

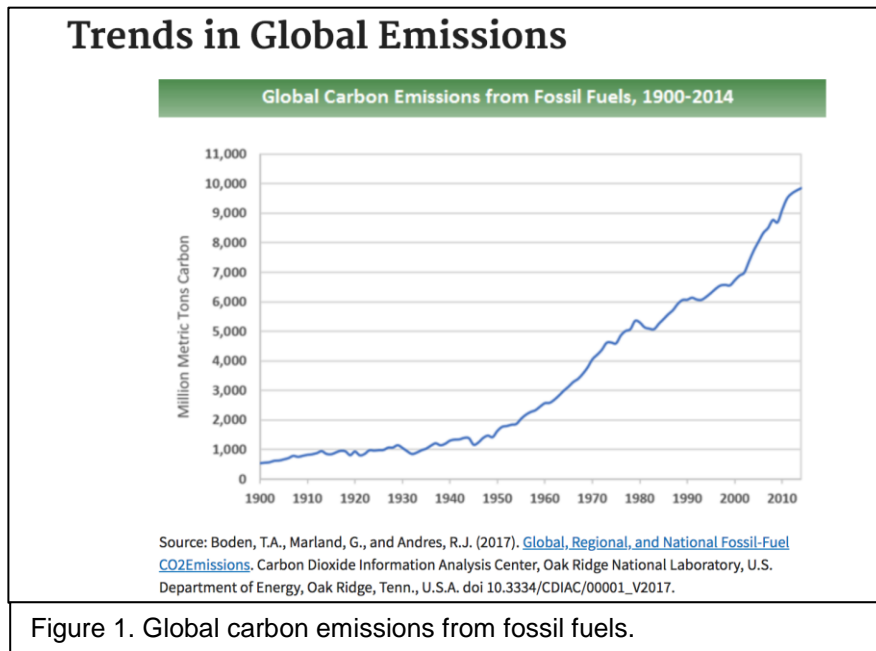


Level 2: New York State Farming Trends

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❖ Background Information

Do you know where your food comes from? Does it matter if you “eat locally” or if your food travels a long distance to get to you? The EPA reports that CO₂ emissions have increased



by about 90% since 1970 (Fig. 1). Historical measurements show that the current global atmospheric concentrations of carbon dioxide are unprecedented compared with the past 800,000 years, even after accounting for natural fluctuations. This trend is concerning because scientists have connected global emissions to climate change.

Our daily activities such as using cars, electricity, and eating food contribute to global emissions. We have a way of measuring our individual contributions to these emissions called a carbon footprint. Our carbon footprint measures the environmental impact of a particular individual or organization's lifestyle or operation, and it is measured in units of carbon dioxide (or equivalent gases) that end up in our atmosphere. According to one study by the Massachusetts Institute of Technology, “The average annual carbon dioxide emissions per person in the United States is 20 metric tons, compared to a world average of four tons.”





Do you have control over your own carbon footprint? These datasets explore where the food that New York residents eat is grown, how that has changed over time, and whether the food choices we make influence our carbon footprint. The first dataset presents information about the number and acreage of farms in NY State over time. The second dataset explores the amount of emissions associated with production and transport of milk and apples, two of the biggest commodities produced in New York State. In addition, an animal product and a non-animal product were chosen so differences in production emissions could be compared. The final dataset looks at the source (in-state or out-of-state producers) of where people in New York State are getting their milk.

❖ Dataset Timeframe

- NY Acres of Farmland: 1912 - 2017
- Milk vs. Apples: July 2018
- Milk Sales NY: 2006 - 2016

❖ Dataset Collection Methods

Carbon emissions are reported in Kg of CO₂e,



including major greenhouse gases such as carbon dioxide, methane and nitrous oxide. CO₂e, or Carbon Dioxide Equivalent, is a standard unit for measuring carbon footprints. This number expresses the impact of each different greenhouse gas in terms of the amount of CO₂ that would create the same amount of warming. The values given are the sum of emissions from production and emissions from transport. Production emissions are for the production (cradle to farm gate) and any processing per 8.6 lbs. (1 gallon) of product. Transport emissions are for the transport of 8.6 lbs. of product: local transport, any ocean transport, and user-defined long-distance truck transport.

Packaging and cooking are not included in calculating carbon emissions.

