

Geography Matters

By Ben Fousek

My name is Ben Fousek. I am a survey tech and the Geographic Information Systems (GIS) manager at KLS Surveying, here in Vernonia. The city has contracted with KLS to build and maintain a GIS for the city. You can find out more about the City of Vernonia GIS by visiting the City's GIS website at <http://www.klssurveying.com/vernonia/>.

This is the first in a regular column that will be appearing in Vernonia's Voice. If you have a specific geography or GIS topic you would like to hear about, contact me through the website.

One of the projects I've had in mind for the Vernonia GIS for quite a while, is installing a weather ISS (Integrated Sensor Suite) here in Vernonia. Right now, Vernonia doesn't have a weather station that is linked into any weather reporting systems, so when you look online for "Vernonia weather" reports, you may not be getting actual information from here in Vernonia.

The ISS I am looking to install is simply a cluster of weather and climate sensors that measures several different conditions. Of course, it measures basic conditions like wind speed and direction, precipitation and humidity, but it also measures other environmental conditions that we don't often think of. These include ultraviolet (UV) index, solar radiation and dose, evapotranspiration and more. The whole of these measurements can give a detailed picture of the weather and climate that goes beyond looking out the window or watching the weather report on the news. And after the past two winters, it's pretty obvious more and accurate weather data could be useful to our community.

Now that you know what an ISS is, let's look at what happens to the data once it is collected and how it benefits not just you, but the whole world. The ISS collects the climate data and sends it to a computer where it is stored. The data is then made available to different external systems. Probably most useful to us locally, the data is made available via the web. Real time weather conditions would be available 24 hours a day right on the Vernonia GIS web site. The other great feature of the ISS package that I've been looking at is the ability to graph the data over time. For example, if you wanted to graph temperature, humidity and solar radiation over the last 30 days, you could do so right through a web browser, and print your graph. On a longer timeline, like a year or ten years, we would be able to monitor changes in climate for Vernonia.

That's great for Vernonia, but how, you might ask, is it going to benefit the world? Well, here it is... The software package that comes with the ISS also sends the collected data to the national weather grid through various means I won't go into here. That data is used in many different ways. One use is in regional and national weather reporting. The data can also be used for weather forecasting and tracking severe weather. The data is also used by researchers at universities and by others who study weather and climate change.

The ISS and software package costs a little over \$900. As of right now, there are \$200 in pledged contributions to purchasing the ISS package. Anyone who would like to contribute or would like to talk about the Vernonia GIS Weather and Climate Project can contact me during the week at 503 429-6115.

I mentioned the term "climate change" above, and I would like to take this opportunity to discuss climate change and what it means for us here in Vernonia. Climate change is getting more and more attention these days, and with good reason. You may have heard the term "global warming" being used, but that isn't always the proper term to use when discussing climate change. Although most of the planet is getting warmer, there are places that are cooling because of recent changes in climate. Another idea to keep in mind when talking about climate change is that the climate on Earth has been continually changing for billions of years. There have been periods when the planet was much colder and periods when it has been much warmer. So what makes changes in climate today so different from past climate change? It is all about the rate of change. The average global temperature has increased almost 1° C in the last 100 years, which may not seem like a lot, but historically that amount of change has taken much longer. The rate in temperature increase over the last few decades has been even steeper. If temperature increases continue at the same rate as they have from 1960 to present, the next hundred years could see an increase of 6.4° C. The issue with such rapid climate change is that species, plants and animals alike, are unable to adapt at the same rate as the climate is changing. These climate changes also promote environmental changes that go beyond atmospheric changes. For instance, most humans live in very dense population centers along shorelines in low-lying areas. With the rate at which polar ice is melting, cities like New York and Los Angeles could be uninhabitable in a hundred years. Imagine the cultural and economic problems that could arise in such a scenario.

So, what about Vernonia? Most likely, the biggest effect

of climate change locally is, I hate to use the f word, but I'm going to--- flooding. With increased global temperature comes increased evaporation of water, which means more precipitation for certain regions. Unlike the Great Plains, which will be drier with increased global temperature, the Pacific Northwest is going to get wetter. Unfortunately, it's not going to be an increase that can be characterized as a daily or monthly average increase, but rather it will be in the form of extreme weather events. That's exactly what we saw in December of 2007. So is climate change responsible for two major flood events on the Nehalem River in 11 years? I won't go so far as to blame climate change entirely, but it certainly was part of the equation. I will, however, make a prediction about future floods, and say that the next couple of hundred years will see an increase in the flood event rate for the Nehalem River.

