THE STATE OF RECYCLING & COMPOSTING IN COLORADO

REDUCING WASTE AND BUILDING A CIRCULAR ECONOMY

2024

8th edition

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2024 STATE OF RECYCLING & COMPOSTING IN COLORADO

Reducing waste and building a circular economy

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STATE OF RECYCLING & COMPOSTING IN COLORADO

Executive Summary

We have a waste problem. Everything we produce—from corn to computers, soda bottles to T-shirts—takes natural resources and energy. That comes at a cost, including impacts on our environment and on our health. Approximately 42% of US greenhouse gas emissions come from the energy involved in extracting, processing, manufacturing, transporting, and disposing of goods and food.[1]

The growing, mining, and extracting of natural resources, from food to forests to metals to fossil fuels, along with the pollution from factories and transportation systems that produce and transport our goods from all over the world to our doorsteps, all take a toll. And it is our climate that pays the tremendous cost of the embedded emissions from the products we consume and the impacts of their disposal, though these emissions are rarely included in federal, state, or municipal climate plans.

Not only do we pay an environmental and health price at every stage of a product's life cycle, we also pay with our wallets, including the cost to haul it to a landfill and to mitigate the resulting pollution.

WASTE IS SIMPLY A SYMPTOM OF POOR DESIGN AND INEFFICIENCIES

Unfortunately, the majority of our linear production system goes one way, from extraction to the landfill, with much of what we produce meeting a literal dead end rather than being reused in a circular system. Some of it even heads to a landfill before it ever gets used—like produce that rots before being eaten, a product that arrives damaged, or an impulse buy that just gets tossed out.

Many products—like single-use cups, straws, and napkins—are designed for disposal, to be used once and then thrown away. Strategies such as "planned obsolescence" purposely ensure that items like cell phones and electronics have short lifespans.[2]

Much of our packaging is completely unnecessary, like a plastic-wrapped apple or banana, or cellophane around a box containing a tube of toothpaste.

Some items are valuable, including:

- batteries that contain critical minerals that could be reused,
- items that could be fixed instead of discarded,
- materials like glass bottles that could be recycled into new glass bottles an almost infinite number of times, and
- grass clippings and egg shells that could be composted into nutrient-rich compost to build up our depleted Colorado soils.

And while it may be out of sight for most people, the millions of tons of stuff sitting in Colorado landfills can create methane pollution or contaminate our water and soils. In fact, in 2020, Colorado landfills produced 6.2 million metric tons of CO_2-equivalent greenhouse gasses.[3] This is equal to nearly 1.5 million gasoline-powered passenger vehicles driven for one year, or the energy use of over 800,000 homes in a year.[4]

COLORADO HAS THE TOOLS TO BUILD TOWARD CIRCULARITY–AND IT STARTS WITH DATA

Waste is a problem with extensive impacts that we should not accept when we have so many tools to prevent it, and we are capable of creating a circular economy that eliminates unnecessary stuff and reuses and recycles what we do need over and over. By measuring the total amount of discarded material we create, as well as how much was diverted from the landfill, Colorado has the data to take informed and decisive action to reduce both of these amounts in the transition from our current linear economy to a circular economy.

MEASURING WASTE

For the sake of this report, unless otherwise indicated, we are referring to municipal solid waste (MSW), the waste generated in residential and commercial sectors. There are three key metrics for measuring how well our state and our communities are doing at reducing waste:

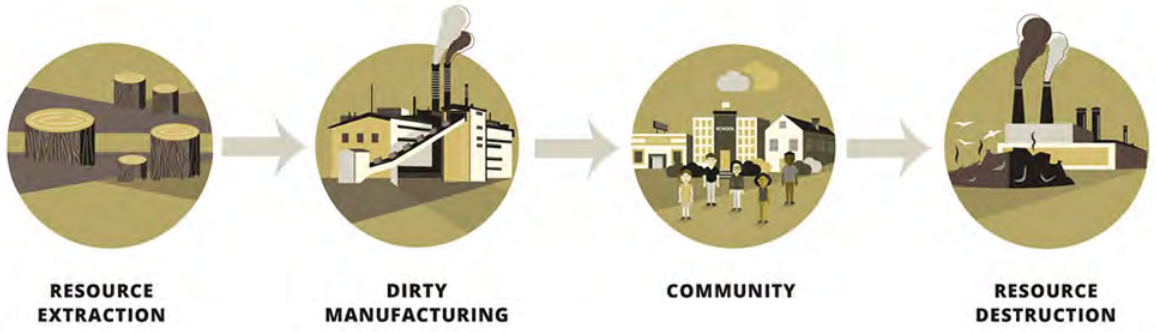
Total waste generation: The total amount of discards we're producing each year. This calculation accounts for all materials discarded, including materials that are recycled, composted, or landfilled. Even more useful is to take a more granular approach by looking at the tons discarded into each stream.

Per capita waste generation: The amount per person of all discards (including recycling, compost, and waste) we're producing, calculated by taking the total MSW generated and dividing by the population. Including this data gives us a clearer picture of whether we're reducing overall waste generation (not just diverting it) even as our population increases. It also allows comparisons between jurisdictions and reveals trends in the same jurisdiction over a period of time, rather than simply looking at total tons.

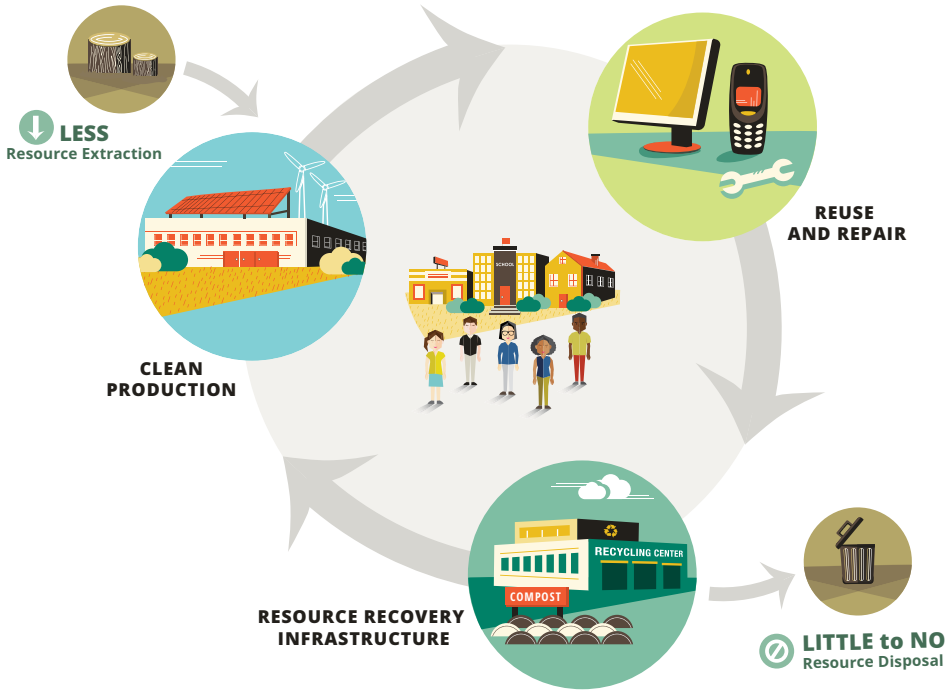
Diversion rate: The percent of our waste stream that we are diverting away from landfills through recycling or composting. A few communities are beginning to try to quantify the amount of material being diverted through reuse as well (see page 30 for calculation method).

