# NMGIC
## 1984-2008

**N E W   M E X I C O   G E O G R A P H I C   I N F O R M A T I O N   C O U N C I L**

*The Map Legend*

# NMGIC Fall 2008 Meeting

The New Mexico Geographic Information Council, Inc. (NMGIC) Fall 2008 Meeting will be held on November 7th, 2008 in Albuquerque, New Mexico.  The meeting's theme is "**Geospatial Education in New Mexico**": topics include geospatial programs at various NM educational institutions, workforce building, and GIS use in tax reporting, archaeology and resource management. The meeting will be held at the Rotunda of the Science & Technology Park (a map, as well as meeting details can be found at the  NMGIC website http://nmgic.unm.edu). A brief summary of the Meeting's agenda can be found inside this issue on page 3.

In lieu of a NMGIC Fall Workshop, NMGIC suggests interested parties attend the UNM Bureau of Economic Research (BBER) "10th Annual New Mexico Data Users Conference" held on Thursday, November 6th from 7:30am—4:30pm, at the UNM Continuing Education Conference Center / Ballroom C.  For more information on the Data Users Conference, go to http://www.unm.edu/~bber/conference.htm.
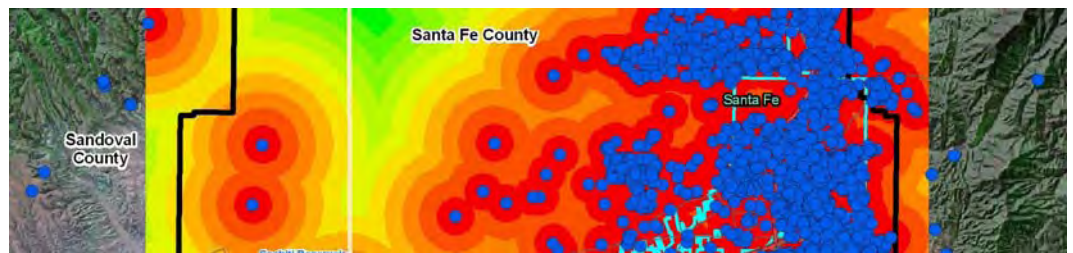


# A GIS-Based Water Resources Supply Decision Support System for Santa Fe County

*by David Jordan, PE (INTERA)*

### Introduction

Population in Northern New Mexico continues to grow, and with it comes a concomitant need for additional water-supply sources.  Santa Fe County, New Mexico (County) is experiencing much of this growth, particularly in the areas of the County adjacent to the City of Santa Fe (City), as development occurs on the outskirts of the City.  Currently, much of the County's water supply is purchased from the City, and wheeled across the City's infrastructure to the County's own distribution system.  The County is seeking to expand their water-supply portfolio through the sustainable development of groundwater resources in the County.  The County is seeking to develop these resources in areas that are advantageous from the point of view of existing infrastructure and groundwater availability, but pose the least threat of impact to existing water-right holders, streams, and springs.

### Inside this issue:

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# NMGIC, Inc.  Board of Directors

| Agenda for NMGIC Fall 2009 Meeting | |
| --- | --- |
| 8:00am | Sign-in, Coffee |
| 8:30am | Announcements (Election results; GNIS project update by *Bob Julyan/Mike Burns*; USGS updates by *Gary Kress*) |
| 9:00am | Presentations by Scholarship Awardees:<br><br>• **Energy Development and Conservation of Imperiled Species: Can a Balance be Found?** - *Bill Dunn* (2008 Jessie Rossbach Memorial Scholarship)<br><br>• **Using GIS to Study Ancient Social Interaction at Copán, Honduras** - *Heather Richards* (2008 SWUG Scholarship)<br><br>• **Optimal Contour Mapping of Groundwater Levels Using Geostatistical Analyst in ArcGIS 9.2** - *B.V.N.P. Kambhammettu* (2008 SWUG Scholarship) |
| 10:00am | Refreshment Break |
| 10:30am | **CNM and the NSF National Geospatial Technology Center of Excellence** - *Amy Ballard* (CNM) |
| 11:00am | **Considering Geography in Education** - *Keary Howley* (San Juan College) |
| 11:30am | **The GIS&T Body of Knowledge and the Role of Universities** - *Paul Zandbergen* (UNM) |
| 12:00pm | Lunch (provided) |
| 1:00pm | **New Mexico Tax Reporting District … or How To Get Non-GIS Users To Access GIS Through An Internet Mapping Service** - *Larry Rose* (PNM) |
| 1:30pm | **IT for Resource Management** - *Don Ellsworth* (BLM) |
| 2:00pm | **Building Our Workforce: GPS, Surveying, GIS and CAD** - *Tony Trujillo* (Holman's) |
| 2:30pm | **Industry-Focused Special Topics GIST Courses at San Juan College: A Case Study from the GIS for Archaeologists Course** - *Rich Friedman* (City of Farmington) |
| 3:00pm | Wrap-up and door prize drawings.  Door prizes and their sponsors are:<br><br>• One (1) ArcGIS ArcView 9.3 fixed license (ESRI)<br>• Two (2) Virtual Campus class course codes (ESRI)<br>• One (1) Floating Globe (Holman's)<br>• One (1) Place Names of New Mexico book (Bob Julyan)<br>• One (1) Apple iPod Nano (NMGIC) |

# Message From The NMGIC President

Mark your calendars! The Fall Workshop and Meeting have been scheduled for November 6-7th, 2008.   It will be held at the traditional location – the UNM Technology and Research Park Rotunda in Albuquerque. The meeting and workshop theme is Geospatial Education – K-12 through workforce education.  Submit your papers to Rich Friedman  - rfriedman@fmtn.org and posters to Larry Spear - lspear@unm.edu!

A quick recap of our Spring workshop and meeting, April 24-25th, 2008:  The focus was on distributing your imagery to large audiences – from DOQQs to Google Earth.

The two-part workshop was well attended. Dave Vaillancourt from ESRI Denver hosted the morning session and Nelson Guda from Roadlessland.org hosted the afternoon session.  Dave's presentation touched on topics ranging from creating Image Catalogs in ArcGIS to using ArcGIS Image Server.  He also gave a demonstration of the State of Utah's Web map services – providing anyone who has access to the internet with aerial photography for the whole state.  The Utah demo highlights how a centralized state mapping service can save the counties, cities, and various agencies the cost of having to host that imagery locally.  Nelson Guda demonstrated how he is using Google Maps and Minnesota Map Server to serve up easy access to information on roadless areas inside Forest Service lands.  Nelson's notes are available on the NMGIC website under Past Meetings.

We kicked off the spring meeting with a short video commemorating Stuart Udall's life and contribution to science.  Most noteworthy from a GIS perspective was his help in creating the Earth Research Observation Center and the subsequent launching of the first Landsat satellites. Both Gary Kress from USGS and Bob Julyan from the GNIS spoke highly of the influence Stuart Udall, his work and his writings, had in their choice of careers.  I was compelled to go out and find a copy of The Quiet Crisis, Stuart Udall's book from 1963.

A number of excellent talks were heard at the Spring Meeting.  Just to mention a few, we heard from Rich Friedman, City of Farmington, about the applications of their new Pictometry oblique imagery.  And David Jordan, from Intera, spoke about analysis of satellite imagery to determine irrigation cropping patterns in the Lower Rio Grande Valley.

The Spring Meeting was our annual "vendor show".  We hosted seven vendors.  We heard about some of their projects and products in the afternoon and were pleased to be able to ask them questions about the directions they see the geospatial industry going in a vendor roundtable session.  Making geospatial data more and more available to a broader audience is the direction we are heading, but the need for standardization and greater broadband access are two areas that deserve attention.

Last not but least – some lucky NMGIC members won prizes ranging from fuzzy dice to a standalone ArcView license.

Hope to see you all in November.  ---     Christina Noftsker

# GNIS Matters: Slippery Generics

*by Robert Julyan*

SLIPPERY GENERICS: People familiar with scientific nomenclature will know that "generic" doesn't necessarily refer to something bland and undistinguished ("My burger came with generic fries") but rather to the class to which a specific individual belongs, as the scientific name <u>Pinus</u> <u>edulis</u> refers to the edible pine, the pinon.  Most geographic names  fall into the generic-specific pattern as well: Rio Grande, Wheeler Peak, Arroyo Hondo, and so on.  And while most people regard the specifics of names as most interesting - trying to figure out whose underwear inspired the name Dirty Drawers Draw in Otero County - name generics have their own fascination and issues.

For example, each of the more than two million names in the Geographic Names Information System (GNIS) database is placed into a feature class, usually based on the generic part of the name, and it's useful, even necessary, to know something about how those feature classes are defined to do useful GNIS searches.  (A Google search on GNIS +feature classes will get you to a list.)

Any place where people are living is designated a Populated Place (abbreviated ppl), and it doesn't matter how many people live there; Albuquerque and Dusty (one residence) both are ppls.   A place where people have done something is a Locale: battlefield, camp, farm, railroad siding, ranch, windmill, ruins, and many more.  Within the class Area are such things as badlands, delta, fan, and garden.

One reason these feature classes are so broad and inclusive is to capture the scores of generic terms used in the US.  Take Stream.  The US Board on Geographic Names records generic terms, and they've tallied more than 100 for water simply flowing from one place to another, including anabranch, awawa, kill, pup, and run.  Think of how many are used just in New Mexico:, agua, brook, creek, fork, prong, rio, rito, and river, among others (creek is the most common by far).

It becomes more complicated still when you consider that the landscape is always changing and feels no obligation to conform to the terms we've assigned it.  Lake McMillan, on the Pecos River in Eddy County.  Well, because it's behind a dam it's technically not really a lake but a reservoir, and actually it's not even that, because a few years ago the dam was breached and the reservoir drained-so what is it now?

And how do you classify a feature that was once an island but is no longer?  And what about a swamp that has been drained and now is farmland?

Generic terms are slippery, and because of this they will be a featured topic of discussion at this year's Council of Geographic Names Authorities (COGNA) meeting in Oklahoma this September.  If you think of any oddities involving generic terms, please let me know.

