Flood Path Application for the Lower Meramec River

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Lower Meramec River

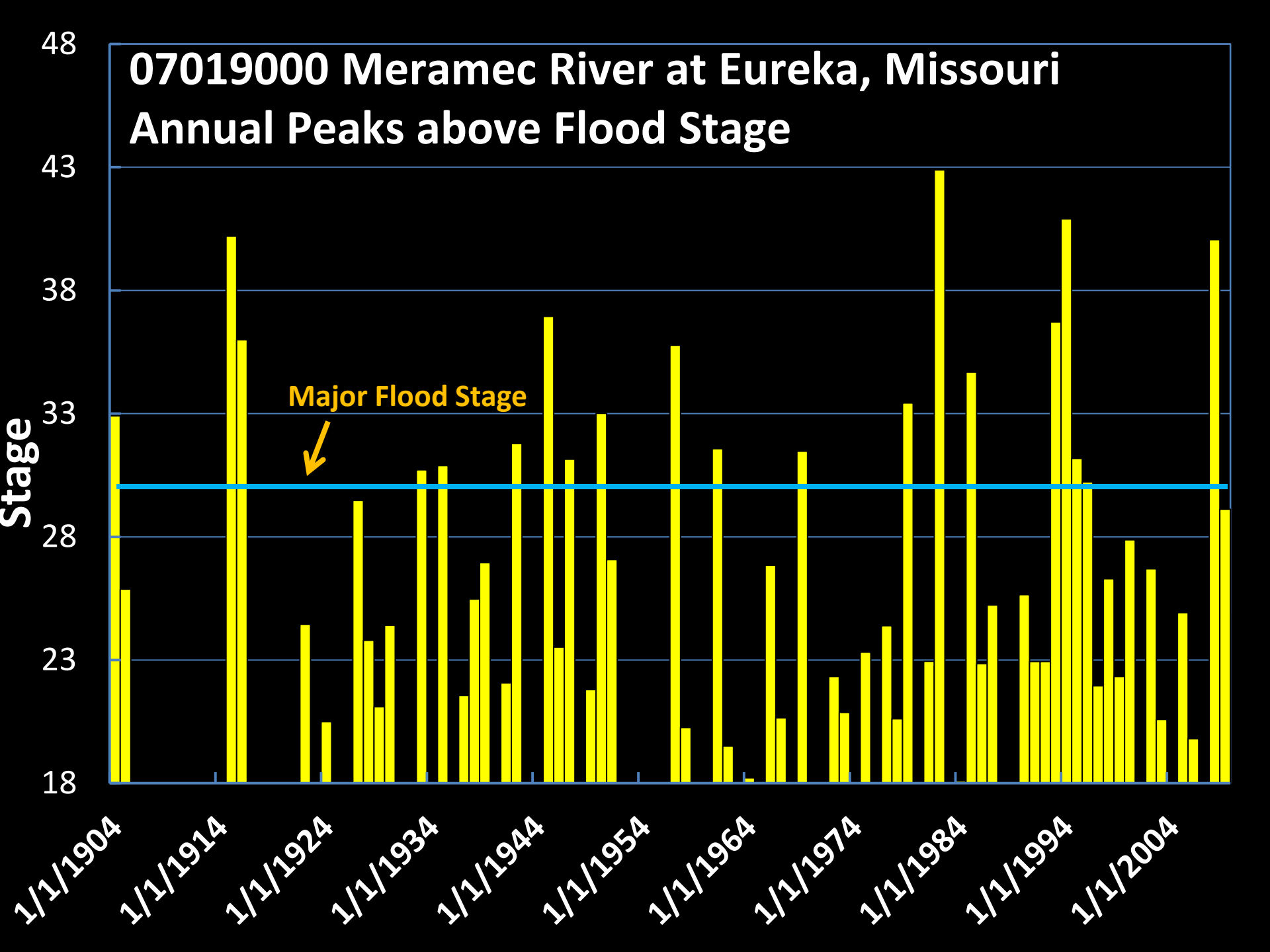
- Eight (8) major floods have occurred in the Lower Meramec River in the last 30 years.
- These floods inundate roadways, businesses and homes resulting in millions of dollars in losses.
- Early notification of the timing and areal extent of flooding would minimize flood losses.

Flood Path and the Lower Meramec River

- The need exists to provide officials and citizens with advanced warning of pending floods throughout the Lower Meramec River.
- Flood Path is a 2-dimensional model (TrimR2D) that can be calibrated to a river reach.
- It uses NWS flood forecasts to compute the timing and areal extent of a flood throughout a reach.

Flood Path and the Lower Meramec River

- Instead of point forecasts of river stage, a flood hydrograph is routed continuously throughout an entire reach.
- GIS derived maps can be produced detailing the impacts of a forecasted flood.
- Changes in the floodplain can be documented and the resulting impact on water surface elevations can be modeled cost effectively.


07019000 Meramec River at Eureka, Missouri
Annual Peaks above Flood Stage
Major Flood Stage
Stage
48
43
38
33
28
23
18
1/1/1904
1/1/1914
1/1/1924
1/1/1934
1/1/1944
1/1/1954
1/1/1964
1/1/1974
1/1/1984
1/1/1994
1/1/2004

