

ANNUAL REPORT: June 1, 2013 – May 31, 2014
(i.e., Summer 2013, AY 2013-2014)
DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY
SUNY-ESF

NAME: _____ **Karin Limburg**

I. INSTRUCTIONAL ACTIVITIES

Course ID	Section	Course Title	Credit Hrs	Number of Students	Total credit hours	Fall 2013
EFB487	1	Fisheries Science and Management	3	28	84	
EFB687	1	Fisheries Science and Management	3	4	12	
EFB797	17	Dim/Human Pop Grwth&Consumptn	1	2	2	
EST797	1	Dim/Human Pop Grwth&Consumptn	1	6	6	

NOTE: PLEASE INDICATE WHICH COURSE(S) HAD A SERVICE-LEARNING COMPONENT AND BRIEFLY EXPLAIN THE NATURE OF THIS COMPONENT. For examples of service-learning in courses, see: <http://www.esf.edu/students/service/courses.htm>. Service-learning is a form of structured experiential education in which students engage with the community to be active learners, to enrich their sense of civic responsibility, and to explore practical application for course content. Faculty oversight, reflective thinking, and reciprocity are key components of service-learning.

2. Non-Scheduled Course Offerings (e.g., 496, 899, 999)

Course ID	Section	Course Title	Credit Hrs	Number of Students	Total credit hours	Fall 2013
EFB498	39	Independent Research/Envrn Bio	3	1	3	
EFB798	39	Resrch Prob/Env&For Bio	1	2	2	
EFB899	39	Masters Thesis Research	1	1	1	
EFB999	39	Doctoral Thesis Research	1,6,1	3	8	

Course ID	Section	Course Title	Credit Hrs	Number of Students	Total credit hours	Spring 2014
EFB496	23	Study Abroad	12	1	12	
EFB498	39	Independent Research/Envrn Bio	1,3,1,2	4	7	
EFB796	2	Practical Ecol Modeling in R	2	11	22	
EFB797	8	A Self-Help Course in R	1	19	19	
EFB798	39	Resrch Prob/Env&For Bio	1	11	11	
EFB899	39	Masters Thesis Research	2	1	2	
EFB999	39	Doctoral Thesis Research	1,6,1	3	8	

3. Continuing Education and Extension (short courses, workshops, etc.)

4. Guest Lecture Activities

Course No.	Title	No. of Lectures
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II. STUDENT ADVISING

- A. Number of undergraduates for whom you are the student's official advisor 15 and unofficial advisor _____
- B. Graduate Students: (list name, degree sought, starting date, month & year; if a degree was completed, please give date and full citation for the thesis or dissertation).

MAJOR PROFESSOR

Mount, Sarah – M.Sc., began Sept. 2013

Nack, Christopher – Ph.D. began May 2013

Turner, Sara; Ph.D, began September 2009; **defended and completed dissertation April 2014.**

- Dissertation title: Understanding River Herring Movement Patterns at Small and Large Scales Through Geochemical Markers.

Evans, Thomas; Ph.D. Began September 2012.

CO-MAJOR PROFESSOR

Hamburg, Jonas; M.Sc., began 9-2013 (GPES, with Stewart Diemont)

Jackman, George; PhD, began 9-2008 (CUNY Queens College, with John Waldman); passed qualifier exams, June 2010.

Mandel, Jill; MSc, began 9-2010 (with Bill Shields); **defended and completed thesis June 2013**

- Thesis title: Great Blue Herons (*Ardea herodias*) as potential bioindicators of the pollution levels of watersheds in the northeastern United States from 1873 to 2012.

Ogburn, Emily, MSc, began 9-2011; became co-adviser with Chris Whipps spring 2012. **defended and completed thesis January 2014**

- Thesis title: Banded Killifish (*Fundulus diaphanus*) Parasite Communities of the Hudson River Estuary: a Prelude to Restoration

Smith, Alexander J.; PhD, began 9-2010 (with Neil Ringler); **defended and completed dissertation April 2014.**

- Dissertation title: Effects of Cultural Eutrophication on Biological Communities in Surface Waters: Implications For Nutrient Criteria Development.

