above). In both eddies we deployed 3 lagrangian SVP drifters, kindly donated by NOAA's Global Drifter Program (shown below), which showed a rotation time of around 24 hours. Both dynamic heights and a fortuitous pass of the new altimetry satellite (SARAL) indicated a surface depression of ~15 cm. Vertical section plots made with a Triaxus profiling down to 200 m depth at 8 knots, supporting a CTD, ecotriplet, and a laser optical plankton counter (shown at right), revealed an eddy about 40 km in diameter, with cyclonic induced uplift of 60 m.

We found a diverse assemblage of over 10,000 tropical and temperate larvae, including labrids (5%), carangids (2%), and pomacentrids (1%), but the gold was in the abundance of typically coastal and estuarine larvae, such as sparids (2%) and platycephalids (0.5%). The analysis continues...with a voyage workshop this December. We hope to see you in June next year!



SVP drifter tracks over 6 days after being deployed across the eddy.

References

Mullaney, T. J. and Suthers, I. M. (2013) Entrainment and retention of the coastal larval fish assemblage by a short-lived, submesoscale, frontal eddy of the East Australian Current. *Limnology and Oceanography* 58: 1546–1556.

From: Jack O'Connor, University of Technology Sydney (jack.oconnor@student.uts.edu.au)

Sediment pollution impacts sensory ability and performance of settling coral-reef fish

I recently published a study (O'Connor et al. 2015) looking at the effects of sediment pollution on the settlement dynamics of coral-reef fish larvae in Okinawa, Japan, focusing on its impact on sensory ability and performance. Along with a team from UTS, and in collaboration with researchers from Japan and French Polynesia (upper figure on p. 5), we first looked at the settlement patterns of pomacentrid larvae on the local reefs to determine favoured coral species for settlement. We then used these corals to provide visual and olfactory cues for settling larvae both in situ and in the laboratory. These cues were provided to individuals along with cues which had been "polluted" with various levels of sediment pollution using lateritic "red soil," which is known to be increasingly

...continued on p. 5

Research Team: David Booth, Gwen Cadiou, Jack O'Connor (UTS), David Lecchini (CORAIL), Hayden Beck (UTS) and Yohei Nakamura (KU).

Pacific Rim Region...cont'd from p. 4

polluting near-shore reefs in Okinawa, particularly during run-off events.

We found that larvae avoided olfactory cues from coral when red soil was present in laboratory tests, and the ability of larvae to discern between visual cues from healthy and degraded habitat was impaired by the presence of red soil. This was reflected in the larval abundance seen in the field, where larval abundance and species richness were lower when red soil was present (lower figure below). Although this was predicted by our hypothesis, we found some surprising results when looking at the behaviour of individuals kept for 5 days in treatments with and without red soil. "Post-settlement" larvae kept under control conditions preferred olfactory cues from live coral over dead coral, as has been demonstrated in other studies (McCormick et al. 2010), but individuals kept in water with red soil present had reversed preference, and choose the unpleasant-smelling dead coral water! We hypothesise this may be due to the effect of the acidic sediment on the micro-scale water chemistry, as similar behavioural effects linked to neurological disruption due to elevated acidity have been reported in larvae reared in elevated CO_2 conditions (Nilsson et al. 2012).

These effects, along with lower feeding rates and body condition of individuals we exposed to red soil after settlement, suggest that sediment pollution as low as 50 mg L^{-1} not only contributes to the disruption of settlement processes for coral-reef fish larvae, but negatively impacts individuals that do manage to settle in these polluted areas. This may contribute to the decrease in larval recruitment success seen in areas impacted by sediment pollution.

Preparing a light trap for in situ treatments (Control, Coral, Red Soil or Coral + Red Soil).

References

McCormick, M. I., Moore, J., and Munday, P. (2010) Influence of habitat degradation on fish replenishment. *Coral Reefs* 29: 537–546.

Nilsson, G. E., Dixson, D. L., Domenici, P., McCormick, M. I., Sørensen, C., Watson, S.-A., and Munday, P. L. (2012) Near-future carbon dioxide levels alter fish behaviour by interfering with neurotransmitter function. *Nature Climate Change* 2: 201–204.

O'Connor, J. J., Lecchini, D., Beck, H. J., Cadiou, G., Lecellier, G., Booth, D. J., Nakamura, Y. (2015) Sediment pollution impacts sensory ability and performance of settling coral-reef fish. *Oecologia* (doi:10.1007/s00442-015-3367-6).

Program and Abstracts of the symposium on "Growth–survival paradigm in early life stages of fish: Controversy, synthesis, and multidisciplinary approach"

As announced in the last issue of *STAGES*, a symposium on "Growth–survival paradigm in early life stages of fish: Controversy, synthesis, and multidisciplinary approach," was held in Yokohama, Japan, on November 9–11, 2015. A PDF version of the booklet of "Program and Abstracts" is now available: *cse.fra.affrc.go.jp/takasuka/gsp.*

I will report on the symposium results in future issues of *STAGES*. §

Northeast Region...cont'd from p. 4

demonstrate the importance of long-term data collection of all life stages for understanding the past, present, and future of marine fisheries.

