The View From the Chair

I became Chair of the department in September 2006 when Charlie Janson stepped down to become Dean of the Division of Biological Sciences at the University of Montana. It has been an interesting, exciting and challenging period for the department and for me personally. E&E recently held a highly successful faculty retreat, led by a professional meeting facilitator (a first for us). We focused on exploring fundamental goals and strategies for the future of the department and will be working to implement these over the coming months. One of the most rewarding things to happen during my three semesters as Chair has been the opportunity to make offers to new faculty members, two of whom have recently joined us, and two more who will become members of the department in the near future.

Stephen Baines is a new Assistant Professor who works at the intersection between community and ecosystem ecology. He is interested in how organism characteristics, ecological processes and factors acting over regional scales combine to shape aquatic biogeochemical cycles. Stephen earned his Ph.D. from Yale University and comes to us after a postdoctoral stint at Stony Brook’s Marine Sciences Research Center. Resit Akcakaya joins us as a Professor with interests in developing and applying quantitative methods to address questions in conservation biology and environmental risk assessment with particular concern for species extinctions. Resit’s Ph.D. is from Stony Brook’s E&E, and he was hired through Stony Brook’s new interdepartmental Consortium for Inter-Disciplinary Research (CIDER).

Dr. Liliana Davalos will be joining the department in Spring 2008 as an Assistant Professor, also through CIDER. She earned her Ph.D. from Columbia University and did postdoctoral work at University of Arizona and The American Museum of Natural History. Her interests are in tropical biodiversity conservation, ecological biogeography, and phylogenetics. Dr. Joshua Rest will join the department as an Assistant Professor in the Fall of 2008. He was awarded a Ph.D. from the University of Michigan and is currently working on a postdoctoral fellowship in the lab of Dr. Wen-Hsiung Li at the University of Chicago. His interests are in using computational and comparative approaches to study how components of genotype and phenotype are linked together, with a focus on the function and evolution of the cis-regulatory code for transcription factor binding sites.

Finally, we are delighted that Professor Daniel Dykhuizen has returned to the department after a two year hiatus, drawn back primarily by our wonderful graduate program and following in the footsteps of Distinguished Professor and National Academy Member Douglas Futuyma, who also returned to the department a short time ago. And it doesn’t end here: we are hoping to be able to carry out future recruitment of faculty members for a new interdepartmental major in Human Biology. Stay tuned!
Norris Muth graduated from Stony Brook in the Summer of 2007, with a thesis on the ecology and evolution of invasive Centaurea and Crepis plants, under the supervision of Massimo Pigliucci. Where is he now? Well, Norris is currently an Assistant Professor at Juniata College in PA. When E&E caught up with him, he had managed to meet all the Juniata freshman biology majors through his segment (ecology and biodiversity) of the introductory biology sequence (about 160 students). He even claimed to actually remember most of their names!

The Spring ’08 semester should be quite different, he said, as he’ll be teaching the initial run of botany – current enrollment five students... Down the road he plans to participate in “God, evolution and culture,” a class that is sure to generate interest and debate at Juniata.

Meanwhile, Norris is continuing his research on invasive species, having obtained summer funding for himself and at least one undergraduate research student. He hopes to run into some fellow Seawolves at meetings next summer, for example the ESA one.

Norris has one paper already out from his Muhlenberg College postdoc, in Acta Oecologica, another one accepted in Ecoscience, and several more in the queue. He says that it has been very exciting to see some interest in his thesis-derived papers from SBU.

New Faculty Profile: Stephen Baines

Stephen Baines is an ecosystem ecologist interested in what governs the fate of carbon and trace elements in aquatic environments. His thesis research at Yale U. and the Institute of Ecosystem Studies described how the fate of organic matter produced by phytoplankton varies along gradients of productivity, challenging orthodoxy by indicating that patterns for freshwater and marine environments differed markedly. For his postdoc at the University of Wisconsin-Madison he then studied the relative importance of regional and local factors in determining the dynamics of individual lake ecosystems.

Currently, Stephen is applying experimental and analytical techniques learned while at the Marine Science Research Center at Stony Brook to study how specific organisms, by dint of their unique physiological characteristics and elemental composition, can shape carbon, trace element and contaminant cycles. For example, variability in the elemental composition among the microscopic organisms that make up the base of the planktonic food chain can influence the rate at which CO2 fixed by phytoplankton into organic carbon is then exported to deeper water in the open ocean, in response to the inputs of nutrients such as iron, silicate and nitrogen. Using state of the art microanalytical techniques, Stephen and his colleagues are the first to study directly how the elemental composition of various aquatic microbes vary in relation to each other and to gradients of nutrient supply and experimental manipulations.

