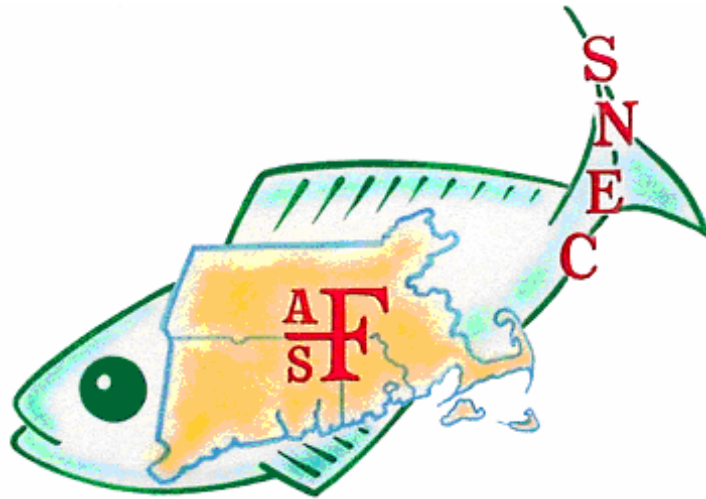


Southern New England Chapter

American Fisheries Society

2009 Winter Meeting



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January 14, 2009

**Roger Williams University
Bristol, RI**

Program

AGENDA FOR SNEC AFS 2009 WINTER MEETING WEDNESDAY JANUARY 14, 2009

- 8:30-9:00 *Registration and Coffee*
- 9:00-9:10 **Opening Comments.** Karina Mrakovcich, SNEC President
- 9:10-9:30 **Contrasting reproductive styles of marine fishes: Implications for assessing egg production and the status of stocks.** Richard McBride and Mark Wuenschel, *Northeast Fisheries Science Center, National Marine Fisheries Service, Woods Hole, MA 02543*
- 9:30-9:50 **The Town Pond Restoration: Now that they have dug the hole, what do we do?** Dale Leavitt, Bryant Jones, Kayla Waskiewicz, Todd Massari, and Steve Patterson, *Roger Williams University, Department of Marine Biology, Bristol RI*
- 9:50-10:10 **Behavioral interactions between summer flounder (*Paralichthys dentatus*) and longfin squid (*Loligo pealeii*): The influence of relative prey size on predatory behavior and selectivity.*** Michelle D. Staudinger and Francis Juanes, *University of Massachusetts Amherst, Department of Natural Resources Conservation, Amherst, MA 01003*
- 10:10-10:30 *Break*
- 10:30-10:50 **Rapid assessment of plankton volumes from settled height measurements of zooplankton samples collected from the northeast continental shelf of the United States.** Jerome Prezioso and Joseph Kane, *NOAA/NMFS/NEFSC, Narragansett, RI 02882*
- 10:50-11:10 **Spatial variations in otolith microchemistry for *Tautoga onitis* in the Northeast US.*** Ivan Mateo¹, Dave Bengtson¹, Edward Durbin²,
¹*University of Rhode Island, Department of Fisheries, Animal and Veterinarian Sciences, Kingston, RI 02881;* ²*University of Rhode Island, Graduate School of Oceanography, Narragansett, RI 02882*

