Effects of agricultural activities on physico-chemical parameters and benthic macroarthropods

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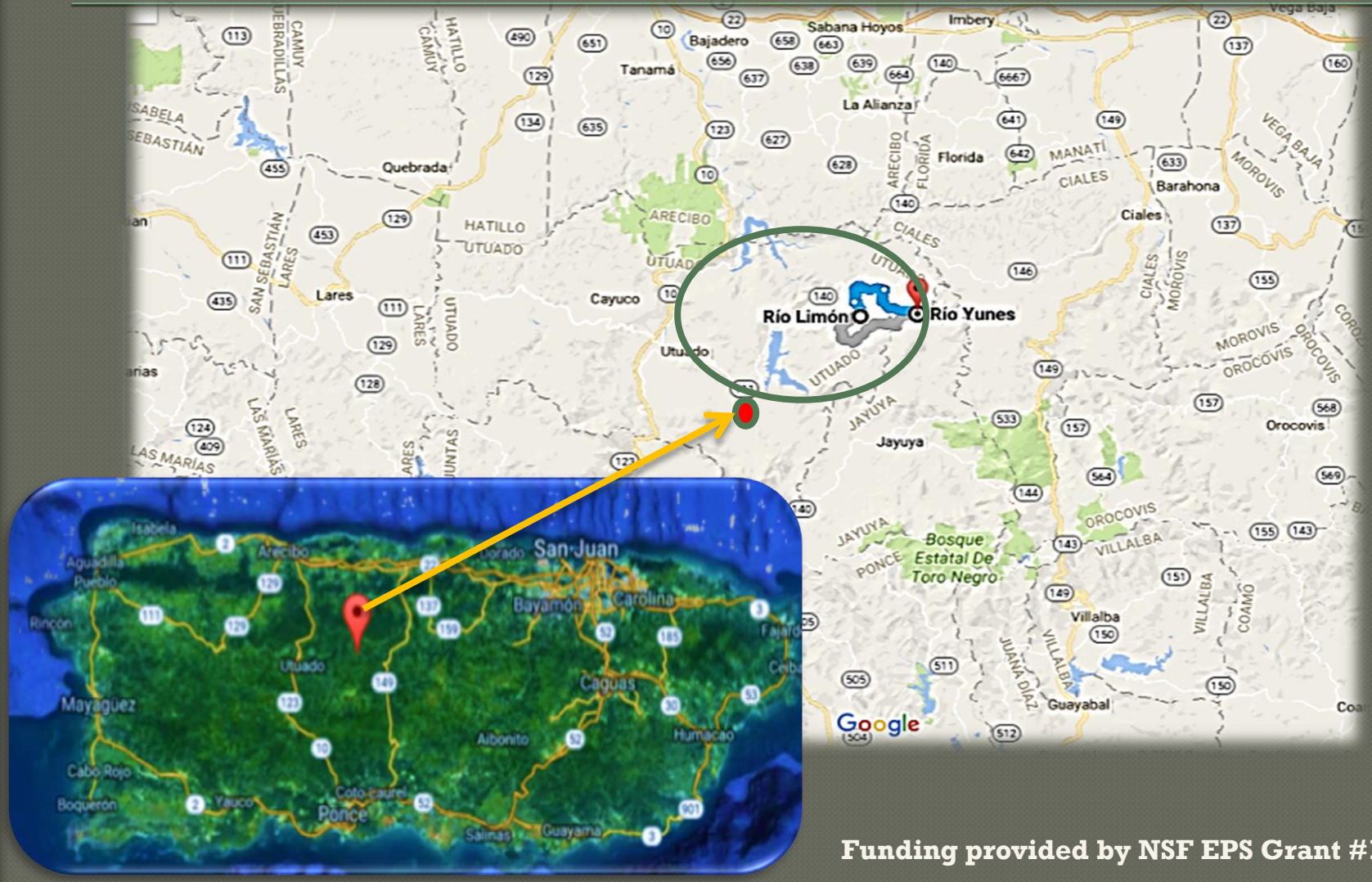
Funding provided by NSF EPS Grant #1101317

Background

Study Areas



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Yunes River

Limon River

Problem:

How anthropogenic activities affect nutrients and macroarthropods families in a tropical stream?

