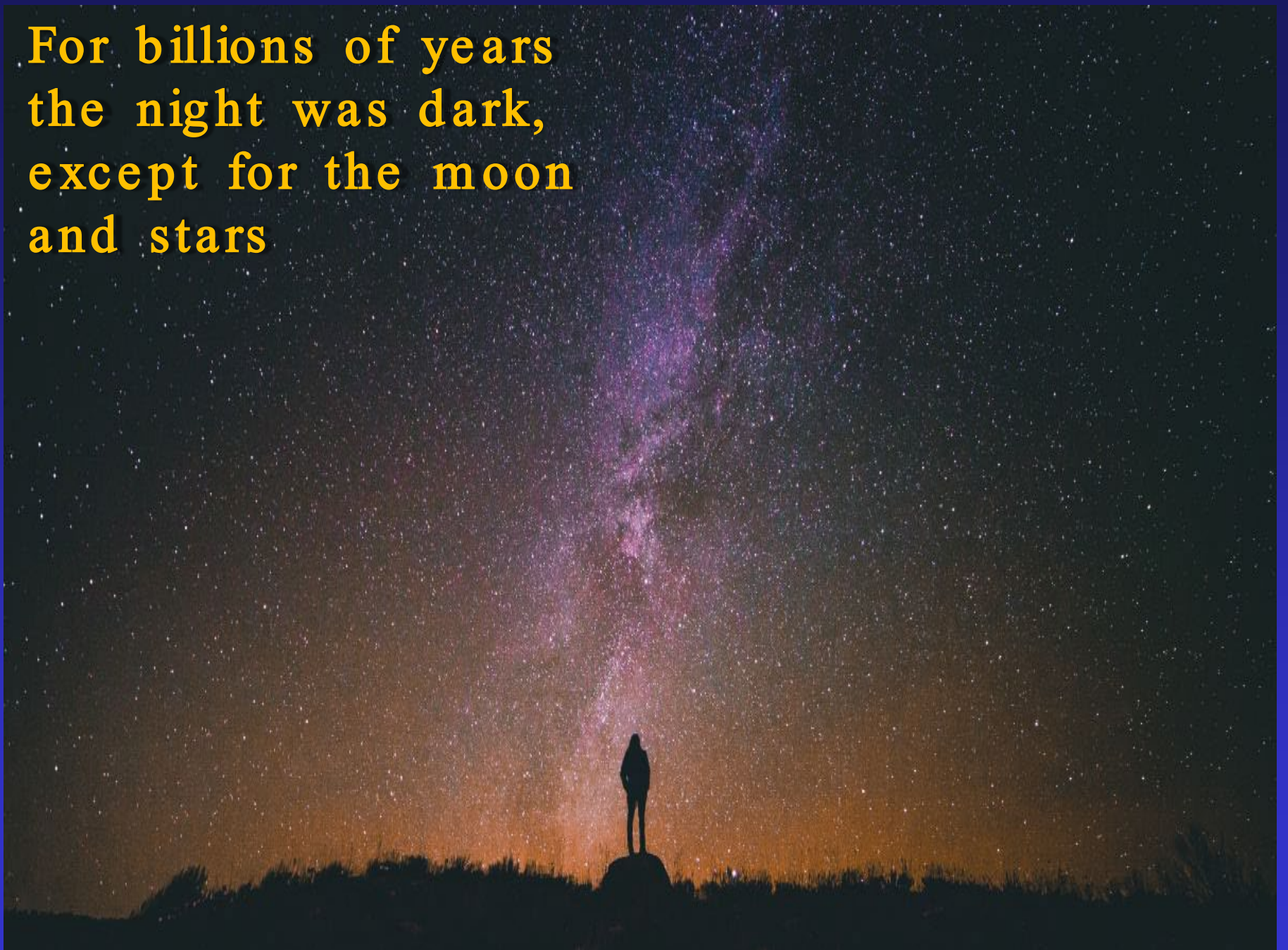


Ecological Consequences Of Light Pollution



Connecticut Association of Wetland Scientists
March 5, 2025

