



Short Communications

What are Carbon Footprint and Carbon Footprint Calculators?

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Abstract

Carbon Footprint (CF) calculations have recently drawn considerable attention in order to limit greenhouse gas (GHG) emissions. Adapting to environmental consequences of climate change will require collaborative action, which involves every stakeholder, particularly libraries. CF calculators are digital tools for revealing and reducing CF. This paper introduces the concepts of “carbon footprint” and “carbon footprint calculator” by reviewing relevant library and information science literature.

Keywords: Carbon footprint, Carbon footprint calculators

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Introduction

Reducing greenhouse gas (GHG) emissions is one of the targets in the fight against climate change. The Paris Climate Agreement, drafted in 2015, provides a broad framework for reducing GHG emissions based upon voluntary commitments by the world's nations. This landmark agreement committed the world to “limiting temperature increases to 1.5 degrees Celsius” above pre-industrial levels while the goal in reality should be 2 degrees. The Paris Climate Agreement is the first document which acknowledges the connection between sustainable development and climate change.

The United Nations (UN) Framework Sustainable Development Goals further examine the linkages between climate change and the economic, environmental, and social development of the world.

Adapting to environmental consequences of climate change will require collaborative action, which involves every stakeholder, particularly libraries. In the same vein, the International Federation of Library Associations and Institutions (IFLA) has called for more environmentally friendly libraries and argued that now is an opportunistic time for libraries to transform themselves into environmental change agents. The American Library Association (ALA) created the ALA Special Task Force on Sustainability in 2017 in response to IFLA's goal. That Task Force came forward with three core recommendations: a) how the Association may provide leadership and serve as a model for sustainability practices more broadly in the profession, b) how the Association may provide leadership in the adoption of sustainability practices in libraries c) how libraries may provide leadership and serve as a model for sustainability in the communities they serve. Library programs may offer opportunities for dynamic citizen engagement around climate change. Libraries can also foster public engagement with climate change knowledge since they have a deeper understanding of the audience.

Carbon Footprint and Carbon Footprint Calculators

Climate change affects all of us, particularly institutions like libraries. What can we do about global warming and climate change? One of the first things we can do is to measure our carbon footprint (CF). A CF is the total amount of greenhouse gases, such as carbon dioxide, released to the atmosphere by organizations or individuals. Transportation, housing, and food consumption contribute to an individual's or a family's footprint. Energy use, particularly burning fossils such as coal and oil, is the main contributor to our CF. CF captures direct and indirect sources of energy use. Direct uses include gasoline burned while driving to work, indirect carbon emissions occur during the production, transportation, and/or retail distribution of commodities purchased by consumers. Data shows that when the world shut down because of the coronavirus, the carbon emission only decreased about 7% ([Le Quéré, 2020](#)). This amount was already proposed by the agencies towards the 2030 goals per year. This data shows that for various possible reasons we are far behind our goals to reduce carbon emissions. The citizens of the world need to consider serious lifestyle changes towards a green economy. This will require informed citizens at the individual level and green economy policies at the governmental level.

According to the recent library science literature, librarians have examined their business operations and explored ways to reduce their CF by reorganizing their library services. Particularly, Singh and Mishra ([2019](#)) focused on the libraries' CF and focused on the carbon cost of library printing services in a college library setting. In the same vein, Truitt ([2009](#)) discussed the CF of library cooperative services such as cataloging and classification of resources.

National and international library cooperative services such as the Library of Congress and the Online Computer Library Center have been facilitating the CF reduction for libraries and information centers for decades. In an earlier study, Truitt ([2009](#)) focused

on the CF of national and international library science related conferences and presented suggestions to reduce those in order to decrease the CF of librarians. Jones (2009) examined the challenges which museums face to reduce CF in order to adapt to climate change. Furthermore, Chowdhury (2010) investigated all the resources libraries provide such as books and periodicals. Based on her analysis, printing and copying services have had largest CF in the library context. She also compared and contrasted the CF of print versus online resources. Her research was very timely and guided many policy changes in academic institutions. For instance, some college libraries included CF count as an item in their cost and benefit analysis. Chowdhury and Fraser (2011) examined the CF of the knowledge industry. Jankowska (2011) and Norton and Gonzalez (2014) focused on environment audit, green policy for AL, and environmental conscience movement. Particularly, Melnick (2022) underlined the role of law libraries in embracing environmental consciousness. Meneghelli (2018) presented a case study of a LEED certified library from Chicago and investigated methods for CF calculations. Nowadays, most of the academic libraries purchase electronic books in lieu of print books and provide article or book chapter requests as a digital copy in order to be carbon cautious. Schumann (2021) reported the Berlin-Pankow Public Library's CF calculations for the years 2018 and 2019.

