

**ANNUAL REPORT: June 1, 2016 – May 31, 2017**  
**(i.e., Summer 2016, AY 2016-2017)**  
**DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY**  
**SUNY-ESF**

**\*\*\*PLEASE DO NOT INSERT TABLES FOR ANY CATEGORIES\*\*\***

NAME: \_\_\_\_\_

**I. INSTRUCTIONAL ACTIVITIES**

1. Regular Course Offerings

Course No.	Title	Credit Hrs.	No. Students	No. of Lab. Sections
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SUMMER:

FALL:	EFB 487	Fisheries Science & Management	3	30
	EFB 488	Fisheries Science Practicum	1	17
	EFB 687	Fisheries Science & Management	3	5

SPRING:

**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.

EFB 488 had a service-learning component, surveying fishes of Meadowbrook in Dewitt. This led to one of the participants going further, taking on a deeper survey of Meadowbrook as an Honors Thesis, obtaining independent research credit for same (below). The data that this student collected was made available to water managers in Dewitt, through Dr.s John Stella and Mark Teece.

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

Course No.	Title	Credit Hrs.	No. Students
EFB 420, Sec. 12	Professional Internship in Env. Biology	11 total	3
EFB 498, Sec. 39	Independent Research in Env. Biology	4	2
EFB 899, Sec. 39	Master's Thesis Research	1	1
EFB 999, Sec. 39	Doctoral Research	28 total	5
ENS 498, Sec. 18	Independent Research in Env. Science	1	1
ENS 999, Sec. 19	Doctoral Research	9	1

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

#### 4. Guest Lecture Activities

<u>Course No.</u>	<u>Title</u>	<u>No. of Lectures</u>
	Guest Lecture, "Otolith chemistry" – Principles of Fisheries Science, Swedish University of Agricultural Science, April 12, 2017; N = 2 students	
	Guest Interviewee, MNS 321, "Marine Ecology," University of Texas at Austin, April 26, 2017; N = 56 students	

## II. STUDENT ADVISING

A. Number of undergraduates for whom you are the student's official advisor 22 and unofficial advisor 1

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

Evans, Thomas – Ph.D., began September 2012 – **Degree completed May 2017**; dissertation title: *Evaluation of Lamprey Populations with Natural and Artificial Tags to Understand the Evolution of Lamprey Life Histories*

Ewell Hodkin, Cara – Ph.D., began January 2016

Heimbrand, Yvette – Ph.D., Swedish Univ. of Agricultural Sciences, began November 2016

Nack, Christopher – Ph.D., began May 2013 – passed candidacy exam, Spring 2015

Samson, Melvin – Ph.D., began May 2015

Smith, Kayla – Ph.D., began September 2015

### CO-MAJOR PROFESSOR

Cramer, Jack – M.Sc., co-MP with Jack Manno, began August 2016

### MEMBER, STEERING COMMITTEE (other than those listed above)

Berdugo Moreno, Monica – Ph.D., passed candidacy exam ()

Cernadas-Martin, Sara – Ph.D., Stony Brook Univ. – passed candidacy exam, October 2015

Chen, Xiaoxia – Ph.D., Syracuse University – degree completed December 2016

Hazelton, Erik, M.Sc. – degree completed, May 2017

Gurdak, Daniel, PhD – passed candidacy exam, October 2011

Hermann, Ted, PhD – passed candidacy exam, August 2014

Matillano, Joie, PhD

McCartin, Kellie – Ph.D., Stony Brook Univ. – passed candidacy exam, January 2016

Siskey, Matt – Ph.D., Stony Brook University, began August 2016

### CHAIRMAN OR READER ON THESIS EXAMS, ETC.

Chair, Prentice Clark, M.Sc. GPES

### **III. RESEARCH COMPLETED OR UNDERWAY**

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

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)

Baltic Sea 2020: “Eastern Baltic Cod: Solving the ageing and stock assessment problems with combined state-of-the-art tagging methods.” 27M SEK (approx. \$3.2 million), 1/01/2016 – 12/31/2019; supports 3 PhD students in 3 Baltic countries; KL is co-PI and leading the otolith chemistry work package.

