Third-quarter newsletter for the Denver Regional Data Consortium.

No Images? Click here

The data consortium consists of Denver Regional Council of Governments members and regional partners with an interest in geospatial data and collaboration. The data consortium newsletter improves communication among local geographic information systems professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

DRDC survey results

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

Over the summer, DRCOG conducted a survey of the Denver Regional Data Consortium to better understand how we can serve you through collaborative projects, meetings and newsletters.

Here are some highlights:

- DRCOG's most important data consortium role – and one for which we are uniquely qualified – is facilitating projects to acquire data. Among respondents, 74 to 79 percent rated DRCOG facilitation of the Denver Regional Aerial Photography Project, planimetrics and LIDAR as "very valuable."
- The majority of respondents are "very satisfied" with the frequency and length of our meetings and newsletters, but only "mostly satisfied" with content. More member content, as opposed to DRCOG content, is a suggested as an improvement, but 78 percent of survey-takers said they would prefer not to contribute.

- 68 percent voted to allow vendors to present at meetings if they didn't give a sales pitch.
- 90 percent voted for DRCOG to continue offering remote attendance options (but 68 percent said remote participation decreases collaboration).
- 63 percent voted for DRCOG to facilitate other types of networking and collaboration opportunities.

Based on the results, DRCOG has developed the following plans for improvement:

- a new way to submit articles: Let us interview you and we'll write the article!
- a new newsletter section: "Meet a local government GIS department."
- a new 2018 meeting schedule to accommodate socializing and encourage in-person attendance
  - spring meeting: 11:30 a.m. to 1:30 p.m. with catered lunch (and a potential vendor presentation)
  - summer meeting: 3 to 5 p.m., followed by happy hour
  - fall meeting: 10 a.m. to noon, followed by a technical workshop
- a new data pursuit: routable street centerlines

Join us for our next meeting Nov. 9 to learn more.

Note: Results are from 19 respondents out of 252 survey recipients.

Denver Water landscape classification project

Article submitted by Robert Stansauk, GIS supervisor, and Phillip Segura, division senior analyst, at Denver Water. Robert and Phillip can be reached at robert.stansauk@denverwater.org or phillip.segura@denverwater.org.

Background

Roughly 40 percent of the water Denver Water treats is used outdoors (irrigation, for example). We have the data necessary for accurate billing based on our rate structures. However, when it comes to better understanding water use behavior we have lacked information about landscape

preferences and trends which have a huge effect on decision-making. The landscape classification project provides robust data to aid in the decision-making and planning processes by many of our groups.

At a high level, this data allows us to understand trends in water use and prepare for factors which will have a major effect on our system such as climate change and population growth. Denver Water can now understand the unique characteristics that affect water use for the individual customer, giving us the ability to help them use water efficiently.

Specifically, this data helps:

- our Conservation group measure water use efficiency
- our Demand Planning group understand customer water use and how it could change in the future, which in turn helps with facility sizing requirements
- our drought response by knowing which customers may be able to achieve reductions
- us understand water reuse based on water rights
- us evaluate customer response to potential rate changes (for example, affordability)

Process

We began by using the 2014 Denver Regional Aerial Photography Project imagery and 2014 planimetric data. We use Earth Resources Data Analysis System (ERDAS) Imagine and ERDAS Objective to classify the imagery by neighborhood (one neighborhood at a time). We use Esri for most of the pre- and post-processing. To date we have completed north and south Park Hill.

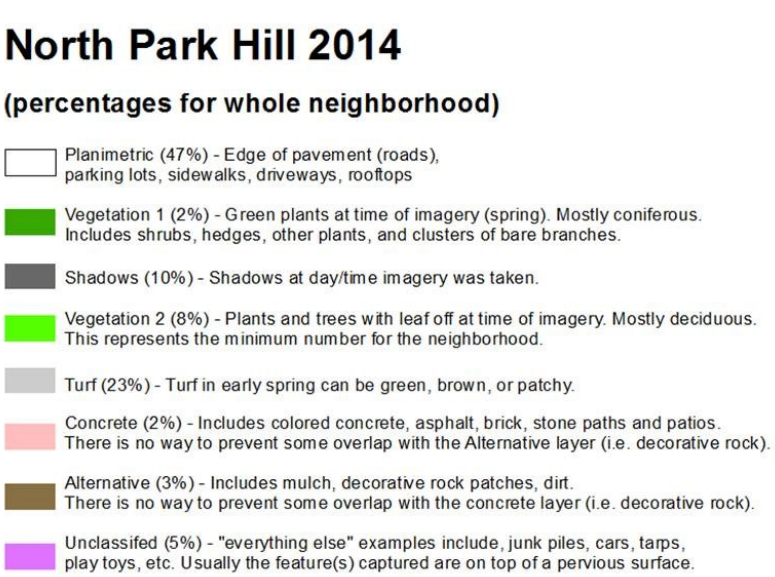
The general workflow is:

