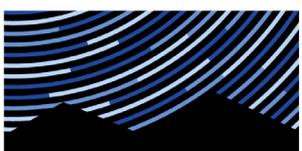


Dark Skies Initiative

McDonald Observatory
FORT DAVIS, TEXAS



Star trails over the Hobby-Eberly Telescope with the glow of the Permian Basin on the horizon
Photo: Ethan Tweedie



McDonald Observatory
Fort Davis, Texas

LIGHT POLLUTION THREATENS THE DARK NIGHT SKIES IN THE HEART OF THE DAVIS MOUNTAINS OF WEST TEXAS.

Located atop Mount Locke and Mount Fowlkes and under some of the darkest night skies in the continental United States, sits the 500-acre world renowned University of Texas at Austin's McDonald Observatory. The Observatory's mission is to advance the understanding of the universe through research and education in astronomy at the University, to contribute to public understanding of science, and to excite schoolchildren about careers in scientific and technical fields. The second largest employer in Jeff Davis County, the Observatory hosts approximately 100,000 visitors each year. Through a campaign of education and awareness, the Observatory's **Dark Skies Initiative** seeks to protect the beautiful, star filled night skies of West Texas for ongoing astronomical research and education.

To protect the dark night skies over the Observatory, the seven counties surrounding



Apache Corporation tank battery using dark sky friendly lighting. Note the light sources are not visible from above; no light shines directly into the sky. Light also stays onsite, providing a well lit working area, and not spilling into the surrounding countryside. All light sources are shielded, reducing glare, creating better visibility.
Photo: Bill Wren/McDonald Observatory

the facility have outdoor lighting ordinances, and all the cities within these counties have similar municipal ordinances. In recent years, the increase of oil and gas related activities in and around the Permian Basin has resulted in an increase of light pollution that threatens these dark skies.

To measure the amount of artificial light over the Observatory, all sky photometry data is collected. To address light pollution

Dark skies friendly lighting has been found to efficiently and effectively increase visibility and worker safety working on oil and gas operations by reducing glare.

coming from the Permian, the Observatory has published "**Recommended Lighting Practices**" in partnership with the Permian Basin Petroleum Association, Texas Oil & Gas Association, American Petroleum Institute, University Lands, Texas Independent Producers and Royalty Owners Association, and Texan by Nature.

Dark skies friendly lighting has been found to not only reduce light pollution, but also to efficiently and effectively increase visibility and worker safety on oil and gas operations by reducing glare. Additionally, dark sky friendly lighting consumes less electricity by redirecting previously wasted up-light to the ground, allowing for the use of lower wattage bulbs. **Converting to warm-white LEDs saves an average of 80% in power consumption over legacy high-intensity discharge lighting!**

TIPS FOR IMPLEMENTING DARK SKIES FRIENDLY LIGHTING



The “**Recommended Lighting Practices**” include:

- Preparing a lighting plan documenting how lighting will be designed and installed.
- Use of audiovisual warning system (AVWS) technology for hazard lighting on structures taller than 200 feet.
- Use of full cutoff luminaires that are fully shielded (i.e., no light shines directly above the horizon and the bare bulb or light source is not visible from offsite).
- Directing lights properly to eliminate light spill and trespass—construction and permanent lighting should be mounted and directed to focus light only on the desired area.
- Use of warm-white instead of cool-white lighting with a color temperature of 3000° Kelvin or less.
- Minimizing light usage during construction and operations—only using lighting when and where you need it.

- Use of vehicle-mounted lights or portable light towers for nighttime maintenance activities—mount high and aim low.
- If the need to flare arises—consider using an enclosed combustor.

IMPACT

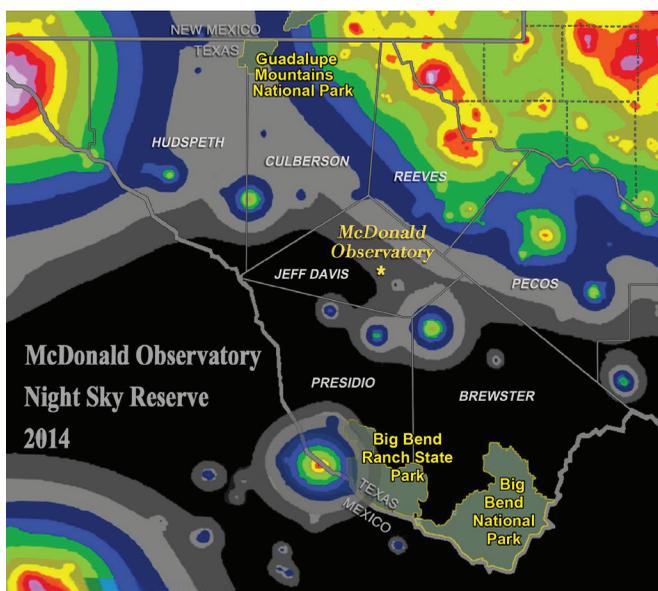
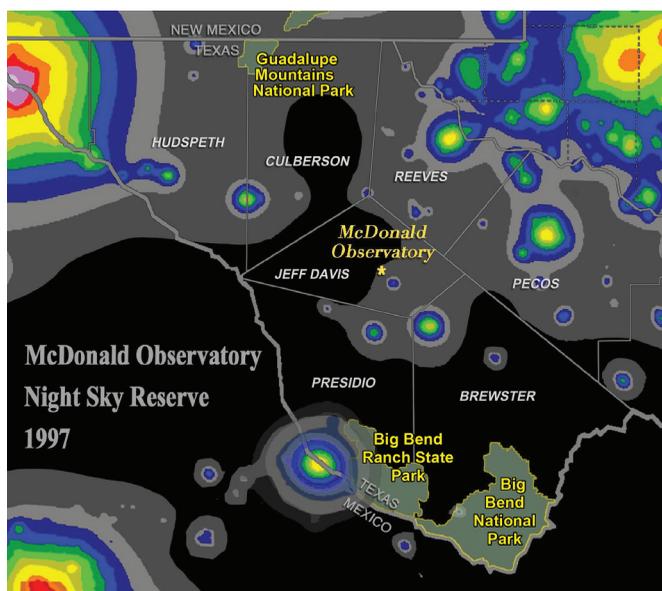
- Increases visibility and safety by reducing glare.
- Reduces light pollution permitting astronomical research.
- Increases cost efficiency by reducing wasted light.
- Lessens disruption of wildlife migratory, feeding, and mating habits.

McDonald Observatory is working with Texan by Nature to connect every oil and gas operator in the Permian, and in the state, to the Observatory. Our goal is to spread education and awareness of the positive benefits of the **Dark Skies Initiative** and encourage oil and gas operators to adopt the “**Recommended Lighting Practices**” because good conservation is good business.

PROJECT NEEDS

- **Partners:** Connections to oil and gas operators and businesses in the Permian and across the state who would like to learn more about the Dark Skies Initiative and adopt the “Recommended Lighting Practices”.
- **Funding:** The Dark Skies Initiative is seeking funding to continue their campaign of education and awareness across the state and to fund the purchase of dark skies friendly lighting fixtures. For more information contact: info@mcdonalobservatory.org

Before and after the oil and gas boom in the Permian Basin. Sky-glow from oil and gas related activities expands across the Pecos River and towards McDonald Observatory.
Source: The New World Atlas of Artificial Sky Brightness.



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This document was made in partnership with

