Statistics allows students to **investigate** the **impact** of lifestyle on their **water footprint.**

Introducing Water Footprints in a Statistics Course

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Introductory Statistics

Our Introductory Statistics course (MA223) emphasizes statistical literacy (interpretation and clear communication of statistical methods, results, and concept) and statistical reasoning (defining the need for data to address questions, modeling variability in a process, and choosing appropriate methodology) within the context of engineering, the physical, and the biological sciences. The course has a large impact, with over 60% of Rose-Hulman students taking the course, typically during the second year.

One of the hallmarks of the course asks students to conduct a small study to investigate a research question. The students participate in the study design, data collection, analysis, and communication of the results. Four sections (totaling over 100 students) coordinated this experience with a focus on water conservation.

The Activity

Students completed a survey asking about demographics and beliefs about water use, conducted an analysis using the resulting data, and reflected on the material.

How much water (gallons) do you think it takes to produce[1]...

Common Household Items	Common Food Items
1 sheet of paper	4oz of chocolate
1 t-shirt	4oz of beef
1 smartphone	8oz coffee

Education on Water Footprint of Apples

Supplemental irrigation often used (4 gallons).

Primarily rely on rainfall (17 gallons).

Pesticide runoff needs to be treated (4 gallons).

Single (4oz) Serving of Apples: 25 gallons

WATER FOOTPRINT® CALCULATOR

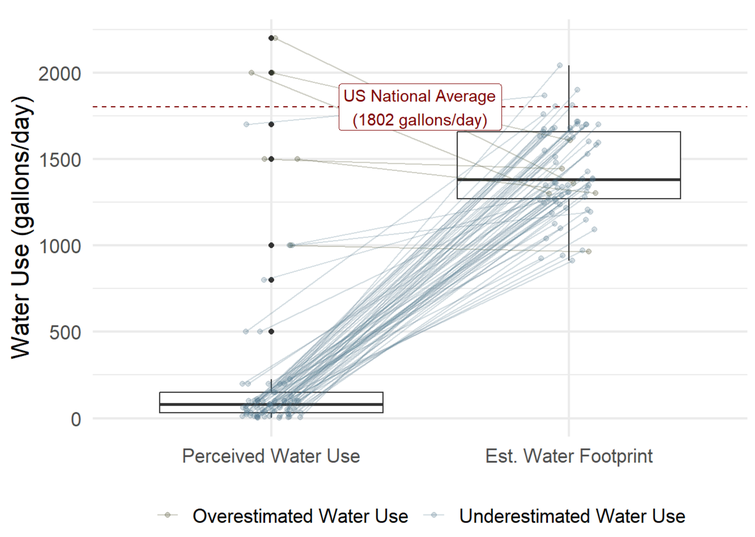

Figure 1: Students tend to underestimate their daily water use by an average of 1160 gal.

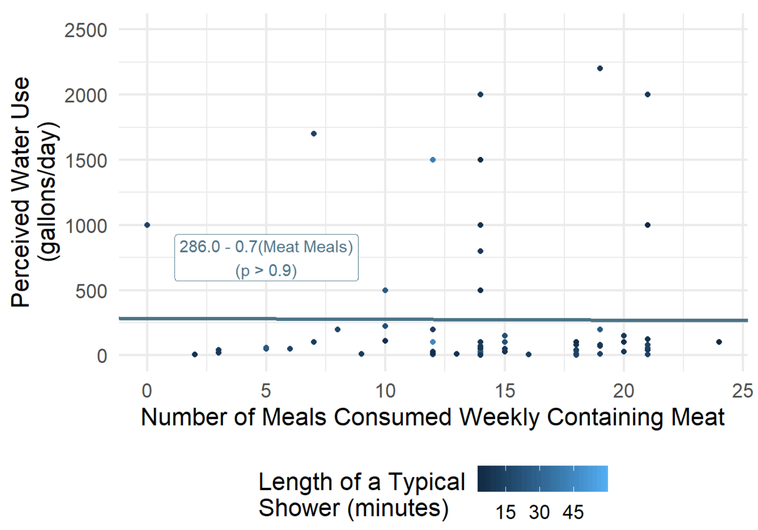

Figure 2: Students misunderstand the impact of lifestyle on their water use.

Our Objectives

The activity was designed with both the UN Sustainability Goals and Institute Learning Outcomes in mind.

6 CLEAN WATER AND SANITATION

1. **Describe** the concept of virtual water[2]
2. **Feel responsible** for their water use[3]
3. **Describe** how to reduce their individual water footprint[4]
4. **Acknowledge** their ability and responsibility to address social problems[5]

Student Response

I found [the topic] really impactful and I actually have become more self-conscious about the amount of water I use everyday.

It was a good way to raise awareness of water conservation. I personally liked how the survey involved questions about our daily lives and made us realize how much water we actually use and waste...This helped me understand how statistics could be really significant in determining the extent to which different factors contribute and affect a concern/problem for the world.

I think that this lab brought to light a big sustainability concern that affect[s] many people...In the lab reflection, I liked the prompt where we got to look at some water conservation methods.

References

1. https://www.watercalculator.org/footprint/the-hidden-water-in-everyday-products/
2. UN Cognitive Outcome 4
3. UN Socio-Emotional Outcome 3
4. UN Behavioral Outcome 3
5. Rose-Hulman Institute Outcome 8.P1

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