I apologize for being blunt, but I feel that's the best way to get people thinking. So now that I have you thinking, what are we going to do about climate change? We could choose to ignore it and hope for the best. Or, we could take action to slow rapid climate change and mitigate future effects. The latter is already happening here in Vernonia in the form of land buy-outs, raising homes and moving important infrastructure like the schools. As a community, we can do more, like moving more homes and businesses away from flood-prone areas, and reestablishing natural flood plains. Not to mention the many other ways to help mitigate future flood events from impacting us as much as the last two have.

I wasn't around for the 1996 flood, but I've heard that the community was told that it wouldn't flood again for a long time. We know better now, so let's accept our circumstances, and get to work correcting the mistakes of the past, which I know many of you are valiantly striving to do. As we move forward, let that work not be for just the present or for our most immediate and selfish desires, but instead let it be for a brighter future for Vernonia for generations to come. As a community, we can make the future brighter for ourselves, our children and the children of our great-grandchildren, but we have to come to a consensus on what our goals are and all work toward those common goals.

Maybe it's a little silly to be so passionate about climate change, or maybe that's the kind of reasoning that will overcome the obstacles we face as a community when it comes to the reality of climate change right here in Vernonia. And if it works for climate change, maybe it could work for the many other issues that Vernonia is facing. Think about it.

What's the Plan Stan? A Monthly Update on City Planning

By Seth Lenaerts

Vernonia has entered the Geographic Information System (GIS) age! In November of 2008, the City and KLS Surveying formed an agreement for KLS to host the City's GIS system. The KLS GIS technician, Ben Fousek, has put in an enormous amount of work (much of which he volunteered) and Monday, March 16, he unveiled Vernonia Map, a web-based GIS that is open to the public. I highly recommend having a look, and be sure to stay posted. This is a young project and more information will continue to be added.

The other day a friend asked me, "What is so great about this GIS I have been hearing about?" I, of course, responded sarcastically, "What isn't so great about this GIS?" And expected the conversation to be over. Seth 1, friend 0. However, it appears that she wasn't satisfied with this response, so we began to talk about some of the basic functions, history and uses for Geographic Information Systems.

GIS is most commonly thought of as a computer-based mapping program. As the name Geographic Information System implies, it is a system to store geographic information. The information is stored and organized by attaching the data or attributes to points, lines and polygons which can then be viewed using mapping software, usually ARCmap. Still with me? Let's use an amusement park as an example of how points, lines and polygons work. At an amusement park, there are a number of vendors and we'll make each vendor a point. Now that the point is established, we can add an infinite amount of information to that point; for example, the name, what they sell, how much items cost, what the profit is per item, customers per day, hours of operation, who is working, their wage, etc. Alright, we have our points, let's make some lines. The lines for our example will be the paths that people walk on. Again, all sorts of information can be added: how many people take each route a day, how wide the path is, the path condition, is it open to the public,

etc. Finally, we need a polygon. The park property is going to be our polygon and I'll call the park, Seth's Wacky Wisconsin World or as people in the know call it, SW3.

At this point, you are probably thinking, "OK, all you did was make a map, not impressed!" But here is the kicker-- we didn't actually make a map, we made a database. We have compiled all our information and organized it, using points, lines and polygons. Then, to make that information more presentable, we can project it in map form.

What's really great is, our map has several advantages over a typical map. For one, all of the information about each site is located in one database, using one program that multiple users can access and update. Secondly, unlike an Excel database or other type of database, GIS allows us to map the information, which makes it easier to understand and present. But, it's the ability as a user to manipulate, view and organize all of the information that really makes ARC software amazing. For example, say the manager at SW3 wants to close an under-performing food cart. Using GIS, he can run a quick

query that compares hours of operation, profit per food item, employee pay rate, number of people that go to the cart, etc. He can find his least profitable cart and close it. However, it may not be that simple. The manger could run another query that takes into account what items are being sold, how much traffic goes by the cart, the cart's proximity to other carts and other carts that sell similar items. Maybe there is

a lot of traffic by the cart, but the problem is that it is too close to another cart that sells similar products. He may just go from Pizza to Tacos and, boom, back in business!

Imagine the efficiency when all of the City's information is linked into one database: fire, police, building, planning, transportation, environmental information, etc. What's really amazing is when one entity updates a piece of information, everybody is updated. Even in small communities, GIS systems can save significant amounts of money.

Finally, in the next month or so, we would like to start hosting a monthly GIS meeting that will give updates, information and work on volunteer projects. Also, be sure to look out for Ben's new article about GIS that is premiering in this month's publication of the Vernonia Voice. So, as you can see, the question really is, "What's not so great about this GIS?"

Till next time, you don't have to be coy, Roy, just listen to me.

You can reach Seth Lenaerts at the Vernonia City Hall or email him at Seth@vernonia-or.us. The new city GIS website is <http://www.klssurveying.com/vernonia/maps.html>.

I, of course, responded sarcastically, "What isn't so great about this GIS?"

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