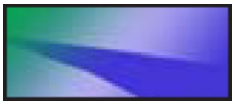


Sustainable Rivers Program

Des Moines River
Environmental Flows:
Inundation mapping below Lake Red Rock

January 2018

Compiled by Rock Island District, U.S. Army Corps of Engineers

1500 Rock Island Drive, Rock Island, IL 61201

Prepared for U.S. Army Corps of Engineers

and other cooperating organizations

Des Moines River flood inundation modeling

One of the discussion points that arose in an Adaptive Management and Monitoring Plan workshop held in 2016 was interest in increasing connectivity between the Des Moines River below Red Rock Dam and existing floodplain features such as oxbows and other out-of-bank low lying areas. While the Corps has no easements or rights to purposefully inundate lands that are outside of the banks of the Des Moines River (as associated with maximum objective flows from Lake Red Rock), many floodplain features would have been inundated during high flows historically and would have provided environmental benefits such as habitat provision. Increased connectivity was viewed as an environmental opportunity because other agencies or non-government organizations may be able to acquire easements to restore some of those natural processes.

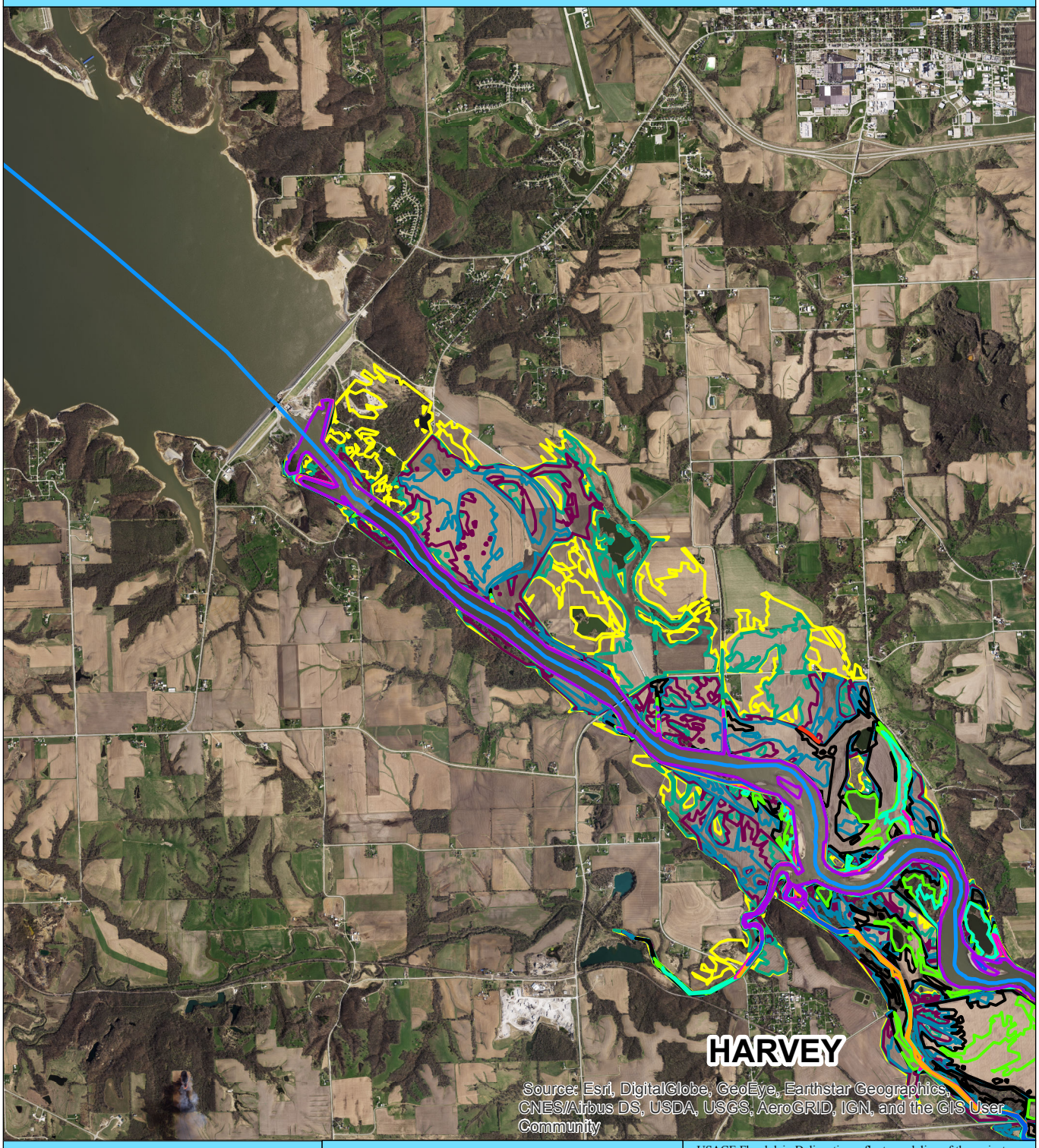
To determine where and how much flow would be necessary to engage a range of floodplain features a series of downstream inundation maps (Plates 1-18) were created based on a series of river flows between 18,000 and 100,000 cubic feet per second (cfs).

The SRP team utilized the one-dimensional modeling capabilities of HEC-RAS and elevations from a Light Detection and Ranging-based (LiDAR) dataset to determine inundation bands along the Des Moines River. Map results will allow water managers to better understand the impacts of river flows on stream and floodplain areas with high accuracy. There is potential to integrate map results with land ownership records to identify entities potentially impacted by high river flows. The information will prove useful to agency partners and TNC to identify potential floodplain easements or permissions that would enable environmental flow releases. Mapping products are datasets that can be easily queried to produce maps and information tables.

Maps have been shared with partners for further evaluation and prioritization of floodplain restoration potential. It is hoped the information will support investigation into environmental flows with a focus on floodplain interactions and identify possible easement acquisitions.

Des Moines River Flood Inundation Map - 2017 SRP

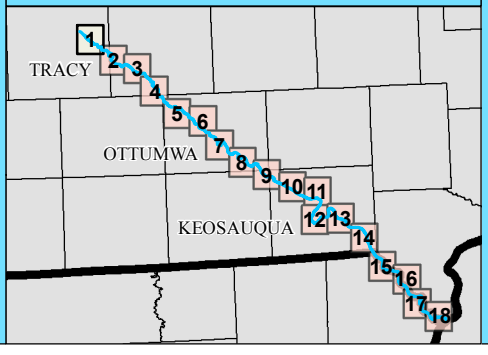
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

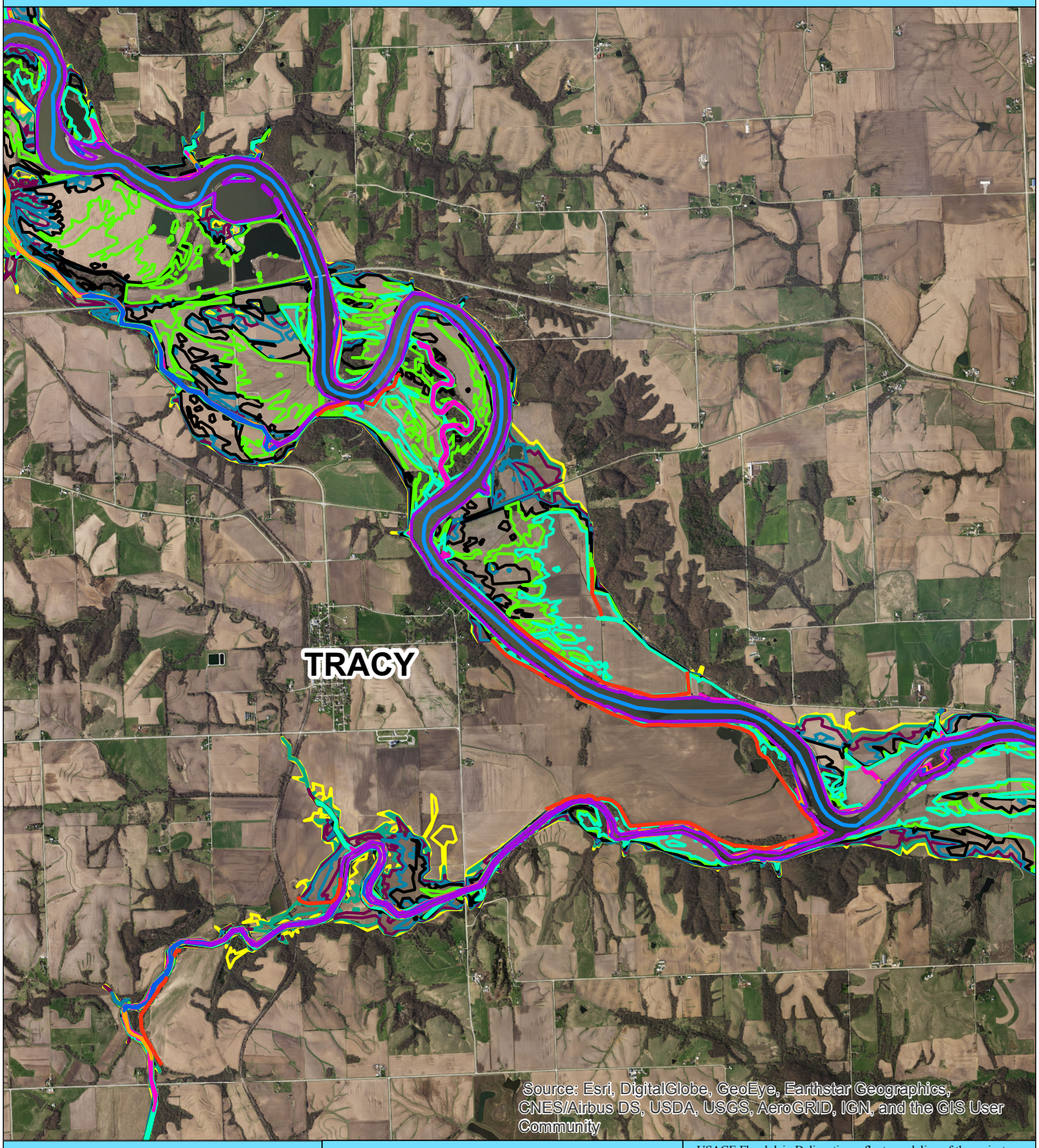
US Army Corps of Engineers ®
Rock Island District

