Dam 3D

Why'd you do that?

Barry Puskas, PE, GISP

Manager, Technical Services

September 30, 2016

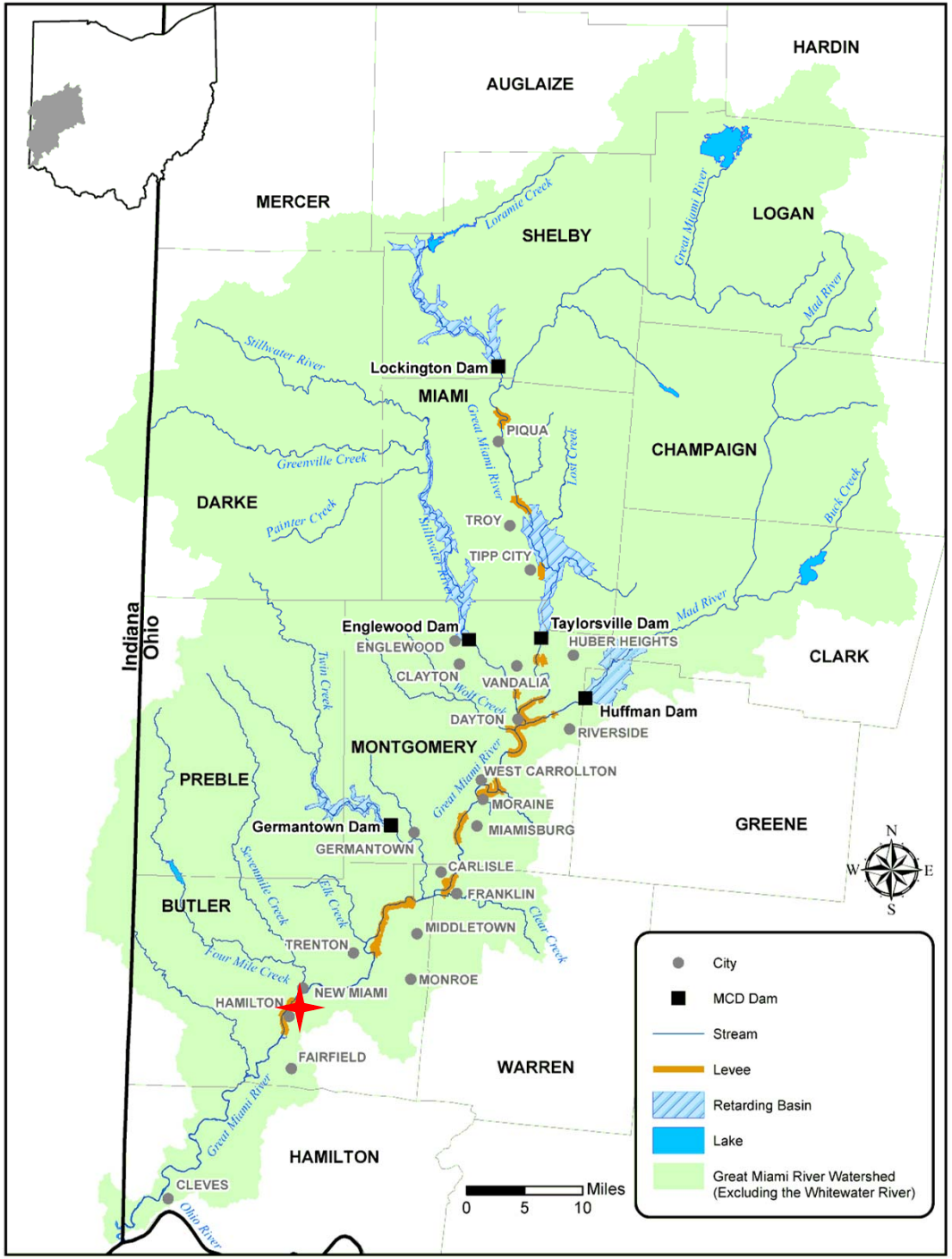
Ohio GIS Conference

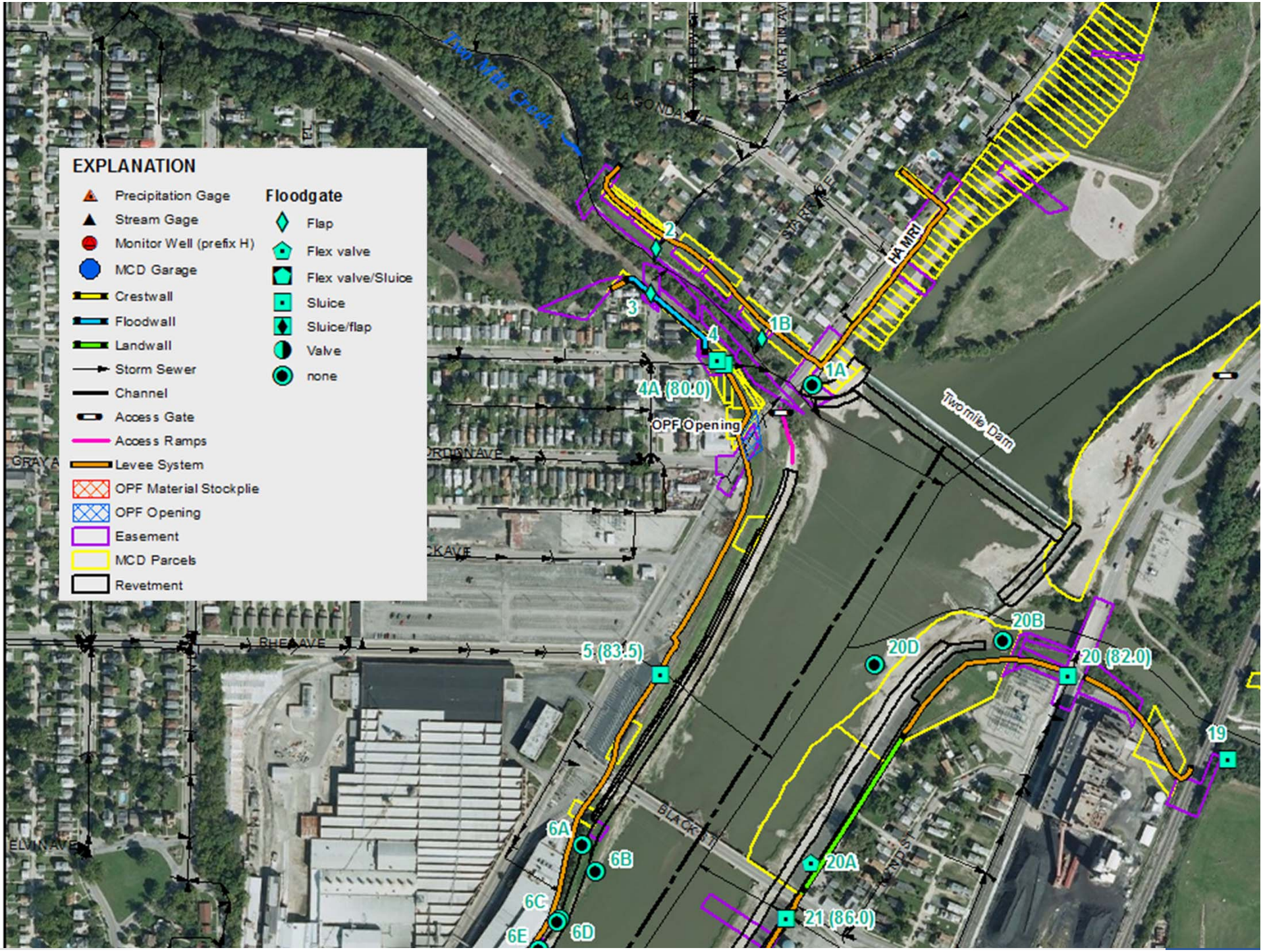
MCD

MIAMI CONSERVANCY DISTRICT

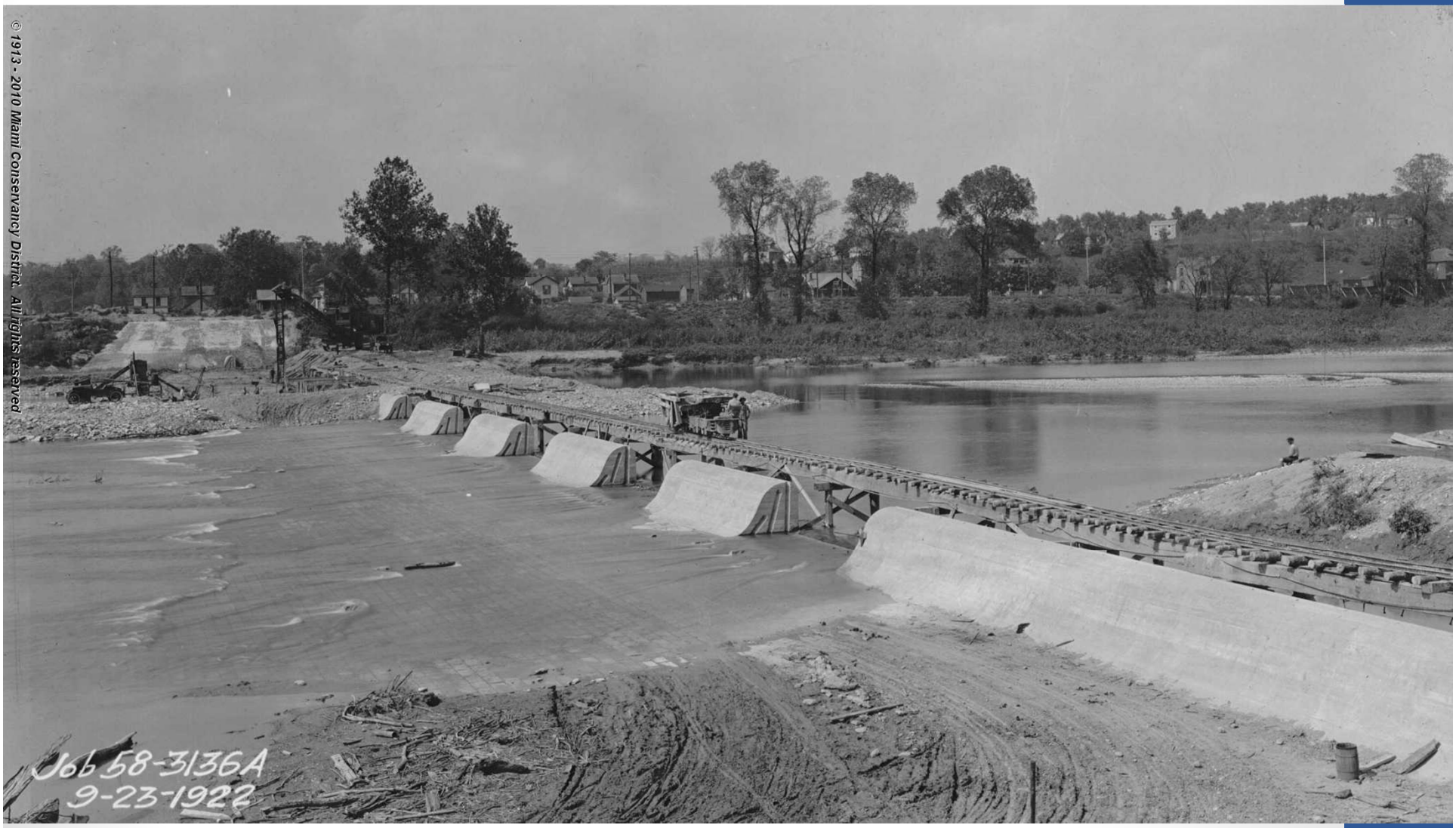
Two Mile Low Dam

- Great Miami River in Hamilton, Ohio
- Miami Conservancy District system completed in 1922
- Dam Purpose to manage river gravel accumulation




EXPLANATION
Precipitation Gage
Stream Gage
Monitor Well (prefix H)
MCD Garage
Crestwall
Floodwall
Landwall
Storm Sewer
Channel
Access Gate
Access Ramps
Levee System
OPF Material Stockplie
OPF Opening
Easement
MCD Parcels
Revetment
Floodgate
Flap
Flex valve
Flex valve/Sluice
Sluice
Sluice/flap
Valve
none
Two Mile Creek
LAGONDA AVE
HAMRI
Twomile Dam
OPF Opening
2
3
4
1B
1A
4A (80.0)
5 (83.5)
20B
20D
20 (82.0)
19
6A
6B
6C
6D
6E
20A
21 (86.0)
RHEA AVE
BLACK ST
ELVIN AVE

