Louisiana Watershed Initiative

Sustainability and resilience through science, engineering and objective decision-making

Objective

Develop a common understanding of known flood risks, vulnerabilities and priorities in Region 8

Building on previous efforts

Region 8 planning and policy professionals worked with LWI to identify these priorities based on their region's flood risk and mitigation needs.

Agenda

1. Region 8 flood risk asses

LOUISIANA
WATERSHED
INITIATIVE

Objective

Develop a common understanding of known flood risks, vulnerabilities and priorities in Region 8

Building on previous efforts

Region 8 planning and policy professionals worked with LWI to identify these priorities based on their region's flood risk and mitigation needs.

Agenda

1. Region 8 flood risk assessment
2. Break
3. Discussion—Pivoting from previous work: Inside and outside of the HSDRRS

Flood risk assessment

Each watershed region throughout Louisiana faces unique flood risks. To understand these risks and to prioritize solutions, we must accomplish the following:

1. Build a common vocabulary
2. Consider various risk factors
3. Work with nature

Building on previous efforts

Region 8 planning and policy professionals worked with LWI to identify these priorities based on their region's flood risk and mitigation needs.

Agenda

1. Region 8 flood risk assessment
2. Break
3. Discussion—Pivoting from previous work: Inside and outside of the HSDRRS

Flood risk assessment

Each watershed region throughout Louisiana faces unique flood risks. To understand these risks and to prioritize solutions, we must accomplish the following:

1. Build a common vocabulary
2. Consider various risk factors
3. Work with nature

Parishes in Region 8

Agenda

1. Region 8 flood risk assessment
2. Break
3. Discussion—Pivoting from previous work: Inside and outside of the HSDRRS

Flood risk assessment

Each watershed region throughout Louisiana faces unique flood risks. To understand these risks and to prioritize solutions, we must accomplish the following:

1. Build a common vocabulary
2. Consider various risk factors
3. Work with nature

Parishes in Region 8

Working together to address risk at the watershed scale

- St. Charles Parish
- Jefferson Parish
- Orleans Parish
- Plaquemines Parish
- St. Bernard Parish

Louisiana Watershed Initiative

Flood risk assessment

Each watershed region throughout Louisiana faces unique flood risks. To understand these risks and to prioritize solutions, we must accomplish the following:

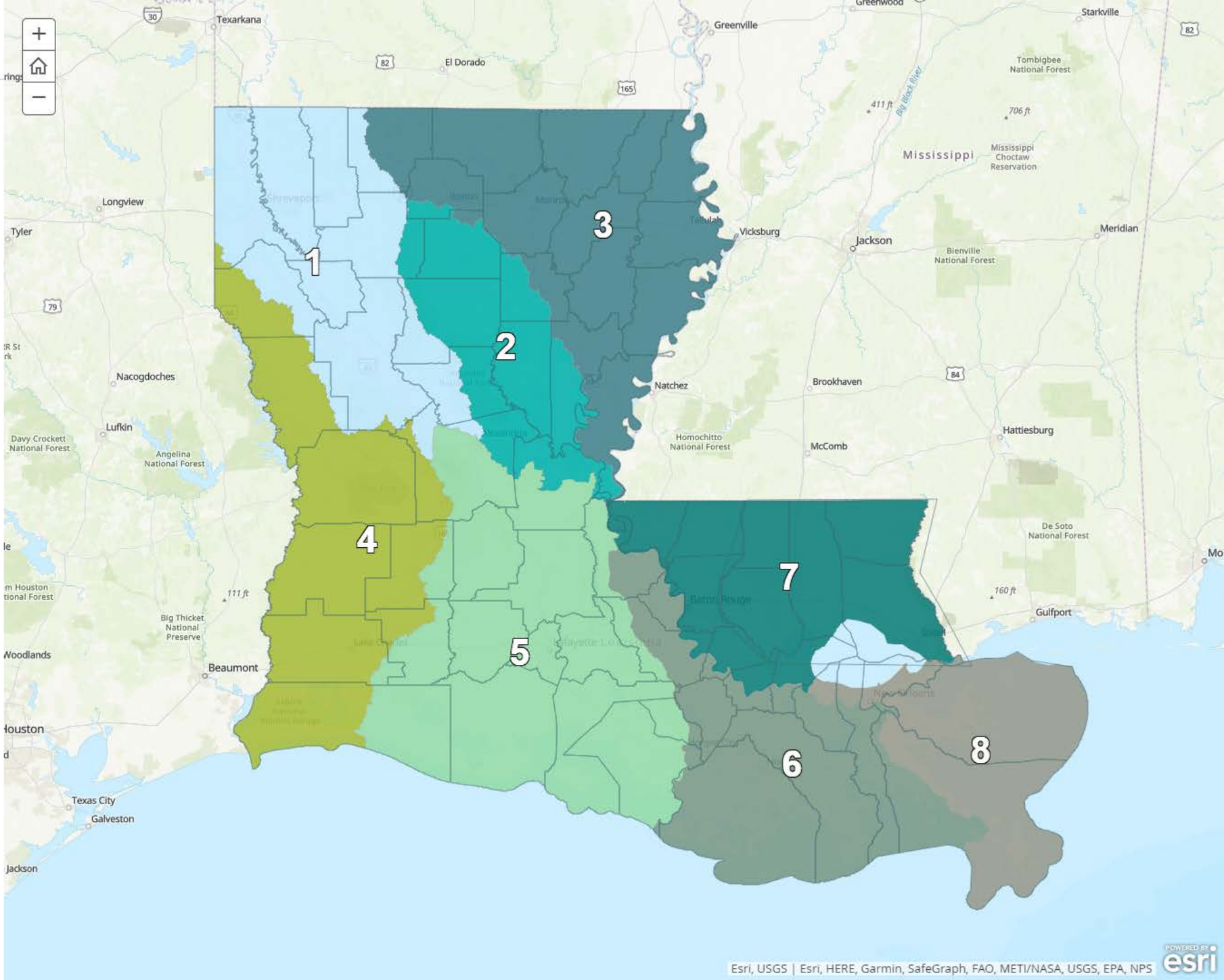
1. **Build a common vocabulary**
2. **Consider various risk factors**
3. **Work with nature**

Parishes in Region 8

Working together to address risk at the watershed scale

- St. Charles Parish
- Jefferson Parish
- Orleans Parish
- Plaquemines Parish
- St. Bernard Parish

Region 8 watersheds



Parishes in Region 8

Working together to address risk at the watershed scale

- St. Charles Parish
- Jefferson Parish
- Orleans Parish
- Plaquemines Parish
- St. Bernard Parish

Region 8 watersheds

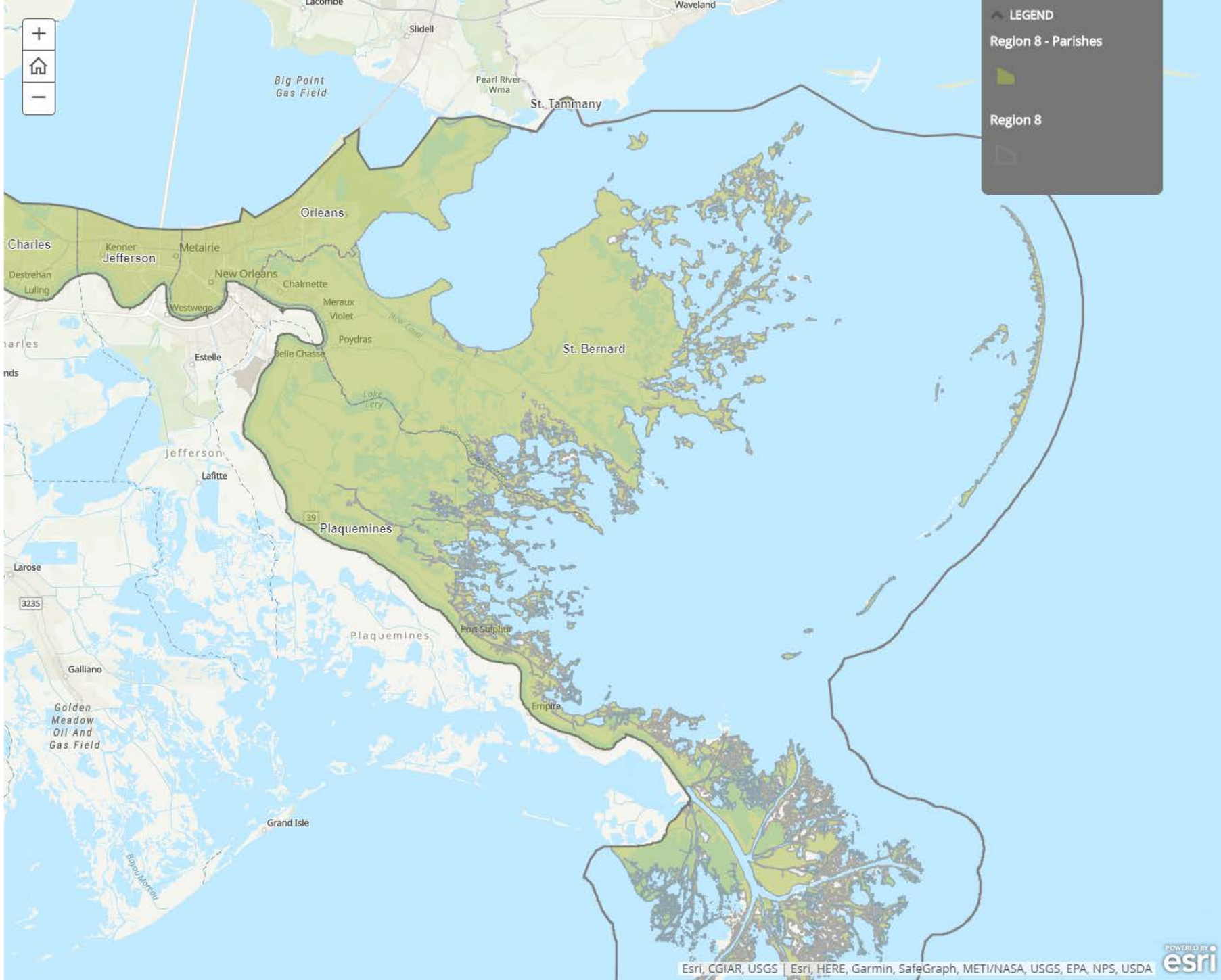
Hydrology: a science that deals with the properties, distribution and circulation of water on and below Earth's surface and in the atmosphere

Types of flood risk

We must consider all types of flood risk to effectively manage flood risk within Region 8 watersheds.

Types of flood risk

- Fluvial floods: river floods
- Coastal floods: surge and tidal



Region 8 watersheds

Hydrology: a science that deals with the properties, distribution and circulation of water on and below Earth's surface and in the atmosphere

Types of flood risk

We must consider all types of flood risk to effectively manage flood risk within Region 8 watersheds.

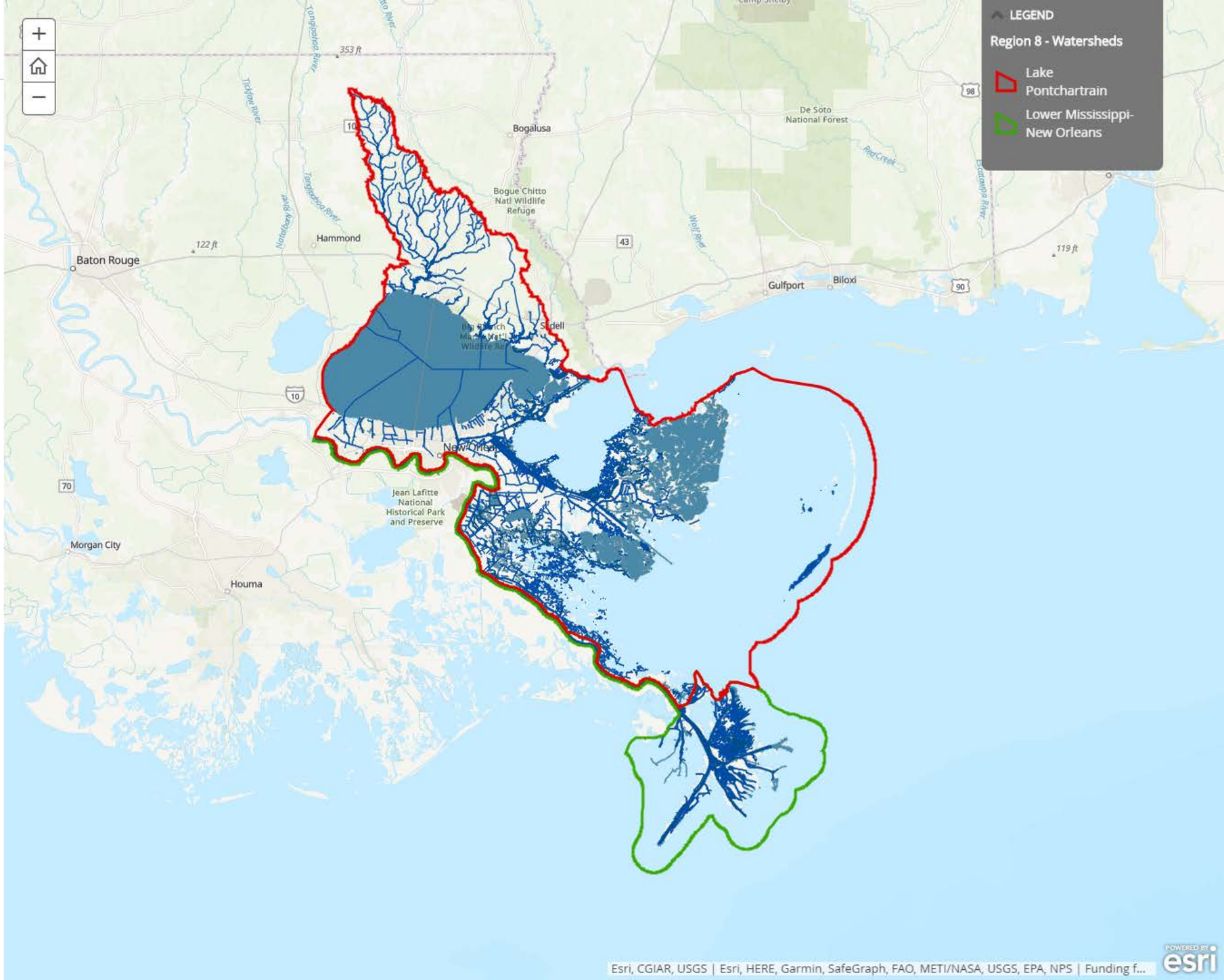
Types of flood risk

- Fluvial floods: river floods
- Coastal floods: surge and tidal
- Pluvial floods: rainfall-induced flash floods and urban flooding

Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods



Types of flood risk

We must consider all types of flood risk to effectively manage flood risk within Region 8 watersheds.

Types of flood risk

- Fluvial floods: river floods
- Coastal floods: surge and tidal
- Pluvial floods: rainfall-induced flash floods and urban flooding

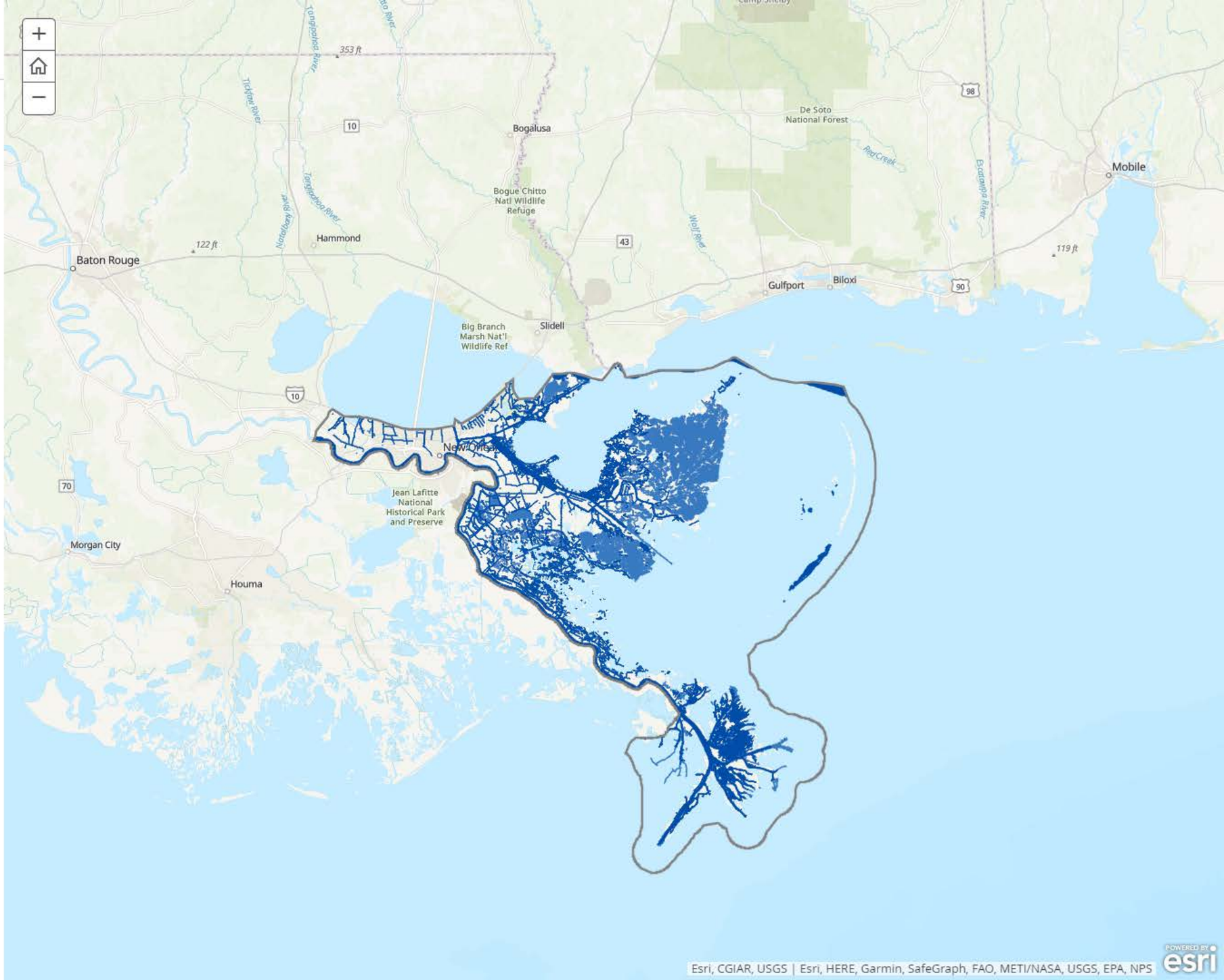
Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods



Types of flood risk

We must consider all types of flood risk to effectively manage flood risk within Region 8 watersheds.

Types of flood risk

- Fluvial floods: river floods
- Coastal floods: surge and tidal
- Pluvial floods: rainfall-induced flash floods and urban flooding

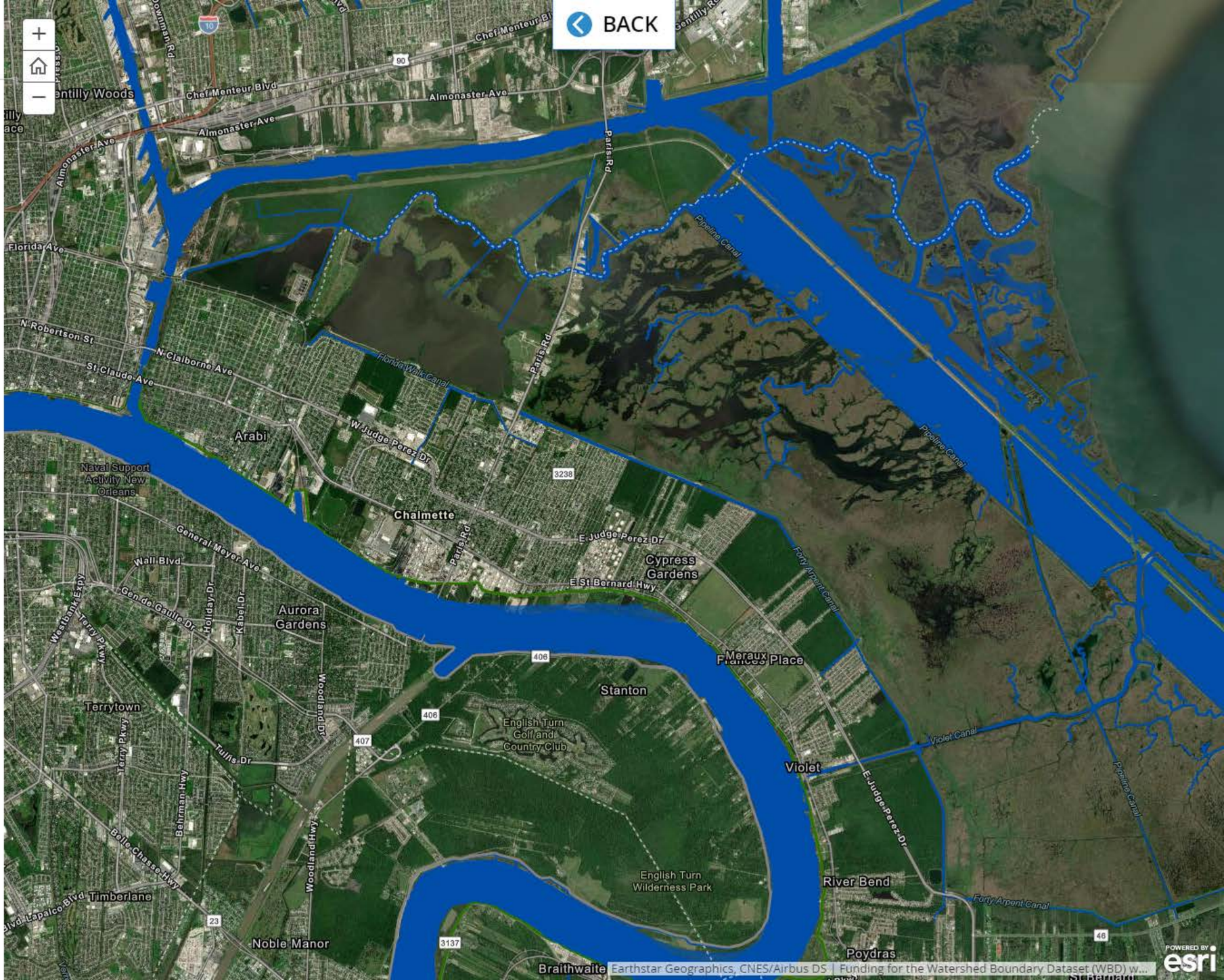
Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods



Types of flood risk

We must consider all types of flood risk to effectively manage flood risk within Region 8 watersheds.

