

Impacts of channelization on coastal streams in South Carolina

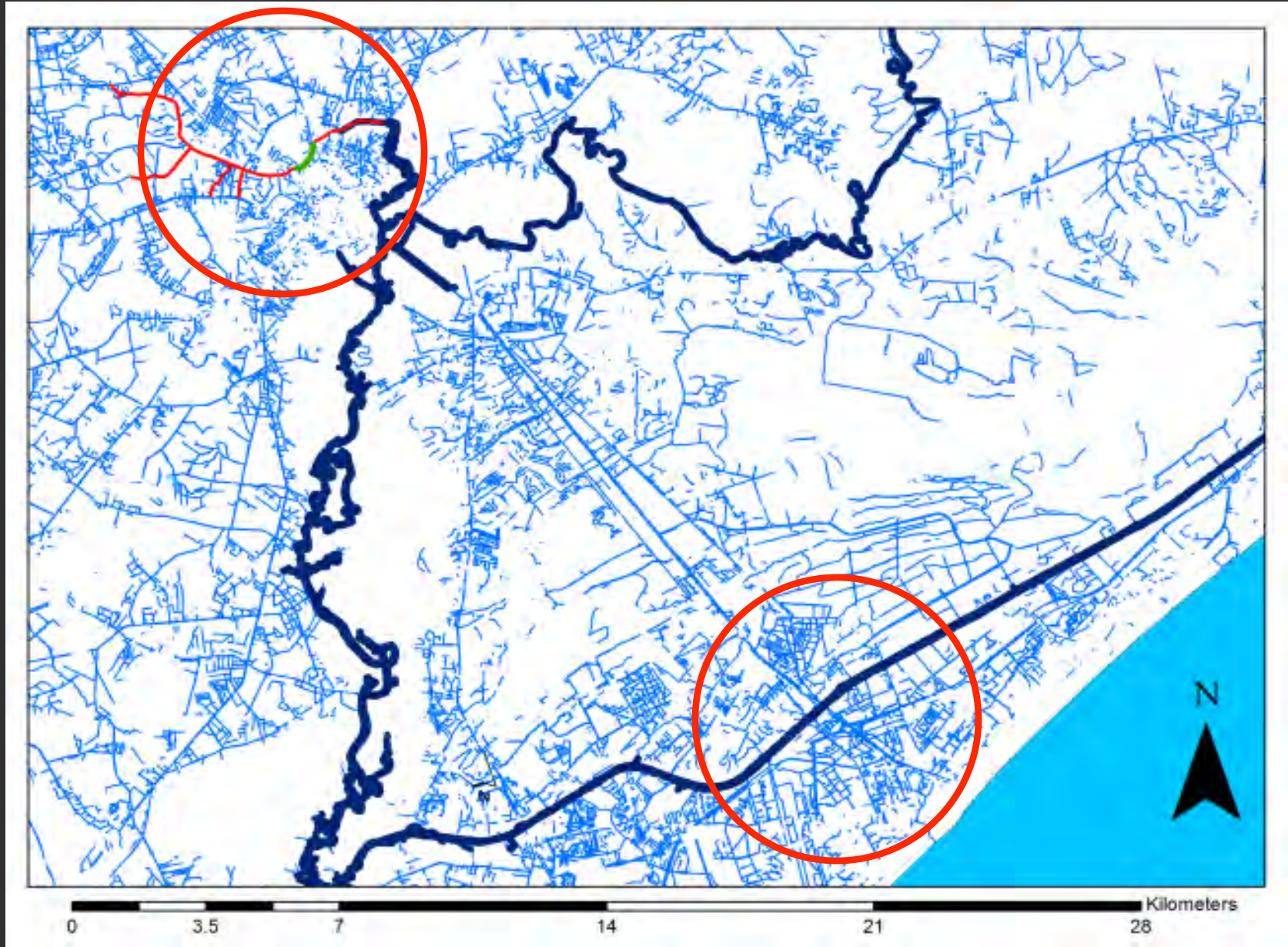
