COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE/if not in response to a program announcement/solicitation enter NSF 11-1

FOR NSF USE ONLY

NSF PROPOSAL NUMBER

1314909

FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S) (Indicate the most specific unit known, i.e. program, division, etc.)

DEB - Ecosystem Studies

DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNS# (Data Universal Numbering System)	FILE LOCATION
11/30/2012	1	08010000 DEB	1181	041065129	11/30/2012 5:13pm

EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)

SHOW PREVIOUS AWARD NO. IF THIS IS
☐ A RENEWAL
☐ AN ACCOMPLISHMENT-BASED RENEWAL

0949317

IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES ☐ NO ☐ IF YES, LIST ACRONYM(S)

NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE

Miami University

AWARDEE ORGANIZATION CODE (IF KNOWN)

0030775000

ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE

Miami University
500 E High Street
Oxford, OH. 450560000

NAME OF PRIMARY PLACE OF PERF

ADDRESS OF PRIMARY PLACE OF PERF, INCLUDING 9 DIGIT ZIP CODE

IS AWARDEE ORGANIZATION (Check All That Apply) (See GPG II.C For Definitions)
☐ SMALL BUSINESS ☐ MINORITY BUSINESS
☐ FOR-PROFIT ORGANIZATION ☐ WOMAN-OWNED BUSINESS

☐ IF THIS IS A PRELIMINARY PROPOSAL THEN CHECK HERE

TITLE OF PROPOSED PROJECT **Collaborative Research: Nutrient co-limitation in young and mature northern hardwood forests**

REQUESTED AMOUNT	PROPOSED DURATION (1-60 MONTHS)	REQUESTED STARTING DATE	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE
$ **15,000**	**0** months		

CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW

☐ BEGINNING INVESTIGATOR (GPG I.G.2)
☐ DISCLOSURE OF LOBBYING ACTIVITIES (GPG II.C.1.e)
☐ PROPRIETARY & PRIVILEGED INFORMATION (GPG I.D, II.C.1.d)
☐ HISTORIC PLACES (GPG II.C.2.j)
☐ EAGER* (GPG II.D.2) ☐ RAPID** (GPG II.D.1)
☐ VERTEBRATE ANIMALS (GPG II.D.6) IACUC App. Date _____
PHS Animal Welfare Assurance Number _____

☐ HUMAN SUBJECTS (GPG II.D.7) Human Subjects Assurance Number _____
Exemption Subsection _____ or IRB App. Date _____
☐ INTERNATIONAL COOPERATIVE ACTIVITIES: COUNTRY/COUNTRIES INVOLVED (GPG II.C.2.j)
_____
☐ HIGH RESOLUTION GRAPHICS/OTHER GRAPHICS WHERE EXACT COLOR REPRESENTATION IS REQUIRED FOR PROPER INTERPRETATION (GPG I.G.1)

PI/PD DEPARTMENT
Zoology

PI/PD FAX NUMBER

PI/PD POSTAL ADDRESS

212 Pearson Hall
Oxford, OH 54056
United States

NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Electronic Mail Address
PI/PD NAME **Melany C Fisk**	**PhD**	**1995**	**513-529-3181**	**fiskmc@muohio.edu**
CO-PI/PD				
CO-PI/PD				
CO-PI/PD				
CO-PI/PD				

Electronic Signature

CERTIFICATION PAGE

Certification for Authorized Organizational Representative or Individual Applicant:

By signing and submitting this proposal, the Authorized Organizational Representative or Individual Applicant is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding debarment and suspension, drug-free workplace, lobbying activities (see below), responsible conduct of research, nondiscrimination, and flood hazard insurance (when applicable) as set forth in the NSF Proposal & Award Policies & Procedures Guide, Part I: the Grant Proposal Guide (GPG) (NSF 11-1). Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U. S. Code, Title 18, Section 1001).

Conflict of Interest Certification

In addition, if the applicant institution employs more than fifty persons, by electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative of the applicant institution is certifying that the institution has implemented a written and enforced conflict of interest policy that is consistent with the provisions of the NSF Proposal & Award Policies & Procedures Guide, Part II, Award & Administration Guide (AAG) Chapter IV.A; that to the best of his/her knowledge, all financial disclosures required by that conflict of interest policy have been made; and that all identified conflicts of interest will have been satisfactorily managed, reduced or eliminated prior to the institution's expenditure of any funds under the award, in accordance with the institution's conflict of interest policy. Conflicts which cannot be satisfactorily managed, reduced or eliminated must be disclosed to NSF.

