

# FACING THE STREAM:

“The challenge of evaluating the periphyton growth in flashy rivers”

By:

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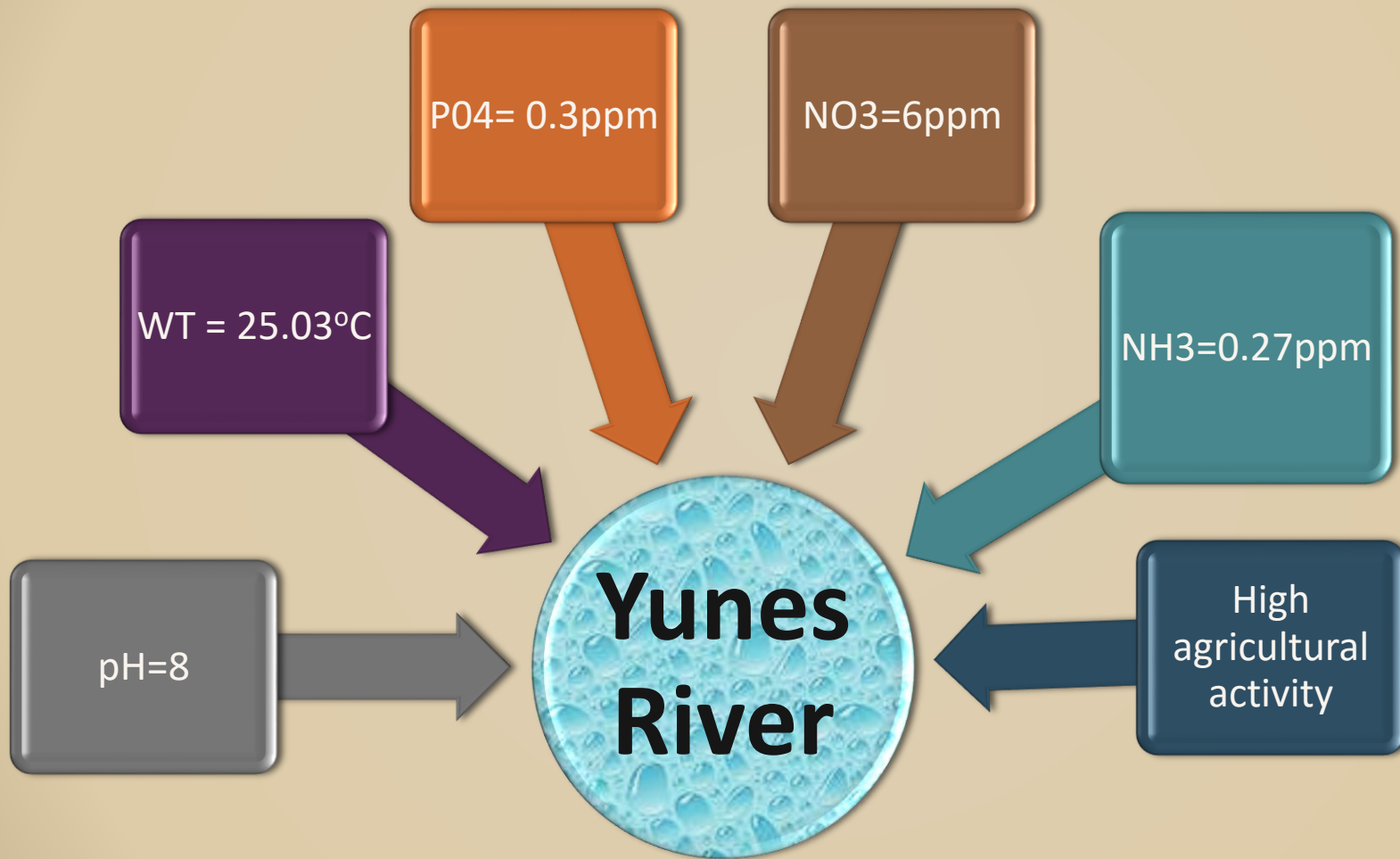
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# Introduction



# Study area background





# Problem Statement and Hypothesis

## PROBLEM

Is the increase in discharge the variable responsible for algae reduction?