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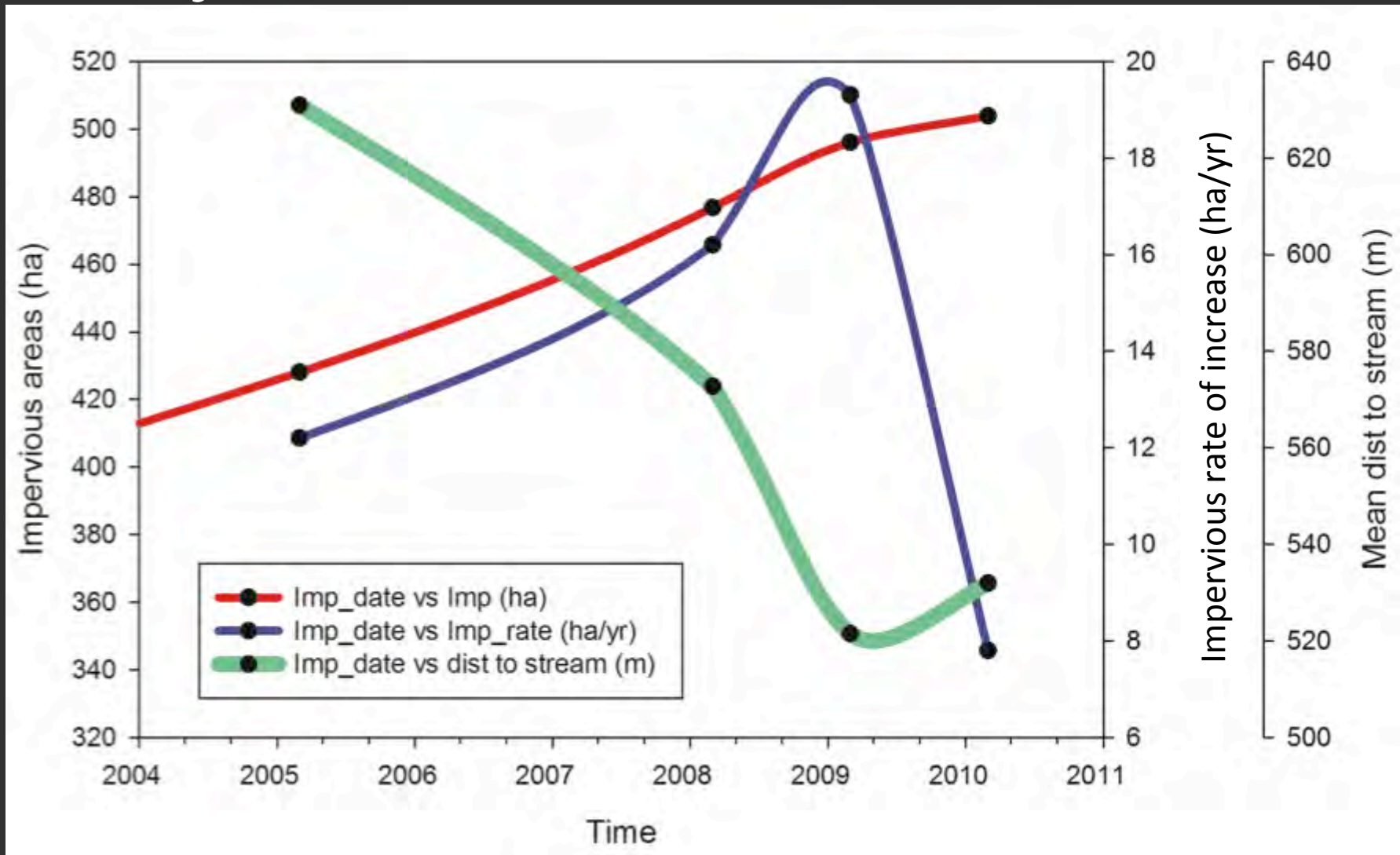
Modified Coastal Hydrology



