



# CONTROLS SUMMIT '24

Integration for the Future  
Oct. 15-16 · Milwaukee, WI





**CONTROLS  
SUMMIT '24**

Integration for the Future



# Wasted Light at Night



# Panelists



Leora Radetsky  
DesignLights  
Consortium



Annette  
Prince  
Chicago Bird  
Monitors



Kristin  
Raduenz  
Mead and Hunt



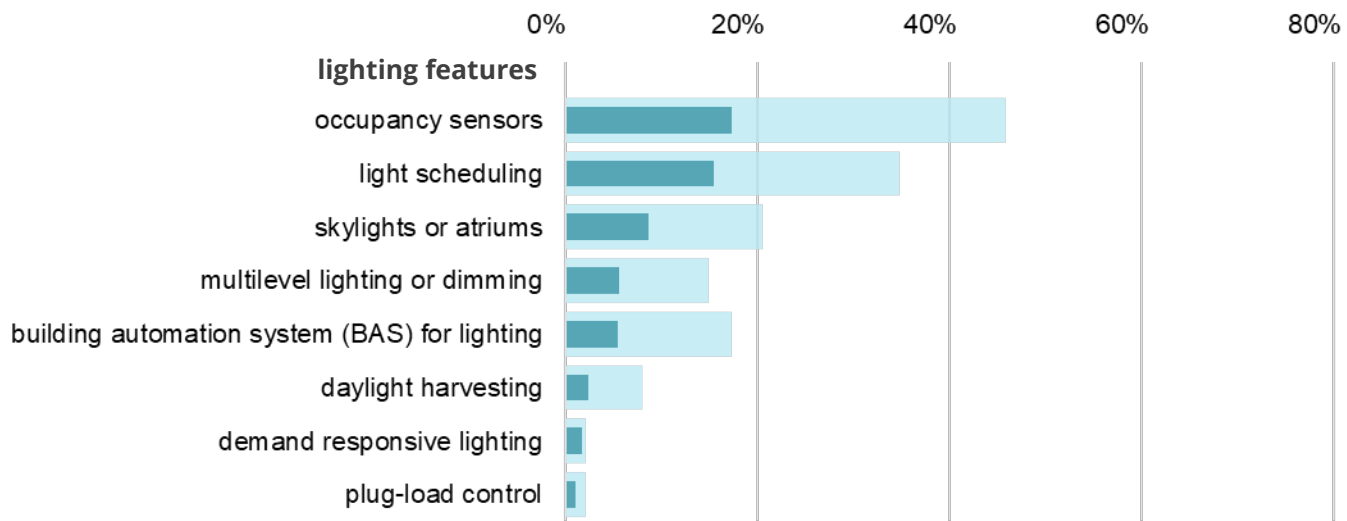
Scott Wollenzien  
Northwestern Mutual  
Insurance Company



# Introduction

# The most common lighting controls in 2018 were occupancy sensors

Total commercial buildings and floorspace by window and interior lighting features, 2018  
percentage



- Occupancy sensors, the most commonly used lighting feature, were used in 17% of buildings, which accounted for 46% of floorspace.

