

## 2009 CURRICULUM VITAE



**NAME:** William E. Bemis  
**DEPARTMENT/UNIT:** Shoals Marine Laboratory and Department of Ecology and Evolutionary Biology  
**TITLE:** Professor and Kingsbury Director, Shoals Marine Laboratory  
**SUPERVISOR:** Dr. Jan Nyrop, Senior Associate Dean, College of Agriculture and Life Sciences, Cornell University, Ithaca, NY 14853 607-255-4677  
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### BACKGROUND

**CITIZENSHIP** United States of America (born Toledo, Ohio 3/7/1954)

#### EDUCATION

<u>Year</u>	<u>Degree</u>	<u>Institution</u>
1983	Ph.D.	University of California Berkeley
1978	M.S.	University of Michigan Ann Arbor
1976	B.A.	Cornell University <i>magna cum laude</i>

#### ACADEMIC RANKS (year achieved; salary data included under Professional Experience)

**Professor:** 2005 (Cornell University)  
**Professor:** 1998 (University of Massachusetts Amherst)  
**Associate Professor:** 1991 (University of Massachusetts Amherst)  
**Assistant Professor:** 1984 (University of Massachusetts Amherst)

#### PRIMARY DEPARTMENTAL/Unit PROGRAM AREA

Ecology and Evolutionary Biology

#### AREAS OF EXPERTISE (key words)

Vertebrate anatomy, ichthyology, paleontology, systematics, embryology

**PROFESSIONAL EXPERIENCE (excludes service on 14 faculty search committees)**

<u>Year</u>	<u>Experience</u>
Oct 2007-Apr 2008	Temporary Program Director, Systematic Biology, Division of Environmental Biology, National Science Foundation (contract employee)
2005-present	Kingsbury Director of Shoals Marine Laboratory and Professor of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY (\$153K faculty stipend +\$25K administrative stipend as of July 1, 2008)
2004	Program Director, Systematic Biology, Division of Environmental Biology, National Science Foundation (IPA)
2002-2005	Adjunct Professor of Geosciences, Department of Geosciences, University of Massachusetts, Amherst, MA (not compensated)
2001-2003	Personnel Committee, Department of Biology (Chair; handled six promotion and tenure cases) (service duty as faculty member)
2002-2003	Research Library Council, University of Massachusetts Amherst (Chair, 2002-2003; wrote a major report that resulted in consolidation of two libraries) (service duty as faculty member)
1999-2003	Research Council, University of Massachusetts Amherst (Co-Chair, 2000-2001; Chair 2001-2002; co-Chair, 2002-2003; Chair, Fall 2003; wrote major reports on intellectual property, status of postdoctoral researchers, non-tenure system “research” faculty, and access to research data) (service duty as faculty member)
1998-2008	Research Associate in Vertebrate Paleontology, Museum of Comparative Zoology, Harvard, MA (not compensated)
1996-1998	Personnel Committee, Department of Biology (member; handled one tenure case) (service duty as faculty member)
1995-1998	Life Sciences Steering Committee, University of Massachusetts Amherst (service duty as faculty member)
1995-1998	Program Officer, Society of Integrative and Comparative Biology (an elected office serving approximately 2000 members of the Society of Integrative and Comparative Biology) (uncompensated professional service)
1995-2005	Director, Zoological Collections, University of Massachusetts (service duty as faculty member)
1993-1995	Senior Mentor for Junior Fellows in the Life Sciences, Department of Biology, University of Massachusetts Amherst (service duty as faculty member)
1992-1994	Personnel Committee, Department of Biology (member) (service duty as faculty member)
1994	Founded Darwin Postdoctoral Fellowship Program for OEB (jointly with Dr. Elizabeth Brainerd) (service duty as Director of OEB)
1991-1994	OEB Seminar Committee (Chair) (service duty as Director of OEB)
1991-1994	OEB Admissions Committee (Chair) (service duty as Director of OEB)
1991-1996	Founding Director, Organismic and Evolutionary Biology (OEB) Graduate Program, University of Massachusetts, Amherst, MA (compensated service duty as Director of OEB; \$10K administrative stipend)

1991-1995 Biological Sciences Steering Committee (service duty as Director of OEB)

1990-2007 Research Associate, Department of Geology, Field Museum of Natural History, Chicago, IL (not compensated)

1989-1991 Program Officer, Division of Vertebrate Morphology, American Society of Zoologists (an elected office serving approximately 600 members of the Division of Vertebrate Morphology) (uncompensated professional service)

1988-1990 Departmental Honors Program, Department of Zoology, University of Massachusetts Amherst (Chair) (service duty as faculty member)

1988 Fulbright Committee for Graduate Fellowships (service duty as faculty member)

1987-1990 Undergraduate Advising Committee, Department of Zoology, University of Massachusetts Amherst (member) (service duty as faculty member)

1985-1987 Colloquium Committee, Department of Zoology, University of Massachusetts Amherst (Chair) (service duty as faculty member)

1983-1984 NIH/NRSA Postdoctoral Fellow, University of Chicago, IL (\$25K)

1984-2005 Curator of University of Massachusetts Fish Collection (service duty as faculty member)

1982-1983 Human Anatomy Lectureship, University of Chicago, IL (\$22K)

1982-1983 Annie Alexander Fellowship, University of California, Berkeley, CA

1979-1982 NSF Graduate Fellowship, University of California, Berkeley, CA (\$3K)

1979-1981 Teaching Assistant, University of California, Berkeley, CA

1977-1978 NSF Graduate Fellowship, University of Michigan, Ann Arbor, MI (\$3K)

1976-1978 Teaching Assistant, University of Michigan, Ann Arbor, MI (\$3K)

1976 Assistant for Electron Microscopy, Cornell University, Ithaca, NY (\$1K)

#### **SABBATICALS AND STUDY LEAVES (year, project, location)**

1997-2005 Dauphin Island Sea Lab, Alabama: collection of fishes of the Gulf of Mexico. This is an annual two-week collecting effort each July to prepare comparative anatomical specimens of fishes; I have directed this effort six times since 1998 and expect to continue this work into the future.

