Ooops, There Goes Half the Ecological Footprint

by Wendell Krossa

(Note: Mounting evidence undermines the anthropogenic warming theory and therefore effectively undermines the basis for over one half of the ecological footprint models)

The Ecological Footprint model has been gaining acceptance across the globe as a government planning tool at federal, provincial/state, and even local/urban government levels. Advocates of the Ecological Footprint (EF) argue that it shows that humanity is "overshooting" the capacity of ecosystems to support our standards of living and we are heading for catastrophic environmental collapse.

Bill Rees, the originator of the EF, refers to a litany of supposed disasters to support his contention that the human enterprise is destroying nature and must be, not just halted, but actually reversed. He points to such things as massive species loss, forest devastation, pollution, overpopulation, soil degradation, agricultural decline, resource exhaustion (e.g. peak oil), and of course, potentially catastrophic global warming. Ozone depletion and acid rain also still hover in the background as occasional elements of his litany. This litany of disasters is employed to support his contention that we are using too much of nature's resources and must reverse this overshoot level of resource use. He claims that if all of humanity desires to attain to the current standard of living of the developed world then we would need several more earths. I've read estimates of from 2 to 4 more earths.

One of his critics noted that politicians tend to accept the EF model without taking a close look at its details (data, methods). Some advocates of the model, noting its weaknesses such as "calculations based on crude estimates", nonetheless dismiss such weaknesses as peripheral to the main purpose of the model. "Since the focus of the ecological footprint is heuristic- to awaken people, particularly those in more heavily industrialized societies, to their extensive resource use and its externalized costs- **greater precision or detail might actually get in the way of this teaching goal**" (http://www.experiencefestival.com/a/Ecological_footprint_-_Criticisms/id/1349467). Did I actually read that? Yikes.

But what piqued my curiosity recently, especially as the model claims that we are seriously overshooting nature's ability to sustain us, was a statement by the co-developer of the EF- Mathis Wackernagel- that "Land for carbon absorption is the most significant globally, representing nearly half of humanity's total footprint" (Methods for Calculating National Ecological Footprint Accounts- available online). Rees has also stated in a paper at http://www.scarp.ubc.ca/faculty%20profiles/W.Rees-Pubs-2004_files/WileyRevised(Rees).doc (Ecological Footprints and Bio-Capacity: Essential Elements in Sustainability Assessment) that sequestration of CO2 makes up "half the global average eco-footprint and a greater proportion in high-income countries". His ecological footprint model is especially dependent on the anthropogenic warming hypothesis and the belief that CO2 is a dangerous pollutant that must be removed from the atmosphere.

I have argued with Bill that his assumption that CO2 is a major factor in climate change and a primary forcing mechanism for climate modification is simply unproven. No consensus exists on this. There is no clear evidence to support this contention. I've sent

him the recent APS paper by Lord Moncton and Roy Spencer's Senate Testimony, along with other research on CO2 and warming. Emerging evidence continues to undermine the AGW theory from many differing angles. It appears then that, ooops, there goes one half, and more, of the human ecological footprint.

What about the other elements of Rees's catastrophe litany that are used to validate the rest of his footprint model- for instance, forests? FAO Production Yearbooks show no serious decline in earth's forest cover over the past 60 years when the human population went from 2.5 billion to 6.3 billion and world GDP went from $4 trillion to over $40 trillion. During this massive increase in population and consumption, forest cover remained roughly stable at about 30% of land area. One would think, according to ecological footprint theory, that such expansion of the human enterprise would have had a much more notable 'overshoot' impact on a resource like forests.

Also, the 1992 IUCN report uncovered no evidence of any species holocaust. Species losses appear to continue at low historical rates. Most species have survived past periods of massive change and upheaval such as glaciations, severe episodes of volcanism (with sudden cooling), and so on. They have adapted by migrating up and down mountain slopes and north and south over continents, as well as making other adaptations. So once again, on biodiversity, no evidence of overshoot. Now, if the litany of disasters is not as apocalyptic as he presents them then this undermines Rees's central contention that the human enterprise is destroying nature and needs to be halted or reversed. Bill responds by pointing to local situations of devastation and the loss of isolated species with the less than subtle presumption that these can be extrapolated out to characterize the overall world situation. Or he will argue that our current overshoot will suddenly hit an unexpected tipping point and massive collapse will then occur. This is hard to imagine as today across the world scientists and others are watching the varied elements of ecosystems more closely and thoroughly than at any previous time in history. Satellites observe 24/7. If evidence of overshoot is there, surely we will know about it.

He further dismisses suggestions that such technologies as hydroponic crop production can be employed to alleviate pressure on what he views as overstressed agricultural resources. Inputs to hydroponic agriculture are even higher than those to regular agriculture, he claims. When I argued that we are not exhausting agricultural resources but are actually using less land over time he again stated that this higher agricultural production that uses less land requires more inputs and the impending disaster is that we will soon exhaust these limited inputs of fertilizers. He also argued that GM technology and other agricultural advances will also run up against similar constraints and limits. For every argument for technological advance he counters with a dark view of limited resources of some sort or other. Creative technological solutions do not fit his apocalyptic outlook which is heavily dependent on concepts of closed systems and strict resource limits and the dissipation, decline, and disorder produced in such systems by the Second Law of Thermodynamics, as he employs it. The unlimited creativity of the human mind has no place in his model and is dismissed as a factor of limited impact. History proves him entirely wrong on this. The Green Revolution and Norman Borlaug's work is one good example here. Borlaug ignored Paul Erhlich's doom prophecies of massive famine and in a relatively short time had turned food shortages into agricultural abundance. The unlimited creativity of the human mind is the key factor that leaves doom scenarios with a 100 percent failure rate.

