

Statesman

Halter: Global warming fatal to Earth's trees

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Earth's forests are breathtaking. In fact, trees are effectively the greatest CO₂ warehouses to have ever evolved on Earth. For every metric ton of wood created, 1.5 metric tons of CO₂ is absorbed and 1 metric ton of oxygen is released.

Frighteningly, Earth's forests are dying from a warming world. The delegates from almost 200 countries who recently attended the Doha climate talks did not acknowledge the dying forests nor did they acknowledge what nature is unequivocally showing atmospheric, biologic and oceanic scientists.

Recently researchers once again sent an SOS call to denizens of Earth — drought conditions are placing deadly water-stress on forests around the globe. Moreover, Earth's forests and myriad 'ecosystem services' that they provide all life — are approaching an irreversible tipping point.

In 2009 the International Union of Forest Research Organizations came to a very bleak conclusion: "The carbon storing capacity of Earth's forests could be lost entirely if the planet heats up 4.5 F above pre-industrial levels." So far, we have increased by about 2 F, which means we are already well on our way toward this fateful threshold. The result of crossing it would be an uninhabitable world.

Rising greenhouse gases are also wreaking havoc in the tropical forests, more specifically in the Ferrari of jungles — the Amazon. The heart of the Amazon has not evolved to contend with fierce winds, nor with drought. In 2005 a vicious combination of climate disruption occurred across a 733,600 square miles of land. In January, an intense thunderstorm, spanning 62 by 124 miles, ripped through the whole Amazon Basin. On its path, the storm leveled between 441 million and 663 million trees — or the equivalent of 23 percent of the estimated mean annual carbon accumulation capacity of the Amazon forest.

Later in 2005 a “one-in-100 year” drought occurred. Not only did the Amazon fail to absorb 1.5 billion metric tons of CO₂ that year, but also over the next decade it’s releasing approximately 5 billion metric tons of CO₂ from decomposing trees. If that isn’t alarming enough, another mega-drought occurred across 1.16 million square miles in the Amazon in 2010, the second once-in-a-century event within five years. The enormous swath of dead jungle is releasing 8 billion metric tons of CO₂ over the next decade. And as the Amazon forests die, the Earth also loses its vast cloud-making machines forcing it to absorb incoming solar radiation rather than reflect it.

In 2009, the United States alone emitted 5.4 billion metric tons of CO₂ from fossil fuel use. These emissions contribute to an equally disconcerting worldwide pattern that is beginning to emerge. Scientists have documented that greenhouse gas emissions have significantly altered global climate — increasing the frequency, duration and/or severity of drought and heat stress in 88 forests on every wooded continent on Earth. If ever there were a clarion wake-up call, this is it. All forest types are suffering from a lethal combination of at least three factors: insects and diseases associated with elevated temperatures; the drying out of plants; and carbon starvation, that is, water-stressed trees are unable to photosynthesize, or make food.

Extreme droughts in North Africa are killing Atlas cedar from Morocco to Algeria. Heat and drought are battering the high-elevation tropical moist forests in Uganda, mountain acacia in Zimbabwe and centuries-old aloe plants in Namibia. Tropical forests of Malaysia and Borneo have also suffered significant death. Drought has also lambasted the tropical dry forests of northwest and southwest India, fir in South Korea, the junipers of Saudi Arabia, and pine and fir in central Turkey. Extensive areas of forest in two regions of China have now been recognized as being at a high threat of mortality in the ensuing years. Russia too has identified 187.8 million acres of high-threat forests whose trees are severely stress by drought. Australia has seen widespread death in acacia woodlands and eucalypt and Corymbia forests. New Zealand has documented drought-induced death in high-elevation beech forests. Oak, fir, spruce, beech and pines across Western Europe are dying too.

Rising greenhouse emissions are elevating temperatures and the occurrence of droughts across western North America. In turn, this is fueling the largest native bark beetle epidemic in modern or past times (dating back over 200 million years). Instead of absorbing CO₂ about 30 billion mature trees are decaying and adding greenhouse gases to the ever-rising atmospheric pool.

Earth's forests are its life-support system.

We need a carbon-tax in America and worldwide. And we need it now.