

THESIS

CLOUDS OVER FORT COLLINS: SETTLEMENT, URBAN EXPANSION, AND
FLOODING ALONG A LAYERED LANDSCAPE

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ABSTRACT

CLOUDS OVER FORT COLLINS: SETTLEMENT, URBAN EXPANSION, AND FLOODING ALONG A LAYERED LANDSCAPE

Fort Collins, Colorado, home to over 150,000 people along the northern Front Range, is prone to flood. This natural disaster threat is not a recent development nor a strictly natural problem. Rather, flooding in Fort Collins is informed by the interaction of the local environment and the city's growth and development beginning in the mid-nineteenth century. This thesis explores the historical roots of Fort Collins's flood threat by considering the social, economic, and political factors that informed the physical shape of the city and how the city interacted with the watershed within which it sat. By tracing how the city's agrarian roots informed its location, and how a university, (usually) pleasant weather, and westward migration paved the way for urban and suburban expansion, this thesis displays flooding not as an exterior threat, but a natural process that has become enmeshed in Fort Collins's physical structure. Fort Collins is just one of many mid-sized American cities across the American West whose growth over the past century-and-a-half has created increasingly pressing environmental concerns. Addressing contemporary and future concerns over further growth and an increasingly unstable environment in Fort Collins and cities like it begins with understanding the historic interconnections between city growth and the environmental problem in question.

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Navigating collections and knowing where to turn in the archives can be a tricky and time-consuming business. I am thankful for the assistance of Patty Rettig at CSU's Water Resource Archive, and Lesley Struc and Jennifer Hannifin at the Fort Collins Museum of Discovery who helped me think through half-baked ideas and theories and pointed me toward the collections that buttress much of this thesis. I would also like to express my gratitude to the CSU History Department and Brigham Young University's Charles Redd Center for Western Studies for their financial support that funded my research and travel.

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INTRODUCTION

In September 2013, much of Northern Colorado lay submerged under floodwater. A week of unprecedented rainfall along the eastern slope of the Front Range—the base of the Rockies and home to a majority of the state’s population—had overwhelmed streams, creeks, and rivers, and spilled into the communities sitting along their banks. Draining to the South Platte River, Front Range runoff then flooded agricultural communities along the eastern plains all the way to the Nebraska border. From Estes Park at the base of Rocky Mountain National Park to Julesburg along Colorado’s state line, flood water destroyed houses, bridges, and roads, stranded communities, and streamed into basements. All told, the flooding killed eight people and caused more than \$4 billion in damages across seventeen counties. One Front Range city with a long history of flooding, however, emerged from the week of flooding relatively unscathed.

In Fort Collins, a city of over 150,000 people nestled along the base of the foothills and the banks of the Cache la Poudre River (a South Platte tributary), the flood caused minimal damage and at no point proved life-threatening.¹ To many, it seemed that Fort Collins dodged disaster because of the city’s investment in flood defenses following a deadly local flood in 1997. As Matthew Fuchs and Laura Lightbody of the Pew Charitable Trusts’ “Flood-Prepared Communities Initiative” have argued, the losses in 1997 “catalyzed city officials to pass stringent

¹ Marsha Hilmes-Robinson and Chris Lochra, “Fort Collins Floodplain Management Program: Success Stories from the September 2013 Flood,” *Colorado Water* 31 (Spring, 2014), 14, https://watercenter.colostate.edu/index.php?gf-download=2019%2F06%2FMarApr31_2.pdf&form-id=38&field-id=4&hash=f551fed9843ba625c7f47146a0c1031206f7eb2de751b1c63bd239f232a5a807; Ruth M. Alexander and Naomi Gerakios, “Final Report: 2013 Northern Colorado Flood History Project,” January 2015, 2013 Northern Colorado Oral History Collection, Water Resources Archive, Colorado State University Libraries, Fort Collins, Colorado, 16, <https://mountainscholar.org/bitstream/handle/10217/167378/2013ColoradoFloodOralHistoryFinalReport.pdf?sequence=1&isAllowed=y>.

regulations,” which “helped Fort Collins escape [2013] relatively unscathed.”² To Fuchs and Lightbody, Fort Collins responded to disaster in a proactive manner, helping circumvent disaster in 2013—a common narrative surrounding the event, but an incomplete explanation. Looking back at the 2013 flood, Fort Collins floodplain manager Brian Varrella chalked up the city’s minimal losses to “a nice mixture of prior planning, measured response, and dumb luck.”³ In broad strokes, Lightbody and Fuchs’ explanation was correct, but an explanation without consideration of “dumb luck,” held little water.

As Lightbody and Fuchs rightly pointed out, Fort Collins catastrophically flooded in 1997, and in the flood’s wake, the city invested in stricter floodplain zoning, warning systems, and structures to divert and catch excess flow. What they missed, however, was that prior to 1997, the city of Fort Collins was already a standout in proactive flood mitigation efforts, a national leader in fact. As chance would have it though, ten inches of rain fell directly on top of the city in 1997, the highest recorded rainfall over urban space in the U.S. to that point—call it bad luck. Fortunately for the city, the 2013 storm flipped the script, as the storm’s epicenter took shape over neighboring Boulder, Colorado, rather than Fort Collins, dumping a staggering sixteen inches of rain over the city, more than doubling Fort Collins’s total. Undoubtedly, Fort Collins deserved Lightbody and Fuchs’ applause, as protecting floodplains from development saved lives and property, but so too did happenstance. Had sixteen inches of rain fallen on

² Quote drawn from Matthew Fuchs, “Colorado City Revamps Flood Plain Management After Severe Flood: New Construction Standards Helped Protect Fort Collins from Later Storm,” *Mitigation Matters* (brief), *The Pew Charitable Trusts*, November 2019, <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2019/11/colorado-city-revamps-flood-plain-management-after-severe-flood>; shared sentiment expressed in Laura Lightbody and Forbes Tompkins, “How a New Flood Strategy Helped a Colorado City Skirt Disaster: Fort Collins Created a Model of Preparedness by Examining its History,” *Pew Charitable Trusts*, May 14, 2018, <https://www.pewtrusts.org/en/research-and-analysis/articles/2018/05/14/how-a-new-flood-strategy-helped-a-colorado-city-skirt-disaster>.

³ “How the Ditch Company Saved Fort Collins,” *North Forty News*, April 20, 2014, Accessed May 20, 2020, <https://northfortynews.com/how-the-ditch-company-saved-fort-collins/>.

downtown Fort Collins, runoff would've overwhelmed the city's flood defenses. Additionally, if it weren't for two empty reservoirs and a willing ditch company siphoning off excess water from the swollen Poudre River before it reached Fort Collins in 2013, the city's story may have read more tragic and less triumphant.⁴

Fort Collins didn't prove floodproof in 2013, but prepared and fortunate. In May of 2018, a mix of hail and rain fell over the heart of town for less than an hour. The short-lived storm flooded intersections and a few basements, swamped parked cars, and stranded a family that required rescuing as rising water began pouring into the vehicle.⁵ A 45-minute storm temporarily swamped a city nationally recognized for its flood preparedness. Storm drains, it turned out, didn't clear hail like they did water, leading to clogged drains and flooded streets. An unfortunate break, bad luck even.

Recontextualizing the floods of 1997, and 2013, and emphasizing the role of happenstance is not meant as an indictment of the city's flood protection efforts. Rather, problematizing the notion that Fort Collins went from flood-prone to flood-proof from 1997 to 2013 justifies a historical study of flooding in Fort Collins with a revised timeline. One where the city's flood risk, occasional inundations, and subsequent local responses date back to the Civil War. Flooding understood as an expensive nuisance at best, and disastrous or deadly at its worst are inherently historical developments: developments where a natural process destructively interacts with human systems and structures built around assumptions as to how the natural

⁴ "How the Ditch Company Saved Fort Collins."

⁵ Jacy Marmaduke, "Mom Thanks the Man who Saved Family," *Coloradoan*, May 30, 2018; Kieran Nicholson, "Storm in Fort Collins Tuesday Evening Backs up Several Intersections with Deep Hail," *Denver Post*, May 22, 2018, <https://www.denverpost.com/2018/05/22/fort-collins-colorado-weather-storms-hail/>; City of Fort Collins Utilities, "Numerous buildings were flooded in Old Town and on the CSU campus," Facebook, August 24, 2019, <https://www.facebook.com/fcutilities/>.

world operates. Lightbody and Fuchs were right about flooding in Fort Collins having a historical bent, they just didn't go far enough back in time.

What this thesis seeks to display is that Fort Collins's flood problems only begin to make sense once we view the city as a layered landscape whose physical structures—from nineteenth century farmhouses and student apartments to irrigation ditches and storm drains—represent residents' contemporary understanding of the natural environment in which they resided.⁶ A combination of developments spanning from local events to national happenings across decades framed the social and intellectual basis that informed how Fort Collins residents interpreted and built around the larger hydrological cycle in the shadow of the Rockies, on the banks of the Poudre. Generations of residents, informed by changing local practices, national markets, and assumptions of human's place within natural processes, built, then altered and expanded, a city they thought best fit the Colorado Piedmont—rarely though, did their calculations consider the region's propensity to flood. As residents cut irrigation ditches, laid street plans, and platted subdivisions with minimal consideration of potential inundation, flooding became embedded in the city's structure.⁷ Thus, if this thesis says anything of the current efforts of city flood planners, it's that they're fighting an uphill battle. In order to enforce what they deem as best practices; today's planners have to cut through a century and a half of urban and suburban development undergirded by logic entirely different than their own. Logic that often prioritized proximity to waterways and unencumbered growth. Further adding to their difficulties, flood planners have no

⁶ On interaction between environment, perception, and construction, see Arthur F. McEvoy, "Toward an Interactive Theory of Nature and Culture: Ecology, Production, and Cognition," *Environmental Review* 11 (Winter, 1987): 289-305.

⁷ In this way, Fort Collins functions as a hybrid landscape, one defined by cultural and natural processes, on hybrid landscapes, see Richard White, *The Organic Machine: The Remaking of the Columbia River* (New York: Hill and Wang, 1996); Mark Fiege, *Irrigated Eden: The Making of an Agricultural Landscape in the American West* (Seattle: University of Washington Press, 1999); Jared Orsi, *Hazardous Metropolis: Flooding and Urban Ecology in Los Angeles* (Berkeley: University of California Press, 2004).

control over snowmelt, rainfall, cloudbursts, or gutter-clogging hail. No mathematical equation or computer program has proved capable of predicting, let-alone harnessing, what “dumb luck,” or utter misfortune lies in future stormfronts.

The Structure of “Dumb Luck:” Flooding along the Front Range

The Front Range Urban Corridor—running from Colorado Springs all the way to Wyoming—sits on the Colorado Piedmont, a physiographic region defined by subdued rolling hills and intersecting minor waterways draining to the South Platte and Arkansas Rivers.⁸ In his study of Colorado from 1860-1940, geographer William Wyckoff called the Colorado Piedmont the state’s transportation hub and a cultural “meeting ground,” where miners congregated with midwestern farmers and European laborers.⁹ The Colorado Piedmont is also an environmental meeting ground, a region where peaks meet plains. This is apparent to anyone making the 60-mile road trip due north from Denver to Fort Collins along Interstate 25. Out the driver’s side window, the Rockies powerfully rise to as high as 14,000 feet. To the east, seemingly unending

⁸ Often, locals and historians alike refer to the Front Range Urban Corridor as simply “the Front Range”—that Denver or Fort Collins are “Front Range cities” for example. Technically, the Front Range is a region made up of prominent peaks and steep topography just west of Colorado’s largest cities. The Front Range Urban Corridor is a rather amorphous entity defined by areas of rapid urban and suburban expansion as far south as Colorado Springs, as far west as Boulder, north to Cheyenne, Wyoming, and east to Greeley. In the pages that follow, I opt to refer to Fort Collins as a city on the Colorado Piedmont, within the Front Range Urban Corridor, or along the base of the Front Range or Rockies. For more on the differences between Front Range, Colorado Piedmont, and Front Range Urban Corridor, see Wallace R. Hansen and Eleanor J. Crosby, *Environmental Geography of the Front Range Urban Corridor and Vicinity, Colorado*, U.S. Geological Survey, Professional Paper 1230 (Washington, 1982), 3, 6, 8, <https://pubs.usgs.gov/pp/1230/report.pdf>; on climate, see Wallace R. Hansen, John Chronic, and John Matelock, *Climatology of the Front Range Urban Corridor and Vicinity, Colorado*, U.S. Geological Survey, Professional Paper 1019 (Washington, 1978); for general overview of the region, see Daniel Tyler, “Front Range,” *Colorado Encyclopedia*, last modified January 6, 2018, <https://coloradoencyclopedia.org/article/front-range>.

⁹ William Wyckoff, *Creating Colorado: The Making of a Western Landscape, 1860-1940* (New Haven, CT: Yale University Press, 1999), 103; For further background on the region, see Kathleen Brosnan, *Uniting Mountain & Plain: Cities, Law, and Environmental Change along the Front Range* (Albuquerque: University of New Mexico Press, 2002); Steven C. Schulte, *Thicker Than Blood: The Western Slope in Colorado’s Water Wars, 1900-1970* (Boulder: University Press of Colorado, 2016); Daniel Tyler, *Last Water Hole in the West: The Colorado-Big Thompson Project and the Northern Colorado Water Conservancy District* (Niwot, CO: University of Colorado Press, 1992); Michael W. Childers, *Colorado Powder Keg: Ski Resorts and The Environmental Movement* (Lawrence: University Press of Kansas, 2012).

semi-arid plains extend well beyond Colorado's eastern border. Where the harvest yellow plains begin to shift to stark rock formations protruding upward sits Fort Collins, one of many Colorado cities nestled into the cracks and crevices of the wrinkled region. It is this dramatic juxtaposition that draws photographers, recreationalists, along with highly variable weather and flooding to the base of the Front Range.

Fort Collins's most obvious flood threat, the Cache la Poudre River, cuts through the northeast end of town. While over a century of human alterations to the river—be it beaver hunting or ditch digging—have turned the Poudre into “a tired and turbid stream as it flows past the city,” the working river, when conditions are right, still packs a dangerous punch.¹⁰ With its head waters located in the high elevations of Rocky Mountain National Park, the river drains an area about the size of Delaware. Fueled by snowmelt, 80% of the river's annual production flows from April through July.¹¹ In the past, runoff from a heavy snow year or snowmelt mixing with rainstorms have cascaded down the Poudre Canyon's steep, minimally absorbent walls before bursting out of the canyon's mouth ten miles northwest of Fort Collins and flooding the fertile bottom lands.¹² Front Range Urban Corridor communities and Fort Collins are no stranger to the destructive potential of such surges. The flood that destroyed Camp Collins (the up-river antecedent to Fort Collins) in 1864, the 1965 flood that coalesced high in the Rockies before tearing through Denver, and the deadly Big Thompson flood of 1976 were all results of heavy

¹⁰ Howard E. Evans and Mary A. Evans, *Cache la Poudre: The Natural History of a Rocky Mountain River* (Niwot, CO: University Press of Colorado, 1991), 137; on human impact on rivers, see White, *The Organic Machine*; Mark Cioc, *The Rhine: an Eco-Biography, 1815-2000* (Seattle: University of Washington Press, 2006); Sara B. Pritchard, *Confluence: The Nature of Technology and the Remaking of the Rhône* (Cambridge, MA: Harvard University Press, 2011).

¹¹ “Cache la Poudre Watershed,” Coalition for the Poudre River Watershed, <https://www.poudrewatershed.org/cache-la-poudre-watershed>.

¹² Hansen and Crosby, *Environmental Geography of the Front Range*, 59-62; Scott W. Anderson, Suzanne P. Anderson, and Robert S. Anderson, “Exhumation by debris flows in the 2013 Colorado Front Range storm,” *GEOLOGY* 43, no. 5 (May 2015): 391, <https://doi-org.ezproxy2.library.colostate.edu/10.1130/G36507.1>.

rain in the high country converging in channelized streams and rivers before charging people and property below.¹³ While reservoirs, irrigation ditches, and urban growth have modified the Poudre River's flow through the canyon and channelized its path along the Piedmont, the river's formidable drainage basin and steep topography still command the respect and attention of Fort Collins flood planners today.

What makes flooding in Fort Collins so difficult to predict and handle, however, has less to do with the Poudre River itself, and more so the topography's effect on local weather. At the base of the Rockies, moisture rich air patterns from both the Gulf of Mexico and the Pacific Ocean suddenly run into a mountain range that either stalls their advance or forces the air to gain altitude in order to clear the continental divide. Both processes often result in heavy downpours or drawn-out rainfalls.

As bucket measurements and stories of flash floods tearing through unsuspecting foothills communities as early as the 1860s attest, the region proved particularly susceptible to heavy-rainfall and subsequent flooding long before scientific studies bore out such a conclusion. This propensity for heavy rainfall is due to a host of factors beyond human control. One of which is orographic lift: a process where wind and steep topography push warm air into higher elevations where it cools and, if carrying moisture, forms clouds. By rapidly sweeping moisture rich air into high elevations, orographic lift can result in cloudbursts: "a rainfall of great intensity

¹³ For 1864 Camp Collins flood, see Charlene Tresner, "Fort Collins Area Histories," Fort Collins History Connection, last modified January 3, 2017, <https://history.fcgov.com/explore/city-history>; on the 1965 Denver flood, see Colorado Legislative Council, Report to the General Assembly, *1965 Flood Disasters in Colorado*, Research Publication No. 106 (Denver, 1965), accessed May 10, 2020, <https://www.law.du.edu/images/uploads/library/CLC/106.pdf>, and Alan Prendergast, "The 1965 Flood: How Denver's Greatest Disaster Changed the City," *Westword*, April 29, 2015, <https://www.westword.com/news/the-1965-flood-how-denvers-greatest-disaster-changed-the-city-6668119>; on Big Thompson Flood of 1976, see David McComb, *Big Thompson: Profile of a Natural Disaster* (Boulder: Pruett Publishing, 1980), 15-45.

confined to a very small area and lasting usually a very short time.”¹⁴ Though cloudbursts occur across the United States, they are prevalent on the Front Range. So prevalent that a 1948 USGS study, *Floods in Colorado*, defined cloudbursts as “a type of storm confined chiefly to the eastern foothills region.”¹⁵ As this report suggests, cloudbursts may open anywhere, but with moist coastal air colliding with the quickly ascending Rockies, scientists have come to expect them along the Front Range.

The regional propensity for cloudburst rain puts Front Range communities in particular danger of flooding. Just south of Fort Collins, it was a cloudburst in the high country that led to the state’s deadliest flood, the 1976 Big Thompson flood. Fueling the disaster was a ten-inch rainstorm so focused at higher elevations that when police officers closed the road at the bottom of the Thompson Canyon, it was so dry “that the men could stamp their feet and stir up the dust.”¹⁶ Only the sound of propane tanks bashing into rocks as they hurtled down the canyon and the smell of gas confirmed to onlookers that the flood was approaching. Focused rainfall only fell from 6:30 to 10:30 that night.¹⁷ On the Front Range, cloudbursts are a part of life, and as the Big Thompson flood displayed, short periods of rain have immense destructive potential.

Beyond cloudbursts, cold fronts dropping south from Canada and colliding with coastal, moisture-rich air patterns present an additional flood-threat to Colorado Piedmont communities. This collision, that atmospheric scientists call frontal systems, adds to the region’s susceptibility when cold fronts halt the advance of warm, moist air, cooling the warm air and forcing it to

¹⁴ Quote drawn from Robert Follansbee and Leon R. Sawyer, *Floods in Colorado*, U.S. Geological Survey, Water-Supply Paper 997 (Washington, 1948), 22; information on rapid upslope winds resulting in heavy rain drawn from the work of Fort Collins atmospheric scientist John F. Weaver in his unpublished manuscript, “Fiver Hours of Rain,” 29, Box 2, John Weaver—1997 Spring Creek Materials, The Archive at Fort Collins Museum of Discovery, Fort Collins, CO.

¹⁵ Follansbee and Sawyer, *Floods in Colorado*, 22.

¹⁶ McComb, *Big Thompson*, 45.

¹⁷ McComb, *Big Thompson*, 45.

condense into storm clouds.¹⁸ Frontal systems can lead to steady precipitation lasting days on end. Such protracted precipitation is responsible for the Northern Colorado floods of 2013, as a stalled storm led to a week of rain that in some places surpassed annual averages.¹⁹ Whether in rain events that only last a matter of hours, or those that last days, the manner in which air patterns from well beyond Colorado's borders collide and interact above the Colorado Rockies make the Front Range particularly flood-prone.

Fort Collins then, finds itself on the destructive end of two separate, but often closely related, environmental particularities—steep, channelized waterways, and rain-inducing weather patterns—that make the region particularly flood-prone. Importantly though, the two factors don't have to converge to spell trouble. While heavy cloudbursts and prolonged rain are more likely at higher elevations, the history of flooding along the foothills and Colorado Piedmont overflows with examples of flooding resulting from rainfall directly above urban space—the dumb luck component.

Fort Collins, like so many American cities sitting on the banks of a waterway, can expect the Poudre to run high in late spring and summer, and even forecast just how high by studying the snowpack. More difficult to predict and prepare for is the region's highly variable rainfall. Fort Collins averages around 15 inches of precipitation annually, but rarely receives 15 inches of rain in a given year. Eight inches one year, for instance, 20" the next, 10" the following, and 22" the last.²⁰ Much of the rain in Fort Collins falls from April to September, but again, precipitation isn't spread evenly across the months. On July 26, 1997, Fort Collins was in a drought, two days

¹⁸ For example and further explanation of frontal systems, see David Gochis's analysis of the 2013 rainfall over the Front Range, David Gochis, "The Great Colorado Flood of September 2013," *American Meteorological Society* (September 2015): 1461-1487, <https://doi.org/10.1175/BAMS-D-13-00241.1>; John F. Weaver also outlines the regional propensity for protracted rain events due to cold fronts dropping from the north, see Weaver, "Five Hours of Rain," 29.

¹⁹ Gochis, "The Great Colorado Flood of September 2013," 1461.

²⁰ Hansen, Chronic, and Matelock, *Climatology of the Front Range*, 42, 40.

later, rain over the southwest corner of town had nearly matched the city's annual average.²¹

Such month-to-month, year-to-year variability explains the irrigation ditches crisscrossing Fort Collins. Variability—combined with orographic lift, cloudbursts, and frontal systems—also explains why the city has installed rain gauges along the foothills and the low points in the heart of town, and constructed detention ponds and natural areas throughout the city.

While flooding along the Poudre falls into a cyclical pattern along a defined route, flash flooding and runoff flooding from heavy rainfall in Fort Collins and across the Piedmont has proved for over a century consistently unpredictable and uncontrollable to city planners, residents, and federal flood experts. In a study following the 1997 flood, CSU climatologist Nolan Doesken concluded that the chances of it raining over ten inches in Fort Collins again was quite low, “but the chances of receiving 10 inches of rain somewhere in Colorado in any given year is quite high—about ten percent.”²² Climatologists along the Front Range know that major rainstorms will come, when and where exactly that storm takes shape, though, is a matter of chance.

Matching the chaotic, unpredictable weather patterns along the Front Range is the chaotic, unpredictable development of the city of Fort Collins. Certainly, Fort Collins sits at the mercy of more volatile weather than many US cities, but that's only half the story. Diagnosing the natural processes informing natural disaster only marks the beginning in understanding why such natural processes result in disaster. There still remains the human component.²³

²¹ Nolan J. Doesken, Thomas B. McKee, *An Analysis of Rainfall for the July 28, 1997 Flood in Fort Collins, Colorado*, Department of Atmospheric Science, Climatology Report 98-1, Colorado State University (Fort Collins, 1998).

²² Doesken and McKee, *An Analysis of Rainfall*, 40.

²³ On the human component of natural disaster, see Ted Steinberg, *Acts of God: The Unnatural History of Natural Disasters in America*, 2nd ed. (New York: Oxford University Press, 2006); Orsi, *Hazardous Metropolis*; Sara B. Pritchard, “An Envirotechnical Disaster: Nature, Technology, and Politics at Fukushima,” *Environmental History* 17 (Spring, 2012): 219-243, <https://doi.org/10.1093/envhis/ems021>.

Interpreting Fort Collins weather as chaotic, after all, represents outsider biases and assumptions. Can occasionally extremely heavy rainfall be “dumb luck” if rain of its ilk has fallen along the Front Range for eons? Weather is but one layer that informs the development of a flood prone city. Human development makes up the rest. To identify and analyze the separate eras of development of this flood-prone layered landscape, this study approaches Fort Collins from the perspective of what historian Jared Orsi called an “urban ecosystem:” where the political, social, economic, and built aspects of the city interact with the climate, and topography of the region in expected and unexpected ways.²⁴ In doing so, this story identifies agricultural colonists as surprisingly adept flood planners, sugar beets as instigators of risky development, New Deal flood control policy as uncharacteristically exclusionary, and city planning at some points so closely aligned with federal flood planning that it overlooked how the Front Range floods.

This study does not consider the context surrounding every flood in Fort Collins history, but many of its most destructive across a timeline that begins with the arrival of Anglo settlers in the 1850s. Such coverage sheds light on how far contemporary struggles with flooding in Fort Collins stretch back, reframing local flood threat not as a solved or solvable problem but an accumulative problem now deeply engrained in the city itself. This has left current planners working with a difficult environment and against the historical grain, and local onlookers without a singular person, development, or time period to blame.

While this study focuses on a single municipality, it carries lessons that apply to historical developments beyond Fort Collins city limits. In tracing the co-development of a city and a flood problem, this work sheds light on the environmental difficulties and ramifications

²⁴ Orsi, *Hazardous Metropolis*, 8.

brought about by the arrival of medium-sized cities across the American West. In *Nature's Metropolis*, historian William Cronon offered the connection between city and countryside, metropolis and hinterland, to understand how the material needs of eastern markets shaped the development of the American West in the mid-to-late nineteenth century.²⁵ Fort Collins in the late nineteenth century certainly resembled the resource rich, sparsely populated hinterland that Cronon described. But then it grew. Fort Collins entered the twentieth century with a population below 10,000, but by century's end, the city was home to over 100,000. The roots of Fort Collins's pesky flood problem lay in the transition from an agrarian producer on the periphery, to metropole—albeit a minor one—that began drawing people and goods toward it. In recent decades, western historians have made profound strides in interpreting the environmental consequences of post-World War II population growth in the region.²⁶ Few, however, have done so from the perspective of the mid-sized city—be it Fort Collins, Boulder, Tempe, Arizona, or Provo, Utah. While Cronon and historians who have adopted his approach have displayed the environmental costs that come with the hinterland, metropole connection, this work illustrates the environmental difficulties born out of the transition from hinterland to metropole in a region where such transitions became common across the twentieth century.²⁷

Additionally, Fort Collins's continued struggles with flooding tells a different story than most historical narratives tracing the interaction between water, the West, and federal policy.

²⁵ William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W.W. Norton, 1991).

²⁶ See Hal K. Rothman, *Devil's Bargain: Tourism in the Twentieth-Century American West* (Lawrence: University of Kansas, 1998); Childers, *Colorado Powder Keg*; Jared Farmer, *Glen Canyon Dammed: Inventing Lake Powell & the Canyon Country* (Tucson: University of Arizona Press, 1999); Nancy Langston, *Where Land & Water Meet: A Western Landscape Transformed* (Seattle: University of Washington Press, 2002); Lincoln Bramwell, *Wilderburbs: Communities on Nature's Edge* (Seattle: University of Washington Press, 2014); Leisl Carr Childers, *The Size of the Risk: Histories of Multiple Use in the Great Basin* (Norman: University of Oklahoma Press, 2015).

²⁷ In their studies of Denver and Phoenix, Kathleen Brosnan, and Andrew Needham, respectively, utilize connections between city and hinterland to explore environmental change across Colorado and Arizona, see Brosnan, *Uniting Mountain & Plain*; Andrew Needham, *Power Lines: Phoenix and the Making of the Modern Southwest* (Princeton, NJ: Princeton University Press, 2015).

