

## Satellite Data Shows Park Fire Devastation

By Mikhail Zhizhin, Kristin Ziv, Christopher Elvidge, and Morgan Bazilian

The largest active wildfire in the U.S, the [Park Fire](#) in northern California, ignited last Wednesday (the 24<sup>th</sup> of July) and quickly engulfed more than 360,000 acres – approximately 560 square miles – by Sunday. As of Monday (29 July), the fire was about 12% contained. Arson has been cited as the cause.

Hundreds have had to flee their homes, and [evacuations](#) were ordered for Butte, Tehama, Plumas and Shasta counties. The more humid weather Monday assisted with firefighting efforts, but drier, hotter conditions were forecast for the rest of the week. President Biden has been apprised, and has offered federal assistance.

The Earth Observation Group at the Payne Institute for Public Policy, Colorado School of Mines, has created a short video of the total burned area and the radiative heat from July 25-29, as shown in Figure 1. With data collected by NOAA’s Visible Infrared Imaging Spectrometer Suite (VIIRS)<sup>\*</sup>, nighttime fire activity was recorded. Our algorithm can show both the scale and the temperature of the fire.

The Park Fire is, thus far, the fifth largest in California history.



Park\_fires\_RH.mp4

**Figure 1: Satellite imagery from Payne Institute for Public Policy, July 29, 2024**

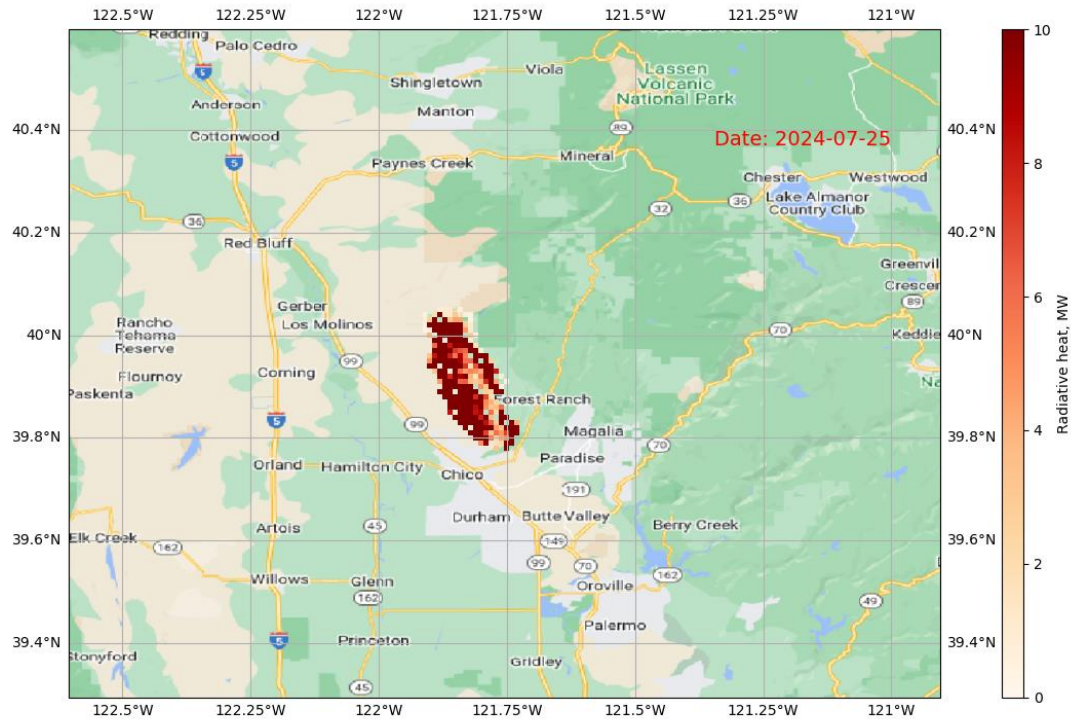


Figure 2: Satellite imagery from Payne Institute for Public Policy, July 25, 2024

