

Release Notes: National Ecological Footprint and Biocapacity Accounts, 2025 Edition

The 2025 Edition of the National Ecological Footprint and Biocapacity Accounts details Ecological Footprint and Biocapacity, by total and by component, at a national level and on a world-total basis, from 1961 to 2024. Ecological Footprint is measured for production, imports, exports, and consumption, where consumption equals production plus imports minus exports. Accounts were generated for 244 countries and territories including the world, current and former/split/unified nations. Of these, 191 countries, plus the world, have a reliable timeline of data and are provided on an open-access basis.

Versions and updates

Version 1.0. Public release on April 22, 2025.

Recommended citation:

Lo, K., Miller, E., Dworatzek, P., Basnet, N., Silva, J., Van Berkum, J. L., Halldórsdóttir, R. B., & Dyck, M. D. R. 2025. National Ecological Footprint and Biocapacity Accounts, 2025 Edition. Data and metadata version 1.0. Produced for Footprint Data Foundation by researchers at York University and University of Iceland. <https://footprint.info.yorku.ca/data/>

Terms of use:

This data may be used under a Creative Commons Attribution-ShareAlike 4.0 International License, in which users may copy and redistribute the material in any medium or format and may remix, transform, and build upon the material for any purpose, even commercially, as long as attribution is provided, and any further distribution is under the same terms of use.

Credits:

This edition was produced by Kiona Lo⁺, Eric Miller⁺, Peri Dworatzek⁺, Neha Basnet⁺, Joanna Silva⁺, Johanna Louise Van Berkum^{*}, Rakel Bærings Halldórsdóttir^{*} and Matthew Don Reimer Dyck^{*} (⁺ at York University and ^{*} at University of Iceland). Production was supported with direction of the Footprint Data Foundation and its Science Advisory Committee, and with funding from the Social Sciences and Humanities Research Council (SSHRC) through the International Ecological Footprint Learning Lab (IEFIL) and the Faculty of Environmental and Urban Change at York University. This edition benefited from an accumulation of prior-year coding and research from analysts in the Ecological Footprint Initiative and from Global Footprint Network.

This edition integrated data from multinational databases with details about consumption, production, population, and economic variables by year and by country or the world. Key sources include: International Energy Agency (IEA), Food and Agriculture Organization (FAO) of the United Nations and its PopStat, ProdStat, TradeStat, ResourceStat, and FishStat databases, Sea Around Us, UN COMTRADE, CORINE Land Cover, Global Agro-Ecological Zones (GAEZ), Global Land Cover (GLC), Global Carbon Budget, Carbon Dioxide Information Analysis Center (CDIAC-FF), World

Bank, International Monetary Fund, and Penn World Tables. This edition also used parameters from peer-reviewed science journals and thematic collections, with citations available upon request.

Definitions and concepts

Ecological Footprint is the area of land and water used to grow food and to harvest renewable materials, plus the area occupied by settlements and infrastructure, plus the area of forests needed to sequester human-generated carbon emissions. Biocapacity is a measure of the potential of an area to support an Ecological Footprint.

Ecological Footprint is measured in global hectares as the sum of the following components: fishing grounds, built-up land, cropland, grazing land, forest products, and forest carbon uptake. Biocapacity is also measured in global hectares as the sum of the following components: fishing grounds, built-up land, cropland, grazing land, and forest biocapacity (which provides the capacity to supply forest products or to absorb carbon).

Fishing Grounds	Area of marine and inland waters used to produce the fish, invertebrates, and aquatic plants that were captured or cultured by humans
Built-up land	Area of land occupied by human-built infrastructure, including housing and other buildings, roads and paved areas, and urban greenspace
Cropland	Area of cropland used to grow food and fibre crops consumed by humans, and for crops that humans fed to animals and cultured fish
Grazing land	Area of grassland needed to feed livestock beyond the feed supplied by crops harvested from cropland
Forest Products	Area of forests harvested for timber products and pulpwood
Forest carbon uptake (Forest c-uptake)	Area of forests needed to sequester anthropogenic carbon emissions from the combustion of fuels including for electricity generation and for the production and transportation of globally traded goods, minus the proportion of anthropogenic emissions sequestered in the same year by the world's oceans

A global hectare is a hectare of land that provides a world-average amount of biological regeneration each year. Global hectares are derived from hectares by applying several conversion factors, including: a yield factor that relates national yield of a specific land type relative to world-average yield, an equivalence factor that relates components to one another based upon their level of biological productivity, and an intertemporal yield factor that relates changes in biological productivity over time. Expressing Ecological Footprint and Biocapacity in standardized units of global hectares allows for comparisons across the world and over time.

