

Mapping the study area

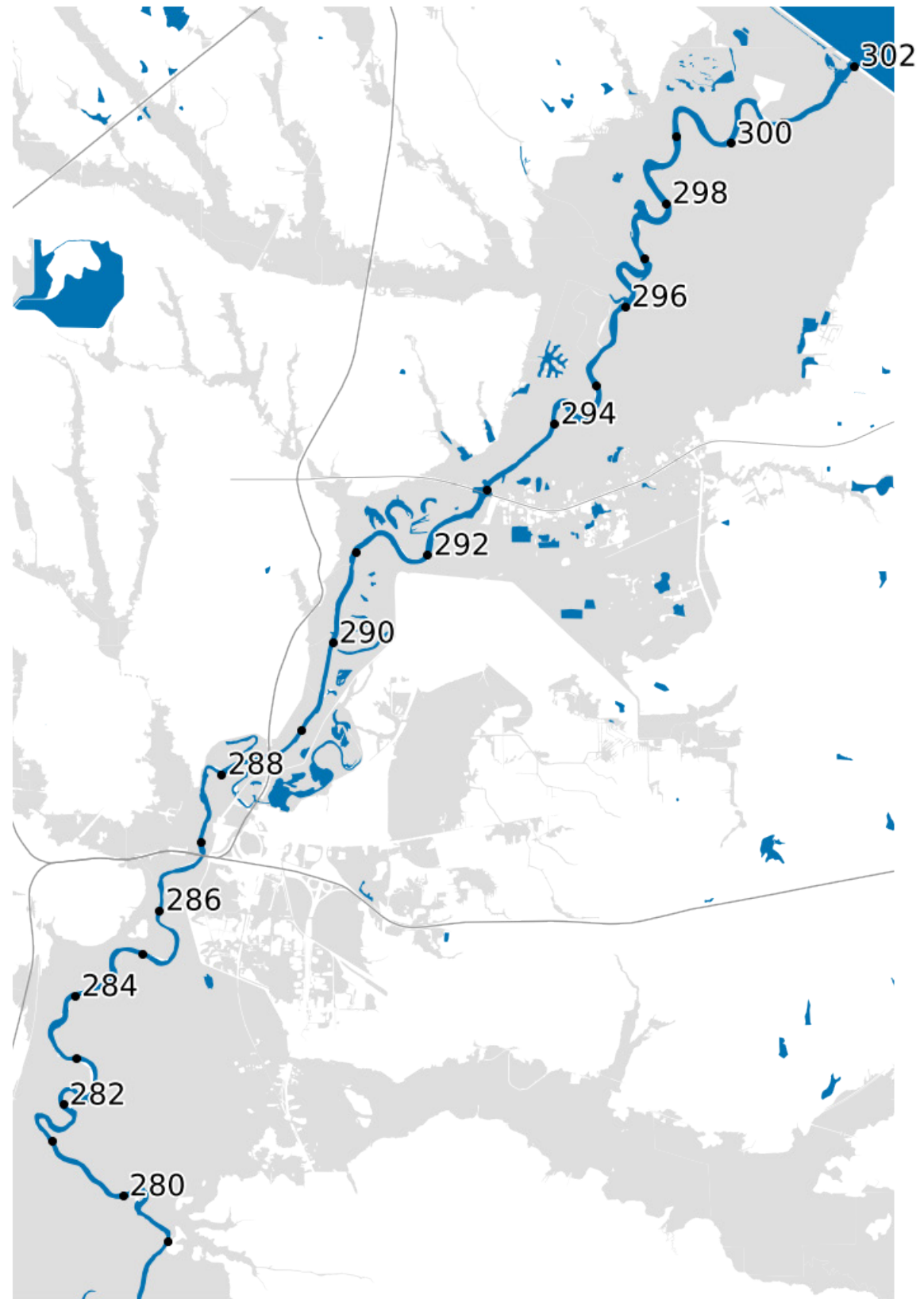
Section 4103 of the 2007 Water Resources Development Act authorized the Pearl River Basin Federal Flood Risk Management Project.

The Assistant Secretary of the Army is authorized “to construct the project generally in accordance with the plan described in the ‘Pearl River Watershed, Mississippi, Feasibility Study Main Report, Preliminary Draft’.”

The referenced feasibility study describes a study area as the Pearl River Basin from River Mile 270, just south of Byram, to the Ross Barnett Reservoir Dam at River Mile 372. This area is mapped on the left.

The blue represents the Pearl River, the reservoir, and other water impoundments. The light gray region is the FEMA-defined 1.0% chance exceedance event zone, also known as the 100-year floodplain. It visualizes the flood hazard posed by the river and its tributaries.

The map shows the region’s interstate highways and Lakeland Drive for reference. The rectangle represents the *study area*, which has been loosely defined by ellipses in maps produced by the Rankin-Hinds Pearl River Flood and Drainage Control District and by the U.S. Army Corps of Engineers.



Flood reduction along the Pearl River

The relocation of the Rankin County levee and the large-scale excavation operation included in the One Lake will lower flood peaks along the river during high-flow events. The level of reduction varies by location.

Table 3-3 of the 2018 DEIS, Appendix C, shows the anticipated flood peak reductions. The table on the right shows those reductions for a 1.0% annual chance exceedance event, also called a 100-year flood. The table can be cross-referenced with a map of the Pearl River showing River Miles (RM).

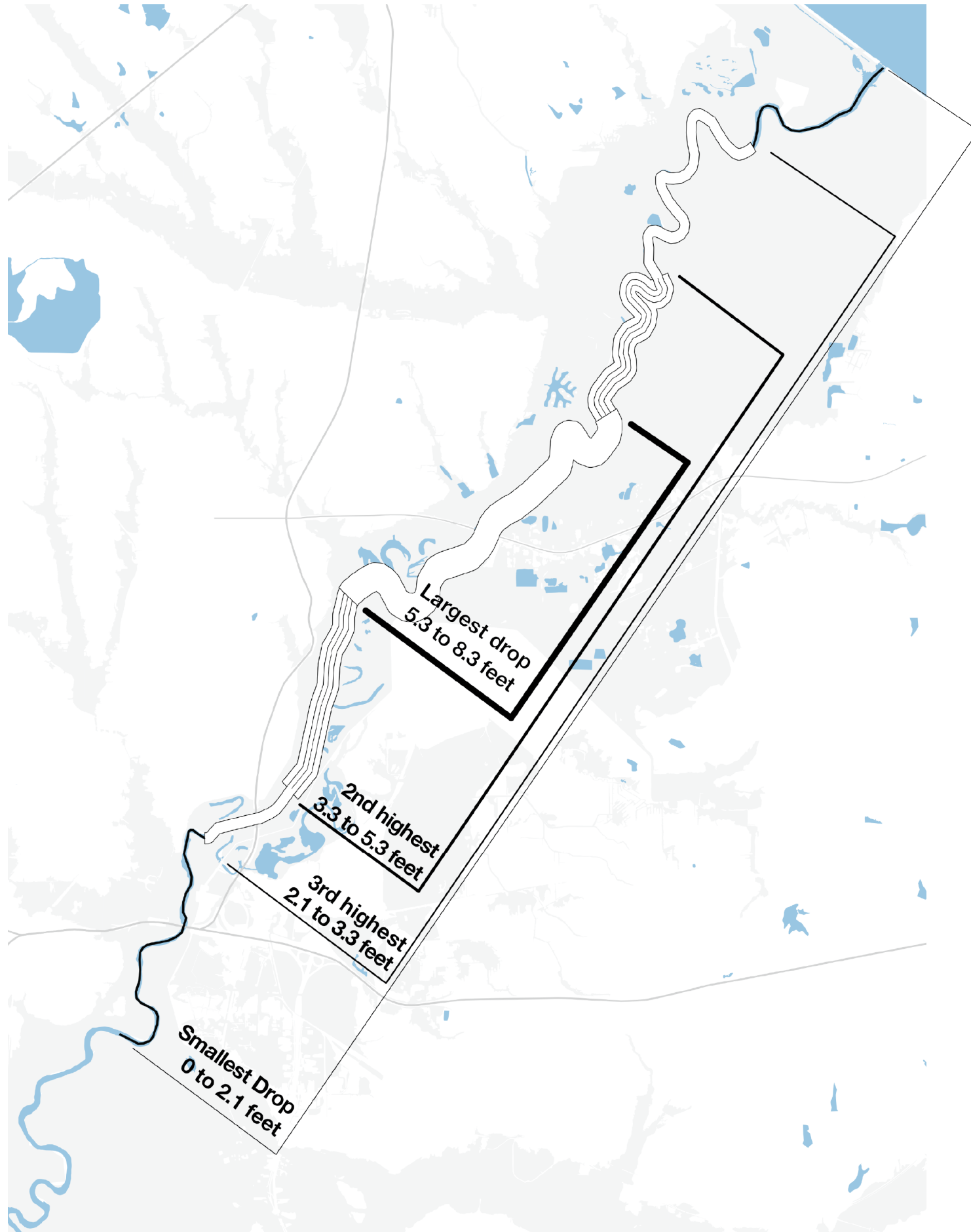
The most significant flood reduction benefits will be between the J.H. Fewell Water Plant, RM 291, and the area just upstream of Meadowbrook Lake, RM 295.



Flood reduction tables digitized:
<https://tinyurl.com/OneLakeReductions>
 or use the QR code.

River Mile	Reduction
302	1.6 feet
301	2.0
300	2.4
299	2.6
298	2.8
297	3.6
296	4.5
295	7.0
294	8.3
293	7.1
292	5.8
291	5.4
290	5.0
289	4.0
288	3.0
287	1.8
286	0.8
285	-0.1

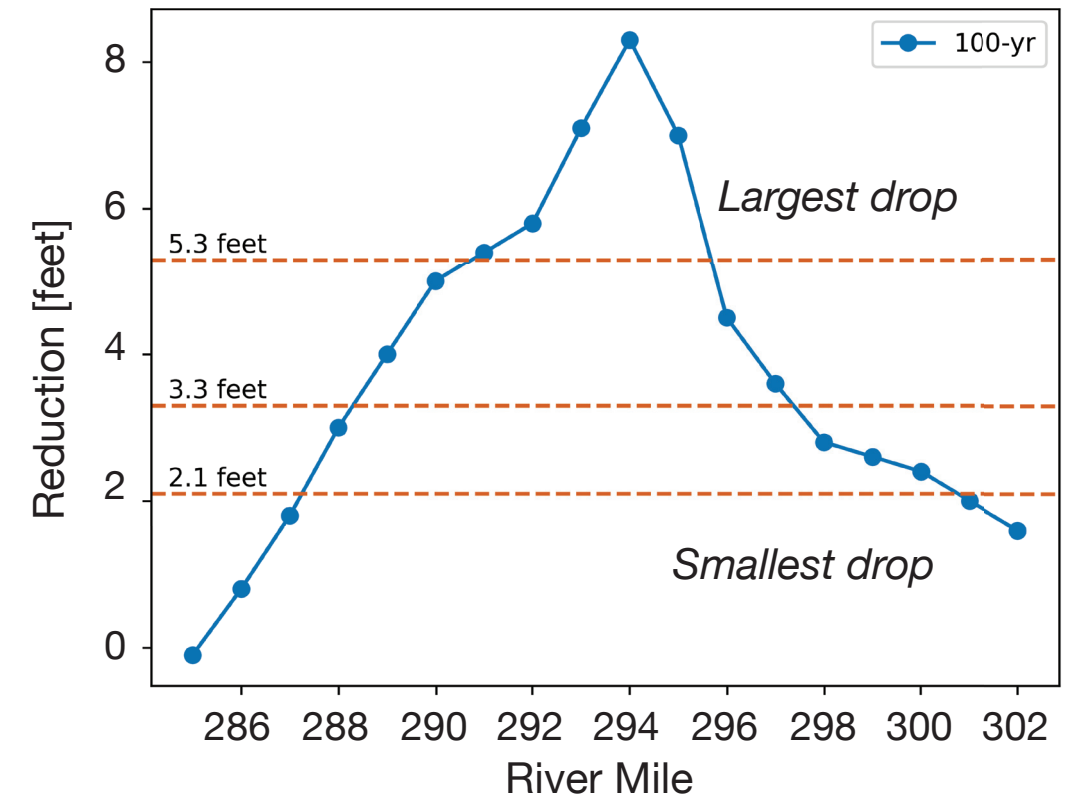
Table: Flood peak reduction for a 100-year flood. Copied from Table 3-3 in the 2018 DEIS, App. C