Analyzing how the local, federal, and natural interact in periods of momentary abundance rather than focusing on aridity unearths a much different role of federal policy across Western landscapes. While historians have written in great depth on uneven western development in relation to aridity and the growing influence of federal planning and the Bureau of Reclamation, periods of momentary water excess display a more ambiguous, less inclined set of federal planners.²⁸ In this story, the federal government, mostly in the form of the Army Corps of Engineers (USACE), is not just the provider of major dam and reservoir projects, but the preeminent, albeit limited, provider of flood control projects. Through the USACE's lack of presence in Fort Collins, and federal government's inability to comprehend runoff flooding so dissimilar from flooding along the Mississippi River, Fort Collins has responded to flooding largely by itself until the late 1970s. At mid-century, in a period of federal expansion, Fort Collins floods existed beyond the scope of federal flood control's purview. Such a counterintuitive development stimulates questions about what else Washington, D.C. offices missed in their assumptions about Western landscapes, and how have other outside-of-the-box environments gone unacknowledged by federal natural resource policy. In a region known for bizarre, sometimes alien-like landscapes, Front Range runoff flooding can't be the only issue that's gone unacknowledged or misinterpreted by federal planners.

Chapter one outlines Fort Collins's transition from an agrarian colony largely aware of and subservient to the particularities of its local hydrological cycle, toward a city defined by industrial agriculture with minimal concern for regional flood risk at the beginning of the

²⁸ A brief list of important studies that deal with Western aridity, the Bureau of Reclamation, and the development of the American West, Donald J. Pisani, *Water and American Government: The Reclamation Bureau, National Water Policy and the West, 1902-1935* (Berkeley: University California Press, 2002); Marc Reisner, *Cadillac Desert: The American West and Its Disappearing Water* (New York: Penguin Books, 1986); Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York: Pantheon Books, 1985).

twentieth century. Chapter two traces flooding in Fort Collins during the interwar and postwar period, when the region's unusual runoff flood threat proved real while comprehensive federal flood protection proved illusory. Chapter three then follows Fort Collins's unprecedented population growth through the 1960s and 1970s and, with the arrival of a new era of federal flood planning, Fort Collins's rush to make up for lost time in flood planning from the 1980s to 1997.

Taken together, these three chapters outline the creation of a problem without a single culprit, without a single solution. Prior to 1980, decade after decade Fort Collins residents built homes, businesses, and neighborhoods without consideration of the flood risk, ensuring that future residents had the expensive burden of retrofitting storm drains, protecting floodplains, and mitigating losses. But the blame for the city's flood problems does not only fall on explosive postwar growth, no matter its environmental short-sightedness. Settlers founded the city near the banks of a Rocky Mountain river, and immediately diverted water through the city's core via irrigation ditches. Flooding presented a risk, of course, but it also presented opportunity to fill reservoirs and break droughts. Recognizing the region's limited water supply, Fort Collins founders, at least partially, hoped for and built for periods of excess. Flooding is part of the city; it is part of life on the Front Range. Residents are not to control flooding though. Perhaps the 2018 hailstorm wasn't a glitch in the city's massive flood protection system so much as a reminder that any idea of a flood-proof city remains riddled with holes and bound to sink. As the Fort Collins Police Department tweeted on May 22, 2018: "NEWS ALERT: Water Wins."²⁹

²⁹ Nicholson, "Storm in Fort Collins."

CHAPTER ONE – A Fort on the Frontier

Rollin Q. Tenney, a Civil War veteran who arrived in the Cache la Poudre Valley in the 1870s, was the owner of multiple farms, a secretary of a canal and reservoir company, a surveyor, and at one point, the appointed commissioner of the local water district. But on March 14, 1904, he was stuck.¹ High above the town of Fort Collins, near the headwaters of the Laramie and Cache la Poudre Rivers, Tenney and his fellow surveyors found themselves trapped by the very hydraulic cycle they sought to reshape. A spring storm had caught the unsuspecting group, and in no time at all they found themselves snowed in.² For the famously active, industrious Tenney, a day or two cooped up in a cabin with his fellow surveyors, unable to lay eyes on the future tunnel site set to soon wed the Laramie and Cache la Poudre watersheds, could well have frustrated the surveyor. But Tenney did not seem to mind the delay. As he recalled, the group passed the time playing cards as the snow fell in a “graceful and artistic manner.”³ It is unlikely this was the first time an unforeseen snowstorm forced him to delay work, and it would not be the last. Just a month later, on April 7, 1904, Tenney recorded in his journal that nine inches of snow fell on his Sand Creek campsite further down the Laramie River, keeping him “in camp all day.”⁴ To Tenney, unexpected snowstorms were just one of many challenges in combatting Colorado’s aridity and unreliable precipitation by bending waterways, trapping runoff, and manipulating watersheds.

¹ “Helen Greenamyre and R. Q. Tenney,” Box 2, folder 15, R. Q. Tenney Collection, The Archive at Fort Collins Museum of Discovery (FCMOD), Fort Collins; Ansel Watrous, “A Biographical Sketch of R.Q. Tenney,” August 1918, box 2, folder 1, R. Q. Tenney Collection, FCMOD.

² Watrous, “Biographical Sketch of Rollin Q. Tenney.”

³ Watrous, “Biographical Sketch of Rollin Q. Tenney.”

⁴ R. Q. Tenney, *Diary No. 2*, box 1, R. Q. Tenney Collection, FCMOD.

Tenney's trip into the Laramie River watershed has much to say about the relationship between his livelihood and the fickle water resources on which his livelihood relied. First, it demonstrated his willingness to venture into the higher elevations in the early spring months. Such times were "as good as the dead of winter" by his account, and heading out anyway highlighted the central importance of increasing water supply for an agrarian-minded city closing in on a population of north of 8,000.⁵ Second, by breaking out the playing cards and giving up on climbing the last few hundred feet of elevation to survey the two miles of forested plateau that separated the Laramie and Cache la Poudre Rivers, Tenney's actions highlighted the humility that guided how longtime overmatched irrigators, agriculturalists, and city planners in nineteenth and early twentieth century Fort Collins interacted with water and local waterways.⁶ In nineteenth-century Fort Collins, being water smart meant being water humble, as local knowledge of unpredictable weather and water and limited technological advantages over waterways framed decision-making (in the case of Tenney), and more broadly, informed the physical shape of the city of Fort Collins itself.

Yet, in May 1904, the same snow that stranded Tenney, melted and mixed with heavy rainfall in the mountains west of Fort Collins, overwhelmed the Poudre River, and flooded the valley, killing two people and destroying two recently constructed neighborhoods in Fort Collins. Considering that these recently built neighborhoods sat along the floodplain, this disaster seemingly contradicted the prior claim that Fort Collins interacted with local water sources with

⁵ Watrous, "Biographical Sketch of R.Q. Tenney," U.S. Department of Commerce and Labor, Bureau of the Census, *Thirteenth Census of the United States Taken in the Year 1910, Volume II: Population* (Washington, D.C.: Government Printing Office, 1913), 208, <https://www.census.gov/library/publications/1913/dec/vol-2-population.html>.

⁶ Eric Clausen, "Laramie River-Cache La Poudre River Drainage Divide Area Landform Origins in the Colorado Mummy Range and Laramie Mountains, USA," *Geomorphology Research* (blog), December 16, 2012, <https://geomorphologyresearch.com/2012/12/16/laramie-river-cache-la-poudre-river-drainage-divide-area-landform-origins-in-the-colorado-mummy-range-and-laramie-mountains-usa/>; Ansel Watrous, "Biographical Sketch of R.Q. Tenney."

the regional environment's inherent difficulties in mind. How, in a community built around water resources, could residents allow for the construction of neighborhoods along the Poudre River's bottomlands? This question is the focus of this chapter, and answering it begins with consideration of the timing of the 1904 flood in relation to the development of Fort Collins and the western US.

In *Rivers of Empire*, historian Donald Worster outlines three fifty-year periods of water development in the American West, and working from his model—where the opening decade of the twentieth century functions as a transition period—provides a temporal framework to help make sense of the counterintuitive construction along the floodplain in a water-oriented city.⁷ Fort Collins began in what Worster called “the period of *incipience*” (1847-1890s), which “was characterized by a general dependence on local skills and means,” diverting “rivers to the extent of their limited abilities.” Then, like much of the rest of arid West, at the turn of the century Fort Collins entered what Worster termed as the “era of *florescence*,” a period when federal government, corporations, and “quasi corporate entities” began “farming rivers for substantial profit,” creating “a sharply divided rural class structure.”⁸ Fort Collins's built environment by

⁷ Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York: Pantheon Books, 1985). In the decades since the publication of *Rivers of Empire*, many historians of the American West have complicated the narrative laid out by Worster and the hydraulic society's increasingly despotic, centralized control of waterways over the twentieth century, see Donald J. Pisani, *To Reclaim a Divided West: Water, Law, and Public Policy, 1848-1902*, (Albuquerque: University of New Mexico Press, 1992), Rose Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River* (Fort Collins, CO: Colorado Water Resources Research Institute, Colorado State University, 2005), Patricia Limerick and Jason Hanson, *A Ditch in Time: The City, The West, and Water* (Golden, CO: Fulcrum Publishing, 2012), Robert Crifasi, *A Land of Made from Water: Appropriation and the Evolution of Colorado's Landscape, Ditches, and Water Institutions* (Boulder: University of Colorado Press, 2015), Michael Weeks, “Industrializing a Landscape: Northern Colorado and the Making of Agriculture in the Twentieth Century,” (PhD. diss., University of Colorado, 2016). In tracing continuities, and cultural holdovers that inform the creation of a hybrid landscape my work also complicates Worster's narrative. However, in line with Worster, and Donald Pisani—whose works, *To Reclaim a Divided West*, and *Water in the American Government*, conclude with and begin with, respectively, the Reclamation Act of 1902—and Michael Weeks and Rose Laflin, who trace the expansion of industrial agriculture at the local level during the close of the twentieth century, I view the closing decades of the nineteenth century and the opening of the twentieth as a period of transition from local primacy to increasing levels of federal and corporate control in water policy and development in Fort Collins.

⁸ Worster, *Rivers of Empire*, 64.

1904, with its roots as an agrarian colony, and later, its industrial-scale sugar processing plant, represented both the modesty of *incipience* and the increasing power of industry that came with *florescence*. When floodwater tore through Fort Collins in May of 1904, it crashed into a hybrid landscape defined both by local knowledge formed over decades and the recent arrival of increasingly profit-minded, industrial development.

Between *incipience* and *florescence* in 1904, much of Fort Collins sat strategically beyond the Cache la Poudre floodplain—a lesson learned the hard way, while new laborer neighborhoods donated by opportunistic, profit-minded outsiders sat directly in the flood’s path. The 1904 flood did not create the divides that defined the bifurcated city, it revealed them. Defining the physical shape of 1904 Fort Collins was the regional context that brought on the earliest American settlement of Fort Collins, the development of the Fort Collins Agricultural Colony in 1873, and the arrival of the sugar beet industry at the turn of the century. But the flood of 1904 did not only serve to display the divides in two separate approaches to building along the Poudre. Rather, the muted response to the disaster shaped the contours for future flooding in the growing city. Ultimately, a flood in the beginning of the century played a role in setting the stage for the flood that closed it.

Sowing the Seeds of an Agricultural Community: Fort Collins and Northern Colorado, 1858-1873

In 1862, the *Rocky Mountain News* (a Denver newspaper) featured an article written by a gold prospector-turned-Boulder County farmer. Colorado, he wrote, “was equal to any State or Territory” in its potential to produce wheat. The land suited cultivation of fruit and vegetables “in

abundance,” and “as for vines, turnips, rutabagas, &e.,” the territory couldn’t be “easily beaten.”⁹ But what separated the rich soils of Boulder County from the rest of the territory? To this booster the answer was its proximity to market. Boulder County’s proximity to Denver, just 25 miles northwest of the city (half the distance separating Fort Collins and Denver), allowed farmers “and hay haulers to make money,” while the “good land” of the Big Thompson and Cache la Poudre Valleys simply rested too far away.¹⁰ Though the good land along the Poudre would eventually sprout the intellectual and production capitals of Colorado agriculture, the distance separating the fertile floodplains from Denver and hungry mining towns dotting the central Rockies influenced early development along the Poudre.¹¹ The region’s position on the edge of larger developments across Colorado and the West played a major role in shaping settlement along the Cache la Poudre, which in turn, informed how settlers interacted with the river itself.

I

Thousands of Americans poured into Colorado on the hunt for gold throughout 1858 and 1859. Though the banks of the Cache la Poudre River never produced the mineral wealth as that of the creeks cutting through Colorado’s central mountains, the Gold Rush sparked the transition of the Poudre’s fertile banks from Indigenous land infrequently treaded by trappers, traders, and travelers, to the permanent homes of American families moving West.

In 1844, French American trapper and guide, Antoine Janis, traveled north through the Poudre Valley on his way to Fort Laramie. Charmed by the region’s high streams and seemingly endless buffalo, he staked a squatter’s claim off the Poudre’s banks with the intent of returning to

⁹ “From Boulder County,” *Rocky Mountain News*, September 18, 1862, <https://www.coloradohistoricnewspapers.org/?a=d&d=RMW18620918.2.27&srpos=20&e=-1859---1873--en-20--1--img-txIN%7ctxCO%7ctxTA-cache+la+poudre-----0-->.

¹⁰ “From Boulder County,” *Rocky Mountain News*, September 18, 1862.

¹¹ For communities practicing early agriculture across the Front Range, lack of rails was mitigated by proximity to mining towns and Denver, Ansel Watrous, *History of Larimer County, Colorado* (Fort Collins, CO: Courier Printing and Publishing Company, 1911), 61.

and settling on what he thought “was the loveliest spot on earth.”¹² In 1858, “once the gold fever broke out,” Janis decided it was high time to return to valley and profit off the rush. Negotiating a deal with Chief Bald Wolf to settle next to the neighboring 150-lodge Arapaho band on the Cache la Poudre, and then creating a town contract and building new lodges for the impending settlers “flocking” in, Janis created the first permanent American settlement in Larimer County.¹³ Colona (later renamed Laporte in 1862), Janis believed, would, with the arrival of thousands of prospectors, blossom into a prosperous gateway to the mountains.¹⁴ But few came, and even fewer stayed.

Not until 1879 did gold and silver seekers charge up the Poudre Canyon in pursuit of the mountains’ wealth.¹⁵ Before then, the banks of the Poudre remained just an afterthought in the region’s mineral boom. Still, by 1859, down on their luck miners and opportunistic agriculturalists began to settle along the base of the foothills across the Front Range. As historian Elliot West noted, early Colorado boosters, “often wrote as much about farming as mining,” leading many to try their hand at food production along the bottomlands of the rivers and creeks streaming down the east side of the Rockies.¹⁶ The Poudre wasn’t an exception to this shift, but because of the river’s distance from hungry mining towns and Denver, settlers didn’t rush to the Poudre’s riverbanks.

¹² “Correspondence: EARLY TIMES, Recollections of Antoine Janis, Colorado’s First Permanent White Settler,” *Fort Collins Courier*, March 23, 1883, <https://www.coloradohistoricnewspapers.org/?a=d&d=FCC18830329.2.2&srpos=1&e=-----en-20--1-byDA-img-txIN%7ctxCO%7ctxTA-janis-----0-Larimer->.

¹³ “Correspondence: EARLY TIMES,” *Fort Collins Courier*; Lucy Burris, *People of the Poudre: an Ethnohistory of the Cache La Poudre River National Heritage Area, AD 1500-1880* (National Park Service, Friends of the Poudre, Cache la Poudre River National Heritage Area, 2006), 39, <http://database.history.fcgov.com/cdm/ref/collection/rb/id/7014>; Elliot West, *The Contested Plains: Indians, Goldseekers, and the Rush to Colorado* (Lawrence, KS: University Press of Kansas, 1998), 189.

¹⁴ Watrous, *History of Larimer County*, 45.

¹⁵ Howard E. Evans and Mary A. Evans, *Cache la Poudre: The Natural History of a Rocky Mountain River* (Niwot, CO: University Press of Colorado, 1991), 16-17.

¹⁶ Elliot West, *The Contested Plains*, 250.

For many of the region’s earliest settlers, the Poudre was not even their intended destination. John and Emily Coy initially aimed their wagon for California before a robbery derailed their travel plans and forced them to winter along the Poudre in 1862.¹⁷ California was also the destination of George Robert Strauss who settled on the river in 1860 after a bout of pneumonia and a robbery in Utah forced him to retreat back into the Kansas Territory.¹⁸ While Strauss and the Coys became recognizable names within Fort Collins in the following decades, they, like many in the 1860s, arrived there by accident.

These early settlers stumbling across the banks of the Poudre during the first mineral boom in Colorado introduced irrigated agriculture to the region. In 1860, a settler named G. R. Sanderson cut a small irrigation ditch off of the Poudre near present-day Bellvue to water his farm, effectively opening the period of *incipience* along the Poudre.¹⁹ In 1865, John Coy completed a ditch to irrigate his alfalfa and garden, making him the eighth claim on the Poudre.²⁰ These first diversion projects—dug by individuals, diverting minimal water, and functioning as a means to help settlers subsist, not necessarily profit—opened a decades-long (centuries-long?) period of working with, and learning from the Poudre to mitigate regional aridity and carve out livelihoods along its fertile banks. Thus, the Colorado Gold Rush introduced the region to permanent American settlement, while at the same time, the Poudre’s lack of gold stunted such

¹⁷ Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River*, 10.

¹⁸ Strauss, George Robert Vertical File, FCMOD; Evadene Swanson, *Fort Collins Yesterdays* (Fort Collins: George and Hildegard Morgan, 1993), 5-6.

¹⁹ Watrous, *History of Larimer County*, 71; Frank Hall, *History of the State of Colorado* (Chicago: The Blakely Printing Company, 1895), 183.

²⁰ Cache La Poudre River National Heritage Area, “Coy Ditch (Water for Agriculture),” <https://poudreheritage.org/locations/coy-ditch/>; Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River*, 13; Brian Werner, “Irrigation Development in Northern Colorado: A Brief History of How Water Influenced the Development of the Fort Collins Region,” (Handout) Water Literate Leaders of Northern Colorado Leadership Program, Colorado Water Center, Colorado State University (September 4, Fort Collins), <https://watercenter.colostate.edu/wp-content/uploads/sites/33/2019/09/Irrigation-Development-in-Northern-Colorado.pdf>.

expansion. Of the 100,000 that set out for Colorado in 1859, and the 10,000 that remained by the end of the year, the estimated population of Larimer County in 1860 stood at around 100.²¹

II

The Cache la Poudre valley and its first permanent town, Laporte (formerly Colona), never matured into the bustling gateway to the mountains that Antoine Janis had hoped, but in 1862, for a moment, the region began functioning as a gateway to the American West.²² Due to increasing violence along the North Platte segment of the Overland Trail, westward traffic—settlers, stagecoach companies, and mail services—began cutting southwest across the Colorado Territory before redirecting north at Denver and passing through Laporte to reconnect with the main trail in Laramie.²³ Violence across the plains and an uptick in travelers crossing the Poudre precipitated the perceived need for a military installation along the river’s banks, leading to the creation of Camp Collins—a development that left an indelible imprint on the physical contours of the eventual city.

With the signing of the Fort Wise Treaty in 1861, which turned most of the Cheyenne and Arapaho land along the Front Range over to the United States, settlers claimed much of the easily irrigable bottomlands along the Poudre from Laporte to the South Platte confluence.²⁴ The arrival of Overland Trail traffic in 1862 furthered regional settlement, as westward bound settlers

²¹ For figures pertaining to Colorado Gold Rush, see Encyclopedia Staff, "Colorado Gold Rush," Colorado Encyclopedia, last modified January 7, 2020, <https://coloradoencyclopedia.org/article/colorado-gold-rush>; population estimate on Larimer County pulled from Watrous, *History of Larimer County*, 43.

²² Swanson, *Fort Collins Yesterdays*, 6; Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River*, 11; W. R. Thomes, "Over an Old Trail," *Fort Collins Courier*, December 28, 1893, <https://www.coloradohistoricnewspapers.org/?a=d&d=FCC18931228.2.29&srpos=6&e=-----en-20--1-byDA-img-txIN%7ctxCO%7ctxTA-overland+trail+-----0-Larimer->.

²³ Watrous, *History of Larimer County*, 66; Hall, *History of the State of Colorado*, 183; "Central Overland," *Rocky Mountain News*, July 29, 1862, <https://www.coloradohistoricnewspapers.org/?a=d&d=RMD18620729.2.18&srpos=19&e=--1862---1863--en-20--1-img-txIN%7ctxCO%7ctxTA-overland+trail-----0->.

²⁴ Watrous, *History of Larimer County*, 51.

began purchasing land from owners along the bottomlands, or making claims on the terrace lands rimming the waterway.²⁵ Not only did the trail's new route stimulate population growth along the Poudre, it laid the foundation for the increasing importance of collaborative, complicated, and expansive irrigation networks, as those unable to secure property along the river itself still needed access to a reliable water source.²⁶

While the redirected Overland Trail aimed to avoid the raids and violence plaguing travel along the North Platte, the new detour didn't present an entirely pacified route through Colorado. After all, it was during the 1860s that tension and violence between settlers, the U.S. Army, and Indigenous peoples in Colorado reached highwater marks.²⁷ However, due to relatively amicable relations between Arapaho, Cheyenne, and Anglo settlers, outright violence never erupted along the Poudre valley.²⁸ Still, in 1862, in an effort to solidify control over the plains and better protect traveling parties from Indian raids, the U.S. army constructed Camp Collins, one of eleven new forts developed across the plains between 1859 and 1864.²⁹ Originally in Laporte, flood-wary infantry men relocated Camp Collins to a higher point along the Poudre after a flood tore away structures and supplies in 1864. Without defensive walls, and manned by poorly trained soldiers, Camp Collins was never much of a fort. In 1866, after passing through the Poudre valley, General William T. Sherman articulated that the fort provided no benefit and

²⁵ Watrous, *History of Larimer County*, 51.

²⁶ For an explanation of the development and expansion of irrigation ditch networks in the 1860s and 1870s in Boulder County, Colorado, see Robert Crifasi, *A Land Made from Water*, 52-64.

²⁷ Burris, *People of the Poudre*, 47-49.

²⁸ Burris, *People of the Poudre*, 42-3, 52; Though never violent, Fort Collins fit natives into the same paranoid tropes as the rest of Anglo settlers, for example, see Watrous, *History of Larimer County*, 130; newspapers also peddled paranoia, in 1865, *Rocky Mountain News* ran a story claiming that an Arapaho band was "pretending to be friendly" to score rations from federal government along the Poudre before leaving the area to plan an attack, see "Indian News," *Rocky Mountain News*, July 5, 1865.

²⁹ Swanson, *Fort Collins Yesterdays*, 5-6; West, *The Contested Plains*, 275.

ordered its closure.³⁰ The U.S. Army abandoned Camp Collins the following year.³¹ Critically though, the fort, and the six-thousand acre military reservation stretching four miles south and four miles downriver (southeast) connected to the fort, remained a federal land holding.³²

Though redirected traffic created new interest in the Poudre valley, the fact that the abandoned fort remained the property of the federal government ensured that arriving settlers didn't begin carving out their new lives on or around the now folded Camp Collins. Only those with land claims predating the fort's establishment and a few of the fort's holdovers remained on the military reservation entering the 1870s. This frustrated opportunistic land developers. Speaking on Camp Collins in early 1872, the *Rocky Mountain News* bluntly stated, "the military reservation under which this place is located is a serious deterrent to its prosperity, and to the growth and development of the country around here."³³ Frustrations over federally-owned military reserves reached beyond Colorado, as hopeful settlers, opportunists, and expansionists from Utah to Iowa pressured elected officials to open vacant military lands to public sales.³⁴ In 1871, Congress acted on such sentiments, authoring multiple acts that opened old military reservations to homesteading.³⁵ In 1872, the US Congress opened the Fort Collins military reservation to preemption and homestead entry.³⁶ At this point though, a new sort of agrarian

³⁰ Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River*, 120.

³¹ Swanson, *Fort Collins Yesterdays*, 9.

³² Swanson, *Fort Collins Yesterdays*, 7; Charlene Tresner, "Fort Collins History in the Nutshell," in *The History of Larimer County*, ed. Andrew Morris (Dallas, TX: Curtis Media, 1985), 36.

³³ "From Northern Colorado," *Rocky Mountain News*, February 15, 1872, <https://www.coloradohistoricnewspapers.org/?a=d&d=RMD18720215.2.1&srpos=19&e--1871---1873--en-20--1-byDA-img-txIN%7ctxCO%7ctxTA-fort+collins+sale-----0-->.

³⁴ "Forty-First Congress," *Rocky Mountain News*, January 26, 1871, <https://www.coloradohistoricnewspapers.org/?a=d&d=RMD18710126.2.1&srpos=3&e--1871---1873--en-20--1-byDA-img-txIN%7ctxCO%7ctxTA-fort+collins+sale-----0-->.

³⁵ An Act for the Disposal of the Lands within the Fort Ridgely Military Reservation, Minnesota, Chapter 198, 2nd sess. (July 1, 1870), 41st Congress, *US Statutes at Large of the United States of America*, 187, accessed February 16, 2020, <https://www.loc.gov/law/help/statutes-at-large/41st-congress.php#2>.

³⁶ An Act Declaring the Lands Constituting the Fort Collins Military Reservation, in the Territory of Colorado, Subject to Pre-emption and Homestead Entry, Chapter 165, 2d sess. (May 15, 1872), 42nd Congress, *US Statutes at Large of the United States of America*, 120, <https://www.loc.gov/law/help/statutes-at-large/42nd-congress.php>.

land practice had taken root twenty miles downriver at the Union Colony, and by the time the fertile land on the southern bank of the Poudre hit the market, certain Union colonists were looking to expand.

Once the land came up for sale, organized agricultural colonists, rather than independent homesteaders, possessed both the interest in the reservation lands and the requisite purchasing power to claim the land. By 1872, the colonist movement in Colorado—predicated on collaborative agricultural pursuits over individual autonomy—was gaining momentum across the Front Range.³⁷ Easterners and Midwesterners had settled the Mercer Colony just upriver from Fort Collins, the Chicago-Colorado Colony on the banks of St. Vrain (Present-day Longmont), and more famously the Union Colony downriver from Fort Collins.³⁸ Once the military reservation lands came up for sale, an offshoot of Union colonists formed the Larimer County Land Improvement Company and purchased the sparsely populated, gently rolling lands on the south bank of the Cache la Poudre River.³⁹ Through it all, the expansion of American settlers from 1858 to 1873 spelled the end of thousands of years of Indigenous hunting and temporary habitation along the Poudre valley. In 1869, the local Northern Arapaho led by Chief Friday relented their effort to remain living along the Poudre and relocated to the Wind River

³⁷ Weeks, “Industrializing a Landscape,” 32-41.

³⁸ “Chicago-Colorado Colony,” Colorado Encyclopedia, last modified December 6, 2017, accessed November 30, 2019, <https://coloradoencyclopedia.org/article/chicago-colorado-colony>; Weeks, “Industrializing a Landscape,” 32-41; William Wyckoff, *Creating Colorado: The Making of a Western American Landscape, 1860-1940* (New Haven, CT: Yale University Press, 1999); Kathleen Brosnan, *Uniting Mountain and Plain: Cities, Law, and Environmental Change along the Front Range* (Albuquerque, NM: University of New Mexico, 2002); Alvin T. Steinel, *History of Agriculture in Colorado, 1858 to 1926* (Fort Collins, CO: The State Agricultural College, 1926), 394.

³⁹ Watrous, *History of Larimer County*, 231; “Early Agricultural Colonies and Cooperative Irrigating,” Public Lands History Center, Colorado State University, accessed November 30, 2019, https://publiclands.colostate.edu/digital_projects/dp/poudre-river/crops-livestock/agricultural-colonies/.

Reservation in Wyoming.⁴⁰ Even Antoine Janis—the first white settler in Larimer County—relocated to the Pine Ridge reservation to accompany his Sioux wife.⁴¹

III

The delayed availability of Fort Collins allowed Union colonists to develop the city of Fort Collins in a much more structured manner than the helter-skelter boomtowns dispersed through the mountains. Open to anyone who “possessed of a good moral character,” the colony offered members the opportunity to purchase a residential or business lot in the center of town or a 10, 20, or 40 acre tract of land on the city’s perimeter.⁴² Bolstered by the early successes of wheat crops across Northern Colorado, the prevalence of irrigable land, and funding from reform-minded colonists, a powerful concoction of economic opportunity, risk mitigation, and higher purpose arrived in the form of 200 settlers in 1873.⁴³ With their arrival came land practices and land development that would lay the foundation upon which Fort Collins would expand over the next century. Though little more than dusty streets and empty lots for much of the 1870s, Fort Collins, with its north-south, east-west grid, its collectively funded irrigation ditches, and its planned city center surrounded by farms and fields represented a uniquely

⁴⁰ Burris, *People of the Poudre*, 48.

⁴¹ Burris, *People of the Poudre*, 54.

⁴² Watrous, *History of Larimer County*, 230.

