Mobile homes and flood risk:
An analysis of flood risk and historical flooding in the Intermountain West and Michigan

By
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**Contents**

## 1. Introduction

According to the World Health Organization, flooding is the most common natural disaster (World Health Organization, n.d.), costing governments tens of billions of dollars each year (Hirabayashi et al., 2013). Like many other natural disasters, flooding is expected to increase with precipitation extremes as climate change progresses. In particular, climate models predict an increase in the size and increase in the frequency of heavy rainfall events (Kundzeicz, et al., 2013, Swain et al., 2020, IPCC, 2021). This increased size and frequency of rainfall will lead to increased flood risk for many communities around the world (Swain et al., 2020).

In the United States, mobile home park residents are often vulnerable to extreme weather events, including flooding (Baker et al., 2014). Often, mobile home parks are developed in flood prone areas, as the land tends to be less valuable (Burby, 2001, Gourevitch et al., 2020). Herein, I aim to explore the intersection of high flood risk areas and mobile home parks in Colorado, Michigan, Utah, and Wyoming. I combine a variety of existing data to understand the extent to which mobile homes are located in more flood prone areas than other single-family homes, and to highlight the impact that historical flooding has had on mobile home park residents.

### 1.2 Study area

This report summarizes flood risk and historical flooding for mobile home parks in the Western Water Assessment region (Wyoming, Utah, Colorado) and part of the Great Lakes Integrated Sciences + Assessment region (Michigan; Figure 1).

#### 1.2.1 Geographic landscape

The Intermountain West covers a wide range of states. While this region varies greatly in its landscape and climate, it is characterized by being located between or around the Rocky Mountains. The Western Water Assessment focuses on Wyoming, Utah, and Colorado. This project also includes analysis in Michigan. Michigan is a Great Lake state and is surrounded by Lake Michigan, Lake Superior, Lake Huron and Lake Eerie.

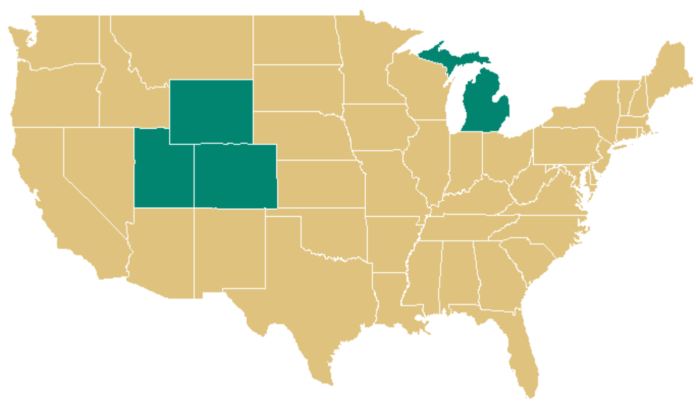

**Figure 1. Map of study area.** The Western Water Assessment region, including Wyoming (WY), Utah (UT), and Colorado (CO); and part of the Great Lakes Integrated Sciences + Assessment region, Michigan (MI). Map created in R.

#### 1.2.2 Flood types

Both types of flooding (river flooding and flash flooding) can occur in the Intermountain West and Michigan. However, river flooding often occurs in areas with wetter climates, such as Michigan. This type of flooding results from long-lasting rainfall and occasionally snowmelt. In the Intermountain West, flash floods are much more common, given the dry climate, lack of soil and mountainous terrain (Gaume and Payrastre, 2017). This flood type occurs when large rain events cause a rapid rise in a typically dry channel. The steep grades and topography of mountainous areas can lead to a much more rapid concentration of rain compared to the flatter terrain in Michigan.

## 2. Methods

### 2.1 Zip- and city-level flood risk data

On May 24, 2021, I created a query in the WWA Access Database to create a new data set. I filtered the full data set to include data in Colorado, Wyoming, Utah, and Michigan. After querying the Access Database for the relevant columns, I added a column to indicate the state for each row.

### 2.2 Mobile home park flood risk data

#### 2.2.1 Mobile home park locations

On May 21, 2021, I downloaded the Homeland Infrastructure Foundation-Level Data (HIFLD) mobile home park database (Homeland Infrastructure Foundation-Level Data, 2018) to collect the addresses (including latitude and longitude) for all known mobile home parks in Colorado, Wyoming, Utah, and Michigan as of 2018. I filtered this data to include addresses only for mobile home parks and MHP/RV/Migrant Housing (i.e., excluding addresses of exclusively recreational vehicle (RV) parks). This yielded 2,134 mobile home parks (Figure 2).

#### 2.2.2 Mobile home park flood risk

I used First Street Foundation's Flood Factor website (First Street Foundation) to collect mobile home park-level data on flood risk. Because I only had a single address for each mobile home park, the flood risk score that I used is an estimate for the whole park. Flood risk scores range from 1-10; 10 being the highest flood risk. I used Flood Factor's search tool to acquire the flood risk score for all the mobile home park addresses in the HIFLD data. For each address, I cross-referenced the satellite image provided by Flood Factor with Google Maps to confirm that the address was a mobile home park. If it was not a mobile home park, I noted the new property type (e.g., field, hotel) and recorded NA for the flood risk score.

If the address was a mobile home park, I recorded the flood risk score. In some cases, the address provided by HIFLD was either "unavailable" on Flood Factor or registered as a non-residential property. In these instances, I used Google Maps to find a nearby address and updated the address in the spreadsheet (keeping the original latitude/longitude). I only updated the address with a nearby address if there was another property within 100 meters of the mobile home park that had a flood risk score (i.e., address was available and registered as residential). While this distance can result in dramatically different flood risk, it still provides an estimate for the area. For mobile home parks without a nearby residential property, I recorded NA for the flood risk score. It is important to note that this method only provides an estimated flood risk for the entire mobile home park and is not an average flood risk across all mobile homes in the park.

