

## EarthMap's images reflect health of crops, forests

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LONGMONT — Growing up on his family's farm north of Peoria, Ill., Greg Knoblauch often looked at the night sky and wondered exactly what was out there. He had no idea that his future career — or the agriculture industry, for that matter — would have any tie-in with the cosmos.

Today, Knoblauch has a different perspective on the relationship between space, technology and the crops on Earth. As president and chief executive of Longmont's EarthMap Solutions LLC, he is bringing a range of products that take the analysis of remote sensing imagery to a new level.

“We provide maps to help businesses or land managers make economic decisions regarding crop production or tree management,” Knoblauch explained. “What we're looking at is vegetative health. We measure chlorophyll content and plant health. The real key to this is having the digital information from the satellites to be able to compare one point in time to another point in time.”

### **Color-coded reports**

The company is focused on the agriculture, forestry and environmental sectors, with agriculture accounting for about two-thirds of sales since the company's launch in October 2004.

EarthMap sells its products direct and through partner agricultural companies of all sizes and uses imagery from such suppliers as Longmont-based DigitalGlobe Inc. and aerial photographers.

Pointing at a bird's-eye image of a California vineyard, Knoblauch described a color-coded map as the product of satellite images crunched by EarthMap's proprietary algorithms.

“The darker green, the better the crop is doing,” he said, noting that EarthMap's datasets are more accurate and have less noise than other analyses. A yellow shows stress.

“Some of these areas, they want to harvest those grapes differently because they carry a higher sugar content and make a premium grade of wine,” he continued. “In the past, guys used to go out and taste-test it until they found these spots.”

Compared with the status quo of wandering fields or studying standard images, EarthMap's methods allow for quicker diagnosis of sick plants. “Plants show their stresses a week, even two weeks before you visually can see it. We can sense that through these cameras,” Knoblauch said. “It's just like any of us getting sick: If we can find out that we have a disease very early, we can quickly treat it. It's the same with plants. If we find something early, you can quickly respond to it and protect your yields.”

EarthMap sells datasets to growers for \$3 to \$5 an acre, which can often save them \$10 to \$20 an acre by maximizing the harvest and minimizing inefficiencies, he said. A prime use is the precise application of fertilizer, especially important in a time when the cost of oil — the base for most commercial fertilizers — is near an all-time high.

The datasets also allow for more efficient use of pesticides.

“You reduce groundwater contamination,” Knoblauch said. “That goes the same for the fertilizers. If you apply just what the plants need out there, they use it all up and again you reduce groundwater contamination.”

In the forestry market, EarthMap’s products and services allow forest managers to more efficiently harvest lumber and replant trees. The company’s environmental analyses can detect the presence of pollutants on land that is to be remediated.

Jason San Souci, director of remote sensing applications for Colorado Springs’ Native Communities Development Corp., gave EarthMap high marks for projects on which the companies have worked together. EarthMap’s canopy density maps “worked very well” for a project that analyzed invasive species, he said. “It was a key enabling technology. They’ve definitely overcome some significant hurdles.”

The intersection of agriculture and remote sensing has defined Knoblauch’s career for more than 20 years. After graduating from Illinois State University with a double major in agriculture and economics, he worked for a regional cooperative through the 1980s before getting into remote sensing technology in Wisconsin. In the early 1990s, he worked at the Space Remote Sensing Center, a federal facility in Stennis, Miss., and in 1994 founded RESOURCE21 to commercialize remote sensing technology in agriculture from a Denver headquarters.

Knoblauch went to DigitalGlobe in 2000 and worked with the satellite imaging company as the vice president of the agriculture and forestry markets. When DigitalGlobe decided to move out of the applications market, Knoblauch jumped at the opportunity to strike out on his own and launch EarthMap. The startup was self-financed by the company’s employees, who now number six, but Knoblauch said the company will soon look for some outside funding to help accelerate sales.

EarthMap licenses algorithms Knoblauch and his staff had a hand in developing at DigitalGlobe and RESOURCE21. (The latter is defunct, its intellectual property now owned by Boeing.) “There’s about 12 years of work (behind the algorithms) we are using with this company,” he said. “As we move through time, we will build our own algorithms and enhance them.”

Chuck Herring, DigitalGlobe’s director of marketing communications, said DigitalGlobe wanted to focus on providing satellite imagery and have partners focus on value-added products. “We believe (EarthMap) is a high-value business partner. We’re pleased with their progress to date.”

Knoblauch said agriculture will remain EarthMap’s focus for the foreseeable future.

“The agriculture market is attractive because it’s renewable every year,” he said. And it’s huge. “Around 2.4 billion acres are in production around the world, and 1.6 billion of those acres are where you can use remote sensing.”

As the first growing season since EarthMap’s launch begins, business is good, with customers on four continents. “We’re very excited,” Knoblauch said. “We’re on the cusp of all of the crops in North America growing, and really getting into it.”