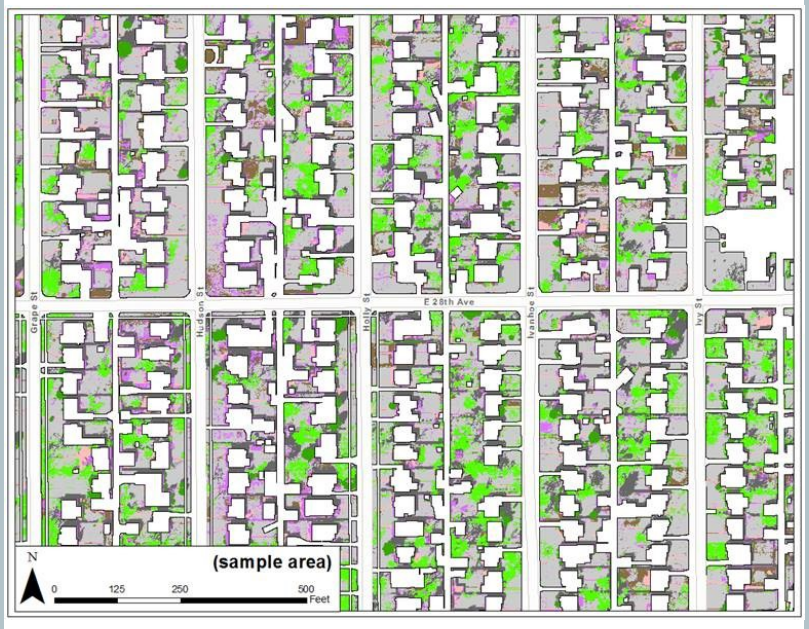
1. pre-processing
- select and merge planimetric features by neighborhood
- create image mosaics
- create classification .aoi files for ERDAS

2. classification
- use ERDAS Objective to classify individual layers (vegetation, shadows, turf, concrete, alternative and unclassified impervious)

3. post-processing
- perform quality assurance on each layer
- merge all layers into a topologically clean vector layer

Results





Summary

Several enabling components came together simultaneously to make this project possible, including 1) DRAPP imagery 2) DRCOG planimetric data 3) a customer focus in our strategic plan and 4) a new model for tracking customer characteristics developed in our Conservation section.

There were also two important keys to our success. First, ERDAS Objective was the right tool for us. It classifies the

image by emulating the human visual system for image interpretation. It uses machine learning and interpretation cues (for example, shape, size, spectral, texture and associations) – not to mention all the other functionality that comes with ERDAS Imagine. The second key is the quality assurance process. The layers we are creating have similar and overlapping spectral signatures (for example, sometimes old mulch can look like dead grass, or a concrete patio might be stained with a natural color that looks like some variation of dirt). These characteristics make it necessary for Denver Water staff to review and edit the results.

Register for LUCA and attend a technical workshop

The U.S. Census Bureau will hold a technical workshop for the Local Update of Census Addresses at DRCOG the morning of Dec. 12.

LUCA is the only opportunity offered to tribal, state and local governments to review and comment on the U.S. Census Bureau's residential address list for their jurisdiction prior to the 2020 census. The program for the 2020 census was introduced in January 2017. Registration for the LUCA program began in July and ends Dec. 17.

The technical workshop is designed to help local address coordinators, GIS practitioners and local planners understand the LUCA process and how they will participate in the program.