**2.3 Historical flooding**

**2.3.1 Global Flood Archive**

On June 24, 2021, I downloaded the Dartmouth Flood Observatory's Global Active Archive of Large Flood Events (Brakenridge, n.d.). This database provides detailed information about many of the large flood events that have occurred globally since 1985. I filtered this data to only include flood events from Colorado, Michigan, Utah, and Wyoming (Figure 2) using the R package dplyr v1.0.7 (Wickham et al. 2021).

**2.3.2 NFIP Redacted Flood Claims**

On June 30, 2021, I downloaded the OpenFEMA FIMA NFIP Redacted Claims database (Federal Insurance and Mitigation Administration). This database contains information on flood insurance claims for the United States dating back to 1985. Because the full database has over 2 million records, I used Access to filter the records to only Colorado, Michigan, Utah, and Wyoming. I used R to compare flood insurance claims from mobile home parks to other single-family homes, and to explore flood claims submitted in areas affected by the large flood events designated in the Global Flood Archive.

**2.3.3 Impact of historical flooding on mobile home parks**

I did a qualitative exploration of the large flood events that occurred in the WWA region (Colorado, Utah, Wyoming) since 1985. This portion of the research project focused on reading newspaper articles, previous academic projects (e.g., websites) and scholarly articles (e.g., Rumbach et al. 2020). I first searched on Google and Google Scholar using the following search terms: flood year, general location of the flood event, as well as variations of 'mobile home park' (e.g., manufactured housing, trailer parks). In this initial search, I searched for WWA-region floods listed in Table 1. I only found coverage of two Colorado floods at this stage: the 1997 Loveland-Fort Collins flood and the 2013 Front Range flood. Next, I searched historical news archives for these two flood events using NewsBank Inc. and the following search terms: "flood" AND "Colorado" AND "mobile home" OR "manufactured housing". I then filtered the results to the starting month and year of each flood event, including articles that were published up to three months after the flood event.

**2.4 Statistical analysis**

I conducted various statistical analyses in R using the following packages: dplyr v1.0.7 (Wickham et al. 2021), plyr v1.8.6 (Wickham et al. 2011), ggplot2 v3.3.5 (Wickham et al. 2016), stringr v1.4.0 (Wickham 2019) and tidyverse v1.3.1 (Wickham et al. 2019). In particular, I fit both logistic and linear regressions to address the following questions: 1. Does the population of the zip code or the number of mobile home parks in a zip code predict whether mobile home parks have a higher flood risk than their zip code, on average? and 2. Does the difference in risk (between mobile homes and their zip code, on average) depend on the population of the zip code or the number of mobile home parks in a zip code?

| State | Year | Displaced | Dead | Area impacted (sq. km) | Severity | Location Reference |
|---|---|---|---|---|---|---|
| WY | 1985 | 0 | 12 | 17922.86 | 2 | Diamond, WY |
| UT | 1991 | 0 | 0 | 24977.94 | 2 | Layton, UT |
| | 2005 | 850 | 1 | 71018.19 | 2 | Gunlock, UT |
| CO | 1997 | 400 | 5 | 15184.9 | 1 | Loveland, CO |
| | 1999 | 450 | 0 | 58491.35 | 2 | Rand, CO |
| | 2013 | 11,000 | 10 | 100404.04 | 2 | North Central CO |
| MI | 1985 | 300 | 0 | 16883.54 | 1 | Maybee, MI |
| | 1985 | 100 | 0 | 2796.82 | 1 | Milton, MI |
| | 1985 | 160 | 0 | 3235.32 | 2 | Burt, MI |
| | 1986 | 4,000 | 6 | 53960.13 | 2 | Eureka, MI |
| | 1997 | 0 | 16 | 16278.89 | 1 | Lake Fenton, MI |
| | 2009 | 0 | 18 | 33319.22 | 1 | Parma, MI |
| | 2014 | 0 | 1 | 11462.27 | 2 | Franklin, MI |
| | 2018 | 50 | 2 | 71930.31 | 1.5 | Cassopolis, MI |
| | 2020 | 10,000 | 0 | 6215.87 | 2 | Hamilton Twp, MI |

**Table 1. Large Flood event data from (Brakenridge).** Notes on ‘Area impacted’ and ‘Severity’ from (Brakenridge): Area impacted ‘is derived from our global map of news detected floods. Polygons representing the areas affected by flooding are drawn in a GIS program based upon information acquired from news sources. Note: These are not actual flooded areas but rather the extent of geographic regions affected by flooding.’ Severity falls on a 1-2 scale. Flood events are assigned one of three classes. Class 1 floods are categorized based on significant damage to structures or agriculture; fatalities; and/or 10-20 year-long reported intervals since the last similar event. Class 1.5 floods are categorized by very large events: with a 20-100 year estimated recurrence interval, and/or a local recurrence interval of 10-20 years and affecting a large geographic region (> 5000 sq. km). Class 2 floods are considered to be extreme events with an estimated recurrence interval greater than 100 years.

## 3. Results

### 3.1 Flood risk data availability

Out of the 2,134 Mobile Home Parks in Colorado, Utah, Wyoming and Michigan, the First Street Foundation had flood risk scores for approximately 85% of them (see Figure 7 for the distribution of risk scores by state).