- 11:10-11:30 **Did the demolition of the Jamestown bridge affect the numbers of fish larvae in Narragansett Bay, Rhode Island in 2006?** Grace Klein-MacPhee and Dennis Erkan, *Rhode Island Department of Environmental Management Marine Fisheries, Fort Wetherill Marine Laboratory, Jamestown, RI 02835*
- 11:30-11:50 **The *back-ended* issues of US fisheries management.*** Chad J. McGuire¹ and Bradley P. Harris², ¹*University of Massachusetts, Department of Environmental, Earth, and Ocean Sciences, Boston, MA 02125;* ²*University of Massachusetts Dartmouth, Department of Fisheries Oceanography, School for Marine Science and Technology, Dartmouth, MA 02747*
- 11:50-12:10 ***Award Presentations and Business***
- 12:10-1:10 ***Lunch***
- 1:10-1:40 **Poster Speed Presentations**
- 1:40-2:20 **Poster Session**
- 2:20-2:40 **Is Cating's method of ageing American shad (*Alosa sapidissima*) applicable to rivers other than the Hudson?** William Duffy^{1,2}, Ken Oliveira¹, Richard McBride², and Steve Cadrin¹, ¹*University of Massachusetts Dartmouth, Dartmouth, MA 02747;* ²*National Marine Fisheries Service, Woods Hole, MA 02543*
- 2:40-3:00 **Marine ornamental invertebrate fisheries.** Andrew Rhyne, Roger Williams University, *Center for Economic and Environmental Development, Bristol, RI 02806*
- 3:00-3:20 **Laboratory evaluation of two nature-like fishway designs for passage of northeastern fishes.** Alex Haro, Theodore Castro-Santos, and John Noreika, *S. O. Conte Anadromous Fish Research Laboratory, U. S. Geological Survey, Biological Resources Discipline, Turners Falls, MA 01376*
- 3:20-3:40 **Overwintering distribution of young-of-the-year winter flounder in Narragansett Bay.*** Richard Bell, *University of Rhode Island, Graduate School of Oceanography, Narragansett, RI 02882; brell@gso.uri.edu*

* Denotes student paper

Poster Session

Management of skate fisheries off the northeastern United States. Tobey H. Curtis, *National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Regional Office, Gloucester, MA 01930*

Histopathologic effects of estrogens on marine. Gerald Zarogian¹, Doranne Borsay Horowitz¹, Ruth Gutjahr-Gobell¹, Lesley Mills¹, and John Fournie², ¹*U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory (U.S. EPA, NHEERL), Atlantic Ecology Division, Narragansett, RI 02882*; ²*U.S. EPA, NHEERL, Gulf Ecology Division, Gulf Breeze, FL 32561*

Effects of PCB exposure on reproductive potential of artificially matured male American eels.** Jennifer Kinsey, Whitney Hable, and Ken Oliveira, *University of Massachusetts Dartmouth, Dartmouth, MA 02747*

Food habits of large pelagic predators in the Northwest Atlantic.** Amy K. Koske, Morgan A. Lindemayer, Michelle D. Staudinger, and Francis Juanes, *University of Massachusetts Amherst, Department of Natural Resources Conservation, Amherst, MA 01003*

Life-long mercury accumulation rates of bluefish, *Pomatomus saltatrix*, in a New England Estuary.** Joseph T. Szczebak and David L. Taylor, *Roger Williams University, Department of Marine Biology, One Old Ferry Rd., Bristol RI 02809*

Mercury exposure for Rhode Island residents consuming local fishery resources. David L. Taylor, Eric Payne, Jennifer Linehan, Joseph Szczebak, and Maria Piraino, *Roger Williams University, Department of Marine Biology, Bristol, RI, 02809*

** Denotes student poster

ABSTRACTS

Management of skate fisheries off the northeastern United States. Curtis, Tobey H., *National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Regional Office, Gloucester, MA 01930; Tobey.Curtis@noaa.gov*

A number of skate species (Family Rajidae) are widely distributed across the continental shelf off the northeastern United States, and are subject to fishing mortality in the region's extensive commercial fisheries. Historically, skates were commonly caught as bycatch in trawl and dredge fisheries targeting other, more valuable species, such as cod, flounder, monkfish, and sea scallops. Catches were largely discarded. In recent years, however, the value of skate products has increased in domestic and foreign markets, resulting in increases in landings and the emergence of localized targeted fisheries. In response, the New England Fishery Management Council drafted the Northeast Skate Complex Fishery Management Plan (FMP) that was implemented by NOAA's National Marine Fisheries Service (NMFS) in 2003. The FMP included management measures for seven skate species: Winter (*Leucoraja ocellata*), barndoor (*Dipturus laevis*), thorny (*Amblyraja radiata*), smooth (*Malacoraja senta*), little (*L. erinacea*), clearnose (*Raja eglanteria*), and rosette (*L. garmani*). Among its measures, the FMP included establishment of an open access Federal permit to possess skates, biological stock status definitions, prohibitions on possession of overfished skates (barndoor, thorny, and smooth skates), possession limits for the skate wing fishery, and an exemption program for vessels targeting small skates for bait markets. In 2007, NMFS declared that winter skate had become overfished, triggering the need to initiate Amendment 3 to the FMP, which would establish a rebuilding program for winter skate, and contribute to the rebuilding of other overfished skate stocks. The amendment is currently under development by the Council, but progress has been hampered by a lack of data on skate biology, population dynamics, and species-specific trends in fishing mortality.