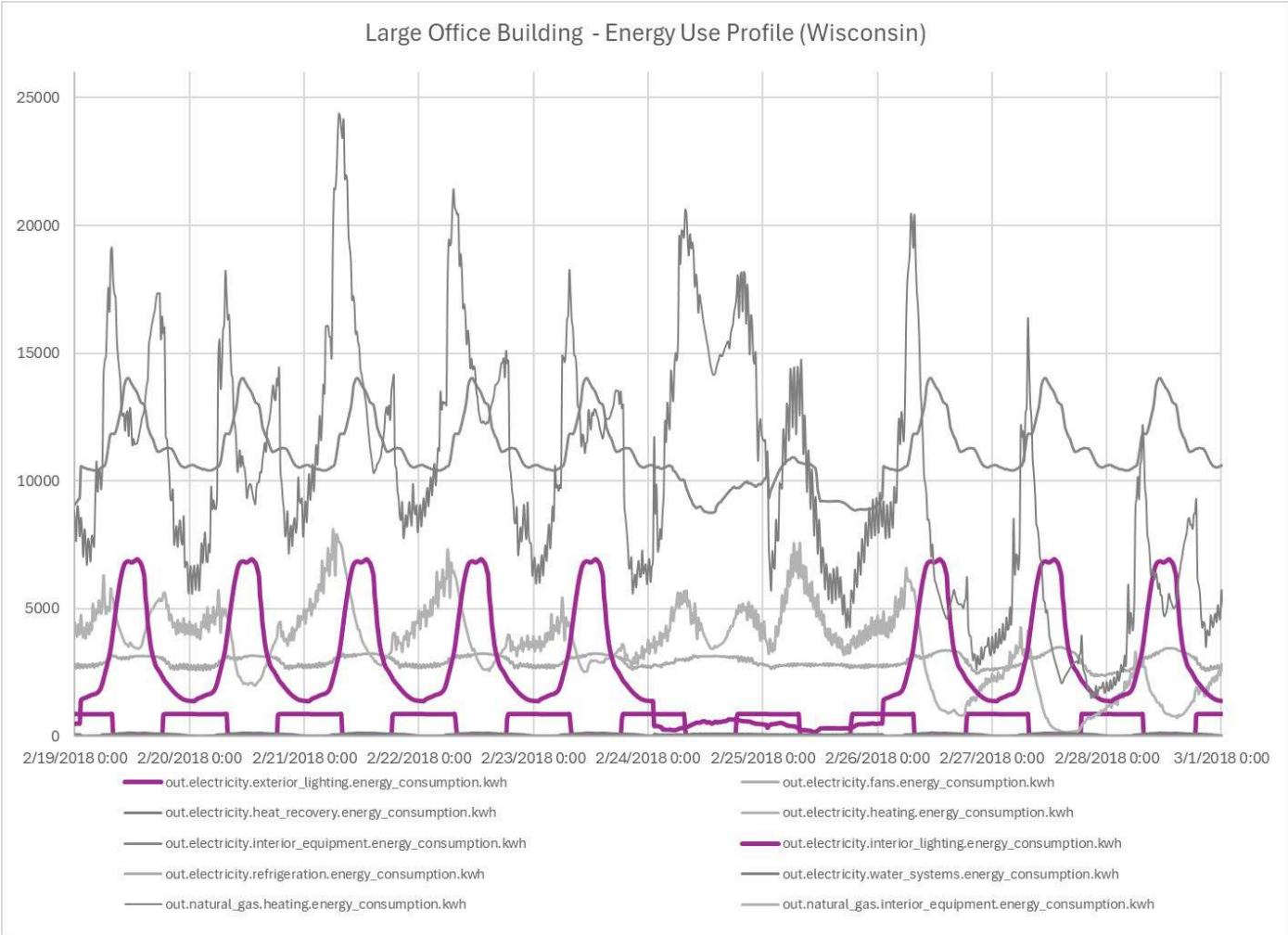
percentage of total commercial buildings  
percentage of total commercial floorspace



Source: U.S. Energy Information Administration, *Commercial Buildings Energy Consumption Survey*  
Note: More than one window or lighting feature may apply. See the [CBECS Terminology](#) for definitions of terms used.



# Large Office Energy Use Load Profile (COMSTOCK)



[https://oedi-data-lake.s3.amazonaws.com/nrel-pds-building-stock/end-use-load-profiles-for-us-building-stock/2021/comstock\\_a my2018\\_release\\_1/time series\\_aggregates/by\\_state/state=WI/wi-largeoffice.csv](https://oedi-data-lake.s3.amazonaws.com/nrel-pds-building-stock/end-use-load-profiles-for-us-building-stock/2021/comstock_a my2018_release_1/time series_aggregates/by_state/state=WI/wi-largeoffice.csv)



# NLCs can save significant energy across building types

- Source: (NEEA & DLC Report, 2020)

**Table 8. Summary of estimated control factors by LLLC and control strategies.**

LLC Presence	Total Buildings	Control Factor (% Savings)			
		Average	25 <sup>th</sup> -75 <sup>th</sup> Percentile	High-End Trim Contributions	Other Control Strategies
NLCs w/ LLLC	98	0.63	0.50 - 0.79	0.37	0.41
NLCs w/o LLLC	96	0.35	0.17 - 0.48	0.17	0.22
All NLCs	194	0.49	0.35 - 0.69	0.27	0.32

*Note: The numbers in this table are meant to provide a high-level overview of average savings trends. Additional study is needed to control for potentially confounding variables, and thus at this time the data does not imply that LLLC is universally superior or applicable to all building types.*