Census staff will discuss and demonstrate:

- LUCA program timeline
- participation options
- LUCA data format
- use of the U.S. Census Bureau's Geographic Update Partnership Software (GUPS) based on QGIS
- use of ArcGIS and Microsoft Excel

Participants can expect a detailed view of the process including a technical discussion on address lists and GIS data processing. Participants will spend several hours reviewing sample data using live software and discuss the U.S. Census

Bureau's geocoding tool as part of the process. While not required, attendees may bring their own laptop, ArcGIS, Microsoft Excel and local address list to explore LUCA processing options. Presenters will demonstrate a prototype but are unable to distribute the U.S. Census Bureau's GUPS tool.

Preregistration is required.

REGISTER

Turning 'dead end' sign asset data into an asset inventory

Article submitted by Ryan Huffman, geographic information systems/database systems analyst at Arapahoe County. Ryan can be reached at 720-874-6685 or RHuffman@arapahoegov.com.

Arapahoe County's Road and Bridge Division was recently in a tough situation. We were faced with a shrinking budget, aging sign assets and a pressing federally mandated deadline for sign retroreflectivity compliance.

We desperately needed to collect data on the county's solid inventory and develop a sustainable way to keep it current. The next step was to use the collected data to accurately budget for and plan sign and post replacement.

The resulting project involved a great deal of staff collaboration and included technical innovation. Such innovations included barcoding all signs using rugged tablets with sufficient GPS receivers. Staff coupled a robust mobile software package with web map services to handle complexities in robust data attribution and offline mapping.

In 2017 we passed an important milestone: 13,547 sign and 5,746 signpost active asset data records were brought online within the asset management system. As a result, the Road and Bridge Division was able to better understand the type and location of assets. Further analysis of the data allowed county staff to achieve compliance and better allocate their budget. Most importantly, Arapahoe Country made

improvements and ensured the safety of its roadways. The project involved considerable collaborative effort, and has set the standard for future endeavors.

DRCOG performs economic analysis for City of Golden

Article submitted by Xavier Gitiaux, economist at DRCOG. Xavier can be reached at 303-480-5642 or xgitiaux@drcog.org.

DRCOG's Regional Planning and Development team recently conducted a pilot to tailor data analysis to the needs of local governments. The pilot supports investment decisions in smaller communities by reviewing data within the local context and comparing macroeconomic trends and local opportunities.

Regional Planning and Development staff applied the concept to the City of Golden in partnership with its Downtown Development Authority. Robin Fleischmann, redevelopment specialist for downtown Golden, explained that "the City of Golden wanted to tailor its economic development strategy for the local business community and the generally available employment and wage data was not specific enough for that purpose. Knowing that it has economists on staff, Golden approached DRCOG for help."

Using the Longitudinal Employer-Household Dynamics data, the American Community Survey and the American Community Survey Public Use Microdata Sample, the Regional Planning and Development team discovered that manufacturing, although shrinking, remains the leading employment sector in Golden. But the team discovered most current economic growth is fueled by the professional and technical services and leisure and accommodation sectors. The analysis highlighted the extent to which Golden's

employment market relies on commuters from east Denver, Lakewood, Wheat Ridge and Arvada, and how current constraints on the housing market in Golden might limit future job growth. Fleischmann finds this information useful "to refine local economic development policy and incentives including tax increment financing, business grants and community partnering."

Regional Planning and Development staff will expand the pilot to other small communities since the effort aligns with DRCOG's objective to inform local strategies with data and make connections among local contexts and regional economic and demographic trends.

Join the 2018 Denver Regional Aerial Photography Project

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

After much coordination and planning, the specifications for the 2018 Denver Regional Aerial Photography Project (DRAPP) are final. The upcoming project – to be flown in the spring and summer of 2018 – will include **double the amount of 3-inch resolution imagery** in the metro area's urban core. In addition, the project will produce the same high-quality deliverables of past projects that are snow- and leaf-free, minimize building lean and shadows, and meet industry standards for positional accuracy. Read more in our handout.

There is still time to become a DRAPP 2018 project partner. If you represent a public entity interested in the project, contact Ashley at 303-480-6746 or asummers@drcog.org for a quote.

