

# Parr-Fairfield Project Relicensing



# Parr Reservoir Status



The Parr Reservoir includes islands and peninsulas established within the water body prior to initial construction. Throughout the different construction stages, reservoir water levels have risen as a result of initial reservoir construction and the installation of the crest gates. Current islands remain in the reservoir where peninsulas and prominent islands resided over the last century. It has been long believed storage capacity was affected by heavy sedimentation, but by analyzing a sediment survey conducted in 2008, along with historic and present day Parr Reservoir geography an enhanced understanding of the soil history and composition of the Reservoir bed may be achieved.

# Project Construction

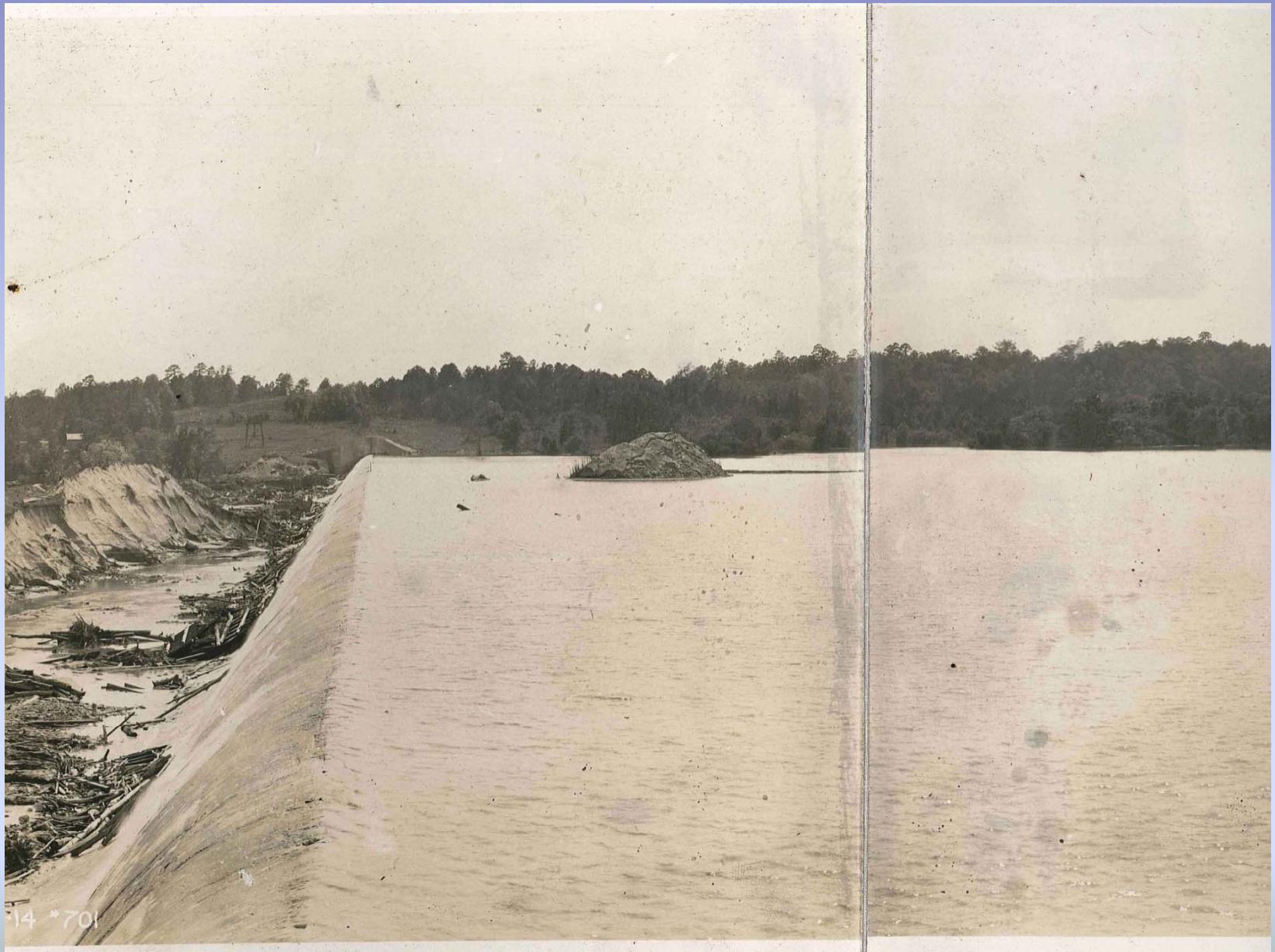




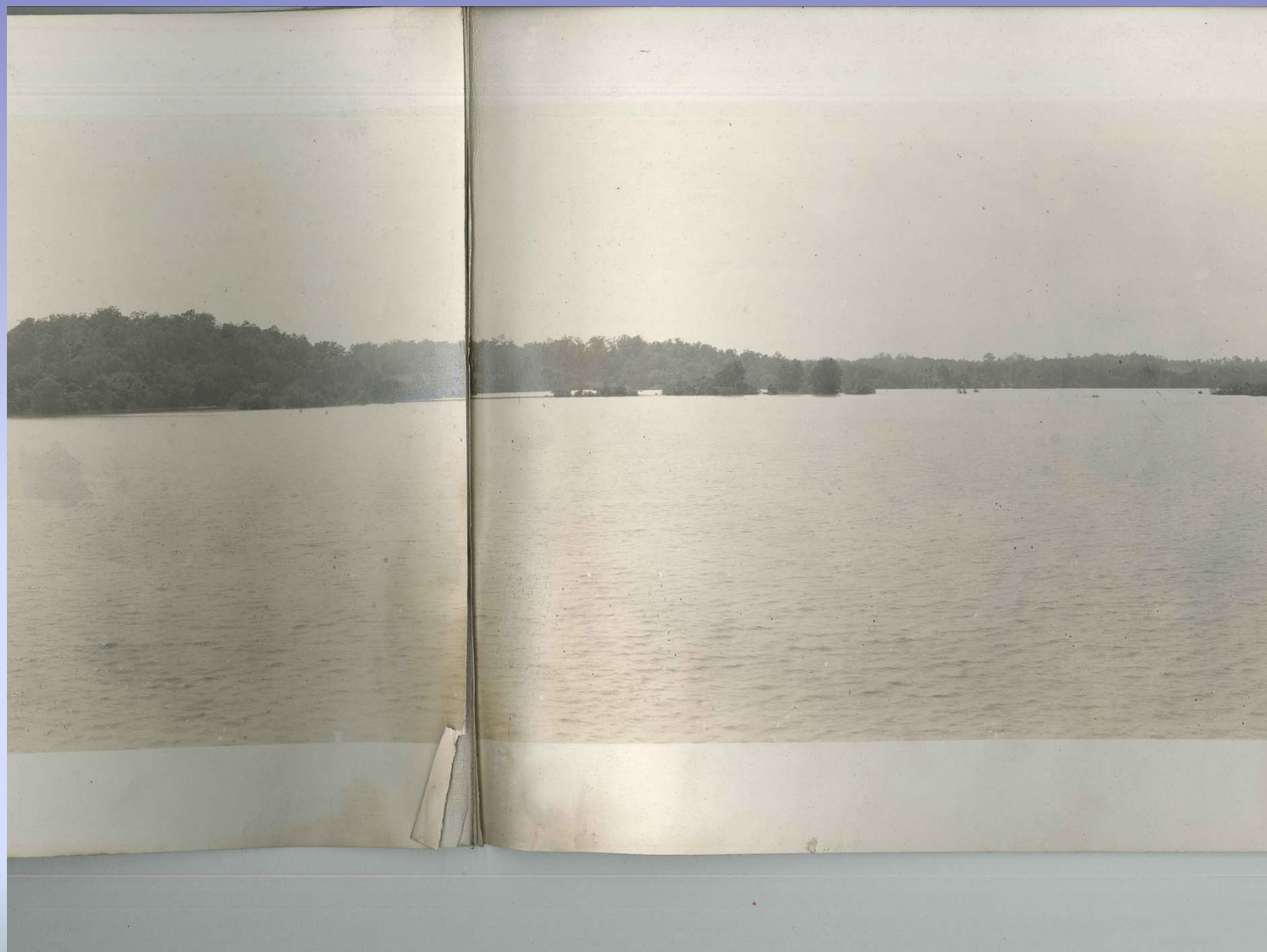
P.S. 6-30-14 # 692

PARR SHOALS POWER CO.  
PARR SHOALS DEVELOPMENT  
J.G. WHITE ENGINEERING CO.