<https://designlights.org/resources/reports/report-energy-savings-from-networked-lighting-control-nlc-systems-with-and-without-lllc/>

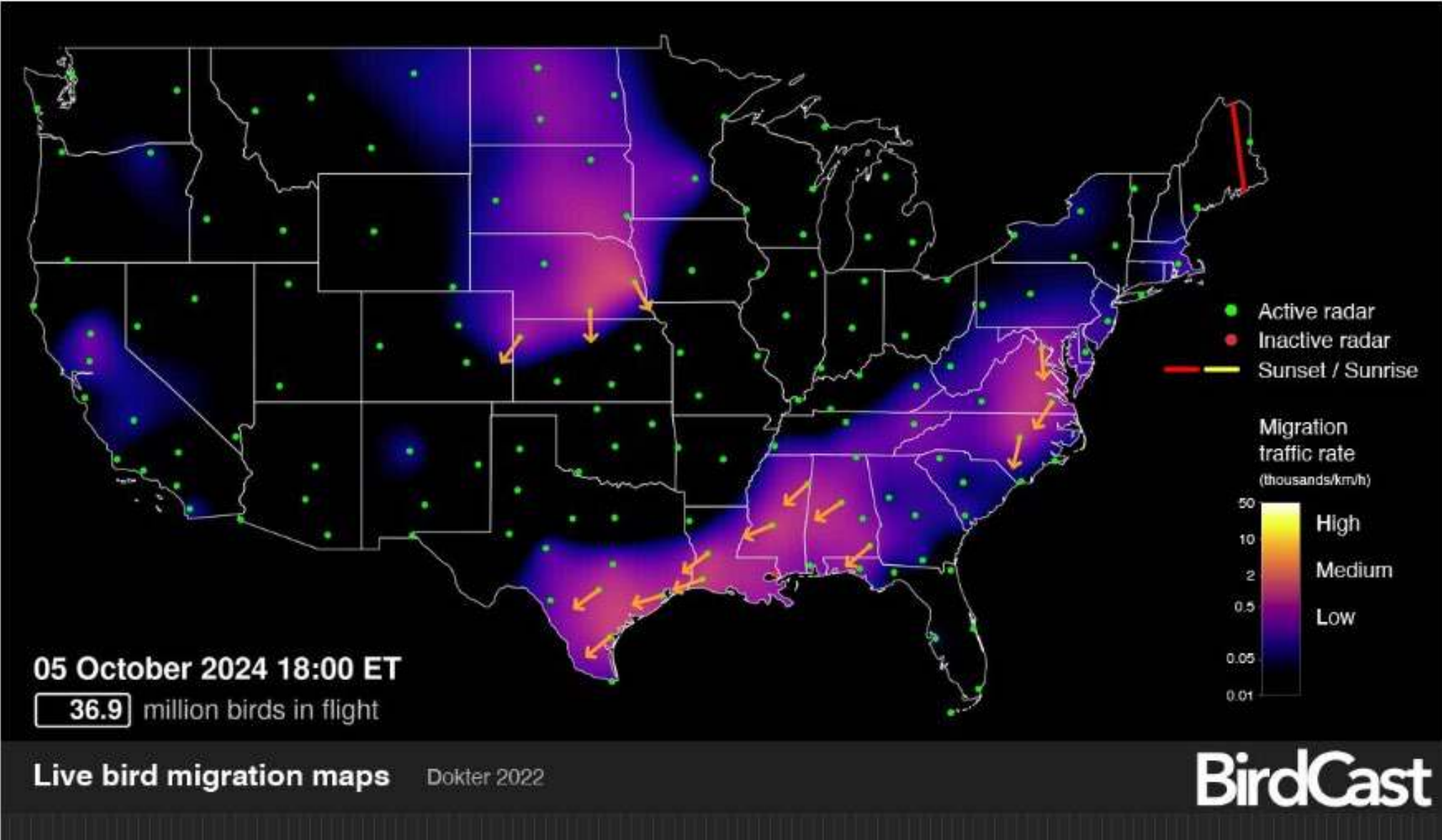


# Non-energy benefits (NEBs) of NLCs

Table 1. Most Important NEBs to Key Stakeholder Groups

Decisionmakers referred by utility	Building operations	Building occupants
Extending the life of lighting equipment	Internal building safety and security	Feeling of safety/security within the building
Look and ambiance of the space	Productivity from the automation of the lighting and equipment	Feeling of safety/security outside the building
Control over energy use	Quality of lighting in the space	Improvement of quality of light in the workspace
Maintenance and associated labor costs	Ability to perform work more efficiently and effectively	Ability to do their job more efficiently and effectively

