



LIDAR 2020

Project Update

Presented by:

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April 11, 2019



Agenda

- Context of this project
- DRCOG's goals
- History of lidar in the region
- Draft capture extents
- Draft deliverables
- More requirements gathering
- Funding
- Timelines
 - USGS BAA award
 - Lidar collection
 - Product delivery



Context

Related projects planned for 2020/21:

- DRAPP imagery acquisition
- Planimetric data capture
- Land use land cover collection

DRCOG routinely facilitates **regional data acquisition** projects on behalf of up to 50 stakeholders.

Why?

Because **open, foundational data** allows city planners, researchers, analysts, consultants, and entrepreneurs to spend **more time answering questions and less time developing data.**



Data acquisition goals

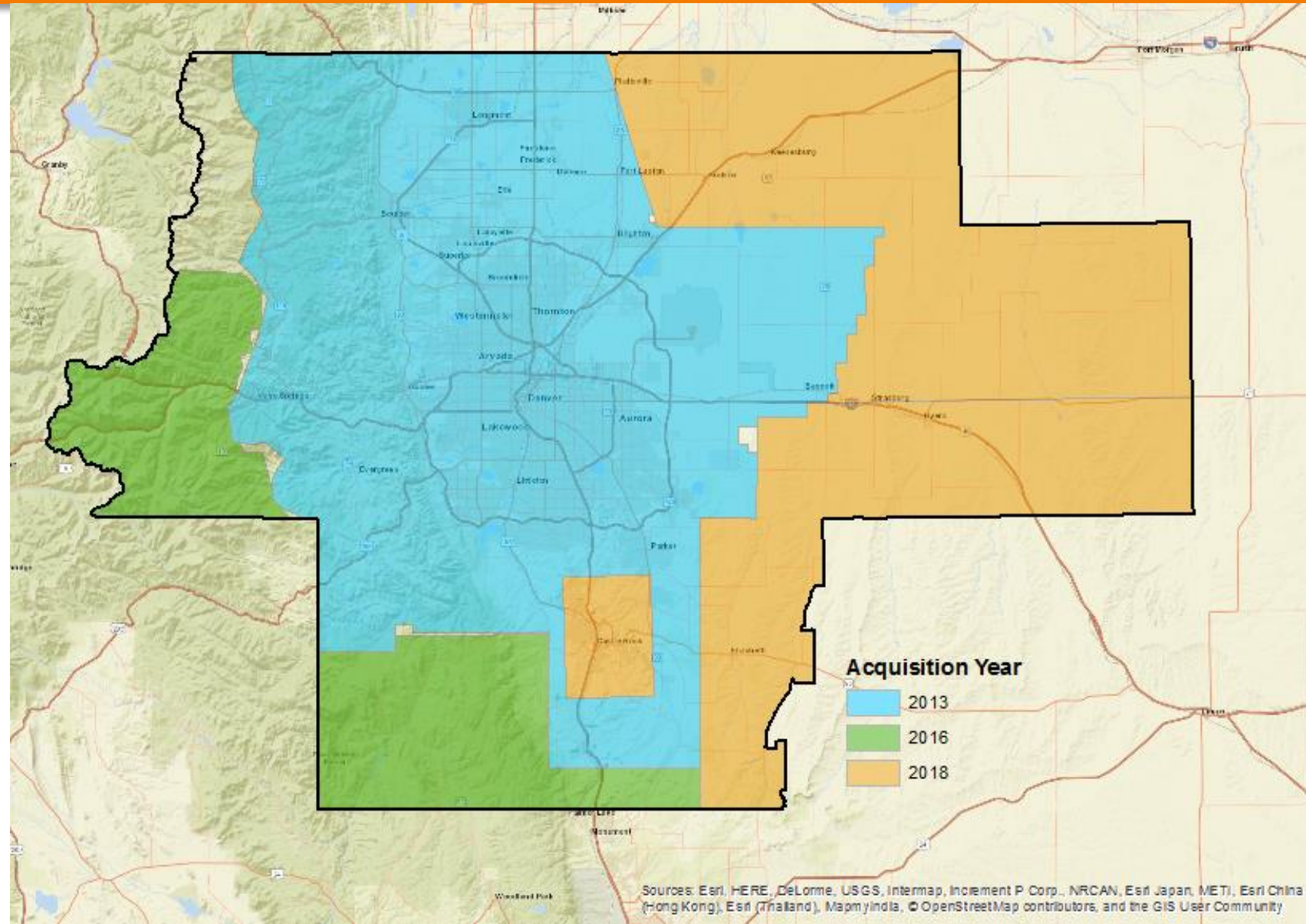
- regional extent; local use
- goldilocks scope - a package of foundational data that's *just right* for the most users and use cases
- value to the whole community – public, private, academic
- high-quality, up-to-date data at a reasonable cost
- free distribution to drive innovation and entrepreneurship



