

## **Shallow Seas and Shifting-Baselines: A Glimpse of the Florida Keys Undersea History**

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Shifting baselines describes a phenomenon where successive generations, based on their personal worldview, accept a progressively degraded environment as the new normal, leading to a gradual lowering of expectations for the natural world. So, it is instructive to occasionally peer back in time to see how the natural world once was especially if, through preservation or restoration, we are to envision a realistic future. The Florida Keys formed and morphed over the past 125,000 years. Indigenous peoples first immigrated to the Keys from the mainland a few thousand years ago, followed by colonization by Bahamians and New Englanders in the early 1800's who furthered exploitation of the marine environment with predictable declines in coastal megafauna: seals, sea turtles, manatees, and large fishes. More profound changes ensued at the turn of the 20<sup>th</sup> century with the construction of the Overseas Railway and the draining of the Everglades. Following World War II, commercial fishing shifted from sponges decimated by disease and devalued by the invention of plastics to large-scale fisheries for shrimp, lobsters, crabs, and fishes. Protected zones and fishery management measures were still few, so the ecologies of those species were gradually transformed by over-exploitation. The region's coral reefs largely resisted change despite abuse by avaricious or ignorant users, whose impacts were largely localized but foretold a growing danger. It was the start of the Keys being "loved to death". From 1950 – 1970, the population of the Keys tripled and by 1970 tourism dominated the economy. Within the next decade (1975-1985) the marine ecosystem began to teeter-todder. Coral diseases erupted, pulling down the Acroporid skyscrapers of the reef. Released from grazing, reef macroalgae proliferated with the disappearance of *Diadema*, also from disease. Climate change was formally recognized in 1988, coinciding with another tilt in the stability of the Keys marine ecosystem. Episodic, massive die-offs of seagrasses and sponges along with blooms of cyanobacteria swept through Florida Bay with dire implications for the region's water quality and ecosystem resilience. Crises prompt attention, so funds and researchers poured into the region along with the establishment of the Florida Keys National Marine Sanctuary (1990), the Aquarius Reef Base (1993), and the Everglades Comprehensive Restoration Plan (2000). Still, marine ecosystems are collapsing. Coral loss continues its downward trajectory – corals are >90% fewer than in 1970. Coastal fishes spin to their death from disease. Florida Bay is now largely devoid of sponges and octocorals due to persistent algal blooms and rising temperatures. We now embark on the restoration of this ailing ecosystem against the backdrop of an unabated change in climate. Perhaps an appreciation of the history of the region's shifting marine environment will help inform our decisions about its future.