In a rapidly changing world dominated by anthropogenic disturbances and global change, there is a great need to understand the ways through which ecosystem structure and function are being perturbed and their potential trajectories. Projecting how coral reefs will change in the Anthropocene is however quite complex due to several factors including high natural variability of systems, and disturbance regime. Also, current efforts may not be enough to identify the fundamental mechanisms causing changes in ecosystem structure and function. Using field observations, in-situ measurements and mathematical modeling, I will show that to help understand how coral reefs may change in response to environment and anthropogenic stressors, we need to better understand long-term coral demographic processes and in-situ dynamics of ecosystem function.