An American Discovers Taiwan’s Vibrant GIS Environment
By Greg Babinski, GISP, King County GIS Center

When an opportunity to visit Taiwan developed in early 2010, I began preparing for the trip. I would be traveling with a friend from Taiwan, so I anticipated that my visit would not be a typical tourist experience. I bought a guidebook to the island, a couple tourist maps, and a tourist phrasebook. I enrolled in a 10-week Mandarin Chinese class at a local community college and booked a flight on Eva Air for a three week visit in August.

And then I thought, ‘I wonder what’s going on with GIS in Taiwan?’ A quick online search revealed that there are a few Taiwanese companies providing GIS services, a professional and educational group called the Taiwan Geographic Information Society (TGIS), and an organization called the Taiwan GIS Center (TGIC). I work for the King County GIS Center (KCGIS) in Seattle, so I was intrigued to learn more. There was enough information on the TGIC web site in English to tell me that it is a branch of the Taiwanese government with offices in Taipei.

I learned that the Chairman and General Manager of the Taiwan GIS Center, Dr. Chih-Hong Sun, earned his PhD from the University of Georgia, and that he is also a professor in the Geography Department of the National Taiwan University (NTU). There was a general contact email address on the TGIC web site, but my attempts to contact Dr. Sun via that route failed. I then visited the NTU web site and discovered Dr. Sun’s direct email. I sent him a message introducing myself, describing my affiliation with the King County GIS Center and with the URISA Board of Directors.

I suggested to Dr. Sun that it might be mutually beneficial to meet and discuss developments and trends in GIS in the U.S. and Taiwan in general, and within TGIC and KCGIS in particular. Within 24 hours I had a cordial reply from Dr. Sun and an invitation to meet with him and his senior staff in Taipei during my visit.

Taiwan Will Touch Your Heart
It’s about a 12 hour flight from Seattle to Taipei, the capitol of Taiwan. At about 36,000 square kilometers and 23 million people, Taiwan is one of the most densely populated places on earth. Taiwan is affluent too, with per capita income similar to Japan, Korea, France, and New Zealand. I found a surprising diversity...with not just Mandarin spoken, but also Taiwanese, Hakka, and a variety of aboriginal languages.

The metropolitan Taipei area is home to 6.7 million and by far the largest city on the island. Despite its
congestion, tree covered hills are always visible in the distance. Tourist highlights include the National Palace Museum – with collections spanning 8,000 year of Chinese arts and crafts, the Chiang Kai-shek Memorial Hall, and Taipei 101 – until 2004 the tallest building on earth. But by far the most awesome tourist experience in Taipei is a visit to a night market. There are at least eight night markets in Taipei…each covering dozens of city blocks with vendor stalls crowding the walks and onto the streets, selling clothing, watches, tools, crafts, and every kind of product imaginable, plus finger food from hundreds of small booths. And an unimaginable crush of people…from dusk until well after midnight…every night of the week!

I was also able to travel to some medium sized cities on the west side of Taiwan, as well as to a rural bed-and-breakfast for a bicycle tour through the countryside. The food continually amazed me with its variety and quality…though in some rural areas I was not quite sure what exactly I was eating.

For me though the highlight of my visit was the East Coast…an amazingly well preserved area of rugged remote natural beauty and quaint villages that reminded me of Big Sur in California or the NaPali Coast on Kauai. Only recently opened up by rail and good highways, the East Coast does not have the industrial development of the rest of Taiwan.

The East is also home to many of Taiwan’s aboriginal people and August is when each tribe and village has its annual festival…I attended three Amis Tribe festivals and at the last I was dressed in tribal regalia and invited to dance along with the chief and all the tribe members. I was able to immerse myself in the island’s natural beauty too…during a daylong white-water rafting trip on the Siukuluan River and then later on a two day tour of Taroko National Park, with a thousand meter deep gorge and refreshingly cool air atop 3,300 meter high peaks.

Taiwan surprised and delighted me in dozens of ways….from the familiarity of its 4,000 Seven-Elevens (each with an ATM and free wi-fi), a nice Ford we borrowed to drive around much of the island, and just enough Starbucks to caffeinate me every few days….to strange but tasty food, truck drivers at little karaoke restaurants belting out a couple songs after lunch before getting back on the road, and people who showed me warmth and friendship every day. Taiwan truly touched my heart.