⁴³ Watrous, *History of Larimer County*, 230; Michael Weeks has argued that the same reform fervor instilled in the fabric of the Union Colony was not entirely present at the Fort Collins Agricultural Colony and that it was more of a business venture than the Union Colony. This is a well-founded point, but such notions didn’t disappear entirely, Fort Collins founders, through the prohibition of alcohol, and sense of divine purpose ensured that reform-minded values made their way into the new colony, see Weeks, “Industrializing a Landscape,” 41; for an example of divine purpose, see William E. Pabor, “The Ranchmen and the Colonists,” *Rocky Mountain News*, February 4, 1873, <https://www.coloradohistoricnewspapers.org/?a=d&d=RMD18730204.2.22&srpos=176&e=-1859---1874--en-20--161-byDA-img-txIN%7ctxCO%7ctxTA-%22fort+collins%22-----0-->; Beyond divine purpose, Larimer County boosters also ensured Denver readers that the mellow winter months and pleasant summer temperatures were ideal for cattle and “well cultivated farms,” see “Larimer County, Colorado,” February 8, 1873, *Denver Daily Times*, <https://www.coloradohistoricnewspapers.org/?a=d&d=DTM18730208.2.25&srpos=177&e=-1859---1874--en-20--161-byDA-img-txIN%7ctxCO%7ctxTA-%22fort+collins%22-----0-->; Fort Collins residents also published wheat receipts to prove the crop’s validity north of Denver, see “Farming in Colorado,” *Out West*, December 12, 1872, <https://www.coloradohistoricnewspapers.org/?a=d&d=OWT18721212.2.44&srpos=160&e=-1859---1874--en-20--141-byDA-img-txIN%7ctxCO%7ctxTA-%22fort+collins%22-----0-->.

collaborative, community-oriented, urban space. Such development, as historian Michael Weeks has argued, “provided an alternative to the common narrative of Western settlement.”⁴⁴ Drawing from successful practices and lessons learned in the establishment of the Union Colony, Fort Collins founders followed best practices from their downstream neighbors, but what would prove unique to this colony overlaid on the Colorado Piedmont was the educational institution that grew with it. Unlike the rest of the Front Range colonies, the Fort Collins Agricultural Colony’s main street bore the name “College.”

As the community-minded colonial development of Fort Collins would outline the city’s physical contours for decades to come, Colorado Agricultural College helped mold the intellectual framework from which agriculturalists interpreted local water resources. In 1870 the Territorial Legislature decided that Larimer County would house the state’s land-grant college designed “to teach such branches of learning as are related to agriculture and the mechanic arts...at or near Fort Collins.”⁴⁵ Though some found it outrageous to not simply connect this agricultural college to the University of Colorado in Boulder, or that the territory planned to place an agricultural school on the “Great American Desert,” clever lobbying on the part of Larimer County representative Mathew Taylor ensured that Fort Collins grew alongside an agricultural college.⁴⁶ Acting on the opportunity presented by the Morrill Act ensured that Fort Collins, forward-thinking in its water policy and irrigation methods through community

⁴⁴ Weeks, “Industrializing a Landscape,” 32.

⁴⁵ Steinel, *History of Agriculture in Colorado*, 583.

⁴⁶ For pushback on locating the university in “the Great American Desert,” see Steinel, *History of Agriculture in Colorado*, 583; see also Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River*, 38. For Boulder resident insisting that the Agricultural College should be attached to University of Colorado, see Charles M. Campbell, “Annual Address to the Boulder County Agricultural Society,” *Boulder County News*, September 28, 1870, <https://www.coloradohistoricnewspapers.org/?a=d&d=BCN18700928.2.1&srpos=37&e=-----en-20--21-byDA-img-txIN%7ctxCO%7ctxTA-colorado+agricultural+college+-----0-->; on legislation surrounding the Agricultural College, see “An Agricultural College,” *The Colorado Transcript*, February 9, 1870, <https://www.coloradohistoricnewspapers.org/?a=d&d=CTR18700209.2.23&srpos=27&e=-----en-20--21-byDA-img-txIN%7ctxCO%7ctxTA-colorado+agricultural+college+-----0-->.

planning, would remain a locus of knowledge and cutting edge technology revolving around water heading into the twentieth century.

Fort Collins's position relative to the rush of settlers in the 1850s and 1860s, and its role as an army installation and reservation kept the banks of the Cache la Poudre less trodden and less settled by eastward bound Anglo-Americans than much of the rest of Front Range. Distance from Denver, and the fort's position as a travel route between nodes of Anglo development shielded the region from the helter-skelter homestead claims, water diversions, and unplanned urban growth that came to define many boomtowns throughout the territory. Once finally opened to the public in 1872, the sale of Fort Collins coincided with both the arrival of reform-minded, community-oriented, eastern colonists enamored with the agrarian potential of the region, and the actualization of the Morrill Act within the territory. While they didn't know it at the time, settlers interacted with local and national developments to lay the physical and social groundwork that would define how Fort Collins's settlers, residents, and students interpreted and organized along the banks of the Poudre and base of the Rockies.

An Agricultural Colony on the Great American Desert, 1873-1890

In 1873, after a long, hot summer day traveling up the Poudre River from Greeley, Isabella Bird's rented carriage arrived in Fort Collins. Dizzy from the heat and bothered by the flies, the British traveler and author found few positives in the newly minted town. Life here, Bird lamented, was principally utilitarian, "coarse speech, coarse food, coarse everything... with nothing on which the eye can rest with pleasure."⁴⁷ Bird's affinity for being in the mountains rather than viewing them from afar likely helped frame her opinion of the fledgling town, but the

⁴⁷ Isabella Bird, *A Lady's Life in the Rockies* (Norman, OK: University of Oklahoma Press, 1960), 35.

lack of amenities was hard to miss in early Fort Collins. As entrepreneur-turned-local-historian, Ansel Watrous, recalled of his arrival in 1878, Fort Collins was “a more desolate and dreary looking country I had never dreamed of seeing.” One defined by empty lots, dirt streets, and the lack of trees and streetlights.⁴⁸

Stalled by the Panic of 1873, grasshopper plagues, and the delayed arrival of railways at the end of the 1870s, the Fort Collins Agricultural Colony hardly resembled the “Irrigated Eden” boosters peddled at the beginning of the decade.⁴⁹ The pursuit of an Irrigated Eden, a profitable, moral, egalitarian, agricultural community, however, shaped local mindsets, influencing how local residents interacted and understood their place within the hydrological cycle and the community. Mindsets that then informed the physical contours of the Fort Collins built environment. The mixture of an agricultural focus, a collective approach, and a wealth of local experience via the Union Colony, resulted in a town that revolved around local water and all the difficulties it presented. Though it didn’t look like much when Lady Bird passed through or when Ansel Watrous arrived, the colony’s few hundred residents had carefully laid out a city irrigated by communal ditches and sitting not in, but above the Cache la Poudre floodplain. Even as the city shed its colony moniker and entered a period of urban and economic growth at the turn of the century, the collaborative, communally oriented mental and physical infrastructure developed in the city’s early years guided Poudre-Fort Collins relations heading into the 1900s.⁵⁰

I

⁴⁸ Ansel Watrous, “Fort Collins in 1878,” in *The History of Larimer County, Colorado*, 38.

⁴⁹ Here I am borrowing historian Mark Fiege’s phrasing from his analysis of irrigated agriculture along the Snake River in Idaho, development along the Poudre differed from that along the Snake, but early optimism drove development in both that irrigation engendered, see Mark Fiege, *Irrigated Eden: The Making of an Agricultural Landscape in the American West* (Seattle: University of Washington Press, 1999).

⁵⁰ For background on urban growth across the United States in the late nineteenth century, see Christopher W. Wells, *Car Country: An Environmental History* (Seattle: University of Washington Press, 2013), 5-34.

The Fort Collins Agricultural Colony never replicated the Union Colony, and it never sought to. Rather, the colony embodied an offshoot. Unlike the Union Colony, which, under the direction of Horace Greeley and Nathan Meeker, sought to square economic opportunity with utopian, communitarian, and moral ideals, the Fort Collins Agricultural Colony coalesced around a more pragmatic bent. While Fort Collins initially embraced the moral tenets of the Union Colony by advertising toward those with “high moral character” and banning alcohol within city limits, the colony—like many across the Front Range—never prioritized reformist ideals. After all, opportunistic locals, not social reformers, had conceived of the Larimer County Land Improvement Company.

Importantly though, these opportunists conceptualized economic prospects within the same framework as that of the Union Colony. City planners and settlers the likes of Robert A. Cameron and William E. Pabor brought their confidence in the Union Colony’s cooperative orientation with them, inscribing such values on Fort Collins in the form of communal ditches and collaborative problem solving. And, not only did former Union Colonist bring with them the playbook, they brought the audibles too. Through their own struggles on the very same river, ex-Union Colonists also knew the risks, difficulties, and mistakes the new city needed to navigate.

The inception of the Union Colony revolved around community-owned and community-funded irrigation projects. In the colony’s first year of existence, membership fees funded two major canal projects that not only provided water for farmers on the bottomlands, but those spread across the higher terraces and bench lands farther from the river’s banks.⁵¹ Unlike ditch projects of the decade prior, these two, though initially mired by design flaws, inaccurate cost

⁵¹ Michael Holleran, *Historic Context for Irrigation and Water Supply Ditches and Canals in Colorado* (Denver: Colorado Center for Preservation Research, University of Colorado at Denver and Health Sciences Center, 2005), 14-15.

estimates, and generally poor understanding of the region's environment, provided an approach to farming and settling that leveraged collaboration to circumvent the traditional restriction of agricultural pursuits only along river's edge. More funding meant bigger ditches, and bigger ditches allowed for irrigated agriculture farther and farther from the actual source. Drawing from firsthand experience as one of the designers of the Union Colony's thirteen-mile Ditch #3, R. A. Cameron—the president of the Fort Collins Agricultural Colony—brought his faith in large, communal irrigation projects with him when he moved upriver.⁵²

Like the Union Colony, the Fort Collins Agricultural Colony organized membership funds to construct large irrigation projects that served the farming community beyond the Poudre's banks. Purchasing and expanding the Town Ditch and the Larimer No. 2 Canal in 1872 and 1873 on the western edge of the settlement, and cutting the Lake Canal north of town in 1874, Fort Collins followed the Union Colony's lead, diverting water miles from the waterway and, in doing so, carving a landscape oriented around communal development.⁵³ In only a little more than a year, Fort Collins's expanding irrigation network proved robust enough to run the Poudre entirely dry in the drought-ridden summer of 1874, much to the dismay of Greeleyites.⁵⁴

While the Union Colony provided the collective-minded social framework from which Fort Collins began carving canals, it wasn't the only local happening that informed the physical contours of Fort Collins. Long before Cameron and company envisioned budding a city from the abandoned fort, the eventual location of Fort Collins's urban center, Old Town, represented early

⁵² Holleran, *Historic Context for Irrigation and Water Supply Ditches*, 14; Cache la Poudre River Natural Heritage Area, "Greeley #3 Ditch," accessed February 17, 2020, <https://www.poudreheritage.org/locations/greeley-3-ditch/>; City of Greeley, "Greeley's Water History," accessed February 17, 2020, <http://greeleygov.com/services/ws/system/water-history>.

⁵³ William E. Pabor, *Colorado as an Agricultural State: its Farms, Fields, and Garden Lands* (New York: Orange Judd Company, 1883), 77.

⁵⁴ David Boyd, *A History: Greeley and the Union Colony of Colorado* (Greeley, CO: The Greeley Tribune Press, 1890), 120.

adaptation to life along the eastern foothills of the Rockies. Army officials originally located Fort Collins on the banks of the Cache la Poudre River near Laporte, a few miles upriver from its eventual location. Unfamiliar with the regional propensity for highly focused, intense rain events in the upper reaches of the Poudre watershed, Army planners did not pick the fort's original location with flash flooding in mind. However, when soldiers of the 11th Ohio Volunteer Cavalry woke up to rising waters in the spring 1864—the result of a cloudburst at higher elevation heightened by seasonal snowmelt—and fled for higher ground to watch helplessly as the river swept their supplies away, it became apparent that if the fort was to remain permanent, it would need to relocate.⁵⁵ The eventual landing spot: the bluff on which Fort Collins's Old Town now sits. Relocating the fort in line with local environmental lessons provided a relatively flood-proof city center from which the colony built around.⁵⁶ Local knowledge then not only informed the large ditches running through and around the city, but the location of the city to begin with.

II

Fort Collins as an agricultural colony proved short-lived. In 1875, the first legal saloon sprouted up in the city, marking the abandonment of Fort Collins's formal "high-moral character" position (but perhaps softening the blow of a difficult first few seasons for local farmers).⁵⁷ Beyond the moral component, new developments across the region deemphasized the need for jointly funded infrastructure projects. The arrival of the rails in 1877 connecting Fort

⁵⁵ Watrous, *History of Larimer County*, 166; Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River*, 107; Kenneth Jessen, "Fort Collins: The Product of a Flood," *Loveland Herald*, May 19, 2014, <https://www.reporterherald.com/2014/05/19/fort-collins-the-product-of-a-flood/>.

⁵⁶ During the Poudre River floods of 1891, 1901, and 1904 flood water ruined fields and killed livestock along the river's bottomlands but didn't reach the city's interior, see "A Destructive Flood," *The Fort Collins Courier*, June 11, 1891, <https://www.coloradohistoricnewspapers.org/?a=d&d=FCC18910611.2.2&srpos=2&e=-----en-20--1-byDA-img-txIN%7ctxCO%7ctxTA-flood+of+1864-----0-Larimer->; see also "The Cache la Poudre Out of Its Banks," *Weekly Courier*, May 23, 1901, <https://www.coloradohistoricnewspapers.org/?a=d&d=TWC19010523.2.32&srpos=6&e=-----en-20--1-byDA-img-txIN%7ctxCO%7ctxTA-flood+of+1864-----0-Larimer->.

⁵⁷ Pabor, *Colorado as an Agricultural State*, 187.

Collins to the markets of Denver provided an expedient outflow for agrarian goods.⁵⁸ Ease of access increased private interest and investment along the Poudre, usurping the role of the colony as the source of capital fueling large irrigation projects.⁵⁹ Still though, the core tenets of the community-oriented colony years remained imbedded within Fort Collins. Both in the physical environment and the collaborative mentality of its residents. While community-funded projects disappeared from the Front Range during the mid 1870s, tracing interactions between Fort Collins residents, their neighbors, and what historian Mark Fiege has referred to as “mobile nature” (in this case water), offers a window into the continuation of communal collaboration within Fort Collins in the closing decades of the nineteenth century.⁶⁰

Though the location of the heart of Fort Collins recognized historical lessons on the messiness of the local hydrological cycle and the river’s relative mobility, local waterways also provided everyday reminders of the difficulties that came with trying to harness water. While most traveled along the unincorporated north bank of the Poudre, multiple large irrigation ditches slithered through the city itself, following not the north-south oriented street pattern, but the gentle dips in elevation that allowed Poudre water to saturate fields south of Fort Collins. As in their construction, the maintenance and difficulties that came with these ditches highlights the collaborative nature of city planners and city residents. As historians have highlighted (and past

⁵⁸ Watrous, *History of Larimer County*, 69; Jason Marmor, “Historical Contexts for the Old Fort Site, Fort Collins, Colorado, 1864-2002,” (Prepared for the City of Fort Collins Advance Planning Department, 2002), 28, accessed November 30, 2019, <https://www.fcgov.com/historicpreservation/research-projects.php>.

⁵⁹ In the 1880s and 1890s, funding for irrigation projects came in from as far as London, UK, see, Steinel, *History of Agriculture in Colorado*, 203; Pabor, *Colorado as an Agricultural State*, 80.

⁶⁰ Mark Fiege, “The Weedy West: Mobile Nature, Boundaries, and Common Space in the Montana Landscape,” *Western Historical Quarterly* 36, no. 1 (April, 2005), 24, for additional works on the difficulties that come with ascribing property rights on natural resources, see Arthur McEvoy, “Toward an Interactive Theory of Nature and Culture: Ecology, Production, and Cognition in the California Fishing Industry,” *Environmental Review* 11, no. 4 (Winter, 1987): 289-305; Virginia Anderson, *Creatures of Empire: How Domestic Animals Transformed Early America* (New York: Oxford University Press, 2006), Lissa Wadewitz, *The Nature of Borders: Solomon, Boundaries, and Bandits on the Salish Sea* (University of Washington Press, 2012).

and present ditch laborers have attested) irrigation ditches required arduous labor, as debris, seepage, and overflow each impinged on the productivity and functionality of ditches.⁶¹ In the case of Fort Collins, these difficulties, and the collaborative responses they engendered, weren't limited to the agrarian outskirts of community, but at its heart, too.

Water's mobility—its propensity to escape through any gap, soak through soil, stagnate at natural low points—engendered collaboration amongst farmers and city-dwellers across property lines. Droughts, floods, and generally ill-conceived designs distanced the goal of irrigation ditches—a stable water source to irrigate crops—from the reality—surprisingly fickle water supply largely at the mercy of inconsistent weather.⁶² The distance between goal and reality undermined health of crops and profit margins, and at certain points, endangered human health.⁶³ The latter was the case of the Fort Collins Irrigation Ditch (or the “Town Ditch,” as referred to by locals), later renamed Arthur Ditch, in the 1870s and 1880s, and to address this health threat residents relied on their collaborative roots to right issues that didn't adhere to property lines.

Initially constructed in 1869, then expanded in 1873 to meet municipal water needs of the city and irrigation needs south of town, the Town Ditch meandered through west Fort Collins

⁶¹ Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River*, 20; Fiege, *Irrigated Eden*, 26-35; interestingly, though separated by than more a century, both Robert Crifasi and David Boyd brought firsthand experience working on irrigation ditches to their histories, see Crifasi, *A Land Made From Water*, xi-xii; Boyd, *A History*, 61.

⁶² Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River*, 20; The R. Q. Tenney papers from his time as water commissioner in the 1890s are filled with on-the-fly deal making and problem-solving, “Papers of R. Q. Tenney as District 3 Water Commissioner, March 1893—May 1893,” box 1, folder 1, R. Q. Tenney Collection, FCMOD; difficulties in water control was a particular area of focus in David Boyd's early history of Greeley, even the most persistent booster, William E. Pabor, acknowledged the headache that was the issue of ditch seepage, see David Boyd, *A History*, 120, 150-151; Pabor, *Colorado as an Agricultural State*, 150, 154.

⁶³ Seepage was a particularly difficult issue for irrigating farmers. As Mark Fiege noted, seepage was not only physical problem, but a social problem, see Fiege, *Irrigated Eden*, 34; Measuring and understanding seepage was a primary concern of the Colorado Agricultural College, as head of the Colorado Experiment Station, Louis G. Carpenter kept meticulous seepage records on the Cache la Poudre River from 1900-1909, “Cache la Poudre Seepage,” box 4, folder 18, Papers of Louis G. Carpenter, Water Resources Archive, Colorado State University libraries, accessed December 1, 2019, <https://mountainscholar.org/handle/10217/75127>.

from the city's inception.⁶⁴ And from its earliest days, it caused problems, as, beginning in 1873, "water soaked through the porous soil" turning areas along Mountain Avenue and Laporte Avenue, near downtown, into "marshes and swamps."⁶⁵ With seepage curtailing construction and providing a breeding ground for diseases, concerned locals banded together and appealed to city officials (their neighbors) to take action. In 1875, the Town Trustees paid for cleaning and repairs on the ditch.⁶⁶ Yet, the collective effort to force the city into repairing the dangerous ditch did not complete the job. In 1883, four city physicians wrote the *Fort Collins Courier* to state that, upon their review, a combination of slowed flow and industrial, agricultural, and human waste build up made the canal "prejudicial to the health of our citizens."⁶⁷ In 1885, A.H. Patterson, chairman of the committee tasked with the ditch issue, implored the city to address the "neglect on the part of ditch owners" and either declare the ditch a public nuisance or file suit. Private interests of a few were getting in the way of public health of the rest.⁶⁸ By constructing a sewer line along Mountain avenue in 1886, the city and its voters articulated the preeminence of the public health over private property.⁶⁹ In the case of the town ditch, addressing problems associated with mobile nature collaboratively across the grid trumped independence and greed traditionally associated with private property. The difficulties of harnessing water weren't just the problems of the individual, but the community.

⁶⁴ Watrous, *History of Larimer County*, 72, 233.

⁶⁵ Watrous, *History of Larimer County*, 235.

⁶⁶ Watrous, *History of Larimer County*, 235.

⁶⁷ E. A. Lee, G. E. Bristol, W. W. Cole, and H. C. James, "Collins' Sanitary Condition: Report of Sub-Committee of Physicians Appointed to Investigate the Subject," *Fort Collins Courier*, May 10, 1883, <https://www.coloradohistoricnewspapers.org/?a=d&d=FCC18830510.2.4&srpos=6&e=-----en-20--1-byDA-img-txIN%7ctxCO%7ctxTA-seepage-----0--Fort+Collins>.

⁶⁸ A.H. Patterson, "Report of the Health Committee," *Fort Collins Courier*, May 14th, 1885, <https://www.coloradohistoricnewspapers.org/?a=d&d=FCC18850514.2.14&srpos=36&e=-1885---1886--en-20-FCC-21-byDA-img-txIN%7ctxCO%7ctxTA-patterson-----0--Fort+Collins>.

⁶⁹ Watrous, *History of Larimer County* 235; "Greeley," *Fort Collins Courier*, April 14, 1887, <https://www.coloradohistoricnewspapers.org/?a=d&d=FCC18870414.2.66&srpos=18&e=-1885---1887--en-20--1-byDA-img-txIN%7ctxCO%7ctxTA-seepage+-----0--Fort+Collins>.

This willingness to collaborate displayed within the core of the city didn't disappear at its edges. In the fields the actual matter of getting water on one's land often hinged on interpersonal communications and imperfect execution of legal allotments. In times of want, irrigators requested that their neighbors and water commissioner recognized their rights to diverted Poudre water, sometimes even providing creative solutions before taking issues to court. In his time as water commissioner, R. Q. Tenney received many letters from farmers and ditch owners that water was not reaching their head gates. Requesting immediate remedies, irrigators presented creative solutions in their letters to the water commissioner, such as diverting water from the local flour mill on Sundays when it closed.⁷⁰

In times of plenty, irrigators requested extra water for side projects to take advantage of peak flow. In 1893, long-time local Charles C. Hawley politely wrote Tenney asking if some of the "big flow" benefitting the Lindell mill could be diverted to "irrigate late garden stuff, strawberries, &c." on his property farther along the shared canal.⁷¹ In either want or plenty, irrigating farmers proved willing to address their neighbors, write their water commissioner, and negotiate and problem-solve. Dodging drawn-out disputes and countering technological limitations while still irrigating their fields forced farmers to lean on informal communication and collaboration.

Early Fort Collins residents did not possess the money, technology, or mastery to completely bend the Poudre to their will. Rather than ignoring the difficulties that local water presented—be it flooding, seepage, fickle rainfall—they identified such limits and then built a

⁷⁰ P. Anderson, C. Buckingham, and Alex Barry to R. Q. Tenney, September 15, 1893, R. Q. Tenney Collection; though district, state, and federal courts all played major roles in defining and protecting water rights, turn-of-the-century irrigators, due to time constraints and the inherent murkiness of water rights in practice, often sought out expedient solutions to procure water, David Schorr, *The Colorado Doctrine: Water Rights, Corporations, and Distributive Justice on the American Frontier* (New Haven, CT: Yale University Press, 2012), Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River*, 41-54.

⁷¹ C. C. Hawley to R.Q. Tenney, October 12, 1893, box 1, folder 3, R.Q. Tenney Collection.

city around them. Past experiences along the Poudre framed how and where to build the city. Everyday issues presented good reasons for Fort Collins locals to continue to rely on and problem solve with their neighbors decades after the Fort Collins Agricultural Colony became simply Fort Collins. Through these developments, the inhabitants of the dusty town Isabella Bird passed through in 1873 laid the groundwork of a city particularly familiar with the local environment and equipped with community-oriented coping methods for when things went awry.

III

None of this is to say that Fort Collins developed in a manner that distanced local consumption patterns from those of the rest of the nation. Though the physical and mental makeup embodied adaptations to the difficulties presented by local water, the city's exploitation of local resources represented broader trends across an urbanizing, resource hungry United States. Fort Collins residents harvesting alfalfa, wheat, and grazing sheep and cattle didn't represent the extreme extraction economy of the mining industry, but they too left their mark on the land. Fencing and railway projects resulted in logging camps in the forests west of town in the Cache la Poudre's watershed.⁷² Ambitious irrigation projects also began reshaping the local environment, as high elevation diversion projects, dams, and reservoirs sought to turn the Poudre from a wild river to a dependable one.⁷³ Even mining eventually took hold along the banks of the Poudre in the final two decades of the century, incentivizing expansion of travel ways along the

⁷² U.S. Department of Agriculture, Forest Service, Rocky Mountain Region, *Cache la Poudre Wild and Scenic River Final Management Plan*, (Fort Collins, CO, 1990), 5, <https://mountainscholar.org/bitstream/handle/10217/21499/WIVG01105.pdf?sequence=1&isAllowed=y>; Howard E. Evans, Mary Alice Evans, *Cache la Poudre: The Natural History of a Rocky Mountain River*, 2nd ed. (Niwot, CO: University of Colorado Press, 1991), 50, 71, 200; Kenneth Jessen, "Colorado History: Larimer County's Extensive Lumber Industry," *Reporter Herald*, July 27, 2019, <https://www.reporterherald.com/2019/07/27/colorado-history-larimer-countys-extensive-lumber-industry/>.

⁷³ For examples, see Laflin *Irrigation, Settlement, and Change on the Cache la Poudre River*, 26-41.

river, requiring lumber for construction material, and creating extraction waste.⁷⁴ General aridity forced the young city to adapt, and adapt it did, altering practices without abandoning the pursuit of maximum gain by transforming the Poudre into a working river.

The Cache la Poudre of 1890, from its high alpine headwaters to its confluence with the South Platte on the plains, looked much different than the river that the Fort Collins Agricultural Colony had platted itself next to in the 1870s. Ditches and dams high in the mountains added to and altered the river's flow above Fort Collins while head gates and reservoirs siphoned and redistributed the river across the Piedmont. Loggers denuded hillsides within the Poudre watershed then used the river to transport lumber to fence builders and rail crews below. In their reliance on the river, Fort Collins residents reshaped the Cache la Poudre. Dams, diversions, and ditches, however, did little to contain flooding on the Cache la Poudre. Instead, removing absorbent forest cover and reengineering the river's drainage basin furthered flood danger. In 1891, a dam failure high above Fort Collins unleashed a flood down the Poudre that uprooted every bridge between the burst reservoir and Fort Collins.⁷⁵ Thanks to the foresight of prior settlers, Fort Collins sat just out of reach of the surging water. Displayed by the flood was that while nineteenth-century Fort Collins residents built around, modified, and relied on the Poudre River, they certainly didn't control it.

Still, while control of the river proved illusory, Fort Collins residents in the closing decades of the century had figured out how to monetize the Cache la Poudre. Reshaping the river allowed Fort Collins to produce agricultural goods at the same time increasing connection to

⁷⁴ Evans, Evans, *Cache la Poudre*, 164, 203; S.B. Stewart, "North Park Toll Road is Now Complete Through to all Points in North Park," *Fort Collins Courier*, August, 26, 1880, <https://www.coloradohistoricnewspapers.org/?a=q&hs=1&r=1&results=1&txf=txIN%7CtxCO%7CtxTA&txq=stewart+toll+road&e=-----en-20--1--img-txIN%7CtxCO%7CtxTA-----0-->.

⁷⁵ "Chambers Lake," Public Lands History Center, Colorado State University, accessed May 20, 2020, https://publiclands.colostate.edu/digital_projects/dp/poudre-river/moving-storing/ditches-dams-diversions/chambers-lake/.

American markets made such production more profitable. Expedited connection with major trade hubs via railways boosted excitement in the irrigated city's potential—leading to an influx of new residents and new capital investment—which in turn paved the way for ambitious irrigation projects and urban growth. Dotted the recently barren streets of Fort Collins in the 1880s and 1890s were barbershops, banks, and candy shops housed not in wooden shanties, but brick buildings.⁷⁶ As the century wound to a close, powerlines hung above the grid, and sewer lines ran below. By 1907, one could even catch the commuter trolley running down the middle of Mountain Avenue to work downtown.⁷⁷ By 1890, the city's population eclipsed 2,000 residents, opposed to the estimated 500 when Watrous arrived in 1878.⁷⁸ With agriculture serving as a stable economic base, Fort Collins had begun to look like the rest of the country.⁷⁹ And yet, though much of the urban center's growth embodied nation-wide development, the city, at its core, still largely operated within the physical and mental framework laid in its founding. Fort Collins at the turn of the century was a hybrid city. A city, that, for good reason, sat not on the banks of the Poudre River, but on the hillside above the river. At least, until 1903.

