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MEDIA BACKGROUNDER: Earth Overshoot Day

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1. Earth's Ecological Limits

While economies, populations and resource demands grow, the size of Earth remains the same. Since the 1970s, when global ecological overshoot became a reality, we have been drawing down the biosphere's principal rather than living off its annual interest. To support our demands on nature, 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. Impacts of ecological overspending are apparent already in water shortages, desertification, soil erosion, reduced cropland productivity, overgrazing, deforestation, rapid species extinction, fisheries collapse and increased carbon concentration in the atmosphere.

Natural capital constraints also pose a threat to economic performance and economic stability. Such economic pressure further complicates the ability of nations to address such challenges as the growing division between the rich and poor.

2. Terms Defined

- Ecological overshoot occurs when human demand exceeds the regenerative capacity of a natural ecosystem. Global overshoot occurs when humanity demands more than what the biosphere can renew. In other words, humanity's Footprint exceeds what the planet can regenerate. The biosphere's renewable capacity includes the replenishment of resources and the absorption of waste, such as carbon dioxide from fossil fuel.
- The Ecological Footprint measures the amount of biologically productive land and sea area required to produce all the resources a population consumes and to absorb its waste. The Ecological Footprint takes every year's technological advances into account.
- Biocapacity is shorthand for renewable biological capacity, the ability of an ecosystem to regenerate useful biological resources and absorb wastes generated by humans. It is measured in global hectares.

- Earth Overshoot Day marks the date when humanity's demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year. We maintain this deficit by liquidating stocks of resources and accumulating waste, primarily carbon dioxide in the atmosphere. Andrew Simms of the UK think tank [New Economics Foundation](#) originally conceived the concept.
- Global hectares are hectares of biologically productive land and sea area with world average bioproductivity. The Ecological Footprint is measured in global hectares. A hectare is about 2.5 acres.

3. Overshoot Trends

The estimated level of resources and ecosystem services required to support human activities is just over 1.5 Earths. *Overshoot has nearly doubled since 1961.* In that time, human demand on resources has gone from being within the means of what nature could support to significantly over budget.

4. Population and Consumption

Overshoot is driven by four key factors: 1) how much we consume, 2) how efficiently products are made, 3) how many of us there are, and 4) how much nature is able to produce. Technology and more intensive inputs have 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 world population and consumption are increasing. Higher per capita demand leaves a smaller pool of resources for everyone. Larger populations mean finite resources must be divided among more people. Whatever the factors — consumption or population — humanity is simply demanding more than Earth can provide. This overuse cannot be maintained for long.

If we continue on the course estimated by moderate United Nations projections for increasing population and consumption, Global Footprint Network data show that we would need the capacity of three Earths to keep up with our level of demand before mid-century. Whether such continued levels of overuse are physically possible is highly uncertain.

Staying on this course would put the well-being of many of the planet's residents increasingly at risk.

5. The Carbon Footprint and Climate Change

The Ecological Footprint also measures the carbon Footprint, which represents the land area required to sequester carbon dioxide emissions from fossil fuel burning and cement production.

Today, the carbon Footprint is more than half of humanity's total Ecological Footprint. It is also the fastest-growing part of the Footprint. One hundred years ago the carbon Footprint was a very small fraction of the overall Ecological Footprint. Since 1970, our total carbon Footprint has more than doubled (in total global hectares).

Humanity's carbon Footprint is the leading driver of climate change. Because we are emitting carbon dioxide into the air at a rate much faster than it can be absorbed, it is building up in the atmosphere and ocean.

Significantly reducing the carbon Footprint is an essential step to ending ecological overshoot and living within the means of our planet. It is also the most essential step in halting climate change, the most pervasive result of our ecological overspending.

6. How Earth Overshoot Day Is Calculated

Every year Global Footprint Network calculates the number of days of that year that Earth's biocapacity suffices to provide for humanity's Ecological Footprint. The remainder of the year corresponds to global overshoot. Earth Overshoot Day is calculated by dividing the world biocapacity (the amount of ecological resources Earth is able to generate that year), by the world Ecological Footprint (humanity's demand for that year), and multiplying by 365, the number of days in 2014:

$(\text{World Biocapacity} / \text{World Ecological Footprint}) \times 365 = \text{Earth Overshoot Day}$

7. How Precise Are Footprint and Biocapacity Results?

The national Footprint and biocapacity calculations are based on United Nations data sets and use about 6,000 data points per country and year. In addition the calculations use some complementary data points from the most recent scientific literature. The precision and reliability of the underlying data is not known and may vary from country to country.

However, Global Footprint Network not only updates its data on a regular basis, but also improves its methodology. Global Footprint Network estimates that the absolute precision may be within 15 percent. However, the assessments of overall trends are more robust.

One significant improvement Global Footprint Network is working on involves calculating the biosphere's ability to absorb carbon. With data collected through the Intergovernmental Panel on Climate Change and the emerging literature, more precise assessments are now possible. Preliminary calculations indicate that the average carbon sequestration capacity may be slightly lower than what was estimated in the past. Using this new number would increase the carbon Footprint and the total Ecological Footprint. As soon as this research is completed, an updated carbon sequestration assessment will be included in the next National Footprint Accounts, which are used to calculate global Ecological Footprint and biocapacity.

Consequently, Earth Overshoot Day is meant as an approximation rather than an exact date. Still, the data shows that humanity's demand on nature is at an unsustainable level — one year is no longer enough to regenerate humanity's annual demand on the planet.

8. Contact and Global Footprint Network Information

Global Footprint Network is an international sustainability think tank working to make ecological limits central to decision-making by advancing the Ecological Footprint. This resource management tool measures how much nature we have, how much we use and who uses what. Together with its partners, Global Footprint Network coordinates research, develops methodological standards, and provides decision makers with robust resource accounts to help the human economy operate within Earth's ecological limits.

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Interviews in Spanish and Italian also available.