Is Cating's method of ageing American shad (*Alosa sapidissima*) applicable to rivers other than the Hudson? Duffy, William^{1,2}, Ken Oliveira¹, Richard McBride², and Steve Cadrin¹, ¹*University of Massachusetts Dartmouth, Dartmouth, MA 02747;* ²*National Marine Fisheries Service, Woods Hole, MA 02543; 508-813-7662, william.duffy@noaa.gov*

The Cating method (counting the number of transverse grooves per annuli of a scale to age American shad), was developed for the Hudson River population of shad and validated for the Connecticut River population of shad. However, scales of American shad are difficult to read, and recently published results from a workshop involving known-age shad from the Delaware River failed to validate Cating's method. Life history of shad varies with latitude, which is a source of concern. Semelparity at southern latitudes and iteroparity at northern latitudes may result in latitudinal differences in scale features. The purpose of this study is to determine if shad from different river systems can be aged consistently using Cating's method of transverse groove counts. To examine the hypothesis that transverse groove

counts per annuli are consistent for rivers in different latitudes, we analyzed scales taken from shad in the Delaware River in Pennsylvania and the St. Johns River in Florida. The number of transverse grooves per annulus was recorded and compared to counts tabulated by Cating for Hudson River shad. Preliminary data show a significant difference in transverse groove counts per annuli from Hudson River shad and shad from the Delaware and St. Johns rivers. Further analyses are underway to compare historical and recent samples, increase sample size, add data from other rivers, and to include otolith age comparisons.

Laboratory evaluation of two nature-like fishway designs for passage of northeastern fishes. Haro, Alex, Theodore Castro-Santos, and John Noreika, *S. O. Conte Anadromous Fish Research Laboratory, U. S. Geological Survey, Biological Resources Discipline, Turners Falls, MA 01376; 413-863-3806, aharo@usgs.gov*

Two 1:20 slope experimental nature-like fishway designs (rock weir and perturbation boulder) were tested under semi-controlled conditions in a large flume facility. Flow depth was varied from 0.42 to 0.76 m and rock configurations were altered to create meandering or in-line flow streams within each fishway channel. Passage performance and behaviors of American shad, blueback herring, alewife, white sucker, and other species ascending the fishways were monitored using PIT telemetry. Over 50% of American shad and white sucker passed the 33.5 m long fishways under most test conditions; transit times for these species were also relatively short. Effect of flow depth in passage performance of American shad, white sucker, and white perch appeared to be relatively minor; slightly better performance was noted at the higher depths, but the trend was not consistent among species or fishway types. No consistent trends in effect of fishway design, configuration, or flow depth were noted for alewife or blueback herring. Passage performance of other riverine species (smallmouth bass, yellow perch, black crappie, channel catfish, common carp, fallfish) tested was modest (a few fish able to ascend the entire fishway), and transit times were variable, but low sample sizes of species tested make these results statistically inconclusive.

Effects of PCB exposure on reproductive potential of artificially matured male American eels. Kinsey, Jennifer, Whitney Hable, and Ken Oliveira, *University of Massachusetts Dartmouth, Dartmouth, MA 02747; 973-464-0022, jkinsey@umassd.edu*

The decline in the population of the American eel, *Anguilla rostrata*, over the past two decades has brought this ecologically and economically important species to the attention of fisheries managers. The cause of the decline is unknown, but possibilities include anthropogenic activities such as over fishing and pollutants, parasites infesting the swim bladder, or oceanic changes. Stress factors, including contamination, which affect reproduction, could hinder recruitment for the American eel. These eels spend the majority of their life history living in rivers along the east coast of North America, where they may be exposed to a plethora of contaminants. Little is known about reproduction in this species considering that spawning, which occurs in the Sargasso Sea, has never been observed.