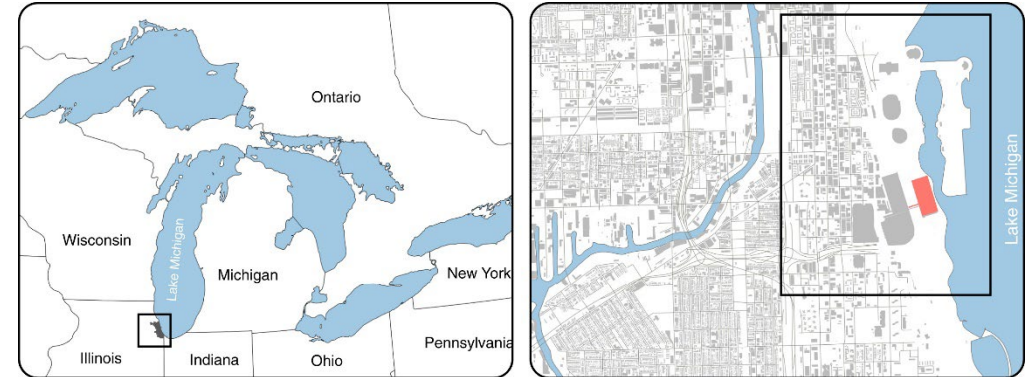




Dokter, A. M. Year/s of live migration map image. BirdCast, live migration map; October 5 2024. Cornell Lab of Ornithology. <https://birdcast.info/migration-tools/migration-forecast-maps>. October 7 2024.

# Turning interior lights off reduces bird collisions

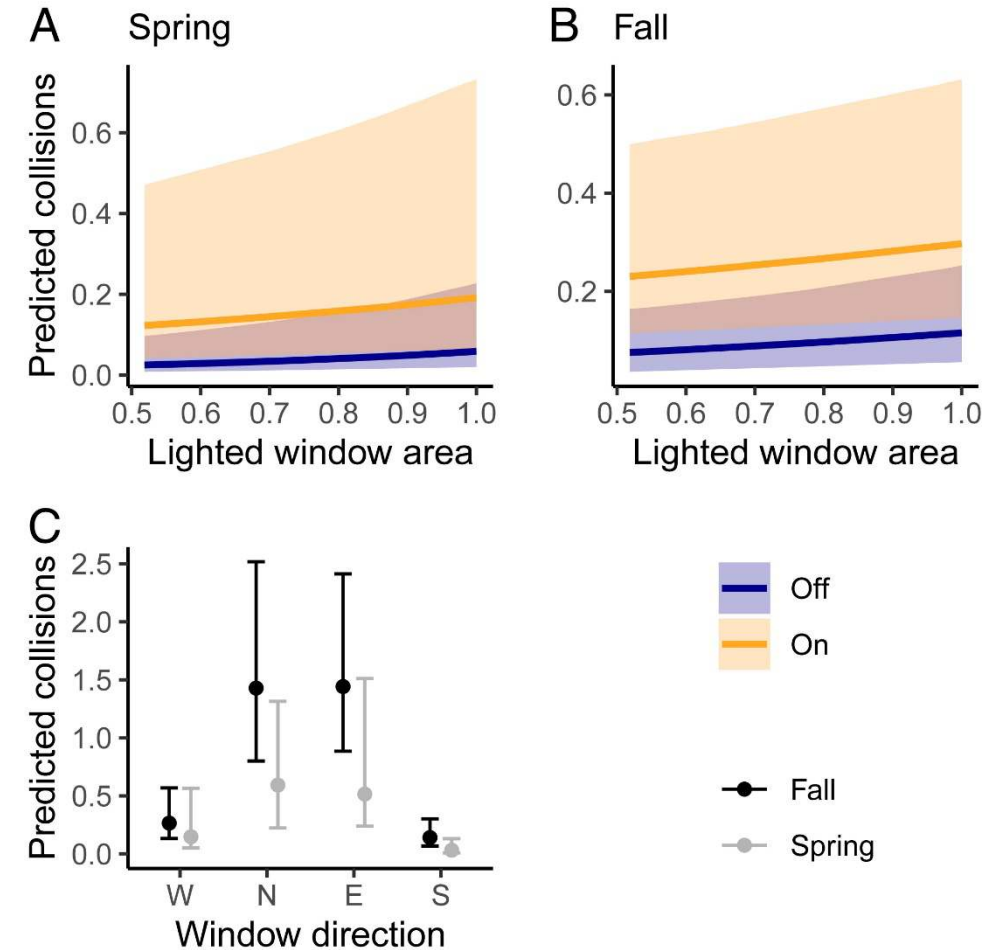
- More than a billion birds are killed by window collisions each year
- Study examined lighting and collisions at McCormick Place.





