

Factors associated with localized distribution of  
adult and juvenile freshwater mussels  
(Bivalvia: Unionidae)

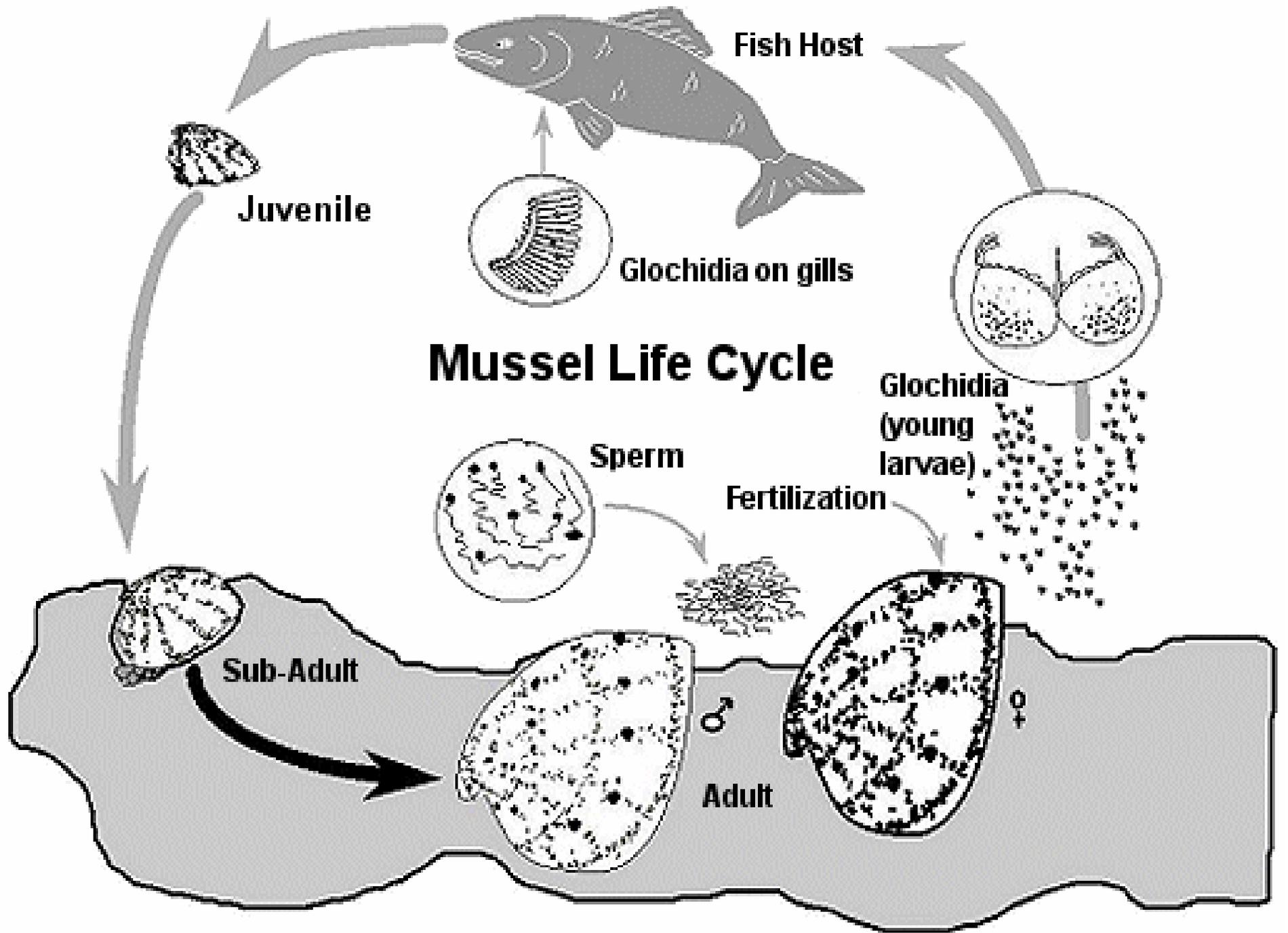
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M. C. Barnhart 1998



# Purpose & Need

- Comprehensive recovery plans are needed to protect dwindling mussel populations.
- Little is known about the ecology of juvenile freshwater mussels.
- Juveniles may respond differently to environmental variables than adults.
- Successful recovery efforts will require a strategy that takes into consideration the environmental requirements of juveniles.