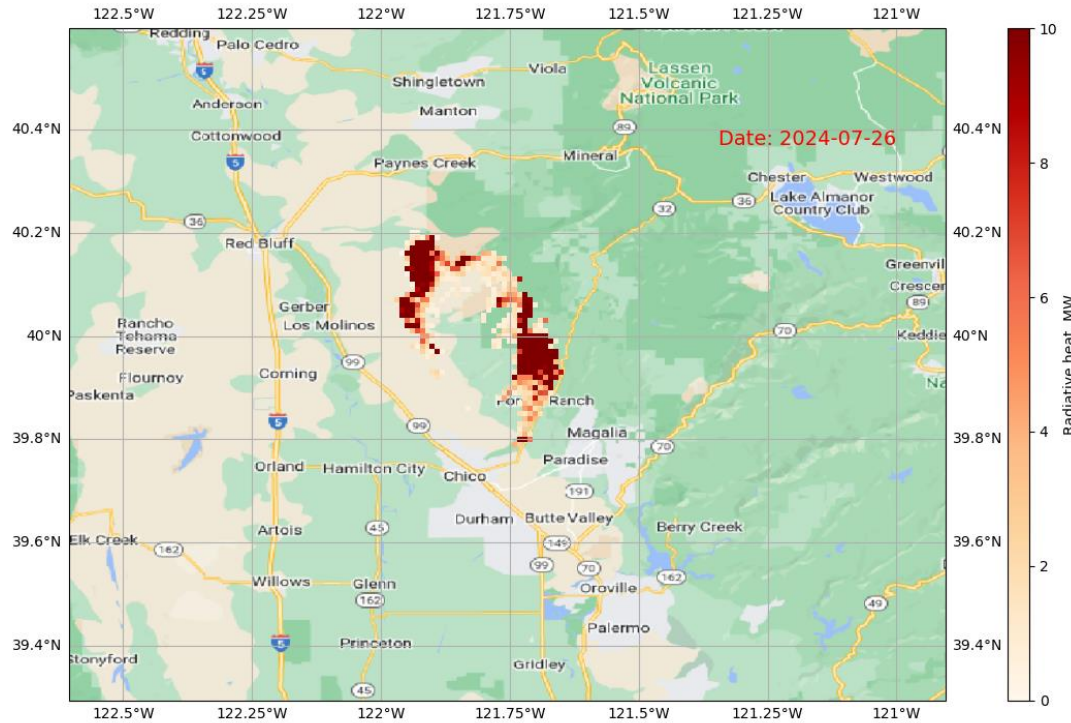


Figure 3: Satellite imagery from Payne Institute for Public Policy, July 26, 2024

