Biology Service Learning: A Resource Sheet

"Participation in Community Service-Learning taught my first-year biology students what all instructors know - you don't really learn a subject until you try to teach it. More importantly, it encouraged them to discover the relevance of their course material to the world beyond the classroom, and to think about how their education could be used to better society."
Dr. Rosie Redfield, Associate Professor, Department of Zoology, UBC

SL Suggestions for Biology Students from University of Wisconsin-Eau Claire:
"perform an environmental study for a local government or community organization; conduct a conservation project in a recreation area or forest reserve; tutor secondary students in biology; serve as service as a judge for a science fair; present an interactive seminar for an elementary or secondary school class or club; organize a neighborhood beautification project; organize a community garden."

Table of Contents:

I. Syllabi and Programs in Biology Service Learning (On-line)

A. Many Sub-fields of Biology

1) Campus Compact Service Learning SYLLABI:

http://www.compact.org/syllabi/

Campus Compact recently examined over 900 service-learning syllabi. Of these 900 syllabi, CC chose 300 exemplary service-learning syllabi across a wide variety of disciplines and put them on their service learning resources web-site. Each syllabus is listed separately by discipline.

2) Biology Service-Learning at University of Wisconsin Madison

http://ibewbe.wordpress.com/service/

"Applying your biology education to local, national and global problems will enhance your academic experience and provide opportunities for personal development, professional networking and meaningful public service. This Public Service Portal is a gateway to the resources and information necessary for a successful service experience at the University of Wisconsin."

A) Undergraduate Research and Mentoring Program in Biology

3 year, rigorous interdisciplinary science research program.
http://biology.wisc.edu/Undergraduates-GettingInvolvedBeyondtheClassroom-UndergraduateResearch-UndergraduateResearchandMentoringProgram.htm

3) Microbiology and Biotechnology courses
@ Kapiolani Community College at the University of Hawaii. Including descriptions, study guides, and lecture outlines.
http://www2.hawaii.edu/%7Ejohnb/micro/
**Student Journals and Descriptions of their SL components of their Microbiology course
http://www2.hawaii.edu/~johnb/micro/service/index.html

4) Service Learning in the Biological Sciences @ University of Tennessee
https://notes.utk.edu/Bio/greenberg.nsf/0/a35dcb6d137163238525675400 5e0c74
OpenDocumet
"Service learning in biology enhances the understanding of biology and other sciences among undergraduate students and increases their capacity and confidence to utilize that understanding in the conduct of creative, problem-solving. A secondary outcome is the enhancement of student understanding of the breadth of application of scientific research principles and the critical role that scientific and cultural context play in framing and solving research problems."

5) Service Learning Courses in Human Biology @ Haas Center, Stanford University
https://humbio.stanford.edu/node/6295

6) Biology 1
http://www.servicelearning.org/slice/index.php?ep_action=view&ep_id=70
This is the first of the two semester General Biology sequence whose objective is to provide students with the necessary foundation for understanding the living world. General Biology I is suitable for both biology/science majors and non-majors alike; General Biology II is normally taken only by science majors. General Biology I deals mainly with the basic chemistry of living things, cell structure and function, cell reproduction, genetics of individuals and populations, and human tissues and anatomy. Includes a fifth credit service-learning option.

7) Informal Life Science: Incorporating Service Learning Components Into Biology Education
http://www.servicelearning.org/library/resource/5684
In a course designed for students pursuing science careers in informal educational settings, students received training in environmental education programs and applied their training at a local nature center to fulfill the course's service learning requirements. Both university students and school children alike benefitted from this partnership.

8) Descriptions of commonly Offered Biology Service Learning Courses @ Carleton College
http://apps.carleton.edu/collab/civic/courses/past/commonlyoffered/

9) In Depth Description of Academic Coursework in a Wide Variety of Disciplines (contains many courses in biology and biological chemistry):
http://www.bates.edu/Prebuilt/07-08YESElectronicFinal.pdf
More than a third of our faculty has included a service component in its courses and more than half of the student body has engaged in a service-learning project. Faculty across all disciplines engage their students in service-learning. Approximately 70 current faculty members have incorporated service learning into their courses.

