Warming waters and hurricane-driven inputs influence primary production and respiration rates in both *Karenia brevis* and phytoplankton communities on the West Florida Shelf

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The ongoing ocean warming and expansion of hypoxia conditions in the Gulf of Mexico, combined with increasing riverine inputs of dissolved organic matter (DOM) into coastal areas due to hurricanes and storms can greatly impact primary production and respiration rates in phytoplankton communities. While recent studies have reported the presence of hypoxia during large *Karenia brevis* blooms, many questions remain regarding how the respiration rates of this species can influence hypoxia conditions. Here, we investigated the effects of temperature and humic acid enrichment on Gross Primary Production (GPP), Net Primary Production (NPP), and Gross Respiration (GR) in samples collected from Florida waters post-Hurricanes Helene and Milton during an ongoing *Karenia brevis* bloom. Primary production and respiration rates were measured using a new, rapid $H_2{}^{18}O$ enrichment technique with Membrane Inlet Mass Spectrometry (MIMS) and the characterization of DOM composition was identified using Spectrofluorometric analysis. Our results show that increasing temperature led to a decline in GPP and NPP, while GR increased and often exceeded GPP rates. Humic acid additions slightly enhanced NPP and reduced GR. Temperature increases also drove compositional changes in DOM. Terrestrial humic declined concomitant with increases in proteinaceous DOM in the *K. brevis* bloom

sample, suggesting selective uptake or degradation by *K. brevis*. These findings highlight how warming and hurricane-driven DOM inputs can influence the rates of primary production and respiration on the West Florida Shelf, with implications for hypoxia development. Understanding these interactions is critical as extreme events become more frequent under climate change.

Palabras Clave

(1) Hypoxia, (2) Hurricane-driven DOM, (3) Karenia brevis.