- **HYPOTHESIS**

If rains and discharges increase, then algae biomass decreases.



# Objectives

- Measure the primary production of algae
- Check if the methodology used is best for flashy rivers
- Establish an initial database of periphyton algae growth to compare in dry season.
- Determine if changes in discharge minimize or reduce primary production.

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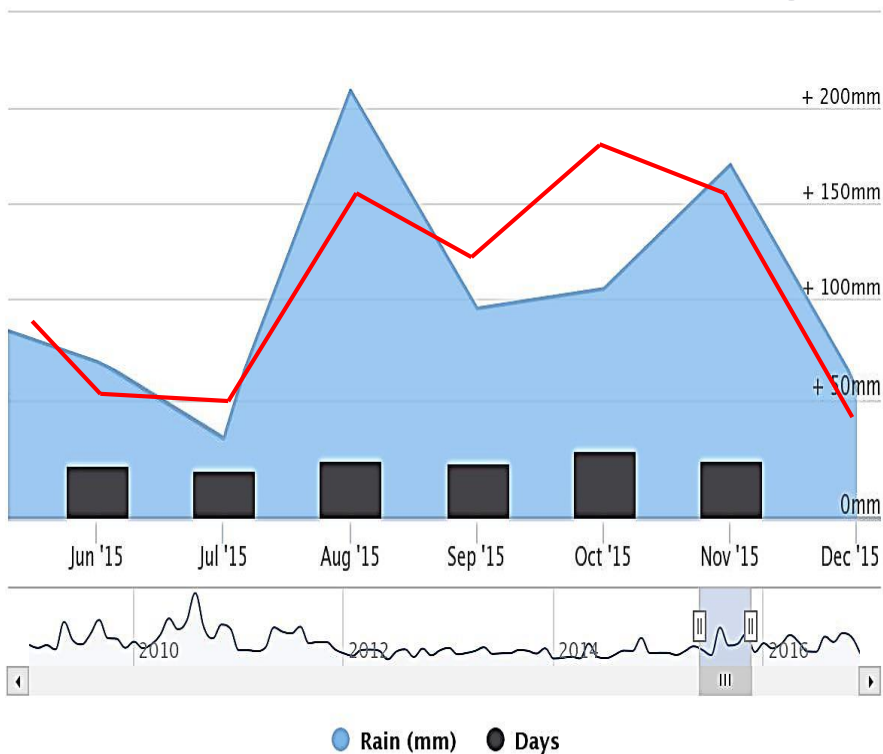
# Puerto Rico declares state of emergency amid heavy rains

Officials say the heavy rains that began on Sunday have unleashed widespread flooding, caused several small landslides and damaged infrastructure.

Ciales (00638)

Average Rainfall Amount (mm) and Rainy Days

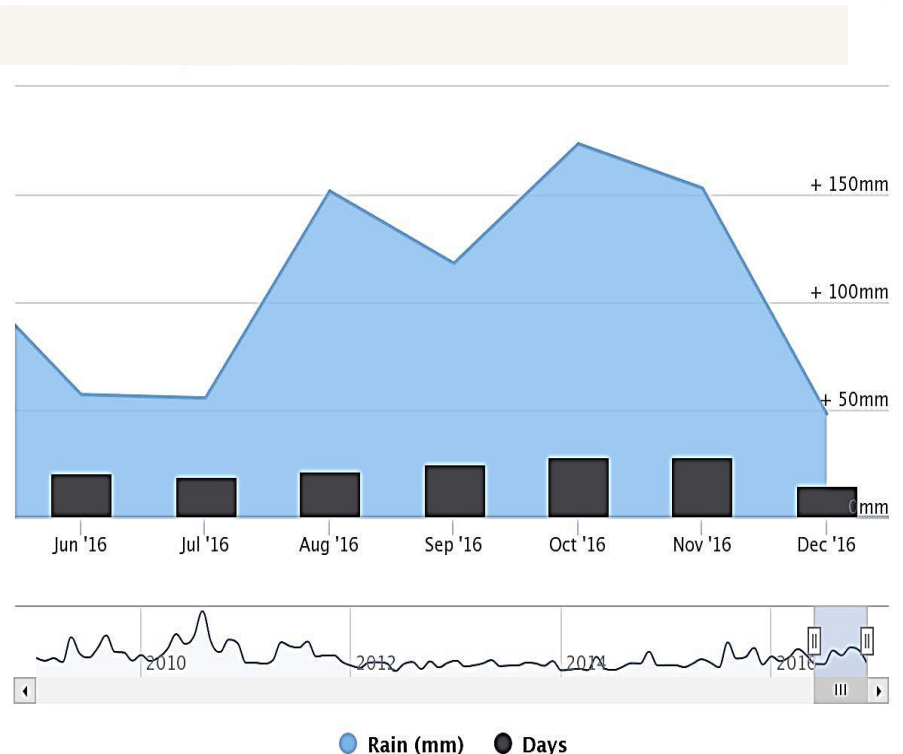
Zoom 1m 3m **6m** YTD 1y All **2015 (Drought)**



