

annual report 2009-2010

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Ottilie White-Day, Museum Associate







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Message from the President

Serving on the Board of Trustees of PRI, I know what Dorothy must have felt like in the Emerald City: It's a truly spectacular place doing special work on extremely important science—but behind the curtain, pulling the levers is actually a rather modest, small group of incredibly talented, phenomenally articulate...hominins.

Where else can you go, as I did recently, not only to hear late-breaking research on the recently discovered "missing link" *Australopithecus sediba*, but to see what our probable ancestor looked like—even before publication? (Thanks to PRI Artist-in-Residence John Gurche.)

What other place can you visit that ties together, in one sweeping panorama, the very origins of life on Earth, the latest scientific data on our future on a warming planet, and what we can do to influence that future right here and now? (PRI published a great new "very short guide" to climate change this year.)

How can you better celebrate the unity of life on Earth than to listen, watch, smell, touch the stuff of creation, and learn from those whose gift it is to make it accessible to the child and the scientist in each of us? (PRI now has eight Ph.D.'s on its incredibly talented staff.)

PRI is limited not by science or art, nor by inspiration or excellence. It is only limited by the same mundane "resource-constrained environment" we all face. To watch how its staff has husbanded resources, yet produced more and more basic research, education, and outreach, has truly been an education in itself.

I am proud to be associated with this most dedicated group of scientists, educators, support staff, and volunteers. Please help me spread the word about how special PRI and the Museum of the Earth are, and learn from these pages how worthy they are of our time, our energy, and our substantial support.

Rob Mackenzie, MD

President

PRI Board of Trustees







Message from the Director

Like most CEOs in these uncertain times, I am frequently asked "how's it going?" in my organization. When people asked me this immediately after the economic downturn in 2008, my initial answer was usually something somber like "things are tough" or "we're holding our own". After a few months of this, however, it became clear to me that this was not accurate, or rather it was less than half-true. For most of the last two years, I have given a different response: "Things at PRI are programmatically amazing, even though they're financially challenging".

This isn't just me relabeling the glass half-full for the benefit of public perception. As real as the current economic difficulties are, just as real are the extraordinary growth and improvements in PRI's programs over the past two years, which are summarized in this Annual Report. In a nutshell: PRI is today fulfilling its mission more successfully than ever -- in collections, research, publications, and educational outreach -- and reaching more people with more and better programs than ever before. Furthermore, PRI's financial situation is actually not that bad, and is certainly better than some other much larger, older, and better known peer institutions.

Not all is good news, of course, either in Ithaca or beyond. The reality of the not-for-profit world in 2010 is that there are fewer financial resources available to support many more organizations. The CEO of a major national foundation was recently quoted as saying that the current model of philanthropic support is "broken", meaning that it will simply not be possible for all existing not-for-profits to continue to do what they have always done and expect to be funded as they have been in the past. This comment is representative of an emerging consensus, among both funders and charities themselves, that we may never return to the previous status quo; some organizations are going to downsize or disappear, permanently.

In such times, the conventional wisdom is to be cautious and husband one's financial resources. This is indeed critical and PRI is doing it. We have reduced our expenses and are being much more cautious about what new initiatives we undertake. Yet in such times it is also difficult to remember that our institutional purpose is not to perpetuate ourselves. It is – as it has always been – to serve society by doing what we are good at doing. This means not just being careful with our expenses and revenues. It also means aggressively doing what we do better, applying what we do to new and pressing societal problems, and explaining to new audiences why and how what we do matters. If previous times of plenty are not going to return any time soon, then it will be those organizations that are most successful in fulfilling important missions that will survive and prosper.

And it is in this incredibly important respect that PRI is, remarkably, thriving in these difficult times. How are we doing? As you will see in this report, the answer is "Great!"

Warren D. Allmon

Director

Research

The Paleontological Research Institution was in part originally conceived as a place for scientists and students to conduct original research. Today, PRI is home to eight Ph.D. scientists, several formally affiliated Ph.D. graduate students at Cornell University, and also hosts active Research Associates.



Dr. Warren Allmon (Director) has focused his recent research on three separate but related areas. He continues to work on the diversity, evolution, and natural history of fossil and living turritellid gastropods, and this year did field work in Panama and museum collections in Switzerland and London. He is also wrapping up an NSF-funded research project (in collaboration with Syracuse University professor and PRI Trustee Linda Ivany) on evolutionary changes in marine faunas across the Paleocene-Eocene boundary (ca.55 million years ago) in the U.S. Gulf Coastal Plain. He also continues theoretical work on how evolutionary biologists can study the process of new species formation using data from the fossil record. Allmon proudly graduated his sixth Cornell Ph.D. student, Ursula Smith, in 2010; Ursula researched the evolution and diversity of late Cenozoic turritellid gastropods in New Zealand, and is now headed for a postdoctoral position in Australia.



Dr. Paula Mikkelsen (Associate Director for Science and Director of Publications) is a marine biologist and malacologist interested in the diversity, anatomy, and evolution of living clams and snails. Mikkelsen is principle investigator on two National Science Foundation grants to study the evolution of bivalves and mollusks in collaboration with colleagues: "Bivatol" (Assembling the Bivalve Tree of Life, http://www.bivatol.org), which also produced the traveling exhibit "Science on the Half Shell: How and Why We Study Evolution," which opened at Museum of the Earth in September 2010, and "BiTS" (Bivalves in Time and Space), which explores the evolution of two large clades of bivalves, from molecular, morphological, and paleontological viewpoints.

The Deepwater Horizon oil spill in the Gulf of Mexico brought Mikkelsen's expertise in marine biology and southeastern U.S. coastlines to the fore, resulting in numerous press contacts, invited lectures, and the exhibit/website "Under Siege: Marine Life versus the Gulf Oil Spill."



Dr. Gregory Dietl (Director of Collections) pursues research that focuses on the evolution of ecological interactions using the molluscan fossil record of the last few million years. Highlights of his research activities this past year included a research trip to the Smithsonian Tropical Research Institute in Panama to study the effects of the final closure of the Isthmus of Panama roughly three-million years ago on the ecology and evolution of marine mollusks.

He also co-organized and led, in collaboration with Patricia Kelley (University of North Carolina at Wilmington), the third year of an NSF-Research Experiences for Undergraduates Program in Biodiversity Conservation. The goal of the program was to examine temporal changes in the marine ecosystems of the Carolinas to determine the degree and nature of societally driven environmental alteration, to assess the health of the modern ecosystems, and to identify possible approaches to conserving biodiversity. He also co-organized (with Karl Flessa of the University of Arizona), the highly successful Paleontological Society short course on Conservation Paleobiology at the Annual Geological Society of America Meeting in Portland, Oregon.



Dr. Judith Nagel-Myers (Collections Manager) focuses in her research on the role that predation has played in the Paleozoic Era. In the course of this work, she examines predation traces on bivalves as well as on brachiopods. An ongoing collaboration with Greg Dietl (PRI) and Carl Brett (University of Cincinnati) is looking at interspecies interactions of organisms in the Devonian Hamilton fauna, with special emphasis on predator-prey systems.



Dr. Richard A. Kissel (Director of Teacher Programs) is a vertebrate paleontologist interested in the terrestrial ecosystems of the late Paleozoic Era, with a current focus on the evolution of herbivory within tetrapods (those vertebrates with four limbs and digits).

Research







Research





Staff and Student Publications

Between July 1, 2009, and June 30, 2010, PRI scientists and affiliated students and research associates (names in bold face) published these 40 titles (plus numerous presentation abstracts and newspaper articles not listed here). (* = peer-reviewed)

Allmon, W. D. 2009. Every year is a year of planet Earth. American Paleontologist, 17(4): 1.

