

THE PINE GULCH FIRE AS VIEWED BY SATELLITE

By Chris Elvidge, Feng-Chi Hsu, and Morgan D. Bazilian

One of the largest fires in Colorado history is now burning just outside of Grand Junction, Colorado. The fire has surpassed 50,000 acres in size, and is believed to be started by lightning, and now spread by high winds. Hundreds of firefighters are onsite.

Satellite data is widely and openly available since as early as the 1970s. Typical publicly available databases provide only the fire's location and scale. A novel methodology developed by The Payne Institute's Earth Observation Group at the Colorado School of Mines that uses Planck's Law to create the only global, daily database that provides temperature, area, and radiating heat information about the fires based on the NASA/NOAA VIIRS instrument. This set of information is useful for improving both emissions models and wildfire management.

Figure 1 is a nightly VIIRS Day Night Band (DNB) mosaic from August 12th overlaid on Google Earth terrain. The placemarks are from VIIRS Nightfire (VNF), with size showing the magnitude, and color depicting the temperature range of the detection. The several areas marked by green in the map are burning at temperatures in excess of 1200 Kelvin.

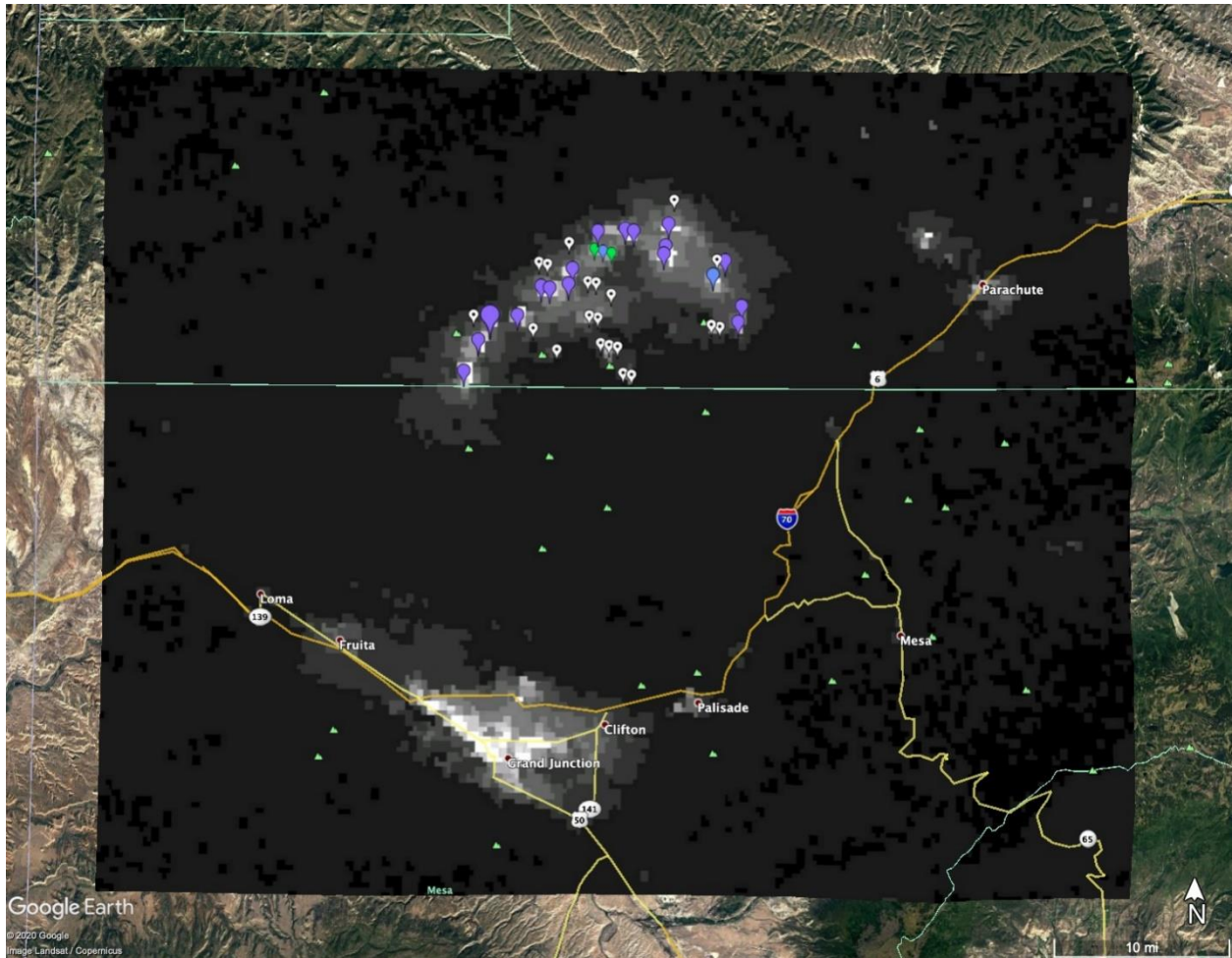


Figure 1: EOG VNF satellite images of the Pine Gulch Fire.

Note: The white placemark means a valid detection but the algorithm was not able to derive the temperature reading for the signal is too low. Green:1200~1400K; Blue: 1000~1200K; Purple: 400~1000K.

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ABOUT THE AUTHORS

Christopher Elvidge

Senior Research Associate, Director of Earth Observation Group

Christopher D. Elvidge has decades of experience with satellite low light imaging data, starting in 1994. He pioneered nighttime satellite observation on visible lights, heat sources including gas flares and wild fires, as well as bright lit fishing vessels. He led the development of these nighttime remote sensed products with images from DMSP, JPSS, and Landsat satellites. These data are very popular and used globally in both public and private sectors. As of February 2018, he has more than 11,000 scholarly publication citations.

Feng-Chi Hsu

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Fen-Chi Hsu was born and raised in Taiwan. He was a trained engineer in Environmental Engineering, later found his passion in remote sensing. He received his PhD degree in the University of Tokyo in 2012, and started working in Earth Observation Group with Dr. Elvidge in the same year. Since then he has learned the secrets of nighttime light production and helped develop critical algorithms for new products as well as tools for robust processing. Besides being a researcher in remote sensing, he is also building up his skill set as a full stack system administrator as well as a web application designer.

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Morgan Bazilian is the Director of the Payne Institute and a Professor of public policy at the Colorado School of Mines. Previously, he was lead energy specialist at the World Bank. He has over two decades of experience in the energy sector and is regarded as a leading expert in international affairs, policy and investment. He is a Member of the Council on Foreign Relations.

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