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# Geomorphology of the Broad River

- 1904, 1969, 1986 USGS Topographical Maps
- Georeferenced in Esri ArcMap 10.1 using the latest Bing Aerial Maps
- Broad River and islands within Parr Reservoir digitized





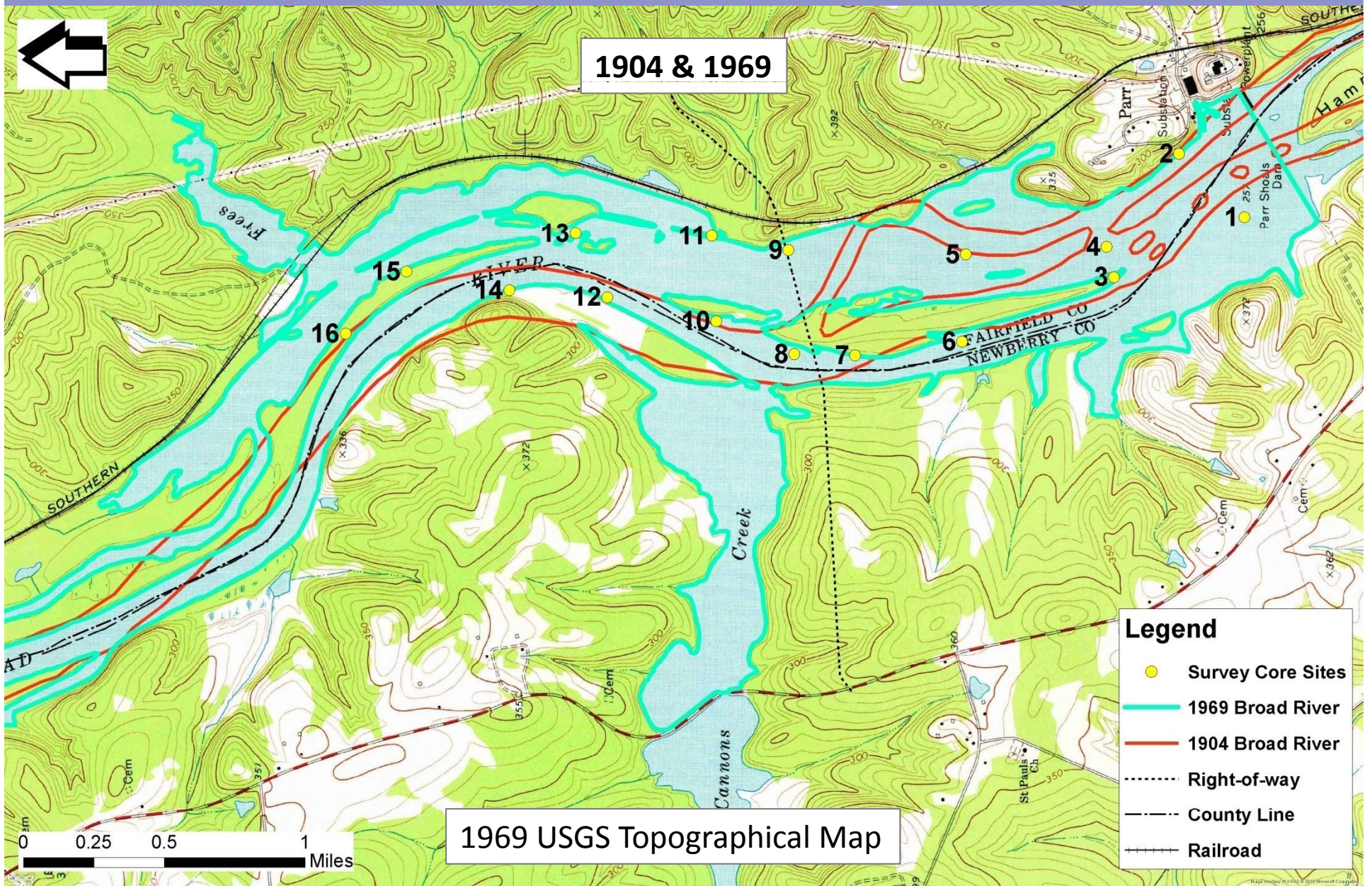
# Parr Reservoir Changes over Time

- 1904 map depicts the Broad River prior to construction of Parr Shoals Dam
- 1969 map depicts formation of Parr Reservoir
- 1986 map depicts Parr Reservoir after increased height of dam and inclusion of Monticello Reservoir
- 2013 map depicts the most recent aerial photography available

- Comparison Maps
  - 1904 & 1969
  - 1969 & 1986
  - 1986 & 2013
  - 1904, 1969, 1986 & 2013

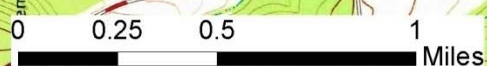


1904 & 1969

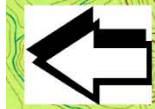


**Legend**

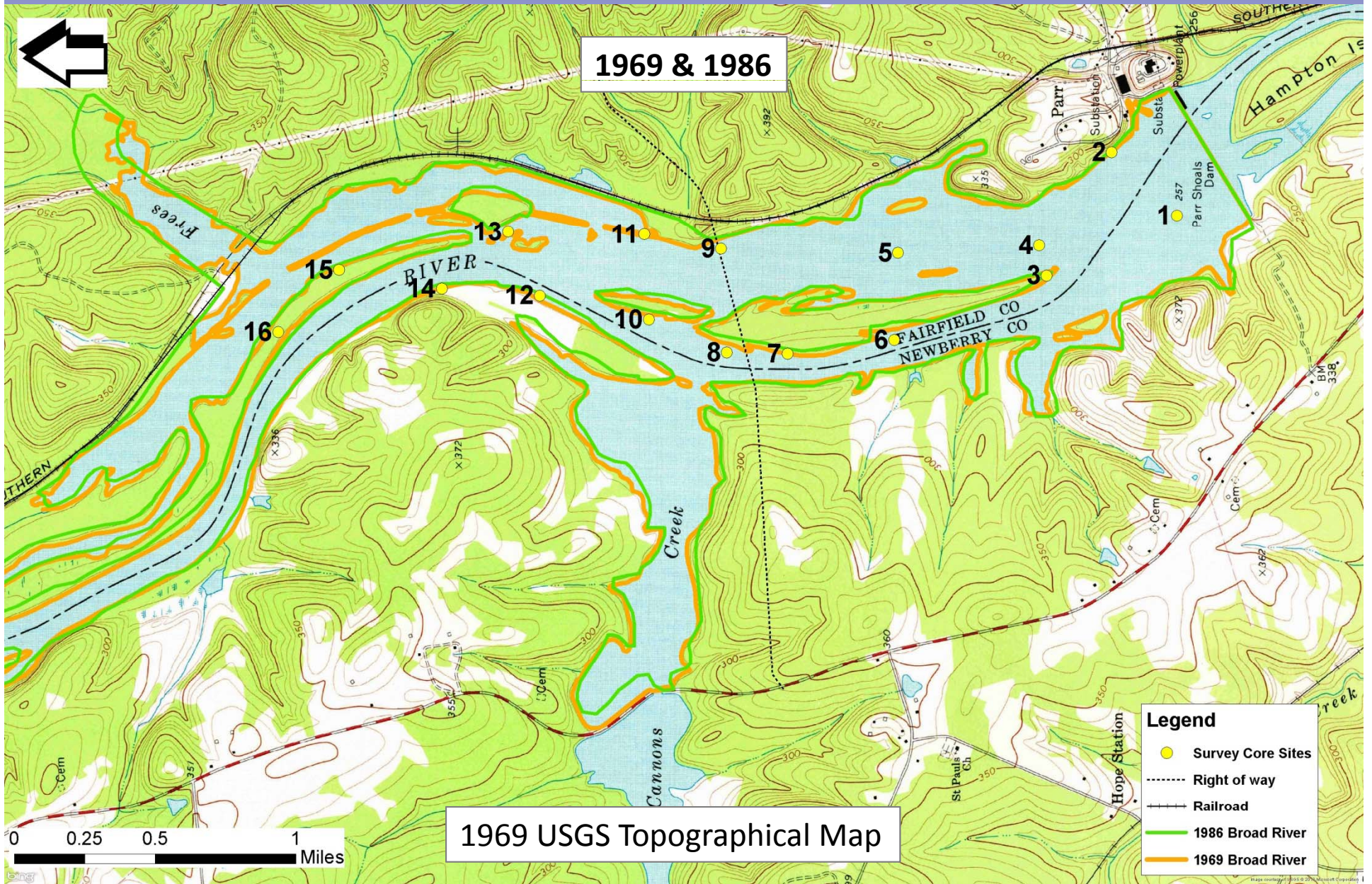
- Survey Core Sites
- 1969 Broad River
- 1904 Broad River
- ⋯ Right-of-way
- - - County Line
- ⊕ Railroad



