



# A Climatic Outlook of the Raritan River

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## Results

### Basin Rainfall Averages

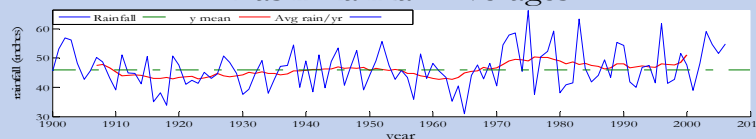


Fig 2- Average rainfall in the Raritan River Basin over the past 108 years shows that major storms occurred in the mid 1970's .

### Atlantic Multidecadal Oscillation

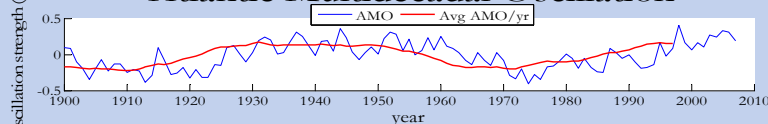


Fig. 3- The Atlantic Multidecadal Oscillation changes between negative and positive phases approximately every twenty to thirty years

### Dissolved Oxygen vs. Rainfall

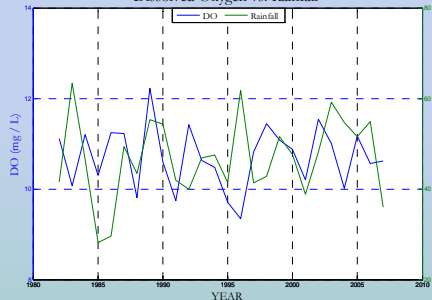


Fig. 4- DO in the Raritan River generally increased with rainfall

### pH vs. Rainfall

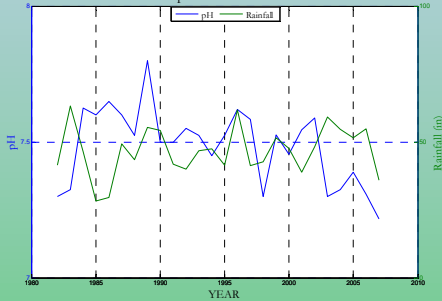


Fig. 5- pH increased during years with large storms

### Temperature vs. Rainfall

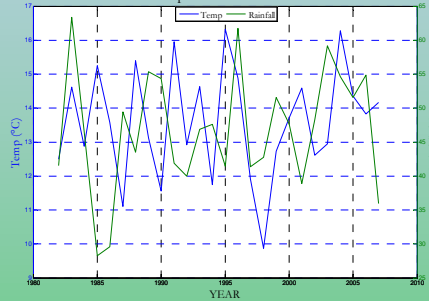


Fig. 6- Water temperature is generally opposite of rainfall

## Results Cont'd

### Main Results:

- The year with the highest average rainfall (1975) occurred during negative AMO

- DO and pH generally followed the same pattern as rainfall

### Additional Results:

- After an abnormally rainy June (2009), saltwater was unable to force its way upstream for several weeks

- DO was high throughout the water column after extended rainfall

- Discovered deep hole downstream called the “Devil’s Lair”

## Conclusions

- The rainfall data and the AMO show no clear relationship at this point

- The Raritan River takes a few weeks to return to its normal state after extended rainfall

## Acknowledgments

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### Top 6 Major Rainfall Events

Highest avg. rainfall	Hurricane David	High Rain Year	Nor'easter	Hurricane Floyd	Hurricane Jeanne
1975	1979	1983	1996	1999	2004

## Introduction

The Raritan River is an estuary located in central New Jersey. It is the largest river in New Jersey that is entirely in the state; however, it is perhaps the least studied river in the state and one of the most polluted rivers in the U.S. Few studies have investigated any aspect of the river. This study explores the water quality of the river and its response to different climatic events.

## Purpose

- To analyze historical water quality and precipitation data from the Raritan River.

- To determine the response of the river to high rainfall events (both historical and recent).

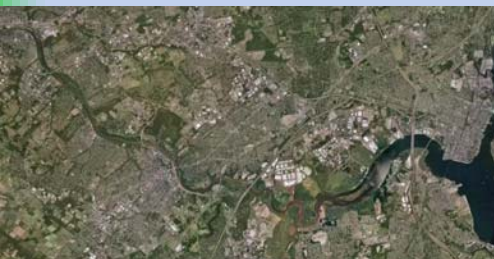


Fig. 1- Satellite image of the Raritan River



CTD with YSI attached to metal frame

## Materials & Methods

- A CTD was used to collect vertical profiles of salinity and nitrate

- A YSI was used to collect vertical profiles of DO, pH, and temperature

- All historic data was analyzed using MATLAB