CLIMATE CHANGE AND THE NUCLEAR POWER RIDDLE

Forty years ago, on April 30, 1977, thousands of protesters converged on Seabrook, N.H., to protest nuclear power generation in the United States. My sympathies were with them.

Their signs read "Split Wood Not Atoms," and "Go Fishing, Not Fission." Led by the Clamshell Alliance, they created a national backlash against nuclear power that tipped government policies toward carbon-based fuels, especially coal-fired electrical plants.

Since then, real clamshells are being challenged by oceans acidified by carbon dioxide pollution. Firewood is split by gasoline-powered splitters, thereby burning and carbonizing the air. Over-fishing, not over-fission, is causing the collapse of global marine ecosystems.

There's no question that solar, wind, hydropower, fuel cells and innovative energy technologies are the best. Nuclear technology has serious problems associated with the proper siting of plants, regulation of fissionable material and the disposal of high-level radioactive waste. But instead of solving these tractable problems, our politicians caved into public hysteria and let nuclear power become the boogeyman, even as thousands work in close proximity to fission-reactors on nuclear-powered submarines. Most notable is President Jimmy Carter, who joined the U.S. Navy's nuclear submarine program in 1952 and is still going strong 65 years later.

Climate change is no boogeyman. Driving that change are electric generation plants fired by coal, petroleum and gas in lieu of carbon-free nuclear ones. The recent glut of inexpensive fracked gas has mothballed nuclear progress.

Luckily, the threat of global sea level rise is far from being a boogeyman. It's so straightforward that it can't be explained away as fake news by a clever press secretary. Nor by an Environmental Protection Agency leader who's reversing national progress in shuttering coal-fired power plants.

Try this simple countertop experiment. Note the temperature in the kitchen. Pour an inch of water into a small bowl and mark the water's edge. Now take a cube of ice from your freezer and put it on a plate draining into the bowl. Watch what happens. The ice melts. The solid turns liquid, drains into the bowl and raises the water level.

This is a model system for today's carbonized world. Terrestrial ice sheets turn to water, which flows to the sea and raises its level.

This brings up my candidate for the scariest real news story this year. It's an uncontested piece of big data published Jan. 20 in Science. A geoscience team at Oregon State University calculated the average temperature of the global ocean during the previous interglaciation (129,000 to 116,000 years ago) based on 104 peer-reviewed paleo-climate studies. They compared this past average temperature to that of our present interglaciation. The average sea surface temperatures for the previous interglaciation were slightly warmer than the period 1870-1899 and indistinguishable from the period 1995-2014.

Now back to the countertop model. The historic sea surface temperature for the 19th century (1870-1899) is analogous to the air inside a freezer whose thermostat is set just below the melting temperature. The modern average sea surface temperature (1995-2014) is analogous to kitchen room temperature. Thus, in the geological near-future, our terrestrial ice sheets will melt and raise sea level to the level of the previous interglacial.
This is the scary part. That previous interglacial sea level at the same temperature was 16 to 27 feet higher than the present shorelines. This is based on a variety of undeniable markers for interglacial shorelines such as elevated beaches and wave-cut cliffs. They cannot be explained away. This is where sea levels are heading.

It's not a matter of if, but when. We've already taken Earth's three largest ice cubes (Greenland, East Antarctic, West Antarctic) out of the freezer. They're melting at rates faster than the politicized international predictions. We can't put them back into the freezer because the excess CO2 in the atmosphere will last for centuries, and because ice-sheet disintegration is an irreversible process. The only thing we can do is wait, watch, retreat and adapt.

I'm still on the fence with respect to nuclear power. But I wish I'd been more careful what I wished for. "Go Fishing, Not Fission" has impoverished the seas and is flooding our shores.