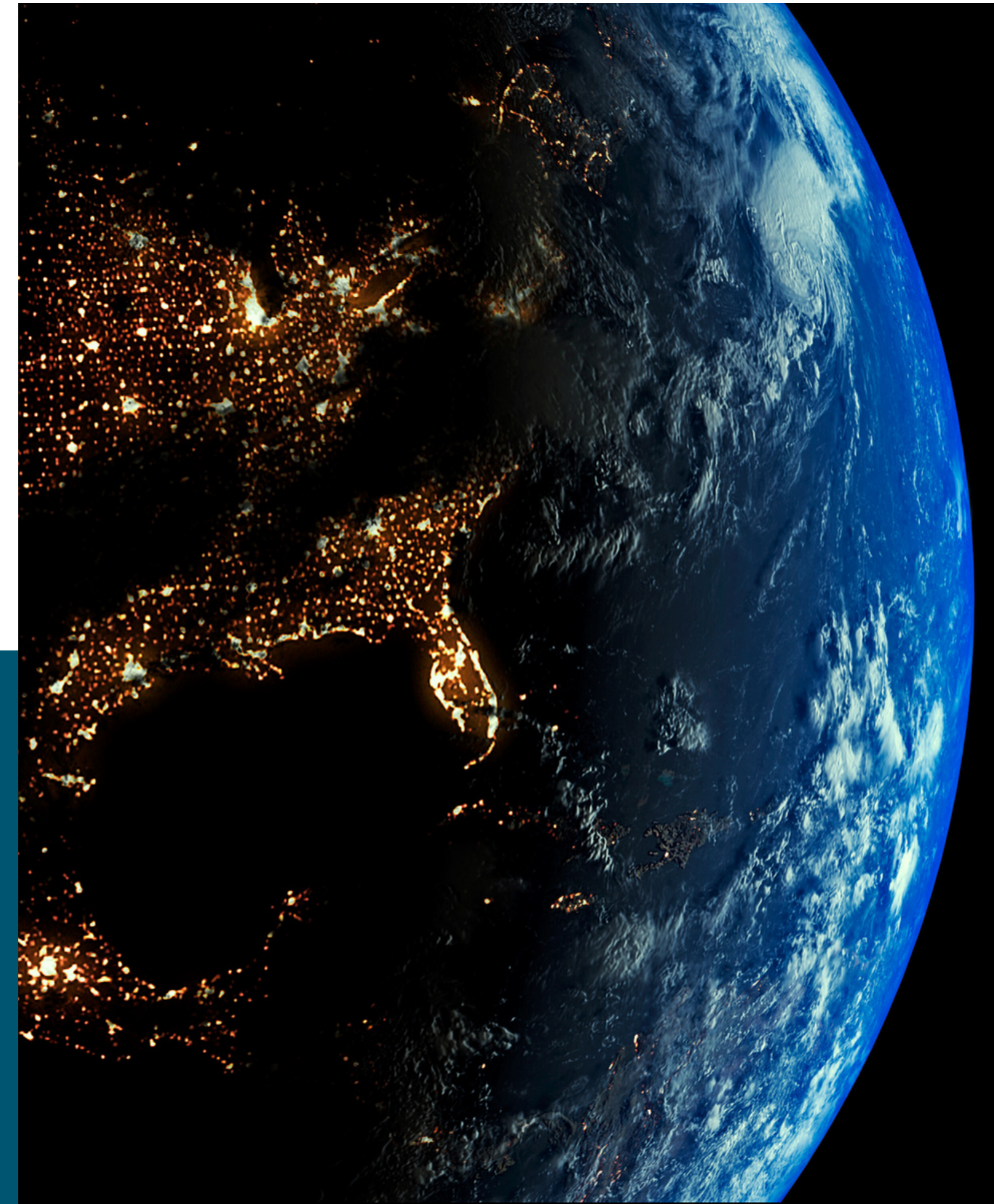


WHAT ARE THE EFFECTS OF LIGHT POLLUTION ON OUR RIVERS AND LAKES?

LIGHT POLLUTION

Light pollution is unwanted, inappropriate, or excessive artificial light that can affect wildlife behaviour, human health, and environmental quality. Excess light is also a form of waste energy contributing to climate change.

In 2016, the World Atlas of Night Sky Brightness was published. It portrayed light pollution as a global issue affecting more than 80% of the world's population and several natural environments, especially coastal areas and water ecosystems.



TYPES OF LIGHT POLLUTION

GLARE

- Visual stimulus created by uncontrolled and excessive brightness in the field of view.
- Glare increases difficulty in spotting nighttime hazards.
- Ex: coach lights on homes, unshielded spotlights.