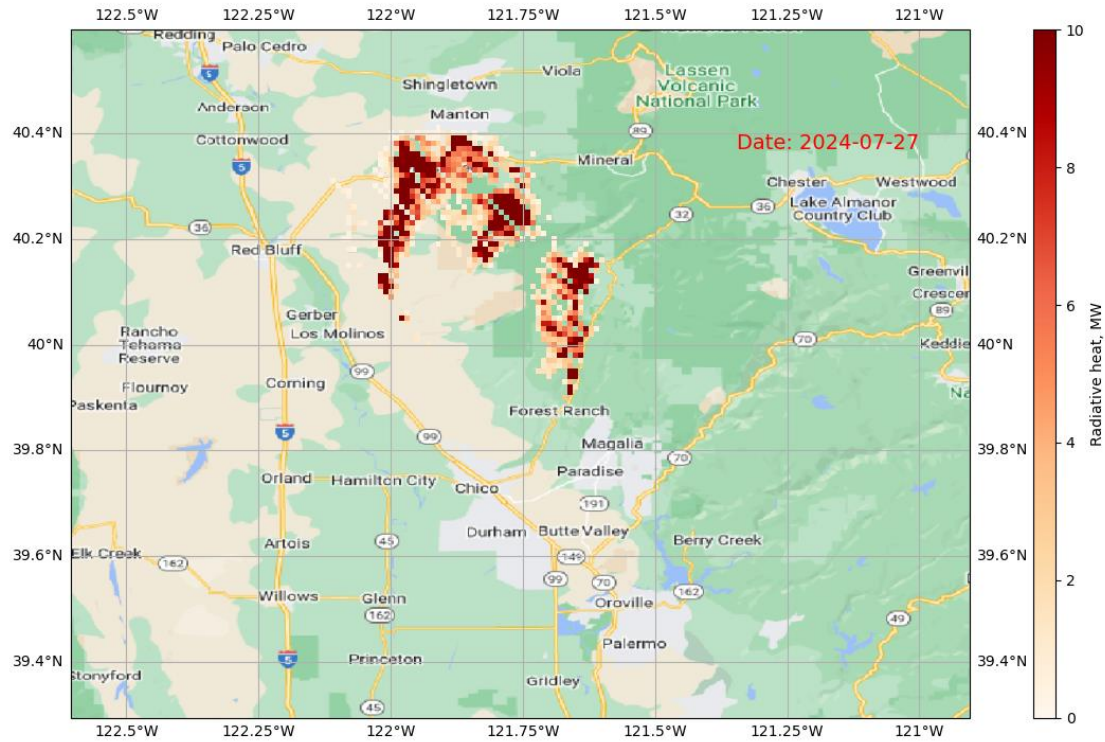


Figure 4: Satellite imagery from Payne Institute for Public Policy, July 27, 2024

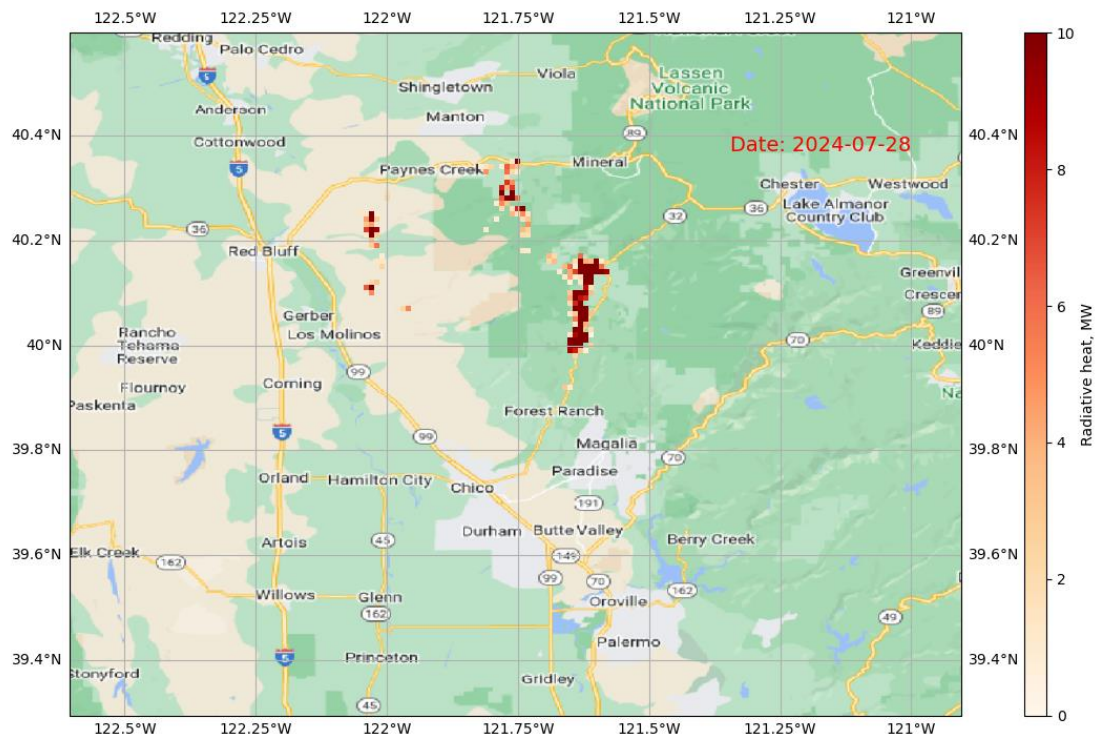


Figure 5: Satellite imagery from Payne Institute for Public Policy, July 28, 2024