Sugar Beets and a Staggering Flood: Florescence along the Floodplain, 1890-1911

On the evening of January 2, 1902, Larimer County farmers across the Poudre valley made their way downtown for a meeting to discuss a seemingly innocuous subject, sugar beets. As the farmers tied up their horses and parked their horseless carriages outside the Opera house,

⁷⁶ Sanborn Map Company, *Sanborn Fire Insurance Map from Fort Collins, Larimer County, Colorado* (March 1906), https://www.loc.gov/item/sanborn00996_005/; Hall, *History of the State of Colorado*, 183.

⁷⁷ Barbara Fleming, "Fleming: Fort Collins' Wide Streets," *Coloradoan*, December 13, 2015, <https://www.coloradoan.com/story/life/2015/12/13/fleming-fort-collins-streets-wide/77260250/>.

⁷⁸ Watrous, "Fort Collins in 1878."

⁷⁹ On broader consumption of nature across Colorado, see Brosnan, *Uniting Mountain and Plain*; William Wyckoff, *Creating Colorado*. On the increasing homogenization of urban and suburban space, see Wells, *Car Country*.

the question at hand seemed, at least to the *Weekly Courier*, a foregone conclusion. The newspaper, calling it a “moral certainty,” ensured its readers that farmers would throw their weight behind supporting the construction of a sugar beet processing factory in Fort Collins.⁸⁰ Farmers that night proved the *Weekly Courier* correct, as one after another pledged to grow sugar beets until they met the 5,000 acre mark that initiated the construction of a local processing plant.⁸¹ On the surface, this development seems to map onto the collaborative manner of development that defined the past three decades. Digging deeper, however, the arrival of this subterranean crop and its companion processing plant launched Fort Collins into a new era of development. Though the result of the pledge meeting that night may have been a foregone conclusion, it is unlikely that anyone in attendance identified the arrival of the sugar beet as a catalyst for the arrival of hierarchically oriented labor and urban expansion onto the Poudre’s floodplain.

The appearance of sugar beets in the 1890s and the construction of the sugar plant a decade later marked the arrival of Worster’s *florescence* in Fort Collins. Unlike the staple crops that defined local agriculture in the decades before, the labor-intensive sugar beet, and the complex mechanical processing the beet required, welcomed corporate control and a hierarchical labor regime to the region. While sugar corporations never seized control over water rights along the Poudre, their control over the highly profitable process of turning sugar beet into a refined commodity ensured the sugar companies’ centrality and power within the agrarian community. Such corporate centrality strained the bonds and understandings framed between resident and

⁸⁰ “A Strong Company Organized to Grow Sugar Beets,” *Weekly Courier*, January 2, 1902, <https://www.coloradohistoricnewspapers.org/?a=d&d=TWC19020102.2.95&srpos=4&e=-1902---1902--en-20--1-byDA-img-txIN%7ctxCO%7ctxTA-sugar+beet-----0--Fort+Collins>.

⁸¹ “Sugar Plant a Big Break for Fort Collins,” *The Coloradoan*, August 16, 1964, in James R. Miller, “Institutional and Community History, Part II,” box 4, folder 7, Papers of James R. Miller, Archives and Special Collections, Colorado State University, accessed February 16, 2020 <https://mountainscholar.org/handle/10217/200652>.

local environment as the pressure of maximizing efficiency and keeping up with competitive national agriculture took center stage. The sugar beet transformed agriculture in Fort Collins by prioritizing efficiency and profit, resulting in an urban environment less in touch with local natural cycles. With sugar beets came an increasingly hierarchically oriented city sprawling into the previously unsettled floodplain. A development that ultimately left Fort Collins's least fortunate directly in harm's way when flood water launched out of Poudre Canyon in 1904.

I

Understanding how a simple crop reoriented the Fort Collins landscape at the turn of the century requires consideration of the economic and environmental context that brought sugar beets to the Colorado Piedmont. Sugar beets weren't just another crop farmers added into their rotation, but a labor-intensive cash crop that, through its profitability, played a central role in Fort Collins agriculture at the turn of the century.

In 1887, far from the fields surrounding Fort Collins, Congress passed the Hatch Act which provided funding for land grant colleges to create agricultural experiment stations.⁸² Though the Colorado Agricultural College already possessed an experimental garden and worked hand in hand with farmers to devise more efficient growing techniques, funding for experimentation allowed the College to begin spending research dollars on ventures beyond the scope of what local farmers were already planting.⁸³ Though individuals had experimented with it in the decades prior, in 1888, the CAC planted its first $\frac{1}{4}$ acre of sugar beets.⁸⁴ As these

⁸² "Experimental Station at CSU Aids Colorado Agriculture," *The Coloradoan*, January 21, 1962, in James R. Miller, "Institutional and Community History, Part II," box 4, folder 6, Papers of James R. Miller, accessed February 16, 2020, <https://mountainscholar.org/handle/10217/200651>, 75.

⁸³ On collaboration between CAC and community, see Weeks, "Industrializing a Landscape," 61-65; On campus garden, see "Historic documents of Colorado State University, volume IV: operations of Colorado Agricultural College," 132-133, 150-3, 160, box 2, folder 1, Papers of James R. Miller.

⁸⁴ Sierra Standish, "Beet Borderland: Hispanic Workers, the Sugar Beet, and the Making of a Northern Colorado Landscape," (Master's Thesis: Colorado State University, 2002), 34.

government-funded experiments got underway, a series of protectionists acts of Congress and tariffs beginning in 1890 stimulated further growth of the plant's appeal across the west.⁸⁵ But opportunity through national policy didn't alone lead to the success of the sugar beet on the Front Range, it had to make ecological sense too.

The environmental preferences of the sugar beet mapped seamlessly onto the Fort Collins landscape. Though adaptable to various soil qualities, the sugar beet grew best in sandy loam—a characteristic of the soil surrounding Fort Collins.⁸⁶ Additionally, the plant produced the most sugar when average summer temperatures hovered around 70°F and when the plant received consistent watering throughout the growing process.⁸⁷ Averaging 66°F throughout the summer months, and possessing an extensive irrigation system, the farmlands running along the Cache la Poudre provided an ideal environment for the sugar beet.⁸⁸ Test results confirmed as much, as fields in Larimer County produced sugar beets in the early 1890s that contained a whopping 16.44% sugar content, well above the national average of 13.66%.⁸⁹ But the compatibility didn't stop there. Fort Collins was also equipped to combat the sugar beet's heavy strain on soil nutrients. The lamb feeding industry—arriving in Fort Collins in 1889 and exploding over the next decade—created an organic solution to both get rid of processed beet waste and return nutrients to the soil in the form of tons of fertilizer.⁹⁰ Taken together, favorable federal governmental policies in the 1890s and a well suited environment turned the sugar beet into what

⁸⁵ Standish, "Beet Borderlands," 34; *Silver Wedge: The Sugar Beet in The United States* (Washington D.C.: United States Beet Sugar Association, 1944), 24-25; Steinel, *History of Agriculture in Colorado*, 295.

⁸⁶ Esther Sanfreida Anderson, "Geography of the Beet Sugar Industry" (Master's Thesis, University of Nebraska, 1917), 73; Weeks, "Industrializing a Landscape," 73; A.T. Sweet, J.N. Spencer, *Soil Survey of The Fort Collins Area, Colorado*, No. 27, Bureau of Chemistry and Soils, U.S. Department of Agriculture (Washington, D.C., 1927), 10; Samuel Jodidi, *The Sugar Beet and Beet Sugar* (Chicago: Beet Sugar Gazette Company, 1911), 1-10.

⁸⁷ Anderson, "Geography of the Beet Sugar Industry," 19, 30.

⁸⁸ Bureau of Chemistry and Soils, *Soil Survey of The Fort Collins Area*, 5.

⁸⁹ Steinel, *History of Agriculture in Colorado*, 297.

⁹⁰ On sheep in Fort Collins, see Watrous *History of Larimer County*, 136; on the relationship between sheep and sugar beets, see *Silver Wedge*, 34-42.

Fort Collins residents saw as the cash crop of the future.⁹¹ But unlike potatoes, wheat, and alfalfa, the process of turning a sugar beet into money required major advances in regional agriculture technology, and more laborers than the city could provide.

As historian Michael Weeks noted, the sugar beet's appeal to national markets, and its labor-intensive cultivation across the Colorado Piedmont, "was part of a larger process that made growers out of farmers and transformed intensive agriculture to industrial agriculture."⁹² This stemmed from the fact that the beet only drew a profit once machines had squeezed the sugar out of the plant, a heavily complicated matter that required factory processing. Furthering difficulties, growing beets required meticulous hand thinning at the beginning of the growing season and manual harvest at its conclusion. Additionally, beets outweighed alfalfa and grain products and, once removed from the soil, began losing sugar content.⁹³ One couldn't decide to plant sugar beets in the spring and expect to turn a profit, they needed a labor force and a processing plant in close proximity. The crop's requisite labor and processing explained the expanding role of sugar companies in the region, as they possessed the necessary capital to create the infrastructure that turned the cash crop into cash. Their capital investment, however, required loyalty in the form of growers pledging to plant the seeds that the companies handed them and work under contract with the company.⁹⁴ Getting in on the crop then, required landowners to sacrifice some of their autonomy, further enmeshing the small agrarian community with larger national economics, and in turn, inscribing national means of production onto the local environment. Importantly, by inviting outside investors and sugary companies unfamiliar with

⁹¹ "Grow Sugar Beets is the Advice for Farmers," *Fort Collins Courier*, November 25, 1897, <https://www.coloradohistoricnewspapers.org/?a=d&d=FCC18971125.2.32&srpos=4&e=-1890---1900--en-20--1--img-txIN%7ctxCO%7ctxTA-sugar+beet-----0--Fort+Collins>.

⁹² Weeks, "Industrializing a Landscape," 103.

⁹³ Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River*, 64.

⁹⁴ Weeks, "Industrializing a Landscape," 70, 135.

the local environment and unencumbered by memories of past floods into local infrastructure decision-making, Fort Collins farmers and enthused city boosters opened the door for risky development along the floodplain that community knowledge had avoided for decades prior.

II

In the closing decades of the twentieth century, thousands of German-Russian immigrants spread across the Midwest looking for work. These ethnic Germans—living for generations in eastern Russia to escape war and difficult living conditions in the Rhineland—arrived with little money and few options after political upheaval and famine pushed them from the banks of the Volga, and promise of cheap land (nearly all of which settlers had already purchased by the time of their arrival) pulled them west.⁹⁵ While an early study on the economic viability of sugar beets in Colorado presented Chinese workers who “could be got at \$1” a day as an enticing option for an inexpensive labor force, Fort Collins investors and agriculturalists pinpointed Germans from Russia as the labor force for the beet fields.⁹⁶ And with the bottom line in mind, when investors decided to provide land for the construction of labor housing, they made sure they were near the fields and factory, and outside of the city.⁹⁷

In an effort to procure consistent labor, the Fort Collins Colorado Sugar Company and local investor, Peter Anderson, in 1902 and 1903, set aside land on the opposite side of the river from Fort Collins for laborers to build temporary housing. Living in tents and abandoned farms during the prior growing seasons, these spaces provided immediate relief for landless German Russians. Building on these plots, however, scripted German Russians as marginal laborers—a

⁹⁵ Adam Thomas, *Work Renders Life Sweet: Germans From Russia in Fort Collins, 1900-2000* (Prepared for Advance Planning Department, City of Fort Collins, 2003), 2-5.

⁹⁶ Alvin T. Steinel, *History of Agriculture in Colorado*, 286.

⁹⁷ Using space and distance to marginalize laborers was a constant across the Colorado Piedmont in the early twentieth century, see Weeks, “Industrializing a Landscape,” 136-139.

strange set of outsiders on the edge of town. The land set aside served investors and farmers in two ways. First, by choosing land next to the sugar beet processing plant and surrounded by beet fields, they maximized immediate profit. Laborers would not waste time travelling to the fields and plant. Second, by placing the neighborhoods on the outskirts of town, investors ensured that German Russians stayed a separate entity in the eyes of the public, different not by their skin tone, but their traditions, dress, labor, and language. Living in hastily built shacks, wearing foreign clothes, and speaking a different language provided angles for locals to speculate, judge, and worry about these perceived outsiders, not welcome them.⁹⁸ This shielded sugar beet growers and processors from a community questioning grueling labor conditions and meager pay for decades. It also countered local norms. Such an expansion didn't fit the mental and spatial development patterns fostered in Fort Collins in the prior three decades. Corporate interest now leveraged cultural difference rather than collective plight when creating the infrastructure to bolster sugar processing. As a result, two neighborhoods popped up in the middle of the Poudre floodplain, the floodplain that since 1864, Fort Collins made sure to avoid.

In the Spring of 1904, a powerful rainstorm displayed the divides in Fort Collins development over the past three decades. Early on May 20, heavy storm clouds along the eastern foothills of the Colorado Rocky Mountains ruptured.⁹⁹ Though far away and high above Fort Collins, this cloudburst, arriving during the height of spring snowmelt, would within hours wreak havoc in the city.¹⁰⁰ By the afternoon, after funneling down Poudre Canyon's steep walls, the deluge reached the gentler rolling hills on which Fort Collins sat.¹⁰¹ For the town's residents,

⁹⁸ Thomas, *Work Renders Life Sweet*, 8-10.

⁹⁹ "A Great Calamity Visits Cache la Poudre Valley," *Weekly Courier*, May 25, 1904, <https://www.coloradohistoricnewspapers.org/?a=d&d=TWC19040525.2.1&e=-1904---1905--en-20--1-byDA-img-txIN%7ctxCO%7ctxTA-poudre+valley+deluged-----0-Larimer->.

¹⁰⁰ Arlene Ahlbrandt and Katheryn Stieben, *The History of Larimer County, Colorado, Volume II: 1860's-1987* (Fort Collins, CO: The Larimer County Heritage Writers), 66.

¹⁰¹ Ahlbrandt and Stieben, *The History of Larimer County*, 66.

who were mercifully warned of the oncoming waters beforehand, there was little to do but watch as the angry river spread across the bottomlands, ripping away bridges, head gates, and homes as it went.¹⁰²

Yet, of the thousands of Fort Collins residents that reportedly “lined the riverbank” in awe of the swollen river, only a small segment of the onlookers burdened much of the loss.¹⁰³ It was the Germans from Russia who stood on the bank helplessly watching the river rip away their homes, gardens, and everything they owned.¹⁰⁴ The rest of Fort Collins, perched above the river remained out of harm’s way.

III

Though likely not front of mind at the moment, those standing on the swollen river’s edge looking upriver to see what came floating down next stood at the heart of a hybrid landscape. To their rear, stood a city center largely untouched by the river’s wrath. On the opposite bank, two neighborhoods under siege, with the river lapping against the few remaining buildings’ midlines and pulling the rest downriver. Considering development over the last forty years, and the prominence of the flood of 1864 in the city’s founding myth, if residents sought to grapple with the historical factors that led to such disparate levels of destruction in 1904, they would have pinpointed recent boosters and investors’ lack of experience and consideration of local flood risk as the principle cause. In 1904 Fort Collins, however, immediate response and long-term recovery did not include grappling with the past.

In popular sentiment and post-flood construction, resiliency and a return to normalcy trumped reflection and redirection. While residents reverted to their neighborly nature in

¹⁰² “A Great Calamity Visits Cache La Poudre Valley,” *Weekly Courier* May 25, 1904.

¹⁰³ “A Great Calamity Visits Cache La Poudre Valley,” *Weekly Courier* May 25, 1904.

¹⁰⁴ Ahlbrandt and Stieben, *The History of Larimer County*, 66.

providing the newly homeless with food, shelter, and clothing, residents and local newspapers seemed uninterested in hashing out why the German-Russian neighborhoods sat along the floodplain to begin with.¹⁰⁵ Beyond acknowledging the heavy rainfall, R.Q. Tenney's diary never mentioned the dramatic flooding.¹⁰⁶ In both *The Fort Collins Express* and *The Weekly Courier*, May 25, 1904's, front-page coverage of the flood concluded with paragraphs that outlined relief efforts and speculated on the cost of reconstruction.¹⁰⁷ Nowhere in either article is there a sentence questioning if it made sense for Fort Collins to rebuild "Russian beet field worker" neighborhoods in the exact same locations. In the following days and weeks, newspaper references to the flood began to shorten in length before disappearing entirely. To the Fort Collins residents who drafted the articles, those who read them, and those who saw their tax dollars go to immediate reconstruction, the flood was a natural disaster devoid of any human culpability. There was no one at fault in this strictly natural disaster, and the most responsible course of action was to rebuild and move on.

Though the flood crashed into an urban environment that represented both old and new manners of addressing the city's place in the environment, the public push to return to normalcy mapped onto larger national responses to disaster that minimized the human role in such disastrous "acts of God."¹⁰⁸ By 1904, Fort Collins represented a hybrid city sculpted by the collaborative period of *incipience* that sought to work with the local water cycle and the

¹⁰⁵ "A Great Calamity Visits Cache La Poudre Valley," *Weekly Courier*, May 25, 1904.

¹⁰⁶ R.Q. Tenney, *Diary No. 2*, box 1, R. Q. Tenney Collection, FCMOD.

¹⁰⁷ "A Great Calamity Visits Cache La Poudre Valley," *Weekly Courier*, May 25, 1904; "Poudre Valley Deluged," *The Fort Collins Courier*, May 25, 1904.

¹⁰⁸ As historian Ted Steinberg displayed, since the nineteenth century, Americans have conceptualized natural disasters from a position that the tragedies are principally natural, "acts of God," that no one can predict or avoid, Steinberg argues that this interpretation is the result of clever maneuvering by those in power to keep the status quo and maximize profits by fostering a business as usual stance where those at the lower rungs of society don't question their unfair burden of disaster risk, see Ted Steinberg, *Acts of God: The Unnatural History of Natural Disaster in America*, 2nd ed. (New York: Oxford University Press, 2006).

industry-oriented period of *florescence* that overlooked local environments as it coupled the landscape with larger national and international economics. How the city responded to the flood, however, displayed a city in lockstep with the rest of the nation, and less so the local environment, effectively articulating that such hybridity wouldn't last and hinting at how the city would interact with the local environment for much of the twentieth century.

The buildup to the flood of 1904 was grounded in historical developments dating to the 1859 Gold Rush and events far beyond Fort Collins's city limits and Colorado's borders, but it didn't only serve to illuminate the city's hybrid nature. The city's response to the flood also foreshadowed the relationship between Fort Collins and the local water cycle going forward. Fortunately for the future of flooding in Fort Collins, the city's core would remain beyond the Poudre's floodplain. But the city was growing, and doing so in line with value systems that prioritized efficiency and command-and-control approaches to the environment. An approach that treated the local peculiarities of the regional environment as an afterthought. An approach that would cost Fort Collins and cities across the Front Range dearly in the middle decades of the twentieth century.

CHAPTER TWO – Runoff Flooding in the Big Dam Era

A westward-moving storm rolled over Colorado's high plains on the afternoon of August 30, 1938.¹ Upon reaching the eastern foothills of the Rockies, the storm's moisture-heavy clouds burst open from Denver to the Wyoming border. Three days into the storm, clouds dumped more than three inches in just hours on already saturated soil along the foothills and directly on top of Fort Collins.² That night, flash floods surged down local creek beds and streams. Southwest of the city, runoff pounding down Dixon Canyon crushed buildings in its path and carried a car a quarter of a mile before depositing its crumpled frame in the quickly-filling Dixon Reservoir.³ Just northwest of Fort Collins, Dry Creek, escaping its name's assumptions, spilled over its banks and tore across fields, sweeping away livestock as it went.⁴ The storm's most extensive damage, though, occurred far from the Cache la Poudre and local creeks. Runoff from heavy rain directly above the city charged into the heart of town, turning streets to streams and pooling along the low points and basements on and around the recently renamed Colorado A&M.⁵ After a decade defined by drought, Fort Collins was suddenly flooding again, but this time the water was charging the city from all sides and from above.

¹ Thomas B. McKee and Nolan J. Doesken, *Colorado Extreme Storm Precipitation Data Study: Summary of Accomplishments and Work Performed February 15, 1995 through October 31, 1996*, Department of Atmospheric Science, Climatology Report #97-1, Colorado State University (Fort Collins, 1997), 11.

² Wayne A. Charlie, *History of Flooding at Colorado State University: 1902, 1938, 1951, 1992, and 1997*, Department of Civil Engineering, Report Number- Geotech 1998-100, Colorado State University (Fort Collins, 1998), 15

³ "Heavy Rains Flood Wide Area from Wyoming Line to Pueblo," *Fort Collins Express-Courier*, September 4, 1938.

⁴ "Dry Creek Becomes Torrent," *Fort Collins Express-Courier*, September 4, 1938.

⁵ "Worst Flood in History of College Stops Power Service and Inundated Buildings on Colorado State Campus," *Rocky Mountain Collegian*, September 9, 1938.

Fort Collins wasn't the only city flooded by the slow-moving September stormfront.⁶ In comparison to other foothill communities, Fort Collins came out of the storm less scathed than most. To the south of Fort Collins, flood water tore away swaths of road winding up the Big Thompson Canyon, ripped buildings down South Boulder Creek in Eldorado Springs, and swept away the lives of six unassuming automobilists outside of Denver between the towns of Morrison and Kittredge.⁷ All along the Front Range, communities suddenly found themselves clearing debris and calculating losses. Separating Fort Collins from the rest of its affected neighbors, however, was how the city responded to the flood.

In the following days, months, and years, Front Range communities from Loveland to Morrison turned to the federal government for immediate aid and assistance in addressing their now obvious proclivity to flood. Fort Collins, on the other hand, addressed flood relief and mitigation projects internally—an odd response considering the massive expansion of the federal government during the New Deal, extensions of federal funding available through the Flood Control Act of 1936, and the city's willingness to work with federal infrastructure programs displayed in 1937 with the passage of the massive trans-basin diversion project: the Colorado-Big Thompson Project. The goal of this chapter is to contextualize this seemingly counterintuitive response to the flood of 1938. Why, in a period of expanding federal power in flood control, and after decades of Fort Collins trending toward a social, political, and

⁶ Four to ten inches of rain within a 24-hour period doused much of Front Range foothills, see CIRES Western Water Assessment at the University of Colorado, NOAA ESRL Physical Science Division, and CSU Colorado Climate Center, "Severe Flooding on the Colorado Front Range, September 2013," Western Water Association, September 25, 2013, <https://wwa.colorado.edu/resources/front-range-floods/assessment.pdf>; see also McKee and Doesken, *Colorado Extreme Storm Precipitation Data Study*, 27.

⁷ "Flood History: The Bear Creek Basin," Urban Drainage and Flood Control District, accessed March 28, 2020, https://www.udfcd.org/FWP/ebb/bear_history.html; "Flood of 1938 – Eldorado Springs," Boulder Area Sustainability Information Network, accessed March 28, 2020, <http://bcn.boulder.co.us/basin/history/1938flood.html>; Robert Follansbee, Leon R. Sawyer, *Floods in Colorado*, U.S. Geological Survey, Water-Supply Paper 997, U.S. Department of the Interior (Washington, 1948), 38-50.

environmental landscape increasingly interconnected to the federal government, did the city never seek out the expertise of the U.S. Army Corps of Engineers to help address the root of the city's well-established flood problems?

That Army Corp experts never surveyed Fort Collins's flood problem is likely, at least in part, due to that fact that federal flood planning was functionally blind to how Fort Collins flooded in 1938.⁸ The way in which the city's interior flooded—heavy, persistent rain directly over urban space—and the environmental factors that made the region inherently flood prone—a propensity for focused downpours capable of overwhelming local waterways or opening over urban space and swamping a city from above—differed so dramatically from how politicians, bureaucrats, and engineers had come to define flooding that city residents simply had no way to access federal aid or expertise. When Fort Collins flooded in 1938, it wasn't because the Poudre had jumped its banks and surged through the community like the mighty Mississippi that had inspired past federal flood control acts, but because a storm had stalled along the Rockies and dumped highly focused rain right on top of the city. While much of Fort Collins sat out of reach of the Cache la Poudre's floodplain, flooding as a result from rain from directly above presented a vexing and persistent issue that would continue to plague the Fort Collins no matter how hard it worked to embody all the trappings of an American city. An issue that, by existing beyond federal authorities' assumptions on flooding, proved all the more difficult to address at the local

⁸ The reader will notice the hesitancy in this claim and claims like it throughout this chapter. Such hesitancy is the result of lacking source material. Tracking down why something did not happen is a difficult task in its own right, and my research in the Fort Collins local history archive, historical newspaper collections, and digitized sources through Colorado State University libraries never unearthed conversations or deliberations between Fort Collins citizens on the merits and limitations of trying to work with federal flood control. Further limiting my archival resources was the outbreak of COVID-19 and the subsequent closing of archives and public offices that contained potentially revealing personal paper collections and meeting minutes in the Spring of 2020. Because of such circumstances, this chapter aims to outline what I believe to be the probable explanation to this city's responses to mid-century flooding by exploring the surrounding context without overstepping my source material.

level in a city that had grown increasingly reliant on federal aid and planning during the interwar period.

Through the expansion of Colorado A&M and the continued value of the sugar beet, 1930s Fort Collins had grown from an economic hinterland to an agricultural hub—functioning as an intermediary between Washington, D.C., and farmers across the state. Enduring the drought-plagued 1930s and the Great Depression, the city had also become closely coupled with federal infrastructure and economic programs. The city’s increased reliance on federal aid—primarily through the Public Works Administration and Works Progress Administration—meant that when its flood problem fell beyond the purview of the federal flood program, city planners missed out on a funding source upon which they had come to rely on in other local infrastructure projects. Following the flood of 1938, with the city’s runoff flood problem existing beyond the scope of federal expertise and aid, and at a point when Fort Collins was just beginning to emerge from the Great Depression and Dust Bowl that had shaken the local economy to its core, Fort Collins chose to rebuild and move on rather than address its drainage problems. In 1951, another storm rolled over Fort Collins and runoff again flooded the city. Standing on steadier ground than in 1938, Fort Collins this time around sought to address the city’s runoff problem. Without federal aid or expertise to lean on, however, the city made only minimal changes to protect against the next flood.

From Agricultural Hinterland to Intellectual Hub, 1911-1938

In 1938, the physical shape of Fort Collins reflected trends dating back to the early 1900s. Over the previous three decades, the city grown in population and urban expanse largely for the same reasons that stimulated growth at the turn of the century: the profitability of the

sugar beet, and the expansion of the Colorado Agricultural College, renamed Colorado A&M in 1935. Physical growth of the city also coincided with the city's increased connection to the rest of the nation. Profitable agriculture, and a center for agricultural study helped link the once middling hinterland community to the U.S. Department of Agriculture (USDA) and the U.S. Forest Service (USFS). Furthering the connection between federal government and Fort Collins were national emergencies which, in the case of the Great Depression and Dust Bowl, pushed the city toward further reliance on federal aid. When the rain began in 1938, it fell on the rooftops of an expanding and increasingly influential college and ran down the streets of a city delineated by ethnic divides. In matters that the city could control—labor, infrastructure, urban expansion—Fort Collins was growing in line with national urban trends. In doing so, the city had become increasingly connected with and recognizable to the federal government. Increasing connection to Washington, D.C., though, led to increasing reliance on federal aid. Connection to federal power helped the city through the tumultuous 1930s, but reliance on federal aid left the city without a key ally when the city's flood problem fell outside the parameters of federal flood control acts.