MEMBER, STEERING COMMITTEE (other than those listed above)

Amos, Benjamin, MSc

Baker, Danielle, MSc

Gurdak, Daniel, PhD

Hazell, C.J.; PhD

Hermann, Ted, PhD

Karbowski, Curt, MSc

Kirby, Lucas

Matillano, Joie, PhD

defended November 2013

(passed qualifier exams October 2011)

(passed qualifier exams 2006?)

defended December 2013

defended July 2013

Payne, Molly, MSc (U. Southern Maine) **defended December 2013**

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

Renata Moreno Quintero, PhD Environmental Studies – passed qualifier exam, March 2014

III. RESEARCH COMPLETED OR UNDERWAY

A. Departmental Research (unsupported, boot-legged; title - % time spent)

I continue to have non-funded collaborations with Swedes and now other Baltic Sea partners, studying Baltic Sea cod, flounder, and eels. To date this has resulted in 5 publications, a dissertation (in Sweden), and numerous presentations. Some funding is coming in, but not directly to ESF:

1. A group of Swedes and I obtained a large (roughly \$446.6K), 3-year grant from the Swedish Research Council Formas to conduct R&D work at Lund University to develop next-generation methods for micron-scale, non-destructive, stable isotope analysis. This work is underway, and I will be doing experiments with the new method this June. Most of the funding is at Lund University where the R&D is ongoing.
2. My Scandinavian colleagues and I continue to put in grant applications; Last spring a group of ca. 20 participants representing a dozen research institutions in 7 Baltic States, with me as a “silent partner” since Americans cannot participate officially, put together a truly ambitious research agenda to study Baltic fishes. The program is called BONUS (Baltic Organisations' Network for Funding Science) and our project is called *INSPIRE – Integrating spatial processes into ecosystem models for sustainable utilization of fish resources*. The project received funding (3.6 million Euros), and we had our kick-off this February. What does ESF get out of this? Quite a lot of business for Analytical and Technical Services via me, plus my deepened collaborations, and if I can swing it, perhaps a graduate student can be involved.
3. I have two other grant proposals in play in Scandinavia: one with the Swedish Research Council FORMAS (somewhat like USDA but geared toward environment), and one to the Danish National Research Council. I am a co-PI on both.

B. 1. Grant-supported Research (source, subject, amount - total award and current year, award period starting and ending dates; list graduate research assistants supported by each grant)

1. In-kind grants:

Grant awards, Cornell High Energy Synchrotron Source (CHESS): Beam time at the synchrotron for X-ray fluorescence analyses: November 2013, March 2014. Note that these are NSF sponsored awards. During these runs in AY 2013-14, 2 EFB grad students conducted research that will be part of their respective theses.

2. Sponsored research with \$ coming to ESF:

Source	Title	Total \$	Current year \$	Start date	End date	Grad students supported
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USGS (via U. Florida)	Near Shore Fish Ecology in the Grand Canyon	\$1,178,711 total, \$272,976 to ESF	\$72,563	10/1/2009	7/31/2013	Post-doc Todd Hayden, PhD student Tom Evans
National Fish and Wildlife Foundation (via UC Santa Cruz)	Determining Origins of River Herring Bycatch	\$428,401 total, \$187,137 to ESF	\$162,018	7/1/2012	5/31/2014	Sara Turner, Jill Mandel
NYSDEC & NEIWPC	Analysis of samples collected in the Hudson River Estuary for various <i>Alosa</i> projects	\$40,000	\$20,000	1/1/2012	12/31/2013	Christopher Nack
Riverkeeper, Inc.	Filling in the gaps: building the knowledge base on ecosystem function, utilizing partnerships to move forward	\$115,000	\$51,200	4/1/2011	12/31/2014	Christopher Nack
Hudson River Foundation	Assessing Silver Eels in the Hudson River Tributaries	\$165,151	\$84,537	6/1/2013	5/31/2015	Sarah Mount
NSRC (U VT), Colin Beier PI	Impacts of Forest Management Practices and Ecosystem Service Outcomes in the Northern Forest: Development of the Forest Ecosystem Services Toolkit	\$115,117		1/1/2012	12/31/2013	Jesse Caputo (Beier MP)
USGS (Grand Canyon Monitoring and Research Center)	Natal Origins of Humpback Chub at Aggregations by Otolith Microchemistry	\$120,000	\$59,162	7/1/2013	1/14/2016	Thomas Evans
Great Lakes Fisheries Commission	Determining if Eye Lenses Can be Used to Understand the Origin and Life History of Adult Lamprey	\$10,000.20	\$10,000.20	10/1/2013	9/30/2014	Thomas Evans
NYSDEC (agreed upon, contract pending)	Blueback Herring in the Mohawk River	ca. \$185,000	\$56,393	not quite sure	3 years later	TBD