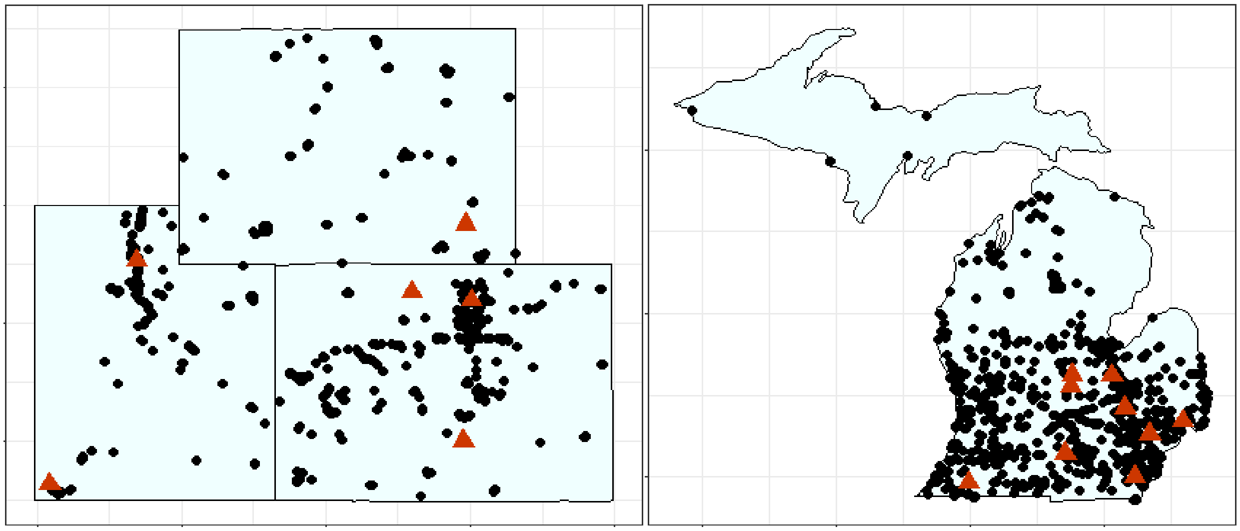

**Figure 2. Mobile home parks and flood events in the study area.** Black dots show all mobile home parks listed in the HFILD data as of 2018. Red triangles show the recorded historical flood events since 1985. (Brakenridge). (left) is Western Water Assessment region and (right) is Michigan.

### 3.2 Summary of mobile home park data

HIFLD provided data on the status (i.e., whether the park is open) and size of the mobile home park. Approximately 84% of the mobile home parks listed in the HIFLD data are considered to be operational (as of 2018; see Table 2 for a breakdown by state). In each of the four states, the majority of mobile home parks are estimated to have less than 50 units (see Figure 3 for a breakdown by state). Michigan has the highest number of mobile home parks out of the four states in this analysis.

| Measure | Colorado | Wyoming | Utah | Michigan |
|---|---|---|---|---|
| Percent of mobile home parks with a known, open status (as of 2018) | 89% | 85% | 99% | 77% |
| Percent of mobile home parks listed as non-residential (by Flood Factor) that are confirmed mobile home parks | 6% | 10% | 11% | 39% |

**Table 2. Summary of mobile home park data by state**

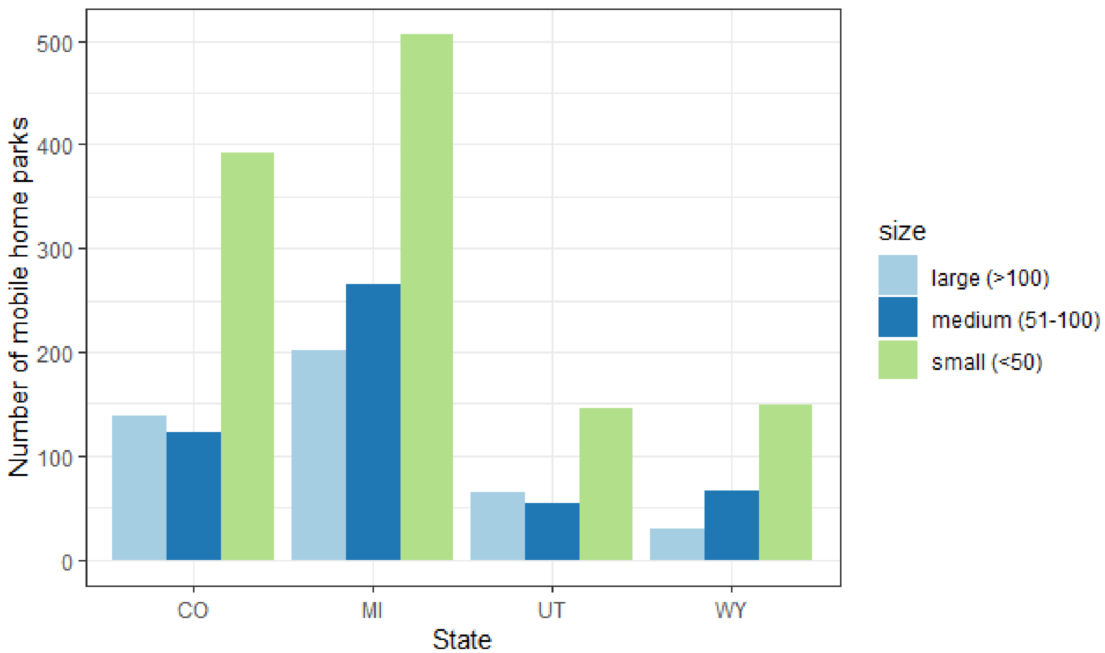


**Figure 3. Most mobile home parks have less than 50 units.**

### 3.3 Comparing flood risk at mobile home parks to their zip code

Across all four states, the majority (at least 70%) of mobile home parks have a lower flood risk score than the average risk in their zip code (Figure 4; 15.7% of mobile home parks have a higher flood risk than their zip code). Of the four states, Michigan mobile home parks occupy the least percentage of mobile home parks with a higher flood risk than the average risk in their zip code. Colorado has the most mobile home parks with a higher flood risk than the average risk in their zip code (Figures 4 and 5). Yet, for all states combined, the mean flood risk for mobile home parks (1.7878, SE=0.045) was significantly higher than the mean zip code flood risk (averaged across all properties, 1.5756, SE=0.009; p=3.927e-06). When considering one state at a time, the mean mobile home park flood risk is significantly higher than the mean zip code flood risk (averaged across all properties) in Colorado and Wyoming (Table 3).

