DENVER REGIONAL DATA CONSORTIUM

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.

Castle Rock launches snowplow tracking system and website

Article submitted by Mark Maloney, information technology project manager, and Amy Hart-Dayton, GIS manager, at Town of Castle Rock. Mark can be reached at 720-733-3515 or mmaloney@crgov.com and Amy can be reached at 720-733-3550 or ahart@crgov.com.

The Town of Castle Rock is always looking for ways to improve services provided to its residents. The recent deployment of PlowOps, its semicustom snowplow tracking system, helped with that initiative. The solution was developed by NeoTreks, Inc., a Castle Rock-based software development company, to specifically meet the town's plow tracking needs.

When a snowstorm begins, plow truck drivers step into vehicles set up with GPS receivers and cellular-enabled Samsung tablets mounted to the dashboards. The technology sends real-time data to a central office, where operations staff use the PlowOps mapping console to manage response.

The real-time data also feeds a public website so residents can see where the plows have been and how much time is expected before their street is cleared. HTML and JavaScript were used to create the site, in addition to live web map services. The mapping site is featured on the Castle Rock website.

In addition to showing the location of a snowplow, the PlowOps tool includes a paperless driver vehicle information report, the beginning and end mileage of each driver's shift and options for drivers to report obstacles in the road (including the obstacle location), such as utility holes and crashes, with a non-intrusive tap on the tablet.

Future PlowOps capabilities include measuring plow up and plow down times, measuring the volume of salt and sand spread on the road, the dynamic creation of street sweeper routes derived from locations where salt and sand were dropped and metrics to allow for more active and accurate oversight of the town's snow plow operations.

NeoTreks specializes in map-oriented technologies, both custom and off the shelf. Their corporate office is located in Castle Rock, Colorado, with a branch office in the Czech Republic.
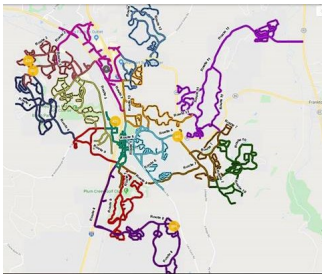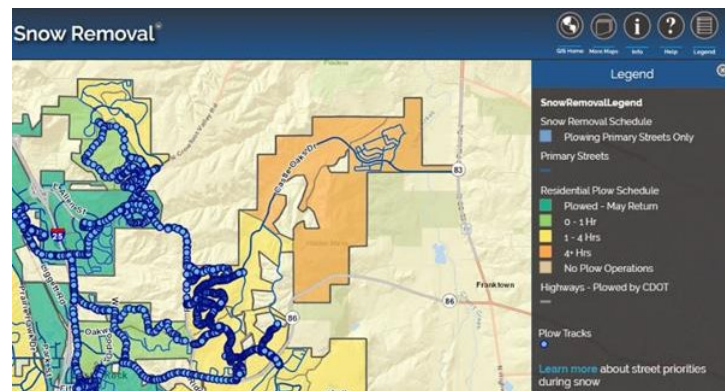
Figure 1: plow routes

Figure 2: public website

Conservation planning application uses DRCOG regional land cover data

Article submitted by Claudia Browne, ecologist, and Chris Rehak, GIS specialist, at Biohabitats. Claudia can be reached at 720-907-6556 or cbrowne@biohabitats.com and Chris can be reached at crehak@biohabitats.com.

Purpose: The High Line Canal Conservancy's stormwater transformation project is helping revitalize a 70-mile linear park-like amenity in the Denver metro area. As part of a recent Pisces Foundation grant, Biohabitats assisted the conservancy in conducting an opportunity analysis along the canal to evaluate the stacked benefits for water quality, habitat and social improvement projects. DRCOG's 1-meter regional land cover data, from the Regional Data Catalog, provided information about habitat connectivity, habitat quality and stream- and lakeside vegetation across the six jurisdiction project area.

Overview of analysis approach: Although the canal is a man-made feature, the analysis

was based on it serving as a riparian-like (stream side) habitat for birds, pollinators, reptiles and small mammals. Initial evaluation of habitat quality and connectivity was therefore completed by aggregating multiple cover classes from the land cover dataset and filtering the information to only include areas within a ¼-mile riparian buffer of the canal (see figure). The vegetation land cover data was then quantified along canal reaches to determine the total acreage of each vegetation type and the riparian-like habitat areas. The analysis results provided valuable information for comparing riparian habitat quantity and quality along the canal (see figure), and for identifying areas where ecological values could be improved or protected. The results were integrated with water management opportunities and social vulnerability mapping to develop concepts for stacked management approaches with the greatest benefits for wildlife, habitats and people.