3. Sponsored research with no \$ coming directly to ESF, but some coming through service-basis:

- BONUS (Baltic Organisations' Network for Funding Science): *INSPIRE – Integrating spatial processes into ecosystem models for sustainable utilization of fish resources.* €3.6 Million, 4 years, begun February 2014.
- FORMAS (Swedish Research Council): *Understanding Fish Migration and Population Connectivity to Restore Resilience in Swedish Fisheries-Social-Ecological-Systems: New-Generation Instrumentation for Mapping Isotopes and Elements in Otoliths.* ca. \$446,600.

2. Research Proposals pending (include information as in B.1., above).

Pending: NSF	Collaborative Research: Consequences of sub-lethal hypoxia exposure for marine teleosts tracked with biogeochemical markers: a trans-oceanic comparison	\$283,564	\$72,334	9/1/2014	8/31/2017	TBD
Pending: Swedish Research Council FORMAS	SPICE Spatial Patterns of fish revealed by Chemical markers in otoliths (mainly to support Swedish collaborators)	\$490,000		1/1/2015	12/31/2017	Some partial support?

3. Research Proposals submitted, but rejected (include information as in B.1, above)

The proposal to NSF was submitted in the 2013 cycle, rejected in late May, and comments received in late October 2013. Comments were highly favorable ("This project is potentially transformative..." the highest praise from NSF) and thus was re-submitted this grant cycle.

IV. PUBLICATIONS (Full bibliographic citation, i.e., do not use "with Jones," or "Jones, et al."; please list only publications published, in press, or actually submitted during this reporting period --- **do not list manuscripts in preparation**).

A. Refereed Publications

Papers submitted or re-submitted revisions:

- Arend, K.K., and K.E. **Limburg**. 2014. Spatial heterogeneity in sources to Lake Ontario coastal embayment food webs: recognizing the influence of areal and temporal scaling on ecosystem and habitat connectivity. *Estuaries and Coasts* (in review after resubmission)
- Evans, T.M., and K.E. **Limburg**. 2014. The distribution of larval lampreys and their nutritional sources in the Hudson River Basin. *Northeastern Naturalist* (submitted)
- Glavovic, B.C, **Limburg**, K., Liu, K.-K., Emeis, K.-C., Thomas, Kremer, H., B. Avril, J. Zhang, M.R. Mulholland, M. Glaser, and D.P. Swaney. Living on the Margin in the Anthropocene: Engagement area for global sustainability research and action. *Nature* (submitted).
- Monteiro, R.O., K.E. **Limburg**, and I. Valiela. 2014. Effects of urbanization of coastal watersheds on growth and condition of juvenile alewives in New England. *Estuaries and Coasts* (in revision).
- Nack, C.C., K.E. **Limburg**, and R.E. Schmidt. 2014. Diet composition and feeding behavior of larval *Alosa sapidissima* (Wilson 1811) after the introduction of an invasive bivalve, *Dreissena polymorpha* Pallas 1771, in the Hudson River Estuary, NY. *Northeastern Naturalist* (submitted)
- Payne Wynne, M., K.A. Wilson, and K.E. **Limburg**. 2014. Retrospective examination of habitat use by blueback herring (*Alosa aestivalis*) using otolith microchemical methods. *Canadian Journal of Fisheries and Aquatic Science* (submitted)
- Turner, S.M., and K.E. **Limburg**. 2014. Does daily growth affect the rate of manganese uptake in juvenile river herring otoliths? *Estuaries and Coasts* (submitted)
- Turner, S.M., and K.E. **Limburg**. 2014. Determination of river herring natal origin using otolith chemical markers: accuracy as a function of spatial scale and choice of markers. *Transactions of the American Fisheries Society* (submitted).

