

Light and Noise Pollution

Noise Pollution

- Noise pollution is the excessive environmental noise that disrupts activity and balance of human and animal life.
- The main sources are construction site and transportation systems, others minor sources can be car alarms, fireworks, barking dogs, loud people etc.



Damages to humans

- The effect of noise pollution on humans can be dangerous and it can be the source of physiological and psychological health problems. Noise pollution can cause aggression, high stress level, hearing loss, sleep disturbances and hypertension. Furthermore, high noise levels can contribute to cardiovascular problems.



Damages to animals

- Not only noise pollution cause problems to human beings, but it can do several damages to animals,for example reducing the habitat area by a noisy close urban zone, which in the case of endangered species may be part of the path to extinction.
- Also, noise can increase the risk of death by changing the delicate balance in predator-prey detection and avoidance, and by interfering with their use of sounds in communication, especially in relation to reproduction and in navigation.

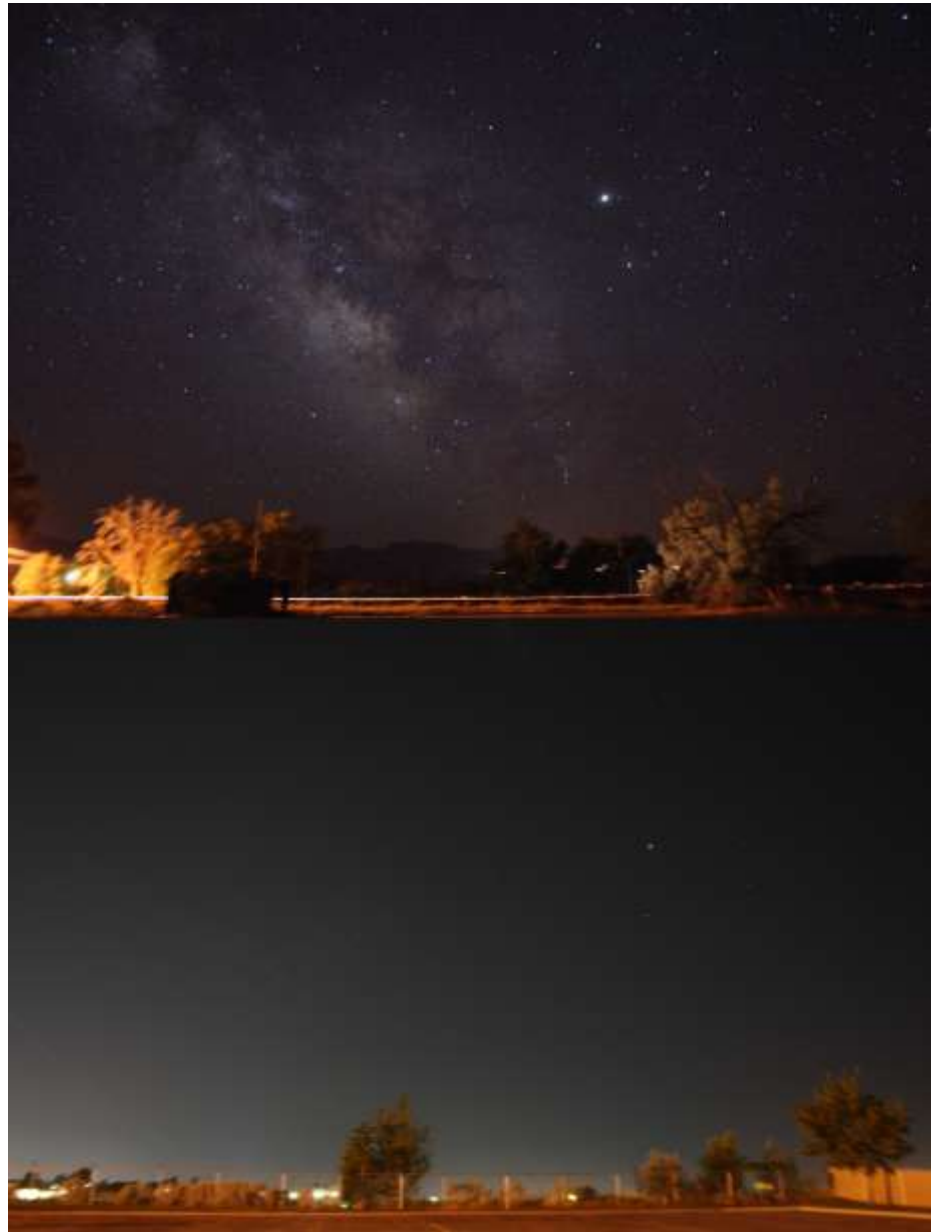
Prevention

- In order to prevent noise pollution we can apply technology to mitigate or remove noise, for example, concerning the roadway noise there are a lot of solutions: use of noise barriers, limitation of vehicle speed, alteration of roadway surface texture, limitation of heavy vehicles traffic , the use of traffic controls that smooth vehicle flow to reduce braking and acceleration and tyre design.
- For the aircraft noise, little change can be done, such as altering flight paths; this has demonstrated benefits for residential populations near airports.

Light pollution

- Light pollution is excessive artificial light and cause effects like sky glow, glare, light trespass, light clutter, decreased visibility at night, and energy waste.
- Its sources include building exterior and interior lighting, advertising, commercial properties, offices, factories, streetlights and like other forms of pollution it causes damage to the environment.

