



Photo courtesy of Allison Stegner

This past summer, grad student Allison Stegner taught children about mammal teeth at a local library in her home town in Vermont.

McKittrick tarpit fossil collection grant!

UCMP is pleased to announce the award of a new \$149,713 grant from the Institute of Museum and Library Services (IMLS) to curate, rehouse, and capture digital images of the important Pleistocene-Holocene McKittrick tarpit fossil collection from Kern County, California.

The McKittrick tarpits were excavated by Berkeley scientists in the 1930s and yielded thousands of bones of extinct and extant mammals, birds, and reptiles. The area was eventually designated a California State Historical Landmark due to the importance of these finds. These fossils span a key climatic transition and extinction event near the Pleistocene-Holocene boundary and have direct relevance to other UCMP and UC Berkeley research initiatives. Unfortunately, the fossils, many of which are housed in the Campanile, have never been fully curated, and few people know of their importance. This funding gives us the support to conserve these fossils properly and develop web content and digital learning materials to highlight McKittrick and contrast the site to the better-known La Brea tarpits. We are excited by and grateful for the support of IMLS in helping us to share this important part of the story of California. The one year project will kick off October 1, 2014. 🦕

UCMP's summer 2014 adventures

Tony Barnosky spent much of June in South Africa, Zambia, and Botswana getting a first-hand experience with megafauna and spent the rest of the summer writing. His new book, *Dodging Extinction—Power, Food, Money and the Future of Life on Earth*, will be released October 1. During Homecoming Weekend at Cal, Tony will give a faculty seminar on Dodging Extinction followed by a book signing on October 10 (see calendar on page 3).

Jeff Benca spent the summer building an evolutionary teaching and research collection of living plants on the roof of the Valley Life Sciences Building. This formerly empty rooftop is now being “greened” by a diverse array of rare and unusual plants that will be used for the paleobotany course being taught by him, **Susan Tremblay**, and **Cindy Looy**.

Predictably, **Bill Clemens** returned to eastern Montana this summer. Working with **Greg Wilson** and Dave DeMar (University of Washington)—and some new, very advanced GPS units—the group returned to a number of UCMP fossil localities to determine their geographic coordinates and elevations, finding that erosion at some localities had uncovered new material. Bill also helped Courtney Sprain, a graduate student in Earth and Planetary Sciences working with Paul Renne (Director of the Berkeley Geochronology Center), collect samples for radioisotopic age determinations and paleomagnetic analyses. Courtney's research is expected to provide greater resolution and understanding of the tempo of evolution of the Hell Creek and Tullock Formation biotas.

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USGS project update

We've had a busy summer at the Regatta facility [UCMP's off-site collections facility in Richmond] rehousing the former USGS Menlo Park collection. The crew of two graduate students (**Renske Kirchohles** and **Camilla Souto**), six undergraduates (including **Marianne Brasil** who is now a new graduate student in the Hlusko lab; see Tidbits), and five volunteers rehoused seventeen new cabinets worth of material in a mere 12 weeks!

Renske worked on the USGS Alaskan and Arctic locality data, adding 10,403 new locality records to the UCMP database (<http://ucmpdb.berkeley.edu/loc.html>). She is also leading the effort to design an educational module that incorporates the USGS collection. Our proposed module will allow/guide K-12 students and other citizen scientists to identify the types of fossils from each photographed locality. Camilla spent the summer curating material collected by USGS geologist John G. Vedder. Using a combination of publications, original field maps and online databases, Camilla was able to add or update information for over 600 localities.

We also want to take the opportunity in this issue to salute the undergraduate student workers. Their dedication to the rehousing project always impresses me, their enthusiasm is contagious and I love deciphering the more unusual fossils together. **Gina Hwang**, **Dianne Quiroz**, **Michelle Sparnicht**, **Olivia Tullier** and **Alexis Williams** have all worked three or four semesters on the project. I hope you enjoy their reflections.

