



Where have all the stars gone?...and how is it affecting you?

Light pollution is an extremely large problem that goes relatively unnoticed by the public. Not many people remember how visible the natural night sky used to be: filled with stars and the Milky Way stretching across the universe. Instead, almost everyone today is accustomed to seeing only a few of the brighter stars at night scattered across a dull gray or pink haze. *The World Atlas of Artificial Night Sky Brightness* found that **over 80 percent** of the earth's population is affected by light polluted skies when they look up. **In Europe and the United States, 99 percent of these populations are living under polluted skies.** This issue is getting worse as well with the transition to LED lights, which are much brighter than older lights.

There are four main types of light pollution – light trespass, clutter/over-illumination, glare and sky glow. Light trespass is when light shines in unwanted or unintended directions or areas (a street light shining into your window). Light clutter (or over-illumination) is when lights are grouped together or near each other which causes them to blend together (think of urban areas where street lights, path lights, building lights all blend together). Glare is excessively bright light which can impair your vision (bright LED vehicle headlights while driving in the dark). The last type; sky glow, is when the sky above populated areas becomes brighter due to lighting which causes a glow effect in the sky above. All of these increases brightness of the night sky which in turn reduces the amount of stars visible.

Humans have evolved to rely on a circadian rhythm to regulate hormonal production and balance. Some of the key hormones that the circadian rhythm helps regulate include serotonin, dopamine, cortisol, melatonin and growth hormone. Serotonin (happiness hormone), dopamine (mental and physical alertness) and cortisol (stress hormone) are all influenced by blue light that is taken in between the times of 6-10am in the morning. Melatonin (sleep hormone) and growth hormone (cell repair and metabolism) are triggered by increasing darkness in the late evening. Therefore, changes to natural lighting affects these hormones. When these hormones are out of balance they can cause issues such as depression, anxiety, weight-gain, sleep disorders and more. There have been several studies that have shown artificial lighting at night creates imbalances that increase breast and prostate cancers.

Not only does light pollution have negative impacts on our well-being it also has a significant ecological impacts, as well as a huge environmental footprint, primarily because of wasted energy. *The International Dark-Sky Association (IDA)* estimates of all the outdoor lighting, at least 30 percent is wasted in the United States. This energy waste equates to about 21 million tons of carbon dioxide being released and costing 3.3 billion dollars per year. Unlike other sources of pollution such as air or water, light pollution is an extremely easy and cheap thing to fix! – the only problem is that it is not often viewed as a problem, or it's not even on people's

“radar”.



Here are some of the easiest fixes to make a huge difference in energy consumption and to reduce impacts on us and our sky:

1. Shielding outdoor lights – light should be directed to the area that actually requires it. Concentrating the light will reduce the need for more light sources- and lower wattage options can be used.
2. Using warmer coloured lighting and/or warmer spectrum lights instead of LEDs – LEDs are typically high Kelvin (bright) which is in the blue/white spectrum, regardless of their “colour”. Therefore, they mimic “daylight”. The IDA recommends using a maximum 3000 Kelvin, warm-white bulb for outdoor lighting. However, lower Kelvin (brightness) is always recommended. Therefore, old-fashioned orange-yellow sodium bulbs with lower wattage are best. In general it is always recommended to reduce the amount of blue-white light.
3. Dimmers, timers and motion sensors – these are excellent options to consider when purchasing or updating outdoor lighting or implementing to current outdoor lighting- they save our heads and nature too!
4. Lighting laws/ordinances – towns, cities or municipalities can implement laws and restrictions by creating a lighting code to reduce the amount of light pollution. These help create a safer and healthier community as well as a clearer night sky.
5. Create awareness – not many people even know this is an issue and could be impacting them personally- spread the knowledge!



Dark Sky Preserves were established to protect areas (great observatories) from light pollution. They are becoming increasingly popular, for people who want to view the full night sky without interruption. Currently Canada is the only country that has standards for Dark Sky Preserves; we have 22 Dark-Sky Preserves recognized by the Royal Astronomical Society of Canada (RASC). These preserves are areas where no artificial lights are visible. Often neighbouring municipalities adopt better lighting practices to extend the area influenced and the benefits. Two of these dark-sky preserves fall within The Land Between. They include the very first preserve recognized in Canada: the Torrance Barrens Dark-Sky Preserve was recognized in 1999. The second preserve is recent: the North Frontenac Township preserve was established in 2013.

Light pollution not only has effects on our mental and physical health it is also disconnecting us from the night sky and the stars, which have inspired artists, writers and scientists since time immemorial. In 1994 there was a massive earthquake that hit Los Angeles overnight and wiped out the power across the entire city. People went outside to see what had happened and caught their first ever glimpse of an unaffected and unpolluted night sky, making the Milky Way visible for the first time in their memories. This was so new to some people it caused them to freak out; they started calling the police and reporting a “silvery cloud” hovering over the city!

How much artificial light is polluting your world? Check out this map:

<https://www.lightpollutionmap.info/>

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- Light and Dark and Human Health – Joan E. Roberts, Ph.D.
- <https://rasc.ca/sites/default/files/publications/JRASC-LPA-Special-Issue-hr.pdf>
- <https://www.darksky.org/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3002207/>
- <https://timeline.com/los-angeles-light-pollution-ebd60d5acd43>