For billions of years
the night was dark,
except for the moon
and stars



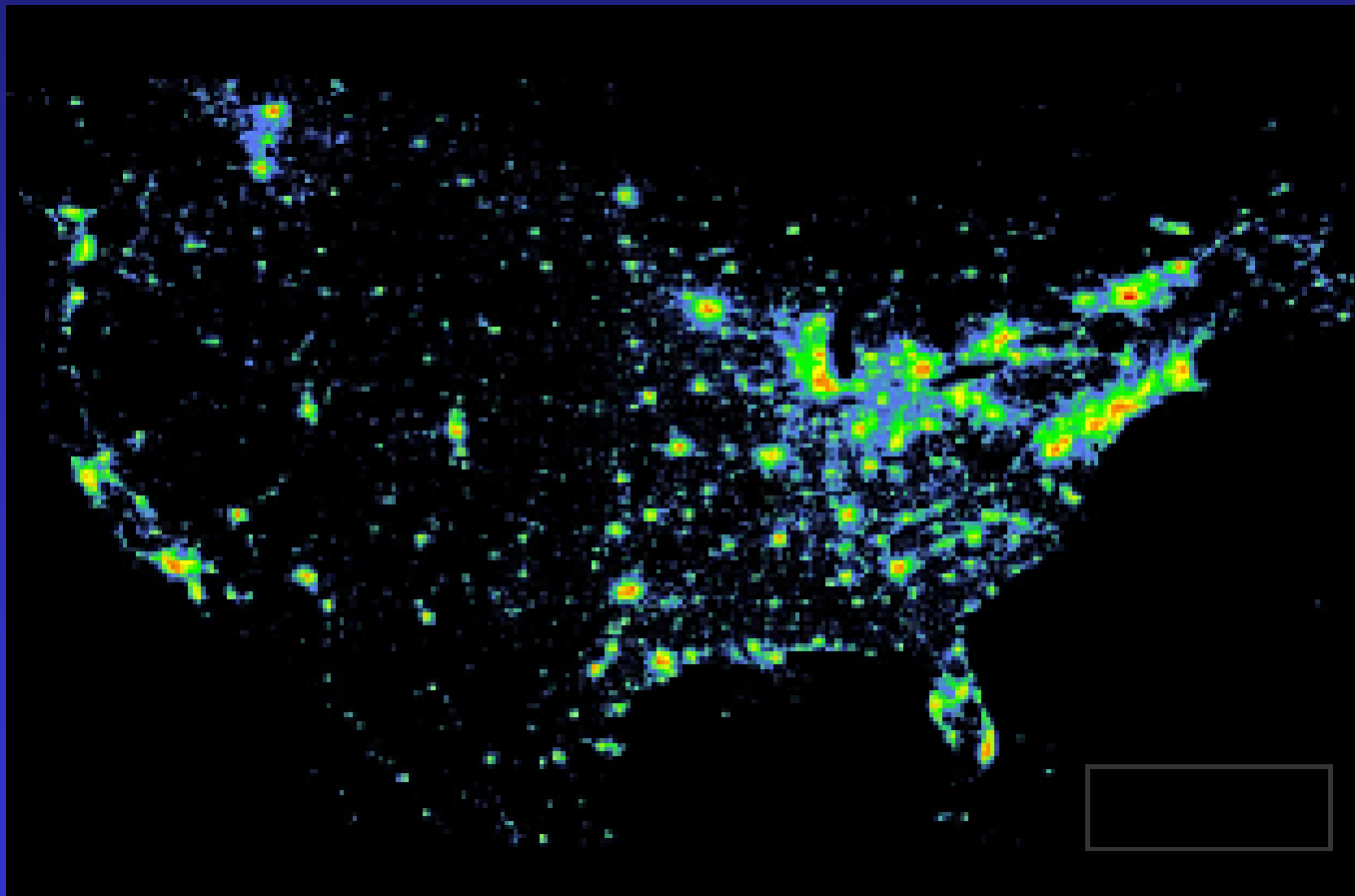
In 1879
the light
bulb is
invented...