Ciales (00638)

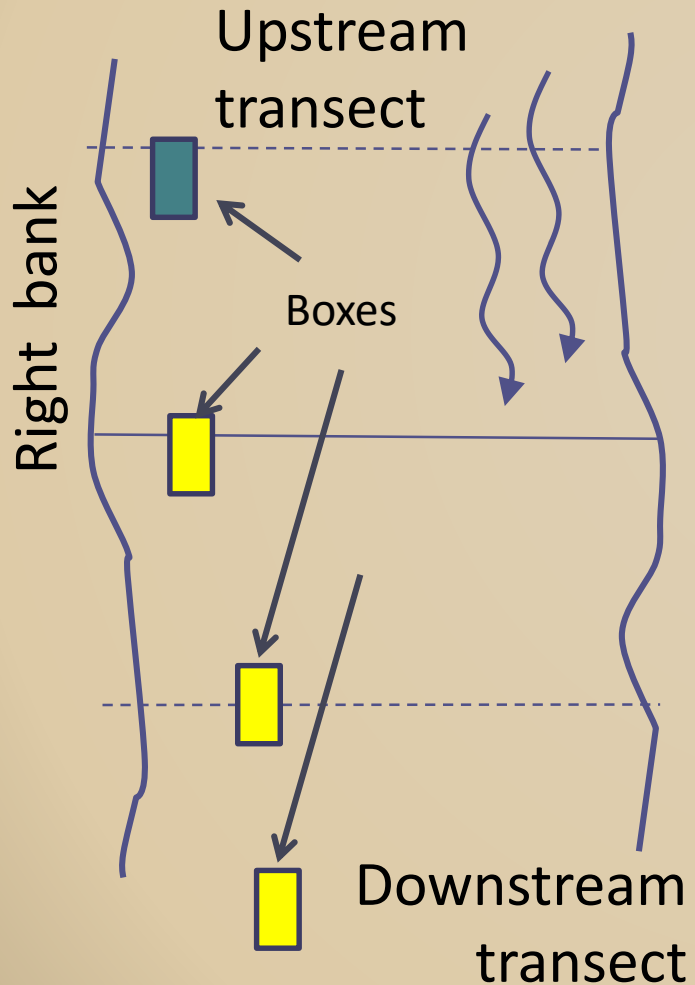
Average Rainfall Amount (mm) and Rainy Days