1922 photograph



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1930 photograph

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2013 photograph

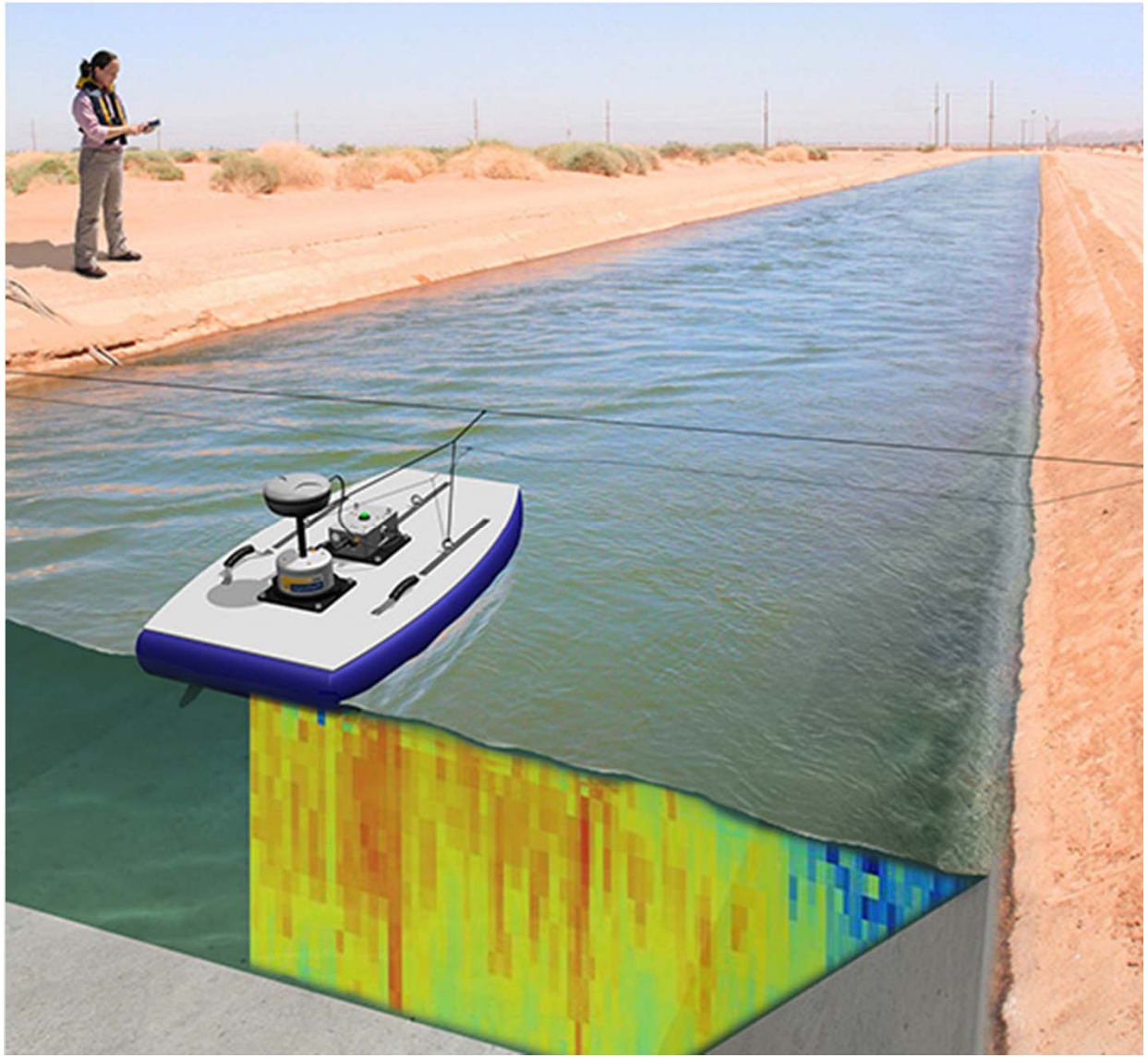
Two Mile Low Dam

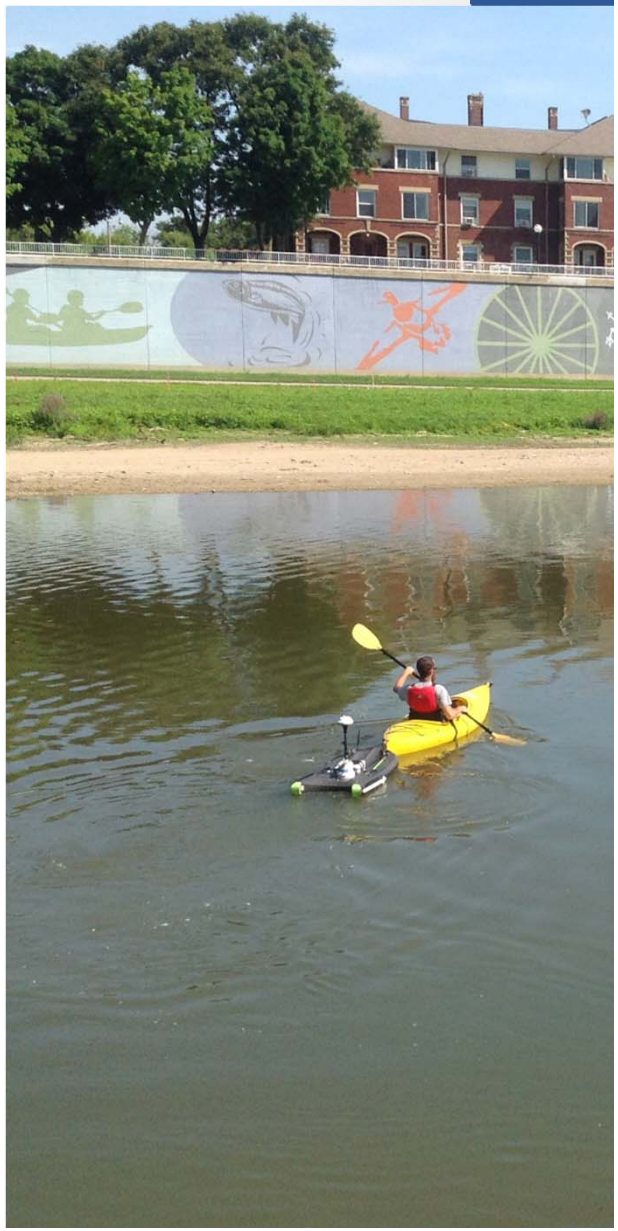
- 2013 MCD staff notice some damage to the concrete

Survey of the depth/loss

- Let's use a kayak and examine the depth
- Engineer inspection
- Acoustic Doppler Current Profiler (ADCP)
  - Multi-Band - Multiple acoustic frequencies
  - Vertical acoustic beam
  - GPS
  - Bottom-tracking