Types of flood risk

- Fluvial floods: river floods
- Coastal floods: surge and tidal
- Pluvial floods: rainfall-induced flash floods and urban flooding

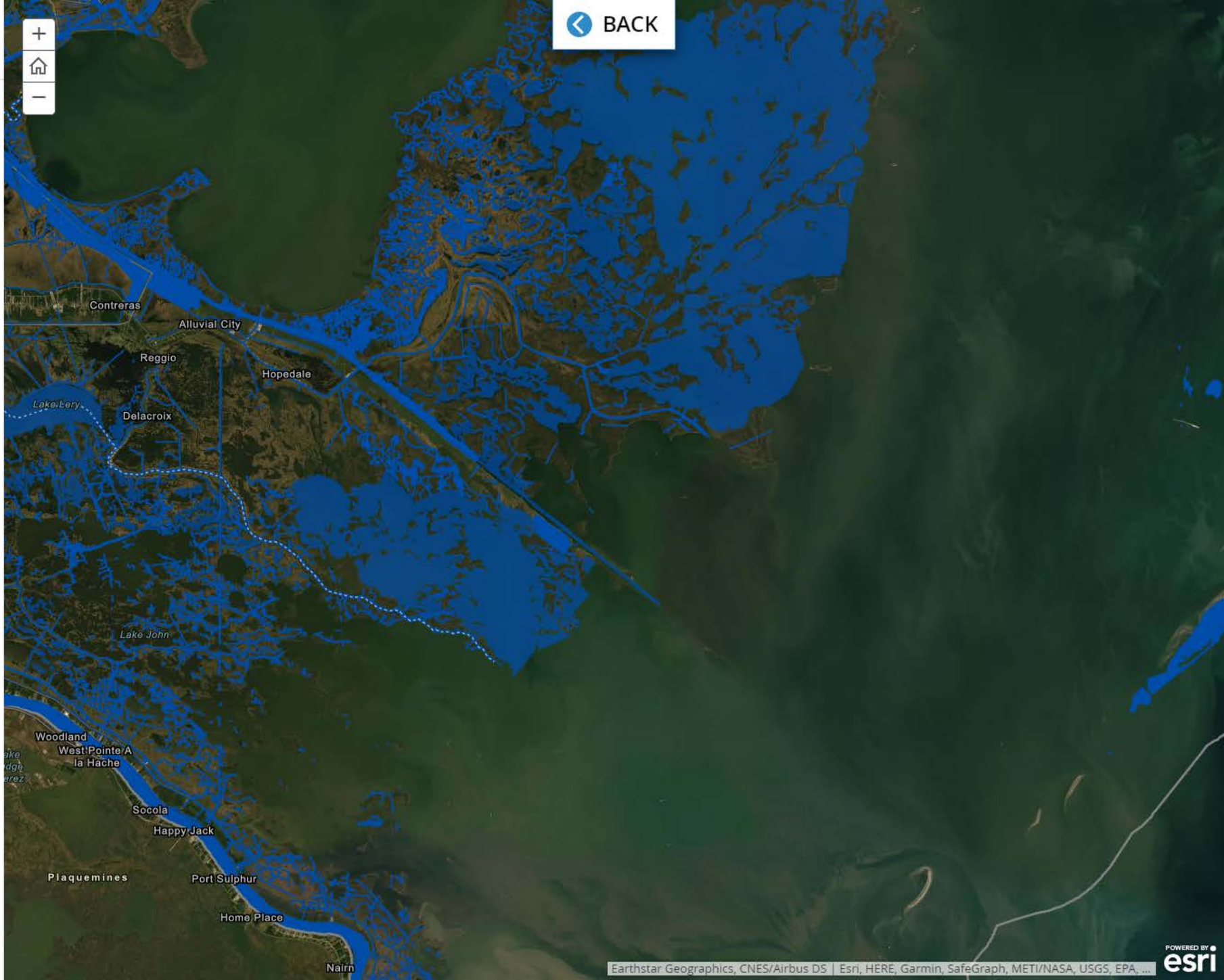
Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods



Types of flood risk

We must consider all types of flood risk to effectively manage flood risk within Region 8 watersheds.

Types of flood risk

- Fluvial floods: river floods
- Coastal floods: surge and tidal
- Pluvial floods: rainfall-induced flash floods and urban flooding

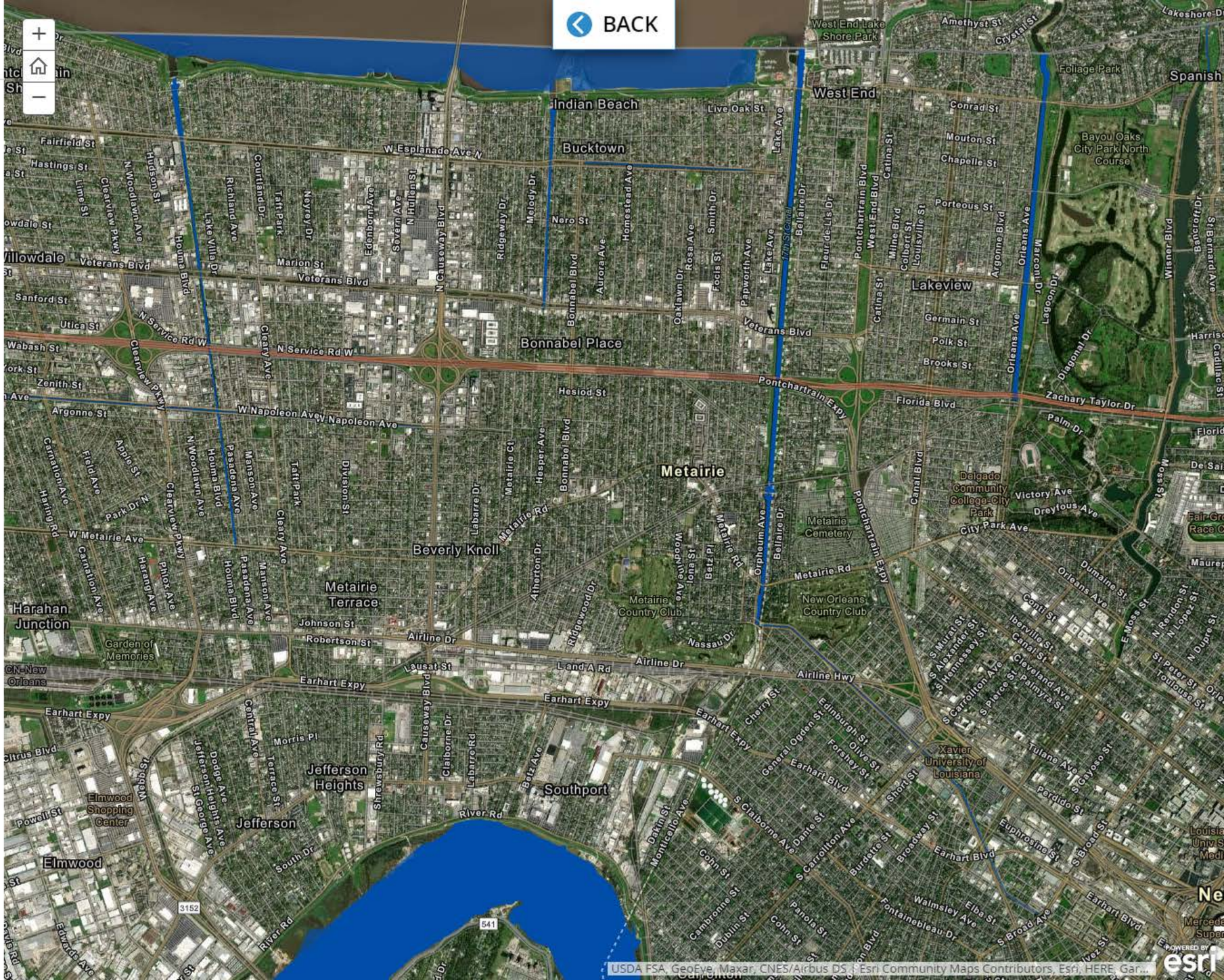
Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods



Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A

Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods

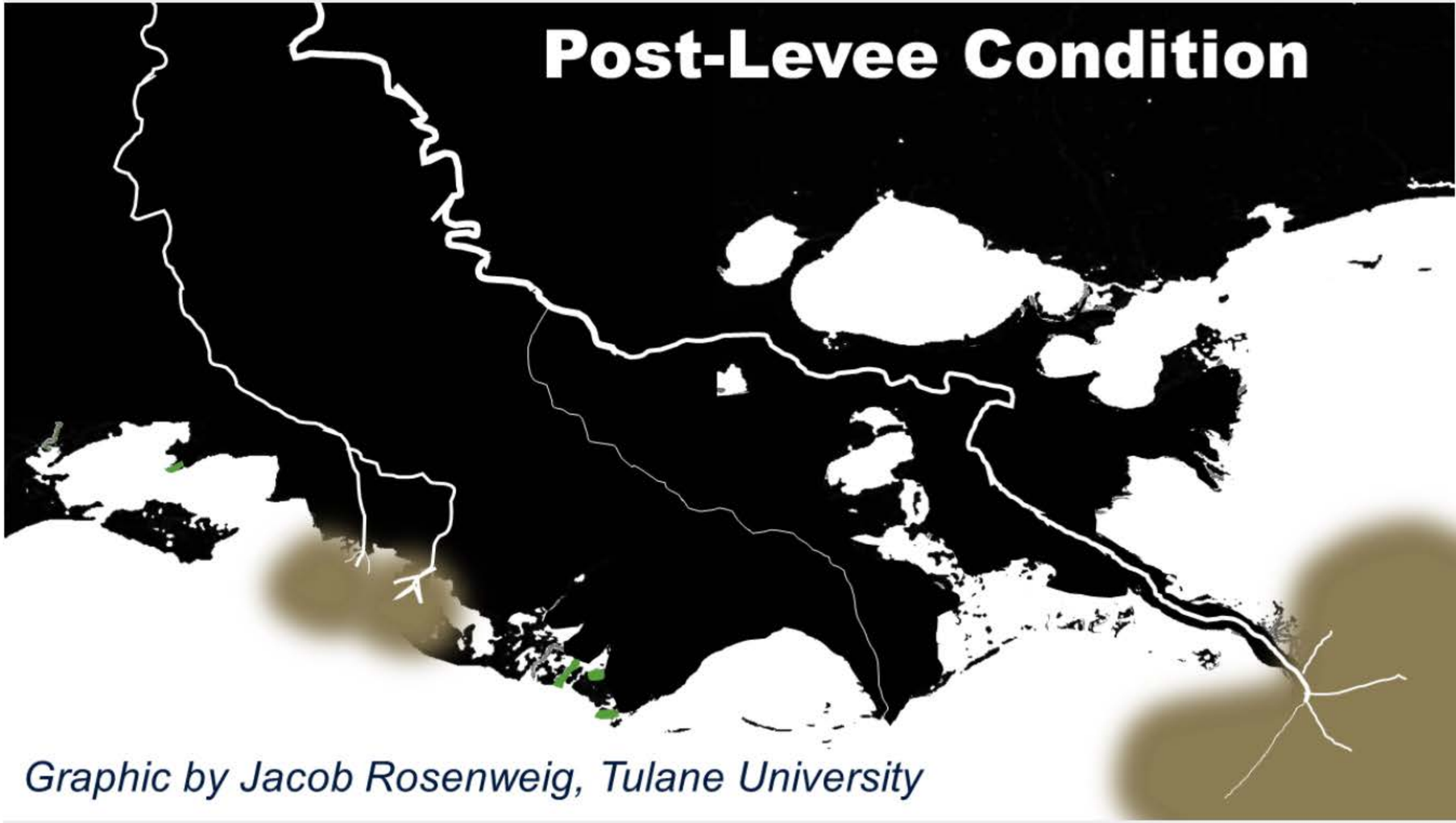
Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

A constrained system

Engineered systems in Orleans and Jefferson parishes providing water management from Lake Pontchartrain



Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

Fluvial floods

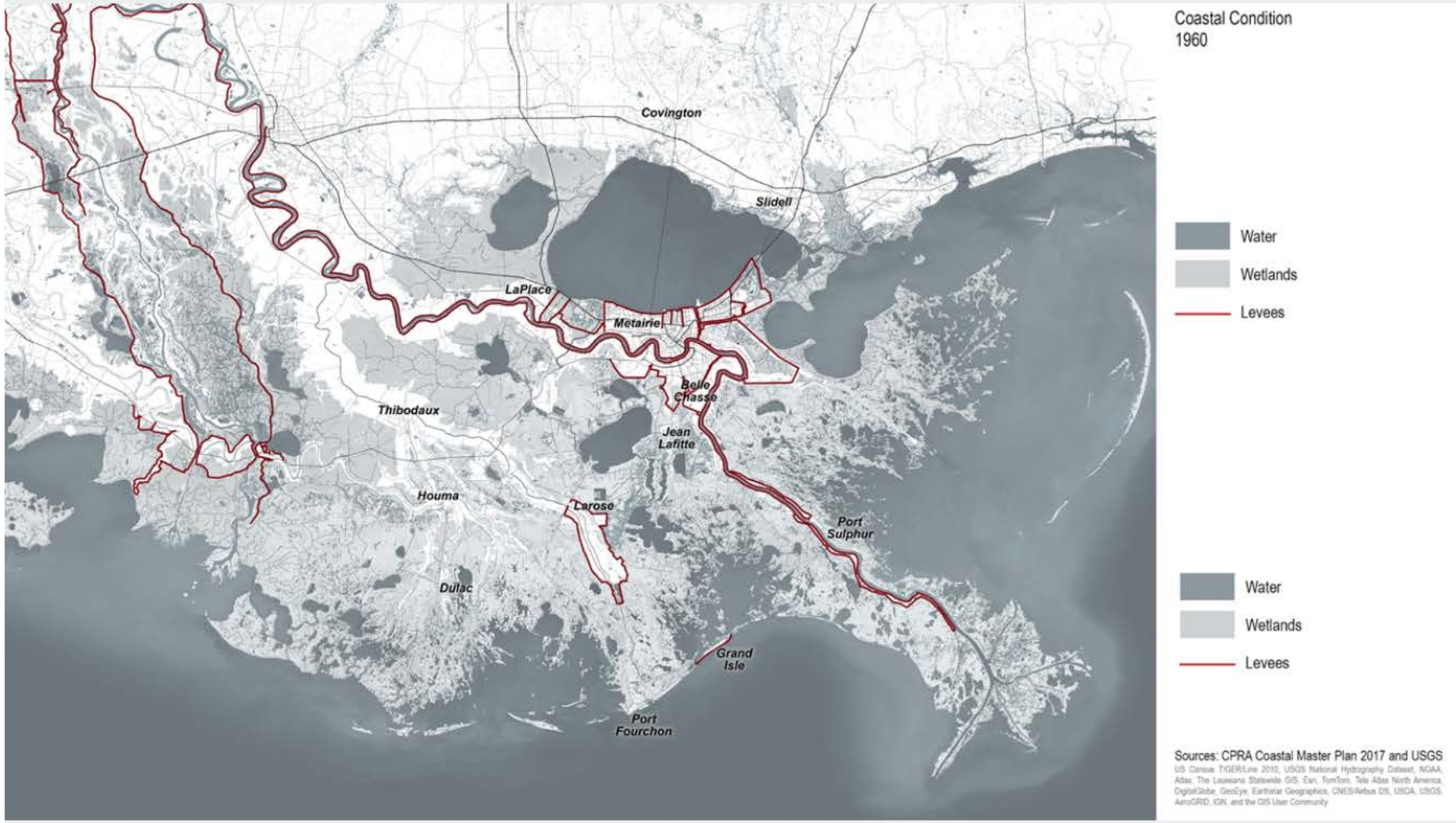
Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

A constrained system

Engineered systems in Orleans and Jefferson parishes providing water management from Lake Pontchartrain

Coastal floods: surge and tidal

Storm surge from the winds and waves of tropical storms and hurricanes causes coastal flooding. The changing tides also have a compounding impact on these types of floods.



Fluvial floods

Fluvial floods occur when excessive rain falls over an extended period of time and causes a river to exceed its capacity. A river's capacity is often monitored by checking the height of a river's crest. These events can cause dams and dikes to break and inundate nearby areas.

A constrained system

Engineered systems in Orleans and Jefferson parishes providing water management from Lake Pontchartrain

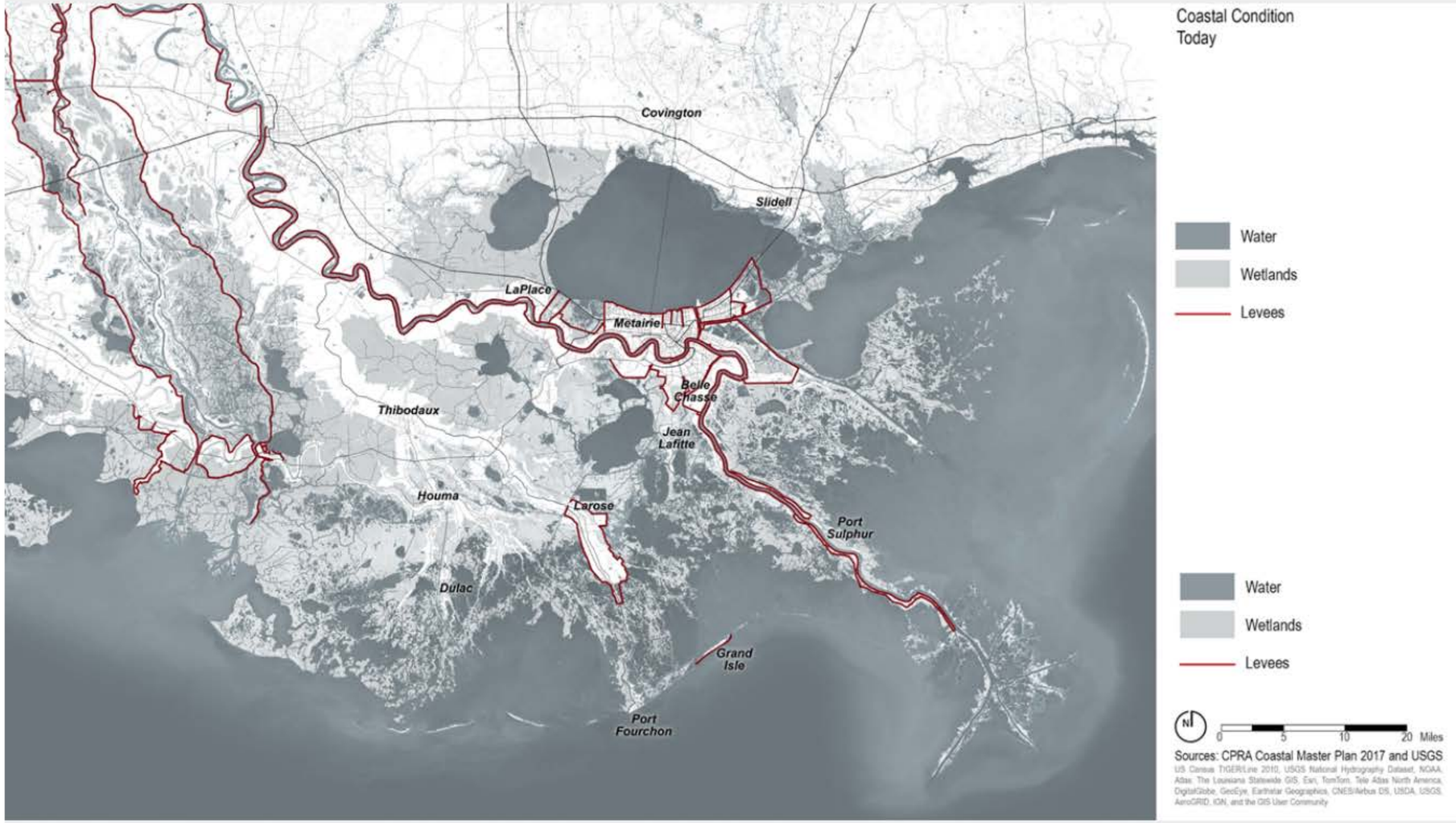
Coastal floods: surge and tidal

Storm surge from the winds and waves of tropical storms and hurricanes causes coastal flooding. The changing tides also have a compounding impact on these types of floods.