Reference:

Walsh HJ, Richardson DE, Marancik KE, Hare JA (2015) Long-term changes in the distributions of larval and adult fish in the northeast U.S. shelf ecosystem. *PLoS ONE* 10(9):e0137382. doi:10.1371/journal.pone.0137382 §

People

In Memoriam
Ronnie J. Kernehan

Ronnie J. Kernehan (from obituary in The News Journal, Elsmere, DE, 6/7/15).

Ronnie, age 65, passed away at his home in Lewes, DE on 3 June 2015, barely two weeks after his wife, Peggy. Ron graduated with a B.S. in Fisheries Biology from Cornell University in 1972 and an M.S. in Fisheries Science from the University of Massachusetts in 1974. According to his obituary in *The News Journal* (Elsmere, DE; 6/7/15), "Ronnie was an ichthyologist for five years" before making a long-term career change to financial consultant, a profession from which he retired nearly 30 years later in 2008. However, those five years were very productive with a focus mostly on ichthyoplankton and early juvenile fishes in the estuarine and coastal waters of Delaware. Ron's legacy to our discipline from that time includes a guide, other publications, and co-conception of our American Fisheries Society (AFS) section.

In the 1960's and 70's, federal requirements to investigate and mitigate the impacts of power plants on aquatic communities spawned a multitude of environmental consulting firms and the careers of many young ichthyologists. Many, including Ron and myself, started as former students of Dr. Edward Raney at Cornell or employees at one of several projects conducted by his consulting firm, Ichthyological Associates, Inc. (IA), in Pennsylvania, New Jersey, and Delaware. These studies included ichthyoplankton or larval fish investigations to help assess the effects of power plant operations (e.g., entrainment of fish eggs and larvae and thermal effluents) and hydro-electric facilities on fish reproduction, recruitment, habitat, and distribution. Beginning in 1972, according to friend and early IA associate Al Maiden, Ron headed up the ichthyoplankton section at IA's (and later Radiation Management Corporation's) Chesapeake and Delaware Canal/Summitt Project (Delmarva Ecological Study, Middletown, DE) under project leader Skip Bason.

Ron and wife Peggy with Grace Klein-MacPhee during our Wilmington, NC, LFC social on the USS Battleship North Carolina, 5/23/11 (cropped photo by Darrel E. Snyder).

One by-product of those investigations was a surge in larval fish descriptions and guides to document early life history and facilitate identification. Ron co-authored one such guide with friend and colleague Johnson C. S. Wang: "*Fishes of the Delaware Estuaries, a Guide to the Early Life Histories*" (1979; E. A. Communications, Ecological Analysts Inc., Towson, MD). Johnson recalls he and Ron "working so hard during so many weekends" on the guide. During those years, Ron also authored "*A Bibliography of Early Life Stages of Fishes*" (1976; Ichthyological Associates Bulletin 14), co-authored with Larry O. Horseman "*An Indexed Bibliography of the Striped Bass,* Morone saxatilis*, 1670-1976*" (1976; Ichthyological Associates), and co-authored with Michael R. Headrick and Reinald E. Smith "*Early Life History of Striped Bass in the Chesapeake and Delaware Canal and Vicinity*" (1981; *Transactions of the American Fisheries Society* 110: 137-150).

...continued on p. 7

In Memoriam...cont'd from p. 6

Ron (right) with Lee Fuiman (left) and Darrel Snyder (middle) during 2011 LFC in Wilmington, NC (cropped photo by Darrel E. Snyder).

Also resulting in part from those and other early life history investigations was the independent conception of an AFS Larval Fish Section by both Ron and myself. I had begun inquiries with the executive director of AFS on the possibility of, and procedures for, establishing such a section in 1976. Then in early 1978, Ron wrote that he was trying to determine interest in forming a Larval Fish Section within AFS and asked me what I thought of the idea! Together, we gathered enough signatures to petition AFS for formation of the section. During the 1979 annual meeting of AFS in West Yellowstone, Montana, the general membership of the Society authorized formation of the Early Life History Section (ELHS; name was changed to broaden the scope of the section), after which Ron chaired an organizational meeting for the section with over two dozen founding members in attendance. A provisional executive committee was established with Ron as interim Secretary-Treasurer and myself as interim President (until that AFS meeting, Ron and I had never actually met in person). During the following year, bylaws were proposed and approved, a slate of section officers elected, and on 22 September 1980 at the AFS annual meeting in Louisville, Kentucky, our section was officially sanctioned and held its first official business meeting. Ron had been elected as our first President-Elect, but subsequently decided to make a career change and declined the post.

