

It's impossible

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Climate change is slowly but steadily cooking the world's oceans

By [Gwynn Guilford](#) | February 4, 2014

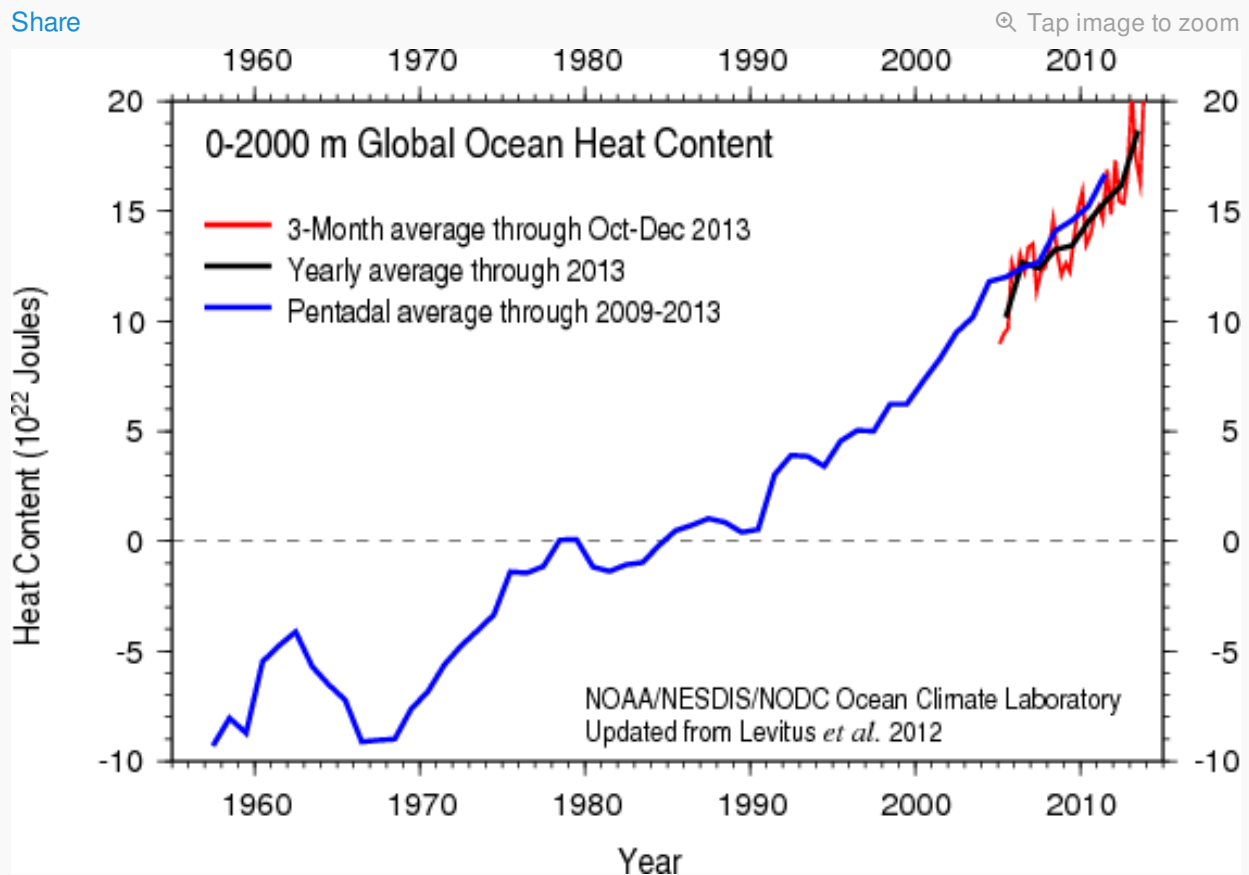


📷 The sea absorbs 90% of global warming. (Reuters/Francois Lenoir)

Because the ocean's so big—it takes up more than 70% of the planet's surface—

it absorbs a lot of energy without anyone being much the wiser. Here's a look at data for the upper 2,000 meters (1.14 miles) of the global ocean. Check out the three-month moving average for the last quarter of 2013, via [the National Oceanographic Data Center](#), which actually goes off the chart:

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(National Oceanographic Data Center (NODC))

