

## Why is Sea Level Rising?

From Scenic Hudson: <https://www.scenicudson.org/our-work/climate/sea-level-rise/>

Around the globe and along the Hudson River, sea level is rising due to global warming, which is in turn primarily a result of emissions from the burning of fossil fuels and other human activities.

The ongoing warming of the planet is driving sea level rise in several key ways:

- 1. Thermal Expansion:** Very simply, as water is heated it expands. Global warming has warmed the world's oceans and so they have expanded, accounting for about half of the globally observed sea level rise over the last century.
- 2. Melting of land-based ice:** Glaciers around the world and the massive ice sheets in Antarctica and Greenland are melting faster in summer than winter snows accumulate and replenish them. This imbalance, due to persistently higher temperatures and reduced snowfalls as a result of global warming, is adding huge quantities of water to the world's oceans. In addition, increasing meltwater and warming oceans are speeding up and weakening the Greenland and Antarctic ice sheets, accelerating their contribution to global sea level rise.
- 3. Weakening of the West Atlantic Gulf Stream:** Changes in the temperature and distribution of saltier and fresher waters in the Atlantic appear to be changing the speed and height of the Gulf Stream current along the eastern seaboard of North America. In turn, this "releases" the current's waters toward the coastline, adding a small but significant amount of height to regional sea levels in the northwest Atlantic. Along the lower part of the Hudson River, a fourth factor is contributing to sea level rise:
- 4. Land Subsidence:** From approximately Kingston southward, the Hudson River Valley itself is slowly subsiding, still reacting to the retreat of ice-age glaciers 10,000-12,000 years ago. This has the effect of raising the relative height of sea level as waterfront areas move downward.