2006-2007 GIS AWARD WINNERS

Using GIS to Explore Montana's Changing Snowpack and What it Means for your Community

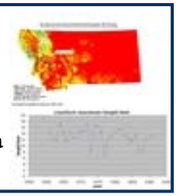
Teacher: Carl Benson Plains High School, Plains, Montana

Check out the Spatial Sci website for a complete list and project descriptions of Carl Benson's award winning GIS student projects. We included a few thumbnails of the maps his students created below. Congratulations to: Meghan, Nathan, Allison, Jessica, Ian, Kara, Bethany, Melody, Breanna, Jennifer, Austin, Bryan, Brandon, Boston, Tara, and Elijah.

Climate Change Impacts on Ski Resorts

Montana Fires in Relation to Precip. and Temp.

Impacts of Global Warming in Montana



GIS FOR EDUCATORS

Paleo Exploration Project

Professional Development Opportunity
Montana 7th and 8th Grade
Math, Science, and Technology Teachers

Field Methods and Spatial Analysis in Paleontology

Use geospatial technologies (GIS and GPS) to analyze actual fossil excavation sites, construct fossil geodatabases, and contribute to scientific discovery. No previous GIS experience required!

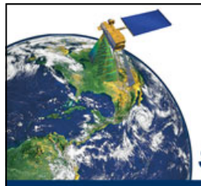
Contact Heather Almquist at heather.almquist@umontana.edu

GTEC Cohort One

GTEC Cohort Two

SpatialSci/GTEC
School of Education
University of Montana
Missoula, MT 59812
MED100

To: «First Name» «Last Name»
«School»
«Address»
«City», «State» «Zip»



Science Goes Spatial

GTEC
www.SpatialSci.com

Geotechnology in the Classroom Project — *School of Education, The University of Montana, Missoula, MT 59812*

FALL 2007 VOLUME II

Upcoming Events:

- **SYNCHRONOUS CHAT: TUESDAY OCTOBER 15TH, 4:30-6:30PM.** Web-based interactive discussion among current and past GTEC fellows and project leaders. Agenda includes introduction and discussion of the 2007-2008 GIS Competition.
- **2007/2008 GIS COMPETITION: Mapping Montana's Energy Alternatives.** This year's competition challenges students to consider what renewable energy sources are best suited for Montana. Do different regions within the state vary in terms of suitability? How would you develop an alternative energy plan for Montana? Which areas would you develop for alternative energy production, and how would you move this energy from its sources to other areas within the state?

FROM THE PROJECT LEADERS

During the 2007 GTEC summer teacher institute, project leaders introduced the power of Google Earth tours and KMZ files along with GIS, GPS, and GPS drawing technologies and added a Google Earth data link to the Spatial Sci website. Here you can download KMZ files for use in your classroom. For example: Studying disease transmission? Check out the Google Earth animated view of the global spread of Avian Flu.

Avian Flu Outbreaks

Google Earth has also launched a "Global Awareness" component that allows Google Earth users to explore data from a selected set of environmental science case studies. Below are two examples of the resources you can find when visiting: **http://earth.google.com/outreach/env_science.html.**

This KML acts as a guide to the environmental issues causing concern for scientists. Current issues and possible solutions are explored using photos, descriptions and overlays.

This KML illustrates the threat to America's forests.

Don't forget that **ArcGIS 9.2 is now available free to all MT public schools** through an agreement between the SpatialSci Project, The Paleo Exploration Project, and ESRI. If you or your students have a GIS related project you would like to include in an upcoming newsletter or have questions for GTEC leaders, please contact Lisa Blank at lisa.blank@mso.umt.edu.

What is GTEC?

GTEC is a collaborative partnership between the University of Montana School of Education and a geographically and culturally diverse representative group of Montana school districts. The goal of GTEC is to ***contribute to a national model for improving the teaching and learning of science in grades 5-12 using geotechnologies*** *(Geographic Information Systems, Global Positioning Systems, and satellite data)*. GTEC supports teacher training, curriculum development, and statewide professional collaboration.