What goes around, comes around. Despite his career change, Ron remained an ichthyologist at heart. His daughter Colleen Best says he "raised me from day one with an incredible love of fish" and "took me seining all the time at the beach (as well as pier and boat fishing) and taught me the common and scientific names of every fish we caught." Colleen followed in his footsteps with an M.S. and career in marine biology. She thinks his proudest moment was when she was hired in 2006 to work under his former IA colleague, Al Maiden, at Environmental Consulting Services, Inc. (Middletown, DE). On her first day of work, she says she was handed a new copy of her Dad's (and Johnson's) book and told she had big shoes to fill. Colleen is now supervisor of their ichthyoplankton lab!

Following retirement, Ron also returned to fisheries research and training as a volunteer extraordinaire. In addition to the Boy Scouts, science field trips with the Wilmington Charter School, outdoor education programs at the Hazel Nature Discovery Center (Allen, MD), and other community service, he volunteered his assistance in a larval fish study with Ed Hale at the College of Marine Studies (University of Delaware, UD), the seining program for the UD high school summer camp, and educational programs and seining surveys for Cape Henlopen State Park and the Delaware Center for the Inland Bays (CIB), including preparation of annual survey reports for the State Park and CIB. Ron enthusiastically designed and served as director of CIB's comprehensive fish monitoring survey. At a memorial held for Ron by CIB staff and volunteers, it was noted that "it's hard to say which Ron Kernehan loved more: fish or teaching other people about fish" (online article by Molly Murray, *The News Journal*, 22 Aug.). CIB also had recognized Ron's service in 2013 with their Friend of the Bays Volunteer Award and is establishing a scholarship for students interested in fisheries biology in his memory.

In addition to all his other retired volunteer efforts, in early 2010 Ron (and Colleen) agreed to help me and several other co-authors conduct a survey of 47 guides and other selected publications or reports for "An Initial Assessment of Descriptive Information Available for Embryos, Larvae, and Early Juveniles of Fishes in Fresh Waters of the United States and Canada." The results were summarized later that spring in the lead presentation for a topical session on "Descriptions and Identification" held during our 34th annual Larval Fish Conference (LFC) in Santa Fe, New Mexico, and in an article prepared for our section newsletter in June 2012 (Stages 33(2):6-10). Ron was unable to attend that conference, but to the delight of many of us "old timers," he and his wife Peggy showed up for our 35th conference in Wilmington, North Carolina. Ron was well loved and will be missed by family, friends, and associates, including those in the larval fish community.

Much of the information about Ron summarized herein was provided by Colleen Best, Al Maiden, Johnson Wang, and various online sources. §

— Darrel E. Snyder,
Colorado State University

Recent Events

Larval Fish Conference in Vienna

The 39th annual Larval Fish Conference, organized by Hubert Keckeis, Paul Humphries and Aaron Lechner was a complete success. There were 160 delegates from 39 countries at the conference, 60 of them students.The meeting was hosted by the University of Vienna. Altogether 105 oral presentations and 46 posters were scheduled. The competition for the Sally L. Richardson award for the best oral presentation included 41 students. There were 15 competitors for the John H. S. Blaxter award for best student poster presentation. Clearly, these two awards have become very popular among students.

The conference program consisted of eight theme sessions:

Dispersal and Early Life History of Early Stages in Rivers;

Particle Tracing, Hydrodynamic Models and Dispersal of Fish Larvae;

Larval dispersal and population connectivity - genetic approaches to ecological problems;

"The secret life of larvae" - individual life history and fate from otolith studies;

Ecophysiology of early life stages: From measurements to models;

Natural mortality in the egg and larvae stages of fishes;

Early Life History of Eels;

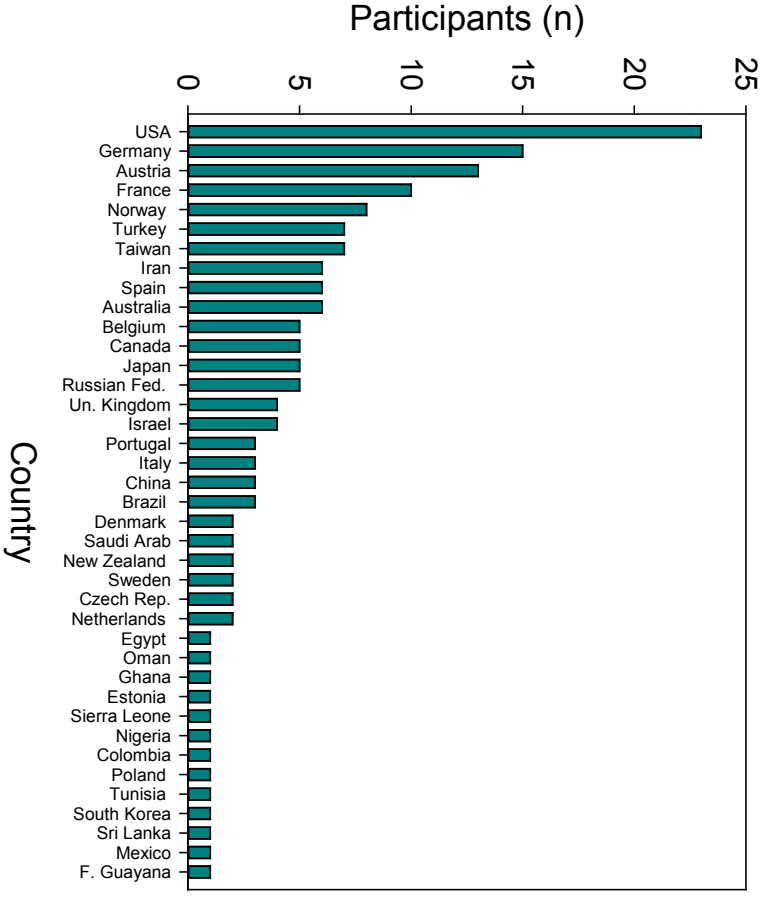
Biology and Ecology of Early Life Stages.

