

A Rising Tide

We model the effects of the melting north polar ice cap due to the rise in global temperature by first examining the rise in sea level. In order to accurately model the rise in sea level we perform regression analysis on data from over 60 NOAA monitoring stations on the American Eastern Seaboard from 1988 to 2008. Using this data we then look to model erosion on the coast of Florida using Bruun's Rule to determine the amount of shoreline recession over a fifty year period. Particular attention is given to large metropolitan areas, such as Tampa, Jacksonville, and Fort Lauderdale, and the effect that the rising sea level will have on these urban environments.

By using our regression equation to model the change in sea level over the next fifty years, we predict that the ocean levels will rise approximately 10 millimeters per decade, which will have a significant impact on the nearby land. Also, by modeling the erosion levels on the coast of Florida over the next fifty years, we see that approximately 55 millimeters of beach will erode every decade. This would have a damaging effect on communities that reside close to the water.

There are several ways in which the erosion and rise in sea level can be slowed. Using external barriers, such as offshore concrete obstructions, is one way that communities can prevent homes and businesses from being reclaimed by the sea. Another less favorable way to handle rising sea levels is to simply allow the beach to migrate inland. However, this option is not desirable by those whose homes and businesses would be affected. The best option is to simply stop development of coastal zones and allow the coast to adapt and evolve at a similar pace as the rising sea level. While this is not the most ideal solution from an economists' perspective, it is advantageous considering the loss of land that will occur if nothing is currently done.