

GIS Day 2006 Project Showcase List

1. CGIG – Clay Geographic Information Group – GIS Partners in Action

Theresa Wurth – GIS Coordinator

Clay County

Clay County GIS, the City of Spencer and the Spencer Municipal Utilities entered into a 28E agreement in 2005 that facilitates the sharing of GIS layer information between the three entities. Clay County, has from its inception, considered the GIS project the basis for all GIS systems in Clay County. One of Clay County's and the Clay Geographic Information Group's goals is to widen the scope of GIS in NW Iowa and this partnership was a step in that direction.

2. Public Works Applications for GIS

Steve Cooper – Infrastructure Management Specialist III

City of Cedar Rapids

GIS plays a major role in how the City of Cedar Rapids manages its underground utilities. Nearly all of the work that we do – utility locates (Iowa one-call), inspecting and cleaning sewer pipes, repairing and reconstructing pipes, and planning for future system expansion – starts with good geographic information.

3. Emergency Response to Tornado Damage Area

Ryan Lafrenz – GIS Specialist

Jones County

In response to a tornado touch down on April 13, 2006, a map was developed by the Jones County GIS Specialist to provide incoming Red Cross and FEMA workers with knowledge of road locations and the area of the damage. This preliminary map was produced in about an hour. Over the next two days, data was created to more accurately depict the damage and became useful for Emergency Management for analysis. The final map is going to be used by the National Weather Service in its new Fujita scale training.

4. Mapping for the Food Service Security Alliance in Black Hawk County

Lisa Swanson – Health Officer/GIS

Black Hawk County

In March of 2005, the group received grant funds from the Iowa Department of Public Health to study hunger and food security as it specifically relates to Nutrition Education in Black Hawk County. The group soon came up with the idea to map the data from all of the participating agencies to move towards their goals. The Alliance contracted with Black Hawk County Health Department for a health officer with a GIS background to help with the project and the mapping began! In order to get a better picture of the current "food safety net" in the county, all available data from the partners was pulled together, (cleaned up), georeferenced and analyzed by the contributing agency. The partner agencies help supply food to needy populations (based on disabilities, poverty level, school children, elderly, etc). Examples of data mapped are service locations, clients based on services they receive, program activities like distribution routes. Demographic information helps the group decide where underserved

populations exist and analyzing to see if resources are being used effectively based on the communities served. Most of the partners were very excited to see their data mapped because it had never been done before. At that point, the brainstorming started as to how the maps would be used most effectively by the alliance to help reach policy makers, funding sources and to do community education. Challenges included very “dirty” data, proprietary data formats, data sharing issues, timeliness of data and demographics/ancillary data not being in useable units for the target populations of the alliance. The project is set to be expanded to include “other” food sources like restaurants/grocery stores in relation to low income populations, updates to current maps, extended demographic information about target populations to overlay with service and client data.

5. 2006 GPS Control Survey – Johnson County

Rick Havel – GIS Coordinator

Johnson County

6. GPS Mapping of Memorial Trees

Jim Harken – GIS Technician

Johnson County

This project started as a request from conservation department members after a meeting to discuss GPS implementation within the department. It was believed to be a good introductory project to test the GPS units mapping capabilities. The points were collected using a Thales MobileMapper and ArcPad 7.0 over the course of several days. Previously, I had created custom forms and a toolbar within ArcPad Studio to lessen the time in the field and ensure data integrity. Accuracies in collecting the location of the trees ranged from 1 ft to 10 ft without post-processing correction (not available in ArcPad). The Memorial Trees locations will be posted on the Johnson County GIS website to allow loved ones to find the trees they have donated and to give more exposure to this conservation program.

7. 2007 Johnson County Road Atlas

Jim Harken – GIS Technician

Johnson County

This project was initially begun to supply updated road maps to the ambulance department and emergency service personnel. The current maps date from 2003 and there has been tremendous growth in the county resulting in a need for updated street mapping, especially for emergency personnel. After discussion, it was decided to produce a spiral bound atlas that would serve the needs of Johnson County departments as well as the general public. Features of the atlas were modeled after Clark County, Washington, whose GIS personnel had successfully created such an atlas in 2005. New spatial data for the county was created including water access points, bike trails, campgrounds, cemeteries, natural areas, and elevation data. The atlas is completed as of today (10/19/06) except for the new 2006 orthophotography background for conservation area maps (expected soon) and a street index which must be created via a 3rd party software. Printing estimates from local printers are being obtained and appear to be around the \$9-\$10 mark for the 125 page, spiral bound, color atlas.

8. Calculating Corn Suitability Ratings

Gail Brown – GIS Specialist

Hertz Farm Management, Inc.

