



Gifford, Krishna <krishna_gifford@fws.gov>

RE: Candy Darter Review

1 message

Frimpong, Emmanuel <frimp@vt.edu>
To: "Gifford, Krishna" <krishna_gifford@fws.gov>
Cc: Keith Hastie <keith_hastie@fws.gov>

Thu, May 4, 2017 at 1:22 PM

Hello, Sorry about that. I did answer the four questions as attached but with no extended comments.

Emmanuel A. Frimpong, PhD

Associate Professor

Department of Fish and Wildlife Conservation

College of Natural Resources and Environment

Virginia Polytechnic Institute and State University

156 Cheatham Hall

Blacksburg , VA 24061-0321

Phone (540) 231-6880 | Fax (540) 231-7580

<http://www.fishwild.vt.edu/faculty/frimpong.htm>

From: Gifford, Krishna [mailto:krishna_gifford@fws.gov]
Sent: Thursday, May 04, 2017 8:29 AM
To: Frimpong, Emmanuel <frimp@vt.edu>
Cc: Keith Hastie <keith_hastie@fws.gov>
Subject: Fwd: Candy Darter Review

Dr. Frimpong,

Thank you for sending us your conflict of interest form and CV. We haven't yet received your comments on the draft Report, so I wanted to check with you to see if you meant to attach them to yesterday's message or if you were sending them separately?

Best,

Krishna

Krishna Gifford

ESA Listing Coordinator

U.S. Fish and Wildlife Service - Northeast Region

Endangered Species Program

300 Westgate Center Dr.

Hadley, MA 01035

413-253-8619 (v); 413-253-8482 (f)

----- Forwarded message -----

From: **Hastie, Keith** <keith_hastie@fws.gov>

Date: Thu, May 4, 2017 at 8:24 AM

Subject: Fwd: Candy Darter Review

To: Krishna Gifford <krishna_gifford@fws.gov>

----- Forwarded message -----

From: **Frimpong, Emmanuel** <frimp@vt.edu>

Date: Wed, May 3, 2017 at 4:26 PM

Subject: Candy Darter Review

To: Keith Hastie <keith_hastie@fws.gov>

Dear Mr. Hastie,

Please see attached documents in connection with the candy darter review that I have completed for your office.

Thanks,

Emmanuel Frimpong

Emmanuel A. Frimpong, PhD

Associate Professor

Department of Fish and Wildlife Conservation

College of Natural Resources and Environment

Virginia Polytechnic Institute and State University

156 Cheatham Hall

Blacksburg, VA 24061-0321

Phone (540) 231-6880 | Fax (540) 231-7580

<http://www.fishwild.vt.edu/faculty/frimpong.htm>

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Keith Hastie

U.S. Fish and Wildlife Service

300 Westgate Center Drive

Hadley, MA 01035

(413) 253-8612 (office)

(413) 253-8482 (fax)



Frimpong Comments.docx

17K

Emmanuel A. Frimpong, PhD
Virginia Tech

1. Does the SSA report provide an accurate and adequate review and analysis of the candy darter's life history characteristics, range and distribution, habitat requirements, and population abundance, trends, or estimates?

Yes

2. Does the SSA report provide an accurate and adequate review and analysis of potential stressors or threats to the candy darter?

Yes

3. Are our analyses logical and supported by the evidence we provide?

Yes

4. Do we cite all necessary and pertinent literature to support our scientific analyses?

Yes

U.S. Fish and Wildlife Service

*Participation in Peer Review of the Candy Darter (Etheostoma osburni)
Species Status Assessment (SSA) Draft Report*

**BACKGROUND INFORMATION
AND
CONFLICT OF INTEREST DISCLOSURE**

NAME: _Emmanuel A. Frimpong_____ TELEPHONE: _540-231-6800_____

ADDRESS: _310 West Campus Dr, Dept. of Fish & Wildlife Conservation_
_Virginia Tech, Blacksburg VA, 24061 _____

EMAIL ADDRESS: _____FRIMP@VT.EDU_____

CURRENT EMPLOYER: __ Virginia Tech_____

This form has two (2) parts:

- Part I – Background Information, and;
- Part II – Conflict of Interest Disclosure.

Please complete both parts, **sign** and **date** the form on the last page, and **return the form to Mr. Keith Hastie**, U.S. Fish and Wildlife Service, Endangered Species Program, Northeast Regional Office, 300 Westgate Center Dr., Hadley, MA 01035 or keith_hastie@fws.gov. **Please retain a copy for your records.**

**PART I
BACKGROUND INFORMATION**

INSTRUCTIONS

Please provide the information requested below regarding **relevant** organizational affiliations, government service, public statements and positions, research support, and additional information (if any). Information is “relevant” if it is related to and might reasonably be of interest to others concerning your knowledge, experience, and personal perspectives regarding the subject matter for which this form is being completed. If some or all of the requested information is contained in your curriculum vitae (CV), you may

prefer to simply attach your CV to this form, supplemented by additional responses or comments below as necessary.

I. ORGANIZATIONAL AFFILIATIONS. Report your relevant business relationships (as an employee, owner, officer, director, consultant, etc.) and your relevant remunerated or volunteer non-business relationships (e.g., professional organizations, trade associations, public interest or civic groups, etc.).

I have been employed by Virginia Polytechnic Institute and State University since 2005 and currently at the rank of Associate Professor of Fisheries Science with research focus in stream fish ecology and conservation. I am a member of several professional organizations with conservation interest, including the Society for Conservation Biology, Ecological Society of America, American Fisheries Society, and the World Aquaculture Society.

II. GOVERNMENT SERVICE. Report your relevant service (full-time or part-time) with Federal, State, or local government in the United States (including elected or appointed positions, employment, advisory board memberships, military service, etc.).

I have served on various advisory boards of the United States Geological Survey Aquatic Gap Analysis (AGAP) program and the National Science Foundation NEON stream sampling technical team. I have also been associated with research groups convened through the National Center for Ecological Analysis and Synthesis and Fish Invasions Risk Assessment Group supported by agencies including the US Fish and Wildlife Service and the Environmental Protection Agency.

III. RESEARCH SUPPORT. Report relevant information regarding both public and private sources of research support (other than your present employer), including sources of funding, equipment, facilities, etc.

I have completed research contracts for the USGS AGAP, National Science Foundation, and United States Agency for International Development (USAID). I have also reviewed research proposals on various panels and as individual reviewer for NSF, USGS, and USAID programs. All review activities have been voluntary.

IV. PUBLIC STATEMENTS AND POSITIONS. List your relevant articles, testimony, speeches, etc., by date, title, and publication (if any) in which they appeared, or provide relevant representative examples if numerous. Provide a brief description of relevant positions of any organizations or groups with which you are closely identified or associated.

None to report. Please find my CV/Academic dossier attached for any such information that may be applicable.

V. ADDITIONAL INFORMATION. If there are relevant aspects of your background or present circumstances not addressed above that might reasonably be construed by others as affecting your judgment in matters within the topics addressed in the proposed rule, and therefore might constitute an actual or potential source of bias, please describe them briefly.

None to report.

PART II CONFLICT OF INTEREST DISCLOSURE

INSTRUCTIONS

It is essential that a peer reviewer used by the U.S. Fish and Wildlife Service (Service) as part of its peer review process for listing determinations under the Endangered Species Act of 1973, as amended (ESA) not be compromised by conflict of interest. For this purpose, **the term “conflict of interest” means any financial or other interest which conflicts with the service of the individual because it (1) could significantly impair the individual’s objectivity or (2) could create an unfair competitive advantage for any person or organization.**¹ Except for those situations in which the Service determines that a conflict of interest is unavoidable and promptly and publicly discloses the conflict of interest, no individual can participate in a peer review process used by the Service in either (1) a proposed listing or proposed critical habitat rule; or (2) of a SSA Report that provides the biological underpinning for the Service to make a decision on whether or not a species warrants listing or that designating critical habitat is prudent and determinable, if the individual has a conflict of interest that is relevant to the functions to be performed.

The term “conflict of interest” means something more than individual bias. There must be an *interest* that could be directly affected by your participation as a peer reviewer.

Conflict of interest requirements are *objective* and *prophylactic*. They are not an assessment of one’s actual behavior or character, one’s ability to act objectively despite the conflicting interest, or one’s relative insensitivity to particular dollar amounts of specific assets because of one’s personal wealth. Conflict of interest requirements are objective standards designed to eliminate certain specific, potentially compromising situations from arising, and thereby to protect the individual, the Service, and the public interest. The individual and the Service should not be placed in a situation where others could reasonably question, and perhaps discount or dismiss, the information produced through the peer review simply because of the existence of conflicting interests.

The term “conflict of interest” applies only to *current interests*. It does not apply to past interests that have expired, no longer exist, and cannot reasonably affect current behavior. Nor does it apply to possible interests that may arise in the future but do not currently exist, because such future interests are inherently speculative and uncertain. For example, a pending formal or informal application for a particular job is a current interest, but the mere possibility that one might apply for such a job in the future is not a current interest.

¹ This definition and the other information in these instructions are drawn from the National Academy of Sciences Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports (May 12, 2003).

The term “conflict of interest” applies not only to the personal interests of the individual but also to the *interests of others* with whom the individual has substantial common financial or other interests if these interests are relevant to the functions to be performed. Thus, in assessing an individual’s potential conflicts of interest, consideration must be given not only to the interests of the individual but also to the interests of the individual’s spouse and minor children, the individual’s employer, the individual’s business partners, and others with whom the individual has substantial common financial or other interests. Consideration must also be given to the interests of those for whom one is acting in a fiduciary or similar capacity (e.g., being an officer or director of a corporation, whether profit or nonprofit, or serving as a trustee).

Such interests could include an individual’s stock holdings in excess of \$10,000 in a potentially affected company or being an officer, director, or employee of the company. Serving as a consultant to the company could constitute such an interest if the consulting relationship with the company could be directly affected or is directly related to the subject matter of the regulatory process.

An individual’s other possible interests might include, for example, relevant patents and other forms of intellectual property, serving as an expert witness in litigation directly related to the subject matter of the regulatory process, or receiving research funding from a party that would be directly affected by the regulatory process if the research funding could be directly affected or is directly related to the subject matter of the regulatory process and the right to independently conduct and publish the results of this research is limited by the sponsor. Consideration would also need to be given to the interests of others with whom the individual has substantial common financial interests, particularly spouses, employers, clients, and business or research partners.

The following questions are designed to elicit information from you concerning possible conflicts of interest that are relevant to the functions to be performed by your peer review.

1. **EMPLOYMENT.** (a) If the information received by the Service through the peer review process were to provide the basis for government regulatory action or inaction with respect to the candy darter:

(i) If you are employed or self-employed, could your current employment or self-employment (or your spouse’s current employment or self-employment) be directly affected?

(ii) To the best of your knowledge, could any financial interests of your (or your spouse’s) employer or, if self-employed, your (or your spouse’s) clients and/or business partners be directly affected?

(iii) If you are an officer, director or trustee of any corporation or other legal entity, could the financial interests of that corporation or legal entity be directly affected?

(iv) If you are a consultant (whether full-time or part-time), could there be a direct effect on any of your current consulting relationships?

(v) Regardless of the potential effect on the consulting relationship, do you have any current or continuing consulting relationships (including, for example, commercial and professional consulting and service arrangements, scientific and technical advisory board memberships, serving as an expert witness in litigation, or providing services in exchange for honorariums and travel expense reimbursements) that are directly related to the subject matter of the possible government regulatory action or inaction?

(b) If you are or have ever been a U.S. Government employee (either civilian or military), to the best of your knowledge are there any Federal conflict of interest restrictions that may be applicable to your service in connection with this peer review?

(c) If you are a U.S. Government employee, are you currently employed by the Service?

If the answer to all of the above questions under EMPLOYMENT is either “no” or “not applicable,” check here _____ (NO).

If the answer to any of the above questions under EMPLOYMENT is “yes,” check here _____ (YES), and briefly describe the circumstances on the last page of this form.

2. INVESTMENT INTERESTS. Taking into account stocks, bonds, and other financial instruments and investments including partnerships (but excluding broadly diversified mutual funds and any investment or financial interest valued at less than \$10,000), if the information received by the Service through the peer review process were to provide the basis for government regulatory action or inaction with respect to the candy darter:

(a) Do you or your spouse or minor children own directly or indirectly (e.g., through a trust or an individual account in a pension or profit-sharing plan) any stocks, bonds or other financial instruments or investments that could be affected, either directly or by a direct effect on the business enterprise or activities underlying the investments?

(b) Do you have any other significant financial investments or interests, such as commercial business interests (e.g., sole proprietorships), investment interests (e.g., stock options), or personal investment relationships (e.g., involving parents or grandchildren), that could be affected, either directly or by a direct effect on the business enterprise or activities underlying the investments?

If the answer to all of the above questions under INVESTMENT INTERESTS is either “no” or “not applicable,” check here ____ (NO).

If the answer to any of the above questions under INVESTMENT INTERESTS is “yes,” check here ____ (YES), and briefly describe the circumstances on the last page of this form.

3. PROPERTY INTERESTS. Taking into account real estate and other tangible property interests, as well as intellectual property (patents, copyrights, etc.) interests, if the information received by the Service through the peer review process were to provide the basis for government regulatory action or inaction with respect to the candy darter:

(a) Do you or your spouse or minor children own directly or indirectly any such property interests that could be directly affected?

