Diatoms in Russell Bank 19B

- Fluctuations in salinity have occurred during the last 150 years.
- Periods of high salinity did occur prior to 1940.
- Diatom assemblages underwent significant changes around 1940.
- For 1820-1859, the diatom assemblage is different from 1860-1940 assemblages.
- Diatom indicators show significant changes in salinity after approximately 1972.

Relevance to Restoration Efforts:

- Debate over natural versus human-induced changes in the South Florida Ecosystem continues, even as restoration begins. It is critical that these questions be answered, because it is neither economically feasible nor realistic to attempt to "fix" changes due to natural causes.

- Our data present compelling evidence of historical changes in Florida Bay, due to both human-induced and natural causes. Natural systems operate on the scale of decades, centuries and millennia. To focus on the component of change due to human activity.

Conclusions:
- Salinity has fluctuated naturally over time, and periods of higher salinity occurred prior to significant human alteration of the environment.
- Beginning around 1900, stable isotopic ratios and biotic data show a shift toward higher salinities.
- Stable isotopes indicate increased evaporation, increased residence time, and decreased circulation.
- Around 1940, a clearly different pattern emerges of increased frequency and amplitude of fluctuation based on the biotic indicators.

Patterns of Change at Russell Bank

- Shifting occurs in stable isotopes between 1949 and 1960.
- Increased salinity reflecting increased evaporation.
- Increased significantly between 1960 and 1984, which reflects increased circulation and/or increased residence time.

Diatom indicators show significant changes after approximately 1972.