The Taiwan GIS Center
A few days into my visit I arrived mid-morning at the Taiwan GIS Center (www.tgic.org.tw/english/aboutus0.aspx) offices on Roosevelt Road, located adjacent to Chiang Kai-shek Square in Taipei. I was met by Dr. Sun in his office where we chatted a while. He told me of his time at the University of Georgia, where he received both his MA (1982) and PhD (1986) from the Graduate School of Geography. I described my travel plans in Taiwan and he provided a few additional suggestions, especially while visiting the remote East Coast, where his wife’s family is from.

We moved to a nearby conference room where I was introduced to some of the TGIC senior staff:

- David Tzaan, Associate Researcher, Planning & Training Division
- Samuel Liang, Director, Technical Division
- Min Fang, Vice Director, Technical Division

TGIC’s origins go back to 1958 when the China Data Processing Center was established with U.S. assistance. From its beginning, its goal was not only to support the application of information technology within Taiwan government agencies, but also to foster the application of industrial automation and IT to help the nation’s economy compete in the global market. From its beginning, the CDPC was tasked with advising Taiwan’s Council for Economic Planning and Development (CEPD) on future technology trends to help set national business development policy and goals.

Dr. Sun, who had returned to Taiwan to serve as a geography professor at National
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Taiwan University (NTU – see: www.geog.ntu.edu.tw/english/introduction/introduction.html), became the consultant to the CEPD in 1988 on the development of a National Geographic Information System (NGIS). Taiwan’s National Spatial Data Infrastructure Plan was drafted and implemented between 1998 and 2003. Based on an SOA platform, the NGIS uses a spatial data registry to integrate GIS data for the whole nation and to facilitate data sharing for government and business applications.

A U.S. Labor Department report in 2004 predicted 15 years of future growth in the biotechnology, nanotechnology, and geotechnology industries. Taiwan’s government had initiated support for the first two of these rising technologies, but geospatial technology in Taiwan was not well developed or understood. CEPD decided that the CDPC should be tasked with developing Taiwan’s leadership in GIS. In 2008, the CDPC was renamed the Taiwan Geographic Information System Center (TGIC), with Dr. Sun as its Chairman and General Manager. TGIC not only retained its existing responsibilities for IT and industrial technology, but also added new responsibilities to promote geospatial technology and development. These development areas include geotechnology, GPS technology, and telemetry technology. TGIC is also charged with advising CEPD on GIS policy and issues.

GIS development can move quickly when it is driven top-down by a national government. Under Dr. Sun’s leadership, within a year TGIC had added more than 20 geotechnology experts to its staff. It also identified more than 50 scholars in geotechnology related fields to serve as advisors to the center. TGIC now has a staff of approximately 200, most working in non-GIS technology areas in support of the national government. About 40 GIS professionals work in TGIC’s Taipei office and a small regional office in Taichung.

**TGIC Activities**

The primary role of the Taiwan GIS Center is to serve as a geotechnology think tank and as a demonstration and support center for government and business GIS applications. Dr. Sun retains his position on the faculty of NTU where he is able to enlist the help of his academic colleagues and graduate students to develop advanced geospatial technology and application concepts, for testing and implementation by TGIC. In essence, TGIC serves as an important link between the academic, government, and business communities in Taiwan for geospatial technology.

**Geospatial Information Policy Planning:** TGIC develops and promotes policies for government GIS implementation and resource sharing via the NGIS.

**Geospatial Industry Promotion:** TGIC consults with industry to promote GIS use and the development of geospatial technology based business sectors. An innovative aspect of TGIC is the Geospatial Technology Exhibit/Demonstration Room in the entrance lobby of their Taipei offices. Looking much like a modern science & technology museum, this area includes exhibits explaining GIS, describing business applications, and providing access to many hands-on touch-screen based GIS applications.

**Geospatial Information Applications:** TGIC helps implement eGovernment for national, county, and municipal governments in Taiwan. Building on the NGIS SOA platform, applications can be developed in an environment without data duplication and with common data standards. With an extensive broadband network covering the island (reaching out to and far beyond those 4,000 Seven-Elevens) the potential to provide real time access to spatial data and applications for government, business, and citizens is an achievable goal. NGIS and TGIC have developed more than 300 applications in the last 15 years.

