

Ecological footprint analysis for Willamette University, 2003-2004 academic year*

| Category | Amount | Conversion factor | Footprint (acres) | FP per cap (acres/person) |
|---------------------------|-------------------|---------------------|-------------------|---------------------------|
| Compound Analysis | | | | |
| Typical Food | \$2,268,592 | \$722.93 per acre | 3138.06 | 0.925 |
| Local Food | \$0 | \$905.08 per acre | 0.00 | 0.000 |
| Housing | \$5,133,061 | \$1,557.70 per acre | 3295.28 | 0.971 |
| Travel | \$1,136,829 | \$700.27 per acre | 1623.40 | 0.478 |
| Consumer goods | \$4,242,889 | \$1,612.64 per acre | 2631.02 | 0.775 |
| Services | \$38,067,662 | \$5,704.43 per acre | 6673.36 | 1.967 |
| Component Analysis | | | | |
| Electricity | 13,999,452 kwh | 33,071 kwh/acre | 423.32 | 0.125 |
| Natural gas | 663,820.50 therms | 570.8 therms/acre | 1162.89 | 0.343 |
| Gasoline | 14,295 gallons | 342 gal/acre | 41.80 | 0.012 |
| Diesel | 613 gallons | 299 gal/acre | 2.05 | 0.001 |
| Water | 75,894 CCV | 2,893 CCV/acre | 26.23 | 0.008 |
| Solid waste | 586,867 lbs | 167,113 lbs/acre | 3.51 | 0.001 |
| Recycled Waste | 291,888 lbs | 835,565 lbs/acre | 0.35 | 0.000 |
| Total | | | 19,021.27 | 5.606 |

* The consumption data comes from Willamette University's '03-'04 budget and the physical plant.

Willamette University population in '03-'04 was approximately 3393 in total (source Registrar and Payroll). Willamette University occupies a physical footprint of approximately 71 acres (source Physical Plant).

Compound Analysis Conversion Factors:

| Consumption category | Total¹ (acres/cap) | GDP per² cap | \$/acre |
|-----------------------------|--|------------------------------------|----------------|
| Food | 5.3 | \$3,831.51 | \$722.93 |
| Local Food | 4.23 | \$3,381.51 | \$905.08 |
| Housing | 5.2 | \$8,100.05 | \$1,557.70 |
| Transportation | 4.3 | \$3,011.18 | \$700.27 |
| Goods | 5.8 | \$9,353.31 | \$1,612.64 |
| Services | 2.9 | \$16,542.84 | \$5,704.43 |
| Total | 23.5 | \$36,496.73 | \$1,737.83 |

¹The footprint figures are per capita for the United States in 1999. The data comes from: <http://www.redefiningprogress.org/programs/sustainabilityindicators/ef/methods/usfootprint.html>

²The values for 1999 GDP data come from BEA adapted for the Berea College US footprint study.

Housing (1975.8) is sum of GDC values under Housing (1590.98) plus residential fixed investment* (384.8) (this is equivalent to construction).

Consumer goods (2281.5) is sum of GDC under Consumer Goods (948.49) plus non-residential fixed investment* (1287.9) plus change in business inventories (45.07).

Services (4035.2) is sum of GDC under Services (2315.12) plus Government (1720.10).

The 1999 GDP reported a combined number for residential and non-residential fixed investment. To separate these, went to National Bureau of Economic Research, Real Gross Private Domestic Investment, <http://www.nber.org/palmdata/indicators/investment.html>. The 1999 data was given in chained 1996 dollars, so was not directly comparable to the 1999 GDP data, but was used to determine that residential fixed investment in 1999 was 22% of total fixed investment, so could calculate residential and non-residential fixed investment for 1999.

U.S. Population 1999 = 272,945,000 from www.census.gov/prod/2002pubs/01statab/pop.pdf

The GDP figures were originally measured in 1999 average US dollars. The figures were adjusted to 2003 Portland dollars using CPI data: 165.33 (US ave 1999); 185 (Portland ave '02-'03).

Component analysis conversion factors:

Electricity: Oregon's electricity generation portfolio in 1999: 6.6% coal, 12% natural gas, 80.5% hydro. From *Sharing Nature's Interest* (p. 83) we get: 2,515 kwh/acre for coal, 4,307 kwh/acre natural gas, and 40,485 kwh/acre for hydro. So, the footprint for electricity in Oregon is 33,071 kwh/acre.

Natural Gas: generates 11.71 lbs. CO₂/Therm (Bonneville Environmental Foundation, http://www.b-e-f.org/GreenTags/calculator_intro.cfm). Average U.S. forest sequesters 6,684.5 lbs. CO₂/acre/year. Footprint is 570.8 Therms natural gas per acre.

Gasoline: generates 19.564 lbs. CO₂/gallon (Bonneville Environmental Foundation, http://www.b-e-f.org/GreenTags/calculator_intro.cfm) Average U.S. forest sequesters 6,684.5 lbs. CO₂/acre/year. Footprint is 341.67 gallons gasoline per acre.

Diesel fuel: generates 22.384 lbs. CO₂/gallon (Dautremont-Smith, J. 2002. Guidelines for College-Level Greenhouse Gas Emissions Inventories. Version 1. National Wildlife Federation. Contact julian@lclark.edu). Average U.S. forest sequesters 6,684.5 lbs. CO₂/acre/year. Footprint is 298.63 gallons per acre.

Municipal water use: From *Sharing Nature's Interest* (p. 99) estimate that each 1 million liters (353.14 CCV) of cold water delivered to the tap results in the emission of 816 pounds of CO₂. Average U.S. forest sequesters 6,684.5 lbs. CO₂/acre/year. Footprint is 2,893 ccv per acre.

Municipal solid waste: Average emissions to transport MSW to landfill is 0.04 lbs CO₂e per lb. MSW (Dautremont-Smith, J. 2002. Guidelines for College-Level Greenhouse Gas Emissions Inventories. Version 1. National Wildlife Federation. Contact julian@lclark.edu). Average U.S. forest sequesters 6,684.5 lbs. CO₂/acre/year. Footprint is 167,113 lbs MSW per acre.

Recycled Waste: From *Oxfordshire's Ecological Footprint* on www.BestFootForward.org recycling has about 1/5 the impact of solid waste. Footprint is 835,565 lbs per acre.