# Turning interior lights off reduces bird collisions

- More than a billion birds are killed by window collisions each year
- Study examined lighting and collisions at McCormick Place.
- Darkening individual windows reduces mortality
- Individual window darkening was more important than window size





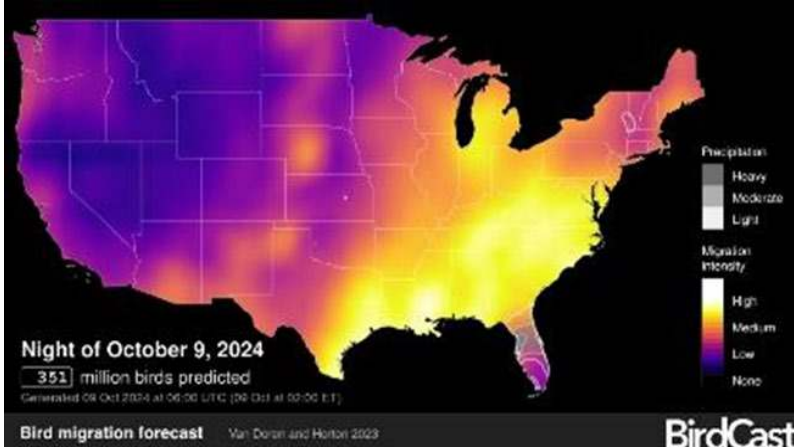
# GSA requires LUNA for GSA managed buildings

