Diatoms as Proxies for Abrupt Events in the Hudson River Estuary

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The Hudson River estuary has been subject to many abrupt events throughout its history including hurricanes, droughts and pluvials. In order to document these events, we use sedimentary and biological proxies to look back into the past further than modern instrumental records can observe. Proxies are ways of using observed physical characteristics (e.g. magnetic susceptibility) or biological assemblages (e.g. diatom and foraminiferal assemblages) as tools to reconstruct past conditions. Using a sediment core taken in the Hudson River (CDO2-29A), around 63rd street in New York City, drought and pluvial layers were selected based on Cs dating and hurricane layers based on occurrences of tropical to subtropical foraminifera. After observing at least one sample from each event, cosmopolitan, hurricane and drought assemblages have begun to be recognized (Table 1). Tropical foraminifera dominated by *Globigerinoides ruber* pink were also found in a known hurricane layer that we infer was deposited during Hurricane Belle in 1976.[1] More work must be done in order to fully catalog and understand which species are truly indicative of these events. Characterizing these layers of interest help to establish more effective proxies, which in turn allow for a better understanding of the intensity and frequency of storm and drought events in the past. Diatom abundance analyses and more SEM pictures and cataloging will provide further insight into how these proxies can be fully understood.

Table 1.

Genera and Species	**Environment**	**Clarification**
Cyclotella caspia	Planktonic, marine-brackish	Cosmopolitan
Karayevia clevei	Freshwater	Cosmopolitan
Melosira sp	Planktonic, marine	Cosmopolitan
Thalassiosira sp	Marine, brackish	Cosmopolitan
Staurosirella leptostauron	Benthic, freshwater	Typical rainfall
Actinoptychus senarius	Planktonic or benthic, freshwater to brackish	Both hurricane and pluvial layers
Amphora aff. Sp	Benthic, marine or freshwater	Hurricane layers only
Nitzschia sp	Benthic, marine or freshwater	Hurricane layers only
Surirella sp	Marine-brackish	Drought layer only
Triceratium sp	Marine	Drought layer only
Other Genera and species	**Environment**	**Clarification**
Globigerinoides ruber pink	Tropical	Hurricane layers only
Silicoflagellate sp	Planktonic, marine	Hurricane layers only