1969 USGS Topographical Map



1969 & 1986



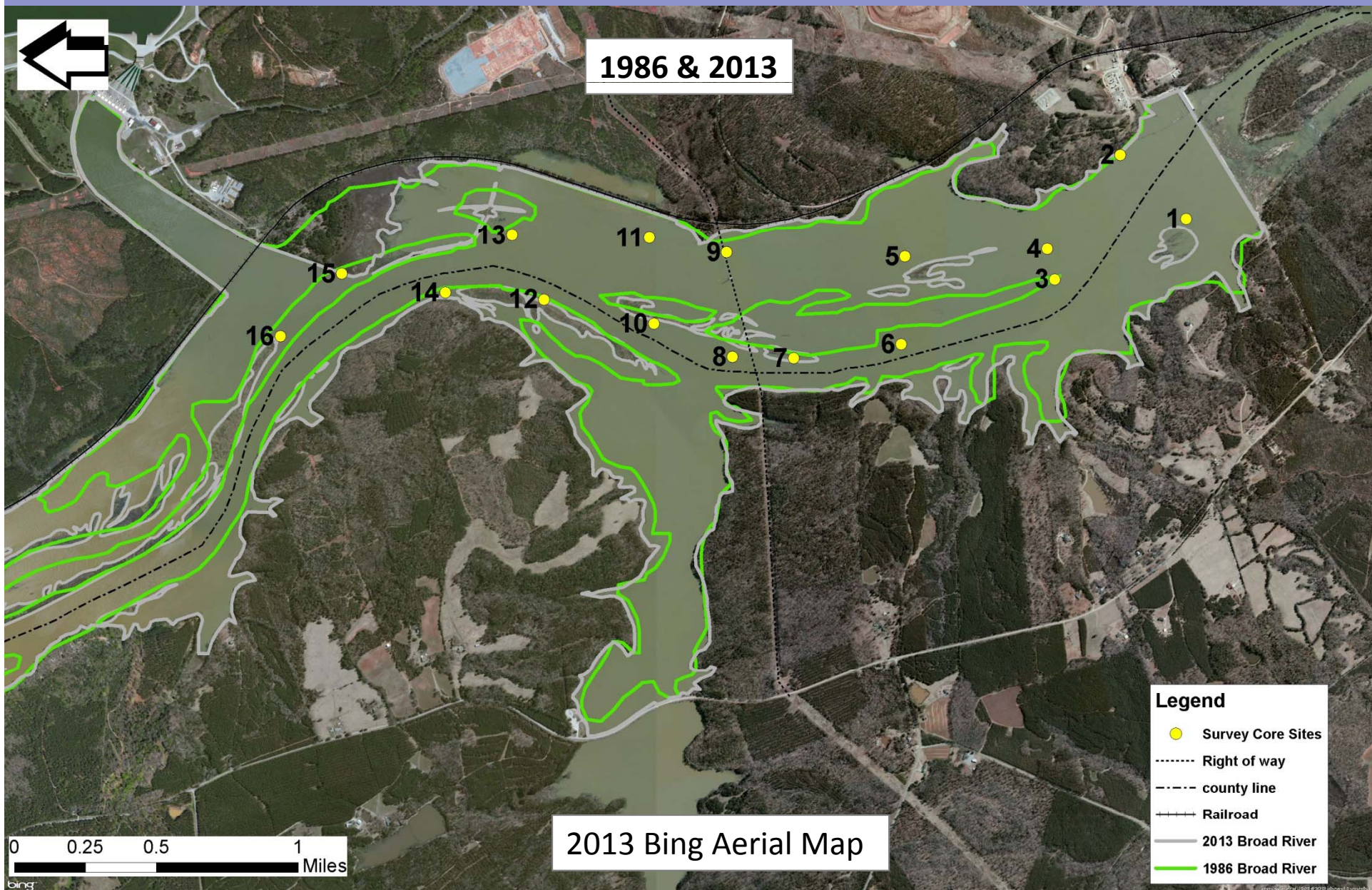
1969 USGS Topographical Map

- Legend**
- Survey Core Sites
  - - - Right of way
  - Railroad
  - 1986 Broad River
  - 1969 Broad River

0 0.25 0.5 1 Miles



1986 & 2013



2013 Bing Aerial Map

- Legend**
- Survey Core Sites
  - Right of way
  - · - · - county line
  - +—+— Railroad
  - 2013 Broad River
  - 1986 Broad River

0 0.25 0.5 1 Miles

bing

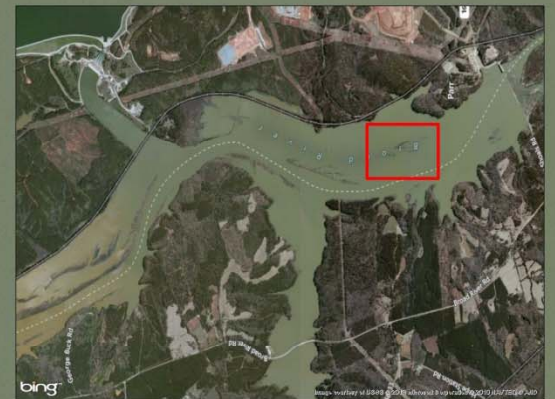
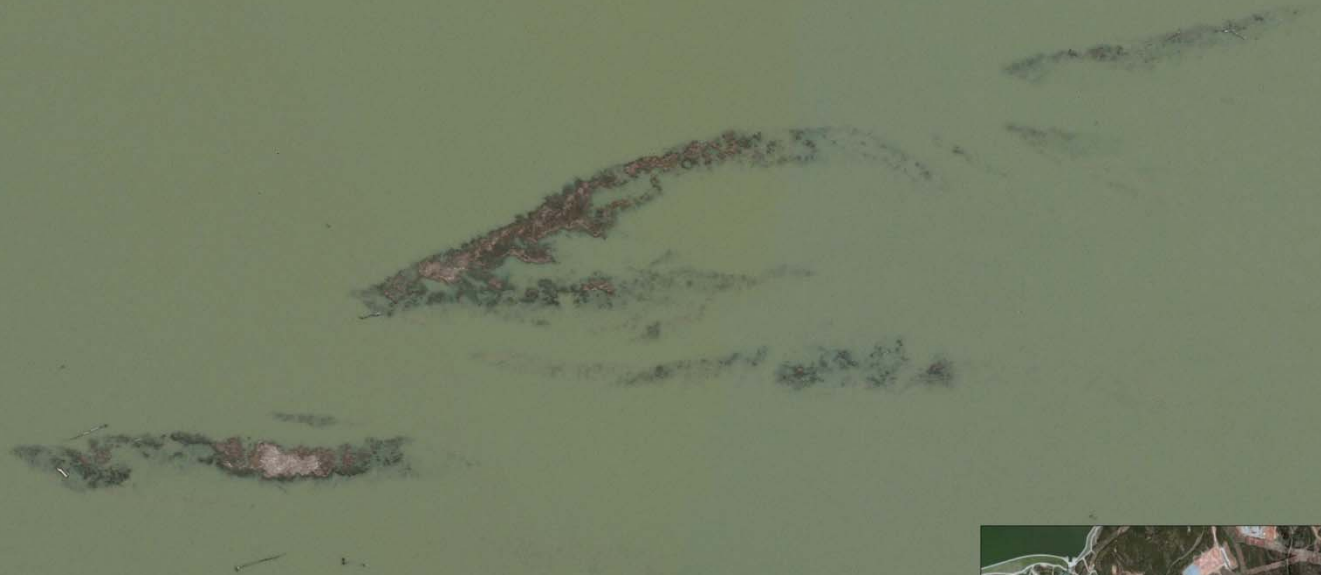
Map data © 2019 Microsoft, © 2019 Bing





