

What Happened to the Dark?

Ignite Montrose

June 29, 2023

Bryan Cashion

Topics

**June is
Colorado Dark
Sky Month**

- The Issue: Light Pollution
 - ❖ Artificial Light At Night (ALAN)
- Why this is Important
- What can be done
- Dark Sky Places in Colorado

The Issue: Artificial Light At Night (ALAN)

- Sunlight is important to all forms of life.
- Artificial light is more complex.
- The technology of artificial light is changing rapidly.
 - ❖ Good and bad consequences

The Issue: Artificial Light At Night (ALAN)

- Animal life
 - Sea turtles
 - Hatchlings move towards the lighted ocean horizon to find safety



Courtesy: Florida Dept of Transportation



Courtesy: Blair Witherington

The Issue: Artificial Light At Night (ALAN)

- Birdlife
 - Disrupts migration
 - Is it a pond or a parking lot?



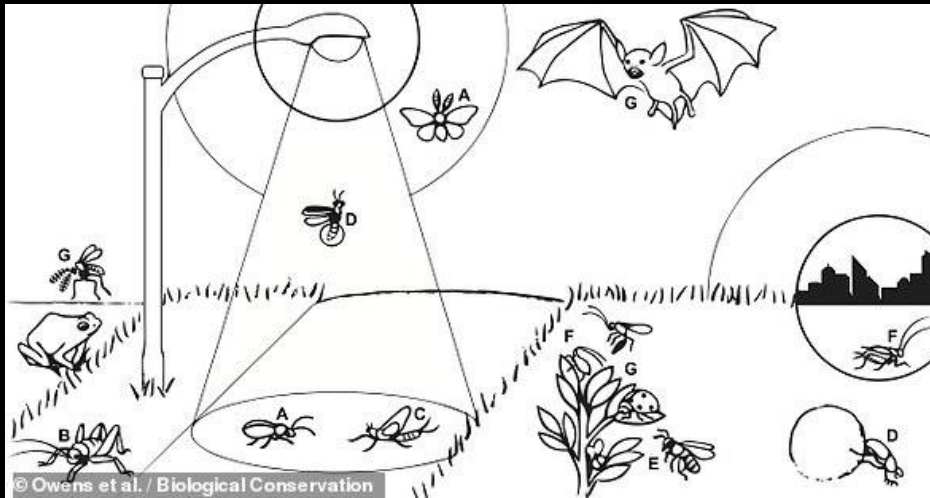
Courtesy: Mary Coolidge, Portland Audubon Society



Support “Lights Out Colorado” <https://rockies.audubon.org/lights-out>

The Issue: Artificial Light At Night (ALAN)

- Animal life
 - Insects
 - Interferes with night-day cycle of fireflies
 - Inhibits pollination (food source impact)
 - Prevents bees from resting at night (Similar impact on humans)



Credit: Wikipedia



Credit: fotogigi85/iStockphoto

The Issue: Artificial Light At Night (ALAN)

- Human life
 - Upsets natural day-night cycle
 - Blue-white light interferes with proper sleep



Would you like this to be
YOUR bedroom window?

BBC News

The Issue: Artificial Light At Night (ALAN)