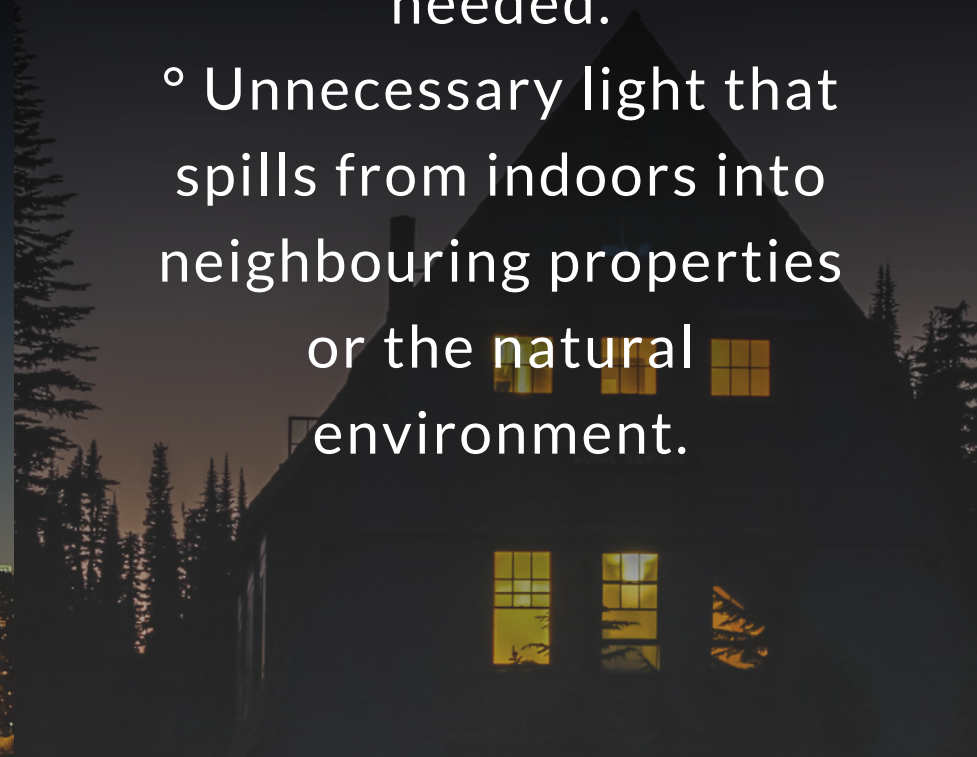
SKYGLOW

- Brightening of the night sky over inhabited areas.
- Results in a pale night sky that washes out starlight.
- 80% of the world's population live under skyglow.



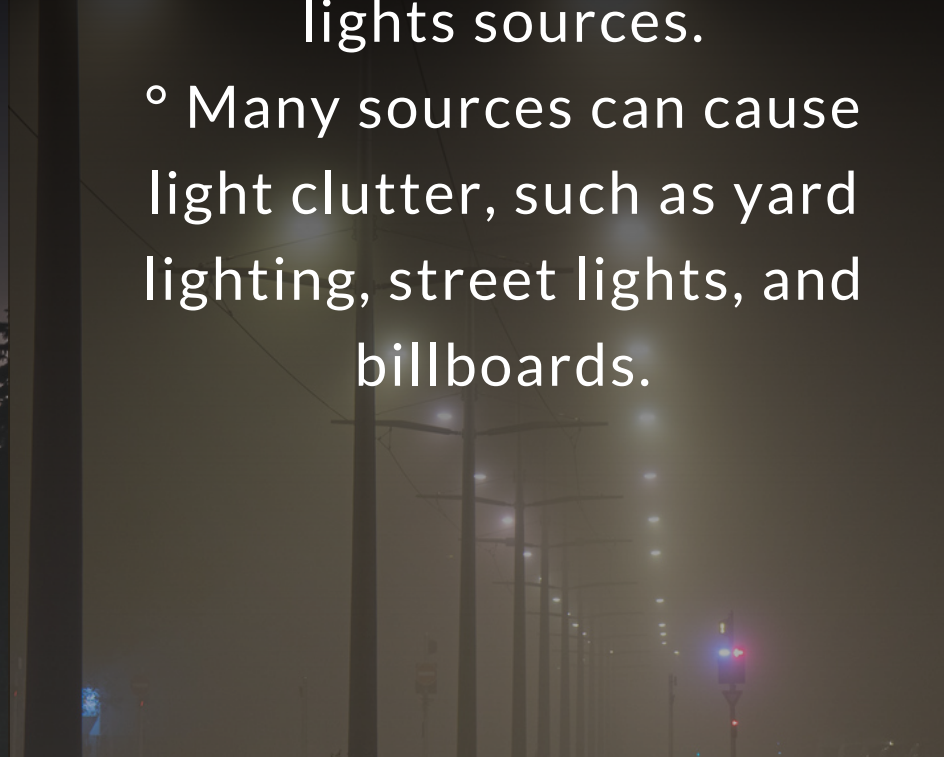
LIGHT TRESPASS

- Light reaching where it is unintended or not needed.
- Unnecessary light that spills from indoors into neighbouring properties or the natural environment.