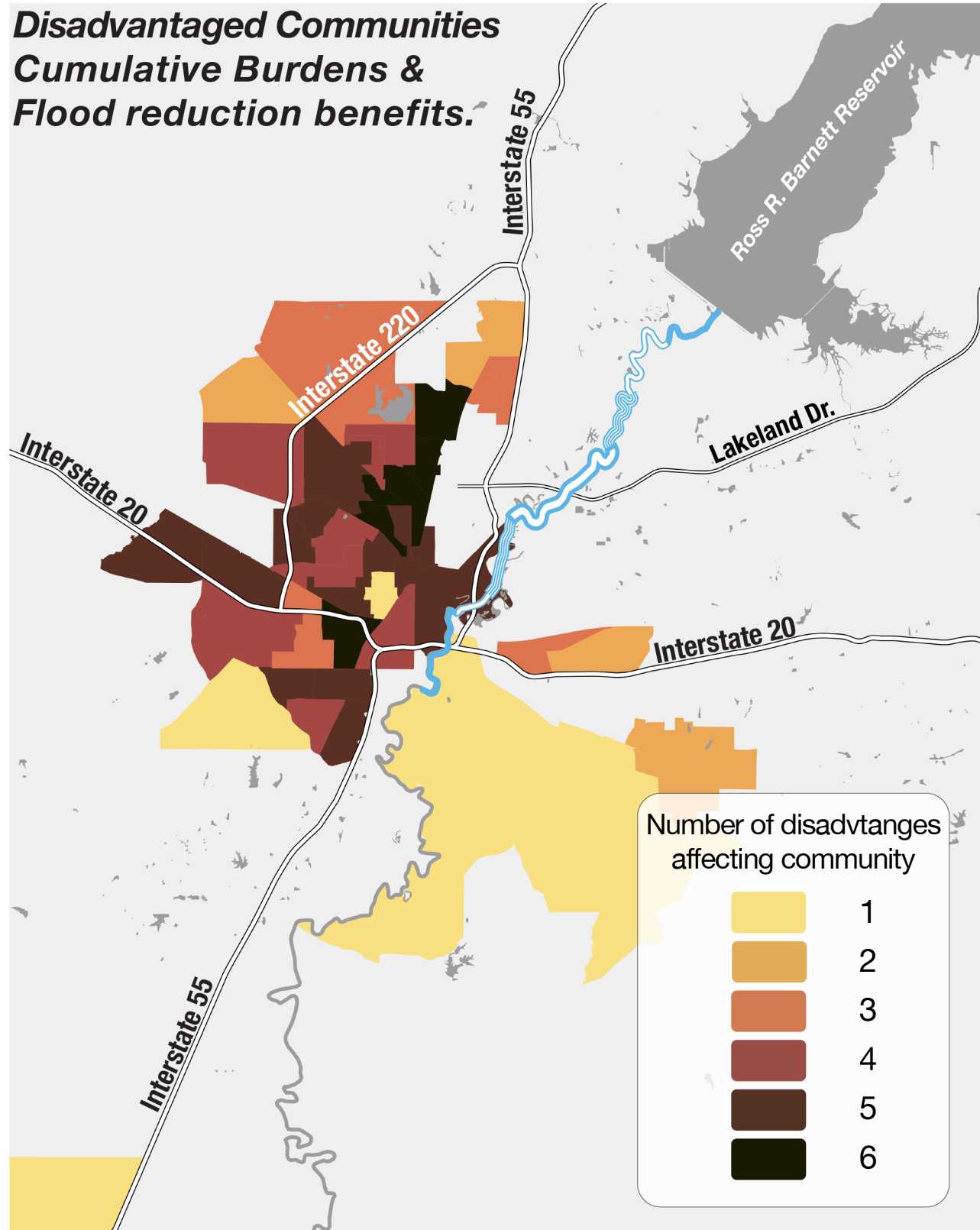


Visualizing the flood reduction along the Pearl River

To visualize what communities receive the greatest levels of flood reduction benefits, the data is divided into four quantiles: The “largest drop” quantile, the “smallest drop” quantile, and two intermediary quantiles.

These quantiles can then be mapped along the river, as shown on the map the left. This flood reduction ruler is used in the following demographic maps.





Map uses 2010 Census tract boundaries

Mapping social, economic, and climate vulnerabilities with the Climate and Economic Justice Screening Tool (CEJST)

The CEJST is a mapping tool developed under the directive of Presidential Executive Order 14008 to help national decision-makers identify communities vulnerable to problems caused by climate, economic, or climate changes.

The tool uses about 30 metrics from various databases to define eight categories of *burdens*. For example, a community has a workforce development burden if a large portion of the adult population in its census tract does not have a high school degree and at least one of four social conditions are met. Data for this burden are pulled from the American Community Survey of the United States Census. (See page 55 for more information on the workforce development burden category.)

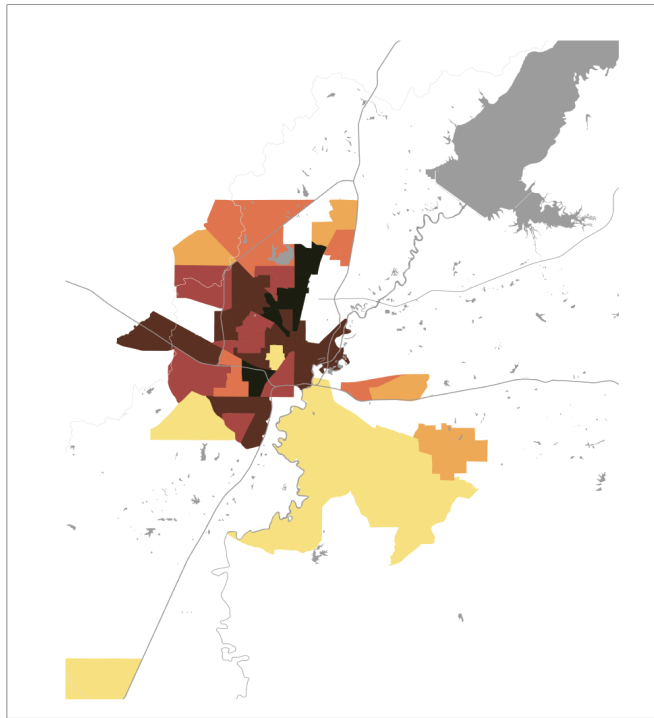
A community is “disadvantaged” if it is in a census tract affected by one or more burdens.

The map on the left shows disadvantaged communities within the Pearl River Flood Risk Management Project Area. Beyond what’s shown in the CEJST, the map also shows the number of burdens affecting each community. Several communities in Hinds and Rankin Counties are disadvantaged, and at least one burden. Much of Jackson west of Interstate 55 is burdened by four to six.

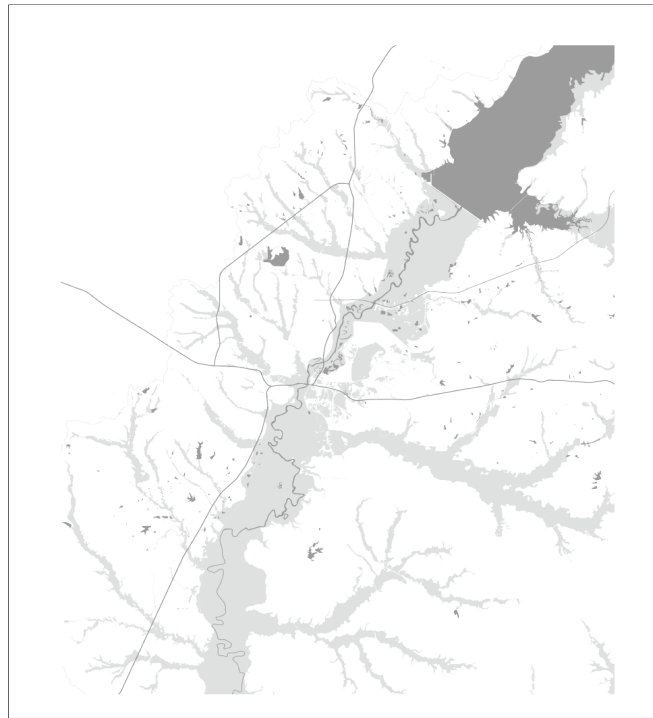
The following maps help visualize the potential flood reduction benefits provided by the One Lake project to these communities.



To see the official CEJST, which is updated periodically, please visit <https://screeningtool.geoplatform.gov/> or use the QR code.



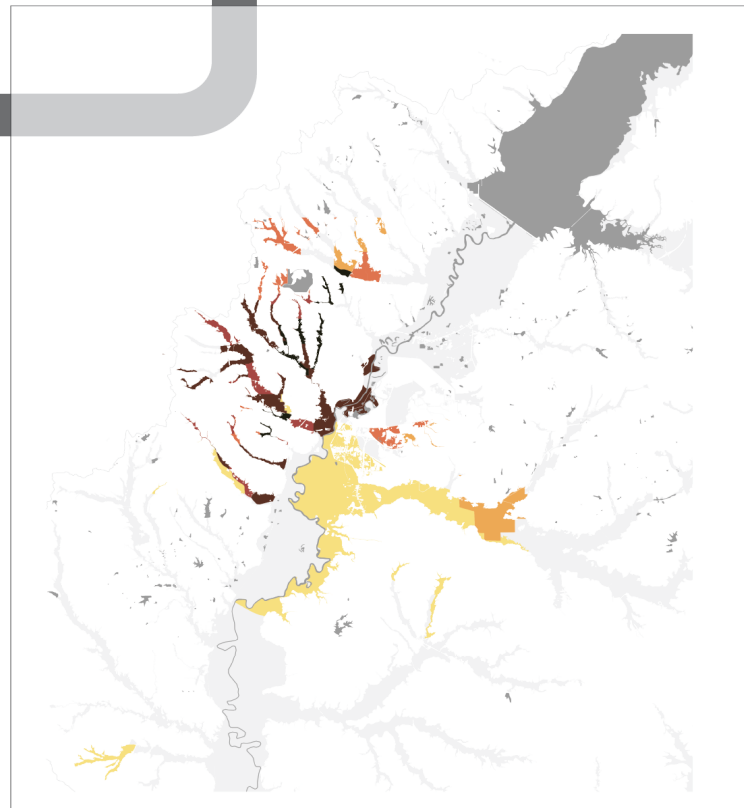
CEJST Burden Map



FEMA floodplain map



CEJST Burden Map
clipped with floodplain

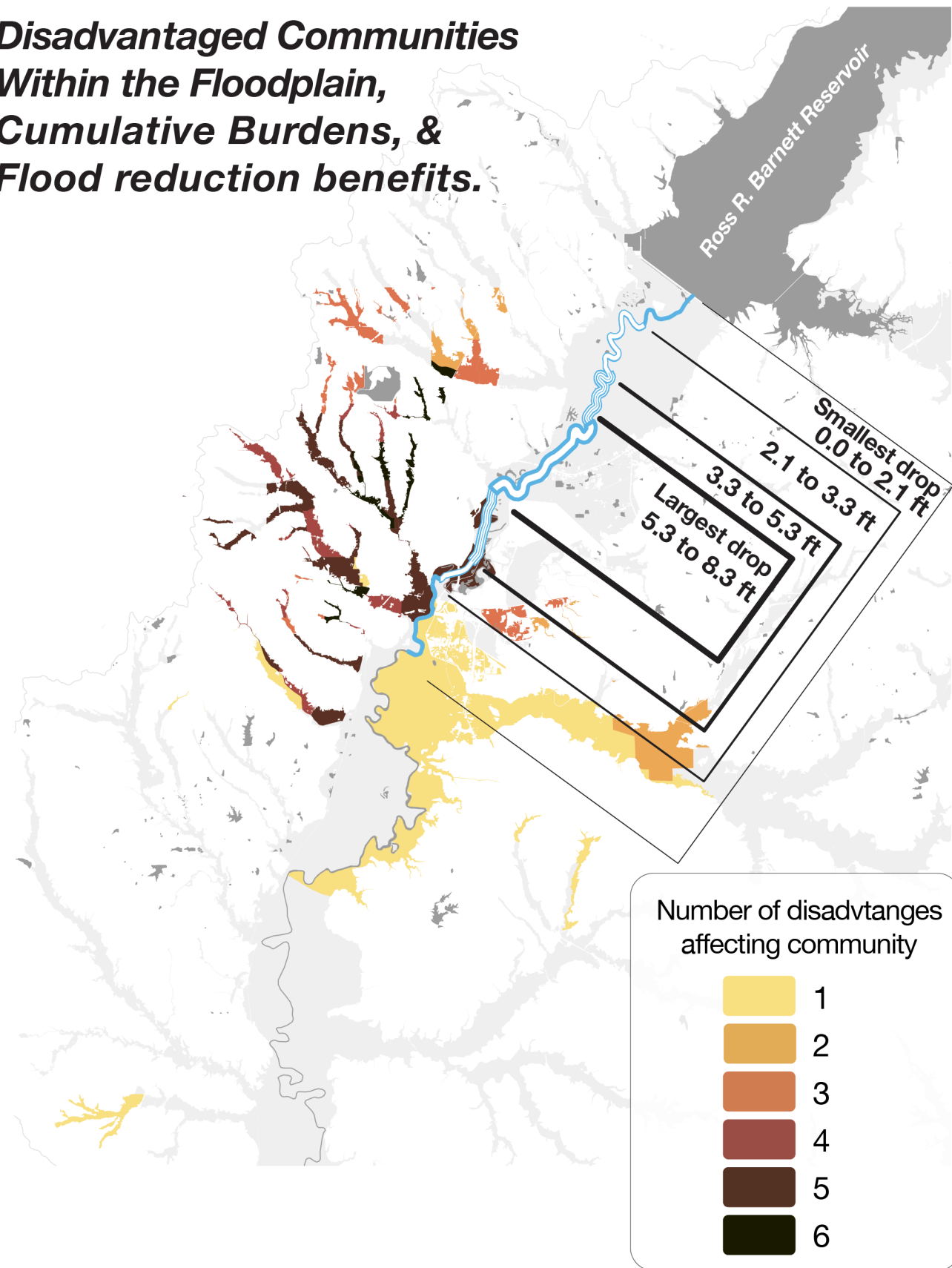


(Full size on page 28)