As we can see in the photo, little rural towns have a more clean night sky (top picture) compared to a metropolitan area (in the bottom), in fact light pollution vastly reduces the visibility of stars



Types of light pollution

There are several types of light pollution:

- Light trespass is when “our” light enters another property.
- Over illumination is the excessive use of light. It can be caused by incorrect choice of fixtures or light bulbs, which do not direct light into areas as needed or not using timers when lighting isn’t needed.
- Light clutter is the excessive groupings of lights and may generate confusion, distract and potentially cause accidents.
- Sky glow refers to the glow effect that can be seen over populated areas.

Some example of:

Over illumination



Light clutter



skyglow



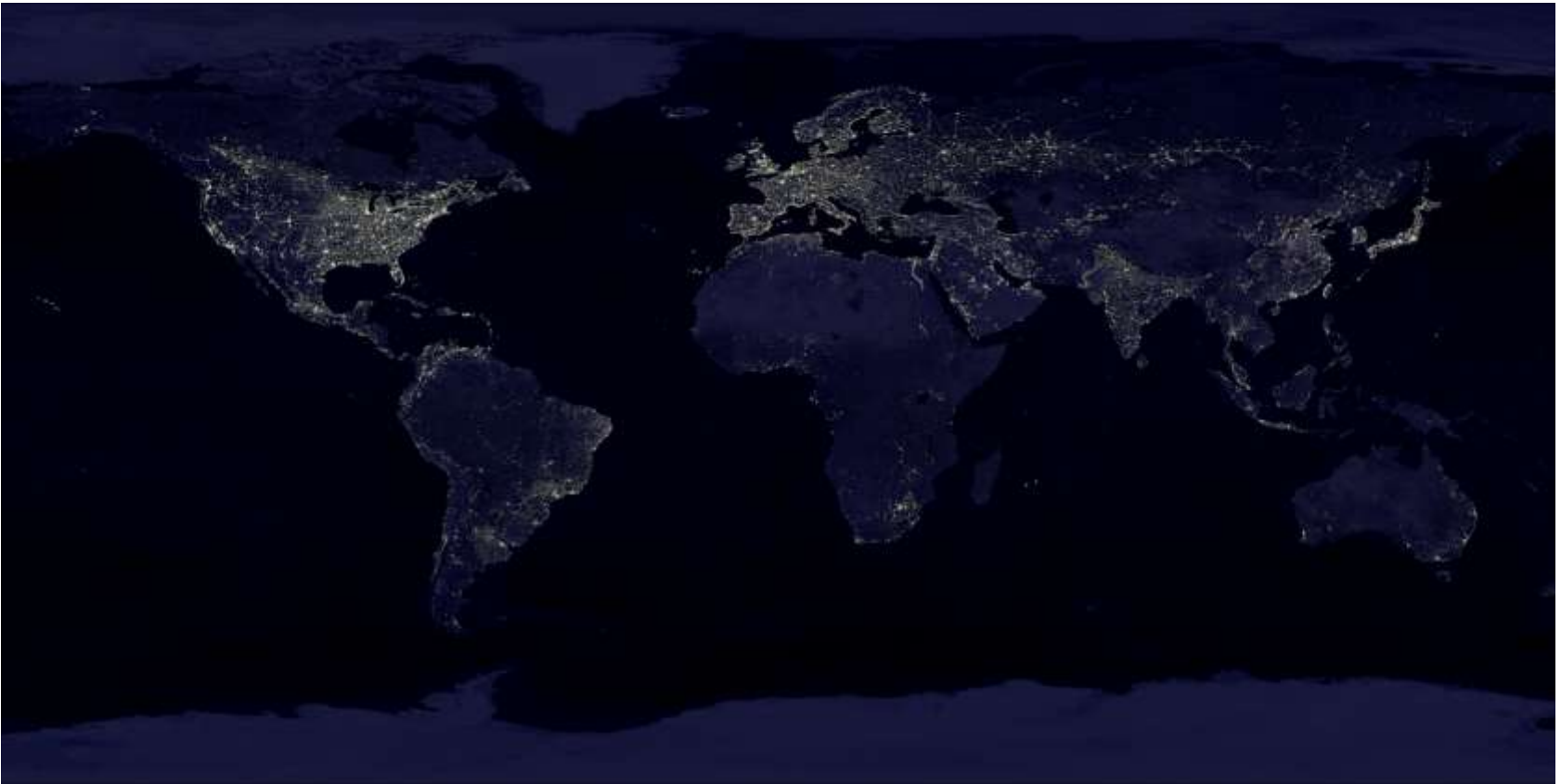
Effects of light pollution

- Light pollution causes problems on human health, like over illumination in workspace can lead to headache, stress, work fatigue. In animals have been reported mood change and anxiety.
- Also, light pollution damages ecosystems, having negative impacts on plant and animal physiology. Light pollution can confuse animal navigation, alter competitive interactions, change predator-prey relations, and cause physiological harm.
- Light pollution can have a negative effect on astronomy too, skyglow can alter the sky night, resulting in lower possibility to see far objects.

The same portion of sky from two
different point of views



The Earth: image taken by a satellite in 1995



Solutions

Reducing light pollution implies many things, such as reducing sky glow, reducing glare, reducing light trespass, and reducing clutter. Possible solutions are:

- Utilizing light sources of minimum intensity necessary to accomplish the light's purpose.
- Turning lights off using a timer or occupancy sensor or manually when not needed.
- Improving lighting fixtures, so that they direct their light more accurately towards where it is needed, and with less side effects.
- Adjusting the *type* of lights used, so that the light waves emitted are those that are less likely to cause severe light pollution problems.
- Evaluating existing lighting plans, and re-designing some or all of the plans depending on whether existing light is actually needed.