Furthermore, sparse information is available about the reproductive development of the American eel. This study aims to test sublethal concentrations of Aroclor 1221, 1242, and 1254 mixture on male American eels. It also serves as a baseline study of the basic sperm parameters. Induction of maturation was achieved by weekly injections of male growth hormone, human chorionic gonadotropin (HCG). Sperm count, spermatocrit, and sperm motility were used to assess the quality of the sperm. A gonadal-stomatic index (GSI) was assessed for each eel and compared between treatments.

Did the demolition of the Jamestown bridge affect the numbers of fish larvae in Narragansett Bay, Rhode Island in 2006? Klein-MacPhee, Grace and Dennis Erkan, *Rhode Island Department of Environmental Management Marine Fisheries, Fort Wetherill Marine Laboratory, Jamestown, RI 02835; gracekmac@110.net*

We have been conducting an ichthyoplankton survey in Narragansett Bay, Rhode Island at fifteen stations for six years. There were fewer fish larvae collected in 2006 than in any other year (Maximum 31,496 in 2005; Minimum 4,138 in 2006; Mean 11,587 in 2001-2006). Egg numbers did not differ significantly from any of the previous years. The monthly distribution of larvae was also different from previous years. The late winter/early spring peak resembled previous years, but the late spring /summer peak was greatly reduced in numbers. Only one of the top twelve larval species, winter flounder (*Pseudopleuronectes americanus*) increased in numbers in 2006. This species spawns in the winter and has completed settlement by late April/ early May. In late April through June Cashmen Equipment Company of Boston using a series of controlled blasts demolished the old Jamestown bridge located mid-bay in the West Passage. The numbers of larvae were most significantly reduced at the stations closest to the bridge. Stations which had values higher than most previous years or that had values higher than at least one previous year were located farther from the blast area in the upper Bay, East Passage and the Sakonnett River. Other factors considered were water temperature, dissolved oxygen, salinity and predators.

Food habits of large pelagic predators in the Northwest Atlantic. Koske, Amy K., Morgan A. Lindemayer, Michelle D. Staudinger, and Francis Juanes, *University of Massachusetts Amherst, Department of Natural Resources Conservation, Amherst, MA 01003; amy.koske@yahoo.com, mlindema@student.umass.edu*

Pelagic predators such as tunas, billfish, dolphinfish, and sharks have large geographic distributions and depend on seasonal prey resources for growth. In comparison to the eastern Atlantic and Pacific Oceans, little is known about the feeding ecology of large pelagic fish in the Northwest Atlantic (NWA). The goal of the present study is to increase information on the food habits of large pelagic predators regionally and to determine reliance on prey resources in the NWA. Stomach samples were collected at recreational fishing tournaments in Massachusetts during 2007 and 2008. Food habits of 194 fish from 9 species were quantified by mass and frequency of occurrence. Additionally, length data of both predators and prey were measured to quantify body size relationships using least squares and quantile regression techniques. Predator mouth gapes were measured to estimate the maximum size

of prey a predator could potentially consume with growth. Preliminary results of diet analyses found that *Thunnus albacares*, *Thunnus alalunga* and *Coryphaena hippurus* relied heavily upon *Illex illecebrosus*; while *Alopias vulpinus* and *Isurus oxyrinchus* primarily consumed *Pomatomus saltatrix*. Both *I. illecebrosus* and *P. saltatrix* are targeted commercially in the NWA. Predator-prey body size analyses will help determine whether predators and fishers are targeting similar portions of these prey resources. Other prey prevalent in predator diets included *Dactylopterus volitans*, *Euphausiid* sp., and *Pagurus* sp. Results of the present study will give a better understanding of trophic relationships between pelagic predators and their prey and will be essential to sustainably managing exploited populations regionally.

Spatial variations in otolith microchemistry for *Tautoga onitis* in the Northeast US.