Inside this issue:

THANKS TO OUR 2007 WORKSHOP

Dr. Dick Hutto, Professor of Biology and Director of The University of Montana Avian Science Center

Amy Cilimburg, Assistant Director of The University of Montana Avian Science Center

The mission of the Avian Science Center is to promote ecological awareness and informed decision making through the collection, synthesis, and dissemination of science-based information on western birds.

http://avianscience.dbs.umt.edu/

Jim Barber, GIS Specialist, Geospatial Service Group, USDA Forest Service

FSGEODATA Clearinghouse

http://fsgeodata.fs.fed.us/clearinghouse/index.html

2007-2008 GIS COMPETITION

Mapping Montana's Alternative Energy Sources

There are many reasons to consider energy production from alternative (or renewable) sources – these include reduction of greenhouse gas emissions, decrease in the amount of toxins that are by-products of energy use, conservation of the natural resources that we currently use as sources of energy, and protection of natural areas and landscapes. As oil and gas prices steadily increase, economic concerns also motivate interests in alternative energies. Renewable energy utilizes natural resources such as sunlight, wind, tides and geothermal heat, which are naturally replenished. Renewable energy technologies range from solar power, wind power, and hydroelectricity to biomass and biofuels for transportation. About 13 percent of the energy the world uses comes from renewables, with most of this coming from traditional biomass like wood-burning. Hydropower is the next largest source, providing 2-3%, and modern technologies like geothermal, wind, solar, and marine energy together produce less than 1% of total world energy demand energy (Party 2002).

Renewable Energy for Montana

Appropriate renewable energy technologies vary with geography. For example, marine energy (from waves and tides) can only be harnessed in coastal locations. Solar energy arrays are best-suited to regions with predominantly cloud-free, sunny conditions. Montana currently generates very little of its electricity mix from renewable sources, although the potential exists to successfully generate most or all of our electricity needs using renewable technologies (Nielsen, Innis et al. 2002).

Challenge

What renewable energy sources are best suited for Montana? Do different regions within the state vary in terms of their suitability? How would you develop an alternative energy plan for Montana? Which areas would you develop for alternative energy production, and how would you move this energy from its sources to other areas within the state? What other considerations are important for energy development.

Meet the 2006 —2007 GTEC Fellows

John Wehrman, IT Coordinator

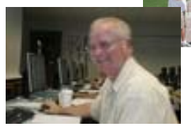
Cayuse Prairie School

Kalispell, MT

Bill Lee, 5th/6th Grade

Winifred Public School

Winifred, MT



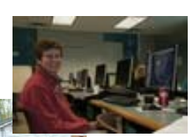
Suzie Flentie, 8th Grade Science

Lewistown Junior High School

Lewistown, MT

Maree Mitchell, Grades K-1, 4-5, 6, 7, 8 Science

Sussex School



Missoula, MT

Lori Ann Muchmore, 7/8 Science

Lone Rock School

Stevensville, MT

Jean Hagler, High School Science

Savage School

Savage, MT

Reed Kuennen, High School Science

Whitefish H.S.

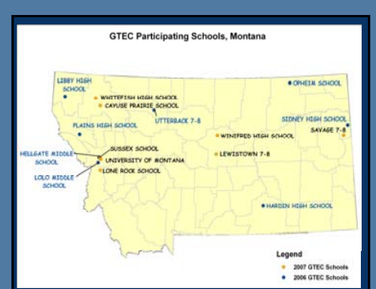
Whitefish,

MT

Kala Flentie, High School Science

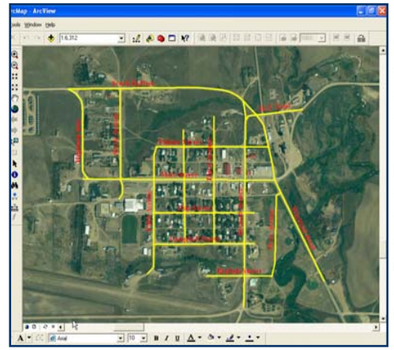
Belgrade High School

Belgrade, MT



FEATURED GTEC PROJECT: BILL LEE

Fire Hydrant Proximity Analysis: Creating Circular Buffer Points



Overview: Proper fire hydrant spacing in a town or city is a very important issue when considering a fire department's ability to successfully fight fire. Careful planning of fire hydrant numbers and their proper spacing is necessary. Also, if a town grows larger, officials need to evaluate if there is a need for new fire hydrants in additional locations to ensure that fire fighting water remains close at hand.

Figure One: Winifred Street Map

Challenge: Winifred's Town Council has decided that every structure should have a fire hydrant located within 300 feet. The Council has asked for your assistance in performing a Fire Hydrant Proximity Analysis to help them see if the current hydrant locations are adequate or if additional locations need to be added and to report back to them. You have decided to use ArcMap's ability to do spatial analysis to help you make this determination and its ability to create a map that will aid in your presentation to the council.

Figure Two: Fire Hydrant Buffer Layer

Creating a Polyline Shapefile For Overlay on a Raster File

Figure Three: Winifred Streets