(b) To the best of your knowledge, do any others with whom you have substantial common financial interests (e.g., employer, business partners, etc.) own directly or indirectly any such property interests that could be directly affected?

If the answer to all of the above questions under PROPERTY INTERESTS is either “no” or “not applicable,” check here ____ (NO).

If the answer to any of the above questions under PROPERTY INTERESTS is “yes,” check here ____ (YES), and briefly describe the circumstances on the last page of this form.

4. RESEARCH FUNDING AND OTHER INTERESTS. (a) Taking into account your research funding and other research support (e.g., equipment, facilities, industry partnerships, research assistants and other research personnel, etc.), if the information received by the Service through the peer review process were to provide the basis for government regulatory action or inaction with respect to the candy darter:

(i) Could the research funding and support for you or your close research colleagues and collaborators be directly affected, or

(ii) If you have any research agreements for current or continuing research funding or support from any party whose financial interests could be directly affected, and such funding or support is directly related to the subject matter of the regulatory process, do such agreements significantly limit your ability to independently conduct and publish the results of your research?

(b) Is the central purpose of the Species Status Assessment Draft Report for which this disclosure form is being prepared a critical review and evaluation of your own work or that of your employer?

(c) Do you have any existing professional obligations (e.g., as an officer of a scientific or engineering society) that effectively require you to publicly defend a previously established position on an issue that is relevant to the proposed rule?

(d) To the best of your knowledge, will your participation in this peer review process enable you to obtain access to a competitor's or potential competitor's confidential proprietary information?

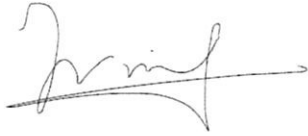
(e) Could your service as a peer reviewer create a specific financial or commercial competitive advantage for you or others with whom you have substantial common financial interests?

If the answer to all of the above questions under RESEARCH FUNDING OR OTHER INTERESTS is either "no" or "not applicable," check here ____ (NO).

If the answer to any of the above questions under RESEARCH FUNDING OR OTHER INTERESTS is "yes," check here ____ (YES), and briefly describe the circumstances below.

EXPLANATION OF "YES" RESPONSES:

During your period of service in connection with the activity for which this form is being completed, any changes in the information reported, or any new information, which needs to be reported, should be reported promptly by written or electronic communication to the responsible staff officer.



YOUR SIGNATURE

05 / 03 / 2017

DATE

Received by:



Keith Hastie
U.S. Fish and Wildlife Service
Northeast Regional Office
Candy Darter SSA Core Team Lead

5 MAY 17

Date

Reviewed by:



Krishna Gifford
U.S. Fish and Wildlife Service
Northeast Regional Office
Endangered Species Listing Coordinator

5/19/17

Date

Emmanuel A. Frimpong, PhD
Cumulative Faculty Activity Report, October 2016

Education

2005 Ph.D. Resource Policy/Fisheries & Aquatic Sciences, Purdue University, W. Lafayette, IN
2009 M.S. Statistics, Virginia Polytechnic Institute & State University, Blacksburg, VA
2001 M.S. Aquaculture and Fisheries, University of Arkansas at Pine Bluff, Pine Bluff, AR
1997 B.Sc (Hons) Natural Resources Management, University of Science & Technology, Ghana

Training with certification

June 9-12, 2014: Sustaining Biological Infrastructure: Strategies for Success. Training for program directors by the Ecological Society of America-SBI Institute, Washington, DC, USA.

Professional appointments

Apr. 2013-present, Associate Professor; Dec. 2007-Apr. 2013, Assistant Professor; Aug. 2006-Dec. 2007, Research Scientist; Aug. 2005-Aug. 2006, Postdoctoral Associate, Department of Fish and Wildlife Conservation, Virginia Polytechnic Institute and State University

Research and teaching interests

Ecology of fishes in fluvial landscapes, Life history-based community and species-habitat modeling, Quantitative ecology, Macroecology, Aquatic bioassessment and monitoring, Aquaculture development in sub-Saharan Africa, Freshwater conservation planning and policy

Awards & Recognitions

July 2015: Citation received from Kwame Nkrumah University of Science and Technology (Ghana), Department of Fisheries and Watershed Management – Recognized for contribution to research and development of aquaculture and fisheries program.
Carnegie African Diaspora Fellow: 2014/2015 (Tenable in Ghana January to April 2014)
Department of Fisheries & Wildlife Curriculum Club Outstanding Faculty Award: 2007, 2009
Outstanding Faculty, Virginia Tech chapter – American Fisheries Society: 2007, 2008, 2009
Biographee, Marquis Who's Who in America: 2011, 2012, 2013, 2014, 2015, 2016

Courses taught

Course Number and Title	Semester	Hours
FiW4614 Fish Ecology	Spring 2016	3
FiW5984 Landscape Ecology & Species Distribution Modeling	Spring 2014	4
FiW4614 Fish Ecology	Spring 2014	3
FiW4614 Fish Ecology*	Spring 2013	3
FiW5984 Fluvial Landscape Ecology & Species Distribution Modeling	Spring 2012	3
FiW4614 Fish Ecology	Spring 2012	3
FiW6984 Linear Modeling/Inference on Ecol Data	Spring 2011	1
FiW4614 Fish Ecology	Spring 2011	3
FiW4614 Fish Ecology	Spring 2010	3
FiW3514 Fisheries Techniques	Fall 2009	3
FiW5984 Life History & Distribution of Fishes	Spring 2009	1
FiW4614 Fish Ecology	Spring 2009	3
FiW3514 Fisheries Techniques*	Fall 2008	3
FiW4614 Fish Ecology	Spring 2008	3
FiW3514 Fisheries Techniques	Fall 2007	3
FiW3514 Fisheries Techniques	Fall 2006	3

*Instructor of record and mentored graduate student instructor

Student advising

Current as major advisor: 2 PhD (Anane-Taabeah, Fynn)

Completed theses: 3 PhD (Ansah, Huang, Peoples),

7 MS (Anane-Taabeah, Ansah, Buckwalter, Deweber, Floyd, Fynn, Henebry, Peoples, Pritt)

Undergraduate research: 10 student projects completed (Bolton [NSF-REU], Emmel, Heindel, Nettles [NSF-REU], Pendleton, Tainer, Tremont, Walker [Virginia Tech-MAOP], Swartwout, Olinger)

Thesis and dissertation committees: 25 students (16 PhD, 9 MS): 13 in progress; 12 completed

Undergraduate academic advising: 20 advisees +26 work-study, interns, and wage technicians

High school student mentoring/recruiting: 1 through AFS Hutton Scholar program (Crane, 2013)

Recent Publications (selected from 53; student under my supervision- *graduate/ **undergrad)

Frimpong, E. A., J. Huang*, and Y. Liang*. (In press). IchthyMaps: A database of historical distributions of freshwater fishes of the United States. *Fisheries*.

Howeth, J. G., C. A. Gantz, P. L. Angermeier, **E. A. Frimpong**, M. H. Hoff, R. P. Keller, N. E. Mandrak, M. P. Marchetti, J. D. Olden, C. M. Romagosa, and D. M. Lodge. 2016. Predicting invasiveness of species in trade: climate match, trophic guild and fecundity influence establishment and impact of non-native freshwater fishes. *Diversity and Distributions* 22:123-247.

Huang*, J., and **E. A. Frimpong**. 2016. Limited transferability of stream fish distribution models among river catchments: reasons and implications. *Freshwater Biology* 61:729-744.

Huang*, J., and **E. A. Frimpong**. 2016. Modifying the United States National Hydrography Dataset to improve data quality for ecological models. *Ecological Informatics* 32:7-11

Huang*, J. **E. A. Frimpong**, and D. J. Orth. 2016. Temporal transferability of stream fish distribution models: can uncalibrated SDMs predict distribution shifts over time? *Diversity and Distributions* 22:651-662.

Mogollon, B., **E. A. Frimpong**, A. B. Hoegh, and P. L. Angermeier. 2016. Recent changes in stream flashiness and flooding, and effects of flood management in North Carolina and Virginia. *Journal of the American Water Resources Association* 52:561-577.

Mogollon, B., **E. A. Frimpong**, A. B. Hoegh, and P. L. Angermeier. 2016. An empirical assessment of which inland floods can be managed. *Journal of Environmental Management* 167: 38-48.

Mogollon, B., A. M. Villamagna, **E. A. Frimpong**, and P. L. Angermeier. 2016. Mapping technological and biophysical capacities of watersheds to regulate floods. *Ecological Indicators* 61:483-499.

Olinger**, C. T., B. K. Peoples*, and **E. A. Frimpong**. 2016. Reproductive life-history of *Heterandria bimaculata* (Heckel, 1848) (Poeciliinae) in the Honduran interior highlands: trait variation along an elevational gradient. *Neotropical Ichthyology* 14(1):e1500501-e1500510.

Peoples*, B. K., and **E. A. Frimpong**. 2016. Biotic interactions and habitat drive positive co-occurrence between facilitating and beneficiary stream fishes. *Journal of Biogeography* 43: 923-931.

Peoples*, B. K., and **E. A. Frimpong**. 2016. Context-dependent outcomes in a reproductive mutualism between two freshwater fish species. *Ecology and Evolution* 6:1214-1223.

Peoples*, B. K., S. P. Floyd*, Jr, and **E. A. Frimpong**. 2016. Nesting microhabitat comparison of Central Stoneroller and Bluehead chub: potential inference for host-switching by nest associates. *Journal of Freshwater Ecology* 31: 251-259.

Peoples*, B. K., L. A. Blanc, and **E. A. Frimpong**. 2015. Lotic cyprinid communities can be structured as nest webs and predicted by the stress-gradient hypothesis. *Journal of Animal Ecology* 84:1666-1677.

Ansah* Y. B., and **E. A. Frimpong**. 2015. Using model-based inference to select a predictive growth curve for farmed tilapia. *North American Journal of Aquaculture* 77(3):281-288.

Ansah* Y. B., and **E. A. Frimpong**. 2015. Impact of the adoption of BMPs on social welfare: A case study of commercial floating feeds for pond culture of tilapia in Ghana. *Cogent Food and Agriculture* 1:1048579.

Huang* J., and **E. A. Frimpong**. 2015. Using historical atlas data to develop high-resolution distribution models of Freshwater Fishes. *PLOS One* 10(6):e0129995.

Swartwout**, M. C., F. Keating, and **E. A. Frimpong**. 2015. A survey of macroinvertebrates colonizing bluehead chub nests in a Virginia stream. *Journal of Freshwater Ecology* DOI:10.1080/02705060.2015.1036943

Bolton**, C., B. K. Peoples*, and **E. A. Frimpong**. 2015. Recognizing gape limitation and interannual variability in bluehead nesting macrohabitat use in a small Virginia stream. *Journal of Freshwater Ecology* DOI:10.1080/02705060.2014.998729

McManamay, R. A., and **E. A. Frimpong**. 2015. Hydrologic filtering of fish life history traits across the US and implications for streamflow alteration. *Ecological Applications* 25(1):243-263.

McManamay, R. A., M. S. Bevelhimer, and **E. A. Frimpong**. 2015. Associations among hydrologic classifications and fish traits to support environmental flow standards. *Ecohydrology* 8(3):460-479.

