



Friends of the Florissant Fossil Beds Newsletter

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Geoparks in the US?

by Heidi Bailey

Canada Unveils North America's First Geopark— Will the United States be Next?

The Stonehammer Geopark, located in New Brunswick, Canada, is now the first North American member of the Global Geoparks Network (GGN). The GGN has 77 members in 24 countries throughout Europe, Asia, South America, Australia, the Middle East and now North America.

The Stonehammer Geopark stretches from Lepreau Falls to Norton, Saint John and Grand Bay-Westfield to St. Martin's.

The geology of the Geopark includes a billion years of stories. The region has a vibrant human and cultural heritage, as well as active educational, tourism and community development sectors, all vital elements for a Global Geopark.

"The designation of the Stonehammer Geopark as North America's first Global Geopark is wonderful recognition of the significant geological heritage of the region, as well as its great potential for sustainable economic development," said Dr. Godfrey Nowlan, Chair of the Canadian National Committee for Geoparks.



"The success of this project is due in part to the incredible community support which we have received," says Bill Merrifield, Chair of the Stonehammer Board of Directors. "The range of organizations, governments, businesses, and individuals who have engaged in this project was identified by the GGN as one of the major assets of the Stonehammer Geopark application."

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Superintendent's Letter

by Keith Payne, Superintendent

Dear Friends of Florissant Fossil Beds,

It's the time of year when the National Park Service takes stock of its accomplishments. It's report season! I won't bore you with all the alphabet soup and acronyms that label the multiple reporting systems we have to reply to, but I am going to "bore" you with the results of our year.

Our annual Visitor Survey results arrived and we are extremely happy to report that

Florissant has maintained its visitor satisfaction rating of 99% for the second year in a row (up from 98% visitor approval in 2008). In addition, 99% of respondents felt that they received a good value from us for their fees and were pleased with our trails, attention from employees, and visitor services. 100% were happy with our Ranger programs and picnic areas. For the third straight year our visitation has increased. Although it increased only by 1% this year, to 65,106, that seems like quite an accomplishment in view of the current economic climate. Visitor con-

tacts, which include every time we have a contact either on- or off-site, increased this year to 106,000 from 102,000 last year. Our Junior Ranger Program increased its participation by a little over 100 kids to 4,300 new Junior Rangers this year.

Our program offerings have also increased this year. Of course we kept our No Child Left Inside Weekend as an annual event, and for the third year it was an unqualified success, generating 200 of our 4,300 Junior Rangers on that one day alone. Our thanks

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Estella Leopold Receives Lifetime Award

Estella Leopold Wins Prestigious International Award
by *Herb Meyer, Florissant Fossil Beds NM Paleontologist*

Florissant Fossil Beds National Monument was established in 1969 after the fossil beds were threatened by a plan for real estate subdivision. Efforts to create a national monument were stalled in the U.S. Congress, and the construction bulldozers were ready to roll. Prompted by the efforts of Estella Leopold and Betty Willard, the Defenders of Florissant presented their case to the U.S. Courts, represented by attorneys Victor Yannacone and Richard Lamm. They were able to obtain a temporary court injunction to stop the development long enough for Congress to act and create the Monument.

This summer, it was announced that Dr. Estella Leopold was the recipient of this year's International Cosmos Prize. This prestigious award might be thought of as the "Nobel Prize of Conservation." The award recognizes Estella's remarkable conservation accomplishments at Florissant and elsewhere as she has carried forward the conservation movement started by her father, Aldo Leopold. She received the award at a ceremony in Japan this fall.

Besides her work in conservation, she also has made significant contributions to our knowledge about the Eocene forest ecosystem at Florissant through her research on the fossil pollen. We are all very proud of Estella for achieving the recognition of the International Cosmos Prize, and very thankful for her efforts that helped save the Florissant fossil beds from destruction.

The following is a public release from the University of Washington.

A prize claimed by renowned conservationists such as David Attenborough and directors of some of the world's largest botanic gardens has been awarded to Estella Leopold, a University of Washington professor emerita of biology, forest resources and quaternary research.

The International Cosmos Prize carries a cash award of 40 million yen, nearly \$500,000, and goes to just one individual or team each year, according to information from Japan's Expo '90 Foundation, sponsor of the prize.

Leopold, 83, has been teaching and conducting research for more than 60 years, 35 of them at the UW. She pioneered the use of fossilized pollen and spores in North America to understand how plants and ecosystems respond over eons to such things as climate change.

She is the daughter of Aldo Leopold, known for proposing the "land ethic" that individuals are responsible for the health of the land and author of "A Sand County Almanac." Estella Leopold "has dedicated herself to the preservation and stewardship of natural landscapes," the prize committee wrote. For example:

She marshaled 20 nonprofit groups in a six-year fight to gain national monument status for Colorado's Florissant fossil beds that contain 35-million-year-old remains of plants, fish, birds and some of the earliest known fossils of butterflies. The beds were on the brink of destruction by real estate developers when, with

bulldozers on the site, Leopold and a small group of activists obtained a court injunction to stop development so there was time to seek protection through the U.S. Congress, the awards committee writes.

After Mount St. Helens erupted in 1980, creating huge swaths of land seemingly devoid of life, Leopold was among those urging Congress to halt Bureau of Land Management's plans to plant areas with non-native grasses and instead leave the land alone. The result: the Forest Service's first national monument, a place where scientists had access to a natural laboratory to study landscape recovery. "The U.S. Forest Service has done a great job in protecting a huge area in the center of the monument for pure research, keeping everyone strictly on the foot trails so the regrowth of native grasses and flowers is taking place so beautifully," Leopold says.

Her public service efforts also have included serving on the national boards of organizations such as the National Audubon Society and the Environmental Defense Fund, and being appointed to governor advisory panels concerning oil shale in Colorado and high-level nuclear waste management in Washington.

"The College of Arts and Sciences could not be prouder or happier to count Estella Leopold as both one of our most distinguished faculty members and one of our closest friends," Ana Mari Cauce, dean of the college, says. "Throughout her career she has been a fierce advocate for science, for the environment, and for the need to make connections between these two passions. The committee could not have picked a better recipient for this award. It brings honor to Estella, and Estella brings honor to the award."

The objective of International Cosmos Prize is to honor those who further the "harmonious coexistence between nature and mankind," according to the foundation.

Asked how she thinks mankind is doing in that respect, Leopold talked about children.

"There's a subculture of birders, of people who love nature, and many of them probably grew up like myself. I was raised outdoors. You'd go out to play, get on your bike and just go everywhere – out all day. But kids now are more restricted. How are they going to learn to love nature and to protect it?"