I

E.G. Whitehead, the Colorado State College's building supervisor, and his crew spent the night of the flood scrambling to divert water and remove valuables from basements across an erratically lit campus.⁹ Sitting at a low point along the city's southwest, runoff from across town drained toward the school. There was no stopping the water, and Whitehead's crew wasn't able to clear the valuables spread across campus basements. The next morning the flood water stood ten feet deep at the heating plant, had cut most power and all campus phone lines, and flooded all

⁹ "Ten Feet of Water in Heating Plant," *Fort Collins Express-Courier*, September 4, 1938.

six campus buildings west of the railways, resulting in \$10,000 of damage (unadjusted) and ruining the college museum's priceless collections.¹⁰ Though an unforeseen expense for the school, and traumatic event for the museum's curator, the college treated the flood as a minor setback during a growth period. Within a week, crews had drained basements and cleared all debris. Just six days later, the college's president, Charles A. Lory, was making light of the flood, telling the 500 new faces arriving for their first semester that "if they had showed up two or three days ago we could have given you lessons in boating."¹¹

The school's momentum, and the president that had overseen the school's growth since accepting the position in 1909 wouldn't let a flood hold back the college. Closely tethered to needs of nearby farmers and local industrial agriculture at the turn of the century, Colorado A&M by 1938 had grown and diversified substantially.¹² The buildings hardest hit by the flood—the museum, library, physics building, and gymnasium—and the programs some of these buildings housed—forestry, home economics, and veterinary medicine—hadn't existed before Lory's time as president.¹³ Peaking at just over 2,000 students by 1940, the college once principally focused on helping local farmers had grown into an institution concerned with issues further abroad than those in its home and neighboring county.

Physical expansion within Fort Collins coincided with an expanding mission. In the early 1910s, professors at Colorado Agriculture College began traveling across the state holding lectures on best agricultural practices.¹⁴ Interest in the technical expertise of CAC faculty peaked

¹⁰ Charlie, *History of Flooding at Colorado State University*, 15.

¹¹ "Quote and Unquote," *Fort Collins Express-Courier*, September 8, 1938.

¹² Michael Weeks, "Industrializing a Landscape: Northern Colorado and the Making of Agriculture in the Twentieth Century," (PhD. diss., University of Colorado, 2016), 61-65.

¹³ Charlie, *History of Flooding at Colorado State University*, 5; James E. Hansen II, *Democracy's University: A History of Colorado State University, 1970-2013* (Fort Collins: Colorado State University, 2007), 12-13.

¹⁴ Joseph McClelland and Blanche Hyde, *History of the Extension Service of Colorado State College, 1912 to 1941*, Extension Service (Fort Collins: Colorado State College of Agriculture and Mechanical Arts, 1941), 11.

at the 1911 International Dry-Farming Congress held in Colorado Springs, as attending members urged U.S. Congress to provide federal funding to connect agrarian counties with land-grant colleges through an Extension Service.¹⁵ Some counties acted before the U.S. Congress considered such funding, hiring extension workers—in the case of Pueblo County, from the CAC—and paying them from their own coffers.¹⁶ In 1914, Congress passed the Smith-Lever Act, establishing the means of funding Extension in order to disseminate scientific findings made at land grant colleges to farmers across the state.¹⁷ The act not only codified the means in which counties could procure needed aid, but established the CAC as the predominant source of agricultural knowledge throughout the state of Colorado.

Functioning as the intermediary between disparate Colorado farmers, federal agricultural policy, and new agricultural science findings, the CAC's expanded role helped transform Fort Collins from an offshoot agricultural community in Northern Colorado, to an intellectual hub for the state's agricultural economy. The CAC also brought federal programs and the city of Fort Collins closer, especially during times of crisis. When the United States entered World War I, the CAC created an advisory committee to streamline food production while Extension used federal emergency appropriations to ensure that farmers were adhering to new protocol.¹⁸ A similar pattern developed during the Great Depression and Dust Bowl through President Franklin Roosevelt's New Deal as well. As historian Doug Sheflin has pointed out, once the New Deal sought to square issues of supply and demand with production control through the Agricultural Adjustment Administration, it fell on Extension Service agents to monitor what farmers

¹⁵ McClelland and Hyde, *History of the Extension Service*, 20.

¹⁶ McClelland and Hyde, *History of the Extension Service*, 38.

¹⁷ Michael Weeks, "Ralph Parshall and Water Engineering in Northern Colorado," (Fort Collins: Cache La Poudre National Heritage Area, N/A), 5, accessed March 29, 2020, <https://www.poudreheritage.org/documents-links-library/>.

¹⁸ McClelland and Hyde, *History of the Extension Service*, 56-7.

produced. Effectively turning the agent into “an administrator rather than a teacher,” and land-grant colleges as the in-between connecting farmers and new policy.¹⁹

Thus, in periods of both uncertainty and stability, the college sitting near the core of Fort Collins served as a point of connection for the countryside and the nation, and a resource the federal government turned to with any sort of national or international issue concerning agriculture or food production. Such standing shaped the physical contours of Fort Collins through the expansion of buildings on campus and housing around it. It also helped inform how the city grew—through contracts and connections with the federal government and the USDA in particular.²⁰

II

During the 1910s and the interwar period, Fort Collins, beyond campus, also expanded. And not in a manner subservient to the university. With continued agricultural success along its periphery, Fort Collins grew, matured, and modernized. Growth and maturation begot central planning and infrastructure expansions. At first, the city itself drew up and funded many of these modernizing projects. Such community-funded undertakings, however, dried up with the Dust Bowl and Depression. But they didn’t stop entirely. Instead, modernizing projects became increasingly tied to federal funding and the New Deal. Thus, as with the college, not only did the city grow in population, but in connectedness to the federal government.

Even by Colorado standards, Fort Collins in the early to mid-nineteenth century was by no means a metropolis, but it was growing. Between 1910 and 1940, the population of Fort

¹⁹ Douglas Sheflin, *Legacies of Dust: Land Use and Labor on the Colorado Plains* (Lincoln, NE: University of Nebraska Press, 2019), 65-66.

²⁰ The school’s connection to the USDA created a revolving door for agricultural elite the likes of Ralph Parshall and Walter J. Morrill who oscillated between educational positions and governmental ones. On Parshall’s career, see Weeks, “Ralph Parshall and Water Engineering in Northern Colorado;” on Walter J. Morrill, see Hansen, *Democracy’s University*, 14, and Hansen, *Democracy’s College in the Centennial State: a History of Colorado State University* (Fort Collins: Colorado State University, 1977), 219-220.

Collins increased from just over 8,200 to 12,200.²¹ With population growth came urban expansion along the city's periphery and increasing commercialization of the city's core.²² Expansion required the city to modernize its infrastructure. In the 1910s and 1920s, city planners made sure that sidewalks and graded streets connected new neighborhoods to the rest of town and that new houses dotting these neighborhoods met city building codes passed in 1924.²³ Beginning in the 1910s, pressure from automobile-enthused locals urged city government to pave roads.²⁴ Though the city had only five miles of roads covered by concrete by 1926, Fort Collins's wide streets and extending subdivisions certainly represented a modern car-centered city.²⁵ What ran underneath Fort Collins's expanding street system and connected the city to the Poudre River, however, represented the most impressive expansion of local infrastructure by the late 1920s.

With an increase in population, and an increase of travel up and down the Poudre Canyon, the city of Fort Collins in 1925 decided to revamp its water supply, storage, and treatment plants. To accommodate population growth, the city bought additional water rights in 1921, drew district boundaries in 1924 to ensure that the city wasn't responsible for all urban growth in the region, and constructed the Soldier Canyon Reservoir in 1926 to hold already treated water.²⁶ In 1925, as local fear of contamination increased with increased vehicle traffic

²¹ U.S. Department of Commerce and Labor, Bureau of the Census, *Sixteenth Census of the United States: 1940, Volume I: Population* (Washington, D.C.: Government Printing Office, 1942), 160, accessed March 29, 2020, <https://www2.census.gov/library/publications/decennial/1940/population-volume-1/33973538v1ch03.pdf>.

²² On city expansion of subdivisions, see Frank P. Goeder and E. A. Lawver, *Combined Report of Commissioner of Works and City Engineer*, City of Fort Collins (Fort Collins: Colorado Printing Co., 1926), 47-48, <https://fchc.contentdm.oclc.org/digital/collection/vf/id/6413/rec/6>; on expansion of commercial core, see "Post World War I Urban Growth," Fort Collins History Connection, accessed March 29, 2020, <https://history.fcgov.com/contexts/post>.

²³ Goeder and Lawver, *Combined Report of Commissioner of Works and City Engineer*, 48.

²⁴ Evadene Swanson, *Fort Collins Yesterdays* (Fort Collins: George and Hildegard Morgan, 1993), 207.

²⁵ Goeder and Lawver, *Combined Report of Commissioner of Works and City Engineer*, 35.

²⁶ Laurie D'Audrey and Christy Dickinson, *From Snowcap to Water Tap: A History of Fort Collins Water Utilities* City of Fort Collins Utilities, (Fort Collins, 2017), 25-26.

along the Poudre, the city overhauled the water filtration system and began disinfecting water with chlorine gas.²⁷ Taken together, these projects, funded by city bonds, ensured Fort Collins a clean, stable, modern water supply system.²⁸ In roads and water supply in the 1910s and 1920s, the city, mirroring national trends, pursued infrastructure projects that furthered sanitation and provided modern conveniences for its residents, well, most of its residents.

Growth in Fort Collins was a function of continued viability of industrial agriculture on the city's edges. Industrial agriculture, in turn, relied on a controllable, marginalized work force. Though speaking German at more hushed tones during the late 1910s, German-Russian immigrants still made up most of the needed labor force in sugar beet fields. Only a decade after the Poudre flooded the fledgling neighborhoods on the Poudre's north bank, over 500 labors resided in Buckingham Place and Andersonville.²⁹ In the 1910s and 1920s, Hispanic laborers had also begun arriving to the region. With political instability pushing Hispanics north for work, Great Western Sugar capitalized on another ethnic group with few options to provide menial labor. Offering housing with the option to buy as a carrot to persuade Hispanic laborers into Fort Collins, the sugar company created the Alta Vista subdivision and platted it right next to the older sugar labor neighborhoods along the Poudre's floodplain in 1923.³⁰ Though central to the Fort Collins economy and growing in population, city planners chose not to include the Buckingham, Andersonville, and Alta Vista neighborhoods in locally-funded modernization projects.

²⁷ D' Audrey and Dickinson, *From Snowcap to Water Tap*, 26.

²⁸ Goeder and Lawver, *Combined Report of Commissioner of Works and City Engineer*, 19.

²⁹ Swanson, *Fort Collins Yesterdays*, 64.

³⁰ Adam Thomas, *Hang Your Wagon to a Star: Hispanics in Fort Collins, 1900-2000* (Prepared for Advance Planning Department, City of Fort Collins, 2003), 6, <https://www.fcgov.com/historicpreservation/pdf/hispanics-doc.pdf>; Sierra Standish, "Beet Borderland: Hispanic Workers, the Sugar Beet, and the Making of a Northern Colorado Landscape," (Master's Thesis: Colorado State University, 2002), 36-7.

With the 1904 flood still in living memory, and another Poudre flood in 1923, the sugar beet neighborhoods along the Poudre floodplain pursued local funding for the creation of storm drains throughout the 1920s. Requests for flood protection, and further investment in infrastructure on the other side of the river fell on deaf ears.³¹ Roads remained unpaved into the 1980s and the city didn't replace outhouses with sewer lines until the 1970s.³² Locally-funded modernization swept across Fort Collins in an uneven, unequitable manner along the city's ethnic and spatial divides. As a local historian has apologetically pointed out, "some of the arrangements which seemed unfair were parts of the pattern of America, not just Fort Collins."³³ This point extended beyond the inequality of modernization within Fort Collins and to the modernization of the city writ large. Funded locally, Fort Collins in the 1910s and 1920s, took on projects that made the city look and function like the rest of the country. Uniform building codes, graded streets, and waterlines narrowed the distance between Fort Collins and Anytown, USA. This process continued through the following decades, but it wouldn't be the city that footed the bill after the bottom fell out in 1929.

III

Reflecting on the Dust Bowl, John Neutze, a former Deputy Water Commissioner of the Cache la Poudre and a child of the 1930s, said that the dust storms in Fort Collins "were very minor, you know. Same kind of dust storms that we get now."³⁴ Richard and Edgar Seaworth, longtime farmers outside of Laporte, echoed a similar, but slightly more nuanced sentiment on

³¹ Swanson, *Fort Collins Yesterdays*, 62, 64.

³² Thomas, *Hang Your Wagon to a Star*, 9.

³³ Swanson, *Fort Collins Yesterdays*, 67.

³⁴ John Neutze, interview by Michael E. Welsh, March 12, 2003, Cache la Poudre Oral History Project, Water Resource Archive, Colorado State University Libraries, Fort Collins, Colorado, <https://mountainscholar.org/handle/10217/188047>.

the Dust Bowl in Fort Collins, recalling, “Well, it wasn’t all that bad but it wasn’t good.”³⁵ All three longtime locals were just children during the tumultuous 1930s that saw the Dust Bowl and Great Depression shred Colorado’s agriculture and economy, but their recollections speak to a larger reality of Fort Collins during the 1930s. neither economic collapse nor environmental disaster spelled ruin for the city. The decade certainly challenged the city, and strained residents like no period before, but no towering dust storms or massive wave of wholesale unemployment enveloped the city. The tumultuous decade, however, fundamentally reshaped the structure of the city’s continued growth and modernization. Through the expansion of federal influence in the region via New Deal programs, the physical shape of Fort Collins, and the funds that initiated new infrastructure projects, tied the city closer to the federal government than at any point prior.

For Fort Collins residents, the timing of the 1938 flood must have felt cruel. While the city and the agricultural areas along its boundaries never felt the brunt of the Dust Bowl like the southeastern corner of the state, continued drought had left many high and dry.³⁶ Irrigators’ concerns over water supply in the decades prior proved well-founded in the 1930s, as reservoirs and creeks to Fort Collins’s east dipped to new lows.³⁷ As drought stretched across seasons, then years, meager flow along the Poudre left some farmers with junior water rights without water entirely.³⁸ Making matters worse, with the collapse of the stock market in late 1929, sugar beets

³⁵ Richard Seaworth and Edgar Seaworth, interview by Michael E. Welsh, December 2, 2003, Cache la Poudre Oral History Project, <https://mountainscholar.org/handle/10217/188050>.

³⁶ On towering dust storms and the plight of southeastern Colorado, see Sheflin, *Legacies of Dust*, 73-123.

³⁷ Rose Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River* (Fort Collins, CO: Colorado Water Resources Research Institute, Colorado State University, 2005), 69.

³⁸ Dust storms swept across Northern Colorado too, but further east of Fort Collins in Greeley, in Fort Collins, though, water proved scarce for those whose claims dated to early 1900s. For dust storms in Northern Colorado, see William Davin Farr, interviewed by Michael E. Welsh, October 16, 2002, Cache la Poudre Oral History Project, <https://mountainscholar.org/handle/10217/188062>; on water shortages in Fort Collins, see Richard Seaworth and Edgar Seaworth, interviewed by Welsh, see also Laflin, *Irrigation, Settlement and Change on the Cache la Poudre River*, 69.

plummeted in value, leaving farmers unable to pay off their debts to local banks and stores.³⁹ The agricultural community of Larimer County put one third of all farms up for sale across the decade.⁴⁰ Business owners, farmers and planters weren't the only ones facing uncertain futures in the 1930s, either.

Those hardest hit by the environmental and economic upheaval of the 1930s in Fort Collins resided on the other side of the river. For German Russian laborers the Depression equaled disaster as plummeting sugar beet value upended many families' slow climb toward property ownership.⁴¹ Though increasing tariffs helped keep the lights on at sugar refineries across Northern Colorado, those actually working the plants and those in the fields felt the brunt of the Depression.⁴² To mitigate losses, sugar companies continued hiring Hispanic labor through the 1930s, but altered their contracts to pay laborers a percentage of the income rather than by the acre, tethering laborers to the crop's fluctuating value.⁴³ At the same time, frustration that came with economic instability boiled over across the Front Range, often resulting in xenophobic outbursts blaming "Mexicans" for taking American jobs.⁴⁴ Unprecedented upheaval and uncertainty along the Front Range didn't shake the core of Fort Collins's social and economic hierarchy. What did change though, were the physical contours of the city, and who helped fund them.

³⁹ Laflin, *Irrigation, Settlement and Change on the Cache la Poudre River*, 68.

⁴⁰ Laflin, *Irrigation, Settlement and Change on the Cache la Poudre River*, 69.

⁴¹ Mark Spier, "Larimer County German's From Russia," in *The History of Larimer County*, ed. Andrew Morris (Dallas, TX: Curtis Media, 1985), 11.

⁴² On Tariff hikes to help protect American sugar production, see Michael Weeks, "Sugar State: Industry, Science, and the Nation in Colorado's Sugar Beet Fields," *Western Historical Quarterly* 48 (Winter 2017), 385-6, and Weeks "Industrializing a Landscape," 169-171.

⁴³ Weeks, "Industrializing a Landscape," 171.

⁴⁴ In her recollections of early to mid-twentieth century, longtime Fort Collins resident, Adela Ambriz, remembered resentment of Hispanic labor resulting in laborers cheated out wages, arson, and an unwelcoming atmosphere toward Hispanics who crossed into Fort Collins, see Daniel Thomas "Adela Ambriz has Seen it All: Revolution, Bootlegging, Hard Times," *Fort Collins Coloradoan* October 12, 1977; for further context, see Standish, "Beet Borderland," 60-65

Fort Collins' modernization took a new shape with President Franklin Roosevelt's New Deal. Federal programs designed to put Americans back to work now funded projects that the city had previously sponsored. In 1934, continued concerns over the health and flood risks of the Arthur Ditch (or "Town Ditch") led city planners to cover the waterway slithering through town with funding from municipal bonds and the Federal Administration of Public Works.⁴⁵ In 1932, city residents voted to construct a new municipal power plant, and though funded largely through city bonds, when the project began in 1935, Works Progress Administration (WPA) workers built the plant's surrounding walls and landscaped the area.⁴⁶ In 1938, the Public Works Administration (PWA) authorized a grant of just under \$70,000 to match city's investment in building and remodeling local schools.⁴⁷ In appealing for aid, Fort Collins welcomed in the federal government and leveraged its expanding role to continue to modernize and ride out the environmental and economic upheaval that defined the decade. But these projects paled in comparison to the massive undertaking that would soon flood the canyons west of Fort Collins.

Furthering the tragic irony of Fort Collins flooding in 1938 was the fact that only a year earlier Northern Colorado farmers and Congress had agreed to terms on the Colorado-Big Thompson Project (C-BT)—a massive, trans-basin diversion project that would pull water from Colorado's West Slope to irrigators along the Colorado Piedmont and High Plains. For decades, irrigators east of the Rockies had kept a keen eye on the headwaters of the Colorado River that drained down the Western Slope, but federal planners, state politicians, and regional water users proved unwilling and unable organize in a manner that would result in a project as complicated

⁴⁵ D' Audrey and Dickinson, *From Snowcap to Water Tap*, 26.

⁴⁶ Swanson, *Fort Collins Yesterdays*, 245, "Post World War I Urban Growth," Fort Collins History Connection, accessed March 29, 2020, <https://history.fcgov.com/contexts/post>.

⁴⁷ "School is Awarded \$69,210 PWA Aid," *Fort Collins Express Courier*, October 4, 1938.

and profound as the C-BT.⁴⁸ The depression proved a shot in the arm for the Bureau of Reclamation, as new opportunity came with the New Deal and a president who sought, in his words, to be remembered “as the greatest conservationist and developer of all time.”⁴⁹ Increasingly desperate irrigators also proved willing to cut deals, as any other opportunity to relieve their water scarcity were quickly drying up.⁵⁰ In 1933, a Weld and Larimer County-funded survey came to the conclusion that, if piped to the Big Thompson River, a diversion at the headwaters of the Colorado could provide 285,000 acre-feet of water to the parched plains without any major violation to prior water allocations and river compacts.⁵¹ For perspective, that would be enough water to address the 540,000 acre-feet water deficit that the Poudre accrued through the drought period of 1930-1937 in under two years.⁵²

In 1937, after four years of careful planning and fierce debate between a dizzying number of stake-holders, Congress passed a \$900,000 appropriation to begin project planning, and a year later, committed to funding nearly half of the estimated \$44 million project.⁵³ The C-BT ensured

⁴⁸ On local politics and distrust of federal planners, see Steven Schulte, *As Precious as Blood: The Western Slope in Colorado's Water Wars, 1900-1970* (Boulder: University of Colorado Press, 2016), 40-41; on the Bureau of Reclamation struggles in the 1920s and transformation in the 1930s, see Laflin, *Irrigation, Settlement and Change on the Cache la Poudre River*, 69.

⁴⁹ Schulte, *As Precious as Blood*: 43

⁵⁰ As drought proved persistent across the Front Range and High Plains, agriculturalists and local politicians proved increasingly willing to sit at a table and negotiate potential projects that would pool resources across counties and seek to leverage New Deal programs, at the same time, it was becoming clearer to the water-starved agriculturists that pulling water from the North Platte and away from Wyoming and Nebraska would bring but an economically unfeasible trickle to the state, and that they needed to look elsewhere, preferably in state. On meetings between community organizers, see Schulte, *As Precious as Blood*, 47-8; on planners running out of options, see Daniel Tyler, *Last Water Hole in the West: The Colorado-Big Thompson Project and the Northern Colorado Water Conservancy District* (Niwot, CO: University of Colorado Press, 1992), 23-25.

⁵¹ Tyler, *Last Watering Hole in the West*, 35-6.

⁵² The figure, 540,000 acre-feet, is lifted from Laflin, *Irrigation, Settlement and Change on the Cache la Poudre River*, 69.

⁵³ One of the many structures of the C-BT project was a tunnel that would run below Rocky Mountain National Park, a factor that caused friction during the project planning largely within the Department of the Interior, more locally, fierce debate raged between Western Slope residents of Grand Junction and Glenwood Colorado and those in Eastern Colorado, for state-level debate, see Schulte, *As Precious as Blood*, 40-72, for NPS debate, see Tyler, *Last Water Hole in the West*, 84-88. For reconfiguration of the 1902 Reclamation Act that allowed farmers on smaller land allotments than 160 acres and municipalities to gain access to project water, see Tyler, *Last Water Hole*

that the future of agricultural output along the Front Range and Colorado plains was tied to the federal government. Also, unique to the C-BT project, water became available to municipalities, tying not just agricultural hinterlands to the federally funded project, but cities like Fort Collins as well.⁵⁴

From the 1910s through the 1930s, Fort Collins modernized at a rapid pace. The manner in which it modernized—through centralized projects that privileged technological convenience, and the automobile specifically, while failing to address the interests of the city’s marginalized labor force—mirrored nation-wide development. By growing and modernizing in a similar manner to the rest of the nation, Fort Collins presented a recognizable landscape for the federal government to work with (in the case of the USDA and the Colorado A&M) or, when things went wrong during the 1930s, offer a hand. By the late 1930s, many of Fort Collins’s infrastructure projects, be it local school construction or a trans-Rockies water diversion, relied on federal funding assistance. Increased connection to and reliance on New Deal programs, the Bureau of Reclamation, and the USDA didn’t fundamentally change the city’s flood risk. Rather, the city’s connection to the federal government shaped how the city would in all likelihood respond to a flood—turn to a federal program to help address the problem at hand. When Fort Collins did flood though, it wasn’t from a surge along the Poudre, but from rain falling directly over the city’s core. While the federal government recognized and built programs to address western aridity, economic downturn, and joblessness, New Deal legislation hadn’t accounted for the manner in which Fort Collins flooded in 1938, a minor oversight at the national level

in the West, 90-96. For details on project funding, see Robert Autabee, *Colorado-Big Thompson Project* (Bureau of Reclamation, 1996), 11, <https://www.usbr.gov/projects/pdf.php?id=97>.

⁵⁴ Fort Collins would buy water shares from Horsetooth Reservoir in the 1950s, see D’Audrey and Dickinson, *From Snowcap to Water Tap*, 34.

perhaps, but one that left a city increasingly reliant on federal aid without a federal program to turn to in the flood's wake.

Federal Flood Planning and Fort Collins's Invisible Flood Problem, 1917-1938

Just four days after flood water rushed through Fort Collins, the *Fort Collins Express-Courier* published an anonymous article: "The Flood in Retrospect."⁵⁵ Though the article began by stating "we should be far enough from our recent flood to view it fairly objectively," it seems that perhaps four days weren't enough. Rather than objectivity, the author provided a glimpse as to just how far off the city was from offering a meaningful, comprehensive response to the flood of 1938. The article began by first arguing Fort Collins residents should be thankful. After all, the flood broke a seven-year drought, and other parts of the country were in the middle of a hot spell. And, "compared with floods of the Ohio, Tennessee, and lower Mississippi Valleys, it was puny." The article didn't dismiss the flood entirely, though, but the author's suggestion as to how to address the city's flood problem fell short in outlining a specific course of action: "Although the flood has its bright as well as dark aspects, we should certainly take steps to minimize the possible destruction which future ones might cause." Those steps remained a mystery.

An opinion piece in all but title, the article offered insight into how the disaster interacted with local sensibilities. Seemingly following the lead of the newspaper in the days, months, and years following the flood, Fort Collins residents focused on the "minor" component of the "minor disaster," rather than grappling with the roots of the problem. The newspaper article hinted at why. Fort Collins didn't flood like cities on the major waterways like the Ohio and Mississippi, not only because of differing scales of destruction, but differing weather and

⁵⁵ "The Flood in Retrospect," *Fort Collins Express-Courier*, September 8, 1938.

topography. The way Fort Collins flooded—heavy rainfall bursting over urban space and excess water streaming along roadways and pooling at low points well beyond the Poudre’s floodplain—diverged so drastically from cultural and legal assumptions of what flooding looked like in the U.S. that clear steps to addressing local flood problems at the city level and securing flood project funding at the federal level escaped Fort Collins.

I

On Tuesday, September 6, while Fort Collins was still working out what to make of the past week’s inundation, the citizens of Morrison, Colorado, a small town in the foothills just west of Denver, met to discuss how to respond to their own flood.⁵⁶ After conversation among residents and the governor, the foothills community torn through by the raging Bear Creek, decided it would rebuild what the creek ripped away and seek federal funding to help ensure that Bear Creek wouldn’t flood the city again. Months later, in January 1939, concerned residents and state and federal inspectors testified in front of the Colorado Senate to argue that Morrison had a flooding problem that required federal aid.⁵⁷ Their appeals weren’t taken lightly. In May of 1939, the U.S. Army Corp of Engineers, the federal authority on flood protection, sent engineers to Morrison to begin scoping out potential projects to alleviate flood danger.⁵⁸ On August 1, Colorado senator, Edwin C. Johnson notified local newspapers that the U.S. Congress had amended the 1938 Flood Control Act to include money for the USACE to survey projects on the

⁵⁶ “Morrison Citizens Want Money for Flood Control,” *Fort Collins Express-Courier*, September 7, 1938.

⁵⁷ “Citizens Urge Flood Control in Bear Creek: Necessity of Prompt Action Shown to Army Man,” *Colorado Transcript* (Golden, Colorado), January 26, 1939, <https://www.coloradohistoricnewspapers.org/?a=d&d=CTR19390126-01.2.3&srpos=32&e=-1938---1939--en-20--21--img-txIN%7ctxCO%7ctxTA-flood-----0-->.

⁵⁸ “Army Engineers Survey for Flood Control in Morrison,” *Colorado Transcript*, March 23, 1939, <https://www.coloradohistoricnewspapers.org/?a=d&d=CTR19390323-01.2.15&srpos=54&e=-1938---1939--en-20--41--img-txIN%7ctxCO%7ctxTA-flood-----0-->.

“South Platte River and its tributaries.”⁵⁹ These surveys never resulted in a project, as the USACE deemed them too expensive to justify through their own cost-benefit analyses, but Morrison’s response to the same storm that flooded Fort Collins highlights the vexing nature of Fort Collins’s internal handling of the flood.

Morrison wasn’t the only community in Colorado appealing for the aid of the federal government and USACE, either. In 1938, along Colorado’s West Slope, the towns of Craig and Steamboat Springs appealed for flood control aid on the Yampa River.⁶⁰ The same year, in eastern Colorado, the town of Wray, located on the North Fork of the Republican River, reached out to the Department of War to appeal for flood protection.⁶¹ Just months after Wray’s request, Congress authorized Army Corp Engineers to undertake surveys in south Denver.⁶² Only the survey in Denver ever resulted in an eventual USACE flood protection project.⁶³ In all cases through, from Denver to the town of Craig, cities across Colorado, whether in response to the floods of 1938 or the opportunity afforded by flood control legislation and the expansion of the

⁵⁹ “Johnson Wires Flood Control Bill Passed,” *Colorado Transcript*, August 3, 1939, 2020, <https://www.coloradohistoricnewspapers.org/?a=d&d=CTR19390803-01.2.7&srpos=18&e=-1938---1939--en-20--1--img-txIN%7ctxCO%7ctxTA-flood-----0-->; An Act Amending Previous Flood-Control Acts, and Authorizing Certain Preliminary Examinations and Surveys for Flood Control, and for Other Purposes, Public Law 396, Chapter 699, 1st sess. (August 11, 1939), *U.S. Statutes at Large* 53: 1414-1417, <https://www.loc.gov/law/help/statutes-at-large/76th-congress/session-1/c76s1ch699.pdf>.