**Training:** TGIC has an extensive educational program...with many business automation course offerings, in addition to an extensive catalog of GIS training classes.

**Taiwan’s Future Vision for GIS**

When we began discussing the future of GIS, Dr. Sun told me, ‘We don’t excel at writing software here in Taiwan...what we do excel at is developing and manufacturing components.’ He went on to explain that TGIC sees great potential in...
Taiwan from the Sensor Web 2.0 concept developed by NASA. Sensor Web 2.0 is an open-source software architecture that allows users to access and control global sensors via the Internet. The potential of Sensor Web 2.0 will only be realized through development of smaller, faster, and cheaper sensors and their use by all aspects of a nation’s human and natural activity.

TGIC is supporting this vision with the development of TIEOS – the Intelligent Taiwan Project. A Sensor Web will be developed across Taiwan – tied to natural features, government assets, infrastructure, business, transport, etc. Sensors will be tied to a multi-agent knowledge-oriented cyberinfrastructure platform. This platform will register sensor data to the geonetwork, refine the data via a knowledge editor system, and process information via a spatial decision support system. Inferring and display agents will facilitate open knowledge-based decision support.

TIEOS will be a ground-breaking nation-wide application of integrated geospatial technology. For Taiwan, it will also provide a test bed for the industrial development of advanced sensors needed to support TIEOS, and which can become a cornerstone of Taiwan’s industrial economy well into the Twenty-first Century.

Dr. Sun, his staff and I had a useful discussion about the challenges of promoting GIS use. I was able to share some of the marketing material and approaches used by the King County GIS Center for GIS outreach in King County. We also discussed the importance of internal training programs and end-user support to accelerate successful GIS implementation, both in Taiwan and in King County. Dr. Sun told me that geospatial technology has not yet been widely implemented at the county government level and only a few of the biggest cities have GIS operations. I was struck with the contrast between our two countries, with very focused and unified GIS development and implementation at the national level in Taiwan, to a degree that does not exist with the U.S. at the federal or state levels. However GIS development at the local and regional level in the U.S. and Canada is far more developed than in Taiwan.

At the end of my visit, I thanked Dr. Sun and his staff and invited them all to contact me if ever they visit the U.S.

The Taiwan Geographic Information Society
About a week after my visit to TGIC, I got an email message from Dr. Sun inviting me to dinner in Taipei with some additional senior staff from the Taiwan government, NTU, and the Taiwan Geographic Information Society (TGIS). Dinner was at a restaurant called the Gourmet Theater, located inside the National Concert Theater in Chiang Kai-shek Square, across from the TGIC offices. We enjoyed a wonderful buffet in an elegant setting that featured many of the distinctive local cooking styles I had experienced throughout my visit.

In addition to Dr. Sun, we were joined at dinner by:
- Jeremy J.H. Sun, Ministry of the Interior Director of Information Services
- Dr. Wan-Kai Lee, TGIC Planning & Training Division Director
- Professor MingDaw Su, NTU and President TGIS
- Dr. Bor-Wen Tsai, NTU and Secretary General TGIS
- Professor Feng-Tyan (Frank) Lin, Dean College of Planning & Design, National Cheng Kung University

I learned from Professor Su and Dr. Tsai that the Taiwan Geographic Information Society (http://211.21.33.110/english.htm), like URISA, is a non-profit educational society. Established in 1994, TGIS’s mission includes:
- Promoting and conducting research on GIS technology
- Publishing research via periodicals and books
- Organizing conferences and study groups
- Develop a GIS knowledge base
- Provide advise and consulting

TGIC TIEOS Concept
discussed the application of GIS to urban planning. This is a growing interest area in Taiwan. Much of the island has been developed without apparent zoning; thus future development and re-development will depend on careful land use analysis. Professor Lin told me that UrbanSim software (www.urbansim.org) is in common use in Taiwan for urban analysis and planning. I discussed use of UrbanSim by the Puget Sound Regional Council in the Seattle area.

Dr. Su, who specializes in water resource management issues, and I discussed GIS for water planning applications in the U.S. and Taiwan. Dr. Su was very interested in the extensive work that the King County GIS Center has done related to potential flooding along the Green River in Washington because of safety concerns with the upstream Howard Hanson Dam.