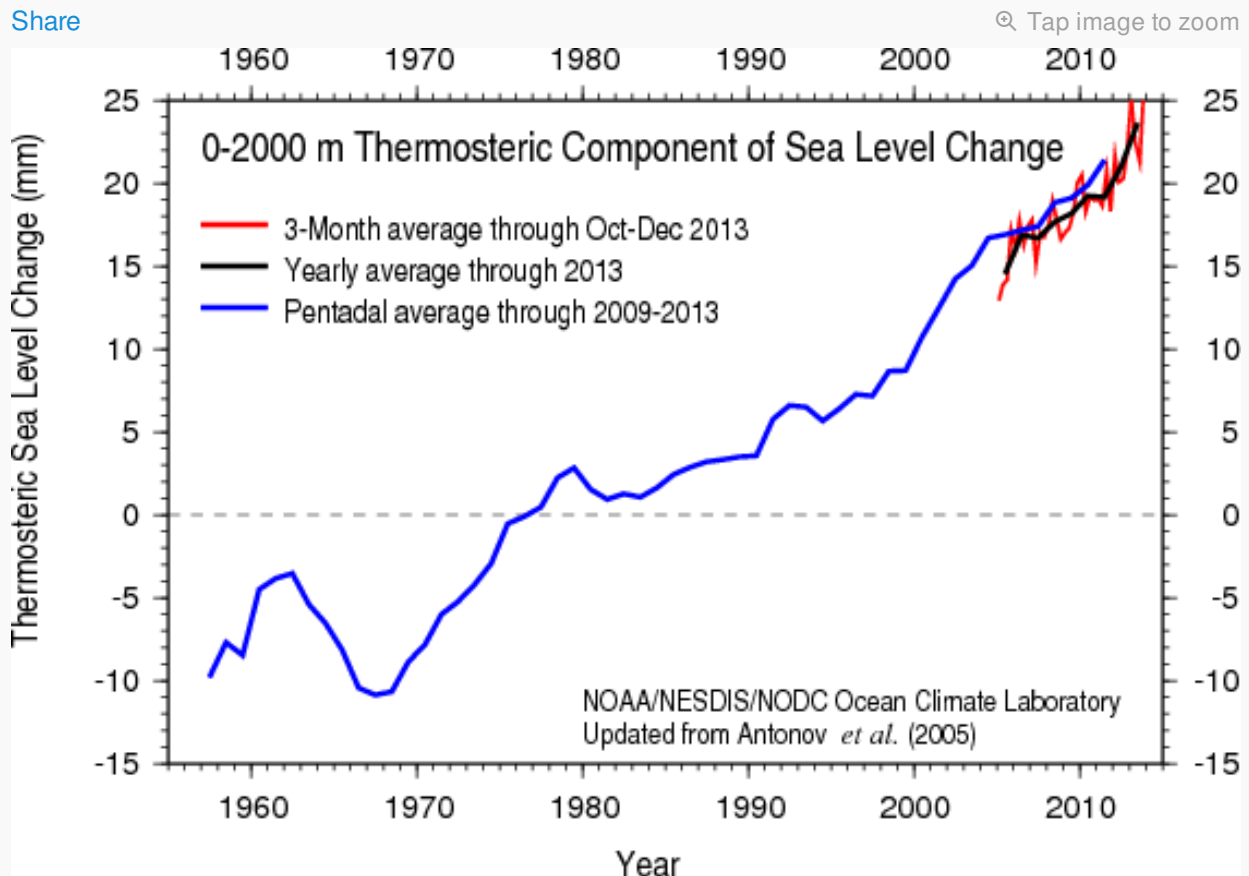
Roughly speaking, from about 1980 to 2000, the ocean gained around 50 zettajoules (ZJ, or 10^{21} joules) of heat. But from 2000 to 2013, it added another 150 ZJs of heat. Of course, even if you knew what a zettajoule is, it's hard to envision what this means. Science Skeptic, a blog on climate change, [offers this useful analogy](#): Over the last half-dozen or so decades, the ocean's been [storing the heat energy equivalent](#) of about two Hiroshima bombs per second. Worryingly, that rate's picking up, with around four bombs per second stored in the last 16 years.

In 2013, however, the ocean gained the heat equivalent to about 12 bombs per second, says Science Skeptic.

That adds up to more than 378 million atomic bombs a year worth of heat. That's troublesome, considering that warmer waters are thought to make [hurricanes and typhoons more severe](#), including [Typhoon Haiyan](#), which [ravaged the Philippines in 2013](#). Warmer waters also cause global sea levels to rise,

threatening property values and exacerbating flooding.

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"Thermosteric" means how much sea surface height changes due to temperature-induced expansion or contraction of ocean volume. (National Oceanographic Data Center (NODC))

The variation in surface temperature is a [big reason people](#) suspect that the earth is getting warmer.

Deep-ocean temperatures are among the more consistent indicators of how our climate is changing. Solar energy transmitted by greenhouse gases doesn't necessarily translate to warmer surface temperatures, which are also influenced by a slew of other factors, including wind and current. In the last decade, around one-third of global warming showed up 700 meters under the sea's surface or deeper, [according to research](#) (pdf) by Magdalena A. Balmaseda, Kevin E. Trenberth and Erland Källén published last year.

So while it's easy to ignore what's going on a mile under the waves, some 378 million Hiroshima bombs worth of heat a year are begging for our attention.