1990-1991 Visiting Researcher, Department of Neuroscience, Scripps Institute of Oceanography, San Diego, CA; worked with Glenn Northcutt

1991 Bass Fellow, Department of Geology, Field Museum of Natural History, Chicago, IL; worked with Lance Grande

1978-2005 More than 50 short research visits to major museums and university collections in North America, Europe and Asia to study specimens of fossil and extant fishes; a partial list of institutions visited in the last decade includes: American Museum of Natural History, New York; Bayerische Staatssammlung für Paläontologie und Historischen Geologie, Munich, Germany; California Academy of Sciences, San Francisco; Cornell University Museum of Vertebrates, Ithaca; Field Museum of Natural History, Chicago; Hebrew University, Jerusalem, Israel; Hessisches Landesmuseum, Darmstadt, Germany; Institute of Paleontology, Moscow, Russia; Jura Museum, Eichstätt, Germany; Kitakyushu Museum of Natural History, Kitakyushu, Japan; Museum für Naturkunde, Berlin, Germany;

Muséum National d'Histoire Naturelle, Laboratoire de Paléontologie, Paris, France; Museum of Comparative Zoology, Harvard University, Cambridge; Museum of Geology, Barcelona, Spain; Museum of Natural History, London, England; National Museum of Natural History, Smithsonian Institution, Washington, DC; Peabody Museum, Yale University, New Haven; Princeton University Department of Geology, Princeton; Royal Scottish Museum, Edinburgh, Scotland; Senckenbergh Museum, Frankfurt, Germany; and Department of Geology, UNAM, Mexico City, Mexico.

**HONORS AND AWARDS (past and current year)**

- 2004-2005      TEACHnology Fellowship, University of Massachusetts Amherst, Amherst, MA (note: I declined fellowship because of relocation to Cornell)
- 2004            Distinguished Faculty Award, University of Massachusetts Amherst Alumni Association, Boston, MA (received at the Massachusetts Statehouse, April 15, 2004)
- 2002            Visiting Scholar, Field Museum of Natural History, Chicago, IL (2002)
- 2001-2002     Distinguished Faculty Lectureship, University of Massachusetts, Amherst, MA. Lecture title: "Evolution of an Ichthyologist" (October 16, 2001)
- 2001            Samuel F. Conti Faculty Fellowship Award, University of Massachusetts, Amherst, MA
- 1991            Bass Fellowship, Department of Geology, Field Museum of Natural History, Chicago, IL
- 1983-1984     NIH National Research Service Award Fellow, University of Chicago, IL
- 1982            Chancellor's Patent Fund Award, University of California, Berkeley, CA
- 1981-1982     Annie Alexander Memorial Fellowship, Museum of Vertebrate Zoology, University of California, Berkeley, CA
- 1977-1981     NSF Predoctoral Fellowship (note: held at the University of Michigan, Ann Arbor and the University of California, Berkeley)

**REPRESENTATIVE ACADEMIC RESPONSIBILITIES**

**CURRENT ADMINISTRATIVE RESPONSIBILITIES**

- 1. Kingsbury Director Shoals Marine Laboratory (2005 - present)

**RESEARCH RESPONSIBILITIES**

- **Active Grants/Contracts/Gifts**

Project Number (Principal Investigator) Source Title of Project	Dates of Approved/Proposed Project Direct Costs	% Effort
GEO-0503538 (Morin, Bemis and others) NSF GEO/OCE <i>From the Campus to the Coast: Increasing Diversity in Marine Sciences</i>	10/1/05-9/30/08 (recently completed) \$99,462	10%

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DBI-0533796 (J. Morin & W. E. Bemis) (active until Spring 2009) 10%  
NSF DBI \$187,000  
*Upgrade of Power and Sanitation Systems at the Shoals Marine Laboratory*

DEB- (W.E. Bemis & M. Shulman) (final report filed August 2008) 10%  
NSF DEB – Note: I was not the original PI for this award. Jim Morin transferred it to me in 2006  
*REU Site: Research Experiences for Undergraduates in Marine Biology at the Shoals Marine Laboratory*

- **Past Postdoctoral Associates (list names and dates)**

Dr. Bernd Pelster, 1991-1992

Dr. Dominique Didier Dagit, 1993-1994

Dr. Judith Shardo, 1994-1995

Dr. Andrew Simons, 1997-1998

- **Other Relevant Research Activities, Accomplishments, etc.**

As Kingsbury Director of SML, I have worked in many areas since my appointment in 2005. In particular, I organized the renewal of a 25-year lease for SML's facilities on Appledore Island. I also organized a 50-year lease for a coastal property in Portsmouth New Hampshire known as Creek Farm to serve as SML's shore base. Since signing that lease in 2006, I have overseen the establishment of SML's Coastal Office at Creek Farm and the hiring of new employees to staff it. I established design criteria and oversaw purchase of a new 21' vessel for SML (the R/V STORM PETREL). I led the Creek Farm Planning Committee, which produced its draft report in December 2007 and final report in May 2008. I established a new seabird conservation internship program at SML that joins SML, the Cornell Laboratory of Ornithology, and the Audubon Society in studies of endangered seabirds. Over the last three years, I have helped to plan more than ten new courses for SML. I recruited faculty to teach these new courses and I serve in lead roles in organizing and teaching three of them (*A Marine Approach to Introductory Biology*, 8 credits; BIOSM 1110; *Sharks*, 2 credits; BIOSM 4650; and *Anatomy and Function of Marine Vertebrates*, 4 credits BIOSM 3210). I typically spend 8-12 weeks on Appledore Island in summers and make 12 to 16 trips from Ithaca to Portsmouth during the year to perform my duties as SML Director.