Dr. Tsai and I discussed common interest in aboriginal mapping. He described his research in the mapping of aboriginal occupancy in Taiwan based on oral records and tradition. I described the work of the Aboriginal Mapping Network (http://nativemaps.org/) in Vancouver, B.C., and promised to send him a copy of their book ‘Chief Kerry’s Moose’ which outlines oral tradition mapping methodology.

Jeremy Shen, Dr. Sun and I discussed the importance of ROI to promoting GIS. I promised to send them the results of the current King County GIS ROI study being conducted by a research team from the University of Washington Evans School of Public Affairs.

There was also general interest in URISA’s proposed GIS Capability Maturity Model (http://tinyurl.com/GISCMCM). Dr. Sun was proud to point out that TGIC is CMMi Level 3 certified. I agreed to send Dr. Sun a copy of the URISA model for translation into Mandarin and application within Taiwan.

Taiwan exceeded my expectations in many ways: friendlier, more beautiful, and more dynamic than I had imagined. I also learned of a vibrant growing GIS community, with challenges to be sure, but also with a realistic perspective and unique plans for geospatial technology. Don’t be surprised to hear more about GIS and geospatial technology from this little island in the future. And if you should ever visit, expect to be warmly greeted. Taiwan will touch your heart!

About the Author
Greg Babinski, GISP, is the Finance & Marketing Manager for the King County GIS Center in Seattle, where he has worked since 1998. Previously he worked for nine years as GIS Mapping Supervisor for the East Bay Municipal Utility District in Oakland. He holds a masters degree in geography from Wayne State University. Babinski is the President-Elect of URISA – the Association for GIS Professionals.

More Information
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Thanks in advance!
This past summer, FEMA, the Federal Emergency Management Agency, denied the City of Milwaukee’s original request for Individual Assistance Program funds to help Milwaukee homeowners repair damages caused by flooding after this year’s July 22 rain event.

Undaunted, the Mayor’s office turned to geographic information systems (GIS) technology to tell the story of the impact of the flooding on our neighbors. The City then re-applied for the funds, this time attaching a series of maps showing an analysis of the neighborhoods affected. Once FEMA officials “saw” the devastating impact on our residents in these distressed areas shown on the maps produced by the City’s GIS, over $38.5 million in funds were approved for Milwaukee. Truly, these maps are worth $38 million.

The maps shown below are some of the most powerful of the eight maps presented to FEMA. They show how the sewer backups affected mostly low income families; mostly minorities; and mostly seniors. Without these maps, the City faced no federal assistance for these people.

The maps were created by the City of Milwaukee (Alice Hagen).

Without the geographic information system, accurate and up-to-date data, and people who know the power of displaying information on maps, the City of Milwaukee could not have produced this information and, therefore, would not have been able to obtain this federal assistance. Fortunately, the City of Milwaukee has a geographic information system and could do these analyses.

On Wednesday, November 17, the $38 million maps were on display at the University of Wisconsin – Milwaukee as part of its annual GIS Day event. Held each year during the National Geographic Society’s Geography Awareness Week, GIS Day is a global event with the purpose of making people aware of GIS and the important contributions it makes in the fields of science, technology,

continued on page 9
Those of you who were able to attend GIS-Pro 2010 saw some fairly significant changes to the conference and to the Association. As this calendar year ends and the next one begins, I believe the rest of the Association’s members are going to see those changes and more. The result of those changes will be a much stronger URISA going forward.

In three years or less, URISA will be an international leader on geospatial policy issues, a strong international participant in driving the geospatial agenda on topics like data access, geospatial education, location-based decision making, professional licensure, base data standardization and creation, spatial data infrastructure development, technological advancement, and other topics that directly and indirectly affect URISA members, particularly those in local, regional and tribal government organizations. We will build on our existing strengths of education and communication, expanding to include strong international advocacy on behalf of our members.

The Chapters will play a key role in strengthening and improving URISA, as a communication and organizational structure to bring issues, opinions, feedback, etc. from the membership. This started with the Chapter Roll Call at GIS-Pro 2010, the result of each Chapter gathering issues and needs from individual members. The outcomes from the Chapter Roll Call and other discussions at the conference have been used to derive the outline of the first URISA Advocacy Agenda (http://www.urisa.org/advocacy_agenda). The Chapters will play an increasingly important liaison role in communicating member issues and needs to the international Association, thereby enhancing their role in their own communities.

