

## AQUATIC BIO & CHEMICAL MONITORING IN AMARILLO STREAM IN URUGUAY

R. Hladki<sup>a</sup>, M. Dorrego<sup>a</sup>, R. Genolet<sup>a</sup>, F. Jesús<sup>a</sup>, V. Cesio<sup>b</sup>, H. Heinzen<sup>b</sup> and S. Niell<sup>a</sup>  
<sup>a</sup> CENUR Litoral Norte Sede Paysandú, Universidad de la República, Uruguay.  
<sup>b</sup> Facultad de Química, Universidad de la República, Uruguay.  
 ricardoladki@gmail.com



### INTRODUCTION

When evaluating pesticide residues in surface waters as a compartment in environmental studies, it is usual to find several non-detects. However, this fact is not conclusive about the presence of pesticides in the environment. On the other hand, when the composition of aquatic macroinvertebrate communities is studied in streams, the effects caused by diverse contaminants that reach surface waters can be integrated in a time period, but little is known about the chemicals or the distortion that caused a particular community composition. Combining ecotoxicological observations with chemical analysis of the biota and the water where this biota lives could bring some light on the overall phenomenon.

### EXPERIMENTAL

In the Queguay river basin in Uruguay



4 sites with different land use and their corresponding reference sites were selected, visited and sampled 6 times during one year from February 2019-2020.



Classification and composition of aquatic macroinvertebrate communities – diversity

Pesticides Residue analysis were performed in samples of water and macroinvertebrates (odonates)

Indexes

- Wealth
- Diversity–Margalef
- Ratio tolerant / intolerant EPT / EPTCH

### RESULTS

#### a) Ecotoxicological

Manguera de Piedra  
Santana  
Capilla Vieja



#### Amarillo Reference:

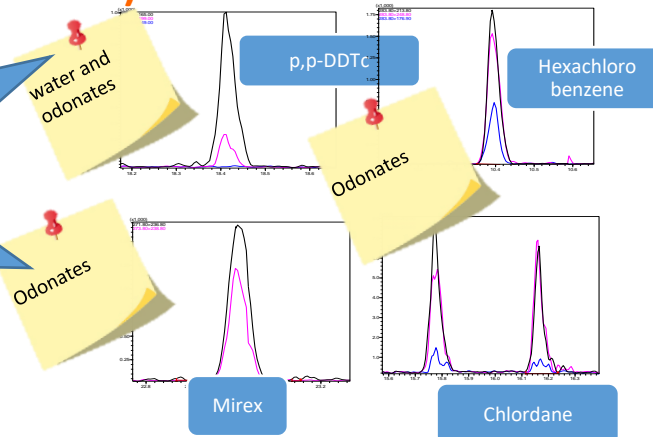
Taxa	31
Margalef	3.29
EPT/Ch+EPT	0.62

#### Study site:

Taxa	35
Margalef	3.83
EPT/Ch+EPT	0.91

The reference site had lower ecotoxicological indexes than the study sites

#### b) Contaminants Amarillo stream



### DISCUSSION AND CONCLUSIONS

- ✓ It was expected that the reference site presented a more diverse macroinvertebrates community than the sites being characterized. Unusually, the reference site in Amarillo stream showed lower ecotoxicological indexes than the impacted site under study.
- ✓ Old banned organochlorines were detected in the aquatic compartment, mainly in macroinvertebrates
- ✓ Further research confirmed that in this site sugar beet cropping have been performed decades ago, when these pesticides used to be applied.
- ✓ Surface runoff eased the pesticides to reach the stream, contaminating it and negatively impacting the aquatic environment
- ✓ Water analysis alone give us only a photograph of what is running in the stream, whereas this type of interdisciplinary approach gives a broader vision of the situation of the environment
- ✓ The strategy to combine biological indexes and chemical determinations showed its utility to understand pesticide dynamics and effects in the environment

### REFERENCES

Jesús, F., Hladki, R., Gérez, N., Besil, N., Niell, S., Fernández, G., Heinzen, H., Cesio, M.V., 2018. Miniaturized QuEChERS based methodology for multiresidue determination of pesticides in odonate nymphs as ecosystem biomonitors. *Talanta* 178, 410-418.

### ACKNOWLEDGEMENTS