I administered three NSF awards related to SML; oversaw three effective recruitment seasons for SML (2006, 2007 and 2008; see graphic summary on last page of my CV); passed a critical milestone in the evaluation of SML's progress in meeting specific programmatic and financial goals set by Cornell President Hunter Rawlings in January 2006; and advanced SML's agenda for alternative energy systems – specifically, our 7.5kW wind turbine and initial set of solar electric cells (2.4kW) were installed this summer, and these will address a variety of research and training needs. In particular, they allow SML to support year-round data collection of atmospheric data for the UNH

AIRMAP project. The systems also serve as a test-bed for wind and solar power systems on offshore islands in the northeastern United States and an example that could be extended to other island and coastal communities.

In July 2007, the Division of Environmental Biology at NSF, where I previously served as a rotating Program Director in 2004, asked me to serve as a Temporary Program Director during AY2007-2008. This role, which essentially continued my work at NSF in 2004, involved helping to lead two panels, processing proposals, and corresponding with PIs; I accomplished this work largely remotely because NSF's computer systems advanced so much since 2004 (i.e., I made only five trips to Arlington for a total of ten days away from Ithaca during AY2007-2008).

## TEACHING AND ADVISING RESPONSIBILITIES

- **Teaching Prizes, Awards Received**

2004-2005	TEACHnology Fellowship, University of Massachusetts Amherst, Amherst, MA (note: I declined this fellowship in anticipation of my relocation to Cornell)
2004	Distinguished Faculty Award, University of Massachusetts Amherst Alumni Association, Boston, MA (received at the Massachusetts Statehouse, April 15, 2004)

- **Administrative Leadership (positions related to teaching/education/advising)**

Fall 2007/Spring 2008	Temporary Program Director, Systematic Biology, Division of Environmental Biology, National Science Foundation
June 2005-Present	Kingsbury Director, Shoals Marine Laboratory
Spring/Summer 2004	Program Director, Systematic Biology, Division of Environmental Biology, National Science Foundation
Fall 2003	Personnel Committee, Department of Biology (Chair)
Fall 2003	Research Council, University of Massachusetts Amherst (Chair)

- **Courses Taught (course number and name)**

Summer 2008	BIOSM 3640 <b>Field Marine Science</b> (at SML; three days of lectures)
Summer 2008	BIOSM 3210 <b>Anatomy and Function of Marine Vertebrates</b> (at SML; three days of lecture and laboratories, jointly with Frank Fish)
Summer 2008	BIOSM 1110 <b>A Marine Approach to Introductory Biology</b> (at SML; one week of lectures and laboratories, jointly with J.B. Heiser and others)
Summer 2008	BIOSM 4650 <b>Sharks</b> (at SML; one week of lectures and laboratories, jointly with Dominique Didier Dagit)
Spring 2008	BIOG 125S <b>Marine Biodiversity and Conservation</b> (seven seminars for first-year undergraduates)

Fall 2007	BIOG 125F <b>Marine Biodiversity and Conservation</b> (seven seminars for first-year undergraduates)
Summer 2007	BIOSM 364 <b>Field Marine Science</b> (at SML; three days of lectures)
Summer 2007	BIOSM 111 <b>A Marine Approach to Introductory Biology</b> (at SML; one month, including two weeks of lectures and laboratories, jointly with J.B. Heiser and others)
Summer 2007	BIOSM 465 <b>Sharks!</b> (at SML; one week of lectures and laboratories, jointly with Dominique Didier Dagit)
Spring 2007	BIOG 125S <b>Marine Biodiversity and Conservation</b> (seven seminars for first-year undergraduates)
Summer 2006	BIOSM 364 <b>Field Marine Science</b> (at SML; three days of lectures)
Summer 2006	BIOSM 477 <b>Marine Vertebrates</b> (at SML; two days of lectures)
Summer 2005	BIOSM 364 <b>Field Marine Science</b> (at SML; three days of lectures)
Fall 2004	UMass Biology 497 <b>Marine Vertebrates</b> (course organization and 7 weeks of lectures)
Fall 2004	UMass Biology 521 <b>Comparative Anatomy</b> (course organization and 6 weeks of lectures)
Fall 2003	UMass Biology 542 <b>Ichthyology</b>

- **Educational Innovations Developed Including; Web-Based Materials; New Courses Developed, etc.**

I posted for free downloading my series of 22 PowerPoint presentations based on the figures from our textbook, *Functional Anatomy of the Vertebrates*, 3<sup>rd</sup> edition. These presentations include virtually all of the more than 450 illustrations from our text. They have been well received by students and by colleagues at other institutions (to view these, follow links from: <http://www.eeb.cornell.edu/Bemis/default.html>).

I have overseen the delivery of an enlarged curriculum for SML. New courses offered since my arrival in 2005 include: *A Marine Approach to Introductory Biology*, *Field Microbial Ecology*, *Seabird Ecology and Conservation*, *Sharks*, *Boats for Biologists*, *Introduction to Marine Conservation Biology*, *Biology of the Lobster*, *Anatomy and Function of Marine Vertebrates*, *Forensic Science for Wildlife Biologists*, *Genetics of Marine Diversity*, *Island Archaeology* and others. Each of these new courses reflects substantial thought, design, and interaction with SML Staff and Core Faculty. A full list of SML courses is at: [http://www.sml.cornell.edu/sml\\_students\\_creditcourses.html](http://www.sml.cornell.edu/sml_students_creditcourses.html).