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Hypothesis

- The intensity of agricultural activity near river banks will increase nutrients concentrations, so the benthic macroarthropod's diversity will decrease.

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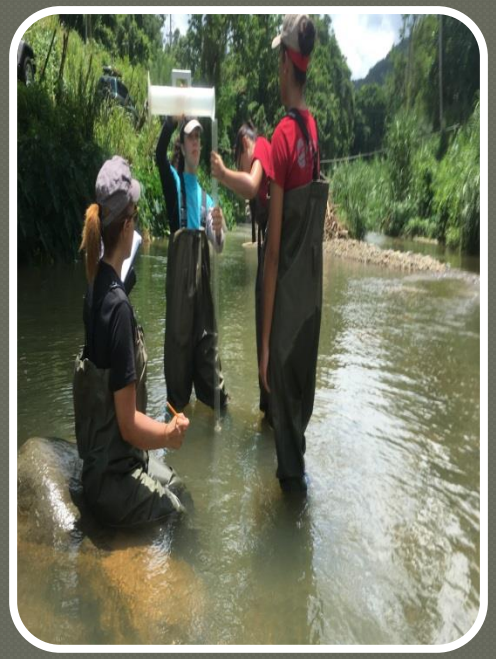
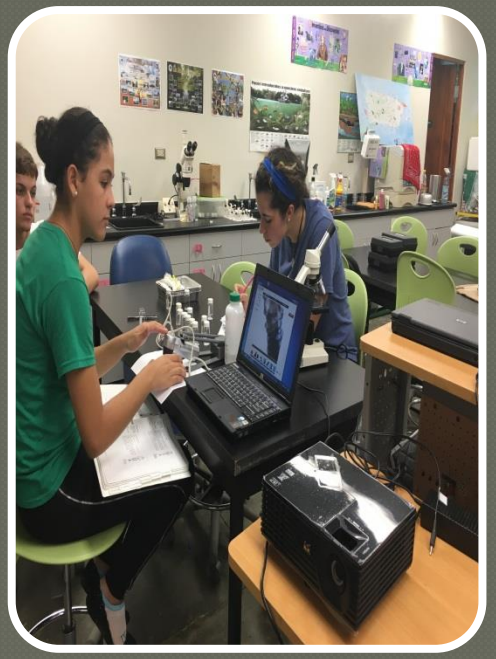
Methodology



Parameters

Samplings



Classification

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Physical-Chemical Parameters

Parameters	Yunes River	Limon River
Water Temp (°C)	25.03	23.77
Velocity (m/s)	0.06	0.23
Conductivity (µS/cm)	198.5	154.66
pH	8	8.3
Dissolved oxygen (PPM)	7	7
Phosphate (PPM)	0.05	0.05
Nitrate (PPM)	0.71	1.00
Turbidity (NTU)	Aprox.14	Less than 10
TSS (PPM)	11.28	5.18
Canopy cover (%)	80	9.2