⁶⁰ “State to Assist Local Men in Preparation of Information for Flood Control Hearing,” *Craig Empire Courier*, September 7, 1938, <https://www.coloradohistoricnewspapers.org/?a=d&d=CEC19380907-01.2.8&srpos=30&e=-1938---1939--en-20--21--img-txIN%7ctxCO%7ctxTA-flood-----0-->; “Army Engineers Hear Testimony on Conservation,” *Steamboat Pilot*, September 22, 1938, <https://www.coloradohistoricnewspapers.org/?a=d&d=STP19380922.2.2&srpos=5&e=-1938---1939--en-20--1--img-txIN%7ctxCO%7ctxTA-flood-----0-->.

⁶¹ “Report on Proposed Flood Control Project Near Wray is Unfavorable,” *Wray Rattler*, May 11, 1939, <https://www.coloradohistoricnewspapers.org/?a=d&d=WRA19390511-01.2.8&srpos=14&e=-1938---1939--en-20--1--img-txIN%7ctxCO%7ctxTA-flood-----0-->.

⁶² “Survey of Cherry Creek Valley Has Been Ordered,” August 26, 1938, <https://www.coloradohistoricnewspapers.org/?a=d&d=TRJ19380826.2.6&srpos=72&e=-1938---1939--en-20--61--img-txIN%7ctxCO%7ctxTA-flood-----0-->.

⁶³ On Cherry Creek Reservoir and USACE’s role in Denver, see *The Federal Engineer, Damsites to Missile Sites: History of the Omaha District* (Omaha, NE: U.S. Army Corps of Engineers, Missouri River Division, 1985), 239-240, and John R. Ferrell, *Big Dam Era: A Legislative and Institutional History of the Pick-Sloan Missouri Basin Program* (Omaha: U.S. Army Corps of Engineers, Missouri River Division, 1993), 1-14.

federal government's role in western infrastructure, identified appeals to the USACE as an opportunity to develop their own flood protection systems on the federal dollar. All while Fort Collins, so interested in modernizing and growing with the aid of federal government in other regards, never even requested a USACE survey.

What separated Fort Collins's response from Morrison's in 1938 and the proactive efforts in Morrison, Craig, Steamboat Springs, Wray, and Denver in the late 1930s likely stemmed from the manner in which Fort Collins flooded. Unlike Bear Creek ripping through Morrison in 1938, or Cherry Creek flooding Denver in 1933, the most destructive component of Fort Collins's 1938 flood had nothing to do with riverine flooding. While swollen creeks along the city's periphery damaged property and uprooted fields, most of the flooding's destruction occurred on the campus of Colorado A&M, as three inches of rain over the west end of the city followed east-west running streets onto the school's low-lying campus. Unlike Morrison and Denver, Fort Collins wasn't grappling with the ramifications of encroaching on the floodplain of local waterways, but the legacy of construction along low points with poor drainage in a region susceptible to highly focused, heavy rainstorms. While federal planners had accounted for flooding along navigable waterways and their tributaries like that in Morrison and Denver, the Flood Control Acts of 1936 and 1938 failed to consider the destructive potential of runoff flooding unbeholden to major waterways and their tributaries. Such a disconnect likely left city planners feeling as though their own particular flood problem didn't fit the congressional acts. Perhaps then, for a city increasingly reliant on the federal government, the choice to not address flood vulnerability wasn't a choice at all, but may have reflected the incompatibility between the Fort Collins landscape and the nation's conception of what a flood looked like.

Unlike the Reclamation Act of 1902, which laid the groundwork for the northern Front Range to land the Colorado-Big Thompson Project by focusing on western aridity, and New Deal programs that sought to put Americans back to work by investing in infrastructure, the Flood Control Acts of the 1930s weren't designed to address the western environment or community development. Rather, American flood control during the New Deal represented continuations of trends dating back to the 1890s.

The Flood Control Acts of 1917 and 1928—on which the better funded New Deal Flood Control Acts of 1936 and 1938 built—were outgrowths of decades of lobbying by agricultural elite along California's Sacramento River and the lower Mississippi River dating back to the turn of the century.⁶⁴ These 1917 and 1928 acts reflected the interests of few politically powerful “largeholders” that turn-of-the-century Congresses were hesitant to pass. As environmental sociologist, Karen O'Neill, has argued, “that activists had to work decades before they won large flood control projects points up politicians' great reluctance to create large federal programs.”⁶⁵ Pre-New Deal reluctance to expand the role of the federal government and the USACE was also on display within the acts themselves, as they only provided federal funding for a few specific rivers initially.⁶⁶ The Flood Control Act of 1917 articulated that the Secretary of War was to take charge in “controlling the floods of the Mississippi River,” and “controlling the floods, removing debris, and continuing the improvement of the Sacramento River.”⁶⁷ While the coverage of Flood Control Acts expanded with the New Deal to provide funding for potential

⁶⁴ Karen O'Neill, *Rivers by Design: State Power and the Origins of U.S. Flood Control* (Durham, NC: Duke University, 2006), 29.

⁶⁵ O'Neill, *Rivers by Design*, 99.

⁶⁶ An Act to Provide for the Control of the Floods of the Mississippi River and of the Sacramento River, California, and for Other Purposes, Public Law 357, Chapter 144, 2nd sess. (May 1, 1917), 64th Congress, *U.S. Statutes at Large* 39: 948- 951, <https://www.loc.gov/law/help/statutes-at-large/64th-congress.php>.

⁶⁷ An Act to provide for the Control of the Floods of the Mississippi River and of the Sacramento River, California, and for Other Purposes, (May 1, 1917).

flood control projects on all navigable rivers and their tributaries, the bills remained tied to the environmental assumptions built into the 1917 act: that flooding, and flood protection, were tied to rivers. The 1936 act explicitly articulated this assumption by opening with “it is hereby recognized that destructive floods upon the rivers of the United States...constitute a menace to national welfare,” and that it was “the sense of Congress that flood control on navigable waters or their tributaries is a proper activity of the Federal Government.”⁶⁸

Federal flood control efforts during the New Deal also carried forward the structure of the 1917 and 1928 acts, ensuring that the funding of projects continued in a case-by-case manner that privileged influential locals. Devoid of what O’Neill has outlined as the idyllic New Deal reformer’s dream of “nonpolitical, professionally managed organizations” best exemplified by the Tennessee Valley Association, the 1936 Flood Control Act maintained that local lobbying and pork barrel politics remained the principle means to acquire highly specific levee, dike, and dam projects.⁶⁹ Additionally, the 1936 Flood Control Act, seemingly drawing from the same hesitancy of the acts before it, implemented a benefit-cost analysis policy so that a project’s economic benefits accrued “are in excess of the estimated costs.”⁷⁰ Perhaps reining in Congressional spending, benefit-cost analysis further disassociated flood control projects from New Deal designs for comprehensive projects and developments that addressed the issues of an entire watershed rather than that of a single community.

By repeating similar language of timid and inherently limited previous legislation within the Flood Control Acts of 1936 and 1938, New Deal flood control didn’t address economic,

⁶⁸ An Act Authorizing the Construction of Certain Public Works on Rivers and Harbor for Flood Control, and for Other Purposes, Public Law 738, Chapter 688, 2nd sess. (June 22, 1936), 74th Congress, *U.S. Statutes at Large* 49: 1570-1597, <https://www.loc.gov/law/help/statutes-at-large/74th-congress/session-2/c74s2ch688.pdf>.

⁶⁹ O’Neill *Rivers by Design*, 150-2.

⁷⁰ An Act to provide for the Control of the Floods of the Mississippi River and of the Sacramento River, California, and for Other Purposes, (May 1, 1917); for further context, see Joseph L. Arnold, *The Evolution of the 1936 Flood Control Act* (Office of History, U.S. Army Corps of Engineers, 1988), 91.

social, and environmental factors in a comprehensive manner. As Army Corp of Engineers rerouted waterways across Los Angeles, walled in the Mississippi River, and dammed Denver's Cherry Creek, New Deal flood control legislation proved inclined to take on massive engineering projects that provided aid for a specific community while operating on the assumption that flooding was inherently tied to waterways and or their tributaries.⁷¹ This assumption unintentionally overlooked flood problems that stemmed from heavy rainfall and drainage problems—flood problems that skirted waterways.

Fort Collins and its pesky runoff problem existed beyond the bounds of federal flood aid. While located on the banks of the Poudre—a tributary of the South Platte and therefore eligible for flood protection surveying—the city in 1938 wasn't grappling with the complications that came with settling too close to the river. After all, the city kept its distance from the floodplain and donated low-lying land to its marginalized labor force. Instead, flood damage was the result of heavy rainfall streaming down streets and pooling on the Colorado A&M campus. Floods of this type, though a persistent threat along the Front Range, went completely untouched in federal legislation that used the Sacramento and Mississippi Rivers as templates from which to address U.S. flood problems at large, resulting in New Deal legislation unable to recognize, let alone address, issues stemming from the environmental realities of Fort Collins. While the city had found programs to turn to when water became scarce and work hard to find, the specific contours of narrowly conceived federal flood control projects left the city without federal aid once the rain finally returned.

⁷¹ On USACE's work on flooding in Los Angeles, see Jared Orsi, *Hazardous Metropolis: Flooding and Urban Ecology in Los Angeles* (Berkeley, CA: University of California Press, 2004); On flood proofing on the Mississippi, see Ted Steinberg, *Acts of God: The Unnatural History of Natural Disaster in America* 2nd ed. (New York: Oxford University Press, 2006), xvii-xviii, 97-115; on flood protection of Denver, *The Federal Engineer, Damsites to Missile Sites* 239-41.

III

As maintenance teams pumped water from the library's first level, Colorado A&M librarians worked to save waterlogged books. Sliding paper towels between soggy pages in the days after the 1938 flood, they began to reconsider the landscape surrounding campus. Sitting along the city's lowlands and just downhill from the "Town Ditch" capable of transporting excess water from the north side of town onto campus, the librarians recognized that the school's location wasn't ideal in a rainstorm.⁷² Though the earliest city residents laid a foundation that protected Fort Collins from floods along the Poudre, they failed to consider the destructive potential of runoff that had not yet drained to the river. Overlooking drainage problems was an understandable oversight by settlers not yet familiar with Front Range cloudbursts. By 1938 though, Fort Collins's drainage problems had become impossible to miss. And yet, neither the college nor city employed structural alterations or zoning regulations to address the root of the issue made apparent by the flood.

Returning to the not-so-objective newspaper article referenced earlier, the runoff flood problem was obvious, and something "ought to be done." Beyond draining basements and repairing campus, though, the city did nothing to protect from the next storm. In the weeks and months following the storm, flooding faded from local newspapers and city council legislation. Not until 1948, would the city pass an ordinance related to addressing local drainage problems with storm sewers.⁷³ Inaction following the deluge was likely a function of the flood's timing and structure. Inundating a city still grappling with the economic and environmental upheaval of the Great Depression and Dust Bowl, Fort Collins wasn't in a position to invest in proactive

⁷² Douglas J. Ernest, *Agricultural Frontier to Electronic Frontier: A History of Colorado State University Libraries, 1870-1995* (Fort Collins: Colorado State University Library, 1996), 89-90.

⁷³ City of Fort Collins Public Records Online, <https://citydocs.fcgov.com/>.

infrastructure at the city level. Throughout the decade, when the city pursued infrastructure projects, it did so through projects that leveraged flexible New Deal programs to help with funding. How Fort Collins flooded in 1938, and the drainage problems it exposed, however, existed beyond the scope of New Deal era flood control legislation. In a city still staggering from a turbulent decade, and without a federal program to turn to for aid and expertise, Fort Collins reverted to the same strategy the city employed after 1904—rebuild and move on.

The storm rolled away, crews rebuilt damaged areas, and students went back to school, but no city planner nor concerned resident did a thing to reduce or prevent damage in the next flood. Nonexistent proactive measures to address the city's flood problems at the local level, and the inability to do so through federal aid proved costly for Fort Collins in 1951.

Flash Flooding Strikes Twice, 1938-1951

In early August 1951, dark clouds again rolled over the Front Range, dousing Fort Collins in three inches of rain on August 2, then three more the morning of August 3.⁷⁴ Like 1938, streets turned into streams and spilled into the basements of Colorado A&M campus and surrounding neighborhoods. This time though, damages weren't light enough to shrug off. Taking three lives and responsible for \$270,000 (unadjusted) of damage on campus and an estimated half a million dollars of damage city-wide, the flood of 1951 demonstrated the cost of failing to overhaul flood protection after 1938.⁷⁵ Yet, by further proving that Fort Collins residents should expect intense rainstorms and subsequent runoff floods, it offered an opportunity to again address the city's flood vulnerability. While federal flood control funds still wouldn't be available due to the nature of the flood, a more financially stable Fort Collins proved

⁷⁴ "Three Dead Here, Flood Damage Half Million," *Fort Collins Coloradoan*, August 5, 1951.

⁷⁵ "College Disaster Recalls Similar Flood of 1938," *Fort Collins Coloradoan*, August 5, 1951.

willing to address disaster this time around. Motivated city planners and concerned locals, however, would only muster up a limited response: two new storm sewer pipelines just east of campus. Such an underwhelming response sheds light on the implications of the Army Corps of Engineer's role as "flood experts" in Fort Collins, revealing how federal planners' faith in expensive, control-oriented fixes helped forward cost-prohibitive planning and stymie creative and cheaper responses to flood threats at the local level.

I

The flood waters that crashed into Fort Collins in 1951 surged across a city at a critical juncture. While World War II paused infrastructure projects and population growth in the short term, Fort Collins's participation in the global conflict, and the implications that came with the war's conclusion left a lasting imprint. With World War II came alterations to agriculture practices along the city's perimeter, and with its conclusion came explosive population growth, which for the first time wasn't tethered to agriculture. From 1950 to 1960, the population of Fort Collins soared from almost 15,000 to 25,000.⁷⁶ Thus, decisions about how to respond to flooding at the beginning of this boom carried weight beyond the present, as such decisions would inform how rapid residential and commercial expansion would interact with flood risk going forward.

As in the first World War, Fort Collins directed its energy and production to national needs in World War II. In the early 1940s, students at Colorado A&M trained to become pilots and army clerks while faculty dug into military-funded research.⁷⁷ Again doing its part in a time of need, A&M's temporary shift carried on the connection between the college and federal

⁷⁶ U.S. Department of Commerce and Labor, Bureau of the Census, *Eighteenth Decennial Census of the United States: Census of Population: 1960* vol. 1, Part 7, 9, <https://www2.census.gov/library/publications/decennial/1960/population-volume-1/vol-01-07-c.pdf>.

⁷⁷ Hansen, *Democracy's University*, 16.

programs and funding. In the fields, however, World War II, precipitated a major change of course.

The end of a decade of drought and the arrival of wartime demand meant big business for food-producing planters. Labor shortages and the continued federal price control of sugar, however, meant equally big change, as farmers moved away from sugar beet cultivation and toward less labor-intensive crops. This shift marked the beginning of the end for sugar beets' hold on the local economy.⁷⁸ With laborers leaving the fields to find steadier employment in the military and farmers pivoting to accommodate less labor, Great Western Sugar began to lose its grip on local economies across the Colorado Piedmont. Thus, while World War II effectively froze Fort Collins development during the conflict, it shook up the city's future by further bolstering the university while destabilizing one of the city's largest employers and economic motor in the Great Western Sugar Company.

If wartime economics disrupted the agricultural/urban balance of Fort Collins, American's postwar mobility and relative wealth reshaped the city. Once the war ended, Fort Collins entered an era of unprecedented population growth, and new arrivals weren't looking for field work. With the Servicemen's Readjustment Act of 1944, or the G.I. Bill, veterans poured into Colorado A&M in the late 1940s.⁷⁹ Prior to the war, school enrollment topped out at 2,057, afterward, in 1948, 4,431 students attended Colorado A&M, sending school officials scrambling to expand the campus.⁸⁰ Growth off of campus proved equally dramatic, as many of the millions of Americans moving west in the postwar period identified the foothills as an ideal landing

⁷⁸ Eric Twitty, "Silver Wedge: The Sugar Beet Industry in Fort Collins" (Historical context submitted to Advance Planning Department, City of Fort Collins, 2003), 56-7.

⁷⁹ Hansen, *Democracy's University*, 16.

⁸⁰ "Factbook 2016-17: Colorado State University by the Numbers," Institutional Research, Planning and Effectiveness, Colorado State University, 9, accessed April 18, 2020, http://irpe-reports.colostate.edu/pdf/fbk/1617/FactBook_2016-17_Final.pdf.

place.⁸¹ Sprawling from the city's downtown, Fort Collins doubled in area from 1948 to 1961, a process that would turn fields into subdivisions and add to the city's flood risk going forward.⁸² Momentarily interrupting all this exciting growth and dramatic economic shift, though, was the flood of 1951.

II

Like the flood before it, the 1951 deluge was the result of rainfall directly over town. Rain poured against foothills, paved roads, and rooftops and then followed eastward sloping roadways into basements across campus and adjacent homes.⁸³ Making matters worse—and foreshadowing future flooding—debris clogging the pedestrian tunnel that cut under the railroad embankment on the eastern edge of Colorado A&M and turned campus into a lake. As runoff pooled, water begun scaling the Student Union's first floor, leaving cafeteria chairs “bobbing up and down with the tide.”⁸⁴ Water not entrapped on campus routed city storm sewers that lacked the capacity to drain three inches in three hours. Such drainage issues thwarted fire department pumping efforts. Campus becoming a lake meant that pulling 50,000 gallons of water out of the physics building didn't drop the water level an inch, while pumping a nearby storefront, to firefighters' surprise, only resulted in downhill neighbors complaining that their efforts were now flooding other buildings.⁸⁵ As in 1938, the only course of action that remained was to wait the flood out and assess damage afterward.

⁸¹ Tyler *The Last Water Hole in the West*, 190; Laflin, *Irrigation, Settlement and Change on the Cache la Poudre River*, 77.

⁸² On the Front Range's place in larger American westward migration, see Mary T. Anstey, Adam Thomas, *Fort Collins Postwar Development, 1945-1969, Survey Report* (Prepared for Advance Planning Department, 2011), 15-17, accessed April 18, 2020, <https://www.fcgov.com/historicpreservation/pdf/postwar-survey.pdf>.

⁸³ “Three Dead Here, Flood Damage Half Million,” *Fort Collins Coloradoan*, August 5, 1951.

⁸⁴ “Campus Damaged by Rising Water of Summer Floods,” *Rocky Mountain Collegian*, September 21, 1951.

⁸⁵ “Twin Floods Started in Small Area, Survey Shows; Overflow of Ditches Inundates Campus,” *Fort Collins Coloradoan*, August 5, 1951.

Unlike 1938, however, the Cache la Poudre was flooding too. At the same time runoff poured into the city's interior, a swollen river burst out of the Poudre Canyon, inundating the floodplain along Fort Collins's northeastern edge.⁸⁶ Running at 8,000 cubic feet per second (cfs) on Saturday at the canyon's mouth, compared the 750 cfs two days prior, the Poudre charged into the migrant neighborhoods on north bank of the river, flooding houses up to three feet and sending residents scrambling for shelter on higher ground.⁸⁷ Flooded in 1904, and ignored in their appeal for storm sewers in the 1920s, Buckingham, Andersonville, and now Alta Vista sat helplessly submerged, their residents again evacuating to the safety of the homes of friends or the Salvation Army hall.

At the beginning of a new era of unprecedented growth, a storm again reminded Fort Collins of the destructive potential of regional weather patterns. As chairs bobbed at eye-level through campus windows and the overflowing Poudre River lapped against predominantly German-Russian and Hispanic homes, the city's two flood vulnerabilities converged. Mirroring the floods of 1904 and 1938, inescapable flood water forced Fort Collins to grapple with the city's vulnerability to riverine and runoff flooding. In the following weeks, residents took action and invested in the city's flood defenses. Such action, however, proved limited, as the city mimicked federal flood control's focus on fixing environmental quirks, not accommodating them, but with a city-level budget.

III

Immediately after the August 3 flood, homeowners living on Plum and Locust—residential streets hit hardest just east of campus—met with Fort Collins city engineer Howard E. Evans to figure out how to make sure their basements weren't ruined by the next storm. Within a

⁸⁶ "Buildings, Plants Flooded, Utilities Service Hindered," *Fort Collins Coloradoan*, August 5, 1951.

⁸⁷ "A&M Campus Part of City Swamped," *Fort Collins Coloradoan*, August 5, 1951.

week, the thirty-five homeowners had successfully acquired the requisite homeowner signatures to move the issue of creating a new storm sewer district to City Council, eventually resulting in “storm sewer improvement district #12.”⁸⁸ Just days later, concerned homeowners four blocks south of Plum Street also surpassed the petition threshold and gained the approval of City Council, creating storm sewer improvement district #10 with zero dissenters.⁸⁹ Only a year earlier, 155 homeowners from the very same district wrote city council to oppose storm drain construction on account of its cost.⁹⁰ Through local funding, these ordinances resulted in curbside drains and underground pipes designed to address each neighborhood’s now obvious drainage issues.⁹¹ Through these two new drainage projects, one of which homeowners had opposed earlier, Fort Collins residents proved their interest in addressing local flood problems. But what came of their interest—a handful of drains and pipes running along the southeast corner of town—hardly represented a comprehensive response that solved the city-wide flood risk.

Residents with flood concerns beyond campus and its next-door neighbors made their voice heard, too. Homeowners in Buckingham Place also reached out to Evans to provide a city survey of the Poudre’s north bank.⁹² Garnering less attention in the local paper, it is difficult to say what came of that survey, but no city ordinance in the next decade addressed any flood or storm sewer-related issue in the Buckingham Place neighborhood. While campus and its

⁸⁸ “Council Starts Planning for Drainage of City Flood Area,” *Fort Collins Coloradoan*, August 12, 1951.

⁸⁹ An Ordinance Creating An Improvement District in the City of Fort Collins, Colorado, to be Known as Consolidated Storm Sewer Improvement District no. 10, Ordinance no. 5, 1951, City of Fort Collins, https://citydocs.fcgov.com/?dt=ORDINANCE&dn=City+Clerk&vid=3&cmd=search&scope=doctype&sortfield=SE_COND_READING&sortdir=ASC&q=storm+sewer.

⁹⁰ “Opposition to Storm Sewer Fades, Council OKs Proposal,” *Fort Collins Coloradoan*, August 19, 1951.

⁹¹ City of Fort Collins, An Ordinance Creating an Improvement District in the City of Fort Collins Colorado to be Known as Consolidated Storm Sewer Improvement District no. 12, Ordinance no. 5 1952, https://citydocs.fcgov.com/?dt=ORDINANCE&dn=City+Clerk&vid=3&cmd=search&scope=doctype&sortfield=SE_COND_READING&sortdir=ASC&q=storm+sewer.

⁹² “Council Starts Planning for Drainage of City Flood Area,” *Fort Collins Coloradoan*.

neighbors were able to turn loss and concern into city ordinances that landed them storm sewer projects, Buckingham Place, Andersonville, and Alta Vista received no such projects. Following the city's minimal response to the flood of 1904, and the fact that the area was still two decades away from paved streets and connection to city sewer, the lack of response to the flood of 1951 fit a longer trend of overlooking the needs of the communities on the other side of the Poudre. As before, modernizing infrastructure within Fort Collins was an uneven process that broke largely along ethnic divides.

Ethnic divides, however, weren't the only issue stalling city response to flood problems across the river. Unlike interior neighborhoods with runoff issues, the old sugar beet neighborhoods sat along the floodplain of the Cache la Poudre, and thus, were dealing with an issue the city had no experience in addressing. While a collection of homeowners on Locust street identified storm sewers as a logical and established response to flood danger, those across the way had more questions than answers. While homeowners on Plum and Locust streets drew up a petition to procure a very specific infrastructure project, spokespeople from city's northeastern edge requested a survey to gauge possible solutions. Could it be dammed? Diverted? What about levees?⁹³ In the era of big dams, and command-and-control engineering, the answer was likely some sort of major earthen or concrete structure.⁹⁴ Displaying the influence of nation-wide faith in technological fixes and the engineer's ability to solve flooding, the local paper covering the survey identified levees along the Poudre as the most logical

⁹³ What a potential project could look like was open for discussion in the newspaper, "Council Starts Planning for Drainage of City Flood Area," *Fort Collins Coloradoan*, August 12, 1951.

⁹⁴ On command-and-control engineering, see Will Wright, "Accelerating Waters: An Anthropocene History of Colorado's 1976 Big Thompson Flood," (Master's Thesis: Colorado State University, 2016), 136-141; Andrew Karvonen, *Politics of Urban Runoff: Nature, Technology, and the Sustainable City* (Cambridge, MA: MIT Press, 2011).

approach to protect the three subdivisions. A project of such scale, though, would likely require federal aid and expertise.

The U.S. Army Corps of Engineers did not survey the Cache la Poudre River until the 1970s, and no appeal for them to help Fort Collins address riverine flooding surfaced in the local press following the 1951 flood. Perhaps the lack of an appeal for federal aid was a function of Fort Collins continuing to overlook the plight of German-Russian and Hispanic residents. Or maybe, not appealing was simply a recognition by city planners that landing a multimillion-dollar engineering project to protect three neighborhoods was unlikely at best. If the USACE through the flood control acts only addressed riverine flooding issues with expensive engineering projects in line with a strict benefit-cost analysis that had already rejected projects in Morrison, Steamboat Springs, and Wray, what chance did three neighborhoods on the edge of Fort Collins stand in landing a project? In either case, local officials heard the appeals for flood aid in Buckingham Place, Andersonville, and Alta Vista, but never took any steps toward addressing the danger through local or federal means. A choice, to be sure, and one that reflected ethnic and class bias, but one also informed by rigid understandings of how to respond to flood risk that emanated from a narrow conception of how to address flood danger.

All told, Fort Collins sought to address flood risk after 1951 and only came away with two new storm sewer districts. Two storm sewers, zero zoning standards to regulate future development, and no effort to better accommodate runoff flooding speak to pervasive belief in controlling flooding rather than adapting to it—a belief that stemmed in large part from the USACE and how federal planners and programs addressed flooding. While federal legislation and the USACE were blind to Fort Collins's unique flood problem, Fort Collins, and much of the

Front Range, were well aware of how army engineers would attack flood danger: fix the problem through structural projects rather than accommodate the region's propensity to flood.

From the 1910s to the 1950s, Fort Collins had transformed from an oddity where an outgrowth of American expansion met surprisingly successful agricultural production, to a city intimately tied to the federal government and increasingly representative of urban trends across the country. The city leveraged marginalized labor to compete in industrial agriculture, it grew in a manner that best suited the automobile, and pursued modernization projects with a sense of purpose. Such trends transformed Fort Collins into a landscape recognizable to and connected with the federal government. But what the city couldn't reconfigure to mimic national trends, and federal policy couldn't make sense of, was the manner in which Fort Collins flooded.

When unruly runoff flooded the city in 1938 and 1951, Fort Collins flooded in a manner that federal natural resource planners and legislation hadn't accounted for. While New Dealers drew up flexible legislation to combat tanking crop prices, fund the struggle against western aridity, and alleviate unemployment, they left Fort Collins hanging when clouds burst directly over the city. By recycling the approaches of the Flood Control Acts of 1917 and 1928, New Deal legislation unintentionally maintained an assumption that flood problems were only a function of rivers and their tributaries overtopping their banks. In a city increasingly reliant of federal assistance, Fort Collins had no program to call upon for help in a federal government that hadn't accounted for flood problems stemming from heavy rainfall and poor drainage. When Fort Collins did try to address its flood problem in 1951, it did so internally, and following the engineering ethos of the time, sought to solve the environment rather than accommodate it. Thus,

Fort Collins entered a period of unprecedented growth in the 1950s with two new storm sewer systems but zero zoning regulations or proactive flood planning measures.