Seven of these were introduced by a distinguished keynote speaker. This comprehensive schedule was made possible through the support and work of many colleagues from the scientific committee. Our thanks go to Maria Manuel Angelico, Howard Browman, Caroline Durif, Arild Folkvord, Audrey Geffen, Martin Glas, Reinhold Hanel, Lorenz Hauser, Myron Peck, Michael Tritthart, and Cindy van Damme.

A workshop on "Tips for Successful Grant Writing" organized and held by Alison Deary, Matthias Paulsen, David Costelago, and Myron Peck was very well received by many participants. The meeting was concluded with an excursion to the Danube floodplains, with the unique chance to taste deep fried carp as a culinary speciality.

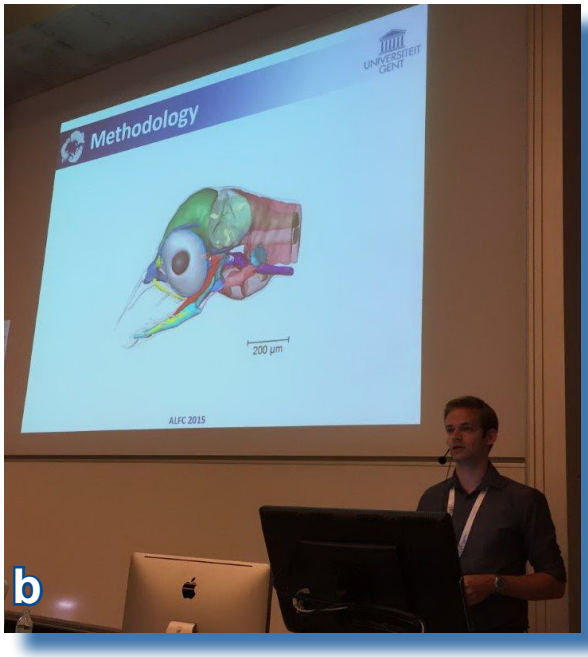
We very much enjoyed hosting this meeting of the ELHS and welcoming so many colleagues from all around the world! §

— Hubert Keckeis,
University of Vienna



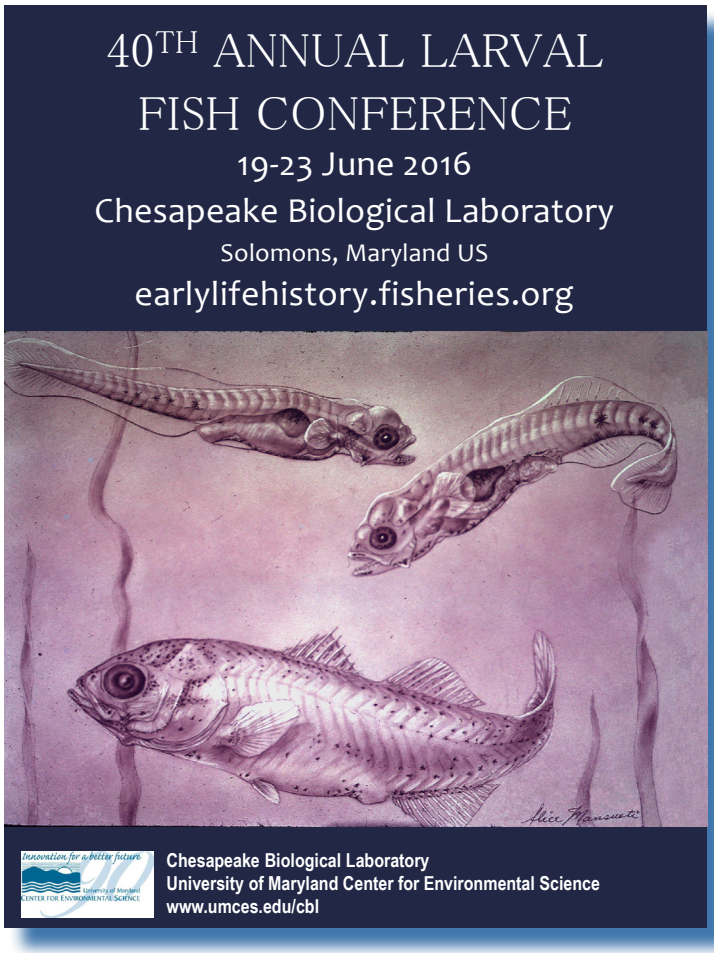
Participation in the 39th annual Larval Fish Conference, held in Vienna, Austria in 2015.