That's only
145
years ago

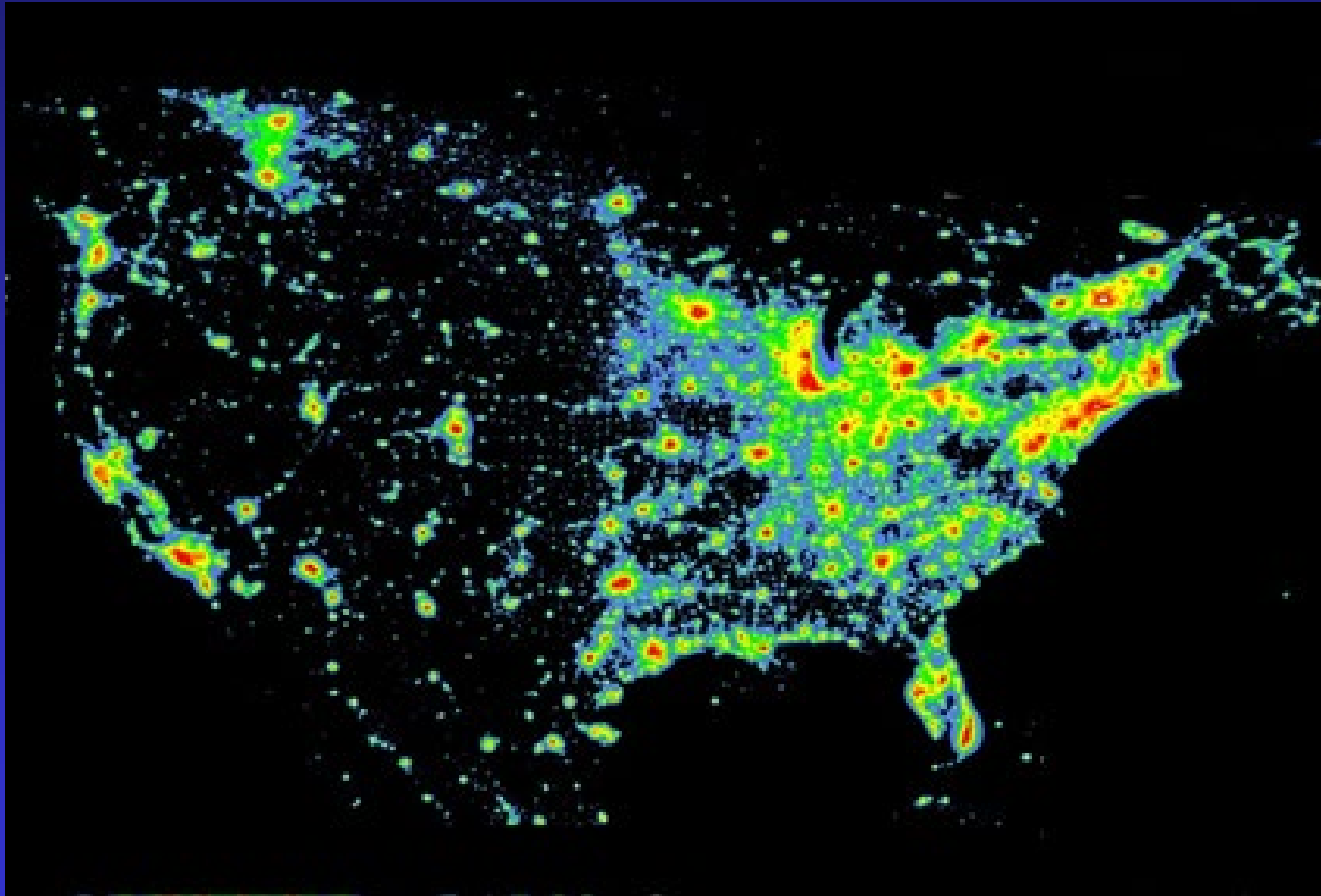


Artificial Sky Brightness Due to Artificial Light At Night (ALAN)

