



DarkSky International 2023

A PRESENTATION TO THE OLD RAG MASTER NATURALISTS

By Tom Reinert –President DarkSky International

DarkSky
International



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INTERNATIONAL



The Piedmont Dark Skies

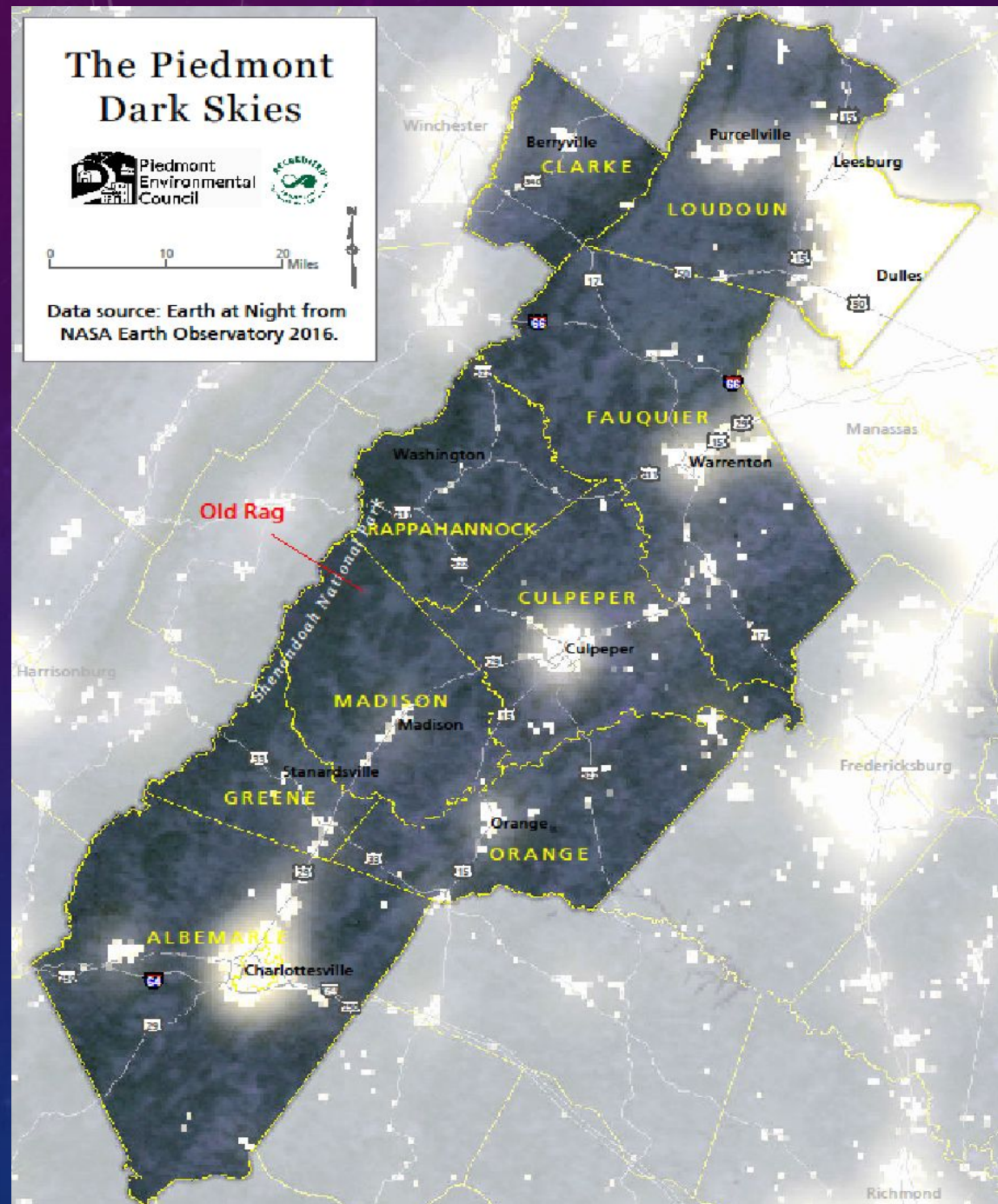


Piedmont
Environmental
Council



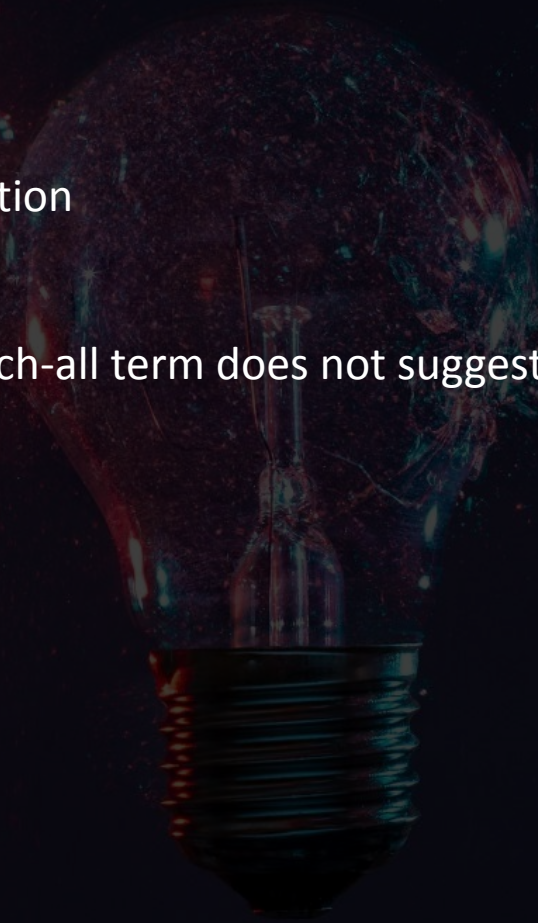
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