Another important activity that has just been announced is the Introductory Membership initiative, providing an opportunity for thousands of GIS practitioners to experience the benefits of URISA membership until the end of 2011 at a very low cost. The increase in membership and interactivity in the Association will result in better opportunities for everyone and a stronger advocacy voice for the Association on behalf of our members.

The many volunteers working with the Education Division are making dramatic improvements to URISA’s workshops and Leadership Academy. Our partnership with the GeoTech Center continues to support geography education and training opportunities in community colleges and other academic institutions.

URISA’s work on the GIS Capability Maturity Assessment will enable local governments and other organizations to measure their progress toward geospatial maturity and benchmark that progress against their neighbors and similar organizations around the world. Our work to develop a standardized GIS Return on Investment (ROI) methodology will provide a way for organizations to measure ROI as it accrues and demonstrate that return to policy-makers that make funding decisions.

A close partnership between URISA and industry is being formed through the Industry Relations Committee so that the influence of industry can be brought to bear effectively on national and international issues of critical importance to URISA members, as articulated in our Advocacy Agenda. A close working relationship with our Chapters and increased membership makes URISA a better partner for industry, providing a closer connection for them to local, regional and tribal government organizations.

Our partnership with industry and with other geospatial organizations is strengthened through the Coalition of Geospatial Organizations (COGO) so that the entire geospatial community can pull together on key issues. URISA provides leadership through COGO on behalf of our members to take advantage of COGO influence and to strengthen COGO over time.

There was a bit of controversy at GIS-Pro 2010 regarding use of the term ‘national’ and I want to address that here. As an international association, it is our intention and objective to meet the needs of all URISA members in every country. The difference in laws and
information, and the humanities. (www.gisday.com)

GIS Day at UWM provides an opportunity for the Milwaukee-area community to learn what the technology has to offer and how businesses and agencies in southeastern Wisconsin are using it or can use it in the future. The event featured presentations by GIS professionals, “hands-on” workshops, map displays, and a featured speaker at a Zaffiro’s pizza luncheon sponsored by the Wisconsin Chapter of the Geospatial Information Technology Association. The featured speaker this year was Dr. Wansoo Im of Rutgers University and founder of VERTICIES, LLC. His talk addressed the use of GIS technology by neighborhood organizations who encourage youth (K-12) to serve their communities by using GIS technology to address local issues affecting their neighborhoods.

Other GIS presentations at the event were given by public health researchers, geoscientists studying volcanoes, Gulf oil spill combatants, transit planners in Milwaukee, community maps developed by the Milwaukee Metropolitan Sewerage District, crime analyses by the Palatine, Illinois police department, and others.

Submitted by: William E. Huxhold, Professor and Chair of the UWM GIS Council

It’s an exciting time to be part of URISA. Your Association is changing and improving to better meet your needs. You’ll see and hear more about these changes in the very near future. I hope you’ll contact us if you have a desire to help make these changes happen. You’ll get more out of the Association than you put in. And I hope you’ll encourage others to give URISA a try. There’s never been a better time to join.

Contact Cy at cy.smith@state.or.us.
Leveraging Cloud Technology to Enhance Collaboration and ROI

By Kevin Willis, GISP, Lake County GIS Director

Private and public sectors are scrambling to create efficiencies, find cost savings/avoidance and visualize choice through detailed spatial analysis. It has been the recent economic crunch that has brought unprecedented exposure and dependence on GIS technologies to deliver such benefits.

GIS technology is now becoming easily accessible to a much broader user community through cloud computing (using the internet to host computer data and software). ESRI has scaled out GIS resources and data to leverage this platform for wide scaled collaboration. It is this collaboration that will further add exponential value to many facets of public and private industry, government, and end users alike.

Background:
Traditionally, Lake County only began within the last 10 years to really take advantage of applying technology driven solutions to outdated methods of record keeping, document storage, paper mapping, and asset tracking. Since then, Lake County GIS has been implementing new and innovative solutions using GIS technologies. One of the GIS Division’s goals is to best leverage and expand the use of GIS technologies to the greatest number of end users at little or no additional cost.