USGS undergraduates

Gina Hwang, Molecular and Cell Biology major; has worked four semesters on the USGS collection

"My summer at the Regatta facility was an amazing experience. Why? The people involved with the project have been great—Erica, the graduate students, my fellow student co-workers. Working with the specimens has been so fun, and the history—especially through the eyes of the collection documents—has been incredible. Also, I'm proud and glad of the progress that we made during the summer!"



Photos by, from left, Kathy Zoehfeld and Erica Clites

Undergrad Olivia Tullier (left) organizes a drawer of fossils while project coordinator Erica Clites confers with volunteer Don Pecko. At right, undergrad Gina Hwang with one of the new collections cabinets.

Olivia Tullier, Integrative Biology major (graduated summer 2014); has worked four semesters on the USGS collection

"Working as a museum assistant on the former USGS Menlo Park Collection in the UCMP was one of my fondest experiences at Cal. Since I began working on the project from its early stages, I was able to witness the collection's transformation from a mysterious disarray of boxes to a current established collection. Some of my favorite memories from the project include photographing the specimens, assisting in identifying their ages, and preparing Cal Day exhibits. However my greatest experience working with the Menlo Park Collection was learning its history through discovering letters and documents from the early 1900s. During the early stages of the project, every newly opened drawer resulted in more specimens and letters describing how and where they were discovered, along with information on their collectors. I enjoyed uncovering the background history of major figures like Cliff Nelson and Warren Addicott and their contribution to the study of paleontology. Overall, working at the UCMP was a great experience that allowed me to explore my interests in natural history with a new perspective." 🐛

— Erica Clites

The Clemens Oral History Project

The UCMP is zeroing in on its goal of \$25,000 for the **Bill Clemens** Oral History Project. At this time, total contributions are near \$16,000. After consultation with the Regional Oral History Office (ROHO) of the Bancroft Library, UC Berkeley, we find that sufficient funds have been raised to begin the project. We thank all of you for your contributions, large and small! Continuing donations will provide for additional interviews with Bill's colleagues, former students, family, and friends, plus the transcription of these interviews.

The project will begin with a series of interviews with Bill starting in late September, continuing through the fall and into the first months of 2015. Paul Burnett, a historian of science with ROHO, will conduct the interviews, touching on the most important aspects of Bill's career. Topics will include the debate over the nature of the Late Cretaceous extinction and vertebrate evolution across the K/Pg Boundary, Bill's life, his research in vertebrate paleontology, his service to UCMP, and his 50+ years of contributions to the evolution of the Museum and paleontology at Berkeley. The interviews will also try to capture some of Bill's deep knowledge of the history and nature of UCMP's collections. 🐛



Congratulations!

This summer we celebrated the career of **Dave Lindberg**, past UCMP Director, Professor of Integrative Biology and now Emeritus Professor. Dave's life history and career accomplishments were center stage at a July retirement party organized by his former and current students. Dave's colleagues, friends, and family gathered to recognize his many contributions to the field of malacology and to the lives of generations of scientists.

Welcome!

The UCMP welcomes five new graduate students this Fall into the labs of UCMP curators: **Caitlin Boas** (Finnegan), from Brooklyn College; **Marianne Brasil** (Hlusko), from Cal; **Sara El Shafie** (Padian), from the University of Chicago and the University of Nebraska; **Nick Spano** (Barnosky), from the University of Minnesota at Duluth; and **Zixiang Zhang** (Barnosky), from Stanford.

Welcome to new research associate **Yael Edelman-Furstenburg** from the Geological Survey of Israel who will work on Miocene foraminifera starting in December 2014.

UCMP welcomes postdocs **Christopher Schmitt** and **Michaela Huffman** to the Hlusko Lab. Chris will be teaching IB35ac this semester and is collaborating on quantitative genetic analyses of non-human primate phenotypic variation. Michaela, who completed her Ph.D. at The Ohio State University, will help develop a project studying human dental development, variation, and adaptation in the Americas.

Welcome to **Giovanni Rapaciuolo**, a postdoc in the Marshall Lab, who earned his Ph.D. at Imperial College, London. Giovanni will work on museum informatics in service of global change biology.