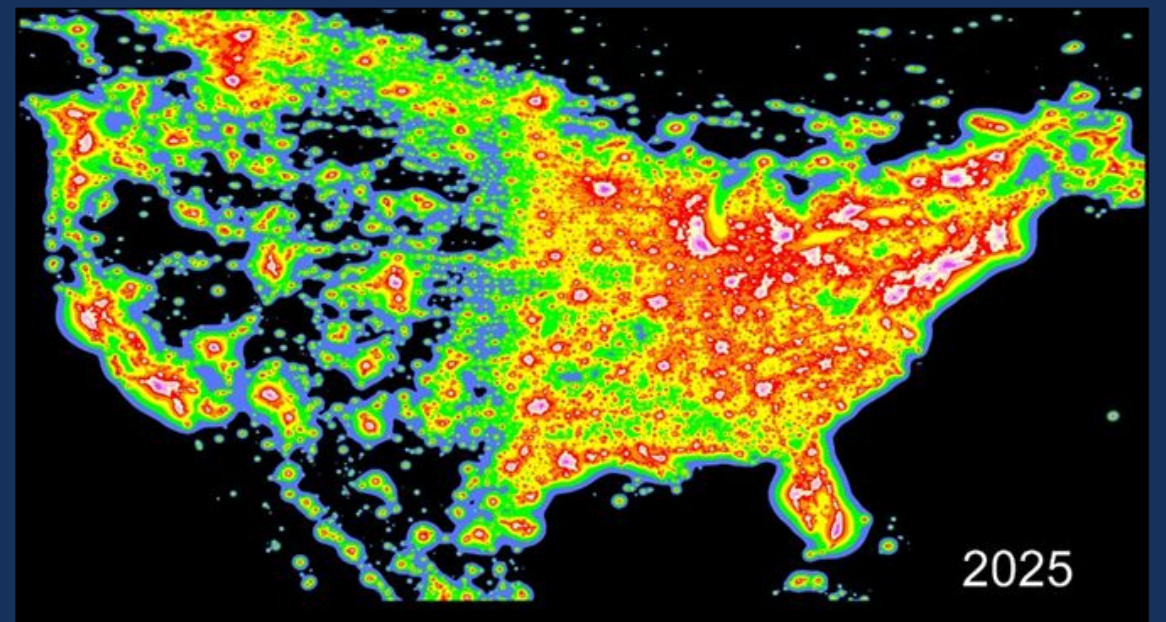
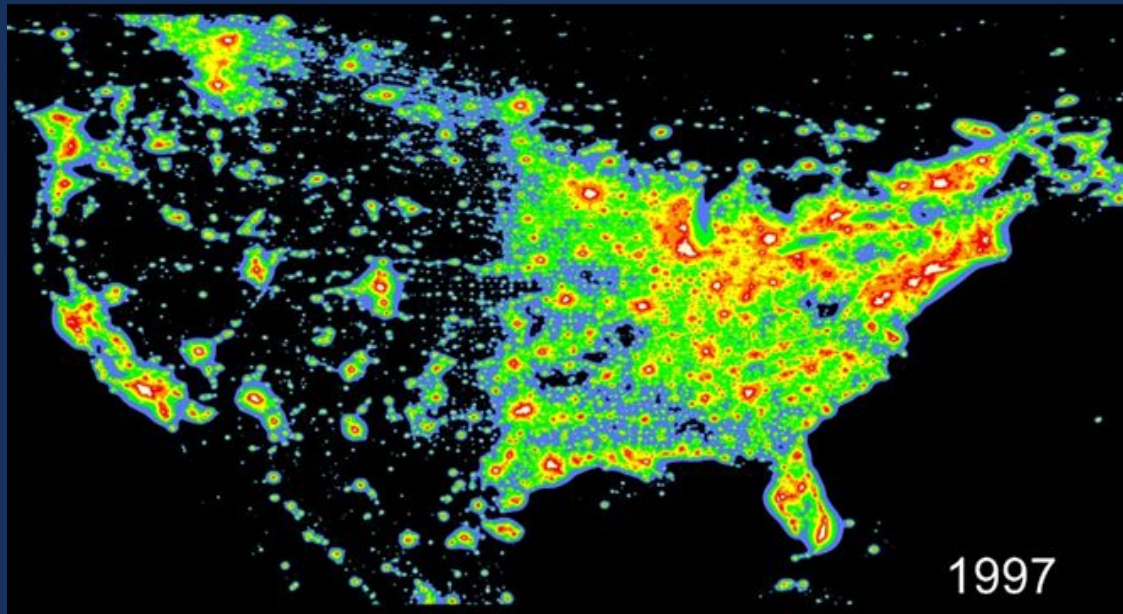
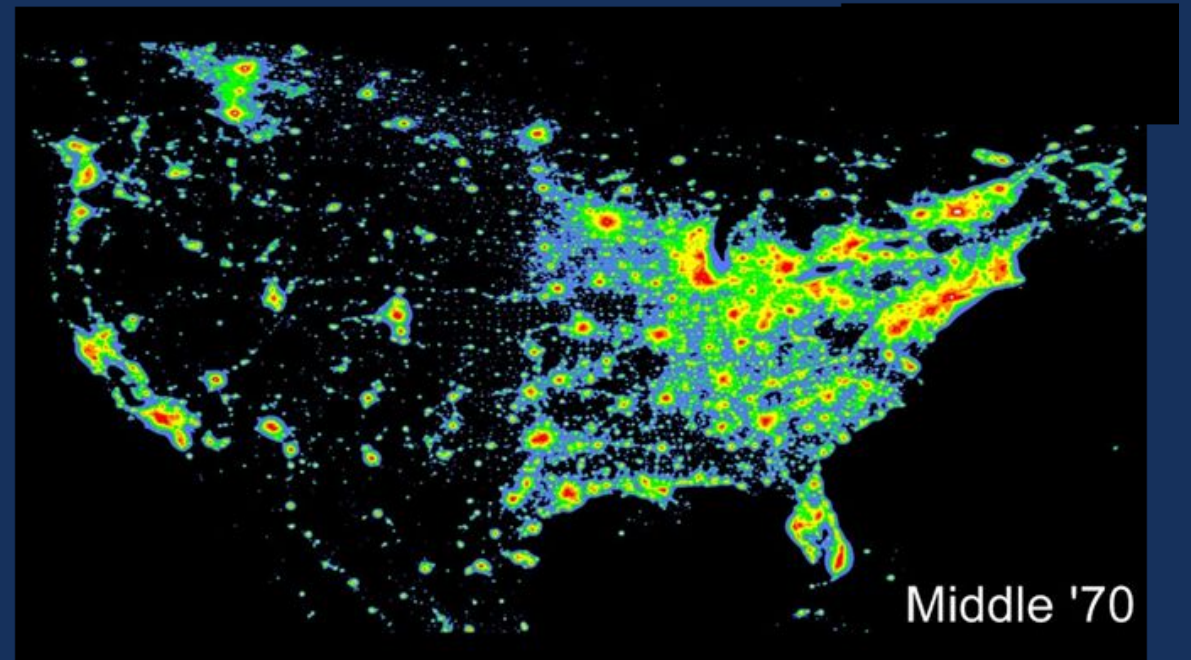
Data source: Earth at Night from
NASA Earth Observatory 2016.



