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## Climate reactions vary from frightened to calm

By Rex Springston | TIMES-DISPATCH STAFF WRITER

*Doug Dwoyer is a friendly, smiling man who looks like the late actor Walter Matthau in a good-guy role. But Dwoyer goes around telling scary, depressing stories -- about climate change. "It depresses me, I can tell you that," Dwoyer said the other day at the kitchen table of his home here. In 2007, Dwoyer retired from the NASA Langley Research Center in Hampton, where he was chief operating officer. The space agency offered him a new job -- scouring the scientific literature on climate change and boiling it down into presentations for lay people.*

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In 2007, Dwoyer retired from the NASA Langley Research Center in Hampton, where he was chief operating officer. The space agency offered him a new job -- scouring the scientific literature on climate change and boiling it down into presentations for lay people.

"I'm educating the public on climate change one Rotary [Club] at a time," said Dwoyer, 68. He does the work for free.

An expert in aerodynamics and fluid mechanics with a doctorate from his beloved Virginia Tech, Dwoyer had a basic understanding of climate science. But the deeper he got into it, the more concerned he got.

Humans have been releasing heat-trapping carbon dioxide into the atmosphere for many decades, and that carbon can last hundreds of years.

Even if society ratchets back its carbon emissions -- and there is no sign of that so far -- we have already begun the process of warming the planet and causing sea levels to rise, Dwoyer said.

"Climate change is irreversible. There is no magic solution to this problem. It's not something that just

goes away if we all buy a Prius and screw in some [compact fluorescent] light bulbs."

Barring some major international effort fairly soon to reduce greenhouse gas emissions, this is Dwoyer's vision of the future:

- A good deal of southeastern Virginia would be underwater or subject to frequent flooding because of rising sea levels. "Our most valuable land, which is waterfront property, is that which is most at risk."

One option would be to build a huge dike. Virginia -- indeed, much of the East Coast -- would become like the Netherlands. Then the question becomes how high to build the dike.

The sea level "isn't going to go to 2 meters and stop," Dwoyer said. "It just keeps on trucking."

- Ocean water could become so acidic from absorbing carbon dioxide that it could interfere with the ability of creatures such as crabs and clams to form their shells. "The acidification of the ocean is just frightening to me."

- Permafrost, a layer of frozen soil in cold regions, could melt and release massive amounts of methane gas, which traps heat more efficiently than carbon dioxide. If that happens, Dwoyer said, mankind could lose control of the climate entirely.

- "If you're in middle age, you'll live long enough to see some pretty dramatic things -- lots of Hampton Roads inundated, and in Richmond it's going to be a lot hotter. . . . And you'll have an awful lot of people want to live with you" who are fleeing rising seas and even hotter places.

Patrick J. Michaels, a Virginia climatologist with the libertarian Cato Institute, said it's impossible to predict the future. If the last century is any indication, he said, there will be dramatic changes in the way we produce and consume energy.

"That's why I'm not particularly alarmed by this issue," said Michaels, responding in general and not specifically to Dwoyer.

Dwoyer said adults have a moral obligation to address climate change. That's because people now in their teens or younger could live to the end of this century and suffer the harshest consequences of warming, he said.

"The people who live through the transition [to a warmer world] are going to have really disrupted lives."

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