Future flood risk: coastal surge floods

Future flood risk is understood in terms of how severe future events may be and how often they will occur. This is reflected as a probability:

- **1% annual chance event**: 26% chance of at least one event in any 30-year period (commonly known as a 100-year event)



A constrained system

Engineered systems in Orleans and Jefferson parishes providing water management from Lake Pontchartrain

Coastal floods: surge and tidal

Storm surge from the winds and waves of tropical storms and hurricanes causes coastal flooding. The changing tides also have a compounding impact on these types of floods.

Future flood risk: coastal surge floods

Future flood risk is understood in terms of how severe future events may be and how often they will occur. This is reflected as a probability:

- **1% annual chance event:** 26% chance of at least one event in any 30-year period (commonly known as a 100-year event)
- **0.2% annual chance event:** more severe and less likely to happen (commonly known as a 500-year event)

Source: 2017 Coastal Master Plan modeling analysis, Coastal Louisiana Risk Assessment model grid

Coastal flooding

Coastal high tide flooding in Plaquemines Parish

Coastal floods: surge and tidal

Storm surge from the winds and waves of tropical storms and hurricanes causes coastal flooding. The changing tides also have a compounding impact on these types of floods.

Future flood risk: coastal surge floods

Future flood risk is understood in terms of how severe future events may be and how often they will occur. This is reflected as a probability:

- **1% annual chance event:** 26% chance of at least one event in any 30-year period (commonly known as a 100-year event)
- **0.2% annual chance event:** more severe and less likely to happen (commonly known as a 500-year event)

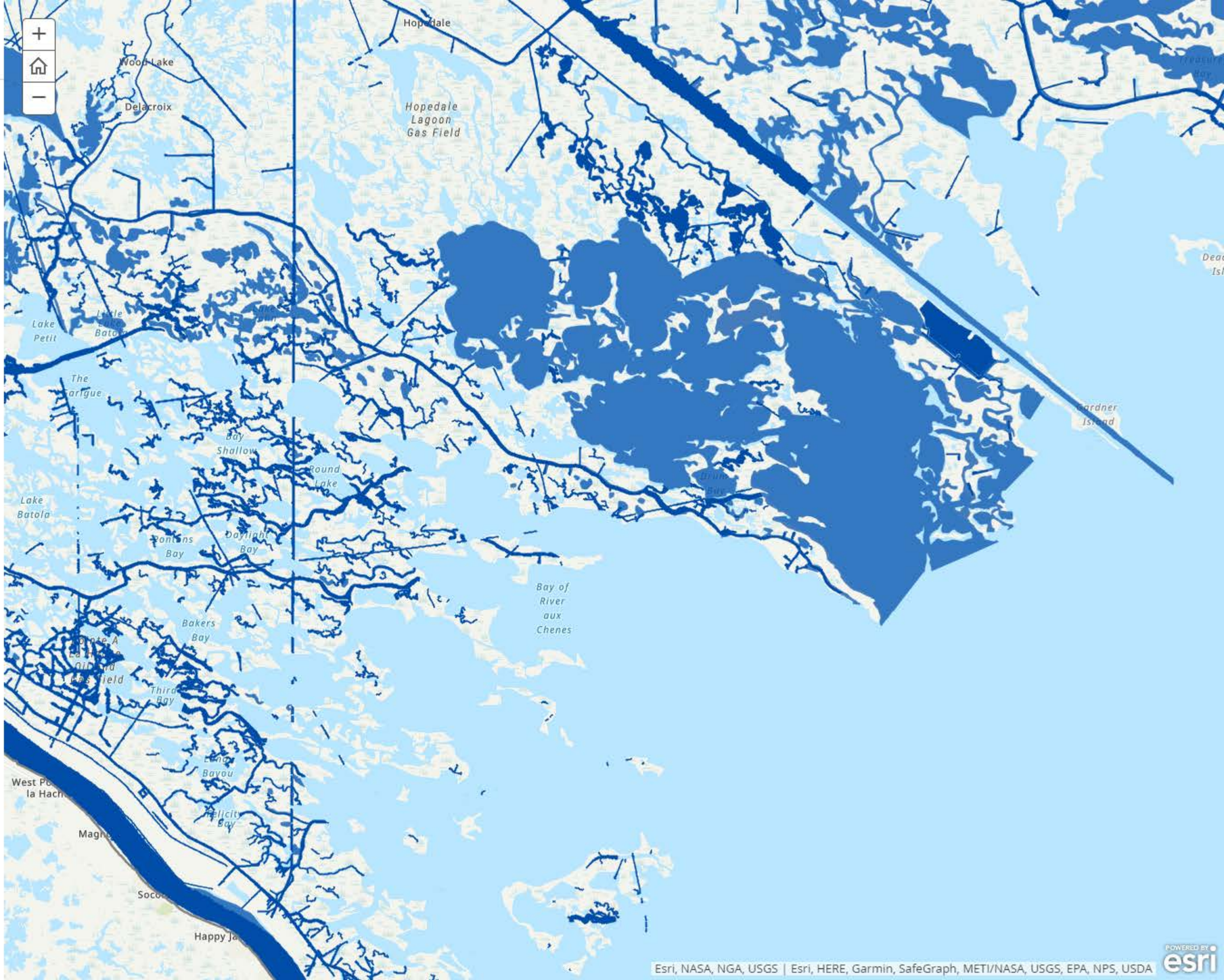
Source: 2017 Coastal Master Plan modeling analysis, Coastal Louisiana Risk Assessment model grid

Coastal flooding

Coastal high tide flooding in Plaquemines Parish

Coastal flooding

Flooding in Braithwaite after Hurricane Isaac



Future flood risk: coastal surge floods

Future flood risk is understood in terms of how severe future events may be and how often they will occur. This is reflected as a probability:

- **1% annual chance event:** 26% chance of at least one event in any 30-year period (commonly known as a 100-year event)
- **0.2% annual chance event:** more severe and less likely to happen (commonly known as a 500-year event)

Source: 2017 Coastal Master Plan modeling analysis, Coastal Louisiana Risk Assessment model grid

Coastal flooding

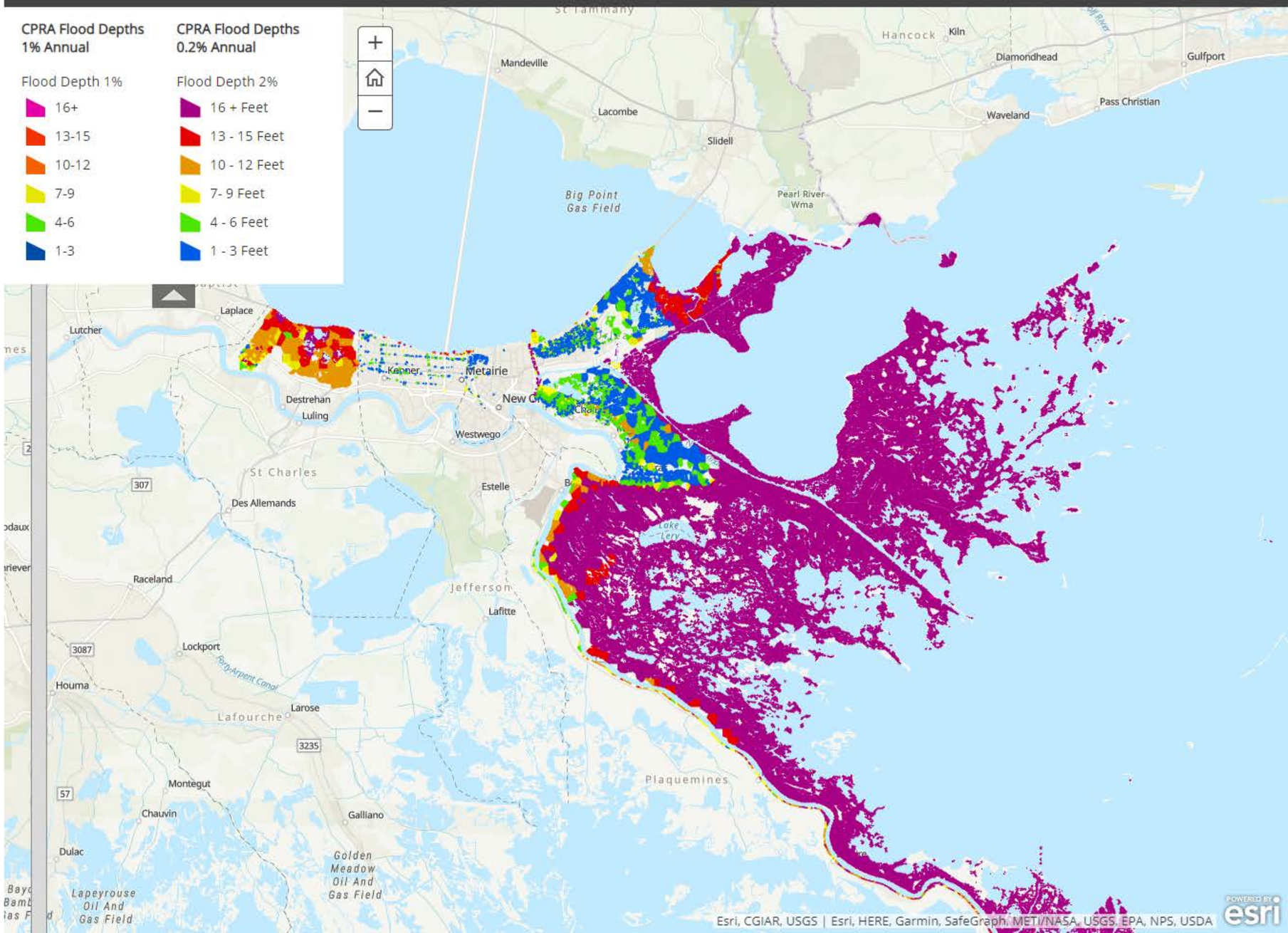
Coastal high tide flooding in Plaquemines Parish

Coastal flooding

Flooding in Braithwaite after Hurricane Isaac

Pluvial floods

Pluvial, or rainfall-induced, floods result from intense rain that causes surface, flash or urban flooding. These events are independent, not caused by an overflowing body of water.



Future flood risk: coastal surge floods

Future flood risk is understood in terms of how severe future events may be and how often they will occur. This is reflected as a probability:

- **1% annual chance event:** 26% chance of at least one event in any 30-year period (commonly known as a 100-year event)
- **0.2% annual chance event:** more severe and less likely to happen (commonly known as a 500-year event)

Source: 2017 Coastal Master Plan modeling analysis, Coastal Louisiana Risk Assessment model grid

Coastal flooding

Coastal high tide flooding in Plaquemines Parish

Coastal flooding

Flooding in Braithwaite after Hurricane Isaac

Pluvial floods

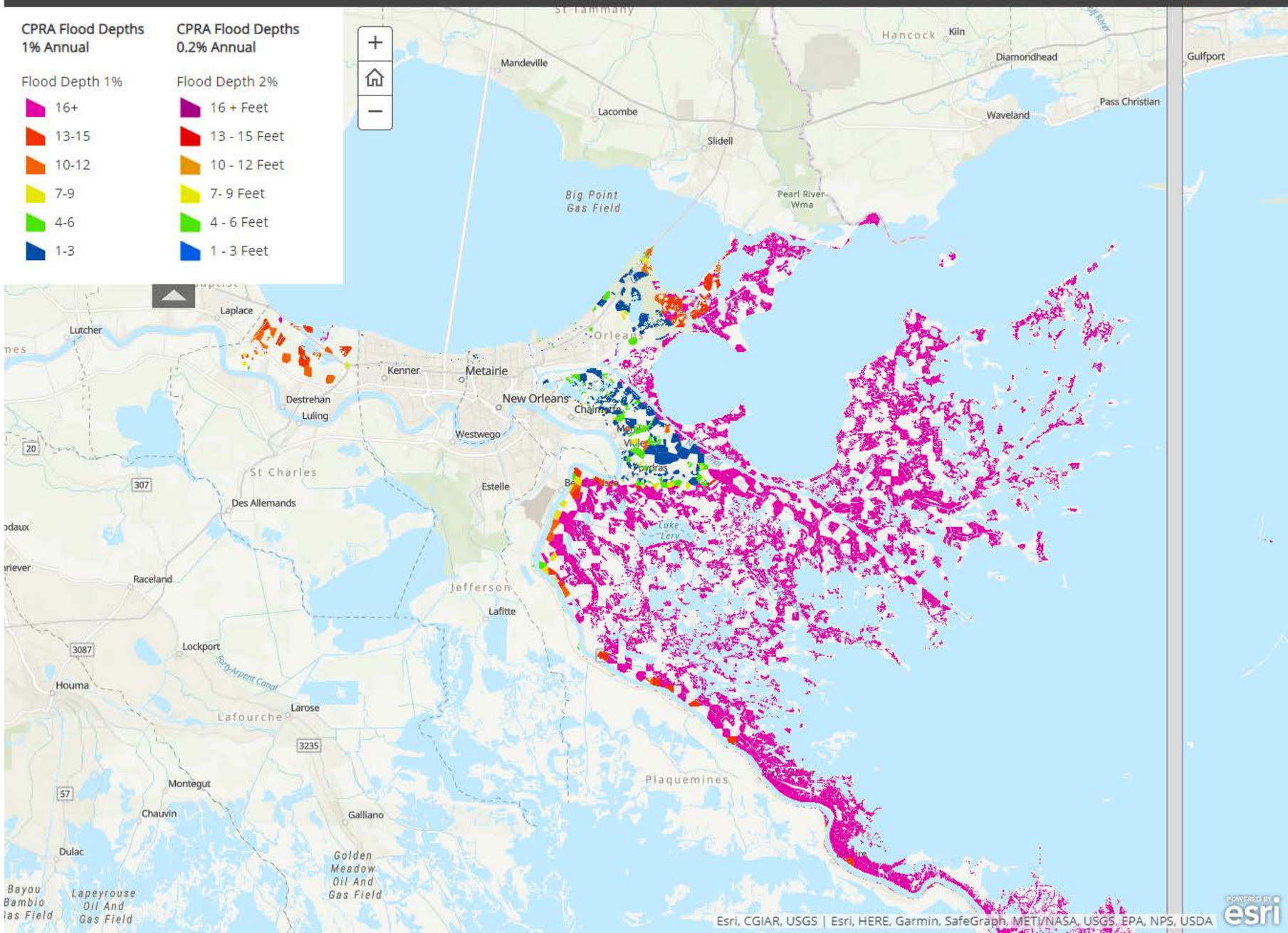
Pluvial, or rainfall-induced, floods result from intense rain that causes surface, flash or urban flooding. These events are independent, not caused by an overflowing body of water.

1% and 0.2% Flood Depths

1% Annual Chance on Left 0.2% Annual Chance on the Right

Switch to builder mode

A Story Map



Coastal flooding

Coastal high tide flooding in Plaquemines Parish

Coastal flooding

Flooding in Braithwaite after Hurricane Isaac

Pluvial floods

Pluvial, or rainfall-induced, floods result from intense rain that causes surface, flash or urban flooding. These events are independent, not caused by an overflowing body of water.

Extreme rainfall or precipitation

Louisiana has some of the highest rainfall rates in the country on an average statewide basis and often experiences high water levels in its major riverine systems.

Because of our flat landscape and interconnected waterways, the impact of a rainfall event in one part of the state is often felt far beyond the boundaries of where the rain falls.

Coastal flooding

Flooding in Braithwaite after Hurricane Isaac

Pluvial floods

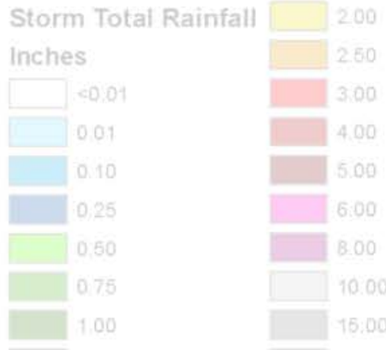
Pluvial, or rainfall-induced, floods result from intense rain that causes surface, flash or urban flooding. These events are independent, not caused by an overflowing body of water.

Extreme rainfall or precipitation

Louisiana has some of the highest rainfall rates in the country on an average statewide basis and often experiences high water levels in its major riverine systems.

Because of our flat landscape and interconnected waterways, the impact of a rainfall event in one part of the state is often felt far beyond the boundaries of where the rain falls.

August 2016 flood



Pluvial floods

Pluvial, or rainfall-induced, floods result from intense rain that causes surface, flash or urban flooding. These events are independent, not caused by an overflowing body of water.

Extreme rainfall or precipitation

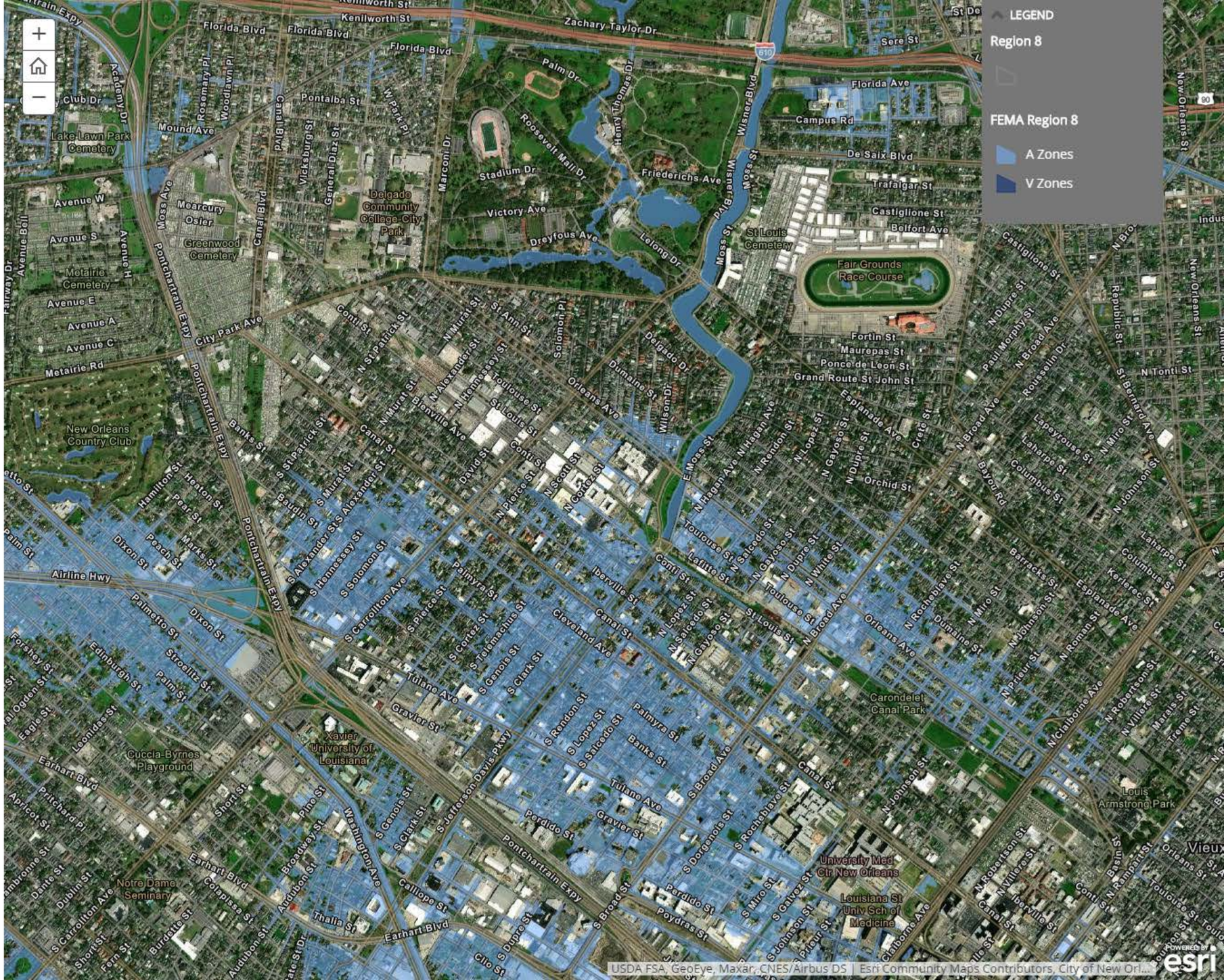
Louisiana has some of the highest rainfall rates in the country on an average statewide basis and often experiences high water levels in its major riverine systems.