The Issue:
While Lake County GIS has been successful with embedding GIS technologies within its organization, there have been some considerations to work through such as basic GIS software training for the new end users, associated software and licensing costs and several others. The recent release of the new ArcGIS Online platform through arcgis.com may be the needed solution to most of these past considerations. Lake County needs an inexpensive way to identify and create efficiencies across and within functional departments, and GIS technology is the tool to deliver many of these efficiencies.

Financial Return on Investment:
The return on investment is anticipated to be tremendous from several perspectives for Lake County. Cost savings/avoidance, enterprise optimization, process improvement, communications and integration, seamless collaboration, and visibility to priority projects that add value to provided services are just a few on the major benefits.

In addition, this platform has the potential to transform how GIS technologies are used by transforming how governments do business in a more proactive and transparent manner. Such websites as Recovery.Gov and GIS for Stimulus Reporting are leveraging GIS technologies to drive decision making and enhance reporting capabilities to an unprecedented level. The strategic deployment of this technology is something Lake County is looking to do, but on a much smaller scale using ArcGIS Online.

While the traditional internal GIS infrastructure is necessary and critical to any successful enterprise initiative, we can now extend the GIS enterprise environment with little concern for additional software, hardware, or licensing expenses. This strategy would only increase the return on investment and allow the general public to actively explore and use GIS technologies. Lake County GIS attempts to add value by implementing high ROI GIS driven strategies, and is now attempting to position itself to do so again using the ArcGIS Online and ArcGIS Explorer Online cloud based solutions.

Some of Lake County GIS’ tentative plans to leverage this technology include porting over several application development projects to be accomplished using ArcGIS Explorer Online in place...
of customized application development. This will empower the custodian department of the project to update the ArcGIS Explorer Online Application Map themselves in a timely manner, thus freeing up GIS staff time. In Lake County’s case, it would allow other departments to create, edit, and share maps related to their specific function. There are tremendous Emergency Operation Center (EOC) possibilities for on the fly sharing of valuable data, such as flagging incidents, reporting damage assessments, sharing shelter site information to name just a few.

Of course, GIS technologies deliver value in many other ways to both internal and external users. This case study attempts to show how GIS driven cloud based web solutions will undoubtedly add value, and raise awareness on how much more they will be used and depended upon. Cloud based GIS technologies will deliver a collaboration platform that will spark innovation and interoperability never previously realized in the GIS industry, and there lies how and where GIS can continue to add value both globally and locally.

**Highlights**
- Flexible deployment of GIS technologies
- Quick and easy dissemination of public information
- Virtually little end user training needed to create and share maps, data, and tools over the internet (cloud)

**Return on Investment (ROI)**
- Extend your enterprise GIS platform at no additional cost
- Robust access to Imagery which saves on storage space and hardware costs
- Collaboration contributes to better decision making, transparency, and timely data dissemination
- Data sharing of this magnitude can exponentially add value with higher return on investment (ROI) and lower total cost of ownership (TCO)

**Contact Us**
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**The GIS Professional • November/December 2010 • Page 11**
By Katie Templeton, Charlotte, NC, November 2010
It is late afternoon in the charming mountain town of Banner Elk, NC. I arrive on time. Kent, as usual, was five minutes early. As he leans back in his chair against the wall of his favorite espresso bar right off Central Way, he looks at ease and ready to share the good word of GIS with the world. He had already ordered his favorite drink, a double Latte, and was halfway through by the time I sat down across the cozy table just outside the door.

“Well, how’s business?” I start.

“Just fine. Why- would you like a job?” He grins. I tell him the family back in Charlotte is fine, he tells me about his family of Border Collies and Australian Shepherds. We chat; and even in this chilly November, the sun stays out from behind the clouds. If there is ever a nice day to talk about SQL, this is it, I decide.

“So Kent, How important is the understanding of an RDBMS (Relational Database Management System) to the comprehension of SQL Server?”

Absolutely critical as that is precisely what SQL Server is. I mean, you don’t have to have a PhD in CIS, but you need to understand the basics: how tables are related via primary/foreign keys, the different kinds of relationships possible among the tables (1-to-1, 1-to-many, many-to-many), the various data types available; etc.