Impervious area 1998 to 2009 colored by distance to stream



Impervious area trends in Horry County, SC



Conventional Ditch Construction / Maintenance

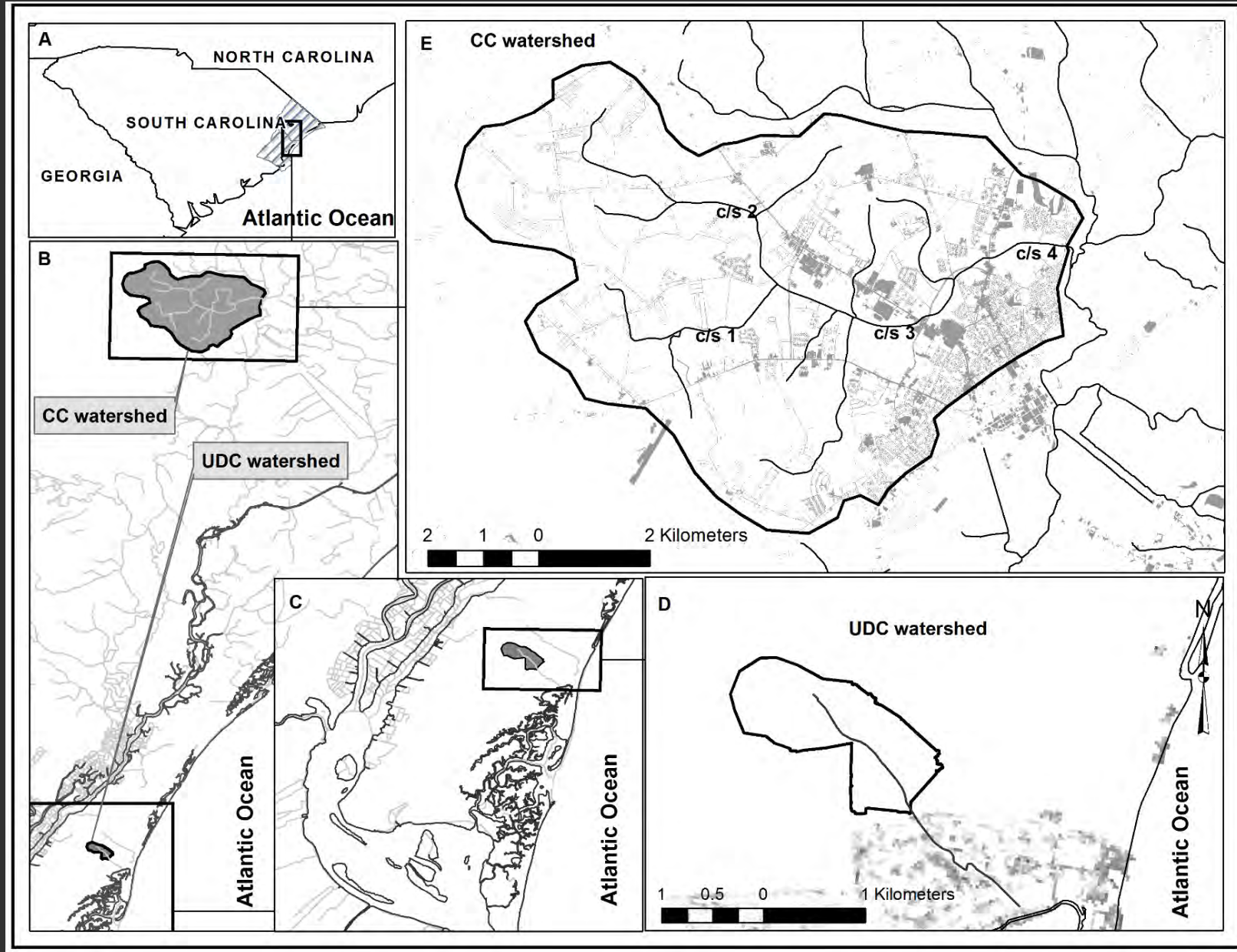


12/17/2013

Images from: Dave Fuss, Horry County Stormwater

Southeast Tidal Creeks Summit, December 16-17, 2013, Wilmington, NC

