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Collaborative CNIC: US-Argentina planning visits for fungal biodiversity investigation

Laurie B. Connell

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Cover

Federal Agency and Organization Element to Which Report is Submitted:	4900
Federal Grant or Other Identifying Number Assigned by Agency:	1342904
Project Title:	Collaborative CNIC: US-Argentina planning visits for fungal biodiversity investigation
PD/PI Name:	Laurie B Connell, Principal Investigator
Recipient Organization:	University of Maine
Project/Grant Period:	02/15/2014 - 01/31/2015
Reporting Period:	02/15/2014 - 01/31/2015
Submitting Official (if other than PD\PI):	Laurie B Connell Principal Investigator
Submission Date:	04/01/2015
Signature of Submitting Official (signature shall be submitted in accordance with agency specific instructions)	Laurie B Connell

Accomplishments

* What are the major goals of the project?

This proposal is aimed at initiating an international collaboration between US institutions [Symbiogenics and the University of Maine (UM)] and Comahue National University, Bariloche, Argentina, for research in the diversity of fungal communities from oligotrophic habitats. This project will allowed us to identify field sites, gather critical preliminary data and unite the divergent scientific expertise necessary for developing a proposal for submission to the

Systematics and Biodiversity Science Cluster (SBS). In this work we identified and characterized potential field sites to study the diversity of fungi in oligotrophic habits transitioning from sub-glacial flow through the development of mesotrophic cold desert habitats. In addition, we will took a small number of samples to help identify the best potential field sites for future work.

*** What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?**

Major Activities: Two trips to Argentina have been completed. See attached file below for details on the locations of field sites. Six field locations were reviewed and samples were taken from both glacial and soil samples on Mt. Tronodor, Argentina. These samples are currently in analysis for fungal diversity studies to determine the focus of the future submission to the SBS cluster.

Specific Objectives: Our specific objectives were

- 1) meet and being a strong foundation for a collaboration with our Argentine partners
- 2) View the potential field sites and their laboratory facilities to better assess our ability to carry out proposed future work.
- 3) Collect a small number of preliminary samples to use as data for a full proposal.

All of these original objectives were successfully carried out.

Significant Results: WE are waiting for our funagl diversity data before we can accomplish analysis

Key outcomes or Other achievements: Most importantly a strong collaboration was developed between the US and Argentinian partners. After review of field sites it was determined that the Altiplano site in the Andes mountains best suits the groups needs for a cold desert habitat with glacial input. This site best is the best analog for previous work in the McMurdo Dry Valleys of Antarctica. This is the highest plateau in the world outside of Tibet. Two students have been identified to work on this project in Argentina and one student in the US has begun work on samples shipped back. As soon as preliminary data has been received from the fungal analysis we will begin to prepare a proposal for the SBS cluster.

*** What opportunities for training and professional development has the project provided?**

One US undergraduate student and two graduate students collaborated from Argentina. This project laid the ground work for student involvment in a larger project including field work in Patagonia.

*** How have the results been disseminated to communities of interest?**

Nothing to report.

Supporting Files

Filename	Description	Uploaded By	Uploaded On
field sites.pdf	the file contains a map and description of field sites reviewed in this project.	Laurie Connell	04/01/2015

Products

Books

Nothing to report.

Book Chapters

Nothing to report.

Conference Papers and Presentations

Nothing to report.

Inventions

Nothing to report.

Journals

Nothing to report.

Licenses

Nothing to report.

Other Products

Nothing to report.

Other Publications

Nothing to report.

Patents

Nothing to report.

Technologies or Techniques

Nothing to report.

Thesis/Dissertations

Nothing to report.

Websites

Nothing to report.

Participants/Organizations**What individuals have worked on the project?**

Name	Most Senior Project Role	Nearest Person Month Worked
Connell, Laurie	PD/PI	1

Full details of individuals who have worked on the project:**Laurie B Connell**

Email: laurie.connell@umit.maine.edu

Most Senior Project Role: PD/PI

Nearest Person Month Worked: 1

Contribution to the Project: lead PI and coordinate field trips from US side. Field work and collection of samples. initial sample preparation and data analysis

Funding Support: NSF

International Collaboration: Yes, Argentina

International Travel: Yes, Argentina - 0 years, 0 months, 16 days

What other organizations have been involved as partners?