“So, why SQL and not Oracle? Is SQL just your personal preference?”

SQL is my preference, out of necessity, as that is the platform of choice for Enterprise GIS systems in the majority of our clients (local governments in NC)... SDE works the same way in either case. The main difference as it applies to most organizations is cost, as Oracle tends to be more expensive and thus, cost-prohibitive for budgetary-challenged local governments...

He shifts a bit to get comfortable; I order a cinnamon spice latte. The town looks inviting, fall leaves are changing colors all over the mountains spread around the valley on all sides. But here, quaint looks can be deceiving. Beneath the sleepy exterior of this mountain town lies a powerhouse of geospatial knowledge along with some great people that help bring it to the further reaches of North Carolina.

“Speak a little more about the three tier system between SQL, SDE and ArcGIS clients. Is this a common way to run desktop applications that harness the power of SQL databases?”

That is true for conventional ESRI-based Enterprise GISs. The general idea is that ArcGIS Clients (ArcGIS Desktop, ArcGIS Server) work with data stored in an RDBMS (i.e. SQL Server, Oracle; etc.) via SDE (the Spatial Data Engine) technology. SDE is implemented as software components living on the server as well as actual tables and other database objects inside of the GIS databases. SDE directs the RDBMS via requests from ArcGIS (whether queries or edits), then returns results to the ArcGIS client accordingly.

One analogy that I use is that SDE is the ‘interpreter’ or ‘middleware’ between the client and server. Some advantages of this configuration include robust multi-user editing and the ability to take advantage of the mature RDBMS packages (and their associated functionality) that are currently available. There are other benefits as well, such as the ability to utilize Spatial Views.
“What are the major differences in the two connection types, Application and Direct? When should you use one over the other?”

An “Application Connection” is one where a service on the SDE server manages client connections to a specific database. Thus, when a client tries to connect, a dedicated thread is spawned for maintaining the connection between the client and the server. A by-product of this architecture is that the server handles most of the load of the client session.

A “Direct Connection” bypasses the aforementioned service (the service does not even have to exist) and connects the client directly to the database in question. The best way to get your feet wet at this point is to download SQL Server Express, which is free from Microsoft. While not as robust as the Standard or Enterprise versions, you can start to learn the basics of using SQL queries, which is where most folks should start. That said, there are lots of SQL Server sites on the Internet, many that offer varying levels of training. W3Schools offers a nice intro to the language (SQL), but not necessarily the SQL Server software package.

The best way to get your hands dirty with SQL Server? Most folks start with ArcGIS at a desktop level, and don’t often get to see the inner workings of the system. Would be nice to have a vehicle to run through the process…”

The latte is smooth, I do love the mountains. Kent takes a call from Tiffany back at the office. From Kent’s answers I gather they are discussing one of their tourism map series which includes Grandfather Mountain. Like Tiffany, most of the Highland Mapping staff has been there since the foundation over ten years ago. Kent built the business from the ground up and has never looked back. The demand for GIS consulting in the western part of North Carolina grows every year, in spite of the recession. Kent ends the call and I try to fit one last question in before we both have to travel on.

“For the beginner user, what is the best way to get your hands dirty with SQL Server? Most folks start with ArcGIS at a desktop level, and don’t often get to see the inner workings of the system. Would be nice to have a vehicle to run through the process…”

We shake hands, he gets up to leave, pushes his chair in and stops a moment to look out at the horizon. The day is giving way to evening, and the clouds are pushing their way back down the mountains to settle in for the night. Tomorrow morning he will be back in the office, helping numerous clients manage their SQL/SDE systems and the problems and challenges that arise. Currently, lots of Kent’s time is being spent integrating Enterprise GISs with other external databases, such as tax and utility billing systems...

As he walks away he leaves me with this:

“If you really want to become an expert at these types of systems, you have to be willing to continue learning and rolling with the new technologies. You must be grounded in GIS basics and have an in depth understanding of RDBMS technology and how SDE works. Ultimately, you just have to really be interested in the technology.
Welcome New URISA Members

Julie Ann Adams, GISP, Stillwater, OK
Brett Addams, Chicago, IL
Fatima Anderson, MS, Houston, TX
William Bauman, Chicago, IL
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