Because of our flat landscape and interconnected waterways, the impact of a rainfall event in one part of the state is often felt far beyond the boundaries of where the rain falls.

August 2016 flood

Storm Total Rainfall
Inches

<0.01	2.00
0.01	2.50
0.10	3.00
0.25	4.00
0.50	5.00
0.75	6.00
1.00	8.00
1.50	10.00
	15.00
	20.00+



Extreme rainfall or precipitation

Extreme rainfall or precipitation

Louisiana has some of the highest rainfall rates in the country on an average statewide basis and often experiences high water levels in its major riverine systems.

Because of our flat landscape and interconnected waterways, the impact of a rainfall event in one part of the state is often felt far beyond the boundaries of where the rain falls.

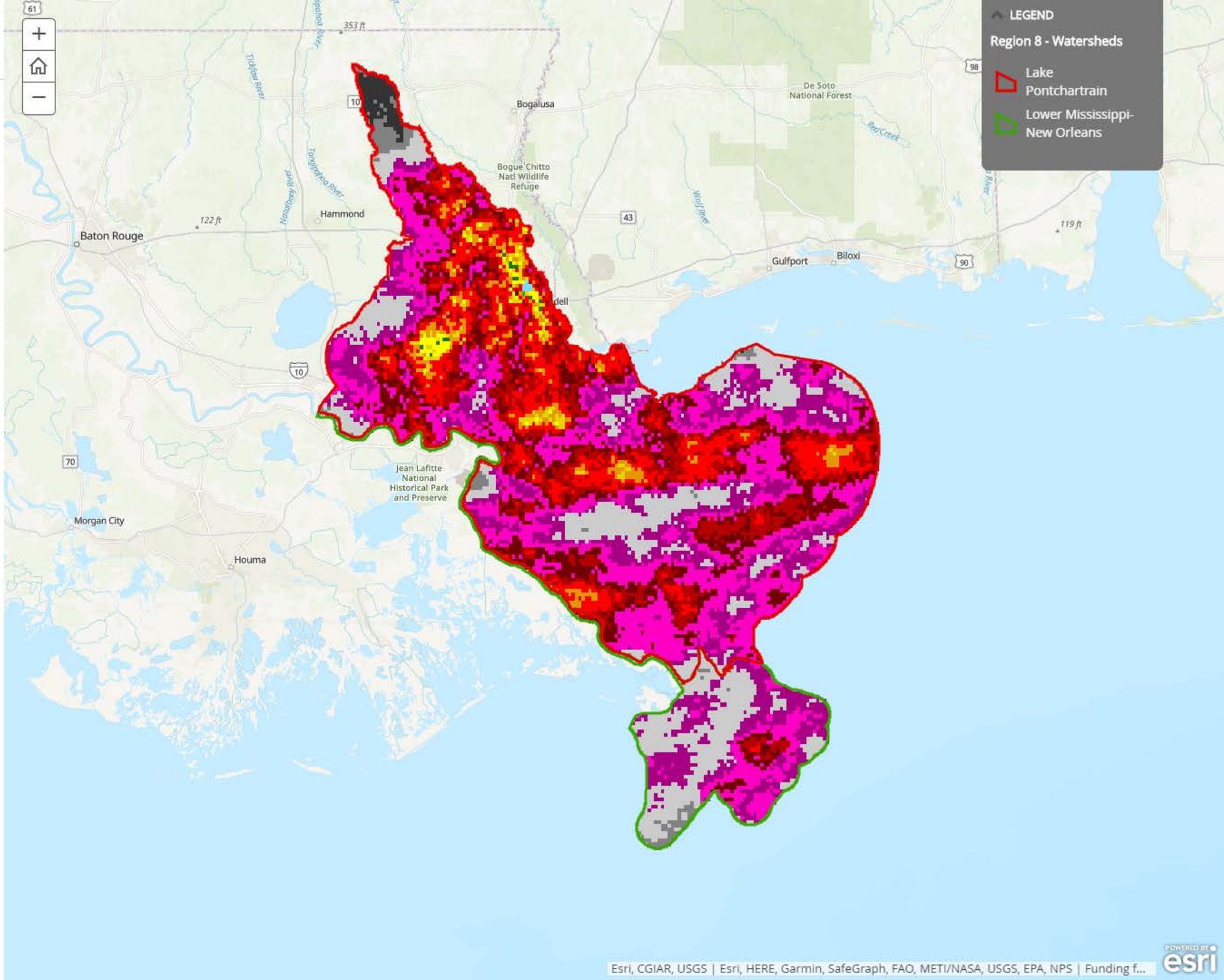
August 2016 flood

Storm Total Rainfall Inches			
<0.01		2.00	
0.01		2.50	
0.10		3.00	
0.25		4.00	
0.50		5.00	
0.75		6.00	
1.00		8.00	
1.50		10.00	
		15.00	
		20.00+	

Extreme rainfall or precipitation

August 2017 flash flood event

Storm Total Rainfall Inches			
<0.01		2.00	
0.01		2.50	
0.10		3.00	
		4.00	
		5.00	



Extreme rainfall or precipitation

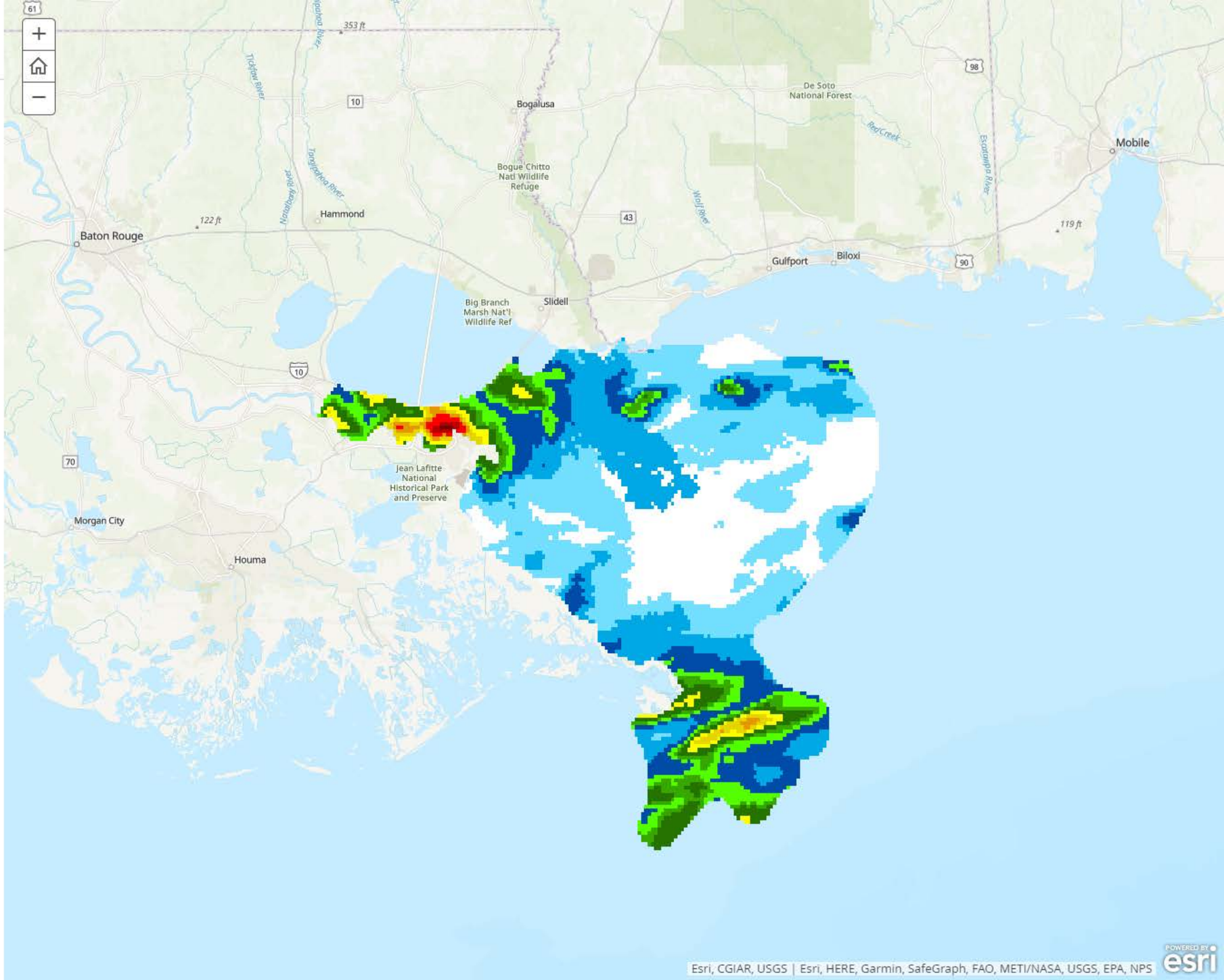
August 2017 flash flood event

Storm Total Rainfall Inches			
<0.01	0.01	0.10	0.25
0.50	0.75	1.00	1.50
2.00	2.50	3.00	4.00
5.00	6.00	8.00	10.00
15.00	20.00+		

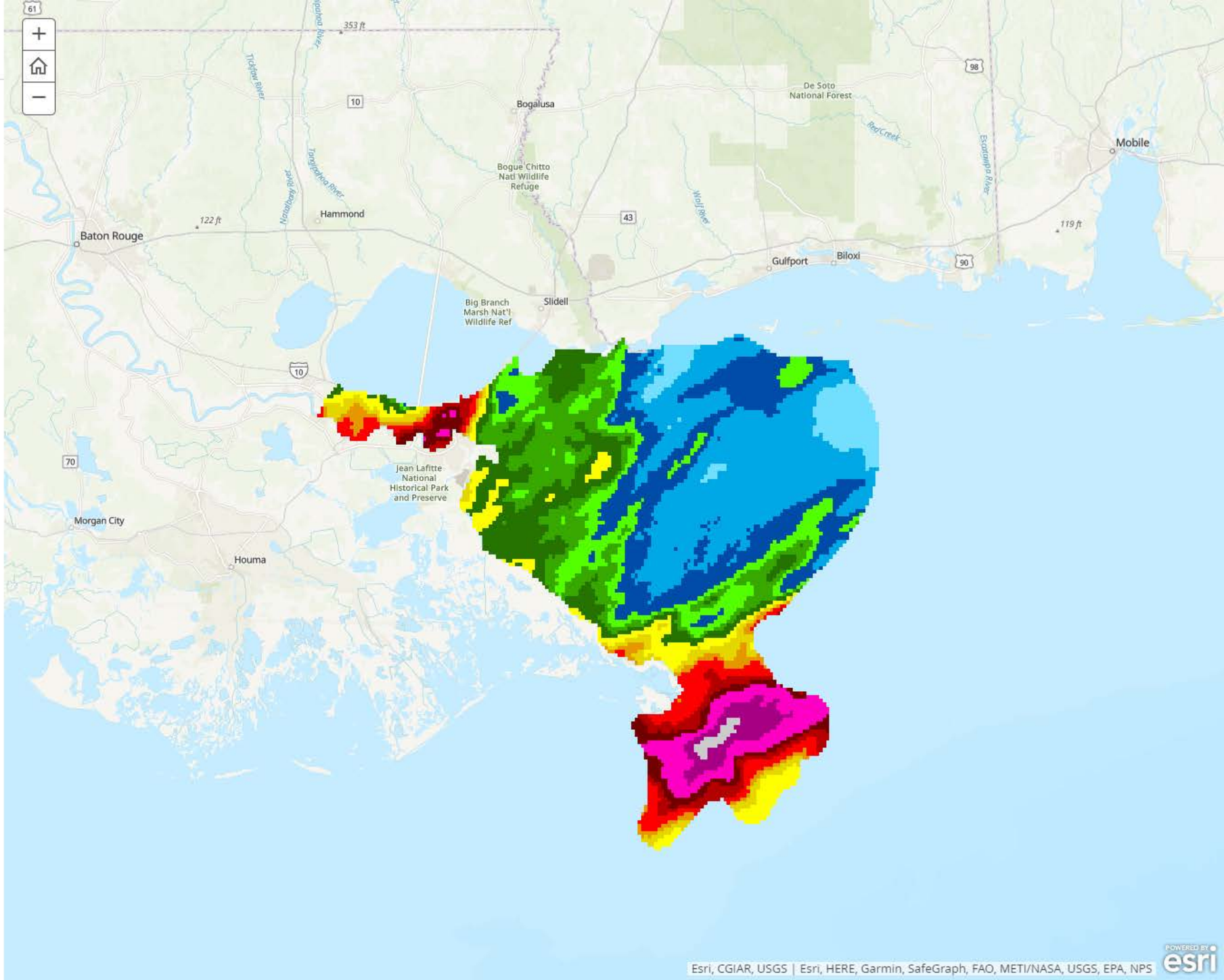
Extreme rainfall or precipitation

July 2019 flash flood event

Storm Total Rainfall Inches			
<0.01	0.01	0.10	0.25
0.50	0.75	1.00	1.50
2.00	2.50	3.00	4.00
5.00	6.00	8.00	10.00
15.00	20.00+		



Extreme rainfall or precipitation



Extreme rainfall

Pluvial flood in Orleans Parish at Bayou St. John in July 2019

Extreme rainfall

Pluvial flood in Orleans Parish at Bayou St. John in July 2019

Rainfall study

In a regional study of precipitation trends, LSU professor Dr. Vincent Brown reported the following findings:

Extreme rainfall

Pluvial flood in Orleans Parish at Bayou St. John in July 2019

Extreme rainfall

Pluvial flood in Orleans Parish at Bayou St. John in July 2019

Rainfall study

In a regional study of precipitation trends, LSU professor Dr. Vincent Brown reported the following findings:

- While total precipitation has remained stable, it is occurring in shorter, more intense events.
- Precipitation during 1% events increased by 18% since 1901 (1901-2016) and 27% since 1958 (1958-2016).
- Precipitation is projected to increase 10% to 29% by 2099 depending on emissions levels.
- These more intense rainfall events increase flood risk because they are more likely to overwhelm the drainage systems.

Citation: Brown, V.M., Keim, B.D., and Black, A.W., 2019. Climatology and trends in hourly precipitation for the southeast United States. Journal of Hydrometeorology, 20(8), pp.1737-1755.; V.M. Brown personal communication, July 17 & July 24, 2020.

Traditional gaps in understanding flood risk

Extreme rainfall

Pluvial flood in Orleans Parish at Bayou St. John in July 2019

Rainfall study

In a regional study of precipitation trends, LSU professor Dr. Vincent Brown reported the following findings:

- While total precipitation has remained stable, it is occurring in shorter, more intense events.
- Precipitation during 1% events increased by 18% since 1901 (1901-2016) and 27% since 1958 (1958-2016).
- Precipitation is projected to increase 10% to 29% by 2099 depending on emissions levels.
- These more intense rainfall events increase flood risk because they are more likely to overwhelm the drainage systems.

Citation: Brown, V.M., Keim, B.D., and Black, A.W., 2019. Climatology and trends in hourly precipitation for the southeast United States. Journal of Hydrometeorology, 20(8), pp.1737-1755.; V.M. Brown personal communication, July 17 & July 24, 2020.

Traditional gaps in understanding flood risk

The Federal Emergency Management Agency is responsible for mapping the nation's hazardous flood areas.

FEMA Special Flood Hazard Areas:

- Provide a basis for flood insurance rates and floodplain management regulations nationwide

Rainfall study

In a regional study of precipitation trends, LSU professor Dr. Vincent Brown reported the following findings:

- While total precipitation has remained stable, it is occurring in shorter, more intense events.
- Precipitation during 1% events increased by 18% since 1901 (1901-2016) and 27% since 1958 (1958-2016).
- Precipitation is projected to increase 10% to 29% by 2099 depending on emissions levels.
- These more intense rainfall events increase flood risk because they are more likely to overwhelm the drainage systems.

Citation: Brown, V.M., Keim, B.D., and Black, A.W., 2019. Climatology and trends in hourly precipitation for the southeast United States. Journal of Hydrometeorology, 20(8), pp.1737-1755.; V.M. Brown personal communication, July 17 & July 24, 2020.

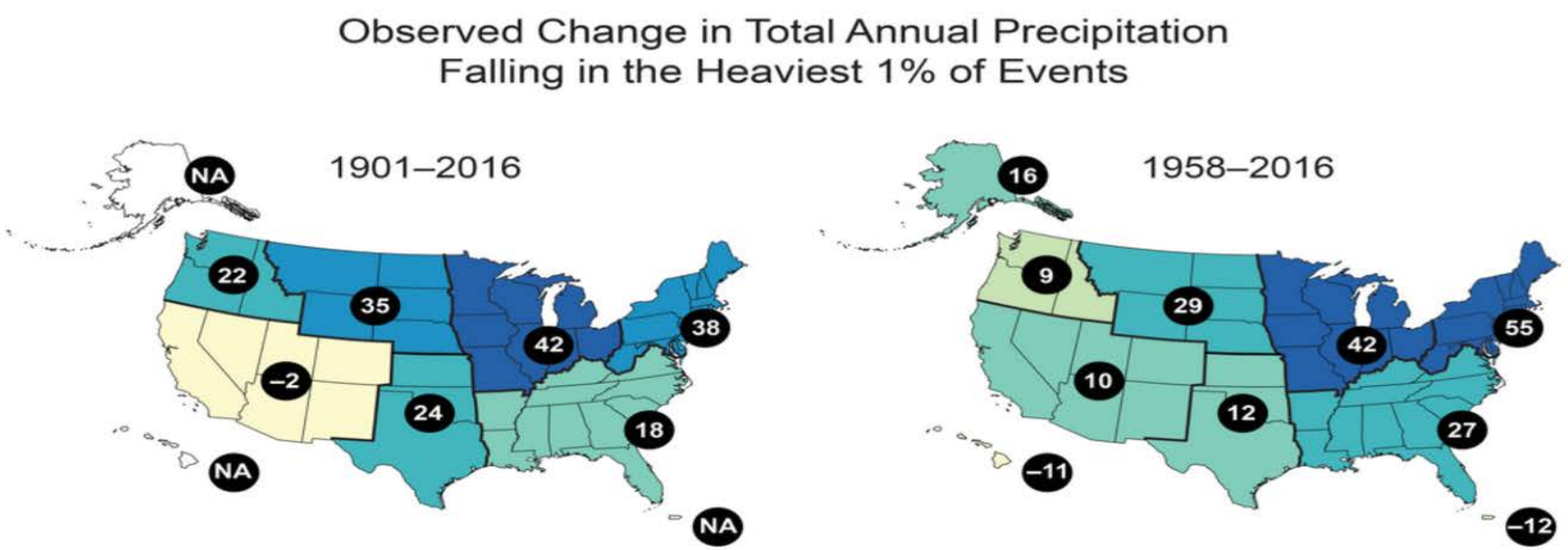
Traditional gaps in understanding flood risk

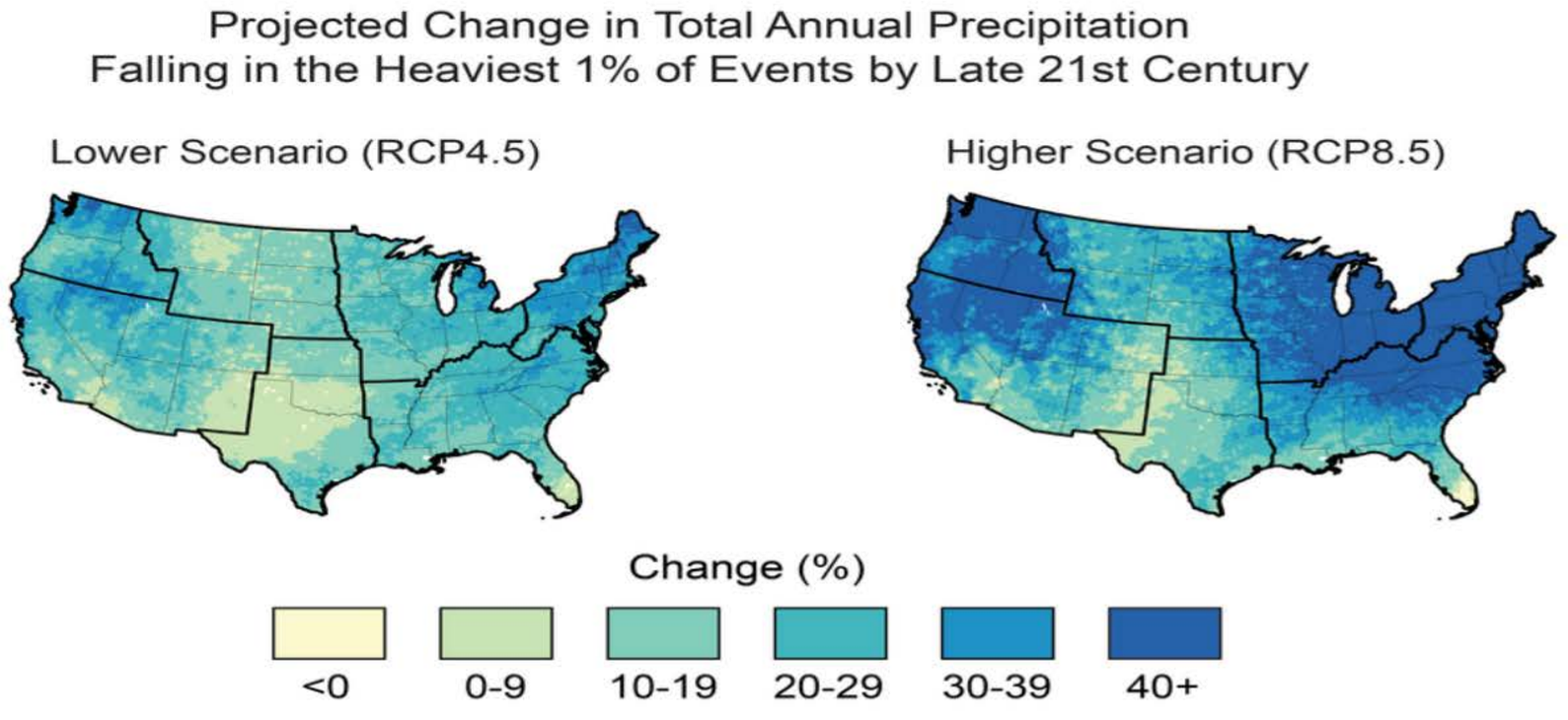
The Federal Emergency Management Agency is responsible for mapping the nation's hazardous flood areas.