Name	Type of Partner Organization	Location
Comahue National University	Academic Institution	Bariloche, Argentina

Full details of organizations that have been involved as partners:

Comahue National University

Organization Type: Academic Institution

Organization Location: Bariloche, Argentina

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: These are our international partners and they contribute all support while in Argentina

What other collaborators or contacts have been involved?

NO

Impacts

What is the impact on the development of the principal discipline(s) of the project?

Nothing to report.

What is the impact on other disciplines?

Nothing to report.

What is the impact on the development of human resources?

This project has involved students in training in science and will involve students in the rapidly advancing field of bioinformatics. In this small project only one US student was involved but the full proposal will have several students trained in both bioinformatics as well as field work

What is the impact on physical resources that form infrastructure?

Nothing to report.

What is the impact on institutional resources that form infrastructure?

Nothing to report.

What is the impact on information resources that form infrastructure?

Nothing to report.

What is the impact on technology transfer?

Nothing to report.

What is the impact on society beyond science and technology?

A strong collaboration with international partners is a vital function of this project and has been highly successful to this point.

Changes/Problems

Changes in approach and reason for change

Nothing to report.

Actual or Anticipated problems or delays and actions or plans to resolve them

Our project funding arrived much later than anticipated so field seasons needed adjustment. as a result our last field trip took place just before the end of the project. Thus, no data analysis has taken place yet from samples taken in Argentina.

Changes that have a significant impact on expenditures

WE needed more resources for the sample processing so took some funds from PI salary to cover those costs.

Significant changes in use or care of human subjects

Nothing to report.

Significant changes in use or care of vertebrate animals

Nothing to report.

Significant changes in use or care of biohazards

Nothing to report.

 RSR Award Detail

Research Spending & Results

Award Detail

Awardee:	UNIVERSITY OF MAINE SYSTEM
Doing Business As Name:	University of Maine
PD/PI:	Laurie B Connell (207) 581-2470 laurie.connell@umit.maine.edu
Award Date:	02/10/2014
Estimated Total Award Amount:	\$ 13,296
Funds Obligated to Date:	\$ 13,296 FY 2014=\$13,296
Start Date:	02/15/2014
End Date:	01/31/2015
Transaction Type:	Grant
Agency:	NSF
Awarding Agency Code:	4900
Funding Agency Code:	4900
CFDA Number:	47.079
Primary Program Source:	040100 NSF RESEARCH & RELATED ACTIVIT
Award Title or Description:	Collaborative CNIC: US-Argentina planning visits for fungal biodiversity investigation
Federal Award ID Number:	1342904
DUNS ID:	186875787
Parent DUNS ID:	071750426
Program:	Catalyzing New Intl Collab
Program Officer:	Franklin Carrero-Martinez (703) 292-2287 fcarrero@nsf.gov

Awardee Location

Street:	5717 Corbett Hall
City:	ORONO
State:	ME
ZIP:	04469-5717
County:	Orono
Country:	US
Awardee Cong. District:	02

Primary Place of Performance

Organization Name: University of Maine
State: ME
ZIP: 04469-5735
County: Orono
Country: US
Cong. District: 02

Abstract at Time of Award

This collaborative project aims to catalyze a research collaboration between US and Argentinian researchers. The project will be led by Drs. Russell Rodriguez at Symbiogenics and Regina Redman of the University of Washington, both in Seattle, Washington, and Dr. Laurie Connell at the University of Maine, Orono, for the US side. On the Argentinian side, Drs. Diego Libkind, Martin Molino and Virginia de Garcia of INIBIOMA (Instituto de Investigaciones en Biodiversidad y Medioambiente, an Argentinian National Scientific and Technical Research Council Institute) and the University of Comahue, are the counterparts for the project. The Argentinian researchers bring to the collaboration expertise in fungal taxonomy and biodiversity, particularly of cold and extreme environments. The US researchers bring expertise in fungal and plant adaptation to stresses, particularly in diverse habitats of Antarctica.