Geospatial Clipping and Floodplain demographics

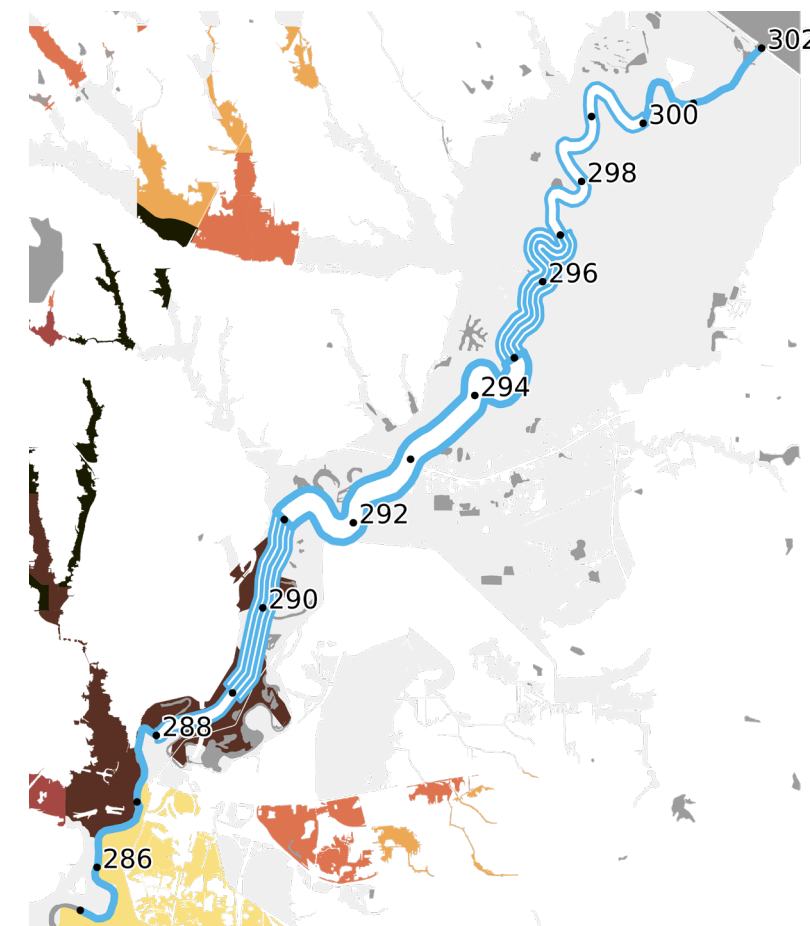
The communities most impacted by the flood reduction benefits of any project are those within in the floodplain. The maps in the following pages approximate the demographics of these communities through *clipping*. Only the parts of a demographic map overlapping the floodplain are shown. The clipping operation is summarized in the figure on the opposite page.

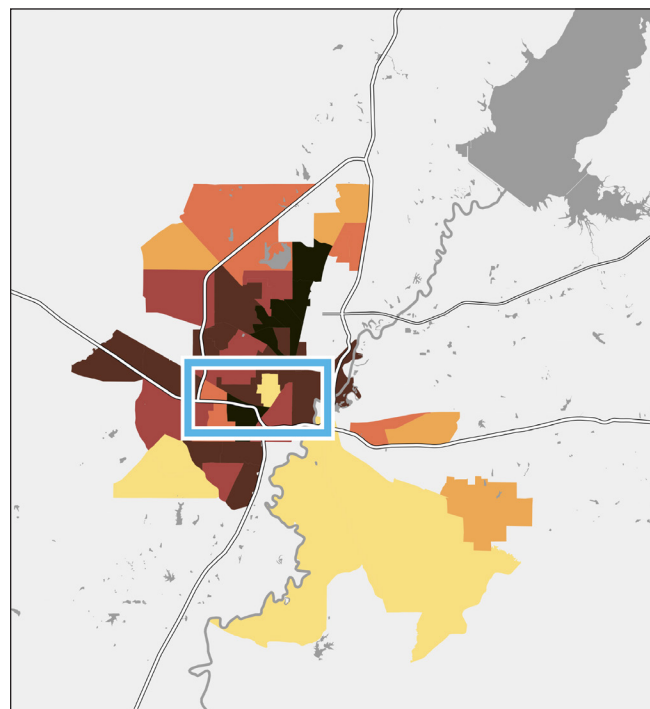
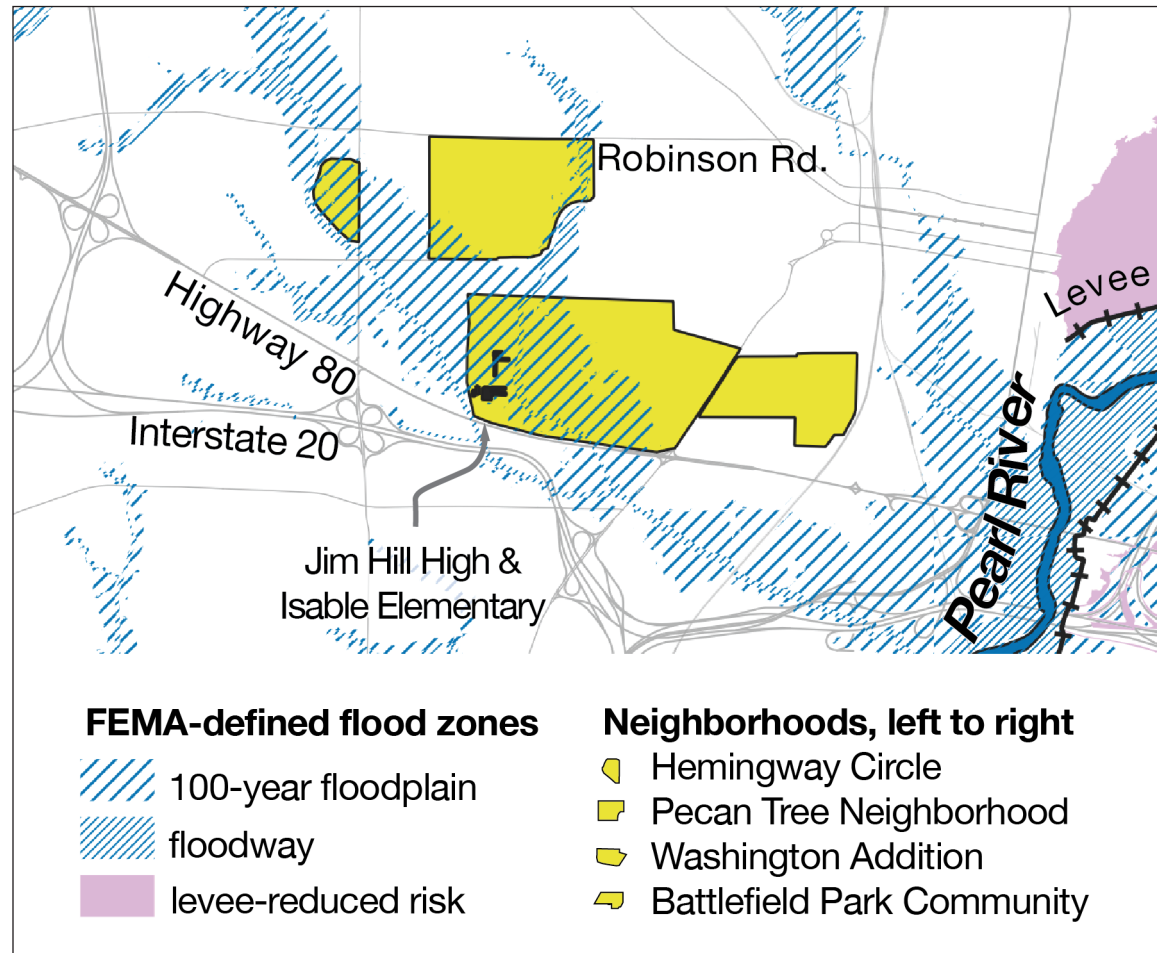
**Disadvantaged Communities
Within the Floodplain,
Cumulative Burdens, &
Flood reduction benefits.**



The most-disadvantaged communities surround the tributaries.

The One Lake could provide some flood reduction benefits to those surrounding Lynch and Town Creeks. Their mouths are between River Mile 286 and 288; the expected level of flood reduction in a 100-year flood within this stretch of the river ranges from 0.0 to 2.1 feet.





The One Lake and flooding in West Jackson

Summary

West Jackson floods along its creeks. Some elected officials support the One Lake because it might reduce backwater-induced flash flooding. The U.S. Army Corps of Engineers must assess this presumed flood risk reduction benefit and explicitly communicate the results to decision-makers and the public.

Furthermore, this comment uses USGS data from documented floods to show that a backwater effect might exacerbate flood risks in West Jackson.

The One Lake as a solution to West Jackson flooding

West Jackson floods. Resident and State Rep. Zakiya Summers spoke at Jackson’s second U.S. Army Corps of Engineers public engagement meeting on May 24, 2023. She said the flood-prone communities in West Jackson face a “glaring environmental justice issue.” They were harmed by flooding on January 2020, and the existing levee system on the Pearl River may have exacerbated the problem. Representative Summers concluded her statement by endorsing the One Lake as a solution.

West Jackson is affected by creek flooding. The map on the opposite page shows four of the neighborhoods mentioned by Representative Summers and the FEMA 100-year floodplain. Lynch Creek’s floodplain dominate this area.

The One Lake as a solution to West Jackson flooding (Cont'd)

The basis of Rep. Summers' conclusion is presumably the One Lake's potential to reduce backwater impacts on the tributaries during "extreme" events, as suggested in the 2020 USACE Agency Technical Review (ATR), comment 7059420, exchanges 1-0 and 2-0. However, the 2018 Draft Environmental Impact Statement (DEIS) did not examine the creekside flood reduction benefits provided by the One Lake project. Exchanges 2-1 and 3-0 also show that the project delivery team (e.g., the One Lake planners) dismissed the opportunity to study tandem storm systems akin to those that caused the West Jackson floods.

Despite the lack of validation, other elected officials have "pitched" the One Lake project in response to the January 2020 flooding in West Jackson [0]. It may be the case that the project is the "Locally Preferred Plan" due to unverified claims. Potential creekside flood reduction benefits, or lack of them, should be explicitly stated in the 2023 DEIS to inform decision-makers and the public.

Gage analysis of Lynch Creek flooding

The remainder of this comment considers the assumption that the One Lake's backwater can affect the communities referenced by Ms. Summers. Three documented floods at Jim Hill High and Isable Elementary Schools provide reference points. The schools are in the Washington Addition neighborhood, approximately 2 miles upstream from the mouth of Lynch Creek. Data from these events suggest backwater effects, if present, could have exacerbated the floods.

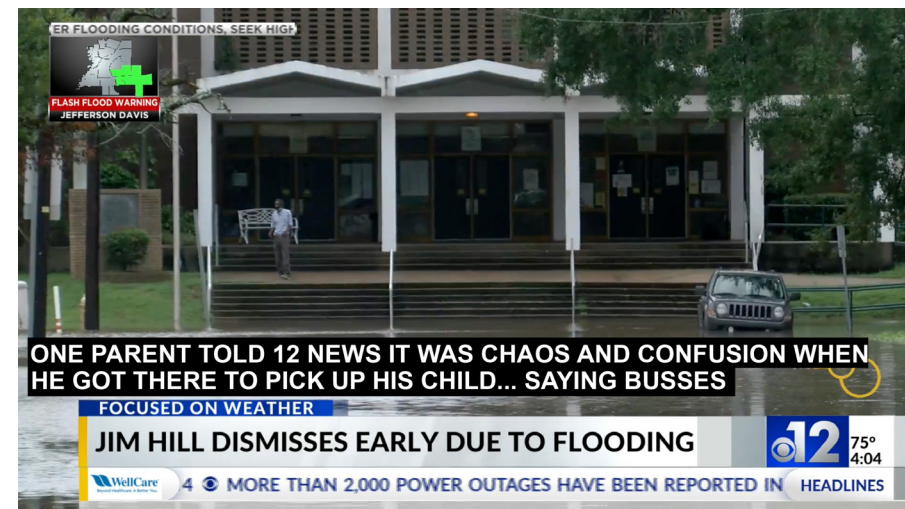
Local news networks televised the floods. The three images on the opposite screen are screenshots from the coverage.