Allmon, W. D. 2009. The power (and peril) of paleontological images. American Paleontologist, 17(3): 20-21 (extended version at www.museumoftheearth.org). *Allmon, W.D. 2009. Speciation and shifting baselines: Prospects for reciprocal illumination between evolutionary paleobiology and conservation biology. In: Conservation Paleobiology: Using the Past to Manage for the Future, G. P. Dietl & K. W. Flessa (eds). Paleontological Society Special Publication, 15: 245-273. Allmon, W. D. 2010. The challenge of climate change. American Paleontologist, 18(1): 1.

Allmon, W. D., P. M. Mikkelsen, & K. Cronin. 2009. Program and Abstracts, American Malacological Society 75th Annual Meeting, Ithaca, New York, July 19-23 2009. Paleontological Research Institution, Special Publication 37, Ithaca, New York, 152 pp.

*Allmon, W. D., T. A. Smrecak, & R. M. Ross. 2010. Climate Change – Past, Present & Future: A Very Short Guide. Paleontological Research Institution, Special Publication 38, Ithaca, New York, 200 pp.

Auer, S.2009. Darwin for Kids in 2009: a review. American Paleontologist, 17(4): 20-21.

*Bieler, R., &R. E. Petit. 2010 Thylacodes – Thylacodus – Tulaxoduswormsnail name confusion and the status of Serpulorbis (Gastropoda: Vermetidae). Malacologia, 52(1): 183-187.

Dake, J. 2009. Field Guide to the Cayuga Lake Region. Paleontological Research Institution, Special Publication 36, Ithaca, New York, 152 pp.
Dietl, G. P. 2009. Paleobiology and the conservation of the evolving web of life. In: Conservation Paleobiology: Using the Past to Manage for the Future, G. P. Dietl & K. W. Flessa (eds). Paleontological Society Special Publication, 15: 221-244.

Dietl, G. P. 2010. Zinsmeister Collection. American Paleontologist, 18(2): 28. *Dietl, G. P.,S. Durham,& P. H. Kelley. 2010. Shell repair as a reliable indicator of bivalve predation by shell-wedging gastropods in the fossil record. Palaeogeography,Palaeoclimatology, Palaeoecology, 296(1-2): 174-184. Dietl, G. P., & K. W. Flessa, eds. 2009. Conservation Paleobiology: Using the Past to Manage for the Future. Paleontological Society Special Publication, 15, 285 pp.

Dietl, G P.,& K. W. Flessa. 2009. An introduction to conservation paleobiology. In: Conservation Paleobiology: Using the Past to Manage for the Future, G. P. Dietl & K. W. Flessa (eds). Paleontological Society Special Publication, 15: xiii-xv.

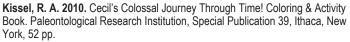
*Herbert, G. S., G. P. Dietl,H. Fortunato, L. R. L. Simone, & J. Sliko. 2009. Extremely slow feeding in a tropical drilling ectoparasite, Vitularia salebrosa(King and Broderip, 1832) (Gastropoda: Muricidae), on molluscan hosts from Pacific Panama. The Nautilus, 123: 121-136.

Kissel, R. 2010. Morphology, Phylogeny, and Evolution of Diadectidae

(Cotylosauria: Diadectomorpha). Ph.D. Dissertation, University of Toronto. Kissel, R. A. 2009. Dogs get their day. American Paleontologist, 17(3): 29-30. Kissel, R. A. 2009. A sale of a tale. American Paleontologist, 17(4): 22-23. Kissel, R. A. 2009. The science of hyperbole. American Paleontologist, 17(3): 22-23.

Kissel, R. A. 2010. All the better to eat you with. American Paleontologist, 18(1): 22-23.





Kissel, R. A. 2010. From ring finger to wing finger. American Paleontologist, 18(2): 22-23.

Mikkelsen, P. 2010. Writing for you (and Mom). American Paleontologist, 18(2): 1.

*Mikkelsen, P. M. 2010. Seventy-five years of molluscs: a history of the American Malacological Society on the occasion of its 75th annual meeting. American Malacological Bulletin, 28: 191-213.

*Nagel-Myers, J., M. Amler, & R. T. Becker. 2009. The Loxopteriinae n. subfam. (Dualinidae, Bivalvia): review of a common bivalve taxon from the Late Devonian pelagic facies. In: Studies in Devonian Stratigraphy: Proceedings of the 2007 International Meeting of the Subcommission on Devonian Stratigraphy and IGCP 499. Palaeontographica Americana, 63: 167-191.

*Nagel-Myers, J., G. P. Dietl, & C.E. Brett. 2009. First report of sublethal breakage-induced predation on Devonian bivalves. Palaios, 24(7): 460-465.
*Nichols, D. L., C. Elson, L. G. Cecil, N. Neivens de Estrada, M. D.

*Nichols, D. L., C. Elson, L. G. Cecil, N. Neivens de Estrada, M. D. Glascock, & P. Mikkelsen. 2009. Chiconautla, Mexico: a crossroads of Aztec trade and politics. Latin American Antiquity, 20(3): 442-472.

*Petit, R. E. 2009. George Brettingham Sowerby, I, II, & III: their conchological publications and Molluscan taxa. Zootaxa2189: 1-218.

Petit, R. E. 2009. Perry's Arcana: a Facsimile Edition with a Collation and Systematic Review. The Academy of Natural Sciences and Temple University Press, Philadelphia. viii + 567 pp.

*Petit, R. E., L. Campbell, & S. Campbell. 2010. A new species of Zeadmete(Gastropoda: Cancellariidae) from South Carolina, a genus previously unknown in the Atlantic Ocean. The Nautilus, 124(1): 41-43.

*Sagarin, R. D., C. S. Alcorta, S. Atran, D. T. Blumstein, G. P. Dietl, M. E.



Hochberg, D. D. P. Johnson, S. Levin, E. M. P. Madin, J. S. Madin, E. M. Prescott, R. Sosis, T. Taylor, J. Tooby, & G. J. Vermeij. 2010. Decentralise, adapt and cooperate. Nature, 465: 292-293.

*Schnetler, K. I., & Petit, R. E. 2010 Revision of the gastropod family Cancellariidae from the Paleocene of Nuussuaq, West Greenland. Cainozoic Research, 7(1-2): 3-26.

Smith, U. 2009. Green River angiosperms. American Paleontologist, 17(3): 32. Smith, U. 2009. K-Pg boundary samples. American Paleontologist, 17(4): 32. Smith, U. 2010. Blastoids. American Paleontologist, 18(1): 32.

Smith, U. 2010. Heteromorph ammonite. American Paleontologist, 18(2): 32. Smrecak, T. 2010. Climate change for younger readers. American Paleontologist, 18(1): 13.

*Stephenson, E. H., R. S. Steneck, & R. H. Seeley. 2009. Possible temperature limits to range expansion of non-native Asian shore crabs in Maine. Journal of Experimental Marine Biology and Ecology, 375: 21-31.

*Tripati, A.K., W.D. Allmon,& D. E. Sampson. 2009. Possible evidence for a large decrease in seawater strontium/calcium ratios and strontium concentrations during the Cenozoic. Earth and Planetary Science Letters, 282: 122-130

*Turgeon, D. D., W. G. Lyons, P. Mikkelsen, G. Rosenberg, and F. Moretzsohn. 2009. Bivalvia (Mollusca) of the Gulf of Mexico. Pages 711-744, in: Felder, Darryl L. and David K. Camp (eds.), Gulf of Mexico—Origin, Waters, and Biota, Volume 1, Biodiversity. Texas A&M University Press, College Station, Texas.

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Publications

Scientific publications remain at the heart of PRI's mission. Bulletins of American Paleontologist magazine: Fall 2009 on Flowering Plants; Winter American Paleontology, first published in 1895, is today the nation's oldest paleontological journal. PRI produces three other series: Paleaontographica Climate Change; Summer 2010 on Heteromorph Ammonites. Americana, our occasional monographs; American Paleontologist, our quarterly membership magazine; and Special Publications, including the ever-popular Ithaca is Gorges and other stand-alone volumes.