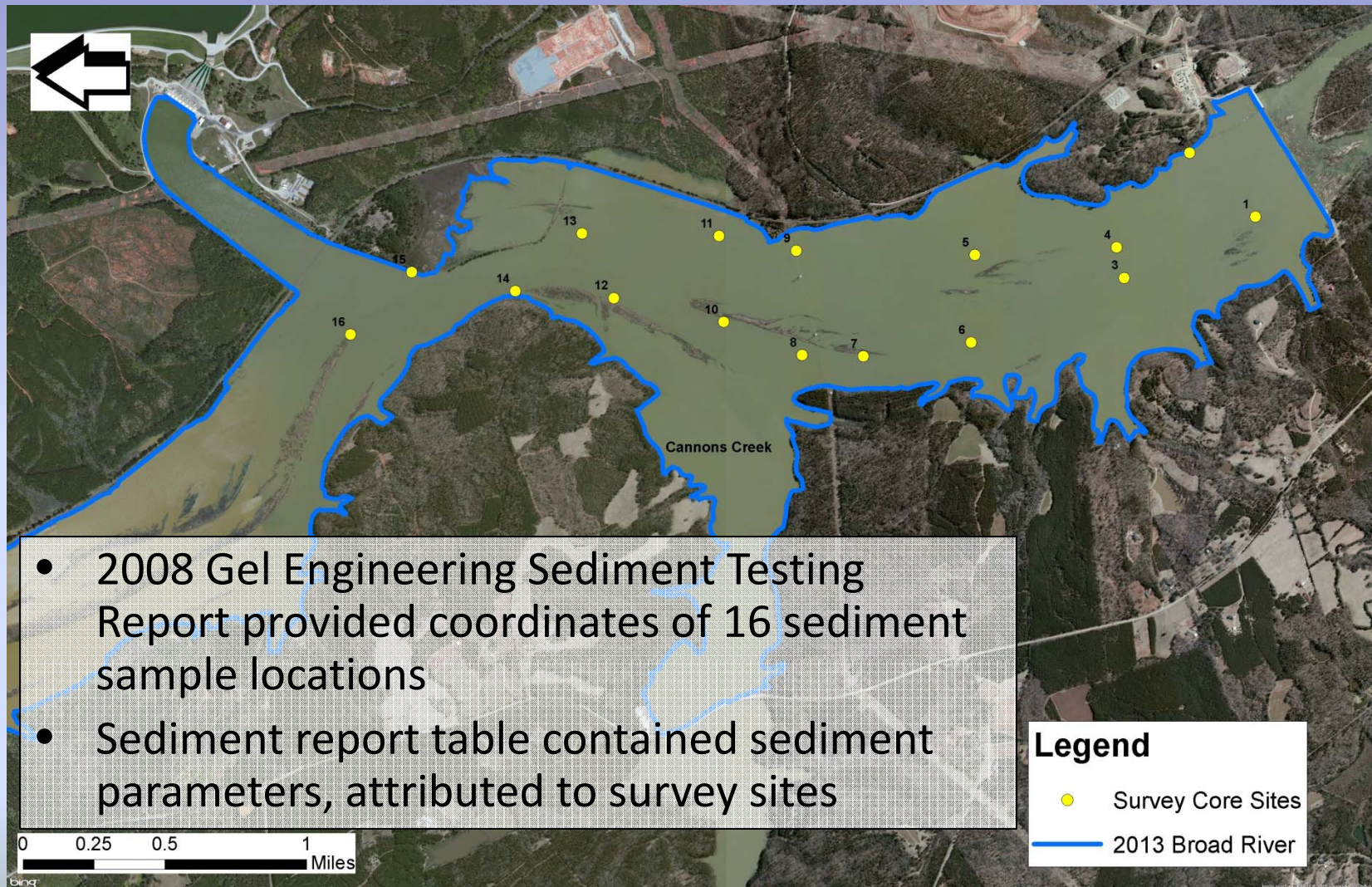
# Residual Islands in Parr Reservoir

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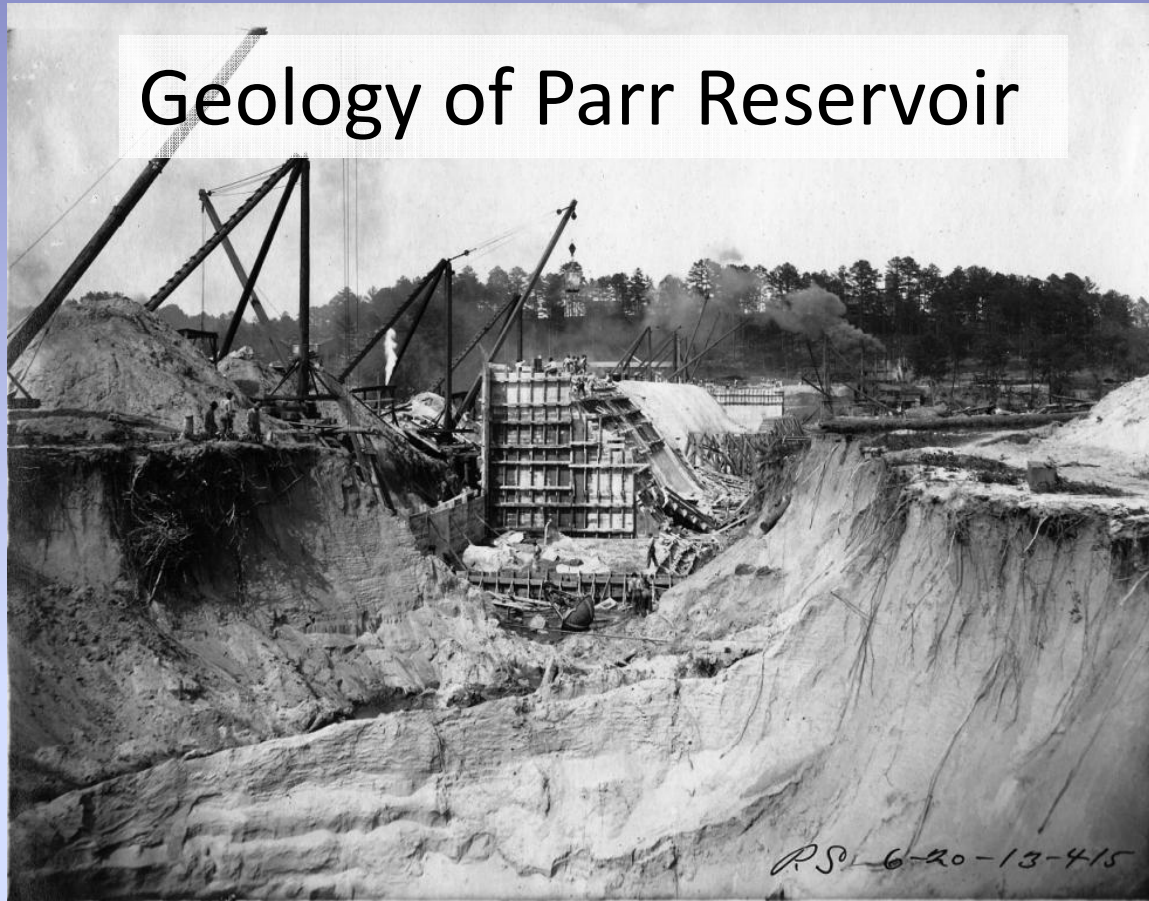




