

DID YOU KNOW?

Artificial Light at Night Can Harm Your Health!

Humans evolved with the rhythms of the natural light-dark cycle of day and night. Due to artificial light, most of us no longer experience truly dark nights.

Circadian Rhythm & Melatonin

Like most life on Earth, humans adhere to a circadian rhythm – our biological clock. It's a sleep-wake pattern governed by the day-night cycle.

Our biological clocks are important. They interact with our body systems, changing our hormone levels and even modifying our genetic code. Natural light helps set our clocks to Earth's 24-hour day-night cycle. Exposure to artificial light at night disrupts this process, increasing our risks for cancers and other potentially deadly diseases.

Blue-rich light at night is particularly harmful. Most LEDs used for outdoor lighting, computer, tablet and smartphone screens, TVs, and other electronic displays emit abundant blue light.

Light Pollution Threatens Wildlife

For billions of years life has relied on Earth's day-night rhythm to govern life sustaining behaviors. It's encoded in the DNA of all plants and animals. Humans have radically disrupted this cycle by lighting up the night. Research shows that artificial light at night has negative and deadly effects on many species.

Sea turtles live in the ocean but hatch on the beach at night. Hatchlings find the sea by detecting the bright horizon over the ocean. Artificial lights can draw them away from the sea, stranding them on land. In Florida alone, millions of hatchlings die this way every year.

Many insects are drawn to light, but artificial lights can create a fatal attraction. Declining insect populations negatively impact all species that rely on insects for food or pollination.

Nocturnal mammals sleep in the day and are active at night. Light pollution disrupts their nighttime environment.

Light pollution hinders astronomy, harms the planet, wastes money, and threatens the health and safety of all life.

You Can Help Save Our Stars!

Light pollution is excessive or inappropriate outdoor lighting. Common forms include:

- **Glare** - excessive brightness causing visual discomfort
- **Urban sky glow** - brightening of the night sky
- **Light trespass** - light falling where it's not intended or needed

Solutions to light pollution are simple, and save money!

What You Can Do

- Use fully shielded, dark-sky friendly fixtures. That means lights shine down, not up.
- Only use lights when needed. Install timers and dimmer switches, and turn off lights when not in use.
- Use the right amount of light. Too much light is wasteful and impairs vision.
- Use long-wavelength lights with a red or yellow tint to minimize negative health effects.

Lighting for Good Health

- **Keep the blues away** - Two to three hours before bed, avoid tablets, smartphones, computers, televisions, and other electronic screens. They emit blue-rich light, making it difficult to fall asleep.
- **Keep your bedroom dark** - Use blackout curtains and cover or remove other light sources. If you need a night-light, use one that emits dim red or amber light.

FOR MORE INFORMATION OR ANSWERS TO YOUR DARK SKY QUESTIONS VISIT WWW.DARKSKY.ORG OR CONTACT THE BON ACCORD TOWN OFFICE



CELEBRATING THE NIGHT SKIES BY LIMITING LIGHT POLLUTION

What does it mean and what should you know about it?

What is Light Pollution?

Most of us are familiar with air, water and land pollution but did you know the light can also be a pollutant?

Light pollution is the inappropriate or excessive use of artificial light. It can have serious environmental consequences for humans, wildlife and our climate. This brightening of the night sky caused by street lights and other man-made light sources, has a disruptive effect on natural cycles of all living things on earth while at the same time inhibits the observation of the stars and planets that surround us.

What does it mean to be Canada's first International Dark Sky Community?

Bon Accord is the first Canadian community to receive IDA status, and only the eleventh Dark Sky Community in the world.