2014

- Levin, L., K.-K. Liu, K.-C. Emeis, D.L. Breitburg, J. Cloern, C. Deutsch, M. Giani, A. Goffart, E.E. Hofmann, Z. Lachkar, K. **Limburg**, S.-M. Liu, E. Montes, W. Naqvi, O. Ragueneau, C. Rabouille, S. Sarkar, D. Swaney, P.F. Wassman, and K. Wishner. 2014 Submitted. Biogeochemistry-ecosystem-human interactions on dynamic continental margins. *Journal of Marine Systems* (in press; DOI: 10.1016/j.jmarsys.2014.0)
- Limburg**, K.E., B.D. Walther, Z. Lu, G. Jackman, J. Mohan, Y. Walther, A. Nissling, P.K. Weber, and A.K. Schmitt. 2014. In search of the dead zone: use of otoliths for tracking fish exposure to hypoxia. *Journal of Marine Systems*. DOI: 10.1016/j.jmarsys.2014.02.014
- Nack, C.C., K.E. **Limburg**, and D.E. Miller. 2014. Assessing the quality of four inshore habitats used by post-yolk-sac larval American shad in the Hudson River: a prelude to restoration. *Restoration Ecology* (in press)

2013

- Brown, J.J., K. E. **Limburg**, J.R. Waldman, K. Stephenson, E. Glenn, F. Juanes, and A. Jordaan. 2013. Fish and hydropower on the U.S. Atlantic coast: failed fisheries policies from half-way technologies. *Conservation Letters* 6(4): 280-286. DOI: 10.1111/conl.12000.
- Finch, C., W.E. Pine III, and K.E. **Limburg**. 2013. Differential growth of humpback chub in regulated and unregulated portions of the Colorado River basin. *River Research and Applications*. DOI: 10.1002/rra.2725
- Limburg**, K.E., T.A. Hayden, W.E. Pine III, M. Yard, R. Kozdon, and J. Valley. 2013. Of travertine and time: otolith chemistry and microstructure detect provenance and demography of endangered humpback chub in Grand Canyon (USA). *PLoS ONE* 8(12): e84235. DOI: 10.1371/journal.pone.0084235.
- Palkovacs, E.P., D.J. Hasselman, E.E. Argo, S.R. Gephard, K.E. **Limburg**, D.M. Post, T.F. Schulz, and T.V. Willis. 2013. Combining genetic and demographic information to prioritize recovery efforts for anadromous alewife and blueback herring. *Evolutionary Applications*. DOI: 10.1111/eva.12111

B. Non-refereed Publications

- Pine, W.E., III, **Limburg**, K.E., Korman, J., Hayden, T., Finch., C., Gerig, B., Dodrill, M. 2013. Nearshore Ecology (NSE) of Grand Canyon Fish. Final Report to the Grand Canyon Monitoring and Research Center. 433 pp.
- Limburg**, K.E., and N.H. Ringler. 2013. Relative Abundance of Blueback Herring (*Alosa aestivalis*) in Relation to Permanent and Removable Dams on the Mohawk River. Final report to Cornell Water Resources Institute.