Zoom 1m 3m **6m** YTD 1y All **2016**





# Methodology



# First Round







Score:  
Yunes 1 Team 0



# Second Round



Score: Yunes 1 | Team 0



# Methodology Revised





# Third Round



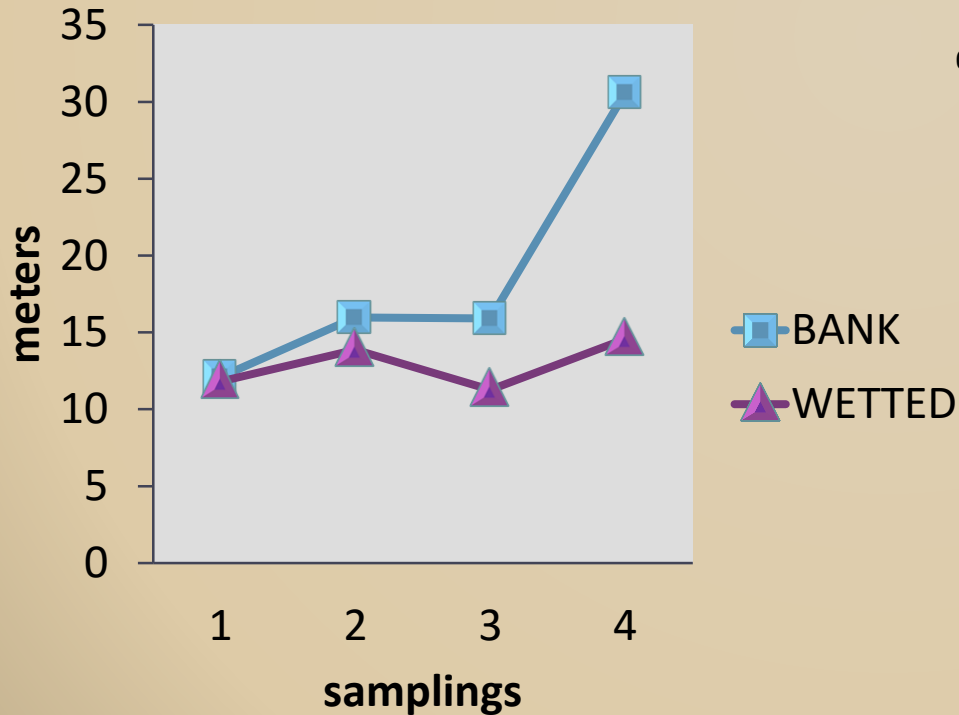
We are  
standing!