Further details about the concepts and calculations are provided in:

Lin, D., Hanscom, L., Murthy, A., Galli, A., Evans, M., Neill, E., Mancini, M.S., Martindill, J., Medouar, F.Z., Huang, S. and Wackernagel, M., 2018. Ecological footprint accounting for countries: updates and results of the national footprint accounts, 2012–2018. *Resources*, 7(3), p.58. doi:10.3390/resources7030058

Borucke, M., Moore, D., Cranston, G., Gracey, K., Iha, K., Larson, J., Lazarus, E., Morales, J.C., Wackernagel, M. and Galli, A., 2013. Accounting for demand and supply of the biosphere's regenerative capacity: The National Footprint Accounts' underlying methodology and framework. *Ecological indicators*, 24, pp.518-533. doi:10.1016/j.ecolind.2012.08.005

How Edition 2025 compares to the prior Edition 2024:

The 2025 edition does not have any significant methodological changes, rather this edition maintains the previous edition's improvements to the methodology and updates the data. Nevertheless, there are some variations of the data in the national accounts due to changes in the data from key data sources.

- Change in CO₂ emissions from Carbon Dioxide Information and Analysis Center (CDIAC)

The CDIAC dataset, which serves as a data source for CO₂ emissions when IEA data is unavailable, has been updated to CDIAC-FF due to changes in the supporting institution and methodology. The 2025 edition is the first to use the new CDIAC-FF dataset, which was published in 2023 and includes data up to 2020. In previous editions, the CDIAC dataset was last updated in 2017 and contained data up to 2014. Small differences (up to 1.8% by year) between the updated and previous CDIAC datasets were observed across 214 countries. The combined effect of these changes, along with updates in other emissions datasets, resulted in a maximum difference of 0.3% in carbon footprint components compared to the previous edition.

- Country-specific changes in area (hectares) for grazing land, cropland and forest land from UN FAO ResourceStat

The ResourceStat data series from the United Nations Food and Agriculture Organization (FAO), one of the key land-use data sources for the national accounts, showed significant differences in the reported area for certain countries and land types. Countries and land types with absolute differences exceeding 20% are listed below, in decreasing order of difference:

- Cropland area: Federated States of Micronesia, New Zealand, Equatorial Guinea, American Samoa, Djibouti, Bahrain
- Grazing land area: Marshall Islands, Sudan, American Samoa, Equatorial Guinea, Liberia; grazing land data no longer provided for Cook Islands and Seychelles
- Forested land area: Pakistan

As a result of countries having updated data, their hectares of the corresponding land type and subsequently the Biocapacity are affected. Additionally, due to cascading effects from the methodological relationship between the grazing land and cropland components, the cropland area and biocapacity of countries with updated grazing land data could also be impacted.

- Change in Global Carbon Budget data for carbon uptake by the world's oceans

The world Ecological Footprint shows slight differences between the 2025 edition and the 2024 edition going back on the full timeline. This can be explained by the new release of updated data from the Global Carbon Budget. The Global Carbon Budget includes data on the flows and sinks of carbon accumulation, an important aspect of this data for the national accounts is the data on carbon uptake by the world's oceans. This data continues to be refined by the Global Carbon Budget, and some changes in this data accounts for variations earlier on the timeline for the national accounts.

Data availability:

Ecological Footprint and Biocapacity, by total and by component, of production and of consumption, at a national level and on a world-total basis, are available within a spreadsheet that can be download from <https://footprint.info.yorku.ca/data/>

The same data of national and global measures of Ecological Footprint (of consumption) and Biocapacity, and their components, are also available at <https://data.footprintnetwork.org/> which presents the data in a more user-friendly way and with integrations of other data.

Each country's data is categorized with a "data quality score" that informs whether all or some or none of the data in a particular year is publicly reported.

Additional details may be requested on a per-nation-year basis in the form of an MS Excel Workbook that contains all the refined data used to produce the composite metrics of ecological footprint and biocapacity for that country in that year.

Questions and comments:

Please direct data-related questions or comments to footprint@yorku.ca or by mail to:

Ecological Footprint Initiative
4700 Keele St
HNES Building Room 243A
Toronto Ontario M3J 1P3
Canada

Ecological Footprint Initiative at York University has the website: <https://footprint.info.yorku.ca>

Footprint Data Foundation has the website: <https://fodafo.org>

International Ecological Footprint Learning Lab has the website: <https://footprintpartnership.net/>