

## Greenhouse Phase Implications To Non-Indigenous Marine Life: Migrations In The New York Bight And Hudson River

Epstein, S.,<sup>1</sup> Epstein, P., and Sassen R.  
Geoval Consultants LLC, Sassen Geocatalysts

[Epstein.samuel58@gmail.com](mailto:Epstein.samuel58@gmail.com)

Over the past 60 years' modern sedimentary depositional environments have been extensively studied in order to interpret the ancient rock record. Conversely, ancient reconstructed paleo-environments are studied in respect to climate in order to help model current and future climate changes.

In 2006 the authors published a paper (2006) on the observance of a spot-fin butterfly fish indigenous to Florida and Caribbean situated in the N.Y. Bight shallow shelf of Rockaway Beach, Queens. The spot-fin was part of eddies offshoots from the Gulf Stream, 150 miles to the east

Over the past 7 years a noticeable migration of warm water non-indigenous animal life is occurring in the same Queens waters, including spinner and reef sharks, turtles, pods of dolphins, humpback whales (spotting went from 5 to 250 per season). Additionally, the spot-fin butterfly fish now occurs further inland in Jamaica Bay, between the Rockaway Peninsula and the open Atlantic Ocean. The migration of marine animal life can be primarily attributed to New York State banning the harvesting of Menhaden, an oil rich bait fish 13 inches long. Large bait balls occur in the NY harbor well as large schools off Rockaway Beach. Additional factors may include over a 25-year period (1973-1998) increase in dissolved oxygen and the reduction of coliform bacteria in the lower Hudson River estuary, New York Harbor. Phytoplankton and zooplankton are primary food for the Menhaden for the large predatory marine life and birds.

An Identified threat to the marine and bird life of Rockaway Beach and further to the east on Southern Long Island (Long Beach, Atlantic Beach etc.), is the occurrence of a significant dumpsite 12 miles from the Rockaway Beach and 6 miles from Sandy Hook New Jersey. High levels of total organic carbon, various organic compounds hydrocarbon derived along with low pH and high Eh levels, along with hydrogen sulfide, suggest an oxygen reducing environment. Recent sub-bottom photographs over 4 years (1998-2002) suggest repopulation of epifauna and benthonic fauna.

Sub-bottom floatation studies along with shear velocity lift capabilities suggest the dump site located in 20 m of water is within an area of high probability (80%) of resuspension during storms, and offer a threat to the shallow waters and coastal beaches.

The predicted temperature increase to 2100 of 4 degrees (f) may alter the annual summer-winter thermocline positioning of upwelling cycles.

The effects of the resuspension of the chemical and organic waste would probably effect the animal life for a relative short duration due to the efficient annual cool pool circulation patterns on the shelf.

Crocodylians genus demonstrate maximum numbers during the Triassic, Late Cretaceous, Miocene, and Eocene. The question remains are we approaching a cycle maximum in biodiversity (Genera) during the Phanerozoic preceding a major (5 in past), or minor (5 in past) extinction event.