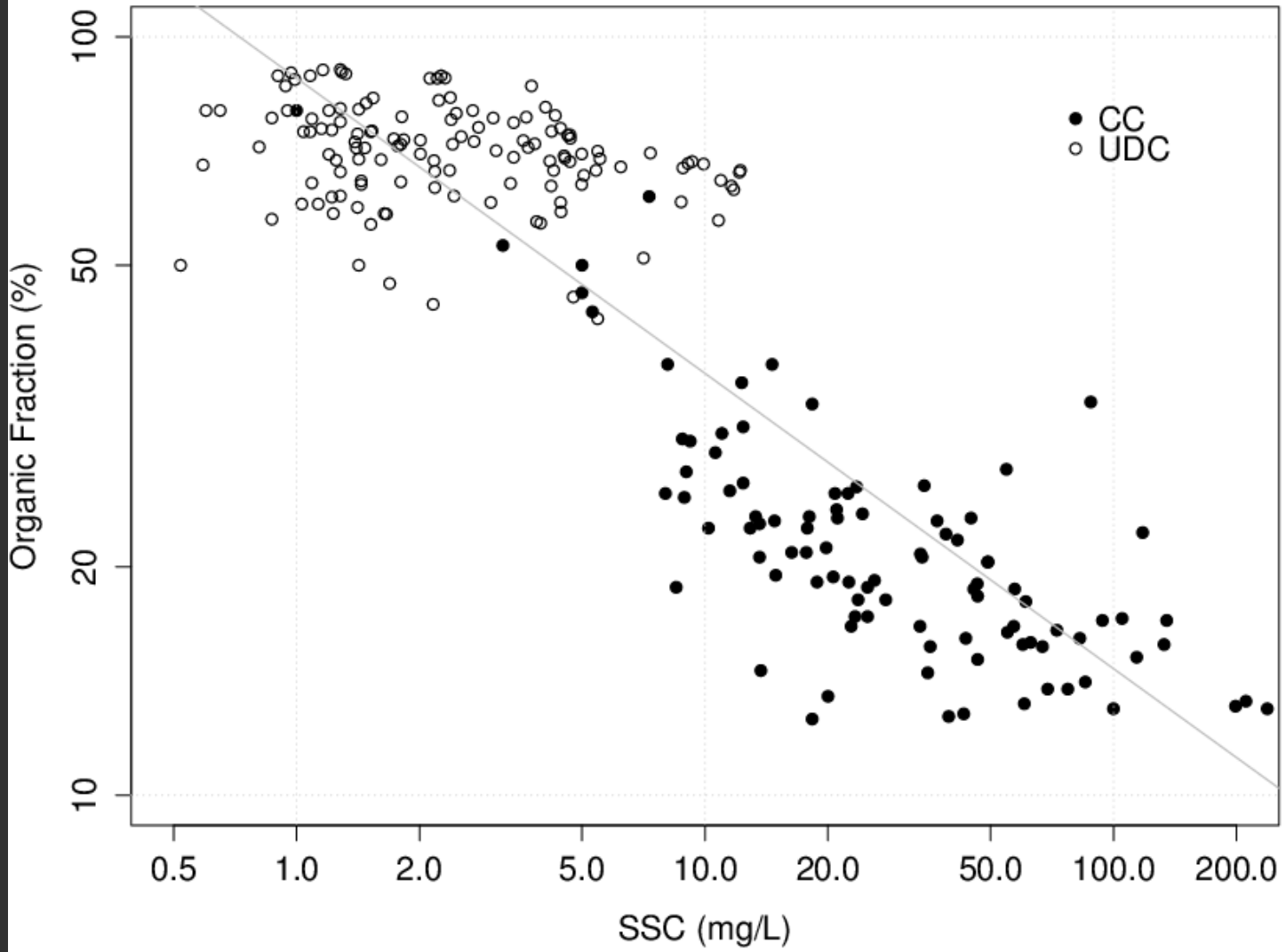
Study watersheds



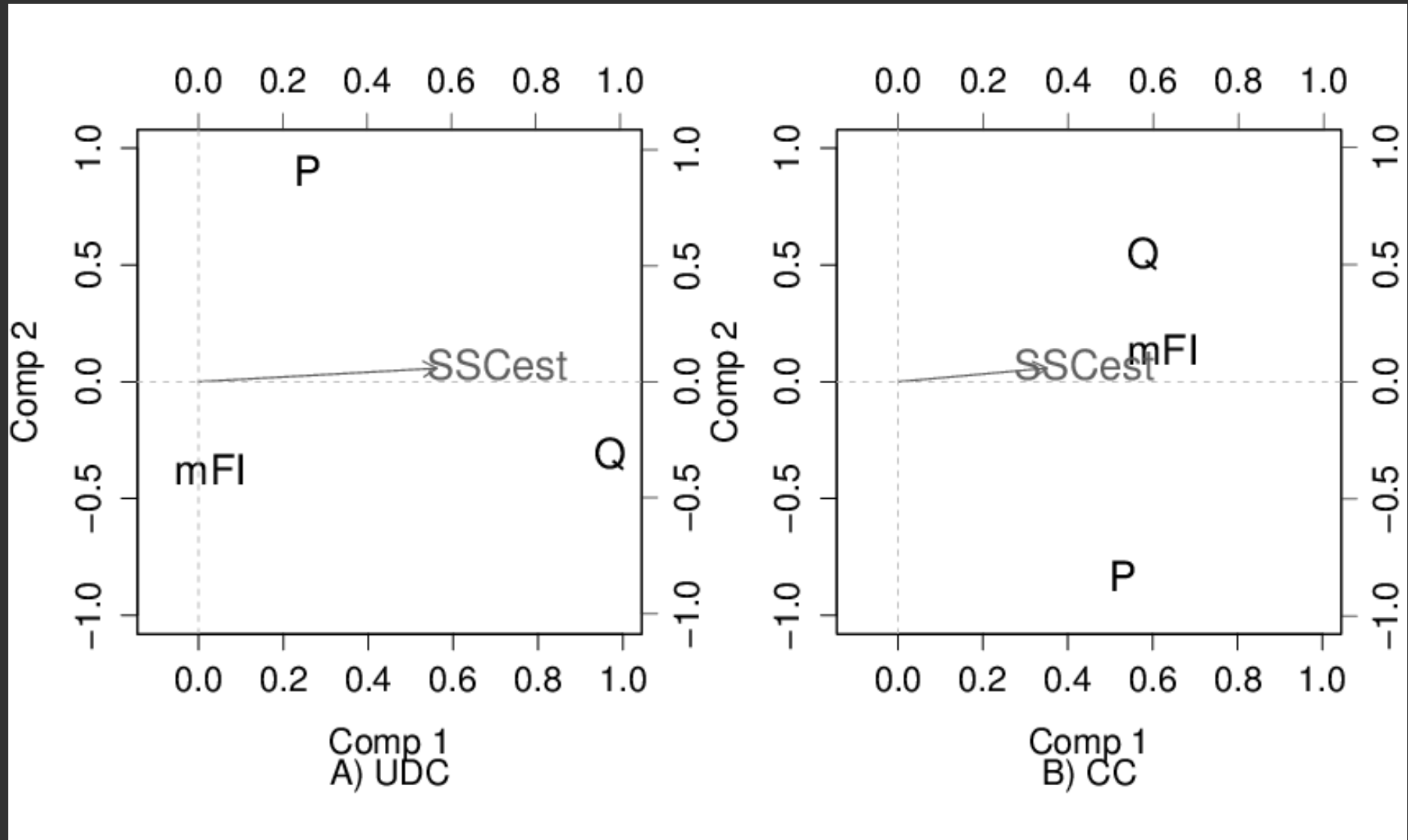
Parameters measured in both watersheds

- Suspended Sediment Concentration (storm samples) -> organic fraction
- Flow (continuous) -> stream flashiness
- Turbidity (continuous) -> SSC_{estimate}