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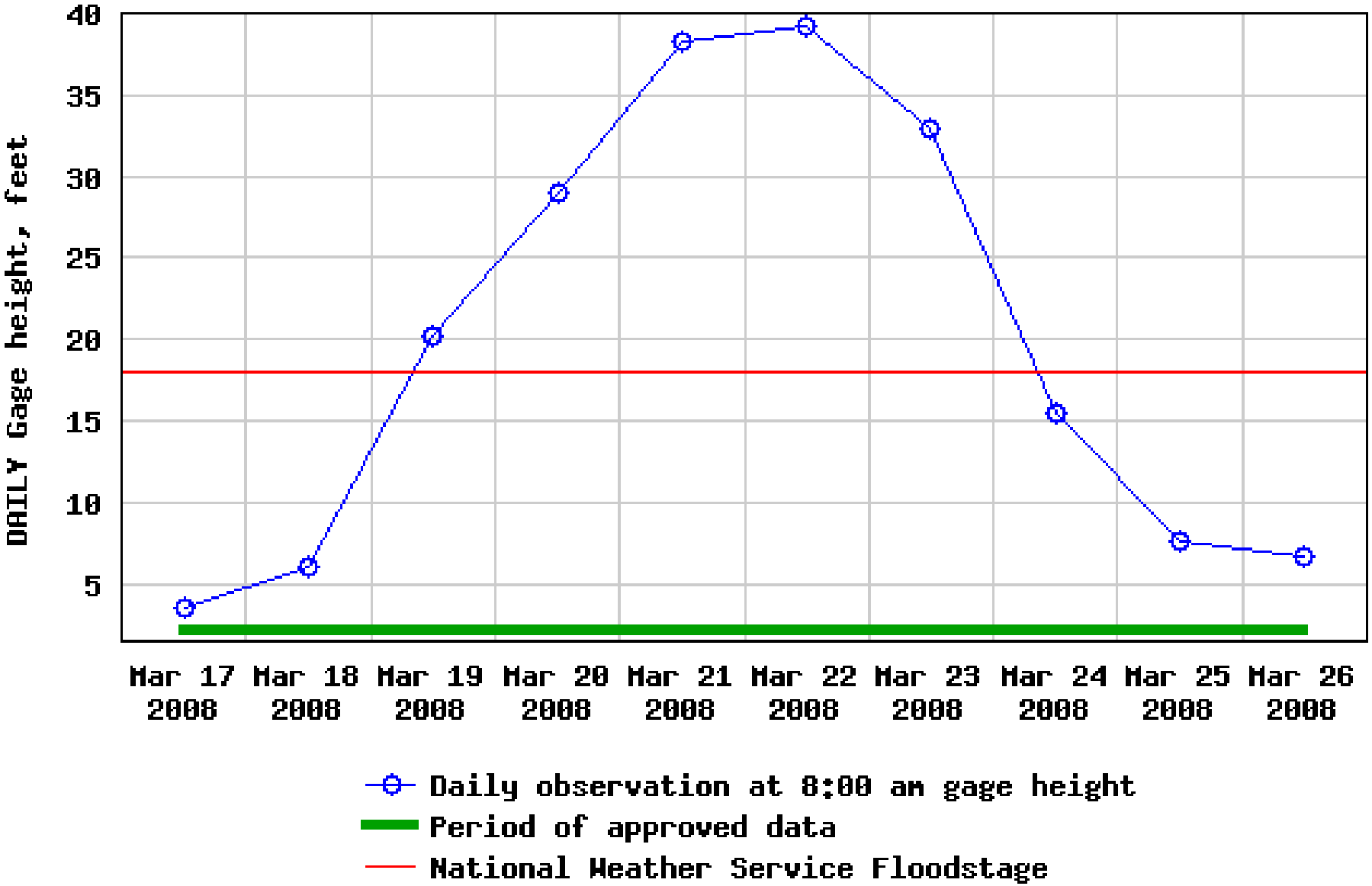
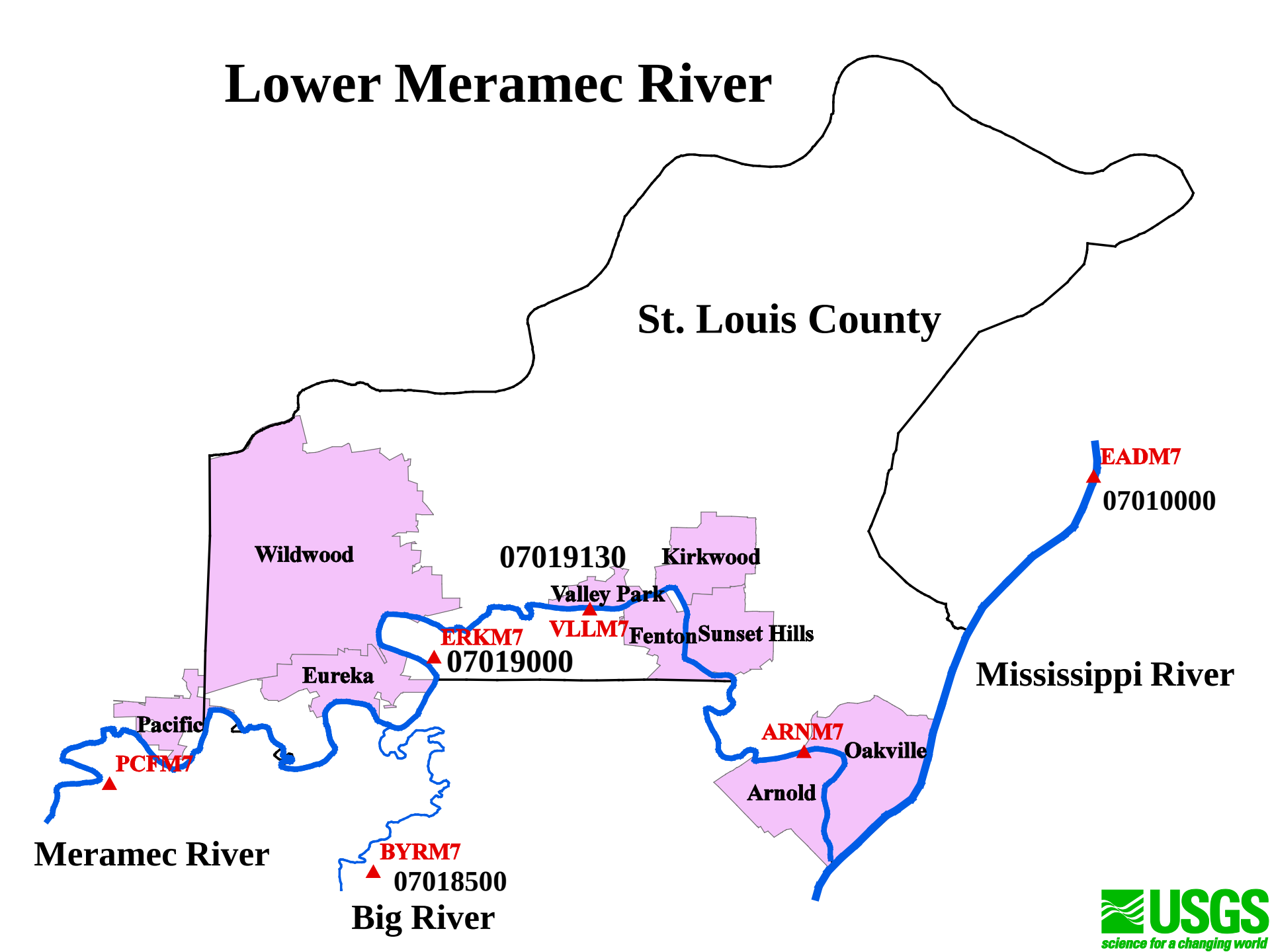
USGS 07019000 Meramec River near Eureka, MO




Lower Meramec River
St. Louis County
EADM7
07010000
Wildwood
07019130
Kirkwood
Valley Park
VLLM7
ERKM7
07019000
Fenton
Sunset Hills
Eureka
Mississippi River
Pacific
ARNM7
Oakville
PCFM7
Arnold
Meramec River
BYRM7
07018500
Big River
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Valley Park Levee on the Lower Meramec River