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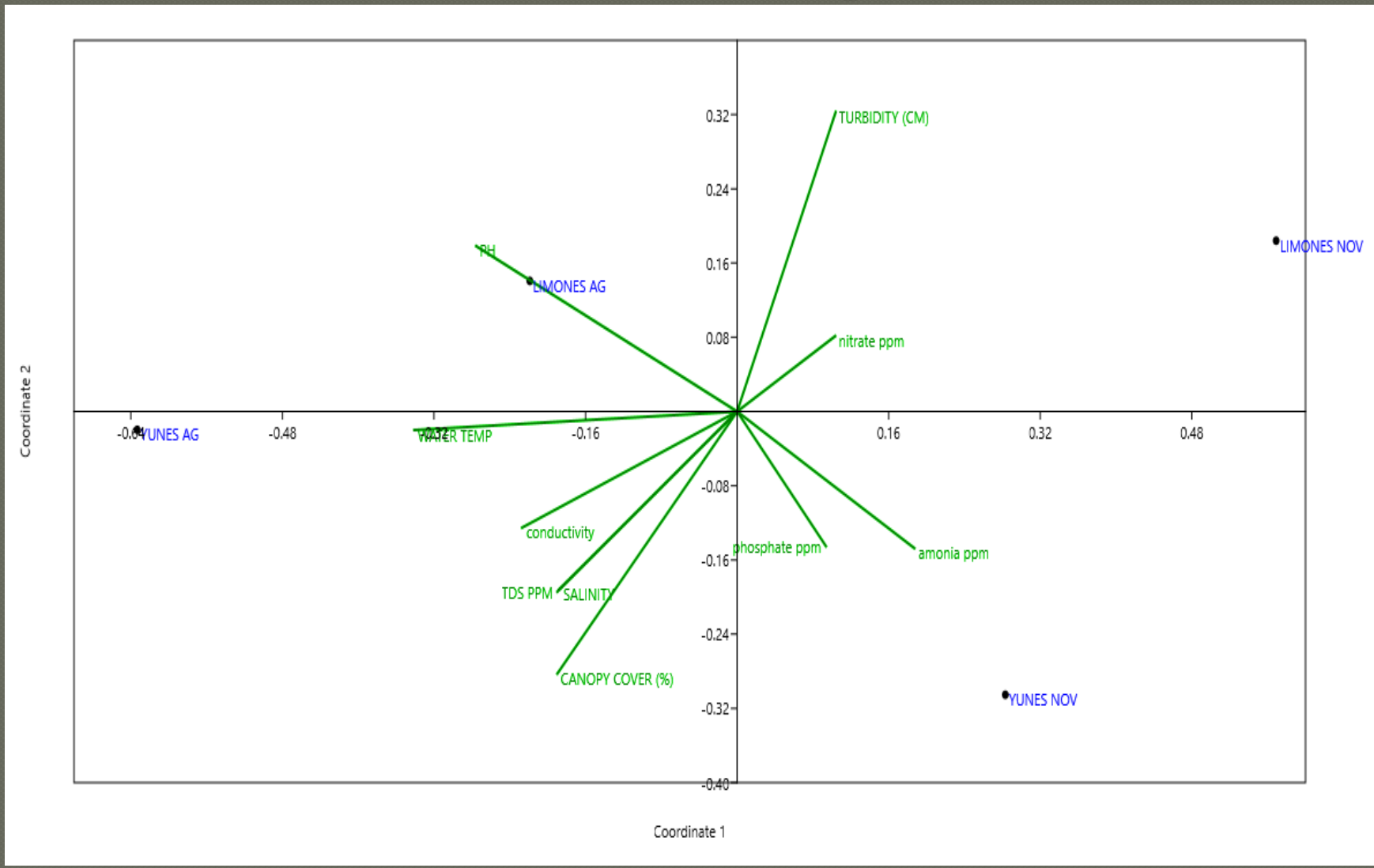
Results