Competitive grants (selected from 8; total of all competitive grants **\$1,272,133**)

\$367,557: US Agency for International Development (AquaFish Innovation Lab), 2013-2018- Identifying local (Ghana) populations of *Oreochromis niloticus* that are adapted to future climate conditions. **PI**

\$206,549: National Science Foundation (DEB), 2011-2014- Testing the effect of context on a nest association mutualism of stream fishes in a comparative-advantage biological market framework. Research Experience for Undergraduates (REU) supplement included. **PI**

\$220,250: US Agency for International Development (AquaFish CRSP), 2010-2014- Enhancing the profitability of small aquaculture operations in Ghana, Kenya, and Tanzania through improved resource management and environmental Best Management Practices. **PI**

Other sponsored research (selected from 8; total of all other sponsored research **\$711,353**)

\$275,000: USGS (Core Science, Analytics, and Synthesis), 2013-2016- Refining stream fish distribution models regionally for a nationally-consistent aquatic gap analysis. **PI**

\$50,400: USGS (Core Science, Analytics, and Synthesis), 2012-2013 Preliminary application of a framework for modeling habitat suitability and distribution of stream fishes with field-testing. **PI**

\$258,103: USGS (Core Science, Analytics, and Synthesis), 2011-2014- Data consolidation and development of an improved web-accessible public database on traits and distribution of North American Freshwater Fishes. **PI**

Professional memberships

American Fisheries Society (Parent Society & Virginia Tech Chapter), Ecological Society of America, Society for Conservation Biology, Sustainable Aquaculture Research Networks in Sub Saharan Africa (SARNISSA), United States Aquaculture Society, World Aquaculture Society

Outreach and professional service

- Reviewer of dossier for promotion and tenure, University of Baltimore, MD, July 2016.
- Panel Reviewer for Institute of International Education, Carnegie African Diaspora Fellowship Program, 2016.
- Panel Reviewer for National Academies of Science and Engineering, USAID-PEER (international) research grants, 2016.
- Advisor to the Ministry of Fisheries and Aquaculture Development in Ghana on development of profitable small-scale aquaculture business models (March 2015-November 2015).
- Invited Panel Member, SEEDS Howard University and Ecological Society of America- Careers in Ecology program, Mountain Lake Biological Station, May 24, 2014.
- World Aquaculture Society, Honors and Awards Committee (member 2014-present)
- American Fisheries Society, Continuing Education Committee (co-Chair 2011-2012, Chair 2012-2014, member 2014-present)
- American Fisheries Society, Publications Overview Committee (member 2013-2015, Chair- 2015-present)
- USGS Aquatic GAP Program, co-Chair of Working Group to re-scope program (2011-present)
- NSF-National Ecological Observatory Network (NEON)– Expert panel on Stream Ecological Observatory Network (STREON) study design (2013)
- USFWS-USEPA, The Nature Conservancy & Great Lakes Restoration Initiative - Fish Risk Assessment Working Group, invited member (2011-present)
- American Fisheries Society, Southern Division, student abstract review and short-listing for best paper award for the 2011 annual meeting (12/2011)
- National Fish Habitat Action Plan & USGS Aquatic GAP program, ad hoc Stressor-Risk Ranking Working Group, invited member (2008-2009)
- USGS Aquatic GAP, expert panel to define research priorities, invited member (2006-2008)
- External Examiner of PhD theses: Rhodes University, South Africa (2012), University of Agriculture, Faisalabad, Pakistan (2009, 2011)
- Grant proposal reviewer: National Science Foundation, Korean-US Science Foundation, US Geological Survey, USAID AquaFish Collaborative Research Support Program, National Geographic, International Foundation for Science
- **Manuscript reviewer (126 times for 48 journals, 15 reviews honored the past 1 year):** African Journal of Microbiology, Agricultural Water Management, Aquaculture International, Aquaculture Research, Aquatic Conservation, Animal Reproduction Science, Biological Conservation, Biological Invasions, Biological Reviews, British Journal of Science and Technology, Canadian Journal of Fisheries and Aquatic Sciences, Conservation Biology, Diversity and Distributions, Ecography, Ecological Applications, Ecological Engineering, Ecological Indicators, Ecological Restoration, Ecology of Freshwater Fish, Environmental Biology of Fishes, Environmental Contamination and Toxicology, Environmental Management, Environmental Monitoring and Assessment; Fisheries, Fisheries Management and Ecology, Freshwater Biology, Freshwater Science, Functional Ecology, Global Ecology and Biogeography, Human Ecology, Hydrobiology, Journal of Applied Ecology, Journal of

Biogeography, Journal of Applied Aquaculture, Journal of Environmental Engineering, Journal of Environmental Management, Journal of Freshwater Ecology, Journal of Soil and Water Conservation, Journal of the American Water Resources Association, Landscape Ecology, Limnology and Oceanography, Marine and Freshwater Research, North American Journal of Fisheries Management, Oecologia, PeerJ, PLOS One, The Natural Areas Journal, Open Journal of Ecology, Transactions of the American Fisheries Society

- Book reviewer: American Fisheries Society (chapters), CRC Press (proposal & book)

Diversity initiatives or contributions

- Panel Member, SEEDS Howard University and ESA-Careers in Ecology program (for minority students), Mountain Lake Biological Station, May 24, 2014.
- Mentor, AFS Hutton Program Junior Fisheries Scholar intern (Paige Crane) June-August 2013
- FiW representative on the planning committee of the CNRE June 2013 diversity conference
- Major advisor for 3 African grad students (2 females [Anane-Taabeah, Fynn], 1 male [Ansah])
- CNRE representative on the Virginia Tech Minority-Serving Institution Advisory Council (2008)
- Supervised 5 female undergraduate student research projects, including 1 African-American
- 1 Asian PhD student (Huang)
- 1 Asian research associate (Liang) co-advised with Paul Angermeier
- 1 male African-American NSF-REU intern from University of Arkansas at Pine Bluff (Nettels)
- 1 female VT Multicultural Academic Opportunities Program (MAOP) intern from St. Augustine's College, NC (Walker)
- 1 Hispanic wage employee and field assistant (Emmel)
- 8 other female wage employees in the past 4 years (Okongo [African-American], Crane [Caucasian], Dellapenta [Caucasian], Fitzgerald [Caucasian], Huggins [Caucasian], Mercer [Caucasian], Shrestha [Asian], Worsham [Caucasian])

II. Recommendation Statements

N/A

III. Candidate's Statement

N/A

IV. Teaching and Advising Effectiveness

A. Recognitions

Department of Fisheries & Wildlife Curriculum Club Outstanding Faculty Award, 2009
 Department of Fisheries & Wildlife Curriculum Club Outstanding Faculty Award, 2007
 Outstanding Faculty Member, Virginia Tech Chapter – American Fisheries Society, 2009
 Outstanding Faculty Member, Virginia Tech Chapter – American Fisheries Society, 2008
 Outstanding Faculty Member, Virginia Tech Chapter – American Fisheries Society, 2007

B. Courses taught

Course Number and Title	Semester	Cr. Hours	Enrollment
FiW4614 Fish Ecology	Spring 2014	3	40
FiW4614 Fish Ecology	Spring 2014	3	42
FiW5984 Landscape Ecology & SDM	Spring 2014	4	9 + 1 Audit

FiW4614 Fish Ecology*	Spring 2013	3	58
FiW5984 Fluvial Landscape Ecology & SDM	Spring 2012	3	11 + 1 Audit
FiW4614 Fish Ecology	Spring 2012	3	57
FiW6984 Linear Modeling/Inference Ecol Data	Spring 2011	1	13
FiW4614 Fish Ecology	Spring 2011	3	56
FiW4614 Fish Ecology	Spring 2010	3	54
FiW3514 Fisheries Techniques	Fall 2009	3	14
FiW5984 Life History & Distribution of Fishes	Spring 2009	1	7
FiW4614 Fish Ecology	Spring 2009	3	50
FiW3514 Fisheries Techniques*	Fall 2008	3	18
FiW4614 Fish Ecology	Spring 2008	3	29
FiW3514 Fisheries Techniques	Fall 2007	3	17
FiW3514 Fisheries Techniques	Fall 2006	3	10

*Instructor of record and mentored graduate student instructor, including offering guest lectures

Guest Lectures

Fall 2014: One lecture in FiW 5414 Endangered Species Management

Spring 2013: Two lectures in FiW 4614 Fish Ecology

Fall 2010: Three lectures & Excel labs in FiW 3514 Fisheries Techniques

C. Non-credit courses and workshops - 11

July 9-10, 2016: Organized and taught Experimental Design and Analysis with R for Natural Resources Professionals at KNUST, Kumasi, Ghana. Workshop was part of sabbatical activities sponsored by the Carnegie African Diaspora Fellowship and attended by 80 participants, including lecturers/researchers, technicians, graduate and undergraduate students.

August 4-6, 2014 – First national workshop on Pond Aquaculture Best Management Practices (BMPs), Morogoro, Tanzania. Workshop was attended by 80 farmers, and government agency officials. Sponsored by USAID AquaFish Innovation Lab.

July 2-5, 2013 – Organized and presented a national workshop on Pond Aquaculture Best Management Practices in Tarkwa, Ghana. Workshop was attended by 180 farmers, and government agency officials. Sponsored by USAID AquaFish CRSP.

January 11, 2013 – Co-organized and presented a national Women's Training Program for Commercial Aquaculture at the Aquaculture Research and Development Center (ARDEC), Akosombo, Ghana. Workshop was attended by 40 fish processors/traders, farmers, and government agency officials. Sponsored by USAID AquaFish CRSP

January 8-9, 2013 – Co-organized and presented a national Women's Training Program for Commercial Aquaculture at the International Centre for Innovative Learning, KNUST, Kumasi,

Ghana. Workshop was attended by 50 fish processors/traders, farmers, and government agency officials. Sponsored by USAID AquaFish CRSP.

June 11-15, 2012 – Organized and presented a national workshop on Pond Aquaculture Best Management Practices in Sunyani, Ghana. Workshop was attended by 130 farmers, and government agency officials. Sponsored by USAID AquaFish CRSP.

September 21-23, 2011 – Organized a research design and protocol training workshop for local researchers, fisheries extension officers, and fish farmers in Eldoret, Kenya, replicating AquaFish CRSP aquaculture studies in Ghana. Program was attended by 30 participants. Sponsored by USAID AquaFish CRSP in collaboration with the Kenyan Ministry of Fisheries and the Fish Farming Enterprise and Productivity Program.

July 12-15, 2011 – Organized and presented a national workshop on Pond Aquaculture Best Management Practices in Kumasi, Ghana. Workshop was attended by 150 farmers, and government agency officials and reported on national and African media. Sponsored by USAID AquaFish CRSP.

March 24-25, 2011: Co-organized and presented at a workshop for stakeholders on Future Scenarios of Ecosystem Services in the Albemarle-Pamlico Basin (VA, NC) at the US EPA, Raleigh, NC. Workshop was sponsored by USGS Aquatic GAP program.

July 28-30, 2010: Organized and taught Experimental Design and Analysis for Aquaculture Professionals in Kumasi, Ghana. Workshop was sponsored by USAID AquaFish CRSP and attended by 22 participants, including lecturers/researchers, technicians, and students.

November 24-25, 2009: Organized and presented first national workshop on Pond Aquaculture Best Management Practices (BMPs) in Kumasi, Ghana. Workshop was attended by 60 farmers, students, researchers, and government agency officials and reported on a national TV network. Sponsored by USAID AquaFish CRSP.

D. Completed theses - 12

Floyd, S. P., Jr (MS 2016) Cheating and selfishness in reproductive interactions among nest associative cyprinids.

Buckwalter, J. D. (MS 2016) Distributional trends of New River stream fish and the role of species traits.

Huang, J. (PhD 2015) Assessing predictive performance and transferability of species distribution models for freshwater fish in the United States.

Peoples, B. K. (PhD 2015) Applying general ecological models to positive interactions among lotic fishes: implications for population and community regulation at multiple spatial scales.

Ansah, Y. B. (PhD 2014) Enhancing profitability of pond aquaculture in Ghana through resource management and environmental best management practices.

Fynn, I. E. M. (MS 2014) Pond aquaculture spatial distribution, production and productivity determinants in Ghana.

Anane-Taabeah, G. (MS 2012) Harnessing the opportunities and overcoming the constraints to widespread adoption of cage aquaculture in Ghana.

Henebry, M. L. (MS 2011) Biological and ecological trait associations and analysis of spatial and intraspecific variation in fish traits.

Ansah, Y. B. (MS 2010) Characterization of pond effluents and biological and physico-chemical assessment of receiving waters in Ghana.

Deweber, J. T. (MS 2010) The role of physiography in the relationships between land cover and stream fish assemblages.

Peoples, B. K. (MS 2010) Detection probabilities and local population demographics of fishes in urbanized and forested streams of the New River basin, Virginia.

Pritt, J. J. (MS 2010) Defining rarity and determining the mechanisms of rarity for North American freshwater fishes.

Undergraduate research projects - 10

Charles T. Olinger (2014). Patterns of growth and reproductive traits of a Mesoamerican poeciliid along an elevational gradient.

Meredith Swartwout (2014-Biological Sciences) Macroinvertebrate community composition in bluehead chub (*Nocomis leptcephalus*) nests.

Christina Bolton (NSF-REU intern 2012) Factors that determine nest placement by bluehead chub (*Nocomis leptcephalus*).

Stanford Nettles (NSF-REU intern 2012) Factors that determine nest size and choice of substrate by bluehead chub (*Nocomis leptcephalus*).

Kayla Walker (VT-MOAP intern 2012) Relationship between stream fish morphology and choice of habitat.

Rachel Tremont (2011- Biological Sciences) Comparative morphology and function of crayfish and crabs found in the freshwater streams of North America and Africa.

Jason Emmel (2010) The Influence of polychaetes and amphipods on denitrification rates within oyster reef communities. [Completed through REU internship at the University of Maryland and supervised on site by Dr. Lisa Kellog].

Koan J. Heindel (2010) Evaluation of consistency between qualitative and quantitative diet data as applied to an index of niche overlap between rock bass (*Ambloplites rupestris*) and redbreast sunfish (*Lepomis auritus*).

Molly B. Tainer. (BS 2009) Relationships among in-stream habitat and bluehead chub (*Nocomis leptcephalus*) nests and population structure in tributaries of the New River.

Richard M. Pendleton. (BS 2009) Determination of degrees of chub nest association and the strengths of phylogeny and space as hypothesized causes for New River cyprinids.

E. Postdoctoral fellow training and research

F. Current positions held by MS and doctoral recipients

Anane-Taabeah, G. (MS 2012) – PhD Candidate, Virginia Tech (Previous, Assistant Lecturer, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana).

Ansah, Y. B. (MS 2010, PhD 2014) – Junior Fisheries and Aquaculture Professional, FAO Sub-Regional Office for East Africa, Addis Ababa, Ethiopia

Buckwalter, J. D. (MS 2016) – Research Associate, Department of Crop & Soil Environmental Sciences, Virginia Tech.

