

The Buchanan Building Complex: Water Consumption

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Introduction

The Buchanan Building was originally constructed in 1956 to house the Faculty of Arts and Science¹. It is currently home to the Faculty of Arts, and is one of the most heavily used buildings on campus². The complex underwent major renovations and retrofits that were completed in June of 2010. These renovations included the installation of energy efficient HVAC and lighting systems, heat recovery, and water consumption reduction measures. The project received LEEDTM Gold Certification, and has been recognized for its incorporation of sustainable design³.

Methodology

The water consumption data for the complex is available through the online portal system. The data that is available through the online system begins in March 2011, after the renovations took place, and new water meters were installed. The data is calculated in daily increments. In some cases, the dataset does not have each day available, but does compile the total water consumption from these missing days into the next available data point. In each case, this data has been kept within the same month period, which made it possible to calculate monthly consumption levels between March 2011 and September 2014.

Water data for Buchanan A-C is gathered on one meter, and Buchanan D-E on another. Trends for both of these have been calculated separately.

Central Tendency and Variance

Buchanan A-C is currently consuming less water than Buchanan D-E on average (See Table 1). The data for Buchanan A-C also have a lower standard deviation and variance than those of Buchanan D-E (See Figure 1 & 2) demonstrating more efficient control of water consumption in that portion of the complex.

¹ http://www.library.ubc.ca/archives/hist_ubc.html

² <http://www.projects-services.lbs.ubc.ca/portfolio/renewal/buchanan-block-b.htm>

³ <http://www.projects-services.lbs.ubc.ca/portfolio/renewal/buchanan-arts-complex.htm>

Table 1: Central Tendency and Variance

	Buchanan A-C	Buchanan D-E
Mean	820	1295
Median	765	1325
Standard Deviation	157	465
Variance	24747	216456

Figure 1: Central Tendency Buchanan A-C

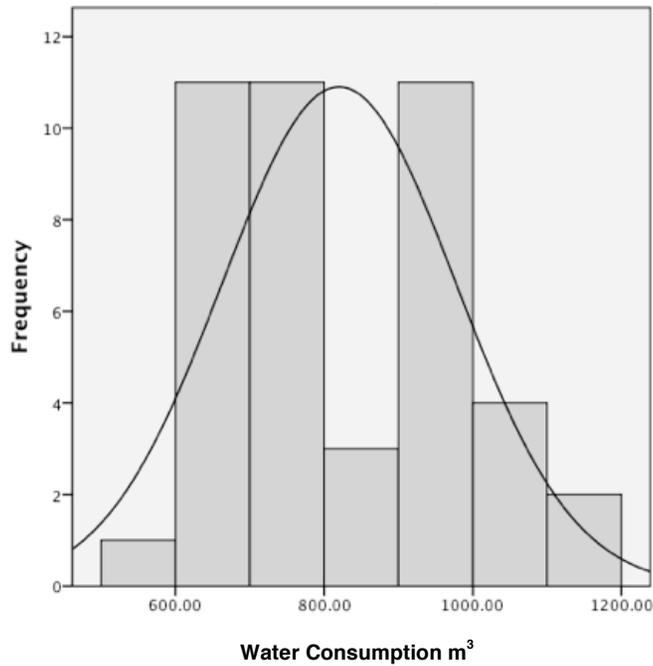
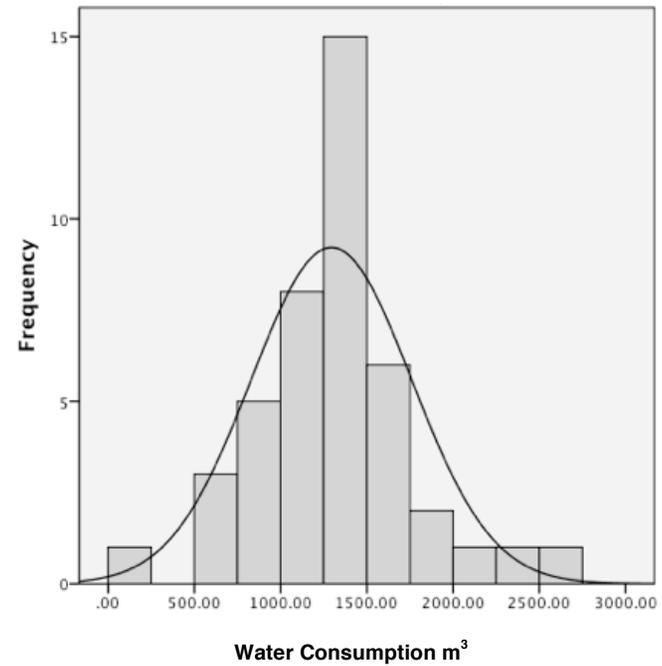


Figure 2: Central Tendency Buchanan D-E



Water Consumption Over Time

Buchanan A-C follows a consistent cycle of reduced water consumption during the summer months of May to August, and the month of December. This is presumably a result of the decrease in student activity in the complex during those times. However, Buchanan D-E does not follow a similar or consistent pattern of high and low water usage.