Cornell University, NY Water Resources Institute: “Temporal changes in spawning in signature fishes of the Hudson River estuary.” 1/01/2015 – 12/31/2016, \$10,000; supported 1 student (Chris Nack, who wrote the proposal).

Hudson River Foundation: “Assessing silver eels in Hudson River tributaries.” 6/1/13 – 06/30/17, \$134,838; supported 3 students (Sarah Mount, Kayla Smith, and Cara Ewell Hodkin).

Hudson River Foundation: Mark Bain Fellowship award to Thomas Evans, “Understanding ammocoete movement and ecology.” 9/01/14 – 3/31/17; \$17,000, 1 student supported (Tom Evans).

Hudson River Foundation: Mark Bain Fellowship award to Christopher Nack, “Evaluating the impacts of large storm events on the early life stages of American shad.” \$17,000, 7/01/15 – 12/31/16; 1 student supported (Chris Nack).

Hudson River Foundation: “Looking into the big green and blue boxes: insights on critical habitat for young and adult blueback herring to assess resilience.” 6/01/2017 – 12/31/2018, \$138,069; 1 PhD student will be supported (Cara Ewell Hodkin) as well as 1 part-time undergraduate research assistant.

National Science Foundation: “Collaborative Research: Consequences of sub-lethal hypoxia exposure for fishes: a trans-oceanic comparison.” 9/1/14 – 8/31/18, \$283,564; supports 1 student (Melvin Samson).

National Science Foundation: “REU Supplemental: Consequences of sub-lethal hypoxia exposure for fishes: a trans-oceanic comparison.” 5/2017 – 8/2017, \$6550; supports one undergraduate researcher on my NSF project.

NYSDEC, Mohawk River Basin Action Agenda (w/Neil Ringler). KL’s part: “Determining the provenance and life histories of blueback herring in the Mohawk River.” 9/1/14-9/30/17, \$115, 171; 3 students supported on my part of the award (Chris Nack, Kayla Smith, Cara Ewell Hodkin); *supplemental funding awarded (\$15,000) for pilot study on use of “sonar camera” to count herring locking through into the Mohawk River (May 2017)*

NY Sea Grant: “Reconnecting waters for eels and river herring: a mediated modeling approach to assess receptivity to dam removal in the Hudson-Mohawk watershed.” 2/01/16 – 1/31/18, \$132,780; supports 1 student (Kayla Smith).

Swedish Research Council FORMAS: “Losing track of time: dubious age determination of Baltic cod, probable causes and promising solution.” 3M SEK (approx. \$353,000), 1/01/16 – 12/31/18; supports 1 PhD student at the Swedish University of Agricultural Sciences (SLU), where KL is a Visiting Professor and lead PI.

USGS: “Natal origins of humpback chub aggregations determined by otolith chemistry.” 7/1-13 – 3/31/17, \$112,670; supported 1 student (Tom Evans).

Virginia Sea Grant: “Impacts of large storm events on the early life stages of American Shad and the importance of non-mainstem habitat.” 7/1/2016-6/30/2017, \$30,000. Written by and supporting 1 student (Chris Nack).

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

Great Lakes Fishery Commission: “Using Light and Heavy Isotopes to Help Identify the Origin of Sea Lamprey Adults in the Great Lakes.” 4/01/2018 – 9/30/2019, ca. \$85,000. Invited to submit a full proposal, due June 1.

New York Sea Grant: “Ecosystem Services Generated by Diadromous Species (DiaSES): a Cross-System, Cross-Cultural Comparison for Environmental Assessment.” 2/01/2018 – 1/31/2020, \$212,539. Invited to submit a full proposal, due 12 June 2017.