## Spanish generic terms:

So you think you're a New Mexican?  Well, it takes more than a tolerance for hot green chile and an old pickup for that!  Here's a list of Spanish generic terms used in New Mexico, see how many you can recognize.  Actually, don't feel bad if some are unfamiliar; I doubt that even Don Juan de Onate would know them all.

1. barranca
2. cienaga
3. cuesta
4. cumbre
5. junta
6. loma
7. ladera
8. morro
9. quebradas
10. rincón

# GIS-Based Water Resources Supply Decision Support System continued

INTERA's approach to developing a plan for groundwater development for the County consisted of three phases. First, a detailed, three-dimensional geologic model was developed, in order to allow for a detailed understanding of the geologic and hydrogeologic features controlling water availability. Second, the geologic model, in conjunction with a variety of other hydrologic data, was used to develop a groundwater flow model using the United States Geologic Survey (USGS) MODFLOW code. Finally, a geographic information system (GIS)-based decision support system (DSS) was developed which integrated information from a variety of sources, including the geologic model, to select potentially promising locations for supply wells. The potential well locations selected by the DSS were then simulated using the MODFLOW model and evaluated with respect to impacts to other nearby wells, streams, and springs. Since the DSS is the primary focus of this article, the development of the geologic and numerical models will not be discussed here.

## Development of the Decision Support System

DSS are very useful tools for evaluating water-supply and water-resources issues. The need for such tools has become apparent as water-resources managers try to balance the sometimes competing demands of numerous stakeholders and supply issues. Stakeholder issues range from developers needing additional supply for new housing developments to endangered species that require minimum river or spring flows for their continued survival. Supply issues range widely, from basic issues such as groundwater availability to economic issues such as the infrastructure costs to bring water from a distal supply to the population that needs it. All of these issues, and many more, must be weighed against each other in order to develop water supply portfolios that maximize supply while minimizing adverse impacts to stakeholders and the environment. A DSS provides a tool with which to evaluate these complex systems, perform "what-if" scenario analyses, and aid in the decision-making process to select an appropriate supply portfolio. The DSS can also provide a way to resolve competing objectives, and apply weighting schemes to decision attributes so that stakeholders can select which decision attributes are most important to them.

For this project, INTERA developed a DSS to determine the best potential supply well locations based on attributes which define desirable locations for these wells. The DSS was programmed into a GIS and thus provided a structured and reproducible decision framework that could be readily explained to stakeholders and justified by County decision-makers. The DSS was used in conjunction with the regional groundwater availability model to quantitatively evaluate the potential supply-well locations identified during the DSS screening.

The DSS was based on a site-suitability analysis to identify promising areas for supply-well locations based on a variety of criteria such as the locations of existing supply wells, streams, springs, existing infrastructure, and population centers, as well as areas of favorable geology. Land ownership was also considered in the analysis, because there are a number of areas such as tribal lands, National Park Service (NPS) property, and Department of Energy (DOE) property where it is not possible to site wells.

The DSS was based on four general decision criteria:

1. Development of a sustainable water supply;
2. Minimizing impact to existing users;
3. Minimizing impact to streams and springs; and
4. Cost.

Each of these decision criteria was then broken down into specific decision criteria that were used to build the DSS. These specific criteria were as follows:

1. Areas of favorable hydrogeology (thick aquifers through which water can flow easily);
2. Proximity to existing population (close proximity is desirable);

3.       Proximity to existing and proposed water conveyance infrastructure (close proximity is desirable);

4.       Proximity to existing supply wells and large water-right holders (close proximity is not desirable);

5.       Proximity to existing domestic wells (close proximity is not desirable);

6.       Proximity to streams (close proximity is not desirable);

7.       Proximity to springs (close proximity is not desirable);

8.       Proximity to areas of existing groundwater contamination (close proximity is not desirable); and

9.       Property ownership.

Each decision criterion was represented as a grid, or matrix, of suitability scores that covered the study area. At each grid cell, a normalized suitability score between 0 and 100 was assigned, with 100 indicating the most suitable areas based on the specific suitability criterion of interest.

Two examples are shown in Figures 1 and 2, respectively. Figure 1 (on page 8) presents the site suitability scoring for proximity to domestic wells. Note that proximity to domestic wells is undesirable (due to potential impacts), so these areas are scored low. Figure 2 (on page 9) presents the site scoring map for areas of favorable hydrogeology. These areas were scored depending aquifer thickness (thicker is more desirable), transmissivity (areas of high transmissivity are more desirable), and aquifer depth (shallower aquifers are more desirable since they are easier to pump from).

## Development of Final DSS Suitability Map

The final suitability scoring map was developed by combining DSS layers 1 through 8 (property ownership was considered separately, and will be discussed below), giving each an equal weighting. At each grid cell on the map, the site suitability scores for layers 1 through 8 were averaged. Due to the averaging process, the range of the suitability scores was diminished, from a possible range of 0 through 100, to a range of approximately 35 through 100. The final combined result is presented in Figure 3 on page 10..

For the purpose of identifying promising potential well sites, a site suitability score threshold of 75 or greater was selected to indicate areas of good potential based on the DSS suitability criteria. These areas were then compared against property ownership. DOE, NPS, and tribal lands were removed from further consideration. Finally, four potential well locations were sited in the approximate centroid of each of the four areas that were identified as a result of the screening process. These locations are also presented on Figure 3.

Note that this study used a generic weighting scheme that weights all of the site suitability criteria equally. The DSS may be re-run using alternative weighting schemes in order to evaluate different stakeholder perspectives.

## Evaluation of Potential Locations Using the MODFLOW Model

Once four potential well locations were selected based on the DSS suitability analysis, the groundwater flow model was used to simulate a pumping well at each location. Each hypothetical well was pumped at 100 ac-ft/yr (approximately 60 gpm) continuously for 40 years, and the potential pumping effect was evaluated against three metrics: (1) drawdown at the nearest supply well, (2) spring depletion, and (3) stream depletion. The results of the simulated pumping allowed relative ranking of the proposed locations with respect to potential impacts to other wells and surface water. In addition, an engineering analysis of relative infrastructure costs for the four proposed locations was also completed, and this information was also available to assist the County in its ranking process.

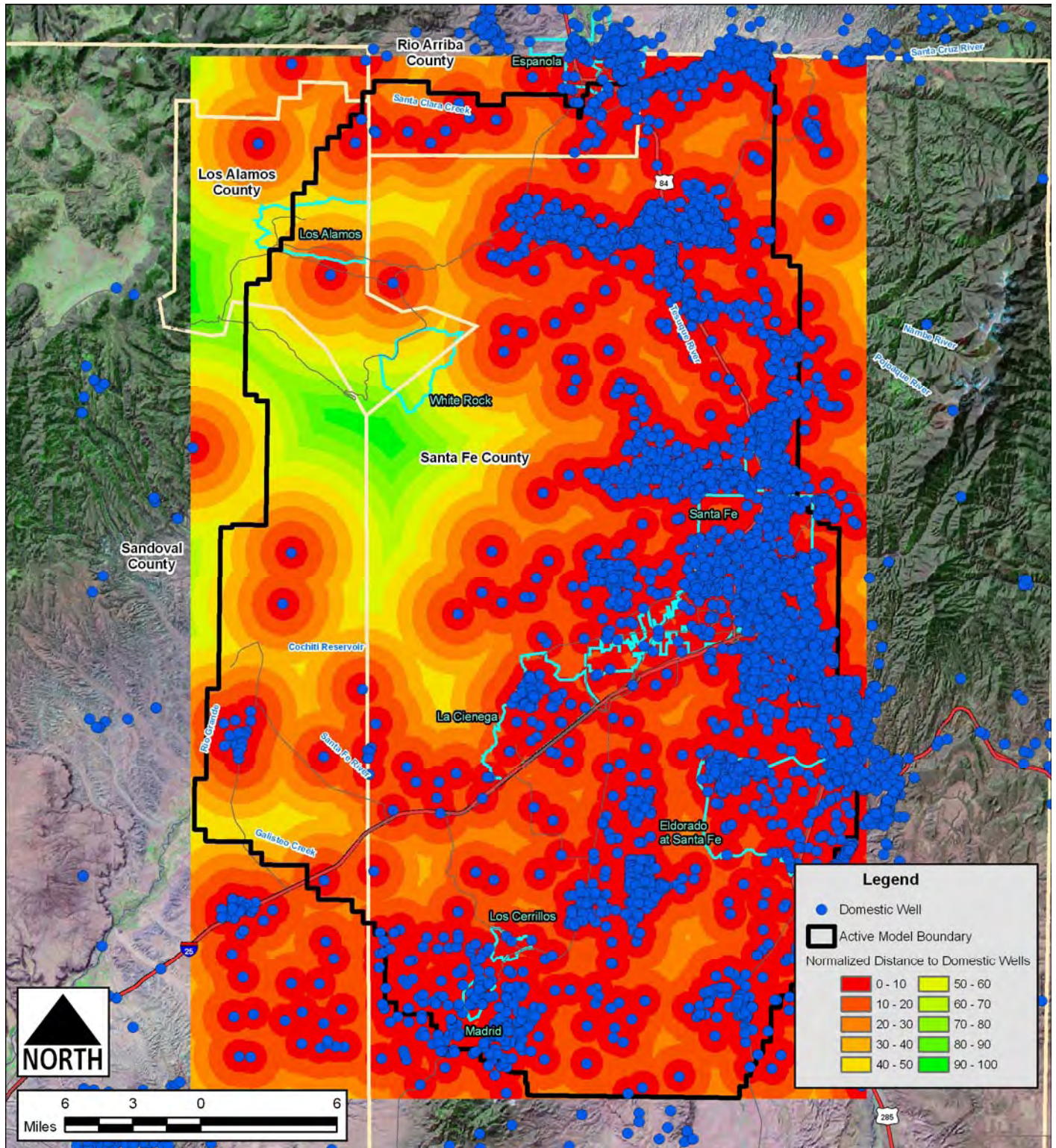# GIS-Based Water Resources Supply Decision Support System continued