I continue to restructure the personnel and reporting lines for SML to more clearly emphasize SML's academic mission. For the first time, the SML Staff includes two persons with doctorates who are charged with keeping the educational mission of SML uppermost. I expect this reorganization to provide a stronger and more focused programming during SML's operating season and improvements in curriculum throughout the year.

I continue to work on resolving many of SML's challenging budget problems by increasing tuition and fees and restricting SML's expenses.

I resurrected the SML Executive Committee, which had met only once in the previous five years before my arrival in 2005. This committee oversees the execution of the SML Covenant, the memorandum of understanding that specifies how Cornell and UNH are to partner in the operation of SML. The SML Executive Committee is helping to sort out many long-term problems and issues that have built up regarding SML tuition and fees, student scholarships, development, shared facilities, etc. All of these are central to the success of SML's undergraduate programming and the long-term future of the partnership.

SML Summer 2008 offered 21 credit courses (versus 14 in 2005), attracted 194 enrollees for credit courses (versus 157 in 2005), and 13 paid interns (versus 10 in 2005; for a full analysis of trends in enrollment at SML, please see the last page of my CV). More than ten new tenure-system faculty participated in instruction at SML. Student evaluations and staff performance in summer 2008 suggest that SML is on a good track for the future.

- **Current Undergraduate Students Mentored in Independent Research (list names)**

none

- **Current Undergraduate Advisees (list names)**

Melissa Chan, Jason Friedman, Alex Caillat, Tyler Garzo, Erica Gornstein, Richard Hepner, Alex Keller, Geoffrey Loffredo, Glenn Palmer, Sherre Sachar, Kyle Traub, Devon van Noble, Andrew Zipkin

## **GRADUATE FIELD MEMBERSHIPS**

Ecology and Evolutionary Biology

## **GRADUATE MAJORS**

- **Current students (names and expected date and field of degree including degree (for example, Ph.D., M.S., MPS, MAT, etc.)**

**Students in my laboratory:**

None

**Students from other laboratories on whose committees I serve:**

Mandy Cass

• **Students who completed graduate degree work in my laboratory (names and dates):**

1. Kerin Claeson, MS Organismic and Evolutionary Biology 2005. Thesis: "New interpretations of the skull of a primitive bony fish *Erpetoichthys calabaricus* (Actinopterygii: Cladistia)." Currently, Kerin is a doctoral student at the University of Texas Austin.
2. Eric Hilton, Ph.D. Organismic and Evolutionary Biology 2002. Dissertation: "A contribution to the comparative osteology and phylogenetic systematics of fossil and living bony-tongue fishes (Actinopterygii, Teleostei, Osteoglossomorpha)." Currently Eric is a Postdoctoral Researcher at the Field Museum.
3. Alan Richmond, Ph.D. Biology 1999. Dissertation: "Contributions to the Herpetology of New England." Currently Alan is Lecturer in Biology at the University of Massachusetts, Amherst, MA.
4. Judith D. Shardo, Ph.D. Biology 1994. Dissertation: "Development of the American Shad *Alosa sapidissima* (Wilson, 1811) and implications for other teleostean fishes." Currently Assistant Professor of Biology, University of Middle Tennessee State, Murphreesboro, TN.
5. Eric K. Findeis, Ph.D. Biology 1993. Dissertation: "Skeletal anatomy of the North American shovelnose sturgeon *Scaphirhynchus platyrhynchus* (Rafinesque 1820) with comparisons to other Acipenseriformes." No longer in field.
6. Dominique A. Didier, Ph.D. Zoology 1991, Fulbright Fellow 1989. Dissertation: "Phylogenetic systematics of extant chimaeroid fishes (Holocephali, Chimaeroidei)." Currently Associate Curator of Ichthyology, Academy of Natural Sciences, Philadelphia, PA.
7. Anne W. Everly, M.S. Biology 1995. Thesis: "Development of the American Goosefish, *Lophius americanus* (Lophiiformes: Lophiidae) with emphasis on phylogenetically significant characters." Currently employed as a Research Assistant in the Museum of Comparative Zoology.
8. James J. DuPrie, M.S. Neuroscience and Behavior 1994. Thesis: "Development and functional anatomy of the olfactory system of the little skate, *Raja erinacea*." Currently at UNH pursuing a doctoral degree in fisheries biology.
9. David Fahey, M.S. Biology 1993. Thesis: Fecundity of the little skate, *Raja erinacea* (Rajiformes, Rajidae)." No longer in field.
10. Catherine Tannert, M.S. Zoology 1987. Non-thesis M.S. No longer in field.
11. Benjamin Kaghan, M.S. Zoology 1986. Non-thesis M.S. No longer in field.

**Students who completed graduate degree work in other laboratories on whose committees I served:**

1. Andrea Ward, PhD Organismic and Evolutionary Biology 2005.
2. Manny Azizi, PhD Organismic and Evolutionary Biology 2005.
3. Alex Ghodino, PhD Forestry and Wildlife Management 2005.
4. Abby Drake, Ph.D. Organismic and Evolutionary Biology 2004.
5. Ted Castro Santos, 2002.
6. Neil Tibert, Ph.D. Geosciences, 2002.
7. Nate Kley, Ph.D. Organismic and Evolutionary Biology, 2001.

