



Understanding Light Pollution: Causes, Effects, and Solutions



Hello! My name is Addison Greene (pictured on the left top in 2014 and bottom in 2024), and I am a senior in high school. I've been involved in Girl Scouts since I was in first grade and am now working on my Gold Award. The Gold Award is the highest achievement in Girl Scouts, and for my project I decided to spread awareness about light pollution and share ways to help minimize the harmful effects it poses. Hopefully, this blog can help you make a difference in a world that is rapidly becoming more and more reliant on artificial lights.

Artificial light has become a staple in the modern world, whether that be car headlights, porch lights, street lamps, or even indoor lighting. It's hard to go somewhere to escape the presence of artificial light, which is the backbone of light pollution. But what is light pollution?

Light pollution is the human-made alteration of outdoor light levels. This includes your porch lights, street lamps, and even Holiday lights. There are many different types of artificial lighting that lead to this alteration of outdoor light levels, and they all lead to negative effects. There are

five big negative effects of light pollution: it disrupts wildlife, impacts human health, wastes money and energy, contributes to climate change, and blocks our view of the universe.

As for disrupting wildlife, artificial lights and light pollution affect more than baby sea turtles trying to make it to the ocean. These lights alter night into an artificial day for most wildlife, some of which include insects, deer, owls, and birds. Animals rely heavily on the day and night cycle, so by effectively taking away their night and replacing it with another ‘day,’ the sleep patterns of these animals are negatively impacted. Light pollution can also harm ecosystems as predators use light to hunt and prey typically use darkness to hide. Taking away that darkness takes away many animals’ safe spots resulting in a decline of some species’ populations.

Light pollution negatively affects humans’ sleep schedule. We follow a circadian rhythm that follows the day and night cycle, similar to animals. The increased light reduces melatonin production, which is most commonly known to help induce sleep, and has a wide variety of other benefits. This lack of sleep and melatonin can cause many health issues, some of which include fatigue, headaches, stress, and anxiety.

Light pollution also wastes money and energy. By constantly using or overusing artificial lights, a lot of energy is wasted. This waste of energy then wastes money. The energy usage can also contribute to climate change because some of the sources used to power these lights release greenhouse gasses into the atmosphere. Greenhouse gasses help trap the heat in our atmosphere, which can lead to overheating and is one of the causes of climate change. Some artificial lights also release heat which can further contribute to climate change.

Lastly, light pollution blocks our view of the universe. Lights also illuminate the sky and block a few to all of the stars depending on the severity of the pollution. To the right is a photo from around Oxford, Ohio showing how much light pollution Walmart contributes



to our skies. Yager Stadium is another big pollutant, especially during the school year.

Luckily, there are steps that all of us can take to make a difference in the amount of light pollution in our city. Here are five responsible lighting practices you can follow:

- **Useful**
 - Use light only if necessary. Make sure all lights have a clear purpose and consider its effect on the surrounding area, including wildlife and their habitats.
- **Targeted**
 - Direct the light so it only shines where necessary. Use shielding to prevent shining the light beyond where needed and aim the direction of the light downwards.
- **Low Level**
 - The light should be no brighter than necessary. Remember that some surfaces may reflect more light into the sky than intended.
- **Controlled**
 - Use light only when necessary. Use motion detectors and timers to make sure light is available when needed, dimmed when possible, and turned off when not needed.
- **Warm-Colored**
 - Use warmer colored lights where possible. Limit the use of shorter wavelength lights to the least amount needed as they are more harsh.

If you follow these five lighting practices you will help to minimize the light pollution in Oxford and limit its harmful effects. To help you can also spread awareness on this issue and it could be as simple as talking to your friends, family, or neighbors. While we are becoming more reliant on artificial light, we still have the power to control the effects it has on us and our environment.

Please take a moment to fill out the survey below to help me measure the impact of my Gold Award. Thank you for reading and I hope you try to make a difference with light pollution.

Survey Link: <https://forms.gle/Gc6AvUTa2JwWZEsE7>