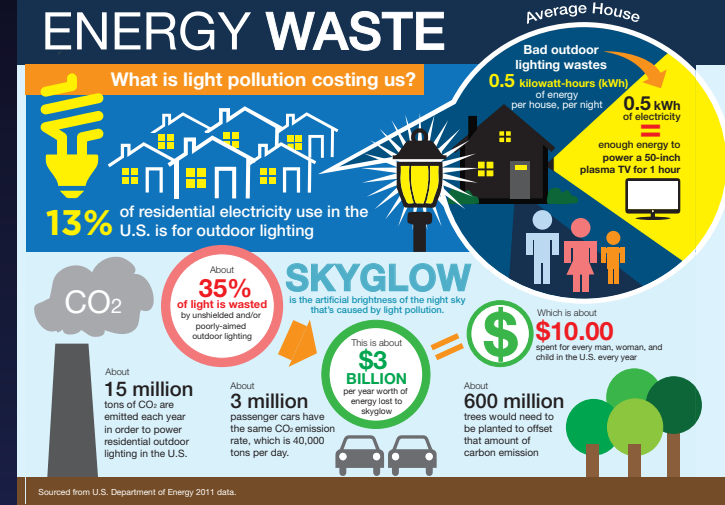
The quality of Bon Accord's night skies is comparable to some of IDA's Dark Sky Parks. Residents have demonstrated their commitment to maintaining these conditions while allowing the town to grow responsibly and sustainably. This long term initiative helps provide Bon Accord the ability to develop sustainable, responsible guidelines for growth while maintaining our existing quality of life goals for the community.

Bon Accord has enacted one of the most progressive and comprehensive outdoor lighting policies in Canada. The Light Efficient Community Standards Bylaw 2015-07 calls for fully shielded light fixtures and limits on the total amount of light allowable on public and private properties. It also establishes a series of lighting "zones" throughout the town where allowable light levels are based on expected ambient light conditions.

To show support for the bylaw, Bon Accord has brought nearly all municipally owned lighting into compliance with this bylaw.

Residents throughout Bon Accord value their ability to view the night sky and acknowledge its importance to our community,

ENERGY WASTE



LIGHT POLLUTION IS REVERSIBLE!



A stunning example of the effects of light pollution. Photos were taken before and after the 2003 Northeast US blackout, a massive power outage affecting 55 million people. Photos by Todd Carlson.

NOT ALL ARTIFICIAL LIGHT IS CREATED EQUALLY



Exposure to blue light at night is especially harmful because it is particularly disruptive to circadian rhythms and melatonin production. Unfortunately, most LEDs used for outdoor lighting — as well as computer screens, TVs and other electronic displays — create abundant blue light. We recommend using light bulbs that emit warm white light with a color temperature of 3000K or lower.

PROTECTING THE NIGHT SKY STARTS WITH YOU!

- 1 Light only what you need**
- 2 Use energy efficient bulbs and only as bright as you need**
- 3 Shield lights and direct them down**
- 4 Only use light when you need it**
- 5 Choose warm white light bulbs**

"BRIGHTER" DOES NOT MEAN "SAFER"

Lighting up the nighttime environment does not necessarily improve safety or security. This may seem contradictory, but there is no clear scientific evidence that increased outdoor lighting deters crime and increases safety.

Glare from bright, unshielded lights actually decreases safety. See how glare in the photo on the right makes it hard to see the man at the gate? Glare creates deep shadows, making it more difficult to see. It also shines into your eyes, constricting your pupils. This diminishes your eyes' ability to adapt to low-light conditions.

So, is that bright light really making this area safer?



Artificial Lights Disrupt the World's Ecosystems

Plants and animals depend on Earth's daily cycle of light and dark to govern life-sustaining behaviors such as reproduction, movement, sleep and protection from predators. Scientific evidence suggests that artificial light at night has negative and deadly effects on many creatures, including amphibians, birds, mammals, invertebrates and plants.

Coral

More than 130 different species of coral on the Great Barrier Reef span new life by moonlight. Bright urban lights can mask the moon's phases, throwing the coral's biological clocks out of sync.



Sea Turtles

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Frogs and Toads

Glare from artificial lights can impact wetland habitats that are home to amphibians, such as frogs and toads, whose nighttime croaking is part of the breeding ritual. Artificial lights disrupt this nocturnal activity, interfering with reproduction, which reduces populations.



Birds

Birds that migrate or hunt at night navigate by moonlight and starlight. Artificial lights can cause them to wander off course towards dangerous nighttime landscapes of cities. Every year millions of birds die colliding with needlessly illuminated buildings and towers.



DID YOU KNOW?

THE STARS ARE PART OF OUR COMMON HERITAGE!

The nighttime environment is a precious natural resource. Uncontrolled outdoor lighting *hides* the stars and *changes* our perception of the night. Until recently, our ancestors experienced a night sky brimming with stars that inspired science, religion, philosophy, art and literature. Let's protect the natural night sky *for future generations*.

Inspired by the Night

Van Gogh painted "Starry Night" in Saint Rémy, France, where the Milky Way can no longer be seen. If alive today, would he be inspired to paint this masterpiece?