PLATE 1

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

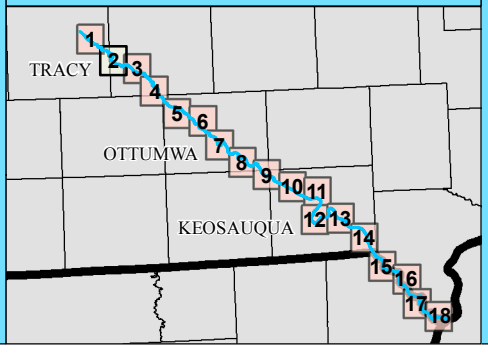
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



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Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

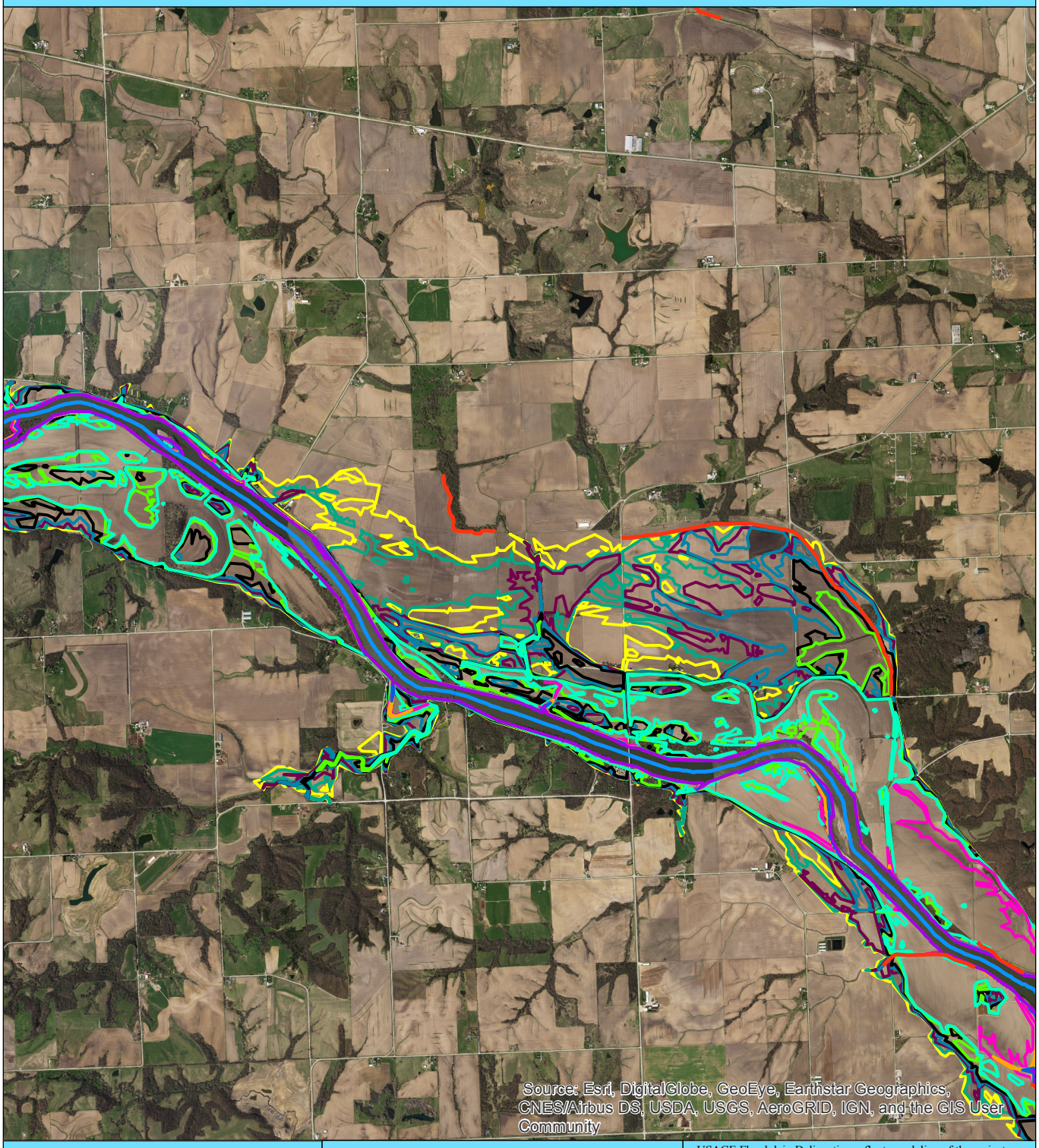
US Army Corps of Engineers
Rock Island District

PLATE 2

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

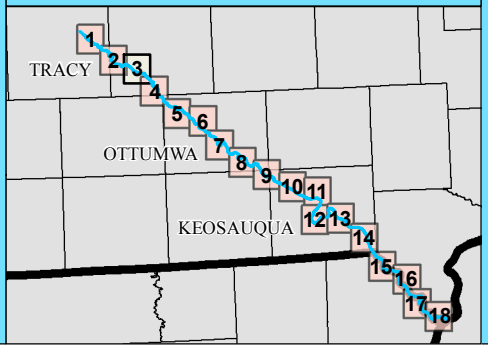
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

US Army Corps of Engineers ®
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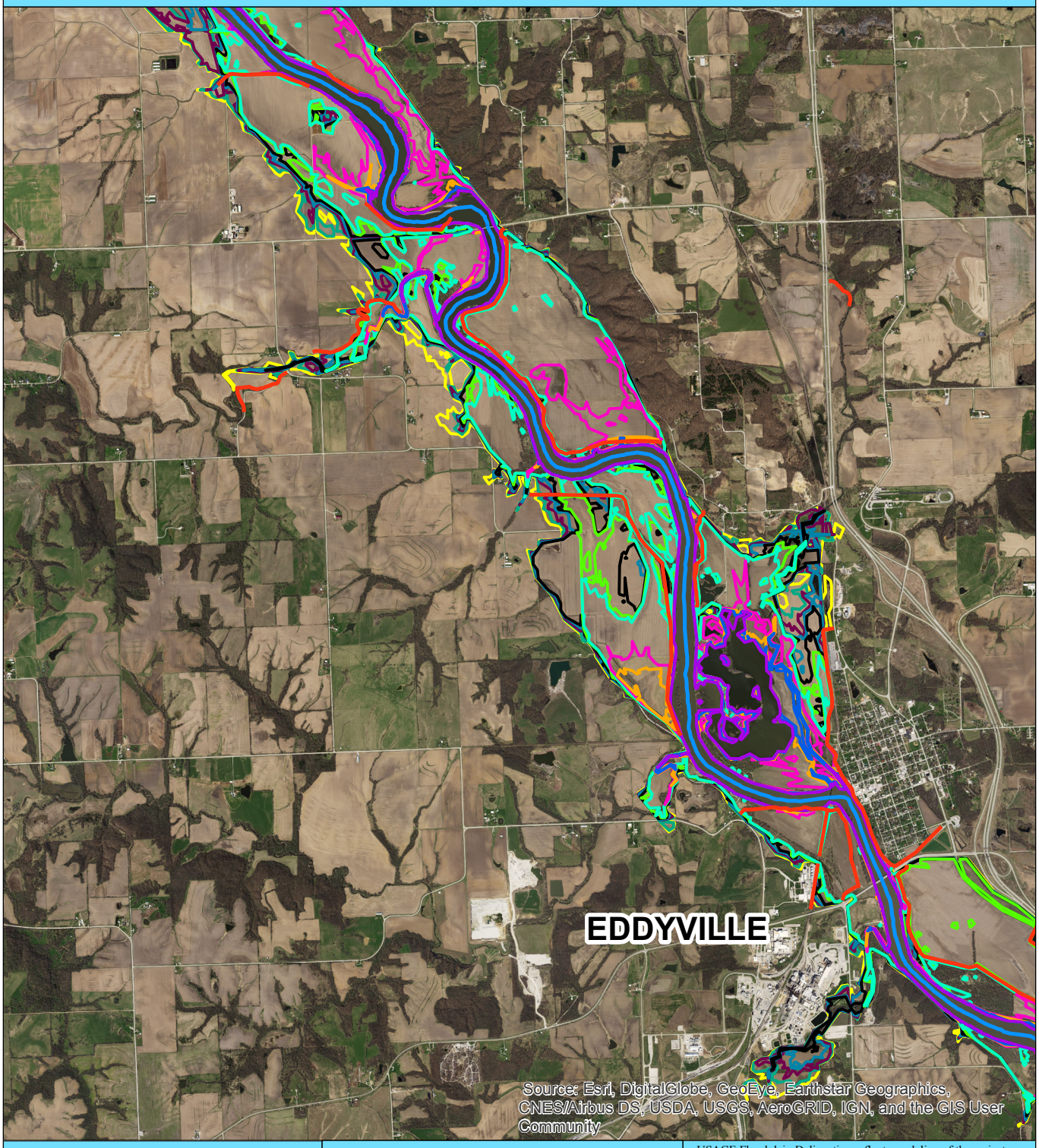
PLATE 3

