

# Notes about the Conference

**Venue:**

The symposia will be held at Fort Marcy Suites in Santa Fe, New Mexico, located just four blocks to the Historic Santa Fe Plaza and within walking distance to numerous restaurants, museums and shops. Address:

321 Kearney Road

Santa Fe, New Mexico 87501

The presentations will all be held in the Kearney Rooms. The rooms will be adjoined for the keynote presentations and separated for the individual sessions.

**Registration:**

Registration starts on Sunday May 30<sup>th</sup>, 2010 from 6:30pm-8:30pm at Fort Marcy Suites. Please enjoy the catered buffet after checking in at the registration table. Registration continues on Monday May 31<sup>st</sup> from 8:00am-5:00pm and will continue to be open throughout the conference. Please see a conference organizer if you need to check in later in the conference.

**Oral Presentations:**

Please bring your presentation to the room where you are presenting on the day of your presentation by 7:30am Tuesday and Wednesday, 8:00am on Monday, to be loaded on to the appropriate computer. There will also be a room available for presenters who wish to preview their visuals. Talks will be 20 minutes in total, including discussion. Limit your talk to 15 minutes to give sufficient time for discussion.

Both lecture rooms will be equipped with digital projectors connect to recent-model laptop computers (you will not be allowed to use your own computer)

Power-point presentations should be brought on CD or USB memory stick. If you use Windows PC, make sure to have it virus checked. Please keep your presentation simple and small in file size. This can be done by scaling images and avoiding video sequences. Please test your presentation on another computer than your own (especially Mac users). The presentations will be run on Windows XP and Microsoft Office 2007.

**Poster Presentations:**

Poster presentations will be displayed at Fort Marcy Suites from 5:00-7:00 pm on Tuesday June 1<sup>st</sup>. Poster presenters will be asked to arrive at 4:30 to set up their poster. Supplies for poster hanging will be available. Posters may be no larger than 4ft wide and 4 ft tall. While we recommend posters to be 4ft wide and 3ft tall (landscape orientation), each presenter will have 4ftx4ft of poster board space at their disposal.

**Business Meeting:**

The ELHS business meeting will be held over lunch on Monday May 31<sup>st</sup> at Fort Marcy Suites from 12:00-2:00pm. Gourmet boxed lunches will be provided. All are encouraged to attend.

**Parking:**

Free parking is available at Fort Marcy Suites.

**Social Events:**

Sunday May 30<sup>th</sup>, 2010 from 6:30pm-8:30pm: Registration Social at Fort Marcy Suites. A catered buffet and drinks will be available once you have checked in at the registration table.

Tuesday June 1<sup>st</sup>, 2010 from 5:00pm – 7:00pm: Poster Session at Fort Marcy Suites. The poster session will commence following a short break after Tuesday's oral presentations. Drinks and finger foods will be provided as you view the posters and meet the presenters.

Wednesday June 2<sup>nd</sup>, 2010 beginning at 7:30pm(a tapas meal will be served at 8:00pm): Banquet at El Farol. The LFC banquet will take place at El Farol Restaurant & Cantina (808 Canyon Road, Santa Fe). Very limited transportation to the restaurant will be organized, but we encourage you to take advantage of the beautiful Santa Fe surroundings and walk down to the plaza.

**Restaurants:**

A list of recommended restaurants and coupons can be found on a separate piece of paper in your registration package.

**Local Activities:**

A list of recommended local activities as well as a Santa Fe visitor's booklet can be found in your registration package.

# General Program

Time		Events	
<b>Sunday, May 30</b>	6:30 – 8:30	Reception/Registration at Fort Marcy Suites	
<b>Monday, May 31</b>	8:30 – 9:00	Opening Ceremony	
	9:00 – 9:40	Conference Keynote: Masaru Tanaka	
	10:00 – 12:00	Theme Session 1 Keynotes	Theme Session 2
	12:00 – 2:00	Lunch and ELHS Business Meeting	
	2:00 – 5:40	Theme Session 1	Theme Session 3
<b>Tuesday, June 1</b>	8:00 – 8:40	Conference Keynote: Jason Podrabsky	
	9:00 – 12:00	Theme Session 4	Theme Session 5
	2:00 – 4:00	Theme Session 6	Theme Session 3
	5:00 – 7:00	Poster Session	
<b>Wednesday, June 2</b>	8:00 – 8:40	Conference Keynote: Kevin Bestgen	
	8:40 – 9:20	Conference Keynote: Marjorie Oleksiak	
	9:30 – 12:50	Theme Session 7	Theme Session 8
	7:30	Banquet at El Farol	
<b>Thursday, June 3</b>		Ideas for activities provided	