While most mobile home parks have a lower flood risk than their zip code on average (Figure 6), there are interesting patterns in the differences in their scores when the flood risk is higher at mobile home parks (Figure 4). For instance, when the flood risk for a mobile home park is higher than its zip code's mean flood risk, mobile home parks have, on average, approximately 35% higher flood risk (Table 4). Yet, when the mobile home park's flood risk is lower, the mean zip code flood risk is only 5% higher on average (Table 4). This trend is also apparent when looking at the maximum and minimum differences between mobile home parks and their zip code on average. When the flood risk is higher at the mobile home park, the maximum difference in risk compared to their zip code on average is 8.4, and the minimum difference is 0.34. However, when the flood risk is lower at the mobile home park, the maximum difference in risk compared to their zip code on average is 2.63 and the minimum difference is 0.05 (Table 4).

| State | Mean (SE) mobile home park flood risk | Mean (SE) zip code flood risk | p-value | n |
|---|---|---|---|---|
| CO | 1.931 (0.081) | 1.522 (0.017) | 1.027e-06 | 579 |
| MI | 1.541 (0.0639) | 1.552 (0.011) | 0.8614 | 610 |
| UT | 1.770 (0.111) | 1.598 (0.023) | 0.127 | 209 |
| WY | 2.115 (0.143) | 1.761 (0.024) | 0.015 | 218 |

**Table 3. Summary of t-test results.** Mobile home parks in Colorado, Utah and Wyoming have a higher average flood risk than their zip code on average.

Neither the population of the zip code nor the number of mobile home parks in a zip code predict whether mobile home parks have a higher flood risk than their zip code, on average (p=0.983 and p=0.725, respectively), or the difference in flood risk between mobile home parks and their zip code, on average (R2=-0.00023, p=0.4319 and R2=-0.00039, p=0.5503, respectively).

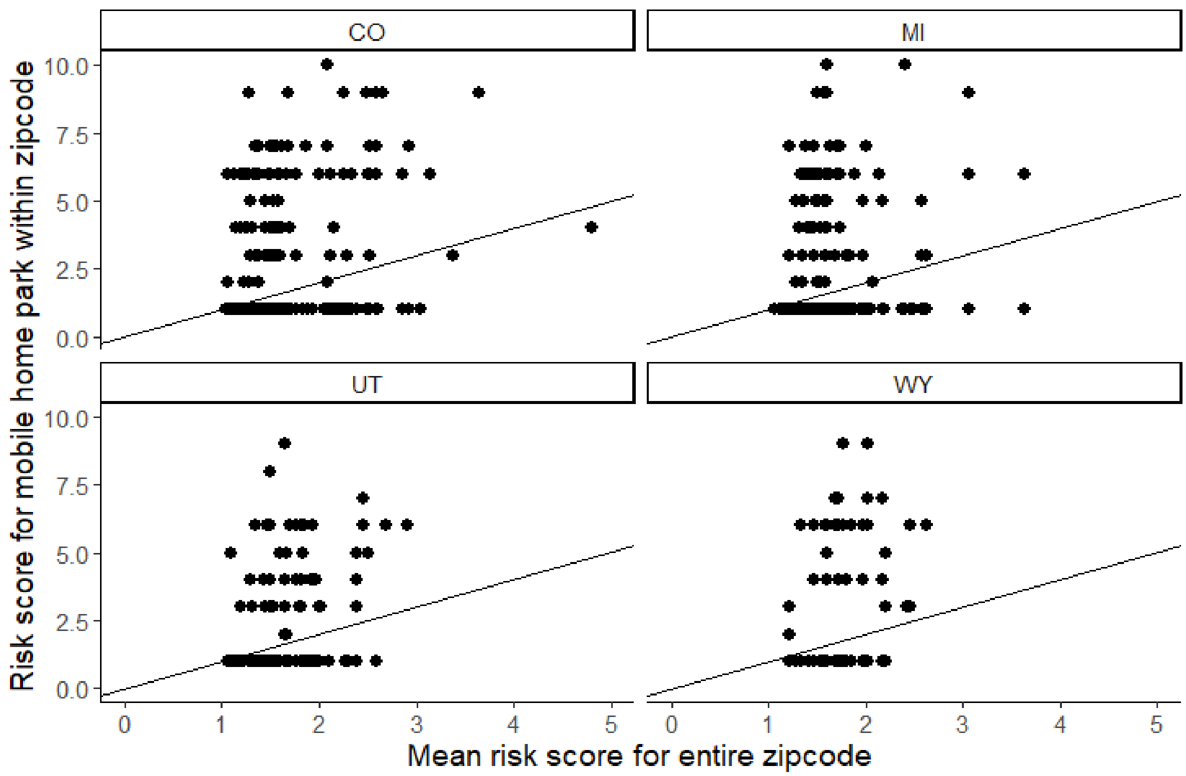


**Figure 4. Comparing mobile home park flood risk to their zip code.** The black line is at y=x. Points that fall above the line indicate that the mobile home park has a higher flood risk than their zip code, and points below the line indicate that the mobile home park has a lower flood risk than their zip code. There are many overlapping points below the line for each state.

| Measure | Value |
|---|---|
| Mean (+-sd) difference in risk score when MHP risk is higher than the zip code (on average) | 3.48 (1.73) |
| Mean (+- sd) difference in risk score when MHP risk is lower than the zip code (on average) | 0.52 (1.73) |
| Maximum difference in risk score when MHP risk is higher than the zip code (on average) | 8.4 |
| Maximum difference in risk score when MHP risk is lower than the zip code (on average) | 2.63 |
| Minimum difference in risk score when MHP risk is higher than the zip code (on average) | 0.34 |
| Minimum difference in risk score when MHP risk is lower than the zip code (on average) | 0.05 |

**Table 4. Flood risk differences when mobile home park flood risk is higher and lower than its zip code's mean flood risk.** Maximum flood risk score on Flood Factor is 10.