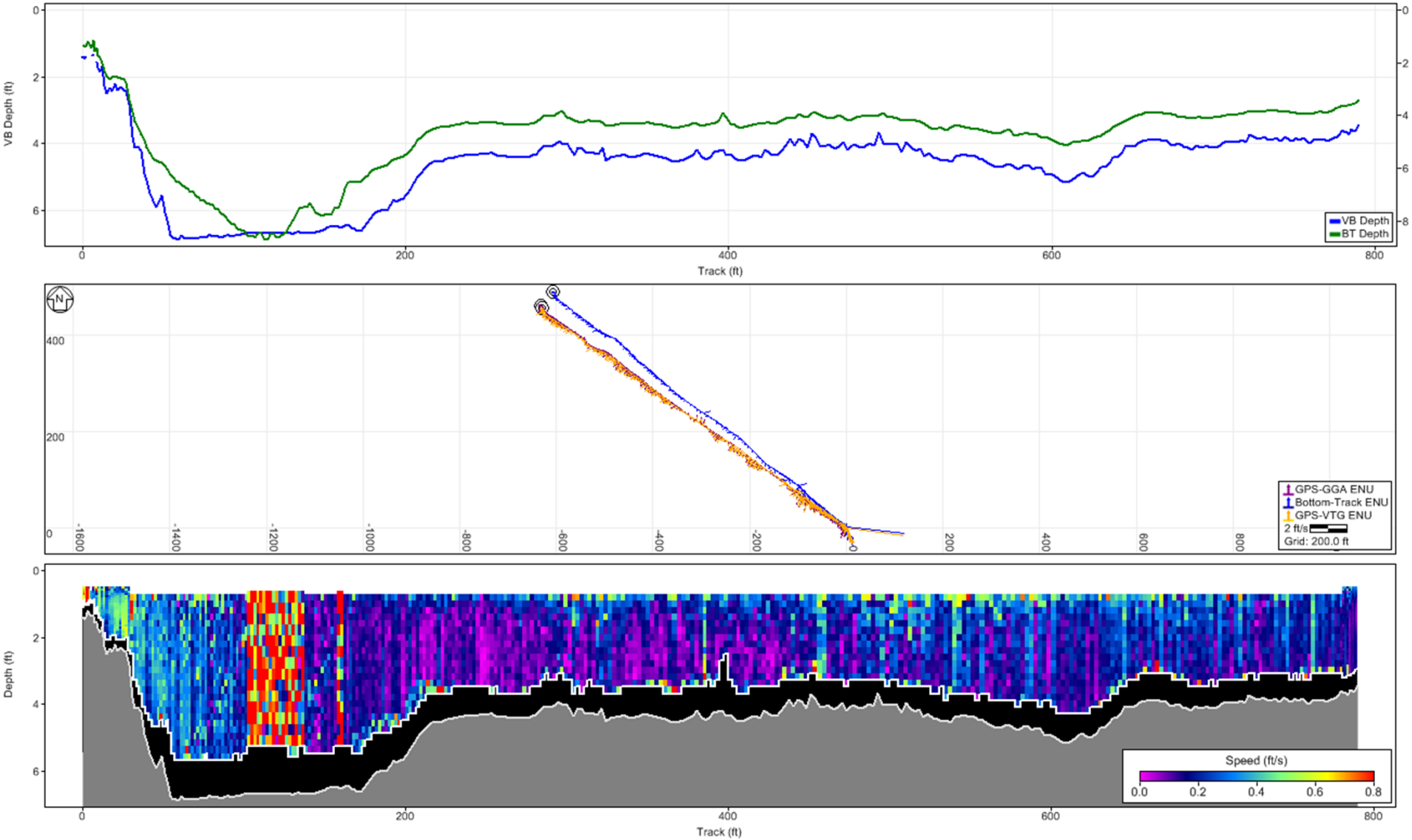
Acoustic Doppler Current Profiler ADCP



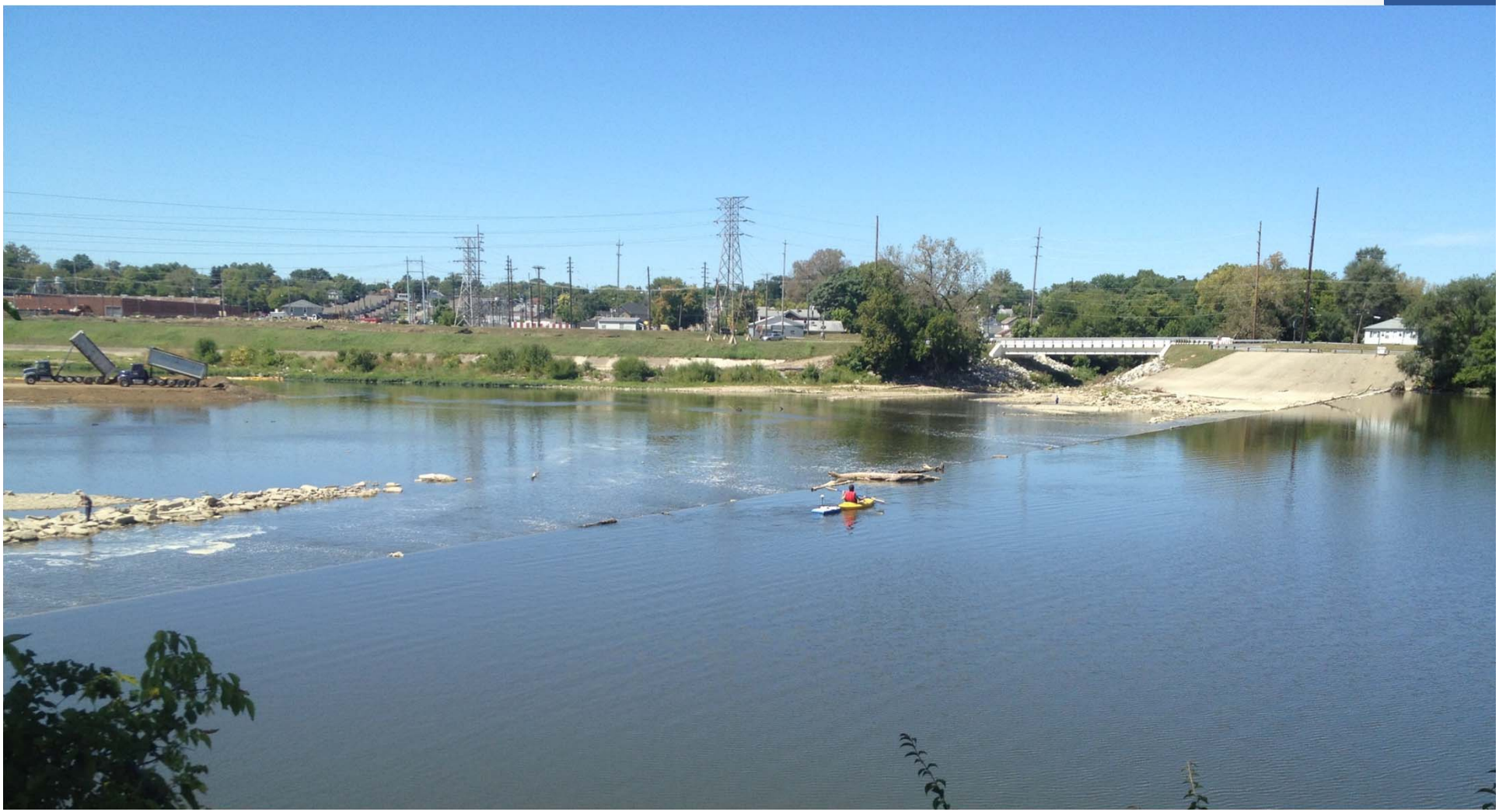