# 2008 Parr Reservoir Sediment Survey



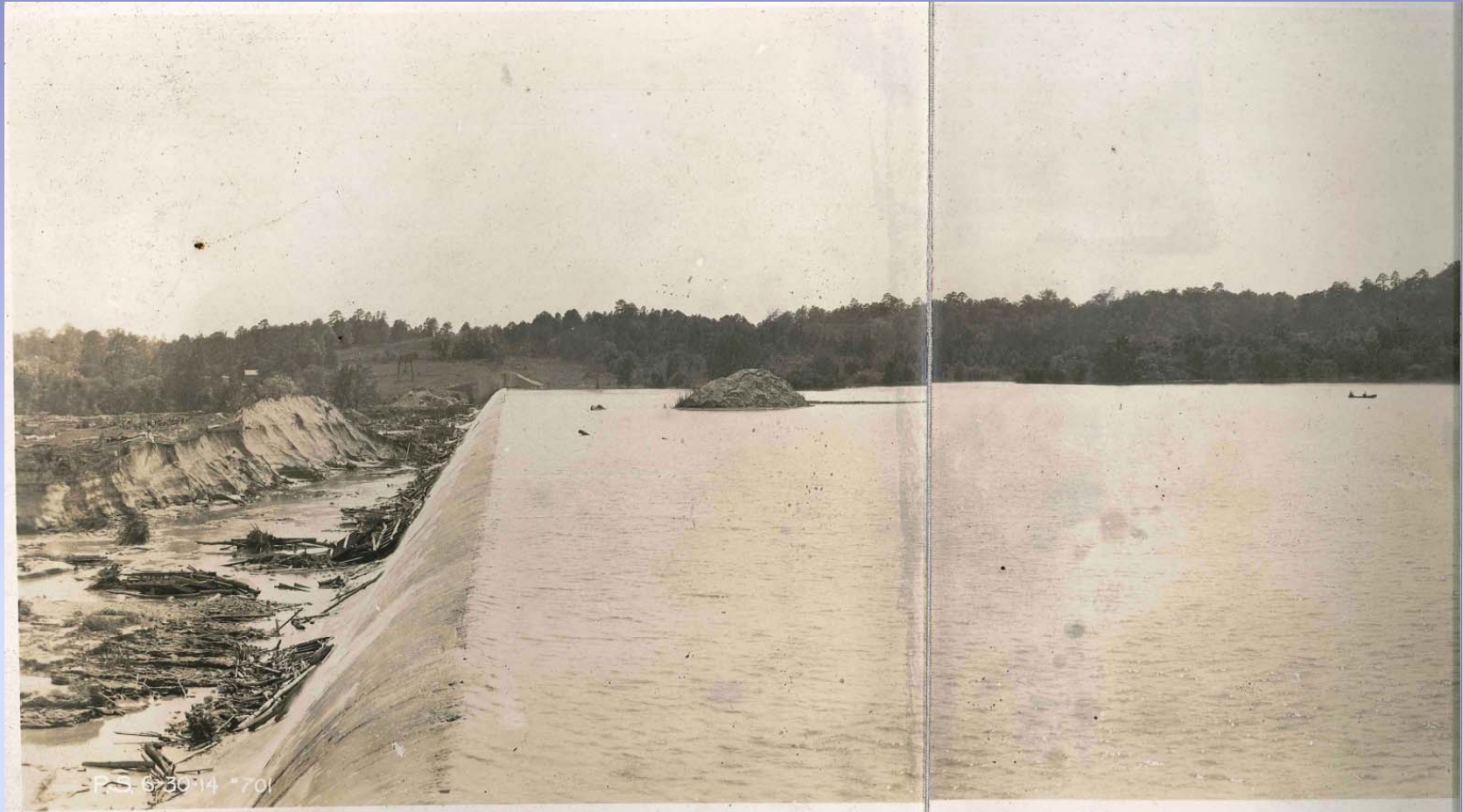
# Geology of Parr Reservoir



Spatial Analysis, using IDW (Inverse Distance Weighted), interpolated the relative sediment concentrations of the three major sediment types within the survey area.

- Clay, Silt, and Sand (Gravel excluded)

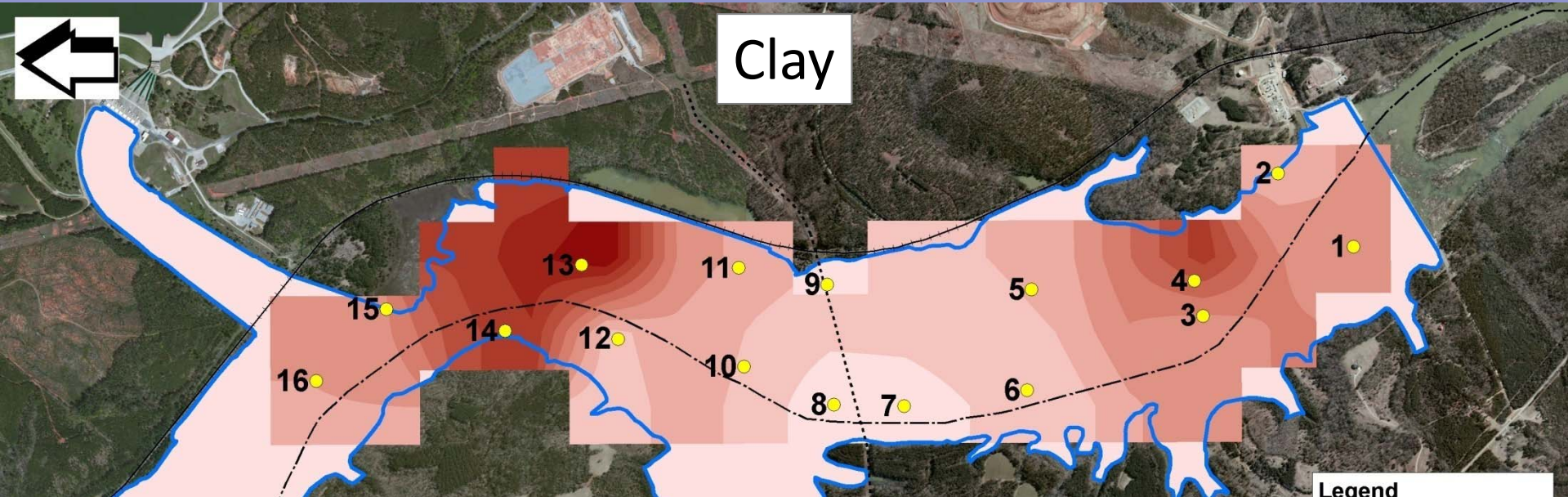
- The spatial analysis of the core soil types provides a method of visual discernment of the different soil type accumulation or erosion.
- A visual demonstration provides comparison of soil types to local geographic features and/or human influences.
- Dam construction photos also provide a source of depiction for Parr Reservoir bathymetry and geology.