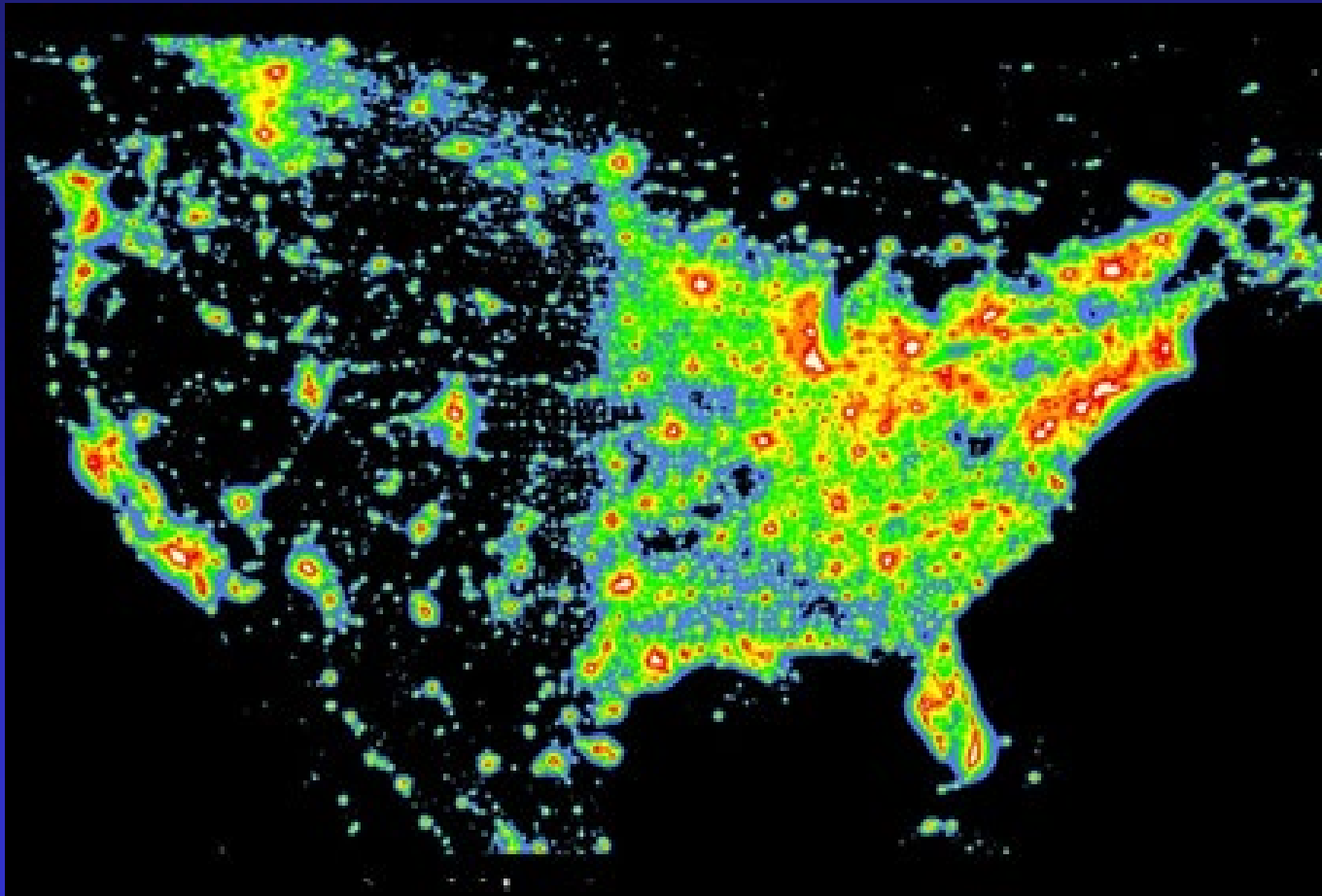
United States - 1950