Theme Session 1: Reproductive and Early Life History Consequences of a Changing Environment

Theme Session 2: Descriptions and Identification

Theme Session 3: General Contributed Papers

Theme Session 4: Integrative Developmental Systems: Where Developmental Biology, Physiology and Ecology Meet

Theme Session 5: Larval Fish Ecology and Recovery of Missouri-Mississippi 'Big River' Fishes

Theme Session 6: Freshwater Larval Fish Ecology

Theme Session 7: Larval Fish Ecology and Conservation of Native Fishes in the American Southwest

Theme Session 8: Developmental Programming and Ontogeny in Fish

Starred(\*) presentations below are eligible for the Richardson(oral presentation) or Blaxter (poster presentation) award.



# Agenda

## Monday May 31, 2010

8:30	<b>Opening Remarks – Fort Marcy Suites Kearney Room</b>	
9:00	<b>Conference Keynote: Masaru Tanaka</b> <b>A Reproductive and Early Life History Consequences of a Changing Environment</b> Conservation and early life history of fish: what is the connection between marine fish larvae and the forest ecosystem?	
9:40	<b>Coffee Break</b>	
	<b>A Reproductive and Early Life History Consequences of a Changing Environment</b> Chair – Chris Chambers Theme Session 1 – Kearney Room A	<b>Descriptions and Identification</b> Chair - Darrel Snyder Theme Session 2- Kearney Room B
10:00	<b>Session Keynote: <u>Christopher Chambers</u></b> Expected direct and indirect effects of changing thermal regimes on fish early life stages	<b><u>Darrel Snyder, et al.</u></b> An initial assessment of descriptive information available for embryos, larvae, and early juveniles of fishes in fresh waters of the United States and Canada
10:20		<b><u>Matthew Scriptor*, J.M. Shenker, A.L. Farson</u></b>
10:30	<b>Session Keynote: <u>Janet A. Nye, J.S. Link, D. Richardson, J.A. Hare</u></b> Climate-induced changes in distribution and spawning of northeast US fish	Development of an identification manual for the early life history stages of fishes of the middle St. Johns River, Florida.
10:40		<b><u>Ponton, D. and Mou-Tham, G., Laure Carassou</u></b> “YFISHCAL”: An interactive electronic key for identifying the larval and juvenile fishes of New Caledonia, SW Pacific, to the species level
11:00	<b>Session Keynote: <u>Howard I. Browman, A.B Skiftesvik</u></b> Direct and indirect effects of UV radiation on ichthyoplankton and their zooplankton prey in warming temperate and sub-arctic oceans	<b><u>Lynn C. Bjork</u></b> The ontogeny of a larval fish drawing–how we do it in the larval fish laboratory
11:20		<b><u>Charles, J.A., Snyder, D.E., Seal, S.C., Bjork, C.L.</u></b> A new description of larval and early juvenile brassy minnow, <i>Hybognathus hankinsoni</i>