This fiscal year showed us branching out from the norm in a variety of directions. In addition to our four issues of American Paleontologist magazine, we published our first coloring book, our first full-color publication (also our first joint publication with Cayuga Nature Center), and a third number in our recently rejuvenated series Palaeontographica Americana. Although no issues were produced in FY10, Bulletins of American Paleontology was hardly dormant; a Field Guide to the Cayuga Lake Region: Its Flora, Fauna, Geology, and 550-page double-number monograph was in production throughout the vear (and was published shortly after the beginning of FY11). Although technically not a PRI publication, PRI's Greg Dietl co-edited a volume, Conservation Paleobiology: Using the Past to Manage for the Future, for The Paleontological Society. PRI serves as publications vendor for PS's "Papers" series that accompany its short courses at Geological Society of America annual meetings; Greg's volume was one such contribution, and has been a very popular item on our sales list. Book sales continue to be extremely healthy, thanks to a variety of factors, including an easy-to-use website (with electronic versions of many volumes) and offerings on Amazon.com.

2009 on the International Year of Planet Earth: Spring 2010 on Fossils &

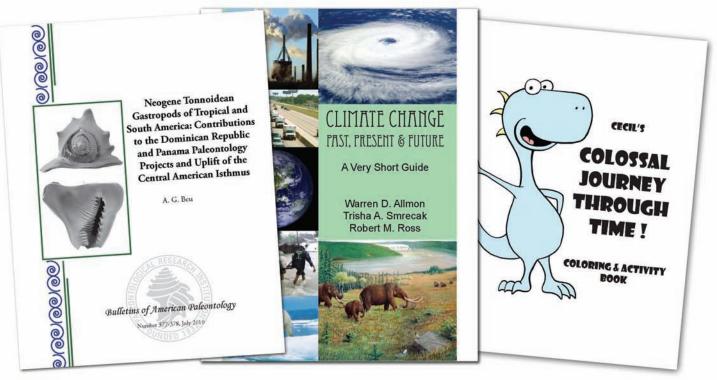
Cecil's Colossal Journey Through Time! Coloring & Activity Book, by Richard A. Kissel, June 2010, 52 pp., [no ISBN number], PRI Special Publication no. 39.

Climate Change - Past, Present & Future: A Very Short Guide, by Warren D. Allmon, Trisha A. Smrecak, and Robert M. Ross, April 2010, 200 pp., ISBN 978-0-87710-491-9, PRI Special Publication no. 38.

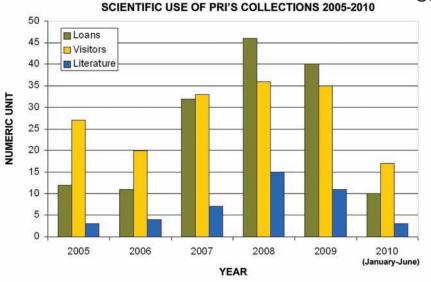
History, by James Dake, July 2009, 152 pp., color illus., ISBN 978-0-87710-485-8. PRI Special Publication no. 36.

Program and Abstracts, American Malacological Society 75th Annual Meeting, Ithaca, New York, July 19-23, 2009, edited by Warren D. Allmon, Paula M. Mikkelsen, and Kelly Cronin, July 2009, 96 pp., ISBN 978-0-87710-489-6. PRI Special Publication no. 37.

Studies in Devonian Stratigraphy: Proceedings of the 2007 International Meeting of the Subcommission on Devonian Stratigraphy and IGCP 499, edited by D. Jeffrey Over, December 2009, 240 pp. + CD-ROM, ISBN 978-0-87710-490-2. Palaeontographica Americana 63.







The PRI collections include between 2 and 3 million specimens, making them among the 10 largest in the United States. The 2009-2010 fiscal year saw significant progress in specimen curation, making PRI's research collections more accessible to researchers, students, and educators. The collections department was awarded a nearly half-million dollar grant from the National Science Foundation to install compactors (mobile storage units) to the upper floor of the Raymond Van Houtte Collections Wing. The 2-year project resulted in the installation of nearly 4000 new compactorized drawers to the Collections Wing, mainly to the upper floor of the addition; the curation and databasing of an estimated 7000 specimen lots in the Harris-Palmer collection of Paleocene and Eocene mollusks from the southeastern US (the formative nucleus around which PRI's entire collection has grown); and the reorganization and basic curation of the non-type systematic fossil and Recent mollusk collection (the backbone of PRI's collection).

The scientific use of PRI's collections also dramatically increased over the past year, making PRI more competitive with its peer institutions. The number of scientific loans in 2009 was the second highest total (40) in PRI's history. Thirty-five professional and student researchers also visited the collections in the 2009 calendar year. PRI's collections were also cited in 11 scientific publications in the 2009 calendar year—a level that is higher than or comparable to reported use at several much larger peer institutions. Data so far for 2010 are on track to equal this level of usage.

The collection itself continued to grow throughout the year. The most significant accession during the past year was a gift of more than 2,500 specimens, mostly trilobites, from Lloyd Gunther of Brigham City, Utah, from various localities in the House Range Mountains of west-central Utah. The House Range is one of the most famous Cambrian fossil collecting regions in the world.

The following individuals donated specimens to the PRI collections between 7/1/09 and 6/30/10:

Loren Babcock William Bemis James Brower Lyle and Sarah Campbell George R. Clark Barbara Dimock John Erickson Lloyd Gunther Linda and Peter Hemmerich Linda Ivany





Volunteers





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Throughout the year, over 170 volunteers and volunteer groups donated 5,953 hours of their time to PRI and its Museum of the Earth. Volunteers willingly contribute their time and talents to the collections, education, development, exhibits, publications, and operations staff on a regular basis. Additionally, many of our volunteers are pursuing individual projects such as identifying and cataloging a newly-received extensive mineral collection, creating a public education course that runs for six weeks every year, and developing a "Discovery Box" program that will explain some topics in the Museum more in depth. We are extremely grateful for the contributions these volunteers have made to the Institution.

Thank you, volunteers, for everything you do for us! The following individuals volunteered regularly during the 2009-2010 fiscal year:

Erin Allen Carrie Allmendinger Elizabether Altier Maria Altier Allison Bailey **Curt Banta** Maureen Bickley Daron Blake Janice Brown Al Burkhardt Peg Burlew Dick Burlew Noelle Chaine Pat Charwat Derrick Chong Michelle Clair Lexi Clarke Jenny Cleland Rory Cooper

Marla Coppolino Tonya Curran Stephen Dacek Megan Davis Molly Deacon Jordan Decker Barbara Dimock Lenore Durkee Vern Durkee Michael Dziewonski Josh Ellis Sally Fabadie Eniko Farkas Natasha Fav Deborah Feld Kelly Finan Lu Fong Jeremy Gardner Walter Gates Christie Graci Ashley Hatfield Robin Henne Kathy Houng Carlene Howard Rickey Ishida Michael Johnson

Min Kang Caleb Kessler Erik Keto Da Yeon Kim Bill Klose Frank Kozlowski Annie Levers Curt Lindy Alison MacNamee Lauren Maistros Mike Marano Phyllis McNeill Zach Montague Sam Moody Elizabeth Munson Kelly Murphey Teresa Ober Trishul Patel Magalie Quey Jeff Reardon Katie Reynolds Paul Rice Kelly Rowland Andrew Ryan Aurora Solla Leah Solla

Maddie Stone Emily Stoopler Samantha Strait Adam Tagliamonte Petra Tremblay Alex Wall Lane Wallet Cathy Whalen Don Wilson Kenny

We work with a number of agencies within the community. Thank you for your efforts and contributions to our organization!
Broome Developmental Disabilities, Ithaca
College Plunge, Cornell POST, Cornell Day of Demeter and the Ithaca Youth Bureau.