CHAPTER THREE – Unprecedented Growth and the Arrival of Floodplain Management along the Front Range

Front Range outdoor recreationists don't recognize Fort Collins as a hotbed for white water kayaking—further up the Poudre Canyon, maybe, but the river runs too slow through town. But on the evening of July 28, 1997, Colorado State University students broke out their boats and took to the streets. They weren't protesting, they were heading out to float the streets of west Fort Collins now knee deep in water.¹ Almost fifty years since the last storm burst directly above the city, rainfall was again flooding Fort Collins, and the extent of the flooding only became more serious as the evening progressed. Fluctuating between a drizzle and heavy bursts throughout the day, storm clouds draping the base of the foothills to Fort Collins's southwest began dumping sheets of rain by evening—likely exceeding a rate of 5-6 inches an hour.² The storm let up before midnight, but not before releasing 14.5 inches over 31 hours, and ten over a single night—an unprecedented total in a region familiar with extreme rainfall.³ For perspective, Fort Collins had received just five inches over 48 hours in 1938 and six inches over 48 hours in 1951.⁴ Rainfall doubling past flood totals powered the most destructive natural disaster in Fort Collins history.

¹ “Storm Timeline,” *Coloradoan*, July 23, 2007.

² Nolan J. Doesken and Thomas B. McKee, *An Analysis of Rainfall for the July 28, 1997 Flood in Fort Collins, Colorado*, Department of Atmospheric Science, Climatology Report 98-1, Fort Collins, Colorado State University (Fort Collins, 1998), 31.

³ Doesken and McKee, *An Analysis of Rainfall*, 32.

⁴ Thomas B. McKee and Nolan J. Doesken, *Colorado Extreme Storm Precipitation Data Study: Summary of Accomplishments and work performed February 15, 1995 through October 31, 1996*, Department of Atmospheric Science, Climatology Report #97-1, Colorado State University (Fort Collins, 1997), 42; Wayne A. Charlie, *History of Flooding at Colorado State University: 1902, 1938, 1951, 1992, and 1997*, Department of Civil Engineering, Report Number- Geotech 1998-100, Colorado State University (Fort Collins, 1998), 15.

As in 1938 and 1951, gravity again led runoff onto the Colorado State University campus. The amount of runoff, though, set this flood apart. By sundown, the flood proved less entertaining as rising runoff began lifting cars and bursting through basement windows and glass entries on and around campus. Overwhelming campus storm drains, floodwater poured into over twenty buildings, resulting in \$100 million of damages, and multiple close calls for those scrambling out of its path.⁵ Just south of campus, the flood played out much more chaotically. In just thirty minutes, two mobile home parks off the banks of Spring Creek, a usually tame stream bisecting the city south of campus, went from untouched by the flooding to underwater. Spurred by a blown culvert that unleashed a lake of pooled runoff on the unsuspecting trailer parks, flood water crushed mobile homes, sparked electrical fires, and triggered a natural gas explosion in a submerged liquor store.⁶ The flooding on Spring Creek killed five, and flooding city-wide left Fort Collins with \$200 million in damages.⁷ And yet, as the city floodplain manager Marsha Hilmes-Robinson put it, “it could have been much worse.”⁸

To Hilmes-Robinson who had worked in flood planning for a decade-and-a-half when she offered the quote, the flood, while undoubtedly tragic, served as a proof of concept. In the days and weeks following the flood, local and national papers rightly focused their coverage on the physical and emotional toll of what the *New York Times* called “a freak flash flood.”⁹

Overlooked in these stories though, were the two decades of proactive measures by the city that

⁵ “How Storm Formed, Where it Hit,” *Denver Post*, July 30, 1997.

⁶ “The Storm that Tore City’s Hearts, Homes,” *Coloradoan*, August 3, 1997.

⁷ Haley Candelario, “Fort Collins looks back 20 years after Spring Creek flood,” *Rocky Mountain Collegian* (Fort Collins), July 27, 2017.

⁸ Brian Varrella, Marsha Hilmes-Robinson, and Kenneth Sampley, interview by Naomi Gerakios, July 28, 2014, Northern Colorado Flood Oral History Collection, Water Resources Archive, Morgan Library, Colorado State University Libraries, Fort Collins, CO, <https://mountainscholar.org/handle/10217/167350>.

⁹ James Brooke, “Flash Flood at Colorado Trailer Parks Kills 5 and Injures 40,” *New York Times*, July 30, 1997

had moved forty structures and ninety-eight people out of the Spring Creek floodplain.¹⁰ To those connected to or familiar with the difficulties of flood mitigation in Fort Collins and beyond, the Spring Creek flood exemplified the benefits of investing in floodplain management. A paper compiled by Fort Collins flood planners and CSU professors stated that they “believe[d] that the pre-disaster mitigation was a success.”¹¹ Thus, in the eyes of experts, Fort Collins’s most destructive natural disaster also represented the city’s largest success in flood planning.

The flood of 1997 was a convergence of two historic developments and a record setting storm. On a July night, forty years of unprecedented urban growth mostly unbeholden to any sort of flood consideration collided with twenty years of flood mitigation efforts that had sought to creatively retrofit city infrastructure to better reflect local flood risk. On display that night were the long term consequences of the inability to address mid-century floods in a comprehensive manner, unprecedented postwar growth, and the delayed arrival of flood planning that—at the federal level and locally—considered flooding from an ecological perspective. The 1997 flood wasn’t just a natural disaster, but a tragedy rooted in historical development patterns that prioritized growth over caution and chose to rebuild instead of rethink after every flooding event until the late 1970s. Thus, when disaster struck, city planners pointed at minimized losses and lives saved by proactive planning in the last two decades as a positive result and the way forward.

¹⁰ Neil S. Grigg et al., “Fort Collins Flood 1997: Comprehensive View of an Extreme Event,” *Journal of Water Resources Planning and Management* (September/October 1999): 258, [https://doi-org.ezproxy2.library.colostate.edu/10.1061/\(ASCE\)0733-9496\(1999\)125:5\(255\)](https://doi-org.ezproxy2.library.colostate.edu/10.1061/(ASCE)0733-9496(1999)125:5(255)).

¹¹ Grigg et al., “Fort Collins Flood 1997,” 259.

*Making the “City of Plentiful Plains, Fascinating Foothills, Magnificent Rockies,” 1950-1975*¹²

Like the Cache la Poudre River, Spring Creek has a long history of flooding. As early as 1901, Fort Collins residents were aware of its destructive potential when rainfall turned the stream into a “raging torrent, carrying away everything in its course,” from wagons to bridges.¹³ What was new by the end of the twentieth century were the houses, neighborhoods, and businesses lining the creek’s banks. These encroaching structures were an outgrowth of the city’s transformation in the 1950s. With pleasant weather, affordable housing, job prospects, and the G.I. Bill bringing thousands of new residents to the city the days of Spring Creek as a minor waterway just south of town—rather than a waterway in the south of town—were numbered.

The city’s advance on the creek began in 1953 when Arthur C. Sheely sold forty acres of farmland between Spring Creek and campus to the Olds and Redd Construction company who began carving the land into a middle-class subdivision.¹⁴ Symbolizing the changing times, as construction crews transformed the former farmland into curving roadways, manicured lawns, and ranch style homes in 1954, the Fort Collins sugar processing factory closed its doors for the last time.¹⁵ By 1970, the agricultural town had transformed into a thriving city reliant on construction, retail, the university, undercutting agriculture’s economic primacy.¹⁶ The Sheely subdivision served as an early example more than an outlier as much of Fort Collins’s growth

¹² Fort Collins Chamber of Commerce, *The Fort Collins Guide: Published for the Out-of-Town Visitor* (Fort Collins: Manly W. Lutz advertising, 1951), 15, The Archive at Fort Collins Museum of Discovery (FCMOD), Fort Collins, CO, <https://fchc.contentdm.oclc.org/digital/collection/rb/id/8755/rec/3>.

¹³ “The Flood Gates of Heaven Jerked Wide Open,” *Weekly Courier*, May 23, 1901.

¹⁴ Advance Planning Committee, “Local Historic Landmark Designation Nomination Form: Sheely Drive Neighborhood Local Landmark District,” (City of Fort Collins, 2000), 7, https://www.historycolorado.org/sites/default/files/media/documents/2018/si_postwwii_sheelydrivedistrict.pdf.

¹⁵ Mary T. Anstey and Adam Thomas, *Fort Collins Postwar Development, 1945-1969, Survey Report* (Prepared for Advance Planning Department, 2011), 33, accessed April 18, 2020, <https://www.fcgov.com/historicpreservation/pdf/postwar-survey.pdf>

¹⁶ Chamber of Commerce, *The Fort Collins Guide*, 15; Anstey and Thomas, *Fort Collins Postwar Development*, 36.

over the second half of the century would take place along the city's western and southern outskirts where developers could turn farmland into spacious neighborhoods outside of the city's core, but easily accessible by car.¹⁷ Developing these areas though, meant inheriting their flood problems, while also adding to the city's well-established runoff issues by turning fields into impermeable roadways and sidewalks.

I

In 1953, a J.C. Penney department store opened downtown, an unmistakable sign that postwar American consumer culture had arrived in Fort Collins. Joining the retail chain were banks, car dealerships, travel lodges, gas stations, strip malls, and drive-up eateries. Like much of the rest of the country, the economy and everyday life in Fort Collins had become enmeshed with consumption, convenience, and cars. Even the new City Hall had a drive-through window.¹⁸ Mirroring urban and suburban patterns from across the U.S., Fort Collins had strayed far from its agrarian roots. And yet, water remained a central issue for the city. The principle concern facing city planners in the postwar period was not the threat of clouds occasionally dumping too much water though, but the fear of having too little. Rapid growth, even disconnected from irrigated agriculture, required proactive measures to obtain more water. To provide for a city that jumped from 14,900 residents in 1950 to 43,300 in 1970, Fort Collins invested heavily into its water utility.

In 1957, the Colorado Big Thompson Project began delivering the Western Slope water it had promised twenty years earlier. Unexpectedly though, fifteen percent of the water from the

¹⁷ On "characteristics of postwar suburbs," see Kenneth T. Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York: Oxford University Press, 1985), 238-245.

¹⁸ Anstey and Thomas, *Fort Collins Postwar Development*, 35-37; Jackson, "The Drive-in Culture of Contemporary America," in *Crabgrass Frontier*, 246-271.

agrarian-minded project headed to Front Range municipalities, including Fort Collins.¹⁹ Looking to provide drought protection and a growth cushion, Fort Collins in the 1950s bought thousands of shares of C-BT water and purchased water rights on the Cache la Poudre that had previously irrigated farmlands.²⁰ Moving more processed water to consumers required further city investment as well. In 1955, Fort Collins added filters to the Poudre Canyon treatment plant and ran a new 27-inch pipeline the twelve miles from the plant to the city.²¹ Expanding treatment and supply kept the city hydrated through the fifties, but the lack of treated water storage and the pressure on the Poudre Canyon treatment plant needed addressing by the mid 1960s.

In 1967 city planners drew up plans for a new treatment facility and treated-water basin at the base of Horsetooth Reservoir—a C-BT reservoir on the west end of town. The projects sought to alleviate peak month stress on the water system but came with a price tag north of \$2.5 million.²² In need of funding for another project set to modernize its infrastructure, the city turned to the federal government. In August 1967, a *Denver Post* article title read “Water Plant Aid Given to Fort Collins.” This time it was the Department of Housing and Development that came through with a \$1.1 million grant to help water the growing city.²³ As in the 1930s, when in need of funding that would allow the city to expand and modernize, federal aid programs provided willing allies. With treated water storage and two water treatment plants by the end of the 1960s, Fort Collins utilities had secured the major infrastructure to provide for the thirsty city.

¹⁹ Rose Laflin, *Irrigation, Settlement, and Change on the Cache la Poudre River* (Fort Collins, CO: Colorado Water Resources Research Institute, Colorado State University, 2005), 81.

²⁰ Laurie D’Audrey and Christy Dickinson, *From Snowcap to Water Tap: A History of Fort Collins Water Utilities*, City of Fort Collins Utilities (Fort Collins, 2017), 34.

²¹ D’Audrey and Dickinson, *From Snowcap to Water Tap*, 34.

²² D’Audrey and Dickinson, *From Snowcap to Water Tap*, 38.

²³ “Water Aid Given to Fort Collins,” *Denver Post*, August 4, 1967.

What federal programs gave to the city water utility, federal environmental law made all the more difficult. With the Water Quality Act of 1965 and the Clean Water Act of 1972, the city became responsible for not only supplying water, but making sure water released back to the Poudre via sewer and storm drain didn't carry deleterious chemicals and contaminants downstream with it.²⁴ Managing the health of local waterways wasn't just a top-down order, either. Fort Collins residents also pressured the city to take better care of the river that had for decades served as a city dump. Fort Collins Chamber of Commerce, after all, had leveraged images of fishing on a glimmering Poudre River to reel America's mobile middleclass onto the Front Range in the 1950s and 1960s.²⁵ As civil rights, women's rights, and anti-Vietnam protests demonstrations took hold of the CSU campus in the late 1960s, local environmentalists turned their attention to the plight of the trash-laden Poudre.²⁶ Spurred by a group of CSU students' 1970 short film, "The Lower Poudre: A Time For Action," Fort Collins residents passed a 1% sales tax that would provide funding for the city to purchase riverfront property for clean-up.²⁷ Thus, mandates from the nation's capital, and those from College Avenue tasked the city to not only secure quantity, but quality.

In the three decades following World War II, the responsibilities of Fort Collins utilities grew at a pace equal to that of the city itself. Population growth necessitated more water, and environmentalism and public health concerns demanded wide-ranging stewardship of local

²⁴ Jacy Marmaduke, "1970s Poudre: A 'Garbage Dump,'" *Coloradoan*, May 5, 2016, <https://www.coloradoan.com/story/news/2016/05/06/poudre-river-fort-collins-garbage-dump/83923054/>; D' Audrey, Dickinson, *From Snowcap to Water Tap*, 45-6.

²⁵ Local brochures referred to the Poudre Canyon as "Colorado's Trout Route," and ran blurbs titled "Fun and Fantasy in the Poudre Canyon," and "The Poudre's Fishing is Fabulous." See Chamber of Commerce, *The Fort Collins Guide*, 31; Estes Park Chamber of Commerce, Fort Collins Chamber of Commerce, and Loveland Chamber of Commerce, *Larimer County Panorama* (Exclusive Presentations: Loveland, CO, 1966), 19, 35, FCMOD, <https://fchc.contentdm.oclc.org/digital/collection/rb/id/8309/rec/44>.

²⁶ James E. Hansen II, *Democracy's University: A History of Colorado State University, 1970-2013* (Fort Collins: Colorado State University, 2007), 25-26.

²⁷ Jacy Marmaduke "1970s Poudre: A 'Garbage Dump.'"

waterways. Lost in the breakneck pace of city expansion, and city planners' effort to keep up, was any reflection on the city's well-documented proclivity to flood. The city continued to lay storm sewers and mandated that drainage "shall not create hazards" in new construction projects, but nothing more.²⁸ With minimal public concern, and little in the way of concrete federal policy that pushed for more comprehensive flood planning, storm drains were good enough. A shifting approach in flood planning at the federal level, however, was beginning to gain momentum in the late 1950s. Its slow development and delayed arrival in Fort Collins, though, meant that city officials would have to retrofit Fort Collins to meet much of the new program's core tenets.

II

At the same time eager developers pushed the borders of Fort Collins west toward the foothills and south toward Spring Creek, a geographer named Gilbert F. White was rethinking how the federal government should approach flooding. Beginning graduate school in the 1930s at the University of Chicago, White accepted multiple positions in New Deal agencies where he worked on flood control projects that interrupted his studies and dissertation project but provided valuable experience in the field.²⁹ Returning to school with a wealth of experience in disaster planning in the early 1940s, White produced an influential dissertation, "Human Adjustments to Floods," that, as title suggested, questioned flood protection that emphasized strictly structural approaches to controlling flooding. Offering the quote "Floods are 'acts of God,' but flood losses are largely acts of man" in his dissertation, White articulated an approach to flood planning that pushed planners to consider the social factors—property value, local economics, local hazard

²⁸ Being an Ordinance Adopting Minimum Standards for Mobile Home Parks, City of Fort Collins, Ordinance NO. 20, June 1, 1967, accessed May 4, 2020, https://citydocs.fcgov.com/?cmd=convert&vid=3&docid=1551530&dt=ORDINANCE&doc_download_date=JUN-01-1967&ORDINANCE_NO=020.

²⁹ Brian Rumsey, "Littoral Limits: Flood Insurance and the Quantification of Risk in the United States, 1914-2018" (PhD Diss., University of Kansas, 2018), 60.

education—in flood-prone communities along with the environmental setting.³⁰ To White, keeping distance from a natural process and protecting floodplains offered a cheaper, more holistic approach to flood protection. White’s belief in nonstructural approaches to flood planning—hydrology studies, education, forecasting, warning systems, flood insurance, zoning regulations—would lead some twenty-first century geographers to call him the “father of floodplain management.”³¹ Spawning these ideas in 1945 and expanding on them over the next two decades, it took time for White’s non-structural floodplain management to mature into federal policy.

If government officials were to embrace floodplain management as nation-wide approach to flood planning, it would require federal planners to part ways with their pre-war approach to natural disaster management. As historian Scott G. Knowles and social scientist Howard C. Kunreuther have pointed out, in the first half of the twentieth century, “Congress provided relief funds on a regular basis, though in a disaster-by-disaster fashion.”³² The flood control acts of the 1930s certainly fell into this case-by-case approach, as Army Corps engineers often arrived to take stock of flood problems in Front Range communities only after a flood. Federal policy, however, began moving away from a disaster-by-disaster approach in the 1950s as the Federal Civil Defense Act of 1951—designed to prepare the country for nuclear war—gave the president “the ability to declare disaster” and bestowed defense officials with funds to support all sorts of

³⁰ N. Macdonald et al., “The Significance of Gilbert F. White’s 1945 Paper ‘Human Adjustment to Floods’ in the Development of Risk and Hazard Management,” *Progress in Physical Geography* 36, (Summer, 2011), accessed May 7, 2020, https://journals-sagepub-com.ezproxy2.library.colostate.edu/doi/full/10.1177/0309133311414607#_i4.

³¹ For further exploration of White’s non-structural ideas, see Gilbert F. White, *Choice of Adjustment to Floods*, Department of Geography Research Paper NO. 93, University of Chicago, 1964, xii-21; Robert W. Kates and Ian Burton, “Gilbert F. White, 1911-2006: Local Legacies, National Achievements, and Global Visions,” *Annales of the Association of American Geographers* 98, (Spring, 2008): 481.

³² Scott Gabriel Knowles and Howard C. Kunreuther, “Troubled Waters: The National Flood Insurance Program in Historical Perspective,” *Journal of Policy History* 26, no. 3 (2014): 331, accessed May 7, 2020, <https://muse-jhu-edu.ezproxy2.library.colostate.edu/article/547675>.

wide-ranging scientific studies.³³ As earthquakes, hurricanes, and floods ripped through the United States in the 1950s and 1960s, government officials increasingly diverted these funds toward natural disaster responses and studies. Defense funds helped expand federal understandings of natural disasters and their rate of reoccurrence, but they didn't cover the cost of increasingly prevalent appeals to Congress for natural disaster aid. With the passage of another disaster relief bill in 1965, President Lyndon B. Johnson lamented that the bill "was the sixth law passed in 18 months for the specific purpose of broadening Federal aids for the victims of the unusually severe succession of disasters."³⁴ Responding to each disaster on its own, and supporting reconstruction rather than reconsideration of where Americans were building their new homes, was costing the federal government time and money.

Fort Collins was not the only city whose growth had begun to stretch onto marginal, disaster-prone land. Enticed by sun-soaked beaches, millions of Americans moved to the coasts of Florida and Texas with little consideration of their hurricane history.³⁵ If rivers were difficult to flood proof, ocean-side communities were next to impossible. As hurricanes forced the federal government into doling out relief funds with regularity in the 1950s and 1960s, the prewar designs to control flooding along rivers in the American interior proved equally problematic. Per capita flood loss grew so high in the 1950s and 1960s that federal politicians couldn't help but acknowledge the limits of structural control of rivers through the Army Corps of Engineers. As historian Ted Steinberg has argued "with the bankruptcy of the containment strategy abundantly clear by the late 1960s," governmental officials had little choice but rethink their approach to

³³ Knowles and Kunreuther, "Troubled Waters," 330.

³⁴ Knowles and Kunreuther, "Troubled Waters," 332.

³⁵ Ted Steinberg, *Acts of God: The Unnatural History of Natural Disaster in America* 2nd ed. (New York: Oxford University Press, 2006) 47; Rumsey, "Littoral Limits," 79.

flooding.³⁶ Tragic, costly, and increasingly recurrent disasters sent federal planners back to drawing board. Case-by-case, after-the-fact, command-and-control style disaster prevention wasn't preventing disaster.

In 1965, Congress passed the Southeastern Hurricane Disaster Relief Act. Built into the bill were funds to search for “alternative permanent programs...including but not limited to flood insurance or reinsurance.”³⁷ With Gilbert White chairing the task force, the 1966 report to president Lyndon B. Johnson concluded that federally-subsidized flood insurance, with rates based on flood probability, would help manage the cost of recovery, and if dangled as a carrot to communities, could also provide leverage to force communities to stop building in flood-prone areas.³⁸ Upon hearing the task force's recommendations, a flood-weary Congress quickly passed federally subsidized flood legislation. With the National Flood Insurance Act of 1968, federally funded, non-structural natural disaster policy had arrived. Application of the act, however, proved tricky.

III

The 1968 National Flood Insurance Act represented an important shift in disaster policy, but still a limited one. In the words of a flood insurance study in Larimer county, “the 1968 Act had a major flaw; it was voluntary.”³⁹ In the case of Fort Collins, while increasing water demand and federal environmental regulations made mandatory demands of city government, it made little sense for city planners—scrambling to keep up already—to join a voluntary flood program, especially one that would curtail expansion. It is doubtful, too, that a city filling with newcomers

³⁶ Steinberg, *Acts of God*, 119.

³⁷ Knowles and Kunreuther, “Troubled Waters,” 332.

³⁸ Dwayne A. Landenberger and Howard M. Whittington, *Implementation of the National Flood Insurance Program in Larimer County, Colorado*, Environmental Resources Center, Information Series No. 22, Colorado State University (Fort Collins, 1976), accessed May 7, 2020, https://mountainscholar.org/bitstream/handle/10217/3080/is_22.pdf?sequence=1&isAllowed=y.

³⁹ Landenberger and Whittington, *Implementation of the National Flood Insurance Program*, 15.

sold on Colorado sunshine had much interest in adopting zoning restrictions to account for flooding. The program's voluntary character didn't catch on nationally, either. With limited participation threatening to sink the program, Congress passed the Flood Disaster Protection Act of 1973, requiring all cities with a designated flood hazard to enroll in the National Flood Insurance program (NFIP) as a prerequisite to access federal financial aid.⁴⁰ Only after the threat of losing out on federal aid materialized in the 1973 Flood Disasters Protection Act did Fort Collins begin preparing to enter the federal program.⁴¹

On September 10, 1975, the Larimer County Planning Commission passed resolutions restricting land uses on the county's designated floodplains.⁴² The resolution didn't receive the warmest reception. As the *Rocky Mountain Collegian* reported, "the resolutions were passed despite misgivings on the part of property owners in the flood plain areas."⁴³ Over the next two decades, Fort Collins emerged as an exemplary member of the NFIP and an adopter of non-structural flood solutions at the local level. By 1975, though, Fort Collins was already entering its fourth decade of unprecedented postwar growth. The long, winding process that turned Gilbert White's approach into federal policy allowed Fort Collins to sprawl across former farmland without any consideration of flood danger for thirty years. And though the banks of the Cache la Poudre remained largely unpopulated within Fort Collins city limits, the city's southward march had engulfed Spring Creek. While involvement in federal flood protection projects and increasing concern over runoff flooding and drainage led to Fort Collins investing in its flood defenses, the city was stuck playing catch up. By 1975, poor drainage on the CSU

⁴⁰ Landenberger and Whittington, *Implementation of the National Flood Insurance Program*, 10-11.

⁴¹ Landenberger and Whittington, *Implementation of the National Flood Insurance Program*, 37.

⁴² Harold Reutter, "Planning Commission Advocates Restricted Flood Plain Land Use," *Rocky Mountain Collegian*, September 12, 1975.

⁴³ Reutter, "Planning Commission Advocates Restricted Flood Plain Land Use."

campus and outdated storm drains downtown weren't the only problems. Around Fort Collins's urban core sprouted a postwar suburban boom that pushed the "City of Plentiful Plains, Fascinating Foothills, Magnificent Rockies" into the submergible Spring Creek floodplain and cloudburst catchment basins.

Making up for Lost Time: Fort Collins Flood Protection, 1975-1997

In 1976, a pair of CSU researchers published a report that gauged difficulties of implementing the NFIP in Larimer County. Among the many roadblocks the study identified were the residents themselves: "in spite of the history of local floods, most residents that we interviewed feel that the 100-year flood is something that 'can never happen here.'"⁴⁴ Considering earlier floods in Fort Collins, this comes as little surprise, as residents following floods in 1904, 1938, 1951 had proved equal parts resilient and forgetful. But then it did happen. And in the very same year the researchers published their findings. The Big Thompson Flood of 1976 displayed that floods far larger and far more tragic than a 100-year event (a flood with a 1% chance of occurring in a given year) did strike along the northern Front Range.

When a cloudburst at the upper reaches of the Big Thompson River's watershed sent a wall of water careening down narrow canyon walls fifteen miles southwest of Fort Collins it became difficult for residents to deny the flood threat their Front Range communities faced. Killing a staggering 143 people, the flood became Colorado's deadliest disaster.⁴⁵ Though untouched by the flood, Fort Collins residents, only one watershed removed from its path,

⁴⁴ Landenberger and Whittington, *Implementation of the National Flood Insurance Program*, 80.

⁴⁵ Harry M. Shoudy, *The National Flood Insurance Program in Larimer County, Colorado Area*, Colorado Water Resources Research Institute, Information Series No. 44, Colorado State University (Fort Collins, 1980), 48, accessed May 10, 2020, https://mountainscholar.org/bitstream/handle/10217/3099/is_44.pdf?sequence=1&isAllowed=y.

witnessed the tragedy at a personal level. Whether through newspapers or stories radiating from the Red Cross aid station set up in Fort Collins, old-timers, new arrivals, and college students in all likelihood heard the stories of water charging through familiar small towns and of water heaters-turned-projectiles eerily pinging down dark canyon walls.⁴⁶ By hitting so close to home, the Big Thompson Flood powerfully demonstrated what floodplain maps created by complicated equations struggled to articulate to the public: the Front Range really does flood. With the disaster seared into Fort Collins's collective memory and the tenets of the NFIP becoming more familiar by the year, city planners became increasingly interested in—and residents more receptive to—local flood mitigation projects.

I

Responding to federal pressure articulated in the Flood Damage Protection Act, the Larimer-Weld Regional Planning Commission requested mapping of the two counties' flood hazard areas in 1973. Funded by the NFIP, a private firm provided the two counties their first flood hazard maps in 1975.⁴⁷ Making the idea of entering the NFIP at least palatable to a disinterested Fort Collins public was the fact that, according to the 1975 hazard maps, only a sliver of the city actually sat in the floodplain of the Poudre River.⁴⁸ Missing in this first iteration of floodplain mapping was Spring Creek.⁴⁹ Though the oversight made it easier for Fort Collins residents to come to terms with building restrictions on a minor swath of land along the Poudre, the omission demonstrated the lack of consideration that the creek garnered when it came to

⁴⁶ David McComb, *Big Thompson: Profile of a Natural Disaster* (Boulder, CO: Pruett Publishing Company, 1980), 79.

⁴⁷ Landenberger and Whittington, *Implementation of the National Flood Insurance Program*, 33-35.

⁴⁸ Being an Ordinance Providing Flood Hazard Area Regulation, City of Fort Collins, Ordinance NO 40, 1975, accessed May 5, 2020,

https://citydocs.fcgov.com/?cmd=convert&vid=3&docid=1509341&dt=ORDINANCE&doc_download_date=AUG-05-1975&ORDINANCE_NO=040; Landenberger and Whittington, *Implementation of the National Flood Insurance Program*, 37.

⁴⁹ Landenberger and Whittington, *Implementation of the National Flood Insurance Program*, 144.

flood risk. If a flood on the Poudre “couldn’t happen here” in pre-1976 thinking, then a flood on a minor stream with a drainage basin of only nine square miles was inconceivable to Fort Collins residents. Spring Creek’s missing status on the city’s first floodplain map represented the apathy toward its flood risk that allowed for heavy postwar development along its banks. It also freed up a few more years for development along its bank without any consideration of flood risk.

