

**Establishing Partnerships in Northern Colorado:**  
**Aims Community College Students Serve The Local GIS/GPS Community**

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**Abstract:** Aims Community College GIS/GPS students in Greeley, Colorado, may earn a two-year Associate of Science degree in GIS/GPS technology or a state-approved Colorado GIS/GPS certificate at Aims. These students work with the Weld County community in solving real-world problems. Examples include assisting Weld County Fire Department in establishing a fire training facility on donated land, using GPS and ArcGIS to catalogue rare trees at the University of Northern Colorado, improving the Aims College facility by proposing a modified infrastructure. Students also have worked for the City of Greeley Planning Department in digitizing one square block (NDDs neighborhood development districts) around major intersections and calculating the percentages of different zoning within each square mile. Because of its established relationship to the community, Aims has been able to place many of its students with the City of Greeley as well as Weld County Government as interns, present and future employees. In addition, students can opt to complete a four-year degree in spatial information management or applied geography at local universities while working for the City of Greeley, North Weld County Water District or Weld County Government. This program demonstrates the true value of a community college as the community helps and is helped by the college in satisfying identified community needs.

**Paper Body:** Aims Community College (ACC), counting 15,000 students and three campuses, lies along the Front Range of the Rocky Mountains 50 miles north of Denver in Greeley, Colorado. In 1998, ACC was awarded a prestigious National Science Foundation (NSF) grant to institute a new Geographic Information Systems (GIS) program. The competitive grant was part of the NSF Instrumentation and Laboratory Improvement Program, Division of Undergraduate Education. Since 1998, the GIS program has evolved into two content areas covering both GIS and Global Positioning Systems (GPS) offering both an Associate of Science (A.S.) Degree and a Colorado State Approved GIS/GPS Certificate.

The A.S. Degree in GIS uses computer technology to solve geographic questions and is designed to introduce students to the application and analysis of spatial data in the natural and social sciences. The GIS/GPS Certificate which students can complete in 31 quarters of course work serves two student populations: (a) those supplementing an existing 2 or 4 year degree (b) those seeking to update technical and career skills. Thanks to articulation agreements with Colorado State University, students are able to transfer GIS and natural science credits in a timely manner without delay

The A.S. Degree in GIS consists of 90 quarter credit hours to include 200 hours in spatial mapping, GIS applications, and GIS/GPS field study, as well as an optional internship (exceeds the 200 hours). The Spatial Mapping Techniques course (GIS I) provides an overview of computer mapping, cartography, and the management of spatial data. It is during this class that students become familiar with ESRI desktop GIS products such as ArcView and ArcInfo. Students demonstrate proficiency through basic individual

projects and tutorials. This course emphasizes the integration of GIS in a natural or social science context.

The second course, GIS Applications (GIS II), gives students the opportunity to research and solve problems whereby they identify, store, update, analyze, and display information. This course focuses on the design and implementation of complex GIS solutions in the public sector. Student projects simulate real world situations where GIS applications are commonly used. Various public and private agencies and municipalities within Weld and Larimer County governments, and the City of Greeley (planning, traffic, police, water resources, and parks departments) are able to utilize Aims GIS students and their knowledge to assist in the creation and analysis of spatial data for decision making and future planning. Examples include the City of Greeley Neighborhood Development Districts (NDDs) whereby students digitized one square mile blocks around key intersections throughout the city. The NDDs were then used to analyze the percentages of zoning types within each square mile. City of Greeley Police and Traffic Departments provided GPS and GIS data to students on individual street lights throughout Greeley. The students went out at night and calculated a light pattern radius using random sampling for each light type and wattage. The sample radius were used to buffer all lights in the city. The buffer areas were compared to larger areas to determine poorly lit areas throughout the city. Additionally, crime data for a three year time period was collected from the Police Department and plotted on the map for two separate neighborhoods. The data and maps are used by both departments for decision making purposes regarding police patrol and street light maintenance/inventory (presentation map1).

Other GIS applications projects include a population study with data provided by the Larimer County Office on Aging. Students generated choropleth, dot density, and proportional symbol maps of the population distribution age 50-64 and 65 and over by census block group. Other maps were generated to show distance from health care providers and hospitals (presentation map2).

The Poudre Valley Health System in Larimer County provided students with data to generate choropleth maps showing patient distribution by categorizations and length of stay. Additionally, maps showing Market Areas were generated and categorized by zip code. These data and maps were used by the Poudre Valley Hospital CEO at presentations in New York to acquire \$150,000,000 dollars to build the new regional hospital in Loveland, Colorado (presentation map3).

The capstone course, GIS/GPS Field Study (GIS III), provides students with intensive GIS and GPS hands-on experience. Students participate in a 90-hour GPS field camp conducted off campus which is project based. Students learn how to design and implement GPS projects that can later be used for GIS analysis. Using Pathfinder Office software, Terrasync, Trimble Pro XRS and GeoXT GPS units, students design and manage data dictionaries, collect data, post process, and export to ESRI Desktop GIS. A sample field study project includes a collaborative effort among ACC, Eastman Kodak, and selected Northern Colorado Fire Departments. Eastman Kodak donated a parcel of land to be considered as the future site of a regional fire training facility for Northern Colorado. The topography, drainage, landuse, existing and future structures, National Heritage Conservation Areas, roads, and utilities were all mapped using GIS and GPS to analyze whether or not the parcel was adequate for such facilities. Students presented completed maps to Kodak and the fire departments (presentation map4).

Another interesting project was needs based as Colorado is suffering from a severe drought. The City of Greeley parks and water resources departments partnered with Aims students in 2002 to strategize a water conservation plan for two Greeley parks. This analysis served as a model for additional parks in the area. Students collected GPS data showing sprinkler heads, irrigation lines, trees, tree drip lines, shrubs and bushes, and grassy areas and exported data to GIS for water distribution and allocation analysis within the selected parks (presentation map5).

Additionally, Aims students have the option of completing a 100 hour GIS internship. Based on the successes in the previous GIS classes, a number of students are (and have been) placed in various agencies and municipalities where they can further their GIS and GPS skills.

The hands-on training and the completion of projects have given students the confidence they need to perform successfully in a real world setting. Students have also learned the importance of integrating natural resource issues and GIS.

**Acknowledgements:**

Data for these projects were supplied by the City of Greeley GIS, Traffic, Water Resources, Planning, Parks, Police Departments, Weld County GIS, Larimer County Office on Aging, Poudre Valley Health Systems, National Heritage Program, Eastman Kodak, and the University of Northern Colorado

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