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Ecological Debt Day

MEDIA BACKGROUNDER

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1. Terms Defined

- Ecological overshoot means exceeding the regenerative capacity of the ecosystem that is being exploited. Global overshoot occurs when humanity's demand on nature exceeds the biosphere's available supply (or more precisely the biosphere's regenerative capacity).
- The Ecological Footprint of a person measures how much productive area it takes to support everything that we do – eating, driving, buying things, etc. The Footprint allows us to assess how much nature we have, how much we use, and who uses what. The Footprint of a population represents the area of biologically productive land and water the population (an individual, city, or all of humanity) requires to provide the resources it consumes and to absorb its waste, using prevailing technology and management practices.
- Ecological debt is the accumulation of annual ecological overshoot. Globally, we have been in overshoot and running deficits since the mid 1980s, which have since accumulated an ecological debt. Examples of the effects of accumulating an ecological debt are depleted fisheries, deforestation, and build-up of CO₂ in the atmosphere. (see section 3 for facts on these effects of ecological debt)

- Ecological Debt Day marks the day when humanity begins using more ecological resources and services in a given year than Earth can regenerate in that year. This is the day we (on average) go into global overshoot for a given year. This overuse adds to our global ecological debt.

2. Footprint Facts

(All statistics in this section from Global Footprint Network data analysis – National Footprint Accounts 2006 Edition.)

- According to current calculations, humanity's first Ecological Debt Day was December 19, 1987. By 1995 it had jumped back a month to November 21. Just over ten years later it had pushed back over six weeks more to October 6, 2007.
- Humanity's use of nature (in terms of natural resources and services) went from using half of planet Earth's biocapacity in 1961 to over one and a quarter planet Earth in 2007 (or 1.3 planets to be more precise).
- The average per capita Ecological Footprint (as of 2003 data) is 2.2 global hectares/person, while the biologically productive area available on this planet to support the world's population of 6.5 billion is slightly less than 1.8 hectares/person. These 1.8 hectares/person include the areas we would need to set aside for wild species.
- The average per person Ecological Footprint for the United States (as of 2003 data) is 9.6 global hectares.
- The carbon Footprint, which accounts for the use of fossil fuels, is almost half of humanity's total Ecological Footprint, and is its fastest growing component, increasing more than nine fold from 1961 to today.
- Currently, humanity consumes 30% more resources per year than Earth can regenerate. In other words, between January 1 and October 6, humanity has used as many resources and ecological services as Earth can regenerate in the entire year. Or inversely, it takes one year and over three months to regenerate what humanity uses within one year.
- Business-as-usual scenarios based on the most moderate projections of UN agencies would lead to using twice the planet's regenerative capacity by 2050 (for details see Global Footprint Network and WWF's [Living Planet Report 2006](#)). This would put Ecological Debt Day on July 1, and it would take two years for the planet to regenerate what we use in one year. Humanity would be living as if we had 2 planets to sustain us. Reaching this level of ecological debt spending may be physically impossible.

3. Global Effects of Ecological Debt

FORESTS

- Deforestation, mainly the conversion of forests to agricultural land, continues at a rate of about 13 million hectares per year.
 - Global Forest Resources Assessment 2005, Progress towards sustainable forest management, FAO, Forestry Paper 14.
- About 6 million hectares of primary forest have been lost or modified each year since 1990.
 - Global Forest Resources Assessment 2005, Progress towards sustainable forest management, FAO, Forestry Paper 43.
- This current rate of loss does not appear to be slowing down.
 - Global Forest Resources Assessment 2005, Progress towards sustainable forest management, FAO, Forestry Paper 43.

FISHERIES

- In 2001 the FAO estimated that about 75% of oceanic fisheries were fished at or beyond capacity.
 - Meadows, Randers and Meadows, Limits to Growth – 30 year update. 2006: page 231.
- 25% of marine fish stocks are overexploited or significantly depleted.
 - Hassan R, Scholes R and Ash N, Ecosystems and Human well being: Current State and Trends, Vol 1. Island Press, 2005: 7.
- Some stocks have collapsed entirely: for example, Atlantic cod stocks off the coast of Newfoundland collapsed in 1992 forcing closure of the fishery after hundreds of years of exploitation.
 - World Resources Institute. Ecosystems and Human well-being-Synthesis Millennium Ecosystem Assessment 2005: 12.
- Human use of capture fisheries has declined because of reduced supply - not due to reduced demand.
 - Hassan R, Scholes R and Ash N, Ecosystems and Human well being: Current State and Trends, Vol 1. Island Press, 2005: 7.