Multivariable Analysis Results



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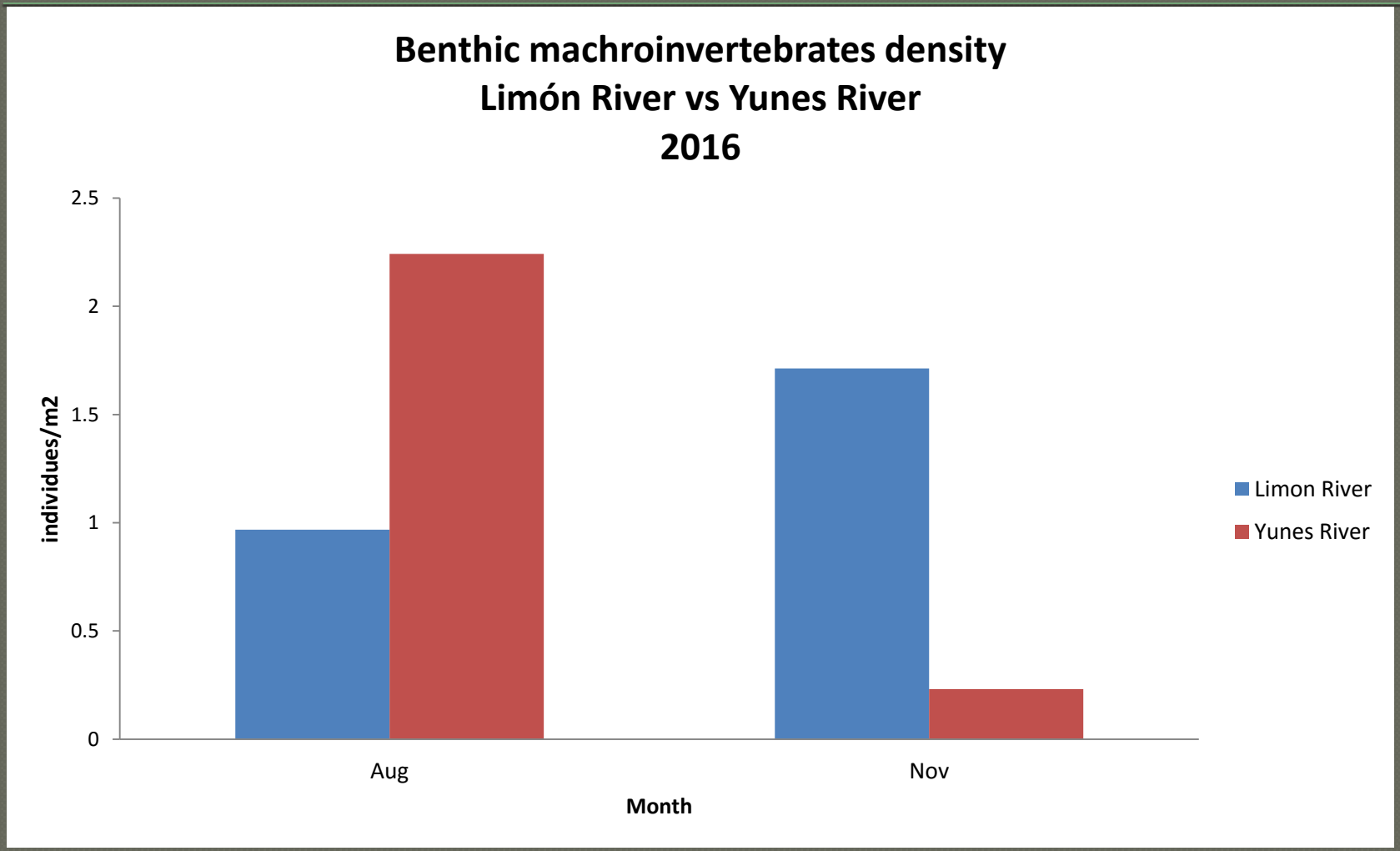
Results



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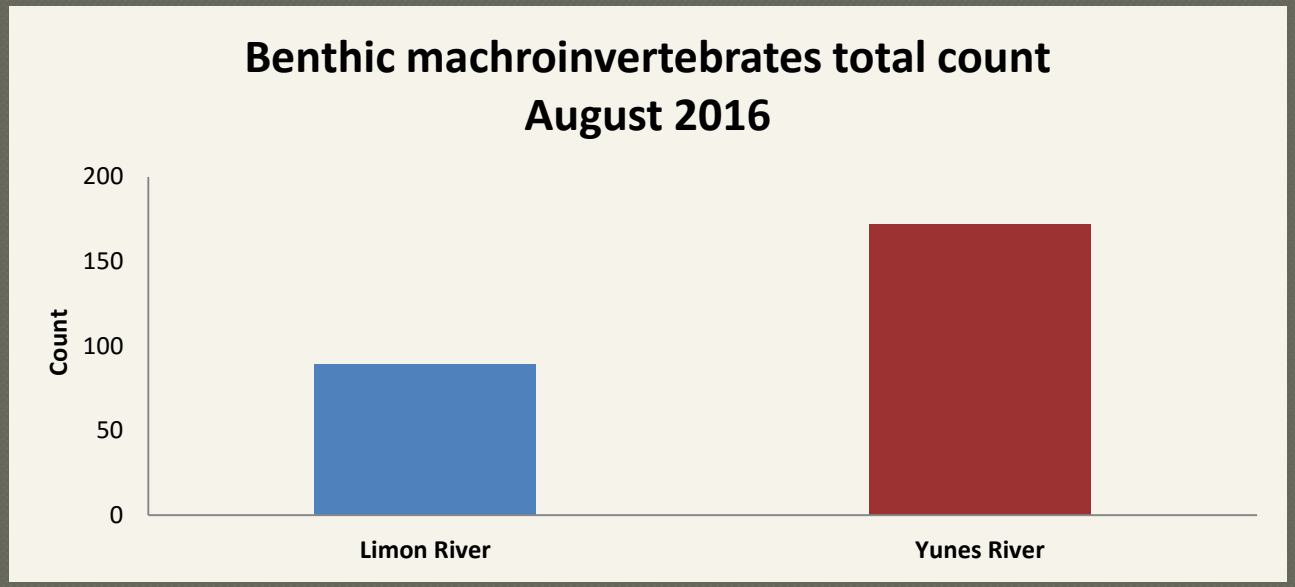