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

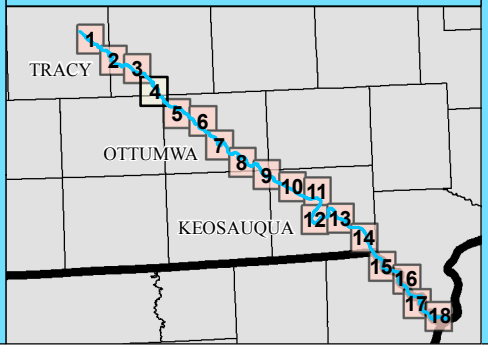
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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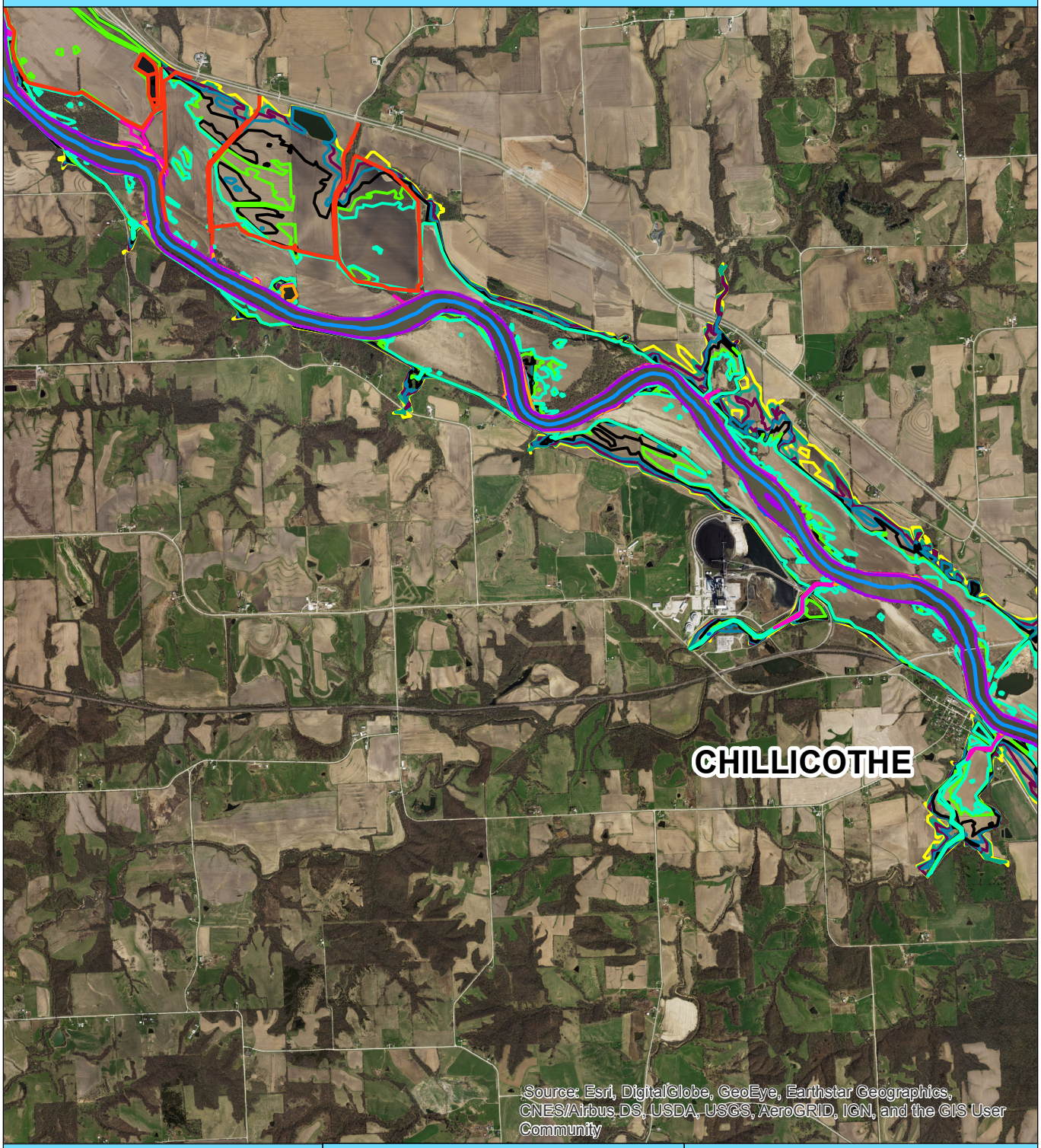
PLATE 4

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

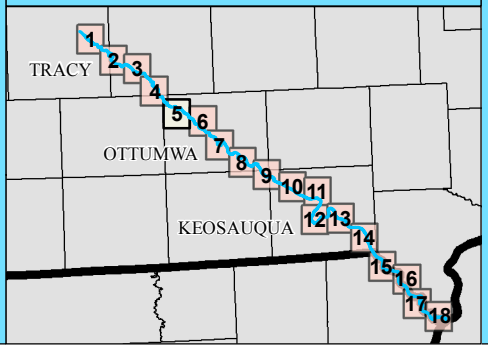
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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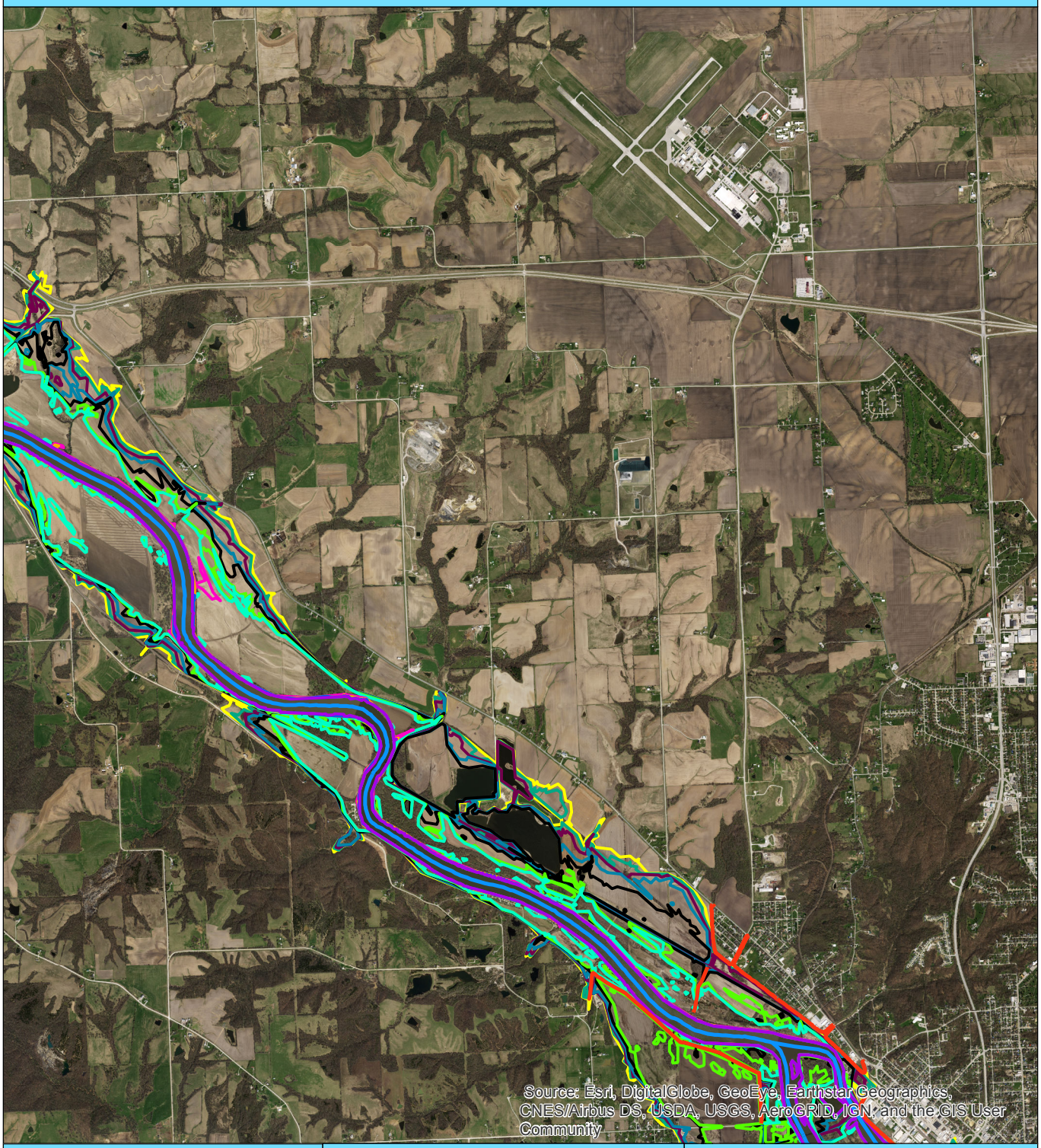
Rock Island District

PLATE 5

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

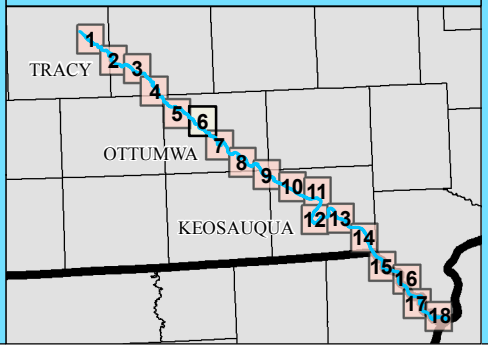
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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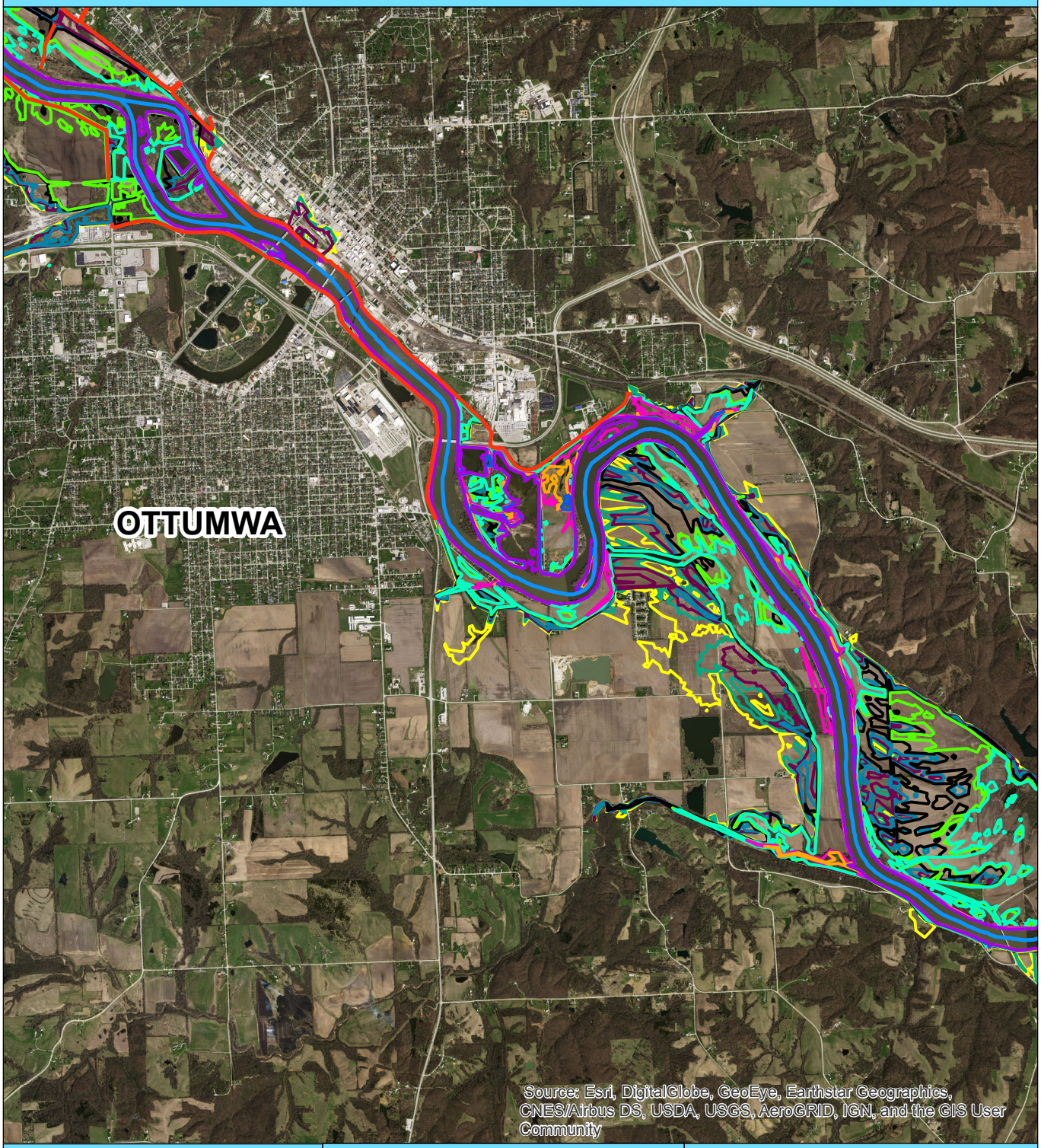
Rock Island District