**Figure 1. Site Suitability Scoring for proximity to domestic wells. Close proximity is undesirable (red areas).**

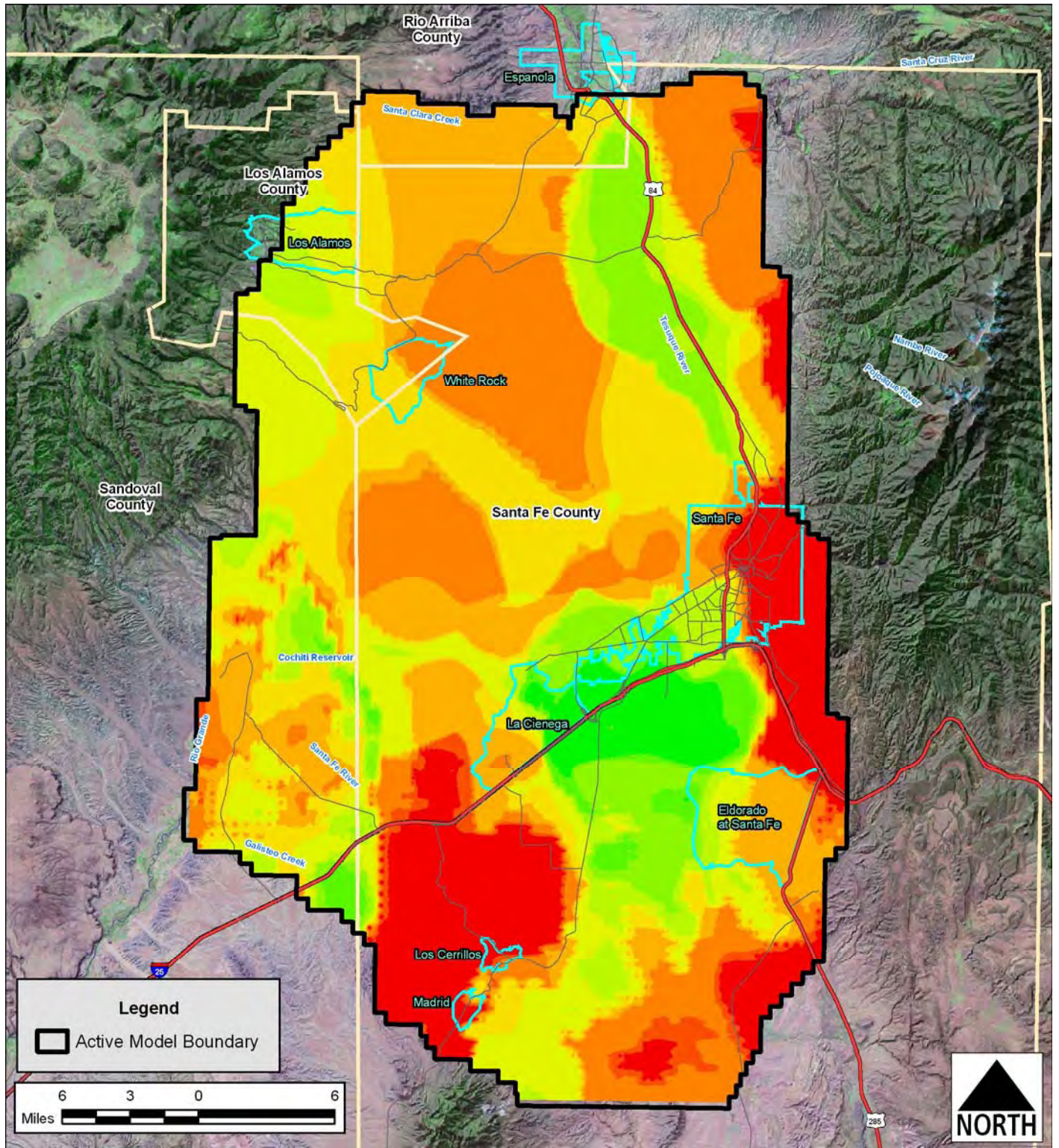# GIS-Based Water Resources Supply Decision Support System continued



**Figure 2.** Site suitability scoring for areas of favorable hydrogeology. Green indicates the areas of highest water availability, based on an analysis of subsurface hydrogeology.
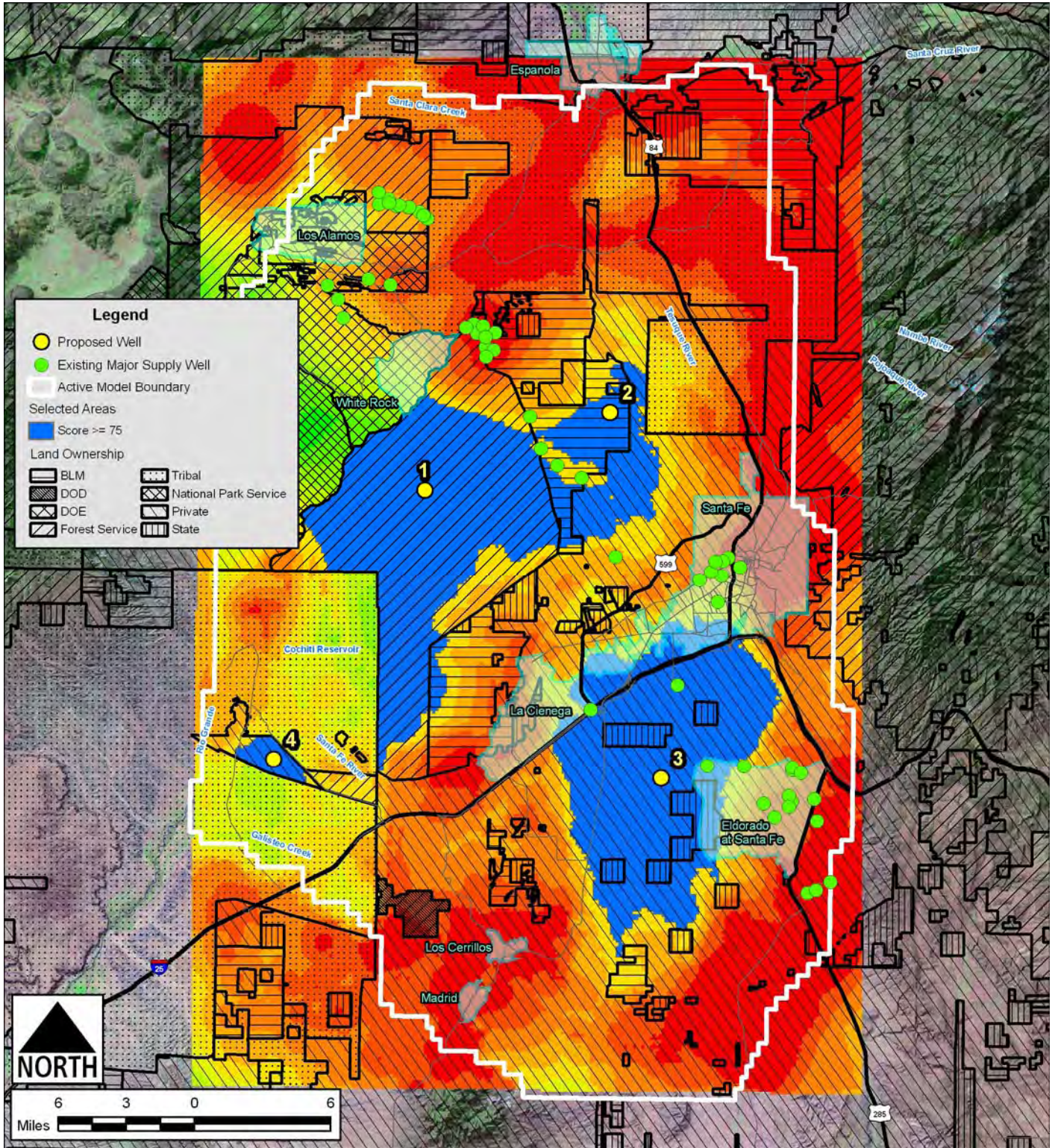
**Figure 3. Overall site suitability scoring map based on all decision factors. Green areas are scored the highest based upon all of the decision parameters.**

# GIS-Based Water Resources Supply Decision Support System continued

## Stakeholder Outreach

Once completed, the results of the DSS and the groundwater modeling were presented in a series of public meetings held throughout the County. The approach was well-accepted by stakeholders because they could understand and appreciate both that all of the available data had been used in the decision-making process, as well as the fact that the decision-making process itself (the DSS) was scientifically-based, transparent, and unbiased. In addition, the graphical nature of the DSS site suitability scoring, and the fact that it was based primarily on proximity, was straightforward for the lay audience to understand. In the end, the County was able to successfully communicate to the stakeholders that the potential supply-well locations selected during this process were indeed good candidate sites that had been selected based on careful and equitable consideration of all of the available data.

For more information, contact David Jordan of INTERA in Albuquerque at djordan@intera.com.

# NSGIC Update *by Leland J. S. Pierce, NM Representative to NSGIC*

The current primary focus for the National States Geographic Information Council (NSGIC) is putting together a document concerning for the structure and use of the National Spatial Data Infrastructure (NSDI). An initial draft of the draft was presented at the mid-year conference in Annapolis, MD, and is going through further revisions. Primary themes for the NSDI recommendations include the following:

1. Creating a Governance Structure

2. Creating a State Infrastructure to Enable Data Exchange

3. Implementing State Spatial Data Infrastructures

4. Developing Guidelines for Data Stewardship

Another primary focus, the Imagery for the Nation effort, is current at the stage where NSGIC is developing the business plan for the effort. Currently no word has come forth as to funding the data acquisition effort.