A circular economy uses a systems-focused approach that enables natural resources used in production processes and economic activities to cycle repeatedly, maintaining their highest value for as long as possible. It is a change from the current linear-system model in which natural resources are extracted, made into products, and then landfilled as waste. A circular economy reduces pollution, redesigns materials to be less resource intensive, and recaptures "waste" as a domestic feedstock to manufacture new materials and products. Building a circular economy is vital to reining in greenhouse gas (GHG) emissions and environmental pollution from extraction processes, preserving biodiversity, reducing water and energy usage from extraction and manufacturing processes, and securing strong local supply chains that can rely on recycled materials as feedstocks for new products.

LINEAR ECONOMY: One way, from extracting natural resources to disposal.



CIRCULAR ECONOMY: Reduces the need for resource extraction and reintroduces "waste" as new feedstocks back into the economy.



THE STATE OF REDUCE, REUSE, RECYCLING, AND COMPOSTING—BIG PICTURE

The good news is that since 2018 when the State updated their waste tracking process, Colorado has actually slightly reduced the amount of total waste generated from 7,077,958 tons in 2018 (reported 2019) to 6,870,398 tons in 2023 (reported 2024), all while the total state population has increased.[5] Colorado's per capita municipal solid waste (MSW) generation has also gone down from 6.8 pounds per person per day in 2018 to 6.4 pounds per person per day in 2023.[6] That's no small feat given hundreds of thousands more residents and visitors, the proliferation of single-use products, the constant barrage of messages that call for us to buy more and more, and an economy that churns out too much stuff designed not to last.

However, our landfill diversion rate in Colorado (commonly referred to as our recycling rate), has gone down slightly: In 2018, Colorado diverted 17.2% of waste from our landfills into recycling and compost bins. In 2023, our recycling rate was 15.5%.[7]

FIGURE 1: COLORADO'S FIVE-YEAR MUNICIPAL SOLID WASTE (MSW) TRENDS[8]

	2018	2019	2020	2021	2022	2023
Population	5,697,000	5,758,000	5,808,000	5,812,000	5,840,000	5,877,000
Total MSW generation in tons	7,077,958	7,271,201	6,979,083	7,103,612	7,046,893	6,870,398
Per capita MSW generation in pounds per person per day	6.8	6.9	6.6	6.7	6.6	6.4
Diversion rate	17.2%	15.9%	15.3%	16%	15.8%	15.5%

While Colorado's waste diversion rate has held steady at around 15% over the past five years, the state's per capita waste generation has very gradually declined from 6.9 pounds per person per day to 6.4 pounds per person per day.

Although the diversion rate has remained stubbornly steady over the past seven years and stands at half the national average, it is not unexpected, because:

- Many Colorado communities have not yet taken action to guarantee access to convenient recycling nor provided options for diverting organics. In our previous reporting we highlighted that fewer than half of Colorado municipalities with 10,000 or more residents automatically provided recycling for all households.[9]

- Many of the significant programs and policies the state and local communities have adopted over the last few years have yet to be fully implemented. Data from recently effected programs may not be reflected in the 2023 data included in this report. It can take years to develop policies and programs, longer still to fully implement them, and sometimes even longer than that to see results.

Colorado is poised for significant improvements in our waste diversion, driven by impactful legislative action, the leadership of Governor Jared Polis's administration, and the dedicated efforts of state and local elected leaders, along with many individuals and groups across the state. See page 22 for details on state initiatives, including:

- Colorado's Plastic Pollution Reduction Act (PPRA) (HB21-1162)
- Producer Responsibility for Recycling Packaging and Printed Paper (HB22-1355)
- Right to Repair (HB22-1031, HB23-1011, HB24-1121)
- Organics Management Plan and SB 23-191 Colorado Organics Diversion Study
- Colorado's Greenhouse Gas Pollution Reduction Roadmap 2.0
- The creation of Colorado Circular Communities statewide enterprise grant fund, which expands the Technical Assistance Service Provider (TASP) program (HB24-1449)
- The Circular Economy Development Center (CEDC) (HB22-1159)

THE STATE OF REDUCE, REUSE, RECYCLING, AND COMPOSTING—LOCAL LEVEL

Though Colorado's diversion rate of 15.5% still lags well behind the national average, as we have reported over the years, many Colorado cities are recycling leaders with far higher rates, demonstrating what is possible in materials management.[10] And, as we have highlighted, too few Colorado municipalities collect their diversion data.

