Differences of oceanic responses induced by volcanic eruptions under a control climate and a globally warming climate are investigated using an atmosphere-ocean coupled general circulation model MIROC3m. It is known that major volcanic eruptions leave cooling signals in the ocean subsurface layer for a several decades (e.g. Gleckler et al., 2006). We have conducted four experiments: (A) a control experiment under a preindustrial condition, (B) an idealized experiment in which a volcanic forcing are given at the 101st year of the experiment (A), (C) an idealized global warming experiment in which the CO2 concentration is increased 1%/yr, (D) same as (B) but for the global warming experiment (C). After subtracting the global warming trend obtained by (C), a cooling signal of the sea surface temperature (SST) induced by the experiment (D) is almost as long as the signal obtained by (B). However, the signal of the ocean subsurface layer in (D) sustains longer then in (B). In our poster, we will show the details of the results obtained by the four experiments and discuss the reasons why the oceanic responses to the volcanic forcing are different between in a control climate and in a warming climate.