

## No Backing Down on Evolution

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## No Backing Down on Evolution

A school board vote of confidence for evolution and a rallying fight song for evolutionary biologists were among the bonuses of the Evolution 2005 conference held 10–14 June in Alaska. The meeting, which was jointly sponsored by the Society for the Study of Evolution, the Society of Systematic Biologists, and the American Society of Naturalists, drew 1060 participants to the campus of the University of Alaska Fairbanks; the Institute of Arctic Biology and the recently expanded University of Alaska Museum of the North hosted the conference.

By the time of the opening night reception, scientists mingling among the musk oxen at the university's Large Animal Research Station were able to share good news: that morning, the Alaska State Board of Education had voted unanimously to make evolution a prominent part of statewide science education standards. The standards previously included only a recently added parenthetical reference to evolution.

University of Wisconsin–Madison geneticist and featured conference speaker Sean B. Carroll praised the decision, noting that similar discussions elsewhere have too frequently mutated into controversy and bad decisions. It's ironic, said Carroll, that “the current surge in antievolution sentiment” and initiatives to downplay evolution in schools have emerged just as understanding of the evolutionary process has been expanding considerably. “It's alarming, and probably to many of us disheartening and worrisome, that there should be such a slippage in the wrong direction, when so much of the science has moved forward and we can say so many things with so much confidence and certainty,” he said. Carroll, who is the author of *Endless Forms Most Beautiful: The New Science of Evo Devo and the Making of the Animal Kingdom*, shared these

thoughts—along with colorful animations showing genetic expression and development in insect embryos and butterfly wings—during a public outreach lecture about evolutionary developmental biology, which relates embryology to evolutionary change. Carroll described the field's emergence as similar to the convergence among paleontology, systematics, and genetics in the 1930s and 1940s.

As evidenced by conference talk subjects, the range of questions that can be addressed by today's tools of evolutionary biology is varied. Liz Alter, of Hopkins Marine Station at Stanford University, is using genetics as a tool to help understand how climate change affects populations of eastern gray whales. “Because the amount of genetic diversity in a population is in part a consequence of the size of that population, we can use genetic data to say something both about the size and the growth or decline of populations in the past,” explained Alter, who is working toward her doctorate. High genetic diversity, for example, would suggest a large population size in the past. Such information can in turn be used to help predict population responses in the future.

Gabriela Ibarguchi, of the Department of Biology at Queen's University in Kingston, Ontario, used genetics to tease out kin group relationships among murrelets living on different ledges in a Canadian arctic seabird colony; these are birds that, although they travel up to 6000 kilometers a year when they migrate, prefer to return to their original hatching site to breed. Genetic work was particularly helpful in identifying males and females, which are difficult to distinguish. One finding, based on behavioral studies by Anthony Gaston and colleagues, from the National Wildlife Research Center in Ottawa: although few males bred farther than 10 meters

from their hatching site, some females that couldn't get that close chose to breed well beyond 10 meters, dispersing into other kin groups. There may be a benefit from being near kin groups for purposes of group defense or chick care, a benefit the far-flung females lost. Or perhaps the far-flung females are demonstrating an attempt to avoid inbreeding, suggested Ibarguchi. The unpublished data are still preliminary, she said.

In an address on 12 June, Society for the Study of Evolution President Dolph Schluter drew on his work with marine and freshwater sticklebacks to address the questions of adaptation and speciation. The two types of fish have evolved again and again in different geographical locations, but with similar results. Noting that such “parallel evolution” may repeatedly involve the same genes, Schluter raised the question, “How far can we take this, and what does it tell us about speciation?”

It was Carroll who contributed the fight song to the event. He closed his talk by playing Tom Petty's “I Won't Back Down,” a message aimed at rallying his colleagues against antievolution opponents. Carroll advised scientists to ask for the help of the clergy. Such a strategy worked in Wisconsin, he said. “What's been missing in a lot of this are the reasonable voices of those who hold both scientifically literate and deeply held religious views,” said Carroll. “These are our allies.... I think it's a broad cross-section of the country that respects science, cares about science, and holds religious views,” he said, “and these may be citizens as well as clergy, but they're not being heard from.”

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