11:30	<b>Session Keynote: <u>Philip L. Munday</u></b> Ocean acidification and the early life history of marine fish	
11:40		<b><u>James E. Wetzel</u>, W.J. Poly, D.E. Snyder, C.L. Bjork</b> Pirate perch larvae—the rest of the story
12:00	<b>Catered Lunch and ELHS Business Meeting</b>	
	<b>A Reproductive and Early Life History Consequences of a Changing Environment</b> Chair – Chris Chambers Theme Session 1 – Kearney Room A	<b>General Contributed Papers</b> Chairs – Lee Fuiman and Samantha Whitcraft Theme Session 3- Kearney Room B
2:00	<b><u>Jonathan A. Hare</u>, M.J. Wuenschel, M.E. Kimball</b> Larval dispersal, overwinter mortality, and climate change: forecasting range shifts of a sub-tropical fish species in a western boundary current system.	<b><u>Samantha R. Whitcraft</u>, E. Malca, F.E. Sosa, M.J. González, J.T. Lamkin</b> Larval fishes, connectivity, and management: a Mesoamerican reef case study
2:20	<b><u>Estrella Malca</u>, T. Gerard, B. Muhling, A. Shiroza, J.T. Lamkin</b> Effects of an anomalous low salinity, high chlorophyll plume from the Orinoco River on larval fish distribution and abundances in the Caribbean Basin	<b><u>Keita Suzuki</u>, K. Nakayama, Y. Kanematsu, , M. Tanaka</b> Micro-distribution and feeding habits of larvae and juveniles of long-tailed anchovy in relation to the estuarine turbidity maximum in the Ariake Sea, Japan
2:40	<b><u>Miriam J. Doyle</u></b> Early life history assessment of vulnerability and response of fish populations to climate change in the gulf of Alaska.	<b><u>J.M. Shenker</u>, <u>Matthew Scriptor*</u>, A.L. Farson, S.J. Miller</b> Temporal and spatial distributions of the ichthyoplankton of the middle St. Johns River, Florida: program overview and implications for watershed management.
3:00	<b><u>Barry Volson*</u>, D. Bengston</b> Reproductive performance of silverside fishes in two Rhode Island estuaries.	<b><u>Klaus B. Huebert</u>, J.E. Serafy, J. F. Walter, J.A. Bohnsack</b> Linking small fish to big fish: population dynamics of gray snapper in Biscayne National Park
3:20	<b>Break</b>	
3:40	<b><u>Catriona Clemmesen</u>, H. Mempel, J.G.R. Peschutter, M. Paulsen, M. Donner, J.A. Stransky, A. Stuhr, A. Lehmann, C. Petereit</b> Effect of winter temperature on the match/mismatch of fish larvae and their prey- a field study in Kiel Fjord	<b><u>John T. Lamkin</u>, B.A. Muhling, E. Malca, L. John</b> Larval transport and small scale gyres along the Yucatan Coast of Mexico

4:00	<b><u>Laure Carassou, F. Hernandez, B. Dzwonkowski, K. Park, S. Powers</u></b> Relationships between climatic conditions and abundances of juvenile winter-spawned fishes during the last 25 years in northern Gulf of Mexico	<b><u>Barbara Muhling, J.T. Lamkin, M.A. Roffer, S. Lee</u></b> Building a classification model to predict the occurrence of bluefin tuna ( <i>Thunnus thynnus</i> ) larvae in the northern Gulf of Mexico
4:20	<b><u>Dwight Ebanks*</u></b> The influence of environmental hypercapnia on cobia, <i>Rachycentron canadum</i>	<b><u>Kestrel Perez*, S. Munch</u></b> Bigger is better, but only for a little while
4:40	<b><u>Kathy L. Mier, S.P. Picquelle</u></b> Avoiding pseudoreplication in ichthyoplankton studies: statistical methods for comparing means of subsampled populations	<b><u>Lee A. Fuiman, L.N. Havel, M. Meekan, M.I. McCormick</u></b> Behavioral traits that predict survival of newly settled reef fishes: a comparison of three species
5:00	<b><u>Rafael Pérez-Domínguez</u></b> Seasonal and spatial changes in larval fish assemblages along the Dutch coast, southern North Sea	<b><u>Reiji Masuda</u></b> Ontogeny of anti-predator behavior in jack mackerel: onset of schooling, swimming speed and interaction with jellyfish
5:20		<b><u>Trika Gerard, J. Lamkin, B. Muhling, E. Malca</u></b> An evaluation of larval transport and distribution in the US Caribbean, British Virgin Islands and Leeward Islands

