Methods

1. Use Basemap to visualize the (1) bleaching level, (2) Sea surface temperature, (3) fishing hours, (4) marine protected area throughout the world.
2. Hypothesis test (Mann Whitney U test, and t test)
3. Linear regression

Results:

1. Southeastern Asia and Southeastern North America have worst bleaching situations throughout the world (figures/statistics folder)
2. Mann Whitney U test shows that there is a significant difference in number of bleaching positions between MPAs and non-MPAs. There are some extremely high number bleaching positions in some MPAs, which indicates that these MPAs are exactly established in response to bleaching. However, for low and middle number conditions, it’s prone to have more bleaching positions in non-MPAs.
3. It’s surprising that though Southeastern Asia and Southeastern North America have worst bleaching situations throughout the world, but the MPA number for Southeastern Asia is 0 (data ends at 2018), and Southeastern North America only has 3 more MPA during 2008 ~ 2018.
4. Linear regression between bleaching level and fishing activity in Southeastern Asia and Southeastern North America. We find a significant positive correlation in Asia in early years (2012-2016), but since 2017, though fishing activities still increase, bleaching level in Southeastern Asia drops dramatically.