U.S. Department of the Interior
Bureau of Reclamation
Research and Development Office
Science and Technology Program

Development of a Platform for Wildfire Incident Support and Evaluation of Post-Fire Impacts

Research Bulletin
S&T Project 20019

Mission Issue

This project positioned Reclamation in a more proactive stance regarding the impact of wildland fire on water reliability and resilience in the face of climate change.

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Problem

The Bureau of Reclamation (Reclamation) like other Federal agencies, can be affected by wildfire. Over the past four wildfire seasons, the Columbia-Pacific Northwest (CPN) Region has averaged 39 individual incidents per season with 750 to 17,600 acres burned annually. These fires could potentially impact Reclamation assets and operations downstream. It is anticipated that fire seasons will continue to lengthen, fires will be more severe, and burned acres will continue to increase.

In the CPN Region, when a fire is reported, there was no single spatial product to immediately reference for communicating values at risk that should be addressed when developing suppression tactics or for anticipating post-fire impacts to watershed hydrology and sedimentation. The CPN Region GIS and Wildland Fire program recognized a need for a product to help shift the programmatic paradigm from reactive to proactive, and to address two goals: 1) to provide a near-real-time visualization of fire activity in the region in spatial relation to critical assets or facilities and, 2) identify large fires upstream of Reclamation reservoirs that may contribute to detrimental sedimentation influx or changes to the watershed hydrology.

Solution

The CPN GIS and Wildland Fire Program developed an ArcGIS Online Application (App) that overlaid mapped Reclamation jurisdictional lands, values, and assets with near-realtime fire perimeter feature layers and satellite heat signatures allowing anyone within Reclamation to quickly assess the impacts of a particular fire of interest or the fire situation at a region scale. Additionally, the App allows anyone within Reclamation to identify large fires that are upstream of Reclamation reservoirs that may trigger detrimental sedimentation issues in a post-fire environment. Identifying fires off Reclamation jurisdiction that may have impactful debris flow, erosion and accompanying sedimentation issues also provides an opportunity for Reclamation to enter post-fire interagency restoration discussions.

"This App lays the foundation for easy adoption and scalability for other Regions or at the Bureau level."

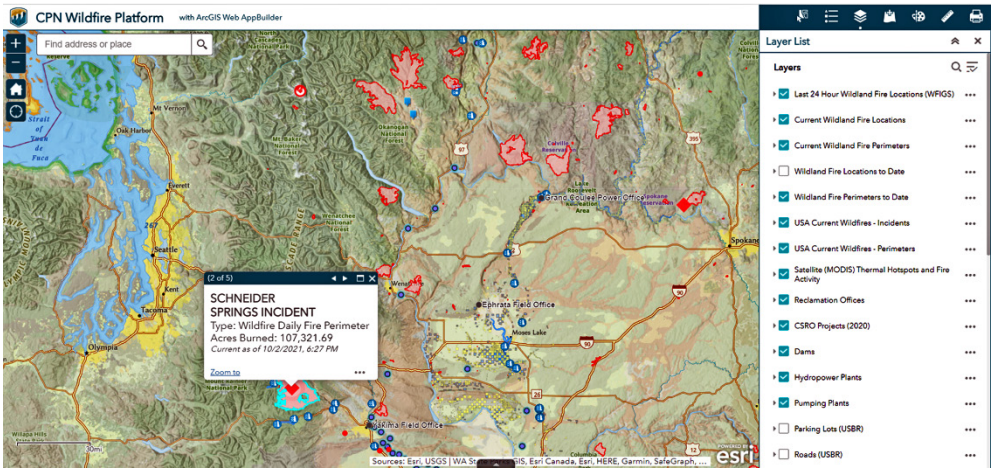
Kendra Fallon
Region Wildland Fire Coordinator
Bureau of Reclamation

More Information

https://www.usbr.gov/research/projects/detail.cfm?id=20019

Application and Results

The 2021 season was particularly active and provided multiple opportunities for utilization and advancement, one example is the Schneider Springs Fire near Bumping Lake, WA. The fire threatened critical Reclamation infrastructure including the Bumping Lake Dam at Goose Prairie and the Tieton Dam and Diversion. The early spatial identification of the fire in relationship to the mapped infrastructure allowed for prompt communication with CPN O&M staff about potential threats to assets/infrastructure and impacts to facility operations for scheduled releases. With the advanced warning, O&M staff were able to ensure that the Goose Prairie facility was not staffed and could be put in stasis while the fire moved through. Last minute site visits during the fire's most substantially threating period were also eliminated, reducing the risk to employees. Additional case studies can be found in the 2021 Reclamation O&M Winter Bulletin.



Screen capture of the App during the 2021 Fire season with a call out on the Schneider Springs Fire.

Future Plans

The App will undergo maintenance as additional lands and values/assets are mapped. One additional goal is to develop the shareability of the app with outside partners. Though the App is hosted on the AGOL platform, many of the Reclamation asset data sets are published on the Reclamation ArcGIS Portal (RGIS) platform due to the sensitive nature of the asset inventories which operates behind Reclamation's IT firewall system. Because of that, outside agencies are unable to access it, eliminating the ability to incorporate Reclamation's data into their fire management response protocols. Upcoming changes to the Federal Risk and Authorization Management Program (FedRAMP) status of the AGOL platform will make it possible to publish Reclamation's asset inventories to AGOL instead of RGIS, enabling collaborator access to the App. In the meantime, the required data can be exported as a geodatabase and shared with agencies that have wildland fire response responsibility on Reclamation land.