8. Nancy Haley, M.S. Fisheries, 1999.
9. Adam Summers, Ph.D. Organismic and Evolutionary Biology, 1999.
10. Susan Feeney, Ph.D. Biology, 1999.
11. Ruth Hartling, Ph.D. Molecular and Cellular Biology, 1999.
12. Joe Zydlewski, Ph.D. Biology, 1999.
13. Kevin Whalen, Ph.D. Fisheries, 1998.
14. Philip Vinogradov, M.S. Fisheries, 1997.
15. Luke Holbrook, Ph.D. Biology, 1997.
16. Jill Leonard, Ph.D. Biology, 1997.
17. Todd Bryant, M.S. Biology, 1996.
18. Robert Benard, M.S. Zoology, 1995.
19. Gordon Waring, Ph.D. Fisheries, 1994.
20. Howard P. Whidden, Ph.D. Biology, 1994.
21. Stephanie Brady, M.S. Fisheries, 1994.
22. Helder Silva, Ph.D. Fisheries, 1993.
23. Gary Nelson, Ph.D. Fisheries, 1993.
24. Steven Crawford, Ph.D., 1993. (University of Guelph.)
25. Terry Grande, Ph.D. 1992. (University of Illinois, Chicago.)
26. John Dobrinsky, Ph.D. Animal Science, 1992.
27. Sean Murphy, M.S. Fisheries, 1990.
28. XiXi Jia, Ph.D. Zoology, 1991.
29. Lucy Hou, Ph.D. Zoology, 1991.
30. Robert Infantino, Ph.D. Zoology, 1991.
31. David Wright, Ph.D. Zoology, 1991.
32. Bryn Mader, Ph.D. Zoology, 1990.
33. Kyle Byrne, Ph.D. Zoology, 1987.
34. James Ryan, Ph.D. Zoology, 1987.
35. Alan Pinder, Ph.D. Zoology, 1985.

## **REPRESENTATIVE PROFESSIONAL ACTIVITIES**

### **PROFESSIONAL SOCIETIES**

American Society of Ichthyologists and Herpetologists

Sigma Xi

Society of Integrative and Comparative Biology (formerly American Society of Zoologists)

## **REPRESENTATIVE PROFESSIONAL CONTRIBUTIONS**

### **RECENT INVITED PRESENTATIONS (please provide detail)**

- Millersville University (Host: D. Dagit) 2006.
- SUNY Cortland (Host: B. Rivest) 2005.
- Shoals Marine Lab, Appledore (Host: J. Factor) 2004.
- University of New Hampshire, Durham (Host: J. Pennock) 2004.
- Cornell University, Ithaca, New York (Host: T. Seeley) 2004.
- Division of Environmental Biology, National Science Foundation, Arlington, Cambridge (Hosts: Q. Wheeler, P. Firth, J. Rodman and J. Woolley) 2003.

### **RESEARCH PANELS (please provide detail)**

- Division of Environmental Biology, National Science Foundation; helped to organize and lead seven panels in 2003, 2004, 2005, one panel in 2007, and one panel in 2008.

### **RESOURCE FOR MEDIA (i.e., called upon as an expert for electronic or print media)**

- I worked closely with author John McPhee to develop materials for a 1998 article in the *New Yorker* and book published in 2002 and more recent articles and books.

### **RESEARCH, INSTRUCTIONAL, AND/OR EXTENSION/OUTREACH PUBLICATIONS (provide full reference—list most current first. Include videos, websites, electronic publications, etc.)**

#### **1. Publications: Books, Peer-Reviewed Monographs and Textbooks (*in reverse chronological order*).**

- Book 6      Liem, K.F., **W. E. Bemis**, W.F. Walker, Jr. and L. Grande (2001) *Functional Vertebrate Anatomy, 3rd Edition*. Harcourt College Publishers, Philadelphia. Pages 1-703. (*A textbook on comparative and functional anatomy of vertebrates with more than 450 illustrations. I was lead author for Chapters 1, 2, 3, 4, 12 and 13 and also Art Developer for the project. The 4<sup>th</sup> edition was commissioned in February 2004; I will serve as its lead author and Art Developer.*)

- Book 5 Grande, L. and **W. E. Bemis** (1998) *A Comprehensive Phylogenetic Study of Amiid Fishes (Amiidae) Based On Comparative Skeletal Anatomy. An Empirical Search for Interconnected Patterns of Natural History*. Journal of Vertebrate Paleontology, Special Memoir #4 (supplement to Vol. 18). Pages 1-690 + ix. (A large format book containing 435 illustrations, most of which are original, and extensive new descriptions of all fossil and Recent amiids as well as selected outgroup taxa within Halecomorphi.)
- Book 4 Birstein, V.J., J.R. Waldman and **W. E. Bemis** (eds.) (1997) *Sturgeon biodiversity and conservation*. Reprinted from Environmental Biology of Fishes, Vol. 48 1-4. Kluwer Academic Publishers, Dordrecht. Pages 1-444. (An edited collection of papers from our 1994 conference on sturgeons and paddlefishes.)
- Book 3 Northcutt, R.G. and **W. E. Bemis** (1993) *Cranial Nerves of the Coelacanth Latimeria chalumnae [Osteichthyes: Sarcopterygii: Actinistia] and Comparisons with other Craniata*. Brain, Behavior and Evolution, (Supplement to Vol. 42). Pages 1-76. (A monograph with color illustrations of the distribution of the cranial nerves of Latimeria and a phylogenetic analysis of craniates.)
- Book 2 Grande, L. and **W. E. Bemis** (1991) *Osteology and Phylogenetic Relationships of Fossil and Recent Paddlefishes (Polyodontidae) with Comment on the Interrelationships of Acipenseriformes*. Journal of Vertebrate Paleontology, Special Memoir #1 (supplement to Vol. 11). Pages 1-121. (A large format monograph with many original illustrations and new descriptions of all fossil and Recent polyodontids known in 1991.)
- Book 1 **Bemis, W. E.**, W.W. Burggren, and N.E. Kemp (eds.) (1987) *The Biology and Evolution of Lungfishes*. Alan Liss, N. Y. pp. 1-383. (An edited collection of papers from our 1984 conference on lungfishes, simultaneously published as the Centennial Supplement to the Journal of Morphology.)

