

Evolution 101: Evolution and Biogeography

A workshop for teachers sponsored by the Society for the Study of Evolution
in conjunction with the Evolution 2009 meetings
12 June, 2009

Connor Museum, Washington State University, Pullman, WA

Biogeography is traditionally a keystone approach to evolutionary biology, as seen in the works of Charles Darwin, Alfred Russell Wallace and Henry Bates. Modern tools have made this field even more powerful and biogeography is playing an important role in developing effective conservation strategies. This workshop will include presentations by evolutionary biologists about their research, hands on demonstrations of resources and materials to effectively teach biogeography and evolutionary biology, and discussions on improving evolution education.

Registration for the workshop includes full participation in the Evolution 2009 meeting and teachers are invited to attend the scientific sessions, symposia, keynote presentations, picnic, and poster sessions to be held at the University of Idaho. Evolution 101 participants may be particularly interested in the evolution education symposium, concurrent sessions on evolution education, and the Public Outreach Lecture by Gould Award recipient Dr. Eugenie Scott of the National Center for Science Education.

Registration Fee: There is a \$25 non-refundable fee for the Evolution 101: K-12 Workshop. Participants will receive a certificate of completion and one Continuing Education Unit, as well as copies of Evolution: Education and Outreach, DVDs of evolution themed Holiday Lectures from HHMI, a CD of educational resources from the 2008 NABT Evolution Symposium “Illuminating Biology: An Evolutionary Perspective,” a copy of “Science, Evolution and Creationism” from the National Academies of Science, and more! Lunch is provided.

Directions, lodging, and transportation

The Evol 101 workshop will be held in Todd Hall and at the Conner Museum (in Abelson Hall) on the Washington State University Campus – these two buildings are located very near each other in the center of campus. Directions to WSU campus can be found at <http://www.campusmap.wsu.edu/directions/>; you can download a campus map showing parking areas at <http://www.parking.wsu.edu/>. The most convenient parking lot to use is the green lot located between College Ave, Columbia St, Spokane St and Idaho St. For more information regarding parking, including the possibility of obtaining a parking pass, please e-mail Mike Webster at mwebster@wsu.edu.

Information about lodging is available here. For those who will not have cars, please e-mail Louise Mead (mead@ncseweb.org) for information on car-pooling to WSU from Moscow.

Contacts

For more information contact the workshop organizers:

Louise S. Mead: mead@ncseweb.org

Kristin Jenkins: kjenkins@nescent.org

Mike Webster: mwebster@wsu.edu

Workshop schedule

8:15-9:00am (WSU, Todd 130)

Registration

9:00-9:05am (WSU, Todd 130)

Welcome to SSE EVO 101 workshop and WSU Connor Museum

Mike Webster,

Director of the Connor Museum

Professor in the School of Biological Sciences, WSU

9:05-9:20am (WSU, Todd 130)

Brief introduction to SSE EVO 101

Rob Pennock,

Professor, Lyman Briggs College,

Departments of Philosophy,

Computer Science and Engineering,

And Ecology, Evolutionary Biology and Behavior

Michigan State University

9:20-10:10am (WSU Todd 130)

Using Biogeography to Illustrate Evolution

Luke Harmon,

Assistant Professor of Biological Sciences,

University of Idaho

Although the geographic distributions of species played a key role in Darwin's formulation of the theory of evolution, this information is not commonly used as a teaching tool. I will suggest ways that we can identify "natural experiments" in evolution that have taken place, through accidents of geography, over the past 100 million years. These experiments can help students understand how evolution makes predictions that we can test using observations of the natural world.

10:10-10:25am

Break

10:30-12:00pm

Lab Sessions

Biogeography (WSU Abelson 215/217)

This session provides basic information and examples about the many ways in which biogeography can inform the teaching of biology. Topics include biogeographic principles, mapping distributions using Google Earth and other tools, how the breakup of the supercontinent Gondwana shaped the distribution of today's organisms, and the biogeography of the Hawaiian islands.

Session Leaders:

Kathryn Perez

Assistant Professor of Biology,

University of Wisconsin, La Crosse

Bryan Falk

Graduate Student,

Richard Gilder Graduate School

American Museum of Natural History

Updated 2009.05.19

Tree-thinking (WSU Abelson 235/238)

The evolutionary process can be pictured as a simple branching tree of life, yet most students have a hard time understanding and interpreting evolutionary trees. In this workshop we will use simple games and simulations to demonstrate why it is that evolution leads to tree-like patterns of relationships among species, how to interpret these trees, and also the modern methods that scientists use to uncover them. Real-life examples will be used to highlight these concepts and also show how evolutionary trees help us better understand biogeographic patterns.

Session Leaders:

Mike Webster

Director of the Connor Museum

Professor in the School of Biological Science

Washington State University

Louise Mead

Education Project Director

National Center for Science Education

Noon-1pm

Lunch

1:00-2:30pm

Lab Sessions

Biogeography (WSU Abelson 215/217)

Tree-thinking (WSU Abelson 235/238)

2:30-2:45pm

Break

2:45-3:25pm (Todd 130)

Improving Evolution Education: What Evolution Isn't

Mike Webster,

Director of the Connor Museum

Professor in the School of Biological Science

Washington State University

3:25-3:50 pm (Todd 130)

Panel Discussion: What college faculty expect students to know about evolution.

Cyndi Gill,

Walla Walla Community College

John Davis,

Associate Professor,

Geological Science and Curriculum & Instruction

University of Idaho

Mike Webster,

Director of the Connor Museum

Professor in the School of Biological Science

Washington State University

3:50-4:00 pm (Todd 130)

Raffle

4:00-4:50 pm (Todd 130)

Beetles, Darwin, and natural history/nature of science

Doug Emlen,

Professor, Division of Biological Sciences

University of Montana, Missoula

4:50-5 pm (Todd 130)

SSE Meeting Orientation

Louise S. Mead,

Education Project Director

National Center for Science Education

Workshop participants are invited to attend the Opening Reception and Gould Lecture Friday night, and are encouraged to attend the Evolution 2009 meetings from 12 to 16 June. Participants in the workshop are encouraged to attend the Education Symposium, public lectures in the evening, and education themed presentations.

Gould Lecture

Eugenie C. Scott, Ph.D.,

National Center for Science Education

8:00pm, Friday, 12 June, 2009

Kibbie Dome, University of Idaho, Moscow, Idaho

Dr. Scott will receive the first Stephen Jay Gould Award for Public Outreach.

Americans have a strikingly high incidence of rejection of evolution, especially compared to citizens of other developed countries. The explanation is multifactorial: there are many cultural and historical threads that have lead to the present situation, and they involve religion, education, the public's understanding of science, legal history, and, of course, politics. But one component that scientists can address directly is the understanding of evolution itself, as a science and as a powerful explanation of biology. The public picks up a lot of misinformation about evolution on the street, and teachers of evolution at the high school or post secondary level have an important role to play to help dispel that misinformation. But it will involve the application of the KISS principle – Keep it Simple, Stupid – because it is the basic or foundational ideas of evolution that people misunderstand. Without a clear understanding of the basics, it is hopeless to seek an understanding of the details.