- Driving Safety

Really, Really Bad Lighting



Courtesy: DarkSky International

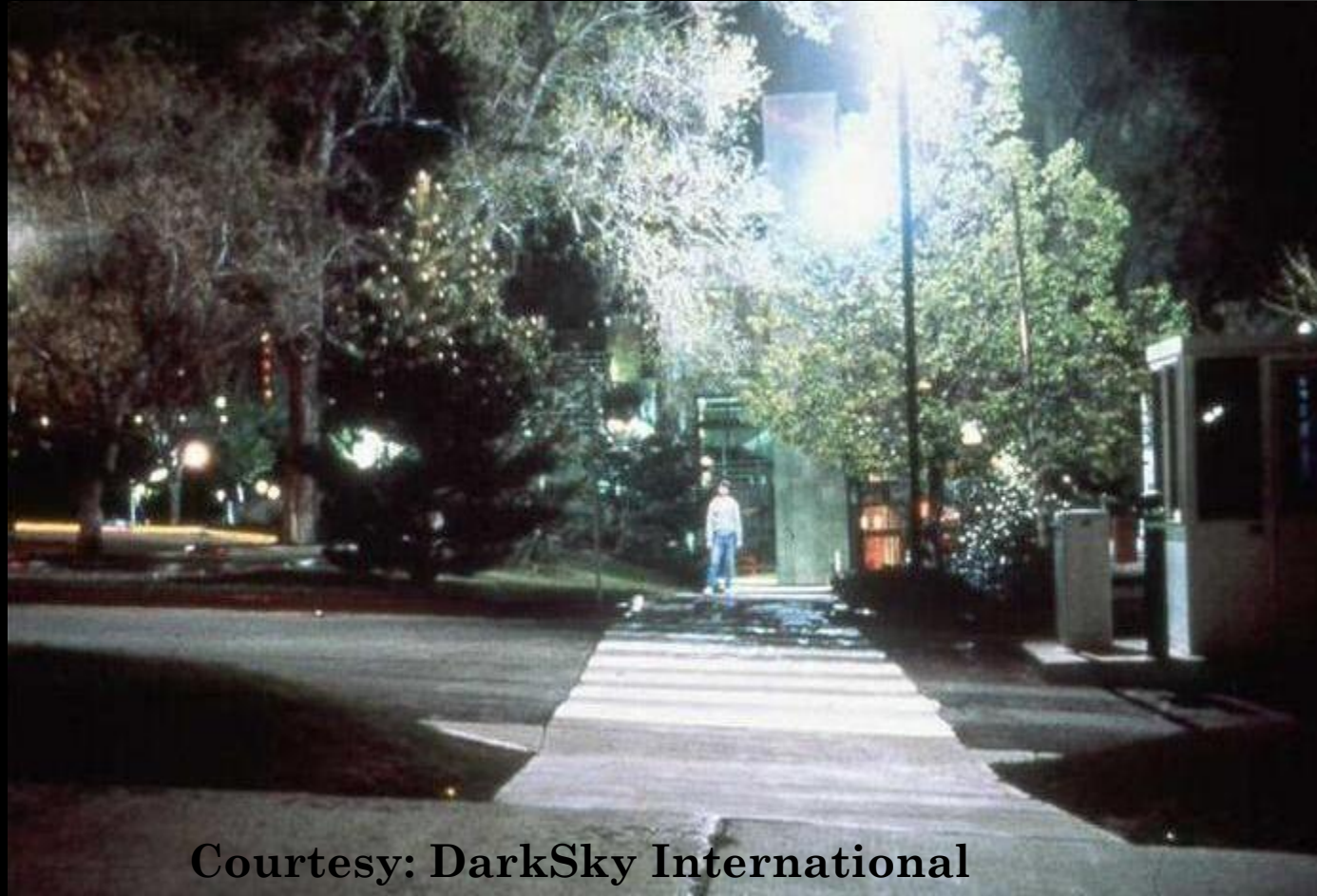


DarkSky International, Jim Richardson

- (1) "A model predicting discomfort glare caused by LED road lights," Joint Chinese-Dutch study
- (2) "American Medical Association Council on Science and Public Health (2012)"

The Issue: Artificial Light At Night (ALAN)

- Personal Safety
 - No conclusive evidence that brighter lights increase safety.



Courtesy: DarkSky International

The Issue: Artificial Light At Night (ALAN)

- Personal Safety
 - No conclusive evidence that brighter lights increase safety.
 - Some studies show a correlation between increased lighting and **INCREASED** crime rates.



Courtesy: DarkSky International

The Issue: Artificial Light At Night (ALAN)

- Personal Safety
 - No conclusive evidence that brighter lights increase safety.
 - Some studies show a correlation between increased lighting and **INCREASED** crime rates.
 - Glare actually decreases safety



Courtesy: DarkSky International

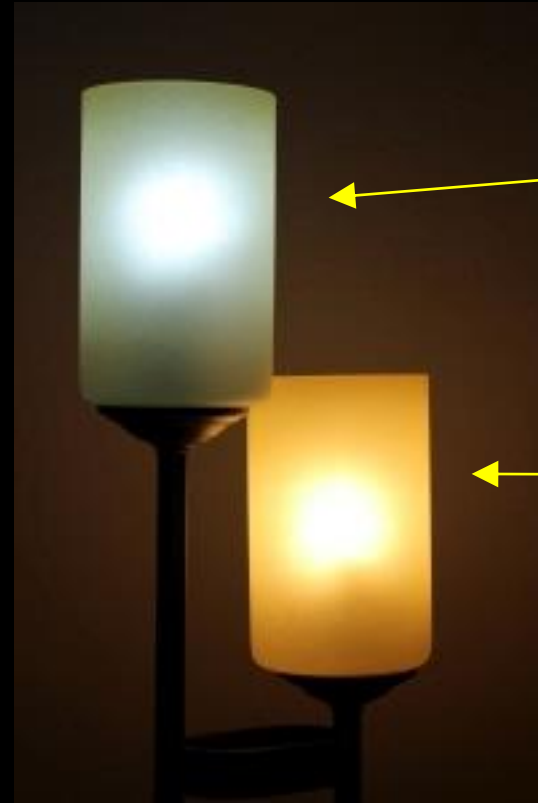
The Issue: Artificial Light At Night (ALAN)