Deweber, J. T. (MS 2010) – Postdoctoral Associate, USGS, Oregon Cooperative Fish and Wildlife Unit (Previous, PhD Candidate, Pennsylvania State University)

Floyd, S. P., Jr. (MS 2016) – Fisheries Research Support staff, Virginia Tech.

Fynn, I. E. M. (MS 2014) – PhD Candidate - Geospatial and Environmental Analysis, Virginia Tech)

Henebry, M. L. (MS 2011) – Crew Leader, USDA Forest Service, Virginia Tech.

Huang, J. (PhD, 2015) – Postdoc/Biostatistician, Duke University, NC

Peoples, B. K. (MS 2010, PhD 2015) – Assistant Professor, Clemson University (Previous, Postdoctoral Scientist, Purdue University)

Pritt, J. J. (MS 2010) – Fisheries Biologist, Ohio Division of Wildlife, Inland Fisheries Research Unit (Previous, Postdoc, USGS, Great Lakes Science Center; PhD University of Toledo)

G. Special achievements of former undergraduate and graduate students

Joseph D. Buckwalter – Department of Fish and Wildlife Cross Award, 2016.

Huang, J. – Department of Fish and Wildlife Georgia Pacific Scholarship, 2015.

Brandon K. Peoples, Department of Fish and Wildlife Burd McGinnis Scholarship, 2014.

Iris E. M. Fynn, Department of Fish and Wildlife International Student Scholarship, 2014.

Steve Watkins, Outstanding Member, VT chapter of American Fisheries Society, 2013

Iris Fynn, PEO International Women's Fellowship, 2013-2014

Jian Huang was one of the recipients of a nationally competed travel award to attend and present his research at the 2012 Annual Meeting of the Organization of Fish and Wildlife Information Managers (OFWIM) in Austin, TX.

Yaw B. Ansah, Outstanding Member, Fisheries and Wildlife Graduate Students Association, 2012.

Brandon K. Peoples, Honorable Mention, Skinner Memorial travel award, American Fisheries Society, 2012.

Brandon K. Peoples, first place, American Fisheries Society student writing competition, 2012.

Brandon K. Peoples, first place, student presentation, mid-Atlantic Ecological Society of America annual meeting, Blacksburg, 2012 (with Travel award to National Meeting).

Brandon K. Peoples, first place, student presentation, Joint Virginia Tech/Virginia chapter American Fisheries Society annual meeting, Blacksburg, 2012.

Jian Huang, third place, student poster presentation, Virginia Tech Office of Geographic Information Systems and Remote Sensing Symposium, Blacksburg, 2012

Gifty Anane-Taabeah, PEO International Women's Fellowship, 2010-2011.

Yaw B. Ansah, one of six awarded the nationally competed Norman E. Borlaug Leadership Enhancement in Agriculture Program (LEAP) fellowship, 2010-2011.

Yaw B. Ansah, Department of Fish and Wildlife International Student Scholarship, 2010.

Jefferson T. Deweber, one of four CNRE recipients of the Edna Bailey Sussman Foundation Scholarship in 2009 awarded on academic and research merit.

Jefferson T. Deweber was one of four recipients of a nationally competed \$1,000 travel award to attend and present his research at the 2009 Annual Meeting of the Organization of Fish and Wildlife Information Managers (OFWIM) in Seattle, WA.

Brandon K. Peoples, Outstanding Member, Virginia Tech Chapter of the American Fisheries Society, 2008

H. Current academic advising responsibilities

Graduate committee as major advisor

2 PhD students (Anane-Taabeah, Fynn)

Thesis and dissertation committees

9 PhD committees (Argentina, Anderson, Darko [Biological Systems Engineering], Martin, Mwamende, Novak [Biological Sciences], Ostby, Poor, Proctor)

4 MS committees (Dunn, Zhang, Nichols, Bell [Biological Sciences])

Undergraduate

20 advisees

I. Course, curriculum, and program development

Under Carnegie Africa Diaspora Fellowship, developed three graduate degree programs (MSc. Aquaculture, MSc. Fisheries and Coastal Resources Management, and MSc. Water Science and Policy) for Kwame Nkrumah University of Science and technology, Ghana.

J. Student evaluation of instruction

Course Number and Title	Semester	# Evaluating/ # Enrolled	Rating* (SPOI/T)
FiW4614 Fish Ecology	Spring 2016	11/40	4.73 (N/A; N/A)
FiW4614 Fish Ecology	Spring 2014	9/42	5.44 (4.99; 5.42)
FiW5984 Landscape Ecology and SDM	Spring 2014	7/10	5.29 (4.99; 5.42)
FiW4614 Fish Ecology**	Spring 2013	58	N/A
FiW5984 Fluvial Landscape Ecology and SDM	Spring 2012	9/11	5.22 [‡] (5.13; 5.42)
FiW4614 Fish Ecology	Spring 2012	39/57	5.36 [‡] (5.13; 5.42)
FiW6984 Linear Modeling/Inference Ecol Data	Spring 2011	12/13	3.92 [†] (3.32; 3.60)
FiW4614 Fish Ecology	Spring 2011	43/56	3.76 [†] (3.32; 3.60)
FiW4614 Fish Ecology	Spring 2010	52/54	3.70 [†] (3.57; 3.66)
FiW3514 Fisheries Techniques	Fall 2009	14/14	3.90 [†] (3.70; 3.67)
FiW5984 Life History & Distribution of Fishes	Spring 2009	7/7	3.70 [†] (3.37; 3.48)
FiW4614 Fish Ecology	Spring 2009	45/50	3.70 [†] (3.37; 3.48)
FiW3514 Fisheries Techniques**	Fall 2008	18	N/A
FiW4614 Fish Ecology	Spring 2008	22/29	3.90 [†] (3.59; 3.63)
FiW3514 Fisheries Techniques	Fall 2007	16/17	3.40 [†] (3.55; 3.60)
FiW3514 Fisheries Techniques	Fall 2006	8/10	3.60 [‡] (3.36; 3.62)

*Respective department and college average in parentheses; **Instructor of record & guest

[‡] Out of 6.00 possible.

[†] Out of 4.00 possible.

K. Peer evaluation of instruction

N/A

L. Alumni evaluation of instruction

N/A

M. Demonstrated efforts to improve teaching effectiveness

N/A

V. Research and Creative Activities

A. Awards, prizes, and recognitions

July 2015: Citation received from Kwame Nkrumah University of Science and Technology (Ghana), Department of Fisheries and Watershed Management – Recognized for contribution to research and development of aquaculture and fisheries program.

Carnegie Fellowship Africa Diaspora Fellowship for curriculum co-development in Ghana.

Biographee, Marquis Who's Who in America, 2011-2016

B. List of contributions

1. Books or monographs

N/A

2. Book chapters - 3

Frimpong, E. A., and G. Anane-Taabeah. (in press). The social and economic performance of tilapia farming in Ghana. Pages 000-000 in J. Cai, N. Hishamunda, and K. K. Quagraine, editors. Social and economic dimensions of tilapia farming. Fisheries and Aquaculture Technical Paper No. 000. Rome, FAO 000 pp.

Haas, C., E. Frimpong, and S. Karpanty. 2009. Ecosystems and Ecosystem-based management. Pages 106-142 in K. Moore, Editor. Innovating for Sustainable Agriculture and Natural Resources Management. SANREM CRSP, Soil and Water Conservation Society, Ankeny.

Sutton, T. M., R. A. Zeiber, and E. A. Frimpong. 2006. Developing an effective resume or curriculum vitae. Pages 13-37 in D. A. Hewitt, W. E. Pine III, and A. V. Zale, editors. An American Fisheries Society Guide to Fisheries Employment, second edition. American Fisheries Society, Bethesda, Maryland.

3. Books edited

N/A

4. Textbooks authored

N/A

5. Textbooks edited

N/A

6. Papers in refereed journals - 54

[*Indicates current or former student under my supervision]

*Peoples, B.K., P. Cooper, E. A. Frimpong, and E. M. Hallerman. 2017. DNA Barcoding elucidates cyprinid reproductive interactions in a Southwest Virginia Stream. *Transactions of the American Fisheries Society* 146(1) <http://dx.doi.org/10.1080/00028487.2016.1240105>.

- Frimpong, E. A., J. Huang*, and Y. Liang*. 2016. IchthyMaps: A database of historical distributions of freshwater fishes of the United States. *Fisheries*.
- Howeth, J. G., C. A. Gantz, P. L. Angermeier, E. A. Frimpong, M. H. Hoff, R. P. Keller, N. E. Mandrak, M. P. Marchetti, J. D. Olden, C. M. Romagosa, and D. M. Lodge. 2016. Predicting invasiveness of species in trade: climate match, trophic guild and fecundity influence establishment and impact of non-native freshwater fishes. *Diversity and Distributions* 22:123-247.
- Huang*, J., and E. A. Frimpong. 2016. Limited transferability of stream fish distribution models among river catchments: reasons and implications. *Freshwater Biology* 61:729-744.
- Huang*, J., and E. A. Frimpong. 2016. Modifying the United States National Hydrography Dataset to improve data quality for ecological models. *Ecological Informatics* 32:7-11
- Huang*, J., E. A. Frimpong, and D. J. Orth. 2016. Temporal transferability of stream fish distribution models: can uncalibrated SDMs predict distribution shifts over time? *Diversity and Distributions* 22:651-662.
- Mogollon, B., E. A. Frimpong, A. B. Hoegh, and P. L. Angermeier. 2016. Recent changes in stream flashiness and flooding, and effects of flood management in North Carolina and Virginia. *Journal of the American Water Resources Association* 52:561-577.
- Mogollon, B., E. A. Frimpong, A. B. Hoegh, and P. L. Angermeier. 2016. An empirical assessment of which inland floods can be managed. *Journal of Environmental Management* 167: 38-48.
- Mogollon, B., A. M. Villamagna, E. A. Frimpong, and P. L. Angermeier. 2016. Mapping technological and biophysical capacities of watersheds to regulate floods. *Ecological Indicators* 61:483-499.
- Olinger**, C. T., B. K. Peoples*, and E. A. Frimpong. 2016. Reproductive life-history of *Heterandria bimaculata* (Heckel, 1848) (Poeciliinae) in the Honduran interior highlands: trait variation along an elevational gradient. *Neotropical Ichthyology* 14(1):e1500501-e1500510.
- Peoples*, B. K., and E. A. Frimpong. 2016. Biotic interactions and habitat drive positive co-occurrence between facilitating and beneficiary stream fishes. *Journal of Biogeography* 43: 923-931.
- Peoples*, B. K., and E. A. Frimpong. 2016. Context-dependent outcomes in a reproductive mutualism between two freshwater fish species. *Ecology and Evolution* 6:1214-1223.
- Peoples*, B. K., S. P. Floyd*, Jr, and E. A. Frimpong. 2016. Nesting microhabitat comparison of Central Stoneroller and Bluehead chub: potential inference for host-switching by nest associates. *Journal of Freshwater Ecology* 31: 251-259.
- Peoples*, B. K., L. A. Blanc, and E. A. Frimpong. 2015. Lotic cyprinid communities can be structured as nest webs and predicted by the stress-gradient hypothesis. *Journal of Animal Ecology* 84:1666-1677.
- Ansah* Y. B., and E. A. Frimpong. 2015. Using model-based inference to select a predictive growth curve for farmed tilapia. *North American Journal of Aquaculture* 77(3):281-288.
- Ansah* Y. B., and E. A. Frimpong. 2015. Impact of the adoption of BMPs on social welfare:

A case study of commercial floating feeds for pond culture of tilapia in Ghana. *Cogent Food and Agriculture* 1:1048579.

