Science Reinforces Human Role as Climate Change Impacts Accelerate (with commentary)

Contributed by World Resources Institute
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A new report of scientific findings confirms not only that human activity is the primary cause of rising temperatures, but that climate change impacts are accelerating.

Critical Comment: World Resources Institute's new study is frightening for its convincing data and restrained tone. WRI, however, is part of the establishment believing in more energy needed to power the economic system. While it's understandable that one would desire more power forevermore from technology for unending manufacturing for appliances, etc., it is past time for the present industrial system to prove it can fit into nature harmoniously. With no concept of simple living and bioregional, tribal cultures inheriting the residue of petrocollapse and climate extinction, WRI's best role ought to be to sound the alarm and now be ignored as to "solutions."

WRI kindly had its energy staffer James MacKenzie on our organization's advisory board for many years. Rather than get closer, the two organizations are staring at each other across the crossroads of human development and the future of life, with vastly different world views and values. (And of course slightly different funding levels!) -- Jan Lundberg

The compilation of peer-reviewed research includes evidence that melting rates for mountain glaciers around the world doubled between 2004 and 2006, and that more than 28,000 plant and animal species are changing habits due to new climatic conditions.

"Climate change impacts are happening now. This is not a distant phenomenon. And many impacts are emerging at a faster rate than previously modeled," said Kelly Levin, an associate at the World Resources Institute who co-authored Climate Science 2008: Major New Discoveries with Dennis Tirpak, WRI senior fellow.

Levin said the trends may seem less surprising because we are inundated with so many stories about global warming. But as a co-author for the past four years of WRI's annual compilation, she added that the repeated reconfirmation of trends should support the need for rapid and substantial greenhouse gas mitigation and adaptation efforts

worldwide.

The report is broken into four sections, which include some of the following sample findings:

Physical Climate:

- The rate of growth of global carbon dioxide emissions between 2000 and 2007 was four times that of the previous decade.

- A large majority of warming over the last century can be attributed to human activities rather than natural factors, such as solar variability.

- If atmospheric carbon dioxide concentrations reach 700 parts per million by 2100 (concentrations in 2008 were 385.57 parts per million), daily maximum temperatures are projected to rise to 104 degrees Fahrenheit in the U.S. Midwest and Southern Europe and exceed 122 degrees Fahrenheit in Australia, India, the Middle East, and parts of Africa.

- Sea ice loss in the Arctic could have the potential to warm ground up to 930 miles inland, threatening to trigger "rapid degradation" of permafrost.

- This section includes studies in the areas of abrupt change, GHG and aerosol concentrations, temperature, and ocean behavior.

Hydrological Cycle:

- From 1996 to 2006, the rate of ice mass loss of Antarctica increased by 75 percent.

- The rate of melting and thinning of 30 glaciers across nine mountain ranges around the world doubled between 2004-2005 and 2005-2006.

- Up to 60 percent of the hydrological changes in the Western United States are due to human activities, a trend which, if sustained, "portends a coming crisis in water supply."

- This section includes studies in the areas of glacial and snow melt, water supply, and storms.

Ecosystems and Ecosystem Services:

- Changes in 28,800 plant and animal systems and 829 physical climate systems have led scientists to conclude that human-induced warming is already "having a significant impact" on natural and physical systems.

- Due to climate change-induced beetle infestations, the forests of British Columbia will turn from a small net sink of carbon dioxide to a large net source by 2020, with emissions trumping those related to forest fires.

- If carbon dioxide emissions continue unabated, tropical ocean "dead zones" are likely to increase by 50 percent by 2100.

- This section includes studies in the areas of both marine and terrestrial ecosystems.

Mitigation Technologies:

- A promising method of capturing carbon dioxide directly from the air is under development.

- A new non-toxic, inexpensive technology for storing solar energy, with potential applications for generating hydrogen power, has been discovered.

- This section includes studies in the areas of solar, thermoelectric, biofuels, wave energy, batteries and ultracapacitors, and carbon capture.

WRI's review includes peer-reviewed 2008 science and technology publications, including those from key general scientific and technical journals.

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