Mateo, Ivan¹, Dave Bengtson¹, Edward Durbin², ¹*University of Rhode Island, Department of Fisheries, Animal and Veterinarian Sciences, Kingston, RI 02881*; ²*University of Rhode Island, Graduate School of Oceanography, Narragansett, RI 02882; 401-316-7326, imateo32@cox.net*

Elemental composition of otoliths may provide valuable information in establishing connectivity between nursery grounds and marine fish populations. Juveniles of the economically important fish species *Tautoga onitis* were captured in 3 stations within Narragansett Bay and 4 high salinity areas along US Northeast Coast in a single year. Concentrations of Rb, Mg, Ca, Mn, Sr, Na, K, Sr, Pb and Ba were determined in otoliths of YOY using solution-based inductively coupled plasma mass spectrometry. Stable oxygen (¹⁸O) and carbon isotopic ratios (¹³C) in YOY otoliths were also analyzed using isotope ratio mass spectrometry to discriminate tautog nursery grounds. Results of MANOVA showed that elemental signatures differed significantly among the distinct nurseries within Narragansett Bay (Pillai's trace =4.465, P<0.001) and among the states (Pillai's trace =1.705, P<0.001). In addition, univariate contrasts indicated that concentrations of three elements (Sr, Ba, Mn) and two stable isotopes (¹⁸O and ¹³C) differed significantly among the 4 high salinity nurseries within states (ANOVA, P<0.001). Our linear discriminant analysis found that the three tautog nurseries within Narragansett Bay (Mount Hope Bay, Gaspee Point, Rose Island) were distinguished with 100% of classification success. High salinity stations along the US coast (RI, CT, NJ, VA) were correctly classified with 92% accuracy. Since accurate classification of juvenile fish to their nursery sites was achieved, otolith chemistry analysis can be used as a natural habitat tag in assigning adult fish to their estuarine nursery.

Contrasting reproductive styles of marine fishes: implications for assessing egg

production and the status of stocks. McBride, Richard and Mark Wuenschel, *Northeast Fisheries Science Center, National Marine Fisheries Service, Woods Hole, MA 02543; 508-495-2000, Richard.McBride@noaa.gov*

The relationship between female spawning stock biomass and population egg production is affected by biotic and abiotic conditions, as well as the way we measure these variables.

This review provides examples of how biotic and abiotic processes affect stock-recruitment relationships. It also explores how the reproductive strategy of the fish affects our perception of its stock biomass and potential egg production. Specifically, we comment on the bioenergetics of reproduction, synchronization of secondary oocyte development, rates of maturation and spawning, and the down regulation of oocyte numbers. Intrannual weight variation, skip spawning patterns, and the influence of age-diversity on annual fecundity are examples that undermine the use of spawning stock biomass as a proxy for reproductive potential. Integrating trophic ecology and reproductive biology of fishes complement and can improve our understanding of recruitment variability necessary to advance the management of marine fishes.

The *back-ended* issues of US fisheries management. McGuire, Chad J.¹ and Bradley P. Harris², ¹*University of Massachusetts, Department of Environmental, Earth, and Ocean Sciences, Boston, MA 02125;* ²*University of Massachusetts Dartmouth, Department of Fisheries Oceanography, School for Marine Science and Technology, Dartmouth, MA 02747; 508-207-5463, cmcguire@umassd.edu*

In response to over-exploitation and ecosystem degradation, U.S. fisheries policy is shifting from species-based to ecosystem-based management. In addition, the reauthorized Magnuson Act prescribes a year 2011 deadline to end over-fishing, market-based incentives, strengthened enforcement, and improved cooperative conservation efforts. We refer to these proposed solutions (including the “status quo”) as *front-ended* policy considerations. Left unresolved are what we term *back-ended* issues, which surround the jurisprudential limitations that inhibit full consideration of ecosystem-based management principles and scientific information. We examine the jurisprudential limitations (including the standard of review) in detail, and propose solutions to these major governance obstacles. The goal is to identify recurring “framework” issues in U.S. management if, left unresolved, will continually limit the application of *front-ended* solutions including rights-based governance structures.