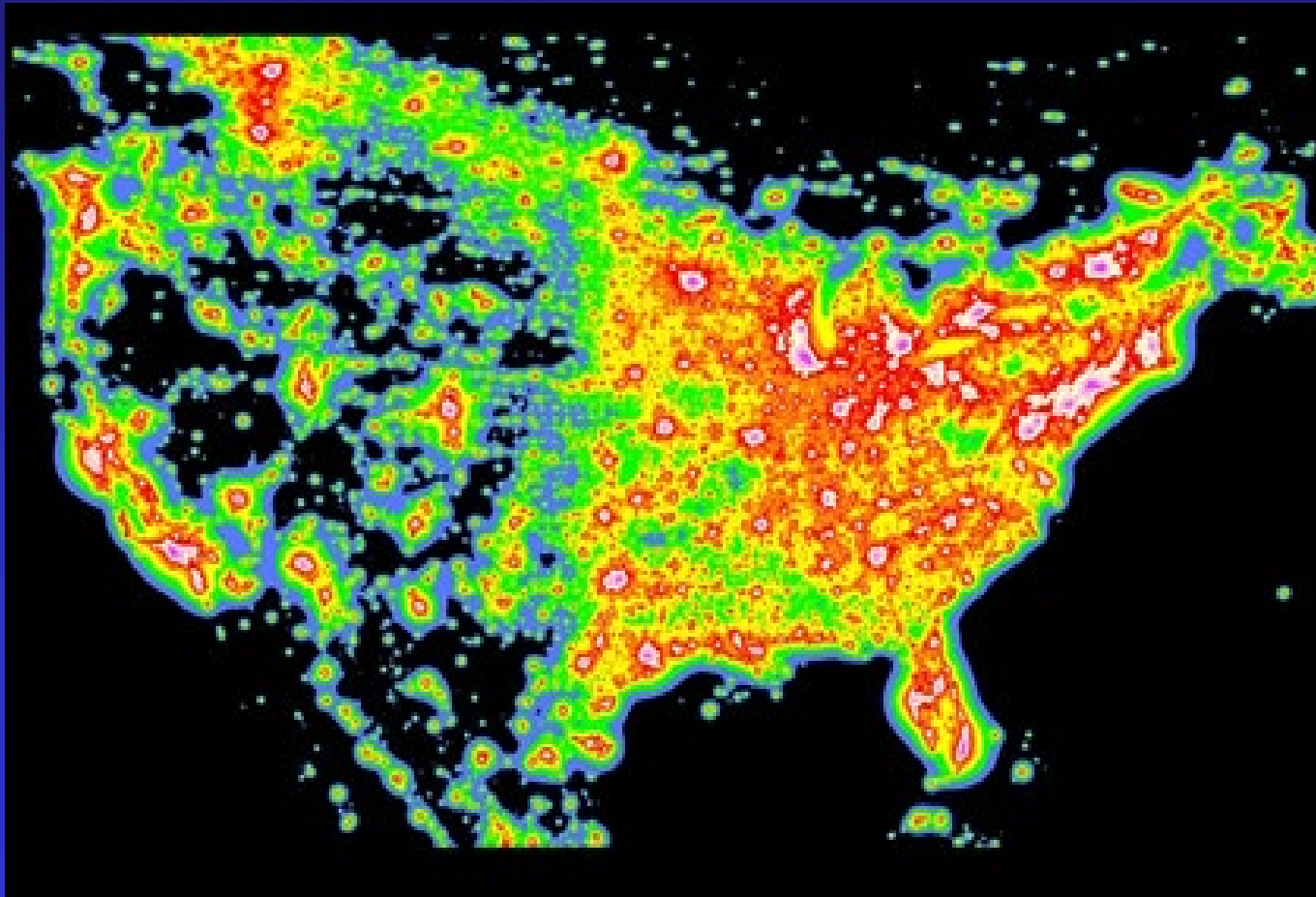
ALAN in U.S. - By 1975