	Earth 101	Climate Change Education	Evolution Education
Local	Permanent and temporary exhibits at the Museum of the Earth School and community group presentations Girl Scout and Boy Scout workshops Teacher Resource Day Cornell University and Ithaca College students use of the Museum and collections Museum docent training Interpretive walks & fossil collecting	 Climate change exhibits Earth Day activities Climate change presentations 	Exhibits and Museum tours on evolution and the history of life Darwin Days celebration Museum docent training
State	Earth science teacher workshops New York State Fair outreach education with 4-H Earthquake education programs Educational resources & presentations on Marcellus Shale Kipp NYC Teacher Programs	 4-H climate change curriculum development Talks on climate change to community groups throughout the state Teacher workshops Traveling exhibit kiosks on climate change 	Teacher workshops and curriculum materials
National	Fossil Finders Teacher pro national series of Teacher-Friendly Guides to Geology Virtual Fieldwork Experiences Earth System Science Informal Education Network Mastodon Matrix project National Earth science education reform initiatives	 Global Change website and blog Online professional development for informal educators Energy transition teacher professional development Climate Change Past, Present & Future book National climate literacy education initiatives 	Fossil Finders Evolution & Creationism book and guide for museum docents Teacher-Friendly Guide to teaching evolution Traveling exhibit and teacher kit on bivalve evolution Traveling exhibit and Teacher-Friendly Guide on maize evolution Evolution educator initiative





A basic understanding of the history of the Earth, its life, and the science by which we study it, plays a vital role in shaping an informed public ready to tackle global environmental issues. These Earth science basics - what we call Earth 101 - are at the core of our educational outreach mission and many of PRI's educational programs and exhibits.

With programs for all ages, PRI helps students learn about topics ranging from ancient reptiles in our "Dinosaur Science" program, to the evolution of plant life and ecosystems in "Botany through the Ages." Using fossils from PRI's collections, these hands-on programs introduce students to basic scientific concepts used in the study of past organisms. Our program "Ancient Seas over New York State" emphasizes the ways that scientists draw conclusions, while highlighting the global

over many centuries. "Ice Age Life" uses the fossilrich sediments from PRI's Hyde Park mastodon excavation to explore how different life was "only" 13,000 years ago.

Programming at PRI goes beyond K-12 with additional public programs that vary from our annual Through a wide variety of hands-on and interactive James Potorti Memorial Interpretive Walks in the local State Parks to public fossil collecting fieldtrips. These excursions teach the story of the past several hundred million years of New York history through the exploration of local gorges and outcrops.

Our Ithaca is Gorges booklet shares that story in an an accessible 28 pages, while the Teacher-Friendly quide to the Geology of the Northeastern U.S. gives more detail of the geology of New York in 200 pages

changes that have occurred in our own backyards of text developed for Earth science educators. The permanent exhibit of the Museum of the Earth. "Journey through Time," invites visitors to explore the history of the Northeast through spectacular fossil specimens, video, original artwork, and interactive stations.

> approaches, we provide Earth 101 information that is relevant from a local to a global level, improving public literacy in Earth science for all ages.









Global climate change remains at the forefront of current environmental concerns, and is one of the central points of focus in PRI's informal Earth science education efforts. We continue to provide outreach on climate change, energy and sustainability, biodiversity loss, and other related issues through our Global Change Project. Aspects of this project include:

- · a comprehensive global change website, www.museumoftheearth.org/globalchange
- an NSF-funded collaboration with NYS 4-H and the Community Collaborative Rain, Hail, and Snow network (CoCoRaHS) that produced a curriculum that engages youth to record precipitation data, and use that data as a catalyst for understanding weather, climate and the effects of climate change.
 - 4-H educator training on this material is far-

- reaching, effective, and engages counties throughout NYS in the project.
- surveying rural audiences for their opinions on climate change and how best to engage them. While we are currently investigating green exhibit construction opportunities and carbonneutral transportation options using preexisting community networks, the eventual goal of the project will be to provide a local, carbon-neutral traveling exhibit to community centers in rural audiences.
- · unbiased outreach on Marcellus Shale drilling in NYS, including presentations and written materials that address various aspects of drilling for natural gas in the Marcellus Shale. We also have a blog documenting our experiences as educators, a sciencejournalism series on the issue, and materials

on our website at www.museumoftheearth.org/marcellusshale

Ross.

- · a book entitled Climate Change Past, Present, and Future: A Very Short Guide, by Warren Allmon, Trisha Smrecak, and Robert
- a blog called Climate Change 101, which features posts reflecting current news, tips for a sustainable lifestyle, and the low-carbon adventures of numerous staff.

Our work is highlighted in a guarterly mailing list that discusses climate change research and education news, as well as what PRI is doing locally. We also remain active in the outreach education arm of the Tompkins County Climate Protection Initiative, a consortium of local businesses, government, educational institutions, and not-for-profits dedicated to improving energy efficiency in and around Ithaca.







Evolution

Through our vast collection of specimens, our museum facility, and our outreach programs, PRI facilitates improved public understanding of what evolution is and how scientists endeavor to study it. PRI's Evolution Project includes many popular outreach events, activities, and publications.

- PRI co-hosted the 5th annual Darwin Days
 celebration with Cornell University
 commemorating Charles Darwin's birthday, with
 panel discussions, lectures, and the opening of
 our temporary exhibit, One Fish, Two Fish,
 Old Fish, New Fish: Exploring the Evolution of
 Biodiversity. The exhibit showcased the work of
 Professor Richard Harrison's lab at Cornell
 University.
- PRI staff continue to work with the Field Museum and Harvard University on a 5 year NSF-funded "Assembling the Tree of Life" grant to develop the evolutionary tree of bivalves. Staff have been assembling a traveling exhibit, "Science on the Half-Shell," which will be featured at the Museum of the Earth from September 2010 to

January 2011, and will then travel.

- PRI, in partnership with the Department of Education at Cornell University, have completed their 2nd year of the 4 year NSF-funded grant, Fossil Finders. This year, 20 teachers from across the nation participated in a week-long professional development in Ithaca, and then were sent Devonian fossil samples for their classroom's to teach the nature of science and science inquiry.
- The early hominid sculpture work featured in production last year by artist-in-residence and noted paleoartist, John Gurche, has now been bronzed and installed in the human evolution exhibition at the Smithsonian.
- The Museum of the Earth is visited by college and university students who use the museum exhibits to better understand evolution and the history of life through time.

Marcellus

The Marcellus Shale, located in parts of New York, PA, OH, and WV, is geographically the largest shale gas basin in the United States, and extraction efforts are already underway in PA and WV. The Marcellus

an obvious example of "geology in our backyard", which has long been a focus of PRI educational programming, and so offers an opportunity to engage people at multiple levels with Earth science that matters to their daily lives. The environmental implications of drilling for natural gas in the Marcellus are of enormous interest locally, regionally, and nationally. Working with Cornell Cooperative Extension (CCE) and with funding from the National Science Foundation, we seek to provide an unbiased source of scientific information on the subject via websites (naturalgas.cce.cornell.edu and museumoftheearth.org/marcellusshale). PRI also helped CCE to offer CCE inservice workshops, community taskforce meetings, and public presentations on Marcellus Shale natural gas drilling. PRI staff are also developing comprehensive, science-based, informational materials on topics including environmental impacts, life cycle analyses, geological considerations, and drilling technology, which will be published beginning in 2011.

LEONTOLOGICAL RESEARCH INSTITUTION

Education | School and Community Groups





PRI's Museum of the Earth offers a variety of education programs for youth and adults. With programs encompassing a wide range of topics from the ever-popular dinosaurs to the paleontology of your own backyard, the Museum attracts a diverse audience from all corners of the state. In the past year, over 2,700 students participated in 188 education programs. Additionally, staff and volunteer docents led 113 tours of the Museum.