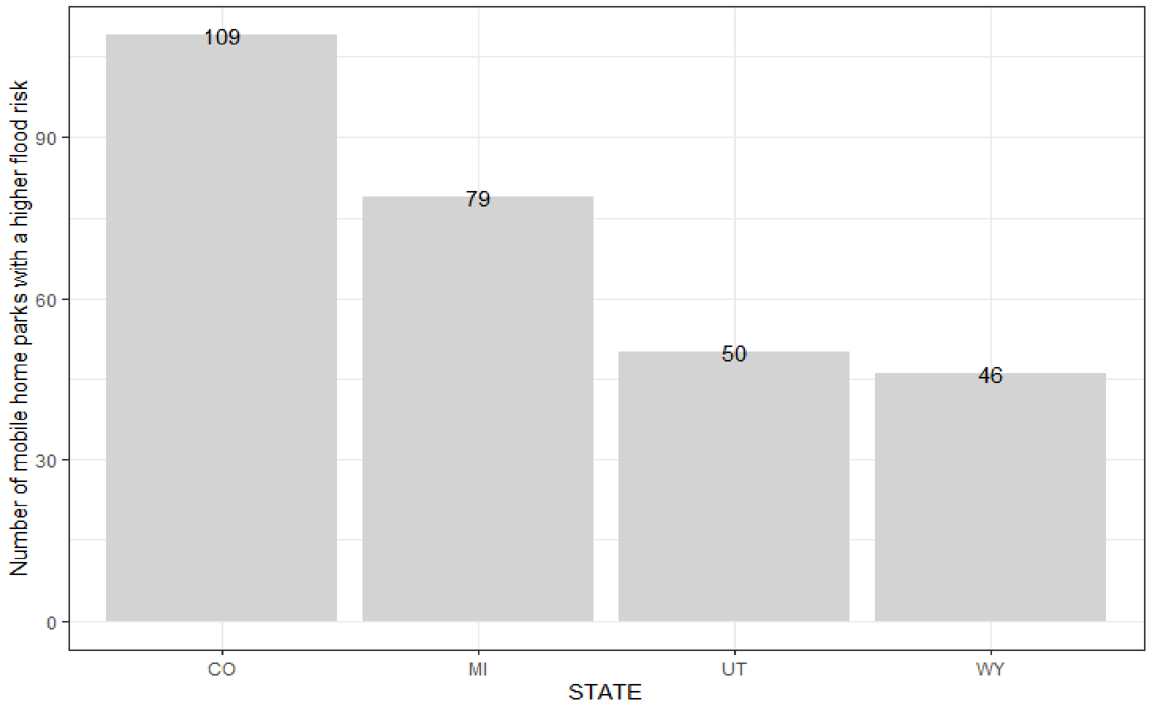


**Figure 5. Number of mobile home parks with a higher flood risk than their zip code, on average.**

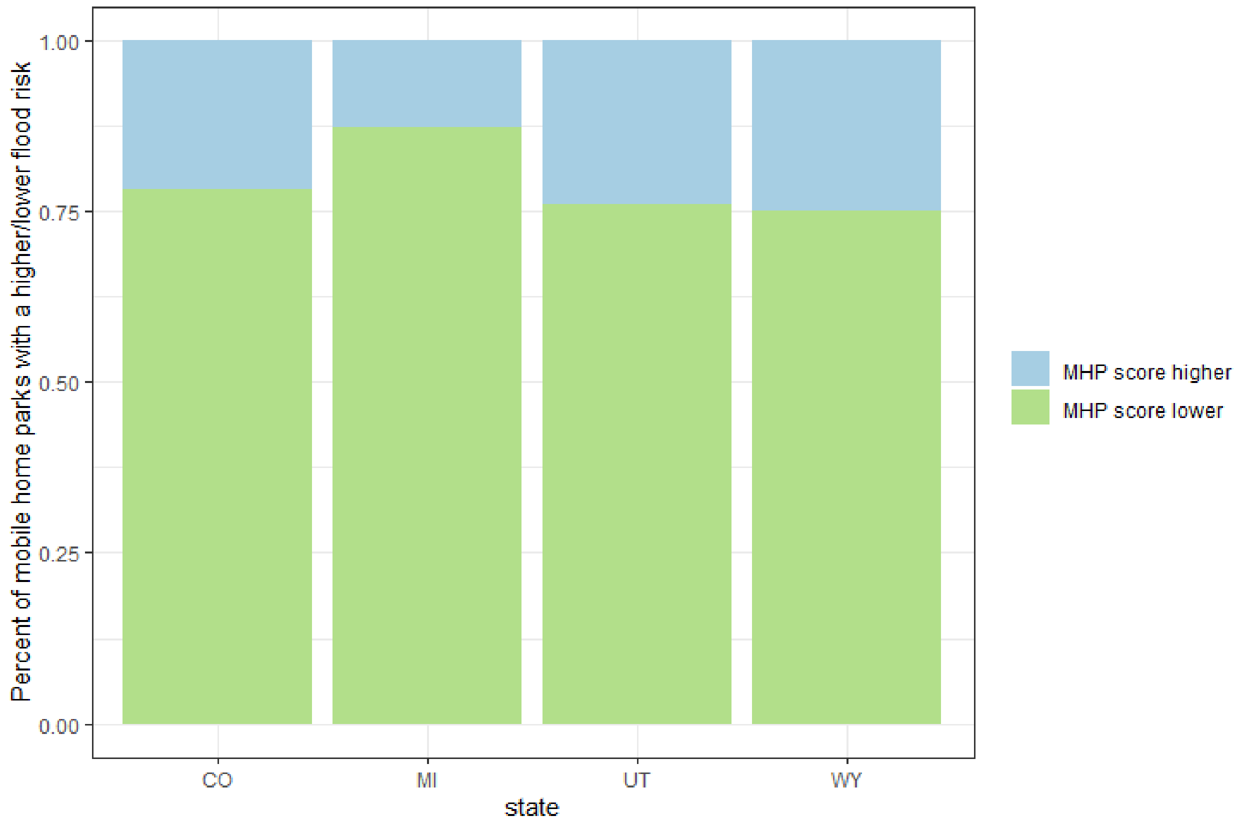


**Figure 6. Most mobile home parks have a lower flood risk than their zip code on average.** Blue shows the percent of mobile home parks with higher risk, and green shows the percent of mobile home parks with lower risk than their zip code, on average.