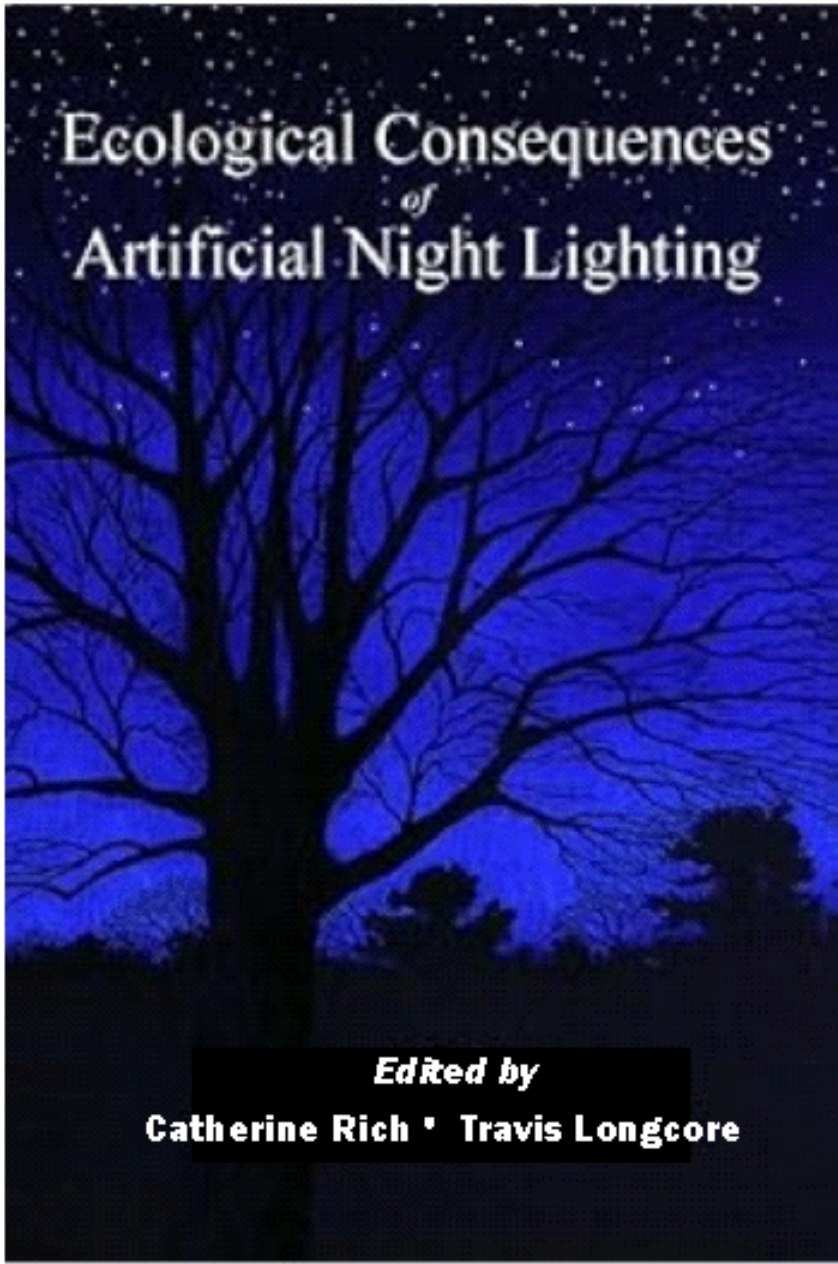
ALAN in U.S. by 1997 – (No LEDs Yet)