FEMA Special Flood Hazard Areas:

- Provide a basis for flood insurance rates and floodplain management regulations nationwide
- Inform mapped communities about their flood vulnerability
- Impact development of the built environment

Region 8: 95% is located in a SFHA and is subject to flooding.





Traditional gaps in understanding flood risk

The Federal Emergency Management Agency is responsible for mapping the nation's hazardous flood areas.

FEMA Special Flood Hazard Areas:

- Provide a basis for flood insurance rates and floodplain management regulations nationwide
- Inform mapped communities about their flood vulnerability
- Impact development of the built environment

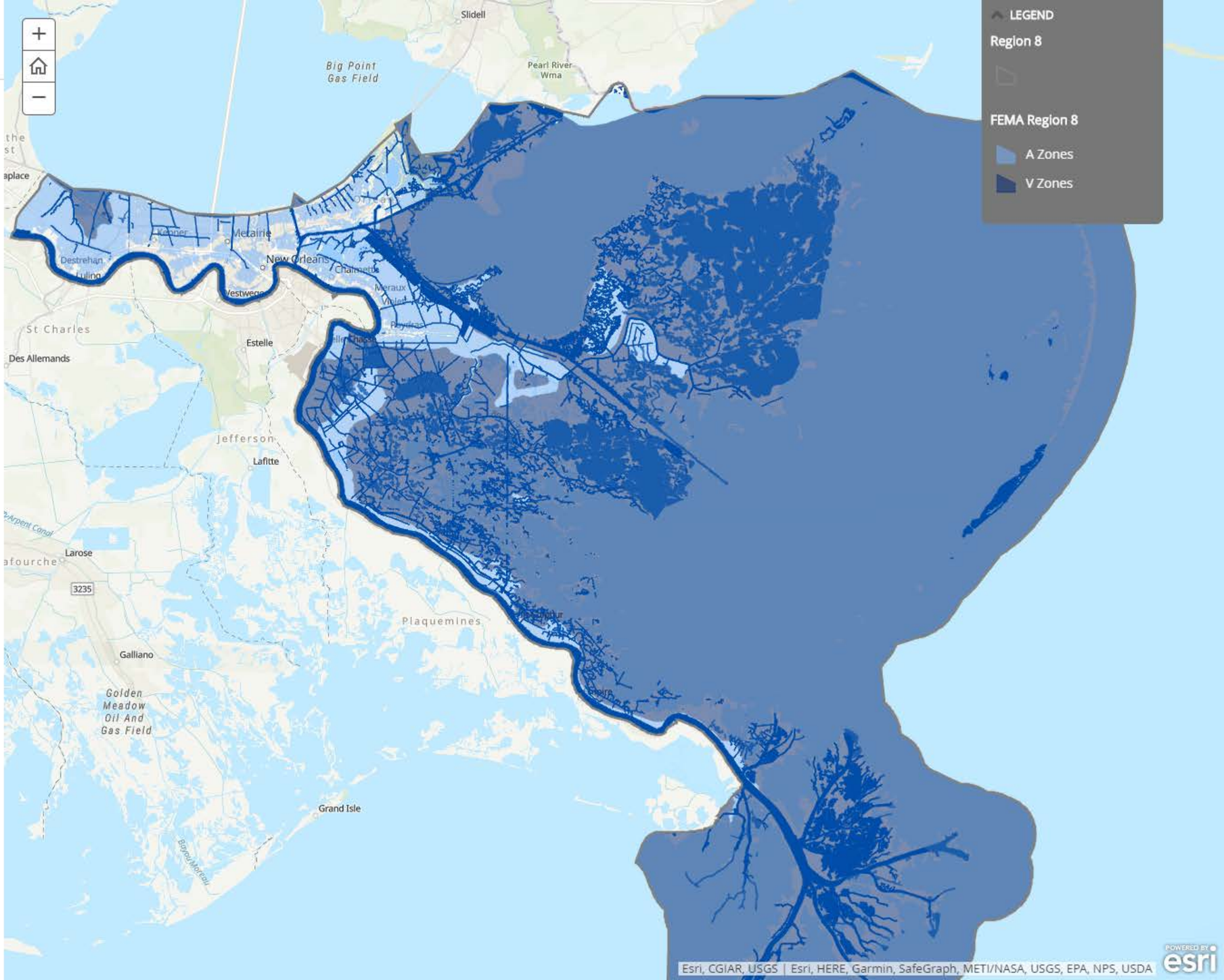
Region 8: 95% is located in a SFHA and is subject to flooding.

Traditional gaps in understanding flood risk

A Zones (shown in light blue)
Special Flood Hazard Areas – High Risk
Special Flood Hazard Areas represent the area subject to inundation by a 1% annual chance flood. Structures located within SFHA have a 26% chance of flooding during the life of a standard 30-year mortgage. Federal floodplain management regulations and mandatory flood insurance requirements apply in these zones.

A ZONES

V Zones (shown in dark blue)
Coastal High Hazard Areas – High Risk
Coastal High Hazard Areas represent the area subject to inundation by a 1% annual chance flood, extending from offshore to the inland limit of a primary frontal dune along an



Traditional gaps in understanding flood risk

A Zones (shown in light blue)
Special Flood Hazard Areas – High Risk
Special Flood Hazard Areas represent the area subject to inundation by a 1% annual chance flood. Structures located within SFHA have a 26% chance of flooding during the life of a standard 30-year mortgage. Federal floodplain management regulations and mandatory flood insurance requirements apply in these zones.

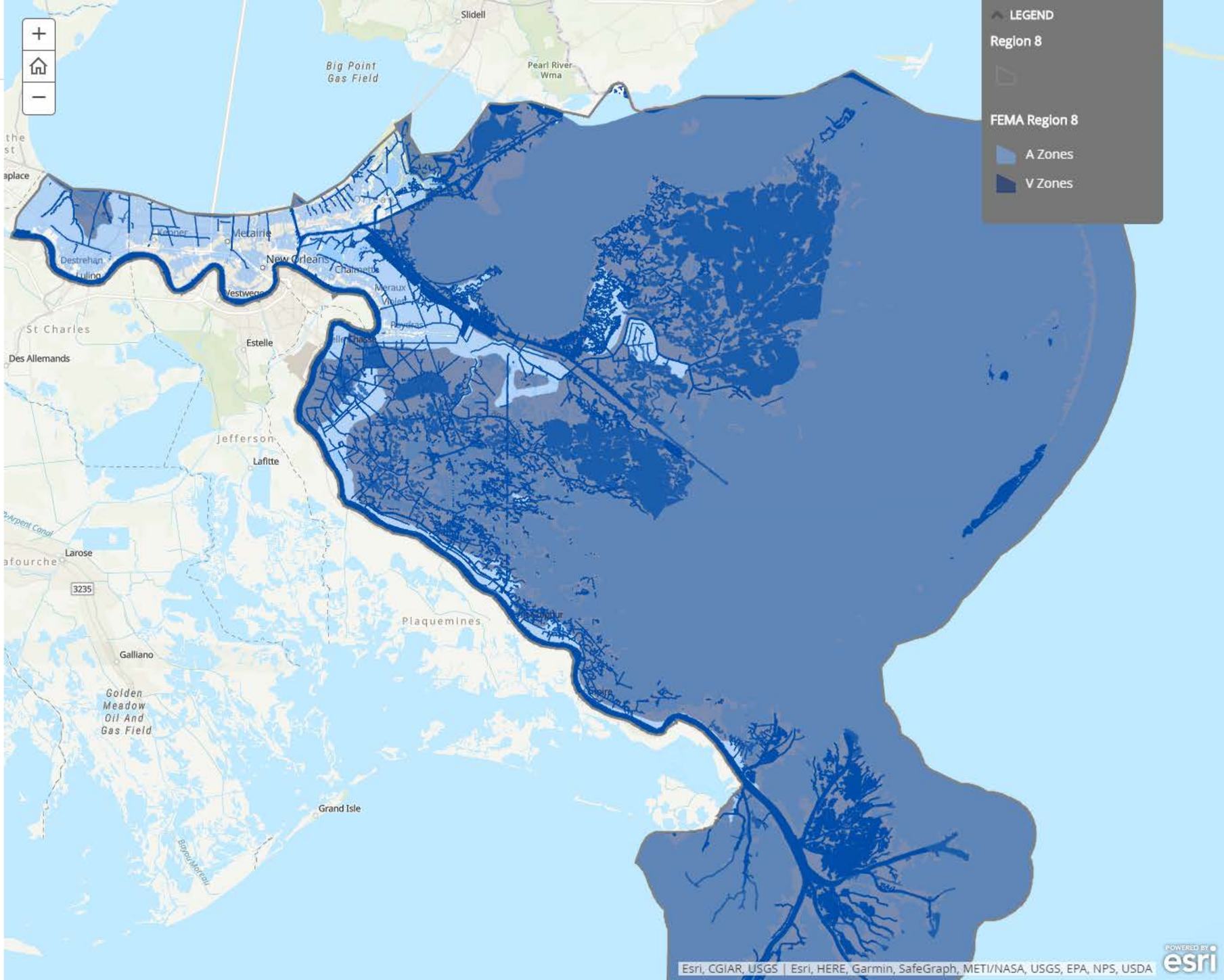
A ZONES

V Zones (shown in dark blue)
Coastal High Hazard Areas – High Risk
Coastal High Hazard Areas represent the area subject to inundation by a 1% annual chance flood, extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. Structures located within CHHA have a 26% chance of flooding during the life of a standard 30-year mortgage. Federal floodplain management regulations and mandatory flood insurance requirements apply in these zones.

V ZONES

FEMA Repetitive and Severe Repetitive Loss data

A Repetitive Loss structure is an NFIP-insured property that has had at least two paid flood losses of more than $1,000 each in any 10-year period since 1978.



Traditional gaps in understanding flood risk

A Zones (shown in light blue)

Special Flood Hazard Areas – High Risk

Special Flood Hazard Areas represent the area subject to inundation by a 1% annual chance flood. Structures located within SFHA have a 26% chance of flooding during the life of a standard 30-year mortgage. Federal floodplain management regulations and mandatory flood insurance requirements apply in these zones.

A ZONES

V Zones (shown in dark blue)

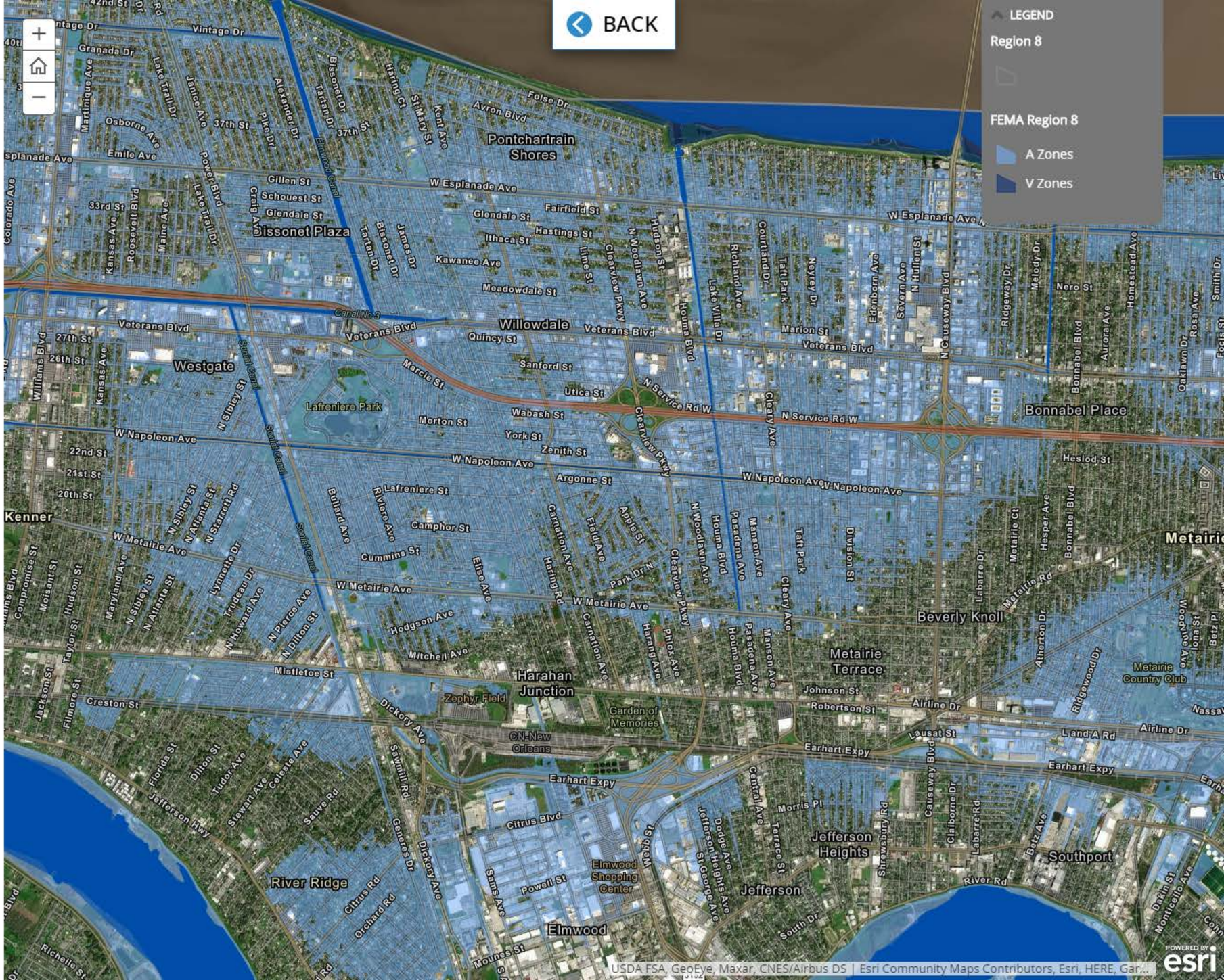
Coastal High Hazard Areas – High Risk

Coastal High Hazard Areas represent the area subject to inundation by a 1% annual chance flood, extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. Structures located within CHHA have a 26% chance of flooding during the life of a standard 30-year mortgage. Federal floodplain management regulations and mandatory flood insurance requirements apply in these zones.

V ZONES

FEMA Repetitive and Severe Repetitive Loss data

A Repetitive Loss structure is an NFIP-insured property that has had at least two paid flood losses of more than $1,000 each in any 10-year period since 1978.



Traditional gaps in understanding flood risk

A Zones (shown in light blue)
Special Flood Hazard Areas – High Risk
Special Flood Hazard Areas represent the area subject to inundation by a 1% annual chance flood. Structures located within SFHA have a 26% chance of flooding during the life of a standard 30-year mortgage. Federal floodplain management regulations and mandatory flood insurance requirements apply in these zones.

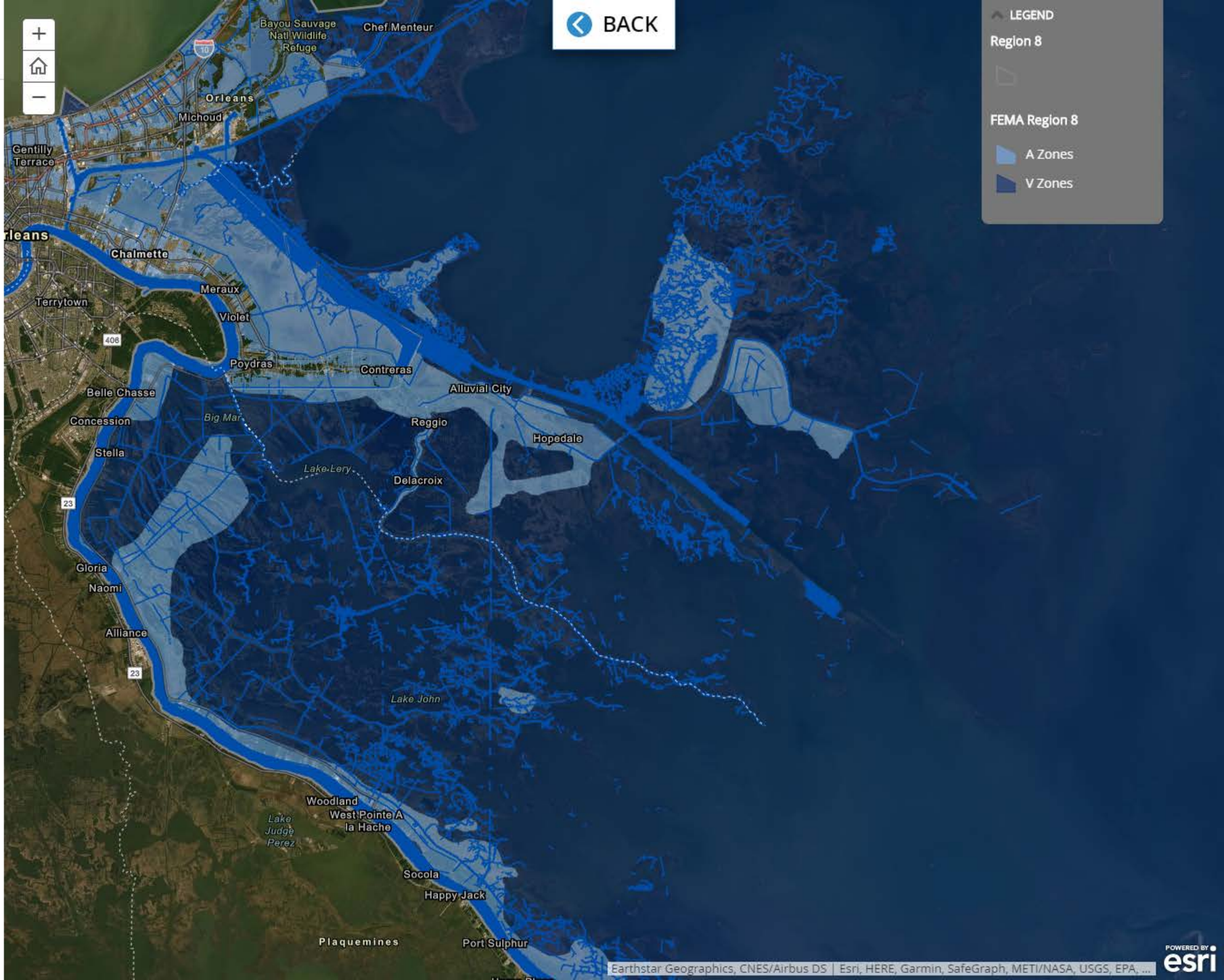
A ZONES

V Zones (shown in dark blue)
Coastal High Hazard Areas – High Risk
Coastal High Hazard Areas represent the area subject to inundation by a 1% annual chance flood, extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. Structures located within CHHA have a 26% chance of flooding during the life of a standard 30-year mortgage. Federal floodplain management regulations and mandatory flood insurance requirements apply in these zones.

V ZONES

FEMA Repetitive and Severe Repetitive Loss data

A Repetitive Loss structure is an NFIP-insured property that has had at least two paid flood losses of more than $1,000 each in any 10-year period since 1978.