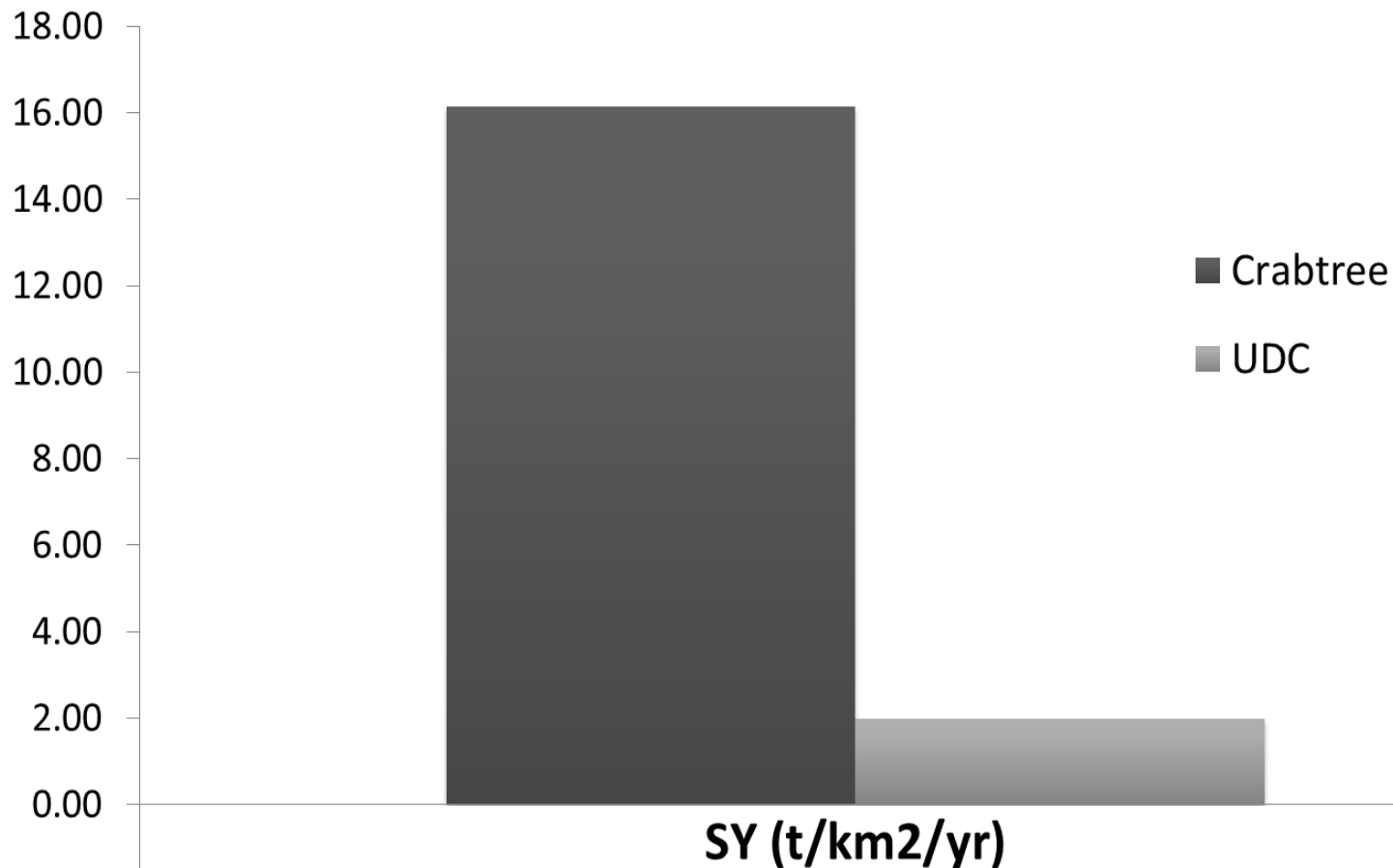
Organic and mineral content



Partial Least Squares – what's driving sediment?