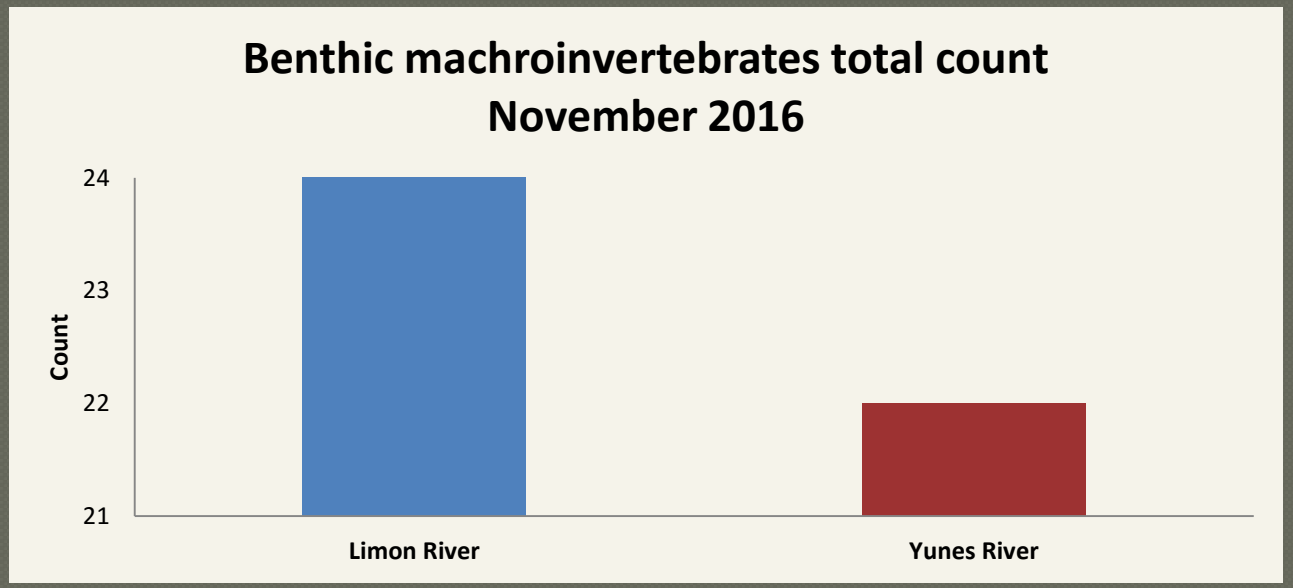

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