"I know nothing with any certainty, but the sight of the stars makes me dream."
— Vincent van Gogh

The night sky provides perspective and inspiration, allowing us to reflect on our humanity and place in the universe.



Discovering the Cosmos

The histories of scientific discovery and human curiosity are indebted to the natural night sky. Because of light pollution, all new major astronomical observatories are being built far from civilization.

Without the natural night sky we could not have

- Navigated the globe
- Walked on the moon
- Learned of our expanding universe
- Discovered humans are made of stardust

Top photo by ESO/Babak Tafeshi
Bottom by Babak Tafeshi



Light for Visibility, Not Pollution

The key to a truly safe night-time environment is to shield lighting on roadways, parking lots, residences, businesses and landscapes.

Smart lighting that directs light where it will be most useful can help you achieve a balance between safety and starlight. The wise use of lighting can lead to less crime and a greater sense of security, while restoring our view of the night sky.



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Babak and during the 2002 Hubble Deep Field. Photo by Babak Tafeshi.

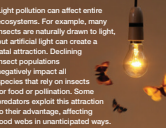
Help Make Change!

- Get informed. Visit us at darksky.org to learn more.
- Join IDA and make a difference.
- Spread the word. Talk to friends, neighbors and government officials about light pollution.

Top photo by Babak Tafeshi.

Ecosystems: Everything is Connected

Light pollution can affect entire ecosystems. For example, many insects are naturally drawn to light, but artificial light can create a fatal attraction. Declining insect populations negatively impact all species that rely on insects for food or pollination. Some predators exploit this attraction in their own ways, affecting food webs in unanticipated ways.



Life on Earth Needs the Natural Rhythm of Light and Dark

For billions of years, life has evolved with Earth's predictable rhythm of light and dark controlled by the length of the day. In fact, it's encoded in the DNA of all plants and animals. Unfortunately, humans have radically disrupted this cycle by lighting up the night.

It used to be that when the sun went down, celestial sources like the moon, stars, planets and Milky Way lit the sky. Life learned to operate under the glow of the night sky. For many animals, a natural night sky signals when to eat, sleep, hunt, migrate and even when to reproduce. It is estimated that half of all life on earth start their "daily" activities at sundown.

"Near cities, cloudy skies are now hundreds, or even thousands of times brighter than they were 200 years ago. We are only beginning to learn what a drastic effect this has had on nocturnal ecology!"
— Christopher Kelso, light pollution research scientist

Exposure to artificial light at night is unnatural



In less than 100 years, humans have radically altered our nighttime environment, putting our health at risk. Due to the rapid growth of artificial light at night, most of us spend our nights bathed in light. But basking in all this light at night is not natural and it may be taking a serious toll on our health.

We are only just beginning to understand the potential negative consequences of this swift change in our environment. A growing body of scientific research suggests that artificial light at night can have lasting adverse effects on human health.

Keep Light on the Ground



Energy Efficiency Solutions

Shielding outdoor lighting saves energy and money, reduces our carbon footprint and helps protect night skies. Luckily, the solutions are easy. Work with your neighbors and local government to keep the light on the ground and the skies natural. It's a win-win for everyone. You save money while preserving a valuable natural resource.

- Tips to help you conserve energy and use light efficiently.
- Install quality outdoor lighting to cut energy use by 60-70%, save money and cut carbon emissions.
- Fully shield all outdoor lighting – light should go down on the ground where it's needed, not up into the sky.
- Be aware that fully shielded fixtures can provide the same level of illumination as unshielded fixtures, but with lower cost and less energy waste.
- Turn off indoor lights in office buildings or homes when not in use to save money and energy.

Visit darksky.org and join IDA for resources and more information.

Energy use and its impacts on our environment has become one of the top concerns facing humanity.



What is Energy Waste?

Poorly designed outdoor lighting wastes energy by not being shielded, emitting more light than necessary or shining where and where it's not needed. Wasting energy in this way has huge economic and environmental consequences.

Lights left on overnight while we're sleeping – such as those in office buildings – wastes energy and contributes to the general skyglow of the city. Dark sky friendly lighting does not mean "no light." It means using the light that you need for a specific task in the most efficient manner possible.

"We can create a more sustainable, cleaner and safer world by making wiser energy choices."
— Robert Alan Silverstein, children's science book author