Welcome postdoctoral scholar, **Jessica Bean**, to the Understanding Global

Change project. Jessica received her Ph.D. at UC Davis in geology (emphasis in evolutionary biology) with Geerat Vermeij, and was program manager for the NSF GK-12 Program at Bodega Marine Laboratory. Also currently an Anthropology Postdoctoral Researcher at UC Davis, Jessica studies gastropod growth patterns and isotopic signatures to determine the geographic sources of shell beads from the archaeological record of California. Jessica is no stranger to the UCMP, and previously worked with the CAL:BLAST program. Working with the *Understanding Science* team, she also developed the Scientific Process Mapping Program, an interactive journaling tool utilizing the *Understanding Science* Flowchart (see <http://bml.ucdavis.edu/education/cam-eos/sciencemap/>).

Understanding Global Change project update

The Understanding Global Change project continues to make excellent progress on an expected spring 2015 launch of the UCMP *Understanding Global Change* web resource. The writing team was busy this summer creating content for the site that highlights the drivers and impacts of change from both deep and modern times. The project held a very successful one-week Understanding Global Change summer institute in August for 25 teachers (mostly middle and high school) who previewed the website, examined process and examples of change storylines, and explored relevant teaching resources aligned with the Next Generation Sci-

CALENDAR

Upcoming events

First Wednesday of each month

East Bay Science Café: On October 1, graduate student Yu Zeng of the UCB Animal Flight Laboratory will be speaking on flight in stick insects. See <https://www.facebook.com/pages/East-Bay-Science-Cafe/109526242408588>.

Fri, October 10, 2014

Dodging extinction—A Homecoming Weekend Faculty Lecture (and book signing) by UCMP's **Tony Barnosky**. See <https://homecoming.berkeley.edu/events/category/event-type/faculty-seminars/dodging-extinction>.

Sat, November 1, 2014

Bay Area Science Festival, Discovery Days at AT&T Park—A program full of interactive exhibits, experiments, games, and shows, all meant to entertain and inspire. See <http://www.bayareascience.org/festival/discovery-days-at-att-park/>.

ence Standards and Common Core Math and Language Arts Standards. Similar to the Think Evolution summer institute now in its 6th year, we plan to offer the Understanding Global Change summer institute as an annual event. 🐌



Postdoc Jessica Bean discusses ocean circulation with teachers at the Understanding Global Change summer institute in August.

Photo courtesy of Lisa White

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In June, **Dori Contreras** collected fossils in New Mexico at a Late Cretaceous fossil flora site with three field assistants: two current undergrads and a recent IB graduate. Excitingly, she found an attached cone for a fossil redwood—a rarity at this site, one she has been studying for several years (Dori has been searching for plant reproductive material for four years; her previous advisor has been searching for over 20). The find is significant and will substantially contribute to the description of the taxon.

Lindsey Doherty spent the first part of the summer mentoring Alex Niebergall, a marine science undergraduate in the SMART program, researching behavioral aspects of the flashing display of the disco clams for which Lindsey has received an enormous amount of recent press (see [blog](#)). She then traveled to Indonesia in order to process a year-long research permit and follow up on ecological analysis from last summer. In Indonesia, she spent time in Jakarta, Raja Ampat and Bali. Lindsey found many more disco clams on the trip, but also ran into a three-meter-long crocodile at one of her dive sites and visited a cave full of human skulls. This fall Lindsey will be heading off to dive and present at the American Association of Underwater Scientists annual meeting in Sitka, Alaska.

Ivo Duijnste and **Cindy Looy** spent most of the summer back in the Old World. In June their alma mater celebrated its 50th birthday with a two-day conference featuring talks on the current research of its scientist alums, including Cindy's. In early July the Paleontological Society of Southern Africa held its biannual meeting at Witwatersrand University in Johannesburg. Cindy was invited to speak about her South African work. It was a particularly successful meeting because it brought together so many paleobotanical colleagues that work in Paleozoic Gondwana and because of Witwatersrand's incredible plant collection.