The following groups participated in programs or tours with Museum of the Earth during fiscal year 2009 – 2010:

4-H Career Exploration Conference **ADT** Aflred University Children and Youth Learning Initiative AnNur Islamic School Arnot Medical Service Athens Science Olympiad Aurica Herb Group Avoca Central School Belle Sherman Afterschool Binghamton University Boy Scouts Brewster High School

Camp Barton Candor Elementary Casowasco Cornell Adult University Cornell Adult University Teen Program Cornell Adult University Youth Camp Cayuga Addiction Recovery Cayuga Heights Montessori School Chapin School Cincinnatus Liberty Partnership Program Community School of Music and Arts Cornell CF-IRMS Workshop Cornell Childcare Center Cornell Evolutionary Biology 2780 Cornell Evolutionary

Biology 2670 Corning High School Learning Center Cub Scouts Dryden Elementary Dryden Middle School F. John Gavars Center **EAC Montessori** East Ithaca Preschool Edmeston High School Elder Hostel Elmira College Elmira Free Academy **Even Start** South Seneca Experience the Fingerlakes Fabius-Pompey Middle School **Fassett Elementary** Fingerlakes Community College Floyd L. Bell Elementary Franklin Central School Genesee Community Charter School George Junior Republic GIAC Girl Scouts Gladys Burnham Elementary Groton High School Happiness House Harley School Holy Family School Homer Brink Elementary Homeschool groups Hornell City School District Ithaca College Speech Language and Audiology Ithaca Youth Bureau Ithaca Youth Bureau Day Camp

KinderCampers

KIPP LACS Lincoln St. Elementary Longview Loretto Heritage Madison Cortland ARC Main-Endwell Science Olympiad Mann Library McGraw Elementary Monroe BOCES #1 Northeast Kids Camp Northside Blodgett MS Onondaga Community College Onondaga Hill Library OSHER at RIT Our Lady of Sorrow School Owego Elementary Pathways Inc. Peachtown Elementary School





Phoenix High School Pittsford High School Ribbons of Hope Russell Doig Middle School School Age Childcare Shippensburg University Sidney Middle School Smith School Southhill Tots Southside Community Center Spencer Van Etten High School SRI Education - Cornell Cooperative Extension St. Patrick's School St. Paul United Methodist Church Syracuse University Onondaga Community College

SUNY Oneonta

SUNY Oswego

TC3

Syracuse VACCC

TC Global Connections Program **Tompkins Community** Action **Tompkins County** Mental Heath Assoc. Towanda Area Elementary **TST BOCES TST BOCES** Adult ESL Program Tuscarora Elementary School University of Rochester Van Dyke ATC Virgil Elementary Waverly Elementary Wavne County Gem and Mineral Club Wells College

Fall Creek Scientist in Residence In May 2010 PRI carried out its first ever

Westhill High School

"scientist-in-residence" program with Ithaca's Fall Creek Elementary. The program took the place of the school's more traditional science fair, in an effort to make an equitable, sciencebased activity in which all students had an opportunity to work on real science projects with real scientists. Kindergarteners learned about dinosaurs, 1st & 2nd graders worked with their 5th grade "buddies" to examine ice age life, while 3rd & 4th graders examined local Devonian fossils, Over the course of this program. PRI staff worked with a total of 215 students for a total of 35 contact hours. This

program was funded through teacher grants from the Ithaca Public Education Initiative and the Fall Creek PTA.

Kids Discover the Trail!

The Museum of the Earth is a member of the Discovery Trail: a group of educational organizations based in Ithaca, NY that promote awareness and understanding of the connections among art. history. literature. science, and the natural world. Every year, each grade in Ithaca City School District from pre K-5 students visit a designated Discovery Trail site. At that site they receive instruction

from the center's educator, on topics ranging from art to paleontology, as part of the "Kids Discover the Trail!" program (KDT!). In addition to enhancement of relevant classroom curricula, the programs serve as a social medium by which students from different elementary schools meet, with the hope that this will make their transition from 8 elementary schools ranging from rural to urban - to 2 middle schools easier. The Museum of the Earth provides the 1st grade program Dinosaur Science. The students also rotate through staffed stations

throughout the Museum to look at key points in Earth history. Before coming to the Museum, each of the classes receives a pre-visit to introduce students to the Museum and to talk about the book (Digging Up Dinosaurs by Aliki) each of the students receive as part of this program. This year 474 students and 27 chaperones attended the Museum through the KDT! program. Due to previous success of this program, Trumansburg Schools created a sister program called the Trumansburg Kids Explorer & Discover (TKEDs), which began this year.

PALEONTOLOGICAL RESEARCH INSTITUTION

Education | Teacher Programs: Overview





Empowering educators with the latest scientific theories and research—as well as the best practices for presenting that research in the classroom—is a primary mission of PRI outreach. Scientific literacy is increasingly important in today's society, and there is no better way to reach large numbers of students than to reach their teachers. PRI possesses a series of programs dedicated to bringing real science to teachers in New York and across the nation. In this role, PRI is actively engaged in imbuing future generations with an awareness and interest in science. Many of the below programs are described more fully on other pages.

 PRI's annual Teacher Resource Day was held on October 3rd, 2009: Over the course of the day, 85 teachers from Ithaca and across New York State received actual fossil specimens (deaccessioned from the PRI research collections), were treated to behind-the-scenes tours of PRI collections, and learned how to use their new-found specimens in the classroom.

- Resources to help teachers learn and teach their local Earth science: PRI offers through workshops, Teacher-Friendly Guides to regional Earth system science, and a database of Virtual Fieldwork Experiences
- Resources to help teachers with evolution education: Teacher-Friendly Guides to evolution and associated teacher kits, e.g., using bivalves to demonstrate evolutionary principles and another guide on the evolution of maize through domestication
- Fossil Finders, in collaboration with the Cornell Department of Education

- Climate Change in Your Backyard, in collaboration with Cornell Cooperative Extension 4-H and Cornell's Department of Earth and Atmospheric Sciences
- Teacher workshops in collaboration with colleagues at Cornell University, such as the Cornell Institute for Biology Teachers
- Trilobites and Treetops teacher workshop, in collaboration with the Cayuga Nature Center

These programs all reflect research-based, best-practices professional development that engages educators in long-term inquiry projects using the local environment as a teaching laboratory. Importantly, all of these of projects also nurture both leadership development and the building of educator networks.

Teacher Friendly Guides



Teaching Earth system science in the the coming years. Visit field—beyond classroom walls—is not only incredibly effective, but also necessary in order for students to those upcoming. properly understand our planet and the forces that shape it. Fulfilling a tremendous need within Earth science education, PRI staff are working with teachers across the country to help

The national series of regional Teacher-Friendly Guides is a curriculum supplement that will provide teachers with the content and background to introduce local Earth system science to their students, vastly increasing the relevance of Earth science in their lives. The Northeast and Southeast Guides are complete, the South Central guide is nearing completion, and the Western, Midwestern, Rocky Mountain, and Southwest guides will be completed in

them introduce local Earth system

science into their classrooms.

teacherfriendlyguide.org to view the completed guides and previews of

Virtual Fieldwork Experiences (VFEs) are virtual re-creations of actual field sites that allow students to do real science at a distance; they bring the field into the classroom. By creating VFEs, teachers are not only collaboratively building rich curriculum resources, they are also engaged in the careful study of their local Earth system science with an eye toward field-based inquiry for their students. The creation and use of VFEs is being incorporated into a range of PRI's outreach activities. Please visit virtualfieldwork.org for more!