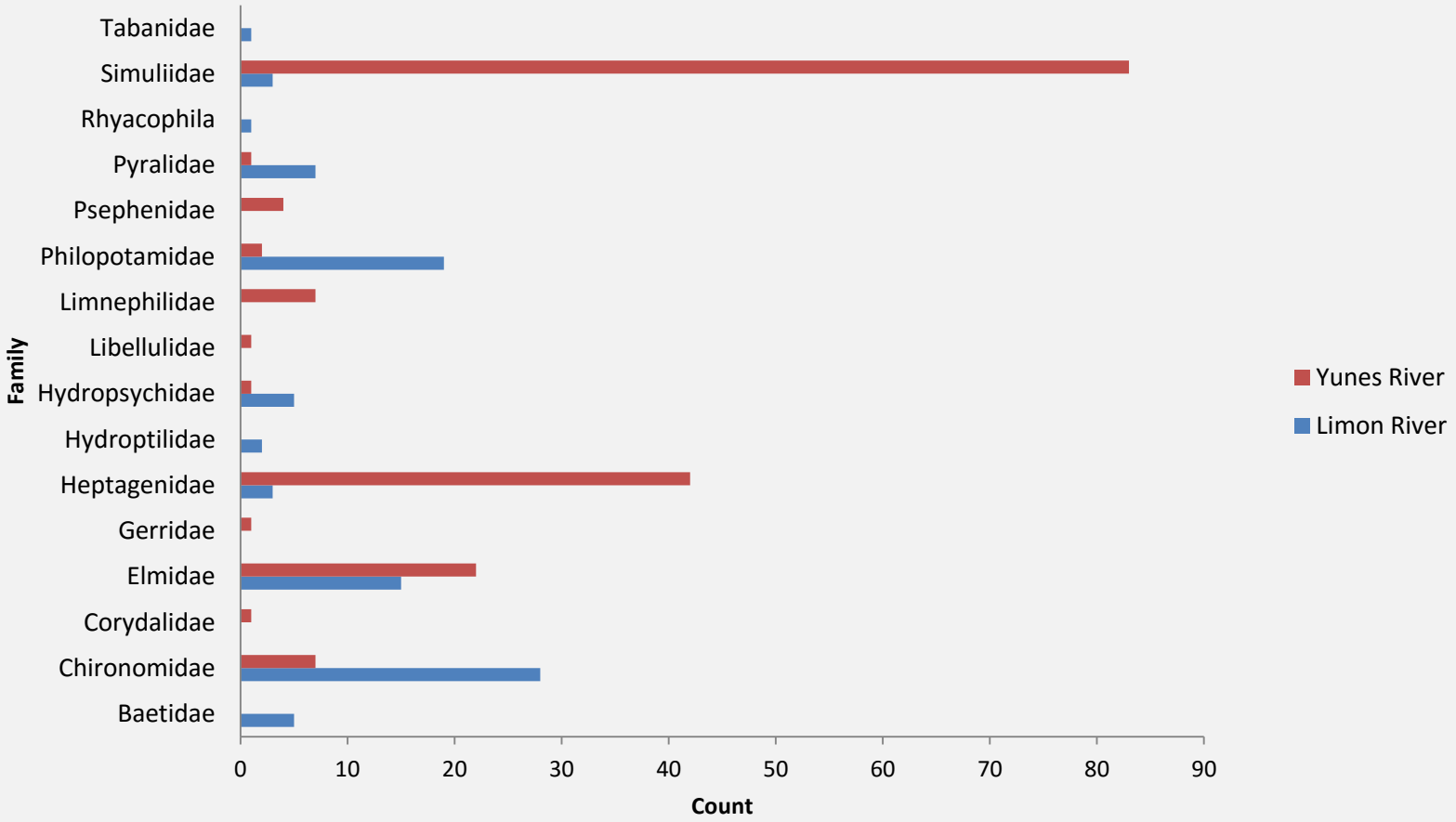
Benthic machroinvertebrates diversity Limon River vs Yunes River August 2016