She also talked about the need for global outreach. In working for the Aldo Leopold Foundation – where she's held a number of director and officer positions through the years – she said the foundation's programming is increasingly engaging audiences around the globe. China, for instance, is rich with a heritage of art showing a love of nature, but the ethic is colliding with popula-

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Sexi, Peru Project

New Progress in the Friends Partnership with the Petrified Forest in Sexi, Peru

by *Herb Meyer, Florissant Fossil Beds NM Paleontologist*

The Friends of Florissant continued to support their new partnership with the nonprofit organization in Sexi, Peru by providing financial support this summer to help develop the infrastructure for the small new museum there. The museum building was constructed from adobe bricks several years ago, using grant support, but it has never had water or electricity. These were installed using the funds that the Friends transferred to Peru.

The exhibits in the museum are still very few, consisting only of four interpretive panels that we created last year with funding from the Friends of Florissant. We are currently looking to involve one or two graduate students from the Museum Studies program at the University of Colorado in Boulder to continue the effort to assist the community of Sexi in developing its new museum and education programs.

The site at Sexi consists of an Eocene fossil forest with large petrified trees and fossil leaves. It is protected by the government



Museum in Sexi, Peru

of Peru. We (the monument's paleontologist Herb Meyer and his collaborator Deborah Woodcock at Clark University) have been studying the fossil woods and leaves for 10 years to help understand the climate of equatorial South America during the Eocene 39 million years ago. We also have been closely involved in helping the local community to develop the site for geotourism. There are currently very few visitors who venture into this remote little village high in the Andes Mountains, but this will undoubtedly change as more people become aware of the site.

We are planning to visit Sexi again in May or June 2011. Members of the Friends who might be interested in joining us should contact Herb_Meyer@nps.gov.



Fossil log

The Friends of Florissant Fossil Beds maintains an account to assist with this project. Donations to the "Peru project fund" are much appreciated and can go a long way in helping this local community to understand and conserve their fossil forest.



Installation of electricity and water in the Sexi museum building



Herb Meyer beside fossil log



Posters funded by the Friends being presented to the museum. Members of the Sexi Association, Deborah Woodcock, and Herb Meyer

Social Media Workshop Hosted by the Monument

by **Matt Greuel** FFLO Seasonal employee

I recently explained Twitter, one of the most popular social networking sites in the world, to a friend. After discussing various aspects of Twitter and social media in general, he just looked at me and asked, "Does that make people who follow us on Twitter, twits?"

What many people perceive to be social media can easily give off that vibe: nothing but people with way too much time on their hands writing postings about the most simple and mundane and flat-out boring aspects of their lives. But Social Media is so much more than that! As a Friend's Member and Social Media specialist Heidi Bailey says, it's a cocktail party. It's a way to start conversations about fossil and forests and getting kids outside and much, much more.

Florissant Fossil Beds has been involved in the Social Media cocktail party since summer 2009, when we joined a Twitter test with about two dozen other NPS sites. The test proved to be very successful, for the Fossil Beds and other sites, in reaching out to more people. This meets the NPS mandates to reach out to underserved populations, and to increase our presence in new technologies. It also helps us reach people who may never physically visit the monument, yet it helps them understand the importance and significance of the monument.

We wanted to share our knowledge and experience with Twitter, Facebook, YouTube, and other sites and aspects of Social Media with other environmental non-profits in the community. We had

the staff this summer to do this kind of outreach. We also wanted to take the opportunity to meet or re-connect with some of our community partners, to see them face-to-face, and to give them something useful in these tough times. We proposed a Social Media Workshop, presented by Heidi and Florissant Park Ranger Matthew Greuel. Heidi has written numerous articles for *Legacy*, the magazine of the National Association for Interpretation. Matthew has managed Twitter accounts for Florissant and Joshua Tree National Park, as well as getting Florissant's feet wet with Facebook.

We learned that many of those groups were interested in creating a Social Media presence, but weren't really sure where to start. We organized a half-day workshop for mid-September, attended by 14 people from Woodland Park Parks Department, Trout Unlimited, Aikon, Audubon, Sanborns, and other groups.

A workshop on all aspects of Social Media would take a month, and still end up leaving things out. We kept our presentation to the basics: Heidi focused on creating a conversational, cocktail party-like atmosphere, being creative, helping participants ask the right questions when starting their own Social Media accounts, etc.. She provided the excellent example of Penelope Seal's Facebook page. Look her up and you'll understand why she has thousands of followers who post things like, "You carry your weight so well!" and "I would pay a million bucks just to give her a hug..." Matthew focused on some of the specifics: details of communication, statistical analysis, photos and photo editing, etc.. Our goal was to give participants the information they

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200 Children Became Jr. Rangers at FFLO

The third annual No Child Left Inside Day brought many families from all over the Pikes Peak region to the park on September 25th, Public Lands Day. Over 600 visitors enjoyed the monument while looking for fossils in the paleontology lab, participating in simulated fossil excavations, hiking with rangers, and visiting the historic Hornbek Homestead for a tour and pioneer games.

By the end of the day, over 200 children became new Junior Rangers. Two new Junior Ranger programs were unveiled during the day. First, a program for one- to four-years olds called "Wee Wasps." This program involves the parents exploring the park while reading a picture book to their toddlers based on the five senses. Participants receive a Junior Ranger sticker. The other new Junior Ranger program at Florissant is called "Post to Parks." This is an initiative to connect military families and youth to national parks. For "No Child Left Inside Day," a busload of children was brought up from Fort Carson. Leading this group were two teacher-ranger-teachers who had worked at the monument and currently teach at Fort Carson.

As part of National Public Lands Day, the monument also conducted a trails restoration project. Staff from Coalition for the

Upper South Platte, a local non-profit, partnered with Florissant Fossil Beds volunteers to work on the Hornbek Wildlife Loop trail.

Florissant Fossil Beds took the lead this year in organizing this regional event which included 15 other partners that hosted activities at their respective sites on the same day. The partner groups represented local non-profits, businesses, and county and state parks.

Contact Information
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jeff_wolin@nps.gov



2010 Visitor Service Award

At the 2010 Friends' Annual Meeting on September 26, Dr. Carl R. (Bob) Carnein received the 2010 Visitor Service Award. Bob is a geologist who began volunteering at the Florissant Fossil Beds NM in early 2008. He and his wife Nell (also a volunteer) moved to Florissant after retiring in June 2007. Bob has an MS degree in glaciology and a Ph.D in geology from The Ohio State University.

His teaching career spanned 37 years and included positions in the undergraduate geology programs at Waynesburg College and Loch Haven University, both of which are in Pennsylvania.

Before ending their Geology program in 1989, Waynesburg College owned a small concrete-block building behind the Thunderbird Motel in Florissant. It began as a museum by college President Paul R. Stewart, the building was converted into a geology field camp in the mid- 1960's. Bob taught field methods there from 1972 to 1988, recruiting students from all over the U.S. to fill the 12 to 24 spaces available in the 4 week course.

Bob and Nell met at Imboden's Cafe (in Lake George) in 1978.