As we develop the guides and VFEs. PRI staff are leading professional development opportunities for teachers across the country. During workshops,



teachers are trained to document a particular field site in order to ultimately create a VFE for the classroom. They are then encouraged to create VFEs based on areas near there schools, producing a product that will help students understand the immediate relevance of Earth system science. For example, in July of 2009, teachers from the South Central region gathered with PRI staff in Norman, Oklahoma; we then worked with these teachers remotely throughout the school year. Teacher input roundtables were held with teachers in Chicago (March 2010) and San Diego (April), and additional workshops were held in in San Antonio (June), and in Oregon and Michigan (July).

Fossil Finders

The Fossil Finders project, in collaboration with Cornell's Department of Education, engages

students in classrooms across the country in an authentic investigation of central New York Devonian fossils. The project develops curriculum and resources, and an interactive website. for upper elementary and middle school students and their teachers. In August 2009 we ran a second workshop for 10 teachers from around New York State and the first of two workshops for 20 teachers from around the country. The students collect data on fossils (nearly 6000 specimens by end of FY10) that they can use to investigate the response of fossil organisms to Devonian environmental change. The end goal of Fossil Finders is to improve teacher and student understanding of geological and evolutionary concepts, and of the nature of science.

Education | Professional Development and Cayuga Nature Center Partnership





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Professional Development for Museum Educators

In an effort to address the need for quality Earth system science professional development for the thousands of informal educational venues across the United States. PRI has developed a 10 week, one credit, graduate-level course for museum and science center educators. The course, taught entirely online and asynchronously, is titled "Global Climate Change and Earth System Science" and is supported by a grant from the Earth System Science Education Alliance (ESSEA), an NSF/ NASA/NOAA funded organization, which supports more than 40 universities across the country in offering a series of online Earth system science courses for K-12 teachers. This course represents ESSEA's first professional development for informal educators.

and fall 2009 was the third consecutive year that PRI/ESSEA have offered this course

The 2009 course had 9 participants including our first Zoo and Aquariumranging geographically from the Aerospace Museum of California. Point Defiance Zoo (WA), Brookhaven National Labs (CT), The Carnegie Museum (PA), to Nauticus Maritime Ctr (VA). Again, we also had international participation; a Cornell student working in the Bangalore National Preserve, India. The resulting VFEs form this class will be used by the participants in their respective organizations, and will be made available to other venues as well as for use by formal educators across the U.S.



Cayuga Nature Center

PRI continues to collaborate with the Cayuga Nature Center, located just a few miles from the PRI campus in Ithaca. The Summer Day Camp, with campers spending time at both CNC exploring the outdoor world and at the Museum of the Earth learning about the ancient world, has continued to be very successful. Summer 2009 saw a

record breaking number of campers and overwhelmingly positive feedback from participants. Other collaborations include day camps in the fall, winter, and spring, a series of programs entitled "Family Adventures in Nature," and teacher professional development opportunities. A Field Guide to the Cayuga Lake Region by James Dake, a product of the PRI/CNC partnership, was released, and sales were high enough to require a second printing.





Permanent Exhibit Upgrades

Preparation Laboratory and Scanning Electron Microscope.

In FY2010 we made many changes to PRI's Preparation Laboratory ("Prep Lab," the lab space in the Museum that demonstrates fossil preparation to visitors). A generous gift from Board Member Don Wilson has permitted many changes that improve the look of the lab and, more importantly, the safety for those working in the space. The room was

reconfigured to allow visitors clearer view of specimens. Lab chemicals are now housed within a new chemical cabinet, and a ductless fume hood provides a safe space for the mixing of chemicals. A new workstation for the air abrasive unit (a tool that acts like a sandblaster, using compressed air to blow gritty particles that flake away tiny pieces of rock to expose fossils) provides improved lighting. Perhaps the most significant improvement is the acquisition of a dust collector; the collector vastly improves the safety of the lab by replacing the very noisy

vacuum that had been used in the lab for years. Finally, an airline dryer prevents moisture from accumulating in the hose that runs from the compressor to the tools in the lab, protecting equipment to ensure increased lifespans.

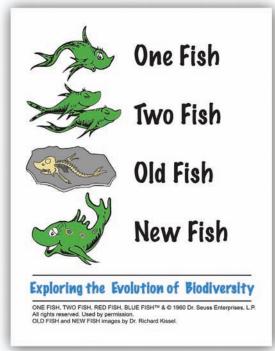
An NSF-funded SEM workstation was added to the Lab in April 2010. Full installation with ability for visitors to view microscopy as its done will be added in FY2011.



Borg Warner Gallery Temporary Exhibitions

A Forest Journey (June 20-September 20, 2009) This exhibition was designed and developed by the Franklin Institute Science Museum in Philadelphia, and was rented by PRI. It explored the science behind the trees and human relationships (past, present. and future) with forests. Accompanying programming helped focus the exhibition on the beauty of our regional forests, with our "Wednesdays in the Woods" and our marketing efforts targeted at the many visitors to our local State Parks.

Ancient Amber: Letting the Past Shine Through (October 3, 2009- February 21, 2010) This long awaited temporary exhibition featured some of the fabulous gems of our permanent collection. The exhibition was designed in house and David Grimaldi from the American Museum of Natural History (AMNH) served as content specialist. The exhibition looked at the geographic distribution, process of formation, historical and scientific appreciation of amber. Exhibition highlights included a few choice specimens on loan from AMNH and a short video





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produced in house that chronicled the formation of amber. It also featured a micro CT scan of a cricket trapped in copal, compliments of the lab of Jonathan Butcher in Biomedical Engineering at Cornell University.

One Fish, Two Fish, Old Fish, New Fish: Exploring the Evolution of Biodiversity (March 6- September 12, 2010) As 2010 marks the International Year of Biodiversity, One Fish, Two Fish, Old Fish, New Fish... contributed to this international celebration of life on Earth and emphasized the value that

biodiversity has in our lives. The exhibition was made possible by with funding from the National Science Foundation support grant 0639904 to Richard Harrison, Department of Ecology and Evolutionary Biology, Cornell University. Harrison was involved in the entire exhibit development process from concept design to implementation. A few of the exhibition highlights include live Laupala crickets from the lab of Kerry Shaw in the Department of Behavior and Neurobiology at Cornell University; live Anole lizards from the lab of Richard Glor, a

Cornell undergraduate alum and faculty member of the Department of Biology at RIT; and live munba cichlids native to Lake Malawi in East Africa.

Temporary Art Exhibitions

Sculpting Human History. John Gurche, our resident paleoartist, completed his major Smithsonian commission of life-sized bronze sculptures of ancient hominins. Visitors watched the process in a temporary studio built into the Museum lobby, from start of the sculptures as clay over wire frames to

fall of 2009. The bronzes are now on permanent display at the newly opened Hall of Human Origins at the National Museum of Natural History. The studio was a fantastic opportunity to showcase scientific understanding of human evolution displayed in art.

Wood Sculpture by June Szabo (June 20 - September 20, 2009). Local Artist June Szabo's work was displayed in the Borg Warner and Education galleries. The show featured three-dimensional representations of landscapes casting of the sculptures in the and complemented the

summer's temporary exhibition A Forest Journey. In the artist's words, "we are bound and interwoven into the living process of the earth. Inexplicably we are intertwined and unable to escape those connections any more than we can escape breathing air. Art is my way of examining our relationship to nature, to the earth and to each other."

Biomorphic by Gregory Brellochs. (October 3, 2009-February 21, 2010) The work of Philadelphia-based artist Gregory Brellochs, Professor of Sculpture and Design at Camden County College, was

Exhibits | Long - And Short - Term Exhibits - Traveling Exhibitions





displayed in the Education gallery. His work explores an intersection of art, science and philosophy through visual experience. The images in the exhibition were selected by the artist from a body of work entitled "Materialization Series." They developed as a result of his exploration of a responsive process of art making aimed at the formal embodiment of concepts in an image.