History of lidar in the region

Recent acquisitions:

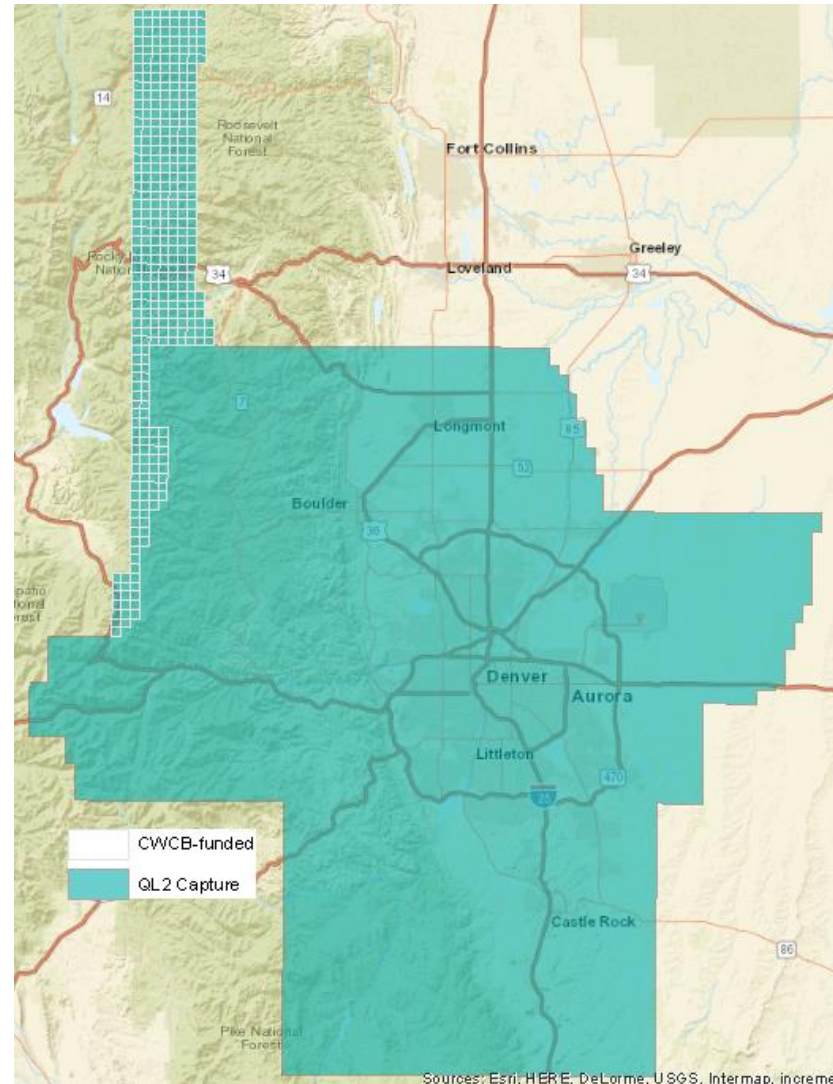
- 2013
- 2016
- 2018





Draft 2020 extent

- Includes areas not collected since 2013 or older
- Includes full counties where previously the data vintage was mixed
- Creates seamless coverage
- 4810 square miles



Notes: We are planning to capture some area outside the Denver Region on behalf of CWCB. This is a condition of their contribution to the rest of our project area.