Score:  
Yunes 0  
Team 1

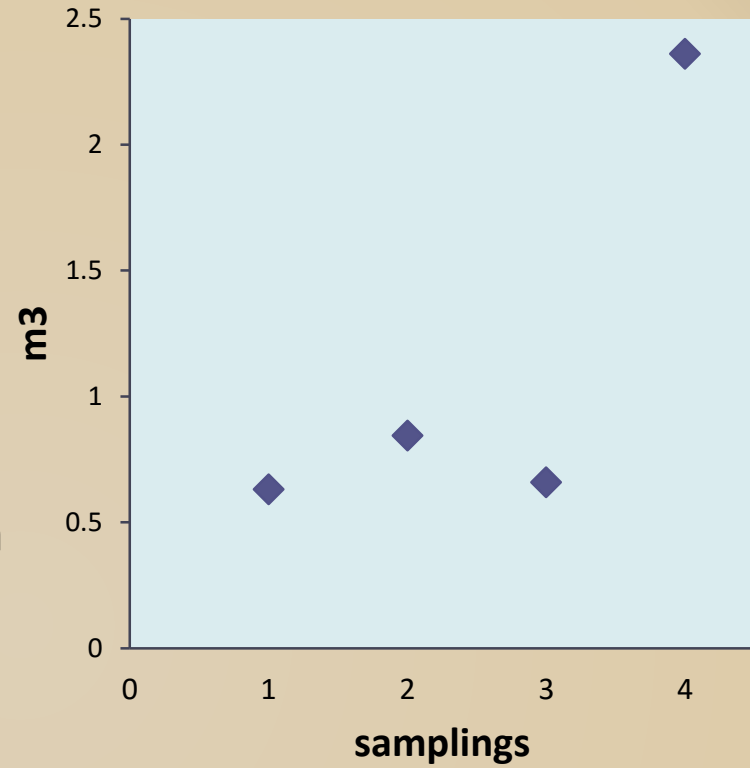


# Results

## Bank full width and wetted width

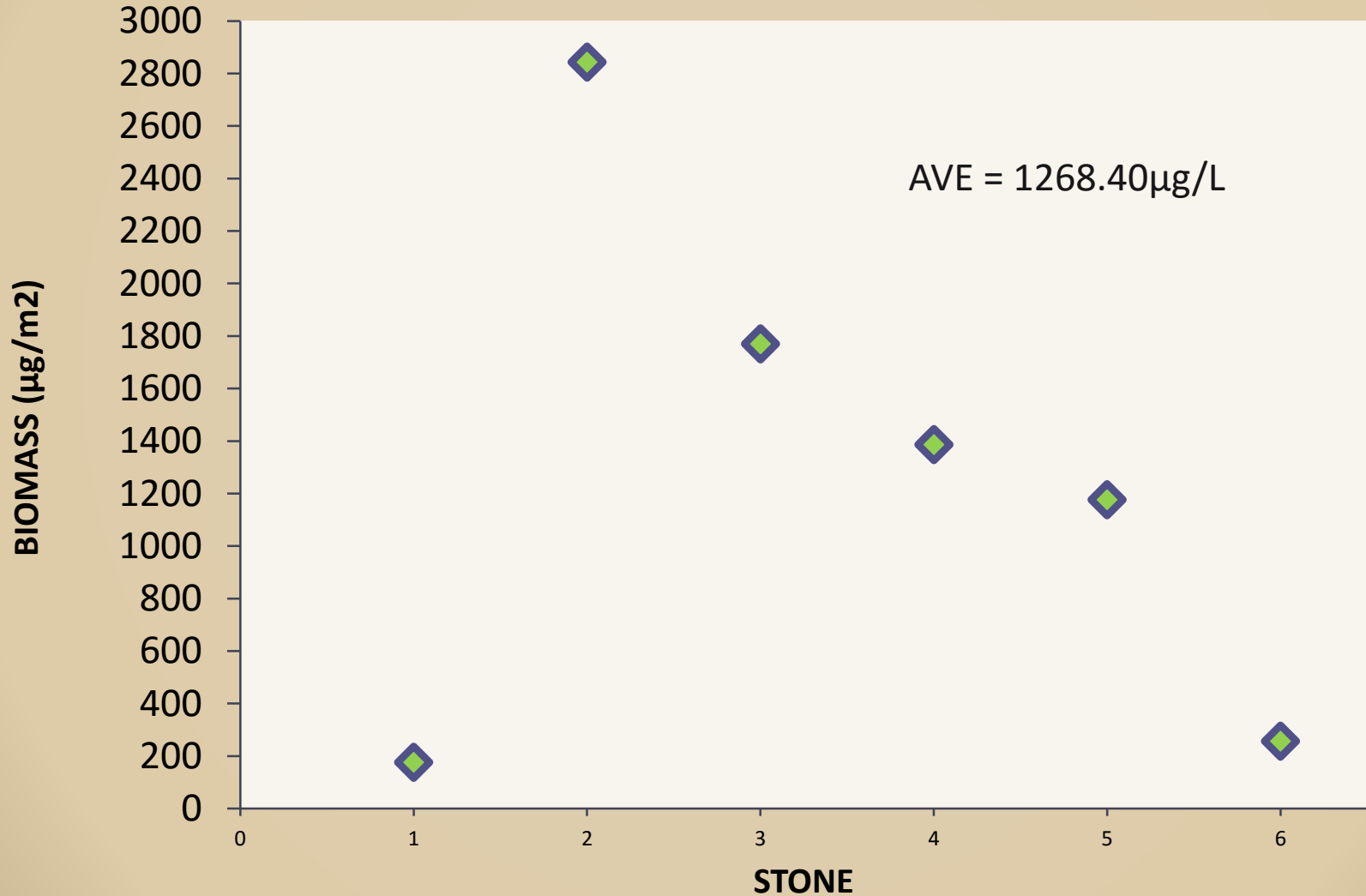


## Discharge by sampling



# Biomass results

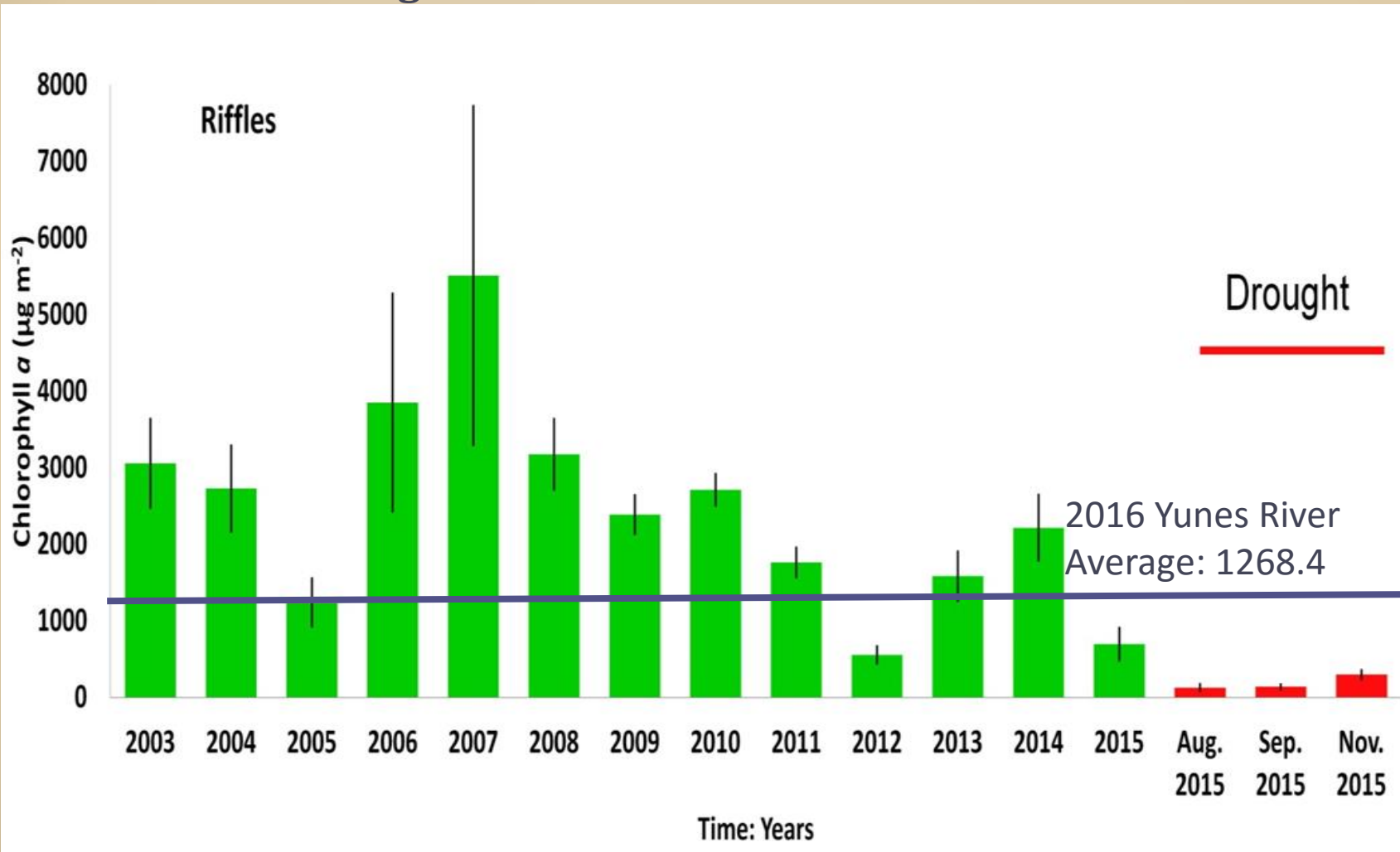
Concentrations of chlorophyll *a* in Yunes River - November 2016





# A comparison with a stream at El Yunque Rain Forest

Drastic changes in the concentrations of chlorophyll a previous and during the drought were observed in riffles micro-habitats



Omar Pérez-Reyes<sup>1</sup>, Todd A. Crowl<sup>2</sup>, Alan P. Covich<sup>3</sup>, Alonso Ramirez<sup>1</sup> & William McDowell<sup>4</sup>

# Conclusions

- In flashy rivers nutrient parameters may be optimal for algae growth, but changes in discharges reduce algae growth.
- The original methodology used was not appropriate.
- The initial data bank was established to compare periphyton growth with the dry season 2017.



*Ready for next round!*



*Thanks for your attention.*



# References

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<https://www.worldweatheronline.com/v2/weather-averages.aspx?q=00638>
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- EPA 600/R-06/126 October 2006 [www.epa.gov](http://www.epa.gov). Field Operations Manual for Assessing the Hydrologic Permanence and Ecological Condition of Headwater Streams.
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# JPL ELLIOT'S TEAM

