The Story of Regenesis Management Group: Balancing Water Use for Profit and Conservation

Jerd Smith

Denver-based Regenesis Management Group (www.regenmg.com) is developing an innovative water monitoring, analysis, and forecasting product that will allow farmers to use billions of gallons of water more efficiently, sell some of the excess to thirsty cities and power plants, and leave the rest of the water in streams. Regenesis hopes the system might support not only capitalistic concerns, but environmental concerns as well.

The company, founded in 2009, believes its suite of water management tools, known as the SWIIM™ System (Sustainable Water & Innovative Irrigation Management™), will help transform the way agricultural water is distributed, bought, and sold. Using about $1 million in start-up funding, a test farm on Colorado's northern plains, and a team of researchers at the United States Department of Agriculture and Colorado State University (CSU), Regenesis hopes to launch a beta version of SWIIM™ later this year.

"This is a way of solving the water crisis on the Front Range," said Ed Warner, a philanthropist and one of four original founders. "It's a crisis of culture – urban versus rural. It's a crisis of usage – use it or lose it, and dry up farms or manage for conservation and maximization of benefit to all water users."

In addition to Warner's work with Regenesis, he funded the Chairs of Geophysics and Economic Geology at CSU. He is known for his philanthropic work in natural resource conservation and in 2005, CSU named the Warner College of Natural Resources after him. The company's team also includes hydrogeologist and research director Robert Stollar who recently funded the Chair of Hydrogeology at CSU, water engineer and irrigation expert Stephen Smith, and Kevin France, a businessman with experience in water transactions.

A farmer typically only fully consumes a portion of his water right. While the rest eventually returns to the stream and satisfies other water right holders or keeps streams and man-made wetlands alive, there is still much that could be redirected and used by water-thirsty cities looking to identify their long range needs. The goal at Regenesis is to make this redistribution easier and faster.

The mission at Regenesis is a difficult one, in part because it hasn't been until fairly recently that new measuring systems – computer-controlled irrigation gates, networks of stream gauges, soil moisture sensors, and remote data gathering devices – have become affordable enough to allow farmers and irrigation companies to use them, and demand for such devices has increased with the increased demands for water use.

Kendall DeJonge, a graduate student in Civil and Environmental Engineering, installed soil moisture sensing equipment on the Regenesis research farm last Spring.

Photo by Stephen Smith with Regenesis Management Group

These changes are the foundation on which Regenesis is building new cropping and management regimes, where field-based water and crop data can be fed instantly into computers and stored in databases. Open and close commands for irrigation systems can be issued as soon as stream gauges change or soil sensors register a new reading. Annual water supply forecasts can be coupled with cropping plans, all to help farmers decide how best to use their water and to allow cities and industrial users easy entry to a nascent water market where farmers can sell the use of an acre-foot of water almost as easily as they can sell a bushel of corn.

Technology, however, isn't the only issue with re-allocating water to protect farms and streams. In Colorado and other western states, water laws make water marketing and leasing, as well as pure conservation, difficult. These laws also sharply limit the ability to move water from one use to another quickly. Both usually require expensive engineering studies and years in special water courts, proving

that the changes - from farm use to municipal or industrial use - aren't harming someone else's water rights.

"It's not that we don't have enough water," Warner said. "It's that our laws don't allow for enough flexibility" in how water is used and distributed.

If a farmer opts to use only 3,500 acre-feet of a 4,000 acre-foot consumptive use water right, and leases the remaining 500 to a city, he must prove definitively that he really had a consumptive use right of 4,000 acre-feet. Otherwise, the sale of that 500 acre-feet would represent an expansion of his water right. That's illegal in Colorado and many other western states operating under prior appropriation. Lawsuits over consumptive use are common, long, and expensive, because if you've expanded your water right by misstating the consumptive portion, that means someone else's right has been diminished.

This is where Regenesis hopes to make its mark by combining precise measurement with in-depth, computerized record keeping, powerful databases, and easily accessible water models whose accuracy and data can be verified by regulators and those who want to buy or lease water. Regenesis' France said the company doesn't envision any need to change water law. Rather it hopes to minimize the amount of time farmers and cities must spend in court to transact sales and leases while creating an efficient system to manage these transactions in the long term.

Regenesis believes it can do that using the SWIIM™ System and educating farmers and cities about new options and cooperation potential. It is the difference between spreading water over a field and using rough numbers to determine amounts applied and amounts used and running a carefully controlled, carefully monitored agricultural plumbing system that can generate data-driven reports on the hour, leaving little to guess work and best estimates.

Regenesis co-founder Stephen Smith – an irrigation expert – has spent 35 years observing and solving the problems inherent in irrigation systems. He, with the help of the U.S. Department of Agriculture and CSU, has been instrumental in developing a unique set of tools that allow farmers to sit down at their desks, open an application on their computers, and observe how their crops are performing, how much water is being applied to a field, how much water the crops are actually using, how much water is likely to be available from snowpack in any given year, and as a result, what the demand will be for this scarce resource.