Comparing Sediment Yield



■ **Crabtree** Only developed areas

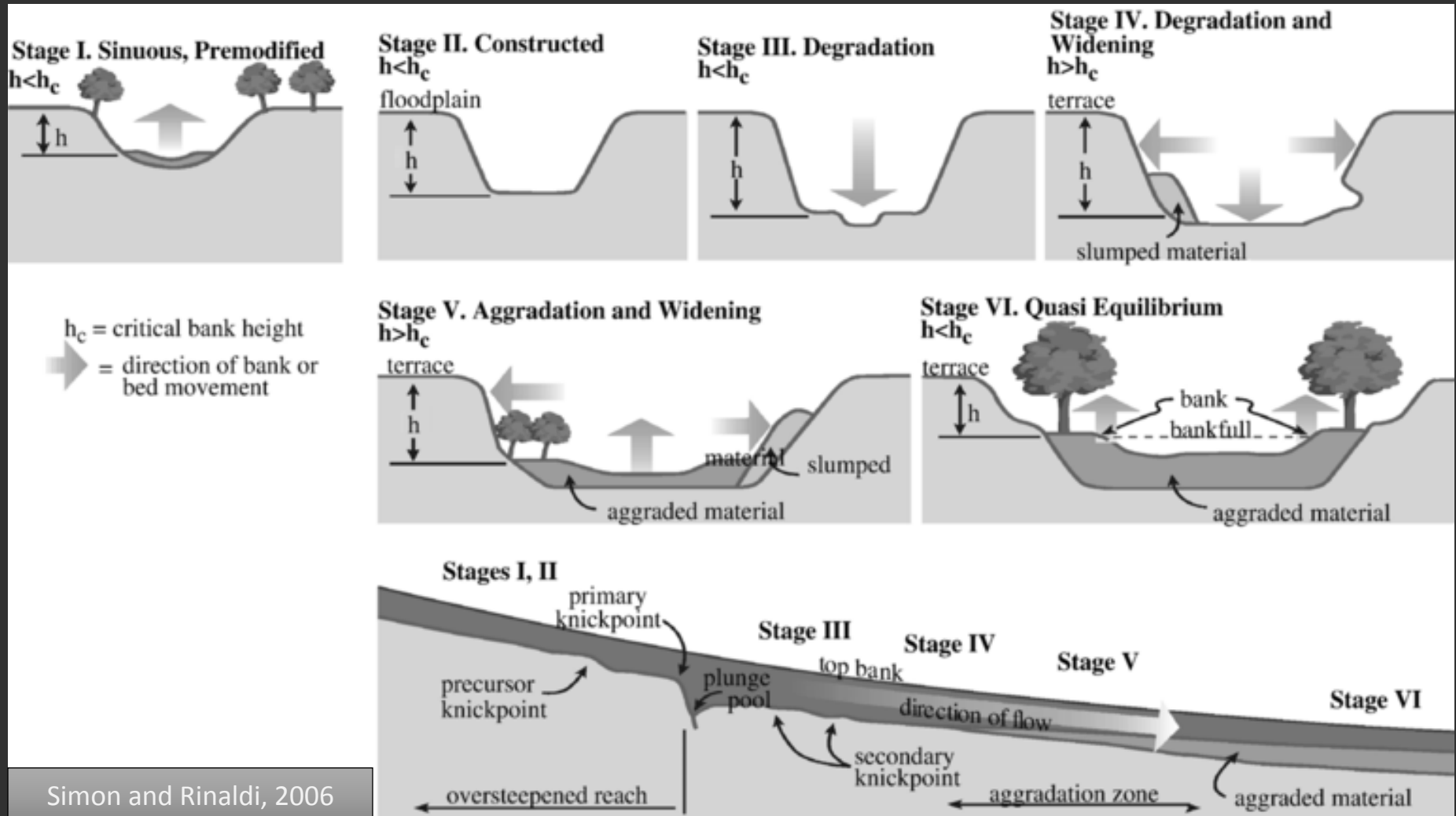
16.15

■ **UDC**

1.99

Jayakaran, A. D., S.M. Libes, D. R. Hitchcock, N. L. Bell¹, D. Fuss. [In Press]. Flow, organic and inorganic sediment yields from a channelized watershed in the South Carolina Lower Coastal Plain. *Journal of the American Water Resources Association* (JAWRA-13-0092-P.R2).