Fort Collins aimed to officially enter the NFIP in 1979. To do so, the city needed updated floodplain maps. Calculated by the Federal Emergency Management Agency (FEMA)—the agency housing the NFIP—this study didn’t miss Spring Creek.⁵⁰ Calculating the 100-year floodplain to define building restrictions and designate building’s required flood insurance, the 1976 FEMA study focused on the Poudre River as well as Dry Creek and Spring Creek. Its findings offer perspective on the implications of three decades worth of unchecked development of suburban Fort Collins. Across all three waterways, Fort Collins’s 100-year floodplain had a population of 1,000 people and 221 residential buildings.⁵¹ For comparison, the 100-year floodplains of Estes Park and Loveland had populations of 85 and 2 people, respectively.⁵² The principle reason for the large disparities between neighboring communities was Spring Creek. In a 1980 study on the NFIP in Larimer County, the report described Dry Creek’s floodplain as “sparsely populated farmland,” and the Poudre’s as dotted with “only a few residential and commercial structures.” Spring Creek’s floodplain, conversely, “[was] approximately 50 percent developed consisting primarily of residential development.”⁵³ What was a minor waterway cutting through farmland in the 1940s, and an unthreatening stream in 1975, had become one of the city’s most prominent flood hazards by 1979. In identifying the hazard, federal flood

⁵⁰ Shoudy, *The National Flood Insurance Program in Larimer County*, 45.

⁵¹ Shoudy, *The National Flood Insurance Program in Larimer County*, 38.

⁵² Shoudy, *The National Flood Insurance Program in Larimer County*, 38.

⁵³ Shoudy, *The National Flood Insurance Program in Larimer County*, 45.

planning provided Fort Collins flood-related assistance for the first time. What to do with Spring Creek's dangerously overpopulated floodplain, however, came down to the city.

Fort Collins entering the NFIP ensured a halt to development along Spring Creek and insured those already living within its floodplain. Joining the federal program did not move people out of harm's way or offer funds to reverse the development along Spring Creek. The drawn-out process of the NFIP's development, its initial voluntary status, and persistent struggles in producing floodplain maps meant that developers had already littered much of Spring Creek's floodplain with structures by the time the NFIP froze construction. If the city wanted to move people out of its populous floodplains it would have to buy back properties and or invest in structural alterations to the creek. Both expensive options that didn't come with NFIP aid. Additionally, like the flood control acts before it, the NFIP only considered the dangers of riverine flooding, overlooking the threat of runoff flooding. While CSU's campus had flooded twice at mid-century none of its structures or surrounding neighborhoods appeared in NFIP floodplain maps. Federal flood aid had pushed Fort Collins into a new era of flood planning but the NFIP didn't solve the two major outstanding flooding concerns: minimizing flood danger on Spring Creek and addressing the city's vexing runoff problem through the heart of town.

Fort Collins's adoption of flood hazard mapping and eventual entry into the NFIP in the 1970s marked the first point in time that federal flood policy provided constructive aid in the city. Perhaps more influential on Fort Collins flood planning though, was the thinking that undergirded the NFIP's approach. As Gilbert F. White summarized, prior to the 1960s, communities at risk of flooding only had two choices: "to either bear the loss from occasional overflow or press for the construction of engineering works protecting against floods."⁵⁴ The

⁵⁴ White, *Choice of Adjustment to Floods*, 1.

NFIP represented a federal-level manifestation of White’s efforts “to correct an erroneous impression” that a community had to either engineer the problem out of existence, or come to accept occasional inundation.⁵⁵ While the NFIP didn’t buy out those living along the banks of Spring Creek or minimize the runoff flood risk around CSU, it provided the framework for a city-level approach that considered creative structural and non-structural maneuvers to minimize risk.

II

Addressing urban runoff is a tricky business. Do taxpayers city-wide pay for capital projects? Or only those who directly benefit from the project? Who counts as a beneficiary? Only those now at a lower risk of property damage or everyone who gained a new natural area from the project? What if flood water spills over jurisdictional boundaries? And what is a base-line storm from which to calculate the project from?⁵⁶ Such uncertainties and complexities can doom projects before they even begin.⁵⁷ But in 1976, Fort Collins City Council decided to try anyway, establishing the Storm Drainage Board to revamp the city’s runoff defenses.⁵⁸ With the Big Thompson Flood just a month removed, a history of runoff floods, and decades of construction that turned absorbent soil into impervious residential blocks, city planners thought it high time to address Fort Collins-type flooding. Organizing a Storm Drainage Board represented

⁵⁵ White, *Choice of Adjustment to Floods*, 108.

⁵⁶ Eugene J. Riordan, Neil S. Grigg, and Robert L. Hiller, *Development of a Drainage and Flood Control Management Program for Urbanizing Communities—Part I*, Colorado Water Resources Research Institute, Completion Report No. 85, Colorado State University (Fort Collins, 1978), 1-2, https://mountainscholar.org/bitstream/handle/10217/2631/CR_85.pdf?sequence=1&isAllowed=y

⁵⁷ Riordan, Grigg, and Hiller, *Development of a Drainage and Flood Control*, 1.

⁵⁸ Being an Ordinance Relating to Storm Drainage... Creating a Storm Drainage Board, City of Fort Collins, Ordinance NO. 61, 1976, accessed May 10, 2020, https://citydocs.fcgov.com/?cmd=convert&vid=3&docid=1507569&dt=ORDINANCE&doc_download_date=AUG-17-1976&ORDINANCE_NO=061.

the city's first attempt to address flooding beyond the floodplains of local waterways and in a more comprehensive manner than the case-by-case midcentury storm sewers.

Mirroring the federal trend toward non-structural solutions, the Storm Drain Board aimed to map and regulate the city's drainage basins as well as construct ditches, pipelines, and retention ponds to protect already threatened areas within the city. By 1980, city government, using National Oceanic and Atmospheric Administration precipitation calculations, drew city floodplains based on 2.89" of rain over two hours in the event of a 100-year storm.⁵⁹ In 1980, the city also settled on a means to fund stormwater projects: a stormwater utility fee.⁶⁰ Developing the fee allowed the city to invest in projects that residents wouldn't vote to fund in years prior and consolidate all stormwater and drainage projects under a singular stormwater utility.⁶¹ Limiting the scope of the new utility's projects, however, was city government's choice to break Fort Collins into eleven separate drainage basins and then only invest in projects with funds raised from the affected basin.⁶² Still, equipped with city floodplain maps and bolstered by residents' monthly investment in the stormwater utility, Fort Collins in the early 1980s had secured a stable base from which it could address decades of growth along flood-prone bottom lands.

Spring Creek garnered much of Fort Collins stormwater utility's attention in the 1980s and 1990s. With the waterway so heavily developed, the city had little choice but invest in structural alterations along the creek. Throughout the 1980s, the city added detention ponds and

⁵⁹ Varrella, Hilmes-Robinson, and Sampley, interview by Gerakios; D'Audrey and Dickinson, *From Snowcap to Water Tap*, 53.

⁶⁰ Of the Council of the City of Fort Collins Establishing a Storm Drainage Utility Fee for Administration, Ordinance NO 168, City of Fort Collins, 1980, accessed May 10, 2020, https://citydocs.fcgov.com/?cmd=convert&vid=3&docid=1457953&dt=ORDINANCE&doc_download_date=DEC-16-1980&ORDINANCE_NO=168

⁶¹ D'Audrey and Dickinson, *From Snowcap to Water Tap*, 53.

⁶² Varrella, Hilmes-Robinson, and Sampley, interview by Gerakios.

expanded channels to move structures out of Spring Creek's 100-year floodplain.⁶³ For buildings still sitting the within the floodplain, Fort Collins bought out the property owners and turned the property into open space.⁶⁴ Following the 1988 Spring Creek master plan, the city identified and acquired thirty mobile homes, a fast food restaurant, and a retirement home that they deemed too hazardous for occupancy.⁶⁵ By 1997, the city had removed approximately forty-five structures from the floodplain.⁶⁶ Of 313 acres of floodplain along Spring Creek, ninety-seven now served as community open space.⁶⁷

City planners worked to make up for lost time along Spring Creek, but not all city-level flood projects of the 1980s were reactionary or structural. In 1984, the city adopted building codes that ensured higher capacity for runoff in future developments.⁶⁸ In an effort to keep the community informed, the city began sending annual brochures that outlined flood projects, flood danger, and the status of the NFIP in Fort Collins. The city even went as far as beginning an annual "Flood Awareness Week," hosting events and running informative blurbs in newspapers and on local television on flood risk and projects.⁶⁹ By the 1990s, Fort Collins had become an example of a community invested in its proactive structural and non-structural flood planning, and it didn't go unnoticed.

⁶³ David Runyan et al., "The Fort Collins Flash Flood of July 28, 1997: Service Assessment Initial Report," U.S. Department of Commerce, National Oceanic and Atmospheric Administration (December 1997), 8, 1997 Fort Collins Flood, Folder 2 of 4, Water Resources Archive, Colorado State University Libraries, Fort Collins, Colorado, <https://mountainscholar.org/handle/10217/169842>.

⁶⁴ Varrella, Hilmes-Robinson, Sampley, interview by Gerakios.

⁶⁵ Runyan et al., "The Fort Collins Flash Flood of July 28, 1997: Service Assessment Initial Report," 8.

⁶⁶ Grigg et al., "Fort Collins Flood 1997," 259.

⁶⁷ Runyan et al., "The Fort Collins Flash Flood of July 28, 1997," 8.

⁶⁸ Association of State Floodplain Mangers, "No Adverse Impact Floodplain Management: Community Case Studies, 2004," 26, accessed May 10, 2020, <https://www.floods.org/index.asp?menuID=460&firstlevelmenuID=187&siteID=1>; "Stormwater History," City of Fort Collins Utilities, accessed May 10, 2020, <https://www.fcgov.com/utilities/what-we-do/stormwater/history>.

⁶⁹ Runyan et al., "The Fort Collins Flash Flood of July 28, 1997," 8.

Developing one of the country's first stormwater utilities, city planners across the US reached out to Fort Collins for advice.⁷⁰ By going beyond minimal standards set by the NFIP—mapping its own floodplains and adopting stricter zoning regulations—FEMA recognized Fort Collins's efforts with a top rating through the Community Rating System (CRS, a FEMA program for communities that exceed NFIP standards).⁷¹ Out of 1,000 communities in the CRS, Fort Collins ranked in the top 10. In just two decades, the city had come to embrace both the NFIP and creative structural and non-structural flood planning at the city level to great success. The city had mapped dangerous areas, invested in moving people out of those dangerous areas, adopted strict building regulations, and worked with the community to keep residents informed of the very real flood threat and the city's very real actions to minimize such threat. Fort Collins by 1997 was a standard bearer for the new era of flood planning. Then in late July, rain fell at a rate of 5-6 inches an hour, not the 2.89 over two hours the city had prepared for.

III

Before Carol Joy Collins knew what was going on, her home was floating. Like most living in the mobile home parks just off Spring Creek in the late hours of July 28, Collins, awoken by neighborhood commotion, only realized the water streaming below her trailer after it was too late to evacuate. Rising water transported Collins's trailer 125 feet before wedging it against a shipping truck and a tree. Fortunately, rescuers made it to Collins before water pouring into the trailer forced her to climb for higher ground. Picked up by a fire department raft and whisked away to an Arby's sitting above the flood waters, Collins was safe.⁷² It was a close call though, and four others living in the mobile home park and one in an adjacent neighborhood

⁷⁰ Association of State Floodplain Managers, "No Adverse Impact Floodplain Management," 26.

⁷¹ Grigg et al., "Fort Collins Flood 1997," 258.

⁷² Carol Joy Collins, Interview by Susan Harness, July 28, 2007, Fort Collins, CO, Box 1, Folder 1, Spring Creek Flood Commemoration Collection, Fort Collins Museum of Discovery, Fort Collins, CO.

weren't so lucky. And yet, Collins's home didn't sit in creek's designated floodplain. In fact, none of the previously inhabited trailers now knocked off their moorings and sent underwater sat in the designated floodplain.

Over two decades, the city of Fort Collins had invested more time and money in mitigating and protecting the city's designated floodplains than almost every medium-sized city in the US. The flood of 1997, however, spilled well beyond designated floodplains. 14.5 inches of rain over 31 hours, ten in a single night, was nothing short of extraordinary. While the city's impressive effort to move people and property out of a heavy storm's path minimized losses, it couldn't contain record-setting rainfall. The railroad embankment that separated Carol Joy Collins' neighborhood from pooling runoff just upstream could handle a 500-year flow. Water overtopped and blew through the embankment to catastrophic consequence only when flows more than doubling a 500-year event pushed against the railway.⁷³ Through the heart of town, runoff quickly overwhelmed detention ponds and storm drains designed for 100 year-storms with flows that at some points stood a staggering five to seven feet taller than that of a 100-year event.⁷⁴ In July 1997, the city was ready for 2.89 inches of rain over two hours, and its preparation for such a storm saved lives and property, but Fort Collins wasn't prepared for rain reaching double digit inch totals.

The flood of 1997 played out much differently on and around campus than it did in the trailer park. There were no fires, no sudden bursts of water, no explosions around CSU, just runoff flowing down roadways and growing taller by the hour. One parallel, however, existed between the flooding on campus and along Spring Creek, a lack of awareness. Whether it be college kids grabbing their kayaks, a staff member at the student center trying to redirect the

⁷³ Grigg et al., "Fort Collins Flood 1997," 257, 259.

⁷⁴ Grigg et al., "Fort Collins Flood 1997," 258.

flood water with a snow shovel, or Carol Collins heading to bed without a worry of flooding, residents had no grasp as to the severity of the developing disaster.⁷⁵ The city had no means of communicating the danger. While no one could expect Fort Collins flood planners to provide the structural means to control such a massive storm, a system that tracked runoff and warned citizens of the flood's enormity was sorely missing that night. The lack of a warning system or any real contingency plan for a storm of such size displayed the city's largest oversight over the past two decades of flood preparation. By utilizing federal flood planning as a template, Fort Collins planners hadn't adequately prepared its own mitigation efforts for the occasional ten-inch storm known to hit the Front Range.

Protecting the 100-year floodplain prepared Fort Collins for a heavy storm, not an extraordinary storm. As the twelve inches of rain outside of Bellvue in 1951 and the ten plus inches above the Big Thompson in 1976 displayed, extraordinary rainstorms hit the Front Range.⁷⁶ As climatologist Nolan Doesken found in 1998, "the chances of receiving 10 inches of rain somewhere in Colorado in any given year is quite high—about ten percent."⁷⁷ When those ten inches fell on Fort Collins, the city wasn't prepared. In becoming a standard bearer for the accommodating structural and non-structural approach preached by Gilbert White and adopted at the federal level, Fort Collins overlooked the environmental particularities of the Front Range that could turn a drought into a double-digit rainstorm in just an afternoon. Still, oversight aside, had the city not invested in moving people out of 100-year floodplains, the flood of 1997 would have wreaked further tragedy. As the next two decades displayed, city planners recognized their

⁷⁵ "Fighting a river of water with a shovel" *The Rocky Mountain Collegian*, August 14, 1997.

⁷⁶ McKee and Doesken, *Colorado Extreme Storm Precipitation Data Study*, 45.

⁷⁷ Doesken and McKee, *An Analysis of Rainfall*, 40.

approach to flood planning prior to 1997 as the best way forward, so long as they further invested in it.

Flood Planning in a New Century, 1997-2013

One year after the disaster, the *Coloradoan's* front page read, “Flood threat still hovers.”⁷⁸ On the ten-year anniversary, the *Coloradoan's* front page read “It’s only a matter of time before next flood.”⁷⁹ Unlike after 1904, 1938, and 1951, Fort Collins didn’t seek to forget the 1997 flood and ignore the fact that there would be another. An increase in public concern combined with the city’s effort to continue minimizing flood risk and account for the weaknesses displayed in 1997 propelled Fort Collins flood planning into overdrive. As the longtime Chief Engineer at Fort Collins Water Utilities, Owen Randall, summarized, “everything changed after the flood in 1997.”⁸⁰ New warning systems, floodplain maps, capital projects, ensured a materially different city landscape after 1997, what didn’t change, however, was the city’s approach.

In the flood’s immediate aftermath, the city didn’t seek to reinvent its approach to flood preparation, but reconfigure. Two of the earliest and most influential alterations at the city level came in how the city mapped its floodplains and funded capital projects. Spurring on the former were not only city planners, but residents. With overwhelmed storm drains and detention ponds seared in recent memory, it now seemed that the city had based its floodplains around too small of a rain total in a theoretical 100-year storm. As post-flood public input emphasized, “it rains really hard in Fort Collins,” perhaps 2.89 inches over two hours wasn’t an ample baseline for

⁷⁸ Kevin Duggan, “Flood threat still hovers: a year later, city’s better prepared, not flood-proof,” *The Coloradoan* (Fort Collins), July 26, 1998.

⁷⁹ Jason Kosenka, “It’s only a matter of time before next flood,” *Coloradoan*, July 23, 2007.

⁸⁰ Owen Randall, conversation with author, March 26, 2019.

Fort Collins floodplains.⁸¹ Following the same sentiment, the city began to move away from the NOAA floodplain projections and toward incorporating local data, initiating a study of historic rainfall in 1998 to help recalculate the rain total of a 100-year storm.⁸² This process resulted in a higher total: 3.67 inches over two hours, which in turn enlarged city floodplains, placed more structures within the floodplain, and depicted detention ponds as undersized. On campus, CSU underwent a similar recalculation process and drew a new, internally calculated, 100-year floodplain for the school.⁸³ CSU then invested in raised vents, storm drains, and water blocking walls in accordance to its new floodplain. The city didn't have the luxury of straight-forward structural alterations that the confined campus offered. With hundreds of additional structures now in the floodplain, and prior structural adjustments now deemed inadequate by a larger base storm prediction, the city needed to again revamp its flood protection city-wide—not a cheap undertaking.

The second major alteration to the city's flood defense came in how it allocated funding for capital flood projects. Prior to 1997, the city funded projects on a basin-by-basin approach where stormwater fees only funded projects in the fee's basin of origin. In order to fund larger projects after 1997, Fort Collins began pooling fees from across all eleven basins and investing in projects without worrying about where the funds originated. More focused funding capabilities allowed the city to invest in major storm drain projects along Oak, Locust, and Howes Street downtown that laid pipes upwards of nine feet in diameter below roadways, taking

⁸¹ Varrella, Hilmes-Robinson, and Sampley, interview by Gerakios.

⁸² D'Audrey and Dickinson, *From Snowcap to Water Tap*, 55; "History," City of Fort Collins Utilities, accessed April 20, 2020, <https://www.fcgov.com/utilities/what-we-do/stormwater/history>.

⁸³ Colorado State University, "2014 Physical Development Master Plan: 'Road Map for the 21st Century,'" (December 2014), 50; Dell Rae Ciaravola, "1997 flood transformed campus for the better," *Source* (Fort Collins), July 26, 2017, Accessed May 19, 2020, <https://source.colostate.edu/1997-flood-transformed-campus-better/>; "Floodplain Management: Floodplain Management and Flood Mitigation," Facilities Management at Colorado State University, accessed April 19, 2020, <https://www.fm.colostate.edu/floodplain>.

hundreds of structures out of the floodplain from 1999 to 2002.⁸⁴ In 2012, the city completed construction on the \$21.5 million runoff control project, Canal Importation Ponds and Outfall (CIPO), on the west side of town. Funded by pooled stormwater fees, CIPO, which connected large detention ponds along the west side of town, moved hundreds of structures out of the floodplain in the exact region that runoff had overwhelmed in 1997.⁸⁵ Even the Buckingham neighborhood landed a project, as the city constructed Oxbow Levee in 2005 to remove the old sugar beet neighborhoods from the Poudre’s 100-year floodplain.⁸⁶

Reconfiguring maps and funding left Fort Collins better protection from the next heavy storm, but the city didn’t stop there. In 1999, with grant money from FEMA, Fort Collins constructed rain gauges along the Poudre River and Spring Creek as well as the drainage basins throughout town.⁸⁷ These gauges, along with city efforts to streamline communication with the National Weather Service forecasters and the city investing in a “reverse-911” system that connected the city emergency operating center to residents, informed what the *Coloradoan* called one of the country’s most comprehensive flood warning systems.⁸⁸ The measure

⁸⁴ Donald T. Grzesiek, “Concrete News: Major Flood Spurs Construction of Large Capacity Storm Drain,” Colorado Association of Stormwater and Floodplain Managers, accessed May 10, 2020, <http://www.casfm.org/wp-content/uploads/2017/05/lso.pdf>; “History,” City of Fort Collins Utilities; “Old Town,” City of Fort Collins Utilities, accessed May 12, 2020, <https://www.fcgov.com/utilities/what-we-do/stormwater/drainage-basins/old-town-basin>.

⁸⁵ On CIPO, see “Canal Importation Ponds and Outfall Project City of Fort Collins Colorado,” Anderson Consulting Engineers, accessed May 29, 2020, <http://www.acewater.com/recent-projects/canal-importation-ponds-and-outfall-cipo-project-city-of-fort-collins-colorado>; For an interpretation compiled by CSU historians, see “Canal Importation Ponds—Drainage in Urban Areas,” Public Lands History Center, Colorado State University, accessed May 19, 2020, https://publiclands.colostate.edu/digital_projects/dp/poudre-river/urban-industrial/canal-importation-ponds-drainage-in-urban-areas/; For building specifics, see “Canal Importation Ponds & Outfall Project,” City of Fort Collins Utilities, accessed May 19, 2020, <https://www.fcgov.com/utilities/what-we-do/stormwater/drainage-improvement-projects/canal-importation-ponds-and-outfall/project-description>; “CASFM Project Awards Nominations, 2012, Canal Importation Ponds and Outfall Design (CIPO),” accessed May 10, 2020, http://www.casfm.org/wp-content/uploads/2017/05/CASFM_2012_awards_winner.pdf.

⁸⁶ Varrella, Hilmes-Robinson, and Sampley, interview by Gerakios; “Design, Construction, and Accreditation of the Oxbow Levee Project on the Cache la Poudre River Near Old Town Fort Collins, Colorado,” Anderson Consulting Engineers, accessed May 10, 2020, http://www.acewater.com/wp-content/uploads/2011/06/01_COFC2003-10-color-Oxbow-Levee-Design-and-Construction.pdf.

⁸⁷ “History of the Warning System,” City of Fort Collins Utilities, accessed May 19, 2020, <https://www.fcgov.com/utilities/what-we-do/stormwater/flooding/warning-system/history-of-the-warning-system>.

⁸⁸ Kosenka, “It’s only a matter of time before next flood,” July 23, 2007.

represented the flood planners' acknowledgement of the very real threat of a rain event that dwarfed a 100-year storm on the Front Range. If the city couldn't control an unprecedented storm like that of 1997, gauges and a warning system—along with continued outreach and education initiatives—could better protect residents in the next storm.

A storm the likes of 1997 has yet to test Fort Collins's revamped flood defenses and warning systems. Perhaps a storm of its ilk never will. Less extraordinary flooding events, however, have passed through Fort Collins and the city has proved up to the challenge. In 1999, a wet April filled the Poudre to its brim. City emergency officials kept a close eye on their gauge readings and stayed in contact with national weather forecasters before deciding the river's peak flow would not rise high enough to necessitate an evacuation along the river.⁸⁹ In 2013, strict zoning rules along the Poudre floodplain ensured that few people and minimal private property stood in the flood's path. Uncertain of the degree to which runoff debris from forest fires in the Poudre's watershed would affect the river's flow, the city evacuated the neighborhoods along the north bank and kept the community updated on the flood's development via social media.⁹⁰ A heavy rainfall is yet to test the city's reconfigured flood planning along Spring Creek and the city's interior, but federal and city-level undertakings beginning in the 1970s, and further efforts to prepare for extraordinary events after 1997 have prepared the city for when the next storm parks atop the city.

⁸⁹ Marsha Hilmes-Robinson, Chris Lochra, "Fort Collins Floodplain Management Program: Success Stories from the September 2013 Flood," *Colorado Water* 31 (Spring 2014), 14, https://watercenter.colostate.edu/index.php?gf-download=2019%2F06%2FMarApr31_2.pdf&form-id=38&field-id=4&hash=f551fed9843ba625c7f47146a0c1031206f7eb2de751b1c63bd239f232a5a807.

⁹⁰ Varrella, Hilmes-Robinson, and Sampley, interview by Gerakios; John F. Weaver, Eve Gruntfest, and Glenn M. Levy, "Two Floods in Fort Collins, Colorado: Learning from a Natural Disaster," *Bulletin of the American Meteorological Society* 81 (October 2000): 2359-2366, www.jstor.org/stable/26215453.

CONCLUSION

Though Fort Collins had dodged the worst of the storm, with the Poudre still rising and rain still falling in September 2013, city flood experts and emergency managers decided to evacuate the Buckingham Place, Andersonville, and Alta Vista subdivisions. Sitting behind Oxbow Levee, designed to protect the subdivisions from floods larger than the deluge on hand, and beyond the Poudre's 100-year floodplain, evacuation, on the surface, seemed perhaps an overreaction. The logic that undergirded the decision, however, displayed city officials grappling with the particularities of the environment within which Fort Collins resided. A wildfire had recently scorched the Poudre watershed, and if the debris were to come hurtling into Fort Collins, it could potentially clog the river's path below bridges in town, city officials reasoned. If the water pooled, it would eventually circumvent the river's normal route, and take a detour right through the north bank neighborhoods.¹ Evacuation, then, represented a city considering the "dumb luck" component—because who knew for certain what the flood water was bringing with it? Evacuation also represented city employees' recognition of their place within an urban environment—that bridges interacting with burn debris had the potential to enlarge the floodplain beyond what the maps depicted.

In the wake of the floods, Marsha-Hilmes Robinson and Chris Lochra, two of the city's flood planning staff, authored a report on the flood that concluded "Floods are a part of life in Fort Collins."² My thesis has sought to develop a similar argument, that floods are a part of Fort

¹ Brian Varrella, Marsha Hilmes-Robinson, and Kenneth Sampley, interview by Naomi Gerakios, July 28, 2014, Northern Colorado Flood Oral History Collection, Water Resources Archive, Morgan Library, Colorado State University, Fort Collins, CO, <https://mountainscholar.org/handle/10217/167350>.

² Marsha Hilmes-Robinson, Chris Lochra, "Fort Collins Floodplain Management Program: Success Stories from the September 2013 Flood," *Colorado Water* 31 (Spring, 2014), https://watercenter.colostate.edu/index.php?gf-download=2019%2F06%2FMarApr31_2.pdf&form-id=38&field-id=4&hash=f551fed9843ba625c7f47146a0c1031206f7eb2de751b1c63bd239f232a5a807.

Collins, a natural process woven into the fabric of the city from the beginning. Flooding is an erratic, unpredictable function of the weather and topography that make up the environment in which Fort Collins resides. Flooding is also a function of an agrarian city encroaching on a water way, of opportunists developing dangerous lowlands, and of worldviews that depicted nature as subservient to humans.

This thesis is a story about a city's growing pains in trying to figure out how it fits with its natural surroundings. Fort Collins originally tied its future to the Poudre's just to survive. A sugar-filled, labor intensive root crop helped it grow, but increased connection to competitive national markets and pursuit of capital gain meant that such growth didn't prioritize reflection on how growth could best fit the landscape. Increased connection to the rest of the nation in the early twentieth century paved the way for explosive expansion in the century's middle decades. Subdivisions defined by green yards, ranch style homes, and garages embodied the "American Dream" and buried the environmental realities of the semi-arid, fickle foothills. As the U.S. began rethinking how it approached flooding in the 1970s, so too did Fort Collins, and since then city officials and city residents have worked to recognize and better adjust to how the Colorado Piedmont functions and how the foothills flood. Through these eras of growth emerged a layered landscape with flooding embedded within the city's structure.

Fort Collins is not a major American metropolis, and its floods aren't harrowing disaster stories that appear on national news feeds. And that's why this story matters. Fort Collins is but a typical mid-sized American city whose current residents inherited a significant-but-not-dire natural disaster risk. A threat that, by past residents building it into the city's urban landscape, presents no cheap or simple solutions. Reflection on how Fort Collins got here, or how any average American city grew in a manner dangerously out of line with its local environment help

all of us recognize the complicated and complex legacies present and future decisions and developments carry with them.

This thesis has peeled back layers of a landscape to better grasp the human component of a problem often associated with unruly nature. In doing so, this thesis has highlighted unexpected urban expansion, the transition from hinterland to minor metropolis, and the disconnect between federal conceptions of an environmental problem and the realities an environmental problem as key factors in the creation of a flood problem in Fort Collins.

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