Overall, this collaboration aims to understand how function impacts bacterial community structures, an important challenge in predicting ecosystems responses to climate change. For this project the researchers will study fungal communities by investigating their diversity, physiology, and ecology in extreme habitats such as glacial water runoff in Patagonia. The results of these initial studies will lay the groundwork for further large-scale projects. The collaboration will provide training opportunities for students at different levels and has significant potential to increase our understanding of global nutrient cycling, inter-organismal relationships, and life in extreme environments.

Project Outcomes Report

Disclaimer

This Project Outcomes Report for the General Public is displayed verbatim as submitted by the Principal Investigator (PI) for this award. Any opinions, findings, and conclusions or recommendations expressed in this Report are those of the PI and do not necessarily reflect the views of the National Science Foundation; NSF has not approved or endorsed its content.

Collaborative CNIC: US-Argentina planning visits for fungal biodiversity investigation.

Project Summary.

This Catalyzing New International Collaborations (CNIC) project was directed toward establishment of a new collaboration among research facilities in the US and Argentina with the intent of developing a full proposal that will be submitted to the Systematics and Biodiversity Science Cluster (SBS).

Significance of proposed SBS research: The purpose of the proposed SBS research (to be submitted after this current work is completed) is to advance our understanding of how microbial community structure is linked to function, a pressing challenge for microbial ecologists and of utmost importance for predicting ecosystem responses to climate change. We will identify fungi from oligotrophic systems, including glacial water run-off, and from across a oligotrophic to mesotrophic gradient in order to begin exploration of how these communities are structured and function. The broader scientific significance of this project include: (1) The proposed research will serve the scientific community by characterizing a previously unstudied group of fungi from understudied oligotrophic habitats including those that are able to fix atmospheric CO₂. (2) The development of terrestrial ecosystems often involves transitioning from oligotrophic to mesotrophic conditions. Yet, little is known about the phenology of this process. This has tremendous potential to increase our understanding of global nutrient cycling, inter-organismal relationships and life in extreme environments.

Key International collaborators and their role: For the international travel portion of this project Dr. Diego Libkind, Dr. Virginia de García and Dr. Martin Moliné of the Biodiversity and Environmental Research Institute (INIBIOMA: Instituto en Investigaciones en Biodiversidad y Medioambiente) Scientific and Technique Research National Council (CONICET) – Comahue National University, Bariloche, Argentina, acted as local hosts and coordinated logistics for review of field sites for the future study at glaciers and in the cold desert region of Patagonia. Dr. Libkind is an expert in fungal taxonomy and biodiversity. Dr. de García is an expert in fungal biodiversity of cold environments. Dr. Moliné is a specialist in fungal adaptations to extreme environments.

Intellectual merit: This new international collaboration provided a unique opportunity to assemble a team with expertise's ranging from glacial fungal populations (an oligotrophic system) through fungal populations in oligotrophic soils, fungal/plant symbionts of arid regions, as well as experience in Antarctic Dry Valleys desert habitats. Patagonian offers access to unique oligotrophic habitats with moisture and nutritional gradients including glaciers associated with deserts. The nutritional gradient will allow us to characterize the development of oligotrophic communities and their transition to mesotrophic communities. Logistically this is an excellent opportunity to explore both glacial and cold desert habitats with one field sampling hub. Data from previous Antarctic work will be compared with results from the future SBS project.

This project successfully identified a field site that will fill our needs. It is the high desert of the Argentine Altiplano. Preliminary samples have already been acquired and are under analysis. Further a strong collaboration has been forged between the partners institutions.

Broader impacts: The primary function of CNIC is to "foster an increase in collaborative research relationships" with the National Science Foundation (NSF) researchers. Societal benefits will be derived from a better understanding of how soil ecological processes and climate induced increases in CO₂ will impact soil ecosystems, food webs and habitat sustainability. In addition, virtually all degradation of terrestrial habitats involves degradation of soil, the building block of healthy ecosystems. Soil degradation may occur as a result of chemical, physical and/or biological stresses. Regardless of the cause, once soils are degraded it is challenging to restore them. This is partially because degradation and restoration processes are poorly defined microbiologically and chemically. Until drivers of soil community structure are characterized and how structure relates to function, it will be difficult to understand degradation and restoration processes.

One undergraduate student in the US participated in this research and two graduate students in Argentina.

Last Modified: 04/01/2015

Modified by: Laurie B Connell

For specific questions or comments about this information including the NSF Project Outcomes Report, contact us.