May 9, 2019

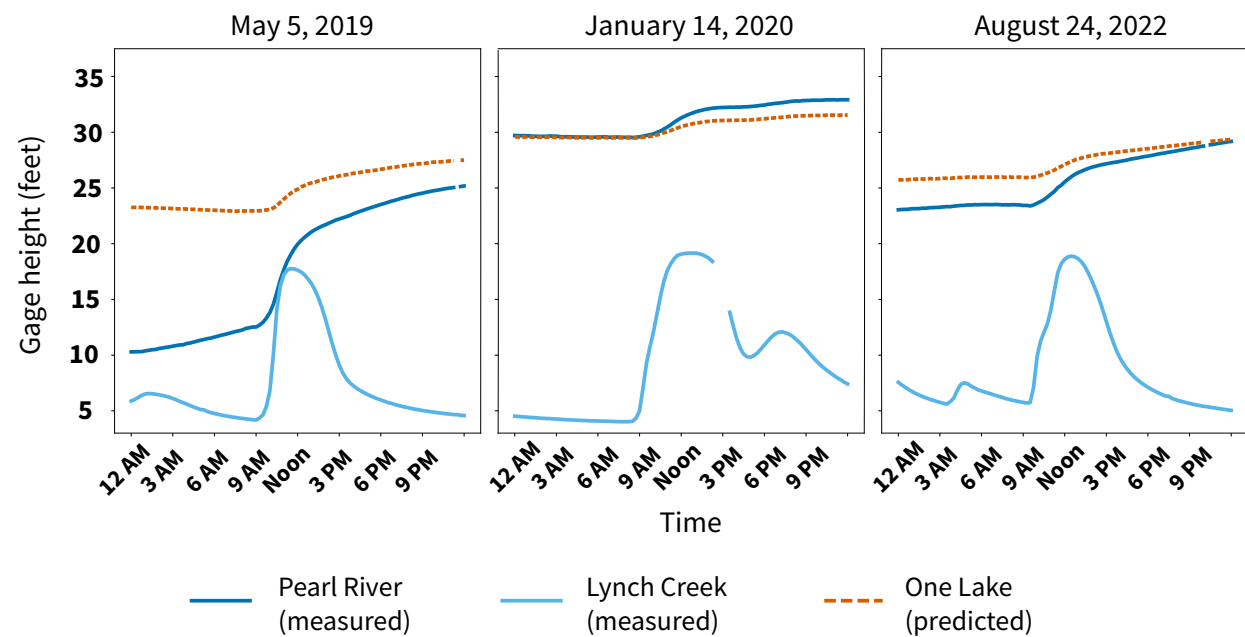


January 14, 2020



August 24, 2022

USGS gage data and predicted One Lake water surface elevation during The 3 Floods at Jim Hill High and Isable Elementary Schools



The graphs above plot creek and river data measured during the school flooding events. The graphs also show predicted river surface elevation levels if the One Lake was in place during the events.

The light blue line shows creek levels on Lynch Creek during these floods, as measured about a quarter mile downstream of the schools (USGS gage #02486100). The creek rose and peaked during school hours, damaging vehicles [3], causing “chaos and confusion” during early dismissals [4], and forcing students and parents to wade in “dirty” water [5].

The darker blue line shows the river level as measured from Highway 80 (USGS gage #02486000). Appendix C suggests that this gage reading is within 1.5 feet of the river’s water surface elevation at the mouth of Lynch Creek. The 2019 data shows that the schools flood, even when the river is between 10 to 20 feet.

The dashed orange line shows the predicted river surface elevation with the One Lake in place. This data was generated using discharge data from the Pearl River and the stage-curve graph from River Mile 287.14. The latter was found in Appendix K of the 2018 DEIS, PDF page 67. A summary of how the data generation process is available at the end of this comment.

In two of these floods, 2019 and 2022, the river’s surface level at the mouth of Lynch Creek would have been higher with the One Lake in place. On the third event, 2020, the flood reduction benefits of the project would not be registerable until the creek was already reaching its peak. ***If backwater effects impact the school, then the lake could exacerbate the “damage,” “chaos”, and “confusion.”***

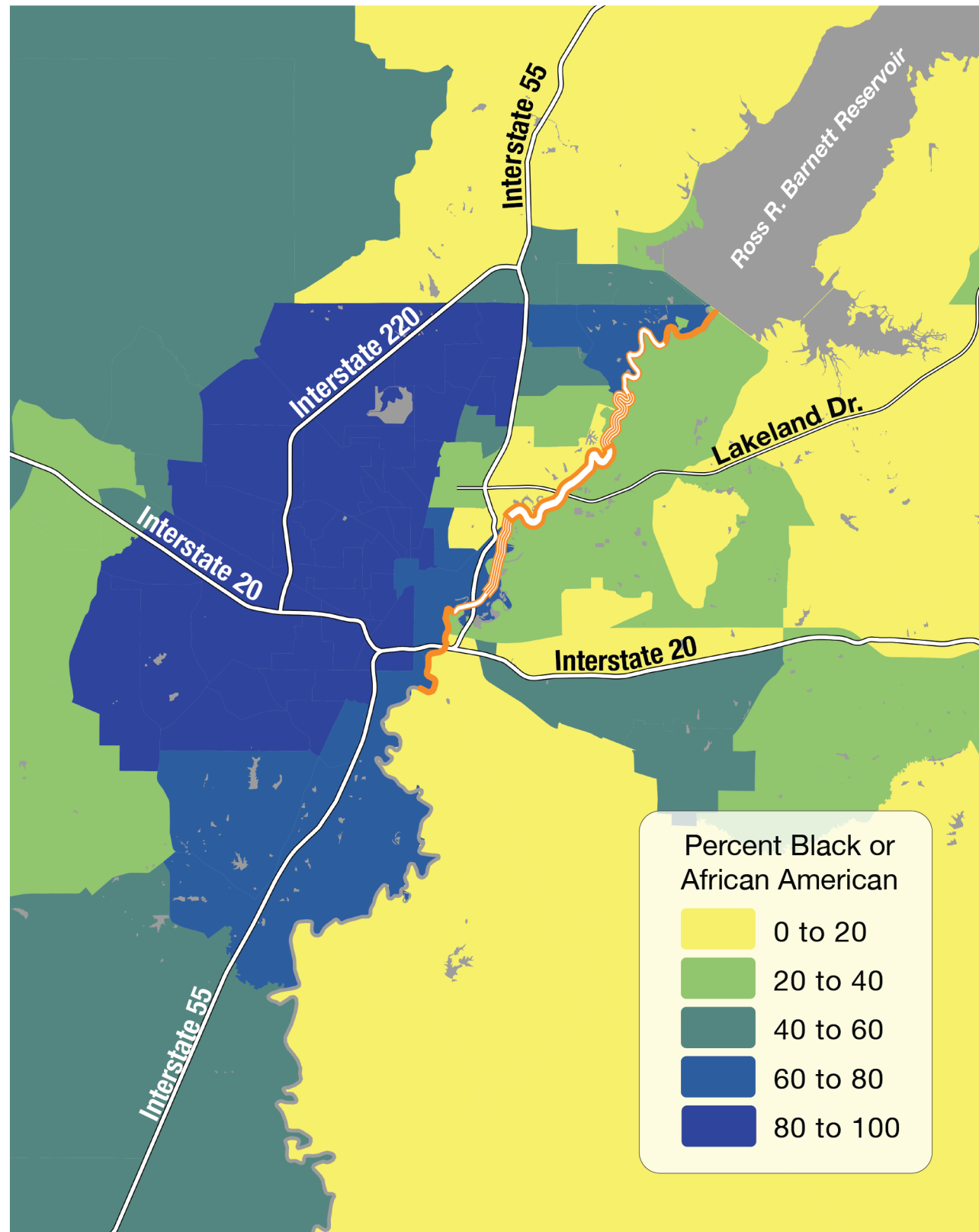
Date	Time	Month	Day of the week	Creek stage (feet)	WSE Difference (feet)	School hours
2019-05-09	11:30	May	Thursday	17.76	5.52	TRUE
2020-01-02	19:30	January	Thursday	18.6	2.32	FALSE
2020-01-11	10:00	January	Saturday	17.56	-0.79	FALSE
2020-01-14	12:30	January	Tuesday	19.16	-0.91	TRUE
2020-04-23	3:45	April	Thursday	18.6	0.66	FALSE
2021-04-09	23:45	April	Friday	18.56	5.22	FALSE
2022-04-17	19:45	April	Sunday	17.29	1.01	FALSE
2022-08-24	12:30	August	Wednesday	18.88	1.36	TRUE
2023-03-26	19:15	March	Sunday	17.24	8.72	FALSE

The creek has peaked nine times at similar gage heights in the past four years. Potential backwater impacts could increase them. Three of these peaks occurred during the three school floods. The six other peaks may have corresponded with under-documented bank overtopping. Unlike the three televised floods, the other six peaks occurred outside school hours.

The above table shows measured peaks greater than 17 feet since March 2019. It also shows the expected water surface elevation (WSE) difference at the mouth of Lynch Creek due to the construction of the One Lake. It indicates that the WSE difference would have been higher during 7 of the 9 peaks, with ranges from half a foot to nearly nine feet. It shows that the WSE difference would have been lower during two peaks, and the decrease would be no more than a foot.

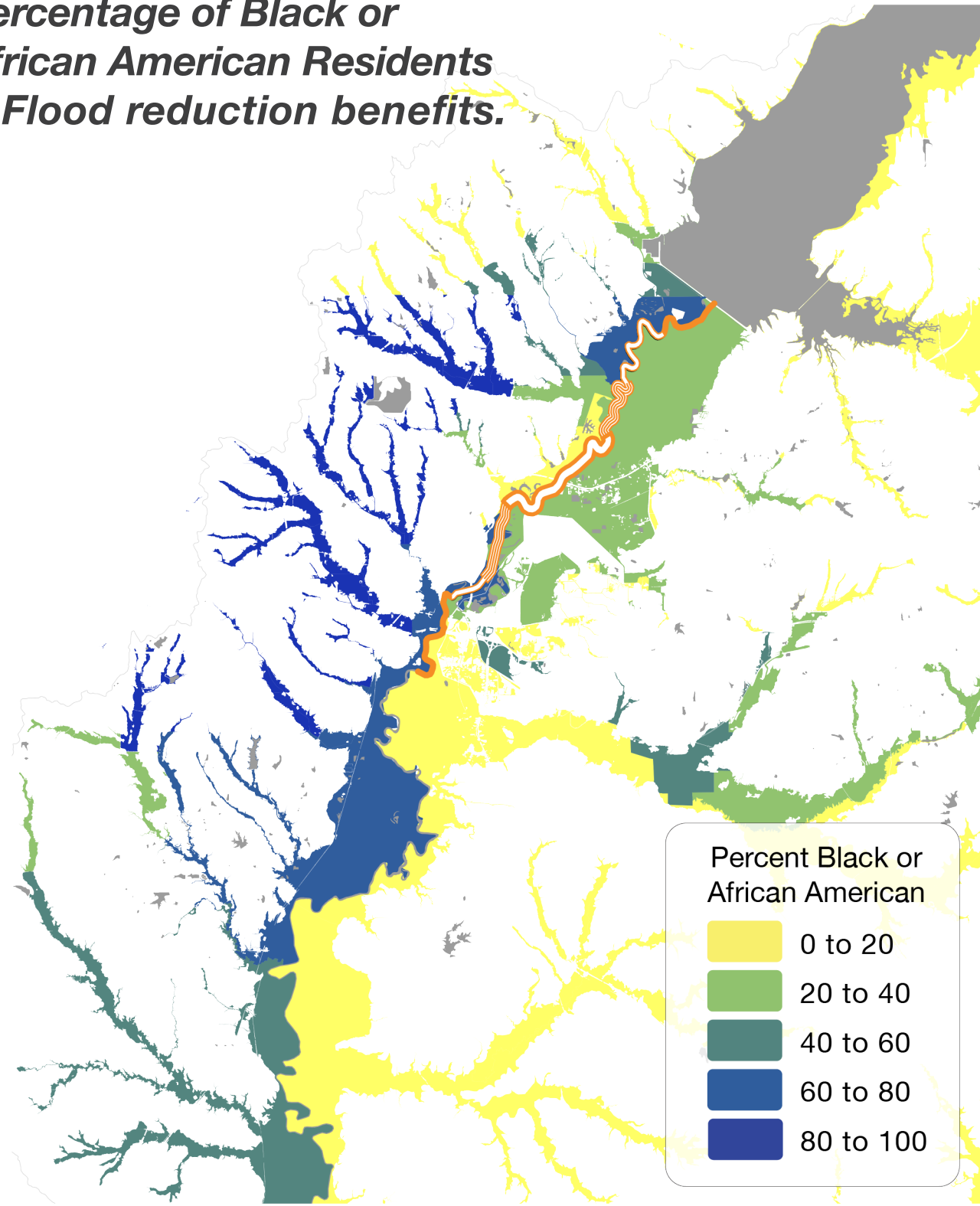
Conclusion (Same as summary on page 25)