At the NSGIC MidYear Dan Widner (Coordinator, Virginia Geographic Information Network Virginia Information Technologies Agency) presented plans for a "proof of concept" involving the border jurisdictions of Tennessee, Kentucky and Virginia, including US Forest Service managed areas. There was a panel discussion (with Q&A) with a representative from Navteq, TeleAtlas and a state GIS Coordinator, discussing the objectives and goals of the TFTN, as described in the TFTN charter:

http://www.nsgic.org/committees1/documents/tftncharter.doc

This related to public private partnerships and how they may or may not provide some solutions to the development of a sustainable Transportation For The Nation. Also, the Transportation Research Board Circular "Improving National Transportation Geospatial Information" is due to be released in 2008.

Coalition of Geospatial Organizations Becomes Official on August 11, 2008 - The Coalition of Geospatial Organizations (COGO) came into official being on August 4, 2008. Representatives of the eleven founding member organizations met at the ESRI Users' Conference in San Diego and voted unanimously to approve a set of Rules of Operation and Procedure that brought COGO into existence. Several attended via conference call and WebEx. NSGIC voted on formalizing NSGIC's affiliation with COGO: it was a unanimous response.

The URISA Coalition of Geospatial Organizations (COGO) page (http://www.urisa.org/cogo) now features a formal announcement of

For more information on NSGIC,
visit: http://www.nsgic.org

# The Trigo Fire: Support of the Wildland Fire Project proves beneficial for New Mexico counties.

*by Larry Brotman, NM Taxation & Revenue Deptartment*

In the winter of 2006 the New Mexico Taxation and Revenue Department and its Property Tax Division began collaborating with the FGDC Subcommittee for Cadastral Data to support its "Wildland Fire Project." The primary goal for the project was to "pre-stage" New Mexico real property parcel data with the US Forest Service prior to the onset of wildfire season. Just one of the many beneficial outcomes of this partnership has been the intergovernmental relationships and protocols developed to support the project's goals and ultimately the residents of New Mexico.

## Fire in the "wildland-urban interface"

Within the past decade, an increase in larger wildland fires has converged with rapid growth in the wildland-urban interface. Suppression resources, including firefighters, equipment and money, are pressed to their limits. Attacking every fire with equal priority is not an option logistically nor is it desirable as some fires play an essential role in keeping forests healthy.

The questions that wildland fire managers must answer as they approach any wildland fire event are: Which wildland fires should be attacked first and what resources should be allocated? What resources should be allocated to protect public and private assets? Where is it not necessary to suppress wildland fires so resources can be preserved for priority areas? Addressing these questions requires the use of sophisticated technology with information to determine fire spread (vegetation, topography and weather) along with information that describes the land use and values-at-risk in the path of expected fire spread. With this information in place incident managers can rapidly identify what needs protection allowing them to get firefighters in the right place for the right reasons.

Over the past several years the National Interagency Fire Center (NIFC) has been testing and utilizing Geographic Information Systems (GIS) mapping technology to compare the different areas threatened by wildland fires. The U.S. Forest Service Rocky Mountain Research Station's RAVAR system (Rapid Assessment of Values At Risk) utilizes fire modeling technology along with land use data. During the 2006 wildland fire season the RAVAR system was first implemented and used in forty incidents in eight states. Information about structures, their value and land use (residential, commercial, agriculture) that comes from local government sources contains the most critical information for providing intelligence to the RAVAR maps.

## Wildland Fire Decision Support System-Rapid Assessment of Values at Risk (WFDSS-RAVAR)

WFDSS-RAVAR, the primary fire economics tool within WFDSS, identifies the primary resource values threatened by active wildfires. Structures are among the most important assets assessed. Where spatially-explicit parcel data are available with assessed value noted, structure locations are estimated by placing a single point within all parcels where the assessed value is greater than zero. These points are referred to as "building clusters" and may represent one or more structures. The "greater than zero" criterion is deemed a conservative and safe estimate helping to include properties with minimal improvements. The success of compiling and pre-staging county parcel data is due entirely to cooperation between counties, states, the USDA Forest Service, the Bureau of Land Management, and several civically conscientious private companies.

Where parcel data are not available, the Forest Service wildfire support team contacts a rapid response team of the US Geological Survey in Denver. This team is on call 24/7 like every other wildfire response unit. During the 2007 season, fire activity required USGS engagement on all major holidays from Memorial Day through Thanksgiving – the Thanksgiving Day fire was located in New Mexico. At a moment's notice, a technical mapping team of 2-6 people mobilizes high resolution aerial photography (most commonly from the NAIP library) and digitizes all visi-

# The Trigo Fire / Wildland Fire Project continued

ble structures. The process is semi-automated for dense urban development but must be completed manually in rural areas. Within hours of the initial call from the Forest Service, the USGS team provides completed GIS files of structure points for a respective event.
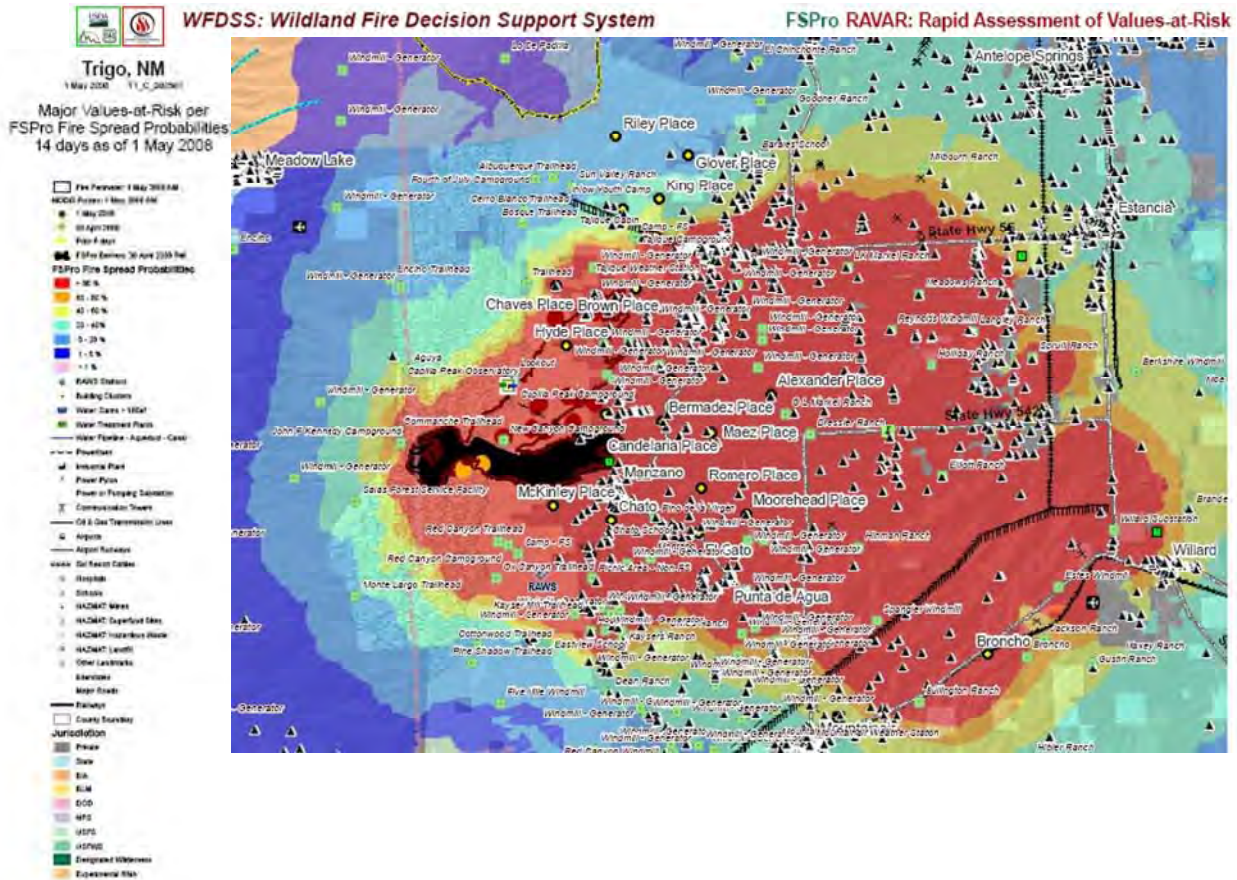


**Figure 1: Major Values-at-Risk per FSPro Fire Spread Probabilities: 14 days as of 1 May 2008**

## New Mexico's first programmatic and statewide parcel data collection effort

With the assistance of exceptional resource documentation, guidance, and support offered by the FGDC Subcommittee for Cadastral Data (hereafter referred to as the Subcommittee), the New Mexico Taxation and Revenue Department (TRD) began a "Wildland Fire Project" education and marketing effort to encourage the support of Department decision makers and the State's county assessors. A letter from the Subcommittee, on behalf of the National Interagency Fire Center (NIFC) and the Bureau of Land Management, was delivered to Cabinet Secretary's at both TRD and the Office of the Chief Information Officer (now Department of Information Technology or "DOIT"). The letter described the project, its intentions and benefits, and briefly explained the WFDSS-RAVAR application and its data requirements. Without objection from the executive level, the program was allowed to move forward.

The next step was to encourage project support from New Mexico's thirty three County Assessors and their respective GIS and mapping staffs. A letter similar to that provided to the Cabinet Secretary describing the project and its

# The Trigo Fire / Wildland Fire Project continued

goals was distributed to the State's assessors from the Director of TRD's Property Tax Division (PTD). In addition to the letters, TRD and PTD staff made an effort to call and talk with each assessor to address any questions or concerns about the program. The project was also presented at the first meeting of the New Mexico Geospatial Advisory Committee's (GAC) Parcel Data Workgroup in January of 2007 and at a number of Affiliate meetings of the New Mexico Association of Counties.

To support the implementation of a statewide parcel data collection, a workflow was established which included the development of documentation that defined the desired data formats, spatial and attribute content, and instructions for connection and data transfer to a newly launched secure ftp site at TRD. The preferred parcel data content closely follows a standard proposed by the Subcommittee in the Cadastral National Spatial Data Infrastructure (Cadastral NSDI). However, as discussed above with regards to the WFDSS-RAVAR application, a limited set of parcel attributes are supportive of the model. And, as the project has matured, its preferred data elements have been adjusted to reflect the practicalities of data on hand and readily available from state and local jurisdictions. This is demonstrated in the inter-governmental effort to support response and mitigation at the April-May 2008 Trigo Fire in the Manzano Mountains of central New Mexico.

