ECOLOGY AND EVOLUTIONARY BIOLOGY

SUMMER 2015 NEWSLETTER NUMBER 23

EEB CELEBRATES 30TH ANNIVERSARY

Since 1985, the faculty and students of the Department of Ecology & Evolutionary Biology have been leaders in discovering, understanding, and preserving biodiversity.

To celebrate the 30 years of excellence, EEB hosted a Distinguished Ecology & Evolutionary Biologist Seminar Series throughout the Spring 2015 semester. Thirteen leading scientists, all members of the National Academy of Sciences, led seminars and spoke on current concepts as well as major advances in a wide array of topics in ecology and evolutionary biology.

Guest speakers included Gene Likens and Peter Raven, as well as Stephen Pacala, Daniel Simberloff, Michael Donoghue, David Hillis, Marc Feldman, Robert Ricklefs, May Berenbaum, Susan Wessler, Douglas Futuyma, G. David Tilman, and Mimi Koehl. For more detailed biographies of the speakers, please go to: http://www.eeb.uconn.edu/eebwww/30th-seminars/

On April 18th, UConn's Rome Ballroom was the setting for a gala anniversary celebration and auction. Nearly 150 friends, faculty, staff and students (current and former) attended the event which included silent and live auctions to raise money for the newly established Graduate Student Research Endowment Fund. The EEB Graduate Student Research Endowment Fund supports emerging young scholars in the Department of Ecology and Evolutionary Biology as they develop and execute innovative research projects.

Gifts to this fund help EEB graduate students pursue their scholarly passions, disseminate their findings, and gain the skills necessary to succeed in a career in organismal biology will provide travel and expense support related to field or museum work, purchase equipment and/or software, present research at conferences and professional meetings, as well attend off-campus workshops on specialized methodologies or techniques to name but a few.

Those interested in supporting EEB graduate student research are invited to make a contribution at: https://uconn.givecorps.com/causes/1166-ecology-and-evolutionary-biology

A video celebrating the Department's accomplishments, produced by Kristiina Hurme (Ph.D. 2011) and Alejandro Rico-Guevara (Ph.D. 2014), can be found at: https://www.youtube.com/watch?v=hjeEDwIXx3g&feature=youtu.be

LEAST STUDIED REGIONS AT GREATEST RISK FOR SPECIES EXTINCTION

Mark Urban's eye-opening study, Accelerating Extinction Risk from Climate Change, appeared in the May 1, 2015 issue of *Science* (http://m.sciencemag.org/content/348/6234/571.full).

His study indicates that for every degree that global temperature rises, more species will become extinct. Further, the risk of species loss is most acute for those continents that have unique climate ranges with native species that can survive only in a limited range. At this point in time, these ranges are the least studied.

Climate change and the resultant extinction of species is not a new concept. However, rather than focus on how individual species may be affected by climate change, Mark's research is the first to take a more holistic approach.

In a meta-analysis based on data from previously published studies, Mark reports that rises in global temperature will threaten up to one in six species if current climate policies are not modified. "We can look across all the studies and use the wisdom of many scientists," Urban says. "When we put it all together we can account for the uncertainty in each approach, and look for common patterns and understand how the moderators in each type of study affect outcomes.

According to Urban, if the earth warms another 3 degrees Celsius, the extinction rate increases to 8.5%; should the current rate of warming continue, the world would experience a 4.3 degree Celsius rise in temperature by the year 2100 and the extinction rate would be as high as 16%.

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Urban took a global approach with his analysis because there are inherent difficulties in comparing previous studies by various authors. Studies differed in significant ways, including assumptions, methods, species examined, and geographic regions. Findings were inconsistent and difficult to compare across species.