ALAN U.S. - 2025 (about 19 Years after LEDs)



Excellent Academic Resource



Ecological Consequences
of
Artificial Night Lighting

Edited by
Catherine Rich • Travis Longcore

Part 1: Mammals

Part 2: Birds

**Part 3: Reptiles &
Amphibians**

Part 4: Fishes

Part 5: Invertebrates

Part 6: Plant Physiology

**Referenced Literature Cited
for each Chapter**

Available at AMAZON and Others

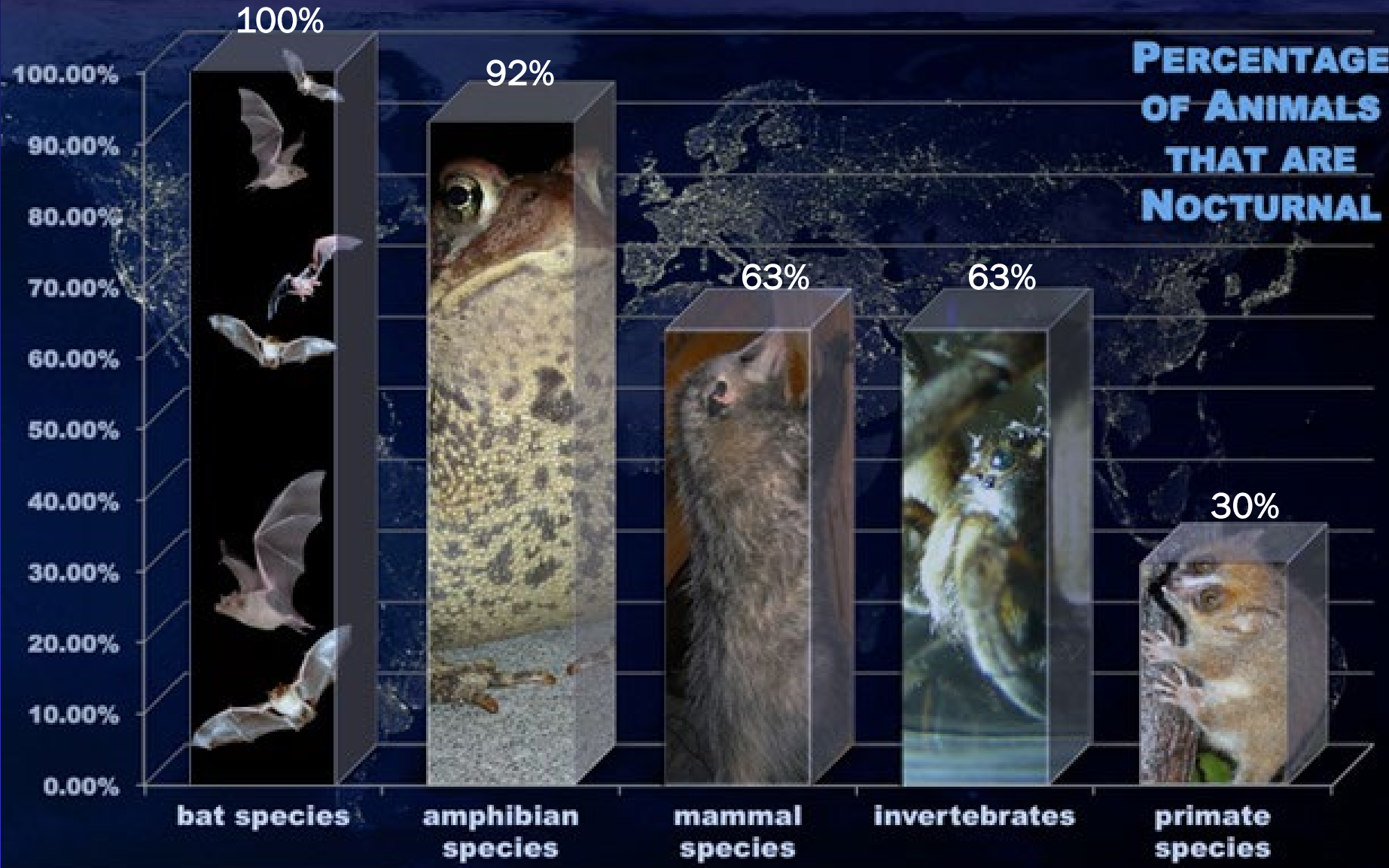
Light Pollution - Consequences for Wildlife

