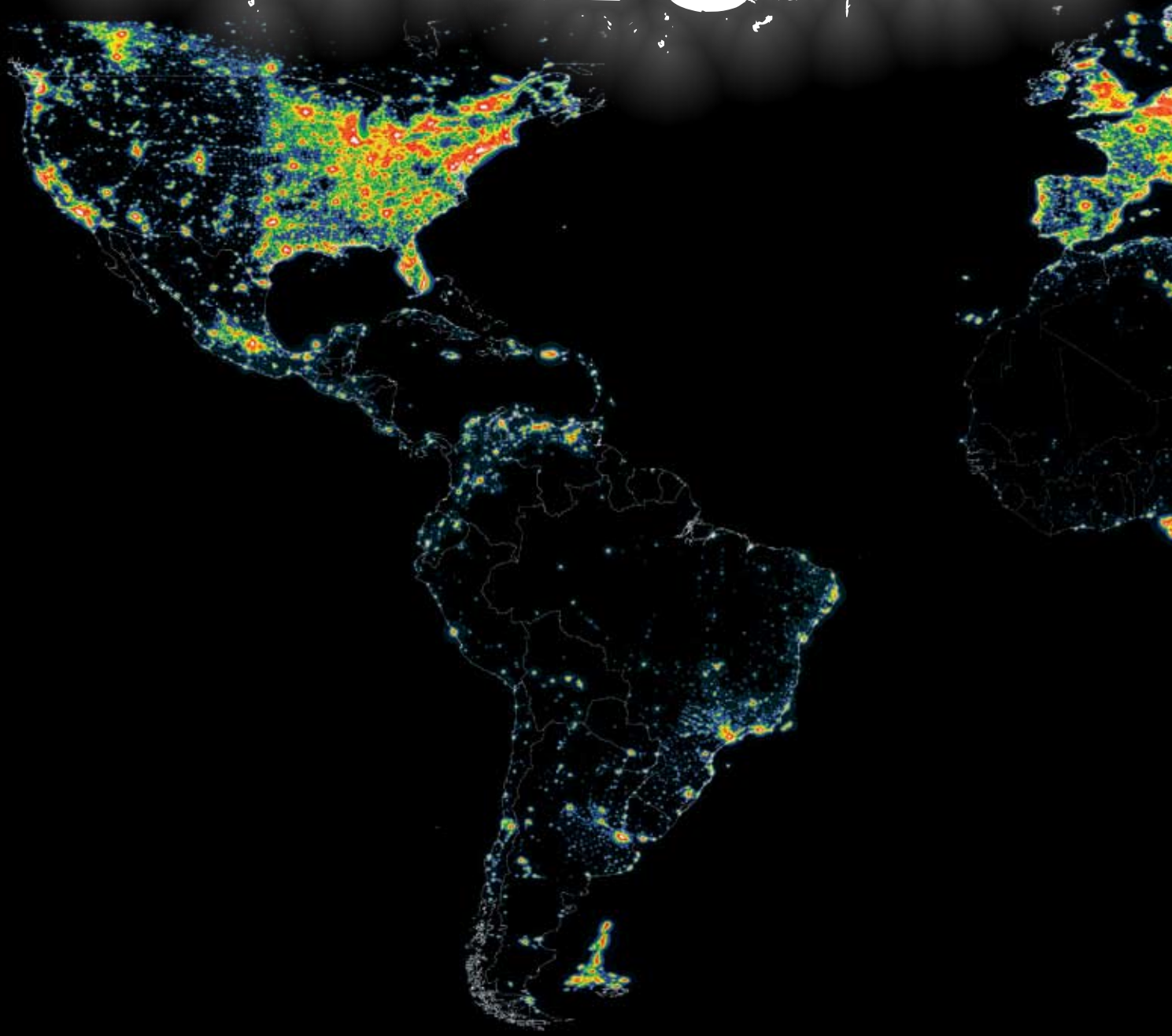


Night Lights





Too Much of a Good Thing?

By Daniel J. Rozell

“Men fell on their knees, groans were uttered at the sight, and many were dumb with amazement.” —Wabash Plain Dealer, 1880

That was the reaction of the residents and witnesses who were present to watch Wabash, Indiana become the first town in the world to illuminate the night with electric lights. One hundred and twenty-nine years later, such lighting is commonplace—so much so that the east coast of the U.S. is among the most lit regions in the world.

Few would argue that the advent of artificial light hasn't made our lives easier and more pleasant—enabling us to do and enjoy a multitude of tasks and activities that would otherwise be impossible. But what are the costs of projecting all this light where there would naturally be darkness?

Scientists only recently began to seriously study the impact of artificial light at night, and a picture began to emerge of its effects on local ecosystems and species. Scientists have discovered that too much artificial light, or light pollution, is disturbing and harmful to local ecosystems and the inhabitants. Since all living things have evolved according to a day/night cycle, it takes little light to upset nighttime cycles and alter natural rhythms. And while most forms of artificial light don't cause light pollution in broad daylight, even weak sources can cause problems on a moonless night. Many species of insects, migratory birds, sea turtles, bats, nocturnal rodents, snakes, fish, aquatic invertebrates, and even plants are affected by night lighting.