Ken Finger and former Integrative Biology grad student Jack Scully spent a week at John Smol's Paleocological



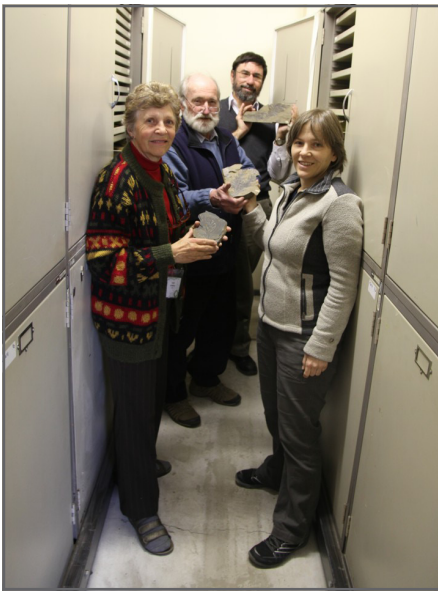
Clockwise from top left: *In Africa, Tony Barnosky had a close encounter with some rhinos. Jeff Benca's roof garden includes these New Caledonian endemic conifers (*Auracaria columnaris*). Two dolphins glide by Lindsey Doherty while she dives in Indonesia.*

Photos by or courtesy of, clockwise from top left: Tony Barnosky, Jeff Benca, Lindsey Doherty

Environmental Assessment and Research Laboratory (PEARL) at Queen's University in Kingston, Ontario, getting oriented to work on the diatoms from cores taken in Clear Lake, California. Ken and Jack will be analyzing these microscopic siliceous algae (a departure from Ken's specialty in foraminifera, calcareous microfossils) as part of the comprehensive paleoclimate study headed by **Cindy Looy** (see photomicrograph of *Stephanodiscus niagarae*, which is one of the largest and most common diatoms from Clear Lake).

Mark Goodwin had a busy summer. In the Hell Creek Formation of eastern Montana, Mark (1) prospected for new dinosaur and microvertebrate localities, (2) visited old localities, (3) found an association of *Thescelosaurus* bones,

and (4) supported the field research of UCMP alum **Greg Wilson's** University of Washington grad students, who were also working in the area. Later, with David Evans of the Royal Ontario Museum, Mark examined Upper Cretaceous rocks exposed along the Milk River in southern Alberta. North of Rudyard, Montana, Mark and David confirmed the stratigraphic level of certain UCMP localities central to Mark and David's collaborative research. Mark then traveled to Ekalaka, Montana, where he was an invited speaker at the 2nd Annual Dinosaur Shindig. He spent a week in the field with a crew from the Burpee Museum in Illinois helping to collect a couple *Triceratops* skulls and confirming other dinosaur localities. Mark worked with



Photos by or courtesy of, clockwise from top left: Cindy Looy, Carole Hickman, Jenny Hofmeister, Winnie Hsiung, Tesla Monson

Clockwise from top left: **Cindy Looy** (right) with Heidi Holmes, John Anderson, and Conrad Labandeira in Witwatersrand University's paleobotanical collections. **Carole Hickman** observed this specimen of the Late Proterozoic (Vendian) Ediacaran *Charniodiscus* from Earth's earliest record of macroscopic life, Port Union, Bona Vista Peninsula, Newfoundland. **Jenny Hofmeister** will be able to track the movements of this octopus now that it has been tagged. In England, **Winnie Hsiung** took time out to visit Stonehenge. **Tesla Monson** with a statue of her namesake, Nikolai Tesla, in Croatia.

Montana State University grad student Nate Carroll and undergrad Jack Wilson to describe a new "Dracorex" pachy skull, and was able to squeeze in some time in the collections at the Museum of the Rockies, Bozeman.

