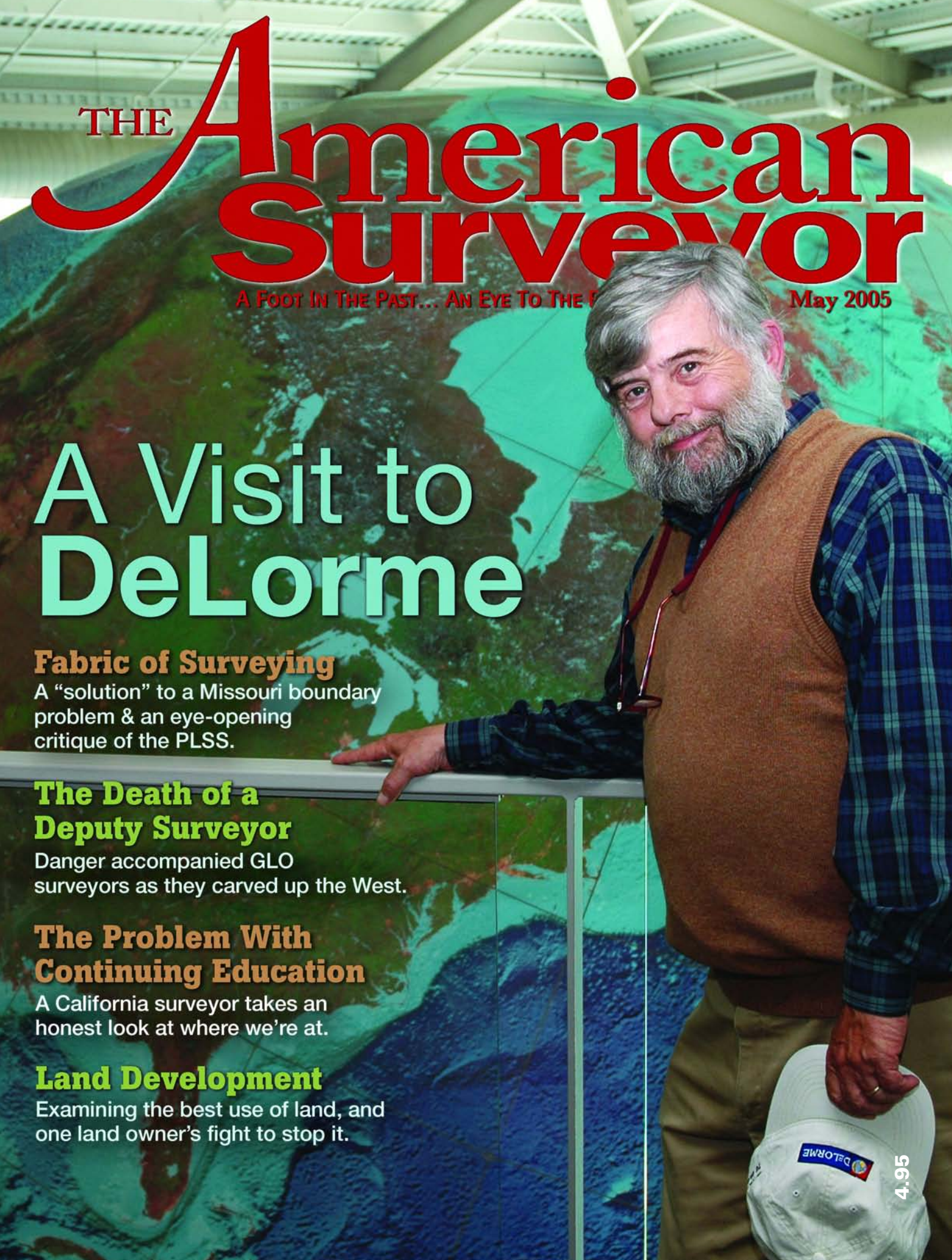
THE American Surveyor

A Foot In The Past... An Eye To The F

May 2005



A Visit to DeLorme

Fabric of Surveying

A "solution" to a Missouri boundary problem & an eye-opening critique of the PLSS.

The Death of a Deputy Surveyor

Danger accompanied GLO surveyors as they carved up the West.

The Problem With Continuing Education

A California surveyor takes an honest look at where we're at.

Land Development

Examining the best use of land, and one land owner's fight to stop it.