# Objectives

- Determine the spatial distribution of adult and juvenile mussels within a mussel bed on the Duck River.
- Determine if any environmental variables were significant predictors of mussel distribution within the mussel bed.

# Study Site

- The upper the Duck River watershed below Normandy Dam.
- Mussel populations are relatively dense.
- Mussel recruitment is occurring.





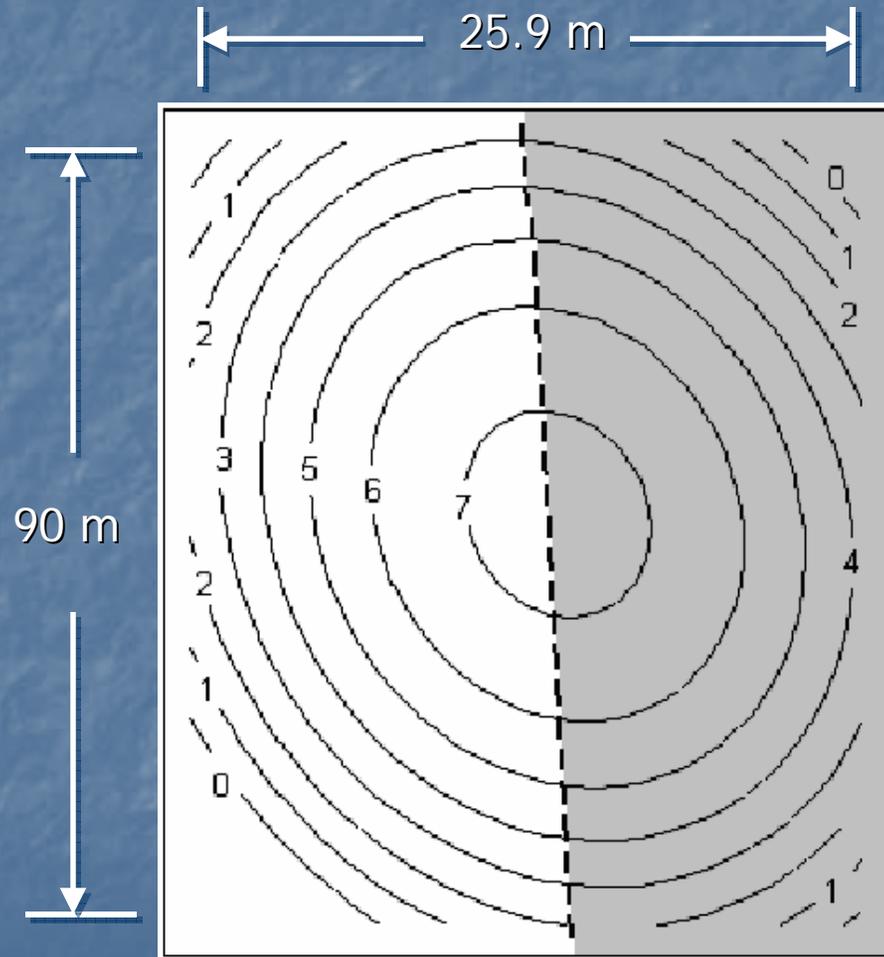


# Results - Mussel Assemblage

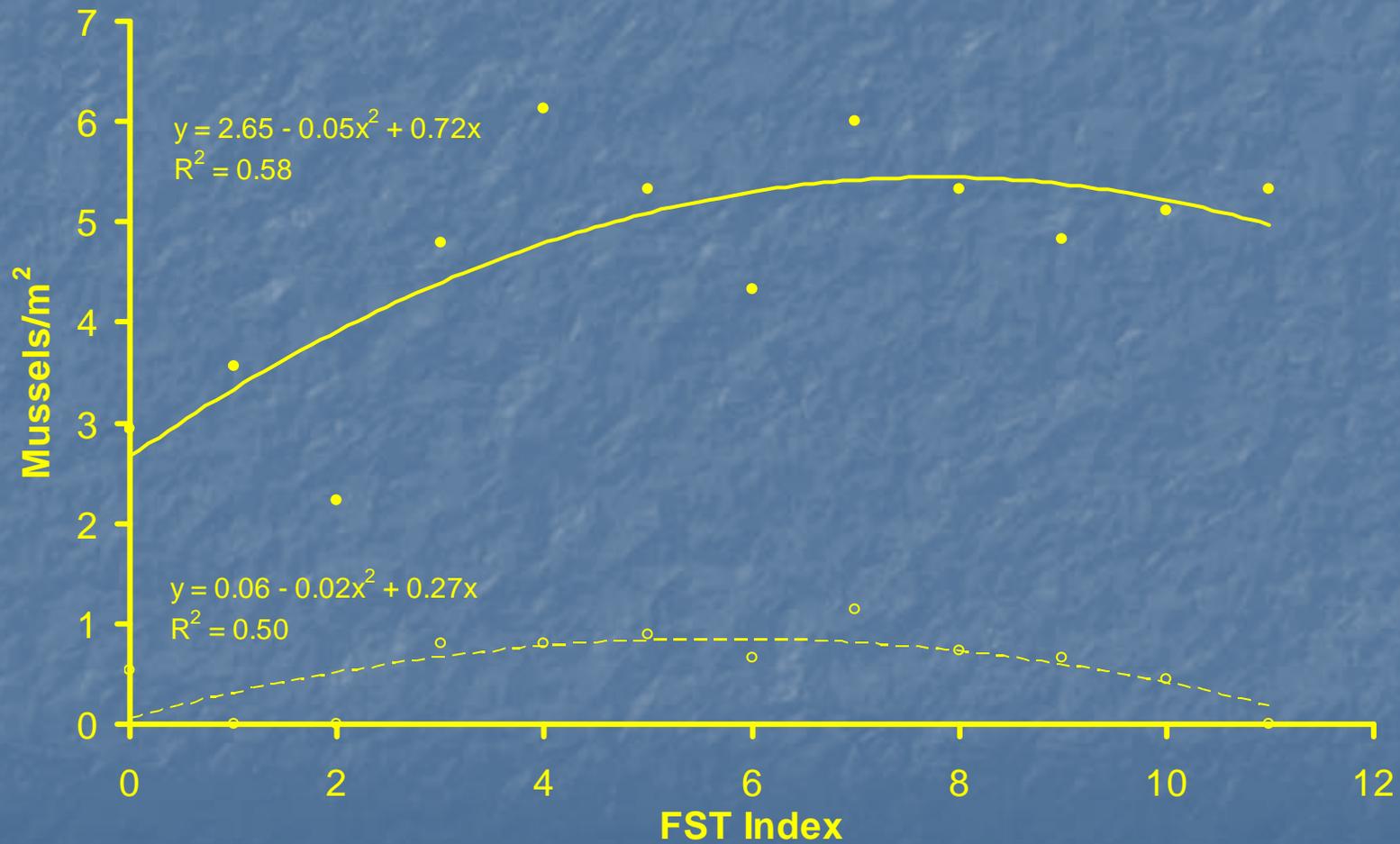
- Juveniles defined as individuals measuring 1.7 standard deviations below mean species length.
- 444 observations representing 21 species.
- 3 species made up 49% of the population (217 observations).
- 12.8% of the population were juveniles (48 observations).

