

World-renowned environmentalist and scholar John Cairns Jr. generously provided the introduction for this issue of Virginia Tech Research, which is devoted to environmental research.

Red Alert – Climate Change:

THIS
IS
THE
LAST
CHANCE



Global view of Arctic Ocean 2000

World-class climate scientist James Hansen has warned Congress that the planet has long passed the “dangerous level” for atmospheric greenhouse gases. Twenty years ago, he warned Congress about the consequences of “business as usual,” and his predictions have been validated by the Intergovernmental Panel on Climate Change (IPCC), the National Academy of Sciences, and individual climate scientists. Hansen has called for Earth’s atmosphere to return to 350 parts per million (ppm) atmospheric carbon dioxide at the most; it is currently 387.6 ppm, and greenhouse gas emissions are still rising.

The first climatic tipping point has already been passed. (Scientists have confidence that a tipping point existed at a specific concentration only after it has been exceeded.) Humankind is engaged in a global experiment that has already reduced agricultural productivity and caused both floods and drought. The “wild cards” are the positive feedback loops that accelerate the rate of change.

The melting tundra is releasing greenhouse gases that cause temperature increases, which, in turn, melt more tundra. The Arctic ice reflects about 90 percent of the sun’s energy, but after the ice melts, the open oceans absorb 90 percent of the energy.

The Arctic ice melted 100 years ahead of IPCC predictions. Hansen affirms that a frank assessment of scientific data provides a certainty on climate change exceeding 99 percent.

Mark Lynas’ book, *Six Degrees*, provides examples of what will happen for each degree of Celsius temperature increase up to 6 degrees (10.6 degrees Fahrenheit) — for example, a climate that is only a degree or so warmer than today could melt enough Greenland ice to drown coastal cities around the planet.

Politicians have set dates, such as 2025 and 2050, for reducing greenhouse gases, but Mother Nature neither bargains nor forgets transgressions. Violate her universal laws and penalties are usually severe and immediate, including starvation, disease, and death. Each day of delay in conforming to Mother

Nature’s laws forecloses options for providing a quality life for posterity and drives more species that exist as fellow passengers on Spaceship Earth to extinction. Politicians who refuse to curtail greenhouse gas emissions because “it might hurt the economy” forget that the economy is based largely on the functioning of the biospheric life support system, which has maintained conditions (e.g., atmospheric gas balance) favorable to humans. Humankind is utterly dependent upon it.

Paul Ehrlich states: “The economy is a wholly-owned subsidiary of the environment.” Paul and Anne Ehrlich’s book, *The Dominant Animal*, provides persuasive evidence that social evolution could result in a harmonious relationship with the natural systems upon which humankind’s survival depends. But time to change is short — perhaps as little as 10 years. What will be done in these 10 years? In these turbulent economic times, will protecting the environment be regarded as a luxury that cannot be afforded?

The carbon dioxide that is discharged into the atmosphere today will remain for at least 100 years.

- John Cairns Jr.

University Distinguished Professor of Environmental Biology Emeritus, and Director Emeritus, University Center for Environmental and Hazardous Materials Studies

Cairns joined the Virginia Tech faculty in 1968. Courses he taught ranged from Protozoology, Ecotoxicology, and Restoration Ecology, to Ethics in Science, Hazard Evaluation, and Ecosystem Risk Analysis. His research has been primarily in ecotoxicology, ecological restoration, protozoan community dynamics, and, for the past two decades, sustainable use of the planet. He has written 63 books and monographs and more than 1,500 scientific articles, book chapters, and other works. His first online book, Goals and Conditions for a Sustainable World (2002), is available free. Recent books include Eco- and Sustainability Ethics and An Odyssey through Stressed Ecosystems: A Continuing Scientific Detective Story.

Links to many works are available at

www.johncairns.net.

Global vegetation map 1979

NASA

