

Evidence-Based Restoration

**Mid-Atlantic Wetland Workgroup
Field Tour Background Session
November 15, 2023**

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Reservoir sediment
Holocene marsh soil
Pleistocene periglacial rubble

Reservoir sediment
(Fill terrace)

▶ Foundation of Process

EPA's Principles for the Ecological Restoration of Aquatic Resources

- Understand the potential of the watershed
- Address ongoing causes of degradation
- Work within the watershed/landscape context
- Develop clear, achievable, and measurable goals
- Focus on feasibility
- Preserve and protect aquatic resources
- Restore ecological integrity
- Restore natural structure
- Restore natural function
- Use reference sites or onsite evidence
- Anticipate future changes
- Involve a multi-disciplinary team
- Design for self-sustainability
- Use passive restoration, when appropriate
- Restore native communities and dominant species
- Use natural fixes and bioengineering
- Monitor and adapt where changes are necessary

Source: USEPA, 2000. *Principles for the Ecological Restoration of Aquatic Resources*. EPA841-F-00-003. Office of Water (4501F), United States Environmental Protection Agency, Washington, DC. 4 pp.

Photo 4: 2018

Photo 5: 2019

Photo 6: 2020

► Evidence-Based Process

Four Core Elements of and Evidence-Based Process



Identify Alterations

Paleo Environment

Modern Constraints

Design/Modeling

Evidence-Based Process Addresses

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► Foundation of Process

Identifying Constraining Alterations



Look beyond traditional water quality impairments

Focus on historic alterations that changed base level controls and hydrologic connections

Don't necessarily focus on where the channel is today!

Don't confuse symptoms for underlying alterations

► Foundation of Process

Verify Unaltered Paleo Environment



Historical Searches

Valley Basis not Channel Centric

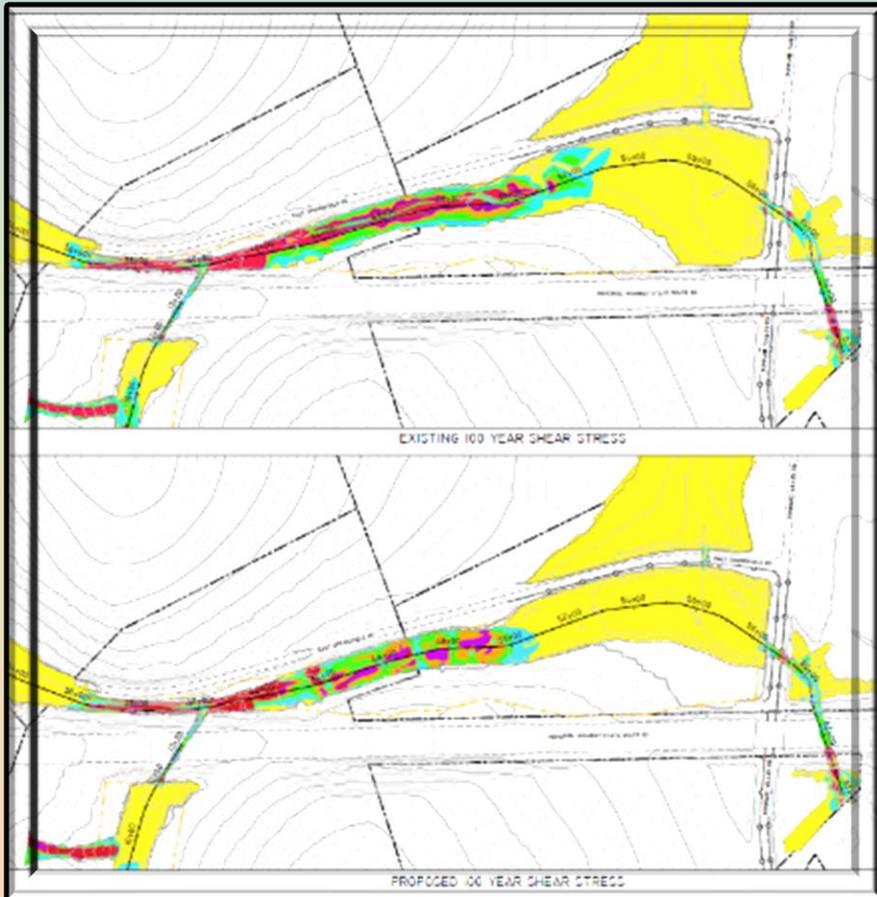
Geotechnical Invest. – Trenches, Pits, Cores, Probes

Carbon Dating – Magnetic Susceptibility

Multiple Lines of Evidence

► Foundation of Process

Modern Constraints



Infrastructure

Landowner(s)

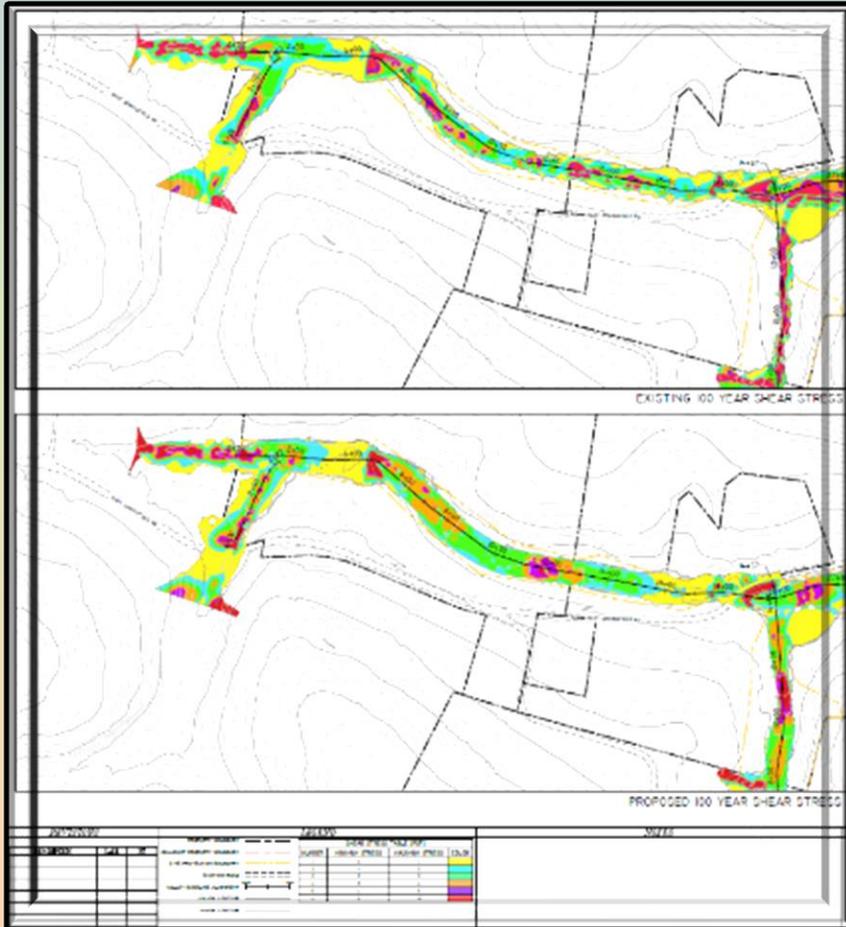
Scope of Alteration

Bedload Transport

Stormwater Flows

► Foundation of Process

Restoration Design and Modeling



Utilize Iterative 2-D Modeling Design

Base Level Control and Scour Protection

Depth of Channel and Valley Width

Retentive System

Hydrodynamic Reconnection