# Results – Spatial Distribution

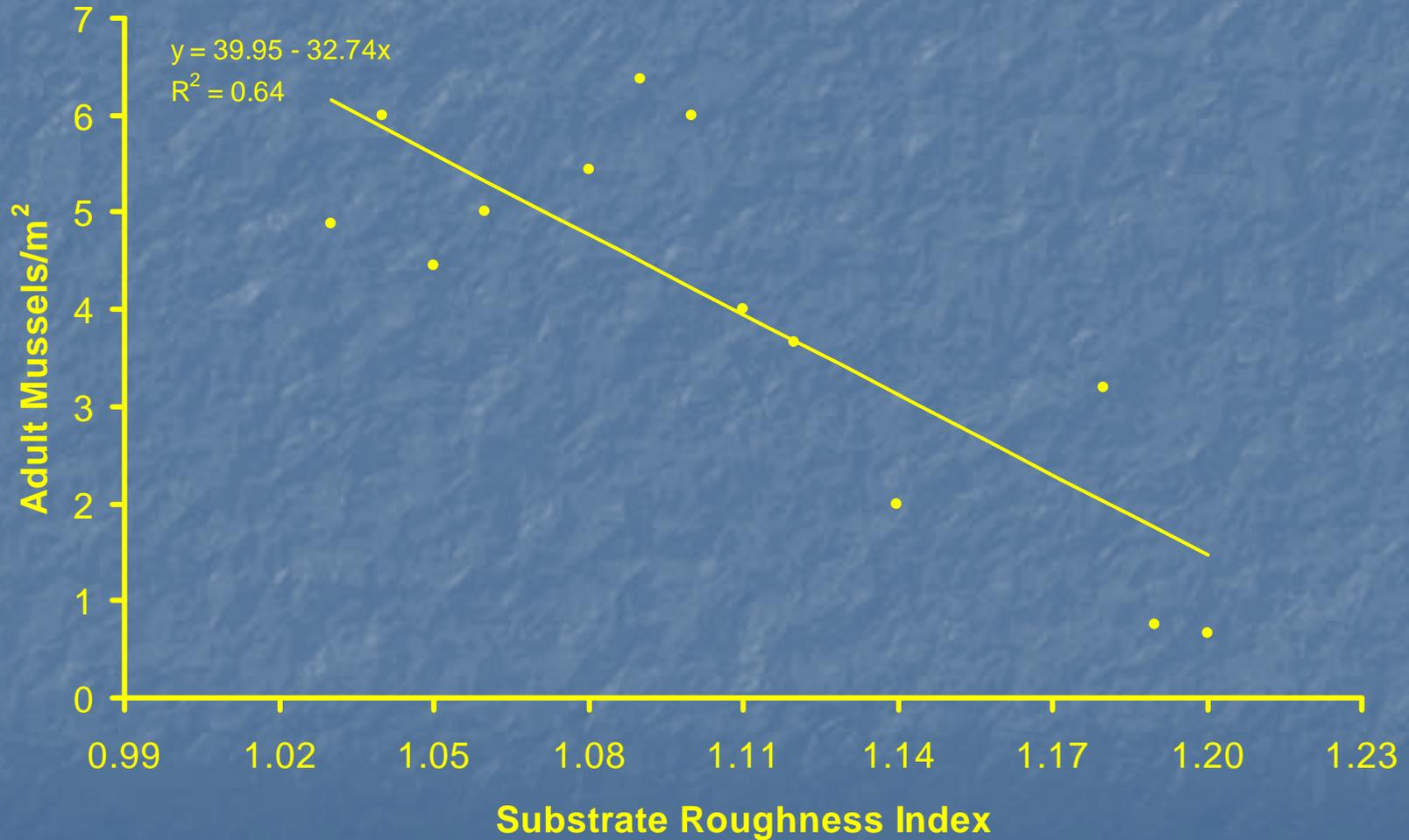
- Contour lines represent adults/m<sup>2</sup>
- Shaded area represents juvenile density > 0