Their daughter Dawn and her husband Lonnie live part-time in Lake George and Bob and Nell decided the Florissant area was a good place to retire.

Besides volunteering at the Florissant Fossil Beds, Bob is Vice-President of Arabian Acres Metro District, which supplies water to about 140 local customers. He is also editor of the Lake George Gem and Mineral Club's monthly newsletter. He helps out with the Pebble Pups program for kids. He continues to actively collect minerals - a hobby that sparked his interest in geology in the mid 1950's. Nominations for the Visitor Service Award come from all of the those who either volunteer or work at the Fossil Beds. The nomination form for Bob stated, "Always willing to help and make the Park better - one of a kind -a wealth of knowledge and so happy to share - always answers

visitor's questions with a smile and a chuckle - goes above and beyond everyday - Dr. Bob's time, smile and willingness to help are invaluable." Congratulations Bob!!!!

Dennis Burr—New Friends Board Memeber

The Friends is fortunate to have as a new Board Member Dennis Burr. He comes to the Friends with a wealth of experience.

Graduate of Wayland Baptist University

Retired Air Force.....

Served as County Official.....1988-1996.

Director, Chamber of Commerce.....1999-2004.....

Retired, 2005

Served Board of Directors; George Washington National Monument

United Fund

Newton Co Historical Society.....

Missouri Association of Counties.....

Volunteer—Florissant Fossil Beds.....

Wife, Debbie, also volunteers, FFB.....

Three children.....**empty nesters and loving it.**



Dennis Burr helping two visitors at the Park

Odds and Ends

We will be emailing future newsletters to those with email addresses. Please send you address to Heidi Bailey (shutterbug@141.com).

THANK YOU to everyone who has taken the time to send letters to our Senators and Congressmen regarding the need for a new Visitor Education and Research Facility at the Florissant Fossil Beds National Monument. The letters are making a difference. There has been a great response for support from our Senators. Keep those letters coming, including to their offices in Washington D.C.

ANNUAL MEETING - September 26, 2010

On a beautiful fall day, Friends' members gathered again in the yurt at the Florissant Fossil Beds National Monument for our Annual Meeting potluck. Dr. Bob Carnein, volunteer, received the Visitor Service Award (see article). Heidi Bailey, volunteer, received a special award for her work on the Wee Wasp Booklet and Steven Veatch, President and volunteer, received a special award for his support to education and research at the Monument. Officers voted in for the 2010-2011 year are President Sally McCracken, Vice-President, Steven Veatch, Treasurer Eric Bailey and Secretary Laine Weber.

SOUTH PARK SYMPOSIUM - June 25-26, 2010

On June 25/26, 2010, several Board members and Keith Payne, Superintendent of the Florissant Fossil Beds NM were in Fairplay for the Annual South Park Symposium. Both Friday and Saturday were filled with interesting and informative topics related to South Park such as ranching, mining, water rights and other historical topics.

On Friday evening, the Friends hosted a lovely reception at the newly renovated and opened Fairplay Hotel. The new chef, hailing from New Orleans, out did himself with the many delightful food offerings at the reception. Almost everyone in town for the 2 day event, attended the reception and thanked the Friends for providing the time for conversation and networking. The Executive Director of the South Park National Heritage Area, Linda Balough, sent a thank you note to the Friends stating, " a great big thank you for hosting the get together during the South Park Symposium. You were wonderful and I hope that this leads to even more collaboration in the future."

HOW YOUR MONEY HELPS

The Friends of the Florissant Fossil Beds Board works hard at

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You Can Take Most of it for Granite

Over a Billion Years of Local Time

by *William A, Dexter*

If you were a cosmic navigator from some other planet, planning to land on earth, what would your chances be for landing on granite? Considering the world's water surface area and other rock type Surfaces, the answer is less than .5 of one percent! The granitic rock Outcrops for Teller County are then not a run of the mill type of rock exposure - these are indeed rather unusual!

The oldest rock in Teller County ranges between 1.1 Billion and 1.4 Billion years old! These measurements are based on recent Radiometric Dating techniques. Some of the oldest rocks in our area have been subjected to intense heat and pressure, so much so, that the minerals making them up have all but lost their identity. One such rock is a smashed layered rock called sillmanite schist. This rock originated from the basic rudiments of the original Rocky Mountain system of nearly two billion years ago!

The most obvious landscape feature in Teller County is Pikes Peak! Its rock is exposed for hundreds of square miles and is seen



Pikes Peak Granite

to weather into rounded boulders. The majority of the hillsides of Teller County display the pink color of this plutonic (intrusively formed) rock called granite. Granite consists of several minerals which vary in the texture of its inter-grown crystals. These crystals range in size from several inches in diameter to very fine crystals, whose properties are not evident without the use of optical aids. These different textures reflect the cooling rates of the once molten rock (magma). To another extent, crystal sizes are controlled by the chemical composition of the rocks' minerals. Certain minerals crystallize at different temperatures. Generally speaking then, the coarser the crystal size, the slower the rates of cooling and the deeper down that the rocks crystallized.

The most common constituent of granite is a pink colored silicate mineral consisting of potassium, aluminum and silicon, and is called orthoclase (meaning straight angles). Its predetermined planes of break are always at nearly perfect right angles. Its hardness on a scale from 1-10 is 6 -about the same as a quality knife blade. If the orthoclase were scratched, its powder would be snow white. Up to 90 percent of the makeup of Pikes

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2010 Intern and Student Staff Program

Accomplishments of Paleontology Interns and Student Staff During 2010

by *Herb Meyer, FFLO Paleontologist*

The Monument had a paleontology staff of nine this summer, which allowed us to achieve many new accomplishments. Three of the paleontology interns were recruited through the Geological Society of America's GeoCorps program and received partial funding from the Friends of the Florissant Fossil Beds. Ariel Demarest worked on our excavations of fossil insects and plants. Elizabeth Waite prepared a draft proposal that can be submitted to designate this area as a UNESCO GeoPark. Allison Platsky completed the annual monitoring of the Monument's fossil sites to assess site conditions and look for new disturbances. Another intern, Kerry Petrie, was sponsored by the University of Colorado at Boulder, and she worked to reorganize and digitize many of the photographs of fossils in the Monument's archive collection.

We also had three student employees in paleontology. Jenell Thoene managed the research excavation of fossil plants and insects, and she is using the fossil insects in statistical analyses for her Masters thesis at University of Colorado in Boulder. Bret Buskirk worked on splitting fossil shale that we recovered from the county road cut during construction a couple of years ago, and she is also beginning a doctoral program at the University of Washington that will include examination of the fossil clams and snails from Florissant. Christina Whitmore continued as the Monument's Museum Technician through the early part of the summer, and she completed the major accomplishment of deaccessioning the many historic objects that no longer have relevance to the Monument's collections. These were given to the Cripple Creek Museum. Christina moved during the summer, and our new volunteer, Conni O'Connor, is taking on the responsibilities for managing the Monument's collections.