Base Map: NAIP Color Imagery for United States

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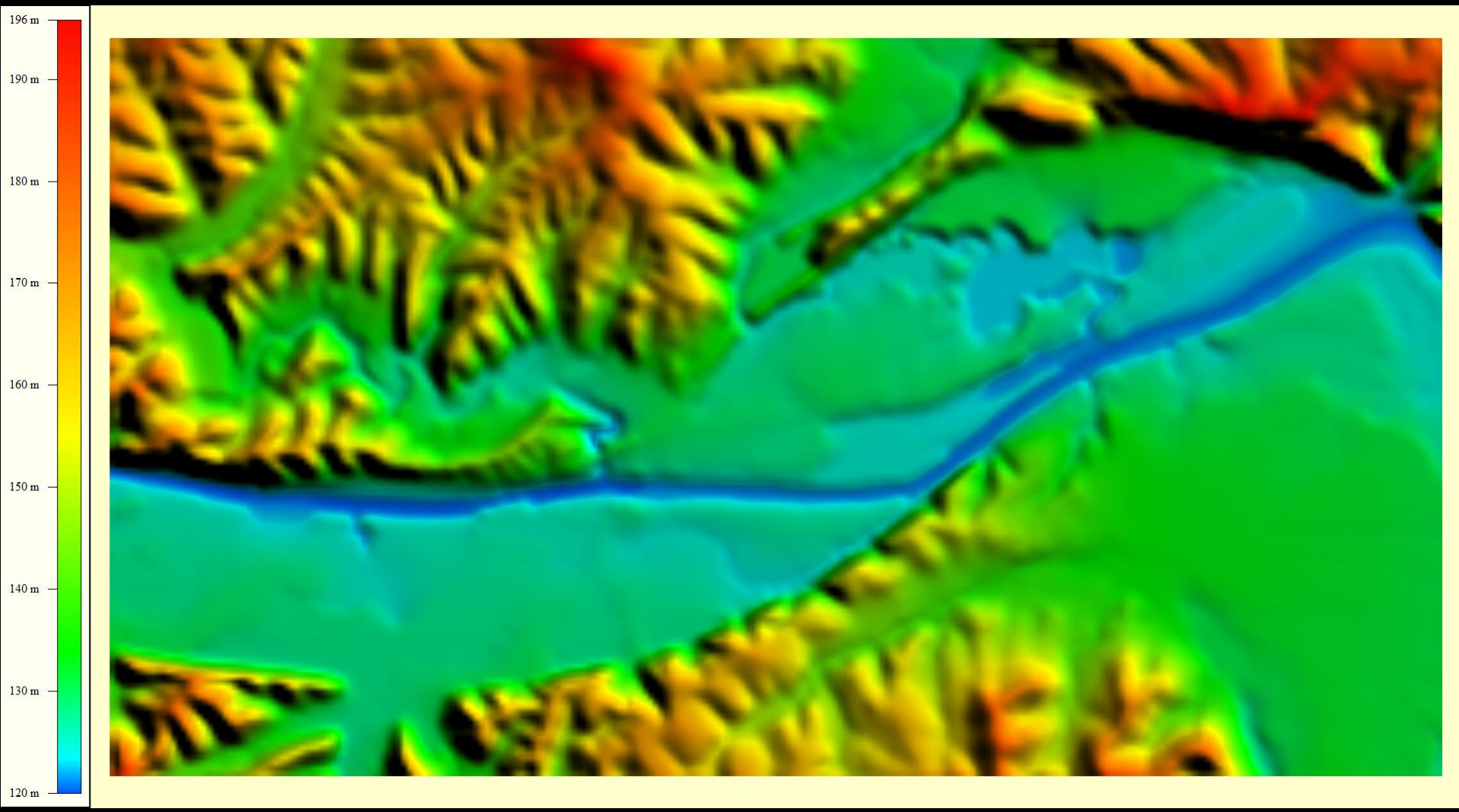
Valley Park Relief on the Lower Meramec River



30-meter grid data

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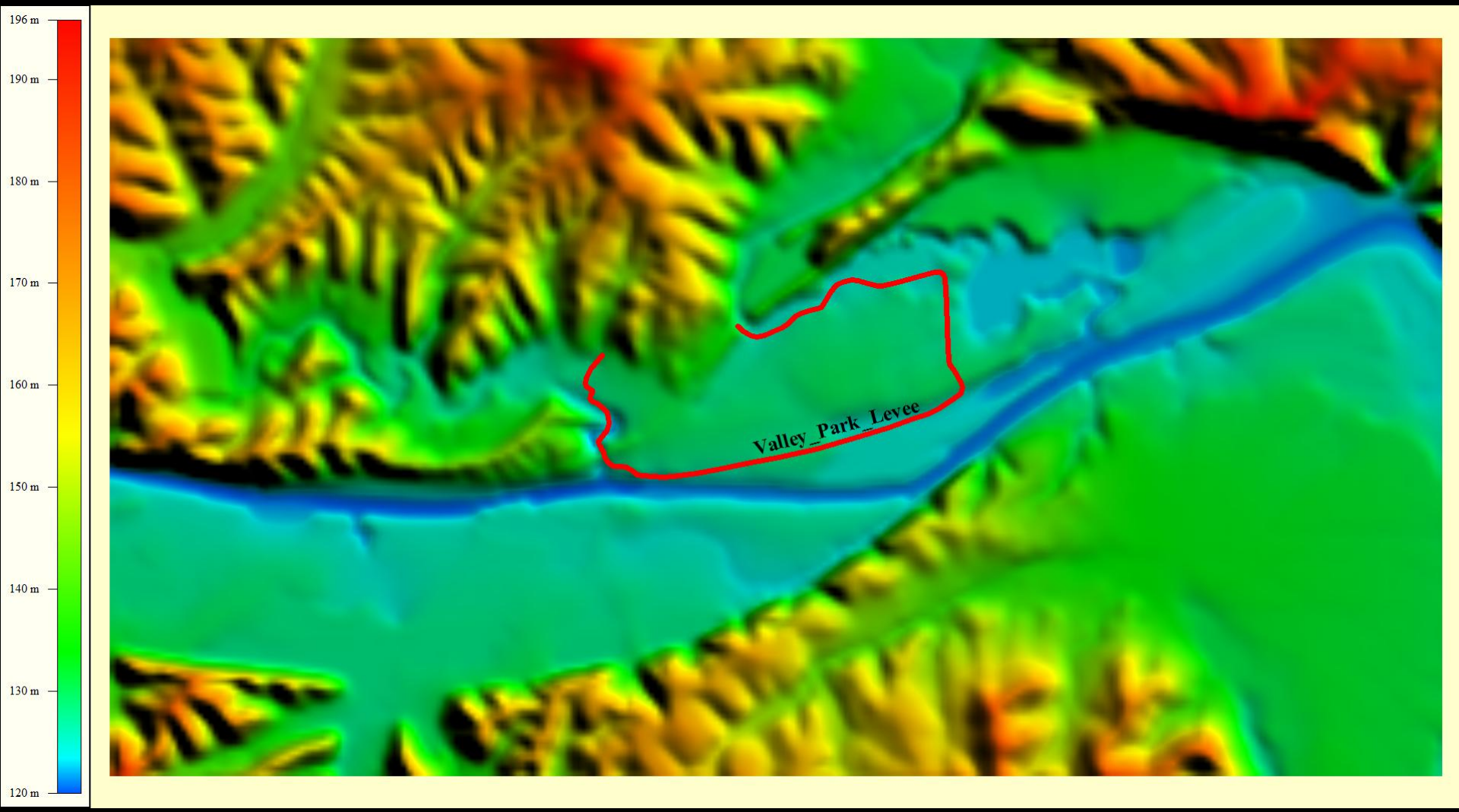
Valley Park Levee on the Lower Meramec River