## Three government tiers working successfully together

Well before the Trigo Fire broke out, Ruben Gastelum from the Torrance County Assessor's Office, Larry Brotman from TRD, and Nancy von Meyer from the Subcommittee had been working together to pre-position Torrance County data with the USFS-RMRS in Missoula. Ruben was fairly new to his mapping role at the County when he attended a GAC Parcel Data Workgroup meeting in November of 2007. Nancy and the Subcommittee supported this meeting in a number of ways including hosting the meeting from South Carolina as a webcast so that folks could attend from a number of locations outside Santa Fe including Albuquerque, Farmington, Las Cruces, and Las Vegas, New Mexico, and Franklin, Tennessee. The agenda for this meeting included demonstration and discussion regarding the use of GIS based address points as a proxy for parcel data in counties that did not have viable digital parcels and their respective attributes.

As a function of the Department and Finance and Administration's (DFA) Enhanced 911 Program (E-911), most of the State's counties have been using a GIS based application developed with Spatial Data Research (SDR) to map road centerlines, assign site addresses, and create point features to represent locations for emergency dispatch purposes. From a Wildland Fire Project perspective, TRD and the Subcommittee's interest in this program was piqued when it learned of Lincoln County's use of an SDR extension to "AddressIt" that allows assessor parcel attributes to be stored with address points and their respective data. Again, as the use of WFDSS-RAVAR has been refined, integrating the address points so diligently developed by counties for rural addressing and E-911 may prove to be very beneficial when digital parcel polygons are not available or in a format supportive of the application. Although supplemented with data developed by the USGS, this concept was illustrated during the Trigo Fire.

Soon after the fire broke out April 15 near the boundary between Valencia and Torrance Counties, Nancy and Larry began working to confirm what data had been pre-positioned with the USFS-RMRS either in 2007 or 2008. Valencia County had provided a well developed parcel coverage in 2007, however because the prevailing winds were taking the fire in an easterly direction that data would have limited use for this event. Because Torrance County's mapping program is in growth mode, there was limited digital parcel data available. No parcel polygons and/or assessor data had been collected either in 2007 or 2008. The team began working to transfer the address point layer Ruben had been building for the County's E911/Rural Addressing program. On April 17th, the USFS-RMRS received this layer, and, using aerial photo interpretation, generated and delivered a GIS layer of points representing structures within the area of potential impact. This layer made it to Ruben at the County on April 21.

# The Trigo Fire / Wildland Fire Project continued
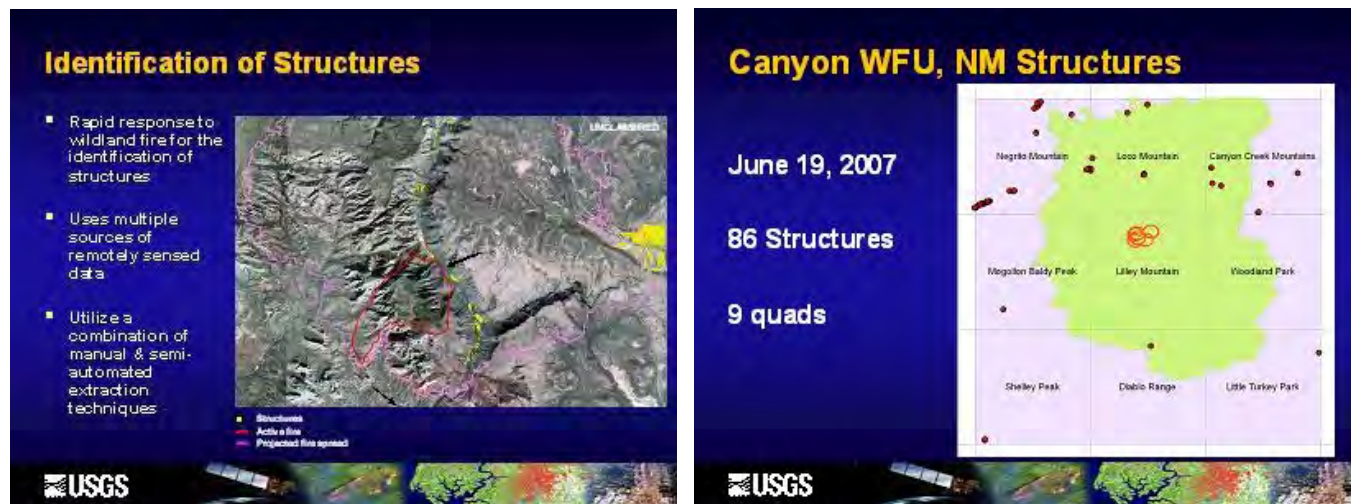
*(Continued from page 14)*



**Figure 2: USGS aerial photo interpretation generates GIS points representing structures**

## The Torrance County Perspective

Again, on April 15 the fire crested the Manzanos about 30 miles southeast of Albuquerque near Capilla Peak. This area is vital for two counties and a number of public and private interests. Capilla Peak serves as a site for important communication assets utilized by Torrance County Law Enforcement and EMS, the Torrance County Road Department, Valencia County Law Enforcement and EMS, Kirtland Air Force Base, state and federal forestry agencies, and three cell service providers. The site also includes an observatory operated by the University of New Mexico. An estimated 85 million dollars in assets was threatened at this location. Fortunately most of the equipment was located within fireproof structures and survived the event. Within hours of fire reaching the area, electricity was lost as a result of downed power lines.
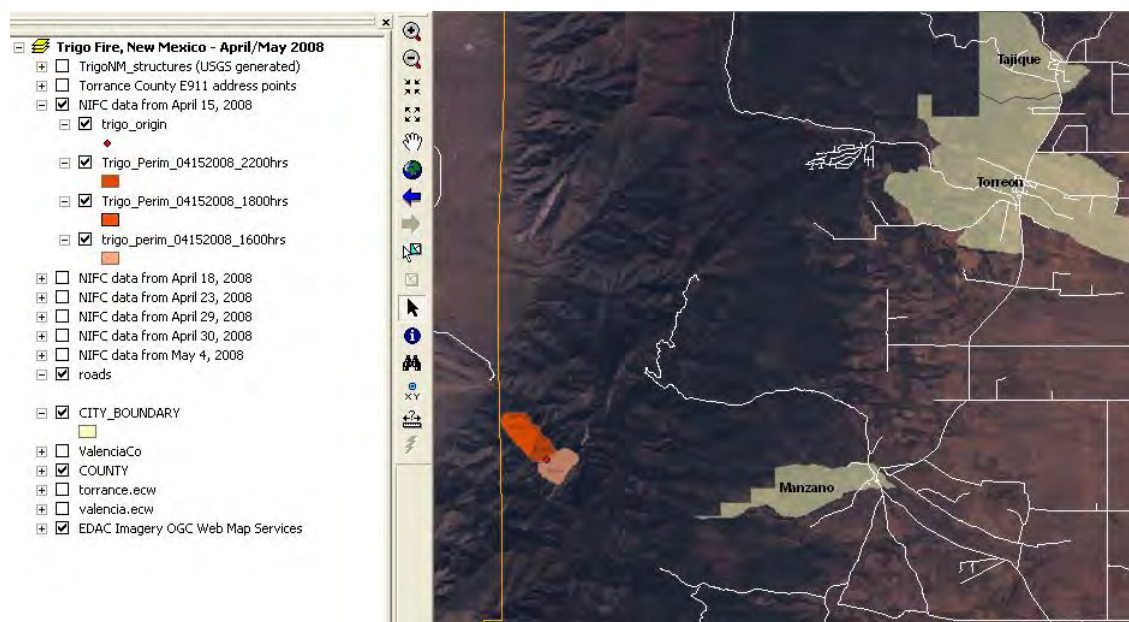


**Figure 3: Trigo Fire point of origin and early perimeters, April 15, 2008.**

*(Fire data provided by NIFC; imagery provided through GDACC/ EDAC OGC Web Map Services)*

# The Trigo Fire / Wildland Fire Project continued

As the fire moved north and east down the saddle of the mountain incident managers began implementing evacuation plans. Several parcel and point maps were generated by the Torrance County GIS Department and delivered to the incident command post. The maps were distributed to emergency crews making direct contact with the residents in the threatened areas.