Having a large staff in paleontology makes it possible for the Monument to achieve projects relating to its primary purpose. New intern positions will again be offered for 2011.

Friends of the Florissant Fossil Beds,

I would like to thank you for your support of the paleontology internship program at the Florissant Fossil Beds National Monument. Because of your generous support, I have been afforded a truly irreplaceable internship experience full of personal and intellectual growth.

I am currently an undergraduate Geosciences student at the University of Texas at Dallas. Paleontology has always been an academic interest of mine, and this internship has allowed me to participate in projects that are very unique to the Florissant, Colorado area.

As an intern at the Fossil Beds this summer, my work focused on creating application documents for a proposed local Geopark. I was given the opportunity to learn about the remarkable history and geology of not only the Florissant Fossil Beds but of the entire south-central Colorado region from Florissant to Canon City. My project allowed me to gain valuable experience collaborating with others, communicating about geologic resources, and developing

a proficiency with the map creation program, ArcMap. In addition to my Geopark work, I was able to assist on other paleontology projects going on this summer, including excavations and Inventory and Monitoring projects.

My time at Florissant has been challenging and beneficial. I appreciate the contributions you made that allowed me to come to Florissant and be a part of the exciting projects taking place at the Monument.

Best regards,

Elizabeth Waite

Every morning, as I hike out to the excavation site, I get to breathe in the sage-resin-vanilla scented air, I get to admire the potentilla, Indian paintbrush, and wild iris, I get to watch the many insects flitting about. Then, after opening the excavation site and allowing the rabbits and salamanders to vacate the pit, I dig into another world of plants and insects. I get to imagine the sight and smells of this ancient place, sometimes so similar and sometimes wildly different from the present. Even on the wretched days when I'm sweating my brains out and splitting shale endlessly without finding a thing, I am simultaneously delighted. I never feel so alive as when I'm doing field research – I love being so close to nature, working so hard and beginning to understand

it. Each day is so vivid and bright and full of the excitement of



Elizabeth Waite



Ariel Demarest

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Odds and Ends

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using your money wisely to help the Monument achieve the mission. The 4 main ways that we receive money to support the Monument are through direct donations, memberships, grants and donation premiums (t-shirts, coffee cups, etc.—Don't forget that your membership card gives you a discount on any of these premium items.)

Below is a list of financial support over the last 4 months that the Friends have provided for the Monument:

- ♦ \$5000.00 - direct support for 3 Paleo interns (partially from grants) The interns monitored fossil sites, worked on excavations and gathered info for a possible Geopark application. (See article on Geoparks)
- ♦ \$630.00 - Grant from F. Martin Brown Publication Board for the publication of 1500 copies of the new Wee Wasp Booklet for children ages 1-4 written by Heidi Bailey.
- ♦ \$1000.00 have pledged \$1000.00 reward for the recovery of the wagon wheels stolen from the Hornbek Homestead.
- ♦ \$2500.00 to the Paleo site in Sexi. Peru for wiring for electricity for the museum, installation for water and

sewage and reconditioning of the windows.

- ♦ Seminar instructors fees and materials
- ♦ Various publications printing - Jr. Ranger Booklet, Trail and Homestead brochures
- ♦ Publicity for No Child Left Inside Day - Sept. 25, 2010 (flyers, posters and ads)
- ♦ Table at Farmer's Market in Woodland Park for info and publicity)
- ♦ Reception at the South Park Symposium in Fairplay, CO
- ♦ Hosting and refreshments for various events including the Annual Friends meeting
- ♦ Supplies for Homestead Days and Jr. Ranger Day
- ♦ Letter writing campaign in support of the new Visitor Education and Research Facility

Your continued financial support to the Friends' group is to serve the Monument, supplying many things that their annual budget is unable to support. Thank you, thank you for supporting the Florissant Fossil Beds National Monument.

Granite (Continued)

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Peak granite is orthoclase.

The second most abundant mineral in granite is quartz. It represents as much as 10 percent, and it is another shiny silicate with a hardness of 7. Its color is usually gray to white with no obvious flat sided predetermined planes of break. A darker



Orthoclase

silicate mineral in the Pikes Peak granite occurs in even smaller percentages. One is hornblende which is black in color, three dimensionally shaped, with a hardness of 5.5 to 6.0. When broken, it will display much more oblique angles and if scratched, its powder will be grayish green. Biotite mica is another dark colored mineral often found in the granite.

Its appearance is flaky and flat and when split thin enough, will peel off in sheets and will display some flexibility. Light colored mica called muscovite is also frequently found in granite and when it is peeled thin enough, it is totally transparent! Other minerals in minor amounts found in the granite include pyrite (fools gold) some of a greenish mineral called olivine, another black mineral called pyroxene, and even some real gold!

After the major Laramide uplift of the Rocky Mountains, about 70 million years ago, erosion began the never ending process of wearing down these mountains, including Pikes Peak! By Eocene times (50 million years ago) most of central Colorado had been

reduced to lower elevations. By 37 million years ago, stream drainages had eroded into the uplifted granite and in some instances; explosive, volcanic activity began in the Sawatch Range, 50 miles to the west. These rapidly moving volcanic mudflows were similar to those associated with the Mt. St. Helens volcanic eruption in Washington State. Today, much of a similar type of volcanic rock in Teller County lies above the Pikes Peak granite and is called the wall mountain tuff. At a glance, this volcanic rock has the appearance of a brownish gray flint. Frequently, Indian artifacts have been found and made from this welded mudstone. The wall mountain tuff, a deposit of 36.6 Million years ago, displays variable thickness, due to the unconformable surface of the lower Pikes Peak granite. The direction of the flow of the wall mountain tuff is significant, as it came from the southwest, suggesting that its source may be the same as that from the intrusive magma from Mount Princeton and the 39 mile volcanic field, to the west of South Park. This same material is found in South Park, Badger Flats, around Lake George and in the Florissant Valley, where it appears to line the edges of the region.

Shortly after the deposition of the wall mountain tuff, a different kind of volcanic activity climaxed about 18 miles southwest of Florissant. Here, an eruption of basaltic lavas (dark and bicolored) spilled from an active volcano near what is now known as the town of Guffey. Early eruptions from the Guffey volcano produced massive mudflows that moved down a stream valley

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Geoparks (Continued)

(Continued from page 1)

What is a Geopark?

A Geopark is similar in concept to a national heritage area. It is a partnership of land managers and private citizens working together to promote earth heritage through education, interpretation, and sustainable tourism.

The United States is mulling over the idea of joining the Global Geoparks Network. Why? The Global Geoparks Network would link significant geologic regions in the U.S. to similar sites around the world. This would bring international recognition and new visitation to these areas.