Contributing 600,000-plus building roofprints to OpenStreetMap

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

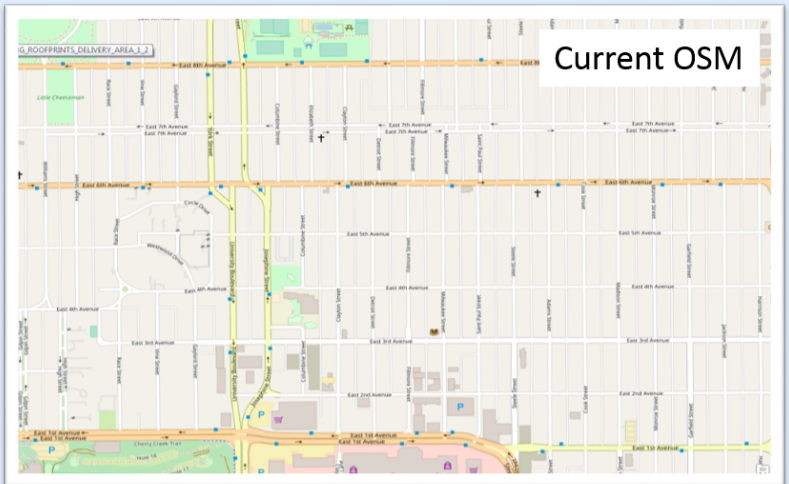
DRCOG, on behalf of 21 partners in the region, completed the Denver metro area's first-ever regional planimetric project in June 2016 (based on 2014 aerial imagery). The contributing partners agreed to publish data immediately in the public domain, so DRCOG made it available for free download from the Regional Data Catalog.

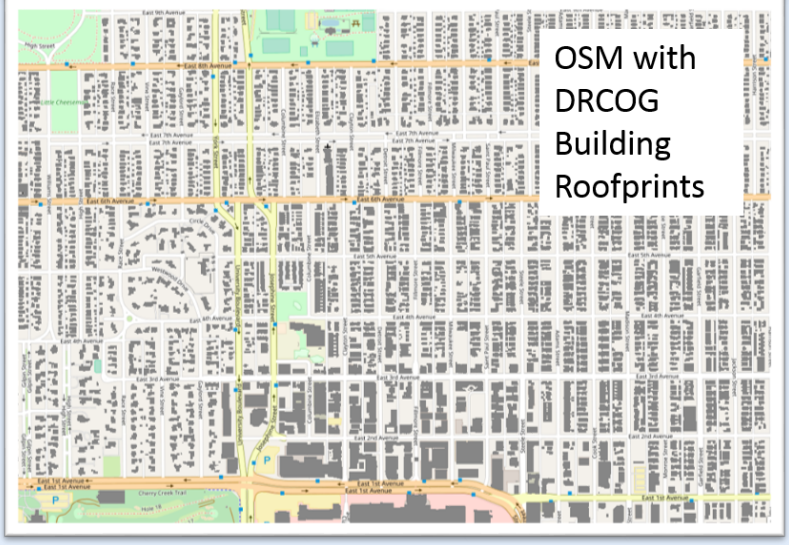
To maximize the usefulness of this detailed data, the DRCOG team also decided to provide the data to OpenStreetMap (OSM). Although we have several planimetric features, we decided to start with contributing **more than 600,000 building roofprints** in the Denver metro region. DRCOG reached out local OSM volunteers for guidance on making planimetric features available. Over the next year, we documented our plan, prepared our data for import and finalized licensing language consistent with the OSM model.

An important consideration was that bulk imports into OSM are not preferred, as they might overwrite previously contributed data. To ensure that existing data was preserved, we determined that our data would need to be checked in by volunteers instead of uploaded all at once. OSM volunteers spent a considerable amount of time configuring a Tasking Manager that divides the data into chunks that can be individually vetted and approved.

DRCOG and the OSM volunteers will discuss the project at the State of the Map Conference in mid-October.

Later in the year, we will host mapping parties to encourage communities to submit data. Stay tuned for an invite!





Your article goes here!

The Denver Regional Data Consortium newsletter is facilitated by DRCOG but written by GIS professionals like you. This quarterly newsletter reaches more than 200 people and has a higher-than-average open rate. It's the perfect place to show off your projects, highlight your great work and contribute ideas to the GIS community in the Denver region.

Newsletter release dates are Jan. 15, April 15, July 15, and Oct. 15 (or the next business day). Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org to contribute.