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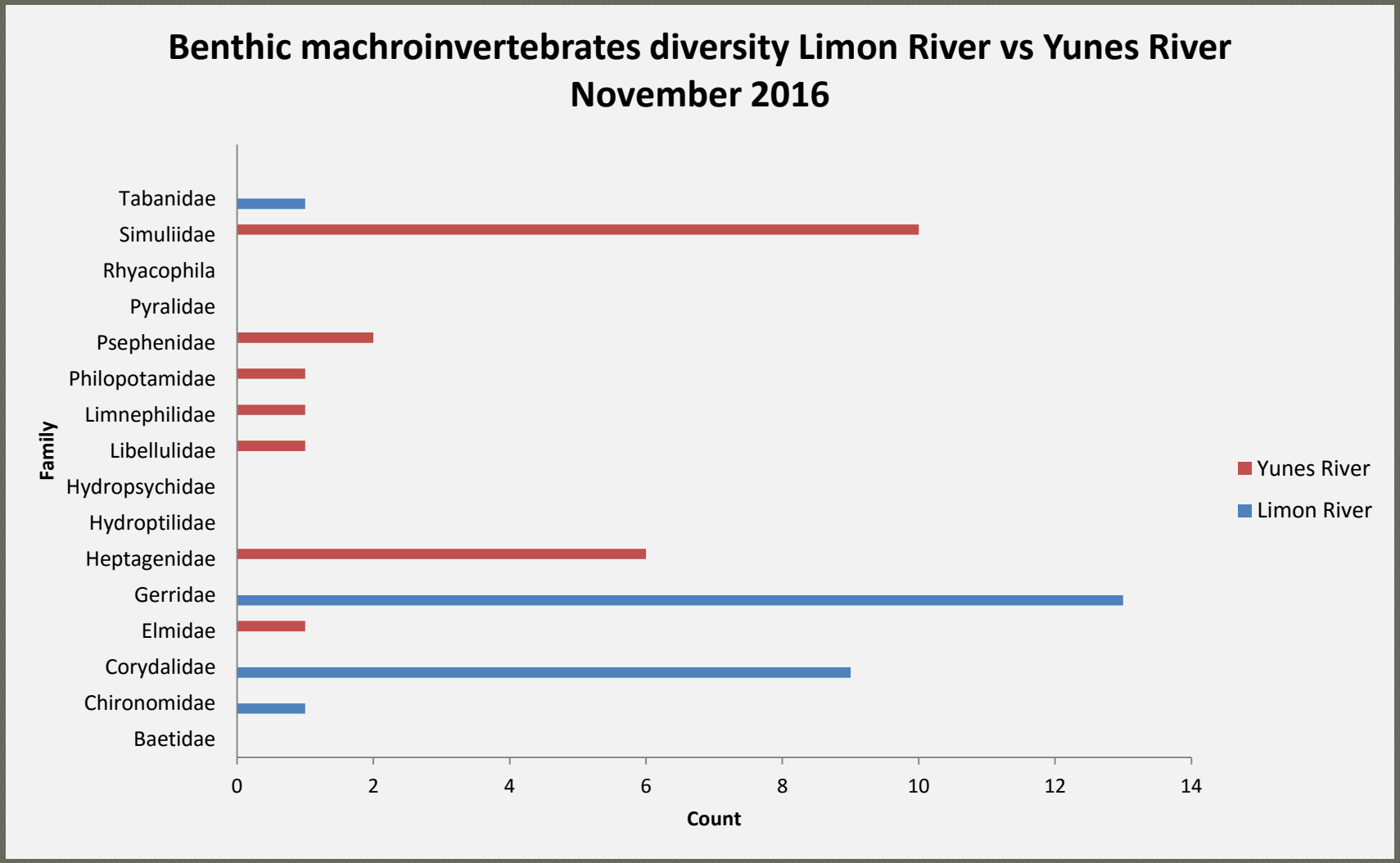

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Families present in both rivers

Yunes River	Families	Limon River
7	Chironomidae	28
42	Heptagenidae	3
2	Philopotomidae	19
1	Pyralidae	7
1	Hydropschidae	2
22	Elmidae	15

Shannon Diversity Index:
Yunes 1.51 low and Limon 1.93 low

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Conclusions

- After studying the measurements of nitrate, phosphate and ammonia concentrations and the diversity of macroarthropods, we can conclude from the multivariable analysis that the increase in the concentrations of these parameters adversely affect diversity. These results validate our hypothesis.

- We plan to continue this research in the dry season, considering that there will be less runoff on agricultural land.

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Funding provided by NSF EPS Grant #1101317

Acknowledgements

- Mike Winslow, Director VT EPSCoR
- Noelia Báez, Prog. Coord. Luquillo LTER Schoolyard
- Omar Pérez, PhD. University of PR
- Prof. Elliot López, CIAM
- Mr. Juan C. Delgado, Land Owner

Funding provided by NSF EPS Grant #1101317

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Funding provided by NSF EPS Grant #1101317