

# GREENSTONE

Norris Geyser Basin

*Yellowstone National Park “...for future generations”*

## YES! Interns from Georgia Tech

The Yellowstone Park Foundation, in collaboration with Yellowstone National Park, launched the Yellowstone Environmental Stewardship Initiative (YES!) this past year and has committed to raising money for various environmental projects in the park. As part of this initiative, the Foundation has raised money to sponsor interns from the Georgia Institute of Technology to work on environmental projects. With support from a senior research scientist at the Georgia Tech Research Institute, interns Michael Harris and Angela Rice are working in the Park this summer. Michael Harris, a Georgia Tech graduate with a B.S. in Civil Engineering, is pursuing his masters degree in water resources from Georgia Tech. Michael will be working on the Mammoth micro-hydropower project, the Mammoth irrigation project, a feasibility study for hydropower



**Interns Michael Harris and Angela Rice enjoying the Park.**

at Lamar Buffalo Ranch, as well as water metering and water conservation efforts around the park. Angela Rice, a recent graduate from Georgia Tech in Chemical Engineering, is starting a graduate program in Environmental Engineering at Stanford University this fall. Angela will be working on energy conservation projects, including employee behavior

change programs in various buildings, developing energy-use databases, and park-wide messaging for environmental programs. The interns are very excited to learn about Yellowstone's efforts and to help it reach its sustainability goals. To learn more about YES!, visit the Yellowstone Park Foundation website, [www.yopf.org](http://www.yopf.org).

## Rain or shine, it's about time: Mammoth Irrigation

As many of you know, the Fort Yellowstone area in Mammoth Hot Springs is a cherished National Historic Landmark. Part of the historic integrity of the fort is the Army installed manicured lawns, much loved by elk and bison. Unfortunately, the grass is a non-native spe-

cies and cannot be sustained by water provided naturally. An irrigation system installed in the 1980's has been supplying 15.4 million gallons of water to the grass each year, around 30% of the water used by the entire Mammoth area. The Yellowstone Park Founda-

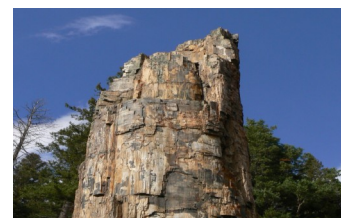
tion has developed a partnership with Rainbird Inc., who will be donating supplies and expertise to install an entirely new irrigation system this fall. Designed with the most recent technologies, the new system is expected to reduce water consumption by half.

Volume 1, Issue 2

June 2009

### *Special points of interest:*

- Yellowstone Environmental Stewardship Initiative interns this summer
- 2008 Waste Stream Data
- “Back to the Future” micro-hydropower projects
- Yellowstone Green Team sign-ups
- Rain or shine, it's about time: Mammoth Irrigation System



### *Waste Analysis 2008*

Waste Stream Total **4444 tons**

Amount Composted **1395 tons**

Amount Recycled **2119 tons**

Total amount diverted from the landfill **3514 tons**

Percent diversion rate for 2008 **79.1%**

Percent diversion rate for 2007 **75%**

Percent diversion rate for 2009 **TBA...it's up to YOU!**

## Yellowstone National Park “...for future generations”

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Comments and feedback on the newsletter are welcomed. If there are stories or topics that interest you, please let us know. Collaboration and communication are prerequisites for change.



### Yellowstone's Environmental Program “Growing into Something Big”

**Recycling Guides on the intranet site under Employee Information!**

In recent years, interest has grown in the environmental arena. More people are talking about greening, environmentally friendly, and sustainability, but what does it all mean? According to *Merriam-Webster Dictionary*, ‘sustainable’ is being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged. Now this is not a new idea for the National Park Service. Minimizing human impact in Yellowstone and preserving it for future generations has been a goal of employees for many years. Nonetheless, research over the past several years has indicated that activities we previously thought insignificant are having huge impacts on the environment. Yellowstone has responded to this information with utmost urgency. As a forerunner in the areas of conservation and sustainability, Yellowstone has led the way by having an active environmental management system. Through the years, Yellowstone's Environmental Program has taken various forms, all of which have contributed to its current form: the Yellowstone's Environmental Coordinating Committee (YECC). Committee members include personnel from the National Park Service, concessionaires, and cooperators. YECC is the organization guiding park-wide environmental programs.

Jim Evanoff, an NPS representative serving on YECC, will chair the NPS Green Team. The Green Team will be working to carry out the park's sustainability goals. If you are interested in joining the Yellowstone Green Team, please seek supervisor approval and then contact Mary Murphy or Jim Evanoff.



## “Back to the Future” Micro-hydropower Projects



**The Mammoth microhydro project will harness the energy of water flowing from the Indian Creek intake through the existing 12” pipe to the Mammoth water treatment plant with an elevation change of 640 feet—over twice the height of Yellowstone's Lower Falls.**

Currently, Yellowstone National Park is in the process of returning to an older form of power generation. In the Mammoth area, extensive studies on a micro-hydro turbine have already been conducted, and with the help of recently received stimulus money, a power plant design will be finalized for construction in the coming months. The turbine will produce between 116 and 162 kWe depending on the results of flow-pressure testing conducted by CTA Architects Engineers in July. This will create a possible annual production of 1,227,000 kWh. Considering the power production range, the cost recovery period is 12 to 17 years. The power produced will partly be used to power the Mammoth water treatment plant. The remaining power will be either sold back to Northwestern Energy to offset the cost of power, or it will be used to power facilities within the Mammoth

area. This is not a new idea; beginning in 1904, the U.S. Calvary installed a similar system that provided electrical needs for all of Fort Yellowstone.

The Lamar Buffalo Ranch, which is an off-the-grid facility within the park, is also seeking to incorporate hydropower into daily operations. It currently depends on a combination of solar power and generator power. A feasibility study is being conducted to determine the possibility of eliminating or limiting the use of propane generators on the site. As the site exists today, approximately 60% of all electricity consumed is being obtained from the sun. The addition of hydropower will allow for valuable education to Buffalo Ranch visitors and a more sustainable operation without the dependence on propane fuel.