Sponges are dominant members of Caribbean coral reefs that play important ecological and biogeochemical roles. These organisms are prolific filter feeders and hosts to metabolically and taxonomically diverse microbial symbionts. The success of sponges within the Caribbean has historically been linked to their prolific filter-feeding ability, but recent research has suggested that this success may also be linked to their complex associations with microbial symbionts. Using a combination of microbiome, stable isotope, biochemical, and statistical analysis, I am investigating how patterns in sponge microbial symbioses relate to resource use in diverse sponge communities. My talk will focus on my recent work aiming to unravel how patterns in microbial symbioses relate to metabolic strategies and contribute to the success of sponges on coral reefs.