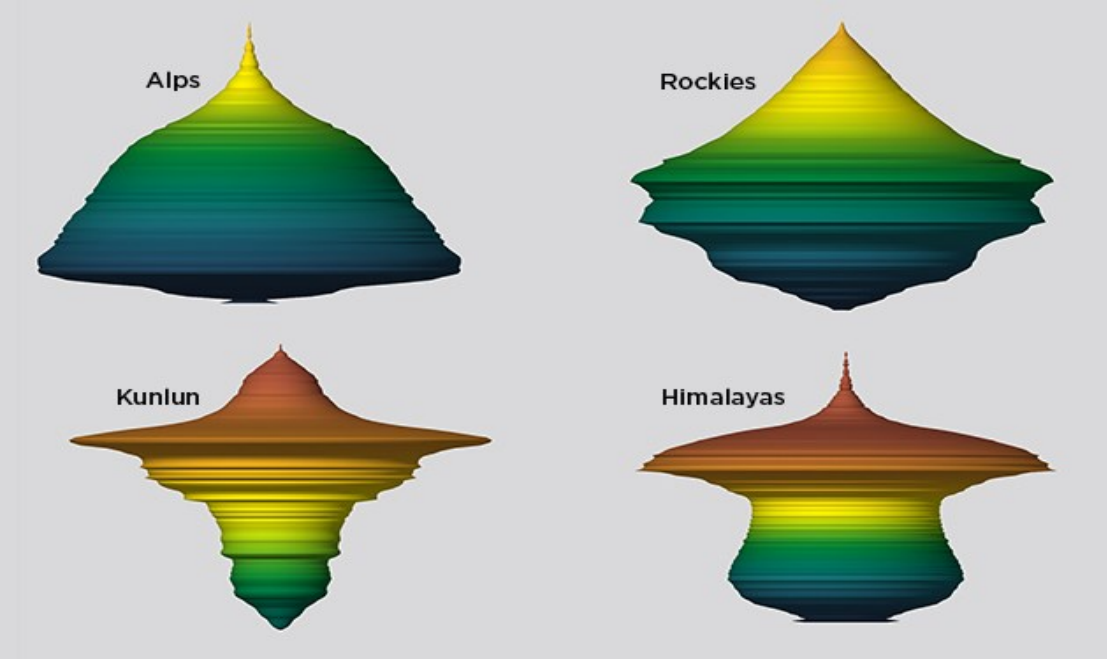
About 60% of the climate change studies center on North America and Europe; however, South America, Australia and New Zealand are at the greatest risk according to Urban. "With Australia and New Zealand, we're looking at land masses that are relatively small and isolated, so that the possibility of a species shifting to a new habitat simply doesn't exist," he says.

An American pika in the Canadian Rocky Mountains. Pikas live in high mountain ecosystems that are cool and moist, and can overheat in higher temperatures. Unlike other mountain species that can move to higher altitudes in warming climates, pikas live so high there is no where for them to go. (Wikimedia Commons Photo)

"We have generally thought that certain groups were more at risk than others, but our results show that all taxonomic groups will be affected as the climate changes. Even species not threatened directly by extinction could experience substantial changes in abundance, distribution, and in their interactions with other species. In turn, this may affect ecosystems, crop growth, and the spread of disease, and have other unanticipated consequences," notes Urban.

"With living things, we are dealing with millions of species, none of which act precisely the same. In fact, we may be surprised, as indirect biologic risks that are not even recognized at present may turn out to have a greater impact than we've ever anticipated," says Urban.

Adapted from a UCONN TODAY article
April 30, 2015 by Sheila Foran



Images courtesy of Morgan Tingley, Paul Elsen, and Nature Climate Change

SPECIES' RESPONSE TO CLIMATE CHANGE AFFECTED BY MOUNTAIN SHAPE

UCONN's **Morgan Tingley** and Princeton University graduate student, Paul Elsen, have published a study in *Nature Climate Change* which changes the perception of mountain shapes. And why would the shape of mountains matter? Because the mountain's shape my directly affect a species ability to respond to climate change.

The Tingley-Elsen study reveals that most mountains are more accurately shaped as diamonds, hourglasses or even upside-down pyramids rather than the long-held belief that they are pyramidal - broad at the bottom and pointy on top with tapering sides.

Conventional thinking regarding climate change has been dominated by the "escalator effect" - which states the higher one travels in elevation, temperature decreases; as the Earth warms, species must climb higher in elevation to stay in their best-adapted conditions, driving species further and further up a mountain. As there is less space at the top of a mountain, species crowd one another out and are pushed into extinction.

The study, which analyzed the surface area across elevations for 182 mountain ranges on all six inhabited continents, challenges the escalator effect theory. Study findings indicated more than two thirds of all mountain ranges did not conform to a pyramidal shape. In fact, 39% had a majority of their area at mid-elevation (diamond shaped), 23% had the least amount of area at mid-elevation (hourglass shaped), and 6% had most of their area at high elevations (inverted pyramid shaped).

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For other species, such as those that live in the foothills of the Himalayas (an hourglass-shaped range), there may be far less space to which to move at the middle of the mountain. Tingley calls these areas "pinch points."

He points out, "Some species that are at low elevation on hourglass mountain ranges could go through a mid-elevation bottleneck where there's not as much space. If you can make it through the bottleneck, that's great, but if you're a species that's narrowly restricted in its elevation range, you could go extinct before you expand into that higher-elevation space."

And in the case of inverted pyramid ranges, where most of the area is toward the top, there would be more area for animals and plants as they move upward – until the very top, of course, where all mountains end.

Tingley says he hopes conservationists will take mountain topography into account when creating species conservation plans. The appendix to the paper classifies all 182 mountain ranges into the four labels, a resource that conservationists can use to make better decisions about priorities for species protection.

He urges conservationists and other scientists to continue to question fundamental assumptions about nature, because , the reality is often surprising. "In the natural world, even things we think we know really well, we don't actually know," says Tingley.

Photo at left is Khalia Top in Munsiari, Uttarakhand, India, at an elevation of approximately 12,000 ft, showing mid-elevation areas supporting wildlife like rhododendrons, seen here flowering in the foreground.