Geoparks offer something different by incorporating a cultural component. For instance, they partner with local farmers and winegrowers who rely on minerals in the soil to produce food and wine. Geoparks also highlight landscape art, architectural sites built from local stone, and the historical relationship of people and geology through activities like mining.

The most important thing to know about Geoparks is that they are formed voluntarily by local collaborative partnerships. They are not designated by any government. If the U.S. decides to join, all applications for Geopark status will come from the local level.

Because it is an ideal candidate for inclusion in the Geoparks network, Florissant Fossil Beds National Monument was mentioned in the spring issues of *Park Science* and the George Wright Society *Forum*, which both carried articles on the Geoparks initiative.

Geopark FAQs

What would be the structure of a U.S. Geopark?

A Geopark is a destination identity similar in concept to a National Heritage Area. Geoparks are defined by the underlying geology of the landscape and transcend the boundaries of parks and other protected areas. A Geopark operates as a partnership of people and land managers working to promote Earth heritage through education and sustainable tourism.

A U.S. Geopark would not be a new category of protected area. The land remains entirely in the hands of local people and existing land management systems. Local, state, or national governments retain control of the public lands within a Geopark. Private land remains in the hands of private owners. When an area is designated a Geopark, it is managed through a bottom-up partnership approach.

Does a Geopark only focus on geology?

A Geopark is not just another geology park. A Geopark encompasses a large geographical setting that includes not just geological sites, but also natural areas and cultural regions. The literal translation of 'geo' is earth, and Geoparks could also be described as Earth-parks. They are areas where the Earth's processes have significantly affected ecosystems and human development.

How does a Geopark differ from a World Heritage Site?

The Geoparks initiative differs from other UNESCO programs like the World Heritage and Man in the Biosphere programs. Countries wishing to join the Geoparks initiative do not sign an official convention of any type nor are sites required to participate. Furthermore, UNESCO does not have any management jurisdiction over Geoparks but serves strictly in the role of quality control of the international guidelines and designation criteria.

The majority of World Heritage Sites are localities designated for their historical or cultural value. Geoparks typically embrace larger regions and might even include a World Heritage site within its boundaries. The reason for developing a separate initiative for Geoparks is that many geoheritage sites of exceptional value do not meet the selection criteria for the World Heritage List.

What are the goals of the Geopark initiative?

The Geoparks program addresses several issues. First, people in rural areas often suffer from economic losses when traditional industries decline. This creates a need for alternative economic



Florissant geology is similar to Lesvos, Greece—GGN offers partnership opportunities

development strategies. Second, locals and visitors alike do not recognize the impact of geological heritage on the existence of ecosystems and the development of cultures. This creates a need for education programs that employ inventive communication techniques.

Third, geological landforms are often ignored or appreciated only for their shape or aesthetic appeal. The names and histories of geological objects may be limited to colloquialisms and myths. Without an understanding of the science behind geodiversity, many people do not see the importance of geoconservation. People accustomed to protecting living plants and animals may be uninspired by inanimate rocks.

(Continued on page 10)

Geoparks (Continued)

(Continued from page 9)

Why should the U.S. be interested in the Geoparks initiative?

Geoparks have the potential to spur economic development while conserving and promoting geological heritage sites. The U.S. contains many landscapes of national and international signifi-



Lesvos Petrified Forest Geopark, Greece

cance. Many of these sites are not primary tourist destinations. The Geoparks initiative provides an opportunity for the U.S. to capitalize on this rich heritage to stimulate tourism in depressed areas.

The U.S. is experiencing an economic downturn. Fuel prices are fluctuating and the cost of living is higher. People will be seeking travel experiences closer to home and they will be attracted to something new. In addition, the growing popularity of Geoparks around the world will make sites in the U.S. a draw for international visitors. According to NPS visitation statistics, the only parks currently experiencing an increase in visitation are those that attract European tourists.

The Geoparks initiative offers a way to revitalize small towns and jumpstart the tourism industry in undervalued areas. And since a Geopark is not a type of public land, it does not require a new agency or a large amount of funding to manage it. A Geopark is a strategy for marketing and branding a region's existing programs and infrastructure. The goal is to create a new destination identity while promoting geoheritage education and conservation.

What will it cost?

The European Union has invested a significant amount of funds in the European Geoparks Program. However, the U.S. should not base cost estimates on the European model. The EU has needed to purchase land, construct trails, and refurbish buildings to use as visitor centers to jumpstart their program. The U.S. is already blessed with an established system of protected areas, trails, and visitor centers.

A U.S. Geopark System would enhance programs and infrastructure that are already in place. Costs would include assem-

bling a Geopark partnership and management plan, joint marketing and promotional materials, hosting a two-person evaluation team to approve the site as a Geopark, sending a representative to meetings or conferences, and periodic reporting.

Who will manage the Geoparks program?

In the U.S., the Geological Society of America has volunteered to assist with forming a national Geoparks working group of agencies, geologists, NGOs, educators, and the tourism industry. This working group would coordinate efforts with UNESCO and oversee the U.S. application process.

How will sites apply to become a Geopark?

A Geopark is created through a bottom-up, grass-roots initiative. The people living in an area decide if they want to take on this challenge for the benefit of their communities. A Geopark can be established by a volunteer coordination team made up of citizens, public lands, businesses, universities, tourism enterprises, conservation groups, and scientific organizations. This team would create an identity for the area as an internationally significant geoheritage site. This team may already exist in the form of a scenic byway partnership or tourism association.

These local stakeholders work together to define a Geopark's boundaries, create a destination identity, enhance educational programs, link sites to a menu of tourist experiences, and form a network of sustainable visitor services. Once this is in place, a site may choose to apply for membership in the Global Geoparks Network. Representatives of the Geological Society of America and the National Park Service are currently working on a set of guidelines that will outline the membership requirements and set forth application procedures.

What are the benefits?

One benefit is the international prestige that comes with earning UNESCO Global Geopark status. People living in economically depressed areas profit when tourists and governments recognize the value of these places. This creates an incentive for young people to build a future in their local areas due to increased employment prospects.

A second benefit is the exchange of ideas and resources. Geoparks have the opportunity to join in collaborations with sister sites around the world. For instance, the Vulkaneifel Geopark in Germany and the Hexigten Geopark in China formed a partnership to share research findings, management practices, and training programs.

A third benefit is the protection of geological sites, natural areas, and cultural traditions. When people are made aware of the beauty and fragility of the Earth's resources, preservation and conservation programs thrive.

What are the challenges?

Due to differences in land management policies, the U.S. faces a number of challenges in adapting the European model to create a Geoparks Network. Money for the European Geoparks Network

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Geoparks (Continued)

(Continued from page 10)

was provided by the European Union in the form of regional development grants. In the U.S., financial support for protected areas is usually scarce and creative funding methods would need to be developed. It may be difficult to garner political support as public officials are faced with budget cutbacks and other urgent issues.