10) Contact: Dr. Jack Kennell @ St. Louis University
http://www.slu.edu/x17545.xml
"In the past, I have incorporated Service-Learning projects in my classes and found that these projects are very effective in stimulating student interest in Biology and lead to very favorable learning outcomes. SL projects allow students to experience biology in real-world settings and offer insight into concepts that underlie biological phenomena faced by our society in ways that cannot be adequately provided in the classroom. If you are interested in incorporating Service Learning into a biology class, please feel free to contact me."

11) Tri-Beta National Biological Honor Society
http://www.tri-beta.org/
"Beta Beta Beta (TriBeta) is a society for students, particularly undergraduates, dedicated to improving the understanding and appreciation of biological study and extending boundaries of human knowledge through scientific research."
**Beta Beta Beta Chapters at Universities Engage in a large amount of service learning and community service activities to increase biological awareness in the community.
**Example Tri-Beta programs at colleges and universities:
Missouri State University: http://organizations.missouristate.edu/tribeta/
Mercer University: http://www2.mercer.edu/NewCLA/Biology/default.htm

B. Health-Related Biology

1) Molecular Biology of Cancer Service Learning Course @ Tulane University
http://tulane.edu/sse/cmb/upload/Cel471-671syl08.pdf
This course will focus on the genetics of cancer and the associated changes in cell biology in transformed cells. Topics covered will include: viral carcinogenesis, oncogenes, tumor suppressor genes, genetic instability, metastasis, the regulation of gene expression in cancer cells, and anti-cancer treatment strategies. Students enrolled Cell 471 may also participate in a Service Learning project, in which they will explore cancer treatment strategies in a clinical setting. Service Learning will be performed by volunteering on the Oncology Ward and in the Oncology Outpatient Clinic at Touro Infirmary in New Orleans.

2) (CBR) St. Jude Children's Research Hospital Summer Plus Scholars @ Rhodes College
This partnership links a major biomedical research institute with a small liberal arts college to provide students with extensive community-based research and seminar opportunities that are usually available only at a large research university. Summer Plus Scholars become part of a community devoted to the diagnosis and treatment of catastrophic childhood illnesses and committed to providing treatment and support to patients and their families regardless of income.

3) Human Anatomy and Physiology I
http://www.servicelearning.org/slice/index.php?ep_action=view&ep_id=69
This is the first of the two semester Human Anatomy and Physiology sequence whose objective is to provide students with the necessary foundation to meet the requirements of two and four year health and life science programs. During the first semester, "A & P" (as it is affectionately called!) deals with anatomical terminology, basic organic chemistry, cell biology and cellular respiration, tissues, and the integumentary, skeletal, muscular, respiratory and reproductive systems. Includes a fifth credit service-learning option.

4) Biology of Cancer SL Syllabi
By: Dr Juliet Spencer, Ph.D. @ University of San Francisco
http://www.usfca.edu/fac_staff/jspencer/pdfs/370_syllabus_S07.pdf

C. Environmental Biology

1) Bahamas Environmental Research Centre (BERC)
http://www.cob.edu.bs/Research/BERC.php
The Bahamas Environmental Research Centre (BERC) is an evolving 'non-profit' research and education center located in Staniard Creek, Central Andros. It was founded in 1995, as a collaborative effort of The College of The Bahamas (COB); George Mason University (GMU), USA; and the people of Central Andros- in particular the settlement of Staniard Creek. BERC supports and facilitates teaching, research in the marine, terrestrial, social and cultural environments and community outreach initiatives and facilitates the research of The College of The Bahamas faculty and students. Its focus is to promote a better understanding and appreciation of the ecology of The Bahamas, in particular the Island of Andros, through the conduct of research and the dissemination of research findings. BERC is a prime example of how a university and a local community can work together to promote scientific research, local businesses, and local preservation of resources. Also see Acting Locally: Concepts and Models for Service-Learning in Environmental Studies page 127-138 for more information.

