VEST CO 2016

State: Colorado
Organization: Voting and Election Science Team (VEST)
Summary of Races included: Presidential, U.S. Senate, Regent Of The University of Colorado [General]
Date File Updated: 09/08/2020
Date Report Updated: 09/15/2021
RDH Validation Code (Github): https://github.com/nonpartisan-redistricting-datahub/pdv-co

RDH Criteria	Explanation

Is all raw data available?
 	
Yes
	<u>Accessible files:</u>
	● VEST CO 16 data file
	    ○ Accessed 08/23/21, Source: VEST
	    ○ https://dataverse.harvard.edu/file.xhtml?persistentId=doi:10.7910/DVN/NH5S2I/XSXFA1&version=67.0
	● VEST CO 16 documentation file
	    ○ Accessed: 08/23/21, Source: VEST
	    ○ https://dataverse.harvard.edu/file.xhtml?fileId=5007728&version=67.0
	● CO Precinct-Level Election Results
	    ○ Accessed: 08/23/21, Source: CO Secretary of State
	    ○ https://www.sos.state.co.us/pubs/elections/Results/archive2000.html
	    ○ File names: 2016GeneralResultsPrecinctLevel.xlsx
	● CO Voting Precincts 2016 Shapefile
	    ○ Accessed: 08/26/21, Source: U.S. Census Bureau's 2020 Redistricting Data Program Phase 2 release
	    ○ https://www.census.gov/geo/partnerships/pvs/partnership19v2/st08_co.html
	    ○ Note: Up to 5 downloaded at a time
	● Adams County Shapefile
	    ○ https://data-adcogov.opendata.arcgis.com/search?q=precinct
	● Arapahoe County Shapefile
	    ○ https://www.arapahoegov.com/1151/GIS-Data-Download
	● Boulder County Shapefile
	    ○ Received precincts from Brad Light blight@bouldercounty.org

- Chaffee County Precinct Map
  - https://chaffeeclerk.colorado.gov/sites/chaffeeclerk/files/Voting-Precincts.pdf
- Delta County Shapefile
  - Requested data from gis@deltacounty.com, shapefiles received via email from Carrie Derco, GIS coordinator at Delta county
- Denver County Shapefile
  - Received data via email from Sr. GIS Analyst Steve Sharp, Steven.Sharp@denvergov.org
- Douglas County Shapefile
  - https://hub.arcgis.com/datasets/dougco::voter-precincts-1?geometry=-106.172%2C39.162%2C-103.814%2C39.533
- El Paso County Shapefile
  - Received shapefiles directly from GIS director Dwayne Liller, DwayneLiller@elpasoco.com
- Fremont County Shapefile
  - https://www.fremontco.com/clerk-and-recorder/elections
- Garfield County Shapefile
  - Received shapefiles directly from GIS coordinator Andrea Grygo, agrygo@garfield-county.com
- Gilpin County Shapefile
  - Received shapefiles directly from County Planner Tami Archer, tarcher@gilpincounty.org
- Jefferson County Shapefile
  - https://data-jeffersoncounty.opendata.arcgis.com/datasets/county-precinct-1?geometry=-107.581%2C39.151%2C-102.865%2C39.893
- La Plata County Shapefile
  - Shapefiles received from County clerk Erin Hutchins Erin.Hutchins@co.laplata.co.us
- Larimer County Shapefile
  - https://www.larimer.org/it/services/gis/digital-data
- Mesa County Shapefile
  - https://opendata-mesacounty.hub.arcgis.com/datasets/7dd0dcebc31944ba8eea467c997c3829_15?geometry=-110.582%2C38.559%2C-105.866%2C39.307
- Pitkin County Shapefile
  - https://pitkincounty.com/874/Base-Map
- Pueblo County Shapefile
  - Data requested from edgis@pueblocounty.us, and shapefiles received directly from Robert Deherrera robde@pueblocounty.us
- Summit County Shapefile