30-meter grid data

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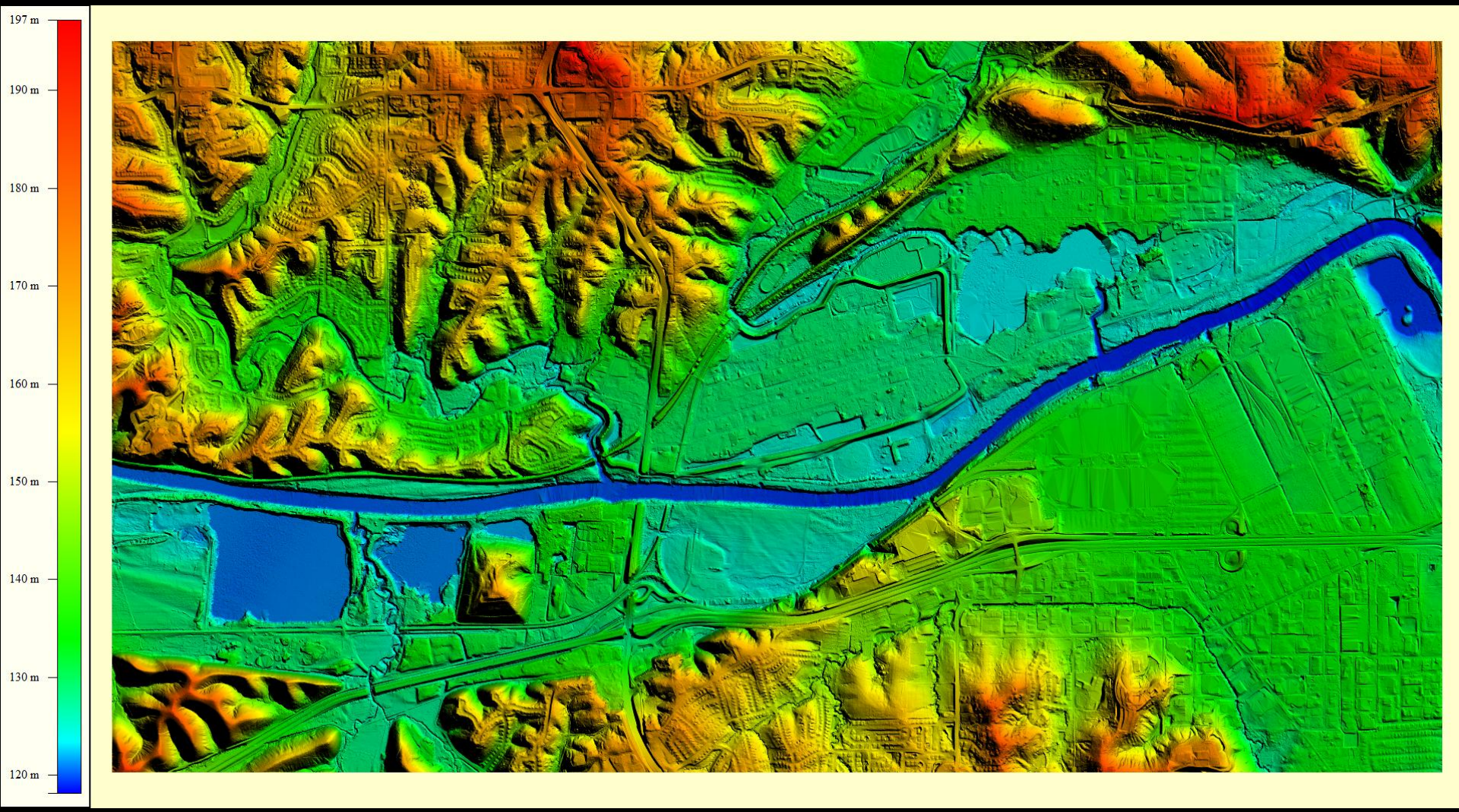
Valley Park Levee on the Lower Meramec River



1.5-meter grid from 2005 LIDAR data

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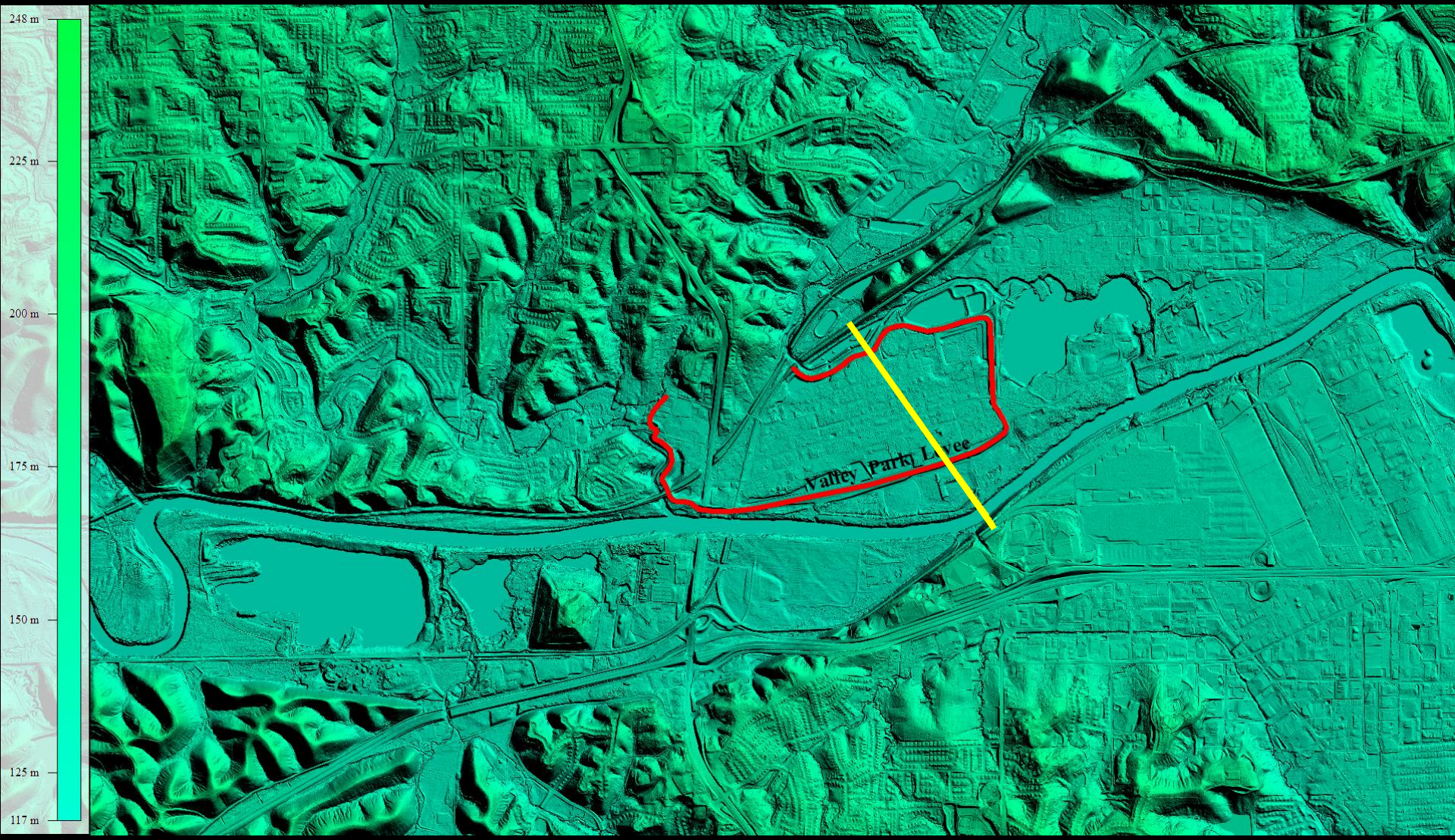
Meramec River Cross Section