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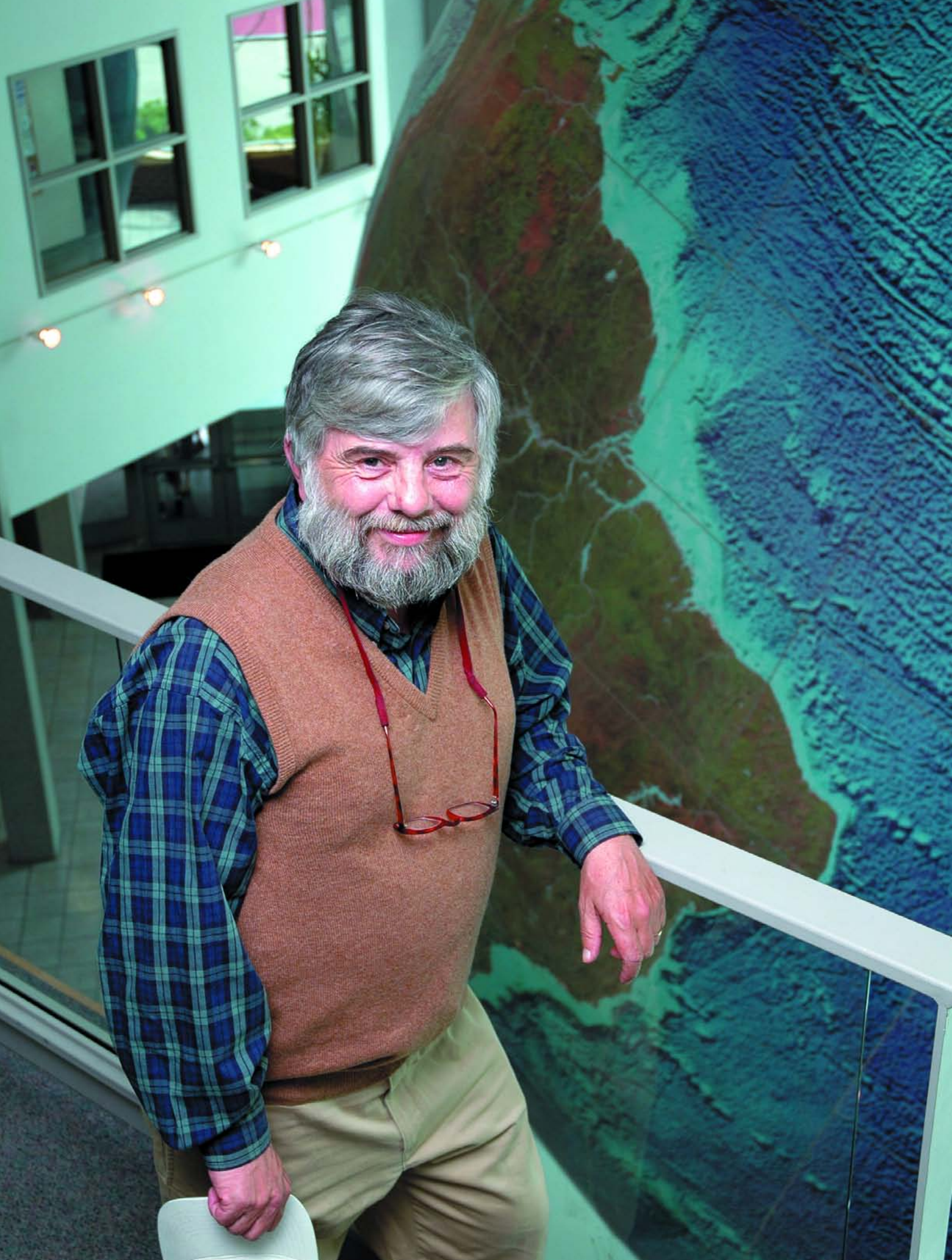

CompanyProFile

DeLorme: Satisfying Spatial Curiosity

Our story begins in the backwoods of Maine in the 1970s, shortly after David DeLorme returned from duty in Vietnam. In an attempt to recover from the war, he retreated to a cabin in the woods. DeLorme enjoyed hiking and fishing, but soon grew dissatisfied with the kinds of map products that were available so he began creating maps at his kitchen table. Convinced that his maps would also be useful to others, he drove around the state, selling his maps from his van, in which he sometimes slept. The maps were an immediate hit, and in 1976, he published his first *Atlas & Gazetteer* for the state of Maine. As most of our readers know, DeLorme map books are now available for all 50 states.

>> By Marc S. Cheves, LS

A portion of the DeLorme building in Yarmouth, Maine which houses Eartha, a 41-foot diameter working globe.