- AMA report
 - Supports the use of LED lighting in order to reduce energy consumption and the use of fossil fuels
 - States that some LED lights are harmful.

June 2016 – American Medical Association “Human and Environmental Effects of Light Emitting Diode (LED) Community Lighting”

The Issue: Artificial Light At Night (ALAN)

- Exposure to blue-rich white light correlates to increased risks for some diseases.
- Recommends lighting with a CCT no higher than 3000k.
- Full disclosure – some disagreement within medical community



Correlated color
Temperature (CCT)
= 4000K

CCT = 2700K

June 2016 – American Medical Association “Human and Environmental Effects of Light Emitting Diode (LED) Community Lighting”

Why is this Important

- Energy efficiency
 - LEDs use much less energy than older technology
- **HOWEVER**
 - Lights shining up are wasted energy.
 - LED upgrade is not just “remove and replace”



NASA Earth Observatory

Why is this Important

- It's not just energy
 - Astronomy Based Science in Arizona brings in \$250 million per year
 - Galloway Dark Sky Park, Scotland
 - Every dollar spent returned \$1.93 to local economy
 - Astronomy outreach (Astro-tourism) is the fastest growing activity at western US National Parks



University of Arizona

What can be done

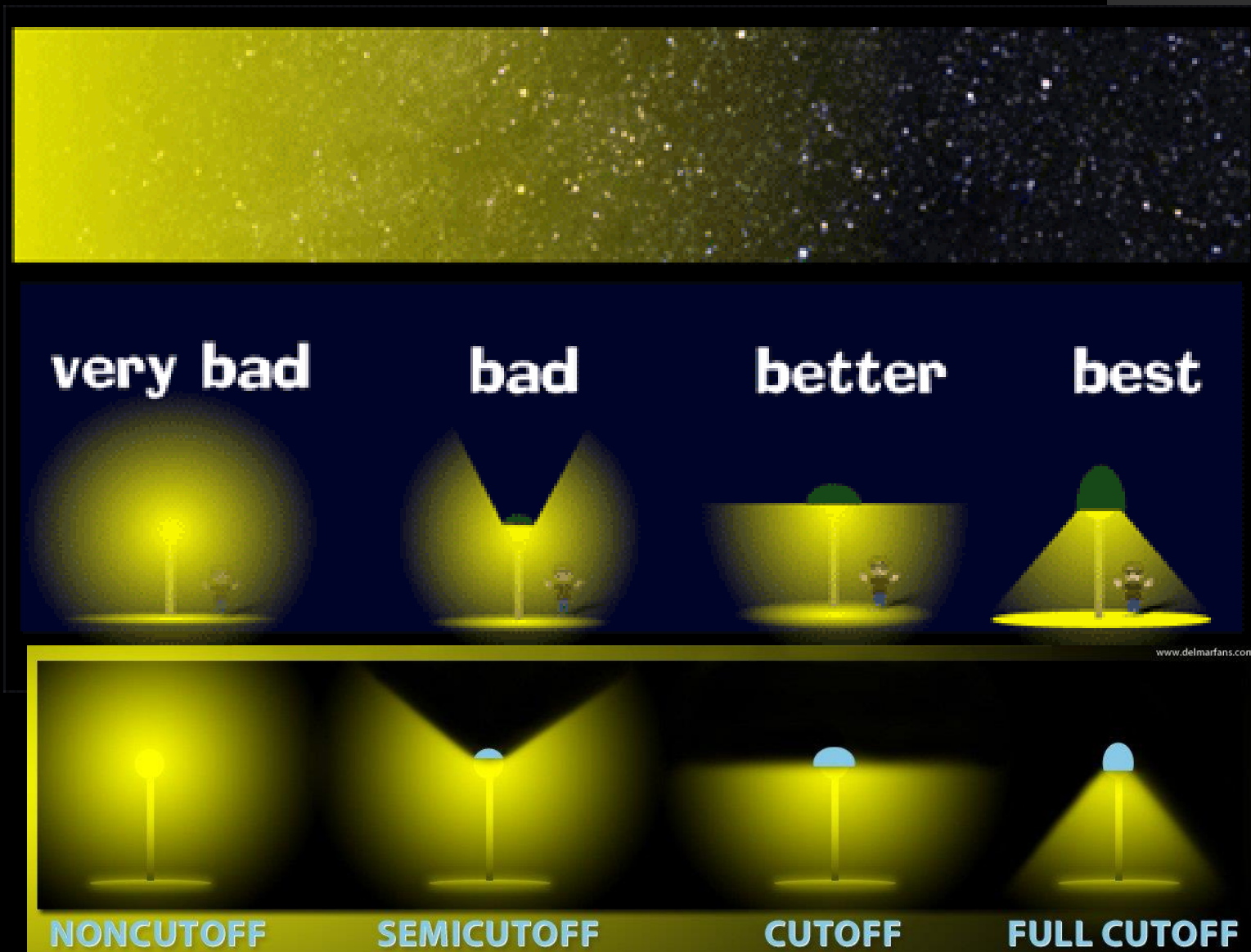
USEFUL – All light should have a clear purpose.