1.0-meter grid from 2011 LIDAR data

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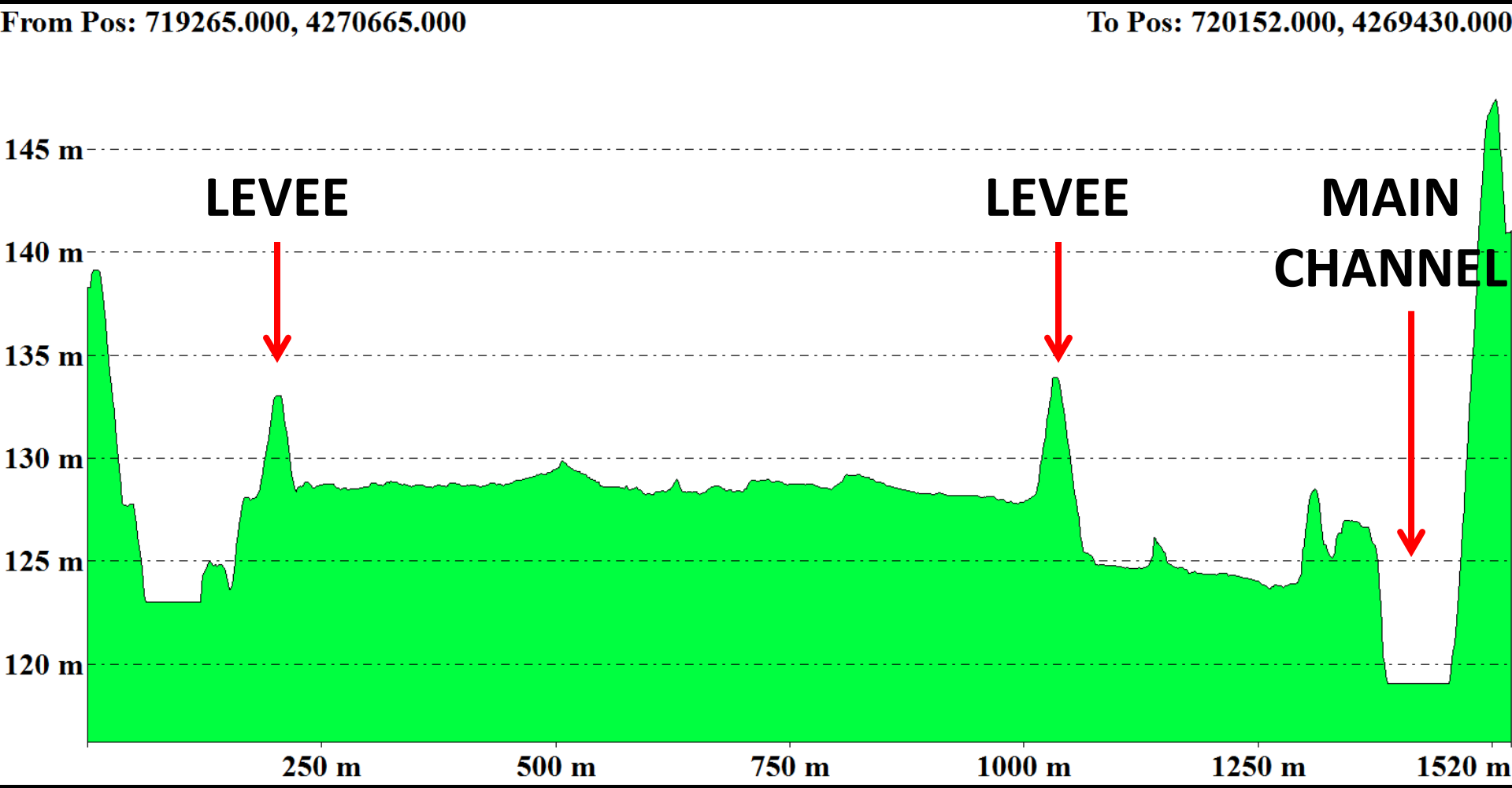
Meramec River Cross Section from 2011 LIDAR



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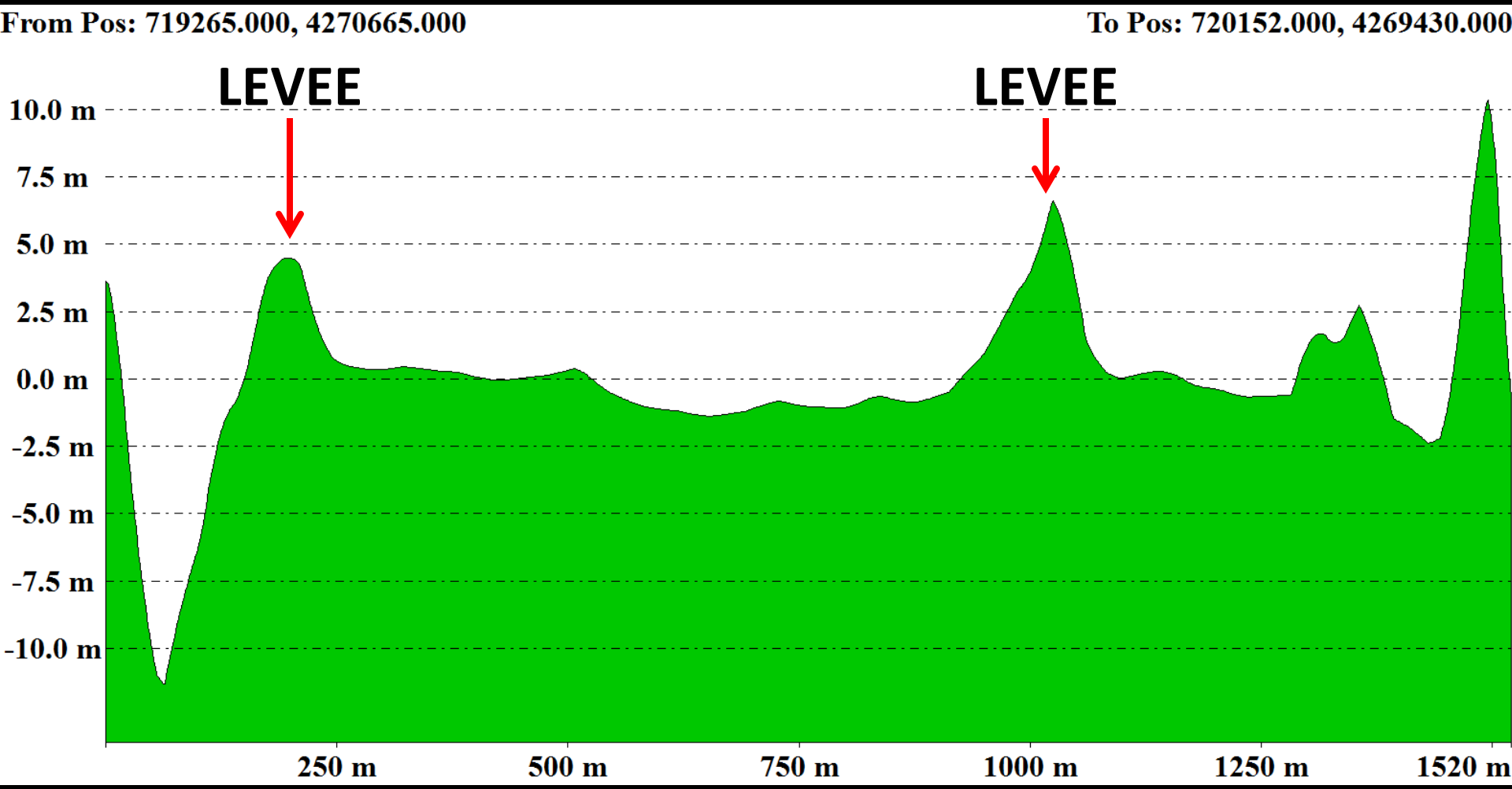
Difference in elevation between 2011 LIDAR and 30-meter data



Boundary from green to white is the difference in meters between elevation data sets.