### 3.4. Impact of historical flooding on mobile home parks

Since 1985, there have been 15 large flood events in the study area (Table 1) displacing an estimated 27,310 people total. Most of these flood events were caused by torrential and monsoon rain with the exception of two in Michigan (caused by snowmelt (2018) and a dam break (2020). The average severity was 1.63 out of 2 (Brakenridge**,** see Table 1 for a breakdown by flood).

Of the 6 major flood events in Colorado, Utah and Wyoming since 1985, only two of those flood events have information available on the impacts to mobile home parks: (1) 1997 Loveland (Fort Collins), CO flood and, (2) 2013 Lyons, CO flood. The remaining 4 flood events were not covered extensively in the news or with (public/published) academic research.

#### 3.4.1 1997 Loveland-Fort Collins, CO flood

The Loveland-Fort Collins area has experienced a handful of flood events over the last 100 years, but the most devastating flood on record occurred in 1997. Heavy rains caused a tributary of the Cache la Poudre River, the Spring Creek, to rise over 30 feet into nearby areas (Langevin and Sullivan, 2015). This flood resulted in approximately 200 million USD in damage, making it the costliest disaster to affect the region (Ogden et al. 2003).

At the time, there were two mobile home parks in Loveland, both of which were largely destroyed (Table 5). One of these (Pleasantville Mobile Home Park; Morson, B and Romano, M, 1997) was located downstream of a detention basin, leading it to be the worst damaged neighborhood in the city and the neighborhood where 4 of the 5 deaths occurred (Ogden et al. 2003). According to a resident, the park was inundated with over 5 feet of water in under 5 minutes (Ogden et al. 2003).

Approximately 400 people were displaced in the area as a result of the flood event (Table 1; Brakenridge, n.d.). In 1997, there were, on average, 2.6 people per household across the United States (Bryson and Casper, 1998). Given this, an estimated 78% of those displaced were living in mobile homes (using data from Tables 1 and 5). More accurate estimates show that the destruction and conversion of the Johnson mobile home park to student housing/apartment complexes (2013) displaced 92 families (Ferrier, 2014). The second trailer park at the time was converted into a strip mall (KUNC, 2017).

| Damage type* | Mobile Homes* | Total* | Percent mobile homes |
|---|---|---|---|
| Destroyed | 120 | 141 | 85.7% |
| Major Damage | 0 | 260 | 0% |
| Minor Damage | 0 | 918 | 0% |

**Table 5. Summary of home damage in the 1997 Loveland-Fort Collins, CO flood**
*Column values from (Ogden et al. 2003)

### 3.4.2 2013 Lyons, CO flood

In 2013, historically unseasonal rainfall led to extreme flooding with over $2 billion dollars in damage in 18 counties across Colorado (Gochis et al., 2015). While this flood event damaged many homes across the 100,000 sq. km of area impacted, mobile homes were particularly vulnerable. At least 12 mobile home parks with 1,300 mobile homes were affected across the north central region (Rumbach et al. 2020).

The Lyons area (including the Lyons, Evans, and Milliken communities) was one of the most damaged areas of the flood event; and thus, has the most information publicly available. The 2013 flood affected 6 mobile home parks (Rumbach et al. 2020), destroying a total of 273 mobile homes in this area alone (deYoanna, 2019). In Evans and Lyons, mobile homes made up 78.4% and 20.4% of the homes damaged in the entire city, respectively. The flooding destroyed a majority of the mobile homes in each of the three cities (Evans: 99%, Lyons: 93.5%, Milliken: 60%; see Table 6 for breakdown by mobile home park; Rumbach and Gossard, 2015, Rumbach et al. 2020).

