Stratigraphic Framework for Deeply Buried Archaeological Sites in the Upper Ohio River Basin, Eastern United States

J. Steven Kite
Ryan W. Robinson
William C. Johnson
Eric N. Davis

XVII INQUA Congress 2007
Holocene Human Environment Interactions - IV
Wednesday, 1 August 2007, 16:00 -18:00
Ohio River

1,579 km

490,603 km²  
(14 states)

\[ Q_{\text{mean}} = 7874 \text{ m}^3/\text{s} \]

>35% more than Mississippi River at their confluence

St. Albans Site

Profile at the End of the 1966 Season

Kirk Points

Ohio River @ Parkersburg, W.Va. (~98,400 km²)

West Blennerhassett Island Site
West Blennerhasset Site Sedimentation Rates

Uncorrected C14 yr BP

Robert C. Byrd Locks & Dam ~137,000 km²
Robert C. Byrd (Gallipolis) Locks & Dam


- **T₀**: Active Floodplain
- **T₁**: Terrace
- **T₂**: Alluvial Ridge
- **T₃**: Terrace

[Diagram of the Generalized Ohio River Valley Cross-Section]

[Map of Robert C. Byrd (Gallipolis) Locks & Dam]
Robert C. Byrd (Gallipolis) Locks & Dam (Mandel, 1988)

Both Sites Mapped as T1

Mandel Site: ~2.2 m Depth ~ 4000 B.P.
Niebert Site: Plow Zone > 2800 B.P.

Robert C. Byrd (Gallipolis) Locks & Dam
Mandel, 1988

Excavation Studied by Rogers, 1990
Robert C. Byrd Locks & Dam, Constructed 1987-1993

US COE Photo

Stratigraphy Exposed in RCB L&D Construction

Rogers, Randal L., 1990, Late Quaternary stratigraphy and geologic history of the upper Ohio River valley, near Gallipolis Lock and Dam (M.S. thesis): Morgantown, West Virginia University, 161 p.

> 18 m Exposed – Critical

Mandel, 1988

Mandel's T1 = Rogers's 52

Mandel Dates: 4.0 Ka, 4.0 Ka, 4.1 Ka

SAND

GRAVELLY SAND

GRAVEL

OVERBANK SILT

6.1 Ka; 6.3 Ka

22.0 Ka; 22.4 Ka; 24.3 Ka

21.1 Ka

23.4 Ka; 24.2 Ka

12.9 Ka

9.7 Ka

4.1 Ka; 4.0 Ka

4.0 Ka; 4.0 Ka
LGM Laurentide Ice in Ohio River Basin

<25% of Basin Glaciated, but Aggradation Drastically Altered Fluvial System

Northern Tribs = Outwash Streams, Sediment Influx Controlled Profiles

Southern Tribs = Slackwater Streams, Ohio River Base-Level Controlled Profiles

Glaciation of Ohio River Tributaries

Several Millennia Required for Ohio River to Transition from Braided Bedload Stream to Meandering Suspended Load Stream
“Details” of Ohio River Valley Cross-Section

180 m
160 m
140 m

Jan 1937 Flood
Pre-Dam Lows
Late Wisconsin Outwash
Late Holocene Alluvium
Colluvium
Older Outwash
Bedrock

Vertical Exaggeration ~ 20

200 m
1000 m

Generalized Ohio River Valley Cross-Section

180 m
160 m
140 m

Jan 1937 Flood
Pre-Dam Lows
Late Wisconsin Outwash
Late Holocene Alluvium
Colluvium
Local Holocene Alluvium
Bedrock

Vertical Exaggeration ~ 20

200 m
1000 m

West
East
Age?
Grossly Over-Simplified Ohio River Valley Cross-Section

Jan 1937 Flood

Pre-Dam Lows

Late Wisconsin Outwash

Local Holocene Alluvium

Early Holocene

Late Holocene

Aeolian

Bedrock

Vertical Exaggeration ~ 20

West

East

1000 m

140 m

160 m

180 m

200 m
Conclusions

Stratigraphy: more complex than surface morphology suggests.
Outwash indistinguishable from later channel deposits in cores.
Unconformities abound.
>20 m range in Ohio River flow creates on-lapping overbank sequences.
Cumulic soils obscure overbank strata.

J. Steven Kite: jkite@wvu.edu

St. Albans Site, 1965