Drug Free Work Place Certification

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Drug Free Work Place Certification contained in Exhibit II-3 of the Grant Proposal Guide.

Debarment and Suspension Certification

(If answer "yes", please provide explanation.)

Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency? Yes ☐ No ☒

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Debarment and Suspension Certification contained in Exhibit II-4 of the Grant Proposal Guide.

Certification Regarding Lobbying

The following certification is required for an award of a Federal contract, grant, or cooperative agreement exceeding $100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding $150,000.

Certification for Contracts, Grants, Loans and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:
(1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, ''Disclosure of Lobbying Activities,'' in accordance with its instructions.
(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Certification Regarding Nondiscrimination

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative is providing the Certification Regarding Nondiscrimination contained in Exhibit II-6 of the Grant Proposal Guide.

Certification Regarding Flood Hazard Insurance

Two sections of the National Flood Insurance Act of 1968 (42 USC §4012a and §4106) bar Federal agencies from giving financial assistance for acquisition or construction purposes in any area identified by the Federal Emergency Management Agency (FEMA) as having special flood hazards unless the:
(1) community in which that area is located participates in the national flood insurance program; and
(2) building (and any related equipment) is covered by adequate flood insurance.

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant located in FEMA-designated special flood hazard areas is certifying that adequate flood insurance has been or will be obtained in the following situations:
(1) for NSF grants for the construction of a building or facility, regardless of the dollar amount of the grant; and
(2) for other NSF Grants when more than $25,000 has been budgeted in the proposal for repair, alteration or improvement (construction) of a building or facility.

Certification Regarding Responsible Conduct of Research (RCR)
(This certification is not applicable to proposals for conferences, symposia, and workshops.)

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative of the applicant institution is certifying that, in accordance with the NSF Proposal & Award Policies & Procedures Guide, Part II, Award & Administration Guide (AAG) Chapter IV.B., the institution has a plan in place to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduates, graduate students and postdoctoral researchers who will be supported by NSF to conduct research. The undersigned shall require that the language of this certification be included in any award documents for all subawards at all tiers.

AUTHORIZED ORGANIZATIONAL REPRESENTATIVE	SIGNATURE	DATE
NAME **Tricia L Callahan**	**Electronic Signature**	**Nov 30 2012 5:11PM**

TELEPHONE NUMBER	ELECTRONIC MAIL ADDRESS	FAX NUMBER
513-529-3600	**callahtl@muohio.edu**	**513-529-3762**

* EAGER - EArly-concept Grants for Exploratory Research
** RAPID - Grants for Rapid Response Research

SUMMARY OF PROPOSED WORK

We are requesting a supplement for Research Experience for Teachers, to involve two teachers in our research of nutrient co-limitation in hardwood forests. Our objectives are to provide two K-12 teachers the opportunities to: 1) participate in field and laboratory research with our crew and conduct their own scientific research; 2) develop curricular materials that enhance student learning of the concepts and the process of science; and 3) integrate those curricular materials under the National Governors Association Common Core Standards to enhance student development of critical science literacy skills. In New Hampshire, the state in which our field sites are located, there is a clear need to improve student science achievement based on results of assessment testing. Involving local teachers in research through the proposed RET addresses this need in a practical and effective way by offering teachers the chance to participate in locally relevant environmental science research and to bring these experiences into the classroom students in related curricular activities. The project is well suited to training teachers through integration within a research team comprised of undergraduate and graduate students, professors, and Forest Service scientists, working together at the Bartlett Experimental Forest in New Hampshire.

Research Experience

The project on Multiple Element Limitation in Northern Hardwood Ecosystems (MELNHE) provides excellent opportunities for exposure to scientific research because it involves many researchers who interact closely to integrate research on many topic areas. In addition to the nine stands of three ages at the Bartlett Experimental Forest originally funded by NSF, we are working in mid-aged and mature stands at Jeffers Brook and at the Hubbard Brook Experimental Forest, which provides a gradient in site fertility. There were five PIs initially funded on collaborative proposals, and four more have written other proposals to fund their work in our sites. The teacher will be part of a summer research team including multiple graduate and undergraduate students from several institutions, who are working on a wide range of questions related to plant, soil, and microbial components of the forest ecosystem. There is also a continuous flow of visiting scientists, foreign exchange students, and visitors from other projects. Interactions are centered at the house, dormitory, and laboratory space at the Bartlett Experimental Forest, where shared housing, meals, and informal evening research discussions contribute to the chances for interactions with scientists at all levels of development.