PLATE 6

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

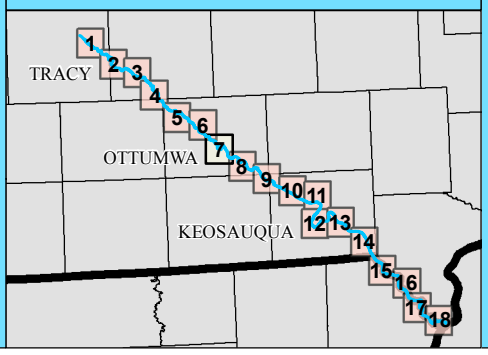
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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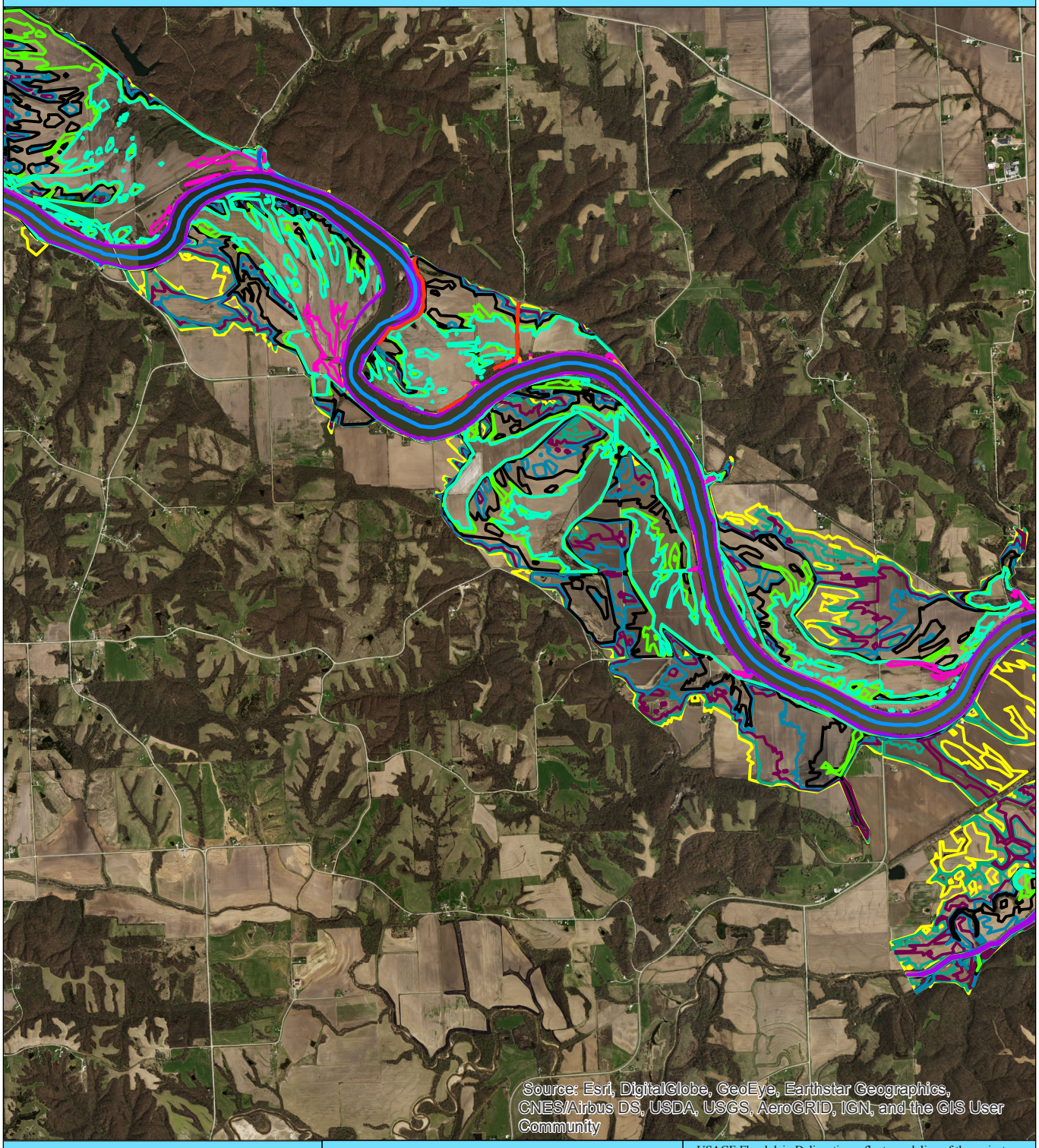
PLATE 7

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

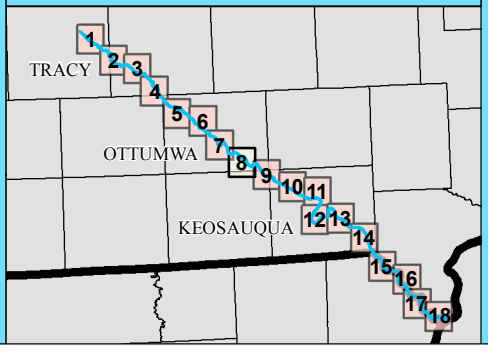
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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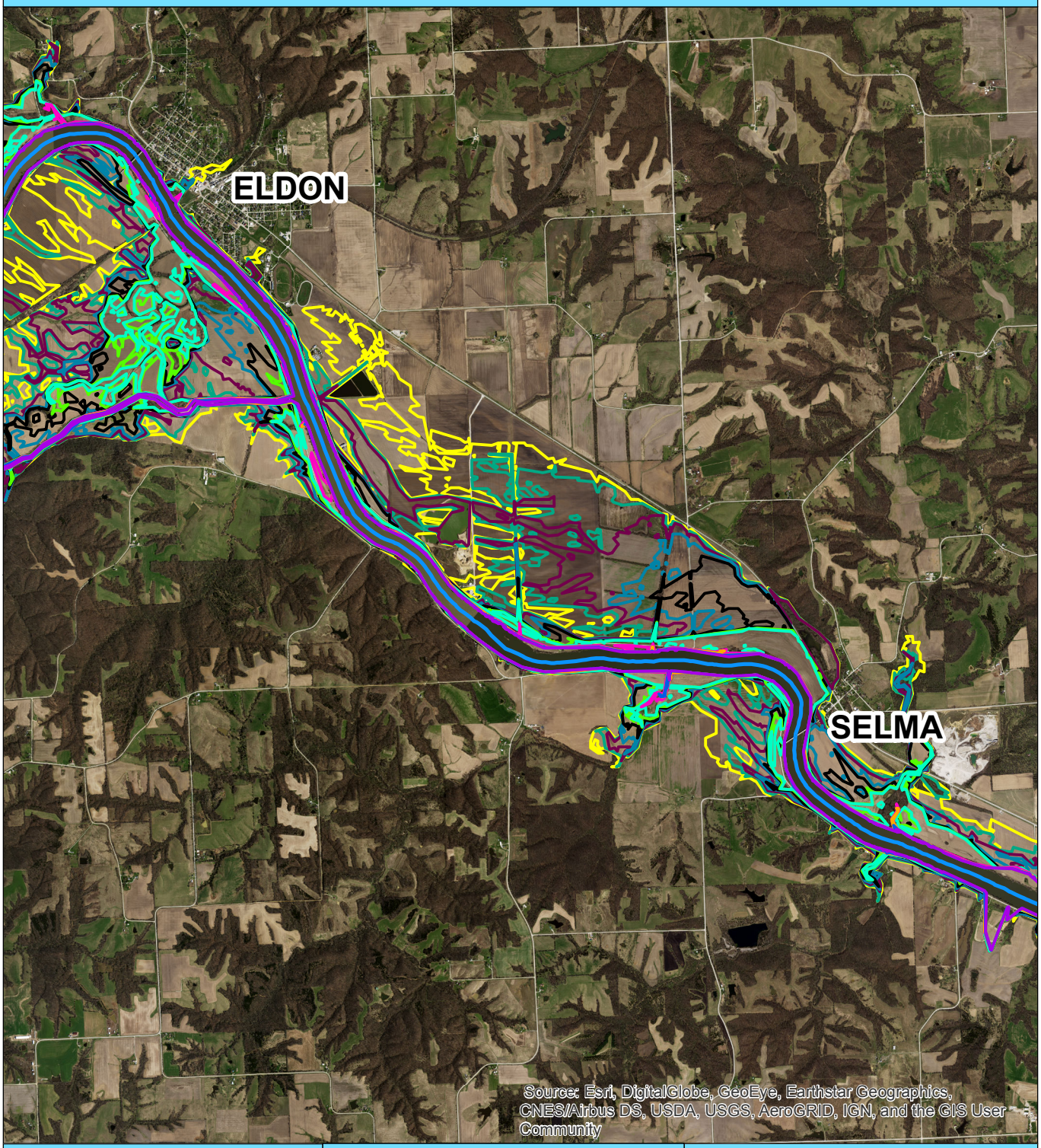
PLATE 8