In a dry year, if water is scarce and water prices high, farmers could develop a significant revenue stream by parting off a piece of their water for lease to a city. At the same time, cities save money because they won't need to develop a new dam and reservoir to meet demand. And streams benefit because no one needs to take more water from their flows.

There are a number of new cropping methods Regenesis is utilizing in its water models. Traditionally, cities have purchased farms outright and taken the water off the land, storing it in their reservoirs. More recently, farmers have begun implementing rotational fallowing plans, where, depending on agreements with urban areas, they have opted not to plant certain fields and crops in a given year, fallowing some lands, and selling or leasing the unused water to a city. Under new planting regimes, researchers working with Regenesis are looking at something known as "deficit irrigation." With this technique, new soil sensors and other climatic monitoring devices help farmers cultivate healthy crops with less consumptive use water. Using all the above planting techniques gives farmers more flexibility in deciding which crops to plant each year and to make an existing asset – water – yield more revenue.

"We want farmers to be able to look at a computer and understand what their options are. We're putting together technology options they can understand. They look at the computer and say, "Here's my farming operation. Here's how I might operate in the future. What does that look like?" Smith said.

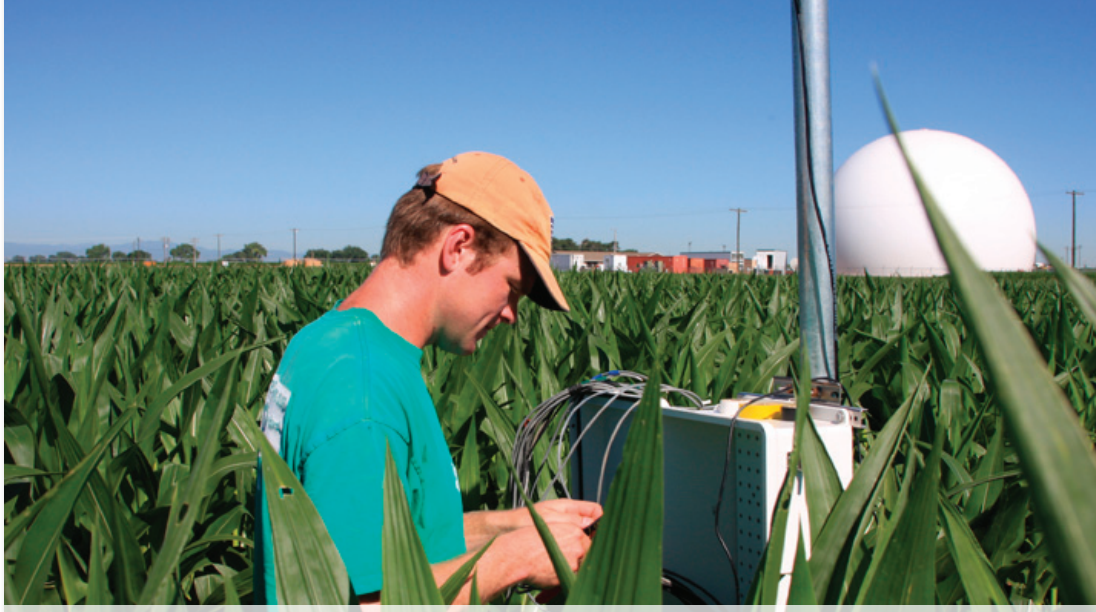
The market for such a product has huge potential. While the product is likely to be attractive worldwide in the future, global warming, population growth, and semi-arid climates make the American West an ideal proving ground.

Part of the instrumentation on the Regenesis research farm includes an internet-accessed camera that records plantwater stress at multiple times during the day.

Photo by Stephen Smith with Regenesis Management Group

Regenesis first plans to focus marketing efforts on 10 test states: Colorado, California, western Nebraska, Utah, Idaho, New Mexico, Arizona, northwestern Wyoming, Nevada and Texas. Within these states, more than 500,000 farms operate and about 33 million acres are irrigated, France said. Water laws are strict, and demand is growing.

"In these areas, there is high pressure for alternative use, where sharing water has become an actual need. We think these states have need and provide a ripe opportunity," France said.



Jonathan King, a graduate student in GeoSciences, is shown completing the wiring for six drainage lysimeters that monitor subsurface return flows under the research plots.

Photo by Stephen Smith with Regenesis Management Group

Even with SWIIM™, transferring water faces challenges. Pipeline and storage systems must be used and for farms in remote regions, new delivery systems must be built or exchanges initiated. But perhaps the greatest challenge, the SWIIM™ System founders believe, is convincing lawmakers, regulators, cities and farmers, that the concept and system are sound.

Irrigation manager Don Magnuson with Cache La Poudre Management Co. said he thinks the SWIIM™ team has most of the engineering, scientific and financial expertise it takes to make the company a success. "But there is a lot of skepticism among farmers, water lawyers and regulators," he said. "That's the major challenge, but if you have good documentation, it can be done. The science and the financing is always easier than the people."