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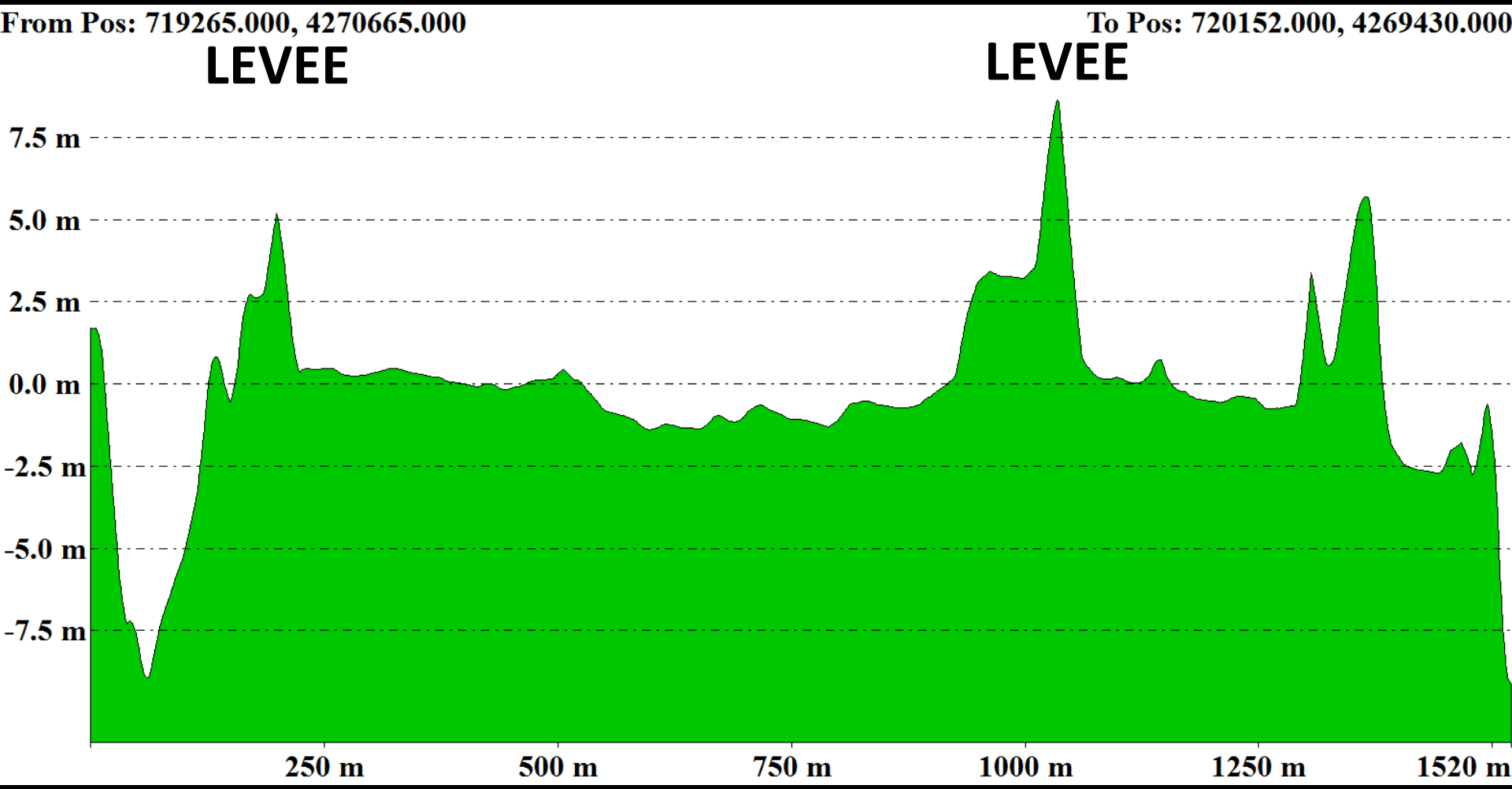
Difference in elevation between 2011 LIDAR and 10-meter data



Boundary from green to white is the difference in meters between elevation data sets.

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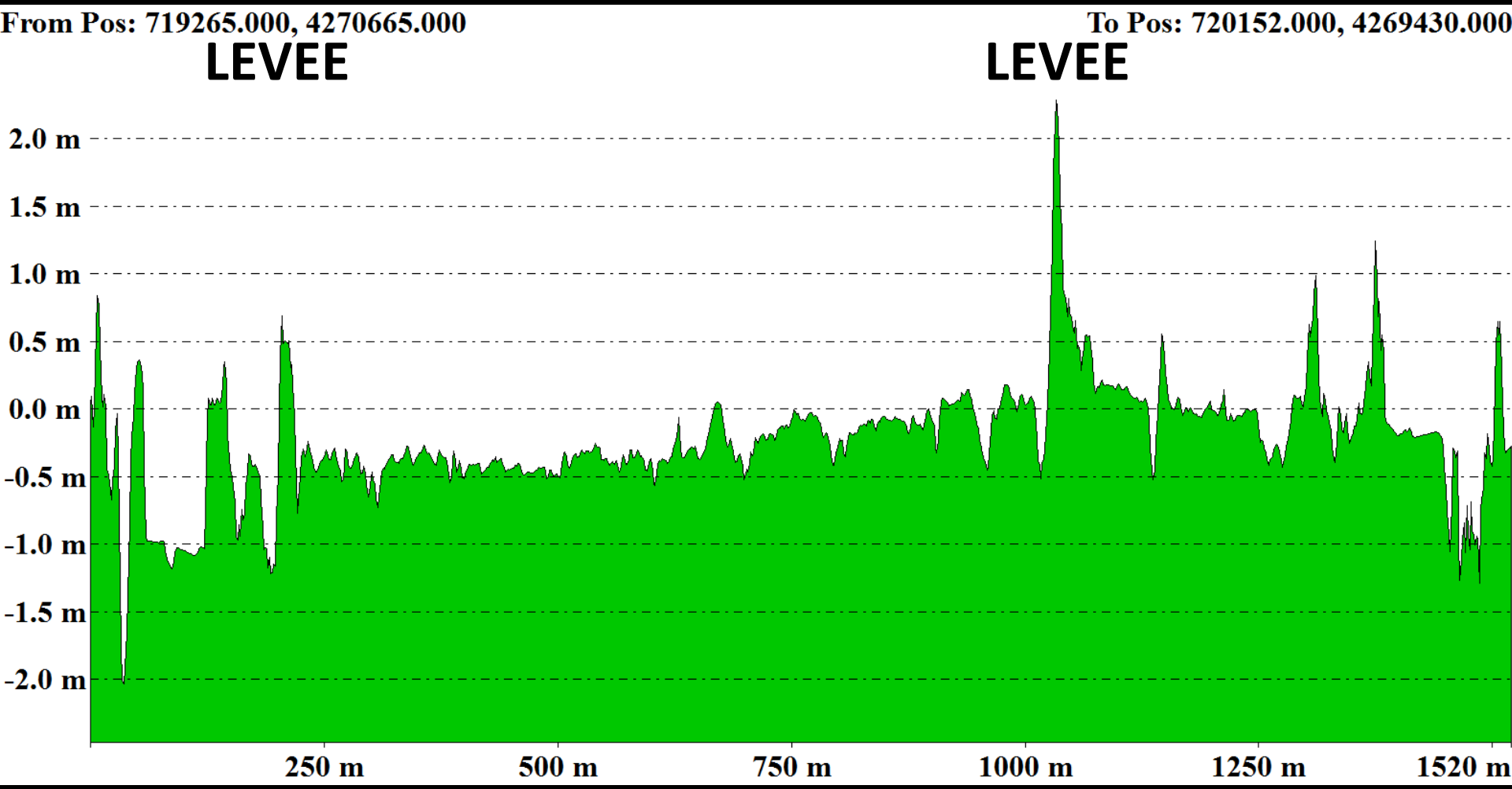
Difference in elevation between 2011 and 2005 LIDAR data