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

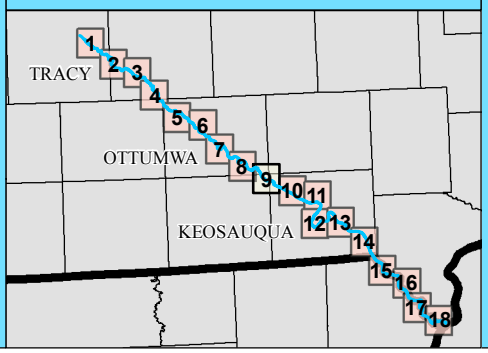
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



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0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

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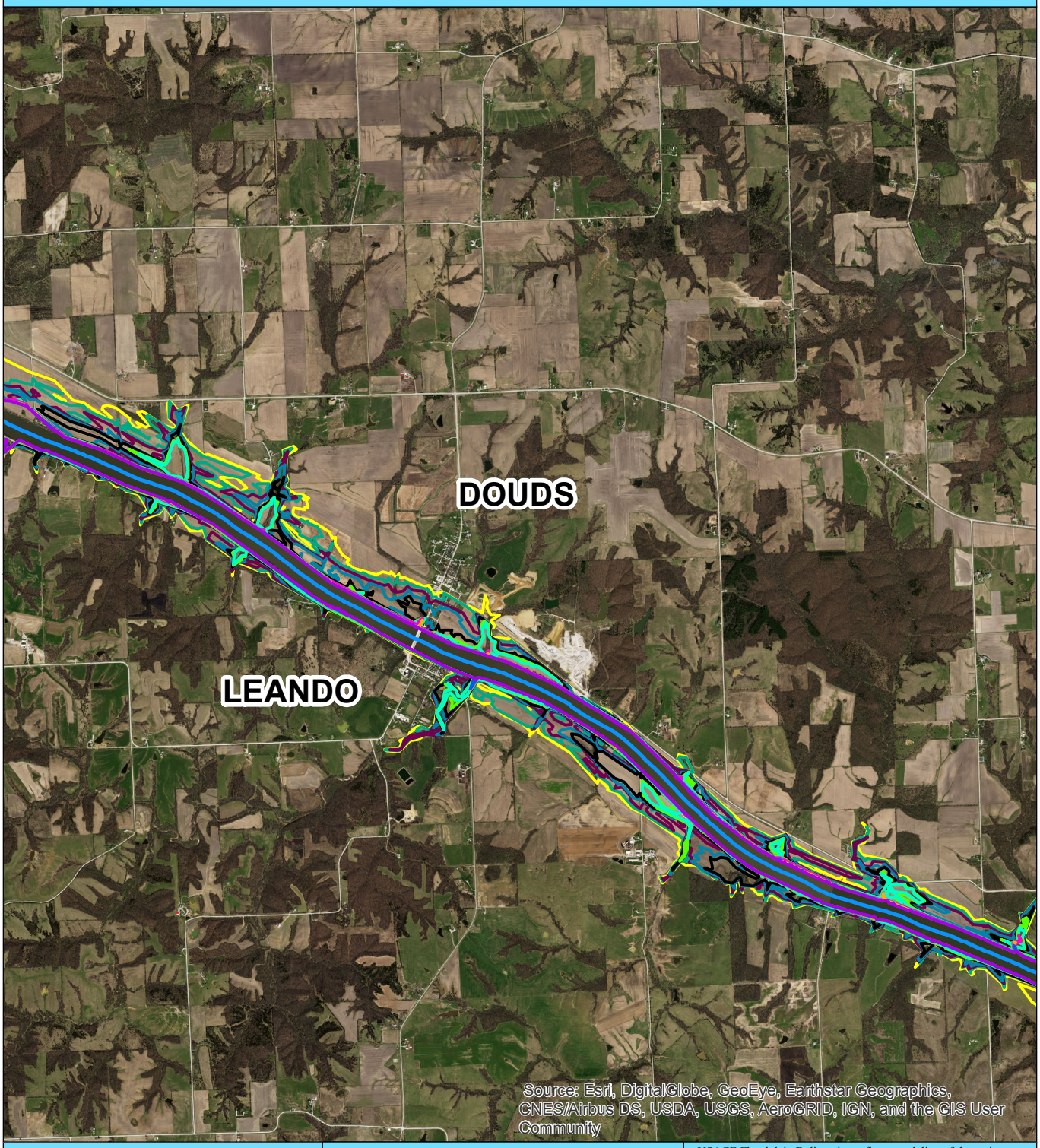
PLATE 9

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

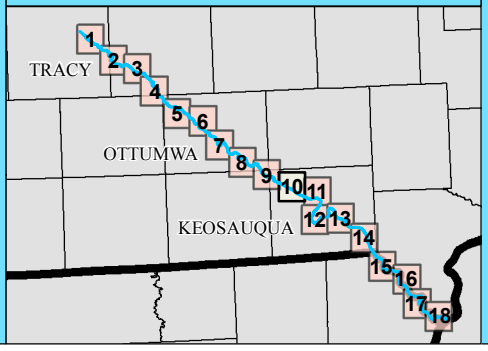
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
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0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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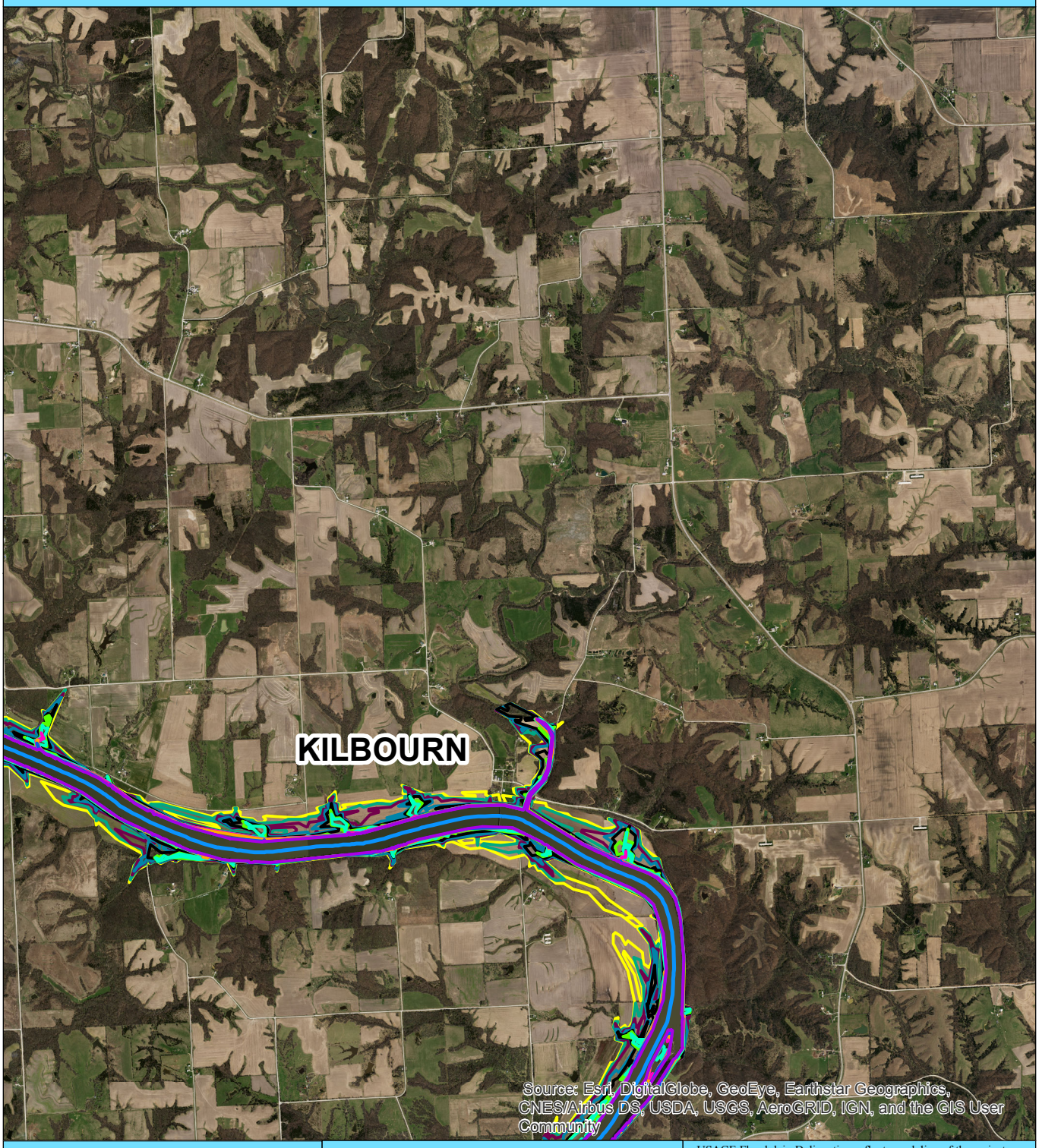
PLATE 10

