

# THE GREAT OUTDOORS



*The Milky Way as seen at Capitol Reef National Park's Chimney Rock, Utah. Night skies such as this can be seen at International Dark Sky Parks established around the globe by citizen efforts. The International Dark-Sky Association assists governing bodies with ordinances to protect night skies. Photo by Jacob W. Frank for IDSA.*

## **Starless Night Skies**

*Light pollution is robbing us of our "starry, starry nights," yet there are lighting design changes that could open our skies back up to stargazing.*

By J. Morton Galetto

As a young teenager I complained to my mother that I was having trouble seeing the chalkboard in school. It took weeks of begging to get her to overcome her vanity about her daughter's appearance and agree to an eye exam for me. Wearing glasses opened up a world that I had forgotten existed. We lived near Union Lake in Millville, NJ in a neighborhood without street lights. As evening fell, suddenly

the night sky took on a renewed glory. Looking up at the heavens my eyes filled with tears. As my nearsightedness had progressed, I had lost sight of the stars.

I wept in sorrow for what I had been missing for years and what I had forgotten but which was now so clear. There were tears of joy too, for what I was seeing. I refused to come in the house. It was as if I personally had rediscovered the universe. I told anyone who would listen, "Just look at the stars!"

I was lucky to have a friend named Steve Jublou. He was a Boy Scout who loved the out-of-doors, stars, and Greek mythology. He described the hunter Orion's belt and the myth detailing his adventures. He explained that because of this constellation's placement on the celestial equator, it can be seen throughout the world in the night sky. Even in high school it was obvious that his destiny would be to join the ranks of future science teachers. His enthusiasm for the stars was profound and contagious.

Fred Schaaf was also a classmate; later he would become one of our country's most celebrated amateur astronomers, publishing a host of books (13) on the heavens.

Today we are all being robbed of the views of the night sky. Manmade light from street lamps, parking lots, sports stadiums, prisons, LEDs, gas flames, car beams and the like, intended to illuminate the earth, shine upwards and reflect down off particulates and moisture, making seeing the heavens impossible.

Shields, a simple design change involving a shade or hood, can keep the light only on the intended object or areas. Many towns and cities have adopted "shielded lighting" ordinances. But vigilance is needed on the part of land-use boards and city engineers to make sure developers are aware of and institute this requirement. It's as simple as selecting a fixture with a hood. Unfortunately, little is done about replacing existing lights.

Cities and towns that have major telescope installations take lighting ordinances very seriously. Since the 1980s Caltech and Palomar Observatory have worked with surrounding communities to minimize light pollution. Tucson, AZ is surrounded by observatories and views protecting night skies as a mandate.

When I first moved to the river in 1983 we could see the northern sky from our

dock. Then a new car dealership put in lighting that blotted out the view. Later the City of Millville installed period lighting. It was stylish but the globes allowed light to shine upwards. The color of the sky changed and the northern view of stars went away. Millville later adopted a shielded lighting ordinance advocated by CU Maurice River for future projects. But the globes remain unchanged.

This scenario has repeated itself worldwide to the point where a quarter of the world's land surface is now affected by light pollution. And with each passing generation people accept a new normal, in this instance the increasing inability to see the heavens. A term has been coined for this phenomenon: "shifting baseline syndrome." By way of example an old timer used to tell me that ducks used to blacken the sky on the Menantico during duck season. I took his words to be hyperbole, but today I suspect they were the truth.

I tell my grandnieces and nephews, "When things got cold the river would freeze nearly across, and if ducks were stones you could hop across the river on their backs." Their new normal is a few hundred ducks where there were once thousands, and that's on a great day. They see some ducks and think,

“Cool.” I see ducks and say, “Where have they all gone.” And ice? Don’t even get me started. So each generation establishes a new baseline of lower numbers. You can’t conceive of what you’re missing if you have never seen it. (CU Maurice River has documented this avian decline over the past 35 years, and thousands of visiting ducks was a reality in the 1980s and 90s. Not an exaggeration but fact.)

Stars are gradually disappearing from view and younger generations don’t know what they have lost. A pair of glasses isn’t going to offer them a magical solution as it did for me. The stars are still there but our ability to see them is what’s changing. It is light pollution that hampers our view of the heavens.

Air pollution used to be the main culprit. I remember going to Pittsburgh as a child when coal was still burned to heat houses and plants manufactured steel. The sky was blackened; a permanent dusk hung in the air some days. The EPA has done a wonderful job of improving our air quality; particulate is much less of a problem, both for our lungs and for stargazing, than it was when I was young.

Many cities still remain famous for smog. The growing use of electric cars

will greatly improve their situation. You may recall news-making photographs taken from cities around the world during pandemic lock-down. People posted before and during photos and marveled at the clear skylines as cars and factories took a time-out. It gave folks a new baseline to think about. But alas, we are creatures of habit; hanging on to that moment and advocating for a cleaner tomorrow is difficult to focus on as the responsibilities of life whisk us away to our old selves.