ADCP Data

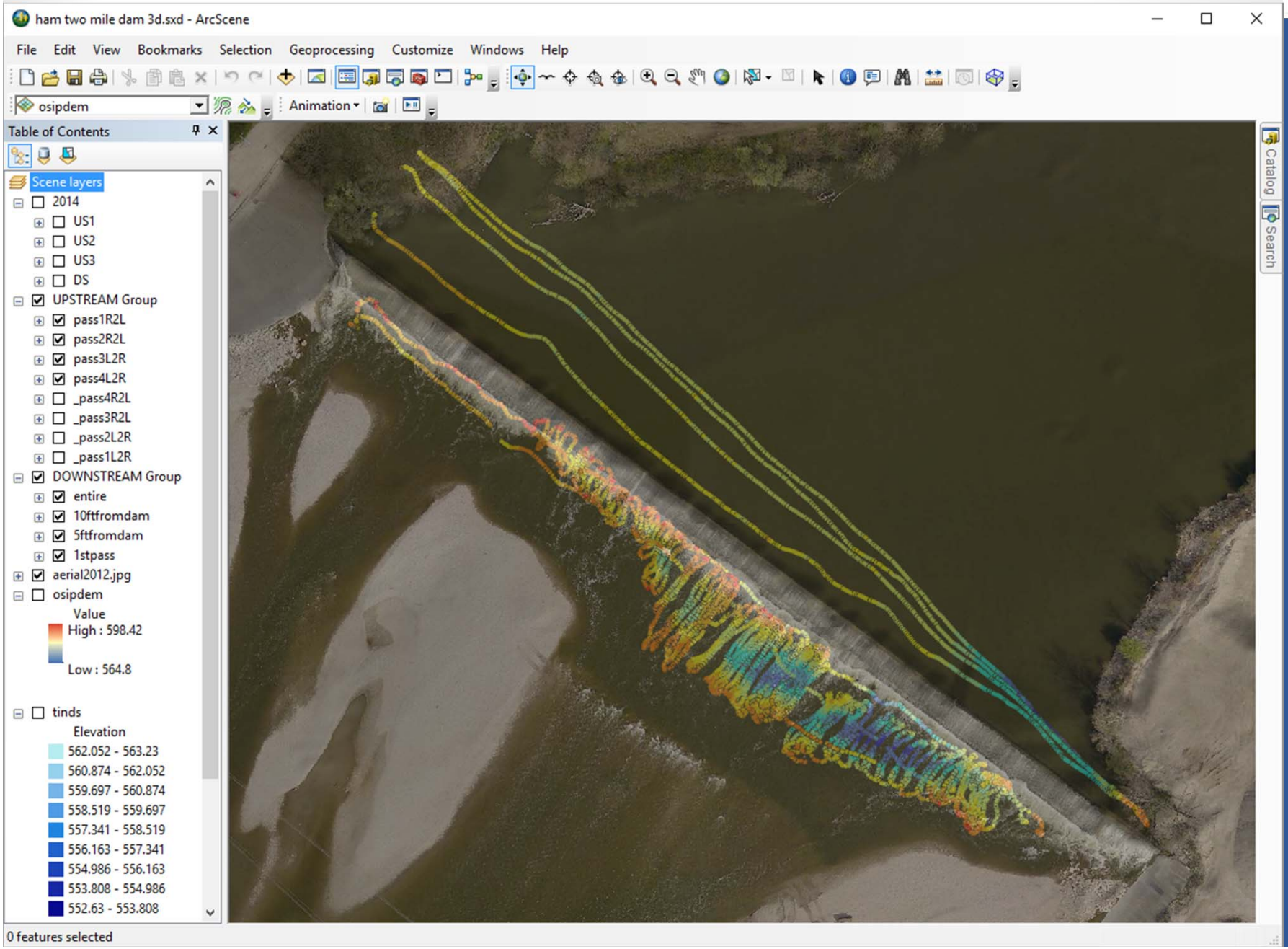
- Live data transmission from ADCP to laptop/tablet on the bank

