Coping with the Anthropocene

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Overpopulation, the greenhouse effect, warming temperatures and overall climate disruption are all well recognized as a major threat to the ecology and biodiversity of the Earth. The issue of mankind's negative impact on the environment, albeit hotly debated and continuously present in the public eye, still only leads to limited policy action.

Urgent action is required, insist Paul Cruzten and Stanislaw Waclawek, the authors of "Atmospheric Chemistry and Climate in the Anthropocene", published in open access in the new *Chemistry-Didactics-Ecology-Metrology*.

In their sobering review, Crutzen, the 1995 Nobel Laureate in Chemistry, and Waclawek, outline the development of a new geological epoch – the Anthropocene, where human actions become a global geophysical force, surpassing that of nature itself.

Anthropocene, which relates to the present geological epoch, in which human actions determine the behavior of the planet Earth to a greater degree than other natural processes. The term, coined by American ecologist Eugene F. Stoermer and popularized by Crutzen, introduced the epoch succeeding the Holocene, which is the official term for the present epoch on Geological Time Scale, covering the last 11, 500 years.

Although the Anthropocene is not a new concept, it is only now that the authors present stunning evidence in support of their claim. The article describes the negative impact of the human footprint, which ensues a gradual destruction of the Earth. Highlighting different data elements –

it yields overwhelming evidence that "man, the eroder" now transforms the atmospheric, geologic, hydrologic, biospheric, and other earth system processes.

The list is long and unforgiving:

- Excessively rapid climate change, so that ecosystems cannot adapt
- The Arctic ocean ice cover is thinner by approximately 40% compared to 20-40 years ago
- Ice loss and the growing sea levels
- Overpopulation (fourfold increase in the 20th century alone)
- Increasing demand for freshwater
- Releases of NO into the atmosphere, resulting in high surface ozone layers
- Loss of agricultural soil through erosions
- Loss of phosphorous. Dangerous depletion in agricultural regions
- Melting supplies of phosphate reserves (leading to serious reduction in crop yield)

Describing the negative impact of human activities on the environment, the authors identify planetary boundaries, as means to attaining global sustainability. It is "a well-documented summary of all humankind actions affecting the environment on all scales. According to Crutzen, we live in a new era, Anthropocene, and our survival fully depends on us. I strongly recommend this unusual publication in the form of highly informative compressed slides and graphs." says Marina Frontasyeva from the Joint Institute for Nuclear Research in Dubna, Russia. Nature is us, and responding to the Anthropocene means building a culture that grows with the Earth's biological wealth instead of depleting it.

More information: *Chemistry-Didactics-Ecology-Metrology*, DOI: 10.1515/cdem-2014-0001

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