



Abstract

Strategic Risk Management for Fire Suppression Aircraft [†]

Crystal Stonesifer ^{*}, David Calkin and Christopher O'Connor [†]

USDA Forest Service, Rocky Mountain Research Station, 800 East Beckwith, Missoula, MT 59801, USA

^{*} Correspondence: crystal.s.stonesifer@usda.gov

[†] Presented at the Third International Conference on Fire Behavior and Risk, Sardinia, Italy, 3–6 May 2022.

Abstract: Aircraft provide critically important capacity for a wide range of missions for wildland firefighters, but their use brings inherent risks. Aviation-related fatalities account for 30% of federal and contractor firefighter deaths in the United States over the last ten years. Aviators are generally well-versed in tactical risk management tools and practices intended to guide individuals through go/no-go decision-making processes. For example, it is common practice for aviators to ask, “Is this flight necessary?” before every mission. The necessity of a flight in accomplishing a singular objective, such as extinguishing a spot fire on a large wildfire, may be clear; however, it may be unnecessary if the incident objective is to contain the wildfire at pre-identified locations far from the active spot. Due to many factors, including the distributed nature of the Incident Command System, aviators may be unaware of strategic objectives guiding the management of a large wildfire, and unnecessary risk may come from misalignment of tactical and strategic objectives. We introduce the Aviation Use Summary (AUS), a decision-support framework which guides managers through a strategic risk management process for aviation use on large wildfires or broader areas of interest. This tool provides a comprehensive summary of the location and timing of aircraft assignments and retardant and water delivery through maps, graphs, and tables. Since 2017, customized AUS products have been utilized by strategic incident managers on over 70 large wildfires or regions. We present an overview of the AUS, describe its use within risk management assistance efforts in the US Forest Service, and explore potential future paths for this work, including automation and incorporation of additional novel analytics. Through this, we aim to shift the question to ask, “Why is this flight necessary?” to increase safe and efficient use of limited resources by minimizing unnecessary risk.

Keywords: fire suppression; aircraft; risk management; decision support



Citation: Stonesifer, C.; Calkin, D.; O'Connor, C. Strategic Risk Management for Fire Suppression Aircraft. *Environ. Sci. Proc.* **2022**, *17*, 64. <https://doi.org/10.3390/environsciproc2022017064>

Academic Editors: Pierpaolo Duce, Donatella Spano, Michele Salis, Bachisio Arca, Valentina Bacciu, Grazia Pellizzaro and Costantino Sirca

Published: 11 August 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Author Contributions: Conceptualization, C.S. and D.C.; methodology, C.S., D.C. and C.O.; software, C.S.; validation, C.S.; formal analysis, C.S.; investigation, C.S. and C.O.; data curation, C.S.; writing—original draft preparation, C.S.; writing—review and editing, C.S. and D.C.; visualization, C.S. and C.O.; supervision, D.C.; project administration, C.S.; funding acquisition, D.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Informed Consent Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.