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

#### 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 (\* = student author)

- Hamberg\*, L.J., S.E.G. Findlay, K.E. **Limburg**, and S.A.W. Diemont. 2017. Post storm sediment burial and herbivory of *Vallisneria americana* in the Hudson River estuary: Mechanisms of loss and implications for restoration. *Restoration Ecology* (online Early View).
- Hermann\*, T.W., D.J. Stewart, K.E. **Limburg**, and L. Castello. 2016. Unravelling the life-history of Amazonian fishes through otolith microchemistry. *Royal Society Open Science* 3: 160206. DOI: 10.1098/rsos.160206.
- Huang, R. K.E. **Limburg**, and M. Rohtla.(in press) Quantitative X-ray fluorescence computed tomography for low-Z samples using an iterative absorption correction algorithm. *AIP Advances* (in press).
- Limburg**, K.E., and S.M. Turner. 2016. How common is “non-textbook” migration in Hudson River blueback herring? *Estuaries and Coasts* 39: 1262-1270.
- Limburg**, K.E., and M. Elfman. 2017. Insights from two-dimensional mapping of otolith chemistry. *Journal of Fish Biology* 90: 480-491. DOI:10.1111/jfb.13048.
- Pine, W., K. **Limburg**, B. Gerig, C. Finch, D. Chagaris, L. Coggins, D. Speas, and D. Hendrickson. 2017. Growth of endangered humpback chub in relation to temperature and discharge in the lower Colorado River. *Journal of Fish and Wildlife Management* (online Early View).
- Walther, B.D., K.E. **Limburg**, C.M. Jones, and J.J. Schaffler. 2017. Editorial: Frontiers in otolith chemistry: insights, advances and applications. *Journal of Fish Biology* 90: 473-479.

##### B. Non-refereed Publications

- Forbes, D., K.E. **Limburg**, et. al. 2017. Report from a workshop on Arctic continental margins supported by IGBP/ESA. Final report to the European Space Agency, for the Continental Margins Working Group of Future Earth Coasts and IMBeR.
- Limburg**, K.E. 2017. President’s Corner, Winter/Spring 2017. *AFS Estuaries Section newsletter, Winter 2017*.
- Limburg**, K.E. 2016. Post Kansas City musings, or, I wish I could get more of that barbecue...! *AFS Estuaries Section newsletter, Fall 2016*.
- Limburg**, K.E. 2016. The ocean is losing its breath – and climate change is making it worse. *The Conversation*. (online: [https://theconversation.com/the-ocean-is-losing-its-breath-and-climate-change-is-making-it-worse-66192#comment\\_1132011](https://theconversation.com/the-ocean-is-losing-its-breath-and-climate-change-is-making-it-worse-66192#comment_1132011))
- Limburg**, K., R. Brown, R. Johnson, W. Pine, R. Rulifson, D. Secor, K. Timchak, B. Walther, and K. Wilson. 2016. Round-the-Coast: Snapshots of Estuarine Climate Change Effects. *Fisheries* 41(7): 392:394.
- Limburg**, K.E. 2016. Is it wrong to be a mycophilic fish biologist? *AFS Estuaries Section newsletter, Spring 2016*.

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

- Limburg**, K. E., Walther, B., Lu, Z., Casini, M., Altenritter, M., Samson, M. Hypoxia as Perceived by Fish: Empirical Observation and Modeling. ASLO Ocean Sciences Meeting, Honolulu, February 2017. (Poster)
- Samson\*, M.A. and K.E. **Limburg**. Tracking Hypoxia Exposure in Yellow Perch with Otolith Chemistry: Spatial Variation in Lake Erie. Poster presentation, American Fisheries Society, Kansas City, August 2016. (Won best poster for the Habitat Section)
- Limburg**, K.E. Ecosystem services at risk from global ocean deoxygenation. UNESCO, Paris, September 2016.