Boundary from green to white is the difference in meters between elevation data sets.

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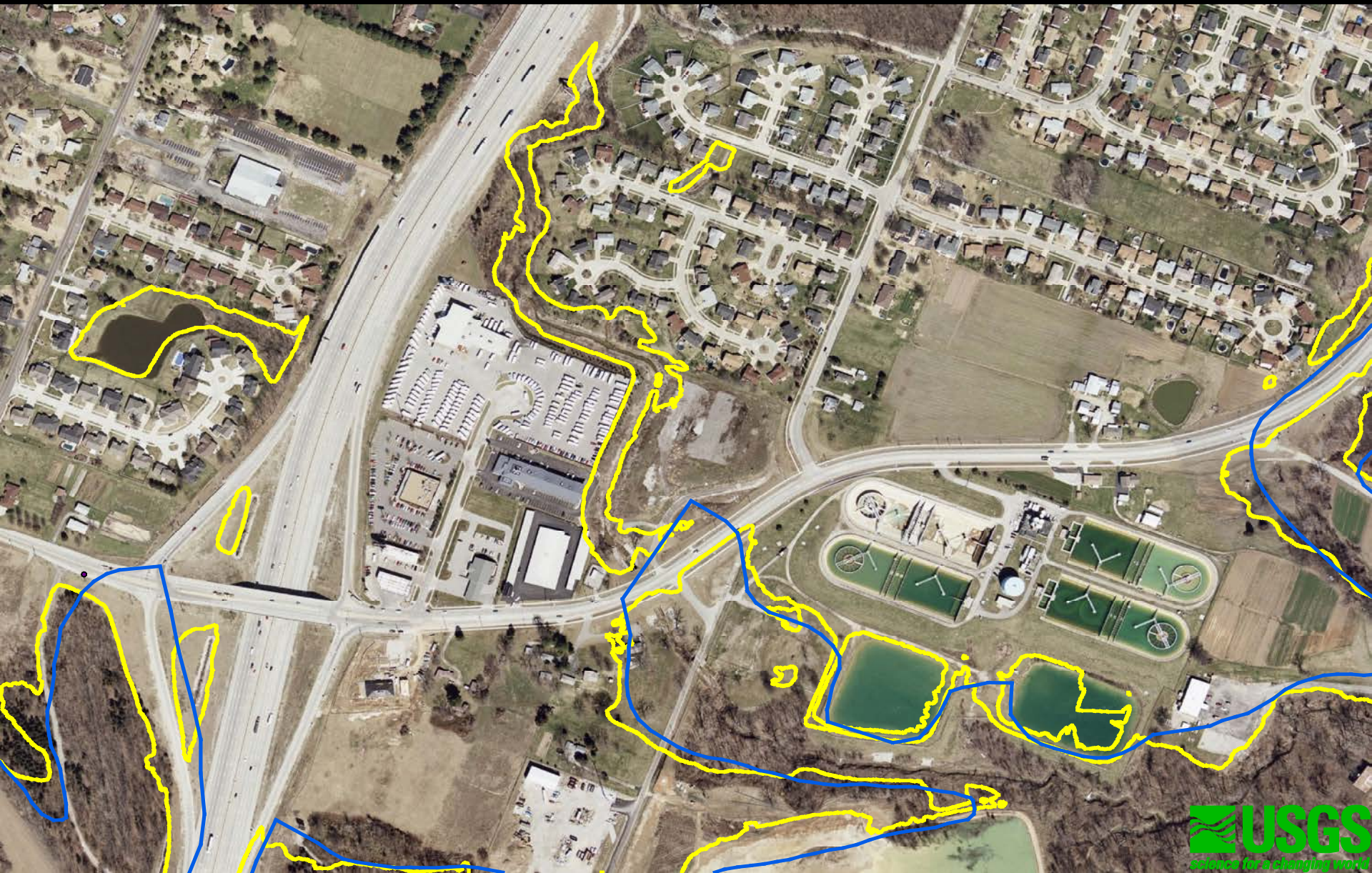
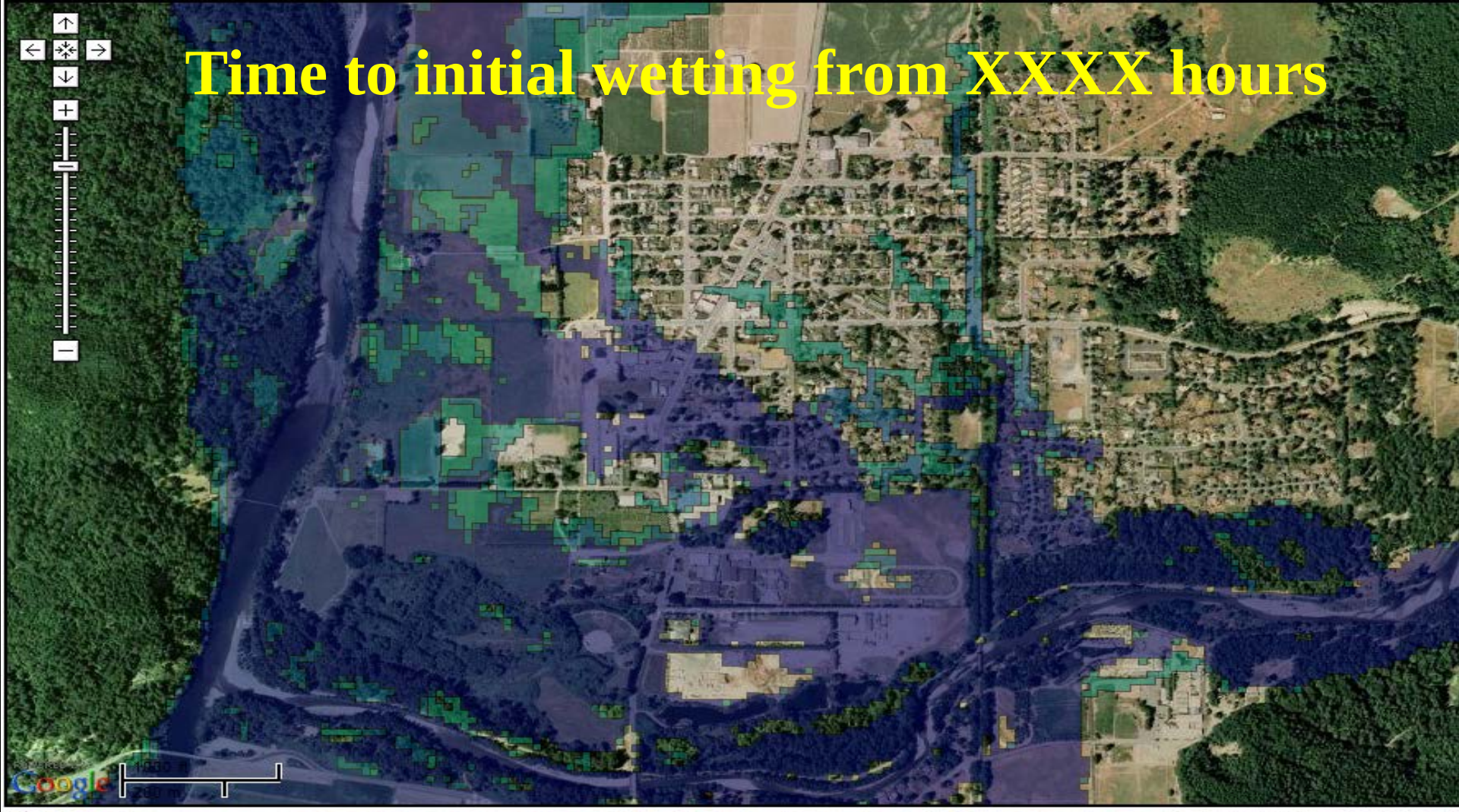
1993 flood on the Meramec River from Mississippi River backwater