The Exhibits department worked on the phased deliverables of three traveling exhibit projects during this fiscal year. These include: Science on the Half Shell: How and Why We Study Evolution.

The Bivatol (Bivalves—
Assembling the Tree of Life)
exhibition is moving forward.
During the last fiscal year we
completed the concept
development and schematic
design phase of the exhibition.
The project fabricators,
Universal Services
Associates, Inc., USA, Inc.
(Colwyn, PA), are managing
the project, but subcontracted
Metcalfe Architecture
(Philadelphia) to lead the

design phase. The exhibit was developed in order to open at the Museum of the Earth in September 2010.

My Climate, My Community.

An NSF-funded planning grant is allowing PRI to lay the groundwork for the design and development of a small traveling exhibition on climate change. The exhibition will specifically target rural audiences that do not seek climate change information in traditional ISE venues. The project has additional funding support from the Park

Foundation for installing the exhibit in Tompkins County. A formal survey will be conducted by the Human Dimensions research group at

Cornell University in FY11. The survey will guide content and design of exhibit prototypes evaluated during fall 2010.





Recognizing that we exist in an increasingly "smaller" world, PRI's education programs are designed to bridge the gap from what's local to what's global, with a significant portion of our outreach nationally relevant. Among our most nationally relevant programs, PRI is involved in:

- · Teacher professional development such as through the publication of our Teacher Friendly Guides on regional geology, encouraging Earth science teachers to use the local environment as a primary teaching tool for all regions of the country.
- · Leading the charge in informal Earth science education by

training museum docents on how to most effectively teach evolution to a wide range of audiences, by offering graduate-level courses for informal Earth science educators from around the world, and creating a central website for resources at www.informalearthscience.org.

Collaborating with nationally recognized institutions like Cornell University, the Denver Museum of Nature and Science, the Field Museum of Natural History, and Harvard University Museum of Comparative Zoology on a variety of education initiatives, many of which are funded by the National Science Foundation. PRI collaborated internationally, with

specimen loans and design of exhibit components and evaluation, with the University of Modena, Italy, for their "Darwin and Evolution" exhibition.

- · Innovation in approaches to education, local implementation of national models such as development of hands-on Discovery Labs in the Museum, the use of "Virtual Fieldwork Experiences," and research partnerships with students and teachers.
- Focusing on major issues in science education through our **Global Change Project** and our Evolution

Project, sharing best practices with formal and informal educators from across the United States and beyond.

- Bringing Earth science to all by reaching underserved audiences through exposure to science and natural history collections, helping all gain a better appreciation of the world we share.
- · Involvement in national efforts to improve and expand Earth science education, such as the Earth Science Literacy Initiative, the Climate Literacy Network, the Conceptual Framework for New Science Education Standards, and the K12 Earth System Science Education Summit.

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National Science Foundation Discovery Research K-12 (FY2008): Enhanced

(FY2008): Enhanced Earth system teaching through ReaL Earth Inquiry: NSF DRL733303, Aug 15, 2007 – Aug 14, 2012, \$1,763,588 (PI: Ross; co-PIs: D. Duggan-Haas, S.E. Humbert)

National Science Foundation Discovery Research K-12

(FY2008): Fossil Finders: Using Fossils to Teach about Evolution, Inquiry and Nature of Science: NSF DRL 733223, Jan 1, 2008 – Dec 31, 2011, \$1,491,746, \$266,951 to PRI. (PI: B. Crawford, Cornell Dept of Education; co-PIs: R. Ross, W. Allmon)

National Science Foundation (FY2008) AToL: Phylogeny on the Half-shell -- Assembling the Bivalve Tree of Life,NSF DEB 732860, Sep 15, 2007 – Aug 31, 2012, \$499,990 (PI: Paula Mikkelsen; co-PIs R. Ross, S.J. Chicone)

Earth System Science Education Alliance (pass-through for NASA and NSF Geoscience Education)(FY2008) Global Climate Change and Informal Earth System Science [online professional development for informal educators], June 1, 2008 – May 31, 2010, \$39,945 (PI: Carlyn Buckler: co-PI; R. Ross, Rusanne Low of GLOBE)

National Science Foundation(FY2008) Temporary Museum exhibit on speciation and biodiversity associated with speciation researchDEB 0639904, \$41,974 (PI: Rick Harrison of Cornell Univ.)

National Science Foundation (FY2008) Traveling exhibit and teacher professional development on evolution of maize. associated with maize genetics research. (DBI 0820619, \$110,000 (PI: Ed Buckler of Cornell Univ.)

National Science

Foundation Geosciences Division(FY2007): Expansion of hands-on inquiry-based interactive labs in Museum of the Earth. GEO 608062, Oct 1, 2006 – Sep 30, 2008, \$141,903 (PI: R. Ross, co-PIs: M.A. Sax, S.E. Humbert)

National Science Foundation EHR Division (FY2007): Integration of PaleoPortal Website, a Paleontology Website for both Researchers and the Public, into Museum Exhibits and Classrooms.EAR 552201, Jun 6, 2006 – Jun 5, 2008, \$56,535 (Pl: R. Ross)

National Science Foundation Geosciences Division(FY2008): Tracking Climate in Your Backyard: Climate education for 4-H educators & youth., GEO 808122, Sep 15, 2008 – Sep 14, 2010, \$148,455 (PI: R. Ross, co-PI: S. Sands, A. DeGaetano, B. Schirmer) National Science Foundation Geoscience Division (FY2009): Planning for a charter schooluniversity-museum partnership to enhance diversity in the geosciences: NSF GEO 0939765, October 1, 2010 – September 31, 2011, \$39,055 (PI: R.Ross; co-PIs: R. Kissel, D. Duggan-Haas)

National Science Foundation Geoscience Division (FY2009): Geoscience education for communities impacted by gas drilling in the Marcellus Shale: NSF GEO 1016359, April 15,



2010 – March 31, 2011, \$97,127 (PI: R. Ross; co-PIs: T. Smrecak, T.

Jordan, L. Brown)

National Science Foundation Informal Science Education (FY2009): My Climate, My Community: Sustainable Climate Change Exhibits for Rural Audiences: NSF ISE 0917581, September 1, 2009 – August 31, 2011, \$74,346 (PI: S. Chicone; co-PIs: R. Ross, T. Smrecak, S. Sands)

National Science Foundation Earth Science Instrumentation and Facilities (FY2009): Acquisition of a New Generation Benchtop SEM for Earth Systems Research, K-16 Education, and Public Outreach. NSF EAR 0930032, \$110,000 (PI: R. Ross; co-PIs: W. Allmon, P. Mikkelsen, G. Dietl)

Cornell Cooperative Extension Smith-Lever (FY2009):

Understanding the environmental, social, and economic impacts of gas exploration and drilling in the Marcellus Shale: NYC-124481, October 1, 2009 – September 30, 2012, \$69,000 (PI: W. Allmon; co-PI: R. Stedman, R. Ross, S. Riha)

Park Foundation

(FY2009): My Climate, My Community: Exhibits and public forums on climate change for rural Tompkins County. July 1, 2009 – June 30, 2011, \$36,000 (PI: S. Chicone, co-PIs: R. Ross, T. Smrecak)

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Buckler, C. S., & R. M. Ross. 2009. ESSEA course for informal ESS educators. Annual Earth System Science Education Alliance meeting, 15-19 June, Biosphere 2, Oracle, Arizona.

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Capps, D.
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D. Ortenzi, & R. Ross,
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Closing the circle of
authentic scientific
research and inquirybased pedagogy:
Teachers, scientists,
and science educators
in a community of

learners. (poster)

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Crawford, B.A., Capps, D.K., Ross, R.M., and Smrecak, T.A. 2010, Developing teachers' science content and pedagogy through an authentic fossil investigation. National Science Teachers Association National Conference Program, Philadelphia (program 1, p.140)



Dake, J. 2009. Field Guide to the Cayuga Lake Region. Paleontological Research Institution, Ithaca, New York, 152 pp.