On April 27th the fire was considered 98% under control and crews were released from the event. Plans were under way to enter the affected areas by the county Assessor's Office and law enforcement when shifting and violent winds began blowing again leading to another flare-up and rekindling the fire. The fire again spread rapidly and within hours area residents were evacuated to Mountainair as response crews attempted to establish defensible space around residences in the suspected path of the fire. The resurgent fire went on to damage or destroy a total of 56 homes and several outbuildings in the Sherwood Forest Subdivision and surrounding non-subdivision areas.
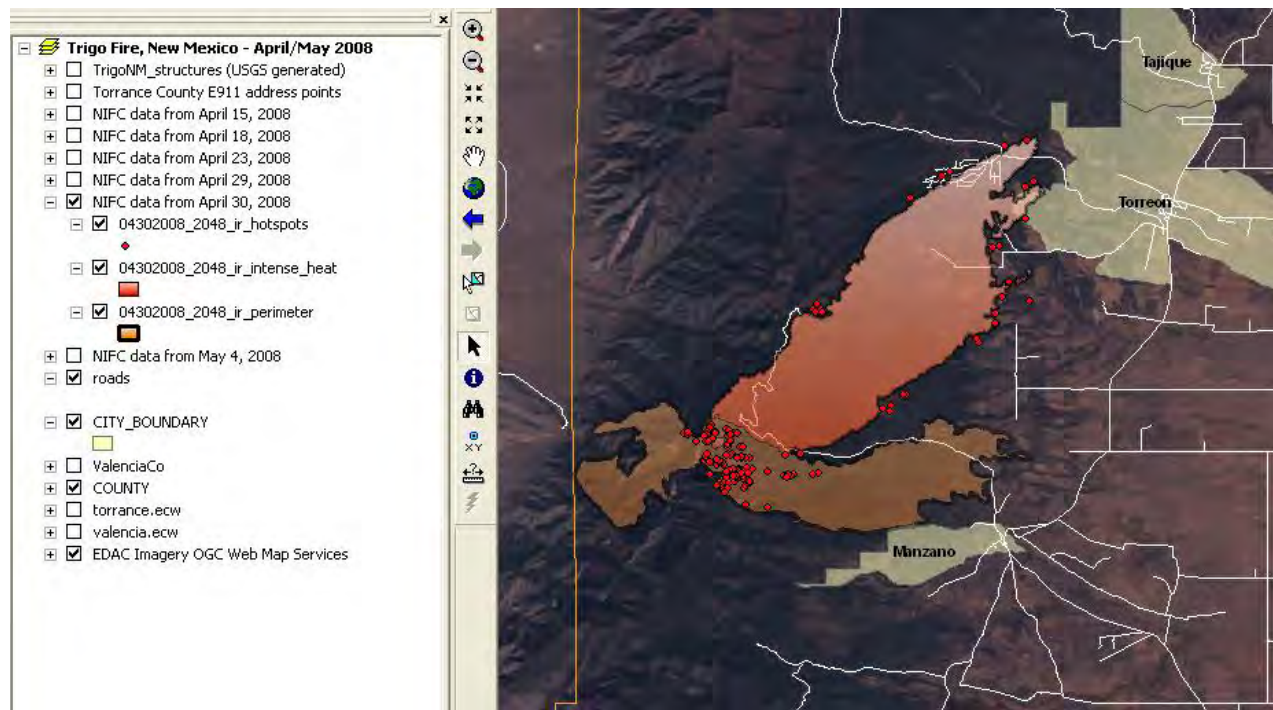


**Figure 4: Trigo Fire hotspots and perimeters, April 30, 2008**
*(Fire data provided by NIFC; imagery provided through GDACC / EDAC OGC Web Map Services)*

The GIS structure points generated and provided by the USFS-RMRS and the USGS located previously unidentified structure sites in Manzano, Sherwood Forest, and other areas not within mapped subdivisions. Viewing these points overlaid on top of aerial imagery (acquired through a "GDACC" State collaboration in 2005-2006), County mapping and appraisal staff concluded that many properties were either not on the current tax roll or they appeared on tax roll but had not had a GIS point created to represent their locations. In addition, the affected area included parts of the Manzano Land Grant. A consequence of this is that drawn parcels were scarce because residents had not tendered surveys during or after property acquisitions. The points also identified residences in the Sherwood Forest area that did not appear in County parcel maps; these homes and structures were built without proper permitting. This data has been useful in allowing the County GIS to identify and enter new residential points and update parcel owner information.

# The Trigo Fire / Wildland Fire Project continued

*(Continued from page 16)*



**Figure 5: Impact area structure points (Torrance County points = green, USGS points = yellow)**
*(Fire data provided by NIFC; imagery provided through GDACC / EDAC OGC Web Map Services)*
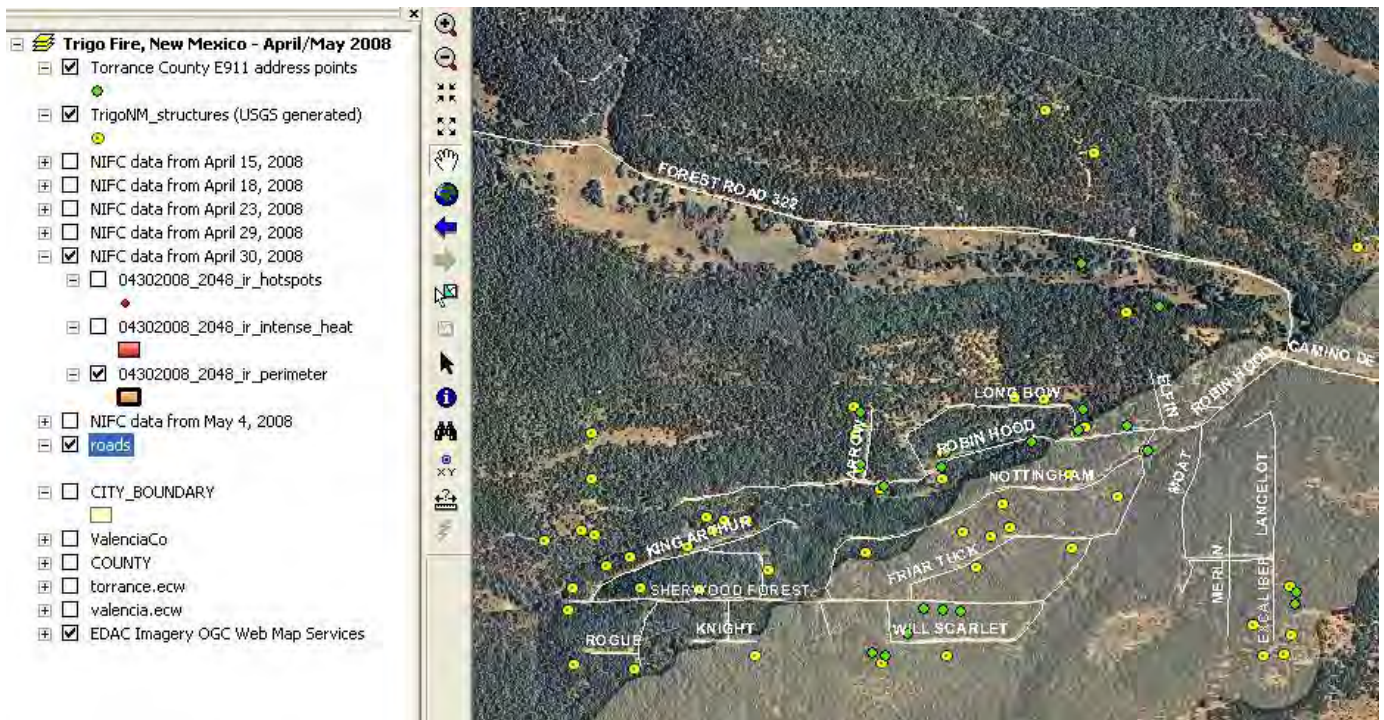


**Figure 6: Sherwood Forest subdivision (Torrance County points = green, USGS points = yellow)**
*(Fire data provided by NIFC; imagery provided through GDACC / EDAC OGC Web Map Services)*

# The Trigo Fire / Wildland Fire Project continued

**Figure 7: USGS structure points (Torrance County points = green #0, USGS points = orange #6)**
*(Imagery provided through GDACC / EDAC OGC Web Map Services)*

## Conclusions

The initial comparison of data sets from Valencia and Torrance counties with the structure points identified through the aerial photo interpretation process found the following:

- *The image analysis identified structures that were not represented in either address points or assessment data. In some cases this is because of the timing of the assessment roll updates. For example, a house may be under construction and not in the assessment roll yet and identified as a structure through image analysis. In the case of the addressing points, not all structures identified in the image analysis are considered addressable structures. In other cases the image analysis identified structures that were misses in either the assessment roll or the addressing point files.*

- *In more populated areas such as subdivisions, the assessment data and addressing points more accurately represented the number of structures at risk for the wildland fire analysis. In urban settings it was noticeable that the county data had a better inventory of structures from both the assessment data and the address points. The image analysis tended to identify a greater number of structures such as outbuildings and auxiliary buildings. These are not needed in the RAVAR analysis.*

- *In rural areas the image analysis identified many outbuildings. This is expected because farm and ranch operations may have significant numbers of related support buildings. On the assessment rolls those structures are collected into a single property with the total value of the structures aggregated to the property.*

Finally, the Trigo Fire and the work of Torrance County, Valencia County, the USFS-RMRS, the USGS, the FGDC Subcommittee for Cadastral Data, and the New Mexico Taxation and Revenue Department clearly demonstrates the benefits derived from multi-jurisdictional collaboration in planning for and responding to potentially catastrophic fire events.

# The Trigo Fire / Wildland Fire Project continued

## Acknowledgements

- **Dave Calkin** (Research Forester, USFS, RMRS, Forestry Sciences Lab);

- **Ruben Gastelum** (Torrance County GIS);

- **Victor Gonzales** (Valencia County GIS);

- **Kevin Hyde** (Landscape Modeler Hydrologist, Management & Engineering Technologies Int'l, RMRS, Forestry Sciences Lab);

- **Amy Steinke** (Data Analyst, Management & Engineering Technologies Int'l, RMRS, Forestry Sciences Lab);

- **Nancy von Meyer** (FGDC Subcommittee for Cadastral Data, Vice President Fairview Industries);

- **National Interagency Fire Center** (Boise, ID);

- **Rapid Response Team** (US Geological Survey in Denver);

- **New Mexico Department of Finance and Administration**, Local Government Division Enhanced 911 Program;

- **New Mexico Taxation and Revenue Department**, Information Systems Bureau;

- **New Mexico Association of Counties**, GIS and Rural Addressing Affiliate;

- **New Mexico Geospatial Data Acquisition Coordination Committee** (GDACC);

- **University of New Mexico Earth Data Analysis Center** (EDAC)

## Mystery Photo Location

This Mystery Photo was taken somewhere here in New Mexico. Can you identify the location?

The last issue's location was correctly identified by Trent Botkin - Dripping Springs in the Organ Mtns near Las Cruces.

A "semi-luxo" prize will be awarded to the first person who correctly identifies the location.

Contact Rick Koehler with your answer.