- Huang* J., and E. A. Frimpong (in press). Using historical atlas data to develop high-resolution distribution models of Freshwater Fishes. *PLOS One* 10(6):e0129995.
- Swartwout*, M. C., F. Keating, and E. A. Frimpong. 2015. A survey of macroinvertebrates colonizing bluehead chub nests in a Virginia stream. *Journal of Freshwater Ecology* DOI:10.1080/02705060.2015.1036943
- Bolton*, C., B. K. Peoples*, and E. A. Frimpong. 2015. Recognizing gape limitation and interannual variability in bluehead nesting macrohabitat use in a small Virginia stream. *Journal of Freshwater Ecology* DOI:10.1080/02705060.2014.998729
- McManamay, R. A., and E. A. Frimpong. 2015. Hydrologic filtering of fish life history traits across the US and implications for streamflow alteration. *Ecological Applications* 25(1):243-263.
- McManamay, R. A., M. S. Bevelhimer, and E. A. Frimpong. 2015. Associations among hydrologic classifications and fish traits to support environmental flow standards. *Ecohydrology* 8(3):460-479.
- Ansah*, Y. B., E. A. Frimpong, and E. M. Hallerman. 2014. Genetically-improved tilapia strains in Africa: potential benefits and negative impacts. *Sustainability* 6:3697-3721.
- Frimpong, E.A., Y. B. Ansah*, S. Amisah, D. Adjei-Boateng, N. Agbo, and H. Egna. 2014. Effects of two environmental best management practices on pond water and effluent quality and growth of Nile tilapia, *Oreochromis niloticus*. *Sustainability* 6:652-675.
- Agbo, N. W., S. Amisah, E. Tettey, and E. A. Frimpong. 2014. Effects of dietary protein levels on the growth performance of clarotid catfish, *Chrysichthys nigrodigitatus*, fingerlings. *Annals of Biological Research* 5(4):17-22
- Pritt*, J. J., and E. A. Frimpong. 2014. The effect of sampling intensity on observed rarity and stream fish community assessment metrics. *Ecological Indicators* 39:169-178.
- Ansah*, Y. B., E. A. Frimpong, and S. Amisah. 2013. Characterization of potential pond effluents and physicochemical and microbial assessment of effluent-receiving streams in central Ghana. *African Journal of Aquatic Science* 38(2):185-192. DOI:10.2989/16085914.2013.767182.
- Peoples*, B. K., and E. A. Frimpong. 2013. Evidence of mutual benefits of nest association among freshwater cyprinids and implications for conservation. *Aquatic Conservation: Marine and Freshwater Ecosystems* 23(6):911-923.
- Peoples*, B. K., R. A. McManamay, D. J. Orth, and E. A. Frimpong. 2013. Nesting habitat use by river chubs in a hydrologically variable Appalachian tailwater. *Ecology of Freshwater Fish* 23(2):283-293.
- Stich, D. S., V. Dicenzo, E. A. Frimpong, Y. Jiao, and B. R. Murphy. 2013. Growth and population size of grass carp incrementally stocked for hydrilla control. *North American Journal of Fisheries Management* 33:14-25.
- Ansah*, Y. B., E. A. Frimpong, and S. Amisah. 2012. Biological assessment of aquaculture effects on effluent-receiving streams in Ghana using structural and functional composition of fish and macroinvertebrate assemblages. *Environmental Management* 50:166-180.
- Frimpong, E., and M. Henebry*. 2012. Short-term effects of formalin and ethanol fixation and preservation techniques on weight and size of fish eggs. *Transactions of the American Fisheries Society* 141:1472-1479.
- Pendleton*, R. M., J. J. Pritt*, B. K. Peoples*, and E. A. Frimpong. 2012. The strength of *Nocomis* nest association contributes to patterns of rarity and commonness among New River, Virginia cyprinids. *American Midland Naturalist* 168:202-217.
- Peoples*, B. K., and E. A. Frimpong. 2012. A snapshot analysis of age distributions of

- fishes in urban and forested Virginia streams. *Urban Ecosystems* 15:927-937.
- McManamay, R. A., D. J. Orth, C. A. Dollof, and E. A. Frimpong. 2012. Regional frameworks applied to hydrology: can landscape-based frameworks capture the hydrologic variability? *River Research and Applications* 28:1325-1339.
- Alexander, K. A., J. K. Blackburn, and E. A. Frimpong. 2011. Buffalo and Maslow's hammer *Frontiers in Ecology and the Environment* 9:302-303 + web appendix.
- McManamay, R. A., D. J. Orth, C. A. Dollof, and E. A. Frimpong. 2011. A regional classification of unregulated stream flows: spatial resolution and hierarchical frameworks. *River Research and Applications* 26:1-26.
- Peoples*, B. K., and E. A. Frimpong. 2011. Among-pass, interregional, and single- versus multiple-season comparisons of detection probabilities of stream fishes. *Transactions of the American Fisheries Society* 140:67-83.
- Peoples*, B. K., M. B. Tainer*, and E. A. Frimpong. 2010. Bluehead chub nesting activity: a potential mechanism of population persistence in degraded stream habitats. *Environmental Biology of Fishes* 90:379-391.
- Pritt*, J. J., and E. A. Frimpong. 2010. Quantitative determination of rarity of freshwater fishes and implications for imperiled-species designations. *Conservation Biology* 24:1249-1258.
- Frimpong, E. A., and P. L. Angermeier. 2010. Comparative utility of selected frameworks for regionalizing fish-based bioassessments across the United States. *Transactions of the American Fisheries Society* 139:1872-1895.
- Frimpong, E. A., and P. L. Angermeier. 2010. Trait-based approaches in the analysis of stream fish communities. *American Fisheries Society Symposium* 73:109-136.
- Frimpong, E. A., and P. L. Angermeier. 2009. FishTraits: A database of ecological and life-history traits of freshwater fishes of the United States. *Fisheries* 34:487-495.
- Roberts, J. H., and E. A. Frimpong. 2009. The extensive and complex landscape of 34. *Fisheries* 34:143-144.
- Hrodey, P. J., T. M. Sutton, E. A. Frimpong, and T. P. Simon. 2009. Land-use impacts on watershed health and integrity in Indiana warmwater streams. *American Midland Naturalist* 161:76-95.
- Frimpong, E. A., J. G. Lee, and A. L. Ross-Davis. 2007. Floodplain influence on the cost of riparian buffers and implications for conservation programs. *Journal of Soil and Water Conservation* 62(1):33-39.
- Frimpong, E. A., J. G. Lee, and T. M. Sutton. 2006. Cost effectiveness of vegetative filter strips and in-stream half-logs for ecological restoration. *Journal of the American Water Resources Association* 42:1349-1361.
- Frimpong, E. A., A. L. Ross-Davis, J. G. Lee, and S. R. Broussard. 2006. Biophysical and socioeconomic factors explaining the extent of forest cover on private ownerships in a Midwest (USA) agrarian landscape. *Landscape Ecology* 21:763-776.
- Frimpong, E. A., and S. E. Lochmann. 2006. An evaluation of the effect of treatments for pond water reuse on zooplankton populations. *North American Journal of Aquaculture* 68:103-109.
- Frimpong, E. A., T. M. Sutton, B. A. Engel, and T. P. Simon. 2005. Spatial-scale effects on relative importance of physical habitat predictors of stream health. *Environmental Management* 36:899-917.
- Frimpong, E. A., T. M. Sutton, K. J. Lim, P. J. Hrodey, B. Engel, T. P. Simon, J. G. Lee, and D.C. LeMaster. 2005. Determination of optimal riparian forest buffer dimensions for stream biota-landscape association models using multimetric and multivariate responses. *Canadian Journal of Fisheries and Aquatic Sciences* 62:1-6.
- Frimpong, E. A., and S. E. Lochmann. 2005. Mortality of fish larvae exposed to varying concentrations of cyclopoid copepods. *North American Journal of Aquaculture* 67:66-

71.

- Bodary, M. J., N. Stone, S. E. Lochmann, and E. Frimpong. 2004. Characteristics of effluents from Central Arkansas baitfish ponds. *Journal of the World Aquaculture Society* 35:489-497.
- Frimpong, E. A., S. E. Lochmann, M. Bodary, and N. Stone. 2004. Suspended solids from baitfish pond effluents in drainage ditches. *Journal of the World Aquaculture Society* 35:159-166.
- Frimpong, E. A., S. E. Lochmann, and N. M. Stone. 2003. Application of a methodology for surveying and comparing prevalence of drainage ditches to baitfish farms. *North American Journal of Aquaculture* 65:165-170.

7. Papers in refereed conference proceedings - 1

- Anane-Taabeah, G., E. A. Frimpong, S. Amisah, and N. Agbo. 2011. Constraints and opportunities in cage aquaculture in Ghana. Proceedings of the Ninth International Symposium on Tilapia in Aquaculture (ISTA 9). Shanghai, China.

8. Performances, exhibitions, and compositions

N/A

9. Digital scholarship

N/A

10. Reviews

N/A

11. Numbered extension publications

N/A

12. Other papers and reports - 18

- Frimpong E. A., Huang, J., and Liang, Y. 2015, Historical Stream Fish Distribution Database for the Conterminous United States (1950-1990): IchthyMaps: U.S. Geological Survey data release, <http://dx.doi.org/10.5066/F7M32ST8>.

- Frimpong, E. A., G. Anane-Taabeah, S. Amisah, A. Ampofo-Yeboah, and K. Quagrainie. 2015. How will tilapia be affected by Ghana's changing climate? *AQUANEWS* 30(1):2-4.

- Frimpong, E. A., Y. B. Ansah, S. Amisah, D. Adjei-Boateng, G. Anane-Taabeah Attu, and N. W. Agbo. Enhancing the profitability of small aquaculture operations in Ghana, Kenya, and Tanzania through improved resource management and environmental Best Management Practices. Final report submitted to AquaFish Innovation Lab. Oregon State University, Corvallis, OR, November 2014.

- Frimpong, E. A. Testing the effect of context on a nest association mutualism of stream fishes in a comparative-advantage biological market framework. Final report submitted to National Science Foundation, Washington, DC, November 2014.

- Frimpong, E. A., and I. E. M. Fynn. Tilapia aquaculture in Ghana: ponds can contribute more to overall production, food security. *Global Aquaculture Advocate* (July/August 2014.):18-21

- Frimpong, E. A., Y. B. Ansah, N. W. Agbo, and S. Amisah. Experimental pond unit assessment of AquaFish CRSP research sites in Ghana. Final report submitted to USAID AquaFish Innovation Lab. Corvallis, Oregon, June 2013.
- Frimpong, E. A., J. Huang, and Y. Liang. Preliminary application of a framework for modeling habitat suitability and distribution of stream fishes with field-testing. Final report submitted to USGS, Core Science Analytics and Synthesis, Aquatic Gap Analysis Program. Reston, VA, June 2013.
- Frimpong, E. A. Enhancing the profitability of small aquaculture operations in Ghana through improved resource management and environmental Best Management Practices. Final report submitted to the Borlaug LEAP Fellowship program. University of California, Davis, CA, June 2012.
- Frimpong, E. A. Modeling how traits mediate fish vulnerabilities to specific habitat alterations. Progress report submitted to US Geological Survey National Aquatic Gap/Biological Informatics Program, Reston, VA, June 2012.
- Delince, G., and E. Frimpong. 2012. Summary and comments of the discussion on Extension Support on SARNISSA. Sustainable Aquaculture Research Networks in Sub-Saharan Africa, Stirling, UK. 20 pp. Available at <http://www.sarnissa.org/tikiindex.php?page=SARNISSA++Project+Publications>
- Agbo, N., S. Amisah, E. Frimpong, and K. Quagraine. 2011. Development and diversification of indigenous species for aquaculture in Ghana. AQUANEWS 26(3): 1, 12.
- Frimpong, E. A., K. K. Quagraine, S. Amisah, N. W. Agbo, and Gifty Anane-Taabeah. Harnessing the opportunities and overcoming the constraints to widespread adoption of cage aquaculture in Ghana. Final Report submitted to the United States Agency for International Development Aquaculture and Fisheries Collaborative Research Support Program, Corvallis, Oregon, September 2011.
- Frimpong, E. A., N. W. Agbo, S. Amisah, E. Tettey, P. Akpaglo, and Gifty Anane-Taabeah. Development and diversification of species for aquaculture in Ghana. Final Report submitted to the United States Agency for International Development Aquaculture and Fisheries Collaborative Research Support Program, Corvallis, Oregon, September 2011.
- Frimpong, E. A. Enhancing the profitability of small aquaculture operations in Ghana, Kenya, and Tanzania through improved natural resources management and environmental best management practices. Progress report submitted to the United States Agency for International Development Aquaculture and Fisheries Collaborative Research Support Program, Corvallis, Oregon, September 2011.
- Villamagna, A. M., P. L. Angermeier, E. Bennet, and E. A. Frimpong. Spatial analysis of relations among conservation practices, aquatic ecosystem services, and human well-being in the Albemarle-Pamlico basin. Progress Report for USGS, Reston, VA. May 2010.
- Frimpong, E. A., Y. B. Ansah, and S. Amisah. Characterization of pond effluents and biological and physicochemical assessment of receiving waters in Ghana. Final Report submitted to the United States Agency for International Development Aquaculture and Fisheries Collaborative Research Support Program, Corvallis, Oregon, November 2009.
- Orth, D. J., K. A. Alexander, E. A. Frimpong, W. Henley, and J. R. Voshell. Investigation into smallmouth bass mortality in Virginia rivers. Final Report Submitted to the Virginia Department of Game and Inland Fisheries, Richmond, VA, September 2009.
- Frimpong, E. A., and P. L. Angermeier. Linking traits of at-risk fish species to types of human impact: a test of concept. Final report submitted to US Geological Survey National Aquatic Gap/National Biological Information Infrastructure, Fisheries and Aquatic Resources Unit, Reston, VA, September 2009.