TARGETED – Light should be directed only to where needed.

LOW LIGHT LEVELS – Light should be no brighter than necessary.

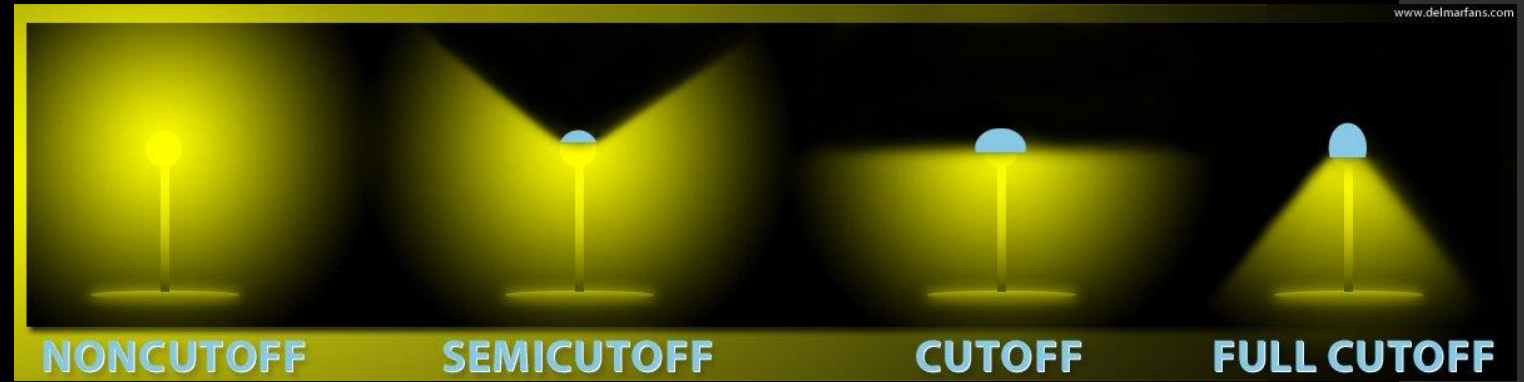
CONTROLLED – Light should be used only when it is useful.

COLOR – Use warmer color lights where possible.