FEMA Repetitive and Severe Repetitive Loss data

A Repetitive Loss structure is an NFIP-insured property that has had at least two paid flood losses of more than $1,000 each in any 10-year period since 1978.

A Severe Repetitive Loss structure is an NFIP-insured property that meets at least one of the following criteria:

- At least four NFIP claim payments (including building and contents) over $5,000 each with the cumulative amount of such claims exceeding $20,000
- At least two separate claims payments (building payments only) with the cumulative amount of the building portion of such claims exceeding the market value of the building

New Orleans area

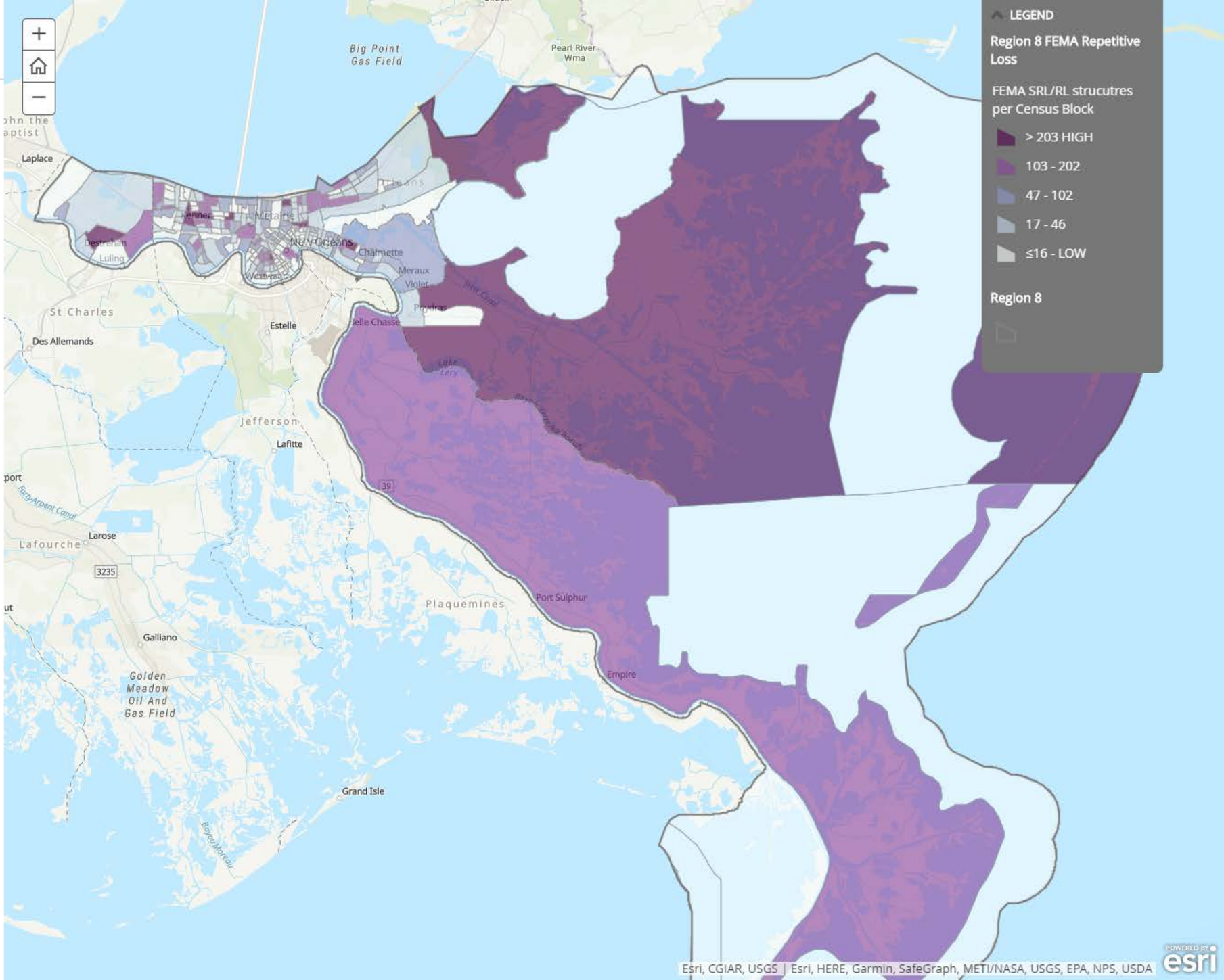
Kenner

CDC Social Vulnerability Index

Natural disasters disproportionately impact socially vulnerable populations. Understanding and addressing vulnerability can help mitigate suffering and recovery costs.

Social vulnerability is based on the following factors:

- Socioeconomic status
- Household composition and disability
- Minority status and language
- Housing and transportation



FEMA Repetitive and Severe Repetitive Loss data

A Repetitive Loss structure is an NFIP-insured property that has had at least two paid flood losses of more than $1,000 each in any 10-year period since 1978.

A Severe Repetitive Loss structure is an NFIP-insured property that meets at least one of the following criteria:

- At least four NFIP claim payments (including building and contents) over $5,000 each with the cumulative amount of such claims exceeding $20,000
- At least two separate claims payments (building payments only) with the cumulative amount of the building portion of such claims exceeding the market value of the building

New Orleans area

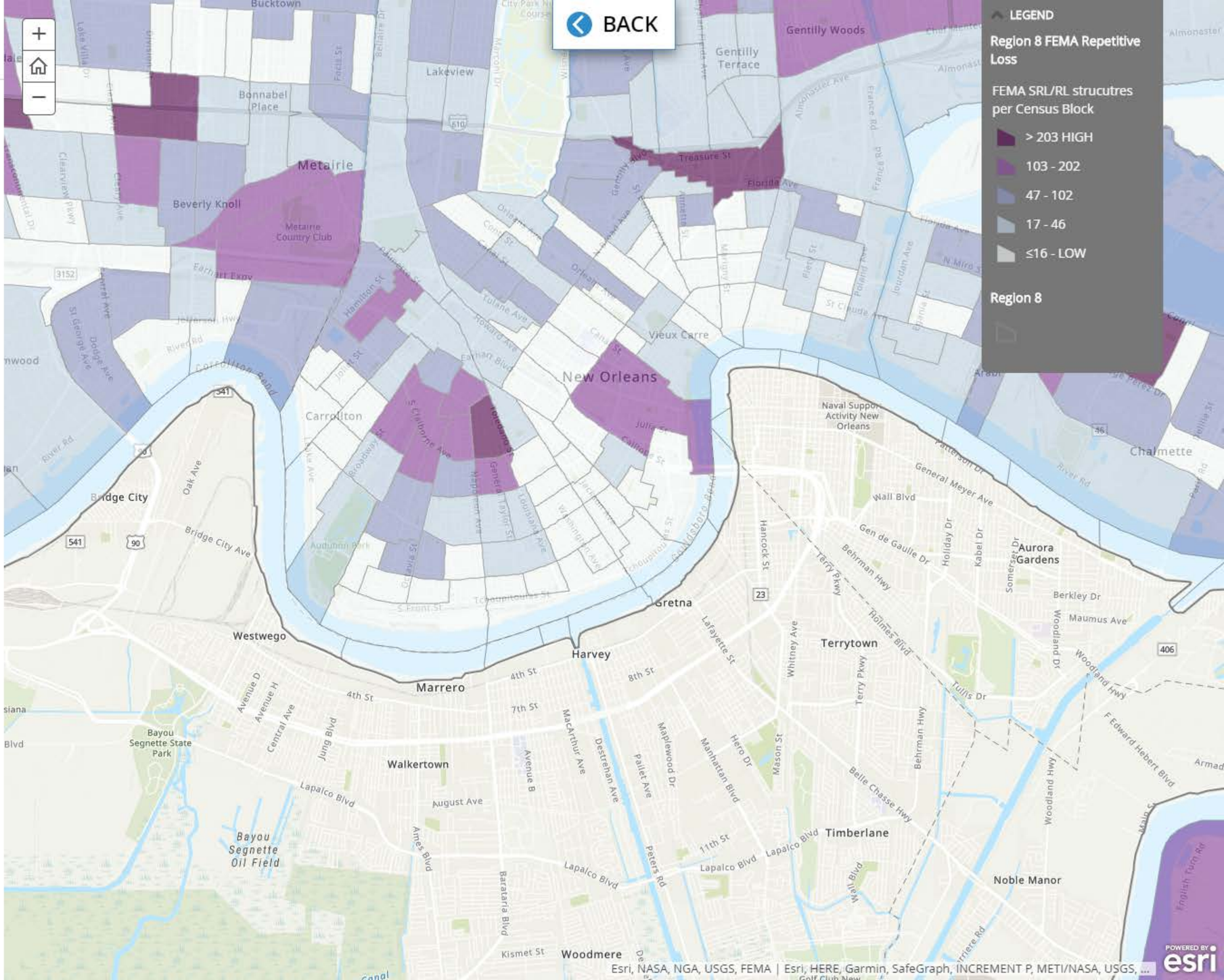
Kenner

CDC Social Vulnerability Index

Natural disasters disproportionately impact socially vulnerable populations. Understanding and addressing vulnerability can help mitigate suffering and recovery costs.

Social vulnerability is based on the following factors:

- Socioeconomic status
- Household composition and disability
- Minority status and language
- Housing and transportation



FEMA Repetitive and Severe Repetitive Loss data

A Repetitive Loss structure is an NFIP-insured property that has had at least two paid flood losses of more than $1,000 each in any 10-year period since 1978.

A Severe Repetitive Loss structure is an NFIP-insured property that meets at least one of the following criteria:

- At least four NFIP claim payments (including building and contents) over $5,000 each with the cumulative amount of such claims exceeding $20,000
- At least two separate claims payments (building payments only) with the cumulative amount of the building portion of such claims exceeding the market value of the building

New Orleans area

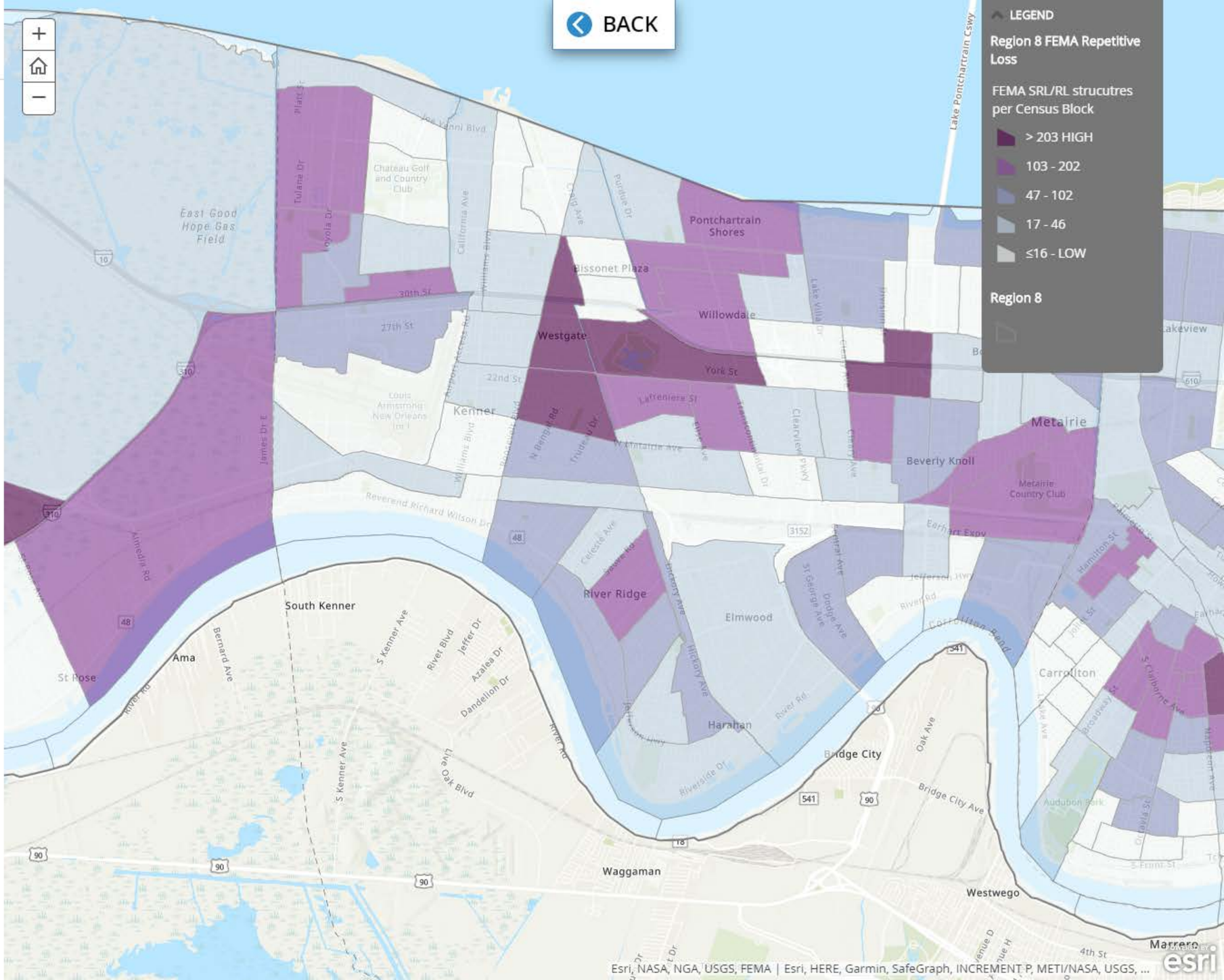
Kenner

CDC Social Vulnerability Index

Natural disasters disproportionately impact socially vulnerable populations. Understanding and addressing vulnerability can help mitigate suffering and recovery costs.

Social vulnerability is based on the following factors:

- Socioeconomic status
- Household composition and disability
- Minority status and language
- Housing and transportation



CDC Social Vulnerability Index

Natural disasters disproportionately impact socially vulnerable populations. Understanding and addressing vulnerability can help mitigate suffering and recovery costs.

Social vulnerability is based on the following factors:

- Socioeconomic status
- Household composition and disability
- Minority status and language
- Housing and transportation

New Orleans area

Kenner

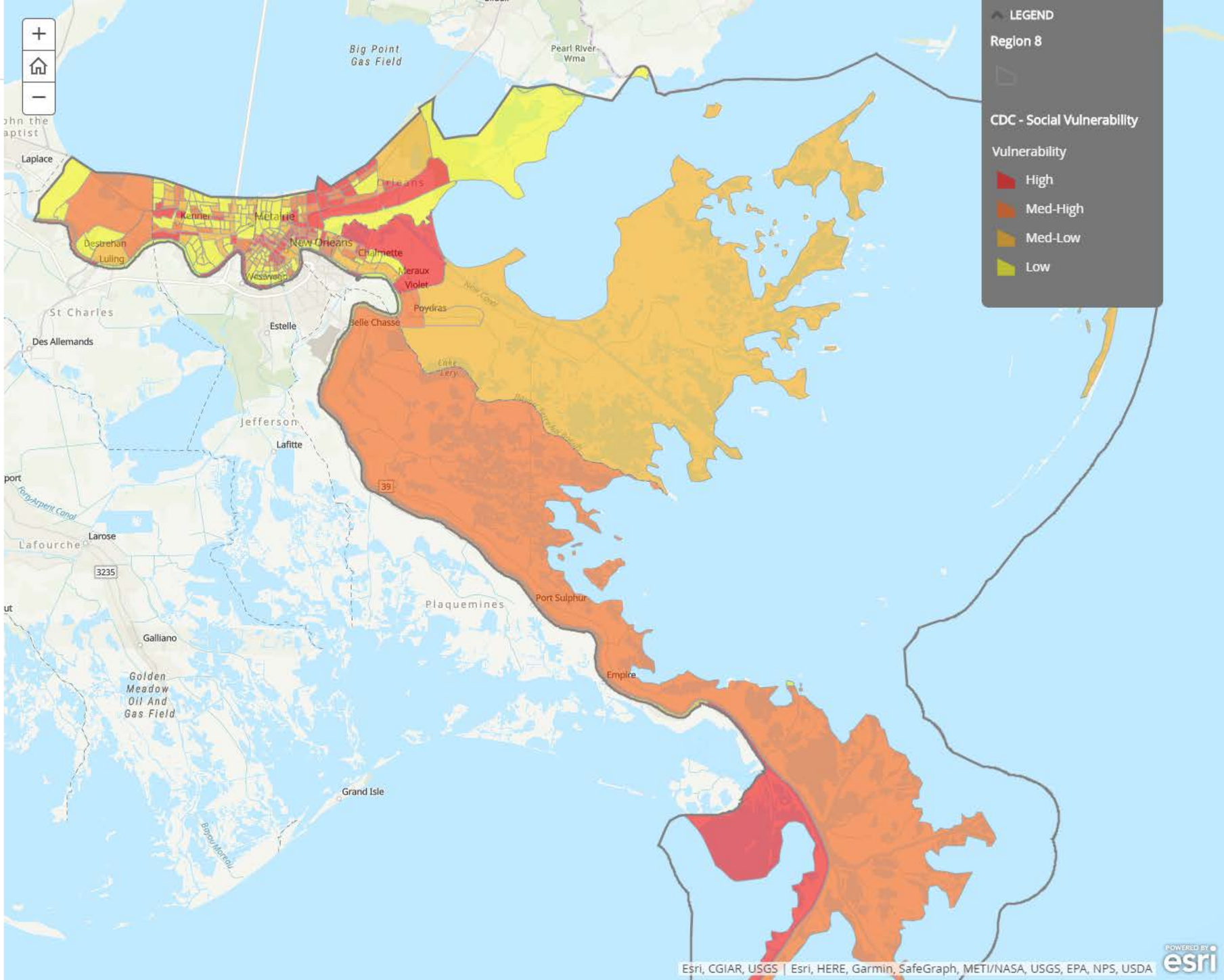
Discussion

Discussion: Where do we go from here?

Reincorporating nature

Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater and floodwaters. Trees, root mats and other wetland vegetation also slow the speed of floodwaters and distribute them more slowly over the floodplain. This combined water storage and braking action lowers flood heights and reduces erosion.

The holding capacity of wetlands helps control floods and prevents waterlogging of crops. Preserving and restoring



CDC Social Vulnerability Index

Natural disasters disproportionately impact socially vulnerable populations. Understanding and addressing vulnerability can help mitigate suffering and recovery costs.

Social vulnerability is based on the following factors:

- Socioeconomic status
- Household composition and disability
- Minority status and language
- Housing and transportation

New Orleans area

Kenner

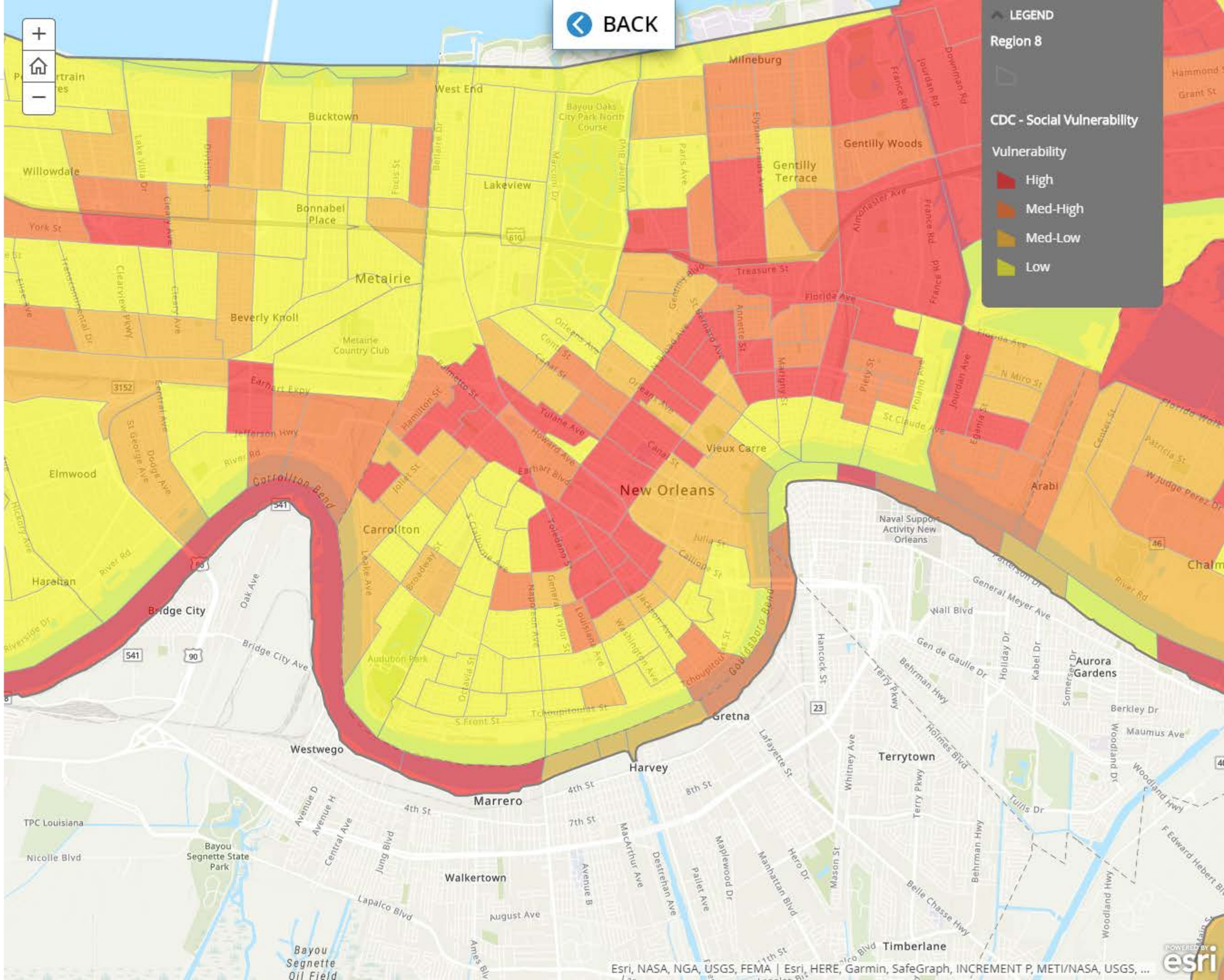
Discussion

Discussion: Where do we go from here?

