Solving the problem of ‘Sea Level Rise’

Seas are predicted to rise a foot by 2050, regardless of how much global carbon emissions can be reduced. Why is this happening, and what can we do to adapt?

***What is Sea Level Rise?***  
  
Sea level rise is an increase in the level of the world’s oceans due to the effects of global warming. Burning fossil fuels is one of the causes of global warming because it releases carbon dioxide and other heat-trapping gasses into the atmosphere. The oceans then absorb the majority of this heat. As water becomes warmer, it expands. This results in ocean levels rising worldwide.

***Causes:***  
The change in sea levels is linked to three primary factors, all induced by ongoing global climate change:

* **Thermal expansion:**When water heats up, it expands. About half of the sea-level rise over the past 25 years [is attributable to warmer oceans](https://climate.nasa.gov/news/2680/new-study-finds-sea-level-rise-accelerating/) simply occupying more space.
* **Melting glaciers:**Large ice formations such as mountain glaciers naturally melt a bit each summer. In the winter, snows, primarily from [evaporated seawater](https://water.usgs.gov/edu/watercycleevaporation.html), are generally sufficient to balance out the melting. Recently, though, persistently higher temperatures caused by global warming have led to [greater-than-average summer melting](http://environment.nationalgeographic.com/environment/global-warming/big-thaw/) as well as diminished snowfall due to later winters and earlier springs. That creates an imbalance between runoff and ocean evaporation, causing sea levels to rise.
* **Loss of Greenland and Antarctica’s ice sheets:**As with mountain glaciers, increased heat is causing the massive ice sheets that cover Greenland and Antarctica to [melt more quickly](https://www.nationalgeographic.com/environment/article/greeland-ice-melting-four-times-faster-than-thought-raising-sea-level).

***Some Facts & Figures:***

* Sea level has risen 8–9 inches (21–24 centimeters) since 1880.
* In 2020, global sea level set a new record high—91.3 mm (3.6 inches) above 1993 levels.
* The rate of sea level rise is accelerating: it has more than doubled from 0.06 inches (1.4 millimeters) per year throughout most of the twentieth century to 0.14 inches (3.6 millimeters) per year from 2006–2015.
* In many locations along the U.S. coastline, high-tide flooding is now 300% to more than 900% more frequent than it was 50 years ago.
* If we are able to significantly reduce greenhouse gas emissions, U.S. sea level in 2100 is projected to be around 0.6 meters (2 feet) higher on average than it was in 2000.
* On a pathway with high greenhouse gas emissions and rapid ice sheet collapse, models project that average sea level rise for the contiguous United States could be 2.2 meters (7.2 feet) by 2100 and 3.9 meters (13 feet) by 2150.

***Effects:***

When sea levels rise as rapidly as they have been, even a small increase can have [devastating effects on coastal habitats](https://www.epa.gov/cre) farther inland, it can cause destructive erosion, wetland flooding, aquifer and agricultural soil contamination with salt, and lost habitat for fish, birds, and plants.

Higher sea levels are coinciding with [more dangerous hurricanes and typhoons](https://news.nationalgeographic.com/2018/06/hurricanes-cyclones-move-slower-drop-more-rain-climate-change-science/) that move more slowly and drop more rain, contributing to [more powerful storm surges](http://ngm.nationalgeographic.com/2012/09/extreme-weather/miller-text) that can strip away everything in their path. One study found that between 1963 and 2012, almost [half of all deaths from Atlantic hurricanes were caused by storm surges](https://www.nationalgeographic.com/environment/article/news-hurricane-florence-dangerous-threats).

Already, flooding in low-lying coastal areas is [forcing people to migrate](https://www.nationalgeographic.com/environment/article/climate-change-drives-migration-crisis-in-bangladesh-from-dhaka-sundabans) to higher ground, and [millions more are vulnerable](https://news.nationalgeographic.com/2018/03/climate-migrants-report-world-bank-spd/) from flood risk and other climate change effects. The prospect of higher coastal water levels [threatens basic services such as Internet access](https://www.nationalgeographic.com/science/article/news-internet-underwater-sea-level-rise), since much of the underlying communications infrastructure lies in the path of rising seas.

***The Solution –***  
1. Reduce your footprint. Greenhouse gasses are a major contributor to sea level rise. Calculate your “Carbon Footprint” at www.carbonfootprint.com to learn how to reduce the amount of greenhouse gases you produce each day.

2. Protect wetlands. Wetlands act as natural buffers for coastal areas during rainstorms and hurricanes. They absorb precipitation and storm surge waters. Learn about wetland restoration activities in your area and get involved.

3. Let it soak in. Hard surfaces prevent water from permeating into the ground and lead to an increase in runoff and erosion. Use stepping stones for walkways and paver blocks for patios. If you are repaving use permeable pavement which allows water to soak into the ground. Direct rain runoff to rain gardens and barrels.

4. Plant more plants and save trees. Plants clean the air and soak up rain. Reduce paper use to prevent trees from being cut down. Set all computers and printers to double-sided printing and reuse one-sided copies as scrap paper.

5. Reduce your energy use. Reducing your energy usage is good for your wallet and the environment. Turn off your lights and appliances when not in use and replace them with more energy efficient varieties. Unplug your chargers and appliances when possible because many use energy even when turned off. Adjust your thermostat to reduce AC and heat use. over, please

6. Obey “no-wake” zones. Waves produced by motor crafts increase erosion along shore lines. Operate in deeper water and keep an eye out for “fragile area” and “slow no wake” signs.

7. Leave the car at home. Vehicles are a leading source of carbon dioxide production. Reduce the number of cars on the road by carpooling, walking, biking, or using mass transit. When driving, turn your car off if idling for more than 30 seconds. This will conserve fuel, save money, and reduce greenhouse gas emissions.

8. Watch what you’re dune. Dunes and grasses protect inland areas from wind and wave action, thus preserving the shore. Dunes and sod banks are fragile areas, so stay on designated paths to avoid them. Support restoration!

9. Know your flood zone. Knowing your risk for flooding before a storm strikes will help you be much better prepared for high storm surge. Contact your local government or go to www.msc.fema.gov to view your local flood map.

10. Push for a Climate Action Plan. Many cities and states do not have plans to address climate change, which is the primary cause of current sea level rise. Contact your local elected officials and encourage them to take action now