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

- Limburg, K.E., S.J. Mount, and C. Bowser.** American eels in the Hudson River estuary: from glass to silver. Hudson River Foundation, May 2017. Attendance: 40 in room, 30 on webinar.
- Participation in workshops, “**Conservation Leaders of Tomorrow,**” April 19-20, Vassar College. In attendance: 60.
- Limburg, K.E.** Living on the margin in the Anthropocene: engagement arenas for sustainability research and action at the ocean–land interface, and Perspectives on engaging in the international science world, and where can YOU fit in? University of Akron, May 2017. Attendance: ca. 70.
- Limburg, K.E.** Hypoxia is not the same old dead zone: global deoxygenation, and how an 'otolithologist' approaches the study of impacts on fish and fisheries. Cornell University, Department of Natural Resources, April 2017. Attendance: 20.
- Limburg, K.E.** The “other” biogeochemistry: otolith chemistry to unlock the secret lives of fishes. Lund University, Dept of Geology, December 2016. Attendance: ca. 25.
- Limburg, K.E.** The “other” biogeochemistry: otolith chemistry to unlock the secret lives of fishes. Syracuse University, Dept of Earth Sciences, October 2016. Attendance: ca. 60.

## 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.

- TNC committee on Targeted Ecosystem Characteristics – restoration of Hudson River tributaries (dam removal)
- NOAA Technical Working Group on River Herring
- Hudson River Estuary Program committee on Gays Point wetland restoration
- Advisory board LabEx COTE (center of excellence), University of Bordeaux, France
- Co-chair, Continental Margins Working Group of IMBeR (= Integrated Marine Biosphere Research, an international collaborative scientific project; [www.imber.info](http://www.imber.info))
- Member, Global Ocean Oxygen Network (GO<sub>2</sub>NE), a working group under UNESCO’s Intergovernmental Oceanographic Commission

## VI. PROFESSIONAL DEVELOPMENT

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

- Visiting Professor, Department of Aquatic Resources, Swedish University of Agricultural Sciences (SLU); 5/2015 – 4/2020 (I was extended 2 years).
- Lise Meitner Visiting Professor, Division of Nuclear Physics, Dept. of Physics, Lund University; 11/2015 – 10/2018.

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

- American Fisheries Society, Estuaries Section president (2015-2017)
  - Co-sponsor of two symposia at the 2017 annual AFS meeting, Tampa (August)
  - Led a Section-based, by-invitation contribution to a special issue on climate change in inland waters, *Fisheries Magazine* (July 2017)

- American Fisheries Society, Governing Board member
- American Fisheries Society, President-elect, New York Chapter (2017)
- Board member, Hudson River Environmental Society
- Committee member, Margaret A. Davis Award in coastal stewardship – Coastal and Estuarine Research Federation (CERF)
- Nominator for 3 awards in 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 Handled 1 manuscript	Subject editor
• Frontiers in Ecology & the Environment Handled 7 manuscripts	Subject Editor
• Journal of Fish Biology	Guest Co-editor

### Other (books, symposia, etc.)

### b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
PNAS	1
Marine Ecology Progress Series	1
Fish and Fisheries	1
L&O	1
ICES J Mar Sci	1
Estuaries and Coasts	1
J Archaeol Sci Reports	1
Fisheries Magazine Policy	4
Estuarine Coastal & Shelf Science	2

<u>Agency</u>	<u>No. of proposals</u>
USDA/NIFA	1

Other

## c. Participation (workshops, symposia, etc.)

Name of workshop, etc.DatePlaceC. Further Education/Re-training Undertaken, Leaves, Workshops, etc.D. Foreign Travel (Where, When, Purpose)

Paris, France, September 2016, UNESCO – participated in Global Ocean Oxygen Network working group meeting

Sweden, various locations, December 2016 – serving as visiting professor and visiting various labs as part of my duties

Prague, Czech Republic, March 2017 – co-led a workshop for the Continental Margins Working Group on Arctic continental margin issues

