

# Preserving Archival Collections while Preserving the Environment: Has High-Density Storage Made SCUA More Energy Efficient?

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## INTRODUCTION

High-density storage facilities for libraries and archives offer many advantages, such as an environment tailored for paper storage and preservation and increased security, and allow for other library spaces to be used for other purposes, like group study or staff offices. But do they offer energy savings? At least one vendor points out that high-density storage “reduces space needs, which in turn can minimize a building's total volume and reduce construction costs, as well as saving energy and reducing operating costs over the life of the building.”<sup>1</sup>

In October 2016, the University of Maryland (UMD) Libraries began operating its own high-density storage facility, called Severn Library, less than two miles from the College Park campus to store both circulating and special collections and archival materials. Using the data available in UMD's *Energy Dashboard*,<sup>2</sup> we compared the energy consumption of onsite storage for Special Collections and University Archives (SCUA) in Hornbake Library to that of Severn Library to determine if using high-density storage has reduced the amount of energy needed to store archival collections.

## METHODS

Using data available from UMD's *Energy Dashboard*, we wanted to determine the total average usage for each energy type (e.g., electricity, chilled water, steam, fuel oil, natural gas) for each building and total them. Because

SCUA and Severn Library only inhabit a portion of their respective buildings, we multiplied the total amount of energy by the percentage of space each department occupies in their buildings. We could then compare the totals to determine which building used less energy.

$$\text{Library Area \%} * (\text{Total Building} \frac{\text{kBtus}}{\text{ft}^2}) = (\text{Library Storage} \frac{\text{kBtus}}{\text{ft}^2})$$

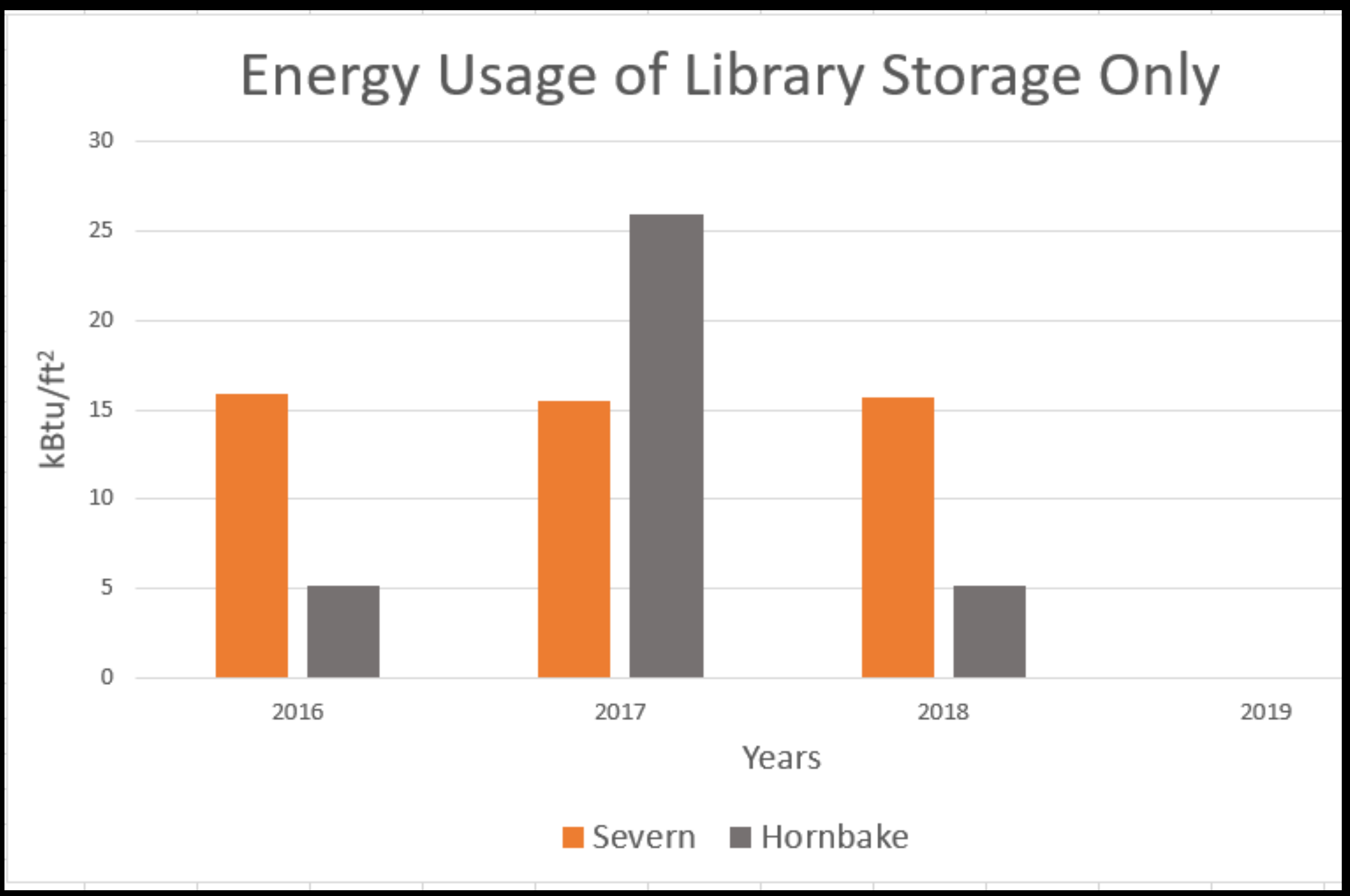
\*Total building **kBtus**/ft<sup>2</sup> refers to the average taken over the span of three years.