A second challenge is that communities may initially resist the Geopark idea due to pre-conceptions about the term “park.” In the U.S., people strongly identify the term “park” with city, county, state, and national parks. Thus, the term “Geopark” may not be appealing to people representing agencies and interests outside of the park system. In addition, people may fear that establishment of a Geopark will lead to issues of eminent domain and restrictions on land use.

Why would the U.S. want to be involved with this UNESCO initiative?

The overall goal is to recognize and protect our outstanding geological heritage sites while also creating a new identity for a region as an internationally significant site. The Global Geoparks Network is a cooperative initiative and membership is entirely voluntary. Sites apply for Geopark status to gain recognition and support from UNESCO, but other than setting membership guidelines, UNESCO does not have a role in management. Acceptance into the Global Geoparks Network is an accolade that fosters local, regional, and national pride in the host country. Local people benefit from the prestige of achieving Geopark status and the mark of quality indicated by the Global Geoparks Network brand.

What are some examples of programs that existing Geoparks offer?

Many European Geoparks offer programs to promote Earth conservation, education, and tourism. Among the most popular are:

◆ GeoCulture

The most innovative aspect of a Geopark is the focus on culture. Geoparks sell local products, train local guides, and encourage local communities to provide services. Geoparks focus on the relationship of geology to cultural elements, such as the distinctive flavors of regionally produced wine. Trips to castles, monasteries, and other historic buildings are a highlight. Geoparks also celebrate musicians, writers, and artists whose work is inspired by the landscape.

◆ GeoRoutes

European Geoparks are areas that encompass large landscapes with a shared geological heritage. Visitors are encouraged to explore these landscapes by following routes that link various geological sites. GeoRoutes offer driving tours or walking/cycling trails that focus on the geology and unique landforms of a region. The routes provide an opportunity to promote sustainable tourism in towns located within a Geopark.

◆ GeoRecreation

Geoparks offer outdoor recreation activities that allow participants to actively celebrate Earth heritage by engaging in geology-oriented adventures. Geoparks add a thematic element to ordinary recreation activities such as hiking, mountain biking, kayaking, rafting, rock climbing, horseback riding, and even paragliding. These activities are often referred to as GeoAdventures and may be offered by local tourist providers.

◆ GeoKids

Geoparks offer programs for kids with activities related to geology and landscape. For example, older children are involved in Geoparks through the Rock Detectives program and younger children are engaged by cartoon characters that go on adventures. These characters introduce geology in storybooks and puppet shows and are quickly becoming important mascots for members of the



North Pennines Geopark Rock Detectives Program

European Geoparks Network.

What are the greatest strengths of the Geopark initiative?

The most appealing aspect of the Geopark concept is the inclusion of people as an integral part of the equation. Local history – including extraction and exploitation of geological resources – is respected as part of a region’s heritage. In addition, living culture is embraced along with the natural environment. Too often preservation and conservation programs exclude the needs of the people living in the local area. A Geopark seeks to balance both.

The strength of the Geopark initiative is in its ability to foster socio-economic development by drawing international attention to a region. The theme of a Geopark is *Celebrating Earth Heritage – Sustaining Local Communities*. Businesses within a Geopark integrate their products into the geological heritage of an area. Geoparks create tangible economic benefits for residents by promoting these local products and services.

Why would Geoparks be attractive to tourists?

To create a high level of interest as a tourism destination, Geoparks intermingle earth science themes with cultural and natural themes. For instance, wine tasting tours offer a glimpse

(Continued on page 12)

Geoparks (Continued)

(Continued from page 11)

into the effect of minerals on the flavor of wine. A nature center program reveals how the habitat of a favorite animal is directly influenced by the shapes of landforms. An art exhibit demonstrates the ways that elements of the landscape are reflected in different artistic periods. Geoparks are attractive to tourists be-



Wine tasting tours link geology and culture

cause of their focus on the relationship between people and the landscape.

What steps is the U.S. taking to join the Geoparks initiative?

In 2005, researchers from the U. S. toured several Chinese Earth heritage sites to see if members of the Global Geoparks Network differed from other geological parks in China. The researchers found that “sites designated as World Geoparks were vastly superior in terms of protecting geological heritage, balancing economic and tourism development, and educating the public” (Partin, Robinson, & Meade, 2006, p.16).

In 2007, a meeting at the U.S. State Department Office of UNESCO Affairs first brought together representatives of the Geological Society of America, the National Park Service, and the Bureau of Land Management to discuss the Geopark initiative. The core working group met again in 2008. In 2009 the George Wright Society hosted a panel discussion on Geoparks at their annual conference.

Currently, the U.S. is in the process of gaining further information, garnering support, and drafting program guidelines. A multi-agency proposal to join the Global Geoparks Network will be prepared for approval by the U.S. National Commission on UNESCO and the State Department. If the U.S. joins the Geoparks network, two Geoparks will be nominated and forwarded to UNESCO every other year. In March 2010, the National Park Service approved its participation in the initiative

should the U.S. decide to join.

What types of sites would apply?

Geoparks are large regions unified by the outstanding geology of the landscape. An example of a site that might apply for Geopark status is Florissant Fossil Beds and the surrounding region. The area encompasses world famous fossil sites, the remnants of extinct volcanoes, a gold mining district, crystalline basement rocks, layered sedimentary rocks, uplifted mountains and ridges, and deeply eroded canyons.

Sites of geological interest attract only a small portion of the tourist population visiting the surrounding area. By creating a new identity that links the geology to the cultural and ecological attractions in an area, the region has an opportunity to attract a larger amount of tourists. In addition, visitors to Geoparks around the world will be made aware of the site.

Local interest from land managers and the public are required for a Geopark nomination; sites will not be pre-selected by Washington.

What are the application requirements?

Although U.S. guidelines are still being developed, the requirements will likely be similar to UNESCO's. A summary of the international guidelines follows:



Geoparks sustain local communities and small businesses

◆ Setting and Size

A Geopark must have well-defined boundaries and encompass a large enough area to sustain local economic development. Geological sites may include rocks representative of historic Earth

(Continued on page 13)

Geoparks (Continued)

(Continued from page 12)

processes, mineral resources, fossils, individual landforms, or entire landscapes. Sites with a relationship to geology and landscape themes may also be included. These include places of ecological, archaeological, historical, or cultural significance.

◆ Management

A Geopark is managed by a partnership entity such as a scenic and historic byway association. Core areas within a Geopark are managed as parks, forests, wilderness areas, wildlife refuges, or other existing public land designations. Public sites within a Geopark must have management and interpretive plans to protect the resources and make geological features accessible.

◆ Economic Development

Geoparks partner with local people to encourage culturally and environmentally sensitive tourism. Members of a Geopark promote local products and sponsor cultural events centered on Earth heritage. Geoparks have the potential to create new jobs by stimulating the growth of small businesses and training local people as guides or other service providers.

