

How Fire Feeds: <http://fire.revealnews.org/>

**Supplemental stories:**

March 9, 2016: [How we used satellite data to track California wildfires](#)

June 21, 2016: [Summer heat in the West sparks fire concerns](#)

Aug. 11, 2016: [Bad wiring at house sparked California's deadly 2015 Valley Fire](#)

**This questionnaire is a required and key component of your Philip Meyer Award entry. Judges may disqualify an entry on the basis of an incomplete questionnaire.**

**1. Title of story, collection of stories, or series and names of people who worked on this story. For a partnership or collaboration, please name each entity that took part in the investigation.**

Title: How Fire Feeds

Reporters: Eric Sagara, Scott Pham, Sinduja Rangarajan, Julia Smith

**2. Date(s) published, aired, or posted.**

Jan. 12, 2016

**3. Topic and synopsis of story or series, including major findings.**

How Fire Feeds used satellite data along with other traditional data sources to tell how three fires tore through Lake County, California, in the summer of 2015, destroying thousands of homes and killing at least four. One of the three fires – the Valley Fire – is now one of the costliest fires in California's history. The app and accompanying story showed how decades of unchecked vegetation growth combined with years of drought led to an explosive fire season for this Northern California county.

**4. How the story got started (tip, assignment, etc.).**

The story was in part a follow-up to a previous project looking at vegetation health throughout California.

**5. Was your work in any way based on another news organization's previously published or aired report? If yes, please provide the name and publication or air date.**

No.

**6. Major types of documents used and if FOI requests were needed. Did you have**

**difficulties obtaining any electronic information? How did you resolve it? Did you use FOI for data under state or federal law?**

In addition to satellite data, we used daily briefings from firefighters on the scenes and maps showing fire progression. We tapped into weather records for the area as well. All this was freely and easily available online.

**7. Major types of human sources used.**

Most of our human sources were experts in remote sensing and imagery analysis used to confirm our methodology. We also interviewed fire experts and officials from regulatory agencies for this project.

**8. Results (if any).**

The article and accompanying app helped explain why fires in the region spread faster than computer models could predict. It also emphasized the role that fire suppression policies have played in creating a tinderbox environment throughout the West.

**9. Follow-up (if any). Have you run a correction or clarification on the report? Has anyone come forward to challenge its accuracy? If so, please explain.**

There has been no correction or clarification to this report.

**10. Advice to other journalists planning a similar project.**

Our project relied heavily on imagery analysis using techniques we were unfamiliar with. It is important when tackling this sort of project to find experts in the field you are reporting on. In this case, we relied on current and former NASA employees as well as academics working with satellite imagery to help us understand how to work with the data.

**11. Difficulty, uniqueness of effort, or other special circumstances related to this subject.**

As far as we know, this is the first time a news organization has used satellite imagery to this extent. We went beyond displaying images of the Earth as they appear to the human eye and incorporated information from other bands of the light spectrum.

This made the project a complex undertaking. Not only did we have to learn how to acquire and analyze satellite images, but we also worked hard to figure out how best to present the finished results in a way that would be easy to understand.

Satellite imagery in its raw format is essentially a bunch of numerical values represented by pixels. These files are pretty bulky at hundreds of megabytes per file (with up to 12 files per

picture) and can be unwieldy to work with. The easiest way for us to work with the data at the time was by writing our own software to handle the image processing.

Learning how to access the data and start analyzing it took a significant amount of time. Eric Sagara used prior experience covering wildfires (including firefighter training he went through as a reporter) to help with the process.

In displaying the data, we attempted to provide a user experience that allowed for exploration, but also was highly focused. To that end, user interaction was built around scrolling. It was a significant challenge to trigger various map animations and movements to the browser's scrolling events.

## **12. Length of time taken to report, write and edit the story.**

This story and the accompanying app took approximately five months to report and develop, however it relied on techniques we had spent a year refining.

## **13. If you extensively used computer-assisted reporting skills, please answer the following:**

### **a. Did you extensively use any Internet sources? If so, please list address(es) and explain how the site(s) was useful.**

Most of our data was obtained from public sources using APIs or downloadable material. This includes the following:

- [Landsat](#) – We used this for satellite imagery
- [Landfire](#) – Additional fire data was acquired here
- [The National Elevation Dataset](#) – For terrain data
- [GeoMAC](#) – Current and historic fire perimeter data
- [Cal FIRE](#) – Daily fire briefings, state-specific land cover data, fire severity maps and previous fire history for the region.

### **b. Did you obtain or build any electronic databases? If you obtained data, what was its name and source? What was the cost? If you created your own database(s), what records did you use?**

We obtained a wide range of satellite, weather, terrain, vegetation, fire and other environmental data sets. Very little of it was incorporated into a database since GeoDjango does not offer full support of raster-based images.

### **c. Did you have difficulties with the data itself? How did you overcome them?**

Most of our difficulty involved working with the data and writing software to process satellite imagery. Learning how to simply open a file containing satellite imagery alone was a challenge. We relied on experts in remote sensing to guide us through opening and analyzing the data within the images.

**d. Was any analysis done? If so, what?**

Most of our analysis was done on imagery. This included rendering the images using different bands from the light spectrum to see different aspects of the region that burned. This involved looking at vegetation health and burn patterns. We also combined images with terrain data from the National Elevation Dataset to render scenes in 3D. Doing so allowed us to see how terrain played a role in fire spread and identify areas where fire actually burned in ways that defied conventional wisdom – i.e. downhill.

**e. Was data analysis done by your own staff or was outside assistance used? Who?**

All of our analysis and production was done in-house. Eric Sagara did the data analysis with assistance from Sinduja Rangarajan. Scott Pham and Julia Smith worked to present the results in a scrolling map that revealed new aspects of the story as readers moved through the story.

**f. What specific software did you use?**

Our software was mostly written in-house with a heavy emphasis on Python. We also used [landsat-util](#), a command line client to download and process satellite imagery. We also used QGIS, ArcGIS and Photoshop.

The interactive news application was built with JavaScript and Ractive.js, a front-end framework. We used Leaflet.js to display custom map tiles we generated from the satellite imagery and to animate the fire boundaries.