Nature and form of teacher's involvement

The diversity of research topics will give the RET participants the opportunity to learn about and contribute to a variety of measurements at these sites, including tree biomass, productivity, leaf area, and tissue chemistry, regeneration success, belowground allocation, litterfall nutrient flux, and soil nutrient transformations. There are opportunities for laboratory experiments, for example on nitrogen mineralization and microbial respiration, as well as field experiments. Teachers will have the opportunity to participate in measurements of interest, to work with any of the data associated with the project, including years of observations from the previous round of funding, and to develop and carry out their own research projects. Additional time can be spent assisting in other field and lab work on the project. All interns and graduate students are expected to present work at the annual Hubbard Brook Cooperators meeting. Presenting at the Hubbard Brook meeting would be an exciting opportunity for an RET participant and we would encourage a presentation if appropriate to the participant's project.

Curriculum Development

With so many research topics there are ample opportunities for curriculum development. Perhaps most exciting is the opportunity presented in authentic research for integrating instruction across disciplines. Science units developed by RET participants will be aligned with both the current NH Science Frameworks and the forthcoming Next Generation Science Standards. Integrating across disciplines, these units will also address critical elements identified in the Common Core Standards.

Cycles of matter and flow of energy in ecosystems is identified as a core idea in *A Framework for K-12 Science Education Practices, Crosscutting Concepts and Core Ideas* (2011), the primary document behind the current development of the Next Generation Science Standards. These ideas are also addressed in the NH Science Frameworks as shown in the examples below.

- Science (S:LS2:8:2.2) Given a scenario, trace the flow of energy through an ecosystem, beginning with the sun, through organisms in the food web, and into the environment.

- Science (S:LS2:8:3.4) Describe how matter is recycled within ecosystems and explain that the total amount of matter remains the same, though its form and location change.
- Science (S:LS2:8:3.6) Given an ecosystem, trace how matter cycles among and between organisms and the physical environment

In addition to the science content, data from our work can provide excellent opportunities enhance science literacy and integrate instruction across curricular areas to support aspects of the Common Core Standards. From the Common Core Writing standards the critical area identified is "*W 6-8 1b Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources"* (Common Core Standards Initiative 2010a). Two of the critical areas identified for middle school math instruction in the Common Core are "*drawing inferences about populations based on samples*" and "*using functions to describe quantitative relationships*" (Common Core Standards Initiative 2010b). Specifically,

- *M 7.SP 1, 2 Use random sampling to draw inferences about a population.*
- *M 7.SP 3, 4 Draw informal comparative inferences about two populations.*
- *M 8.F 4, 5 Use functions to model relationships between quantities.*

We hope to support two RET participants each year of our 5-year project, such that teachers of all grade levels will have the chance to work as an RET and develop curricular materials. At the end of this period, there would be at least ten modules that teachers across the state would have access to. Units developed by the RET teachers will be made available on the Hubbard Brook Research Foundation (HBRF) website. These activities will also be shared via presentations at the New Hampshire Science Teacher's conference. Additional outreach will be supported by HBRF education staff, who have on-going school partnerships throughout the state, and using the New Hampshire Science Teachers' Association.

Plans for follow up

Our hope is to develop long-term relationships with RET teachers and their classrooms. In order to foster collaboration we will provide the following over the school year.

- Include RET participants regularly in MELNHE lab meetings.
- Form a RET cohort group with HBRF-supported RET participants and education staff to share ideas and support instructional innovation throughout the year.

For example, Rick Biche, last year's RET under separate funding, continues to be part of our regular lab meetings via Skype/video conferencing and email. MELNHE researchers are currently scheduled for a virtual meeting with his entire team of 7th and 8th graders to share research between scientists, graduate students and Mr. Biche's classes. Two other teachers in the school district have been supported by the Hubbard Brook Research Foundation previously. Through collaboration with HBRF we hope to further the connection to the SAU#9 school district while reaching out to other districts in the state.