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

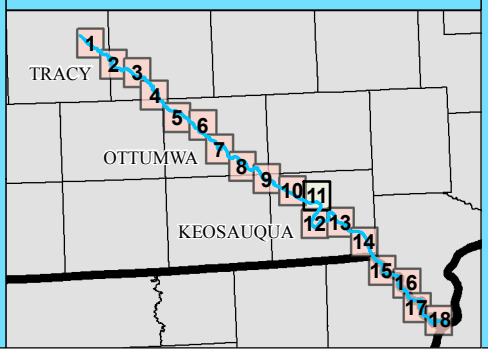
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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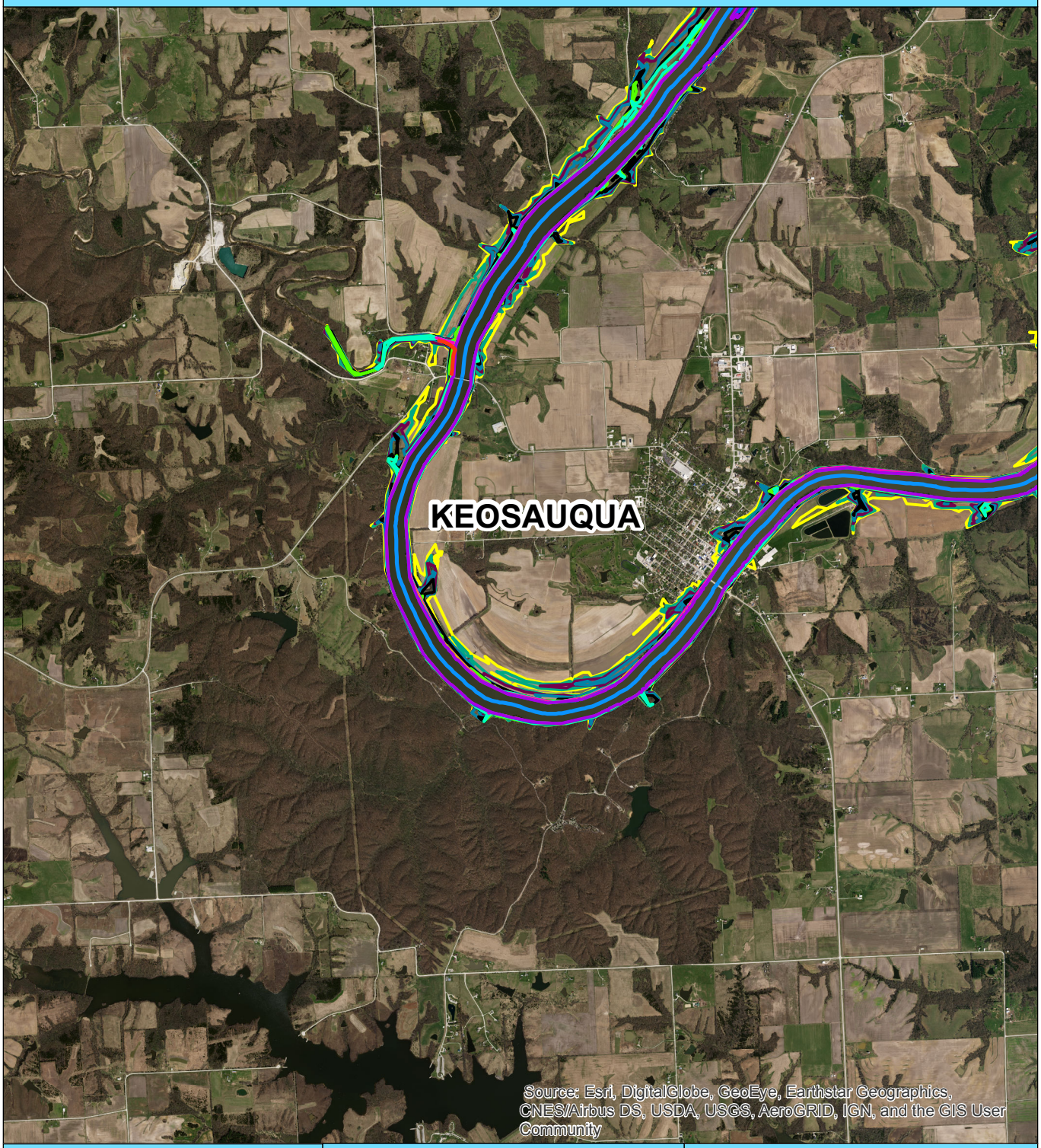
PLATE 11

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

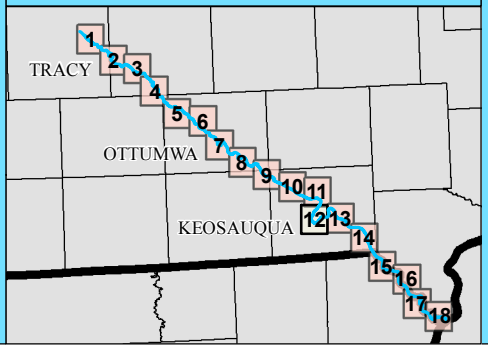
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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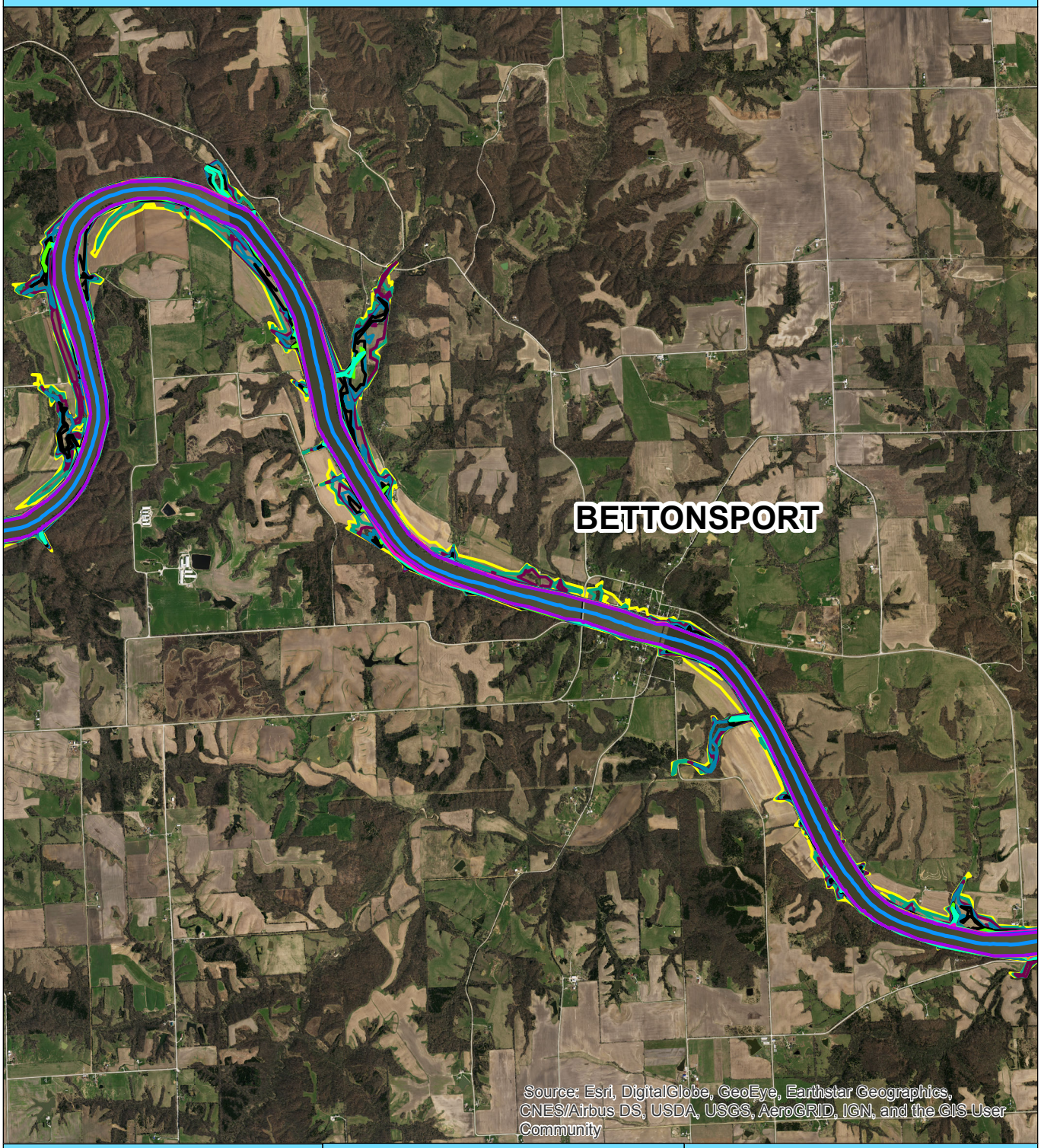
PLATE 12

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

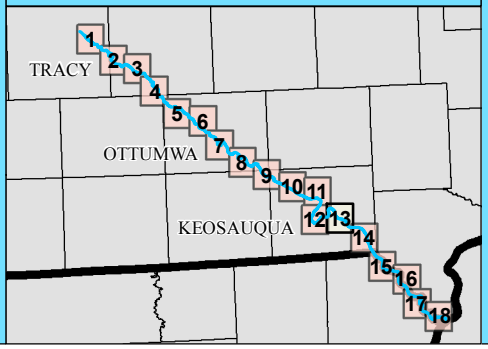
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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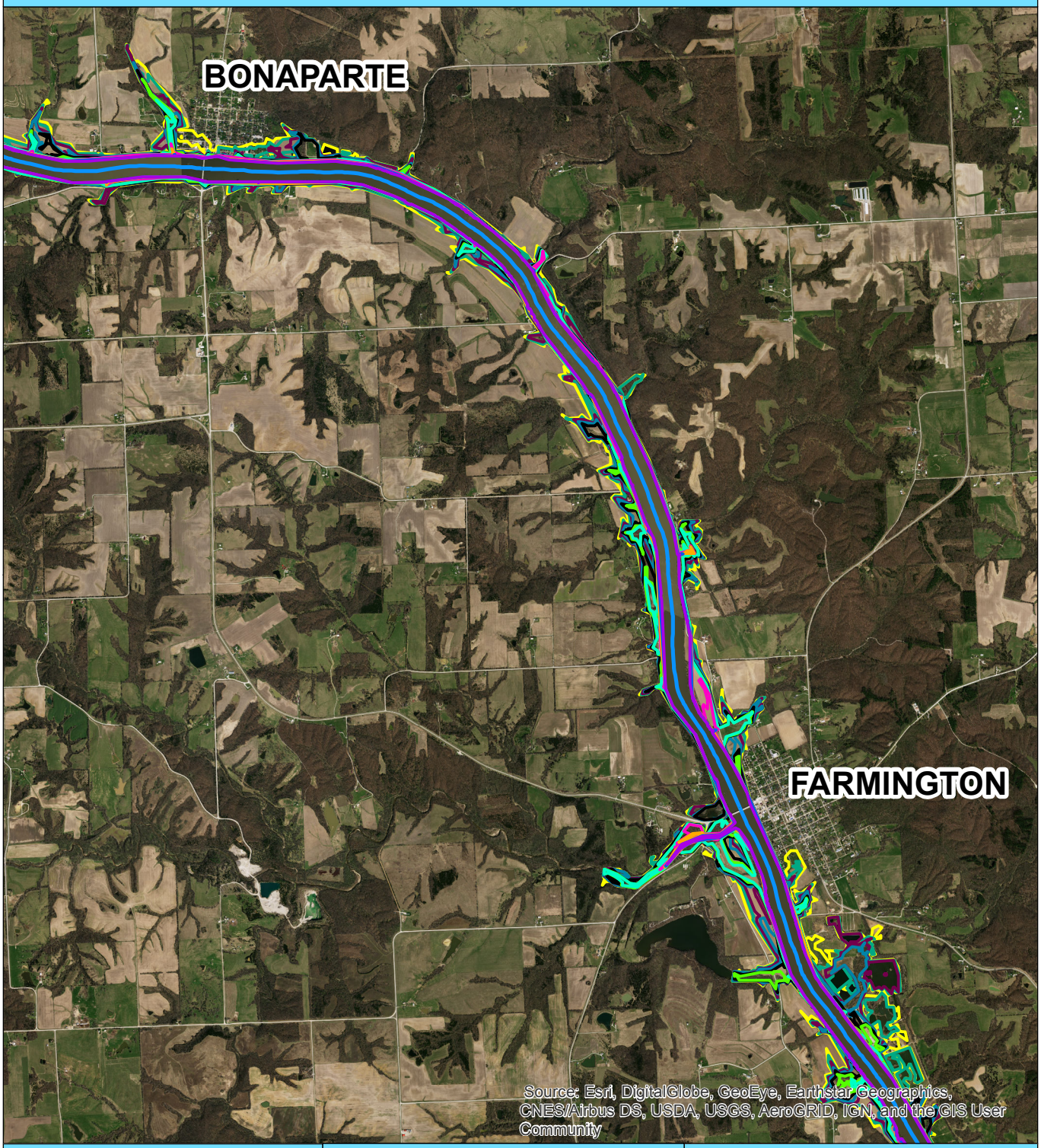
PLATE 13