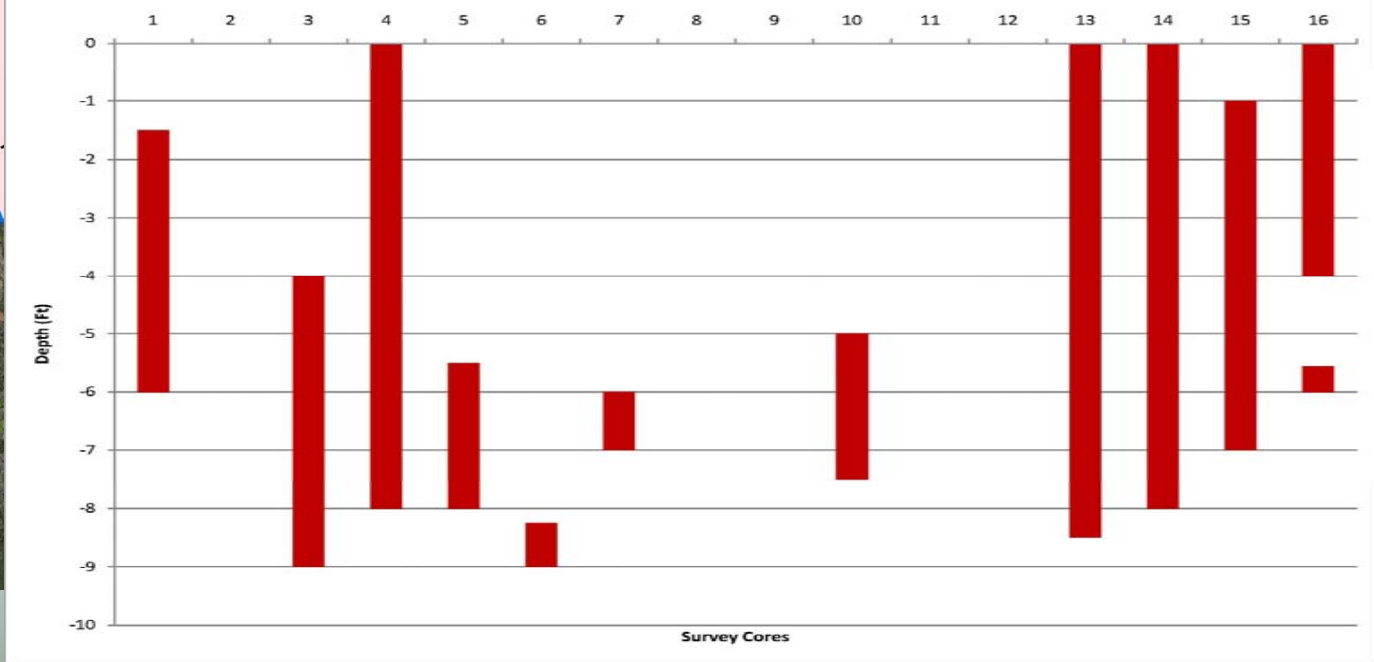
The highest concentration of sediment material, by depth per foot increments, are exhibited on a bar graph for each survey site.



# Clay



Clay Predominance in Survey Cores at Parr Reservoir



**Legend**

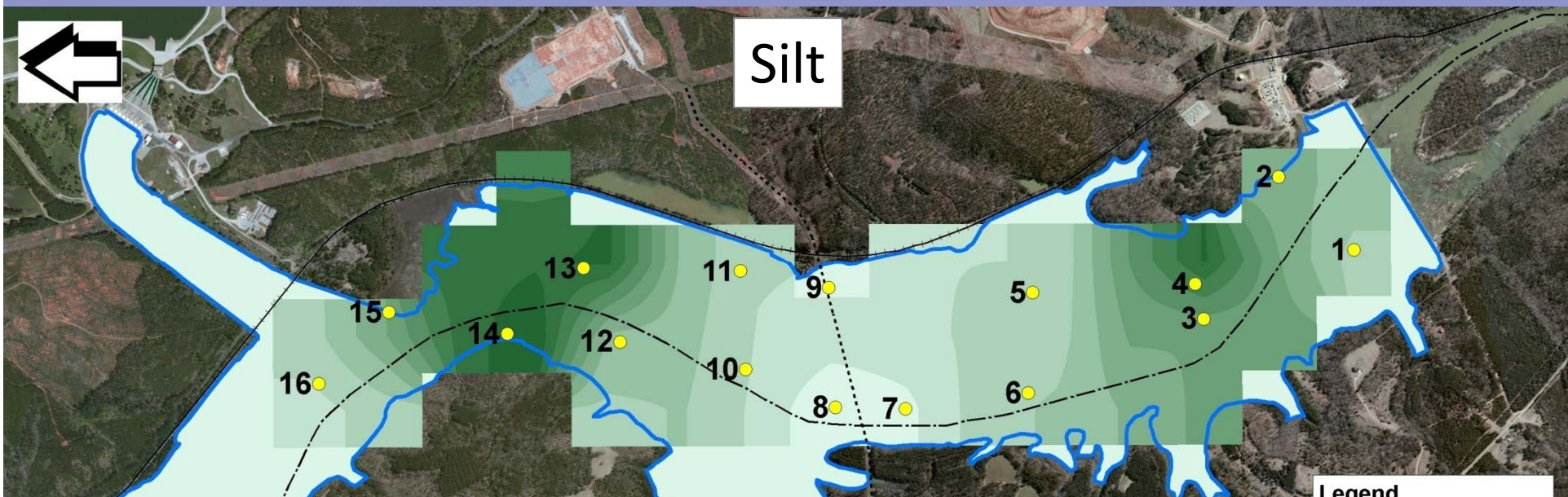
- Survey Core Sites
- Right-of-way
- County Line
- Railroad
- 2013 Broad River

**Sediment Concentration**

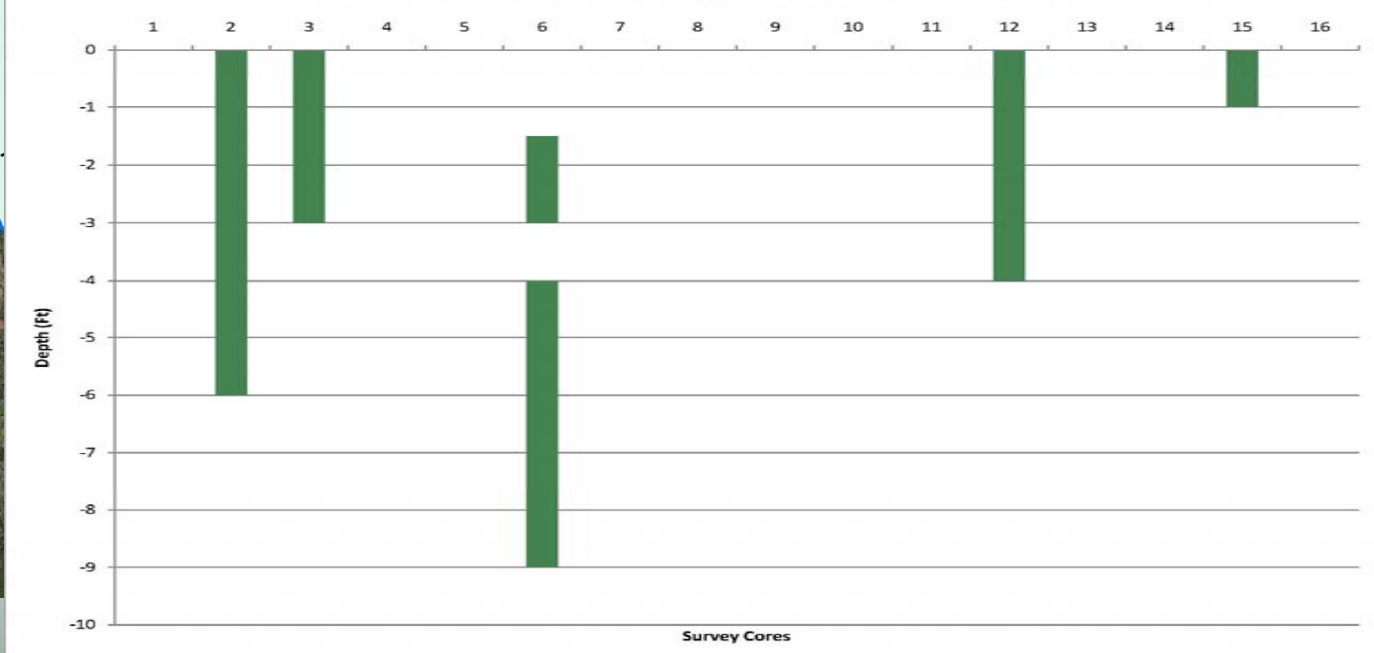
- 0-10
- 10-20
- 20-30
- 30-40
- 40-50
- 50-60
- 60-70
- 70-80
- 80-90
- 90-100



