

**Patten B C.** Species diversity in net phytoplankton of Raritan Bay.

*J. Mar. Res.* 20:57-75, 1962.

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This paper described an annual net phytoplankton cycle in Raritan Bay, New York-New Jersey, using entropy-related diversity indices. Mean diversity increased seaward and correlated with reduced pollution, and spatial diversity patterns corresponded with water mass movements. A niche theory of diversity changes in succession was formulated. [The SCJ<sup>®</sup> indicates that this paper has been cited in over 110 publications since 1962.]

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December 12, 1984

I almost never look at my old papers. I got around to reading this one in preparation for these remarks between flights at JFK airport. I realized as I read that I would shortly be flying over Raritan Bay, and I resolved to jot down some impressions and then write this en route home.

The paper is from my Rutgers PhD dissertation. My mentor was Edwin T. Moul, a superb algalogist and bryologist in the taxonomy-natural history tradition who tolerated a student who wanted to know about ecosystems. He and Murray F. Buell, also influential during both my stints at Rutgers (1952-1954 and 1957-1959), were, in their natural-history excellence, more "systems ecologists" than they would ever care to be typed. They taught me initially about ecosystems. The dissertation paper was my first effort to discover systems organization in a real community.

Why has the paper been so often cited? I'm not sure. First, there was then (as now, at another level) a growing ecological interest in systems ideas. The paper used diversity measures as system variables, and explained mathematical diversity indices relatively clearly and with examples that may have had some heuristic appeal. The results were also interesting. Spatial diversity patterns correlated well with general characteristics of water mass circulation and distribution of pollutants and enrichment. The niche-based formulation of succession made some sense.

Raritan Bay was an ebony splendor tonight, its familiar outline etched in dark contrast against the dazzling luminary display of the New York winter megalopolis. I knew it was cold down there, from

when we used to be there. The "we" refers to H. Perry Jeffries (University of Rhode Island). We did our doctoral studies together—the zooplankton, and I phytoplankton. People who know me might find this unlikely, but it's true: Perry was the spark-plug of our collaboration, its heart and soul. I could look down into the cold black hole of the Raritan tonight and remember the dawn to dark January days with him making stations in a frigid, ice-encrusted, small boat that for me defined "cold." I might have quit, but not Perry. Here I am a third of a lifetime away looking down and knowing the diatoms are there in the blackness, dominating the winter waters—*Nitzschia*, *Leptocylindricus*, *Asterionella*, *Thalassionema*, *Guinardia*. And when spring comes, *Skeletonema* will bloom.

I have to tell this postscript to my dissertation work. In the summer of 1959, after we'd completed our dissertations, Perry and I wanted to make some productivity measurements. We spent the week before July Fourth corraling material and constructing elaborate floating rigs from which dark and light bottles were to be suspended. We tested them in their flag-bedecked glory over the weekend of the Fourth; every one of them fell prey to the legendary New York vandalism. That was my first hard lesson in "small and simple are good" in field ecology. This dictum translated a few days later into low-profile floats that, if they were approached, would deter aggression with a prominent radioactivity emblem and stern warning about the "radiation" experiments in progress (they were, of course, solar). Ten experiments, and the study plan, were completed without a mishap or even a missing data point. With a week or so remaining before I was to report for my first job in Virginia, however, I decided to go for 11. One Saturday night, I got a phone call—something about a Coast Guard cutter, men in the hospital, mayhem. One of my stations included tying the experiment to a navigation buoy—an illegal act. The Coast Guard came upon the scene around midnight, hauled the experiment on deck, and saw the radioactivity symbol entangled in the heap of eerie black and white bottles and lines. Twenty-three men (a number I remember well, but can't attest to its accuracy) spent several days in a Staten Island hospital before it all got sorted out. I slinked out of Rutgers and was greeted a week later at my new job with a letter from the university president. You will have to imagine its content, because I long ago blotted it from memory. The data set in question was published,<sup>1</sup> as it turned out before this *Citation Classic* paper. I should have quit while I was ahead, but I didn't know then that I was.

1. Patten B C. Plankton energetics of Raritan Bay. *Limnol. Oceanogr.* 6:369-87, 1961.