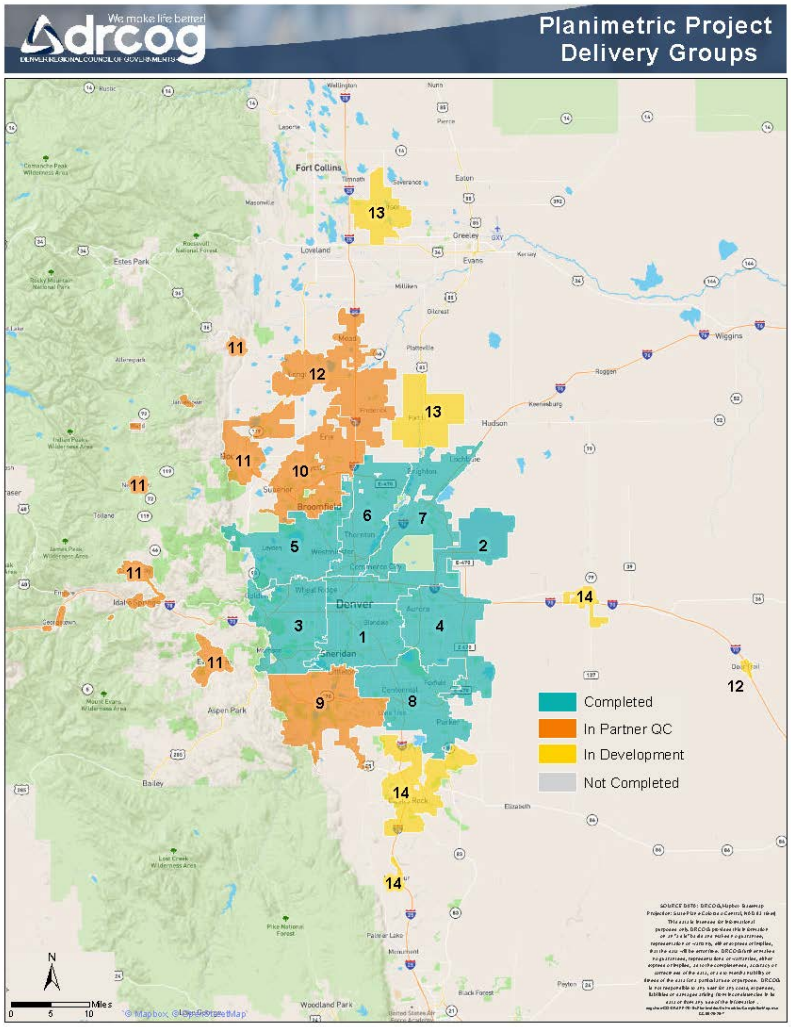
Things you might have missed

- DRCOG featured on the Cesium blog

- Check out a graphic summary of RTD's Quality of Life Report. Read more on the RTD website.
- Fall DRDC meeting: Nov. 9

New and updated resources in the Regional Data Catalog

- Crash data 2014
- Planimetrics 2016: See our progress on this project! Note: Data is being delivered on a rolling basis. At the end of the project in December, we will upload a final, compiled data set for each feature.



The DRCOG information system team has slowed down on adding content to the Regional Data Catalog while we work on a new version of the application. We intend to improve discovery of data and maps by:

- categorizing information in an intuitive way
- adding new data sets that are specific to DRCOG's areas of expertise
- standardizing naming conventions and keywords
- employing more flexible search methods
- allowing users to sort and filter results by topic, date, format
- advertising new additions and popular downloads
- adding web maps to the map gallery
- improving navigation between the Regional Data Catalog and other DRCOG web properties

Stay tuned for the new site soon.

Pop quiz: Can you answer this question about the region?

Which two cities have the largest combined population?

> a) Parker and Glendale
> b) Commerce City and Bennett
> c) Castle Rock and Mead

Hint: Use DRCOG's Community Profiles.

If you know the answer, respond to Christine Connally at cconally@drcog.org. The first to respond with the correct answer will be recognized in the next newsletter. Also, Ashley will treat you to a beer (or beverage of your choice) at our next happy hour. Good luck!

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact Ashley Summers, DRCOG information systems manager, at 303-480-6746 or asummers@drcog.org.

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