**2. Publications: Peer-Reviewed Journal Articles and Book Chapters** (in reverse chronological order; the list omits non-reviewed publications such as meeting abstracts).

- Article 43 McGuire, B. and **W. E. Bemis** (2007). Parental Care. IN: *Rodent Societies, An Ecological and Evolutionary Perspective*. J. O. Wolf and P. W. Sherman (eds.). University of Chicago Press: Chicago. pp. 231-242.
- Article 42 McGuire, B., E. Parker, and **W.E. Bemis** (2007) Sex differences, effects of male presence and coordination of nest visits in prairie voles (*Microtus ochrogaster*)

during the immediate postnatal period. *American Midland Naturalist* 157: 187-201.

- Article 41 McGuire, B, T. Pizzuto, **W. E. Bemis** and L. L. Getz (2006) General ecology of a rural population of Norway rats (*Rattus norvegicus*) based on intensive live trapping. *American Midland Naturalist* 155: 221-236.
- Article 40 **Bemis, W. E.**, A. Giuliano, and B. McGuire (2005) Structure, attachment, replacement and growth of teeth in bluefish, *Pomatomus saltatrix* (Linnaeus, 1766), a teleost with deeply socketed teeth. *Zoology* 108: 317-327.
- Article 39 Hilton, E. J. and **W. E. Bemis** (2005) Grouped tooth replacement in the oral jaws of the Tripletail, *Lobotes surinamensis* (Perciformes: Lobotidae), with a discussion of its proposed relationship to *Datnioides*. *Copeia* 2005: 665-672.
- Article 38 Hilton, E. J., L. Grande and **W. E. Bemis** (2004) Morphology of †*Coccolepis bucklandi* Agassiz 1843 (Actinopterygii, Coccolepidae) from the Solnhofen lithographic limestone deposits (Upper Jurassic, Germany). IN: *Mesozoic Fishes 3 – Systematics, Paleoenvironments and Biodiversity*. G. Arratia and A. Tintori (eds.). Verlag Dr. Friedrich Pfeil: München, Germany. pp. 209-238.
- Article 37 Little, C. D. and **W. E. Bemis** (2004) Observations on the skeleton of the heterocercal tail of sharks (Chondrichthyes: Elasmobranchii). IN: *Recent Advances in the Origin and Early Radiation of Vertebrates*. G. Arratia, M.V.H. Wilson and R. Cloutier (eds.). Verlag Dr. Friedrich Pfeil: München, Germany. pp. 563-573.
- Article 36 **Bemis, W. E.**, E. J. Hilton, B. Brown, R. Arrindell, A. M. Richmond, C. D. Little, L. Grande, P. L. Forey and G. J. Nelson (2004) Methods for preparing dry, partially articulated skeletons of osteichthyans, with notes on making Ridewood dissections of the cranial skeleton. *Copeia* 2004: 603-609.
- Article 35 McGuire, B., E. Henyey, E. McCue and **W. E. Bemis** (2003) Parental behavior at parturition in prairie voles (*Microtus ochrogaster*). *Journal of Mammalogy* 84: 513-523.
- Article 34 Grande, L., J. Fan, Y. Yabumoto, and **W. E. Bemis** (2002) †*Protopsephurus liui*, a well-preserved primitive paddlefish (Acipenseriformes: Polyodontidae) from the early Cretaceous of China. *Journal of Vertebrate Paleontology* 22: 209-237.

- Article 33 **Bemis, W. E.** and P. L. Forey (2000) Occipital structure and the posterior limits of the skull in actinopterygians. Pages 41-62. In *Development, Paleontology and Evolution*. (P. Ahlberg, ed.). Taylor and Francis, London.
- Article 32 **Bemis, W. E.** and L. Grande (1999) Development of the median fins of the North American paddlefish (*Polyodon spathula*) and a reevaluation of the lateral fin-fold hypothesis. IN: *Mesozoic Fishes II. Systematics and the Fossil Record*. G. Arratia and H.-P. Schultze (eds.). Verlag Dr. Friedrich Pfeil: München, Germany. pp. 41-68.
- Article 31 Hilton, E. J. and **W. E. Bemis** (1999) Skeletal variation in shortnose sturgeon (*Acipenser brevirostrum*) from the Connecticut River: Implications for the study of fossil fishes. *Mesozoic Fishes II. Systematics and the Fossil Record* (G. Arratia and H.-P. Schultze, eds.). Munich: Pfeil. pp. 69-94.
- Article 30 Grande, L. and **W. E. Bemis** (1999) Historical biogeography and historical paleoecology of Amiidae and other halecomorph fishes. *Mesozoic Fishes II. Systematics and the Fossil Record* (G. Arratia and H.-P. Schultze, eds.). Munich: Pfeil. pp. 413-424.
- Article 29 Vernadakis, A. J., **W. E. Bemis** and E. L. Bittman (1998) Localization and partial characterization of melatonin receptors in amphioxus, hagfish and skate. *General and Comparative Endocrinology*. 110: 67-78.
- Article 28 **Bemis, W. E.** and A. M. Simons (1997) Letter to Science concerning relationships of coelacanth, lungfishes and tetrapods. *Science* 278: 370.
- Article 27 **Bemis, W. E.**, V. J. Birstein and J.R. Waldman (1997) Sturgeon biodiversity and conservation: an introduction. *Environmental Biology of Fishes* 48:13-14.
- Article 26 **Bemis, W. E.**, E. K. Findeis and L. Grande (1997) An overview of Acipenseriformes. *Environmental Biology of Fishes* 48:25-71.
- Article 25 **Bemis, W. E.** and B. Kynard (1997) Sturgeon rivers: an introduction to acipenseriform biogeography and life history. *Environmental Biology of Fishes* 48:167-183.
- Article 24 Birstein, V. J. and **W. E. Bemis** (1997b) How many species are there within the genus *Acipenser*? *Environmental Biology of Fishes* 48:157-163.
- Article 23 Birstein, V. J. and **W. E. Bemis** (1997a) Leo Semenovitch Berg and the biology of Acipenseriformes: a dedication. *Environmental Biology of Fishes* 48:15-22.