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

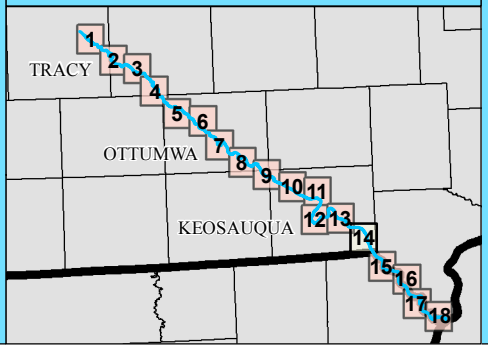
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



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Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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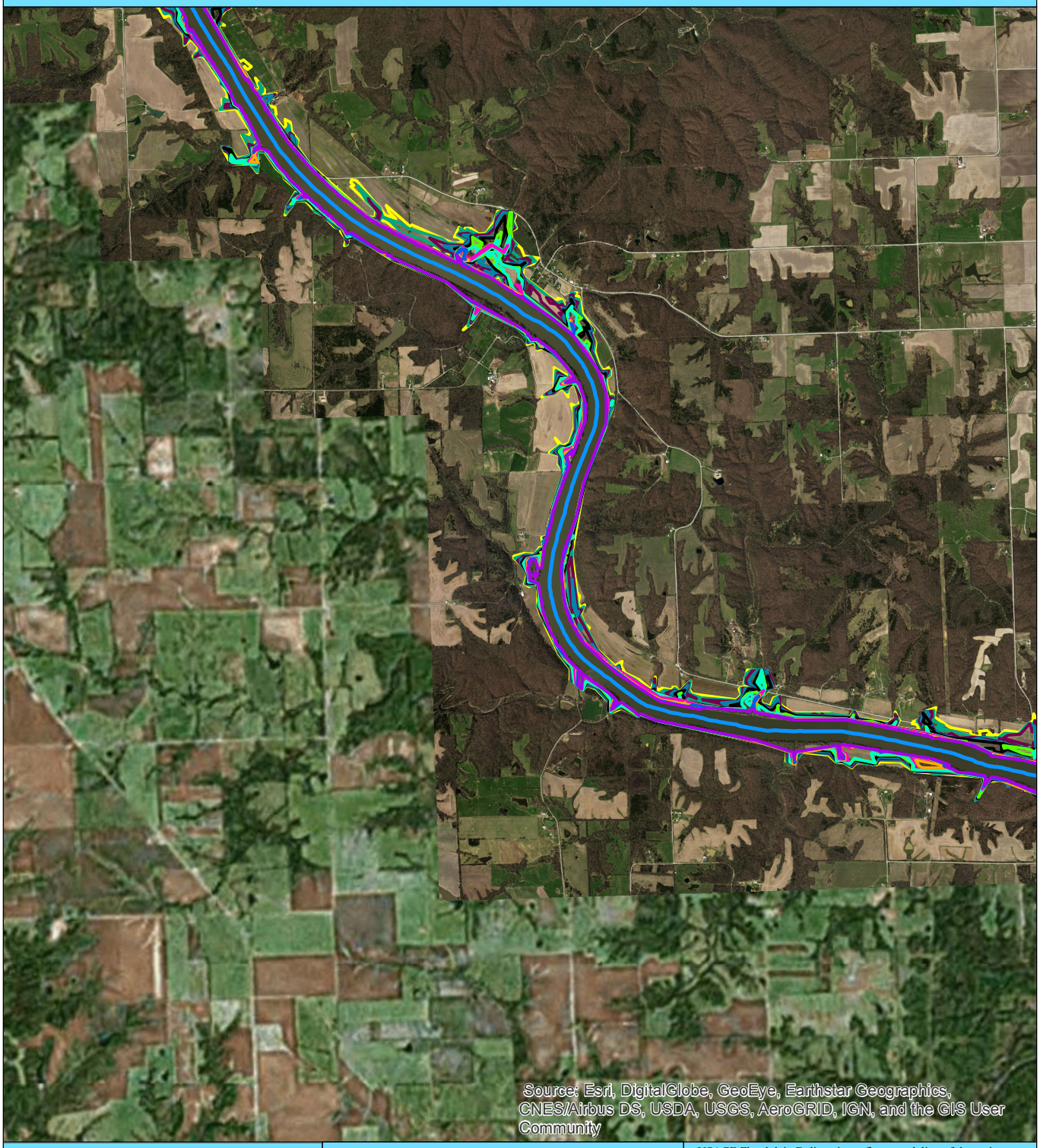
PLATE 14

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

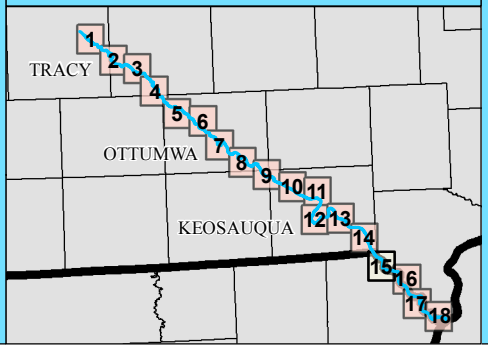
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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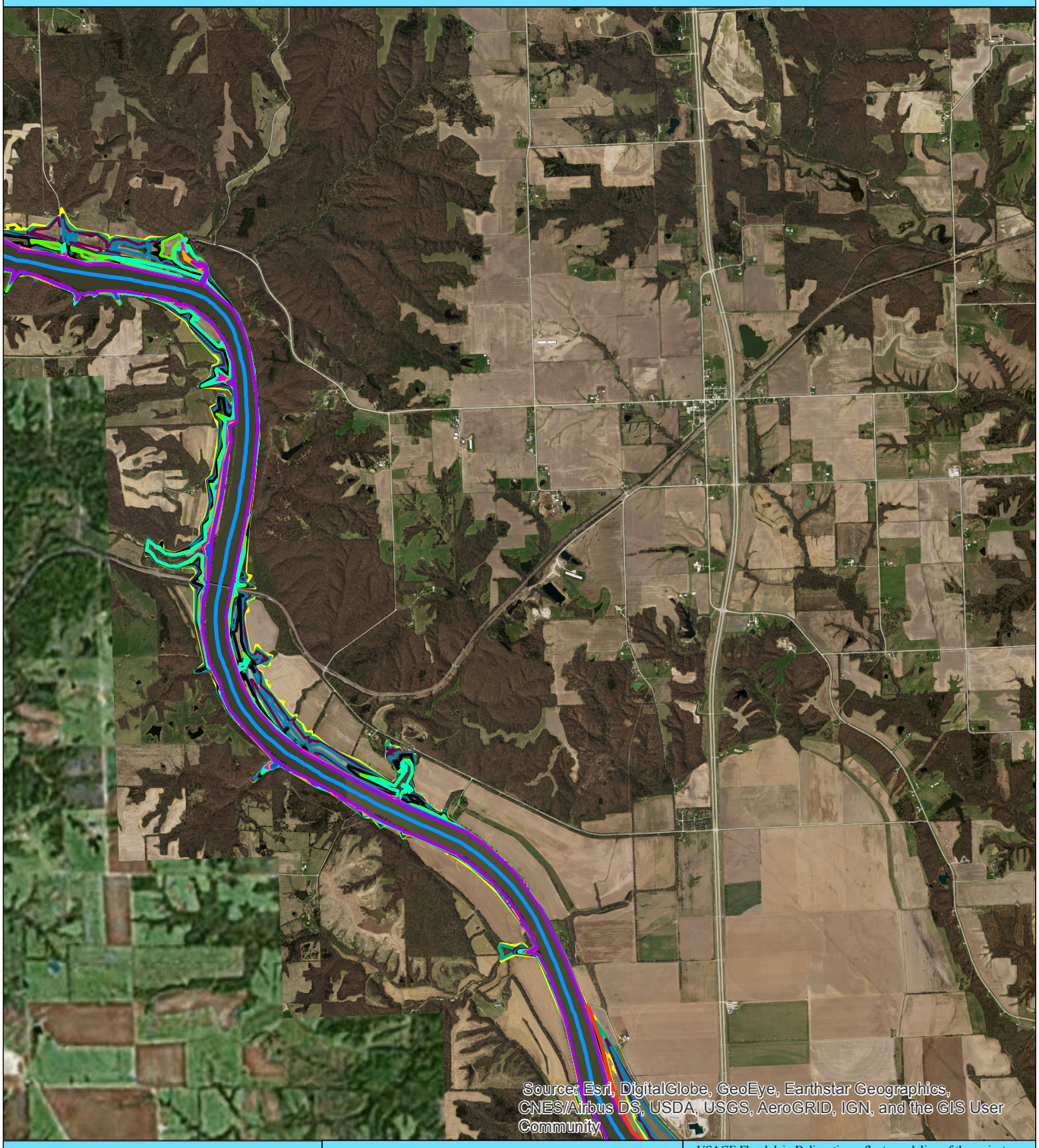
PLATE 15

