Fisheries and conservation biologists use bioenergetics models to relate metabolic activity and environmental factors to fish growth. However, the effects of daily fluctuating temperature on fish are not clearly understood. The objectives of this project are (1) to determine if the growth of fish under daily fluctuating temperatures differs from growth at static temperatures, and (2) evaluate the ability of a bioenergetics model to accurately estimate fish growth in both fluctuating and constant temperature environments. In the first portion of the experiment, 48 male Nile tilapia (*Oreochromis niloticus*) were raised in four different temperature treatments: high (30ºC), low (25ºC), average (27.5ºC) and fluctuating (30ºC daytime, 25ºC nighttime). Two tanks per treatment were used and feed rations were equal across all treatments. Although the fish were initially marked, they were no longer distinguishable after the 61-day experimental period, causing considerable change in the statistical strength of the results. To produce greater clarity of data, 24 fish were marked using cold branding with liquid nitrogen, and the experiment was extended for an additional 30 days. Results from the first set of data suggest that there is no statistically significant difference in growth caused by exposure to varying water temperatures. However, fish behavior changed drastically with temperature, indicated by high mortality resulting from harassment in the high temperature treatment. This is an indicator that social interactions and fish maturity need to be considered as well as growth when evaluating the effects of temperature on fish.