- Article 22 Birstein, V. J., **W. E. Bemis** and J. R. Waldman (1997) The threatened status of acipenseriform fishes: a summary. *Environmental Biology of Fishes* 48:427-435.
- Article 21 Grande, L. and **W. E. Bemis** (1996) Interrelationships of Acipenseriformes with comments on “Chondrostei”. IN: *Interrelationships of Fishes*. M.L.J. Stiassny, L.R. Parenti and G.D. Johnson (eds.). Academic Press, San Diego. 496 pages. pp. 85-115.
- Article 20 **Bemis, W. E.** and E. K. Findeis (1994) The Sturgeon’s Plight. *Nature* 370:602.
- Article 19 **Bemis, W. E.** and R. G. Northcutt (1992) Skin and blood vessels of the snout of the Australian lungfish, *Neoceratodus forsteri*, and their significance for interpreting the cosmine of Devonian lungfishes. *Acta Zoologica (Stockholm)* 73:115-139.
- Article 18 Burggren, W. and **W. E. Bemis** (1992) Metabolism and ram gill ventilation in juvenile paddlefish, *Polyodon spathula* (Chondrostei: Polyodontidae). *Physiological Zoology* 65:515-539.
- Article 17 Pelster, B. and **W. E. Bemis** (1992) Structure and function of the external gill filaments of embryonic skates (*Raja erinacea*). *Respiration Physiology*. 89:1-13.
- Article 16 **Bemis, W. E.** and L. Grande (1992) Early development of the actinopterygian head. I. External development and staging of the paddlefish *Polyodon spathula*. *J. Morphol.* 213:47-83.
- Article 15 Pelster, B. and **W. E. Bemis** (1991) Ontogeny of heart function in the little skate, *Raja erinacea*. *J. Exp. Biology*. 156:387-398.
- Article 14 **Bemis, W. E.** and R. G. Northcutt (1991) Innervation of the basicranial muscle of *Latimeria chalumnae*. IN: *The Biology of Latimeria chalumnae and the Evolution of Coelacanth*s. J. A. Musick, M. N. Bruton and E. K. Balon, eds. Kluwer, Dordrecht. pp. 147-158.
- Article 13 Burggren, W. W. and **W. E. Bemis** (1990) Studying physiological evolution: Paradigms and pitfalls. IN: *Evolutionary Innovations. Field Museum of Natural History, Spring Systematics Symposium Series*. M. H. Nitecki, ed. University of Chicago Press, Chicago. pp. 193-228.
- Article 12 Findeis, E. K. and **W. E. Bemis** (1990) Evolutionary morphology of tongue projection in *Taricha torosa* (Urodela: Salamandridae). *Zool. J. Linn. Soc.* 99:129-157.

- Article 11 **Bemis, W. E.** and W. W. Burggren. (1987) Introduction. IN: *The Biology and Evolution of Lungfishes*. **W. E. Bemis**, W.W. Burggren, and N.E. Kemp, eds. Alan Liss, NY pp. 3-4.
- Article 10 **Bemis, W. E.** (1987) Convergent evolution of jaw opening muscles in lungfishes and tetrapods. *Can. J. Zool.* 65:2814-2817.
- Article 9 **Bemis, W. E.** (1987) Feeding systems of living Dipnoi: Anatomy and function. IN: *The Biology and Evolution of Lungfishes*. **W. E. Bemis**, W.W. Burggren, and N.E. Kemp, eds. Alan Liss, N. Y. pp. 249-275.
- Article 8 **Bemis, W. E.** and G. V. Lauder (1986) Morphology and function of the feeding apparatus of the lungfish, *Lepidosiren paradoxa* (Dipnoi) *J. Morphol.* 187:81-108.
- Article 7 **Bemis, W. E.** (1986) Review of: Evolutionary Biology of Primitive Fishes. R. E. Foreman, A. Gorbman, J. M. Dodd, and R. Olsson, eds. *Science* 233:114-115.
- Article 6 **Bemis, W. E.** (1984b) Paedomorphosis and the evolution of the Dipnoi. *Paleobiology* 10:293-307.
- Article 5 **Bemis, W. E.** (1984a) Structure and growth of lepidosirenid lungfish tooth plates (Pisces: Dipnoi). *J. Morphol.* 179:73-93.
- Article 4 **Bemis, W. E.**, K. Schwenk, and M. H. Wake (1983) Morphology and function of the feeding apparatus in *Dermophis mexicanus* (Amphibia: Gymnophiona). *Zool. J. Linn. Soc.* 77:75-96.
- Article 3 **Bemis, W. E.** and T. E. Hetherington (1982) The rostral organ of *Latimeria chalumnae*: morphological evidence of an electroreceptive function. *Copeia* 1982:467-471.
- Article 2 Clark, B.D. and **W. Bemis** (1979) Kinematics of swimming of penguins at the Detroit Zoo. *J. Zool. Lond.* 188:411-428.
- Article 1 Pough, F.H., G. Kwiecinski, and **W. Bemis** (1977) Melanin deposits associated with the venom glands of snakes. *J. Morphol.* 155:63-72.