We paid a visit to DeLorme's worldwide headquarters in Yarmouth, Maine to get a behind-the-scenes look at how these famous map products are produced and distributed, as well as to discover what else the company is up to.

In a wide-ranging conversation with David DeLorme, we learned that the first third of the company's history revolved around analog paper maps. In 1984, the company bought its first PC, and spent six months trying to make a map digitally. After trying this for more than 20 years, the company has realized that it is probably impossible to make a 100 percent digitally-generated map, and that there are some things that humans simply do better. But DeLorme hasn't given up hope–he says the obstacles have made the quest interesting, and believes that one day computers *will* be able to accomplish this task.

Also in 1984, the company began development of what DeLorme calls the spatial Dewey Decimal system for indexing spatial data. They discovered that the key problem was finding the data: the data must be hierarchical to enable the user to "see the forest through the trees." Most recently, the company has developed a pyramid data storage scheme–like drawers in file cabinets–that is capable of storing 3D data for the entire world at a scale of 1:1.

By 1985, DeLorme was one of the pioneers in CD-ROM technology, and many of their early patents directly revolutionized how maps are made. In 1986,

A History of Innovation

1976

Paperback *Atlas & Gazetteer* becomes available for all states.

1985

Early explorations with CD-ROM technology lead to government contract work and the beginnings of the digital mapping industry.

1991

Street Atlas USA, the first consumer CD-ROM mapping product, becomes a huge success and helps establish the entire CD-ROM product category.

Workstation for preparing products on CD-ROM and portable disk drives.

DeLorme released the first world atlas on CD. National success came in 1991 when DeLorme released *Street Atlas USA*, the first consumer CD mapping product. (DeLorme laughed as he recalled that an early edition of *Street Atlas USA* required 500 floppy disks and a dedicated computer just to run it!) From that success, the company was able to fund a number of innovations that took it beyond the consumer market and into the geospatial arena (see timeline).

In 2001, DeLorme released *XMap*, its geospatial solution that allows viewing of multiple datasets including street-level data, a library of 7.5-minute USGS raster topographic maps, and the USGS DLG vector topographic data. DeLorme's topographic datasets can be viewed in 3D using the 30-meter DEM that is included with the product. Included in XMap is a 1-km worldwide elevation dataset and worldwide 1:800k vector map data showing cities, roads, natural features, and urban areas. Also in XMap are map mark-up tools, advanced printing capabilities, door-to-door routing, importing and exporting of ESRI and AutoCAD file formats, GPS support and terrain profiling. In addition, add-on software such as the PhotoFlight module offers automatic flight planning including flight lines, trigger points, and altitudes (see sidebar).

Today, as a technology, data collection and publishing company, DeLorme's strength lies in its ability to compile easy-

continued on page 18

1992

AAA's Map'n'Go introduces the first mapping product capable of generating automatic routing.

1995

DeLorme is the first map publisher to develop and market software for the Palm operating system.

1999

DeLorme's 3D TopoQuads DVD and CD products widen professional market access to digital topographic maps.

Products are stored and shipped from DeLorme's massive warehouse.

continued from page 15
to-use software with comprehensive datasets and provide it at an affordable price. Data offerings include national datasets of raster USGS topographic maps, digital vector street atlases, vector topographic maps, satellite imagery, and digital ortho-quarter quads (DOQs).

DeLorme operates its own aerial acquisition system called TopoBird, using a digital Leica ADS40 and ALS40 to fly ±50cm spec photography in New England and elsewhere in the country. Company products have been used by FEMA and the United Nations for relief efforts. The company aerial acquisition system business provides an airborne laboratory. Recently, DeLorme developed GeoSpider least squares adjustment software in conjunction with Alfred Leick at the University of Maine. This full-featured package also works well with DeLorme's inexpensive WAAS-enabled submeter-capable Earthmate GPS receiver. Look for more exciting capability for the Earthmate in the future.

Perhaps the most impressive announcement in the company's history, and the realization of its founder's long-held dream, came in August of 2004 when it announced TopoWorld–a digital globe product that fuses Landsat 14.25 meter color satellite imagery, elevation data and vector map data for the entire planet.

TopoWorld is an ambitious product, and includes searchable GPS-accurate

A History of Innovation

2000

DeLorme forms a new Applied Geospatial Solutions line of business to develop affordable professional and business solutions.

2001

XMap professional product line released. This flexible, modular software and data combination expands the total GIS market.