Reincorporating nature

Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater and floodwaters. Trees, root mats and other wetland vegetation also slow the speed of floodwaters and distribute them more slowly over the floodplain. This combined water storage and braking action lowers flood heights and reduces erosion.

The holding capacity of wetlands helps control floods and



CDC Social Vulnerability Index

Natural disasters disproportionately impact socially vulnerable populations. Understanding and addressing vulnerability can help mitigate suffering and recovery costs.

Social vulnerability is based on the following factors:

- Socioeconomic status
- Household composition and disability
- Minority status and language
- Housing and transportation

New Orleans area

Kenner

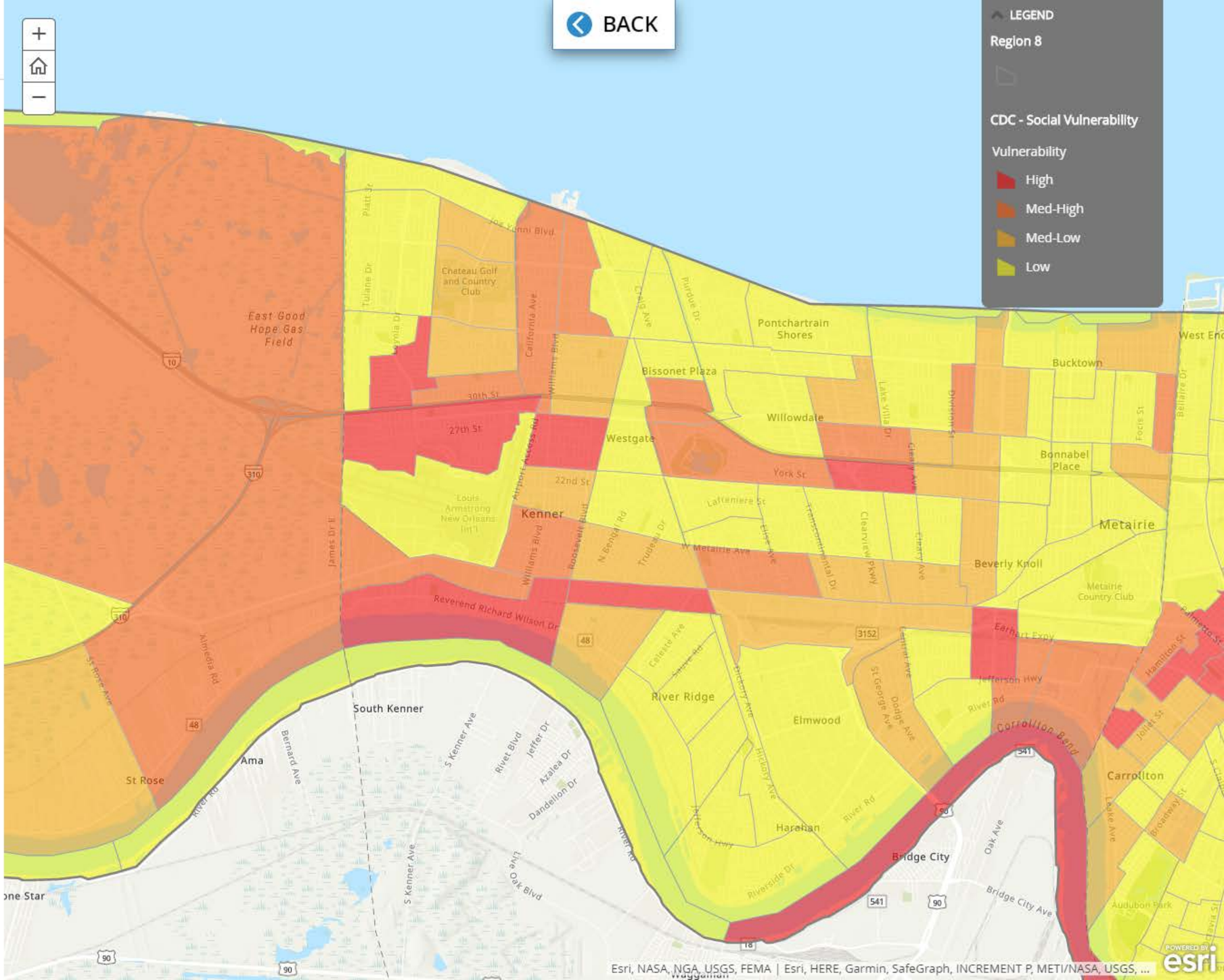
Discussion

Discussion: Where do we go from here?

Reincorporating nature

Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater and floodwaters. Trees, root mats and other wetland vegetation also slow the speed of floodwaters and distribute them more slowly over the floodplain. This combined water storage and braking action lowers flood heights and reduces erosion.

The holding capacity of wetlands helps control floods and



Discussion

Discussion: Where do we go from here?

Reincorporating nature

Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater and floodwaters. Trees, root mats and other wetland vegetation also slow the speed of floodwaters and distribute them more slowly over the floodplain. This combined water storage and braking action lowers flood heights and reduces erosion.

The holding capacity of wetlands helps control floods and prevents waterlogging of crops. Preserving and restoring wetlands together with other water retention efforts can often provide the same level of flood control otherwise provided by expensive dredge operations and levees.

Greater New Orleans Urban Water Plan

Regional plan: The Greater New Orleans Urban Water Plan is a regional effort spanning three sub-basins in Region 8 including the east banks of Jefferson and Orleans parishes and a portion of St. Bernard Parish.

A different approach to managing water resources: The urban water plan, acknowledging that the region's 100-year-old infrastructure is no longer adequate to sustain the region, provides a long-term program of retrofits to existing systems and the urban landscape. The plan strongly emphasizes the need for better management of stormwater and groundwater

Reincorporating nature

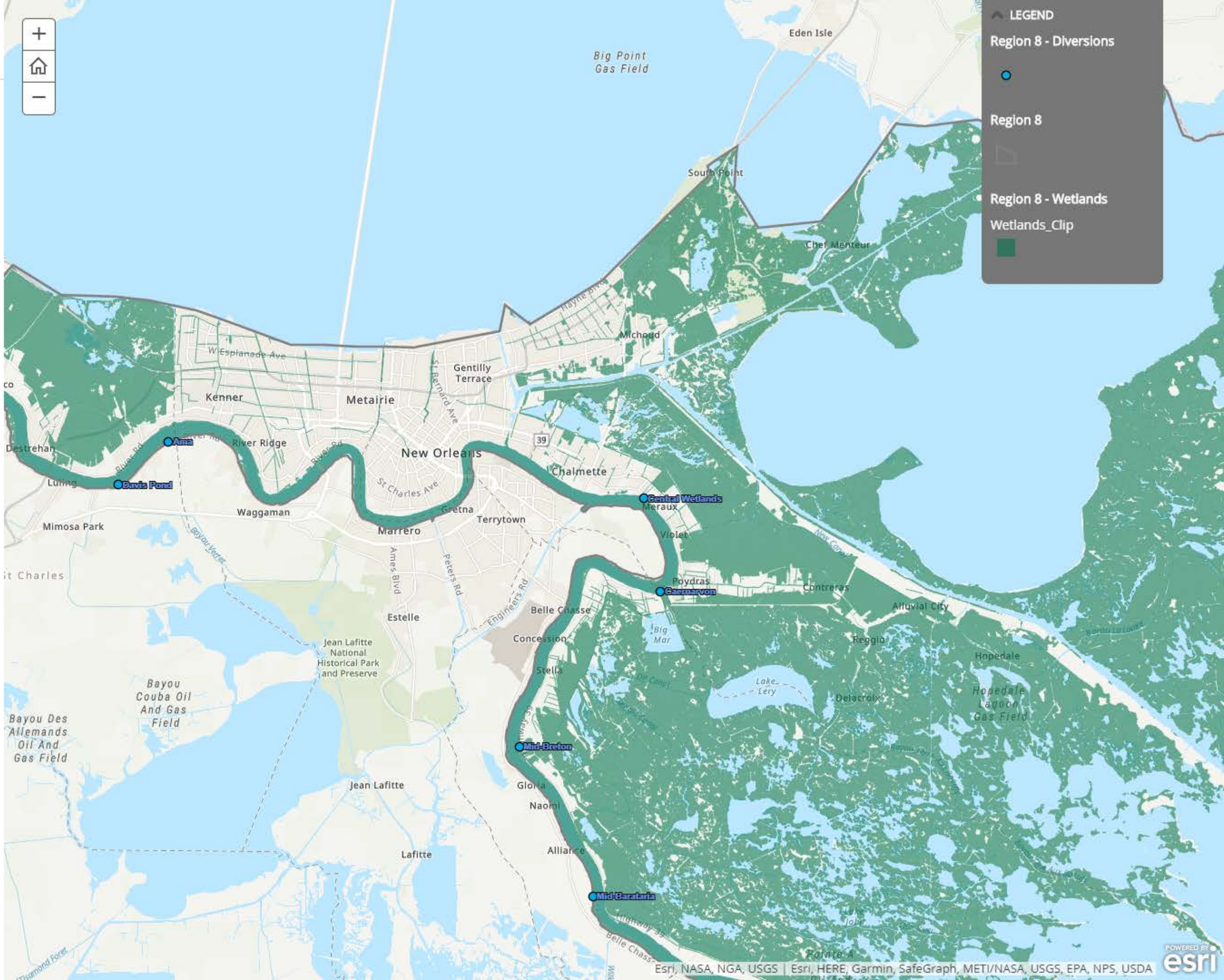
Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater and floodwaters. Trees, root mats and other wetland vegetation also slow the speed of floodwaters and distribute them more slowly over the floodplain. This combined water storage and braking action lowers flood heights and reduces erosion.

The holding capacity of wetlands helps control floods and prevents waterlogging of crops. Preserving and restoring wetlands together with other water retention efforts can often provide the same level of flood control otherwise provided by expensive dredge operations and levees.

Greater New Orleans Urban Water Plan

Regional plan: The Greater New Orleans Urban Water Plan is a regional effort spanning three sub-basins in Region 8 including the east banks of Jefferson and Orleans parishes and a portion of St. Bernard Parish.

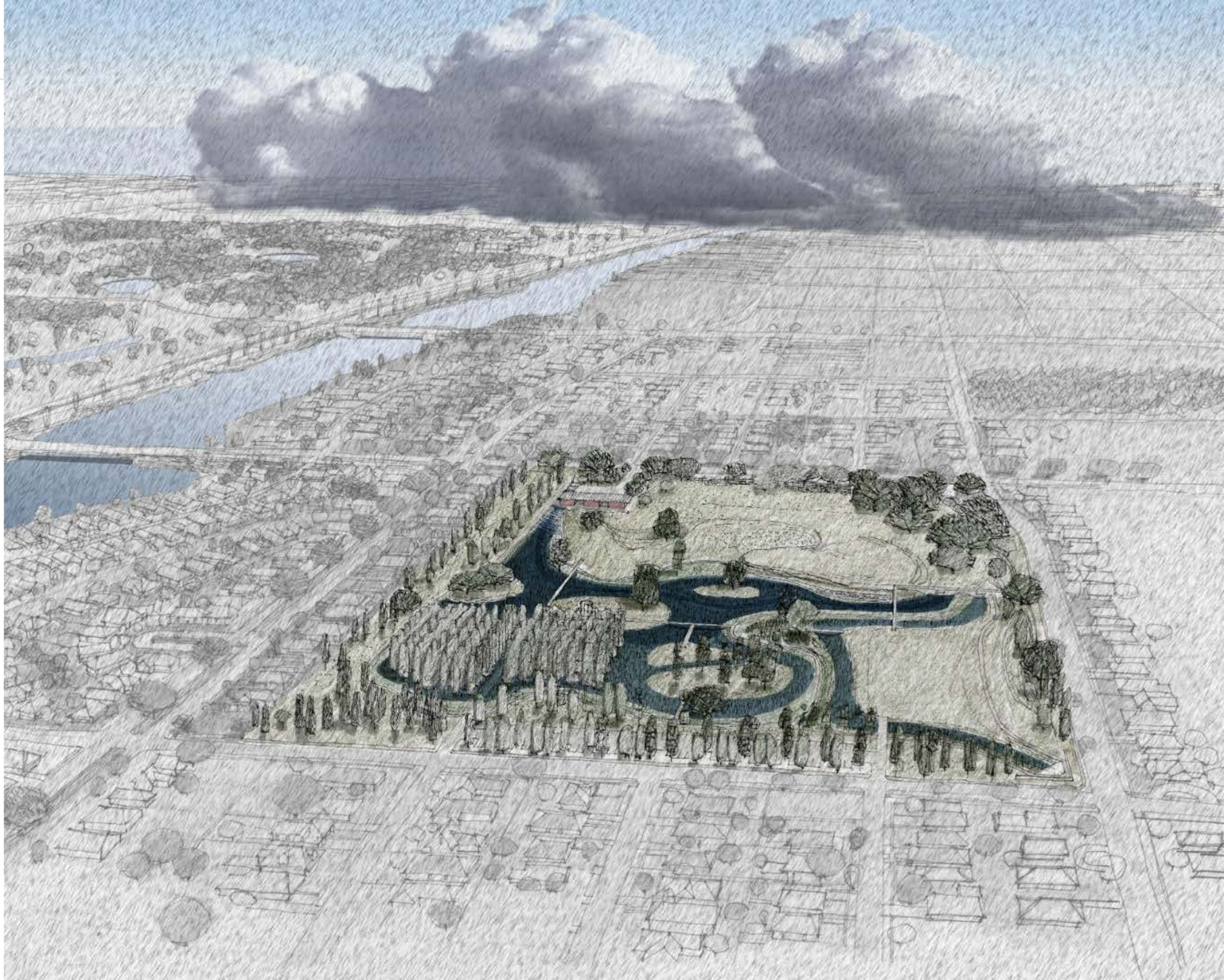
A different approach to managing water resources: The urban water plan, acknowledging that the region's 100-year-old infrastructure is no longer adequate to sustain the region, provides a long-term program of retrofits to existing systems and the urban landscape. The plan strongly emphasizes the need for better management of stormwater and groundwater to prevent subsidence (slow and store).



Greater New Orleans Urban Water Plan

Regional plan: The Greater New Orleans Urban Water Plan is a regional effort spanning three sub-basins in Region 8 including the east banks of Jefferson and Orleans parishes and a portion of St. Bernard Parish.

A different approach to managing water resources: The urban water plan, acknowledging that the region's 100-year-old infrastructure is no longer adequate to sustain the region, provides a long-term program of retrofits to existing systems and the urban landscape. The plan strongly emphasizes the need for better management of stormwater and groundwater to prevent subsidence (slow and store).



Greater New Orleans Urban Water Plan

Plan implementation: The urban water plan outlines a 50-year timeline for implementation of these major retrofits and includes several action items related to community outreach, design, engineering and public policy adoption. From 2013 to 2020, the plan recommends the implementation of seven demonstration projects across the region.

Recap

Putting it all together

- Three types of flood risk

Greater New Orleans Urban Water Plan

Plan implementation: The urban water plan outlines a 50-year timeline for implementation of these major retrofits and includes several action items related to community outreach, design, engineering and public policy adoption. From 2013 to 2020, the plan recommends the implementation of seven demonstration projects across the region.

Recap

Putting it all together

- Three types of flood risk
- Future coastal surge flood risk
- Special Flood Hazard Areas, A zones and V zones
- Wetland areas
- Social Vulnerability Index
- Greater New Orleans Urban Water Plan

Your feedback

Now we will examine risk more closely by combining some of these datasets and dividing Region 8 into subregions.

Legend

FEMA Region 8

A Zones

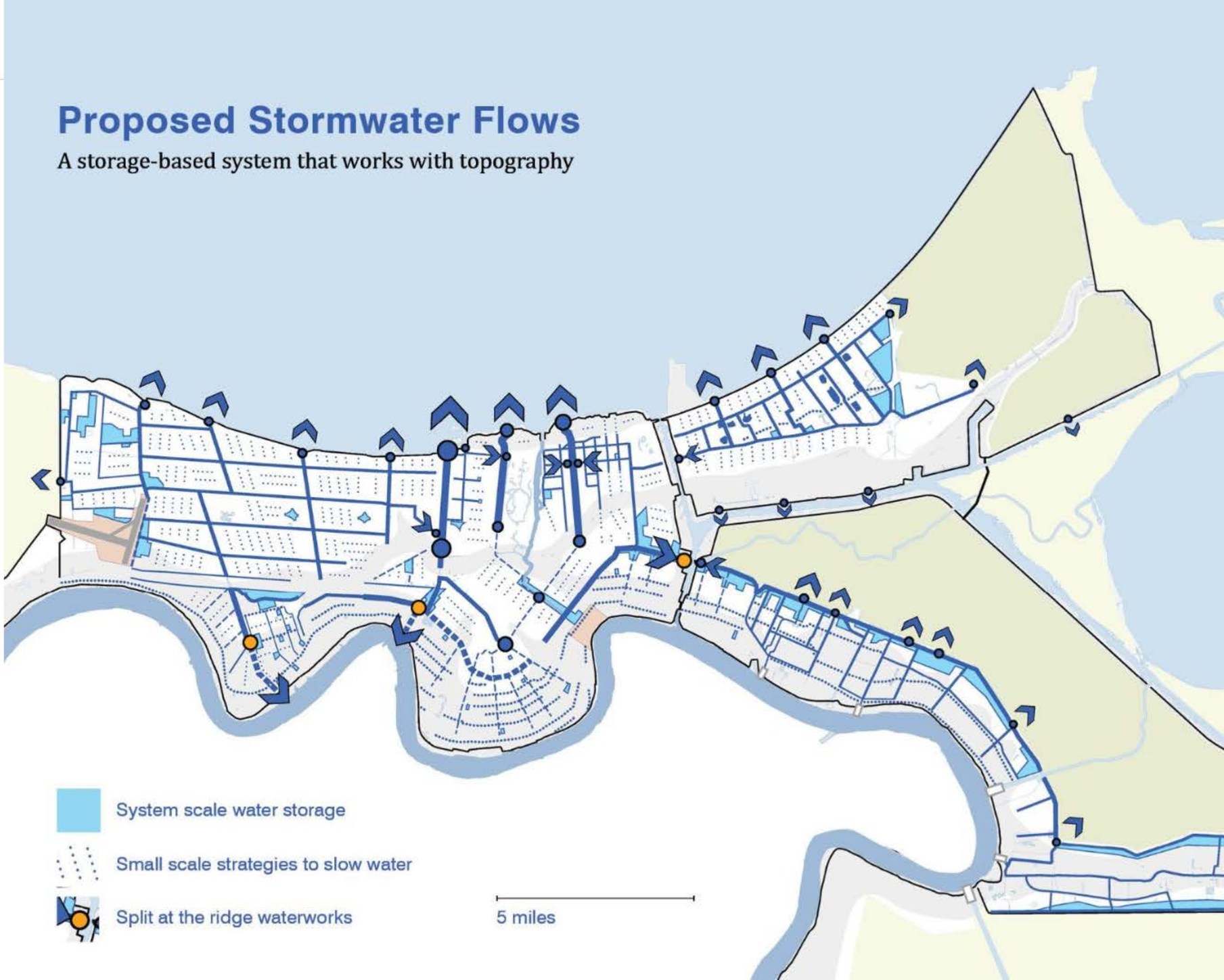
V Zones

CDC - Social Vulnerability

Vulnerability

High

Med-High



Recap

Putting it all together

- Three types of flood risk
- Future coastal surge flood risk
- Special Flood Hazard Areas, A zones and V zones
- Wetland areas
- Social Vulnerability Index
- Greater New Orleans Urban Water Plan

Your feedback

Now we will examine risk more closely by combining some of these datasets and dividing Region 8 into subregions.