## RESULTS

In order to compare these readings, the average unit/sq ft of each energy source had to be converted into kBtus/sq ft, and the raw data was presented in gallons, therms, and kWh. We lacked the necessary information to be able to do this conversion. Based on incomplete information, we found that SCUA's average energy usage over the past three years was 8.35 kBtu/sq ft, and Severn's average energy usage over the past three years was 18.76 kBtu/sq ft.

In an attempt to calculate a more accurate comparison, we then used the *Energy Dashboard*'s total energy use for each building, which was already listed in kBtus/sq ft. We took the average total kBtu/sq ft for 2016-2018 and multiplied it the by the libraries' average area percentage. Based on this information, we found that SCUA's average energy usage over the past three years was 12.086 kBtu/

## Energy Usage Breakdowns for SCUA and Severn Library

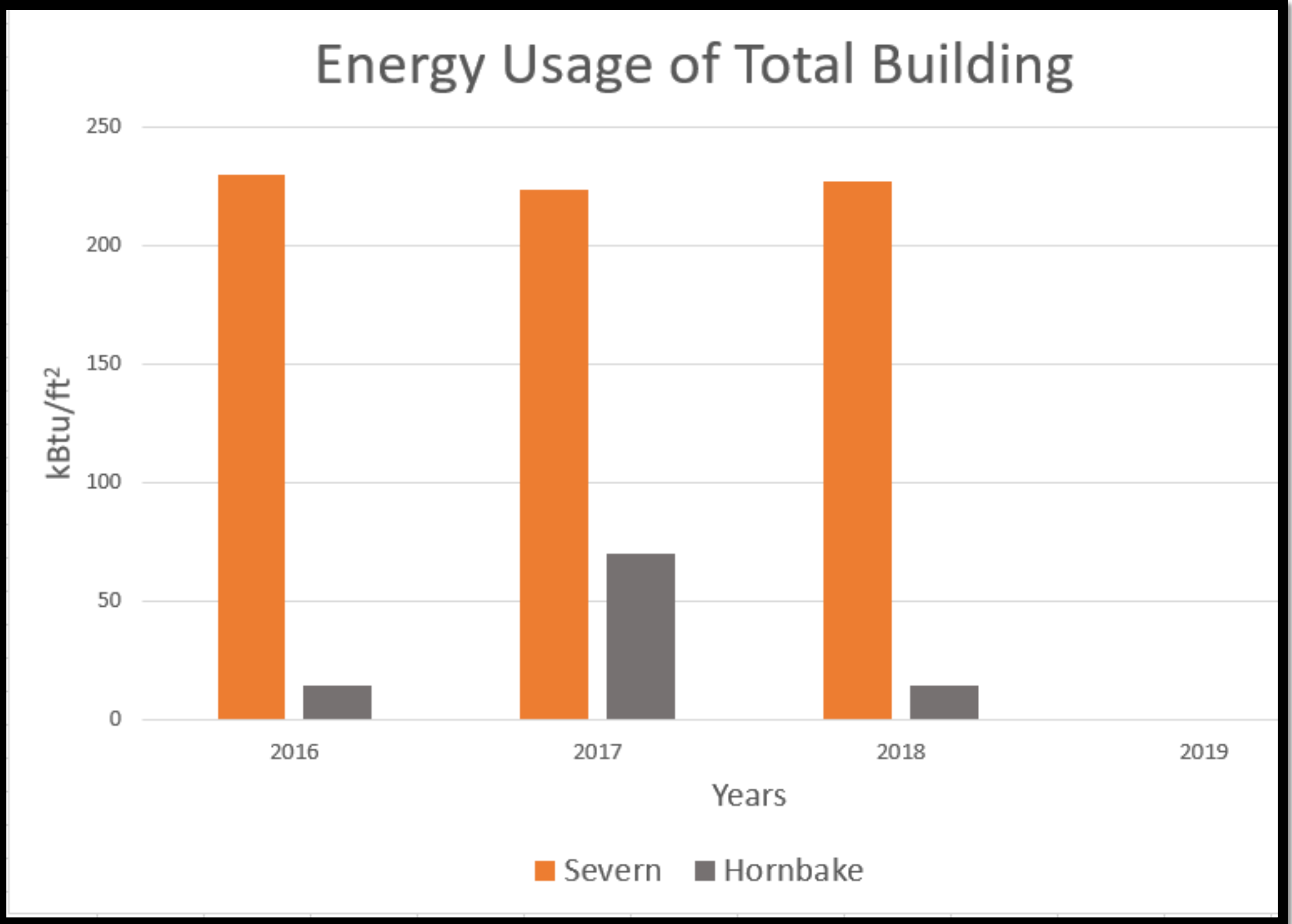


sq ft, and Severn's average energy usage over the past three years was 15.663 kBtu/sq ft. However, a regression test declared that the difference between the two data sets is not statistically significant.

## CONCLUSIONS

Using the data available through UMD's *Energy Dashboard*, we found that Severn Library does not use less energy than SCUA in Hornbake Library, though our second finding showed that the difference was not statistically significant. Our findings could be due to extra energy expenditure needed for Severn to maintain an ideal book storage environment, incomplete data, errors in our calculations, or other factors. We found that performing a thorough and accurate energy audit of a building requires many data points, some of which are not readily available, as well as collaboration with outside parties in order to truly understand a building's energy efficiency.