At the banquet of the 39th annual Larval Fish Conference, in Vienna, Hubert Keckeis (left) paid special tribute to his mentors, Ewa Kamler (middle) and Fritz Schiemer (right).



Scenes from the Vienna Larval Fish Conference. a, b) Delegates enjoyed the comfortable modern facilities for presentations at the University of Vienna. c) Hubert Keckeis addresses the banquet in the grandeur of the Stadtsenatsitzungssaal in the Vienna Rathaus. d) Victor Mikheev, Dmitrii Pavlov, Svetlana Pekkoeva, and Svetlana Murzina toast to a successful meeting. e, f) During the excursion, participants dined on delicious fried carp at Gasthaus Binder on the banks of the Danube River, and g) learned about the ecology of the Danube floodplains at a nature center. (Photo credits: Michael Miller and Paul Humphries). For additional photos from the conference, go to: tinyurl.com/qfkxz3v.

Upcoming Events and New Opportunities



Postdoctoral Opportunity

The Alaska Fisheries Science Center in Seattle, Washington announces the availability of a full-time position for a Postdoctoral Research Associate through the National Research Council. We seek a research colleague who will join an interdisciplinary team of researchers studying the seasonality of distribution (horizontal, vertical) and abundance of early life stages of commercial groundfishes (walleye pollock, Pacific cod, arrowtooth flounder, rockfishes, and sablefish) in Alaska. The Postdoctoral Associate will examine variability in the distribution, abundance, and species assemblage patterns of larval and juvenile fish in the eastern and western Gulf of Alaska as derived from historical and recent field collections, and will seek to resolve underlying mechanisms that influence that spatial and temporal variability. This opportunity also examines factors that influence transport and connectivity of larval stages to juvenile habitat areas. The Postdoctoral Associate will collaborate to utilize biophysical models to describe key oceanographic features that influence dispersal and connectivity. The incumbent will be based at the AFSC in Seattle, WA, working within the Ecosystems and Fisheries-Oceanography Coordinated Investigations (Eco-FOCI) Program (*www.pmel.noaa.gov/foci*).

Appointment: Full-time (1.0 FTE), 12-month fixed-term appointment, to start sprin 2016. Renewal of appointment is contingent upon performance and availability of funds.

Location: NOAA/Alaska Fisheries Science Center, 7600 Sand Point Way NE, Seattle, WA 98115

Requirements: Ph.D. in quantitative marine ecology, biological oceanography, fisheries, ecology, biostatistics or related disciplines.

Must have prior experiece with advanced statistical analyses, such as Generalized Additive Models (GAM), State-Space Models, Random Forest Models, Multivariate Analyses, and/or geostatsistics.

Prior experience in fish early life history, dispersal, and/or particle tracking using oceanographic models recommended.

Good organizational skills, proven ability to manage diverse data sets, and willingness to work and collaborate in an interdisciplinary group are essential.

Strong written and oral communication skills are essential. Applicants must be able to communicate with a diverse group of stakeholders including scientists, fisheries managers, conservationists, and the public.

Stipend: $56,000 US/year

To Apply: Applications must be made through the National Research Council website (*sites.nationalacademies.org/pga/rap*), RO# 26.03.40.B8179

...continued on p. 12

5th Field Technology Conference

November 18-19, 2015 at Portland, OR - Holiday Inn by the PDX Airport

Collecting and managing electronic field data are evolving rapidly as new technological advances are applied in both fisheries and forestry fields. This conference will offer a wide range of topics and speakers with a focus on the practical and applied aspects of field data collection. Speakers will offer first-hand experience with field-tested applications and electronics that function well on an operational level and survive the rigors of field use.

This is a follow up to the Emerging Technology Workshop that Sitka Technology Group, PNAMP and StreamNet organized November 18, 2014. This year we have joined the Western Forestry Association and GPS professionals to add a fisheries track to their recurring conference, which has been successful in bringing forestry professionals together for the past four years. For more information, go to: *westernforestry.org/upcoming-confereneces/5th-annual-field-technology-for-data-collection-and-mapping-in-forestry-and-natural-resources* §

Publications

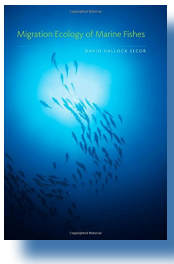
Dispersal During the Early Life History of Fishes

Special Issue of the Canadian Journal of Fisheries and Aquatic Sciences

Hubert Keckeis has arranged for a selection of papers from the 39th annual Larval Fish Conference to be published in a special issue of *Canadian Journal of Fisheries and Aquatic Sciences.* The aim and scope of the special issue are described as follows:

The special issue will bring together the latest research and understanding of dispersal patterns and processes of early life stages of fishes. It will identify and describe the abiotic (e.g., temperature, habitat, hydraulics, hydrodynamics) and biotic (e.g., growth, feeding, genetics, energetics, species specificity, species interactions, development and morphology, life history) factors that influence the capacity for and the outcome of dispersal patterns and processes. An important component of this compendium will be to outline the consequences of these findings for recruitment, population dynamics, and conservation and management in different environments around the world.