Channel Evolution Models



Simon and Rinaldi, 2006

Extreme Examples

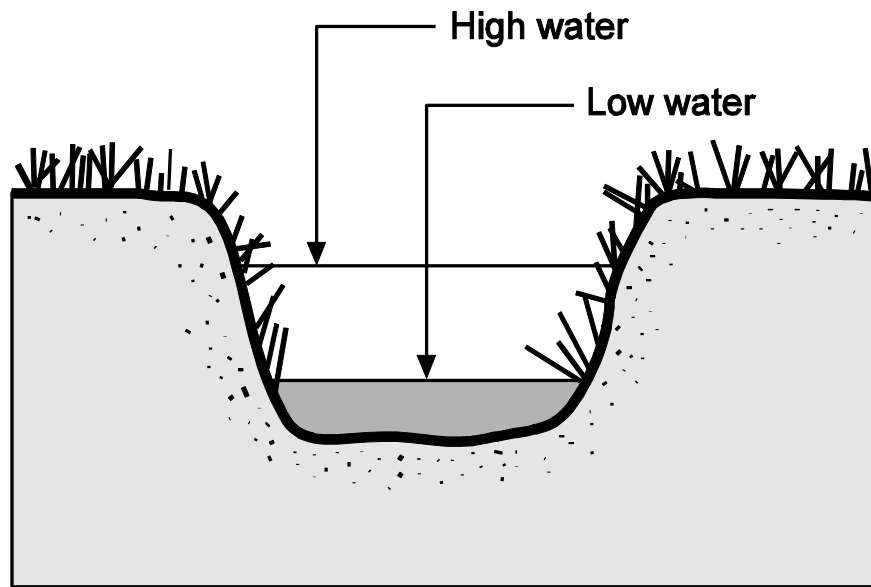


Self-Organization in Agricultural Ditches

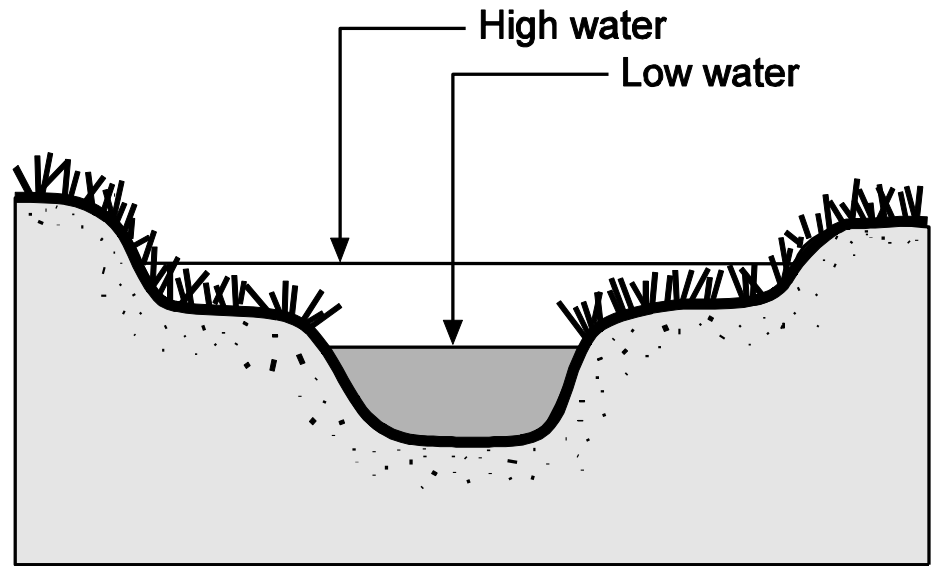


Jayakaran, A. D., and A. D. Ward. 2007. Geometry of Inset Channels and the Sediment Composition of Fluvial Benches in Agricultural Drainage Systems in Ohio. *Journal of Soil and Water Conservation*, 62(4), 296-307.