Figure 1: Water Consumption in Buchanan A-C over time

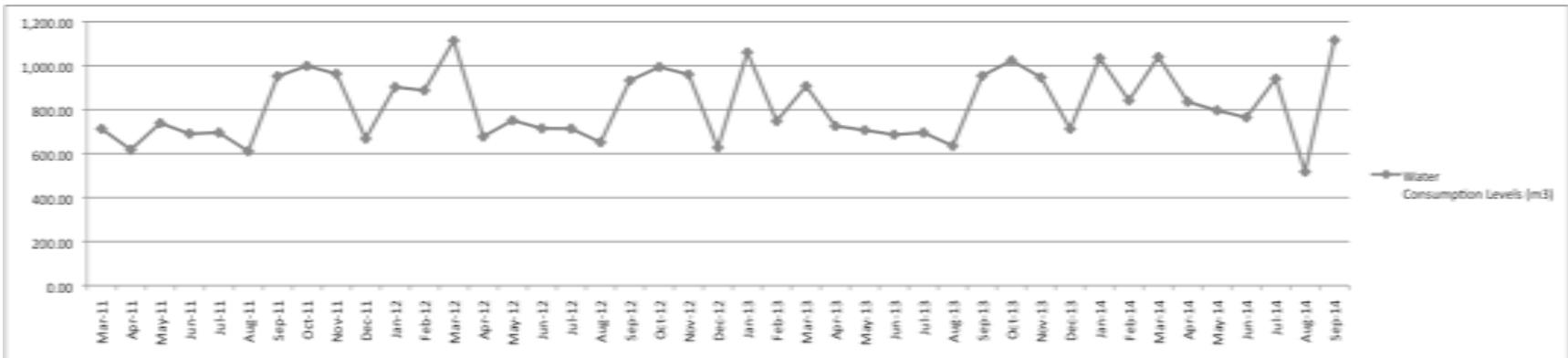
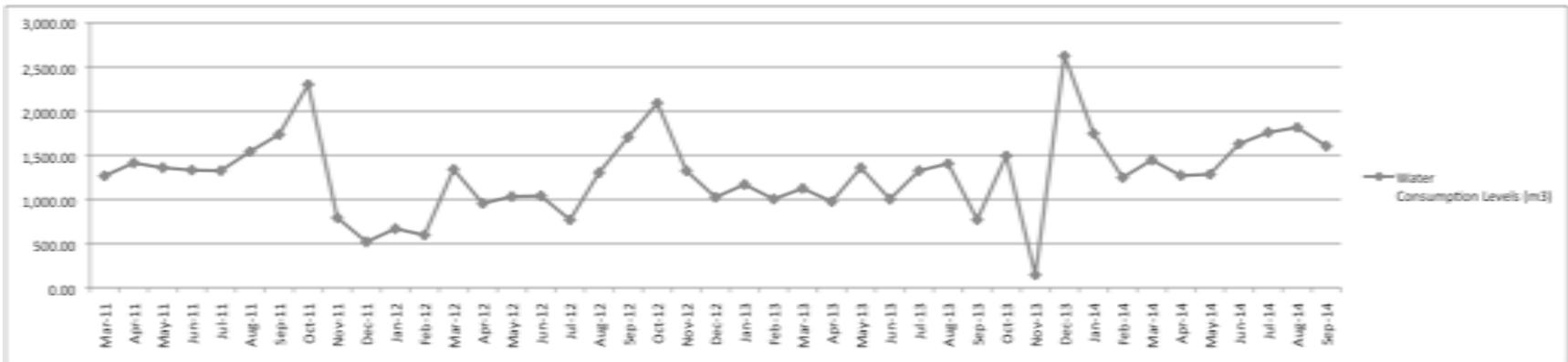


Figure 2: Water Consumption in Buchanan D-E over time



Recommendations

In the review of the water consumption results for the Buchanan Building Complex there are not any standout issues that require immediate attention. There are, however, opportunities for future water conservation efforts in the Buchanan Buildings to future enhance water management efforts.

The water consumption results indicate a lower standard deviation and variance in Buchanan A-C compared to Buchanan D-E. This can be seen to demonstrate a more consistent rate of water consumption in Buchanan A-C. It would be worthwhile to explore what water conservation measures are in place in each portion of the complex, and how to ensure that similar practices are in place throughout the buildings to better control for this variance.



<http://www.projects-services.lbs.ubc.ca/portfolio/images/renewal/buchanan-block-a-1.jpg>

Monthly consumption rates indicate that water usage in the Buchanan complex is largely dependent on student use of the facilities. This means that water conservation efforts need to target students, particularly at peak use times when term is in session.

The implementation of these types of programs may prove to be necessary, as water consumption rates appear to be heading into their highest overall trend since water data first began to be gathered post-renovation. The consumption rate has been higher in almost every month in 2014 compared to those in previous years (See Figures 1 & 2). It will be important to monitor this trend to determine what might be causing this increase in water consumption patterns in the facilities, and to seek solutions to mitigate the issue.

The consideration of these recommendations will help to better control water usage and management in the Buchanan Buildings, and will continue to further the sustainability initiatives on the UBC campus.