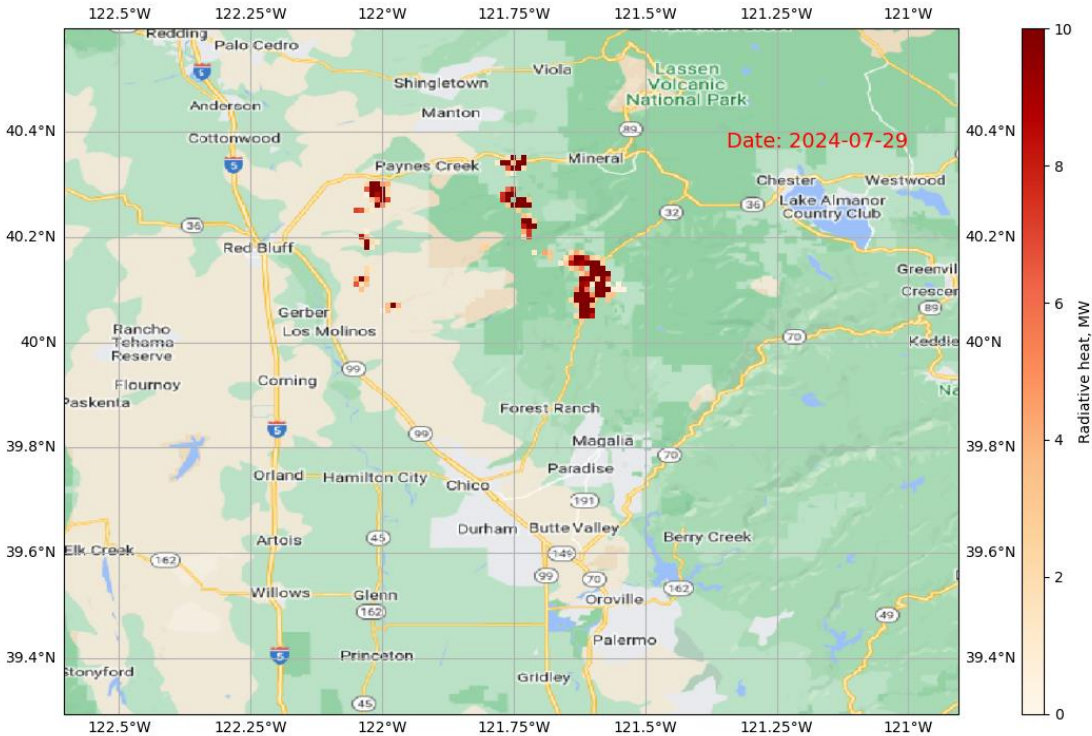


Figure 6: Satellite imagery from Payne Institute for Public Policy, July 29, 2024

**\* Notes:** VIIRS is the Visible Infrared Imaging Radiometer Suite which is flown jointly by NASA and NOAA. The VIIRS design was set by meteorologists, but other valuable products are also produced from VIIRS data. The Earth Observation Group developed the Nightfire algorithms in 2012 for quantifying natural gas flaring and biomass burning. It is the only global fire detection product that calculates fire temperatures, source sizes and heat output using physical laws.

## ABOUT THE AUTHORS

### **Mikhail Zhizhin**

#### **Research Associate, Earth Observation Group**

Mikhail Zhizhin, M.Science in mathematics from the Moscow State University in 1984, Ph.D. in computational seismology and pattern recognition from the Russian Acad. Sci. in 1992. Research positions from 1987 to 2012 in geophysics, space research and nuclear physics at Russian Acad. Sci., later at NOAA and CU Boulder. Currently he is a researcher at the Earth Observation Group at Colorado School of Mines. His applied research fields evolved from high performance computing in seismology, geodynamics, terrestrial and space weather to deep learning in remote sensing. He is developing new machine learning algorithms to better understand the Nature with Big Data.

### **Kristin Ziv**

#### **Payne Institute Communications Associate**

After receiving a master's degree in journalism from Northwestern University's Medill School, Kristin worked as a public relations professional in Chicago. She has both agency and non-profit experience. After raising a family, she campaigned for and was elected to public office, serving a term as a Village Trustee in Winnetka, IL, before moving to Colorado in 2019.

### **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 wildfires, 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.

### **Morgan Bazilian**

#### **Director, Payne Institute and Professor of Public Policy**

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.

# *The Payne Institute* for Public Policy



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The mission of the Payne Institute at Colorado School of Mines is to provide world-class scientific insights, helping to inform and shape public policy on earth resources, energy, and environment. The Institute was established with an endowment from Jim and Arlene Payne, and seeks to link the strong scientific and engineering research and expertise at Mines with issues related to public policy and national security.

The Payne Institute Commentary Series offers independent insights and research on a wide range of topics related to energy, natural resources, and environmental policy. The series accommodates three categories namely: Viewpoints, Essays, and Working Papers.

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