Carole Hickman spent 15 days visiting and photographing spectacular

geological and paleontological sites in the provinces of Atlantic Canada with a group led by **Doris Sloan**. Highlights included observations of Ediacaran fossils (the oldest body fossils of multicellular organisms) on the Bonavista Peninsula at Port Union, Newfoundland; the Global Boundary Stratotype Section (GSSP) for

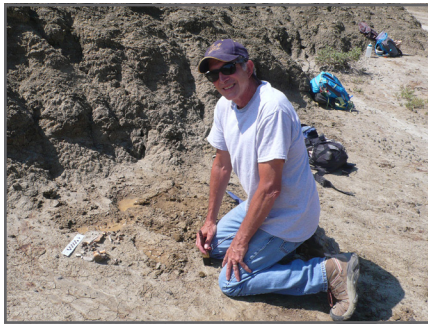
the Cambrian-Ordovician boundary at Green Point, Gros Morne National Park, Newfoundland; the first appearance of graptolite fossils in deep-water shale immediately above the Cambrian-Ordovician boundary; and Pennsylvanian coal-age lycopsid tree trunks preserved in standing position in the Joggins Cliffs on the Bay of Fundy, Nova Scotia.

This summer, **Jenny Hofmeister** returned to Catalina Island for her final field season at the USC Wrigley Institute for Environmental Studies. She continued her adventures in SCUBA diving and started a new and exciting project tracking octopuses using acoustic telemetry. In collaboration with Alaska Pacific University, and with funding from the UCMP, Jenny tagged 10 *Octopus bimaculatus* individuals and tracked them over a period of 14 days. This is the smallest octopus species to be tracked and only the third time tracking has been done successfully in any octopus species. As a result of this work, Jenny was invited to give a public lecture at the Aquarium of the Pacific in Long Beach in November. Jenny also coauthored a recent paper appearing in *Advances in Marine Biology* (Volume 67) entitled "Transitions during cephalopod life history: The role of habitat, environment, functional morphology and behaviour."

Shih-Yi (Winnie) Hsiung traveled to the University of Exeter in England and took over 150 oak pollen SEM (Scanning Electron Microscope) images from 23 modern oak taxa (all California natives) and some unknown fossil oak taxa which showed detailed wall ornamentations. The high resolution SEM images will help to quantify the wall features of modern oak pollen and assist in the identification of fossil oak pollen. Winnie plans to present her results at the Geological Society of America annual meeting in Vancouver in October. While in England, Winnie visited the World Heritage sites Stonehenge and the Jurassic Coast, and beaches in Devon.

Tesla Monson attended the 16th International Symposium on Dental Morphology/Paleodontology Conference in

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Photos by or courtesy of, from top: Mark Goodwin, Julia Sankey, Camilla Souto, Lisa White

From the top: **Mark Goodwin** collects the fossil bones of the dinosaur *Thescelosaurus* in the Upper Cretaceous Hell Creek Formation, eastern Montana. One of **Julia Sankey's** students prepares a large fossil bone collected from the Pleistocene-age Fairmead Landfill site. **Camilla Souto** (left) with **David Pawson** and **Luciana Martins** at the NAEC meeting in Florida. **Lisa White** at a workshop for high school teachers at the University of Delaware.

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Zagreb, Croatia, where she presented her paper, "Identification of a derived dental trait in *Papionini* relative to other Old World Monkeys," recently published in the *American Journal of Physical Anthropology* (Monson and Hlusko 2014). After a successful series of "The Graduates" on KALX radio, Tesla plans another round of the show this fall. The *Berkeley Science Review* featured the research of two of her subjects (**Jenna Judge** on wood falls, limpets, and conservation, <http://berkeleysciencereview.com/jenna-judge-graduates/>, and **Ashley Poust** on dinosaur eggs and early mammals, <http://berkeleysciencereview.com/dino-eggs-ancient-mammals/>).

Emily Orzechowski participated in the Paleontological Society's Stratigraphic Paleobiology field course in the Tobacco Roots Mountains of Montana and the Larval Biology course at the University of Washington's Friday Harbor Marine Laboratories.

Research Associate **Julia Sankey** and her students at California State University, Stanislaus, are helping the UCMP prepare Pleistocene mammal fossils collected at the Fairmead Landfill (near Chowchilla, Madera County) in 1993 and stored at the museum's Regatta facility. This summer, Sankey's student volunteers learned how to prepare fossils under the guidance of CSU lab technician, John Wheeler. This project started small several years ago and has grown in popularity and productivity. Over the past year, 18 student volunteers have contributed over 300 lab hours preparing fossils.