Participants

Rick Biche was a 2012 RET participant, working with the research team from the MELNHE project and funded as a supplement to the Hubbard Brook LTER. He is currently a middle school teacher in Conway,

NH less than 20 miles from Bartlett Experimental Forest. In addition to his classroom duties Rick has chaired the middle school and district level science curriculum committees and led the redesign of the middle school science curriculum. Rick's commitment to inquiry based science teaching is evidenced by his leadership in the Mount Washington Valley Regional Science Fair, the largest and fastest growing student science fair in New Hampshire. Through his involvement in the project we hope to develop long-term relations with all the middle school science teachers in his district allowing students opportunities to explore the research happening in their own backyards.

Results from previous RET work

This PI (Fisk) has not had a previous RET supplement. However, last year's RET, Rick Biche, supported by a supplement on a different award, participated in all aspects of field and laboratory operations in the MELNHE project and thus gained first-hand understanding of forest ecology and nutrient cycling. Rick also designed and implemented an experiment investigating nutrient co-limitation of leaf litter decomposition. His goal for the project was to conduct and publish research with his students. Rick and his 100, 7th and 8th grade students collected and sorted litter to species, then made and deployed 640 litterbags at four of the Bartlett stands. This spring Rick and his students will develop a sampling protocol for invertebrates as part of the litter decomposition work. He and his students will carry out invertebrate sampling before the end of the school year. Rick hopes to continue this work next school year when his students will analyze invertebrate and decomposition data from the first litterbag collections. In addition, Rick is working on an inquiry and data lesson to be used by other teachers. Lisa LaValley, an RET participant in 2010, designed experiments to catch and sample arthropods in the Bartlett stands. She also developed data activities aligned with the science NECAP testing to promote achievement on the inquiry portion of the test. This activity is stored and accessible on the BBRF Website.

Prepared by Rick Biche and Melany Fisk

References

A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. 2011. Committee on Conceptual Framework for the New K-12 Science Education Standards, National Research Council. Washington, D.C. The National Academies Press.

Common Core State Standards Initiative. 2010a. National Governors Association Center for Best Practices, Council of Chief State School Officers. "Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects." National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C., 2010. Web. 25 Nov. 2012. <http://www.corestandards.org/assets/CCSSI_ELA%20Standards.pdf>.

Common Core State Standards Initiative. 2010b. National Governors Association Center for Best Practices, Council of Chief State School Officers. "Common Core State Standards for Mathematics." National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C., 2010. Web. 25 Nov. 2012. <http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf>.

SUMMARY PROPOSAL BUDGET

YEAR 1

FOR NSF USE ONLY		
PROPOSAL NO.	DURATION (months) Proposed	Granted
AWARD NO.		

ORGANIZATION: **Miami University**

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR: **Melany Fisk**

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months CAL	ACAD	SUMR	Funds Requested By proposer	Funds granted by NSF (if different)
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**0**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**0**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**0**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**0**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **12,000**					
2. TRAVEL **1,000**					
3. SUBSISTENCE **0**					
4. OTHER **2,000**					
TOTAL NUMBER OF PARTICIPANTS (**2**) TOTAL PARTICIPANT COSTS				**15,000**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**15,000**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **(Rate: , Base:)**					
TOTAL INDIRECT COSTS (F&A)				**0**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**15,000**	
K. RESIDUAL FUNDS				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**15,000**	

M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $

PI/PD NAME: **Melany Fisk**

ORG. REP. NAME*: **Tricia Callahan**

FOR NSF USE ONLY		
INDIRECT COST RATE VERIFICATION		
Date Checked	Date Of Rate Sheet	Initials - ORG

***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY PROPOSAL BUDGET

Cumulative

FOR NSF USE ONLY		
PROPOSAL NO.	DURATION (months) Proposed	Granted
AWARD NO.		

ORGANIZATION: **Miami University**

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR: **Melany Fisk**

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months CAL	ACAD	SUMR	Funds Requested By proposer	Funds granted by NSF (if different)
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**0**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**0**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**0**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**0**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**0**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **12,000**					
2. TRAVEL **1,000**					
3. SUBSISTENCE **0**					
4. OTHER **2,000**					
TOTAL NUMBER OF PARTICIPANTS (**2**) TOTAL PARTICIPANT COSTS				**15,000**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**15,000**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				**0**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**15,000**	
K. RESIDUAL FUNDS				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**15,000**	

M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $

PI/PD NAME: **Melany Fisk**

ORG. REP. NAME*: **Tricia Callahan**

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INDIRECT COST RATE VERIFICATION		
Date Checked	Date Of Rate Sheet	Initials - ORG

C ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

Budget Justification Page

We request $12000 for teacher stipends to support part-time work at the field sites during the summer field season and also preparation work during the school year. $6500 is requested for teacher leader Rick Biche and an additional $5500 is requested for a second teacher to be recruited from the same district. $1000 is requested for travel to and from the field sites. An additional $1000 is requested for class bus travel to and from the field sites during the school year, and $1000 is requested for supplies for projects carried out by the teachers and classes.