C. Papers Presented at Science Meetings (give title, date, occasion, and location)

Title	Authors	Date	Occasion	Location
Ecosystem Services	K. Limburg	7/12/2013	COTE Summer School: Global Ecology for Global Change	University of Bordeaux
Urbanization consequences to diadromous fish production: lateral and vertical hardening of watersheds	K. Limburg	9/11/2013	American Fisheries Society Annual Meeting	Little Rock, AR
Using biogeochemical markers to track migratory histories of diadromous fishes	S. Turner, K. Limburg	9/10/2013	American Fisheries Society Annual Meeting	Little Rock, AR
Otolith chemistry of flannelmouth suckers in Grand Canyon	T. Evans, K. Limburg	9/11/2013	American Fisheries Society Annual Meeting	Little Rock, AR
Phylogenetic constraints on elemental uptake in flounder otoliths: aid to interpreting migration and other life history events	K. Limburg, M. Wuenschel	11/5/2013	Coastal and Estuarine Research Federation	San Diego, CA
The distribution of larval sea lamprey and their nutritional sources in Hudson River Tributaries	T. Evans, K. Limburg	2/5/2014	NY Chapter, American Fisheries Society	Geneva, NY

More than the sum of its parts: A discussion on the combined effect of anthropogenic pollutants and dams on river fish	J. Hamberg, K. Limburg	2/5/2014	NY Chapter, American Fisheries Society	Geneva, NY
The development of a non-lethal index to determine sexual maturity in American eels (<i>Anguilla rostrata</i>)	S. Mount, K. Limburg, R. Schmidt, C. Bowser	2/5/2014	NY Chapter, American Fisheries Society	Geneva, NY
Juvenile river herring habitat use and migrations from Maine to Florida	S. Turner, K. Limburg	2/6/2014	NY Chapter, American Fisheries Society	Geneva, NY
What can fish ears and eyeballs tell us about fish use of Onondaga Lake and vicinity?	K. Limburg, A. Lochet, C. Karboski	3/28/2014	Onondaga Lake Scientific Forum	Syracuse, NY

D. Public Service Presentations (lectures, seminars, etc. to and for the public; give group or occasion, date(s), and attendance)

Title: "Secrets of Fishes Revealed with Otolith Chemistry." April 5, 2014 as part of **Illuminating Physics!** Conference for secondary school educators, Cornell University. Attendance: 30

Title: "Climate Change and Urban Sprawl: Impacts to Diadromous (and Other) Fishes." Hudson River Environmental Society Conference (mix of scientists, managers, and citizens), May 7, 2014. Attendance: ca. 150.

V. PUBLIC SERVICE

A. Funded Service (include consulting activities)

1. Government Agencies (Federal, State, Local):
2. Industrial and Commercial Groups, etc.

B. Unfunded Service to Governmental Agencies, Public Interest Groups, etc.

- Technical advisor to "Targeted ecosystem characteristics for restoration of the Hudson River Watershed," a project of The Nature Conservancy
- Technical working group on River Herring (for NOAA and the Atlantic States Marine Fisheries Commission); includes serving on Habitat and Climate Change sub-committees
- Scientific advisor, Mohawk River Basin Program (NYSDEC)
- Member, Conseil Scientifique (Science Advisory Board) for "LabEx COTE – Evolution, Adaptation and Governance of Continental-to-Coastal Ecosystems" – Bordeaux, France
- Member, Continental Margins Working Group (IMBER-LOICZ)
- External reviewer for P&T decision, Cornell University
- External reviewer for promotion decision, U.S. Environmental Protection Agency

VI. PROFESSIONAL DEVELOPMENT

A. Professional Honors and Awards (for teaching, research, outreach, etc.)

B. 1. Activities in Professional Organizations (offices held, service as chairman, member, participant or consultant)

- Serve as President-Elect, Estuaries Section of the American Fisheries Society

2. Professional Society Membership

- American Fisheries Society
- American Institute of Biological Sciences
- American Society of Limnology and Oceanography
- Coastal and Estuarine Research Federation
- Ecological Economics (both the International and U.S. chapters)
- Ecological Society of America
- Hudson River Environmental Society
- Sigma Xi

3. Other Professional Activities

a. Editorial activity

<u>Journal (s)</u>	<u>Responsibility</u>
• Ecology and Society	Subject editor
• Estuaries and Coasts	Subject Editor
• Frontiers in Ecology & the Environment	Subject Editor

Other (books, symposia, etc.)