DiMatteo, J.A., Ross, R.M., Crawford, B.A., Capps, D.K., Smrecak, T.A. 2010, Using Devonian fossils to connect science content across the curriculum. National Science Teachers Association National Conference Program, Philadelphia. (Program 3, p.118)

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National Science
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Duggan-Haas, D., S. R. Miller, & J. Henderson. 2009. What if we only taught five things? Focusing Earth science instruction on bigger ideas. Science Teachers' Association of New York State, Rochester, New York.

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Kissel, R.A. 2010. From ring finger to wing finger. American Paleontologist, 18:2.

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PRI was founded in 1932 by Gilbert D. Harris (1864-1952), Cornell University class of 1885 and a professor of geology at Cornell from 1895-1934, to preserve his large fossil collection and library, continue his scientific printing enterprise, and serve as a scientific home for independent researchers in paleontology. Despite his close ties to Cornell, Harris' parting form the University was not a friendly one, and the estrangement it established lasted well beyond his lifetime.

In November, 2004, PRI and Cornell signed a formal affiliation agreement that recognized the growing ties between both institutions. While not officially a part of Cornell, and receiving no regular financial support from the University, PRI interacts with numerous units and members of the Cornell community in a wide variety of ways.

Public Education Outreach

- PRI's Education Department and its Museum of the Earth help fulfill Cornell's land-grant mission to serve (as Cornell President David Skorton put it in his
 inaugural address) "the world outside our gates."
- PRI staff are regular members of the STEM (Science Technology Engineering Math) group which coordinates pre-college outreach at Cornell.
- PRI played a leading role in organizing the first annual Ithaca Darwin Day celebration in February, 2006, which featured events at PRI and Cornell in celebration of the birthday of Charles Darwin. The Darwin Days celebration has grown in each of its five years.
- The Museum is a conduit for presenting the results of Cornell faculty and student research especially for the Department of Earth and Atmospheric Sciences -- to the general public through exhibits, programs, and publications.
- PRI staff work with Cornell Cooperative Extension (CCE) on several projects, including most recently Climate Change and the Marcellus Shale, to expand the range for content provided to 4-H and CCE programs across New York State.

Cornell Relations







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Undergraduate Education

- The Museum of the Earth is a regular resource for Cornell undergraduate courses in biology, geology, anthropology, and art.
- PRI collections staff are a resource for Cornell undergraduates engaged in independent research, including recent senior projects in the Department of Earth and Atmospheric Sciences (EAS), Ecology and Evolutionary Biology, Anthropology, and Fine Arts.
- PRI staff regularly teach undergraduates in EAS and the Department of Ecology and Evolutionary Biology.
- Paleontology is inherently interdisciplinary. By bringing together faculty, staff, students, and collections from disparate fields, PRI and its Museum of the
 Earth serve as a stimulus for what President Skorton termed "interdisciplinarity" linking people and programs at Cornell that would otherwise not interact as
 much.

Graduate Education

Three PRI staff are members of graduate faculties at Cornell and advise Ph.D. students. PRI's Director has served as a major advisor for seven Ph.D. students in the fields of Zoology and Geology.

The Hunter R. Rawlings III Professorship in Paleontology

Hunter Rawlings served as the tenth President of Cornell University from 1995 to 2002 and as Interim President from 2005 to 2006. During his time at Cornell, Rawlings took leadership positions on a number of issues that are directly relevant to PRI's mission. In particular, in October, 2006, Rawlings gained national recognition when he used his State of the University speech to focus on the issue of evolution and intelligent design (ID), drawing attention to the dangers to education and civil society posed by ID masquerading as science. This issue is at the core of several of PRI's educational initiatives.

In March, 2006, then Interim President Rawlings was instrumental in discussions between the PRI Board of Trustees and the Cornell administration that resulted in an agreement to establish the position of Director of PRI as an endowed full professor position in Cornell's Department of Earth and Atmospheric Sciences, provided that funds could be raised by PRI to provide for such an endowment. In May, 2007, Rawlings agreed to allow the position to be named in his honor. PRI Director Warren Allmon now serves as the first Hunter R. Rawlings III Professor of Paleontology in the Department of Earth and Atmospheric Sciences at Cornell.

Other Faculty Appointments

In addition to the Rawlings Professorship, which is permanently connected to the PRI Director position, three other current individual PRI staff have formal faculty appointments at Cornell:

- Director of Collections Greg Dietl is Adjunct Assistant Professor in the Department of Earth and Atmospheric Sciences and a member of the graduate field of Geology.
- Associate Director for Outreach Rob Ross is Adjunct Associate Professor in the Department of Earth and Atmospheric Sciences.
- Associate Director for Science Paula Mikkelsen is a Visiting Fellow in the Department of Ecology and Evolutionary Biology.

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PRI is a national leader in Earth science education due not only to the efforts of its staff. It is also because of the foresight of a community that generously supports PRI's educational mission. Everything that is PRI, from its scientific research and collections to its publications, programs, and exhibits, owes itself to those whose direct financial support make it possible. In the year covered by this report. PRI passed its Annual Fund goal while resurrecting its Planned Giving program. As we continue to build a Triad Foundation strong foundation of support going forward, we owe our sincere thanks to all those who made a gift - your support matters!

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Statement of Financial Activity

Herri of Financial Activity	FOR THE VEAROUR	DN10 11115 00	
UNRESTRICTED NET ASSETS:	FOR THE YEARS ENDING JUNE 30,		
Revenue, gains and other support:	2010	2009	
Grants, contributions, and gifts	\$386,466	\$1,158,944	
Programs	25,752	21,653	
Publications	66,074	49,675	
Dues and memberships	31,225	29,658	
Museum admissions '	93,785	104,676	
Specimen casts	27,423	<u>-</u>	
Merchandise sales, net costs of goods			
sold	40,480	39,965	
Investment income	2,791	7,480	
(Loss) on investments	14,688	(26,863)	
Gifts in kind	83,255	10,036	
Gain on legal settlement	-	663,993	
Other	54,551	47,997	
	808,490	2,107,214	
NET ASSETS RELEASED FROM RESTRICTIONS:			
Grants	1,324,034	603,247	
Specific uses	74,093	227,036	
	1,398,127	830,283	
TOTAL REVENUE, GAINS, AND OTHER SUPPORT	2,206,617	2,937,497	
EXPENSES AND LOSSES:	4 400 000	4 450 407	
Payroll and related benefits	1,198,322	1,158,167	
Depreciation and amortization	378,310	363,283	
Interest expense Professional fees	174,872	234,091	
Other	36,129 102,372	199,073 178,154	
Building and maintenance	183,209	140,691	
Grant subcontracts	240,198	99,025	
Publications and printing	36,242	62,811	
Exhibit expense	20,019	48,055	
Supplies	17,408	18,621	
Travel and workshops	14,093	13,968	
Postage	13,378	13,343	
TOTAL EXPENSES AND LOSSES	2,414,552	2,529,282	
CHANGE IN UNRESTRICTED NET ASSETS	(207,935)	408,215	
TEMPORARILY RESTRICTED NET ASSETS:	, ,	,	
Grants, contributions, and gifts	2,330,534	508,955	
NET ASSETS RELEASED FROM RESTRICTIONS:			
Grants, contributions, and gifts	(1,398,127)	(830,283)	
CHANGE IN TEMPORARILY RESTRICTED NET ASSETS	932,407	(321,328)	
CHANGE IN NET ASSETS	724,472	86,887	
NET ASSETS, BEGINNING OF YEAR	5,341,556	5,254,669	
NET ASSETS, END OF YEAR	6,066,028	5,341,556	

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