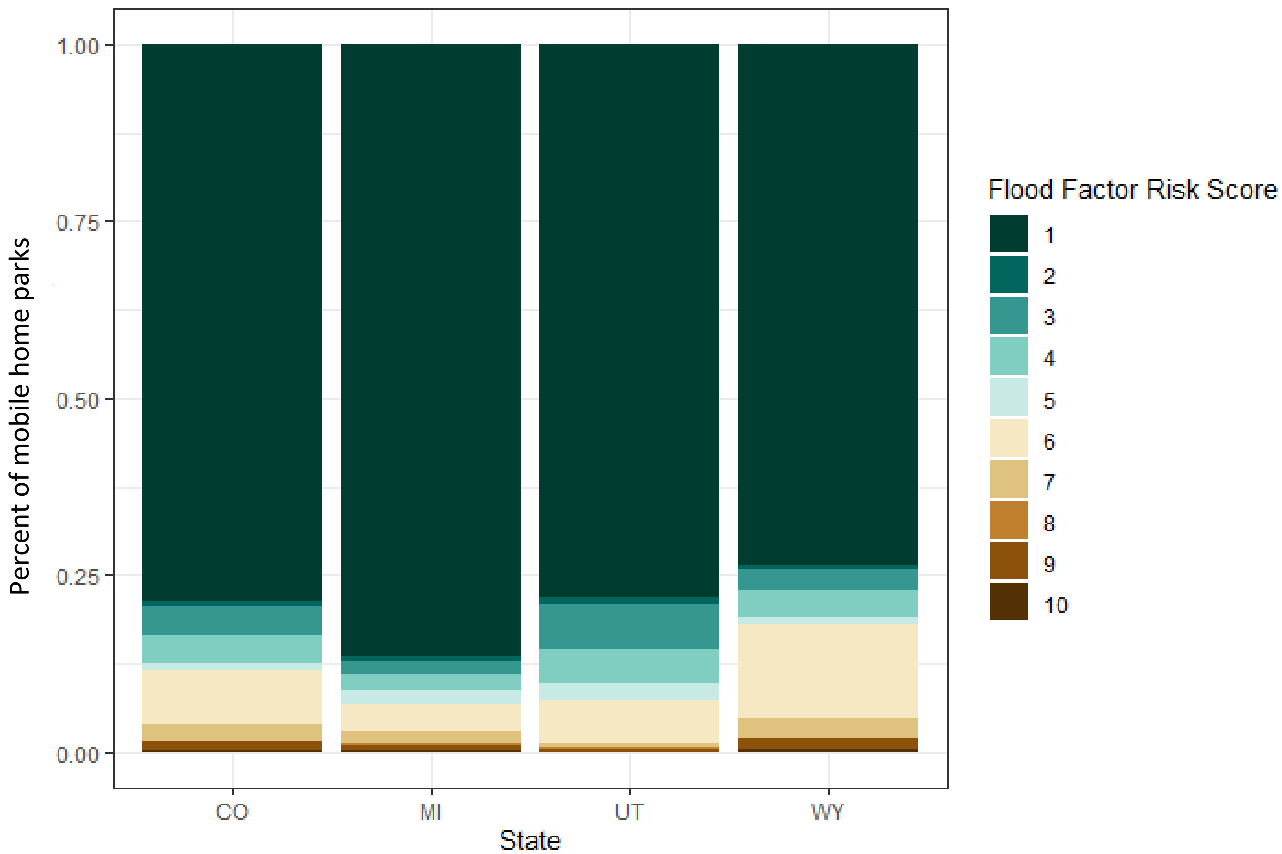


**Figure 7. Percent of mobile homes with each flood factor risk score per state.** Most mobile home parks have low flood risk.

Of the 6 mobile home parks affected, 4 of them (in Lyons and Evans) permanently closed and have been converted into open spaces (e.g., baseball fields and botanical gardens) and a wedding venue (Powell, 2019, Rumbach et al. 2020; Table 6). The Lyons community voted against building affordable housing to replace approximately 48 mobile homes (deYoanna, 2019). Many of the mobile home residents were forced into difficult housing situations given the lack of affordable housing options in the city without mobile home parks (deYoanna, 2019). The government offered homeowners federal buy-out money for their homes' pre-flood market value to encourage people to move out of flood prone areas. Unfortunately, mobile homeowners were paid much less; and, while this helped, many mobile homeowners still struggled to find housing they could afford (deYoanna, 2019). In Evans, many of the mobile homes housed immigrants who weren't given federal help or insurance because of their residency status (Moreno, 2013).

**3.5. Insurance claims in mobile home parks compared to other single-family homes**

For each of the major flood events in Colorado, Utah and Wyoming, a majority (over 98%) of flood insurance claims came from non-mobile single-family homes (Table 7). Of the 120 (Ogden et al., 2003) and 1,300 (Rumbach et al. 2020) mobile homes damaged or destroyed by the 1997 Loveland-Fort Collins and 2013 Front Range floods, there are only 1 and 20 insurance claim records, respectively (Table 7). For the other four flood events, there are no insurance claim records for mobile home parks.

According to archived news sources, very few mobile home park residents had flood insurance at the time of the 1997 Loveland-Fort Collins flood (Frazier, 1997a, 1997b). This is likely a result of how hard it was for residents to find and/or afford the insurance. Some residents claimed that nobody would insure them, or that they had to call multiple agents before they were given a policy (Frazier, 1997b). Others mention the cost barrier: there are anecdotes that this insurance cost $500 per year for contents coverage only. Many insurance policies excluded flood damage and excluded mobile homes older than 15 years (Frazier, 1997b).

| City | Mobile home park* | No. MHP units in park* | No. MHP units destroyed* | Percent of mobile homes destroyed in park | No. homes damaged/ destroyed total* | Percent of mobile homes destroyed out of total homes damaged/ destroyed in area |
|---|---|---|---|---|---|---|
| Evans | Bella Vista | 50 | 50 | 100% | 259 | 19.3% |
| | Eastwood Village | 155 | 153 | 98.7% | 259 | 59.1% |
| Lyons | Riverbend | 30 | 28 | 93.3% | 211 | 13.3% |
| | Foothills | 16 | 15 | 93.8% | 211 | 7.1% |
| Milliken | Greenwood village ** | 35 | 21 | 60% | Not available | Not available |
| | Martin Family Trailer Park ** | 10 | 6 | 60% | Not available | Not available |

**Table 6. Summary of mobile homes damaged by 2013 Lyons, CO flood.**

*Column values from Rumbach et al. 2020

**Partially rebuilt and reopened

| State | Flooding event | Total no. flood insurance claims | No. flood insurance claims from mobile home(s) | Percent of flood claims by mobile homes | No. mobile homes destroyed or damaged |
|---|---|---|---|---|---|
| CO | Loveland - Fort Collins; 1997 | 150 | 1 | 0.6% | 120 (source) |
| | Jackson County; 1999 | 0 | 0 | NA | unknown |
| | Front Range; 2013 | 1703 | 20 | 1.17% | 1,300 (Rumbach et al. 2020) |
| WY | Cheyenne; 1985 | 55 | 0 | 0% | unknown |
| UT | Layton; 1991 | 10 | 0 | 0% | unknown |
| | Gunlock area; 2005 | 5 | 0 | 0% | unknown |

**Table 7. Summary of flood insurance claim records for major flood events in the WWA region.**

The OpenFEMA FIMA NFIP Redacted Claims database includes information about the insurance coverage and amount paid out for claims for each record. Not surprisingly, non-mobile single-family homes have a higher coverage amount on average for both building and contents damage than mobile homes (Table 8). They also tend to have a higher payment for damage in both categories, on average, with the exception of insurance money for contents in Utah. In Utah, mobile homes get more money, on average, than other single-family homes (Table 7). However, when comparing the amount that is actually paid to the amount of coverage, mobile home parks tend to get a higher percent of their total coverage for both building and contents damage, with the exception of contents insurance in Colorado and Wyoming (Table 7, Figure 8). This could mean that mobile homes tend to have more flood damage than other single-family homes, but there is no data to back this up.