- Co-organizer, symposium at American Fisheries Society Annual Meeting: Ecosystem Connections: Watershed Health, Anadromous Species, and Ocean Production (September 2013, Little Rock, AR)
- Co-organizer, special session at Coastal and Estuarine Research Federation Biennial Meeting: SCI-027: Unraveling the "black box" of migration with novel methods. (November 2013, San Diego, CA)

b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
BioScience	1
Boreal Environment Research	1
CJFAS	2
Ecol Econ	2
Ecology & Society	1

Environmental Management	1
Fisheries	1
ICES J Marine Sci	1
J. Mar. Systems	1
JEMBE	1
MEPS	1
N Am J Fish Mgmt	1

<u>Agency</u>	<u>No. of proposals</u>
National Science Foundation	1
<u>Other</u>	
IUCN Red List – proposal for listing	1

c. Participation (workshops, symposia, etc.)

<u>Name of workshop, etc.</u>	<u>Date</u>	<u>Place</u>
• Mohawk River Basin Program: Designing a Research Agenda	3/20/2014	Schenectady, NY

C. Further Education/Re-training Undertaken, Leaves, Workshops, etc.

D. Foreign Travel (Where, When, Purpose)

- Bordeaux, France, July 2013, to teach in a summer school

VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

A. Department-level – I served as chair of the Graduate Program Advisory Committee, and as a member of the Promotion and Tenure Committee.

B. College-level – I served as coordinator for the GPES Area of Study, Biophysical and Ecological Economics, in the fall while Jack Manno was on sabbatical. I now serve in the AOS as a faculty member, as we get the program on its feet.

C. University-wide, including Research Foundation - I am a member of the Technical Steering Committee as well as the Faculty Leadership Team of the SUNY 4E Network of Excellence (for the Research Foundation).

VIII. SUMMARY OF SIGNIFICANT ACTIVITIES AND ACCOMPLISHMENTS DURING THIS REPORTING PERIOD, ESPECIALLY THOSE MOST NOTEWORTHY AND RELATIVE TO THE COLLEGE'S AND DEPARTMENT'S MISSION.

One paragraph on each of the following (**i.e., three paragraphs total**) would be most helpful: this past year, what

have you done for our students, department/college, and self professionally? NOTE: The information in this section (along with the supporting specific information elsewhere in this report) should be your strongest case for being considered for a discretionary raise (when available), which I'll continue to award based on your contributions to the department and college this reporting period.

For students, I feel that my adding new, quantitative courses at the graduate level helps to build up our graduate program, aiding in making it attractive for PhD students in particular. This spring, in addition to teaching an introduction to the R programming language (which had record enrolment this spring of 19, from various departments and SU), I piloted a course in ecological modeling that used R as the modeling platform. I used a textbook written by two Dutch researchers, and although it was challenging, we – 11 grads and me – made it all the way through together. Two things impressed me, doing this course: (1) this was a very nice, comprehensive book that I intend to use next year as well, albeit cutting out some material, and (2) students in EFB don't get a lot of exposure to this kind of modeling (differential and difference equations, as well as analysis), but rather spend a lot of time thinking about statistics. I hope to continue to attract students in order to give them an alternative way of thinking theoretically. Aside from this, I continue to teach, mentor, and guide students as we all do.

For the department, I continued my service as head of the Graduate Program Advisory Committee, and have now turned over the reins to co-chairs Melissa Fierke and Jonathan Cohen (I'll continue as a committee member). We have completed our list of tasks set out when we were convened, and now we are going to look more closely at the suite of courses we offer grads, as well as ways to enhance stipends. Additionally for the department, I continued service on the Promotion and Tenure Committee. We had a difficult task to revise the P&T criteria and there was disagreement as to how to proceed. However, it appears we now have a way to move ahead. **For the college**, I do not play any direct service role, but continue to represent it as I can. I am a member of the Technical Steering Committee as well as the Faculty Leadership Team of the SUNY 4E Network of Excellence.