## Tuesday June 1, 2010

7:55	<b>Announcements</b>	
8:00	<p><b>Keynote: Jason Podrabsky</b>  <b>Integrative Developmental Systems</b>          Alternate developmental trajectories in embryos of the annual killifish <i>Austrofundulus limnaeus</i>: An example for the importance of integrating ecological and physiological approaches into the study of development.</p>	
	<p><b>Integrative Developmental Systems:          Where Developmental Biology,          Physiology and Ecology Meet</b>          Chair – Ione Hunt von Herbing          Theme Session 4 -Kearney Room A</p>	<p><b>Larval Fish Ecology and Recovery of          Missouri-Mississippi 'Big River' Fishes</b>          Chair – David Galat          Theme Session 5 - Kearney Room B</p>
9:00	<p><b><u>Pamela Padilla, L. Toni</u></b>          Cell biological analysis of neuroglobin in <i>Fundulus heteroclitus</i></p>	<p><b><u>Patrick J. Braaten, D.B. Fuller, R.D. Lott, M.P. Ruggles</u></b>          Drift dynamics of larval pallid sturgeon in the mainstem Missouri River: inferences for lack of recruitment in fragmented river reaches</p>
9:20	<p><b>Blank, T., <u>Warren Burggren</u></b>          Hypoxia-induced developmental plasticity of respiratory structures in larvae of the blue gourami, an air-breathing fish</p>	<p><b><u>Quinton E. Phelps, G.W. Whitley, S.J. Tripp, J.E. Garvey, D.P. Herzog, D. E. Ostendorf, J.W. Ridings, J.W. Crites, R. A. Hrabik</u></b>          Identifying river of origin for age-0 <i>Scaphirhynchus</i> sturgeon in the middle Mississippi River using fin ray microchemistry</p>
9:40	<p><b><u>Kaitlyn Schroeder, T. Horton, I. Hunt von Herbing</u></b>          Hemoglobin Sickling in Marine Fish Red Blood Cells: Effects of Environmental Stress</p>	<p><b><u>Diana M. Papoulias, D.E. Tillitt, M.L. Annis, D.K. Nicks, M. Schwarz</u></b>          Laboratory evaluation of effects of early life-stage exposure to selenium on pallid sturgeon (<i>Scaphirhynchus albus</i>) and shovelnose sturgeon (<i>Scaphirhynchus platorynchus</i>)</p>
10:00	<b>Break</b>	
10:20	<p><b><u>Louise A. Copeman*, B.J. Laurel, C.C. Parrish</u></b>          Use of fatty acid biomarkers to indicate residency in the nearshore in two juvenile gadids; pacific cod (<i>Gadus macrocephalus</i>) and walleye pollock (<i>Theragra chalcogramma</i>).</p>	<p><b><u>David B. Fuller, R.D. Lott, P.J. Braaten</u></b>          Larval paddlefish and shovelnose sturgeon in the upper Missouri River Basin including the flow-regulated Missouri River below Fort Peck Dam, Milk River, and Yellowstone River</p>