**4. Future Directions**

Future research is needed to further explore the results from this analysis. In particular, these results would be more robust if accompanied by a spatial analysis of the overlap of mobile home parks in the floodplain. It would also be interesting to explore whether mobile home park flood risk compared to the average flood risk of their zip code is associated with the size of the zip code and the extent to which a zip code lies in a floodplain. This analysis would also benefit from a property-level comparison of mobile homes to other single-family homes. This data is available from Flood Factor but requires special access.

| State | Type | Mean amount covered for building damage | Mean amount paid for building damage | Mean amount covered for contents damage | Mean amount paid for contents damage |
|---|---|---|---|---|---|
| CO | Other single-family homes | $143,347.90 | $18,620.28 | $37,402.72 | $8,716.31 |
| | Mobile homes | $56,668 | $12,611.33 | $10,418 | $2,201.25 |
| WY | Other single-family homes | $101,066 | $6,679.38 | $24,010.51 | $4,517.53 |
| | Mobile homes | $28,240 | $5,201.11 | $5,600 | $269.72 |
| UT | Other single-family homes | $86,658.32 | $8,599.54 | $25,038.58 | $4,084.59 |
| | Mobile homes | $28,235.29 | $5,008.09 | $11,405.88 | $4,294.62 |
| MI | Other single-family homes | $79,384.07 | $11,504.17 | $14,332.01 | $3,766.07 |
| | Mobile homes | $43,905 | $9,200.17 | $6,582.50 | $3,358.77 |

**Table 8. Comparing insurance coverage and payouts for buildings and contents.**

## 5. Conclusion

While there is limited data available/accessible on property-level mobile home flood risk, there are several key findings to highlight from the above analysis. First, most mobile home parks have a low flood risk. While this result appears promising, this report highlights that mobile home parks are, on average, more vulnerable to flooding than their zip code. Further, mobile home parks with higher flood risk than their zip code, on average, tend to have a much higher risk. This is especially true in Colorado, where the two highlighted historical flood events severely impacted mobile home residents. Second, it appears that mobile home residents have not historically had access to affordable flood insurance. Mobile home residents made up less than 5% of the insurance claims across all of the historical flood events in Colorado, Michigan, Utah, and Wyoming since 1985. Lastly, archived news from the flood events highlights the pervasive lack of affordable housing available to low-income residents, especially when mobile home parks are destroyed by natural disasters. With the increase in flooding that is projected to accompany climate change, and the impact that flooding has had on mobile home parks, cities must prioritize resilience in low-income housing.

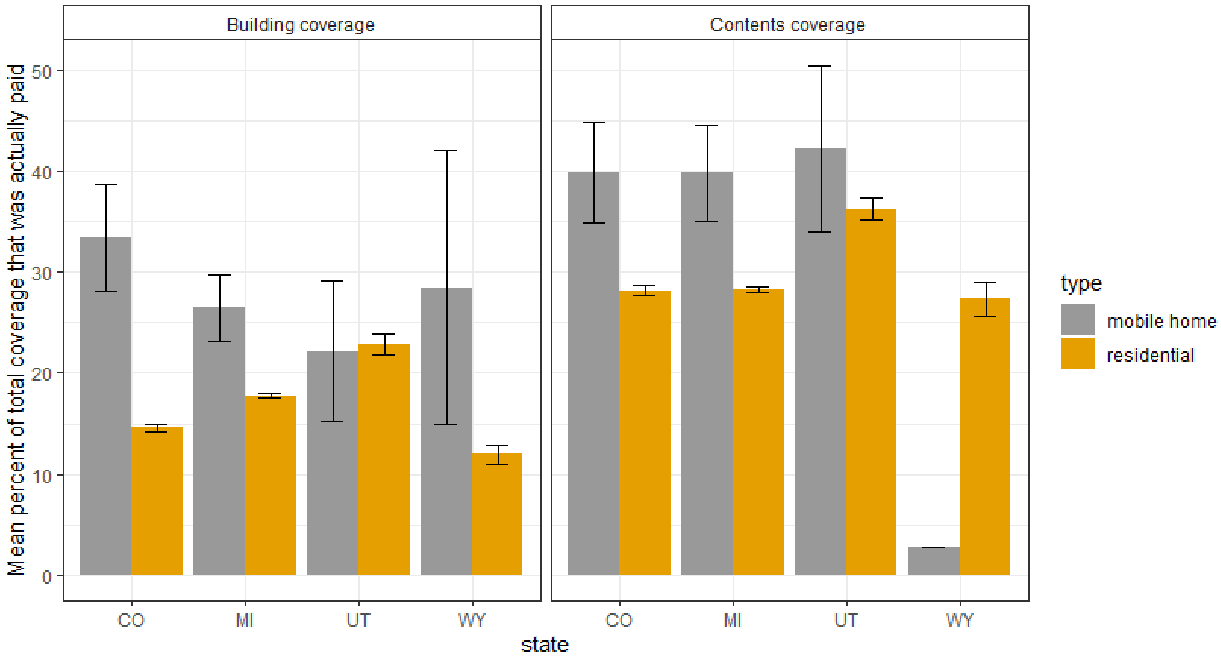


**Figure 8. Mobile homes tend to have a higher percentage of their coverage paid out.**

## 6. Supplementary Data

All data used in this report (and associated metadata) are available for future use. They are saved in the Data-for-WWA folder in the 2021 Summer Fellow Google Drive Folder. See Metadata-All-Files.xlsx for file and column descriptions.

**7. References**

World Health Organization. (n.d.). *Floods*. World Health Organization. https://www.who.int/health-topics/floods#tab=tab_1.

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