Lund, Sweden, April 2017 – to work with colleagues and my doctoral student

**VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)**A. Department-level

Member, Graduate Program Advisory Committee

B. College-level

Member, College-wide P&T Review Committee

Member, Adirondack Ecological Center advisory board

Provost search committee

C. University-wide, including 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 the students:** This past academic year, I continued to bring students more into my professional life. In Fisheries lecture and Practicum, I continued to infuse my classes with current understanding and experiences. In fact, our work in the Practicum revealed some surprising changes at sites where I'd taken that class in the past. Notably, we discovered alarming changes in the fauna of Arbutus, Deer, and Wolf lakes at Huntington – dramatic losses of fishes, and a non-native, *freshwater* jellyfish (a creature I did not know existed). This prompted the AEC to begin to plan for more intensive monitoring of these lakes; but for the students, I think (as did they) that we may have seen some direct evidence of climate change occurring. This was something they commented on. In addition, I worked closely with my graduate students to share aspects of grant writing that I'd not done before, in order to “show by example” how to

master this important skill. Finally, together with faculty colleagues in the Aquatic and Fisheries Sciences major, I participated in events that built a sense of professional camaraderie among undergraduates in that major.

**For the department and college:** I continued to serve on the department's Graduate Program Advisory Committee, and continued on the College's P&T oversight review committee. I also initiated a discussion among aquatic science faculty in EFB and several faculty at the Department of Aquatic Resources, Swedish U. of Agricultural Sciences "SLU-Aqua"), about joint doctoral student courses or other activities. We hope to develop something for next spring and/or summer. And, for what it's worth, my article in *The Conversation* on oxygen loss in the world's oceans was read by > 43,000 people, so that could potentially help with ESF's visibility in the marine realm.

**For myself:** I continued in my professional activities, notably my participation in two international scientific working groups, both focused on environmental problems in the global oceans. I also continued to work with my (now) 6 Ph.D. students, one of them in Sweden, as well as a Master's student. This is a very nice cohort to work with, and perhaps finally I'm getting the hang of being a decent mentor. I've also benefitted considerably, in a "horizon-expanding" manner, from being a visiting professor at SLU-Aqua and at Lund University. The research projects that my students and I are engaged in are supported mostly by external funding, so we are contributing to that aspect of ESF's mission.

#### **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)**

1. Continue working on my current grants; get out manuscripts.
2. Continue working with international working groups, writing papers and attending meetings. Try to involve ESF students and faculty colleagues when possible.
3. Write a proposal to NSF (MRI or other) for a high resolution, laser ablation ICP-MS system.
4. Write a proposal to NSF International Programs to fund a grad student collaborative program with SLU-Aqua.
5. Write other proposals as opportunities arise.
6. Teach a joint graduate-level course between ESF and SLU-Aqua.

#### **B. PROJECTED ACTIVITIES FOR NEXT YEAR**

##### 1. Summer 2017

- a. Course(s) to be offered
- b. Proposed research activity (all with students, all involving analysis and manuscript preparation)
  - Baltic Sea hypoxia and impacts on cod and flounder
  - Impacts of hypoxia and invasive round goby on troutperch in Oneida Lake
  - Blueback herring ecology in Hudson River watershed and ocean phase
  - Provenance of humpback chub in Grand Canyon
  - Climate change effects on marine and estuarine fishes
- c. University, professional society, and public service
  - Run the business meeting for Estuaries Section of American Fisheries Society (AFS)
  - Participate in "Monsters of Habitat Science" fundraiser at AFS annual meeting
  - Continue to serve in CMWG and GO<sub>2</sub>NE working groups
  - Continue editorial duties



2. Fall Semester 2017

a. Course(s) to be offered

EFB 487/687 Fisheries Science and Management

b. Proposed research activity

Continue the work outlined above in Summer 2017

c. University, Professional society, and public service - ditto, but will be taking on more responsibilities in the NY Chapter of the AFS

3. Spring Semester 2018

a. Course(s) to be offered

Graduate level experimental course

b. Proposed research activity

Similar to Fall

c. University, professional society, and public service

Similar to Fall