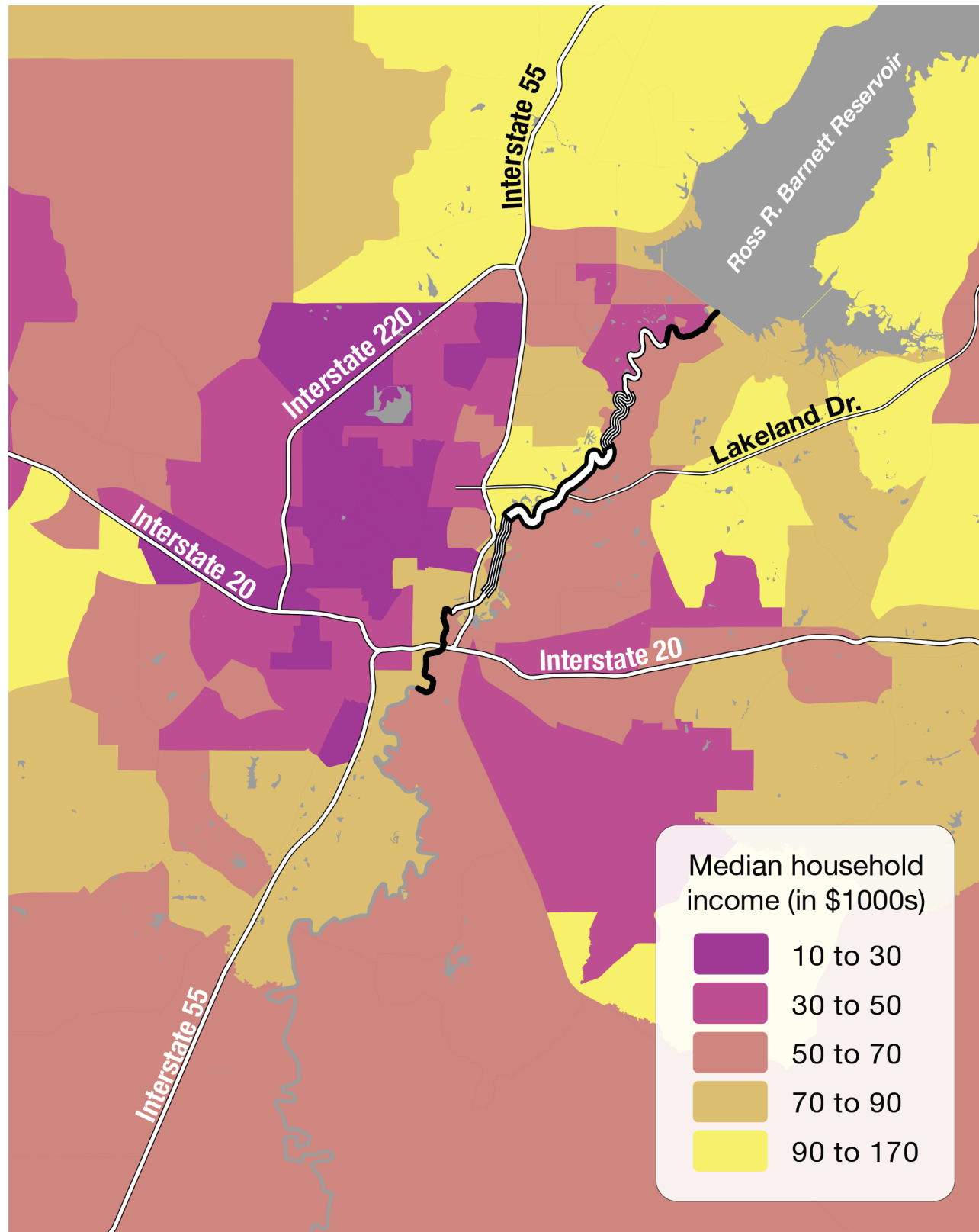
West Jackson floods due to creek flooding. Some elected officials support the One Lake because it might reduce backwater-induced flash flooding. The U.S. Army Corps of Engineers must assess this presumed flood risk and explicitly communicate the results to decision-makers and the public. Furthermore, USGS data suggests that a backwater effect might exacerbate flood risks in West Jackson.



Map uses 2010 Census tract boundaries

Percentage of Black or African American Residents & Flood reduction benefits.





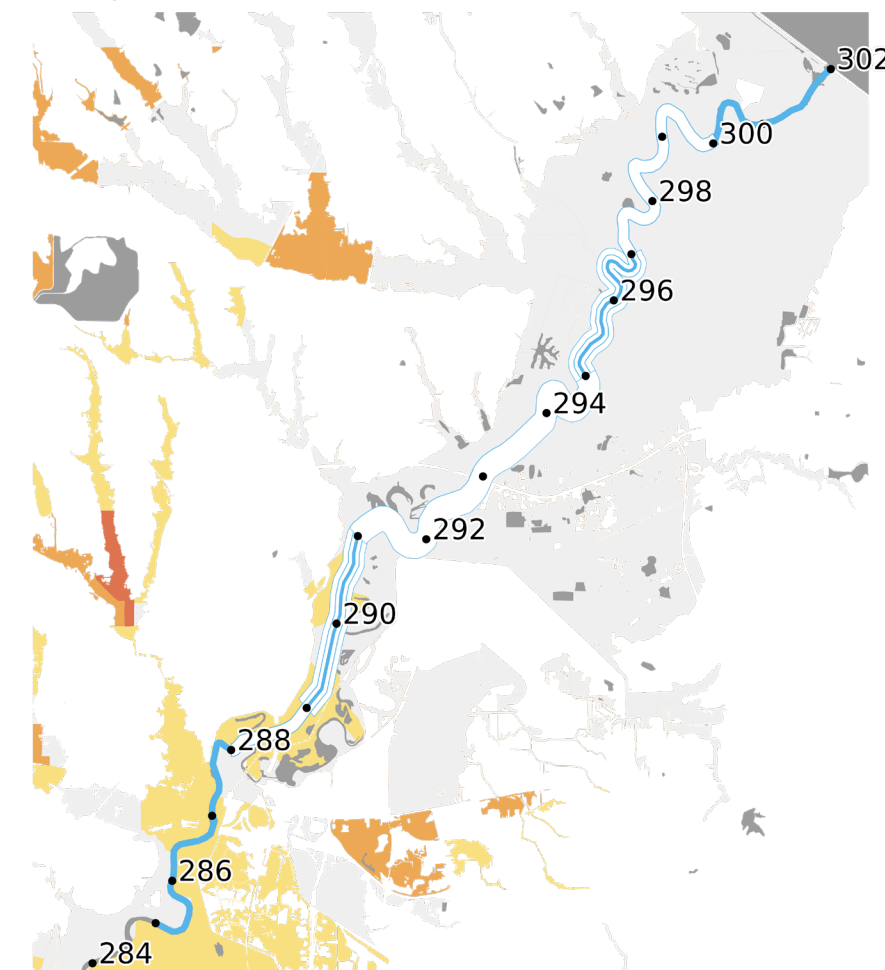
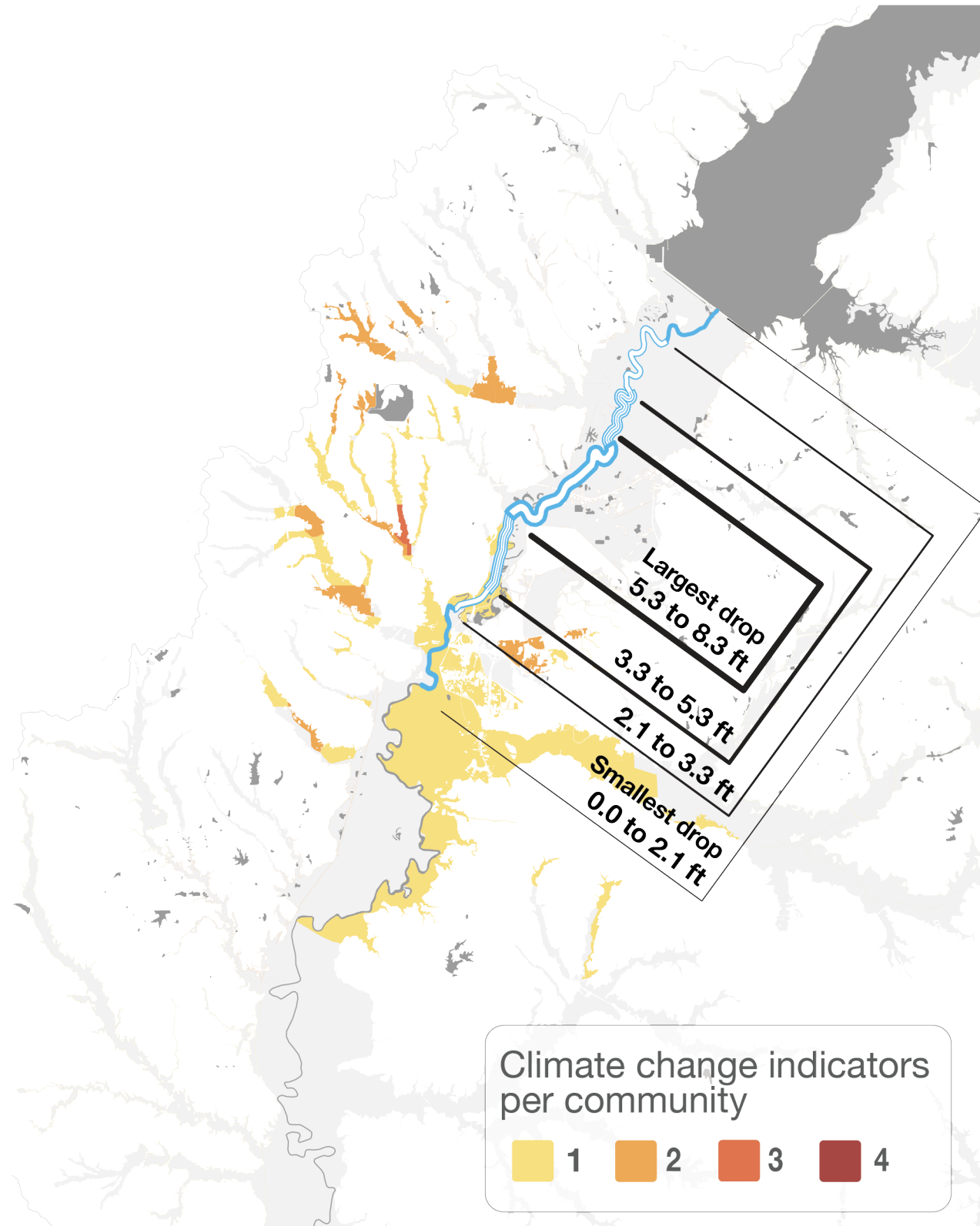
Map uses 2020 Census tract boundaries

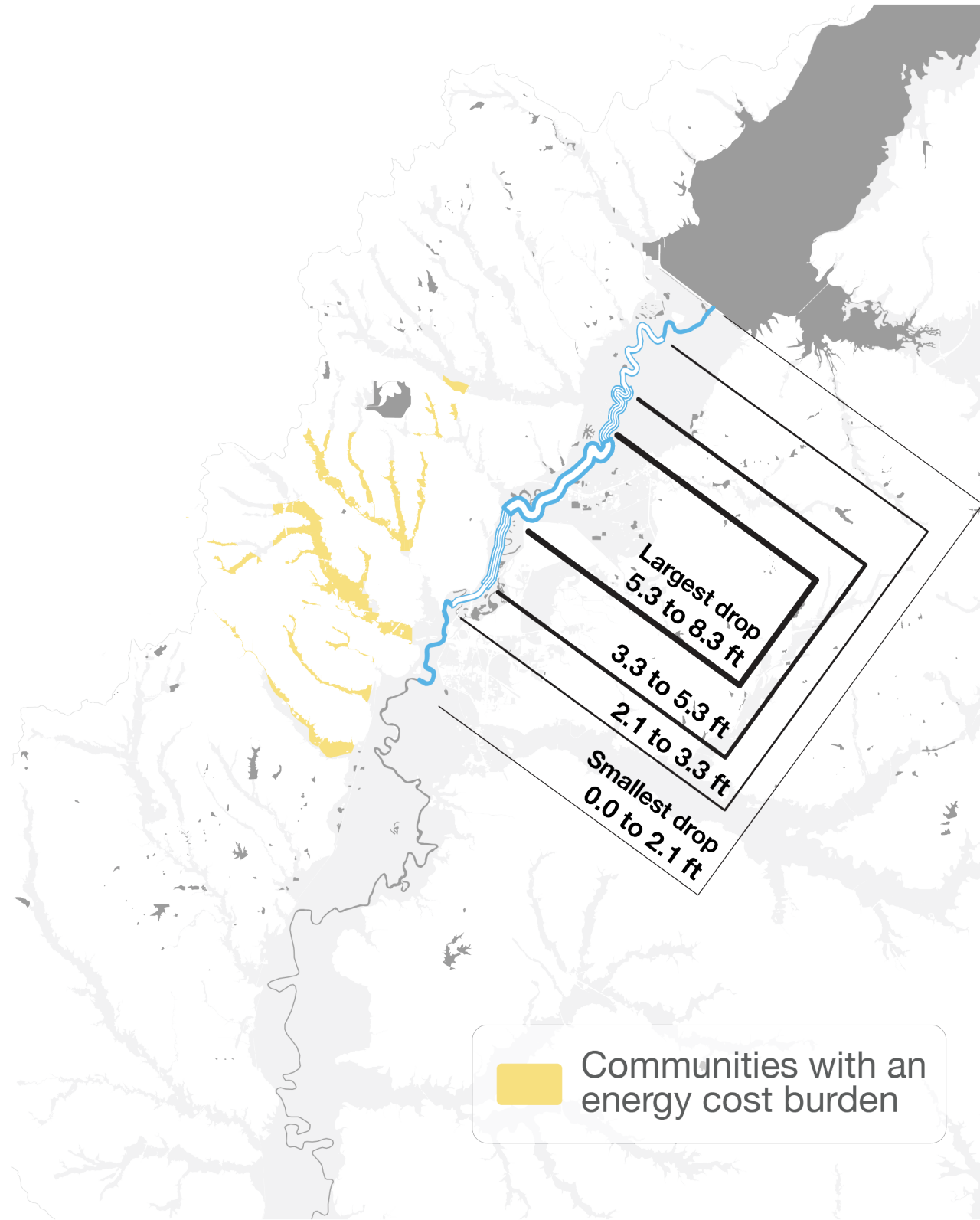
Climate change burden

A community is **disadvantaged by a climate change burden** if 65% or more of its households are low-income and *at least one* of the following risk indicators exceed a specified threshold...