New Faculty Profile: Resit Akcakaya

Resit Akcakaya arrived at Stony Brook from Turkey in 1984 to start his doctoral studies at E&E, and completed his Ph.D. in 1989 on ratio-dependent models of predator-prey dynamics. He then worked at Applied Biomathematics (Setauket, NY), focusing his research on applied ecology and conservation biology. He developed methods for threatened species assessments, models for risk assessment and modeling of metapopulations, software for integrating metapopulation dynamics with geographic information systems, and methods for incorporating uncertainty into the IUCN Red List Criteria for threatened species.

He is currently interested in a variety of methods and approaches for assessing the vulnerability of species to extinction; projecting human land-use based on human population trends; and predicting the vulnerability of species to global climate change. He is also editing a book on population-level ecotoxicological methods. As the chair of the IUCN Red List Standards and Petitions Subcommittee, which develops guidelines for threatened species assessments and evaluates petitions against the red-listing of these species, he...
recently organized a working group at Imperial College to explore new quantitative methods for predicting species extinction risks due to climate change.

Resit was hired through Stony Brook’s new Consortium for Inter-Disciplinary Environmental Research (CIDER). He is very excited to return to SBU and to the Ecology and Evolution Department, and is looking forward to interesting and fruitful collaboration with the faculty and students.

**Darwin Day ’08: David Sloan Wilson**

The 2008 Darwin Day speaker at Stony Brook is David Sloan Wilson, from Binghamton University. David is a Professor of Biology and Anthropology, whose recent work focuses on multilevel selection theory, the conceptual foundations of sociobiology, the evolution of religion and the study of social behavior.

David has written several influential books, including *Unto Others: The Evolution and Psychology of Unselfish Behavior*, co-authored in 1998 with philosopher Elliott Sober; the 2002 _Darwin’s Cathedral: Evolution, Religion and the Nature of Society_; and his most recent one, the 2007 *Evolution for Everyone: How Darwin’s Theory Can Change the Way We Think About Our Lives*.

In *Evolution for Everyone* Wilson maintains that evolution is not just about dinosaurs and human origins, but about why all species behave as they do—from beetles that devour their own young, to bees that function as a collective brain, to dogs that are smarter in some respects than our closest ape relatives. And basic evolutionary principles are also the foundation for humanity’s capacity for symbolic thought, culture, and morality. E.O. Wilson called the book “a remarkable contribution,” while Niles Eldredge says that it “fills a gap in understanding evolution, and will help in the much-needed bridge building across the divide that has threatened educational values in recent years.”

David also finds the time to blog at the prestigious liberal blog, the Huffington Post: http://www.huffingtonpost.com/david-sloan-wilson/#blogger_bio

**Recently Graduated**

**Windsor Aguirre on stickleback adaptive radiation**

How do organisms diversify or “radiate” in nature? This is the question on which Windsor pondered during his dissertation, under the guidance of Mike Bell. Windsor studied an Alaskan three-spine stickleback adaptive radiation to examine the rate at which organisms adapt to novel environmental conditions.

He exploited a recently established population in Loberg Lake to examine the rate and pattern of stickleback adaptation in nature, and found that adaptation to freshwater environments occurs within decades after freshwater populations form. Windsor also examined the relative importance of gene flow and natural selection on phenotypic divergence within a phenotypically diverse stickleback lake-stream radiation, in a small Alaskan drainage. Genetic distances among populations were associated with geographic distances, indicating that they were generally more important than the nature of the environment for structuring of genetic diversity. Morphological distances, however, were strongly associated with environmental conditions. Consequently, even within small drainages, local environmental conditions can select for adaptively important genes, despite genetic exchange with phenotypically contrasting, neighboring populations.

**Bengt Allen on the costs of sexual selection**

Bengt has defended his dissertation, advised by Jeff Levinton, investigating the costs and condition-dependence of sexually selected traits in the sand fiddler crab, *Uca pugilator*. Theory suggests that sexually selected structures and behavioral displays are honest signals of male quality to opponents and mates that are costly to produce and maintain. In mid-Atlantic salt marshes, reproductively active males use a single greatly enlarged major claw as both a weapon to defend specialized breeding burrows from other males and an ornament to attract females for mating. Carrying the major claw, which can comprise as much as 40% of the total body mass, imposes significant energetic and locomotor costs to male fiddler crabs.