CLUTTER

- Bright, confusing, and excessive grouping of lights sources.
- Many sources can cause light clutter, such as yard lighting, street lights, and billboards.



EFFECTS ON AQUATIC LIFE

Artificial light that illuminates coastal areas and penetrates the water's surface can severely disrupt the natural behaviors and processes of aquatic life.

For many aquatic species, including corals, fish, and zooplankton, light cues play a critical role in spawning, predation, navigation, and daily rhythms.



EFFECTS ON CYANOBACTERIA

This phytoplankton produces oxygen and is a vital food source in aquatic ecosystems. Artificial light can reduce their photosynthetic efficiency, affecting their survival and having tremendous effects in the entire ecosystem.

EFFECTS ON WILDLIFE

Bats, moths, owls are some of the many creatures who rely on the dark to hunt, mate, and conduct their nocturnal lives. The interference of artificial light disrupts their activities, putting entire ecosystems out of balance.

Migratory birds that rely on stellar and lunar cues for navigation often become disoriented in brightly lit urban areas, leading to collisions with buildings and other structures. Similarly, the confused flights of moths around street lamps waste their energy and make them easy prey, altering predator-prey dynamics.



EFFECTS ON OWLS

Owls rely heavily on their keen vision in low-light conditions to catch prey. Increased ambient light can reduce the shadows and dark pockets they use to their advantage, making it challenging for them to catch their prey.

EFFECTS ON HUMANS

Light pollution can severely disrupt our circadian rhythms—the internal biological clock that regulates sleep-wake cycles.

This leads to poor sleep quality and can contribute to sleep disorders. Moreover, a misaligned circadian rhythm has been linked to various health issues, including depression, obesity, cardiovascular problems, and even certain types of cancer.

Beyond physiological impacts, light pollution robs us of the experience of a natural night sky, leading to a disconnection from nature, which affects our psychological well-being.



TAKE ACTION

You can also take part to prevent light pollution and conserve the ecosystems around rivers and lakes.

Here are some simple changes you can make:

- ✔ Install **light shields** to concentrate the light where needed (such as doorways and stairs) while eliminating glare and light trespass.
- ✔ Choose **lower-wattage bulbs** and change cold lights into **warm lights** to reduce the impact on biological rhythms.
- ✔ Use **timers** and **motion sensors** to reduce average illumination exposure.
- ✔ **Turn off** unnecessary lights.
- ✔ Convince others to **join efforts** to reduce light pollution and **support dark sky initiatives**.



CONCLUSION

Light pollution has effects on natural cycles, wildlife behaviour, and human health.

Urbanization near water bodies intensifies light pollution, impacting aquatic life and migratory birds. Mitigation strategies, such as Dark-Sky Preserves and lighting ordinances, offer solutions.

Personal actions, like using light only when and where needed and raising awareness, are vital to curbing this environmental concern.

REFERENCES

DLC. (2022) What is an outdoor lighting ordinance?

<https://www.designlights.org/wp-content/uploads/2022/12/Outdoor-Lighting-Ordinances.pdf>

Government of Canada (2023) Dark-Sky Preserves

<https://parks.canada.ca/voyage-travel/experiences/ciel-sky>

Hölker F, Bolliger J, Davies TW, et al. (2021) 11 Pressing Research Questions on How Light Pollution Affects Biodiversity. *Front. Ecol. Evol.* 9:767177. doi: 10.3389/fevo.2021.767177

Mu H, Li X, Du X, et al. (2021) Evaluation of Light Pollution in Global Protected Areas from 1992 to 2018.

Remote Sensing. 13(9):1849. <https://doi.org/10.3390/rs13091849>

Rajkhowa R, (2014) Light Pollution and Impact of Light Pollution. *International Journal of Science and Research (IJSR)*. Vol. 3(10). www.ijsr.net

UNEP (2023) Global light pollution is affecting ecosystems -what we can do?

<https://www.unep.org/news-and-stories/story/global-light-pollution-affecting-ecosystems-what-can-we-do>

University of Exeter. (2021) Rapid increase in global light pollution. *ScienceDaily*, 14 September 2021.

www.sciencedaily.com/releases/2021/09/210914111302.htm.

Image sources: Canva/Getty Images

For more information, please visit
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