10:40	<b><u>Benjamin J. Laurel</u>, L.A. Copeman, T.P. Hurst, C.C. Parrish</b> The ecological significance of lipid/fatty acid synthesis in developing eggs and unfed larvae of Pacific cod ( <i>Gadus macrocephalus</i> ).	<b><u>Sara I. Tripp</u>, Q.E. Phelps, D.P. Herzog, D.E. Ostendorf, J.W. Ridings, J.E. Garvey, R.A. Hrabik</b> Early-life ecology of paddlefish in the unimpounded Mississippi River
11:00	<b><u>Cynthia K. Faulk</u>, R. Perez-Dominguez, K.A. Webb, G.J. Holt</b> Expression of insulin-like growth factor-I mRNA in red drum, <i>Sciaenops ocellatus</i> , and its potential use as a measure of larval condition	<b><u>David L. Galat</u>, K.S. Reeves</b> Nursery microhabitat for reophilic larval fishes in the channel margin of a regulated, large floodplain river, lower Missouri River
11:20	<b><u>Martha J. Hauff*</u>, S. Sponaugle, R.K. Cowen</b> Condition of coral reef fish larvae along the Florida Keys shelf: implications for connectivity	<b><u>Greg A. Wanner</u>, K.L. Grohs, R.A. Klumb</b> Spatial and temporal patterns of larval fish catches in the lower Niobrara River
11:40	<b><u>Alice C. Gibb</u>, L.A. Ferry-Graham</b> Testing the “morphogenesis-improves-performance” model of escape-response performance in teleost fishes	<b><u>Duane C. Chapman</u></b> Investigations of eggs and larvae of Asian carps in the lower Missouri River and its tributaries to determine spawning locations and drift duration
12:00	<b>Lunch Break</b>	
	<b>Freshwater Larval Fish Ecology</b> Chair – Nancy Auer Theme Session 6 - Kearney Room A	<b>General Contributed Papers</b> Chair – Chris Chambers Theme Session 3- Kearney Room B
2:00	<b><u>Jeffrey D. Allen</u>, G.K. Walker</b> Creating 3D models using serial section reconstruction of Great Lakes larval fish	<b><u>Toby D. Auth</u></b> Analysis of the spring-fall epipelagic ichthyoplankton community in the northern California current in 2004-2009
2:20	<b><u>Audrey L. Farson*</u>, J.M. Shenker, M. Scriptor, S.J. Miller</b> Effects of Flooding from Tropical Storm Fay on Larval Fish Assemblages in the Middle St. Johns River, Florida	<b><u>Robert K. Cowen</u>, C. Guigand, C. Cousins, A. Greer, S. Chatzis, J.A. Hare</b> Update on the In Situ Ichthyoplankton Imaging System (ISIIS)
2:40	<b><u>Timothy P. O'Brien*</u>, W.W. Taylor, E.F. Roseman, A. Briggs</b> Abundance, growth and survival of larval rainbow smelt in St. Martin Bay, Lake Huron	<b><u>Joel K. Llopiz</u>, R.K. Cowen</b> The complex larval fish food web of the low-latitude open ocean

3:00	<p><b><u>Jerome Plourde*</u>, P. Sirois, M. Trudel</b> Quantifying zooplankton consumption of larval and juvenile rainbow smelt using a mercury mass balance model</p>	<p><b><u>Francois Demontigny*</u>, P. Sirois, P. Ouellet, S. Plourde</b> Feeding habits and diet overlap of three co-occurring larval fish species in the northern Gulf of St. Lawrence (Canada)</p>
3:20	<p><b><u>Filipe Ribeiro</u>, M.F. Magalhães, M.J. Collares-Pereira</b> Is river discharge an adequate predictor of larval fish assemblages? Evidence from Mediterranean-type rivers</p>	<p><b><u>Sofia Ferreira*</u>, E.K. Stenevik, K.W. Vollset, A. Folkvord</b> Vertical migration of Norwegian spring-spawning herring (<i>Clupea harengus l.</i>) larvae</p>
3:40	<p><b><u>Edward F. Roseman</u>, T.P. O'Brien, B. Davis</b> Ontogenetic shifts in diet and habitat use of age-0 deepwater sculpins</p>	<p><b><u>César Flores Coto</u></b> Ichthyoplankton seasonal variation in the water column off Tabasco and Campeche coast.</p>
5:00-7:00	<b>Poster Session – Fort Marcy Suites</b>	