2) Service Training for Environmental Progress (STEP) @ Vanderbilt University Medical Center
http://staging.mc.vanderbilt.edu/root/vumc.php?site=step&doc=813
The mission of the Service Training for Environmental Progress (STEP) program is to assist community based environmental organizations in low-income communities as they mobilize and educate citizens about environmental health. Since its conception, STEP has provided community education and technical assistance on a wide range of issues such as environmental justice, community mobilization, pollution prevention, environmental testing and documentation of environmental problems.

4) Virginia Water Resources Research Center
http://www.vwrrc.vt.edu/
The Water Center was established at Virginia Tech in 1965 by the U.S. Congress as one of the nation's 54 water institutes and is affiliated with the College of Natural Resources of Virgina Tech. The center's mission is to offer research and educational opportunities to water scientists and students, and provide citizens and government leaders with water science information. This Research Center, along with funding from the EPA, created the following 3 programs/projects with Virginia Tech (among many other things):

A) Service Training for Environmental Progress
The Virginia IREX Program at Virginia Tech
(Program is temporarily inactive, but has useful information past projects since 1986.)
http://www.irex.org/system/files/Zoya.pdf
IREX summer interns provide service to communities by helping community groups study, understand, and work toward resolving water-resource issues. While doing so,

STEP students learn technical, analytical, and communication skills, and they get an introduction to jobs in
public and community service. Prior to placement in the community, students receive training designed to prepare them for a range of water-quality issues or activities with which communities might need technical assistance. Examples of community needs STEP students might address are testing well water, setting up a surface water-monitoring network, or learning how to prevent groundwater pollution.

B) Stroubles Creek Watershed Initiative @ Virginia Tech

http://www.pdfio.com/k-59449.html

Virginia Tech main campus is situated within the boundaries of the Stroubles Creek watershed. A major goal of the Stroubles Creek Watershed Initiative is to develop a university-wide outdoors watershed laboratory at Virginia Tech.

5) Field-Based Biology Research as Service Learning @ Anoka Ramsey Community College
http://webs.anokaramsey.edu/slbfp/Default.htm
During the Spring 2007 semester Anoka Ramsey Community College students enrolled in the Principles of Biology II course (BIOL 1107) participated in a service-learning, field-based research project in conjunction with the annual raptor survey conducted at Elm Creek Park Reserve of Three Rivers Park District. The overall goal of this project was to provide students an opportunity to directly apply skills learned within a traditional classroom setting to a relevant, community-based matter.

7) Marine Behavioral Ecology & Conservation Biology SL Syllabi
By: Dr. Alejandro Acevedo-Gutierrez @Western Washington University
http://fire.biol.wwu.edu/mbel/media/pdfs/BIOL445_Spring04_Syllabus.pdf

8) Marine Biology SL Syllabi
By: Dr. Laura Mydlarz @University of Texan at Arlington
http://www.uta.edu/biology/syllabi_sp09/3310002.pdf

9) "Biology Students Save Sand Dune" @ University of Minnesota-Crookston
http://www.umcrookston.edu/Services/ServiceLearning/projects/story-sanddune.htm

D. Community Based Research in Biology

1) Center for the Biology of Natural Systems (CBNS) @ Queens College
http://qcpages.qc.cuny.edu/cbns/
"CBNS is a research organization with considerable experience in the analysis of environmental, energy and resource problems and their economic implications. Established in 1966 at Washington University, St. Louis, CBNS moved to Queens College in 1981, where it is organized as a research institute of the City University of New York. Over a period of 30 years CBNS has become known for an extensive series of pioneering studies on environmental issues such as trash disposal, agricultural sources of pollution, and environmental carcinogens; on energy issues such as conservation, cogeneration and solar energy; on resource issues such as organic farming and waste reduction; and on the relation of such issues to economic factors and social welfare."

