

**Retention and Growth of Pelagic *Sargassum* in the North Equatorial Convergence Region of the Atlantic Ocean: A Hypothesis for Examining Recent Mass Strandings of Pelagic *Sargassum* Along Caribbean and West Africa Shorelines**

**Retención y Crecimiento del *Sargazo* Pelágico en la Zona de Convergencia Norecuatorial del Océano Atlántico: Una Hipótesis para Examinar Recientes Masas de *Sargazo* Retenido a lo Largo del Caribe y la Costa Occidental de África**

**Rétention et Croissance des *Sargasses* Pélagiques au Nord de la Zone de Convergence Inter-tropicale : Une Hypothèse pour l'Étude des Échouages en Masse de *Sargasses* le Long des Côtes des Caraïbes et de l'Afrique de l'Ouest**

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**EXTENDED ABSTRACT**

In the spring and summer of 2011, unprecedented quantities of pelagic *Sargassum*, a brown, holopelagic macroalga that serves as habitat for a large and diverse assemblage of marine organisms (Wells and Rooker 2003, Hoffmayer et al. 2005), stranded along Caribbean island coastlines, significantly disrupting local fishing, tourism, and community life. Pelagic *Sargassum* is typically found in low abundance in North Atlantic equatorial regions and the Caribbean and is rare in the South Atlantic. During the 2011 Gulf and Caribbean Fisheries Institute, we discussed probable ocean current mechanisms that transported masses of the alga into the Eastern Caribbean (Franks et al. 2011). Based on our back-tracings of *Sargassum* drift using ocean models, we speculated that such masses originated from the equatorial region of the Atlantic Ocean where the alga likely flourished as a result of nutrient input from a variety of sources.

Our present investigations into the unique 2011 event include examination of the effects of an unusually strong North Equatorial Counter Current (NECC), coupled with an unusually strong Inter-tropical Convergence Zone (ITCZ) event in 2010, that we speculate deflected large quantities of pelagic *Sargassum* into the NERR between the equator and the NECC where nutrients and rising sea surface temperature amplified *Sargassum* growth before being transported into the Caribbean in 2011 by regional ocean currents. We suggest that stronger than normal ocean currents and higher sea surface temperatures can be expected as the earth warms, likely enhancing retention of pelagic *Sargassum* in the NERR and enabling subsequent blooms such as occurred in 2014, an event we are currently investigating.

**LITERATURE CITED**

- Franks, J.S., D.R. Johnson, D.S. Ko, G. Sanchez-Rubio, J.R. Hendon, and M. Lay. 2011. Unprecedented influx of pelagic *Sargassum* along Caribbean Island coastlines during summer 2011. *Proceedings of the Gulf and Caribbean Fisheries Institute* **64**:6-8.
- Hoffmayer, E.R., J.S. Franks, B.H. Comyns, J.R. Hendon, and R.S. Waller. 2005. Larval and juvenile fishes associated with pelagic *Sargassum* in the northcentral Gulf of Mexico. *Proceedings of the Gulf and Caribbean Fisheries Institute* **56**:259-265.
- Wells, R.D. and J.R. Rooker. 2004. Spatial and temporal patterns of habitat use by fishes associated with *Sargassum* mats in the northwestern Gulf of Mexico. *Bulletin of Marine Science* **74**:81-99.