❖ Dataset Variables

NY Acres of Farmland Sheet

- **Year:** The year the samples were collected
- **Number of Farms in NY (thousands):** number of operating farms in New York State
- **Acres of Farmland in NY (millions):** area of operating farmland in New York State

Milk vs. Apples Sheet

- **Long-distance truck transport (miles):** the distance of truck transport for the product
- **2% Milk Total Emissions (kg CO₂ e):** the Carbon Dioxide Equivalent value for the combination of production and transport emissions for 1 gallon (8.6 lbs.) of 2% milk





- **Apple Total Emissions (kg CO₂ e):** the Carbon Dioxide Equivalent value for the combination of production and transport emissions for 8.6 lbs. (1 gallon equivalent) of apples

Milk Sales NY Sheet

- **Year:** year that data was collected
- **Sales by NYS Milk Producers (Million lbs.):** the amount of 2% milk sold by New York milk producers in New York in millions of pounds
- **Sales by Out-of-State Milk Producers (Million lbs.):** the amount of 2% milk sold by out of state milk producers in New York in millions of pounds
- **Total 2% Milk sales in NY (Million lbs.):** total 2% milk sold in New York in millions of pounds

❖ **Data Sources**

Data on farmland and dairy sales were collected from the United States Department of Agriculture (USDA) and the New York State Dairy Statistics 2016 Annual Summary. Carbon emission data were calculated using Food Carbon Emissions Calculator Cleanmetrics: <http://www.foodemissions.com/foodemissions/Calculator.aspx>, for 8.6 lbs. of product (either Milk, processed, 2% MF, or Apples) in July of 2018.

❖ **Inquiry Idea Starters**

Here are some sample questions you could ask using these data. These are just suggestions, and we hope you'll come up with many interesting questions of your own!

- How has the number of farms in New York changed over time?
 - How does the carbon footprint of food change with the distance food travels from farm to table? Does carbon footprint vary depending upon type of food?
 - What is the trend in the amount of out-of-state milk sales in New York over time?
- **Extension Ideas**
- Define a “farm.” Has the definition of a farm changed over the years due to advances in technology? For example, would a hydroponic farm (or any type of indoor farm) be considered in these statistics? Does the definition of a farm shape the way we understand the data collected from the USDA about farms?
 - The data provided is for 1 gallon of 2% milk (8.6 pounds) or 8.6 pounds of apples. How many gallons of milk do you (or your family) consume in one year? How many apples do you (or your family) consume in one year? Add a column of values in the table for yearly averages.
 - Where does your milk come from? Examine your milk carton/bottle at home. Is the farm local? Calculate a yearly value for how much your milk choice contributes to your carbon footprint.



- What other food sources could you examine? How can your choice of food influence your carbon footprint?
- What is the average New Yorker's carbon footprint? How does this value compare to the average American? How does the average American's footprint compare to the average World Citizen's footprint? How does the average New Yorker/American/World Citizen's footprint contribute to the overall problem of climate change (can you calculate a values/visually represent this idea).
- Design an action plan that would actively cut your carbon footprint. Create a plan that would get you to below the world citizen average. Create another plan that is more doable. Reflect upon what changes you would be willing to make to ensure the future of the planet.

❖ **Additional Resources:**

- **Carbon Dioxide Information Analysis Center:** Additional data about emissions and the carbon cycle: http://cdiac.ess-dive.lbl.gov/trends/emis/tre_coun.html. (n.d.).
- **Carbon emissions by individual/by country:** <https://www.theguardian.com/environment/datablog/2009/sep/02/carbon-emissions-per-person-capita>
- **Carbon emissions by state:** <https://www.eia.gov/environment/emissions/state/analysis/>
- **Development of Farming in the Hudson Valley the Land and the People:** Historical information about how agriculture developed in the Hudson Valley. <https://mohonk-consultations.org/wp-content/uploads/2014/12/Reports-2003-Development-of-Farming-in-the-Hudson-Valley-C.-Danielsson.pdf>
- **University of Michigan Carbon Footprint and Food Footprint Fact Sheet:** information about carbon footprints as well as how your food source impacts your carbon footprint. <http://css.umich.edu/factsheets/food-footprints><http://css.umich.edu/factsheets/carbon-footprint-factsheet>. (n.d.).
- **EPA: Global Greenhouse Gas Emissions Data** <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data>
- **The Footprint Blog:** <https://www.terrapass.com/eat-your-way-to-a-smaller-carbon-footprint>
- **Massachusetts Institute of Technology** "Carbon Footprint of Best Conserving Americans Is Still Double Global Average." ScienceDaily. ScienceDaily, 29 April 2008. <www.sciencedaily.com/releases/2008/04/080428120658.htm>.
- **Northeast Farms to Food: Understanding Our Region's Food System** <http://nesawg.org/resources/northeast-farms-food-understanding-our-regions-food-system>. <http://nesawg.org/sites/default/files/NESAWGFarmsToFood2002.pdf>
- ***Using agroecology to enhance dietary diversity*** published in UNSCN News 43 special issue on 'Advancing equity, equality and non-discrimination in food systems:



Pathways to reform' (full issue available here

<https://www.unscn.org/uploads/web/news/UNSCN-News43.pdf>).

- **Where is Your Milk From?** Locate the code on the carton and find out where your milk was sourced. <http://www.wherismymilkfrom.com/#>:

% of American workforce in agriculture, 1840-2000