Everyone has seen moths fluttering around an outdoor light at night. They can be drawn to a standard street light from up to 400 feet away. Some moths die immediately when they fly into the light. Others endlessly circle it, risking starvation, or land nearby and become food for spiders, birds and bats. A steady

decrease in nocturnal flying insects in populated areas has been attributed to the “vacuum cleaner” effect of night lighting. In other words, every porch light and streetlight lures them from surrounding habitat, often to their deaths. Since these nocturnal insects play an important role in the ecological food chain, excessive night lighting is a concern. Fortunately, studies show that switching to low-pressure, sodium vapor lamps or UV-filtered bulbs drastically reduces insect attraction and mortality.

While switching light sources helps insects, the same solution doesn't apply to amphibians. Frogs and salamanders subjected to artificial night light may change normal feeding behavior, become less fertile and become more vulnerable to predators. The only solution for them is to limit their exposure to night light.

In New York State, the most evident victims of night lighting are migratory birds which are attracted to brightly lit tall structures, including lighthouses and radio towers. These birds will circle the light repeatedly until they collide with the structure and die. Overcast moonless conditions can result in the deaths of thousands of birds in one night. In Toronto, the Fatal Light Awareness Program educates building owners on how to reduce such deaths by darkening buildings during the height of migratory seasons.

Research has also shown that too much artificial night light can contribute to air pollution. When you look into the night sky and see a glow, that glow is wasted energy. According to the International Dark-Sky Association, this is due to poor lighting design, like unshielded outdoor lighting. In New York State alone, excessive light creates millions of tons of greenhouse gases—equivalent to the emissions from thousands of cars. Clearly, reducing light pollution can mean big benefits for the environment.

Obviously, there are circumstances when outdoor night lighting is necessary. Common sense tells us that night lighting provides safer night travel conditions and deters crime. However, current research suggests that night lighting for these reasons is probably overused. In fact, bright or poorly shielded lighting along roads can create glare that actually decreases the ability of drivers to see into surrounding dark areas; in effect, reducing visibility.

According to a study sponsored by the U.S. Department of Transportation, the safety of a highway lit only at interchanges is similar to the safety of a highway illuminated along its entire length. So, in this case, why not use less lighting?

Most people don't realize how little night lighting is required to improve vision and safety. Once the human eye has adjusted to darkness, it can see surprisingly well with only the limited light provided by a full moon. In fact, farmers and travelers of centuries past relied on moonlight to extend their day. Even now, the Harvest Moon is welcomed by farmers around the world.

Because people commonly associate darkness with higher crime rates, they believe that night lighting deters crime. Increasing security lighting is often the first response to a crime, even though most crimes occur during the day. A Department of Justice report on the relationship between night lighting and crime found that there was no significant evidence that lighting affected levels of crime. However, increased lighting did appear to decrease the *fear* of crime.

A few pioneering communities have ignored conventional wisdom and reduced “crime-deterrent” lighting with good results. Five years ago, the city of Des Moines shut off 40 percent of its streetlights along main thoroughfares to save money. Despite the



Many species of insects, migratory birds, sea turtles, bats, nocturnal rodents, snakes, fish, aquatic invertebrates, and even plants are affected by night lighting. Moths can be drawn to a standard street light from up to 400 feet away. Some die immediately when they fly into the light, while others may get caught in a spider's web, or eaten by birds and bats. Since these nocturnal insects play an important role in the ecological food chain, excessive night lighting is a concern.

concerns of shop owners and police, there was a 3.5 percent drop in vandalism, burglary and robbery.

Even those who aren't afraid of the dark or the threats it might bring react strongly to the absence of night light. After an earthquake knocked out power in Los Angeles, Ed Krupp, director of Griffith Observatory, was barraged with calls regarding a strange phenomenon believed to have been caused by the earthquake. As it turned out, callers were perplexed by the rarely seen, very starry night sky over Los Angeles!

With no light pollution and fair weather, a young observer with good vision should be able to see as many as 7,000 stars with the unaided eye. Most of us in New York State don't see anywhere near that number. As a general rule, if you can't see the Milky Way on a clear summer night, then fewer than 250 stars are visible in your area.

According to author Verlyn Klinkenborg, "Living in a glare of our own making, we have cut ourselves off from...the light of the stars and the rhythms of day and night." This is especially true in brightly lit New York City where some young people

today may never have seen anything in the night sky other than the moon and perhaps a dozen of the brightest planets and stars.

To help relieve light pollution, we must reduce our own contribution to the problem. While installing a simple outdoor light without giving it much thought beforehand seems harmless enough, an accumulation of many such decisions can have global consequences. Good lighting decisions consist of three components: determining when lighting is necessary, choosing the right fixture, and choosing the right light source. Keeping in mind misconceptions regarding security lighting, common sense dictates when lighting is necessary. Good light fixtures generally point all their light downward where it will be used. Likewise, a good outdoor fixture is mounted low enough to prevent light from invading surrounding areas.

Selecting the best light source depends on where and how it will be used. For lighting a small, specific area, low-powered LED sources—which have become increasingly energy-efficient—are a good choice. But for larger areas, low-pressure, sodium

vapor lamps remain the most efficient and preferred source of outdoor light.

We need to keep in mind that even an efficient lamp can illuminate more than necessary. Remember, being continuously suffused in light is neither natural nor ideal; darkness has its own value and beauty. Let your eyes—and your expectations—adjust. You just might find you appreciate something you've been taking for granted all along.

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For more information about light pollution, visit the website of the International Dark-Sky Association (IDA) at www.darksky.org. To find additional information on light-pollution legislation in New York State, visit Sensible and Efficient Lighting to Enhance the Nighttime Environment (SELENE) online at www.selene-ny.org.

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