We applaud leading cities and counties that track their data, as it is an incredibly valuable tool for improving materials management. However, a significant challenge in compiling this report is data consistency; different municipalities track data in various ways, if they track it at all. This makes it difficult to provide accurate "apples to apples" comparisons between communities and even when comparing local data to the state's diversion data. Moving forward, the Producer Responsibility for Recycling Packaging program will require recycling haulers to report the tons taken to recycling facilities. While this will not account for tons landfilled or composted, it will establish a more universal metric for recycling.

We strongly encourage municipalities to adopt ordinances to require haulers to be licensed and report data on the tons landfilled, recycled, and composted as a key step toward understanding community material flows and ways to reduce waste.

We also particularly applaud the **City of Boulder** for taking initial steps to estimate the amount of material diverted through reuse, mainly through their sustainable deconstruction program. As the reuse economy grows, we hope that systems for calculating diversion and

waste prevention achieved through reuse will grow, including methods for calculating single-use materials never needed due to food serviceware reuse systems, as well as products kept in circulation through secondhand stores and repair. As the saying goes, you can't change what you can't measure—or at least, it's a lot easier to change what you can measure.

FIGURE 2: COLORADO'S LEADERS FOR BEST RECYCLING AND COMPOSTING PROGRAMS IN 2023[11]

FRONT RANGE LEADERS	COMMUNITY	RECYCLING & COMPOSTING RATE*
Best citywide—residential and commercial	City of Boulder	52%**
Best residential	City of Loveland	58%
Best industrial	City of Ft. Collins	82%***
GREATER COLORADO LEADERS		
Best citywide—residential and commercial	City of Aspen	32%
Best residential	City of Durango	41%

* See appendix for details on data collection terminology and how rates are calculated.
** The City of Boulder diversion rate is 51.79% without estimated tons diverted through residential reuse, and 52.06% with the inclusion of estimated reuse tons.
*** The City of Fort Collins reported a much higher than previous industrial diversion rate. That is in part due to the addition of an increased amount of crushed aggregate, such as concrete and asphalt, and also due to new reporting that was previously not included.

These leading local cities have five common elements of success:

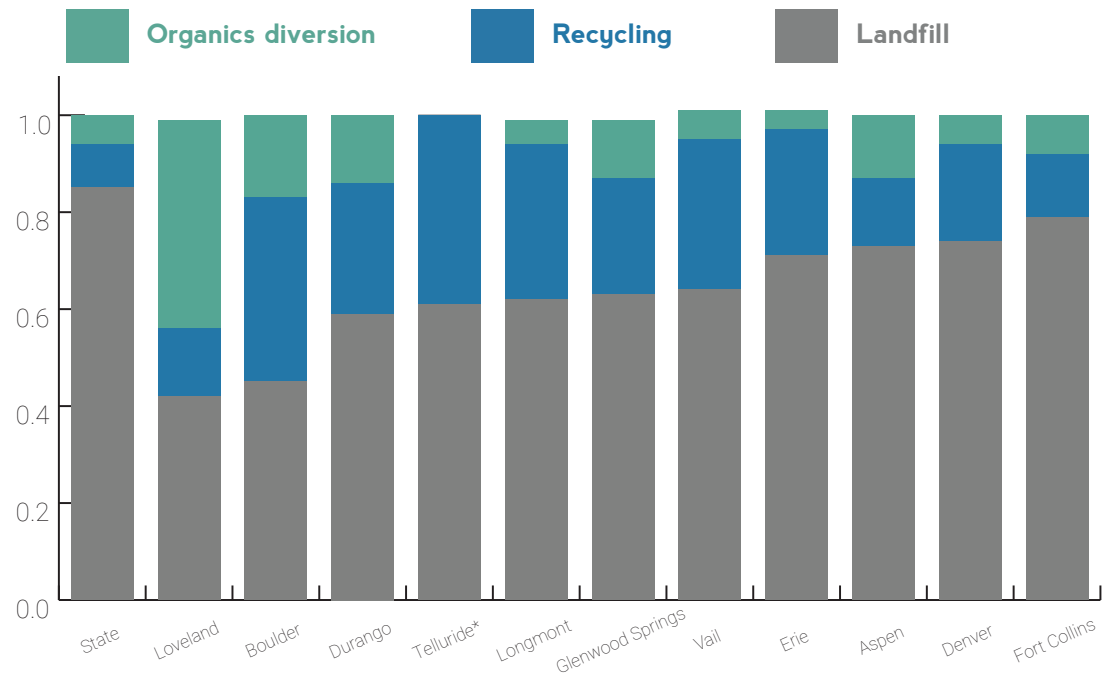
- Universal curbside recycling programs in which every resident is provided with a recycling cart alongside their trash cart, often at no additional charge to residents. Communities with organized curbside recycling are best positioned to easily and most immediately reap the benefits of free curbside recycling when the Producer Responsibility for Recycling Packaging and Paper program begins covering the cost for recycling.
- Volume-based pricing for trash that encourages recycling and composting by charging based on the amount of material landfilled and providing recycling and sometimes composting for no additional cost.
- Convenient drop-off centers and access to curbside collections for food scraps and/or yard trimmings.
- Strong education programs that teach residents and businesses why recycling and composting are important and provide clear guidelines on what can and cannot be recycled, reused, and composted.
- Community interest, advocacy, volunteering, and engagement in waste reduction and diversion, as well as dedicated staff and funding for waste diversion infrastructure, services, and programs.

MOVING FORWARD: THE BIG FOCUS AREAS FOR 2025

In 2025, Colorado has a chance to make significant progress in a few key areas:

Organics Diversion: As we build toward a circular economy, Colorado has made significant strides in passing policy and creating programs that address the "materials" side of our economy, or the products and packaging. It is now time we do the same for the "organics" side of our economy. Diverting organic matter such as food scraps and yard trimmings from landfills avoids methane emissions and creates valuable soil amendments for depleted Colorado soils, including compost, biochar, and mulch, which protect and build healthier soils. The SB23-191 Colorado Organics Diversion Study makes it clear that Colorado could increase organics diversion from around 10% of organic materials to 60% by 2036.[12] This increase would require the addition of more collections and processing infrastructure as well as policies that require the diversion of organic material from landfills through donation of usable food and composting of nonedible organic material, similar to the policy the City of Aspen adopted in 2023. Of the reporting communities with diversion rates of 25% or more, all have access to organics diversion programs—either for food scraps, yard trimmings, or both.

FIGURE 3: ALL OF THE TOP ELEVEN REPORTING COMMUNITIES OWE PART OF DIVERSION SUCCESS TO ORGANICS[13]



*Telluride does have access to organics diversion through a private hauler even though the data reported does not reflect organics tons diverted.

Batteries: Batteries contain a variety of materials, some of which are very valuable and can be recycled into new products. However, when improperly disposed of in trash or curbside recycling, batteries, particularly lithium-ion batteries, pose a serious fire hazard. Battery-caused fires in collection trucks, material recovery facilities, and waste facilities are increasingly becoming more frequent, endangering employees, damaging infrastructure, and significantly increasing operational and insurance costs.[14] Adopting a Producer Responsibility program for batteries could provide funding and a mechanism to reduce battery waste and ensure these critical materials are recovered and repurposed.

Reuse: Reuse offers significant environmental benefits by reducing the need for new products, and it saves consumers and businesses money. The potential for reuse is vast, encompassing various sectors such as reuse/refill businesses (bulk food, serviceware, etc.), resale markets (thrift/consignment, used books and gear, used cars, auction, pawn, etc.), rental services (cars, bridal, sports equipment, etc.), and repair services (tailoring/mending, shoe repair, electronic repair, auto repair, etc.).