## Wednesday June 2, 2010

7:55	<b>Announcements</b>	
8:00	<b>Keynote: Kevin Bestgen</b> <b>Larval Fish Ecology and Conservation of Native Fishes in the American Southwest</b> Larval fish ecology and conservation of native fishes in the American Southwest	
8:40	<b>Keynote: Marjorie Oleksiak</b> <b>Developmental Programming and Ontogeny in Fish</b> Development and Population Divergence	
	<b>Larval Fish Ecology and Conservation of Native Fishes in the American Southwest</b> Chair – Kevin Bestgen Theme Session 7 – Kearney Room A	<b>Developmental Programming and Ontogeny in Fish</b> Chair - Elin Kjørsvik Theme Session 8- Kearney Room B
9:30	<b><u>W. Howard Brandenburg, M. A. Farrington, S. P. Platania</u></b> Distribution, hatching period, and dispersal of larval razorback sucker in the San Juan River, NM, CO, UT: eleven years of research (1999-2009)	<b><u>Elin Kjørsvik</u></b> Maternal effects on cod ( <i>Gadus morhua</i> L.) egg and larval characteristics
9:50	<b><u>Patricia K. Delrose*, T.A. Burke, T.E. Dowling</u></b> Maintenance of razorback sucker brood stock diversity by capture of wild larvae	<b><u>Åsa Espmark, M. Eriksen</u></b> Can prenatal stress be a problem in salmon farming?
10:10	<b><u>Michael J. Horn, J.R. Stolberg</u></b> Salinity tolerances for egg and larval stages of razorback suckers	<b><u>Ian. C. Zink*</u></b> Temperature influences upon rate of development, size at hatching, growth, and survival of early life stages of cobia <i>Rachycentron canadum</i> .
10:30	<b><u>Trevor J. Krabbenhoft*, S.P. Platania, T.F. Turner</u></b> Reproductive phenology of fishes of the middle Rio Grande, New Mexico.	<b><u>Andres Carrillo*, H. Aryafar, T.A. Treybig, K.A. Dickson</u></b> Effects of extended incubation in the California grunion, <i>Leuresthes tenuis</i>
10:50	<b>Break</b>	
11:10	<b><u>D.B. Osmundson, Sean. C. Seal</u></b> Successful spawning by stocked razorback sucker in the Gunnison and Colorado Rivers, as evidenced by larval fish collections, 2002–2007	<b><u>Kai Kristoffer Lie, M. Moren</u></b> Expression of genes related to bone formation in ex vivo cultured Atlantic cod jaw tissues

11:30	<b><u>James R. Stolberg, M.J. Horn</u></b> Dissolved oxygen tolerances for egg and larval stages of razorback sucker	<b><u>Su Sponaugle, K.D. Walter, K.L. Denit, J.K. Llopiz, R.K. Cowen</u></b> Variation in pelagic larval growth of Atlantic billfishes: the role of prey composition and selective mortality
11:50	<b><u>Koreen A. Zelasko, K.R. Bestgen</u></b> Drift of flannelmouth sucker ( <i>Catostomus latipinnis</i> ), bluehead sucker ( <i>Catostomus discobolus</i> ), and white sucker ( <i>Catostomus commersoni</i> ) larvae in the Big Sandy River, Wyoming	<b><u>Øystein Sæle, A. Nordgreen, P.A. Olsvik, J.I. Hjelle</u></b> Toxic effects of dietary hydrolyzed lipids in Atlantic cod larvae
12:10	<b><u>Angela A. Hill, K.R. Bestgen</u></b> Patterns of growth rates and lengths of age-0 smallmouth bass in the Yampa River, 2003-2009	<b><u>Marie Vagner*, J.L. Zambonino-Infante, J. Robin, J. Person-Le Ruyet</u></b> Influence of larval conditioning on the metabolic process of European sea bass juveniles.
12:30	<b><u>Kevin R. Bestgen, A. A. Hill</u></b> Smallmouth bass otolith microstructure analyses and implications for Green River Basin fish and flow management	
7:30	<b>Banquet at El Farol</b>	

## Posters

### Reproductive and Early Life History Consequences of a Changing Environment

- R-1      **Scott A. Holt, C.M. Pratt**  
Annual pattern of larval fish immigration through a south Texas tidal inlet
- R-2      **Yasunori Ishibashi, N. Hiroe**  
Ontogenic changes in tolerance to hypoxia and energy metabolism of larval and juvenile red sea bream (*Pagrus major*)

### Descriptions and Identification

- D-1      **Estrella Malca, L. Vásquez-Yeomans, E. Sosa-Cordero, J. Cohúo, T. Gerard, J.T. Lamkin**  
Description of newly settled *Mycteroperca bonaci* (Serranidae: Epinephelini) using genetic identification in Quintana
- D-2      **Rene C. Reyes**  
Dichotomous key to the fish eggs of the Sacramento-San Joaquin River Delta end estuary, California
- D-3      **Rene C. Reyes**  
Descriptions of the embryogenesis and ammocoete morphological development of the pacific lamprey, *Entosphenus tridentatus* (gairdner, 1836), from the American River, California
- D-4      **Filipe Ribeiro, C. Carrapato**  
Larval development of the highly endangered Iberian cyprinid *Anaocypris hispanica*
- D-5      **Felipe Ribeiro, M.F. Magalhães, M.J. Collares-Pereira**  
The early stages of the larval fish collection at the National Museum of Natural History, Lisbon
- D-6      **Darrel E. Snyder**  
A family-level computer-interactive key to the larvae of freshwater fishes in the United States and Canada
- D-7      **Darrel E. Snyder, R.T. Muth, C.L. Bjork**  
Larvae and early juveniles of endangered cyprinids in the upper Colorado River Basin: *Ptychocheilus lucius*, *Gila cypha*, and *Gila elegans*