Rapid assessment of plankton volumes from settled height measurements of zooplankton samples collected from the northeast continental shelf of the United States. Prezioso, Jerome and Joseph Kane, *National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center, Narragansett, RI 02882; Jerry.prezioso@noaa.gov*

Measuring zooplankton sample volume is one way of assessing zooplankton biomass in the marine environment. A technique that has been used extensively by the Northeast Fisheries Science Center is the displacement volume method. The Ecosystem Monitoring Program of the Northeast Fisheries Science Center has been measuring zooplankton biomass along the northeast coast of the United States since the inception of the Marine Resources Monitoring Assessment and Prediction (MARMAP) Program in 1977 (Sherman, 1980) using the displacement volume method. This non-destructive technique allows for subsequent analysis of the sample after it has been volumized. Recently, the Ecosystem Monitoring Program,

which has succeeded the MARMAP program, has begun using a settled volume method as a supplement to the displacement volume method. The settled volume method provides quick initial estimates of zooplankton biomass with a minimum of sample handling prior to processing the sample for displacement volume and zooplankton identification and enumeration. One drawback of the settled volume method is that results can vary depending on the type of organisms captured in the sample. To better relate the results of these measurements to those obtained with the displacement volume method, algorithms were devised by season and region and regressed against the zooplankton biomass results obtained from displacement volumes, so that the samples within each group would be similar in terms of species composition. A similar strategy was successfully used by Wiebe et al. (1975) and Kane (1982) to provide conversion factors for biomass estimates based on data collected from a variety of seasons and areas. A strong linear relationship was found between results from the displacement volume biomass and the settled volume biomass methods when samples had at least 10 mm of settled height. Since the implementation of this method two years ago by the Ecosystem Monitoring Group in Narragansett, the Center has been receiving timely estimates of zooplankton volumes for Ecosystem Advisories and Ecosystem Status Reports.

Behavioral interactions between summer flounder (*Paralichthys dentatus*) and longfin squid (*Loligo pealeii*): The influence of relative prey size on predatory behavior and selectivity. Staudinger, Michelle D., and Francis Juanes, *University of Massachusetts Amherst, Department of Natural Resources Conservation, Amherst, MA 01003; mstaudin@nre.umass.edu*

Summer flounder (*Paralichthys dentatus*) is an ecologically and commercially important species that inhabits estuarine and continental shelf waters of the Northwest Atlantic. Summer flounder are primarily piscivorous, however at lengths greater than 30 centimeters squid become increasingly important in their diets. Relative body size is one of the most important constraints on predator-prey relationships and directly impacts capture success and handling time, factors fundamental to modeling foraging behavior and predicting predator diets. Through a series of feeding experiments, size-selection, attack rates, and capture behaviors were quantified using longfin squid (*Loligo pealeii*) as prey. Flounder were offered squid ranging from 10-70% relative to predator size which corresponds to the range of squid sizes occurring regularly in flounder diets. Attacks rates did not vary significantly among relative squid sizes indicating that size-selection by summer flounder was passive. Capture success rates also did not vary as a function of relative squid size and were not considered a limiting factor on selection. Handling times increased exponentially with increasing relative squid size signifying larger squid were energetically more costly to manipulate. The relationship between prey profitability and relative squid size was found to be dome-shaped and peaked between 0.30-0.39 relative squid size. This trend is consistent with previous studies however squid's estimated profitability was several orders of magnitude higher than has been found for prey fish. These results suggest that squid may offer summer flounder a higher energetic reward in comparison to prey fish and selection on squid is primarily constrained by handling time.

Diet composition of juvenile bluefish *Pomatomus saltatrix* during winter in the northern Florida coastal ocean. Stormer, David, G.¹, Francis Juanes¹, and Caitlin McGarigal², ¹*University of Massachusetts Amherst, Department of Natural Resources Conservation, Amherst, MA 01003*; ²*University of Massachusetts Dartmouth, Dartmouth, MA 02747*; 413-545-0157, dstormer@nrc.umass.edu

The shallow coastal shelf of northern Florida is a unique region of recruitment for juvenile bluefish *Pomatomus saltatrix*, but has received little attention as an important over-wintering area. Examining the feeding habits of juvenile bluefish in this region during winter will contribute to a better understanding of the foraging ecology for this important migratory species throughout its range. This study represents one of the first diet examinations of juvenile bluefish inhabiting the coastal ocean at the southern extent of their North American distribution during winter. The stomach contents of 364 juvenile bluefish collected from the coastal ocean of Florida (St. Augustine to Daytona Beach) in late fall, winter, and early spring 2006-07 and 2007-08 were examined. During the 2 years studied, juvenile bluefish foraged primarily on piscine prey. Of the juvenile bluefish stomachs containing diets (49%), 90% contained striped anchovies *Anchoa hepsetus* across years. Other prey fishes including Atlantic bumper *Chloroscombrus chrysurus*, and Atlantic cutlassfish *Trichiurus lepturus* constituted a small proportion of the juvenile bluefish diet composition. Squid were the only invertebrates found in the diets of juvenile bluefish. Overall, small pelagic schooling fishes dominated the diets of juvenile bluefish in this study. Although *A. hepsetus* has been observed in the stomachs of juvenile bluefish in other regions along the United States coast, this engraulid dominated the diet composition of juvenile bluefish in our study.