Canadian Space Agency

What can be done



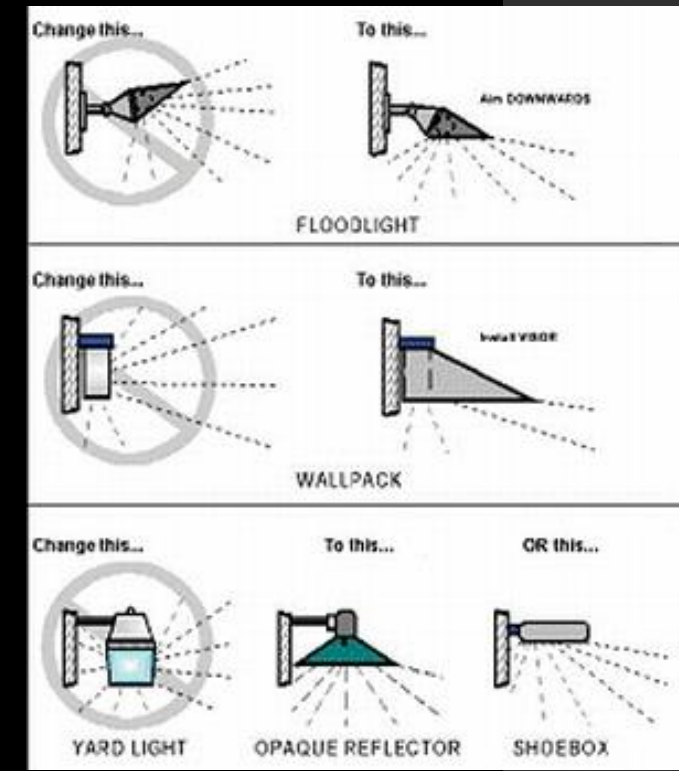
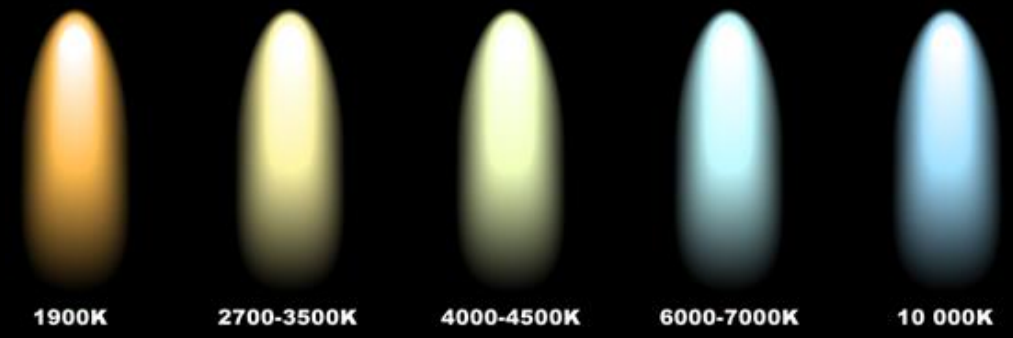
Illuminating Engineering Society

Install Full-cutoff lights

Correlated Color Temperature below 3000K

Install adaptive controls

- motion sensors,
- timers,
- auto-dimming function



See <http://darksky.org/fsa/fsa-products/>

What can be done

Thank state level legislators who support dark skies



First Regular Session | 74th General Assembly

Colorado General Assembly

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HB22-1382

Support Dark Sky Designation And Promotion In Colorado

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Concerning the designation and promotion of dark sky locations in Colorado.

SESSION: 2022 Regular Session

SUBJECTS: Business & Economic Development, Natural Resources & Environment

BILL SUMMARY

The International Dark-Sky Association (IDA) encourages communities, parks, and protected areas to preserve and protect dark skies by various means, including an international dark sky places program that offers designations for 5 types of dark sky places. The act requires the Colorado tourism office (office) to establish the Colorado designated dark sky designation technical assistance grant program (program) to:

- Provide technical assistance grants to applicants seeking direct support from the IDA for activities related to international dark sky designation; and
- Provide general education and outreach about dark skies and specifically promote responsible and sustainable tourism opportunities in designated dark sky places in the state.

PRIME SPONSORS



Representative
Julie McCluskie



Representative
Marc Catlin



Senator
Kerry Donovan

What can be done

- Encourage local officials (City and County) to enforce existing ordinances.
- Thank City officials for recent steps to improve Montrose lighting

Montrose City Ordinances

Chapter 4-13	
OUTDOOR LIGHTING	
Sections:	
4-13-1	DEFINITIONS
4-13-2	APPLICABILITY
4-13-3	STANDARDS
4-13-4	EXEMPTIONS
4-13-5	LIGHTING PLAN REQUIRED

Montrose County Regulations

SECTION V	DETAILED DEVELOPMENT STANDARDS	81
A.	Signs	81
1.	General Provisions	81
2.	Signs Not Requiring a Permit	82
3.	Prohibited Signs	84
4.	Nonconforming Signs	84
5.	Sign Standards	85
6.	Sign Permit Review Process	86
B.	Parking and Loading	87
C.	Lighting	92