Camilla Souto attended the 7th North American Echinoderm Conference—a small conference held in honor of Dr. David Pawson, a great echinoderm worker recently retired from the Smithsonian Institution—at the University of West Pensacola in early June. Upon returning to Berkeley, Camilla worked with **Erica Clites** and **Renske Kirchholtes** on the Menlo Park Project at the Regatta facility, georeferencing and assigning ages to the fossils.

Allison Stegner spent two months

FRIENDS OF UCMP

We would like to welcome the following new or renewing members to our Friends of UCMP:

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Zhe-Xi Luo and Sharon Feng
Donald L. and Margaret S. Lofgren
Louise Taylor

Anthony "Tony" Barnosky Honorary Fund for Graduate Student Support

Everett H. Lindsay

in San Juan County, Utah, doing catch-and-release trapping of small mammals and excavating a woodrat- and raptor-generated Holocene cave deposit. For part of this work, she was joined by Berkeley undergraduate assistant Molly Hardesty-Moore. Back in Allison's hometown in Vermont, she taught a class on mammal teeth for kids at the local library linking fossil to modern species.

Brian Swartz (Ph.D. 2011, Padian Lab) started a research position at the University of Pennsylvania this fall and looks forward to getting back to Paleozoic research; he will study the paleoichthyology of early vertebrates. After receiving his Ph.D., Brian transitioned away from

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LETTER FROM THE DIRECTOR



This past summer saw UCMP firing on all cylinders—our community was active in the field, wrote papers, attended meetings, hosted visitors, and ran teacher workshops. The ongoing re-housing and digital imaging of the former USGS invertebrate collection was also a priority, and UCMP supplemented our NSF grant to fund undergraduates this summer, and will continue to do so during the Fall to speed the work. But we have had little time to reflect on our accomplishments—the Fall semester has now begun! We are excited to have five new graduate students, and we are teaching a full palette of undergraduate and graduate-level classes, nurturing our next generation along. And with the new academic year, the on-going process of grant writing is now getting into full swing, including preparation of a large NSF grant to continue our digital imaging of the collection. This grant builds on the current NSF collection grant, and we are excited to be partnering with other collections,

including the Burke Museum, University of Oregon, California Academy of Sciences, Los Angeles County Museum of Natural History, and the Paleontological Research Institute. So, as we work hard to keep UCMP growing, I am, well, floored by the very positive responses to our fundraising campaign announced in our last newsletter—UCMP is deeply appreciative of the commitment and support you provide this amazing place, to help us in our goals of furthering the understanding of the history of life, through our research, education and outreach, and service.

Sincerely,
Charles Marshall

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the Paleozoic and focused on global change in the Anthropocene. Brian and colleagues from Berkeley and Stanford have an open access book (with Springer) coming out next summer about this research, entitled *Speciesism in Biology, Culture, and Sociopolitics*.

In partnership with San Francisco State and the University of New Orleans, **Lisa White** led another group of high school students on a geological field trip, part of the METALS geoscience education program. The trip to the southern Louisiana coast emphasized the Mississippi River delta system, post-Hurricane Katrina land loss and shoreline retreat, and the societal impacts of sea level change on Gulf Coast communities. Later in the summer, and after organizing the *Think Evolution* and *Understanding Global Change* workshops for teachers (see Tidbits), Lisa was an instructor in the Integrated Ocean Drilling Program (IODP) “School of Rock” workshop for high school teachers. Held at the University of Delaware College of Earth, Ocean, and the Environment, Lisa was back to her micropaleontology roots leading an activity for teachers on microfossils (foraminifera and diatoms) in deep sea sediments. 🦑

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Edited by Lisa White; layout & graphics by David K. Smith

For the broader UCMP community, visit the UCMP website: www.ucmp.berkeley.edu; Understanding Evolution: evolution.berkeley.edu; and Understanding Science: www.understandingscience.org

*emeritus