**3. Publications: Articles or Chapters Currently Submitted to Peer-Reviewed Journals or Books** (*in reverse chronological order*).

- In Prep 1 Hilton, E. J., L. Grande and **W. E. Bemis**. (manuscript) Skeletal Anatomy of the Shortnose Sturgeon, *Acipenser brevirostrum* Lesueur 1818 (Actinopterygii, Chondrostei, Acipenseriformes), and the Comparative Osteology and Systematics

of Sturgeons (Acipenseridae). To be submitted to Fieldiana Zoology; estimated to be 200 pages text, 100 figures, 20 tables. Publication is anticipated in 2008.

- Submitted 3 Hilton, E. J. and **W. E. Bemis** (Accepted). External Morphology of Shortnose Sturgeon, *Acipenser brevirostrum* (Acipenseriformes: Acipenseridae) from the Connecticut River with Notes on Variation. For American Fisheries Society Special Publication on Connecticut River Sturgeons, guest edited by B. Kynard. Submitted to the editor May 19, 2003.
- Submitted 2 Hilton, E. J., L. Grande and **W. E. Bemis**. (Accepted). Hiodontidae, Anguillidae, and Clupeidae, Mooneyes, Freshwater Eels, Herrings, and Shads. For North American Freshwater Fishes, R. Mayden and B. Burr, eds. Submitted February 2005.
- Submitted 1 Grande, L. and **W. E. Bemis**. (Accepted). Lepisosteidae and Amiidae, Gars and Bowfins. For North American Freshwater Fishes, R. Mayden and B. Burr, eds. Submitted February 2005.

#### **4. Publications: Articles and Monographs Resulting from Graduate Research in my Laboratory** (*in reverse chronological order*).

*Note: I adhere to long tradition in vertebrate morphology and have not jointly published with students the major papers that result from their M.S. and Ph.D. research in my laboratory. I do this because I consider that helping my students to publish their major graduate papers is part of my training role. For the eight publications listed in this section, I provided substantial project design, advice, funding, editing, illustrations, and other efforts relevant to publication.*

- Student 8 Hilton, E. J. (2003) Comparative osteology and phylogenetic systematics of fossil and living bony-tongue fishes (Actinopterygii, Teleostei, Osteoglossomorpha). *Zoological Journal of the Linnaean Society* 137: 1-100.
- Student 7 Hilton, E. J. (2002b) Osteology of the extant North American fishes of the genus *Hiodon* Lesueur 1818 (Teleostei: Osteoglossomorpha: Hiodontiformes). *Fieldiana (Zoology) New Series*. 100: 1-150.
- Student 6 Hilton, E. J. (2002a) Observations on rostral canal bones of two species of *Acipenser* (Actinopterygii, Acipenseriformes). *Copeia* 2002: 213-219.
- Student 5 Everly, A. W. (2002) Stages of development of the goosefish, *Lophius americanus*, and comments on the phylogenetic significance of the development

of the luring apparatus in Lophiiformes. *Environmental Biology of Fishes* 64: 393-417.

- Student 4 Hilton, E. J. (2001) The tongue bite apparatus of osteoglossomorph fishes: Variation of a character complex. *Copeia* 2001: 372-382.
- Student 3 Findeis, E. K. (1997) Osteology and phylogenetic relationships of Recent sturgeons (Acipenseridae). *Environmental Biology of Fishes* 48:73-126.
- Student 2 Shardo, J. (1995) Comparative embryology of teleostean fishes. I. Development and staging of the American shad *Alosa sapidissima* (Wilson, 1811). *J. Morphol.* 225:125-167.
- Student 1 Didier, D. A. (1995) Phylogenetic systematics of extant chimaeroid fishes (Holocephali, Chimaeroidei). *American Museum Novitates*, No. 3119, 86 pp., 46 figs.

##### **5. Reviews and Other Commentaries on my work (in reverse chronological order).**

- Commentary 8 Benetti, M. (2004) **New SML Director** <http://www.sml.cornell.edu/about/ps-newdir.htm>.
- Commentary 7 McPhee, J. (2002) **The Founding Fish**. Farrar, Straus & Giroux, New York. 1-358.
- Commentary 6 Wiley, E. O. (1999) Sturgeon Biodiversity and Conservation [review of Birstein, Waldman and Bemis, 1997]. *Copeia* 1999: 1135-1137.
- Commentary 5 Gardiner, B. G. (1999) [review of Grande and Bemis, 1998] *Copeia* 1999: 240-242.
- Commentary 4 Klenotic, D. (1999) Professor Bemis's Dream. *UMass Magazine* 3: 28-35.
- Commentary 3 Creekmore, C. (1999) A Fish Story. Teaching, Research, Outreach. A Report to the Alumni, Friends and Supporters of the University of Massachusetts Amherst. David K. Scott, Chancellor. 4-8. (Chancellor's Annual Report).
- Commentary 2 McPhee, J. (1998) Catch-and-Dissect. *The New Yorker* October 19, 1998: 58-66.
- Commentary 1 Janvier, P. (1998) Bowfins and the Revenge of Comparative Biology [review of Grande and Bemis, 1998]. *Science* 281: 1150.

## 6. Video

Video 1 Bemis, W.E. and J. Fitzpatrick (producers). (2008) *Signals for Survival*. (37 min). Inspired by the famous 1969 film of the same name by Niko Tinbergen and Hugh Falkus, this high-definition video provides an in-depth look at the communication behaviors of Great Black-backed and Herring Gulls. Intended for use in college level courses on animal behavior and communication, it also documents the biology of these species during their annual five-month breeding season on Appledore Island, Maine, site of Shoals Marine Laboratory.