2002

XMap HandHeld Street Atlas 2003 Edition is released—navigation software for Palm OS and Pocket PC handheld devices.

worldwide vector map data. The datasets can be viewed, annotated or GPS-tracked using XMap. The world-wide 3D satellite data layer is composed of pseudo-color seamless Landsat7 data draped over 90-meter SRTM data. The product is delivered on a 500Gb external hard drive, and comes with three Earthmate GPS units. TopoWorld is designed to be a toolkit for regional or global planning and to perform estimation tasks for logistics planning, land-use design, virtual exploration, or engineering.

Locally employed contract employees work on TopoWorld and 1:68,750 scale world-wide vector map data. Because the data represented by TopoWorld would require a physical globe a thousand feet in diameter, the globe exists only in cyberspace. Computers can perform 99 percent of the work, but the remaining one percent has to be done by humans. The contract employees also do something that DeLorme is good at: taking data and fixing it. This QA capability is part of DeLorme's value-add revenue stream.

It was never David DeLorme's goal to conduct business from a large corporate headquarters, but with 125 permanent employees and 50 contract CAD employees, a large building became necessary. Additionally, they also designed what is now the world's largest revolving globe (41 feet in diameter). As luck would have it, construction estimates also revolved and evolved: the initial quarter-million dollar cost grew to one million, and the initial six-month building schedule grew to two years. In spite of all that, the impressive structure now affectionately called "Eartha" is the focal point of DeLorme's building and a favorite of the thousands of tourists who stop by to visit the company store.

DeLorme's research has shown that among non-surveyors, people are seven times more likely to know about GPS than GIS. Having once worked on a survey crew himself, David DeLorme sees electronics bringing surveying and mapping ever closer together. The accuracy and detail in digital maps is always improving, and he sees surveyors using DeLorme's offerings to plan and organize jobs. When asked about the future, DeLorme said the company will continue to innovate in GPS, GIS and mapping.

From DeLorme's beginnings as a paper map provider in Maine, this privately-held company has grown to create digital products that span the globe. Under the guidance of David DeLorme, the company has successfully released many digital products. Reflecting back on the days of his kitchen table drawing board in the cabin in the woods, DeLorme explained that it wasn't about the money, but rather a desire to create solutions. "Everybody has the same questions," he said. 'Can I find my way? Or maybe a different way back?' The reason why we've done what we've done is to satisfy a spatial curiosity." I suspect the same can be said for many of us surveyors.

Marc Cheves is Editor of the magazine.

FROM A DOT PHOTOGRAMMETRIST

We provide aerial photography and topographic mapping for the DOT as well as other state agencies. XMap has really changed the way we plan, fly, and deliver final products. The process begins when we receive a project layout of an area to be mapped. Using PhotoFlight, we can easily and quickly lay out the flight lines for the photographic mission. The photo centers are calculated by PhotoFlight on the DEM so terrain is taken into account when they are planned. The planning file imports easily into a variety of flight navigation systems, so there no duplication of work. This is especially important for us as most of our work is considered low altitude photography, where terrain has a greater effect on the overlap of the photos. By using the DEM to calculate the photo centers, we can then use the GPS data with the camera's flight navigation system to trigger the camera. This means the photos we capture are positioned nearly perfect to what was planned. By maintaining this degree of accuracy we are able to plan where our mapping control points will be, download the control coordinates to a handheld GPS receiver, and if panels need to be placed the field personnel can put them in the precise location.

What does it all mean? We can plan projects faster, with a higher degree of accuracy and be confident the mapping control will be where it is supposed to be. The field work takes less time and we have far fewer re-flights.

It doesn't end there. Because PhotoFlight can put the photo and neat model outlines on the map, we can them provide an index map (either digital, hard copy, or both) to the customer so they can see exactly how the project was flown so finding a particular area on the photos is much easier as well.

The customer gets high-quality maps showing how the project was flown and it makes the entire planning and production process easier and more cost efficient! I am certain XMap and PhotoFlight have more than paid for themselves in saving of time, manpower, and quality of our delivered products. —by John Weaver, PennDOT

2003

Earthmate USB (WAAS enabled and submeter capable with post-processing software) is released; TopoBird airborne platform announces a collaborative effort to collect 3D imagery and vector models for all major metropolitan areas in the U.S.

2004

XMap/GIS Editor (an affordable, easy to use GIS) and Earthmate Blue Logger GPS (a Bluetooth Wireless Data Logger) are released.

2005

Earthmate LT20, a USB GPS receiver with software for under $100, is released.