USGS Base Specification

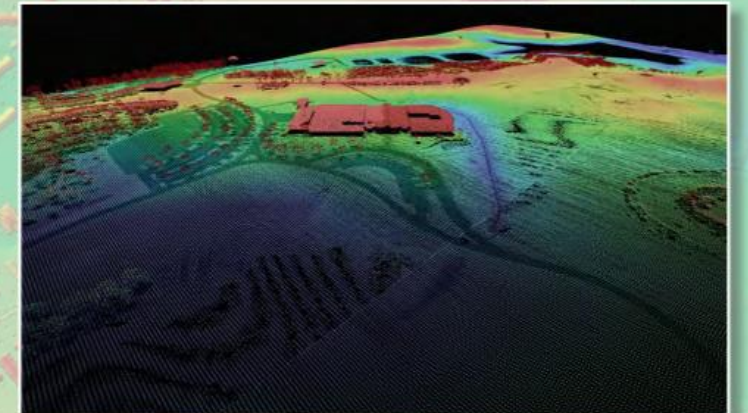
- Quality Level 2
- Leaf-off collection
- 5 deliverables
- Limited classification



National Geospatial Program

Lidar Base Specification

Chapter 4 of
Section B, U.S. Geological Survey Standards
Book 11, Collection and Delineation of Spatial Data



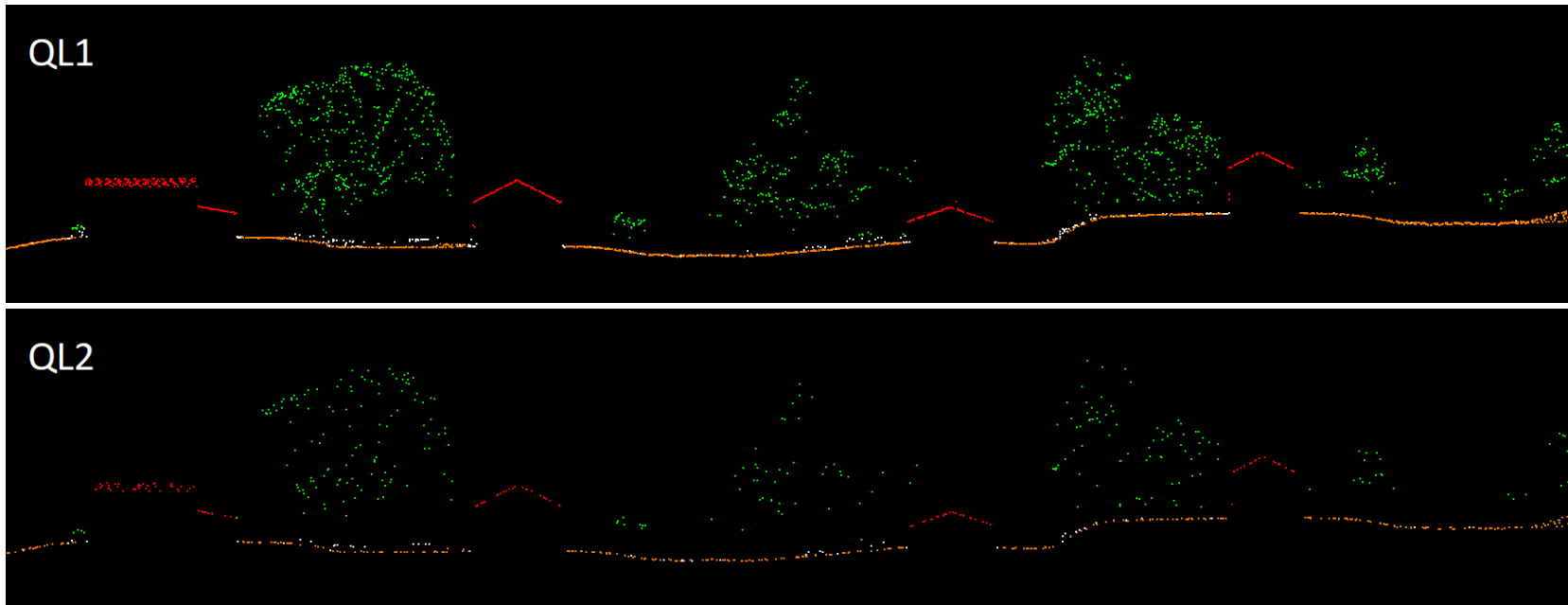
Techniques and Methods 11-B4
Version 1.0, August 2012
Version 1.1, October 2014
Version 1.2, November 2014
Version 1.3, February 2018

U.S. Department of the Interior
U.S. Geological Survey



Quality levels

- All areas will be captured at **QL2** unless a partner pays to upgrade to QL1.
- DRCOG is currently investigating upgrades to QL1 for Denver and Boulder County.





