USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Rocky Mountain Research Station

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# Looking to the Past to Plan for Future Wildfire Response

The request from the U.S. Department of Agriculture, Forest Service's Region 5 to Area Command Team (ACT) 2 was straightforward: Identify potential gaps between wildfire resource needs and resource availability for October through December 2020. The Fire Weather Outlook at this time was predicting that parts of California and the Southwest would see higher-than-usual fire activity into the fall and winter. In preparation for the worst-case scenario, the region needed to identify the regional and national availability of personnel and equipment, including crews, engines, aircraft, and Incident Management Teams.

Because risk was predicted to become elevated shortly, the four-person Rocky Mountain Research Station (RMRS) research team had days to turn around the analysis. Although the team members had experience translating historical resource assignments and wildfire data into answers to management questions, this situation was different.

"What was novel with this request was the focus on future resource availability rather than ongoing use, that analyses needed to be performed at the regional and national level rather than the incident level, and that the analysis timeframe had to cover 2 to 3 months rather than a period of days to weeks," explains Erin Belval, a research forester with RMRS.

## Quantifying What Happened in the Past

From the Resource Ordering and Status System (ROSS) and Aviation Business System (ABS), the team collected data on personnel and equipment used during the late fall and early winter of 2016 through 2018. These data were visualized by creating graphs of resource use by type, region of use, supplying region, and supplying agency. Additionally, the team modeled the resource needs that would have been observed if there had been heightened demand simultaneously across multiple Forest Service regions.

"With these graphs, managers could have a visualization of what's happened in the past and what might be their need in the future given a worst-case scenario," Belval says.

Among the answers the analyses revealed: There is limited availability of crews, such as Interagency Hotshot Crews, Type 2 Crews, and Type 1 State and Local Crews, in October and November; Incident Management Teams were likely to be further stressed after a very busy and complex season; and, given that the availability of non-Federal personnel and equipment could not be guaranteed, historical sources of personnel and equipment might not cover potential needs during fall 2020 and beyond. The modeled scenarios demonstrated that, while some personnel and equipment would be available, the current system had never been tested under simultaneous demand conditions in the off-season. Severe rationing could be likely. These graphs were included in the ACT2 Pacific

Southwest Region 2020 Wildfire Situation Regional Strategic Plan, October-December 2020 report that was presented to managers.

## Informing the Future

Fortunately, the feared worst-case scenario did not happen. Yet this exercise prompted the RMRS research team to rethink how historical resource assignment data, which Belval describes as being "underutilized," can be used to inform future wildfire planning scenarios.

"This project spurred us to think more deeply about what personnel and equipment needs might be required in the future," she says. "Our resource needs are likely to change in the future, so it can be useful to think through how to manage that change, whether it be shifting how agencies manage their internal workforce or how cooperators engage with each other to ensure adequate coverage."

For managers in other Forest Service regions, there would be value in similar analyses to determine where personnel and equipment might be coming from if high levels of fire activity are predicted at unusual times.

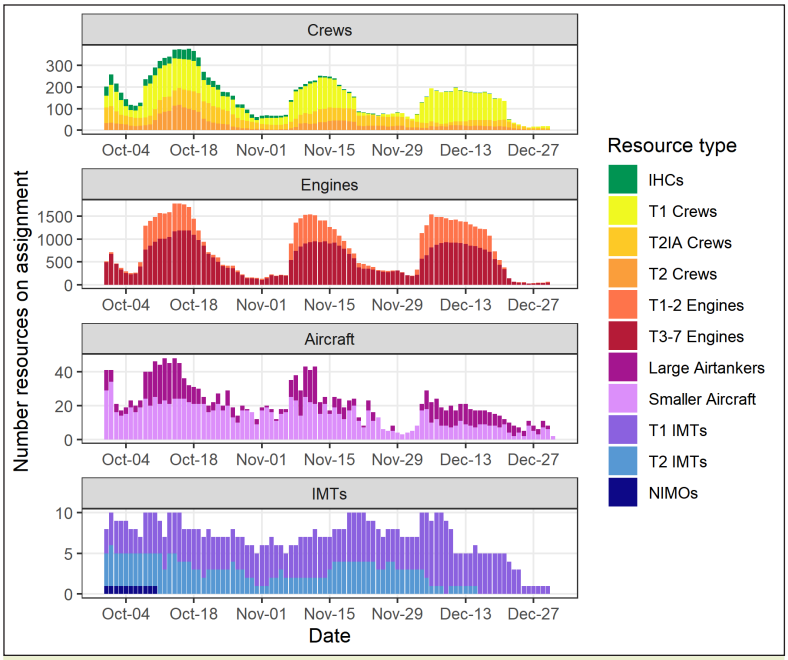
## FEATURED SCIENTIST

Erin Belval is a Research Forester with the USDA Forest Service, Rocky Mountain Research Station and specializes in the management of wildland fire, particularly focusing on the effectiveness and efficiency of the current management system and policies. Belval can be contacted at erin.belval@usda.gov.

## FURTHER READING


Belval, Erin J.; Short, Karen C.; Stonesifer, Crystal S.; Calkin, David E. 2022. A historical perspective to inform strategic planning for 2020 end-of-year wildland fire response efforts. Fire. 5(2): 35.

Belval, Erin J.; Stonesifer, Crystal S.; Calkin, David E. 2020. Fire suppression resource scarcity: Current metrics and future performance indicators. Forests. 11(2): 217.


*A visualization of resources that could have been requested each day in the maximum daily resource use scenario. Data from the Resource Ordering and Status System; analyses and graphs by Erin Belval, USDA Forest Service. IHCs: Interagency Hotshot Crews; T1 Crews: Type 1 Crews; IMTs: Incident Management Teams; NIMOs: National Incident Management Organizations.*

*Photos on the front page are modified USDA photos.*

## KEY MANAGEMENT CONSIDERATIONS

- This is a very flexible framework for Forest Service regions, national forests, and Incident Management Teams to use when looking at how wildland fire response personnel and equipment have been used in the past. The framework can be updated to include data through the most recent fire season.
- Characterizing where personnel and equipment are coming from, both geographically and by managing agency, may help fire managers project how to fill future resource needs.
- The work done to build this analysis has provided the basis to answer a variety of questions such as, "Has there been a change in annual Interagency Hotshot Crew's qualification levels?" and "How equitably has workload been distributed across Incident Management Teams?"
- Erin Belval can be contacted for further discussion of additional applications of this framework.

**The Rocky Mountain Research Station is one of seven units within USDA Forest Service Research & Development. RMRS maintains 14 field laboratories throughout a 12-state geography encompassing parts of the Great Basin, Southwest, Rocky Mountains, and the Great Plains. While anchored in the geography of the West, our research is global in scale. RMRS also administers and conducts research on 14 experimental forests, ranges and watersheds and maintains long-term research databases for these areas. Our science improves lives and landscapes. More information about Forest Service research in the Rocky Mountain Region can be found here: https://www.fs.usda.gov/rmrs/.**

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