What can be done

- Encourage update of local ordinances (City and County) to incorporate latest knowledge about lighting
 - Color Temperature < 3000K
 - Adaptive controls
 - Digital sign rules

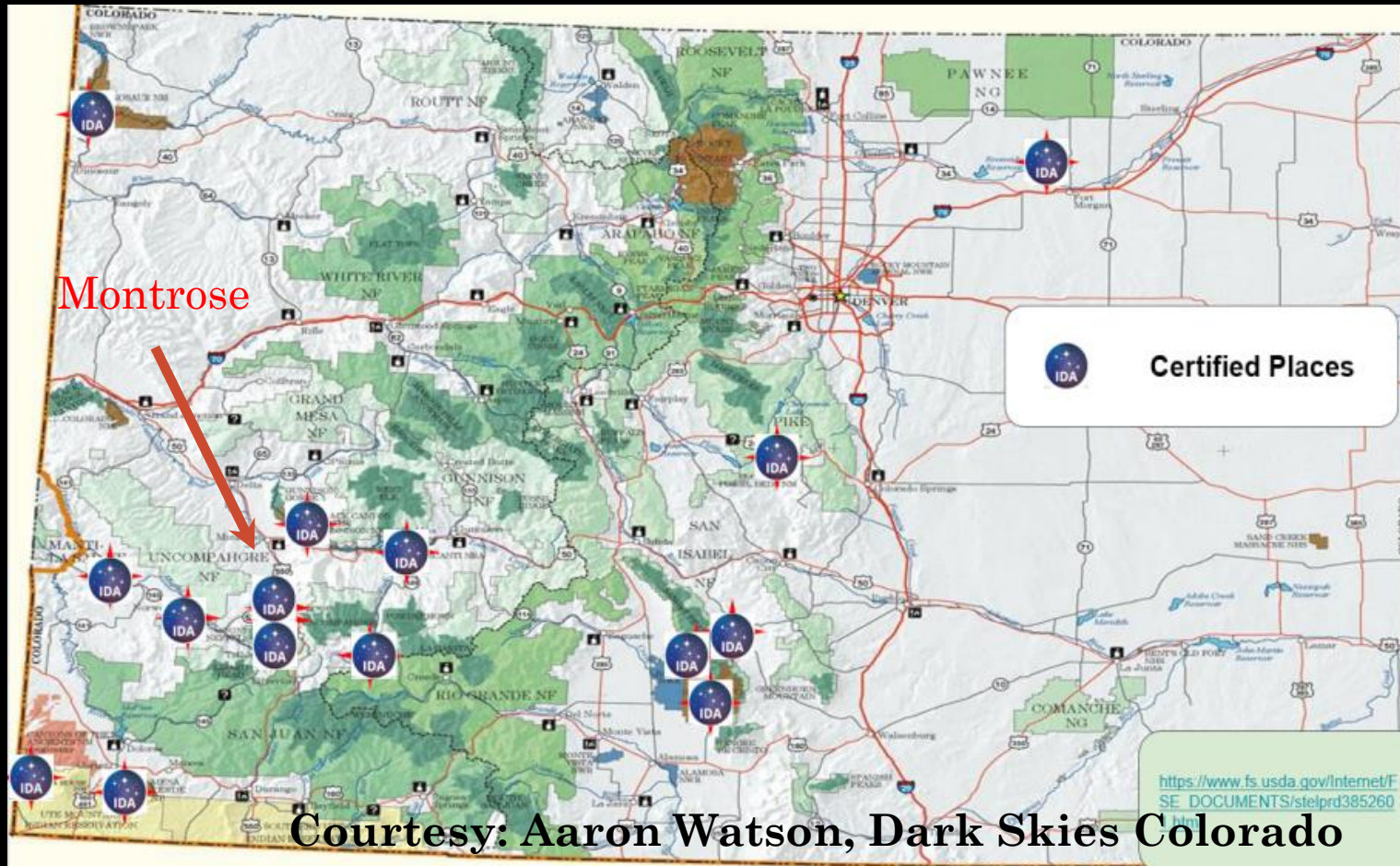
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Dark Sky Places in Colorado



- Support Dark Sky Colorado - <https://www.darkskycolorado.org>



Time's Up!

- About your speaker:
- Bryan Cashion
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<https://www.darksky.org/our-work/lighting/lighting-principles/>

<http://darksky.org/fsa/fsa-products/>

<https://www.darkskycolorado.org>

<https://rockies.audubon.org/lights-out>