

## 4-H teens use geospatial technology to solve water management issue

### The Situation

Declining groundwater supplies and fluctuating surface water availability for irrigation in the arid environment of south Idaho are deeply concerning factors for the people and economy. One community in particular in the Big Wood Canal system has been dealing with water shortages for decades, since the development company grossly oversold the land to be irrigated. In addition, the amount of water available during the irrigation season is not consistent from year to year, making it difficult for farmers to predict what crops to grow based on water availability. In 2007, Lincoln County stakeholders and University of Idaho Extension created a Water Team with the mission to use research-based data to better manage water for the future. Since 2007, the Water Team and the Big Wood Canal Company (BWCC) have created 17 recommendations to help reshape canals, reduce water losses, and encourage water conservation. In order to continue the wise water-use, a more complete spatial database of the Big Wood Canal system was needed for organizing, mapping, analyzing, and planning water needs for the future.

### Our Response

Extension Educators involved 4-H teens in a series of geospatial technology workshops to help solve the water management issues in Lincoln County. The teens used geospatial technology, such as Global Positioning Systems (GPS) and Geographic Information Systems (GIS), to spatially mark and map canal headgates and canal laterals in the Little Wood District of the Big Wood Canal system. Through workshops, the Extension Educators taught teens the following:

- How to use a GPS unit to collect data



Teens used GPS units to collect canal headgates and canal lateral data in the Little Wood District of the Big Wood Canal system. Photo by Christi Falen.

- How GIS is used to help solve real world problems
- Creating useful irrigation maps from GPS data in ArcGIS software

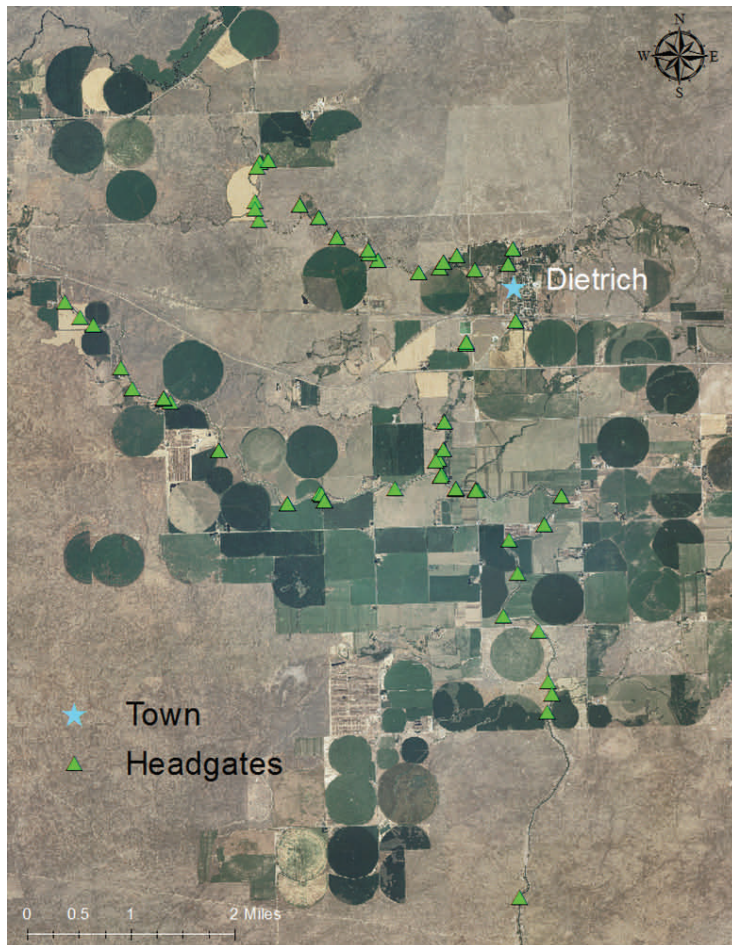
Over the course of the summer, the teens spatially marked 150 headgates and over 5 miles of canal lateral data in the Little Wood Canal system. Using the data in ArcGIS, the teens created irrigation maps for the BWCC. The teens finished their leadership project by presenting the data they collected and the irrigation maps to the BWCC employees and board members.

### Program Outcomes

The collected spatial data was contributed to the BWCC's GIS database. The GIS database helps to organize and store water data not only for the BWCC but the Idaho Department of Water Resources (IDWR) in Boise. The BWCC manager, Lynn Harmon, said the spatial data and irrigation maps

will be useful to “help us predict whether we have enough water so local growers can plan for partial or full season crops. What these teens did is very impressive and will save us a lot of time. With headgates numbered, emergency management of canals and ditches are simpler and faster to locate.”

Through the geospatial workshops, teens gained knowledge in a field providing high paying jobs. Danielle Favreau, GIS Analyst for the IDWR said, “this Extension program has not only helped the county and state, but it has given these kids an incredible addition to their resume.” For example, a GIS Coordinator position in Twin Falls is currently paying \$38,090-\$56,264 with a college degree or three years of experience. One teen is already taking college courses in GIS and building on this advanced job skill.



Map created by teens showing the previously un-marked canal headgates in the Little Wood Canal system. Map created in ArcGIS.

### **The Future**

After seeing the use of the collected spatial data and the irrigation maps created by the 4-H teens, the BWCC plans to have all or most ditch riders collect spatial data on the canal

system. As a result, University of Idaho Extension Educators were asked to teach two geospatial trainings to the BWCC employees.

### **FOR MORE INFORMATION**

**Lauren Hunter**, Extension Educator  
University of Idaho Extension, Blaine County  
302 First Avenue South  
Hailey, ID 83333  
Phone: 208.788.5585  
Fax: 208.788.5587  
E-mail: lhunter@uidaho.edu

**Christi Falen**, Extension Educator  
University of Idaho Extension, Lincoln County  
201 South Beverly  
Shoshone, ID 83352  
Phone: 208.886.2406  
Fax: 208.886.2407  
E-mail: cfalen@uidaho.edu

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