◆ Education

Members of a Geopark must offer educational programs to universities, school children, and the public. Geoparks provide field trips to students and create resource materials for teachers. Sites within a Geopark communicate Earth science concepts to the public through interpretive centers <http://novohrad-nograd-geopark.eu/elements/contentimages/earth.jpg>

, tours, trails, and media.

◆ Protection and Conservation

The people and governments of a nation protect geological resources in accordance with existing traditions and legislative requirements. Quarrying or mining sites continue to operate according to existing national or international regulations. Geoparks work with local craftspeople to create casts, imprints, and other products to discourage the collecting and unsustainable trade of geological objects.

◆ Reporting and Periodic Review

Members of the Global Geoparks Network provide updates about

the ongoing work of the Geopark in order for UNESCO to publish educational and tourism information about the site. In addition, each site receives a review every four years to ensure the Geopark is continuing to fulfill membership guidelines.

Conclusion

Geoparks have proven to be highly successful in other parts of the world, particularly in Europe and China. The greatest strength of the Geopark initiative is the attention it brings to Earth heritage resources and the resulting socio-economic development that occurs in rural areas. The United States is viewed internationally as setting the standard for site protection and park management worldwide. Thus, UNESCO and the Global Geoparks Network are eager for the U.S. to join this global conservation initiative.

It is important to note that while the UNESCO World Heritage program is governed by a binding international treaty, the Geoparks initiative is not. If the U.S. approves a Geoparks program, participation at the local level is entirely voluntary and private property rights are honored. The next steps for the U.S. are to obtain State Department approval, finalize a set of guidelines, and continue discussion with local sites that are interested in the initiative.

If you are interested in the Geoparks initiative, please email Wesley Hill at the Geological Society of America at WHill@geosociety.org.

For more information, visit www.globalGeopark.org.



Fiora Eocene cartoon mascot in German Geopark



Geoparks throughout the World in 2009

Superintendent's Letter (Continued)

(Continued from page 1)

go to you, our Friends, for helping to make that event possible. We must also recognize the yeoman work delivered by one of our temporary student employees, Sheena Grabsky, who planned, organized, and orchestrated that event nearly single-handedly. We are definitely in her debt. This summer we initiated the Wee Wasps program, essentially a pre-Junior Ranger program for preschoolers. This program and workbook were conceived and produced by Heidi Bailey, and it has been strongly received by our visitors. The new Junior Paleontologist program also started in late summer and has enjoyed good success by appealing to youth who want to gain more in-depth information about paleontology.

Of more general interest to us all was learning that Dr. Estella Leopold, one of our Founders, was this year's recipient of the International Cosmos Award. This award is given every year by the Japan-based Expo '90 Foundation to a person who has advanced "the harmonious coexistence of nature and mankind" and it includes a medallion and 40 million yen (about \$480,000). It has been described as the "Nobel Prize" for conservation. We can think of no one more deserving of the award, although (typically for her) Estella insists there are many people more deserving than she is. We would agree that there may be many people who are *just as deserving*, but certainly none who are *more deserving*. We are very proud to be associated with her and her research, and we are grateful for her contributions to the preservation of Florissant Fossil Beds.

The Intermountain Region of the National Park Service has a new Regional Director, John Wessels. He has visited our park several times (all when he was one of the "little people") and has enjoyed it every time. He has been aware of the level of national attention we have enjoyed this past year and when we spoke last week, he wanted the full report of "what's happening at Florissant now?" I was happy to oblige – in what must have been nauseating detail for him. As a result of that conversation, and to keep him from being surprised by any congressional queries, I will be making a personal presentation to him about the proposed new visitor center on Monday, October 18th in Denver. I wanted you all to know that because that invitation is due in LARGE measure to the letter writing campaign of the Friends, which got the attention of the offices of Senators Udall and Bennet. I have already responded to several questions from their offices and have had the pleasure of supplying them with detailed information about the visitor center. So, yes, your letters were extremely effective! Keep them coming. I want to publicly express my personal thanks to Steve Veatch for getting that effort underway and setting up the initial meeting with Senator Bennet's office. But we cannot stop in the effort. As of today, and as far as I am told, the new visitor center is *officially* still scheduled for 2012, however, the dark specter of a greatly depleted federal budget is becoming more and more real. I am warned that the likelihood of additional federal spending cuts is growing, and the Florissant Visitor Center could slip yet again to 2013.

Many of you are local residents and may have noticed the con-

struction activity at the road entrances to the Monument. What you are seeing are the bases and structures for four new entrance signs. Chief Ranger Rick Wilson has shepherded this project from concept through design to funding, contracting and construction. It has been a years-long, tedious and frustrating process for him but he has persevered and we are all excited that we will soon have new entrance signs that are compatible with the strides we are making in our programs and other services. There are two sign styles. The larger signs will be at the north and south ends of Teller County Road 1. The smaller, scaled-down signs will be at the east ends of Upper Twin Rock Road and Lower Twin Rocks Road. The signs will be made of stone and wood timbers, and the pictures below will give you an idea how they will look when completed.



In sum, Florissant Fossil Beds National Monument has had a banner year, achieved growth in programs and visitation, and takes a back seat to no one in the National Park system. The support of enthusiastic Friends such as all of you have made this possible. I know this to be true because other superintendents have told me how jealous they are of our Friends group at Florissant. We will never take you for granted. Thank you for all your support.

Interns (Continued)

(Continued from page 7)

new knowledge. Thank you so much, Friends of the Florissant Fossil Beds, for making this experience possible for me.

Truly, when I visited the Fossil Beds last summer, I never dreamed I would be working at the monument in a paleontology position. As I entered school last fall, I was preparing to graduate with a degree in biology, concentrating on entomology. On a lark, I decided to take a course in paleobiology with Dena Smith, enjoyed myself immensely, and was promptly recruited into her lab. Here I was introduced to the field of paleontology and encouraged to apply for this internship. Because of my background in entomology, my project as an intern was to assist in the ongoing excavation to collect insects for Jenell Thoene's research on insect diversity at Florissant. I lead the excavation every other week while Jenell worked in Boulder, collecting hundreds of insect and plant fossils, then preparing them for entrance into the collections. With the end of excavation this year, Jenell should have enough specimens to write her thesis and achieve her masters.

I will be moving on to graduate school myself with in the next two years, in either entomology or paleontology. I may return to Florissant for my thesis research, but even if I do not, this has been a wonderful experience. Thank you again for supporting this sort of opportunity for young scientists!

Cheers,

Ariel Demarest



Ariel Demarest, Bret Buskirk, Jenell Thoene, Allison Platsky, Elizabeth Waite



Allison Platsky

Leopold (Continued)

(Continued from page 2)

tion growth, poverty and politics, she says.