So how does light pollution impact the planet we live on - beyond the chance to see the Milky Way on a cloudless night and to share the human heritage of the constellations that inspired so many myths? Beyond our right to appreciate the heavens that has been stolen by wasted light? It impacts us in many ways.

Some will advocate that we need lighting to keep criminals at bay, studies show that evil-doers are more active where there is light because they too are scared of the dark. But lighting is one of the primary things people demand where there is crime. It's ironic that it will only allow them to identify the criminal, not to deter him. And criminals aren't active above the light; only below it - so shield it!

In terms of the other creatures that share our planet, lighting misdirects migrating birds who navigate, like ancient ships, by the stars. This disorientation is responsible for thousands of avian deaths.



*The majority of birds migrate in darkness. Brightly-lit cities blot out stars and confuse migrants, luring them into urban areas. Trapped in a windowed maze of city buildings, they have fatal collisions, or circle about and die from exhaustion. Photo credit: Portland Audubon, photo by Jurgen.*

Insects whose numbers are in a massive worldwide decline are also disoriented by light. Swiss researchers found that moths, beetles, and other bugs that are night-time pollinators are attracted by night lighting, thus failing to pollinate fruit; as a result crops have fallen by 13 percent. Our beloved fireflies are one of the insects whose numbers have been adversely impacted by artificial lighting. Salamanders and other creatures' body clocks are

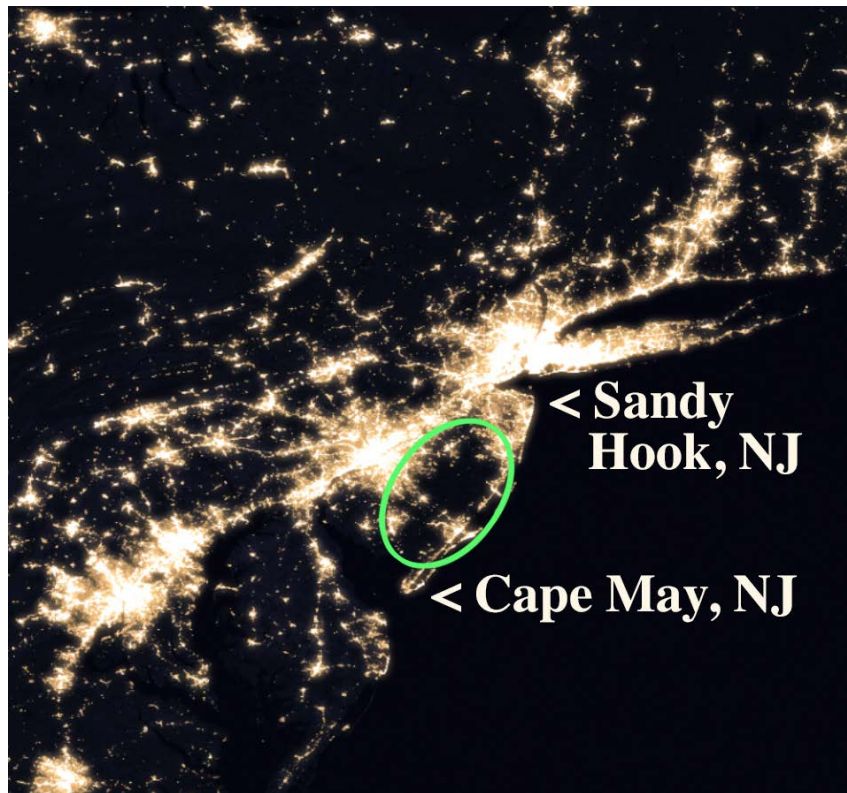
interrupted such that foraging time is restricted to fewer hours.

Moths attracted to light are exhausted and killed, if a predator doesn't pick them off first. Sea turtles are confused by lighting and are drawn to roadways instead of returning to the ocean. Because of this, wildlife agencies have directed beachfront lighting to be turned off along some stretches to protect these endangered marine creatures.

And what about us? Light pollution intrudes on the privacy of people's homes. Our sleep patterns are adversely affected by nightlights as well. Empty office buildings illuminated at night are an obvious culprit, as are the structures that emit light shows.

On October 20 and 21, if we have a cloudless night, consider going to a dark sky near you to view the Orionid meteor shower. Then consider improving our grandchildren's night skies; don't allow them to be robbed of the myths, legends, and dreams that fired our ancestors' imaginations.





*This satellite view of New York City to Philadelphia shows the positive effect that the Pinelands National Preserve, within the green oval, has had on night skies and light pollution. Because of this our region remains the best place in the Tri-State area to view stars.*

*Photo Credit: NASA Worldview*

### **Some Easy Fixes to Reduce Light Pollution**

You can help protect reptiles, amphibians, birds mammals, insects – and people by taking these steps:

- Use motion detectors as opposed to constant lighting.
- Purchase lights that are directed downward \_ shielded.
- Use LED lights that are warm-colored as opposed to white.
- Don't shine lights into neighboring properties.
- Turn off unnecessary illumination of yards and other areas.

## **Sources**

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Fred Schaaf's lectures

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