Potential future opportunities and next steps: Across the country, there is an urgent need for improved conservation and restoration planning to reduce the rapid loss of habitat, as evidenced by recent reports of national bird population declines. An integrated land and water planning approach is also critical for watershed protection and climate resiliency. Local, high resolution land cover data provides a bridge to implementation for planners. For example, future analysis proposed by the Denver Metro Nature Alliance will focus on habitat prioritization and connectivity by summarizing vegetation classes, defining focal species and determining thresholds for habitat patch size to support the focal species. The information would be used to define and locate core habitats across the project area, representing the main hubs of habitat connectivity and areas where high biodiversity likely exists. Any remaining non-vegetated classes from the 1-meter planimetric data are then converted into a layer representing barriers that can impede movement of the focal species (roads, buildings, parking lots). This information can then be used in connectivity analysis software, which uses algorithms from electronic circuit theory to predict connectivity in heterogenous landscapes. These connectivity predictions, along with the identification of pinch-points, provide valuable information for locating areas with conservation and restoration potential.

Given the importance of conservation, restoration and other nature-based solutions for maintaining ecosystem functions and climate-resilient communities, the availability of high resolution land cover data will be integral to supporting these efforts in the future.

For additional information, feel free to contact Claudia Browne or Chris Rehak.

click to view full-size image

Highline Canal Segment Example
High score riparian vegetation and connectivity in buffer

Highline Canal Segment Example
Low score riparian vegetation and connectivity in buffer

The Data to Policy Project wants your questions!

Article submitted by Diane Fritz, geospatial services specialist at Auraria Library. Diane can be reached at diane.fritz@ucdenver.edu.

The Data to Policy Project (D2P) is an initiative hosted by Auraria Library to engage students with their community needs through course-based assignments, which culminate in data-driven policy proposals to local governments and agencies. The D2P project is open to any students from the University of Colorado Denver, Metropolitan State University of Denver or Denver Community College who want to use public data for public good, regardless of whether they are in a D2P class, pursuing an independent study project, or exploring the work for fun. (This happened last semester with the Machine Learning Club!) Participating faculty from a variety of disciplines encourage students in D2P classes to apply open data to building evidence-based policy proposals, enhancing the learning outcomes in their courses. Although some students' topic selections are self-selected, many students desire to work on pressing projects and issues identified by the community.

This is where you, the community, can help! The Data to Policy Project invites questions and topics the students can select for their semester-long projects. In turn, the students may derive novel perspectives and solutions that can help your organization or cause.

The D2P website has a submission button for **community questions** on the homepage. Incoming questions are reviewed by the D2P committee before being offered as subject

options to the students. D2P will work with you to tailor the questions for participating semester long courses. If you have supplementary data pertinent to answering the questions, D2P can supply it to the students as well. The D2P symposium occurs every semester, and students start looking for specific questions and datasets a few weeks into their classes. **Please submit your questions before the end of January** to get them in front of students for spring 2020. (Note: Questions can be submitted at any time and are kept for following semesters.)

Please reach out to Diane if you have any questions about the process or want to know of other ways to be involved with the D2P project.

DRCOG's 2020 Census outreach

Article submitted by Lisa Houde, AICP, public engagement specialist at DRCOG. Lisa can be reached at 303-480-5658 or lhoude@drcog.org.

DRCOG has received a grant through the Colorado Department of Local Affairs to complete outreach work for the 2020 Census. Staff will leverage their experience, expertise and community standing to approach the hard-to-count older adult population and ensure an accurate and complete count in the 2020 Census. DRCOG will undertake a variety of methods in the outreach work, including creating resource toolkits for use by community partners, launching an advertising campaign to raise public awareness about the importance of the census, and convening a regional workgroup to share best practices, strategize and maximize combined efforts.

If you are interested in participating in DRCOG's 2020 Census outreach efforts, please contact Lisa Houde, DRCOG public engagement specialist, at 303-480-5658 or lhoude@drcog.org.

DRCOG data acquisition updates

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

Regional planimetric data project 2018

Since 2014, DRCOG has facilitated a planimetric data capture immediately following the completion of an imagery project. The 2018 iteration began in February 2019 and is expected to be completed in February 2020.

Project deliverables, except for some premium attribution reserved for funding partners, will be free for public download on DRCOG's Regional Data Catalog. Learn more about 2018 project specifics and visit our webpage.