- the expected **agricultural loss** rate due to natural hazards
- the expected **building loss** rate due to natural hazards
- the expected fatalities and injuries due to natural hazards (**population loss**)
- the number of properties in a **high-risk flood** area
- the exposure to potential **wildfire risks**

A number of communities in the Jackson metro are disadvantaged by climate with one or more risk indicators met, including nearly all census tracts within the Town and Lynch Creek floodplains, and the tract along Richland Creek.



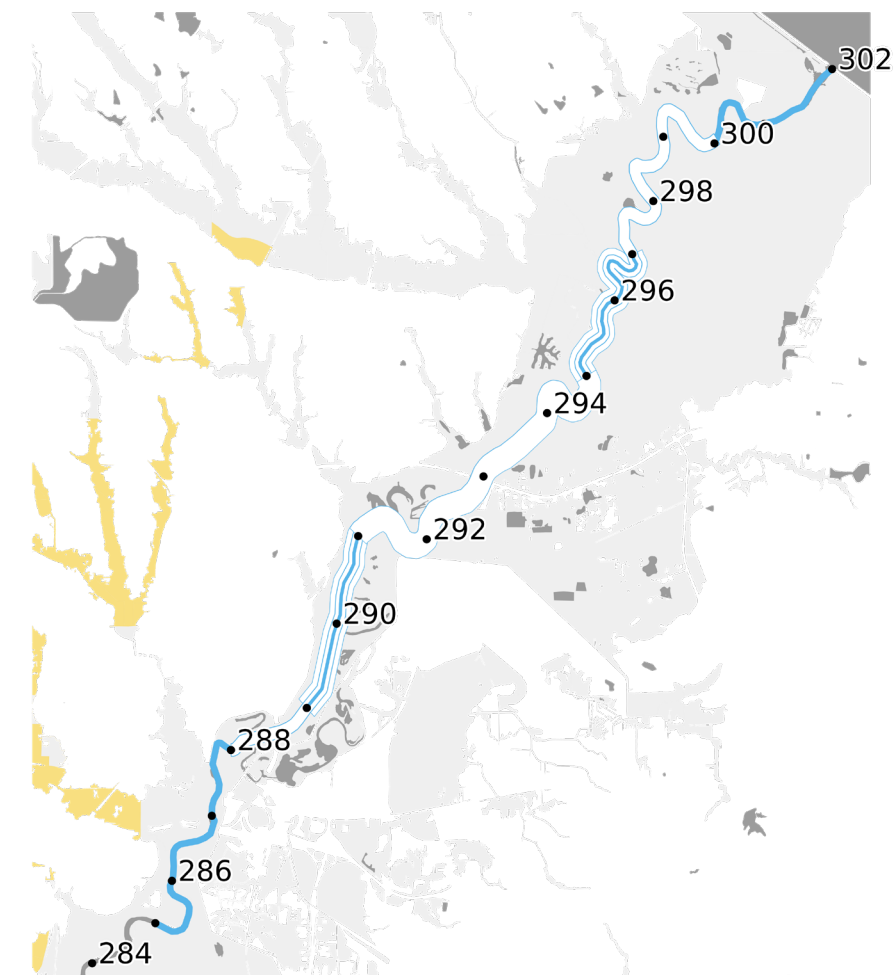


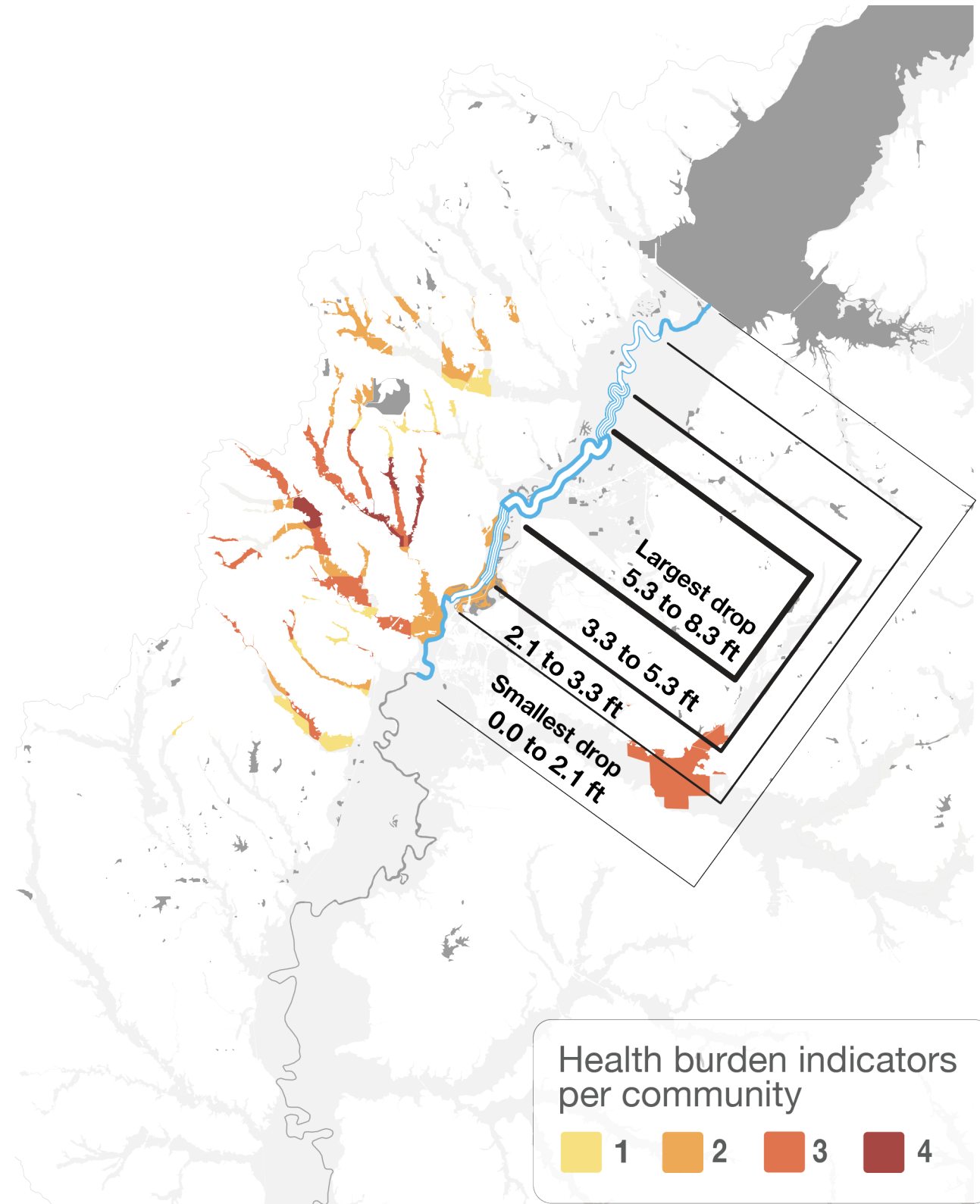
Energy burden

A community is **disadvantaged by an energy burden** if 65% or more of its households are low-income and *at least one* of the following risk indicators exceed a specified threshold...

- the **energy costs** relative to average household income
- the concentration of inhalable pollution (**PM2.5 pollution**)

Several creekside communities in Jackson are disadvantaged due to an energy burden. These communities all meet the first criterion, relatively high energy costs.



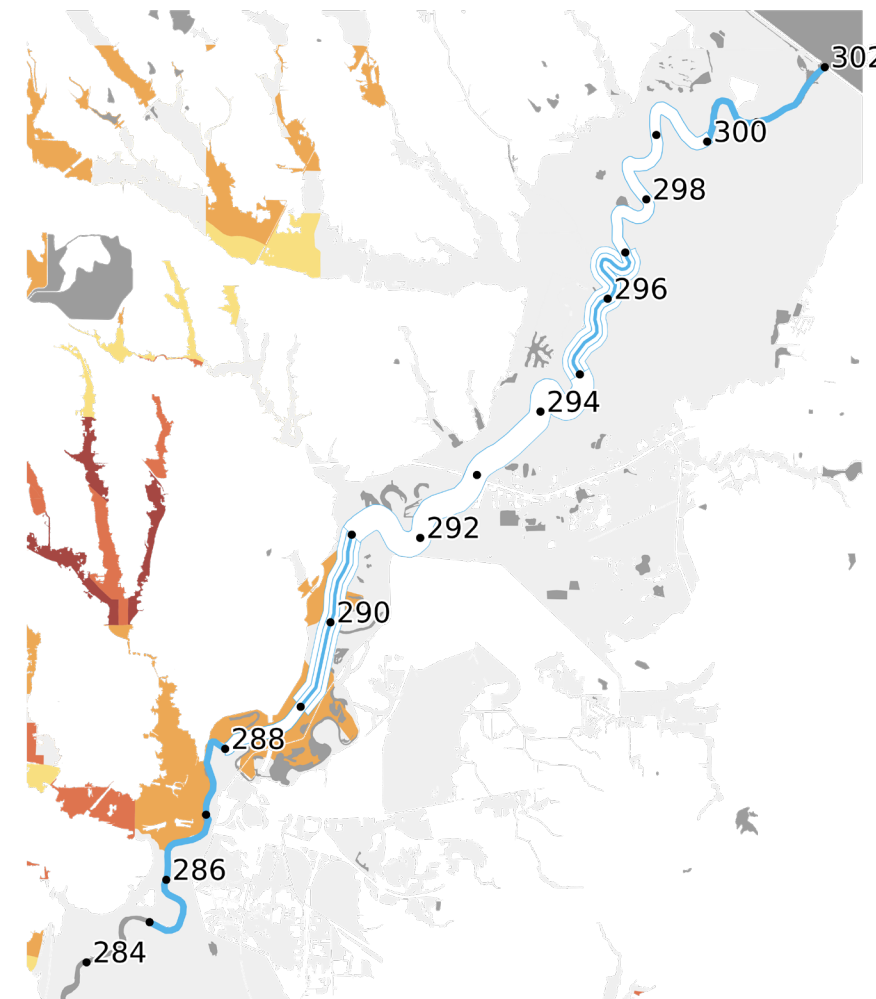


Health burden

A community is **disadvantaged by a health burden** if 65% or more of its households are low-income and *at least one* of the following risk indicators exceed a specified threshold...

- the share of residents with **asthma**
- the share of residents with **diabetes**
- the share of residents with an **angina or coronary heart disease**
- the average remaining life expectancy (**low-life expectancy**)

Multiple communities in the Jackson metro are disadvantaged by a health burden. Several of those in the Town and Lynch Creek floodplains meet all four criteria.