13. Prefaces, introductions, and catalogue statements, etc.

N/A

14. Papers presented at professional meetings – 74 since 2006

*Student under my supervision

#Presenter

International - 14

- Frimpong[#], E. A., Y. B. Ansah, S. Amisah, and D. Adjei-Boateng. Using on-farm experiments to untangle the causes of low productivity of tilapia *Oreochromis niloticus* grown in ponds in Ghana. Aquaculture America 2014. Seattle, WA, 7-13 February 2014.
- Ansah^{**}, Y. B., and E. A. Frimpong. Profitability and adoption of two aquaculture best management practices in Ghana. Aquaculture America 2014. Seattle, WA, 7-13 February 2014.
- Fynn^{**}, I., and E. A. Frimpong. Estimating the potential and actual production capacity of aquaculture ponds in Ghana. Aquaculture America 2014. Seattle, WA, 7-13 February 2014.
- Zhiwu^{**}, X., E. Frimpong, and S. Lee. FishTraits Version 2: Integrating ecological, biogeographic, and bibliographic information. Joint Conference on Digital Libraries 2013, Indianapolis, IN, 22-26 July, 2013.
- Ansah^{**}, Y., E. Frimpong, and R. Namara. Characteristics of adopters of environmental best management practices in small-scale pond aquaculture. Aquaculture 2013. Annual Meeting of the World Aquaculture Society, Nashville, TN, 21-25 February 2013.
- Fynn^{**}, I., Y. Ansah, E. Frimpong, D. Adjei-Boateng, and S. Amisah. Direct and indirect effects of management practices on pond water quality and growth of Nile tilapia *Oreochromis niloticus*. Aquaculture 2013. Annual Meeting of the World Aquaculture Society, Nashville, TN, 21-25 February 2013.
- Amisah^{**}, S., D. Adjei-Boateng, E. Frimpong, Y. Ansah. Effect of water re-use and feed type on the growth of Nile tilapia *Oreochromis niloticus*. Aquaculture 2013. Annual Meeting of the World Aquaculture Society, Nashville, TN, 21-25 February 2013.
- Agbo[#], N. W., S. Amisah, E. Tettey, and E. A. Frimpong. Effect of dietary protein levels on growth performance of *Chrysichthys nigrodigitatus* fingerlings. 9th Asian Fisheries and Aquaculture Forum (9AFAF), Shanghai, China, 21 – 25 April 2011.
- Anane-Taabeah*, G., E. A. Frimpong, S. Amisah[#], and N. W. Agbo. Constraints and opportunities in cage aquaculture in Ghana. 9th Asian Fisheries and Aquaculture Forum (9AFAF), Shanghai, China, 21 – 25 April 2011.
- Ansah*, Y. B., E. A. Frimpong, S. Amisah, and G. Anane-Taabeah^{**}. Fish and macroinvertebrate assemblages in receiving streams in the vicinity of earthen ponds in Ghana. Aquaculture 2010. Annual Meeting of the World Aquaculture Society, San Diego, CA, 2-5 March 2010.
- Ansah^{**}, Y. B., E. A. Frimpong, and S. Amisah. Potential effluent quality and microbial levels in earthen ponds and receiving streams of central Ghana. Aquaculture 2010. Annual Meeting of the World Aquaculture Society, San Diego, CA, 2 – 5 March 2010.
- Frimpong, E. A., S. Amisah[#], and Y. B. Ansah*. Relationships among management practices, pond water quality, and receiving stream integrity in central Ghana. Aquaculture 2010. Annual Meeting of the World Aquaculture Society, San Diego, CA, 2 – 5 March 2010.
- Frimpong[#], E. A., and P. L. Angermeier. Life-history traits in stream fish community studies.

138th Annual Meeting of the American Fisheries Society, Special Session on Community Ecology of Stream Fishes, Ottawa, Ontario, Canada. September 2008.

Mattson[#], K., E. A. Frimpong, and P. L. Angermeier. Testing the sensitivity of a rank-based threat assessment index applied to the Upper Tennessee River Basin, USA. US-International Association for Landscape Ecology, 22nd Annual Conference, Tucson, AZ, 9-13 April 2007.

National – 34

- Frimpong[#], E. A. Using freshwater fishes to explore some major assumptions of species distribution models. 143rd Annual Meeting of the American Fisheries Society, Little Rock, AR, 5-12 September, 2013.
- Ansah[#], Y. B., E. A. Frimpong, and E. M. Hallerman. The GIFT tilapia strain in Africa: potential ecological risks and economic benefits. 143rd Annual Meeting of the American Fisheries Society, Little Rock, AR, 5-12 September, 2013.
- Bolton[#], C., B. K. Peoples*, and E. A. Frimpong. Spawning microhabitat use of bluehead chub in a small Virginia stream. 143rd Annual Meeting of the American Fisheries Society, Little Rock, AR, 5-12 September, 2013.
- Huang[#], J., and E. A. Frimpong. Evaluating fish-habitat relationships in the multiscale stream network. 143rd Annual Meeting of the American Fisheries Society, Little Rock, AR, 5-12 September, 2013.
- Liang[#], Y., J. Huang*, and E. A. Frimpong. Improving model precision and accuracy by introducing presence-absence data from a massive fish occurrence dataset. 143rd Annual Meeting of the American Fisheries Society, Little Rock, AR, 5-12 September, 2013.
- Peoples[#], B. K., and E. A. Frimpong. Behavioral responses of bluehead chub and mountain redbelly dace to experimental manipulation of host, associate, and egg-predator abundances. 143rd Annual Meeting of the American Fisheries Society, Little Rock, AR, 5-12 September, 2013.
- Watkins[#], S., and E. A. Frimpong. Complementary indicators: can fully integrating fish and benthic macroinvertebrate IBI metrics better reflect stream condition? 143rd Annual Meeting of the American Fisheries Society, Little Rock, AR, 5-12 September, 2013.
- Walker[#], K., and E. A. Frimpong. Relationship between stream fish morphology and choice of habitat. Annual Biomedical Research Conference for Minority Students (ABRCMS), San Jose, CA, 7-10 November 2012.
- Huang[#], J., and E. A. Frimpong. Modeling optimal habitat for stream fish species with derived historical metacommunity samples. Organization of Fish and Wildlife Information Managers (OFWIM) Conference and Annual Meeting, Austin, TX, 15-18 October 2012.
- Frimpong[#], E. A. The future of traits-based fish ecology and the FishTraits database. Invited symposium presentation. 142nd Annual Meeting of the American Fisheries Society, Minneapolis-St Paul, MN, 19-23 August 2012.
- Ansah[#], Y. B., and E. A. Frimpong. Comparison of the performance of growth models for farmed tilapia. 142nd Annual Meeting of the American Fisheries Society, Minneapolis-St Paul, MN, 19-23 August 2012.
- Deweber[#], J. T., and E. A. Frimpong. The role of physiography in the relationships between land cover and stream fish assemblages. 142nd Annual Meeting of the American Fisheries Society, Minneapolis-St Paul, MN, 19-23 August 2012.
- Huang[#], J., and E. A. Frimpong. Modeling optimal habitat for stream fish species with derived historical metacommunity samples. 142nd Annual Meeting of the American Fisheries Society, Minneapolis-St Paul, MN, 19-23 August 2012.
- Peoples[#], B. K., and E. A. Frimpong. Exploring the consequences of nest association

- among freshwater cyprinids in a multiple working hypothesis framework. 142nd Annual Meeting of the American Fisheries Society, Minneapolis-St Paul, MN, 19-23 August 2012.
- Pendleton*, R. M., J. J. Pritt*, B. K. Peoples^{**}, and E. A. Frimpong. The strength of *Nocomis* nest association contributes to patterns of rarity and commonness in New River, Virginia cyprinids. 97th Annual Meeting of the Ecological Society of America. Portland, OR. 5-10 August 2012.
- Howeth[#], J. G., C. A. Gantz, P. L. Angermeier, E. A. Frimpong, M. Hoff, R. P. Keller, D. M. Lodge, N. E. Mandrak, M. P. Marchetti, J. D. Olden, and C. M. Romagosa. A trait-centered approach to risk assessment of non-native fishes in trade. 97th Annual Meeting of the Ecological Society of America. Portland, OR. 5-10 August 2012.
- Anane-Taabeah^{**}, G., E. A. Frimpong, S. Amisah, and N. W. Agbo. Cage aquaculture adoption-decision process and factors affecting adoption in Ghana. Aquaculture America 2012, Las Vegas, NV, 29 February-2 March, 2012.
- Ansah^{**}, Y. B., E. A. Frimpong, D. Adjei-Boateng, and S. Amisah. Effects of two aquaculture best management practices on tilapia growth. Aquaculture America 2012 Las Vegas, NV, USA, February 29 – March 2, 2012.
- Angermeier[#], P. L., J. H. Roberts, N. P. Hitt, E. A. Frimpong, B. W. Albanese, and P. D. Pegelow. Potential influences of individual mobility and habitat use on vulnerability of stream fish populations to habitat fragmentation. 141st Annual Meeting of the American Fisheries Society, Seattle, WA, 4-8 September 2011.
- Pritt^{**}, J. J., and E. A. Frimpong. Definitions of rarity for stream fishes and factors associated with rarity. 140th Annual Meeting of the American Fisheries Society, Pittsburgh, PA, 12 – 16 September 2010.
- Deweber^{**}, J. T., and, E. A. Frimpong. Physiographically constrained land use/land cover regions for the United States. Annual Meeting of the Organization of Fish and Wildlife Information Managers (OFWIM), 13 - 17 September 2009.
- Deweber^{**}, J. T., and, E. A. Frimpong. Physiographically constrained land use/land cover regions for the United States. 139th Annual Meeting of the American Fisheries Society, Nashville, TN, 31 August - 3 September 2009.
- Henebry^{**}, M. L., and, E. A. Frimpong. Determination of ontogenetic diet shifts for New River fishes. 139th Annual Meeting of the American Fisheries Society, Nashville, TN, 31 August - 3 September 2009.
- Pendleton^{**}, R. M., J. J. Pritt*, and E. A. Frimpong. Identifying strong chub-nest associates along a continuum of reproductive strategies of New River cyprinids. 139th Annual Meeting of the American Fisheries Society, Nashville, TN, 31 August - 3 September 2009.
- Peoples^{**}, B. K., M. B. Tainer*, and E. A. Frimpong. Bluehead chub nesting activity: a potential mechanism of population persistence in degraded streams habitats. 139th Annual Meeting of the American Fisheries Society, Nashville, TN, 31 August - 3 September 2009.
- Peoples^{**}, B. K., R. M. Pendleton*, and E. A. Frimpong. Bluehead chub nesting activity: a possible mechanism of nest-associate persistence in degraded streams. 139th Annual Meeting of the American Fisheries Society, Nashville, TN, 31 August - 3 September 2009.
- Pritt^{**}, J. J., and E. A. Frimpong. The effect of sampling intensity on observed rarity and stream fish community assessment metrics. 139th Annual Meeting of the American Fisheries Society, Nashville, TN, 31 August - 3 September 2009.
- Frimpong[#], E. A., and S. Amisah. Evaluating pond aquaculture effluents through biological assessment of fish and benthic macroinvertebrate assemblages in receiving streams in Ghana. Aquaculture America 2009, Seattle, WA, 14 – 17 February, 2009.
- Orth[#], D. J., K. A. Alexander, E. A. Frimpong, W. Henley, and J. R. Voshell. Investigation

- into smallmouth bass mortality in Virginia Rivers. 18th Annual Conference of the Society of Environmental Journalists, Roanoke, VA, 15 – 19 October, 2008.
- Frimpong[#], E. A. and P. L. Angermeier. Incorporating fish traits into aquatic gap analysis for effective conservation of native species. Invited presentation. Second USGS Gap Analysis Program Working Group Meeting. National Center for Ecological Analysis and Synthesis, Santa Barbara, CA, January 2008.
- Frimpong[#], E. A., and P. L. Angermeier. Mapping the distribution of fish-traits as tool for prioritizing large-scale freshwater conservation. National Gap Analysis Program Conference, Asheville, NC, 10 – 13 September, 2007.
- Frimpong[#], E. A., and P. L. Angermeier. Regional frameworks for fish-based bioassessment in the United States 137th Annual Meeting of the American Fisheries Society, San Francisco, CA, 2 – 7 September, 2007.
- Frimpong[#], E. A., and P. L. Angermeier. Association between benthicity and other traits in North American Freshwater Fishes: implications for predicting species imperilment. 55th Annual Meeting of the North American Benthological Society, Columbia, SC, 3 – 8 June, 2007.
- Frimpong[#], E. A., and P. L. Angermeier. Development of fish-community metrics for nationwide assessment of ecological health: Concepts and analytical approach. First USGS Gap Analysis Program Working Group Meeting National Center for Ecological Analysis and Synthesis, Santa Barbara, CA, 16 – 20 January, 2006.

Regional – 22

- Floyd^{*#}, S. P., B. K. Peoples^{*}, and E. A. Frimpong. Identifying potential cheaters in a mutualistic nest association among North American minnows. Annual Meeting of the Southern Division of American Fisheries Society, Wheeling, WV, 17-21 February, 2016.
- Buckwalter^{**}, J., and E. A. Frimpong. (Accepted abstract) Exploring New River stream fish invasions. New River Symposium, Fisheries Science Session, Radford, VA. May 19, 2015.
- Buckwalter^{**}, J., and E. A. Frimpong. The spread and traits of introduced stream fishes in the middle and upper New River drainage. Annual Meeting of the Southern Division of the American Fisheries Society, Savannah, GA. January 29-February 1, 2015.
- Floyd^{*#}, S. P., B. K., Peoples^{*}, and E. A. Frimpong. Investigating the role of parental care in Nocomis nest association. Annual Meeting of the Southern Division of the American Fisheries Society, Savannah, GA. January 29-February 1, 2015.
- Peoples^{*}, B. K., P. Cooper, E. Hallerman[#] and E. A. Frimpong. Identification of stream-collected larval minnows by morphometric and molecular methods. Virginia Chapter of the American Fisheries Society. Blacksburg, VA, February 2015.
- Peoples^{*#}, B.K. and E. A. Frimpong. Communal spawning with a facilitator drives stream fish community structure: preliminary evidence for the stress-gradient hypothesis. Invited symposium presentation: Ecology and Conservation of Cypriniform Fishes. Annual Meeting of the Southern Division of the American Fisheries Society, Savannah, GA. January 29-February 1, 2015.
- Floyd^{*#}, S. P., B. K., Peoples^{*}, and E. A. Frimpong. Investigating the role of parental care in Nocomis nest association. Southeastern Fishes Council, Asheville, NC. November 14-15, 2014.
- Peoples^{*#}, B. K. and E. A. Frimpong. Communal spawning with a facilitator drives stream fish community structure: preliminary evidence for the stress-gradient hypothesis. Southeastern Fishes Council, Asheville, NC, November 14-15 2014.