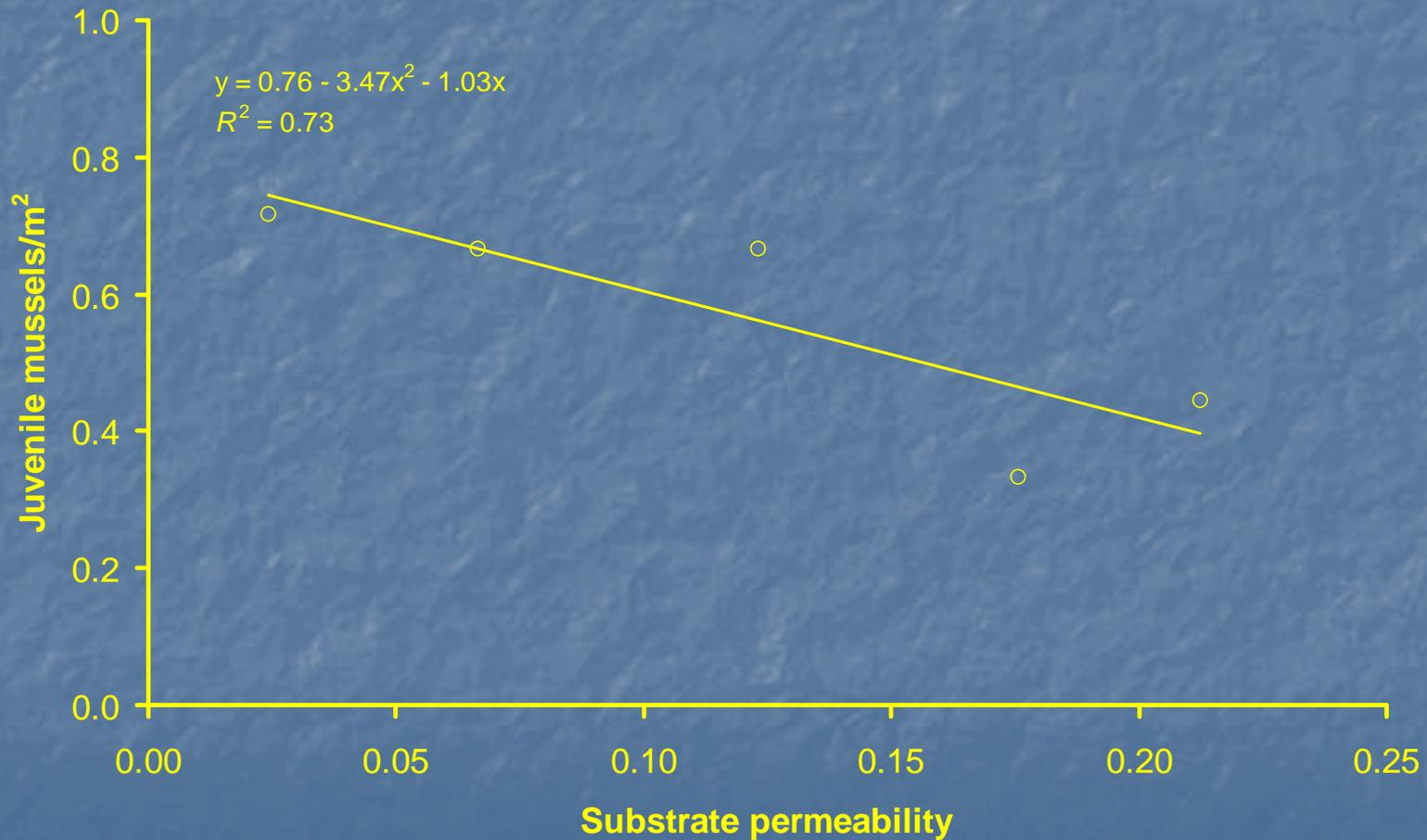
# Results – Environmental Variables



# Results – Environmental Variables



# Results – Environmental Variables



# Conclusions

- Adults are more tolerant of complex hydraulic effects at the substrate/water interface.
- Juveniles may be more dependent on conditions below the substrate surface.
- As juveniles increase in size and develop adult characteristics they disperse laterally.

# Application

- Current mussel conservation efforts are focused on reintroduction of juvenile mussels cultured in laboratories
- Conditions that support long term survival of adults are not good indicators of successful recruitment.
- Habitat suitability models for juvenile mussels need to be developed.

# Acknowledgements

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- Mr. Edwin Allen Jr.
- The many students who assisted in collecting data

Questions?