1993 flood on the Meramec River from Mississippi River backwater



Time to initial wetting from XXXX hours



Real-time station

Forecast station

Time to flood arrival from XX/XX/1986 @ XX:XX

- >28
- 24-28
- 20-24
- 16-20
- 12-16
- 8-12
- 4-8
- <4

Overlay Transparency

- 100%
- 75%
- 50%

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Time to flood peak from XXXX hours

Real-time station
Forecast station

Time to flood peak in hours from XX/XX/1986 @ XX:XX

- >59
- 56-59
- 53-56
- 50-53
- 47-50
- 44-47
- <44

Overlay Transparency

- 100%
- 75%
- 50%

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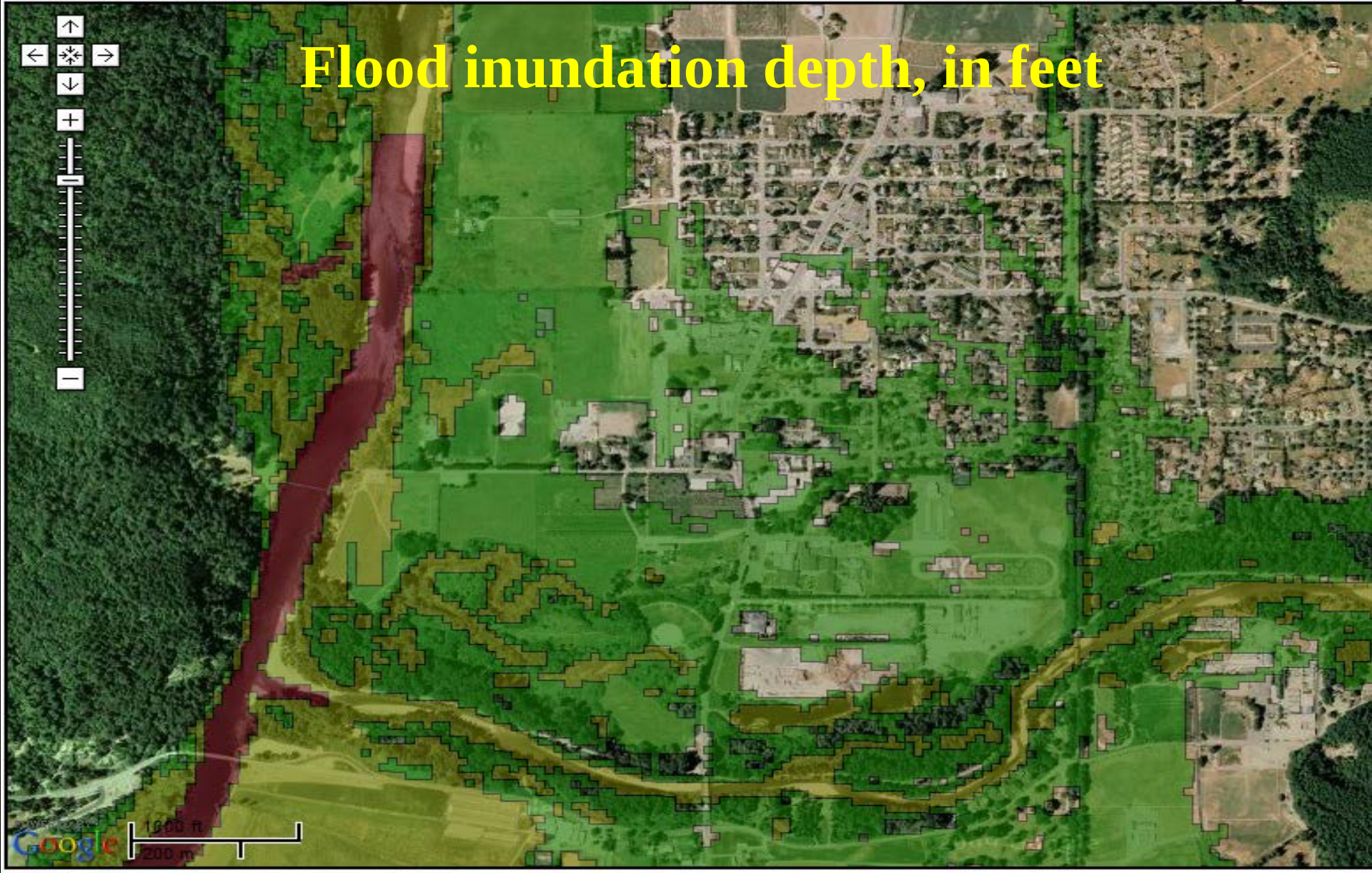

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Flood Path – What is it?

- Combination of accurate elevation data, 2-D model (TRIMR2D), and NWS flood forecasts
- Flood wave routed through a reach depicting time of arrival, area of inundation, and depth of flood
- Model updated based on the frequency of NWS forecasts and results stored in map libraries which are available for viewing on the Web

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Flood Path and WaterAlert

- TrimR2D model output, at pre-defined locations, within the modeled reach can be uploaded into NWIS for distribution by WaterAlert

- USGS WaterAlert service sends email and texts when certain user defined thresholds are met or exceeded

- Thresholds are unique to each user and there are no limits on the number of users

The End – Thank You

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