

Survey and GIS in San Diego



Everyone forms their own impressions of San Diego, but for surveyors and GIS folks in the Summer, it means the largest geospatial event in the world, the ESRI Survey & Engineering GIS Summit combined with the ESRI International User Conference.

The 28th annual User Conference (UC) came in early August with the theme 'Building New Opportunities', the bulk of the Survey Summit running as prelude the previous weekend. The summit drew over four hundred attendees, a roughly 8% increase over last year. Both conferences featured a trade show. The summit also includes the Survey and Leadership Forum, actually, a Special Interest Group discussing GIS-related survey issues.

Survey Summit Grows

SRI survey/engineering industry manager Brent Jones kicked off the Survey Summit, stressing the importance of GIS and surveying working together. He went on to introduce keynote speaker Colonel David Madden, commander of the GPS wing of the Air Force Space Command in Colorado Springs, who told the meeting how rapidly GPS technology was advancing, giving many examples. There was John Deere developing systems that allow a tractor to ply a field without a driver, GPS-guided cargo loads dropped from planes, a GPS receiver on a pet or in a training shoe in order to track the child owner. "Currently, we have 31 satellites operational," said Madden. "Maybe not much to the average person, but more is better." Newer satellites had better technology, better clocks for timing signals, and the increasing number (Madden thought someday we might see fifty to sixty) provided better performance under trees and buildings. He marvelled at how GPS receiver manufacturers had used signals in ways that surprised them, so they had to use caution in phasing out older satellites and bringing new ones online. Other future trends envisaged by Madden included technology embedded in many other devices, such as cell phones and PDAs. Putting laser reflectors on satellites would increase accuracy to millimetre level.

Switch to Lidar

The afternoon keynote address came courtesy of Tim McCormick, senior vice-president of Dewberry's Hazard Engineering and Geospatial Services Group. His talk, entitled 'GeoFIRM: An Integrated Geodatabase Approach to Engineering and Mapping for Flood Studies', detailed how in 2004 FEMA started a five-year, USD1 billion flood-plain modernisation programme to increase accuracy, reduce costs and provide faster public service for flood maps. To meet increased engineering and mapping needs across the country, practitioners had switched from using photogrammetry to Lidar. David Maguire, chief scientist at ESRI, gave the next address on 'The Current State of Geospatial Technology', describing how GIS took advantage of servers, centralised resources and network access. Interestingly, he commented that the most profound technologies were those that seemed to disappear because they became part of the fabric of everyday life.

Fittingly, one of the liveliest activities of the summit comes near the end of the first day, with the 'Industry Leadership Panel'. This year's version was entitled 'Machine Control: Where and What are the Geospatial Professional's Boundaries?' and covered the usual discussion, with machine-control thrown into the mix. Joe Paiva, survey industry consultant, led exchanges with a panel of four people influential in the business. The issue arose that machine control actually takes work away from surveyors. Panellist Bruce Carlson, president of Carlson Software, said that in some states, only engineers could submit certified data to contractors for machine-control work. Surveyors, he said, should be allowed to do so too, since they were the ones that prepared the data. On the other hand, in Michigan, only surveyors could certify a digital terrain model for machine control. Carlson thought GIS might offer a final haven for surveyors who appeared to be losing work to machine control.

Storm-water System

The second day took a different tack, offering a multitude of breakout sessions under various tracks. In 'NGS Support for Real-Time Positioning', William Henning of the National Geodetic Survey told conference how today "everything is real-time, navigation and positioning". He predicted we would have standalone positioning by the year 2017, allowing the acquisition of accurate data by simply walking around. Dixon Brackett of Earthworx described a project her firm undertook to map the storm-water system for the city of Chattanooga in an intelligent GIS. Survey-grade accuracy was required to allow engineers to design systems from the data. Officials could predict where water would flow, and thus foresee floods and warn citizens. She pointed out that the EPA required cities of a certain size to keep their storm-water system in a GIS as part of the Clean Water Act. The next speaker, Eric Gakstatter, contributing editor on GPS World magazine, called his talk 'GPS is Changing ...A Lot'. He said GNSS was replacing GPS as the standard technology, and GPS/Glonass receivers were the standard in high-end, survey-grade systems.

Time for the Big Show

The User Conference filled the convention centre with about 14,500 participants from 114 countries. The first day was spent in plenary sessions, followed by 1,050 technical sessions, 260 paper sessions in 190 meeting rooms. An exhibition hall hosted hundreds of vendors.

The Map Gallery featured more than nine hundred maps and nearly twenty special displays. The conference was preceded by the Remote Sensing and GIS Summit (attended by 170 people), the Education Users Conference (570), and the GIS for the Census event (ninety) in addition to the Survey Summit. At the opening plenary US Secretary of the Interior Dirk Kempthorne, recent creator of a 28-member National Geospatial Advisory Committee announced that his department would make its archive of 35 years of Landsat imagery available online for free by the end of the year. A new Geospatial Information Officer (GIO) would oversee geospatial programmes in all nine of the department's bureaux.

Libraries of Shared GIS

As in previous years, the role of GIS in environmental protection formed a central theme of the conference, highlighted by ESRI president Jack Dangermond in his opening remarks, and keynote speaker Peter Raven, who has been president of the Missouri Botanical Gardens for nearly four decades. After presenting several awards, Dangermond gave a wide-ranging presentation in which he explained how GIS promoted sustainability. Reviewing the three basic forms of GIS implementation (desktop, server, and federated), he referred repeatedly to "Web GIS", the subject of several very popular technical sessions over subsequent days. Web GIS refers to more complex activities than 'web mapping', and continues ESRI's insistence on the term GIS. It also points to the future, which is now making the transition back to client-server architecture, the client being a desktop or mobile application. This shift is due to two things: the availability of larger, faster and more reliable servers and networks ('supply push'), and increased demand for access to myriad data services (satellite imagery, aerial digital orthophotos, real-time tracking etc). According to Dangermond, GIS professionals are constructing libraries of shared GIS services. At the core is the geodatabase, which organises and manages geodata of any kind and is easily scalable. Central to ESRI strategy is ArcGIS Online, which now gives ArcGIS users access to Microsoft Virtual Earth mapping and imagery content, as well as the ability to stream data in KML.

Version 9.3 and 9.4

At the plenary, John Calkins counted down the "top ten" timesavers in version 9.3 of ESRI products, all introduced in response to feedback from users, the most important being an error-reporting system that automatically sends details of a crash to the development team. A sneak preview of version 9.4 revealed ArcMap would have a new interface with upgraded icons and more than sixty colours, allowing users to export KML layers in 2D and automatically hide the Table of Contents. One of the most informative and entertaining plenary presentations showed how MIT mapped all its 12 million square feet of building space in 3D, used to analyse the impact of proposed road construction on sensitive lab equipment and to reallocate parking permits so as to minimise walking distance for holders. Another presentation showed how the Bavarian Forest Service and the Hamburg Fire Department used ArcGIS Server to integrate into their GIS imagery from a variety of sources, and ITT's ENVI application for orthorectification, pan sharpening, and automated feature extraction. ESRI beta tested a 3D UC Route Finder application with zoom, rotate and tilt features, and walking times. This was yet another of the many features highlighting the nature of this multifaceted, two-part conference, as many worlds came together for a week in San Diego.

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