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Earth Overshoot Day

MEDIA BACKGROUNDER

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1. The Earth's Ecological Limits

While economies, populations and resource demands grow, the size of the planet remains the same. Since the 1970s, when global ecological overshoot became a consistent reality, we have been drawing down the biosphere's principal rather than living off its annual interest. To support our consumption, it is likely that we have been liquidating resource stocks and allowing carbon dioxide to accumulate in the atmosphere.

Ecological overshoot is possible only for a limited time before ecosystems begin to degrade and possibly collapse. This can already be seen in water shortages, desertification, erosion, reduced cropland productivity, overgrazing, deforestation, rapid extinction of species, collapse of fisheries and global climate change. New consequences of overshoot are regularly being discovered, and other consequences may only become apparent after they become irreversible.

2. Terms Defined

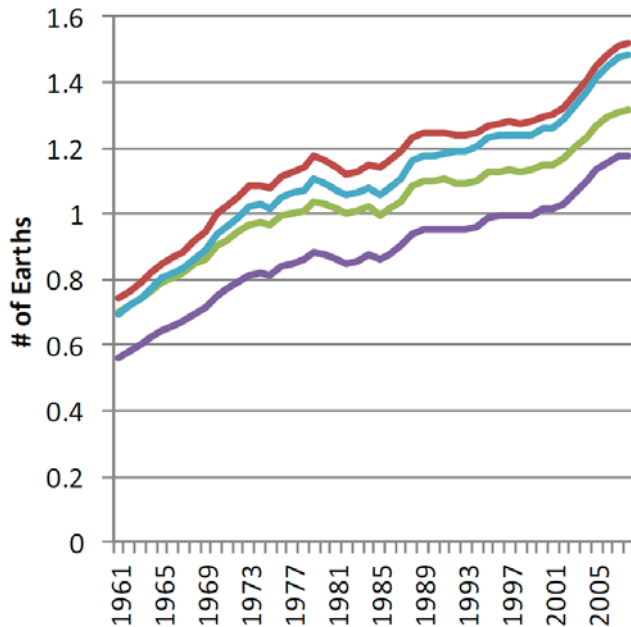
- Ecological overshoot occurs when human demand exceeds the regenerative capacity of a natural ecosystem. Global overshoot occurs when humanity demands more resources and produces more waste, such as CO₂, than the biosphere can regenerate and reabsorb.
- The Ecological Footprint measures the amount of productive land and sea area it takes to produce all the resources a population consumes and absorb its waste, using prevailing technology.
- Biocapacity is shorthand for biological capacity, which is the ability of an ecosystem to regenerate useful biological materials (resources) and to absorb wastes generated by humans.
- Earth Overshoot Day, a concept devised by the U.K.-based [new economics foundation](http://www.neweconomics.org), marks the day when humanity's demand for ecological resources and services in a given year exceeds what the Earth can regenerate in that year. We maintain this deficit by liquidating stocks of resources and accumulating waste, primarily CO₂ in the atmosphere.
- Global hectares (acres) are hectares (acres) of land at world-average productivity.

3. Overshoot Trends

This year, we are in the midst of an in-depth methodological review focused on the basis by which we compare the productivity of different land types (fishing ground versus forest, for example). The following graph shows the results based on each of four different approaches being considered.

The estimated level of resources required to support human activities ranges from that of 1.2 to 1.5 Earths depending on the approach used. But the trends each reveals are absolutely consistent: Overshoot has essentially doubled since 1961. And in that time, human demand on resources has gone from being well within the means of what nature could support, to being significantly over budget.

The graph below shows overshoot curves based on four slightly different data sources and means of valuing the productivity of land types.



- **Red:** Land types are valued according to how productive each is for growing crops, based on UN FAO data and GFN estimates.
- **Green:** Land types are valued according to how productive each is for growing crops, based on UN FAO satellite data maps.
- **Purple:** Land types are valued according to how quickly and abundantly plants grow on each land type, based upon NASA satellite data.
- **Blue:** Land types are valued according to how quickly and abundantly plants grow on each land type, based upon Alpen-Adria University (Austria) satellite data.

Based on these assumptions, we would expect that each year since 2001, Earth Overshoot Day would have moved an average of three days earlier in each year. That would have put it at around Oct. 1 last year, and around early November in 2000. (See "How Earth Overshoot Day is calculated, below). The curves show overshoot growing sometimes at a slightly faster and sometimes slightly slower rate, but on a continuing upward trend every year.

4. Population and Consumption

Overshoot is driven by three key factors – how much we consume, how many of us there are, and how much nature is able to produce. Technology has helped expand biological productivity over the years, but that expansion has not come close to keeping pace with the rate at which population and resource demand have expanded.

Global Footprint Network's data show that both population and consumption are increasing overall in the world. More per capita demand means there is a smaller pool of resources left for everyone, and bigger populations mean the same amount of resources must be divided among more people. It's not a question of consumption vs. population – whatever the cause, people are simply demanding more than the Earth can provide. That can't be sustainable in the long-run – eventually we'll run out of resources unless we change how we use, what we use, and/or how many people use them.

If we continue on the course estimated by moderate United Nations projections for increasing population and consumption, Global Footprint Network data show we would need the capacity of two Earths to keep up with our level of demand before mid century. Staying on this course would quickly diminish our room to maneuver, and would put the well-being of many of the planet's residents increasingly at risk.

5. The Carbon Footprint and Climate Change

Global Footprint Network measures the carbon Footprint as the land area that is required to sequester carbon dioxide emissions, and convert them back into resources.

The carbon Footprint, which accounts for the emissions from use of fossil fuels, is more than half of humanity's total Ecological Footprint. It is also the fastest-growing part of the Footprint. Since 1970, our total carbon Footprint has more

than tripled – and in that time has gone from being a smaller part of humanity's total Footprint than cropland, to outstripping every other area of demand by a significant margin.

The extent by which humanity's carbon Footprint exceeds what nature is able to absorb is the leading driver behind climate change. We are putting carbon dioxide into the air at a rate much faster than it can be absorbed, so it is building up in the atmosphere and ocean, contributing to costly and deadly climate change.

Significantly reducing the carbon Footprint is an essential step to ending overshoot and living within the means of our planet -- and it is also the most essential step in halting climate change, overshoot's most prominent symptom.

6. How Earth Overshoot Day is Calculated

Every year, Global Footprint Network determines global biocapacity -- or the amount of resources nature is able to generate each year -- and compares that with Ecological Footprint, the amount that humanity requires. Earth Overshoot Day is calculated by comparing our demand (as calculated by the Ecological Footprint) against nature's supply (as calculated by biocapacity.)

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

Because the precision of this calculation is dependent on large aggregated datasets for each country, it is difficult to ascertain the exact day on the calendar that humanity enters overshoot. Furthermore, as mentioned above, we have not fully finalized our datasets for the year. This year, we chose a date representing a day within the lower part of the overshoot range. Hence, the date is meant as an indication rather than an exact date. But while we cannot pinpoint the exact day we cross the threshold, we know we now are moving into an unsustainable level of resource demand for the year, and well before the year is over.

7. Contact and Global Footprint Network Information

Global Footprint Network promotes a sustainable economy by advancing the Ecological Footprint, a resource management tool that tells us how much nature we have, how much use and who uses what.. Together with its partners, the network coordinates research, develops methodological standards, and provides decision makers with robust resource accounts to help the human economy operate within the Earth's ecological limits.

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