

ECOLOGY OF PELAGIC *SARGASSUM* BLOOMS AND THEIR EMERGING IMPACTS ON SOUTH FLORIDA'S COASTAL ZONE

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Since 2011, unprecedented coastal strandings of the pelagic seaweed *Sargassum* have occurred over broad areas of the North Atlantic basin, Caribbean Sea and South Florida. These strandings, characterized by excessive biomass, are harmful because of their growing impacts on both the environment (fish kills, dead zones, toxic H₂S) and the tourist-based economies of affected areas. We used long-term *Sargassum* tissue C:N:P data from offshore the Florida Keys, satellite imagery, numerical models, and field measurements to assess changes in the ecology and oceanography of these blooms. Comparison of *Sargassum* C:N:P data in the Straits of Florida from 1983-1989 and 2010-2018 showed significant increases in %N and the N:P ratio, indicating increasing P-limitation of growth. A 19-year record of observations from MODIS satellite imagery revealed the recent development of a Great Atlantic *Sargassum* Belt (GASB) that extends across the tropical Atlantic Ocean. The GASB formed in the spring/summer months between 2011 and 2018. In 2015 and 2018, the GASB showed the highest coverage, extending > 8,850 km from west Africa across the tropical Atlantic Ocean and through the Caribbean Sea to the Gulf of Mexico. Since 2015, mass strandings of *Sargassum* have increasingly impacted South Florida's coastlines, and in 2018 co-occurred with an extensive red tide (*Karenia brevis*). Considering that these *Sargassum* blooms likely represent the new normal, local governments are now challenged with developing mitigation and management programs.

PRESENTER BIO: Dr. Lapointe is a Research Professor with four decades of research experience in nutrient enrichment, harmful algal blooms, and coastal eutrophication in Florida and the Caribbean. His work focuses on phytoplankton and macroalgae blooms in seagrass and coral reef ecosystems, as well as identifying land-based nutrient sources supporting blooms.