Lidar 2020

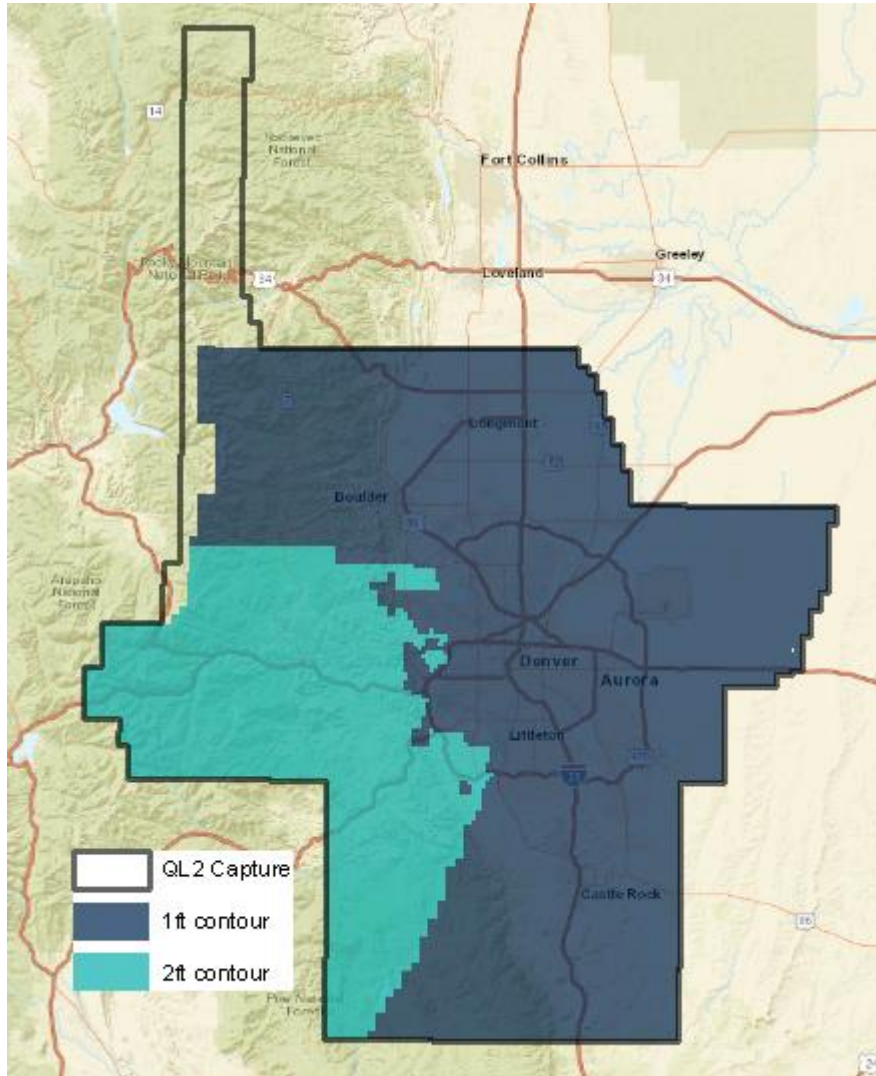
Deliverables:

- Classified Lidar Point Cloud
- Bare-Earth Digital Elevation Model
- First Return Intensity Raster
- Breaklines
- FGDC Metadata
- Contours ← Add on at our expense
- Raster DSM?