# GNIS Matters: Slippery Generics continued

Now for the definitions:

1. gorge, ravine, gully
2. swamp, marshy area
3. ridge
4. summit, top
5. junction, confluence

6. hill (smaller than a cerro)
7. hillside
8. butte, headland
9. breaks, broken eroded land
10. corner, box canyon

Bob Julyan, Chair

NMGIC Geographic Names Committee

*nunca más*

# NM GAC Receives ESRI SAG Award

The State of New Mexico Geospatial Advisory Committee (GAC, a standing committee of the NM Department of Information Technology) received an ESRI Special Achievement in GIS (SAG) Award during the August 2008 ESRI International User Conference in San Diego. GAC was recognized for their collaborative efforts in advancing geospatial technology for New Mexico. Roger Tomlinson, often referred to as the "Father of GIS" gave a keynote speech, after which ESRI's Jack Dangermond presented the awards to the various recipients.
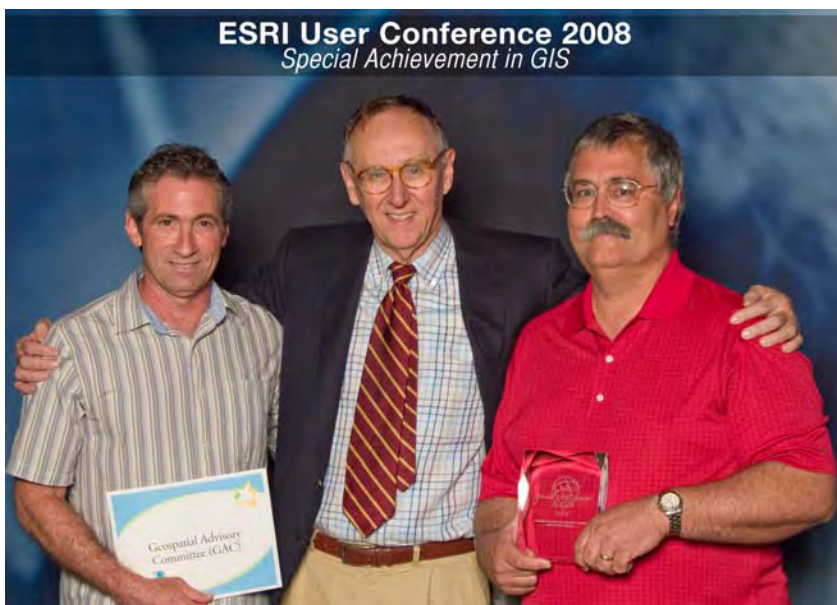


GAC is, above all, a community effort by representatives from not only state agencies, but the whole gamut of GIS professionals throughout New Mexico. Accepting the SAG Award on behalf of all GAC members were past GAC Chairs Larry Brotman (2007, on left) and Rick Koehler (1999-2000, 2006, on right). Mr. Dangermond (center) congratulated GAC on its achievements in coordinating GIS for the state and wished them every success in their continued efforts to implement the recent State of New Mexico Geospatial Strategic Plan.

# NMGIC Survey Results

This past summer, the NMGIC Board conducted an online survey to gain input from the NMGIC membership on several topics.  Of NMGIC's approximately 200 active ("paid up for 2008") members, 48 responded to the survey. While not exactly a mind-blowing number of responses, the results will prove useful to NMGIC in guiding decisions about meeting topics, and even provide some insights in how to make NMGIC better.

The first survey question was simple enough: "Education has been proposed as the topic for next Fall's NMGIC Meeting.  Is this a topic that would interest you?"  Survey respondents largely said it would:

**1. Education has been proposed as the topic for next Fall's NMGIC Meeting. Is this a topic that would interest you?**

|  | Response Percent | Response Count |
|---|---|---|
| Yes | 72.9% | 35 |
| No | 27.1% | 13 |
| answered question | | 48 |
| skipped question | | 0 |

The second question offered some of the alternatives and asked to what extent each was "interesting":

**2. How much do these potential Meeting topics appeal to you as a NMGIC member:**

| | Very much interest | Moderate interest | Neutral | Not very much interest | No interest | Rating Average | Response Count |
|---|---|---|---|---|---|---|---|
| Business Applications and Location-Based Services (LBS) | 12.5% (6) | 27.1% (13) | **39.6% (19)** | 12.5% (6) | 8.3% (4) | 3.23 | 48 |
| Interoperability | 20.8% (10) | **39.6% (19)** | 18.8% (9) | 18.8% (9) | 2.1% (1) | 3.58 | 48 |
| Solving Real World Problems with GIT | 50.0% (24) | 25.0% (12) | 22.9% (11) | 2.1% (1) | 0.0% (0) | 4.23 | 48 |
| Spatial DBMS for GIS (or " ... for Enterprise GIS") | 37.5% (18) | 27.1% (13) | 25.0% (12) | 8.3% (4) | 2.1% (1) | 3.90 | 48 |
| Spatial Analysis | 60.4% (29) | 31.3% (15) | 6.3% (3) | 2.1% (1) | 0.0% (0) | 4.50 | 48 |
| Use of GIT in Border Issues | 14.6% (7) | **33.3% (16)** | 29.2% (14) | 12.5% (6) | 10.4% (5) | 3.29 | 48 |
| Use of GIT in Education Industry and Issues | 22.9% (11) | **29.2% (14)** | 27.1% (13) | 12.5% (6) | 8.3% (4) | 3.46 ??? | 48 |
| Use of GIT in Energy Resources Industry and Issues | **33.3% (16)** | 29.2% (14) | 27.1% (13) | 10.4% (5) | 0.0% (0) | 3.85 | 48 |
| Use of GIT in Health Care Industry and Issues | 20.8% (10) | **37.5% (18)** | 29.2% (14) | 8.3% (4) | 4.2% (2) | 3.63 | 48 |
| Use of GIT in Transportation Industry and Issues | 22.9% (11) | **45.8% (22)** | 20.8% (10) | 6.3% (3) | 4.2% (2) | 3.77 | 48 |
| Web Mapping | 43.8% (21) | 37.5% (18) | 16.7% (8) | 2.1% (1) | 0.0% (0) | 4.23 | 48 |
| answered question | | | | | | | 48 |
| skipped question | | | | | | | 0 |

# NMGIC Survey Results

*(Continued from page 21)*

The third question asked "Other than the above-mentioned topics, what topic would you most like to see for a NMGIC meeting?", which resulted in responses ranging from the ever-useful "No" to several calling for Landscape Ecology/Ecosystem GIS/"GIS for ecology and landscape"/Conservation (2)/"Environment & Habitat issues", and a plethora of other good ideas ...

| | | Comment Text | Response Date |
|---|---|---|---|
| Find | 1. | Remote-sensing based land classification | Tue, 7/22/08 11:54 AM |
| Find | 2. | Conservation | Thu, 7/17/08 10:28 AM |
| Find | 3. | GIS and Census/Sociological Data | Fri, 7/11/08 9:59 AM |
| Find | 4. | No | Wed, 7/2/08 11:34 AM |
| Find | 5. | Python Programming | Tue, 7/1/08 11:54 AM |
| Find | 6. | Natural Resource Issues | Sun, 6/29/08 3:10 PM |
| Find | 7. | Application of GIT in Water Resources management | Sun, 6/29/08 10:03 AM |
| Find | 8. | GIS to improve public outreach | Fri, 6/27/08 1:41 PM |
| Find | 9. | Landscape Ecology | Fri, 6/27/08 9:45 AM |
| Find | 10. | GIS and preserving New Mexico's historic maps | Thu, 6/26/08 10:52 AM |
| Find | 11. | environmntl,habitat issues; political mappng; as much as I like ESRI, let's explore the alternatives | Thu, 6/26/08 7:18 AM |
| Find | 12. | GIS in 911 and Search and Rescue (Katrina) | Wed, 6/25/08 5:53 PM |
| Find | 13. | Conservation GIS (was a topic in previous years, but I'm a new member) | Wed, 6/25/08 4:00 PM |
| Find | 14. | IT Security | Wed, 6/25/08 3:19 PM |
| Find | 15. | GIT and Land Use Planning | Wed, 6/25/08 2:55 PM |
| Find | 16. | Entrepreneurial opportunities for GIS professionals | Wed, 6/25/08 2:16 PM |
| Find | 17. | Emergency Preparedness | Wed, 6/25/08 1:36 PM |
| Find | 18. | Mobile GIS-enable workflows | Wed, 6/25/08 1:32 PM |
| Find | 19. | How people use GIS for ecology and landscape | Wed, 6/25/08 10:23 AM |
| Find | 20. | Maintaining and enhancing cartographic quality/integrity in web and published media. | Wed, 6/25/08 9:30 AM |
| Find | 21. | Census & Urban Planning; or Ecosystem GIS | Tue, 6/24/08 9:47 AM |

So, between the list of suggested meeting themes from Question 3 and the member's suggestions garnered from Question 4, it seems there are many good potential meeting topics. When it comes to brain-storming about upcoming meetings, the NMGIC Board usually doesn't have a hard time coming up with ideas, but it's useful to know what really interests the members, what topics would draw them to meetings - whether it be from direct applicability to their professional careers or a strong sense of curiosity about an aspect of the geospatial world they've not had the opportunity to explore.