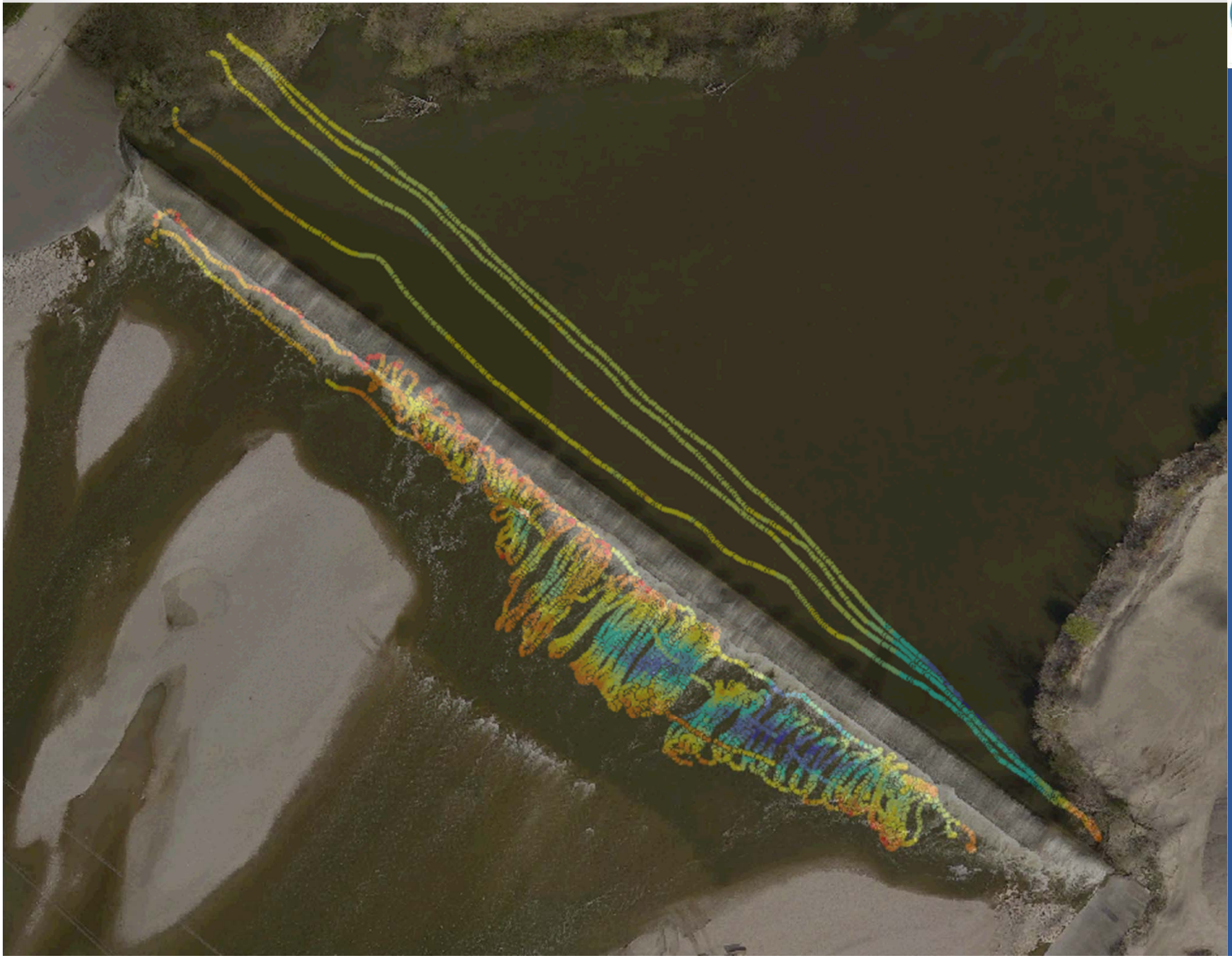


2013 ADCP collection

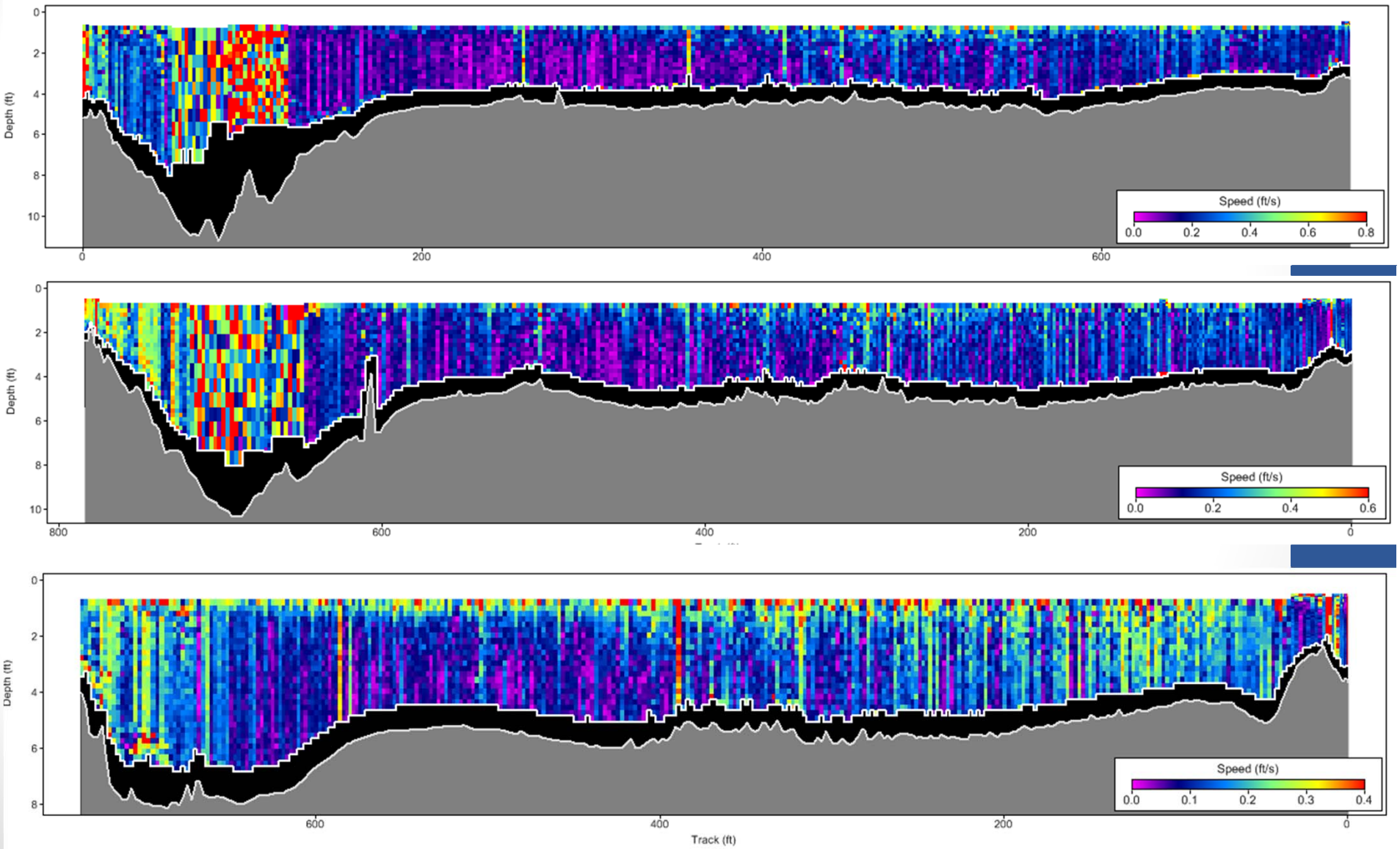


2013 ADCP collection - ArcScene

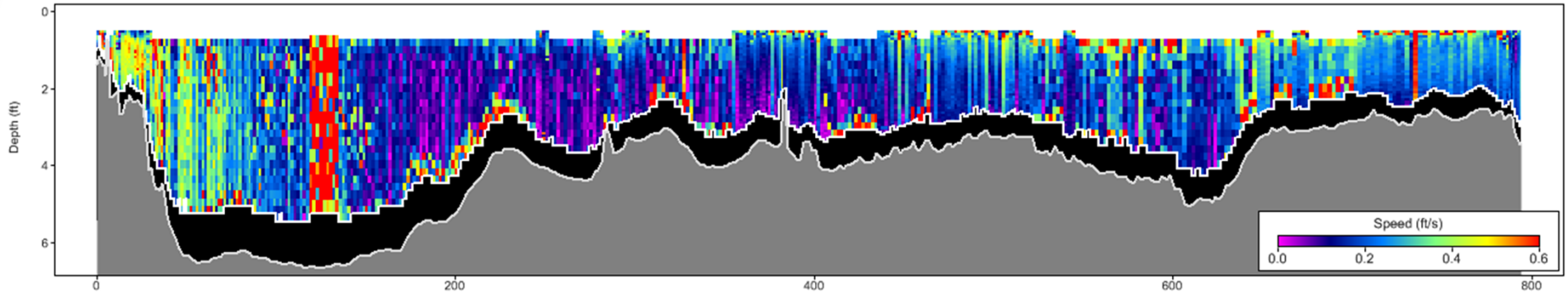


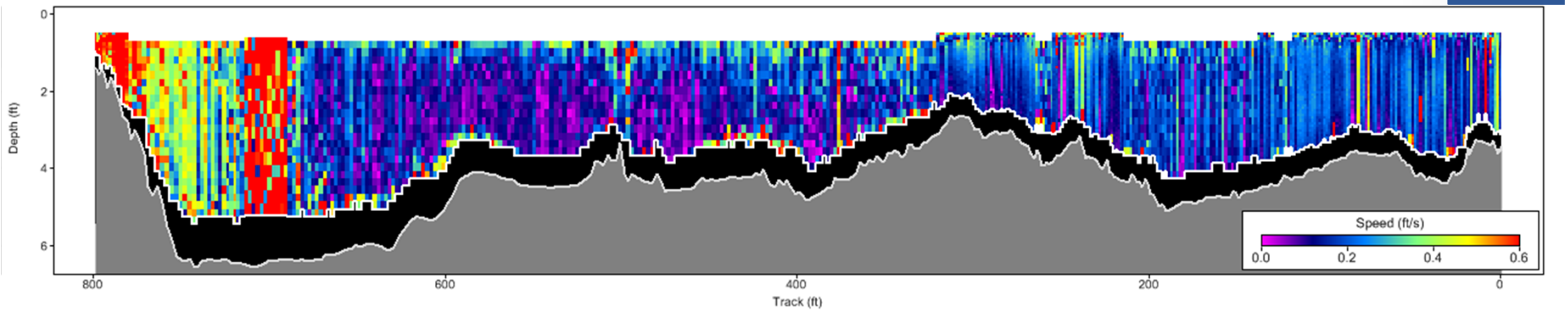


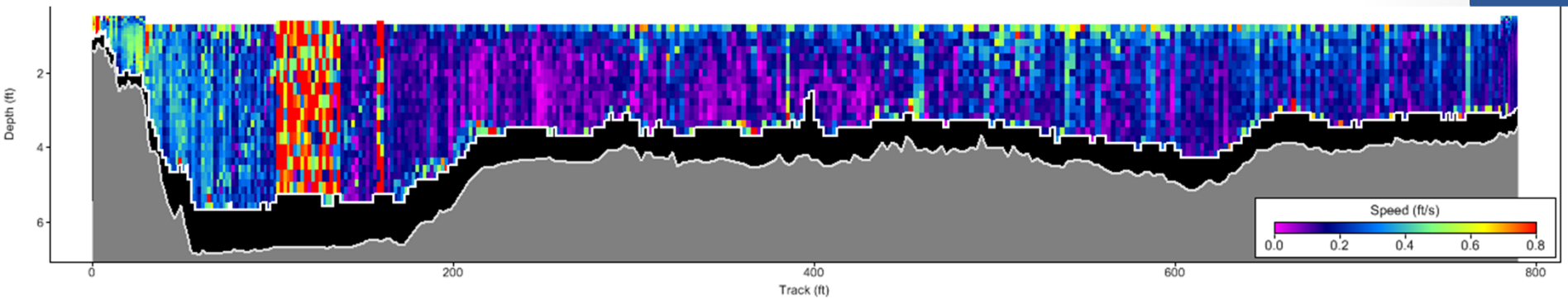
ADCP data evaluation



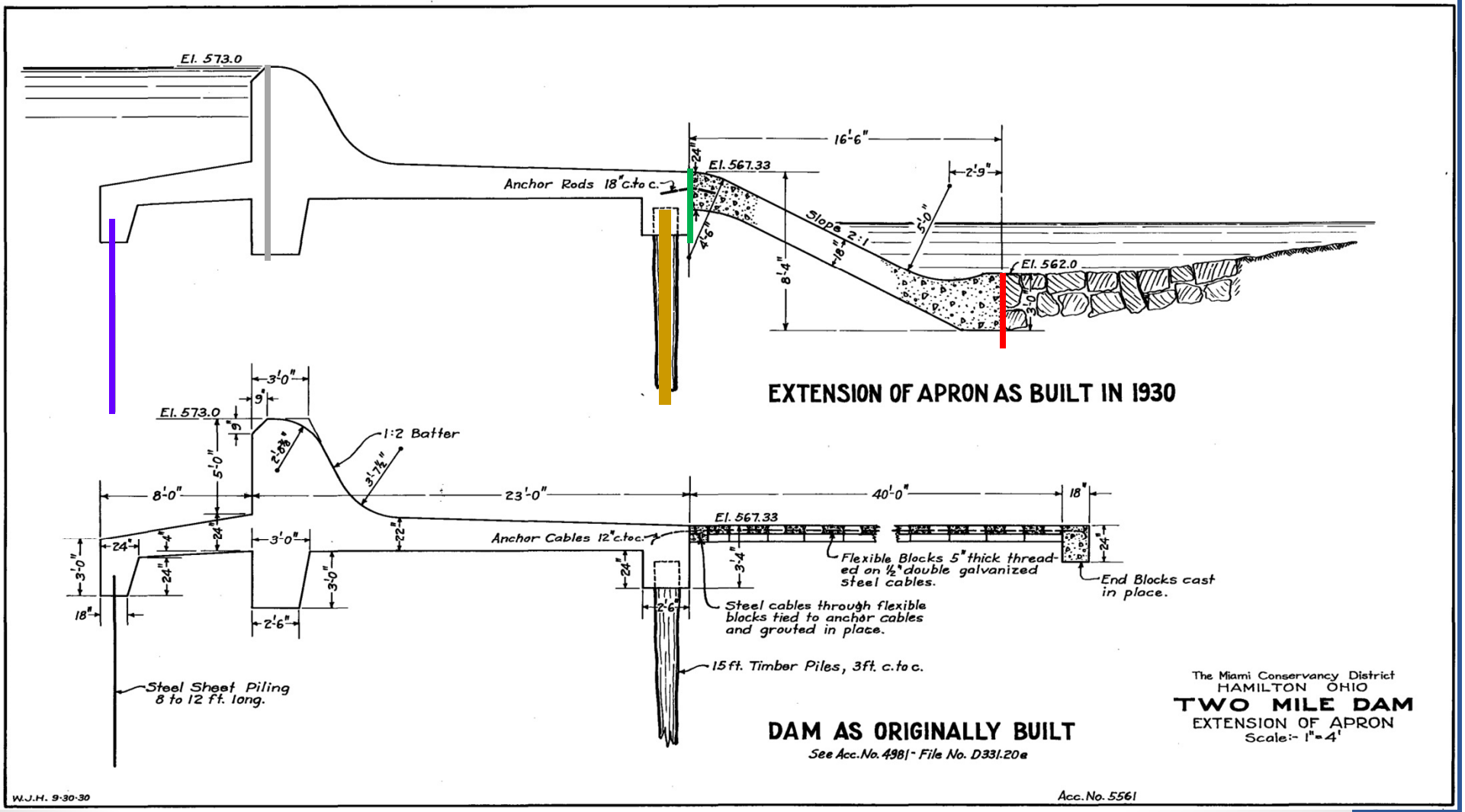
ADCP data evaluation