Legend

FEMA Region 8

A Zones

V Zones

CDC - Social Vulnerability

Vulnerability

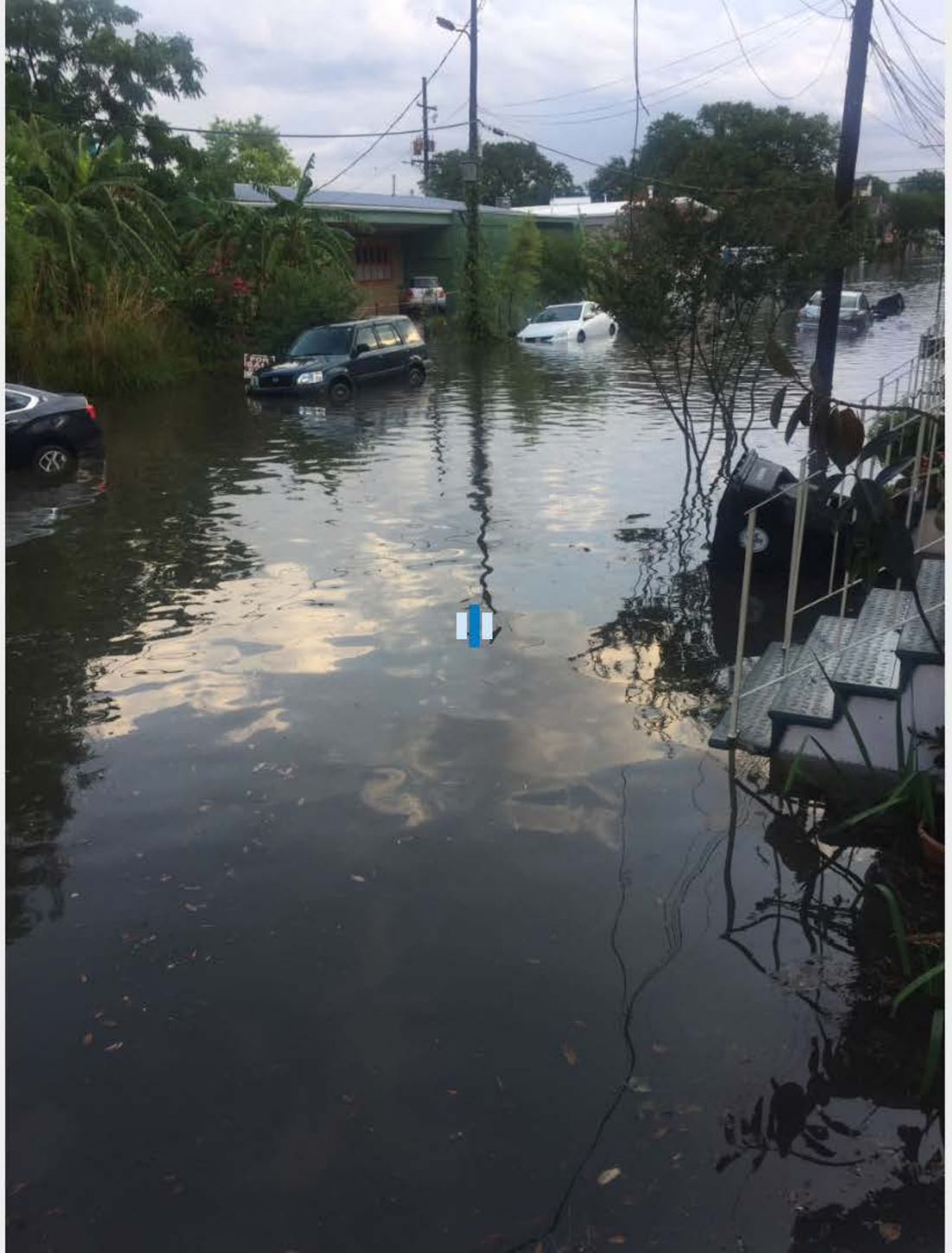
High

Med-High

Med-Low

Low

Let's Review



Your feedback

Now we will examine risk more closely by combining some of these datasets and dividing Region 8 into subregions.

Legend

FEMA Region 8

- A Zones
- V Zones

CDC - Social Vulnerability

Vulnerability

- High
- Med-High
- Med-Low
- Low

Let's Review

Your feedback

Now we will examine risk more closely by combining some of these datasets and dividing Region 8 into subregions.

Legend

FEMA Region 8

- A Zones
- V Zones

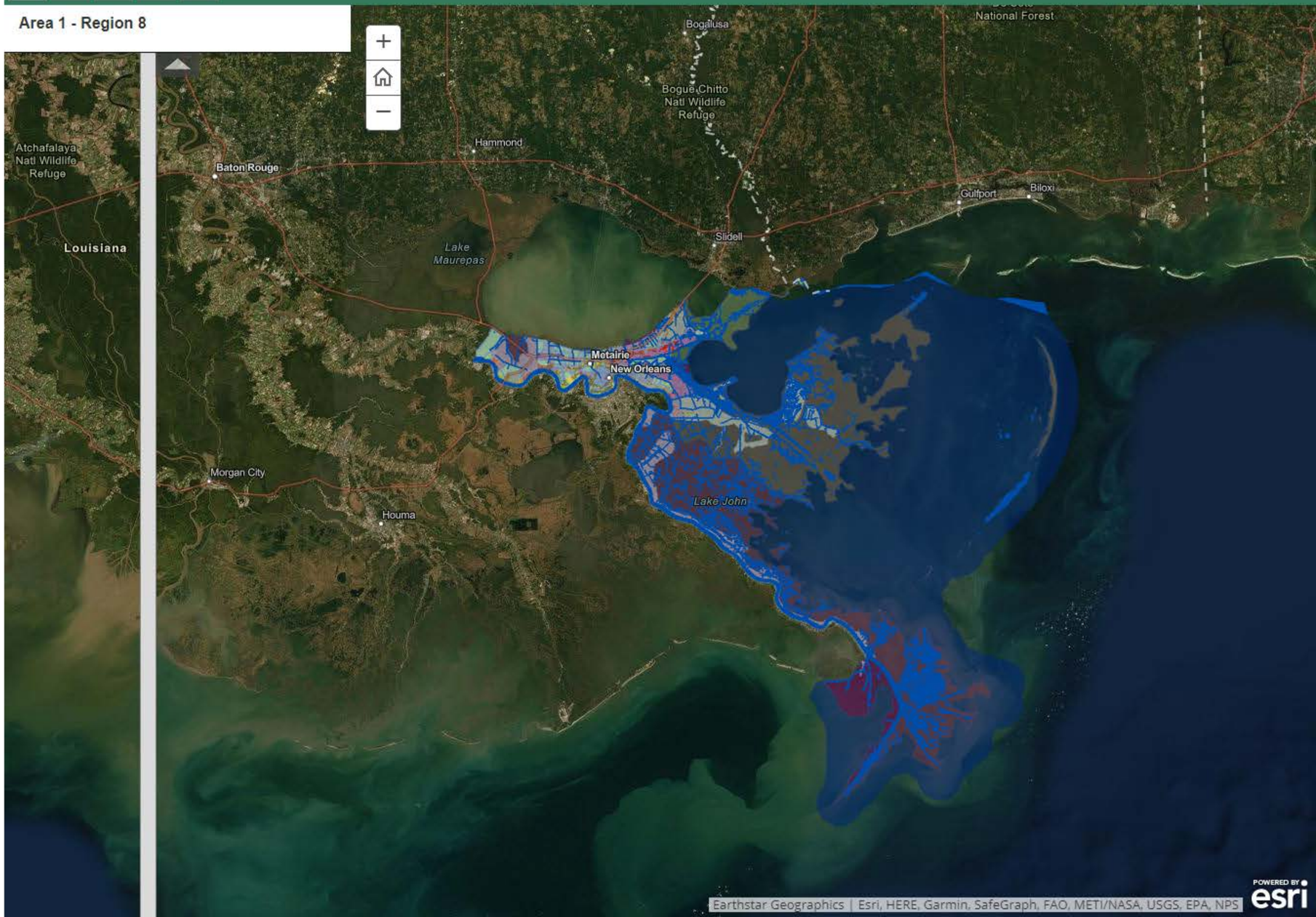
CDC - Social Vulnerability

Vulnerability

- High
- Med-High
- Med-Low
- Low

Let's Review

Area 1 - Region 8



Your feedback

Now we will examine risk more closely by combining some of these datasets and dividing Region 8 into subregions.

Legend

FEMA Region 8

- A Zones
- V Zones

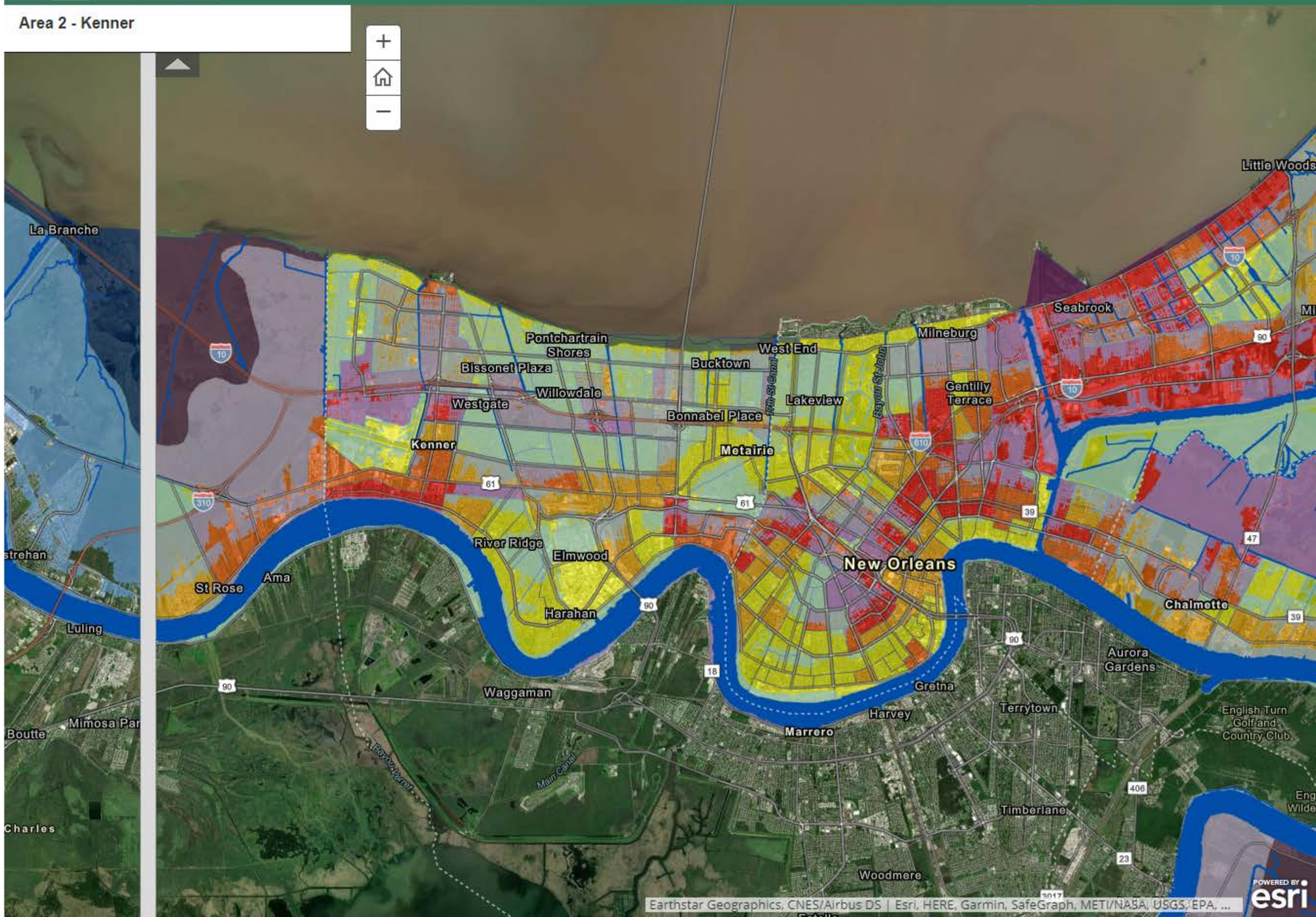
CDC - Social Vulnerability

Vulnerability

- High
- Med-High
- Med-Low
- Low

Let's Review

Area 2 - Kenner



Your feedback

Now we will examine risk more closely by combining some of these datasets and dividing Region 8 into subregions.

Legend

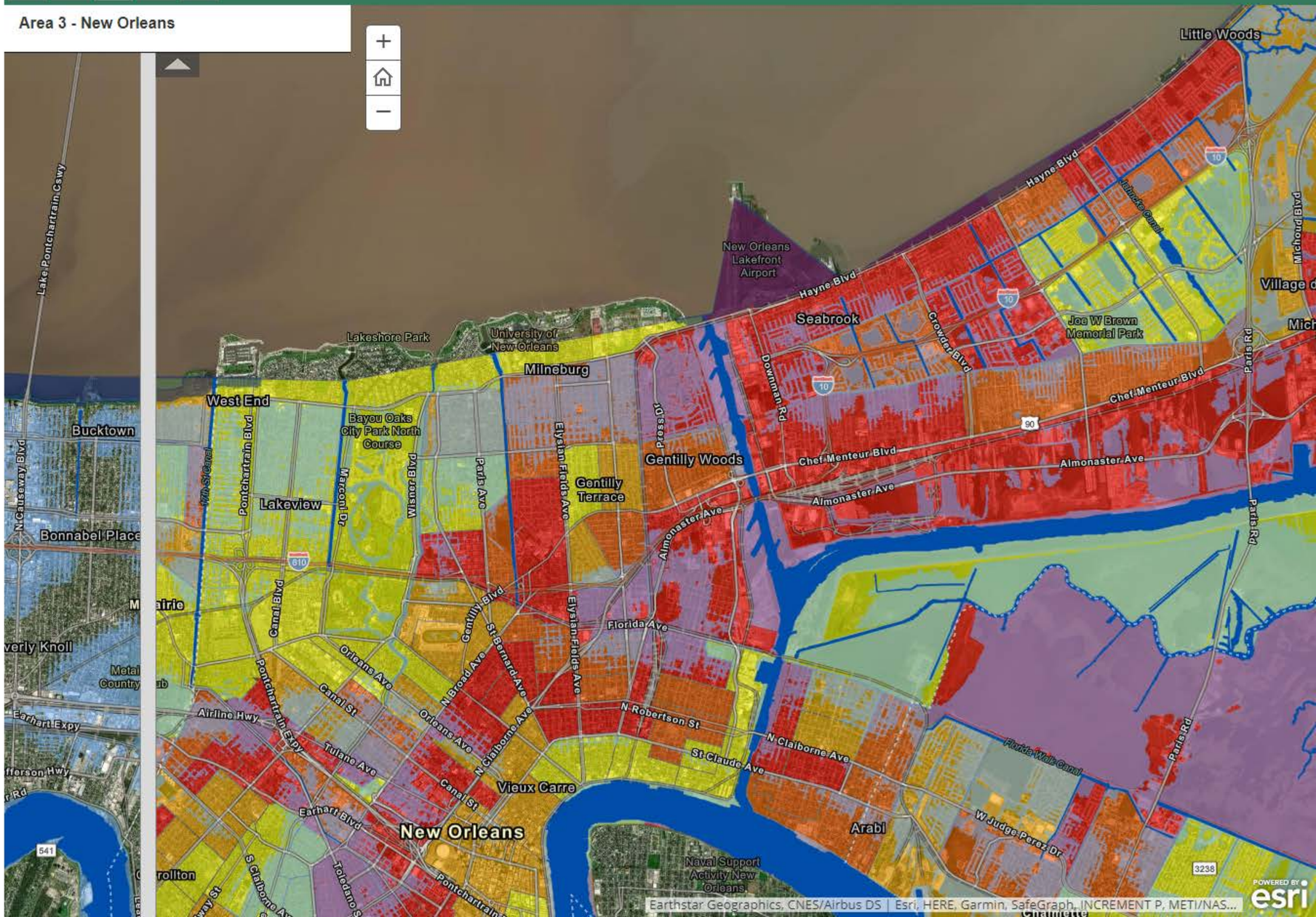
FEMA Region 8
- A Zones
- V Zones

CDC - Social Vulnerability

Vulnerability
- High
- Med-High
- Med-Low
- Low

Let's Review

Area 3 - New Orleans



Your feedback

Now we will examine risk more closely by combining some of these datasets and dividing Region 8 into subregions.

Legend

FEMA Region 8

- A Zones
- V Zones

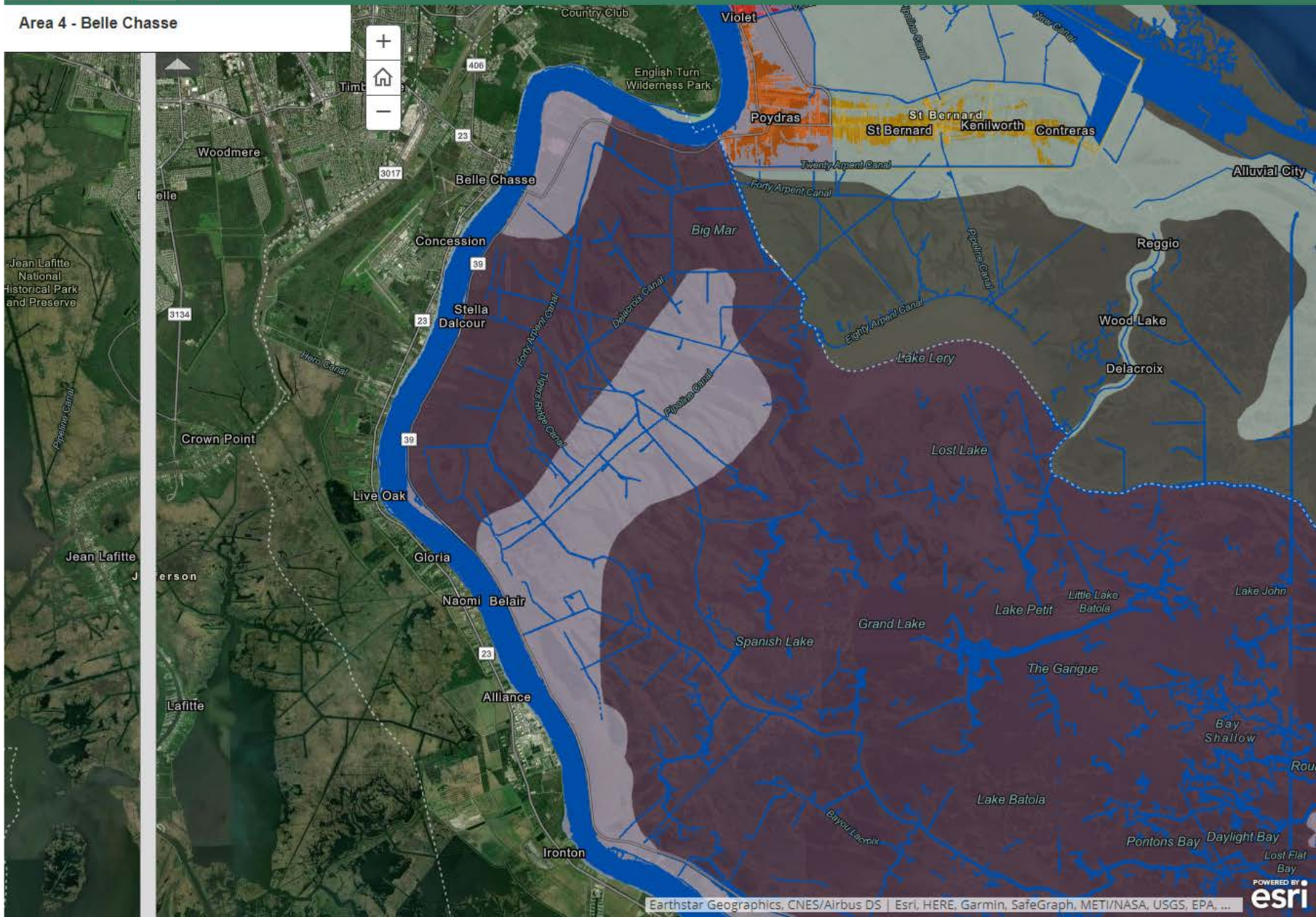
CDC - Social Vulnerability

Vulnerability

- High
- Med-High
- Med-Low
- Low

Let's Review

Area 4 - Belle Chasse



Your feedback

Now we will examine risk more closely by combining some of these datasets and dividing Region 8 into subregions.

Legend

FEMA Region 8

- A Zones
- V Zones

CDC - Social Vulnerability

Vulnerability

- High
- Med-High
- Med-Low
- Low

Let's Review

Area 5 - New Orleans East