While additional research and collaboration should be undertaken to determine how to reduce the energy usage of Severn Library, Libraries employees can (and have already) done much to implement sustainable office practices. The Library Sustainability Committee has spearheaded many efforts since its formation in 2011, including successfully lobbied for more sustainable practices at Libraries events (e.g., bring your own mug, compostable plates/utensils), coordinated annual shredding and electronics recycling drives, and installed water bottle



refilling stations and compost bins throughout the Libraries. Several Libraries offices also participate in the campus Green Office Program, which encourages offices to reduce their environmental footprint through awarding three levels of green office certification.

We hope that bringing attention to the energy usage of the Libraries' facilities will encourage discussion and action on a larger scale and contribute to UMD's goal of making the campus carbon neutral by 2050.<sup>3</sup>

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## Hornbake Library and the Severn Building at a Glance

### Hornbake Library

Home to Special Collections and University Archives, Library Media Services, and the Maryland Institute for Technology in the Humanities

Built in 1972 as the undergraduate library

Special Collections and University Archives moved into the building in 2001<sup>4</sup>

### Severn Building

Home to Severn Library, campus facilities management, campus procurement, storage for the performing arts center, and more

Built in 1998 by the *Washington Post* as a printing plant

A portion of the building was renovated for high-density library storage and began operations in 2016