Slide 1

Hertz Farm Management uses ArcView in determining land valuations and land use on managed farms, real estate properties, and appraisal properties. Since land value can be tied to the corn suitability rating (CSR) of the property, a CSR is determined for each farm Hertz Farm Management is involved with.

Slide 2

The first step is to locate the property area. By doing a query on the Public Land Survey (PLSS), it is possible to zoom in to the correct Section-Township-Range. The background map, either a DOQQ or NAIP image, is turned on and, using the legal, the farm boundaries are digitized. Depending on the property, field boundaries, waterways, and building sites may also be outlined.

Slide 3

Once the digitizing is complete, the soils are clipped to the tillable acres. This results in a table that has attributes for only those soils that will likely be farmed. The acres for each soil type are calculated, and an overall CSR is determined using these acres. An in-house legend is applied to the final soil map, giving a consistent look to all Hertz Farm Management soil maps.

Slide 4

The final CSR calculations are based upon the soil name and symbol, CSR, crop yield, and soil yield. All of these are attributes within the Iowa Soils ISPAID attribute table.

Slide 5

The resulting map is printed along with the soils data for the property. The final CSR is used to determine land value per point of CSR, tile placement, and location for Conservation Reserve Program (CRP) acres.

Slide 6

Hertz Farm Management is a privately owned corporation with 14 offices in 4 states. They manage 450,000 cropland acres across the Midwest and provide a full range of farm management, real estate brokerage, and appraisal services.

9. County Parcel Merge Application

Brandon Haas

NewCom Technologies

Slide 1

NewCom provides their SeeCity suite of applications for Iowa governments and utilities. One of these applications is the County Parcel Merge

Slide 2

Most cities are within one county. Some cities straddle two counties. West Des Moines has grown into its 4th county, creating a data challenge. The Parcel Merge application takes GIS data from multiple counties and merges them into a combined data model.

Slide 3

Most counties store parcel and tax data in their own unique data model. These data models can differ in table locations, field names, and field formats.

Slide 4

NewCom used Visual Basic to create a custom toolbar for ArcCatalog. When the City runs the Parcel Merge, the City is guided by wizards to select options for the Parcel Merge.

Slide 5

The merge process reads an XML script file to determine the source fields within each County data model and the destination fields within the City's data model. This XML file can be easily modified by the City to accommodate future changes in any of the data models.

Slide 6

NewCom and its SeeCity suite of applications provide Government Information Solutions for your GIS.

10. Structure Inspection and Appraisal Reports

Jon Lubke – GIS Coordinator

Winneshiek County

This is a very simple application we use in our Engineer's office to view FHWA bridge inspection reports. It utilizes Schneider's Navigation toolbar, which simply populates a path to the data from a field in the bridge layer. The navigation tool is very generic and can work with any layer or software application.

11. Linn County Sex Offender Tracking

Jason Siebrecht – GIS Administrator

Linn County

In July of 2005, the Linn County Sheriff requested a web based application to help maintain Sex Offender's current residence with the ability to share this information with the public on a map. After several meetings, we identified a need to also accurately map current child care facilities in order to create and maintain the 2000' buffers as the law states. The GIS division then assisted with creating a child care MS Access database, loaded the locations from the best available local resource and then turned over the verification and maintenance to the Sheriff's office for this project. Once this was done, the GIS staff Geocoded the locations, verified each with our Real Estate data, added the parcel number, and built buffers based on the real property of the child care location. By mid August of 2005, the Sheriff held a news conference unveiling this new web application, although not yet complete. The several weeks that followed this news conference this application had all 400+ child care facilities accurately placed based on the sheriff's office verification and photo card hyperlinked to a majority of the 300+ sex offenders in Linn County. This is publicly available on the Linn County Sheriff's office web site and it also contains a secure log-in access for the Sheriff's office get access to more sensitive information.

12. Sales Ratios Map

Todd Kruse

Iowa City Assessor's Office

This map is a graphical representation of sales as a ratio (percentage) of assessed value and sale price. The ratio is calculated by dividing the assessed value by the sale price. The smaller the ratio, the higher the sales price is, relative to the Assessed Value. We only consider "Good" sales, which are arms length or open-market sales transactions, in our analysis. This provides us an indication of how our assessed values compare to market value, and ultimately what adjustments to value are needed. The map is pretty straight forward. I exported data from a database and joined it with a layer in GIS, then used the Quantities and Graduated Colors symbolization to represent the data. The trick to making this data useful is determining the relevant range of ratios, and colors to visually distinguish between the ranges of ratios. This allows us to visually display trends in value. Our map is broken out into "neighborhoods", which are designed to group similar

properties together for more accurate comparisons. During the appeal process, this map is useful for Board of Review members to quickly see trends in an area and address the individual property owner's concerns about sales in their area. It shows the individual property owner how the sales are in relation to our assessed value in their neighborhood, and can quickly alleviate concerns that our values are too high or low. Additionally, we can use this map to create new, or refine existing, neighborhood areas, using several years of data to identify natural division in properties, based on sales history for an area. Overall, this map is more about displaying information rather than any in-depth analysis, but it does allow for a unique view of that information that would otherwise be very difficult, if not impossible, to visualize.