(Photo courtesy of Paul Elsen)

Adapted from a UCONN TODAY article
May 18, 2015 By Christine Buckley

EEB SAYS GOODBYE TO GOOD FRIEND AND COLLEAGUE

Professor emeritus Carl Schaefer of the Department of Ecology and Evolutionary Biology died on April 29, 2015 of cancer. He was 80.

Schaefer earned his BA in zoology from Oberlin College and his Ph.D. in entomology from UConn in 1964. He was extremely well-read, and had extensive familiarity with the works of Charles Dickens. He was also a musician, having played the viola in a string quartet with his siblings, and had a penchant for musical composition, composing, among other things, a clarinet sonata.

Schaefer began his teaching career at Brooklyn College in 1963. He came to UConn, to join what was then the Department of Entomology, in 1966, and stayed at UConn, retiring in 2009 but continuing as an emeritus faculty member.

Carl especially loved his interactions with students, whether teaching his Medical Entomology course or advising his graduate students, he was never too busy to provide support and encouragement.

Aware of the high cost of publishing research in scholarly publications, Carl established an endowment fund to help both graduate and undergraduate students defray the cost of publishing their research. Contributions in Carl's memory may be made to the UConn Foundation, Carl Schaefer Fund for Student Research (31279).

Not only were his students' lives impacted by his outstanding teaching ability, but he was an active member of the UConn community, serving on the University Senate and as president of the faculty union, AAUP. He was also an influential figure in the town of Mansfield, as a member of the Mansfield Town Council for 10 years, and a member of the Mansfield Historical Society.

Robert Colwell, Board of Trustees Distinguished Professor Emeritus of Ecology and Evolutionary Biology, whose lab was next door to Schaefer's for 25 years, remembers his colleague:

"We became good friends, invariably talking longer about whatever than either of us intended to, as we dropped into each other's labs for a chat. And 'whatever' ranged from entomology (our common passion) to classical music, literature, politics, and of course, jokes and stories. … This delightful man lives on in all our memories."

Schaefer is survived by two siblings, Emily and Jon; two daughters, Madelyn, Ann and her husband Mark; seven grandchildren; six great-grandchildren; and many cousins, nieces, and nephews.

FACULTY AWARDS AND GRANTS

EEB is proud to announce that seven faculty have received grants and awards in Spring 2015.

Dr. Robin Chazdon was awarded a $25,000 grant from National Geographic Society for her project, *"Tree Seedling Regeneration and Frugivore Networks During Tropical Forest Regrowth."*

Dr. Chris Elphick was awarded at $303,350 grant from the DOI/U.S. Fish & Wildlife Service/ University of Maine for his project, *"Resilience of the Tidal Marsh Bird Community to Hurricane Sandy/ Assessment of Restoration Effects."*

Dr. Charlie Henry was granted a $24,467 award from the Research Excellence Program (UCONN) for his project, *"Identification of Genetic Loci Responsible for Premating Isolation by Singing Behavior in Green Lacewings."*

Dr. Eric Schultz received a $64,489 grant from DOC/National Oceanic and Atmospheric Administration for his project, *"Modeling Alternative Management for Sustainable Stocks fo Tautog."*

Dr. Chris Simon and **Dr. John Cooley** were granted a $24,906 award from the Research Excellence Program (UCONN) for their project, "*Using Anchored Hybrid Enrichment Genomics to Study the Biodiversity of a Host-Symnbiont Consortium against a Backdrop of Changing Climates."*

Dr. David Wagner was awarded a $18,990 grant from the National Geographic Society for his project, *"Odonata of Amazonian Ecuador: Expedition to Remote Reaches of Yasuni National Park."*

Dr. Charlie Yarish received a $25,000 grant from the Maine Aquaculture Innovation Center for his project, "*Development of a Cultivation Program for a Morphologically Distinct Strain of Sugar Kelp, Saccharina latissma forma angustissima From Southern Maine."*

Recent Publications:

Chris Simon, Russ Meister (M.S. 2014), et al. **Genome expansion via lineage splitting and genome reduction in the cicada endosymbiont *Hogdkinia.*** PNAS 2015 A link to the publication can be found at: http://www.pnas.org/content/early/2015/05/15/1421386112.abstract

ALUMNI NEWS

BRIAN KLINGBEIL (Ph.D. 2015) has accepted a post-doctoral position in EEB working with Chris Elphick on a project entitled "Saltmarsh Habitat and Avian Research Program" (SHARP).

JUAN CARLOS VILLARREAL (Ph.D. 2011) has accepted a tenure track position in the Department of Biology at the University of Laval, Quebec City (Canada).

DIEGO SUSTAITA (Ph.D. 2013) has accepted a tenure track position in the Department of Biology at California State University San Marcos.

ELLEN WOODS (MS. 2015) received a Graduate Research Fellowship from the National Science Foundation. Ellen is currently a Ph.D. student at Wesleyan University in Middletown, CT