The deadline for submitting manuscripts is December 31, 2015. If you are interested in contributing to this publication, contact Hubert Keckeis (*hubert.keckeis@univie.ac.at*). §



Available now: Migration Ecology of Marine Fishes.

By David Hallock Secor

Published by Johns Hopkins University Press. 2015. 304pp.

ISBN-13: 978-1421416120

Available from Johns Hopkins University Press, c/o Hopkins Fulfillment Service, P.O. Box 50370, Baltimore, MD 21211-4370, USA or *www.press.jhu.edu*

With stunning clarity, David Hallock Secor's Migration Ecology of Fishes finally penetrates the clandestine nature of marine fish migration. A synthetic treatment of all marine fish taxa (teleosts and elasmobranchs), this book employs explanatory frameworks from avian and systems ecology while arguing that migrations are emergent phenomena, structured through schooling, phenotypic plasticity, and other collective agencies.

The book provides overviews of the following concepts:

- The comparative movement ecology of fishes and birds
- The alignment of mating systems with larval dispersal
- Schooling and migration as adaptations to marine food webs
- Natal homing
- Connectivity in populations and metapopulations
- The contribution of migration ecology to population resilience

Special 30% discount available. Or order by phone: 1-800-537-5487. Be sure to mention the code HNAF to receive the 30% discount. §

Other Publications

An Atlas of Early Stage Fishes in Japan. 2nd edition. Edited by Muneo Okiyama. Tokai University Press, Hadano, Japan. 2014. ISBN: 978-4-486-01775-2 C3645

Guide d'Identification des Post-larves de Méditerranée. Edited by G. Lecaillon, M. Murenu, F. Hackradt, and P. Lenfant. Ecocean Nova Science Publishers, Inc.. 2012.

Proceedings of the 36th Annual Larval Fish Conference. Edited by H.I. Browman and A.B. Skiftesvik. *ICES Journal of Marine Science* 71(4). 2014.

A Handbook to Help Identify Hudson River Fish Larvae. By L. G. Arvidson and J. B. Alber. Published by the authors, Rosendale, New York. 2013.

Larval Fish Aquaculture. Edited by Jian G. Quin. Published by Nova Science Publishers, Inc.. ISBN:978-1-62417-899-3. 2013

Zooplankton of the Atlantic and Gulf Coasts: A Guide to Their Identification and Ecology. 2nd edition. By William S. Johnson and Dennis M. Allen. Published by Johns Hopkins University Press. ISBN-13:978-1421406183. 2012.

Larval Fish Nutrition. Edited by G. Joan Holt. Published by Wiley-Blackwell. ISBN-0813817927. 2011.

Identification of Eggs and Larvae of Marine Fishes. Edited by A.W. Kendall, Jr. Published by Tokai University Press. ISBN-978-4-486-03758-3. 2011.

Ecology of Estuarine Fishes: Temperate Waters of the Western North Atlantic. By Kenneth W. Able and Michael P. Fahay. Published by Johns Hopkins University Press. ISBN-0801894719. 2010.

Early Stages of Marine Fishes Occurring in the Iberian Peninsula. P. Ré and I. Meneses. Published by IPIMAR/IMAR. ISBN-978-972-9372-34-6.

Ecology of Anguilliform Leptocephali: Remarkable Transparent Fish Larvae of the Ocean Surface Layer. M.J. Miller. Published by Aqua-BioScience Monographs. TERRAPUB. 2009.

...continued on p. 12

Publications...cont'd from p. 11

Advances in Early Life History Study of Fish. C. Clemmesen, A.M. Malzahn, M.A. Peck, and D. Schnack, eds. *Scientia Marina*, volume 73S1, Supplement 1. Consejo Superior de Investigaciones Cientificas. 2009.

Plankton. A Guide to Their Ecology and Monitoring for Water Quality. I.M. Suthers & D. Rissik. Published by CSIRO Publishing, 272 pp. 2009. ISBN: 9780643090583.

Manual of Recommended Practices for Modelling Physical – Biological Interactions during Fish Early Life. Edited by E.W. North, A. Gallego, and P. Petitgas, Jr. ICES Cooperative Research Report No. 295. 111 pp. 2009. ISBN: 978–87–7482–060–4.

Early Life History of Marine Fishes. B.S. Miller and A.W. Kendall, Jr. Published by University of California Press. ISBN: 978-0-520-24972-1. 2009.

Fish Larval Physiology. R.N. Finn and B.G. Kapoor. Published by Science Publishers. ISBN: 1578083885. 2008.