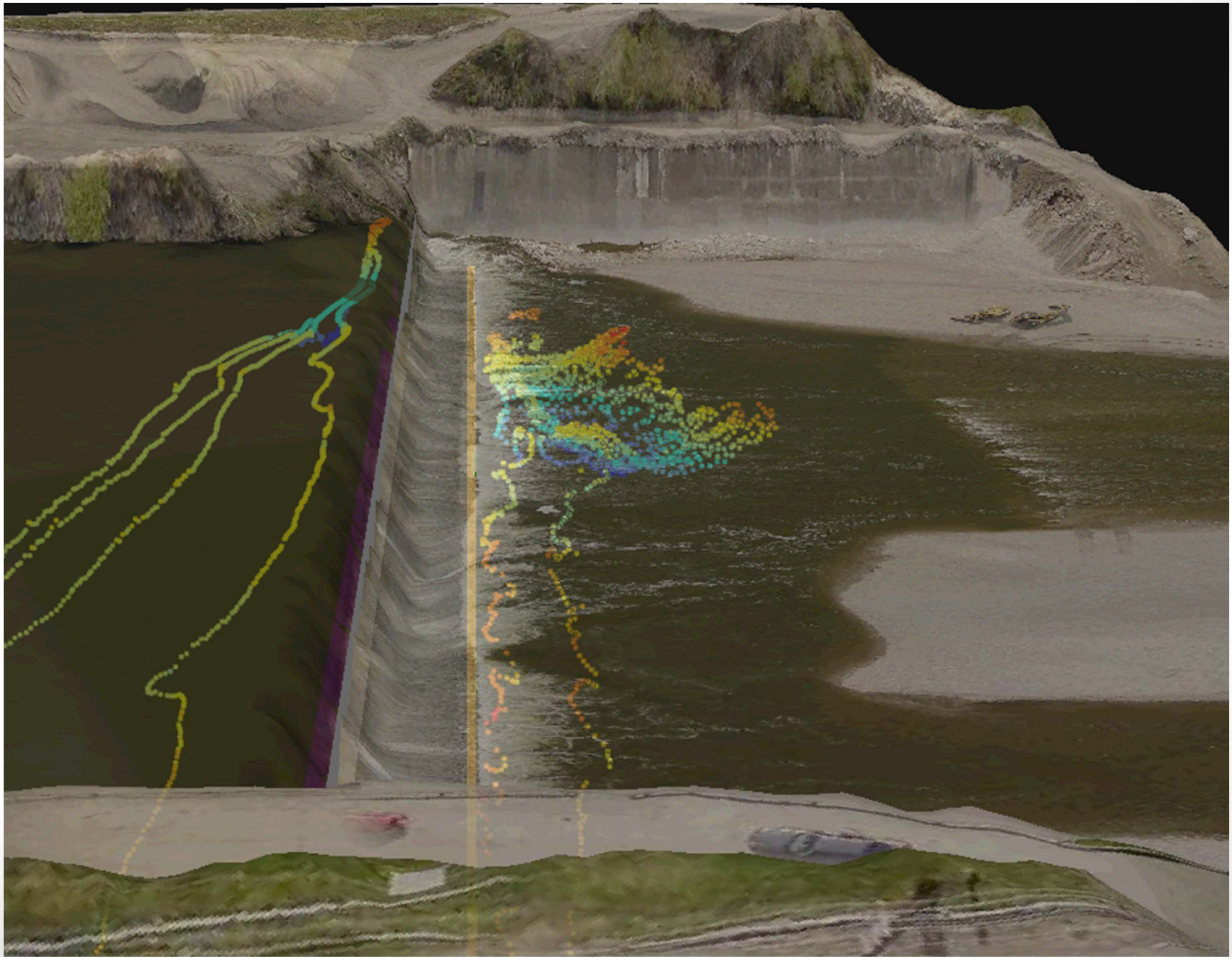




MCD original drawings

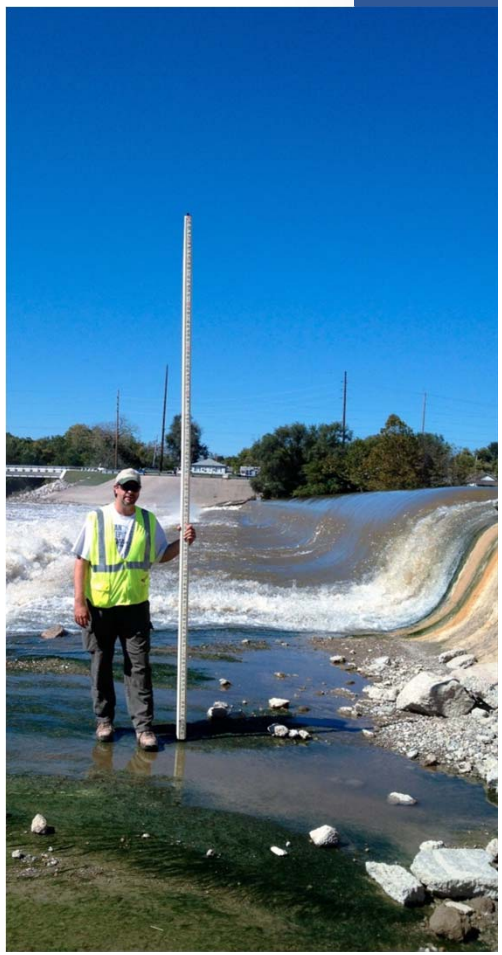


Structure in 3D



Dam Repair

- MCD Engineers determined the dam needs repaired
  - Repair solution
  - Design and specifications
  - Inspection
- MCD staff and equipment repaired the dam
  - Cofferdam
  - Dewatering
  - Materials



Dewater and Inspection

Dewater and Inspection

Repair

Repair

Summary
Dam 3D Why'd you do that?

- 3D GIS
  - Data collection using ADCP with GPS
  - More data is better
  - 3D visualization is a valuable tool
- Check historical information
- Survey data collected 1 year after repair demonstrates a successful repair project

Two Mile Dam 2016

Questions

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