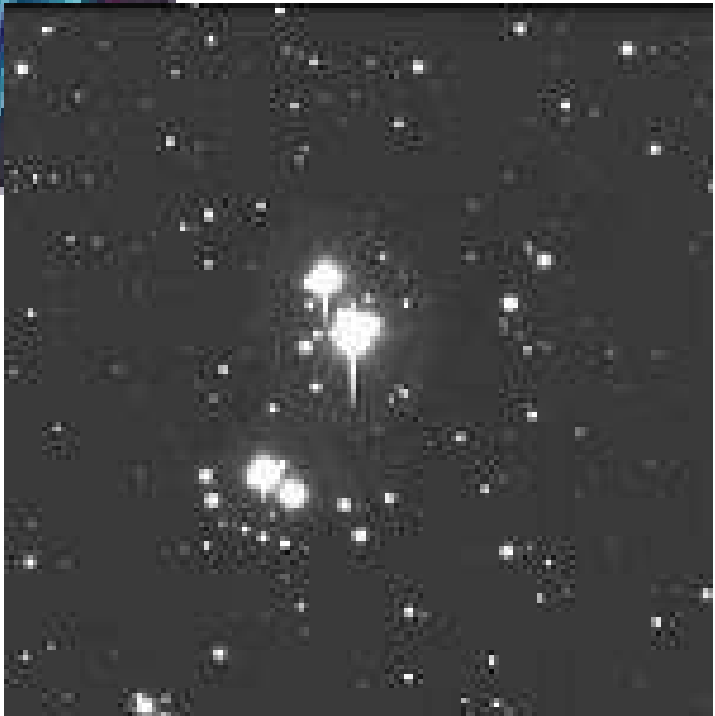
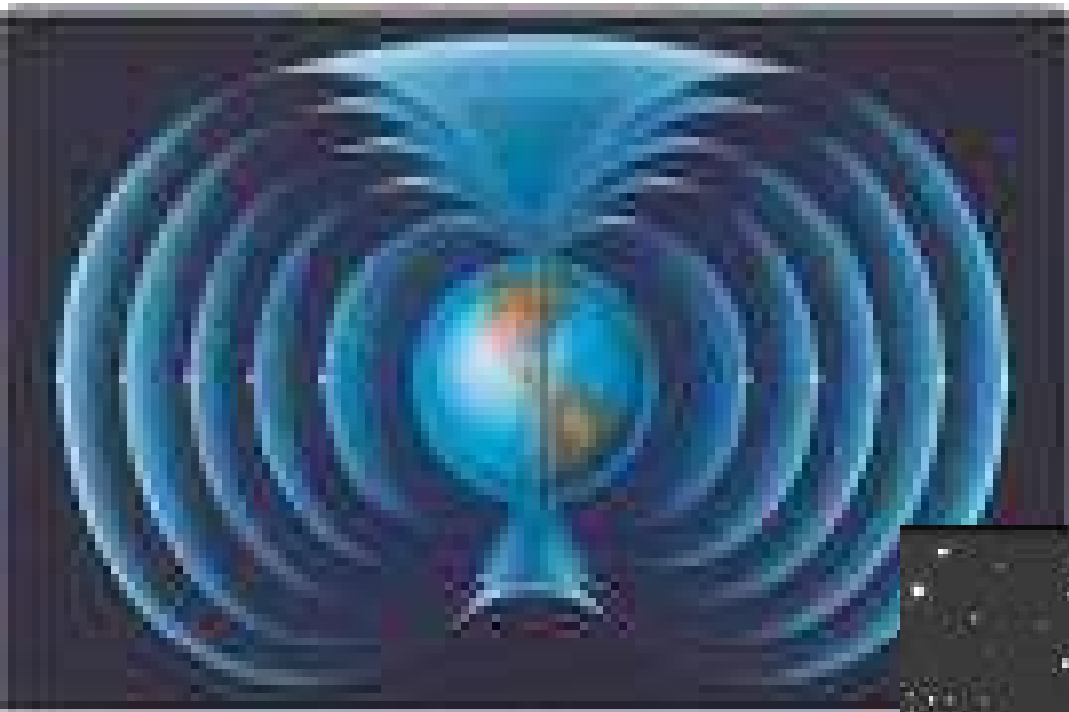
- GSA 2024 P100 Facilities Standard requires outdoor luminaires to be LUNA listed for all projects (applies for all LUNA categories)
- P100 is a mandatory standard for new construction, repairs, and operations/maintenance work for over 9600 GSA-managed buildings