Reproductive Biology and Early Life History of Fishes in the Ohio River Drainage

Volume VI, Elassomidae and Centrarchidae. Edited by R. Wallus and T.P. Simon. Published by CRC Press. ISBN 978-0-8493-1923-8. 2008; 472 p.

Volume V, Aphredoderidae through Cottidae, Moronidae, and Sciaenidae. Edited by R. Wallus and T.P. Simon. Published by CRC Press. ISBN 978-0-8493-1921-1. 2006; 360 p.

Volume IV, Percidae – Perch, Pikeperch, and Darters. T.P. Simon and R. Wallus. Published by CRC Press. ISBN 978-0-8493-1920-4. 2006; 648 p.

Volume III, Ictaluridae – Catfish and Madtoms. T.P. Simon and R. Wallus. Published by CRC Press. ISBN 0849319196. 2003; 232 p.

Ecology of Juvenile Salmon in the Northeast Pacific Ocean: Regional Comparisons. Edited by C. B. Grimes, R. D. Broder, L. J. Halderson and S. M. McKinnell. American Fisheries Society, Symposium 57, Bethesda, MD. 2007.

Early Stages of Fishes in the Western North Atlantic Ocean: Davis Strait, Southern Greenland and Flemish Cap to Cape Hatteras. Michael P. Fahay. Published by North Atlantic Fisheries Organization.

Early Development of Four Cyprinids Native to the Yangtze River, China. Edited by D.C. Chapman. *U.S. Geological Survey Data Series* 239. 2006. accessible online at *pubs.usgs.gov/ds/2006/239*

Recent Advances in the Study of Fish Eggs and Larvae. Edited by M.P. Olivar and J.J. Govoni. Published in *Scientia Marina*, Volume 70S2 Supplement 2. ISSN: 0214-8358. 2006.

Eggs and Larvae of North Sea Fishes. P. Munk and J.G. Nielsen. Published by Biofolia Press. ISBN 0849319161. 2005.

Early Stages of Atlantic Fishes: An Identification Guide for the Western Central North Atlantic. Edited by W.J. Richards. Published by CRC Press. ISBN 0849319161. 2005.

Developmental Biology of Teleost Fishes. Y.W. Kunz. Published by Springer Press. ISBN 1-4020-2996-9. 2004.

Early Life History of Fishes in the San Francisco Estuary and Watershed. Edited by F. Feyrer, L.R. Brown, R.L. Brown, and J.J. Orsi. Published by the American Fisheries Society. ISBN 1-888569-59-X. 2004.

Freshwater Fishes of the Northeastern United States - A Field Guide. R.G. Werner. Published by Syracuse University Press. ISBN 0815630204. 2004.

The Development of Form and Function in Fishes and the Question of Larval Adaptation. Edited by J.J. Govoni. Published by the American Fisheries Society. ISBN 1-888569-58-1. 2004.

The Larvae of Indo-Pacific Coastal Fishes: An Identification Guide to Marine Fish Larvae. (2nd edition). J.M. Leis and B.M. Carson-Ewart. Published by Brill Academic Publishers. ISBN 90-04-13650-9. 2004.

The Big Fish Bang. Proceedings of the 26th Annual Larval Fish Conference. Edited by H.I. Browman and A.B. Skiftesvik. Published by the Institute of Marine Research, Bergen, Norway. ISBN 82-7461-059-8. 2004.

Fishery Science: The Unique Contributions of Early Life Stages. Edited by Lee A. Fuiman and Robert G. Werner. Published by Blackwell Publishing. ISBN 0-632-05661-4. 2002. §

Postdoctoral opportunity...cont'd from p. 10

Or go to: *nrc58.nas.edu/RAPLab10/Opportunity/Opportunity.aspx?LabCode=26&ROPCD=260340&RONum=B8179*

The period for applications is open December 1, 2015 – February 1, 2016.

Questions and more information about the position may be directed to Janet Duffy-Anderson, phone (206-526-6465; email *Janet.Duffy-Anderson@noaa.gov*) or to Ann Matarese (206-526-4111; email *Ann.Matarese@noaa.gov*). Applicants are strongly encouraged to contact the advisors prior to application. §

President's Message...cont'd from p. 1

the Red Sea and, last but not least the Danube River just down the block from our meeting venue at the University of Vienna. All of the keynote speakers gave word-class presentations reviewing the state-of-the-art across a wide range of fields (from organismal physiology to biophysical modelling). The cosmopolitan group of attendees included a heavy student presence and the schedule was packed full of excellent student talks. If I remember correctly, more than one-third of the oral presentations were given by students. This resulted in a fairly fierce competition and a difficult decision for the judges of the Sally Richardson Award. On behalf of our section, I would like to thank Hubert and his gang for showing us such great hospitality and for holding such a successful meeting! Also, I owe special thanks to Catriona Clemmesen for our (somewhat successful? – translation = it was loud) duet at the banquet dinner. We sang a few rounds of "Do-Re-Mi" – you know, that really famous song sung by Julie Andrews in The Sound of Music. Soon after we finished singing, I learned that very few, if any, Austrians had ever seen that movie…which could explain "some" of the confused faces staring at us during our rendition (sorry Hubert).