13. E-911 Atlas

Jeff Miller – GIS Coordinator

Dubuque County

The E-911 Atlas was originally created by the Auditor's Office in 1996 and the only updates were road lists, no maps. GIS enabled us to more easily update maps and road names in a more timely fashion. New subdivisions with new roads are constantly added and the emergency responders might get called to one of these new roads now they will know where they are and how to get there. Copies will be distributed to *all* emergency vehicles in the county in a three ring binder which township or cities can be swapped out quickly and easily. Additional bound copies will be available for sale at the Auditor's Office. All data, map, and report generation was completed in house with printing to be done at a local printing company. The project took only a few of weeks to complete with most of the time spent on road name annotation and learning Crystal Reports.

14. Planning and Zoning ArcReader Application

Eric Loecher – GIS Specialist

Linn County

The Planning and Zoning department was using the Linn County Planning and Zoning ArcIMS/Pvweb site for providing customers with maps and answering general questions. Issues like internet speed and the ArcIMS website locking up frequently during peak hours of usage brought up problems. These issues were brought to the GIS department to find a better way of creating maps. The ArcReader solution was a simple and practical approach to the problem. The project was completed in a day and training on how to use ArcReader only took less than hour. The Planning and Zoning department now uses it on the counter computers in addition to the four personnel computers. It has helped the customers and the department to do more in less time.

15. LANDMASS – Landscape Model of Archaeological Site Suitability

Joe Artz – GIS Coordinator

U of I Office of the State Archaeologist

The purpose of the LANDMASS project is to establish a Geographic Information System (GIS) decision support tool that will assist local, state, and federal agencies to anticipate archaeological survey needs and costs involved in meeting Section 106 compliance for cultural resource investigations. The project is near completion after an estimated 4000 man hours. The website, still under construction, can be accessed using the URL on the last slide. The LANDMASS model, soils grid and LANDlogs database have already been utilized in Phase I planning for various projects.

It is important to note that we see LANDMASS as a dynamic modeling system where new data can be integrated as it becomes available to help maintain, assess, and refine the initial modeling efforts. Model Builder and VBA scripts in ArcGIS will provide the tools to automate this.

16. Biogeographic Analysis with Python Scripting

Brett Lord-Castillo

This project is a part of Brett Lord-Castillo's thesis project at Oregon State University in Geography and was completed as part of an Advanced GIS class (GEO 580). The larger project is a case study of the Arc Marine Data Model as applied to animal tracking. This section was an exploration of a new analysis method automated through Python scripting. The final product is being developed in VBA for the OSU Marine Mammal Project (OSU-MMP) by Brett and Tomas Follett, the resident GIS analyst for the OSU-MMP. That application includes data processing and analysis functions for remote sensing (MODIS) and satellite telemetry (ARGOS) data. Primary funding is from the NOAA Coastal Services Center.

17. GIS Data Quality – Positional Accuracy

Dan Corbin – President

Dan Corbin Inc.

In 2003 Johnson County contracted with Dan Corbin, Inc. of Cedar Falls, IA to provide independent photogrammetric consulting services to the County. One of the services provided by DCI included testing Johnson County's newly acquired ortho-rectified imagery for positional accuracy. Utilizing the National Standard for Spatial Data Accuracy (NSSDA), DCI measured and reported the horizontal accuracy of the countywide ortho-rectified imagery. The ortho-rectified imagery tested 1.4ft horizontal accuracy at the 95% confidence level, which easily exceeded the design specifications of 3.0ft accuracy.

A Geographical Information System (GIS) is dependent on the quality of the inherent data sets. How do you measure the quality of your GIS data and is it possible to compare the quality of different data sets? The National Standard for Spatial Data Accuracy (NSSDA) is designed to answer both of these questions and others concerning the quality of GIS data.

18. Muscatine County Digital Survey Submittal Procedures

Mark Warren – GIS Coordinator

Muscatine Area Geographic Information Consortium

19. Voter Information System

Matt Boeck – GIS Coordinator

Story County, Iowa