# Silt



Silt Predominance in Survey Cores at Parr Reservoir



**Legend**

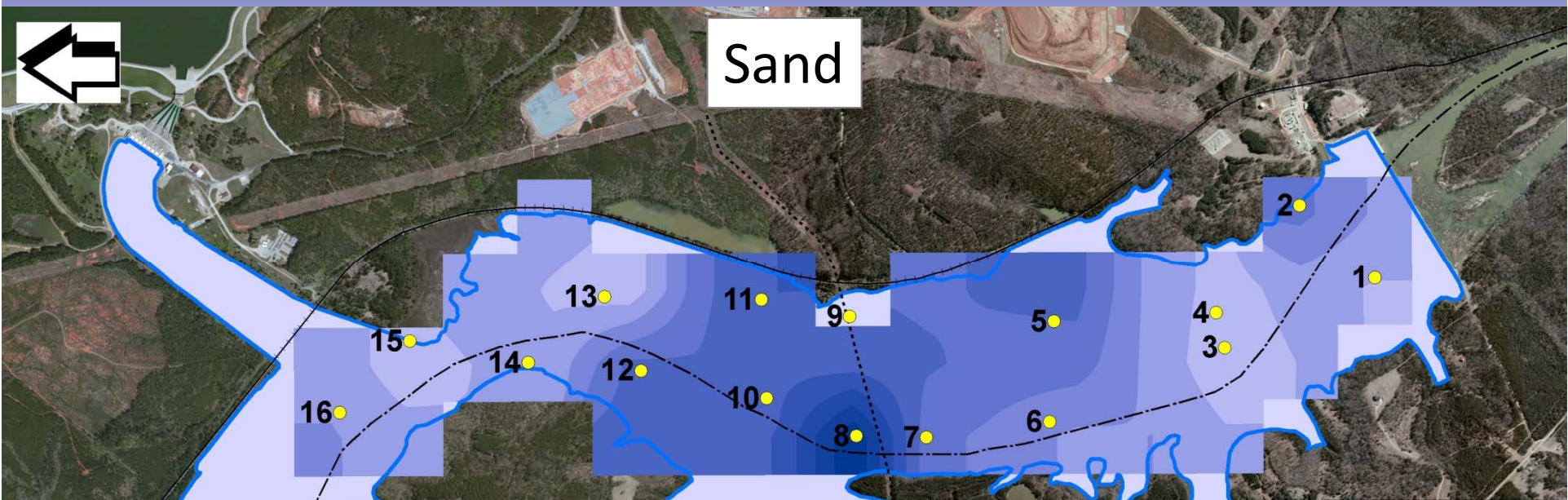
- Survey Core Sites
- Right-of-way
- County Line
- +— Railroad
- 2013 Broad River

**Sediment Concentration**

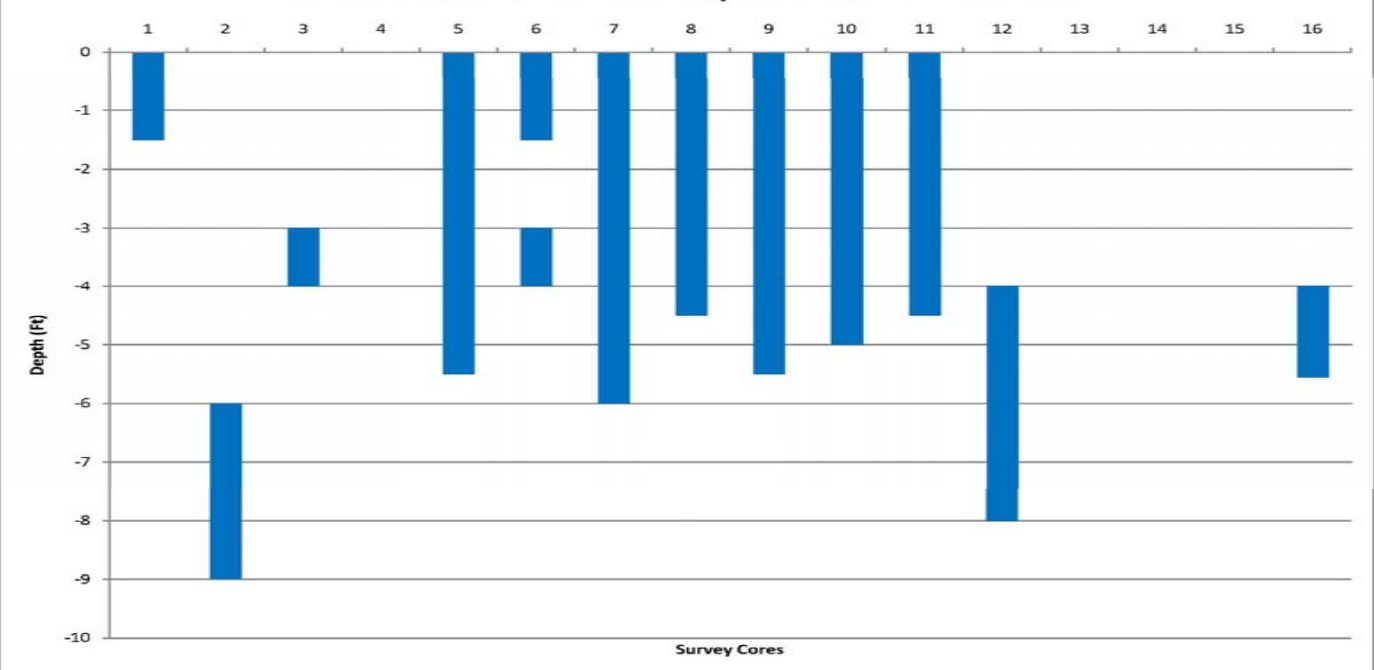
- 0-10
- 10-20
- 20-30
- 30-40
- 40-50
- 50-60
- 60-70
- 70-80
- 80-90
- 90-100