While I am thanking people, I would like to send special thanks on behalf of our section to Howard Browman for hosting our Larval Fish Conference website for almost 15 years. That website is an excellent archive of our section's meetings and proved quite helpful in advertising and helping folks register for meetings. Our Early Life History Section (ELHS) website has been hosted for quite some time by Jeff Buckel at the University of North Carolina (thank you Jeff). The ELHS website contains general information about the section including our history and bylaws, etc. We have entered a time of transition, moving from these two, separate websites to our new, combined website hosted at AFS. The new website address is: earlylifehistory.fisheries.org

At the time of writing this, there are no automatic re-directs in place to help you find your way from the old sites to the new site. Thus, please PUT THE ABOVE URL IN YOUR LIST OF FAVORITES – please stop reading – please do it now - then please continue reading STAGES. (short pause… okay, thanks for doing that). Along with this new website, we are looking for a volunteer to serve as our section's webmaster. AFS will likely make small updates to the site for us, but they stressed the need for our section to have someone who is dedicated to do this. They are willing to help train our new webmaster. Please contact Fred Scharf (our Secretary) or me if you want to serve our section in this capacity. In this case, we self-nominations are more than welcome!

There is always a perfunctory section in the President's Message about our financial situation, our membership numbers, and a plea (or two) for people to serve the section in elected leadership positions. I'll make this part of the report very short. The financial situation is still strong (Sally L. Richardson Award fund, John H. S. Blaxter Award fund, Grace Klein-MacPhee Student Travel Grants fund, and our general fund are all in good shape). The latter point about section officers will be resolved (after we hold elections…). In terms of membership, prior to the Vienna meeting we had 203 regular (full) members. Active recruiting took place in Vienna (strategically occurring close to our banquet's dessert). Our numbers have, thus, increased in terms of both normal and affiliate members.

During this summer's LFC, we held our annual Business Meeting. Although we did not have a quorum (so voting was not possible), we had active discussions. One highlight was an informative presentation from Alison Deary on the results of the online questionnaires sent to current and previous members by the Early Career Committee (ECC). At the close of the business meeting, a second highlight was viewing a presentation introducing us to next year's 40th (!) annual Larval Fish Conference from 19-23 June 2016 at the Chesapeake Biological Laboratory (CBL), Solomons, Maryland. Please mark your calendars – print and hang or distribute the poster that Tom Miller and Dave Secor have designed for the event. You should be receiving information soon about meeting specifics including registration, etc. Thank you Tom, Dave, and the other folks at CBL for your work in preparing what I am sure will be a fabulous meeting next June!!

Best regards from Yokohama. §

— Myron Peck, President

Recipients of Student Travel Awards

Name	Location	Program
Leo Barbut	Royal Belgium Institute of Natural Sciences (Belgium)	PhD
Franziska Bils	University of Hamburg (Germany)	PhD
Carlos Mario Palacio-Barros	University of Hamburg (Germany)	MS
Erin Satterthwaite	University of California, Davis (USA)	PhD
Alison Deary	Virginia Institute of Marine Science (USA)	PhD
Maria Munoz	Universidad de Valparaíso (Chile)	MS
Liraz Levy	Tel Aviv University (Israel)	MS
Carissa Curie	Memorial University (Newfoundland, CAN)	MS
Yiqing Song	Institute of Hydrobiology (China)	PhD
Svetlana Pekkoeva	Institute of Biology, Russian Academy of Sciences (Russia)	PhD
Naama Kimmerling	Institute for Marine Sciences in Eilat (Israel)	PhD

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.

Newsletter Editor

Lee A. Fuiman
Marine Science Institute
University of Texas at Austin
lee.fuiman@utexas.edu

Northeast Region

David Richardson
NMFS, Northeast Fisheries Science Center
Narragansett, Rhode Island
David.Richardson@noaa.gov

Southern Region

vacant

North Central Region

vacant

Western Region

Daniel Margulies
Inter-American Tropical Tuna Commission
LaJolla, California
dmargulies@iattc.ucsd.edu

European Region

Hubert Keckeis
Department of Limnology
University of Vienna
Vienna, Austria
hubert.keckeis@univie.ac.at

Pacific Rim Region

Akinori Takasuka
National Research Institute of Fisheries Science
Yokohama, Japan
takasuka@affrc.go.jp

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: *cmast.ncsu.edu/elhs/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."

Editor's Ramblings

Better Late than Never

My apologies to all for the late arrival of the October issue of *STAGES*. Two months of fieldwork at latitude 77 degrees South delayed me. My thanks to Darrel Snyder for a superb remembrance of our friend, Ron Kernehan.

That's all the ramblings for now. I leave you with some of Mike Miller's photos of nature along the Danube River. §