Trip the Lights Fantastic

A one year accumulation of VIIRS low light imaging data

This map showcases the astonishing details of human activities visible from space at night. From spectacular lights of cities, hustling shipping lanes, boats fishing with heavy lights, to heat sources from gas flares, wildfires and industry.

Using multiband observations, VIIRS (Visible Infrared Imaging Radiometer Suite)* made at night, we are able to see social and economical behaviors that cannot be seen by remote sensing in daytime.

This map employs annual data of Nighttime Lights from 2015, VIIRS Boat Detections from 2017, and VIIRS Nightfire from 2017.

Shale Oil

The boom of shale oil production is clearly depicted by the number of gas flares detected in North Dakota.

Passenger and Cargo

Ferries and cruise line ships form clear tracks between ports in Europe and many other places.

Siberia Oil Field

A major oil production area for Russian Federation. Russia leads in global gas flaring.

Biomass Burning

Agricultural burning occurs every year in many parts of Africa.

South Atlantic Anomaly

High energy particles from space strike the sensor, producing random readings that do not represent actual surface activities.

Squid Fishing

Waters offshore Argentina are favorable for squid. A line is formed where fishing boats pack the fishing ground just outside of the Argentina EEZ.

Political Boundaries

Nighttime lights are sensitive to local economic activities and social status. Here they show the vast difference in lighting patterns between North and South Korea. Cumulative results from VIIRS Boat Detection also show the fishing behavior that reflects boundaries between China, North Korea, South Korea, and Japan.

Global Gas Flared Volume

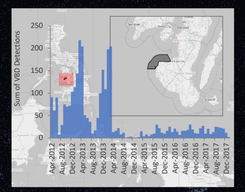
VIIRS Nightfire (VNF) characterizes the temperature, radiant heat and size of detected heat sources, making it possible to identify gas flares and to derive estimates of gas flared volume globally.

This information is critical in determining the effort required to reduce the green house gas emissions originating from oil wells and refineries.

* BCM: Billion Cubic Meter

Elvidge et al., Energies **2016**, *9*(11), 14

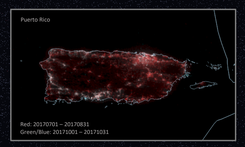
Fishing Ban



By tracking fishing vessels in restricted areas and seasons, it is possible to measure regulation compliance.

Here, the change of VBD detections in Cauayan municipal waters in the Philippines is shown. At the end of March 2014, the Provincial Environment Management Office (PEMO) and other organizations began a campaign to enforce the existing ban on commercial fishing boats active in the area, causing a drastic drop in the number of fishing boat detections.

Blackout



Changes in the patterns of Nighttime Lights can indicate social/economical change or can reveal the impacts of a natural disaster.

Puerto Rico was heavily damaged by hurricane Maria on September 20, 2017. More than 95% of the area had no power after the storm as shown in red in the image.

Legend

- Nighttime Lights
- VIIRS Nightfire (VNF)
- VIIRS Boat Detection (VBD)

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Background
NASA Blue Marble 2004 September

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