CURRICULUM VITAE

Rick Biché
99 VFW St.
Conway, NH 03818
603-730-7234
rbiche@gmail.com

EDUCATION

1999	Teaching Certificate, University of Denver,
1995	M.S. Zoology, University of New Hampshire
1992	B.A. Biology, Magna Cum Laude, University of Southern Maine

PROFESSIONAL EXPERIENCE

2002-Present	Science Teacher, 7-8th grade, A. Crosby Kennett Middle School, Conway, NH
2012	Summer Research Technician, Research Experience for Teachers, Hubbard Brook Research Foundation, N. Woodstock, NH
2003-2011	Team Leader, A. Crosby Kennett Middle School, Conway, NH
2004-Present	Computer Instructor, Mount Washington Valley Adult Education, Conway, NH
2007	Cooperating Teacher, Plymouth State University and A. Crosby Kennett Middle School
2004-2007	Mentor Teacher, Science, A. Crosby Kennett Middle School
2000-2002	Math and Science Teacher, 6-7th grade, Acacia Middle School, Hemet, CA
1998-1999	Paraprofessional, Portsmouth Middle School, Portsmouth, NH
1996-1998	Instructor, Pathfinder Outdoor Science School, Mountain Center, CA
1994-1995	Summer Research Technician and Diving Supervisor, Eelgrass Restoration, University of New Hampshire
1994-1995	Teaching Assistant, Anatomy and Physiology, Department of Zoology, University of New Hampshire
1994	Research Diver, Nitrox and Saturation Mission, Aquarius Underwater Habitat. The Effects of Ultraviolet Light on Corals, M.P. Lesser PI
1994	Teaching Assistant, Biological Oceanography, Department of Zoology, University of New Hampshire
1993	Teaching Assistant, Animal Behavior, Department of Zoology, University of New Hampshire
1992-1993	Teaching Assistant, Environmental Zoology, Department of Zoology, University of New Hampshire

PRESENTATIONS

2011	Integrating Google Docs into Classroom Practice, SAU 9 Professional Development Series
2009	Online Science Fair and Student Collaboration, NH Science Teachers Conference
2008	Using a Joomla CMS for Website Content, A. Crosby Kennett Middle School
2008	Gradequick and Edline, Using Online Grading to Increase Student Achievement, A. Crosby Kennett Middle School
2008	Embedding Technology into Classroom Practice: First Steps, A. Crosby Kennett Middle School

2008	Using a Content Management System for a School Web Site, Mount Washington Valley Career and Technical Center
2008	Best Practices for Embedding Technology in Classroom Practice, SAU9 Technology Committee
2007	Blogging for Teachers, A. Crosby Kennett Middle School
2004	Gathering Data from Classroom Assessment: Practical Measures, Kennett High School
2004	Science Curriculum Adoption: The FAST Program, LEIP committee
1995	Mazurkiewicz, Michael and Richard A. Biché, Mechanism of prey location and feeding by the flatworm *Stylochus elipticus*, Poster, Benthic Ecology Meeting, Rutgers
1994	Biché, Richard A., Particle Capture and the Mechanism of Feeding by Larvae of the Sea Anemone *Metridium senile*, Poster, Benthic Ecology Meeting, Mystic, CT

SERVICE

2008-Present	District Science Curriculum Committee
2007-Present	KMS Technology Committee
2007-2010	District Technology Committee
2004-2008	Renovation and Construction Committee, SAU 9
2005-2006	Scheduling Committee
2003-Present	Various hiring committees
2003-2004	Middle School Science Curriculum Adoption Committee

GRANTS AND FELLOWSHIPS

2009, 2010	Tech Leader Cohort Mentor, North Country Educational Services (Stipends)
2008-2009	NH DOE NCLB Title II-D Digital Tools Grant, $61,000, PI
2003	MWV School to Career Externship, Mount Washington Observatory (Stipend, Fees)
1994	PADI Foundation Grant $4000
1993, 1994	UNH Summer Research Fellowships (Stipend)
1993, 1994	Center for Marine Biology Research Grant, University of New Hampshire $1500, $300