Denver regional aerial photography project 2020

DRCOG is scheduled to collect 6,000 square miles of high-resolution imagery in the spring and summer of 2020 on behalf of 48 partners. Additionally, DRCOG is offering a discounted Nearmap subscription to partners that want to pay for this streaming service.

If you'd like to become a project partner, reach out to me at asummers@drcog.org. Read more about our imagery projects on our website.

Historical imagery is available for download via the Colorado Governor's Office of Information Technology FTP site.

Regional lidar project 2020

In the fall of 2019, DRCOG applied for a U.S. Geological Survey Broad Agency Announcement award to help us fund a 2020 lidar collection in the region, and DRCOG was recently informed that the USGS is interested in the project! More details on the partnership to come. Preliminary plans include collecting quality level 2 lidar in 5,000 square miles of the region and deriving contours in most of the Denver metro area. Many thanks to our 32 local and state partners that committed funding to this project!

For more information, visit our website.

Do you have an interesting use case for lidar data? Tell us about it by emailing me at asummers@drcog.org.

Planimetric and land use land cover project 2020

Plans are in motion for collecting a substantial amount of foundational data in 2020. DRCOG staff wants to make sure they leverage the investment by preparing to create derivatives that would benefit our region's GIS community. With updated imagery and lidar, we can delineate, quantify and measure many aspects of our built and natural environments. See some examples.

Discussions are happening **now** to shape the data products and determine potential partnerships for funding. **If you're interested in knowing more, please reach out to me at asummers@drcog.org**. Also, be aware of our tentative schedule:

- now to Feb. 14 – requirements gathering surveys and meetings
- March 2 – release request for proposals to get vendor bids
- April – send preliminary quotes to partners for budgeting purposes
- fall – letters of intent due from participating partners
- winter 2021 – new imagery is delivered
- spring 2021 –new lidar data is delivered; derivative projects begin

Changes are coming with the 2020 Census data release

Article submitted by Zachary Feldman, economist at DRCOG. Zachary can be reached at 303-480-5637 or zfeldman@drcog.org.

The U.S. Census Bureau will be applying differential privacy to the 2020 Census public data release. Differential privacy is the U.S. Census Bureau's method to rigorously define the acceptable privacy risk in a data release to ensure the confidential 2020 Census microdata cannot be reconstructed from publicly released tables.

What does this mean for users of the public data releases? Public tables from the 2010 Census gave total population, voting age population, total housing units and occupancy status as counted for each census block. The 2020 public tables will introduce noise so that only total housing units will be as counted for each census block. Estimates of population and demographics can significantly vary from the census count at all geographies. Even county level estimates can vary drastically from true census counts. Estimates of population by age and gender for rural areas will show the largest discrepancy.

Colorado's State Demography Office has provided resources comparing the old and new privacy methods using the 2010 Census summary file data release. Online maps comparing various estimates at multiple geographies are available here.

Additional resources:

from Integrated Public Use Microdata Series

from the U.S. Census Bureau

2010 Census demonstration files:

Differentially Private 2010 Census Data

2010 Demonstration Data Products

For further information, questions or concerns, please contact Zachary Feldman at zfeldman@drcog.org or 303-480-5637 or Cindy at the Department of Local Affairs at cindy.degroen@state.co.us.

The U.S. Census Bureau is taking feedback on the 2010 demonstration files through March 1.

DRCOG is hiring!

DRCOG will be opening a recruitment period for a **GIS analyst** in the near future. Stay tuned for more details in February, and keep an eye on the jobs at DRCOG page if you're interested in the position.

Things you might have missed

- Congratulations to Doug Genzer from the City and County of Denver for his recent publication in the GIS&T Body of Knowledge!
- Sign up to attend the GIS Colorado winter meeting on Jan. 31. DRCOG will be there to present on regional data acquisition projects. View all GIS Colorado events.
- The OpenStreetMap Colorado community continues to add DRCOG's regional building footprints to OpenStreetMap. You can help at their next Importathon on Jan. 23. View all OpenStreetMap Colorado meetups.

Engage with us

- This quarterly newsletter reaches more than 300 people, has a higher-than-average open rate, and is written by professionals like you. 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 the 15th of January, April, July and October (or the next business day afterward). Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org to contribute.

- Did you miss a newsletter or a meeting? Visit our website for past newsletter issues and Denver Regional Data Consortium meeting materials.

We make life better!

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