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Andre Archer, Eliza Matt* (ewm1@williams.edu) and **Colin Okasaki**. *Modeling Coral Reef Ecosystems: The Need for Models of Intermediate Complexity*. Preliminary report.

Coral reefs in the Caribbean have been in crisis since the mass die-off of keystone herbivore *Diadema antillarum* in 1983. Since then, reef coverage has declined dramatically, and macroalgae have proliferated to become the dominant occupier of space in many reefs. Though this system has been well studied, there is a need for models of intermediate complexity, that capture a small number of complex interactions and provide insight into the resulting system behavior. To respond to this need, we have constructed several models of Caribbean coral reefs. We focus in particular on parrotfish, whose life-cycle is complex and whose role as grazers of macroalgae is unclear; sea urchins, which are effective grazers but require careful conservation efforts if they are ever to reach their previous population levels; and the importance of spatial information and violations of the mean-field approximation commonly used in reef modeling.

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