

## **Understanding and dealing with a changing world**

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It has been an extraordinary year dominated by water and flooding. Precipitation has set new records from Ohio to Vermont. Slow moving weather patterns have favored rain in the northeast but extreme drought in Texas. In addition, evaporation-precipitation feedback has given us extra rain showers on many days. More rain increases the evaporation from the ground and wet leaves and the transpiration from plants. This increases the humidity near the surface. The moist air cools as it rises in thermals from the surface, and the humidity increases until the air becomes saturated and cloud droplets form — this is cloud base. As evaporation puts more water vapor into the air, the cloud base gets lower. And as more water flows up and condenses in clouds, rainfall increases. More rainfall keeps the ground wet, and the cycle continues.

Some days we have seen afternoon thunderstorms popping up everywhere on the weather radar maps. Other days the extra evaporation has simply intensified the bands of rain coming through with warm and cold fronts. Most of the water with tropical storm Irene had evaporated from the ocean, but the stronger evaporation over the wet land increased the rain a little more. And because the soils were already saturated, the very heavy rain just ran off — with catastrophic flooding as a result.

Day after day in the first week of October, we experienced very low clouds and fog in the early morning. Some days a steady drizzle fell, reminding me of the moorlands of England where I grew up. Then high pressure moved in as the weather pattern shifted very slowly to the east, giving us a warm glorious week with temperatures reaching the seventies.

I am still waiting for the first frost on my vegetable garden. The weather has been either too warm — or too wet and cloudy. I am grateful to still have basil and some tomatoes. My last spring frost was on April 20, so my growing season between frosts has set a new record of over 180 days. Everything is connected, and the global climate is changing. Further north in the Arctic, the melting sea ice almost set a new record last month.

When I give talks on climate change, a few listeners get angry when they realize we are endangering the well-being of the Earth and of our children and grandchildren. Some people feel overwhelmed and react with despair, because the challenge seems so great and our political systems so paralyzed. Others resonate with the fact that I am speaking from a position of hope, as I map out what is happening to the Earth and to Vermont. Sometimes a person will look up from their despair and ask with burning clarity, “Why are you so hopeful?”

This is a much deeper question than understanding and responding to climate change. For us as human beings, hope opens doors to possibilities that expand our vision and deepen our sense of communion. But despair closes us off from the real world of possibilities into a dark and isolated world.

Imagine the hope and joy of a summer sunrise immersed in the dawn chorus. Hope opens doors and frees us to be creative and joyfully work with each other and with the Earth as things change around us.

Climate change presents humanity with many difficult choices. If we first recognize the truth and choose hope over despair, we are freeing ourselves to work together and meet the challenges facing us.

*NOAA precipitation maps:* <http://www.ncdc.noaa.gov/temp-and-precip/maps.php>