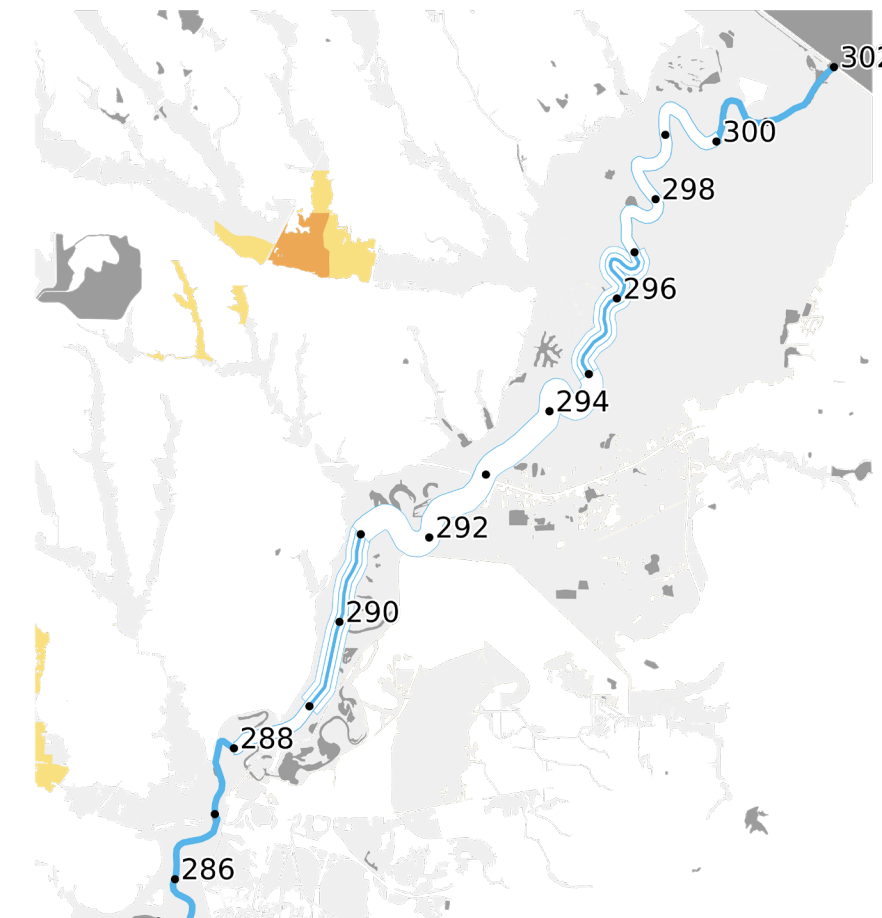
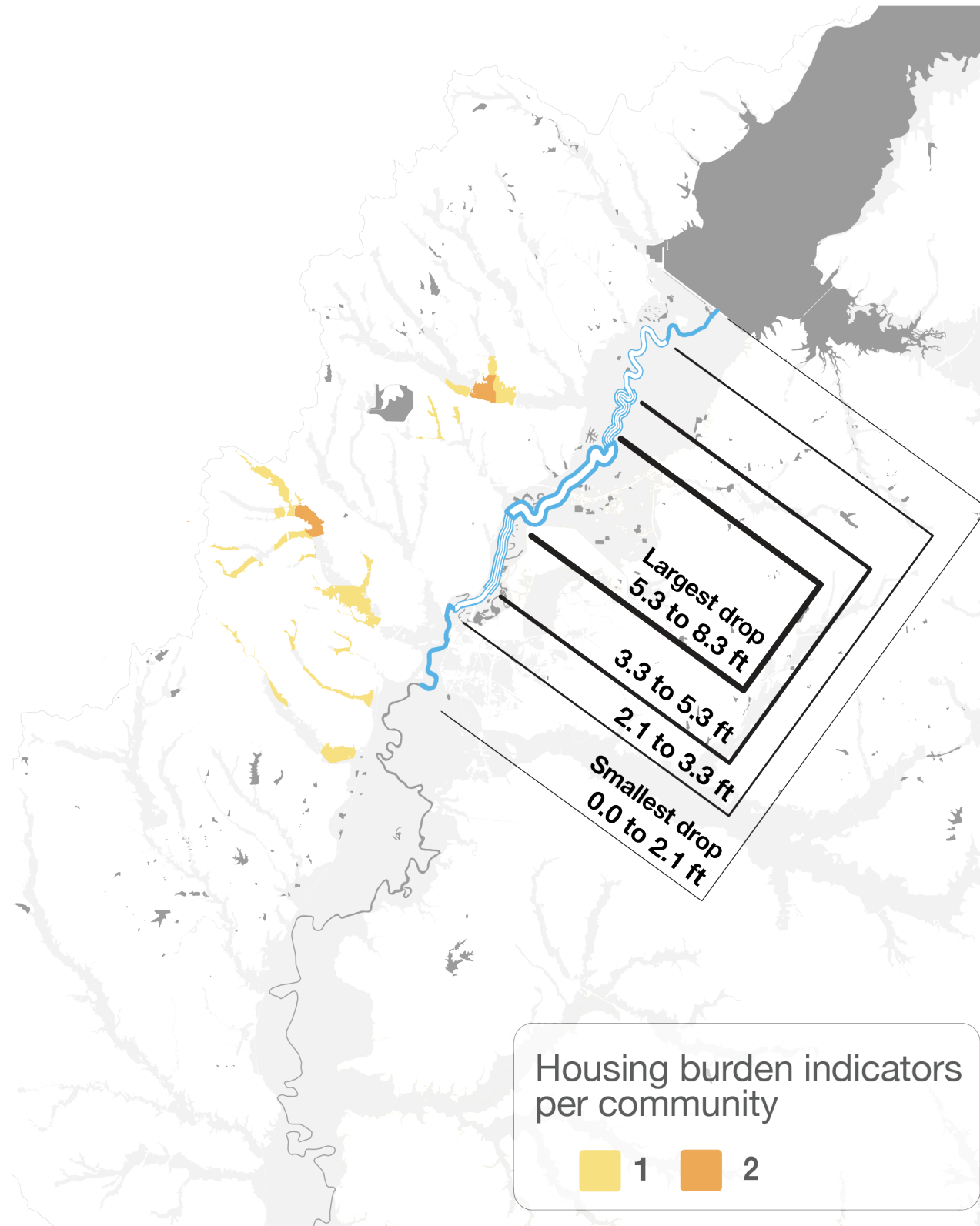


Housing burden

A community is **disadvantaged by a housing burden** if 65% or more of its households are low-income and *at least one* of the following risk indicators exceed a specified threshold...

- the census tract with redlined in the 1930s (**historic underinvestment**)
- the share of relatively low-income households paying 30% or more on **housing costs**
- the portion of land covered by concrete, pavement, or other impervious surfaces (**lack of green space**)
- the share of households without a **plumbing** or an indoor kitchen
- the share of houses built before 1960, which is correlated with elevated **lead paint exposure**.

Some communities in Jackson's creek valleys are disadvantaged by housing burdens.

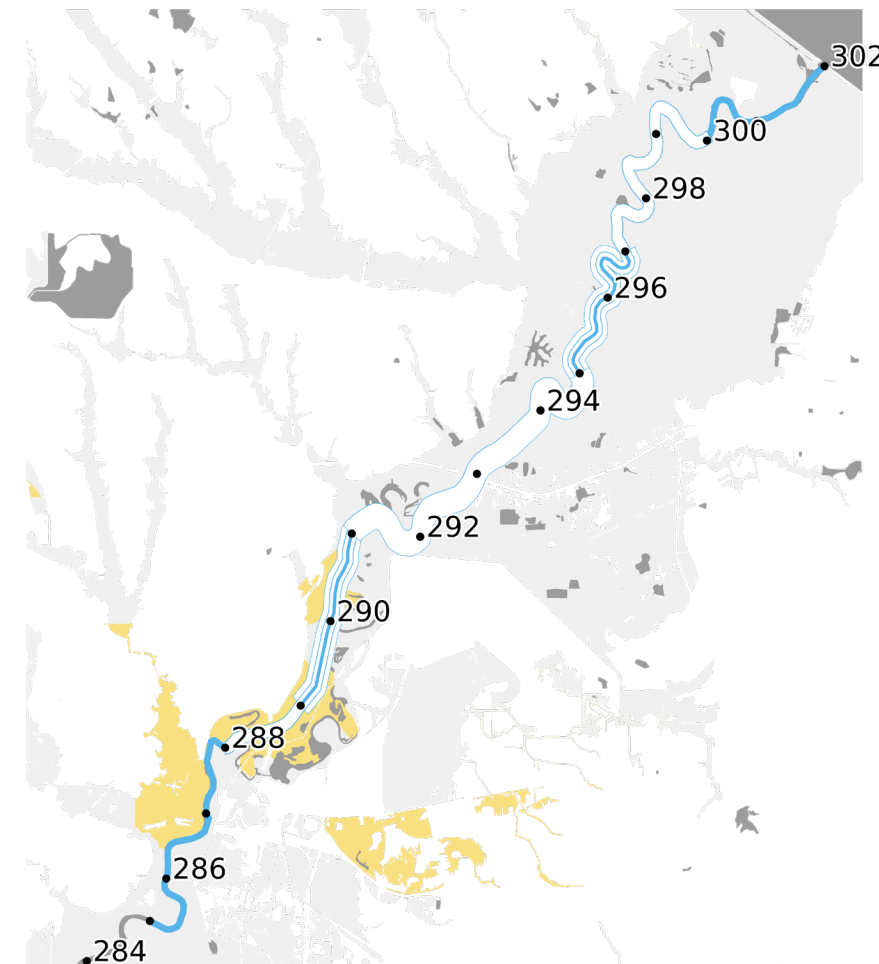
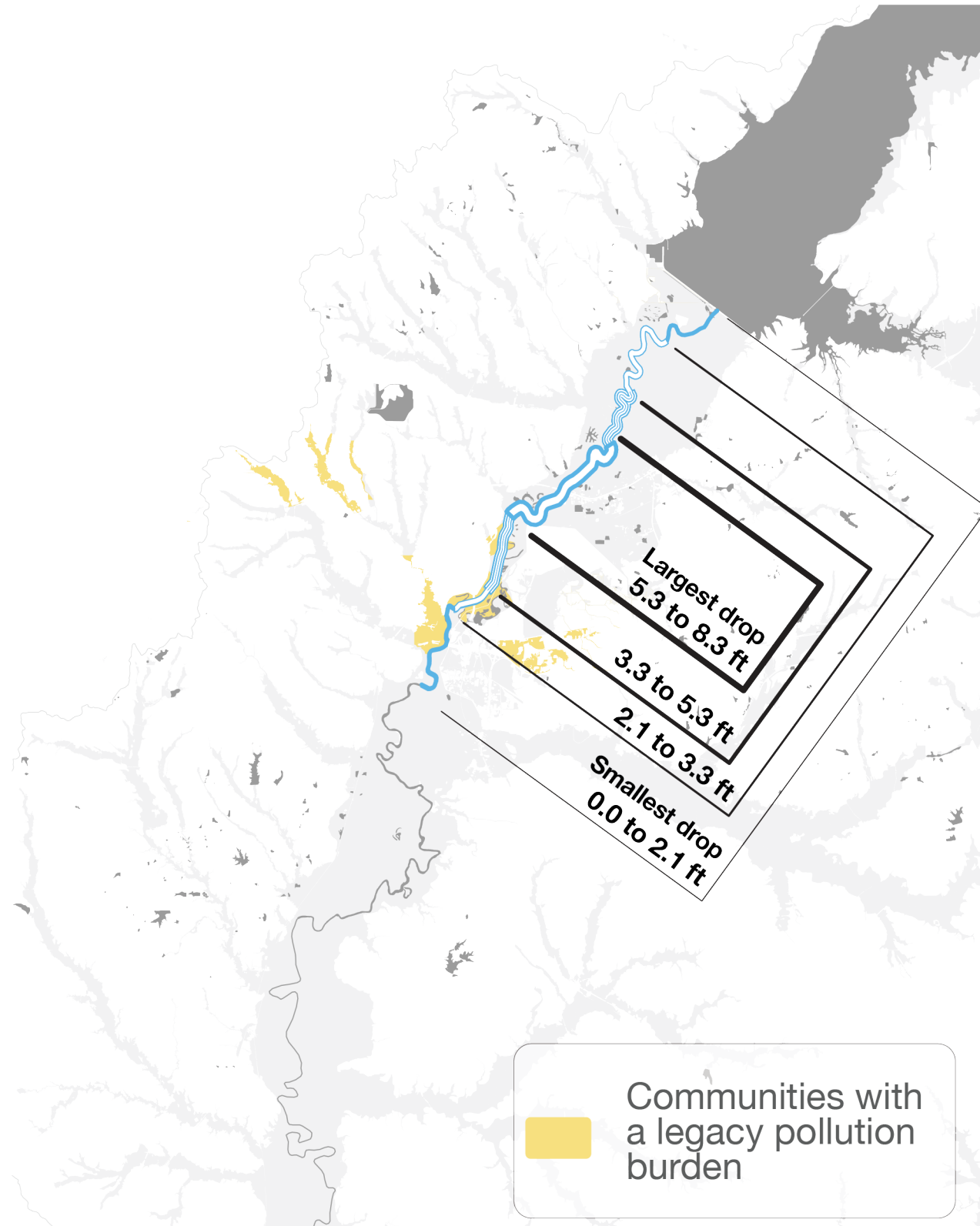


Legacy pollution burden

A community is **disadvantaged by a legacy pollution burden** if 65% or more of its households are low-income and *at least one* of the following risk indicators exceed a specified threshold...

- there is at least one **abandoned mine** in the area
- there is at least one **formerly used defense site**
- the number of and proximity to of **hazardous waste facilities**
- the number of and proximity to of highly-polluted Federal priority sites (**NPL Superfund sites**)
- the number of and proximity to facilities that handle substances with significant environmental and public health risks (**RMP facilities**)
- the concentration of diesel exhaust particles found in the air

A few communities in the Jackson metro are disadvantaged by a legacy pollution burden due to meeting one of the criteria above.

