

OUTDOOR LIGHTS, ECOLOGY, SKY GLOW, AND ENERGY

PRELIMINARY PRESENTATION TO TCEMC

June 9, 2016

Bill Evans

Town of Danby

Response of night-migrating songbirds in cloud to colored and flashing light

WILLIAM R. EVANS • OLD BIRD, INC. • 605 WEST STATE STREET • ITHACA, NEW YORK 14850 • (CORRESPONDING AUTHOR; E-MAIL: WREVANS@CLARITYCONNECT.COM)
YUKIO AKASHI • LIGHTING RESEARCH CENTER • RENSSELAER POLYTECHNIC INSTITUTE • 21 UNION STREET • TROY, NEW YORK 12180
NAOMI S. ALTMAN • DEPARTMENT OF STATISTICS • PENN STATE UNIVERSITY • UNIVERSITY PARK, PENNSYLVANIA 16802-2111
ALBERT M. MANVILLE, II • UNITED STATES FISH & WILDLIFE SERVICE • 4401 NORTH FAIRFAX DRIVE, MBSP 4107 • ARLINGTON, VIRGINIA 22203



Figure 1. 1500W halogen test lights with blue and red filters used to study the impact of light upon migrating birds.

Abstract

Night-migrating birds often accumulate near bright man-made light on nights with low cloud cover or rain. Mass avian mortality events associated with this phenomenon have

tion on clear nights (Sauer 1957, Emlen 1967), and on cloudy nights they can orient by sensing the axial inclination of the earth's magnetic field through a light-dependent mechanism, probably residing in their eye

cause bird aggregation behavior by Cochran and Graber (1958) and in a subsequent study by Avery et al. (1976). The towers in these studies had multiple tiers of slow flashing red beacons each alternating with a tier of man-

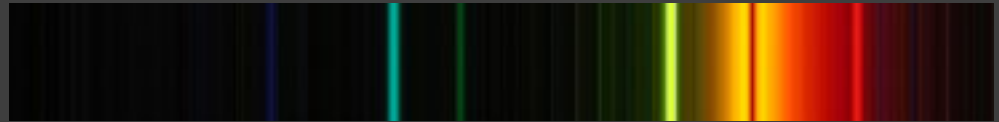
Gas-discharge lamps

LIGHT SPECTRA

Low pressure sodium



High pressure sodium



Mercury vapor



Low pressure sodium – Flagstaff, AZ



Mercury vapor



LED (light emitting diode)

NBA LED**	Narrow-band amber LED – a narrow-spectrum yellow-orange LED nearly equivalent to LPS in light pollution impacts.	1.0	0.4
PCA LED***	Phosphor-converted amber LED – Similar to HPS though products vary.	2.4	1.0
FLED****	Filtered warm-white light-emitting diode – a straw-yellow LED lamp with a filter that removes most emission with wavelength shorter than 500 nanometers.	3.6	1.5
LED 2400K	Light-emitting diode with "correlated color temperature" (CCT) of 2400K – a "warm-white" LED. This type of LED has not seen wide use.	4.3	1.8
LED 4100K	Light-emitting diode with CCT of 4100K – a "cool-white" LED. This is a common LED type in recent LED area lighting installations.	6.4	2.7
LED 5100K	Light-emitting diode with CCT of 5100K – a "cool-white" LED. This also is a common LED type in recent LED area lighting installations.	7.9	3.3

City of Ithaca buying ~2000 street lights from NYSEG with an eye to convert to LEDs

Need to weigh & balance:

Energy savings

Sky glow

Ecological impacts

Etc.

EMC advisory input?



Demonstration of variable insect attraction to different light types
@
5th annual Ithaca Moth Night



Saturday July 9th 2016 at Lower Robert Treman State Park
(parking lot near Park office)
9PM-Midnight

<http://www.oldbird.org/mothweek/FingerLakesMothEvents.html>