"Do you have a suggestion for a NMGIC Workshop topic?" was the fourth question, and again, the responses were wide-ranging (see Figure on page 23), with image analysis, projections, and GPS each being mentioned more than once. It isn't hard to imagine that everyone would like to see meetings and workshops on topics focused on their interests, even if those interests are quite highly focused. But with limited "time slots" for workshops, it's diffi-

*(Continued on page 23)*

**Page 22**                                                                 THE MAP LEGEND

# NMGIC Survey Results

cult to cover all the bases.  One possible solution is to have additional workshops throughout the year, rather than the present "habit" of having one each with the Spring and Fall Meetings.

| | | Comment Text | Response Date |
|---|---|---|---|
| 🔍 Find | 1. | Land-use change analysis (particularly automated) | Tue, 7/22/08 11:54 AM |
| 🔍 Find | 2. | VBA for ArcGIS | Thu, 7/17/08 10:28 AM |
| 🔍 Find | 3. | GIS and History | Tue, 7/15/08 9:35 AM |
| 🔍 Find | 4. | Understanding Methodologies in GIS Analysis | Fri, 7/11/08 9:59 AM |
| 🔍 Find | 5. | None | Wed, 7/2/08 11:34 AM |
| 🔍 Find | 6. | New GPS technology | Fri, 6/27/08 9:45 AM |
| 🔍 Find | 7. | Historical GIS | Thu, 6/26/08 6:08 PM |
| 🔍 Find | 8. | Positioning Technologies | Thu, 6/26/08 12:56 PM |
| 🔍 Find | 9. | (3. cont) imagery acquisition, maybe water again | Thu, 6/26/08 7:18 AM |
| 🔍 Find | 10. | Something about map projection problems | Wed, 6/25/08 7:08 PM |
| 🔍 Find | 11. | GIS for Emergency Management | Wed, 6/25/08 5:53 PM |
| 🔍 Find | 12. | IT Security | Wed, 6/25/08 3:19 PM |
| 🔍 Find | 13. | Planning and GIT Simulations | Wed, 6/25/08 2:55 PM |
| 🔍 Find | 14. | No | Wed, 6/25/08 2:13 PM |
| 🔍 Find | 15. | GIS Resource Materials—Finding Government Agency Information | Wed, 6/25/08 2:02 PM |
| 🔍 Find | 16. | 3D GIS and/or Processing and using LiDAR Data | Wed, 6/25/08 2:02 PM |
| 🔍 Find | 17. | projections & coordinate systems & geoids/ellipsoids/etceteroids | Wed, 6/25/08 1:36 PM |
| 🔍 Find | 18. | Something on image analysis & classification like ENVI | Wed, 6/25/08 10:23 AM |
| 🔍 Find | 19. | workshop and meeting theme could be the same | Wed, 6/25/08 9:09 AM |
| 🔍 Find | 20. | Feature Extraction and Image Analysis | Tue, 6/24/08 9:47 PM |

The fifth question was "Are you satisfied with NMGIC overall?", and there seems to be a bit of trend for this particular question - at least for members who took the time to take the survey.  For those who take issue with the results of this question, or feel it isn't reflective of their opinion, please express your concerns to a Board member (and maybe take the survey next time?):

| 5. Are you satisfied with NMGIC overall? | | Response Percent | Response Count |
|---|---|---|---|
| Yes | | 100.0% | 46 |
| No | | 0.0% | 0 |
| | answered question | | 46 |
| | skipped question | | 2 |

# NMGIC Survey Results

The next question (#6) asked members for suggestions to improve NMGIC, and generated a total of 30 responses from the members who chose to answer it. Improving or updating the NMGIC website was most-often suggested, along with holding more workshops. The responses are given below, "as-is"; some members submitted multiple responses to this question.

| Comm # | Comment Text |
|---|---|
| 1 | Consider broadening focus to include non-public sector entities (i.e. private industry and consulting) |
| 2 | More workshops throughout the year |
| 3 | Have a social so we can interact more. |
| 4 | Attract more user exhibits and presentations. |
| 5 | Develop a website to include minutes and presentations for each NMGIC meeting |
| 6 | Submit newsletter in a timely fashion |
| 7 | Better speakers at meetings |
| 8 | website needs to be more central tool-outdated,unmaintained;bad look for those meeting us for 1st time on web; makes us look not serious, amateurish |
| 9 | All in all I think that NMGIC runs really well. |
| 10 | Update the website, it is outdated looking. [Editor's note: Yes, it is.] |
| 11 | More from Rich Friedman - Wow is that guy SMART [Editor's note: Yes, he is.] |
| 12 | Group trips to GIS events |
| 13 | If meetings are a little more "educational", it is easier for me to justify getting there. |
| 14 | I pay more for membership in other organizations so maybe you could raise the membership fee amount to $40 or ...? |
| 15 | Provide more grants and scholarships, perhaps through partnerships with industry |
| 16 | Consider including non-public sector members on the Board [Editor's note: from the same respondent that provided Comment #1] |
| 17 | More cutting edge content |
| 18 | Use NMGIC as a vehicle for creating relationships to better support RGIS and a statewide data repository. |
| 19 | Imrpove website |
| 20 | More workshops |
| 21 | Post links to educational institutions with GIS programs |
| 22 | More on Remote sensing |
| 23 | Educate employers on importance of their GIS employees to participate in NMGIC |
| 24 | Please use the same lunches as they are pretty good and better than going out to find food in a hurry |
| 25 | Line up higher-profile speakers to attract people to meetings |
| 26 | More robust/modern website |
| 27 | Provide member directory |
| 28 | More Historical aspects like the program on Chaco Canyon |
| 29 | What ever happened with the UNM Education effort of a few years ago?  It seems like lots of talk but no action on UNM's part. |
| 30 | Increase the membership fee so NMGIC can build a bank account over time (see Comment One) [Editor's note: #14 in this listing] |

The seventh NMGIC Survey question asked "Why did you join NMGIC?"  Rather than chart all thirty-five responses, we'll just summarize them and pick out a few noteworthy "reasons":

# NMGIC Survey Results

- Networking Opportunity / Make Contacts / Meet GIS People (19 hits)

- Learn / Keep Up On GIS / Professional Development (10 hits)

- Job-Related / Part of Work / Matches Interests (3 hits)

- Share Ideas / New Ideas / Exchange Ideas (3 hits)

- "Because it's there"; "For the GIS Camaraderie"; "Industry Organization of Record in NM ..."

The eighth question asked "Do you plan on renewing your membership and if not, why?"  Forty of the forty-eight respondents said "Yes" (or in one case, "Absolutely!").  One member said "Not sure", and the other seven people who took the survey did not respond to this question.  So, members gave a largely positive overall response to renewing membership, and some added their reasons for doing so (*eg.*, "Yes, I plan to renew because it offers good value for a mere $25 a year, and I enjoy seeing my colleagues outside of the work environment, especially those from out-of-town." and "Yes, since it's so cheap and I enjoy the meetings.").

The final (9th) survey question was "What do you value most from your Membership?"  Again, interaction with others & networking were mentioned many times, along with the opportunity to learn and expand, the meetings, the newsletters, and the "opportunity to meet new beer-drinking buddies".  A member who shall remain nameless said: "Oh, the lunches, without question!  And the smoking big cigars and drinking hot toddies and hob-nobbing with luminaries like Kurt and Leland and Larry and Amy and Rich and Jane Goodall and Gandhi and Ayaan Hirsi Ali and  ...".

So, thank you to all the members who took the survey: you can rest assured that the NMGIC Board has heard your voices and will work hard to take your suggestions to heart.

# NSGIC Report continued

the "officialization" of COGO. The announcement includes a more complete list of founding member organizations and founding advisory organizations.

President Bush signed into law the New and Emerging Technologies 911 Improvement Act of 2008 (HR 3403). The National Emergency Number Association (NENA) applauds the signing of this landmark legislation and thanks all those who have worked so hard to make it a reality. NENA CEO Brian Fontes said, "The passage of the NET 911 Improvement Act is a significant event for the 9-1-1 community. The law's provisions will improve access to 9-1-1 for all Americans and help ensure that our nation's 9-1-1 system is able to keep up with advancements in communications technology. This legislation will save lives."

Making 9-1-1 service available and effective for all Americans today and in the future as technology advances is a top priority for NENA. Ensuring that emerging technologies are able to seamlessly connect to the 9-1-1 system and that we as a nation are taking steps to advance towards a Next Generation 9-1-1 and emergency communications system must be a national priority. NENA remains focused on the need for continued deployment of E9-1-1 for all technologies, the need for appropriate liability protections for 9-1-1 telecommunicators and service providers, and the need to ensure adequate funding is available for today's 9-1-1 system as well as the migration to an IP-based Next Generation 9-1-1 system. The New and Emerging Technologies 911 Improvement Act will help make these priorities a reality.

Existing issues remain that must be addressed. Paramount among these is the need for Congress and the Administration to recognize the funding challenges being faced by 9-1-1 centers across the country and the critical need for federal 9-1-1- grant funding. Funding for 9-1-1 grants authorized by the ENHANCE 911 Act of 2004 has been requested by the Congressional E9-1-1 Caucus, but Congress has yet to appropriate such funds through the budget process. Similarly, the Bush Administration's budget request to Congress has not included such grant funds.

The legislation is available at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_bills&docid=f:h3403enr.txt.pdf.

# NMGIC Spring Meeting 2008:

The New Mexico Geographic Information Council, Inc. (NMGIC) was held on April 25th, 2008 in Albuquerque, New Mexico. The meeting theme was "**From DOQQ to Google: Facing the Challenge of Geospatial Imagery**", with presentations on managing, deploying and incorporating imagery in geospatial applications. The panel discussion by industry experts on the present and future of deploying imagery seemed to have been the highlight of the meeting for many of the over 100 people who attended. The Spring Workshop was held Thursday, April 24th and featured **David Vaillancourt** from ESRI - *ESRI's ArcGIS Server Image Server Component*, and **Nelson Guda** from Roadless-land.org - *Serving Up Your World: How to Get Your Geographic Data Online with Google & Other Available Tools.*

# NMGIC Corporate Sponsors

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## 2008-2009 GIS Calendar of Events

**GIS Day**

GIS Day 2008, November 19th, 2008, "everywhere"

**NSGIC**

2009 Midyear Conference, February 22nd-25th, 2009, in Annapolis, Maryland

**ASPRS**

2009 Annual Conference March 9th-13th, 2009, in Baltimore, Maryland

**GITA**

GITA's 2009 Geospatial Infrastructure Solutions Conference April 19th-22nd, 2009, in Tampa, Florida

**NMGIC**

Spring 2009 Workshop, Date and Location to be determined

Spring 2009 Meeting, Date & Location to be determined

**ESRI**

International User Conference, July 13th-17th, 2009, in San Diego, California

**URISA**

2009 Annual Conference September 29th– October 2nd, 2009, in Anaheim, CA

**SWUG**

2009, Colorado, Dates and Location To Be Announced

# 2009 Membership Dues

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