Code	Description
1	Processed, but unclassified
2	Bare earth
7	Low noise
9	Water
17	Bridge deck
18	High noise
20	Ignored ground (typically breakline proximity)
21	Snow (if present and identifiable)
22	Temporal exclusion



Draft contour extent



Contours will be machine-generated and not part of the QAQC performed by USGS (assuming they take on our project).

2ft contours are cheaper to generate than 1ft contours.



Needs met by current specs

- Seamless point cloud for the whole AOI
- Seamless DEM for the whole AOI
- Identification of historic features - trails, roads, building sites, plowed fields
- Geological hazard identification/visualization
- Bridge identification (as points)
- **Project planning** - trailheads, parking lots
- Trail planning and implementation
- Slope analysis
- Cultural resource identification
- Communicating with property owners; cartography
- Wildfire defensible space (vegetation distance from structures), canopy density
 - If *primary concern is coniferous* then this can be done with the current specifications.
- **Asset collection**, DEM in micro station
- Trail location determinations, realignments, storm water drainage sizing, view sheds
- **Assess drainage** and impact of spills
- Depict trail and terrain steepness
- Navigable channels
- Development and regrading; needs data to give consultants
- Slope and terrain analysis
- **View shed analysis**
- spot elevations
- Change detection related to stream morphology
- 3d mapping



Needs that require post-processing

These deliverables can use data generated with the current specs:

- 3d structures with **realistic rooflines**
- 3d visualization of sites with **photo colors**
- **Feature extraction** to find assets
- Additional point classification
- Higher resolution specification for hydro flattening
- Hydro enforcement

An organization interested in products like this would need to pursue post-processing on their own. It would not be part of the project that DRCOG/USGS facilitate.



Needs that require different specs

- View shed/line of sight analysis, including and excluding vegetation, structures
 - Base specification would not allow for **separation of the view shed into vegetation and structures.**
- Rivers and streams less than 10ft
- Waterbodies less than 1/2 acre
- **Identify tree species**
 - Would probably require QL1 density or better and leaf on conditions.
- Stream bed bathymetry
 - Would require a specific sensor type to identify below water elevations..
- Wildfire defensible space - **vegetation heights**, identifying lower and upper vegetation
 - Would require greater density and leaf on.
- Vegetative analysis - canopy density, tree identification
- Vegetation density mapping for forestry department



Remaining requirements to gather

- Things we need to know before we can finalize the project specs and cost estimations:
 - Locations of any upgrades to QL1 capture
 - Determination on flight timing
 - Leaf off (part of USGS spec) vs. leaf on (all at our expense)



Who can provide funding?

- State agencies (e.g. CWCB)
- Local governments (e.g. cities and counties)
- Public entities (e.g. water utilities, highway authorities, flood control districts)
- Private sector (e.g. consulting firms)

- Federal government (USGS BAA Award)
 - In FY18, the average BAA award covered 39% of the total project cost, with an average award of \$403,134. By law, USGS can't cover more than 50% of the cost.



BAA Award

- Our competitive advantage:
 - Long history of data acquisition partnerships in the region.
 - Leads on funding sources
 - Data is almost out of date (and will definitely be by delivery time)
 - Draft extent is sizeable and in an area with significant change
- But what if we don't get the award?
 - Try again in 2020 for a 2021 project



Quotes

- QL2 captured according to [USGS Lidar Base Specifications](#)
- 1-foot or 2-foot machine-generated contours
- Costs are based on USGS and CWCB contributing significant funding to keep your fee low (and their contribution is only applied to QL2 capture). Contours are solely the responsibility of the remaining partners
- Unless specifically stated in your quote, you have not been quoted for any additional buy-ups in your area.



Timeline

- **July** – Submit your signed LOIs
- **August** – DRCOG plans to submit BAA application to USGS
- **Mid November** – USGS BAA notifications
- **Winter/Spring 2020** – Acquisition
- **Spring/Summer 2021** – Delivery from USGS
- **Summer/Fall 2021** – Data will be publicly hosted by OIT



Next steps

- If you have requirements that are not satisfied by the current specs OR you did not get a quote and want one, reach out to asummers@drcog.org.
- If you plan to participate, let me know when you'd be able to commit to funding.

Questions? Reach out to Ashley Summers at asummers@drcog.org.

THANK YOU