Two-stage channel - alternative



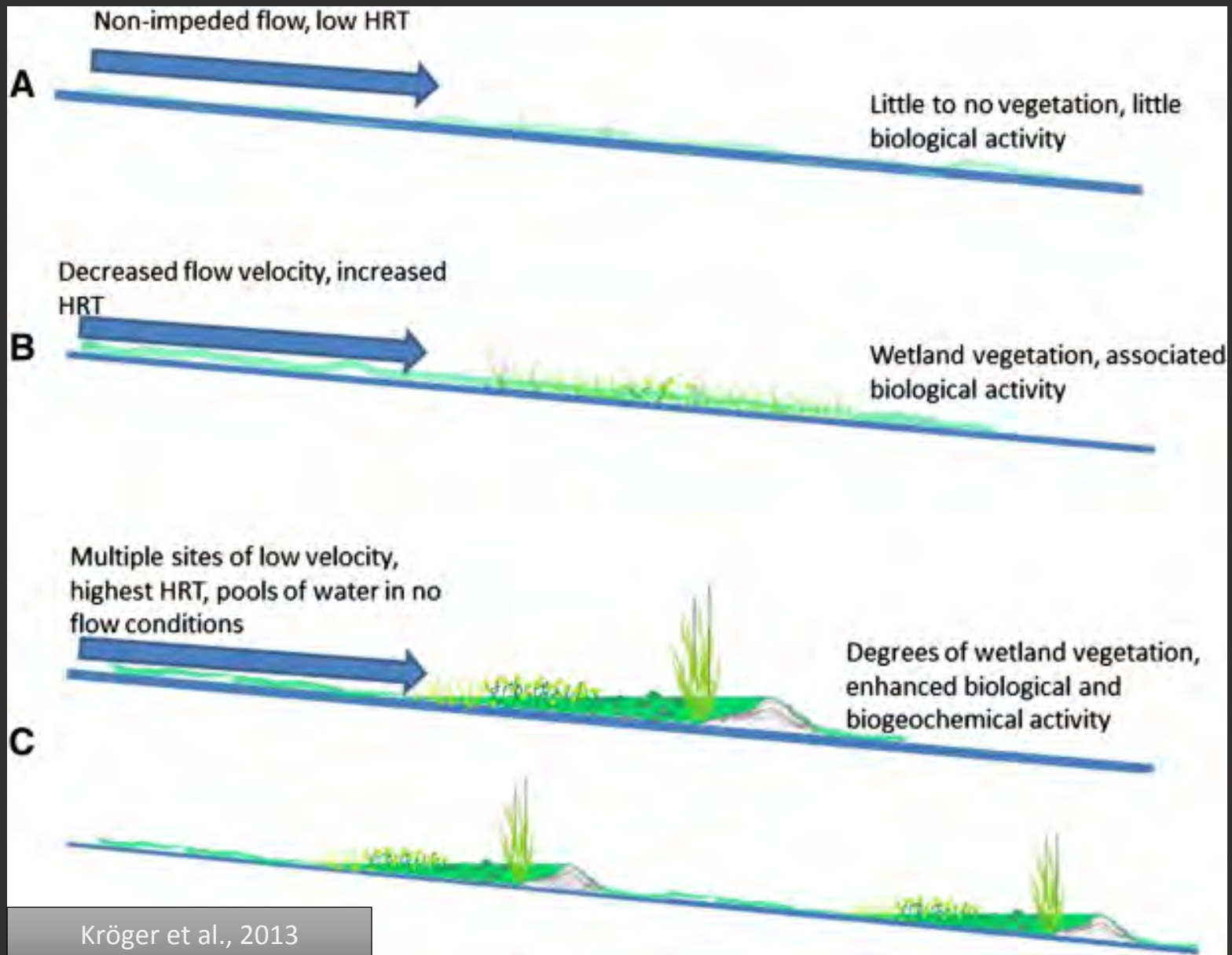
Channel 1



Channel 2

Graphic credit – Ohio State University Extension Service

Inline Retention



Kröger et al., 2013

Restoration strategies in Horry County, SC

1. Floodplain connection / two stage channels – **opportunistic** - April 2009 onwards.
2. Sediment removal from channel bottom stopped – **watershed wide** - Sept 2010 onwards.



1/17/2013

Southeast Tidal Creeks Summit, December 16-17, 2013, Wilmington, NC



12/17/2013

Southeast Palmetto Creeks Summit, December 16-17, 2013, Wilmington, NC



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Southeast Tidal Creeks Summit, December 16-17, 2013, W/ilmington, NC



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Southeast Tidal Creeks Summit, December 16-17, 2013, Wilmington , NC



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