What Is Light Pollution?

- All artificial light at night technically is light pollution
- While “light pollution” can be measured, the catch-all term does not suggest causes or solutions
- Causes:
 - Unsustainable lighting infrastructure
 - Irresponsible lighting behavior







Why Is Light Pollution Increasing?

- Population growth & “Suburbanization”
- Automobiles
- Transition to LEDs
- “Mindless Lighting”

VIRGINIA URBANIZATION & SUBURBANIZATION

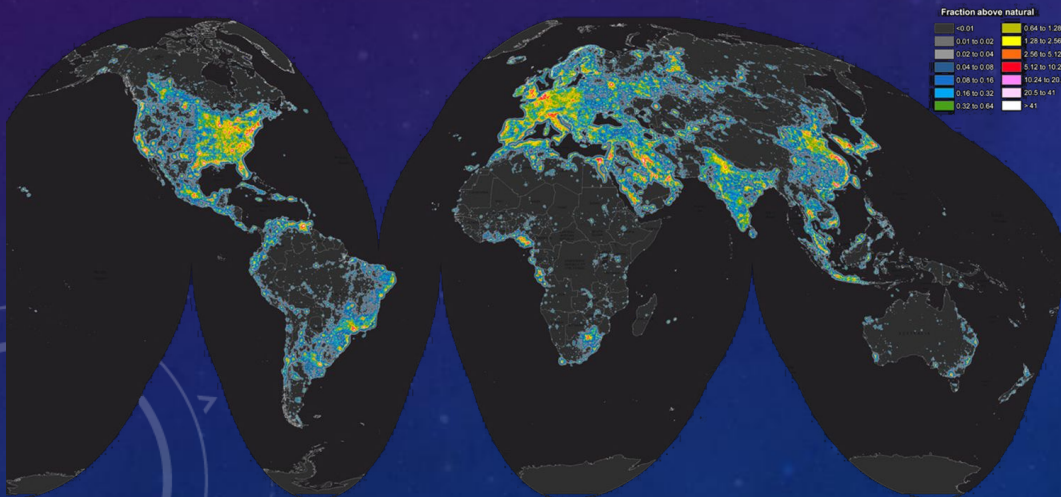


Artificial Light At Night comes at a price

Artificial light at night has revolutionized the way we live and work, but it has come at a price. Outdoor lighting disrupts nature, impacts human health, wastes money, drives climate change, and obscures our view of the universe.

10% Light pollution has grown globally at 9.6% annually from 2012 - 2022.

83% 8 out of 10 people worldwide live under a light polluted sky



Biodiversity *Virtually every species studied has been harmed by light pollution.*

- 27% Globally, 27% of the land surface is affected by light at night.
- 50% Almost 50% of terrestrial protected areas are impacted by light at night.
- 35% 35% of the world's marine protected areas are impacted by light at night.
- 0.05 lux Research has found species like grunion and plover are affected by light at very dim levels - as low as a half moon.

Energy and climate change *Wasted light is wasted energy.*

- \$50B Light emissions from the continents represents 246,238 gigawatt-hours of energy, costing us at least \$50B each year.
- 2.3% Street lights consume approximately 2.3% of global electricity.

Public health and equity *Light pollution impacts quality of life.*

- 14% Women exposed to the high levels of light pollution had a 14% increased risk of breast cancer compared to low levels. As levels of outdoor light at night increased, so did breast cancer rates.
- 2X Black, hispanic, and asian groups in the U.S. were found to live in neighborhoods with 2x the levels of light pollution as white groups.



LIGHT POLLUTION AWARENESS ALSO IS INCREASING

- Light Pollution was an unknown term
- Articles in National and International Media
- Smithsonian Exhibit – “Lights Out: Recovering Our Night Sky”
- Dark Sky Week – Press Release Reached Almost One Billion
- Science Magazine & Philosophical Transactions

LIGHT TO PROTECT THE NIGHT

Five Principles for Responsible Outdoor Lighting



Illuminating
ENGINEERING SOCIETY



USEFUL



ALL LIGHT SHOULD HAVE A CLEAR PURPOSE

Before installing or replacing a light, determine if light is needed. Consider how the use of light will impact the area, including wildlife and the environment. Consider using reflective paints or self-luminous markers for signs, curbs, and steps to reduce the need for permanently installed outdoor lighting.

TARGETED



LIGHT SHOULD BE DIRECTED ONLY TO WHERE NEEDED

Use shielding and careful aiming to target the direction of the light beam so that it points downward and does not spill beyond where it is needed.

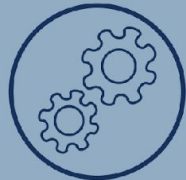
LOW LIGHT LEVELS



LIGHT SHOULD BE NO BRIGHTER THAN NECESSARY

Use the lowest light level required. Be mindful of surface conditions as some surfaces may reflect more light into the night sky than intended.

CONTROLLED



LIGHT SHOULD BE USED ONLY WHEN IT IS USEFUL

Use controls such as timers or motion detectors to ensure that light is available when it is needed, dimmed when possible, and turned off when not needed.

COLOR



USE WARMER COLOR LIGHTS WHERE POSSIBLE

Limit the amount of shorter wavelength (blue-violet) light to the least amount needed.

DarkSky's New Strategic Plan

- Restoration as well as preservation
- Empower advocates and allies with the tools for change
- Broaden the coalition
- Public policy / Government action – regulation and procurement



DarkSky

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Brazil. Egon Filter