- Peoples^{**}, B. K., C. Olinger^{*} and E.A. Frimpong. January 2014. Longitudinal patterns of stream fish assemblages in the interior highlands of Honduras. Southern Division of the American Fisheries Society. Charleston, SC, 22-26 January 2014.
- Peoples^{**}, B. K., and E. A. Frimpong. The New River basin: a natural laboratory for addressing complex ecological questions. New River Symposium. Radford, VA, 30-31 May, 2013.
- Peoples^{**}, B. K., R. A. MacManamay, D. J. Orth, and E. A. Frimpong. Nesting habitat use by river chubs in a hydrologically variable Appalachian tailwater. Spring Meeting of the Southern Division of the American Fisheries Society, Nashville, TN, 7-10 February 2013.
- Anane-Taabeah^{**}, G., and E. A. Frimpong. Cage aquaculture adoption-decision process in Ghana. 28th Annual Graduate Student Assembly (GSA) Research Symposium. Blacksburg, VA, March 28, 2012.
- Huang^{**}, J., and E. A. Frimpong. Modeling the spatial distribution of stream fish based on metacommunities. OGIS 2012 Symposium, Blacksburg, VA, April 2012. (Third Place, best poster)
- Pendleton^{*}, R. M., J. J. Pritt^{*}, B. K Peoples^{**}, and E. A. Frimpong. The strength of *Nocomis* nest association contributes to patterns of rarity and commonness in New River, Virginia cyprinids. Annual meeting of the Mid-Atlantic chapter of Ecological Society of America. Blacksburg, VA. 14-15 April, 2012. (First Place, best student paper)
- Pendleton^{*}, R. M., J. J. Pritt^{*}, B. K Peoples^{**}, and E. A. Frimpong. The strength of *Nocomis* nest association contributes to patterns of rarity and commonness in New River, Virginia cyprinids. Joint meeting of the VA and Virginia Tech chapter of AFS. Blacksburg, VA. 31 January-February 2, 2012. (First Place, best student paper)
- Peoples^{**}, B. K., and E. A. Frimpong. A snapshot analysis of age distributions of fishes in urban and forested Virginia streams. Annual Meeting of the Southeastern Fishes Council, Athens, TN, 10 – 11 November 2011.
- Frimpong[#], E. A. Symbiotic reproduction and patterns of rarity versus commonness among New River, Virginia, cyprinids. Annual Meeting of the Southeastern Fishes Council, Athens, GA, 11 – 12 November 2010.
- Pritt^{**}, J. J., and E. A. Frimpong. Definitions of rarity for North American freshwater fishes and the biological traits associated with rarity. Annual Meeting of the Southeastern Fishes Council, Athens, GA, 11 – 12 November 2010.
- Peoples^{**}, B. K., and E.A. Frimpong. 2010. Mechanisms of stream fish population impairment and persistence in urban habitats. Arkansas-Oklahoma Chapters of AFS 2010 joint meeting. Fort Smith, AR. February 2-4, 2010.
- Henebry^{*}, M. L., and E. A. Frimpong[#]. Determination of lengths at ontogenetic diet shift: a method and application to fishes of the New River. Student Colloquium of the Southern Division of the American Fisheries Society, Blacksburg, VA, 16-17 October 2009.
- Peoples^{**}, B. K., and E. A. Frimpong. Bluehead chub nesting activity: a potential mechanism of population persistence in degraded streams habitats. Student Colloquium of the Southern Division of the American Fisheries Society, Blacksburg, VA, 16-17 October 2009.
- Pritt^{**}, J. J., and E. A. Frimpong. A classification of rarity for North American freshwater fishes and implications for research and management of rare species. Student Colloquium of the Southern Division of the American Fisheries Society, Blacksburg, VA, 16-17 October 2009.
- Orth[#], D. J., K. A. Alexander, E. A. Frimpong, W. Henley, and J. R. Voshell. Investigation into smallmouth bass mortality in Virginia Rivers. Virginia Chapter of American Fisheries Society Annual Meeting, Lexington, VA, February 10 – 12, 2009.
- Hitt[#], N. P., E. A. Frimpong, and P. L. Angermeier. Using fish communities to assess the quality of freshwaters: Applications at multiple spatial-scales. Deans' Forum on the

Environment, Blacksburg, VA, 26 February, 2007.

15. Translations

N/A

16. Abstracts

N/A

C. Sponsored research and other grant awards

- Total number of grants and contracts = **16**
- Total grants and contracts contribution based on percent budget I control = **\$ 1,983,486**

Title	Investigators	Years	% of Budget Under Direct Control	Source	Amount
Refining stream fish distribution models regionally for a nationally-consistent aquatic gap analysis	E. Frimpong (PI)	2013-2016	100	U.S. Geological Survey, Aquatic Gap Analysis Program	\$275,000
Identifying local strains of <i>Oreochromis niloticus</i> that are adapted to climate change	E. Frimpong (PI)	2013-2018	100	USAID AquaFish Innovation Lab	\$367,557 of \$1,500,000
Data consolidation and development of an improved web-accessible public database on traits and distribution of North American Freshwater Fishes (Extension with additional funding)	E. Frimpong (PI) Z. Xie (co-PI)	2013-2014	100	U.S. Geological Survey, Aquatic Gap Analysis Program	\$61,000
Preliminary application of a framework for modeling habitat suitability and distribution of stream fishes with field-testing	E. Frimpong (PI)	2012-2013	100	U.S. Geological Survey, Aquatic Gap Analysis / Biological Informatics Program	\$50,400

Experimental pond unit assessment of AquaFish CRSP research sites in Ghana	E. Frimpong (PI)	2012-2013	100	USAID AquaFish CRSP flow-through from Oregon State and Purdue University (in collaboration with the University of Arkansas at Pine Bluff)	\$201,000 of \$440,000
Research experience for undergraduates (REU) supplement – Testing the effect of context on a nest association mutualism of stream fishes in a comparative-advantage biological market framework.	E. Frimpong (PI)	2012-2012	100	National Science Foundation, Division of Environmental Biology, Population and Community Ecology cluster	\$7,480
Testing the effect of context on a nest association mutualism of stream fishes in a comparative-advantage biological market framework.	E. Frimpong (PI)	2011-2013	100	National Science Foundation, Division of Environmental Biology, Population and Community Ecology cluster	\$199,069
Data consolidation and development of an improved web-accessible public database on traits and distribution of North American freshwater fishes.	E. Frimpong (PI)	2011-2013	100	U.S. Geological Survey, Aquatic Gap Analysis / Biological Informatics Program	\$197,103
Enhancing the profitability of small	E. Frimpong (PI)	2011-2012	100	Norman E. Borlaug	\$19,660

aquaculture operations in Ghana through improved resource management and environmental best management practices.	[Application on behalf of PhD student Yaw Ansah]			LEAP fellowship. USAID via University of California, Davis.	
Enhancing the profitability of small aquaculture operations in Ghana, Kenya, and Tanzania through improved resource management and environmental best management practices.	E. Frimpong (PI)	2010-2013	100	USAID AquaFish CRSP through Oregon State University (and collaboration with Purdue University)	\$220,250 of \$400,000
Development of assessment tools for evaluating stream and watershed responses to climate change along thermal gradients.	P. Angermeier (PI) E. Frimpong (co-PI)	2010-2013	43	USDA Forest Service	\$30,000 of \$70,000
Environmentally sustainable development of new species and technologies for diversification of Ghana's aquaculture.	E. Frimpong (PI)	2009-2011	100	USAID AquaFish CRSP flow-through from Oregon State and Purdue University (in collaboration with the University of Arkansas at Pine Bluff)	\$143,205 of \$700,000
Spatial analysis of relations among conservation practices, aquatic biodiversity, ecosystem services, and human well-being in the Albemarle-Pamlico Basin.	P. Angermeier (PI) E. Frimpong (co-PI) [Budget not separated into individual PI accounts, therefore % effort	2008-2011	50	U.S. Geological Survey, Aquatic Gap Analysis Program	\$58,328 of \$116,657

	reported to Office of Sponsored Programs is used as a proxy]				
Characterization of aquaculture effluents and biological and physicochemical assessment of receiving waters in Ghana.	E. Frimpong (PI)	2007-2009	100	USAID AquaFish CRSP flow through from Oregon State and Purdue University (in collaboration with the University of Arkansas at Pine Bluff)	\$113,912 of \$400,000
Investigation into smallmouth bass mortality in Virginia rivers	D. Orth, K. Alexander, E. Frimpong (co-PI), W. Henley, J. R. Voshell	2008-2009	27	Virginia Department of Game and Inland Fisheries	\$27,023 of \$99,569
Linking traits of at-risk fish species with types of human impact: a test of concept	E. Frimpong (PI) P. Angermeier [Budget not separated into individual PI accounts, therefore % effort reported to Office of Sponsored Programs is used as a proxy]	2008-2009	50	U.S. Geological Survey, Aquatic Gap Analysis Program	\$12,499 of \$24,998
TOTAL Grant Involvement, including external collaborators					\$4,325,936
TOTAL Grants to Virginia Tech, including Virginia Tech co-PIs					\$2,166,860
My Contribution to Virginia Tech (i.e., budget under my direct control)					\$1,983,486

D. Invited keynote presentations or lectures - 12

Commencement Speaker, College of Agriculture and Natural Resources, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, 2nd July 2015.

Frimpong, E. A. March 31st 2016, University of Georgia, Athens, Warnell School of Forestry and Natural Resources and the Odum School of Ecology - "Freshwater fish-fish mutualism".

Frimpong, E. A. March 3rd 2016, Clemson University, Department of Forestry and Environmental Conservation – "The role of positive interspecific interactions in population dynamics: stream fish case studies from habitat use to range-wide distributions to ecosystem invasions".

Frimpong, E. A. Should GIFT be introduced into Ghana? Stakeholders' Workshop on the Possibility of Introducing Genetically Improved Farmed Tilapia (GIFT) into Ghana's Aquaculture Industry. Ministry of Fisheries and Aquaculture Development, Accra, Ghana, February 26, 2015.

Frimpong, E. A. Africa aquaculture statistics: Good data, bad data, whose data? Regional Meeting of the AquaFish Innovation Lab, African region. Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

Frimpong, E. A. Mutualisms ignored. Ecology, Evolution, and Behavior (EEB) Seminar, Virginia Tech. 20 September, 2012.

Frimpong, E. A. Rarity of organisms: exploring its definitions and biological causes using freshwater fishes. Graduate Seminar, Department of Forestry and Natural Resources, Purdue University. 27 March, 2012.

Frimpong, E. A. Biotic interactions. Guest Lecture. Senior Fish Ecology class. Department of Forestry and Natural Resources, Purdue University. 27 March, 2012.

Frimpong, E. A. A conversation on sub-Saharan Africa aquaculture, fish ecology, and climate change. Graduate Seminar. Aquaculture and Fisheries Center, University of Arkansas at Pine Bluff. 11 October, 2011.

Frimpong, E. A. A research career from ecology to aquaculture and everything in-between. Undergraduate Seminar. Aquaculture and Fisheries Center, University of Arkansas at Pine Bluff. 11 October, 2011.

Frimpong, E. A. Rarity of freshwater fishes: definitions, mechanisms, prediction, and conservation practice. Texas State University, Department of Biology. March 13, 2010.

Frimpong, E. A. Fish and macroinvertebrate assemblages: alternative or complementary indicators of stream condition in agricultural landscapes? Virginia Tech Chapter of the American Fisheries Society, 7 November, 2006. Blacksburg, VA.

E. Editorships, curatorships, etc.

Freshwater Biology journal - Editorial Board Member (2016 -)

Chair of *American Fisheries Society (AFS) Publications Overview Committee* (2015 – present) – Duties include assisting publications director and staff in recruitment of journal editors, evaluation of publisher bids for society journals, directing development and review of journal editorial policies, evaluation of journal competitiveness and

recommendation of strategies for improved communication of science and conservation/management knowledge through society journals.

F. Economic contributions and entrepreneurship

N/A

G. Intellectual Properties

N/A

VI. International and Professional Service and Additional Outreach Activities

A. International programs accomplishments

1. International recognition and awards

July 2015: Citation received from Kwame Nkrumah University of Science and Technology (Ghana), Department of Fisheries and Watershed Management – Recognized for contribution to research and development of aquaculture and fisheries program.

2. International research collaborations

I am currently undertaking research in Ghana, Kenya, and Tanzania as part of USAID AquaFish CRSP/Innovation Lab-sponsored aquaculture development and fisheries projects targeting several sub-Saharan African countries. My involvement includes research and training activities reported in detail elsewhere in this document.

