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Autumnal Equinox Final Version
BU CAS IN 250
Monday September 29, 2025

The **Autumnal Equinox** is a day when the Sun sets almost exactly west because Earth's axis is neither tilted toward nor away from the Sun. This makes the sun be a reference point for the direction of west without a compass. Observing the sunset on the day of the Autumnal Equinox allowed me to see how the Sun's position aligned with my location and to confirm the location of the sun setting westward.

Experimental Procedure

Objective: Use the autumnal equinox sunset to locate true west from multiple points and compare observations across dates.

My experiment took in the state of Massachusetts in 3 separate locations, spread across 3 weeks of the month of September beginning on September 8th and ending on September 22nd. These following were the location of my observations: Commonwealth Ave near BU Questrom and Fenway area, East Chop Lighthouse, Martha's Vineyard, and lastly BU Law Tower, 17th floor, facing West. At each site, I took about ten photographs within a 20 minutes span, beginning around 10 minutes before the official sunset time and until about 10 minutes after. Along with each photo, I noted the exact time and compared it to that day's published sunset time, I also noted my exact location on the map. This allowed me to track the Sun's position but also the color changes in the sky as the sunset approached the horizon. Over the course of several weeks, I learned the importance of selecting an obstruction-free viewing point, because buildings and trees blocked the view at lower elevations. Higher altitude locations, such as taller buildings such as BU Law, provided a much clearer view of the sunset. Clear skies helped see the most accurate results, whereas cloudy days often interrupted the ability to see the sun itself and forced me to rely on color of the horizon as an indicator of the direction of the sunset. I also realized that arriving before the official sunset time was essential in order to watch the sun set fully. By the final week, these realizations helped me capture the most accurate observation of the Sun setting directly toward the west on the day of the equinox.

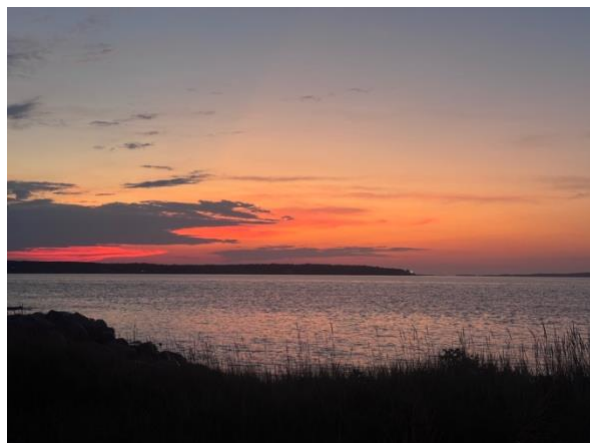
Data Collection

WEEK 1 – September 9th, 2025



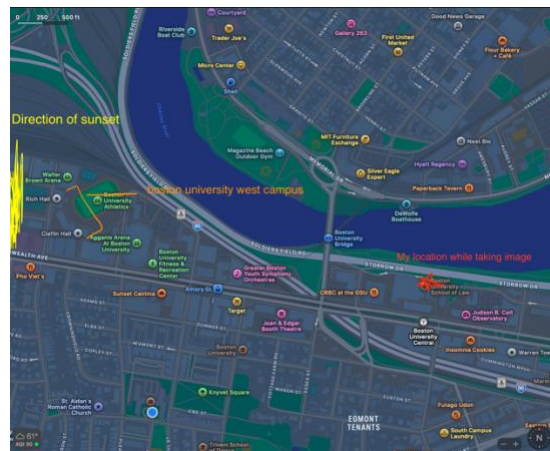
This observation was made at 7:03pm, and the sunset was supposed to be at 7:06pm. It was taken from my car, and the location of this observation is on intersection of the Fenway stadium. Although, I didn't specifically get to see the sun setting, it is visible through looking at the skies change colors that the sun set. I tried getting a view from different angles but wasn't successful. This observation doesn't specifically show the sun setting, but it can be assumed the skies changing as the sunset. From my understanding, the sunsetting is just when the skies start becoming a darker shade, and that's depicted through the image. I do realize that location makes a significant difference in how the sunset may look for someone. I believe improving data collection for documenting the Autumnal Equinox may require being in a location with low-rise buildings, and clear visibility. I think it may help to be at the location 30 minutes prior and after the indicated sunset time for that day.

Week 2 – September 14th, 2025



This observation was made at 7:13pm, and the sunset was at 6:53. I made this observation on Martha's Vineyard, right by the East Chop Lighthouse, which is supposed to be the best sun set view on the entire island. I believe the direction of the sunsetting was northwest, though I was slightly late and missed seeing the sun set into the horizon. Though, I was able to see the horizon's changing colors and get an idea of the direction. I'm confident in these findings, as I also understand the sun sets westwards. It is visible by looking at the map, and my location that the sun set westwards. Also visible from the compass on the bottom right, I am facing directly north, and the direction I'm facing when I made the observation is westward. Although, it is important to realize that if I saw the actual sunsetting I could be more accurate about the direction. There weren't many landmarks around my location, other than the East Chop lighthouse. I do believe being in a location with less landmarks/buildings could be very helpful with getting an accurate view.

Week 3 – September 22nd, 2025 – Day of Autumnal Equinox



I made this observation on September 22, 2025 at 6:38pm, and the sun was supposed to set at 6:41pm today. I initially went out onto Commonwealth Avenue, right in front of the GSU, but wasn't really able to capture the sun, due to the angle and obstructions. The observation I've attached was taken in the BU law building, on the 17th floor, facing westward towards BU west campus and Boston College. As visible in the picture, the sun is towards the left and is almost dipping under the horizon. The weather app also indicated that it was slightly cloudy, so that could be why the sun isn't the most visible. I believe my picture accurately shows the sunset westwards, as indicated by the surrounding buildings. Even without a compass, BU West campus is a good indicator of where west is located.

Data Processing

Looking at my observations over the month of September, I found a clear progression in both my technique and accuracy. In the first week, obstructions and the choice of location really hindered my ability to see the sun set directly, forcing me to rely on color changes in the sky. The second week on Martha's Vineyard, although I was slightly late, the open horizon right on the water gave me a much stronger idea of direction and confirmed the sun set westwards, even if the timing reduced my accuracy. On the day of the equinox, observing from the BU Law building at a much higher elevation, I was finally able to capture the Sun close to the horizon with far fewer obstructions. This helped me realize the importance of selecting a high, clear viewing point and arriving prior to the scheduled time of sunset.

Overall, the experiment helped me understand that while weather conditions and viewing angles affect the accuracy a lot. The Sun did set almost exactly westward on the day of the equinox, and my results were fairly accurate. Although, if I were to repeat this experiment next year, I would improve it by planning additional observation sites with obstruction free horizons, looking at weather forecasts to avoid cloudy days, and making multiple observations before and after the sunset to ensure the direction of the sunset. These improvements would allow for more consistent observations and an even clearer results of the sunset aligning with true west.