## Integrative Developmental Systems: Where Developmental Biology, Physiology and Ecology Meet

- I-1      **Tiffani Horton, K. Schroeder, I. Hunt von Herbing**  
Effects of pH on the frequency of in vitro red blood cell polymerization/sickling in marine fish
- I-2      **Lee S. Toni\*, P.A. Padilla**  
Cellular analysis of developing *Fundulus heteroclitus* through indirect immunohistochemistry
- I-3      **T.-C. Francis Pan, I. Hunt von Herbing**  
Ontogeny and interactions of stress and immune responses in zebrafish, *Danio rerio*

## Larval Fish Ecology and Recovery of Missouri-Mississippi 'Big River' Fishes

- M-1      **James E. Garvey, D.R. Sechler, Q.E. Phelps, S.J. Tripp**  
Searching for an energetic-based habitat designation for age-0 river sturgeon
- M-2      **Amy E. George, D.G. Simpkins**  
Spatiotemporal variation in diversity and density of larval fish in the Missouri National Recreational River, South Dakota and Nebraska

## Freshwater Larval Fish Ecology

- F-1      **J.M. Boucher, Audrey L. Farson\*, J.M. Shenker**  
Spawning patterns and larval growth and mortality of American Shad, *Alosa sapidissima*, in the St. Johns River, FL.
- F-2      **Mónica Vanessa Garduño-Paz, J.F. Méndez-Sánchez, G. Enríquez-Marín**  
Demographic data and perturbation analyses as important tools to determine the vulnerability of the juvenile stage of the darkedged splitfin, *Girardinichthys multiradiatus*, in Central México
- F-3      **José Fernando Méndez-Sánchez, M.V. Garduño-Paz, G. Enríquez-Marín** High larval vulnerability of the Toluca silverside, *Menidia riojai* (Atheriniformes: Atherinopsidae): a semelparous, threatened, and endemic species.
- F-4      **Edward F. Roseman**  
Fish habitat assessment and restoration in the Huron-Erie Corridor
- F-5      **Edward S. Rutherford**  
Early life dynamics of walleyes (*Sander vitreus*) in a Great Lakes tributary

## General Contributed Paper Session

- G-1      **Elaine M. Caldarone, S.A. MacLean, B. Sharack**  
Potential indices for estimating nutritional condition and growth rates of juvenile atlantic cod (*Gadus morhua*)
- G-2      **Dan Cooper, J. Duffy-Anderson, B. Norcross, B. Holladay, P. Stabeno**  
Age-0 northern rock sole nursery areas in the Eastern Bering Sea in relation to hydrography.
- G-3      **Casey L. Harthorn**  
“Tow in progress” initial protocol and first year results of a larval fish monitoring program on a large southwest impoundment.
- G-4      **Marshall B. Johnson\*, F.J. Hernandez, S.C. Muffelman**  
Early life history dynamics of forage fishes in the northern Gulf of Mexico
- G-5      **C.M. Jump, J.T. Duffy-Anderson, K. Mier, Dan Cooper**  
Feeding ecology and niche separation of young of the year northern rock sole and yearling yellowfin sole in the Eastern Bering Sea.
- G-6      **Sarah L. Privoznik, E. Malca, B. Muhling, T.L. Gerard, J.T. Lamkin**  
The effect of the Florida Current on dispersal of larval fish.
- G-7      **Alba Ruth Vergara, I. Riveiro, A. Pérez-Rodríguez**  
Incubation time and survival of sardine eggs in the Ria de Vigo, NW Spain