

Abstract

Development of Information Databases for Vegetation Fire Behavior Prediction [†]

Aleksandra V. Volokitina ^{1,*} , Mikhail A. Korets ¹  and Tatiana M. Sofronova ² ¹ Forest Fire Science Laboratory, V.N. Sukachev Institute of Forest SB RAS, Krasnoyarsk 660036, Russia² Department of English Philology, Krasnoyarsk State Pedagogical University named after V.P. Astafyev, Krasnoyarsk 660049, Russia

* Correspondence: volokit@ksc.krasn.ru

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

Abstract: To study the vegetation affected by fires and to create databases useful for fire behavior prediction, three methodological approaches are used: (1) selective, (2) standard, and (3) individual-standard. The selective method consists of empirically studying the drying and moistening dynamics of vegetation fuels in terms of fire hazard and burning characteristics in relation to dynamic external factors. This method is used in Russia and Canada. In the standard method approach, all vegetation, forest and non-forest, is divided into pyrological types—“fuel models”. This method is used in the USA. The individual-standard method consists of compiling individual pyrological characteristics of vegetation areas from typical elements that reflect the description of the components of a complex of vegetation fuels, as well as the conditions for their moistening, drying, and burning. This method is being developed in Russia. The essence of the method consists of making an individual pyrological description for any plot of forest and non-forest area with the help of the available descriptions (for example, forest inventory) or aerial satellite images, thus creating an information database useful for the prediction of fire behavior. The method is based on long-term pyrological studies of drying and moistening rates of the primary fire carriers in different regions of Russia. Using the developed software, we will present an example of an information database for predicting the behavior of vegetation fires in the Krasnoyarsk Priangarye, the most fire-prone region of Siberia.

Keywords: vegetation fires; vegetation fuels; fire behavior prediction; information database



Citation: Volokitina, A.V.; Korets, M.A.; Sofronova, T.M. Development of Information Databases for Vegetation Fire Behavior Prediction.

Environ. Sci. Proc. **2022**, *17*, 17.

[https://doi.org/10.3390/](https://doi.org/10.3390/environsciproc2022017017)

[environsciproc2022017017](https://doi.org/10.3390/environsciproc2022017017)

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

Published: 8 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, A.V.V.; methodology, A.V.V.; software, M.A.K.; validation, A.V.V. and M.A.K.; formal analysis, T.M.S.; investigation, M.A.K.; resources, M.A.K.; data curation, M.A.K.; writing—original draft preparation, A.V.V.; writing—review and editing, T.M.S.; visualization, M.A.K.; supervision, A.V.V.; project administration, A.V.V. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

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