Rees also makes the following argument that we have improved our developed country environments at the cost of devastating the environment's of other countries. "There is a whole other point: China and now India are among the most polluted countries on Earth

but much, if not most, of the worst pollution comes from particularly dirty processing and manufacturing industries that have migrated there from Europe, North America and Japan but continue to operate producing goods mostly for consumption in those countries. Result: The rich countries get cleaner, the developing countries and their populations pay the pollution costs. (This phenomenon is readily revealed in our ecological footprint analyses--much of the pollution in China represents the extra-territorial eco-footprints of the US, Canada, Europe, Japan, Australia, etc., not of China itself.) In short, Goklany, Beckerman, Lomborg and the like, select data to create a black and white and partial caricature of a very complex and grey-scale picture. This is dangerously delusional and grossly misleading". In my discussions with Rees I had been quoting research from Goklany, Lomberg, and Beckerman.

To be generous, one could grant that on varied points Rees expresses common sense concern over environmental issues. Obviously, we ought to try as much as possible to better understand our engagement of nature and the capacities of its varied resources that are essential to our living standards. Its just that this EF model has been constructed by an ecologist who is committed to halting and reversing the human enterprise to a level appropriate to what many view as environmental extremist visions-a much diminished human population living in a largely wilderness world at a much lower standard of living. Rees states plainly that the human enterprise, as it currently exists in developed countries, is unsustainable. He believes this to be so because he is committed to the concept of strict limits in closed systems and the primacy of the Second Law with its inevitable consequences of decay, dissipation, and decline. I have responded to Bill that the concept of closed systems is a human invention and not a natural fact. It is simply a "philosophical prejudice that has led to unsound long-term forecasts" (Julian Simon, Life Against The Grain, p.330). Simon has countered well the dismal philosophical prejudice of limited resources and closed systems that is promoted by doomsters like Bill Rees (see for instance Ultimate Resource or A Poverty of Reason by Wilfred Beckerman).

If you buy Rees's contention that our current developed world standards of living are unsustainable and all of humanity attaining these standards of living will require from 2 to 4 more earths, then you can see what diminished levels of living standards all of us would need to return to in order to live on just one of Rees's earths. Rees argues that most families could live on about $8,000 of annual income. I doubt he is trying to do this himself.

Other questionable assumptions that under-gird the EF model include the argument that humanity should be allowed access to only a strictly limited amount of natural resources because if we take more, then other species are denied access to those same resources (e.g. photosynthetic capacity). Wilfred Beckerman responds to this argument in his book Green Colored Glasses. Also, the contention is made that our excessive use of renewable resources is undercutting the ability of ecosystems to regenerate or replenish themselves and hence these systems are facing collapse. While isolated species (e.g. cod in Eastern Canada) have been decimated, as noted above there is no evidence of overall collapse of larger ecosystems or general serious loss of biodiversity. Another contention is that of intergenerational equity. EF advocates argue that we must pass on to future generations an undiminished stock of natural capital. This ignores the fact that future generations will be much wealthier than we are and better able to solve any resource issues. They most likely will discover and access entirely new sources of energy to fuel the human enterprise. Arthur Clarke suggested that we would access dark energy in this century and have an unlimited source of energy. Again, researchers like Wilfred Beckerman have responded well to these questionable assumptions and

presented the more complex elements surrounding these issues such as personal values/ideology and sense of aesthetics.

It is hard to take this ecological footprint model seriously because it seeks validation in an unsubstantiated litany of disasters to support its disturbing devaluation of the human enterprise. And then there is the political component- Rees views the free enterprise system as responsible for what he believes to be our current destructive overshoot and he zealously advocates central planning and state regulation to slow and reverse economic growth. Hence this telling quote at the end of some of his papers, “Mutual coercion, mutually agreed upon”. Emphasis on coercion. As Wackernagel said in a video presentation on EF, “Aggressive sustainability initiatives are good for us” (http://ecocity.wordpress.com/tag/ecological-footprint/). Even if we don’t like them.

Despite the weaknesses of EF analysis, Rees has managed to promote awareness and acceptance of this planning model across the globe. His model claims to provide the factual basis for the sustainable development movement (what levels of human activity are ecologically sustainable). And it has now become a widely accepted belief in the public arena that the human footprint is too large and must be decreased in every way possible. As its influence grows, this model (its data details, methods, and assumptions) will have to be more closely looked at by capable researchers.

PS. In relation to the above, the debate continues over the Science paper (see http://www.publicaffairs.noaa.gov/pr98/oct98/noaa98-67.html) that suggested that North America naturally absorbs perhaps all of its human emissions of CO2 (human emissions of CO2 in the US are estimated to be around 1.7 to 2.0 billion tons annually- 1.87 billion tons in 2004, http://cdiac.ornl.gov/trends/emis/em_cont.htm). Pieter Tans is quoted as stating, “The North American land surface appears to be absorbing possibly as much as between one and two billion tons of carbon annually, or a sizable fraction of global emissions of carbon dioxide from fossil fuel burning”. This appears to further weaken the ecological footprint arguments for fully one half of the human footprint to be allocated to CO2 sequestration. Bill Rees dismisses this evidence.