# USING ARTIFICIAL NEURAL NETWORKS TO PREDICT WILDFIRE GROWTH

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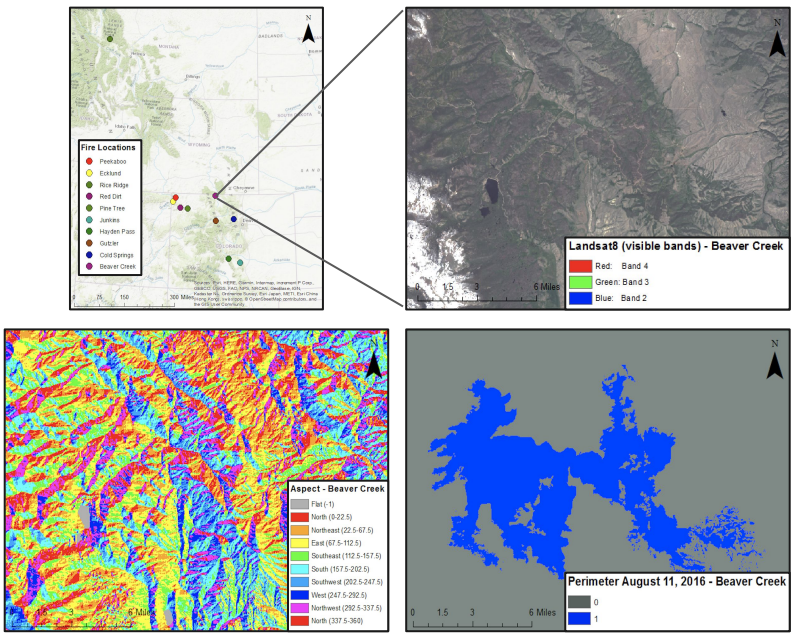
## Costs of Wildfires

- Fighting wildfires in 2017 **cost over $2 billion.**
- The US Forest Service **budget** allocation towards fighting wildfires has **risen from 15% to 55%.**
- **Over 66,000** fires in 2017.
- More than **40 people killed** in Sonoma, CA wildfires.

## Methods

- Used an **Artificial Neural Network** to predict how wildfires would spread in the future.
- The network used **historical wildfire perimeters, weather data, satellite imagery**, and **Digital Elevation Models** to "learn" patterns.
- It **predicted** what will burn **in the future**.

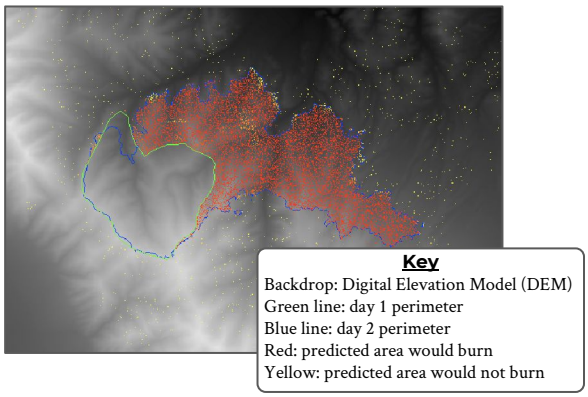
## Example Inputs



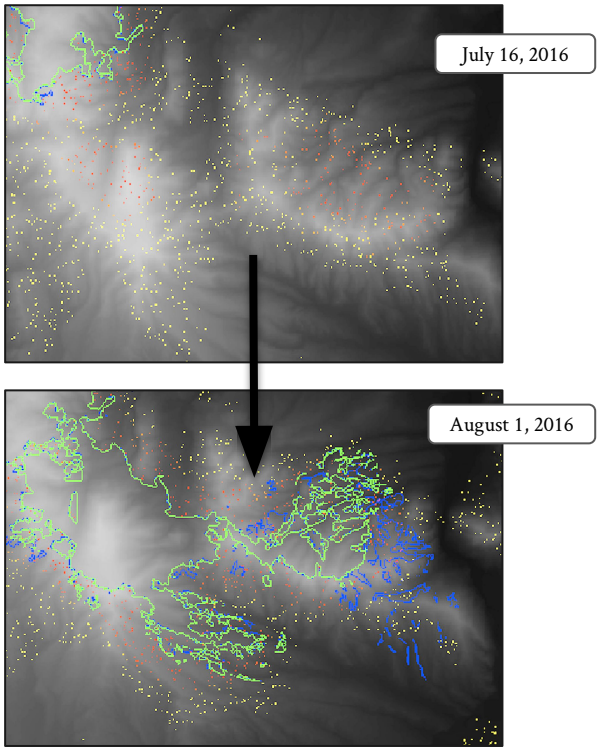

## Results

- As shown in the following images, the model **successfully predicted how the fire would spread** in the future.
- The neural network **learned general patterns** about how fires spread and was able to apply those patterns to **determine spread** on a fire that it has **never before seen**.

## Example of Training Results




## Example of Validation Results




## Call to Action

- **Forest fires will continue to intensify** in prevalence and severity due to Climate Change.
- **Freely available data** from USGS, NOAA, and other federal agencies is critical to research.
- **Machine Learning** will be the underpinning of future **economic and military power.**
- **Undergraduate research** trains future scientists that will drive American innovation and growth.

## Contact Us

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