Habitat Disturbance * Wildlife Behavior

Wildlife Survival



PERCENTAGE OF ANIMALS THAT ARE NOCTURNAL



How ALAN Harms Bats



When bats avoid an area due to light, this limits the habitat they can use for foraging, roosting, and other purposes.

ALAN may reduce the already-limited habitat available to light-sensitive species, especially species like the little brown bat that are already imperiled by white-nose syndrome (WNS), which has killed over 90% of the species in less than 10 years.

Baby Sea Turtles Migrate Towards Light





Artificial Lighting Causes Disorientation

...and death

Light Pollution and Insects



**The
Guardian**

The New York Times

Smithsonian
MAGAZINE

**“The Devastating Role of Light
Pollution in the Insect Apocalypse”**

For Insects, Light Pollution...



- disrupts normal flight activity
- attracts insects that don't normally move from their habitat.
- are effectively trapped by the light
- Loss of insect population is detrimental to human communities as well

Bumble Bees

Pollinate our ecosystems & sustain our crops

7 states all lost the
American bumblebee
ENTIRELY.

New York lost 99%

In 2021, Fish & Wildlife
determined that
Endangered Species
protections for bumble
bees may be warranted



Light Pollution is a Contributing Factor

“Fire fly Populations Are Blinking Out” Is Light Pollution the Reason?



Light Pollution harms mating rituals

Light Pollution & Trees



**Ways
To Minimize
Light
Pollution**

Five Principles for Responsible Outdoor Lighting

LIGHT TO PROTECT THE NIGHT

Five Principles for Responsible Outdoor Lighting



Illuminating
ENGINEERING SOCIETY



DarkSky

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.

Adaptive Street Lighting

A night city street scene featuring modern, adaptive streetlights. The lights are illuminated, casting a glow on the road and surrounding buildings. The background shows tall skyscrapers with lit windows, and a bridge or overpass structure is visible in the distance. The overall atmosphere is a modern, urban night setting.

SMART STREET LIGHTS

Dim or Turn Off - 11 PM until 5 AM

Efficient Use of Streetlights

Guidelines for the Implementation of Reduced Lighting on Roadways

PUBLICATION NO. FHWA-HRT-14-050

JUNE 2014



U.S. Department of Transportation
Federal Highway Administration

Research, Development, and Technology
Turner-Fairbank Highway Research Center
6300 Georgetown Pike
McLean, VA 22101-2296

Advocate for Adaptive Roadway Lighting

From 11 PM until 6 AM
streetlights either

a) turn off, or

b) reduce output by 50%

**Connecticut
State Building
Code Applies
To All Exterior
Lighting for
Commercial
Property:**

**Parking and
Area Lighting
Must be Full Cutoff**





Model Outdoor Lighting Regulations for Connecticut



Menunkatuck
Audubon
Society



LIGHTSOUTCT.ORG

Free Download

Encourage Municipalities to Adopt A Streetlight Master Plan

Identify where streetlights are warranted.

Turn some streetlights off after midnight.

Remove unnecessary streetlights

The Future of Streetlight Technology

Safety from roadway lighting will be obsolete within 20 years!

Transportation Safety will come from Vehicle-to-Everything (V2X) technology

2036 Projected completion for V2X technology to be embedded into 100% of the Federal Highway System

CONTACT INFORMATION



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