	○ https://data-summitcountyco.opendata.arcgis.com/search?groupIds=548c92e5e1af41a09155d6ff7141fba0 ● Weld County Shapefile ○ Shapefiles received from Charles Vetter, cvetter@weldgov.com
Processing steps available? Yes, No	**Description of processing steps:** ● The full processing steps were short enough to be copied below: ● Election results from the Colorado Secretary of State (https://www.sos.state.co.us/pubs/elections/Results/Archives.html) ● Precinct shapefiles primarily from the U.S. Census Bureau's 2020 Redistricting Data Program Phase 2 release. The following counties used shapefiles sourced from the respective county governments instead: Adams, Arapahoe, Boulder, Chaffee, Delta, Denver, Douglas, El Paso, Fremont, Garfield, Gilpin, Jefferson, La Plata, Larimer, Mesa, Pitkin, Pueblo, Summit, Weld. ● Las Animas County precinct assignments in the voter file differ markedly from both the Census VTD boundaries and from maps received from the county. All precincts were revised to match the geocoded voter file and the list of districts assigned to precinct splits. As appropriate, precinct boundaries were revised using Census blocks, the Trinidad municipal boundary shapefile, school district or fire district boundaries, and the parcel shapefile from the Las Animas County Assessor. ● The following additional revisions were made to match the 2016 precinct boundaries: ○ Lake: Revise Precincts 1/4, 2/3 to reverse 2017 redraw ○ Logan: Align Sterling City precincts with city limits ○ Montezuma: Precincts renumbered to match county maps ○ Otero: Align La Junta City precincts with county maps ○ Prowers: All precincts adjusted to match county maps ○ Rio Grande: Adjust Precincts 2/3 to match county maps ● Larimer County reported provisional votes countywide. These were distributed to precincts by candidate based on their share of the vote reported by precinct. **Information not in their processing steps:** ● List of splits and merges of precincts.
Able to replicate	No, we were unable to replicate joining election data and shapefiles, as we did not have an exact list of merges and splits that VEST made.

joining election data and shapefiles? **No**	In Chaffee county, we were unable to locate a shapefile, but could find a precinct map. We took a quick look to see if the precinct looked close and the names appeared to match the election results. For the areas where we did have a shapefile, we were able to join 2992 precincts, with 111 precinct geometries and 18 precinct election results unjoined.
Able to replicate joining demographic data to block-level shapefiles? **N/A**	There is no demographic data on the file.
Able to replicate joining boundary data? **N/A**	There is no boundary data on the file.

Successfully ran validation?
 	
No
	<u>Election results:</u> **Yes**
	● We validated election results at three different levels:
	    ○ Statewide candidate vote totals
	    ○ Countywide candidate vote totals
	    ○ Precinct-level candidate votes
	● At the statewide total level, the election results matched VEST's. The totals also matched those of CO's election summary report (https://results.enr.clarityelections.com/CO/63746/184388/Web01/en/summary.html), although Presidential and Senate write-in votes are not included in those totals, and need to be added to match VEST's "Other" columns for those two races (https://sos.state.co.us/pubs/elections/Results/2016/General/compiledWriteInResults.pdf).

- At the County-level, the election results matched VEST's, as well as the county-level data the state has posted (https://www.sos.state.co.us/pubs/elections/Results/2016/General/2016GEstatewideAbstractResults.xlsx).
- At the Precinct-level, the election results matched VEST's.

Geographies: No

- We were not able to fully validate the geographies, as we did not have shapefile data for every county.
- For the counties where we did have shapefile data, we were able to validate 2992 precincts (out of 3010 total VEST precincts).
- Out of the 2992 precincts:
    - 0 precincts w/ a difference of 0 km^2
    - 2813 precincts w/ a difference between 0 and 0.1 km^2
    - 116 precincts w/ a difference between 0.1 and 0.5 km^2
    - 22 precincts w/ a difference between 0.5 and 1 km^2
    - 8 precincts w/ a difference between 1 and 2 km^2
    - 10 precincts w/ a difference between 2 and 5 km^2
    - 23 precincts w/ a difference greater than 5 km^2
- VEST talks about a number of shapefile changes that we did not carry out that could explain most of these differences. The notebook contains a print out of all differences larger than 5km^2.