CIRCULARITY ALIGNS WITH COLORADO'S STRENGTHS

As a state, we need to continue working to adopt and implement a range of approaches that will help us develop a true circular economy. Colorado is known for both its natural beauty as well as its commitment to being "green" and serving as a hub of technical innovation. Developing a true circular economy is a way to meld the values of conservation and innovation to drive solutions that provide the materials we need while protecting and actually regenerating the natural resources we rely on.

THE Rs: KEY CONCEPTS TO EMBRACE AS WE DRIVE OUR LOCAL ECONOMIES TOWARD CIRCULARITY

REDUCE the need for a product or its packaging in the first place. This R is the highest priority in the Zero Waste hierarchy. If we don't make a product, we don't need to extract natural resources and can avoid the associated negative environmental and social impacts.

REDESIGN products to use fewer resources, few-to-no toxins, and higher recycled content. Design should prioritize longevity of use, repair, and ultimately recycling.

REUSE already extracted resources, keeping materials and products in circulation for as long as possible. Establishing reuse systems can help eliminate the need for single-use items.

REFILL reusable containers. Rather than using single-use items (even those that are recyclable or compostable), durable, reusable containers are refilled for everything from condiments and milk in schools to reuse/refill to-go containers at restaurants and returnable/washable containers at reuse/refill stores.

REPAIR products and keep them in use. For some products, this requires changing systems to guarantee the right to repair products.

RECYCLE transparently and authentically, capturing products at the end of their useful lives and turning these materials into new products that can be recycled yet again. Composting is essentially the recycling of organic matter, including food scraps and yard trimmings.

REGENERATE soils that have been depleted by overuse and conventional agricultural practices by applying recycled organic material such as compost, biochar, and mulch.

BUILD RESILIENCE within our urban landscapes using nature-based climate solutions so that we and our local ecosystems can better withstand the impacts of climate change.

ENDNOTES

1 US EPA. "Documentation for Greenhouse Gas Emission and Energy Factors Used in the Waste Reduction Model (WARM)" (2020). https://www.epa.gov/sites/default/files/2020-12/documents/warm_background_v15_10-29-2020.pdf.

2 Sierra Club. "Planned Obsolescence: What Is It and How to Overcome It." September 2021. https://www.sierraclub.org/sierra/2021-4-fall/material-world/planned-obsolescence-what-it-and-how-overcome-it. Accessed 10/29/2024.

3 CDPHE. "2023 Colorado Statewide Inventory of Greenhouse Gas Emissions and Sinks." December 2023. https://drive.google.com/file/d/1l3r_urNEVffgd2byD959DyN6BOITQs_b/view. Accessed 10/16/2024.

4 EPA. "Greenhouse Gas Equivalencies Calculator." https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator. Accessed 10/16/24.

5 CDPHE. "Colorado Recycling Totals." (2018–2024) https://cdphe.colorado.gov/hm/swreports.

6 Ibid.

7 Ibid.

8 Ibid.

9 Eco-Cycle and CoPIRG. "State of Recycling & Composting in Colorado Report." (2022) https://ecocycle.org/our-programs/zero-waste-colorado/state-of-recycling-composting.