Using biophysical engineering methods Bengt found that, from the perspective of a fiddler crab, the thermal environment of the mating area is quite harsh, and that high temperatures and desiccation stress significantly constrain physiological performance and reproductive activity. Nevertheless, fiddler crabs can adjust their behavior in response to the magnitude of perceived benefits and costs. It turns out that males in good condition spend more time in the breeding area guarding a burrow and courting females than do males in poor condition. As a consequence, by selectively mating with only breeding area residents, females obtain mates of higher than average quality relative to males in other parts of the marsh. Bengt’s results provide a possible mechanistic explanation for the maintenance of the sand fiddler crab mating system.

**Chris Jensen on the consequences of predation**

Chris defended under the supervision of Lev Ginzburg, starting from the observation that ecological theory depicts predators and their prey as instantaneously interacting particles. But a series of recent models that consider mutual interference between predators to be an important factor in determining consumption rate and therefore predator-prey dynamics have challenged this view of predation.

Chris investigated the importance of interference and designed experiments to contrast between competing models of
predator-prey interaction. In order to provide a full understanding of the competing models, Chris presented a detailed exploration of their stability based on numerical simulations. He argued that the time scale of predation rates is not universal and showed that the degree of predator interference detected depends on the time scale on which predation is measured.

Jennifer Verdolin on prairie dogs’ social organization
Jennifer has defended her thesis under the supervision of Charlie Janson. She investigated the ecological determinants of Gunnison’s prairie dog social structure and mating system in two colonies in northern Arizona. She tested whether Gunnison’s prairie dog social structure was resource-based or whether male mating strategies drive the organizational patterns observed. Contrary to predictions of typical mammalian male mating strategies, adult females ranged significantly further than males during the mating period. Results from her genetic data indicated that Gunnison’s prairie dog social groups are not composed of close kin and that relatedness is not correlated with space-use in these populations. Jennifer’s study supports critical components of the resource dispersion hypothesis and suggest that patterns of space use and group membership in Gunnison’s prairie dogs are the result of individual responses to resource abundance and distribution.

Jeff Yule on modeling Pleistocene extinctions
Jeff defended his thesis with Lev Ginzburg arguing that while the modeling of metapopulation dynamics has illuminated biotic causes of extinction, the techniques mathematical modeling can be used to assess extinction in so far generally overlooked ways. He investigated a series of informative modeling case studies dealing with predation and competition in vertebrate systems in order to demonstrate its potential to inform conservation biology and North American restoration.

His results suggest that existing Late Pleistocene extinction models should be subject to considerable skepticism, both due to their inability to account for survival-extinction patterns in North American species and their inability to differentiate between different extinction scenarios.

Also, Jeff assessed the ecological consequences of the loss of a guild’s top carnivore by developing a new conceptual model of intraguild competition among North American canids.

Newsworthy
George Hechel to retire
We heard recently that George will be retiring soon, and a party in his honor is being organized (for further information contact Jeff Levinton: levinton@life.bio.sunysb.edu). George’s research interest focus on the sponges of the North Carolina continental shelf, a biogeographically transitional zone. His teaching contribution to the department has been invaluable, affecting generations of students.

Endowment for E&E!
The Department of Ecology and Evolution has been informed that former department faculty member Barbara Bentley and her husband, former Department of Chemistry faculty member Glenn Prestwich, have specified that a substantial portion of their estate after their deaths will be donated to support graduate educational opportunities for women in the Department of Ecology and Evolution.

We are grateful for their generosity and for their support of our graduate program, particularly for the continued success of our women graduate students.

More pubs!
DO WE NEED AN EXTENDED EVOLUTIONARY SYNTHESIS?
By M. Pigliucci. Evolution 61:2743-2749, 2007. The answer, according to Massimo, is “largely yes,” though we are not about to have anything as upsetting as a paradigm shift, just yet...

CORRELATED EVOLUTION AND DIETARY CHANGE IN FOSSIL STICKLEBACK
By M.A. Purnell, M.A. Bell, D.C. Baines, P.J.B. Hart and M.P. Travis. Science 317:1887, 2007. Mike, Matt and colleagues show that rapid evolutionary change in Miocene stickleback was associated with shifts in feeding, providing direct evidence from the fossil record for changes in trophic niche.

THE GENETIC ARCHITECTURE OF A NICHE: VARIATION AND COVARIATION IN HOST USE TRAITS IN THE COLORADO POTATO BEETLE

PROTEIN SUBCELLULAR RELOCALIZATION: A NEW PERSPECTIVE ON THE ORIGIN OF NOVEL GENES

Call to Alumni: If you have news or comments, send short blurbs or longer essays to massimo.pigliucci@gmail.com