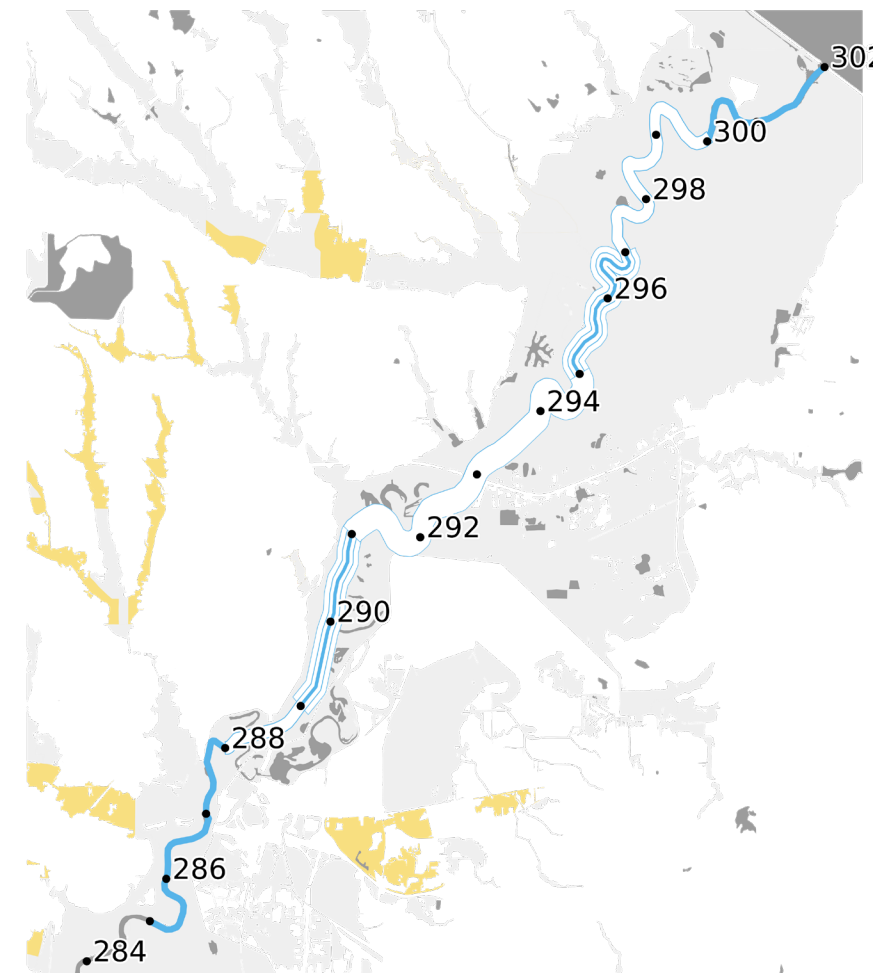
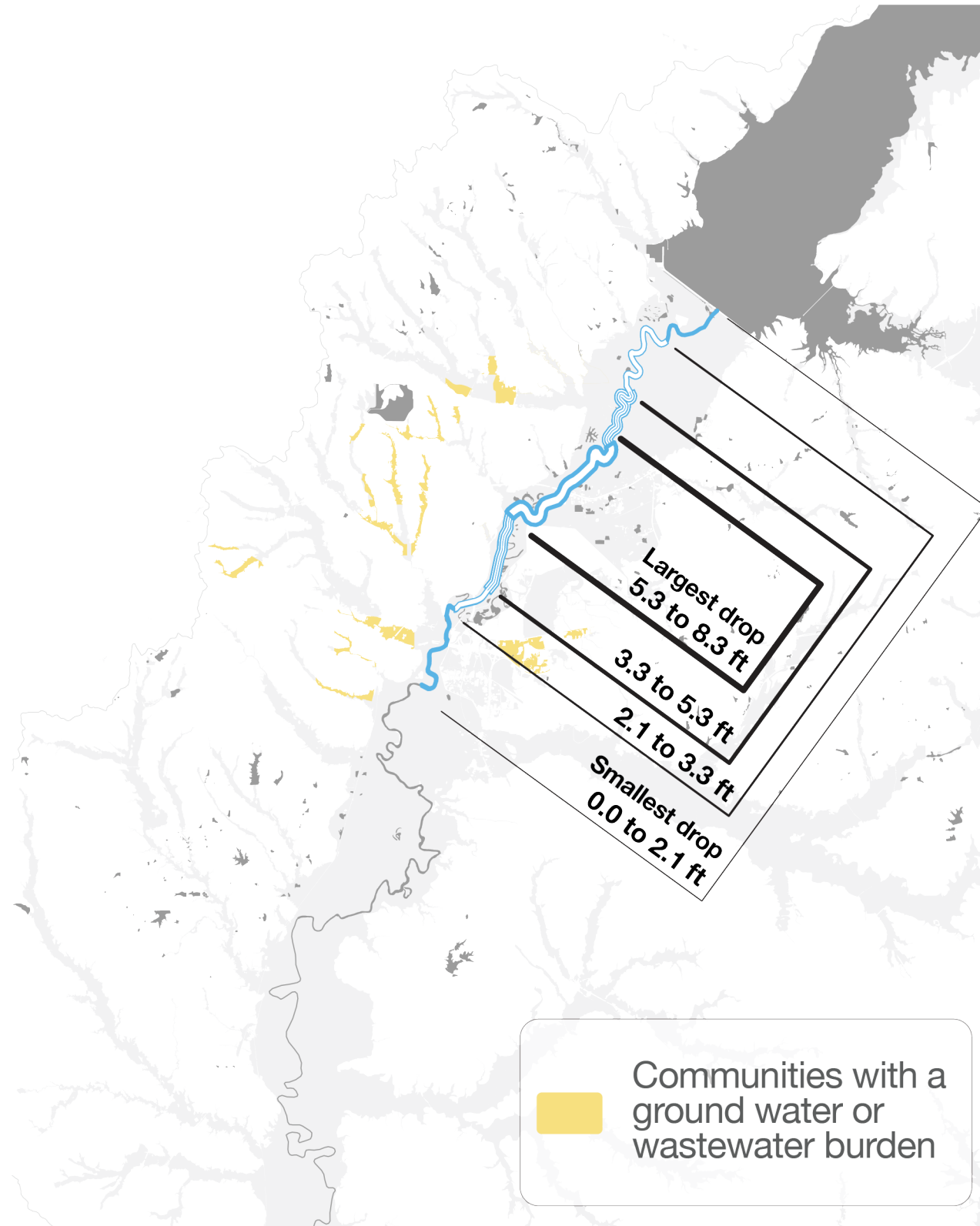


Ground water or wastewater burden

A community is **disadvantaged by a ground water or wastewater burden** if 65% or more of its households are low-income and *at least one* of the following risk indicators exceed a specified threshold...

- the density of **leaking underground storage tanks** and the number of active storage tanks storing petroleum or another hazardous substance in or near the census tract
- the concentration of toxic waste in streams (**wastewater discharge**)

A few communities in the Jackson metro are disadvantaged by a ground water or wastewater burden due to meeting one of the criteria above.

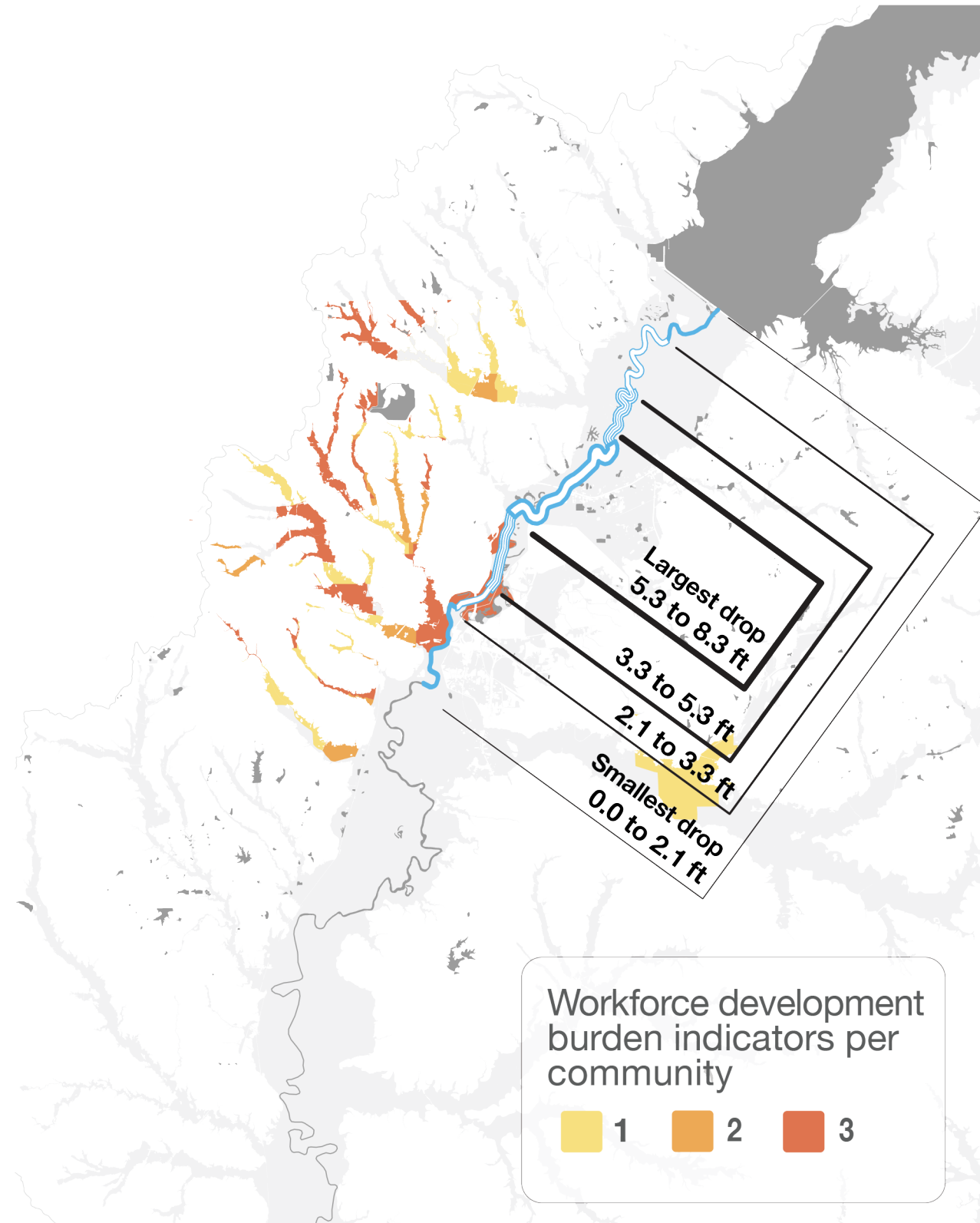
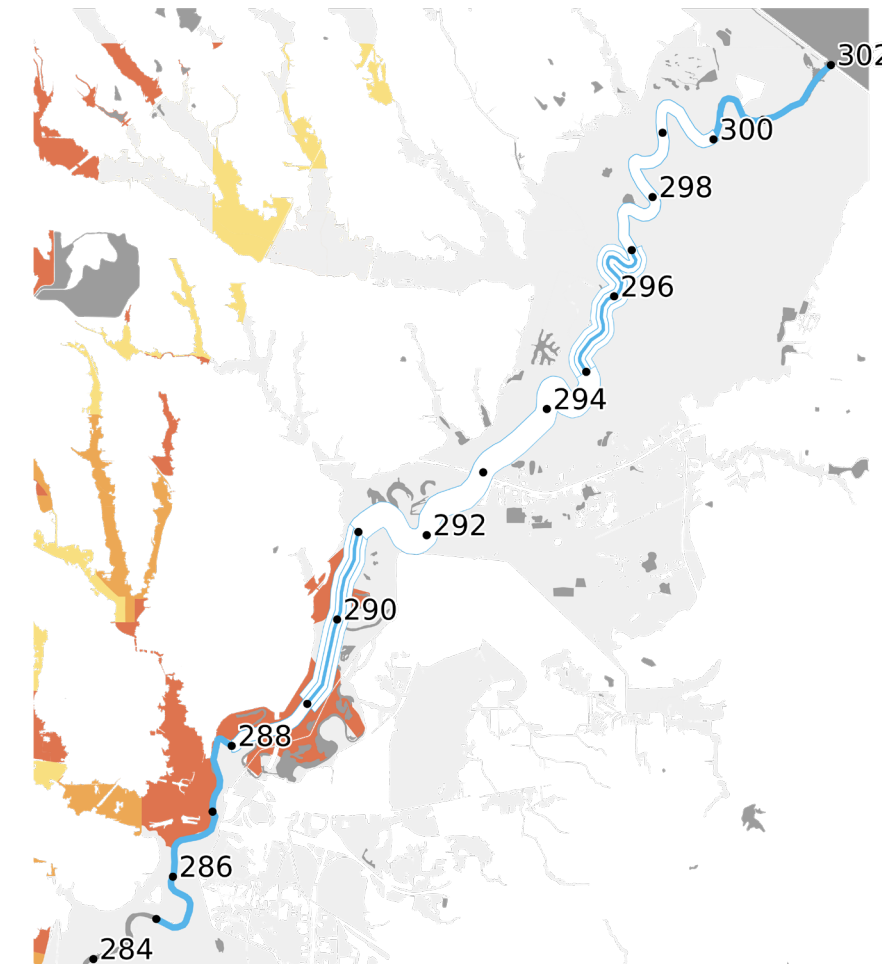


Workforce development burden

A community is **disadvantaged by a workforce development burden** if 10% or more of its adult residents did not graduate from high school and *at least one* of the following risk indicators exceed a specified threshold...

- the share of households where no one over the age of 14 speaks English (**linguistic isolation**)
- the share of **low median income** households, relative to the area's median income
- the share of residents at or below the Federal **poverty level**
- the share of **unemployed** people relative to the labor force

A number of communities are disadvantaged by a workforce development burden. Several within the creek valleys meet three of the four criteria. (None met the linguistic isolation criterion)



**Pollution burden indicators
per floodplain community**

**Communities within floodplain
disadvantaged by a transportation burden**