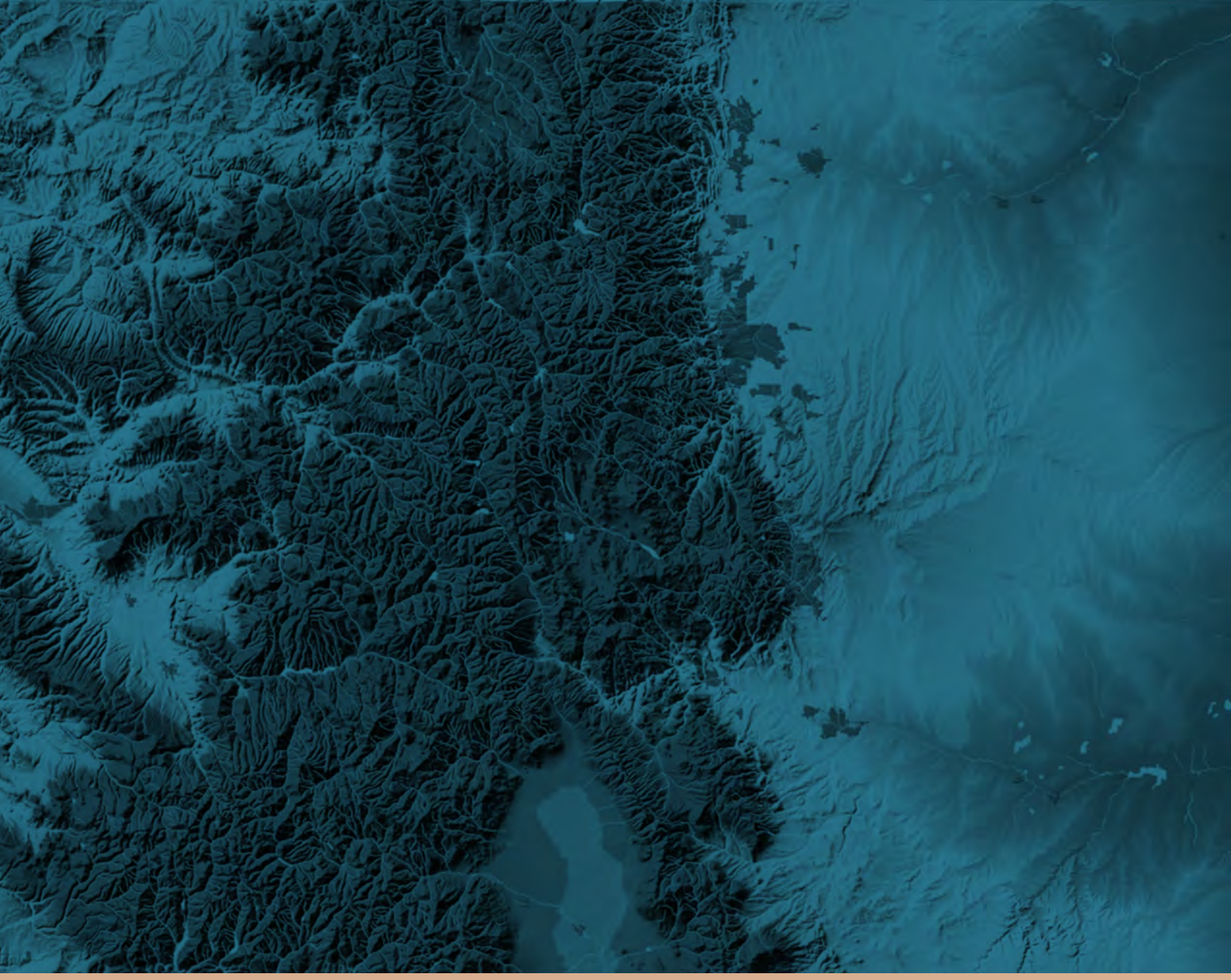
10 CDPHE. "2023 Colorado Recycling Totals." https://cdphe.colorado.gov/hm/colorado-recycling-totals. Accessed 10/31/24.

11 See municipality communications in the references section.

12 CDPHE. "SB23-191 Colorado Organics Diversion Study." (2024) https://cdphe.colorado.gov/hm/statewide-organics-mgmt-plan.

13 See municipality communications in the references section.

14 National Waste & Recycling Association. "NWRA and RRS Release Report on Threat of Lithium Batteries to Waste and Recycling Infrastructure." (2024) https://wasterecycling.org/press_releases/nwra-and-rrs-release-report-on-threat-of-lithium-batteries-to-waste-and-recycling-infrastructure/#:~:text=Arlington%2C%20VA%20%E2%80%93%20A%20new%20report,cost%20to%20insure%20these%20facilities.



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