2) Laboratory for Human Biology Research @ Northwestern University
http://groups.anthropology.northwestern.edu/lhbr/index.html
"Biological anthropologists endeavor to understand the evolutionary origins and consequences of human biological variation. . . . The Laboratory for Human Biology Research is committed to collaborative, population-based research into the biological, social, and cultural factors that shape human biology and health in a range of international settings, including the U.S.. A primary goal of the laboratory is the development of minimally invasive, "field-friendly" methods for assessing biomarkers of health and physiological development that can be used to facilitate community-based research on human biology. The laboratory is also committed to providing graduate and undergraduate students with opportunities to conduct independent human biology research. "

3) Undergraduate Senior Research Project @ Vancouver Island University
http://www.mala.ca/biology/undergrad.asp
"The Bachelor of Science (B.Sc.) degree program in biology at Vancouver Island University requires students to complete a research project during their 4th year. These one-year projects involve the students in the scientific process, while advancing their training in field and laboratory research skills.
Students are provided the opportunity to interact with their peers and with scientists affiliated with various local agencies, organizations or institutions, in addition to VIU Faculties. Student research projects generally address topics of interest to people in the community, and cover a broad range of scientific interest, including molecular biology, cell biology, ecology, parasitology, microbiology and botany."

E. Undergrad Biology Service Learning with K-12

1) Center for Biology Education @ University of Wisconsin- Madison
http://biology.wisc.edu/index.htm
The Center for Biology Education develops and coordinates activities and programs for the university, for K-12 teachers and students and for the general public with the aim of promoting excellence in biology education at all levels. CBE staff members have backgrounds in a variety of biology sub-disciplines as well as in the field of education. Program development and implementation is done in partnership with UW-Madison faculty, staff, graduate students and undergrads as well as with community members.

2) Science Teaching Educational Research and Service (STERS) @ California State University Fullerton
http://faculty.fullerton.edu/npelaez/BIOL4xx/index.htm
A collaboration involving CSUF faculty, science majors, and public school teachers is working to guide students through community service learning opportunities for academic credit...Each student partners with an experienced science teacher mentor to involve children with hands-on activities designed to show the interconnectedness of basic science concepts.

3) Vanderbilt Student Volunteers for Science (VSVS)
http://studentorgs.vanderbilt.edu/vsvs/graduate.html

"VSVS is a service organization composed of undergraduate, graduate, and medical students who are committed to bringing inquiry-based, hands-on science lessons to middle-school students." This Program began in 1994 and has grown from serving 8 classes per semester to 121 classes per semester.
**Site includes Lessons for over 50 chemistry, physics, and biology/environmental activities to do with 5th and 6th graders. "Lessons include: Cryogenics, iron in cereal, polymers, rates of chemical reactions, light, UV light, and dry ice." designed to teach basic biology concepts. Brief reflective writing assignments help you process and learn from your experience.

4) Reflections on Biology SL Tutoring High School Students
www.lanecc.edu/sl/resources/documents/EllyReflection.doc

5) Human Biology (BIO 109) SL Syllabi: Working with Middle School Students
By: Prof. Amy Boyd @ Elon University
http://www.elon.edu/e-web/org/nccc/

6) Anatomy Lesson with High School Students @ Northern Illinois Univeristy
http://www.niu.edu/PubAffairs/RELEASES/2006/feb/anatomy.shtml
In a very popular and innovative program, high school students come to NIU for an intensive anatomy lesson that includes dissection of human cadavers.

III. Partnering Organizations & Grant Supporters

A) Ohio Resources

1) Alford Center for Service Learning at Denison University
http://www.denison.edu/campuslife/servicelearning/

2) Ohio Campus Compact: Supports Academic Service Learning in all disciplines.
http://www.ohiocampuscompact.org/

3) Ohio Environmental Education Fund
http://epa.ohio.gov/oee/EnvironmentalEducation.aspx
The Ohio EPA Office of Environmental Education administers the Ohio Environmental Education Fund (OEEF), which awards approximately $1 million annually in grants for education projects targeting preschool to university students and teachers, the general public, and the regulated community. OEEF funds projects to enhance the public's awareness and understanding of issues affecting environmental quality in Ohio.

4) Great Lakes Directory: Environmental Grant-making Organizations
http://www.greatlakesdirectory.org/grants.htm