SPECIES

- Over the last 30 years, the Living Planet Index, “the Dow Jones index of wild vertebrate populations” has decreased 30 percent.
 - WWF, Global Footprint Network, Zoological Society of London, 2006 [Living Planet Report 2006](#). WWF, Gland.
- There are currently 41,415 species on the IUCN Red List of Threatened Species, and 16, 306 of these are threatened with extinction.
 - IUCN, *Extinction crisis escalates: Red List shows apes, corals, vultures, dolphins all in danger* http://www.iucn.org/en/news/archive/2007/09/12_pr_redlist.htm, September 12 2007, Accessed September 28, 2007.

- The current extinction rate of plant and animal species is around 1,000 times faster than it was in pre-human times – and this will increase to 10,000 times faster by 2050.
 - Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Biodiversity Synthesis. World Resources Institute, Washington, DC.

SOIL

- Salinization affects 20-30 million hectares of the world's current 260 million hectares of irrigated land.
 - Tilman, D, Cassman K et al, 2002, Nature, 418: 617-677.
- Soil erosion affects more than 1.1 billion hectares of land worldwide, re-distributing 75 billion tons of topsoil.
 - World Resources Institute, Ecosystems and Human well-being: Synthesis, Millennium Ecosystem Assessment, 2005.
- Current USA agriculture practices are destroying topsoil 18 times faster than it can be replenished.
 - Pimental, David and Pimental, Marcis. Land Energy and Water: The constraints governing ideal U.S Population size, 1991.

CLIMATE CHANGE

- In 1990 the IPCC Report stated the observed trend of warming from 0.3 to 0.6 degrees was not likely to have effect for a decade or more and not directly linked to human involvement. In 2005 the IPCC Report stated that warming of the climate system was 'unequivocal', and that this warming is *very likely* due to anthropogenic greenhouse gas concentrations.
 - Intergovernmental Panel on Climate Change, The IPCC 1st Assessment and 3rd Assessment Reports, 1990 and 2005, respectively. www.ipcc.ch (collected by Svante Bodin, Swedish Ministry of Environment)
- Global average temperatures have increased 0.6 +/- .2 °C since the 19th Century.
- The 1990s are likely to have been the warmest decade of the millennium in the Northern Hemisphere, and 1998 is likely to have been the warmest year.
- Mean sea level has risen by 10 to 20 cm in the last hundred years.
 - Above 3 statistics all from UNFCCC, Climate Change Information Sheet 6, http://unfccc.int/essential_background/background_publications_htmlpdf/climate_change_information_kit/items/282.php, September 27, 2007.
- "Overall there is new and stronger evidence that most of the warming observed over the last 50 years is attributed to human activities."
 - UNFCCC, Climate Change Information Sheet 6, http://unfccc.int/essential_background/background_publications_htmlpdf/climate_change_information_kit/items/282.php, September 27, 2007.
- In 1990, 51% of all CO₂ emitted was not absorbed by planetary carbon sinks (oceans, forests), and accumulated in the atmosphere.
- The rate of increase in atmospheric CO₂ has gone up by 1.5 ppm/per year in the last two decades, and has increased 31% since 1750.

- 75% of anthropogenic emissions of CO₂ during the last 20 years are due to burning of fossil fuels, and the rest comes from land use change, especially deforestation.
 - Above 3 statistics from Houghton, J.T, et al [Ed]. Climate Change 2001: The Scientific Basis. Cambridge University Press, 2001.

DROUGHT

- Climate change affects the global environment and droughts, flooding and changes in seasonal weather patterns will increase as global temperature increases.
 - European Environment Agency, IPCC Report- Climate change impacts a fact of life, April 06 2007. <http://www.eea.europa.eu/highlights/ipcc-report-climate-change-impacts-are-a-fact-of-life>. Accessed September 27, 2007.
- The percentage of Earth's land that has been affected by drought has more than doubled from the 1970s to early 2000s.
- Dry conditions rose from 10-15% in early 1970 to 30% in 2002 due to increase in average mean temperature.
 - Above 2 statistics from National Science Foundation, Scientists find Climate Change a major factor in drought's growing reach, January 11 2005. http://www.nsf.gov/news/news_summ.jsp?cntn_id=100710

4. Quotations on Overshoot

“To overshoot means to go too far, to go beyond limits accidentally- without intention.”

“The Ecological Footprint of global society has overshoot the Earth's capacity to provide.”

“Once the population and economy have overshoot the physical limits of the Earth, there are two ways back: involuntary collapse caused by escalating shortages and crises, or controlled reduction of the ecological footprint by deliberate social choice.”

- above 3 quotations from Donella Meadows, Jorgen Randers and Dennis Meadows. Limits to Growth, the 30 Year Update, p. 234. Chelsea Green, VT, 2004.