Mercury exposure for Rhode Island residents consuming local fishery resources. Taylor, David L., Eric Payne, Jennifer Linehan, Joseph Szczebak, and Maria Piraino, *Roger Williams University, Department of Marine Biology, Bristol, RI, 02809*; 401-254-3759; dtaylor@rwu.edu

Mercury (Hg) is a toxic environmental contaminant affecting human health, and exposure occurs mainly through dietary uptake of contaminated fish. To minimize Hg exposure, public health officials issue consumption advisories to inform citizens of the possible health risks associated with eating fish. While consumption advisories have been developed on a site-specific basis for fish inhabiting freshwater systems, advisories regarding the consumption of saltwater species lack geographic specificity. In this study, measurements of Hg in fish collected from Narragansett Bay (RI, USA) were incorporated into exposure assessment models. Daily exposure to Hg was estimated for children (0-14 years), women of childbearing age (15-44 years), and the general adult population (18+ years). To evaluate the efficacy of the RI-specific exposure assessment model, results were compared to: (1) national estimates of human exposure to Hg, and (2) the reference dose (RfD) established by the U.S. EPA. Estimates of Hg exposure for RI residents, in many instances, do not reflect nationally aggregated data. Moreover, selectively consuming bluefish and striped bass (>1 meal per week) result in Hg intake exceeding the RfD, whereas eating black sea bass,

tautog, summer flounder, and winter flounder are not expected to cause deleterious effects on human health. The cumulative result of the modeling exercise is the improved assessment of human dietary exposure to Hg at the local scale.

Histopathologic effects of estrogens on marine fishes. Zarogian, Gerald¹, Doranne Borsay Horowitz¹, Ruth Gutjahr-Gobell¹, Lesley Mills¹, and John Fournie², ¹*U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory (U.S. EPA, NHEERL), Atlantic Ecology Division, Narragansett, RI 02882;* ²*U.S. EPA, NHEERL, Gulf Ecology Division, Gulf Breeze, FL 32561; 401-782-3042, borsay.dodi@epamail.epa.gov*

Endocrine-disrupting chemicals (EDCs), such as estrogens estradiol (E2) and ethinylestradiol (EE2) have been reported to affect fish reproduction. This study histologically compared and evaluated effects of EDCs in two species of treated fish. Juvenile male summer flounder (*Paralichthys dentatus*) and cunner (*Tautoglabrus adspersus*) were treated in the laboratory with E2, EE2 or ATD through injected slow-release implant systems. Excessive vitellogenin (VtG) accumulated in livers, kidneys, and testes treated with E2 in both species. Accumulations resulted in hepatocyte hypertrophy, disruption of spermatogenesis, and obstruction of renal glomeruli. Inhibition of testicular growth with atrophy and clusters of dead germ cells were prevalent in flounders at highest E2 treatments. Hepatocyte nuclei and nucleoli were enlarged and accumulations of VtG observed in treated fish. Hepatocyte hypertrophy was common in these areas and mortalities occurred in the highest doses. All E2 treated flounders displayed VtG accumulation in testes tissue sections. Some of E2 and EE2 treated male cunner had hemorrhaging testes in addition to VtG accumulation in renal tubules and glomeruli; one with extensive hepatocellular necrosis, hemorrhage, and hemosiderin accumulation. In cunner treated with aromatase inhibitor androstatrienedione, no notable histopathological abnormalities were found. Overall, histopathological changes in liver, testicular, and renal glomeruli tissues appear similar in both species of fish and relate to excessive accumulation of VtG.