# Annette Prince







Chicago Live from rreese.com 08/19/04 20:45:03

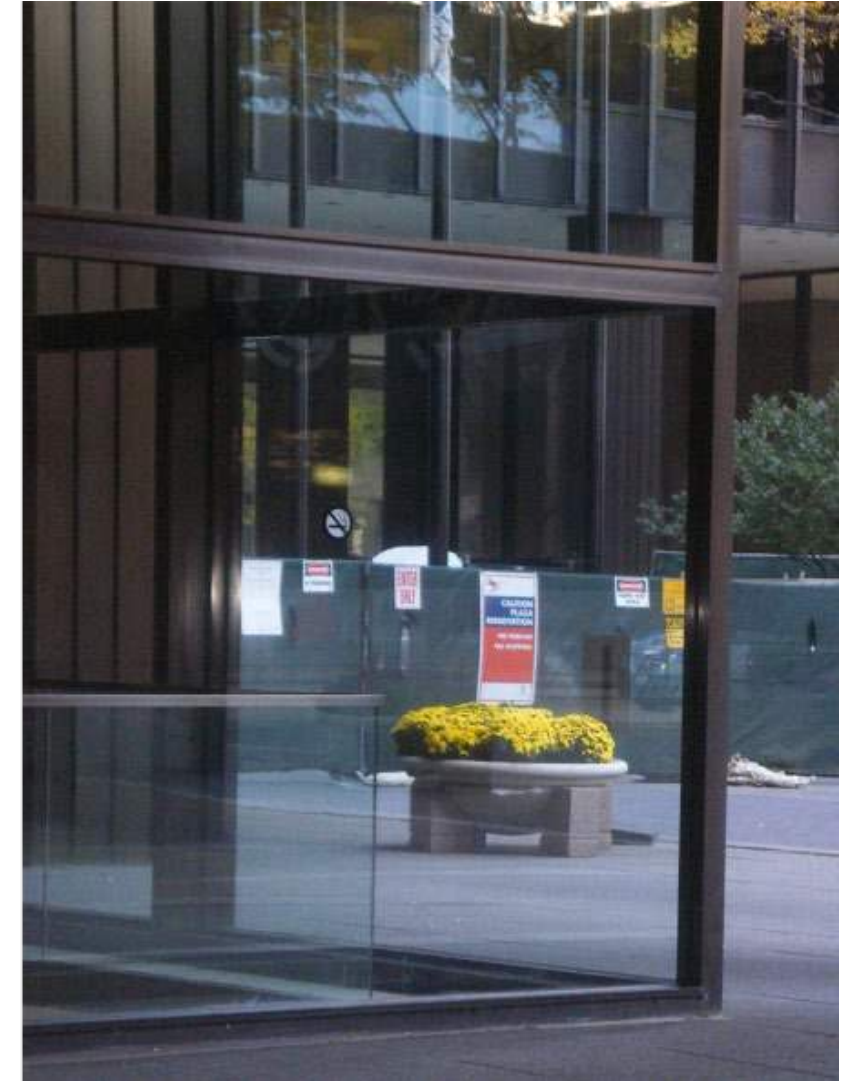








# Dangerous glass transparency AND reflectivity





# LIGHTS OUT CHICAGO

REDUCE COLLISIONS AND  
SAVE MIGRATORY BIRDS





# CHICAGO'S McCORMICK PLACE

**2 year study found turning off lights resulted in 83% fewer birds deaths - 1,297 birds crashed into lit windows compared to 192 into unlit windows**

**"Turning Off Building Lights Reduced Bird Window-Kill 83% Field Museum Scientists Release Data from Two-Year Study." Field Museum Press Release, 2002**



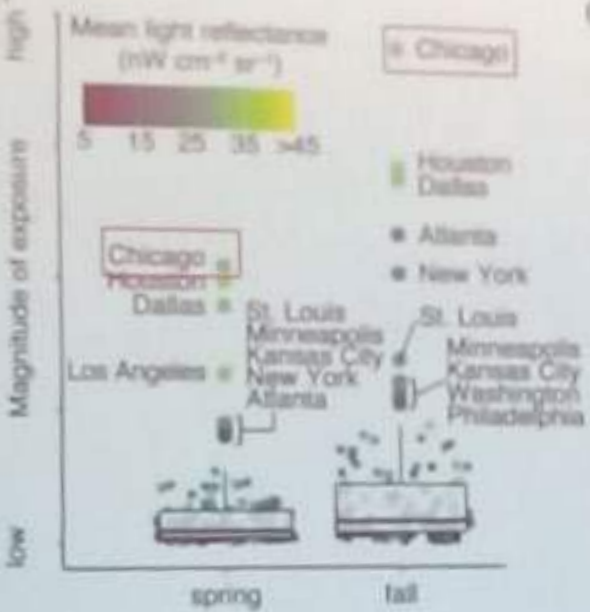
# DLC CONTROLS SUMMIT '24





October 5, 2023





Horton et al. 2018 compared densities of bird migration to magnitude of urban light, and found that *Chicago exposes more migratory birds to artificial light than any city in the U.S.*





**Kristin Raduenz**





MSN Dane County Regional Airport - Madison, WI  
Photography by Eric M Beron



Energy · Quality · Controllability™

GRR Gerald R Ford International Airport – Grand Rapids, MI  
Photography by Peter McCullough Photo + Drone



# Scott Wollenzien



# Benefits and Challenges with Lighting Controls

- Benefits
  - Energy Savings
  - Sustainability
  - Higher EE productivity and wellness
  - Security Enhanced
  - Can be controlled remotely
  - Can be set to avoid Holiday
  - Can be programmed and turned down during migrations
- Challenges
  - Day Light Harvesting
  - Lights going on and off





# Minimize Bird Collisions

- Most collisions happen within 60 ft of the ground
- Unique way birds are made up physiologically
- Use of FRIT – small dots film/etched/ceramic
- Window Shades – Shades Down 7 P to 6 A
- Timing of the Lighting - Lights off 7 P to 6 A





# Q&A