For myself, my biggest accomplishment was finally to publish a coherent paper on the use of biogeochemical tracers of hypoxia ("dead zones") recorded in fish otoliths. Every so often, most of us have moments of novel thinking and innovation: this was one such moment for me. I was able to show how these tracers in effect track the history of a fish's exposure to low oxygen waters, whether it is fresh, marine, or in between; and I developed statistical metrics (magnitude, frequency, and duration) to characterize the events. The paper, recently out in the *Journal of Marine Science*, has become in six weeks the third most downloaded paper of the journal over the last 90 days. Given the global interest in fisheries and dead zones, I think that for once I have made a contribution that will be widely used. It should also help bolster our application to the National Science Foundation. The other major accomplishments were solidifying some research collaborations, locally, nationally, and internationally, and involving grad students where possible. I also have been serving on a committee in the realm of global international research (programs within the IGBP) called the Continental Margins Working Group. Our charge is to develop a framework for international scientific research in the zone from the coast down through the continental shelves. To date we have drafted up a policy paper that we are trying to publish in a high-profile outlet; we will work on more detailed papers in the years to come. I also continue to collaborate in an international group of scientists studying the impacts of hypoxia on marine food webs. Of course, engagement with my students has been a high priority as well, and I have been working increasingly with my students to get them to publish papers. This involves a large time investment on my part, but it is a good one as it is training these students to get their work out successfully. Finally, I also mentor junior colleagues at other institutions, serve on international program committees, and continue service to a number of professional societies.

IX. A. FUTURE PLANS, AMBITIONS, AND POTENTIAL CONTRIBUTIONS FOR YOUR OWN PROFESSIONAL DEVELOPMENT AND THE ENHANCEMENT OF THE PROGRAM IN ENVIRONMENTAL AND FOREST BIOLOGY (brief summary)

If our NSF project is funded, this will deepen my research into marine hypoxia. On another front, I may become more involved in organizing research on human population growth and consumption. I would like to see ESF adopt this theme going forward, as it has a great deal to do with how societies will be able to deal with climate change and all that entails. I believe we are uniquely positioned to develop a program in "sustainability for *H. sapiens* persistence" or something to that effect. I also would like to invest more energy into strengthening our graduate programs.

B. PROJECTED ACTIVITIES FOR NEXT YEAR

1. Summer 2014

- a. Course(s) to be offered
- b. Proposed research activity:

work on eel, river herring, and Baltic Sea projects

- c. University, professional society, and public service

Attend Continental Margins Working Group meeting, June 2014

2. Fall Semester 2014

- a. Course(s) to be offered - I will be on sabbatical.

- b. Proposed research activity

I will be working on a review of otoliths and other hard parts of fishes that are used in chronometric studies (for *Reviews in Fisheries Science*). I will also be developing a proposal to the Major Research Instrumentation panel at the NSF.

Continue work in Grand Canyon, Hudson and Mohawk rivers, and Baltic Sea

- c. University, Professional society, and public service

I will continue working with the Continental Margins Working Group
I serve as President-elect of the Estuaries Section of the American Fisheries Society
I serve on the Graduate Program Advisory Committee and the P&T Committee (EFB)
I serve on review panels, and provide ad hoc reviews, as requested

3. Spring Semester 2015

a. Course(s) to be offered

I will likely re-offer EFB 797, *A Self-Help Course in R*, and EFB 796, *Practical Ecological Modeling*. In addition, I may offer EFB 500, *The Hudson River Watershed: Source to Sink in Eight Days*

b. Proposed research activity

Continue work in Grand Canyon, Hudson and Mohawk rivers, Baltic Sea, and possibly other areas

c. University, professional society, and public service

I will continue working with the Continental Margins Working Group if funding persists
I serve as President-elect of the Estuaries Section of the American Fisheries Society
I serve on the Graduate Program Advisory Committee and the P&T Committee (EFB)
I serve on review panels, and provide ad hoc reviews, as requested