Damaging Economies and Ecosystems: Light Pollution in Logan City

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Damaging Economies and Ecosystems: Light Pollution In Logan City

Rachel Nydegger
Shane L. Larson, Ph.D., Mentor
Student Showcase

Effects of Light Pollution

What is Light Pollution?
"Artificial light which shines where it is neither wanted nor needed." - International Astronomical Union (IAU)

My Research
I use a Sky Quality Meter and GPS to measure light pollution on USU campus and in Logan City.

Future Work
I plan to develop an application to analyze the output of light pollution data and create a map of light pollution in the area.

To Get Involved:
Contact Logan City or contact me at rznydegger@gmail.com for more information or to participate in this project.
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Future Work
- RKQ Reading and writing guide to improve understanding of light pollution
- Exposition of light and its affects on environment
- Learn new techniques for gathering and analyzing light pollution data
- Keep collecting data from Logan city and USU campus
What is Light Pollution?

"Artificial light which shines where it is neither wanted, nor needed."

- International Astronomical Union (IAU)
Major Cause of Light Pollution

Inefficient Shielding
Effects of Light Pollution
The Environment

Thousands of migratory birds were disoriented by and trapped within the Ground Zero memorial lights in 2010.
- FLAP

Sea turtle hatchlings often die from heading towards cities rather than the light reflecting off of the ocean.
The Economy

According to the International Dark-Sky Association, an estimated 30% of street lighting is wasted. Considering an average of $0.10 per kilowatt-hour, this amounts to the yearly waste of:

- 3.6 tons of coal
- 12.9 million barrels of oil
- $2.2 billion in the U.S.
- $809,597 in Cache Valley
Astronomy

Excess ambient light obscures the night sky, forcing astronomers to use special filters for their telescopes.
Do People Care?

April 11th is the last day of International Dark Sky Week

Recent Herald Journal articles:

- February 20 - Article recognizing Logan city’s switch to Dark-Sky compliant outdoor fixtures.
- March 10 - Citizens thank Cache Valley Oxygen for recent measures against light pollution.
My Research

I use a Sky Quality Meter and GPS to measure light pollution on USU campus and in Logan city.

- Using the Sky Quality meter, the light pollution directly overhead is integrated and rated on an arbitrary scale.
- Three readings are averaged at every fifty steps.
- The latitude and longitude are tracked by the GPS so a light pollution map can be made.
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• Three reading are averaged at every fifty steps.
• The latitude and longitude are tracked by the GPS so a light pollution map can be made.
Future Work

URCO funding has enabling me to acquire equipment to analyze the output of light fixtures directly as well as take remote, continual ambient light pollution data.

Learn new techniques for gathering and analyzing light pollution data at Kitt Peak National Observatory over the Summer.

Keep collecting data from Logan city and USU campus.
To Get Involved:

- International Dark-Sky Association

- Globe at Night - Next opportunity to contribute is April 29th.

- 'The City Dark' - Available at Merrill-Cazier library