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

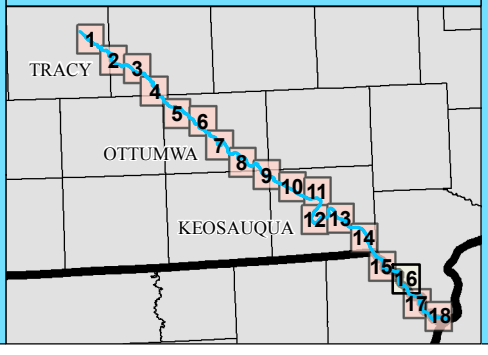
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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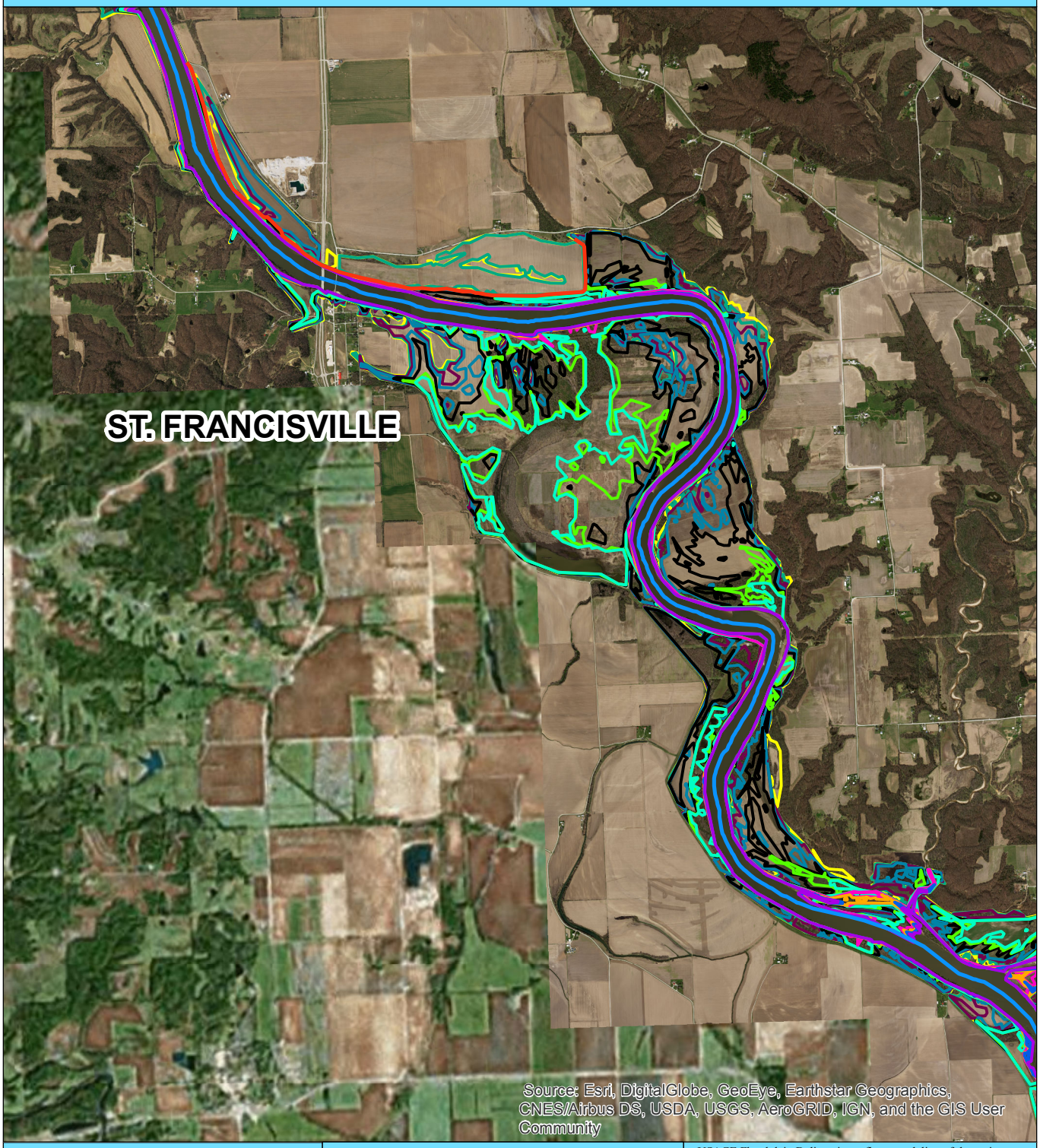
PLATE 16

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

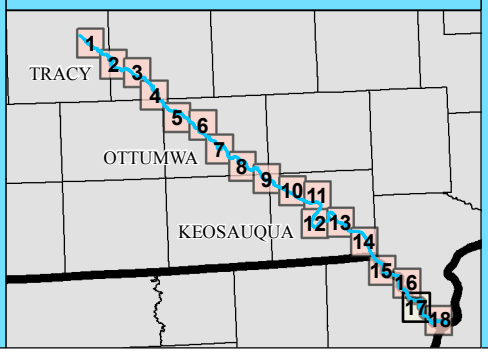
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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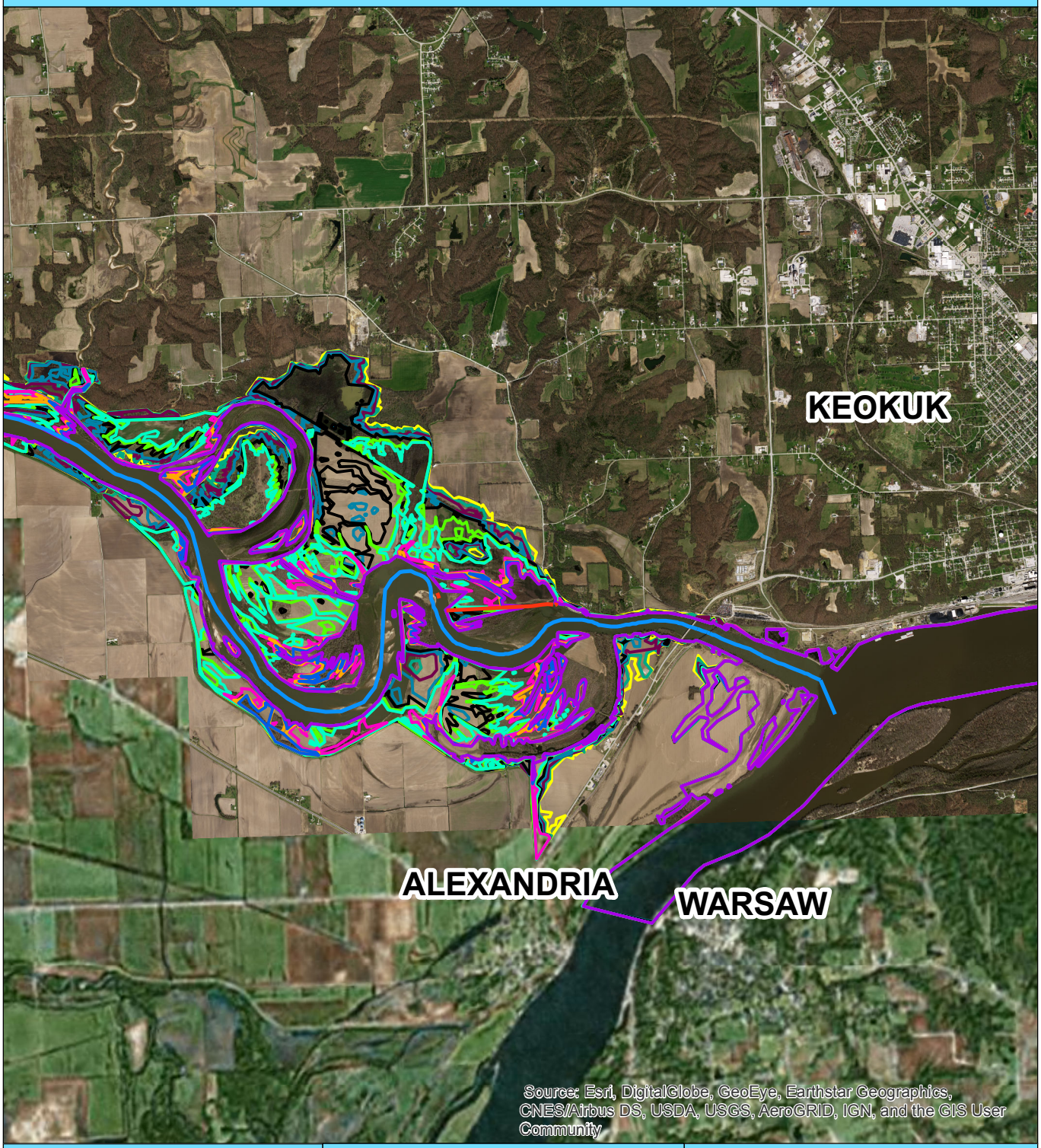
PLATE 17

N W E S

Des Moines River Flood Inundation Map - 2017 SRP

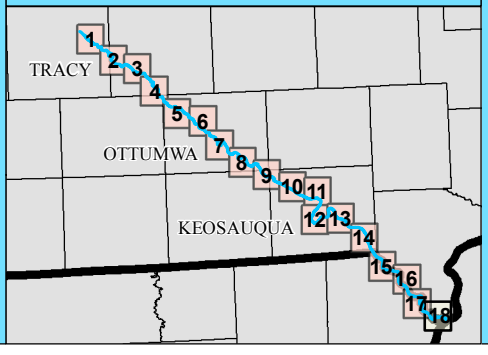
18K, 22K, 25K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K Releases from Lake Red Rock



Legend

- River Centerline
- Levees - IA DNR
- 18K Release
- 22K Release
- 25K Release
- 30K Release
- 40K Release
- 50K Release
- 60K Release
- 70K Release
- 80K Release
- 90K Release
- 100K Release

Location Map



USACE Floodplain Delineation reflects modeling of the mainstem reaches of the Des Moines River (identified by the blue River Centerline feature on the maps).
Tributaries of the mainstem were not modeled.

0.35 0.175 0 0.35 0.7 1.05 1.4 Miles

1 inch equals 0.86 miles

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PLATE 18

N W E S

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