“By living so far beyond our environmental means, and running up ecological debts, we make two mistakes. First, we deny millions globally who already lack access to sufficient land, food and clean water the chance to meet their needs. Second, we put the planet's life support mechanisms in peril.”

- Andrew Simms, Policy Director, nef (new economics foundation)

“Climate change, collapsing fisheries, water scarcity, and the long list of ecological ills, are merely symptoms. They are symptoms of humanity's ever larger metabolism; humanity's demand on resources and its production of waste has become larger than what planet Earth can handle. In short, we are in overshoot.”

“Overshoot accumulates an ecological debt, and eventually leads to ecological bankruptcy. Ecological bankruptcy will be even harder to get out of than financial bankruptcy.”

“Overshoot is not only a possibility, it is already happening, and it is highly undesirable.”

- above three quotations from Mathis Wackernagel, co-creator of Ecological Footprint and Executive Director, Global Footprint Network

5. Ecological Debt Day Calculation Methods

$[\text{world biocapacity} / \text{world Ecological Footprint}] \times 365 = \text{Ecological Debt Day}$

The day of the year on which humanity enters into overshoot and begins adding to our global ecological debt is calculated by considering that the total global Footprint represents the total biological capacity demanded over the 365 days of the year. By calculating the ratio of global available biocapacity to global Ecological Footprint and multiplying by 365, we find the number of days of demand that the biosphere could supply, and the number of days we operate in overshoot this year. This ratio shows that in just 279 days, we demand the biosphere's entire capacity for the year 2007. The 279th day of the year is October 6th.

Note: 2007 Ecological Debt Day is projected from the 2006 Edition of the National Footprint Accounts, where the most recent data are for 2003. Ecological Debt Day is calculated based on Global Footprint Network's projections of overshoot, how much global Ecological Footprint exceeds global biocapacity, in 2007. Based on United Nations Food and Agriculture Organization (FAO) and Intergovernmental Panel on Climate Change (IPCC) projections, we estimate global overshoot will have reached 30% in 2007. For reference, overshoot was 25% in 2003, the last year of data available without projections.

6. Consumer Tips to End Overshoot:

1. **Decrease consumption:** demand less from the planet by consuming less.
 - If you don't need it, don't buy it
 - If you buy it, make sure you can use it again, and again, and again
 - Bike more, drive less
 - Vacation locally, fly less
 - Eat less meat, eat locally grown food
 - Use less electricity: If you're not using it, unplug it – if possible, purchase green electricity

- Insulate your attic, doors, and windows, and heat and cool your home only as needed
2. **Increase efficiency:** Use the best practices and green technologies available for your consumption needs.
 - Keep your car (and bicycle) tires inflated and carpool when you need to drive
 - Use low-energy technology like compact fluorescent light bulbs and energy-star appliances
 - Use a drying rack or clothes line instead of an electric or gas-powered dryer for your clothes
 - Only run your dishwasher when it's fully loaded
 - Run your machines during non-peak hours
 - Tell your government and local businesses to meet best practice efficiency standards for their buildings, products, and operations
 3. **Slow down, and eventually reverse global population growth:** Its simple math: the more people on the planet, the fewer resources are available for each person. Reducing and eventually reversing population growth will help us meet both the UN's carbon reduction and human development targets. We can choose to help stabilize our global population by:
 - Having smaller families
 - Consider adopting if you'd like to expand your family
 - Supporting organizations and efforts that make family planning easily available worldwide
 - Remove barriers for women to access education and economic opportunities
 4. **Support land restoration and protection:** We can increase our planet's ability to provide for us by restoring degraded lands and ecosystems.
 - Use non-toxic cleaning products in your home
 - Recycle your batteries and electronic wastes
 - Support projects that protect and restore forests, fisheries, wetlands and watersheds
 - Join in your local watershed clean-up efforts
 - Help maintain and increase productive farmland by supporting small farmers
 5. **Get Active: Our local and national government agencies** control the infrastructure – the buildings, the roads, the cities – that influence the size of our Footprints. The lifespan of infrastructure put in place today largely determines resource consumption for decades to come – we can help future-proof our cities by demanding smart planning. We can encourage our political leaders to:
 - Use best green practices for buildings and products
 - Design cities for easy public transportation, biking, and walking
 - Support efficient technologies and environmental policies
 - Track and minimize their demand on nature with resource accounting

6. Contact and Global Footprint Network Information

For any inquiries about Ecological Debt Day, please contact:

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Global Footprint Network supports the shift towards a sustainable economy by advancing the Ecological Footprint, a measurement and management tool that makes the reality of planetary limits central to decision-making everywhere. See www.footprintnetwork.org for more technical information about overshoot, Global Footprint Network, and the Ecological Footprint.

www.footprintnetwork.org/overshoot