Leopold's research concerns climate and plant species change during the last 50 million years. At sites where sediments and ash from volcanic eruptions have fossilized plant material in the soils, Leopold looks for ancient grains of pollen and spores for clues of what used to grow where. Pollen grains, she discovered, can be present even if leaves and other plant materials have decayed.

At the fossil beds in Colorado, for instance, pollen provides evidence for a far greater variety of plants than revealed by the leaves alone. At a site near Hanford in eastern Washington, no

plant material other than pollen has been preserved. There, in soil cores dating back 5 million years, pollens provide evidence that cypress-type swamps were once present. Like those in southern Florida today, the kinds of plants present would have needed almost tropical temperatures and 40 inches of water a year. Today Hanford receives less than 7 inches of rain.

"Ancient floras were richer than we have at Hanford today and climate change wiped them out," Leopold says. "If there's a lesson from that today, it would be that it's a shame to be losing more species at the hand of man."

For more information: Leopold, 206-685-1151, eleopold@uw.edu

Granite (Continued)

(Continued from page 8)

near Florissant and inundated a giant sequoia (Redwood) forest. This mudflow, of 34.9 million years ago entombed the redwood trees' bases up to 15 feet and created a dam at both the north and south edges of the Florissant Valley. Dissolved silicate minerals, over long periods of time, gradually replaced the trees' woody tissue with silica, creating petrified wood. About a dozen of these impressive petrified redwood stumps are displayed on the Petrified Forest walk at the Florissant Fossil Beds National Monument - 2 miles south of the town of Florissant on Teller County Road One!

Above the lowest layer of the Florissant mudstone is a sandier mudstone called tuff and it appears to follow closely the main axis of the Florissant valley. This provides for confirmation that the source of the flow originated southwest of Florissant and from the Guffey volcano. This impervious mudstone also provided a basin 12 miles long which filled up to form what is known as Old Lake Florissant. This lake existed geologically for only a short time, perhaps as little as 700,000 years, but during its existence, it supported an abundance of plants and animals. Over 1300 species of plants and some 1,200 types of insects and spiders have been found as fossils in the paper thin shale beds of Old Lake Florissant. All of these organisms were entombed by the continuous and sporadic eruptions from the Guffey volcano. Today, these delicately preserved fossils from the Florissant lake bed shales are among the finest preserved fossils in the world.

Finally a cap rock, a coarser and more erosionally resistant volcanic mudflow called breccia covered the Florissant shale beds protecting them from continuous deterioration.

During the ensuing 34 million years, the most recent uplift occurred in the Colorado Rockies, including Teller County and it is still being slowly uplifted, with a few exceptions. One exception is the Woodland Park valley, which is actually showing some degree of subsidence!

Looking south toward Cripple Creek, one can see Rhyolite Mountain. It is composed of a very fine textured volcanic mudstone called rhyolite. This cooled on or near the surface, and its crystals are small - but it has exactly the same mineral compositions as granite!

In southern Teller County, in the Cripple Creek area there is also a basement rock similar in character to Pikes Peak granite. It too represents a very large intrusive reservoir of solidified magma. This material is called monzonite, similar to granite, but is bi-color and contains only about 5 percent quartz.

Most of the volcanic deposition around Cripple Creek consists of cemented angular volcanic fragments called breccia, with an additional welded mudstone known as phonolite. This is similar in texture to the Wall Mountain Tuff. The Cripple Creek volcanic deposits are dated to be only 28 Million years old, hence is the youngest major rock depositional feature of Teller County.

The most recent uplift affecting Teller County is paralleled by faulting (vertical displacement breaks in the surface rocks). Two major faults are evident in Teller County. These follow Ute Pass from Colorado Springs up through Woodland Park, on to the Douglas County line and are called the Ute Pass fault and the Rampart Range fault.

Within the Last million years, some glaciation has occurred in the highest parts of Pikes Peak and along with continued erosion and weathering will, in time, alter the present day landscape.

So you see, the geological history of Teller County is rather remarkable and fascinating, but what unknown processes will cause dramatic landscape changes in the future? You can be sure, whatever the cause, the majority of the future geology of Teller County will still be taken for granite!

Social Media (Continued)

(Continued from page 4)

needed to get their own Social Media presence started, and to give them tools to keep that presence going. Sanborn is an excellent example of our success. They had some Social Media presence, but after the workshop they have increased their Twitter postings, and are leveraging their Facebook page to stay connected with people previously connected to them, and people who may get connected to them in the future. Matthew has had several conversations with them about everything from the impacts of first snow of the season to sharing the National Fossil Day details and the NFD video, featuring the NFD song written and performed by Lead Park Ranger Jeff Wolin.

Our goal is certainly not to replace the experience of visiting

Florissant Fossil Beds, or any other site. The feeling of splitting shale and finding a fossil, smelling the sweet aromas of a ponderosa pine, seeing Junior Rangers learn and experience and grow...these have no equal. Sharing our experience and knowledge in Social Media, however, allows the Fossil Beds and other groups to increase our reach. It gives us the opportunity to introduce people to the Fossil Beds, it lets people re-live the positive experiences they had when they did visit, and it reinforces NPS messages. Sharing with others in different communities - paleontology, outdoors, families, etc. - we nurture and encourage a whole new group of people to get outdoors and learn and experience the very nature in their backyard.

Advertising Rates

Business Card Size:	\$6.00
¼ Page	\$12.00
½ Page	\$24.00
Full Page	\$48.00

You may submit advertisements to: Steven Veatch, P.O. Box 5938, Woodland Park, CO 80866 or via email: sveatch@fossilbeds.org.

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Please send feedback on the newsletter or any topic you are interested in to Sally McCracken. If you are interested in serving on various committees or the Board, please contact Sally McCracken at the address to the left or by email (samckind@aol.com).

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The Friends of the Florissant Fossil Beds newsletter is published quarterly by the Friends of the Florissant Fossil Beds and is governed by the by-laws of the Friends. Articles appearing in the newsletter do not necessarily reflect the views of the National Monument, officers, members, or sponsors of the Friends.

About Our Organization....

In 1987, the Friends of the Florissant Fossil Beds, Inc. was organized by a group of dedicated individuals interested in assisting the National Park Service in its mission to preserve and protect our national treasures. As a non-profit organization, the Friend's mission is to secure resources to help preserve the fossils and promote programs and activities that enhance the Monument's education, research, and scientific objectives.

Membership fees and donations to the Friends of Florissant Fossil Beds are used for:

- Environmental education programs
- Support for our sister park in Sexi, Peru
- Field seminars
- Year-round interpretive programs
- Jr. Ranger programs
- Paleontological and geological resources
- Natural history resources
- Publications
- Support for Paleo interns each summer
- Funding for special events at the Monument
- Funding and coordination of the Summer Seminars Program
- Planning, funding and coordination of the Monument's 40th Anniversary (2009)

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