3. Other international activities

University of Development Studies, Ghana. Review of a dossier for promotion to Associate Professor, February 2016.

June 2012-present; External Examiner for MPhil thesis of Ms. Gifty Attu in the Department of Fisheries and Watershed Management, Kwame Nkrumah University of Science and Technology, Ghana. (Thesis title: "Aquaculture and market potential of the African snakehead *Parachanna obscura*").

July-November 2012: External examiner for the Ph.D. Dissertation of Ms. Irene Naigaga in the Department of Ichthyology and Fisheries Science, Rhodes University, Grahamstown, South Africa. (Tentative Dissertation Title: "Development and assessment of biomonitoring methods and use biomarkers to gauge pollution in Ugandan wetlands").

May-July 2011: External examiner for the Ph.D. Dissertation of Ms. Hamda Azmat in the Department of Zoology and Fisheries, Faculty of Sciences, University of Agriculture, Faisalabad, Pakistan. (Dissertation Title: "Studies on 96-HR LC 50 and lethal responses of major carps in relation to their growth and bioaccumulation of waterborne metals").

October-December 2010: External and technical reviewer of a proposed BS program in Aquaculture, Fisheries, and Water Resources for Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

January-April 2009: External examiner for the Ph.D. Dissertation of Mr. Abdul Rauf in the Department of Zoology and Fisheries, Faculty of Sciences, University of Agriculture, Faisalabad, Pakistan. (Dissertation Title: "Studies on metal eco-toxicity of the River Ravi stretch from Lahore to Baloki headwaters, Pakistan").

November 2008-April 2009: Proposal reviewer in the Korean Ministry of Education/ Korean-US Science Foundation World Class University (WCU) Program in several rounds of screening and two rounds of panel reviews.

B. Professional Service accomplishments

1. Service as an officer of an academic or professional association

2014 - present: Member of American Fisheries Society Continuing Education Committee

2014 - present: Member of World Aquaculture Society Honors and Awards Committee.

2013 - present: Member of American Fisheries Society Publications overview Committee.

2012 - 2014: Chair of American Fisheries Society Continuing Education Committee

2011 - 2012: Co-chair of American Fisheries Society Continuing Education Committee.

2. Other service to profession or field

I have completed 114 peer-review requests for journals and publishers since 2005 at an average of 9-10/year. In December 2010, I reviewed and short-listed 93 student abstracts presented for the 2011 meeting of the Southern Division of AFS for the best student paper contest. I have also reviewed multiple research grant applications, presented in section C-5.

March 2016 & August 2016 – Proposal review panel (44 total) for the Institute of International Education, Carnegie African Diaspora Fellowship Program.

June 2016 – Review Panel for USAID-PEER grant proposals administered by the National Academies of Sciences, Engineering, and Medicine.

April 2015 – Evaluated a grant application for the international foundation for science.

September-October 2012 - Reviewed a major OPUS grant application for the NSF Population and Community Ecology program

April-May 2012 – Reviewed a major grant application for the NSF Science and Technology Centers program.

April 2011 – Reviewed a grant application for the USAID AquaFish CRSP program.

3. Professional meetings, panels, workshops, etc. led or organized - 12

August 4-6, 2014 – First national workshop on Pond Aquaculture Best Management Practices (BMPs), Morogoro, Tanzania. Workshop was attended by 80 farmers, and government agency officials. Sponsored by USAID AquaFish Innovation Lab.

July 2-5, 2013 – Organized and presented a national workshop on Pond Aquaculture Best Management Practices in Tarkwa, Ghana. Workshop was attended by 180 farmers, and government agency officials. Sponsored by USAID AquaFish CRSP.

January 11, 2013 – Co-organized and presented a national Women's Training Program for Commercial Aquaculture at the Aquaculture Research and Development Center (ARDEC), Akosombo, Ghana. Workshop was attended by 40 fish processors/traders, farmers, and government agency officials. Sponsored by USAID AquaFish CRSP

January 8-9, 2013 – Co-organized and presented a national Women's Training Program for Commercial Aquaculture at the International Centre for Innovative Learning, KNUST, Kumasi, Ghana. Workshop was attended by 50 fish processors/traders, farmers, and government agency officials. Sponsored by USAID AquaFish CRSP.

Organized and presented a national workshop on Pond Aquaculture Best Management Practices (BMPs) in, Sunyani, Ghana. Workshop was attended by 130 farmers, and government agency officials. June 11-15, 2012.

Co-led the first face-to-face meeting of the USGS Aquatic Gap Analysis (AGAP) Working Group to re-scope the AGAP program. Annapolis, MD, 6 – 9 November 2011.

Organized a research design and protocol training workshop for local researchers, fisheries extension officers, and fish farmers in Kenya. Program was attended by 30 participants. Sponsored by USAID AquaFish CRSP in collaboration with the Kenyan Ministry of Fisheries and the Fish Farming Enterprise and Productivity Program. Eldoret, Kenya, 21 – 23 September, 2011.

Co-led the planning meeting of the USGS AGAP Working Group to re-scope the Aquatic Gap Analysis program, held at the 141st Annual Meeting of the American Fisheries Society, Seattle, WA, 3 September, 2011.

Organized and presented a national workshop on Pond Aquaculture Best Management Practices (BMPs) in Ghana. Workshop was attended by 150 farmers and government agency officials and reported on national and African media. Sponsored by USAID AquaFish CRSP. Kumasi, Ghana, 12 – 15 July, 2011.

Co-organized a workshop for stakeholders on Future Scenarios of Ecosystem Services in the Albemarle-Pamlico Basin (VA, NC) at the US EPA, March 24 – 25, 2011, Raleigh, NC.

Organized and taught Experimental Design and Analysis for Aquaculture Professionals in Ghana (July 28-30, 2010). Workshop was sponsored by USAID AquaFish CRSP and attended by 22 participants, including lecturers/researchers, technicians, and students.

Co-led the Risk Ranking Working group of the National Fish Habitat Action Plan (NFHAP) and USGS Gap Analysis Programs, first meeting to develop source and stressor risk ranking approaches for nation-wide applications, 20–23 May, 2008, Reston, VA.

C. Additional outreach and extension activities and outcomes

1. Peer evaluation of extension program(s)

N/A

2. Professional achievements in program development, implementation, and evidence of impact

N/A

3. Outreach and extension publications, including trade journals, newsletters, websites, journals, multimedia items, etc. - 4

Frimpong, E. A., G. Anane-Taabeah, S. Amisah, A. Ampofo-Yeboah, and K. Quagrainie. 2015. How will tilapia be affected by Ghana's changing climate? AQUANEWS 30(1):2-4.

Frimpong, E. A., and I. E. M. Fynn. Tilapia aquaculture in Ghana: ponds can contribute more to overall production, food security. Global Aquaculture Advocate (July/August 2014.): 18-21

Delince, G., and E. Frimpong. 2012. Summary and comments of the discussion on Extension Support on SARNISSA. Sustainable Aquaculture Research Networks in Sub Saharan Africa, Stirling, UK. 20 pp. Available at <http://www.sarnissa.org/tikiindex.php?page=SARNISSA++Project+Publications>

Agbo, N., S. Amisah, E. Frimpong, and K. Quagrainie. 2011. Development and diversification of indigenous species for aquaculture in Ghana. AQUANEWS 26(3): 1, 12.

Frimpong, E. A., and P. L. Angermeier. 2009. Web-based FishTraits database. Available at <http://www.fishtraits.info>.

4. Presentations in area of expertise to community and civic organizations, including schools and alumni groups, etc.

Community meeting in Galax on December 3rd 2009 to present results of biological assessment of Chestnut Creek conducted with my graduate students and the Fisheries Techniques class. The activities were supported by the Matthews National Forest foundation through the CNRE office of Engagement.

5. Service on external boards, commissions, and advisory committees

March 2014 – present: Invited Member, Tropical Biology Association African Alumni Group Scientific Advisory Board.

January 2013 – present: Member NSF National Ecological Observatory Network (NEON - STREON), Stream Sampling Methods Expert Panel.

June 2011 – present: Co-chair (With Dana Infante, Michigan State University) of a Working Group tasked to re-scope USGS Aquatic GAP Program.

April 2011 – present: USFWS-USEPA, The Nature Conservancy & Great Lakes Restoration Initiative - Fish Risk Assessment Working Group to formulate approaches to assess risks of species invasions in the Great Lakes.

January 2009 – May 2010: Nature Reader Panel – An advisory panel constituted by invitation only by the journal *Nature*. This panel contributed ideas to development of *Nature* products, including print and web-based products.

July 2009 – Participated in research proposal reviews for the USGS National Climate Change and Wildlife Science Center. Reviewed 6 proposals.

November 2008 & April 2009: Participated in the Bioscience and Natural Science proposal review panels of the Korean-US Science Foundation World Class University Program. Panels were constituted by invitation and reviews were conducted in Alexandria, VA using the US NSF format. Reviewed 10 proposals in two sessions.

October 2008: USGS National Fish Habitat Action Plan (NFHAP) research proposal reviews. Reviewed 8 proposals.

January 2008-2009: Risk Ranking Working group of the NFHAP and USGS Gap Analysis Programs (GAP). Participated in several teleconferences by the GAP and NFHAP programs January-June 2008. Attended and Co-led working group's first meeting to develop source and stressor risk ranking approaches for nation-wide applications, 20–23 May, 2008, Reston, VA.

January 2006-2008: National Aquatic Gap Analysis Advisory Group. Attended Second USGS GAP Working Group Meeting: A Search for New Paradigms to Guide Future Research. National Center for Ecological Analysis and Synthesis, Santa Barbara, CA, 15–17 January, 2008. Attended First USGS GAP Working Group Meeting: A Search for New Paradigms to Guide Future Research. National Center for Ecological Analysis and Synthesis, Santa Barbara, CA, 16–20 January, 2006.

6. Expert witness/testimony

N/A

7. Consulting that is consistent with university/department priorities

March 2015-November 2015: Ministry of Fisheries and Aquaculture Development- Ghana. West Africa Regional Fisheries Program (WARFP) for Ghana. Aquaculture business Models development.

September 2013-December 2014: Food and Agriculture Organization (FAO) of the United Nations case study of the Social and Economic Performance of Tilapia Farming in Ghana.

I have provided more than 50 hours in statistical consulting on thesis and other research projects to students and technicians on whose research committees I did not serve. A sample of these students are: Barkley, DuRant, Gorman, Hahn, Johnson, Lahey, Lapointe, Matson, Persapane, Riley (undergrad), Roberts, Roghair, Thorson, Villamagna, and Vincie.

8. Recognitions and awards for outreach and extension effectiveness

N/A

VII. University Service

A. University meetings, panels, workshops, etc. led or organized

N/A

B. Department, college, and university service, including administrative responsibilities

FWC ad hoc committee to develop guidelines and strategies for departmental teaching assistantships resources and student training, 2016 – present.

FWC ad hoc committee to review and develop policies for international research travel, 2016 – present.

CNRE faculty Association - FWC department representative to college nominating committee, 2016 – present.

2015-2016: Member of the Promotion and Tenure Committee, Department of Fish and Wildlife Conservation, College of Natural Resources and Environment, Virginia Tech.

FiW Faculty Search Committee, August 2015-March 2016.

FWC departmental graduate affairs committee, 2014 - present

University commencement, Usher, May 2014

June 2013-present: Member of Executive Committee, Department of Fish and Wildlife Conservation, College of Natural Resources and Environment, Virginia Tech.

June 2013-March 2014: Co-chair, Department Head Search Committee, Department of Fish and Wildlife Conservation, College of Natural Resources and Environment, Virginia Tech.

August 2013-December 2014: Member of the Promotion and Tenure Committee, Department of Fish and Wildlife Conservation, College of Natural Resources and Environment, Virginia Tech.

June 2012-June 2013: Member of the Organizing Committee, National Diversity Conference: The Future of Diversity in Our Disciplines and Careers, 19-21 June 2013, Virginia Tech, Blacksburg, VA.

FiW Faculty Search Committee, August 2012-April 2013.

University commencement, Assistant Marshall, May 2011

CNRE Faculty Association Nominating Committee 2009/2010; 2010/2011; 2011/2012; 2012/2013

Proposals reviewed: Virginia Tech Graduate Research Awards (3/08), 3 applicants

Proposals reviewed: Virginia Agricultural Experiment Station (10/07; 02/09; 07/12)

University commencement, Assistant Marshall, May 2008

Extension Faculty (FiW) Search Committee, November 2007-August 2008

C. Contributions to diversity

Panel Member, SEEDS Howard University and ESA-Careers in Ecology program (for minority students), Mountain Lake Biological Station, May 24, 2014.

Planning committee for the College of Natural Resources and Environment 2013 diversity conference (April 2012 – June 2013)

CNRE representative to the Virginia Tech Minority-Serving Institution Advisory Council

D. Service to students— involvement in co-curricular activities, advising students organizations, etc.

Faculty advisor (2007-2009), Virginia Tech Chapter of the American Fisheries Society

VIII. Work Under Review or In Progress

A. Work submitted and under review

B. Work in progress (Selected)

IX. Other Pertinent Activities