Lin (2017) surveyed a group of Taiwanese undergraduate students to find out about their intention and attitudes towards online CF calculators. This study suggested that environmental literacy and environmental action have a positive outcome on the students' CF knowledge. According to the findings, students who have a positive low-carbon attitude had a positive relation to the use of CF Calculator. Therefore, the CF Calculator service providers should see such individuals as their major target users for the future. A similar survey can be done among librarians as a pre-test prior to facilitating CF community programs.

We are facing an urgent crisis. The most critical question is "How can we motivate change to reduce carbon emission?" Perhaps an easier way of assessing an individual's or an institution's CF is use of a CF calculator. A CF calculator is a tool used to estimate the amount of CO₂ emissions that result from various activities, such as energy consumption, transportation, waste management, and deforestation. The main purpose of CF calculator is to help individuals, businesses, and institutions understand their CF, which is a measure of the impact they have on the environment through their emissions of GHG. These are digital tools for revealing and reducing CF.

For instance, Environmental Protection Agency's (EPA) Household Carbon Footprint Calculator can be used to calculate anyone's carbon footprint. In addition to EPA's calculator, another popular one is Climate Neutral (UN) CF calculator. Mulrow et al. (2019) presented the most commonly used CF calculators in their work.

Users typically input information about their activities such as how much energy they use, how far they travel, and how much waste they generate, into these CF calculators. These calculators then use established emissions factors to estimate the amount of CO₂ emissions that result from these activities. The results of a CF calculator may be used for a variety of purposes, such as tracking progress towards emissions reduction goals, identifying areas for improvement in business operations, and developing strategies to

reduce emissions in their everyday tasks. Some CF calculators also provide recommendations for reducing emissions, such as using more energy efficient products or taking public transportation instead of driving. CF calculators are useful tools for raising awareness and promoting action to reduce carbon emission.

Discussion/Conclusion

How can we run libraries more sustainably? If you want to manage the impact that your library and or information center has on climate change you need to get the numbers. Numbers will be crucial in setting your goals. CF calculations have recently drawn considerable attention in order to limit GHG emissions. The CREW project (Carbon Reduction for Earth Wellbeing) can be used as an outstanding example of a community driven initiative of reducing CFs. The CREW project is a simple process of using the book *2040* by Damon Gameau to create a “Personal Climate Action Plan” in a small group with others. The Carbon CREW Project (<https://www.carboncrewproject.org/>) aims for creativity, collaboration, and community building based on Paul Hawken’s philosophy of Climate Literacy. CREW members create their own Carbon Reduction for Earth’s Wellbeing plan. The members strive for bold goals and simplify the Intergovernmental Panel on Climate Change (IPCC) goals of 50% carbon reduction by 2030, by using the Earth Overshoot Day calculator as a metric for progress. This project and the related documentation including the syllabus is available from the website for anyone interested in utilizing it. The CREW project can be a model program for libraries to start a CF campaign.

With the renewed commitment of the United States to the Paris climate agreement, this is an opportune time for librarians to play a role in tackling and mitigating the climate crisis. Library patrons would also want to learn how to lessen their personal impact on the environment such as being a sustainable traveler, using clean energy, shopping, or switching to more sustainable diet. Libraries should participate in the transition to affordable, reliable, and sustainable energy systems by adopting clean energy infrastructures such as “net zero energy.” Since assessment is a very important tool to fight climate change, online CF Calculators can be utilized to reduce CF. Libraries should urgently investigate options for sustainable development and potential benefits of CF calculators. We suggest that future research should investigate the possibility of starting a comprehensive CF survey of librarians.

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