Sand



Sand Predominance in Survey Cores at Parr Reservoir

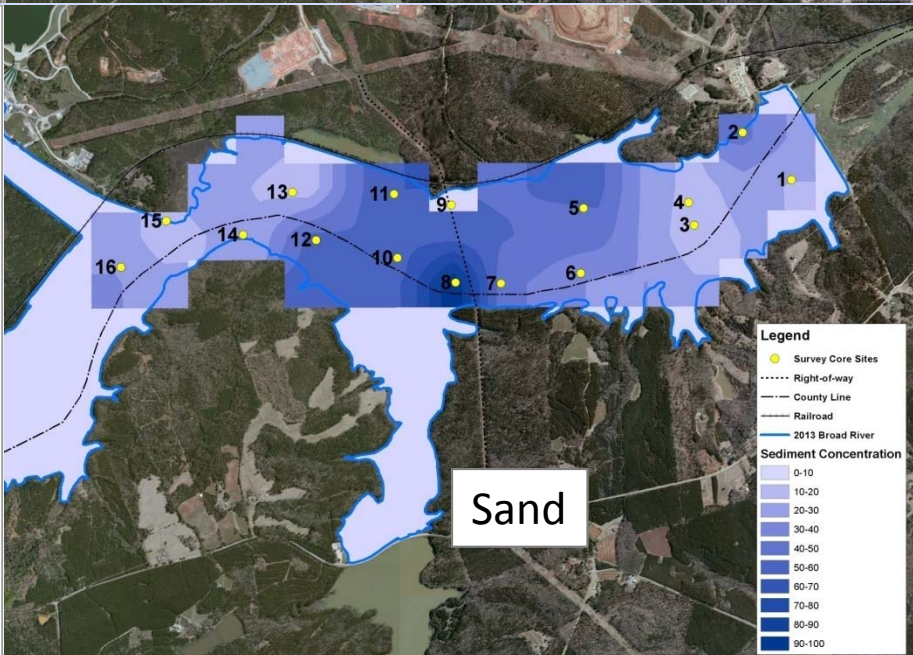
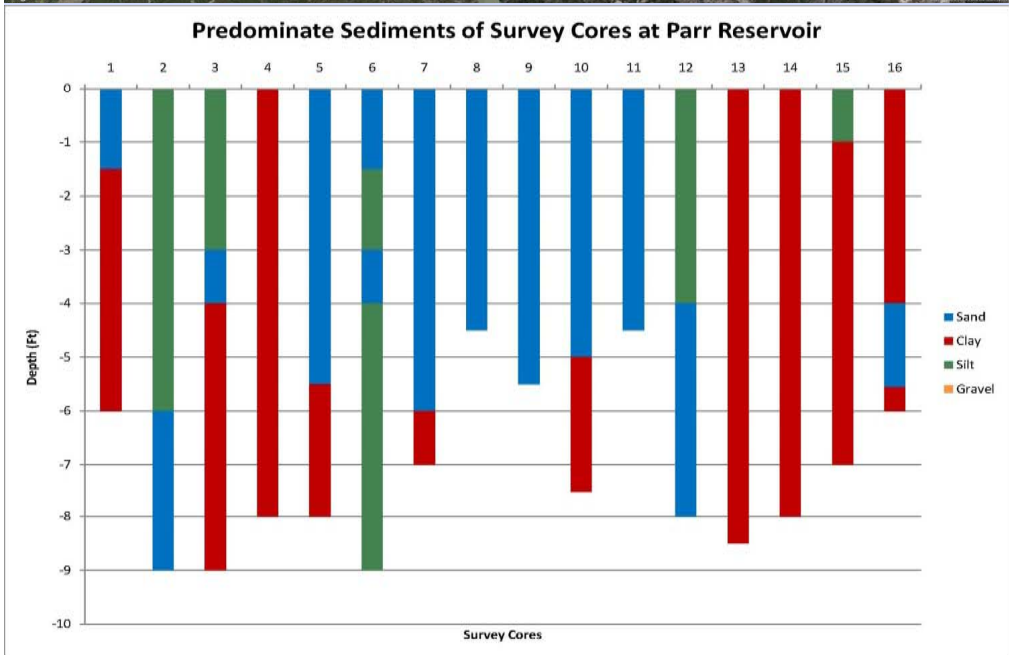
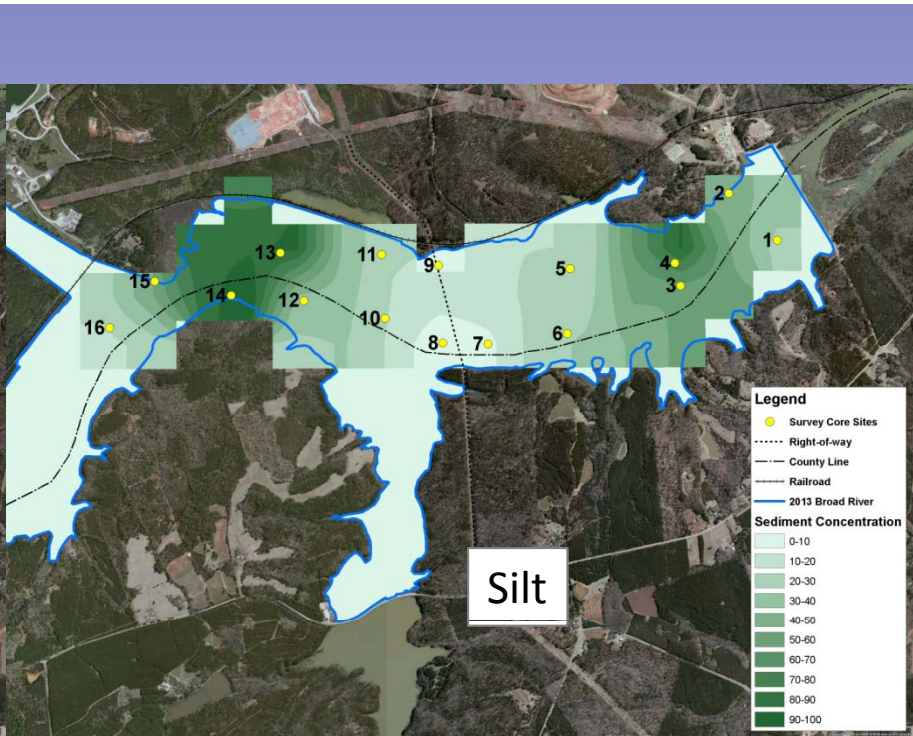
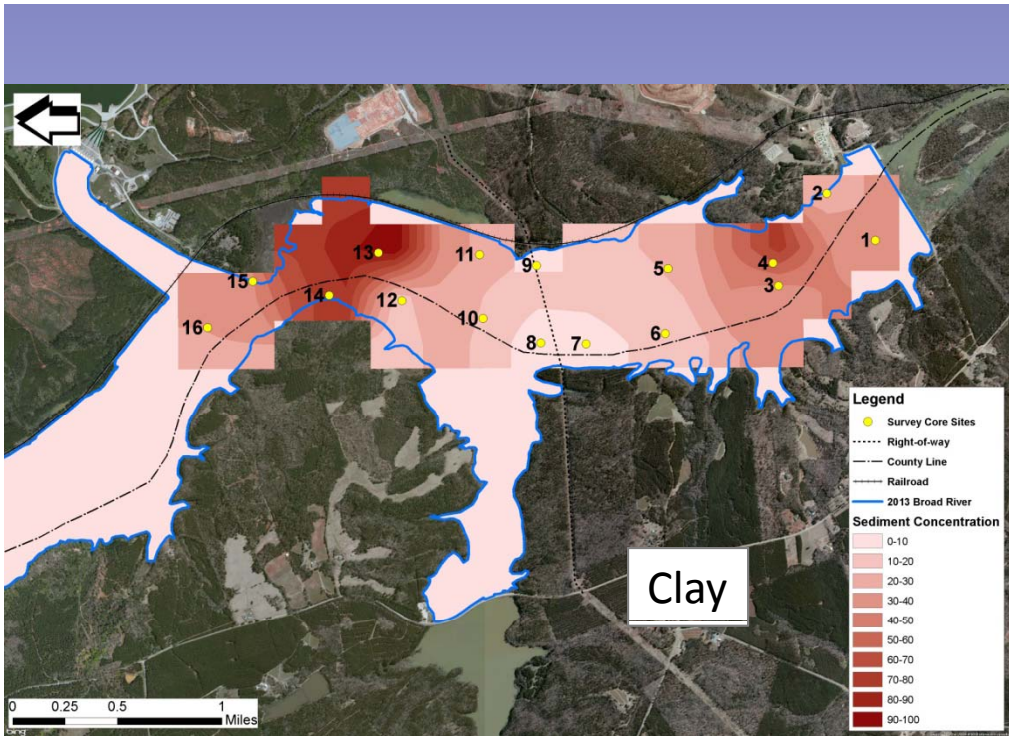


**Legend**

- Survey Core Sites
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**Sediment Concentration**

- 0-10
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# Findings

- Hampton Island was excavated down to bedrock during Parr Dam construction
- Historical photographs and data suggests no dredging of Parr Reservoir was conducted during construction
- Highest sand concentrations confined to the confluence of the Broad River and Cannon's Creek
- Highest and most extensive clay and silt concentrations can be traced to Monticello dredging activities and spoil area.

# Findings

- Present day islands remain from pre-construction islands or peninsulas
- Minimal changes have occurred between 1969 and 1986 within Parr Reservoir
- 2008 sediment analysis suggests reservoir is in a state of “equilibrium” (what comes in goes out) with respect to sedimentation and confirms observations by SCE&G operators.