

DROUGHT AND FINE FUEL MOISTURE CODE EVALUATION: AN EARLY WARNING SYSTEM FOR FOREST/LAND FIRE BY REMOTE SENSING APPROACH

Yenni Vetrta¹, Nanik Suryo Haryani¹, Indah Prasasti¹, M. Priyatna¹, M.Rokhis Komarudin¹

¹Indonesian National Institute of Aeronautics and Space (LAPAN),

Jl. Kalisari No. 8, Pekayon, Pasar Rebo, Jakarta Timur, Indonesia, yenni.vetrta@lapan.go.id

Abstract: Optimizing the utilization of remote sensing data for monitoring forest / land fires in Indonesia has been widely used, such as fire hotspots. In addition, some early warning program also has built nationally, including the Fire Danger Rating System (FDRS) which uses input from the weather station that are air temperature, wind speed, rainfall, and humidity. Indonesian National Institute of Aeronautics and Space (LAPAN) have begun to operationalize FDRS since 2005, by utilizing remote sensing data to support national FDRS program. However, the evaluation parameters FDRS still needs to be done. This study has evaluated two FDRS parameters using remote sensing data i.e. Drought Code (DC_s) and Fine Fuel Moisture Code (FFMC_s). By using the reference DC (DC_{obs}) and FFMC (FFMC_{obs}) from weather station data processing, was calculated the value of accuracy, bias and error from DC_s and FFMC_s. The results showed that FFMC_s have fairly high correlation with FFMC_{obs} ($r = 0.68$, bias = 7.6, and RMSE = 15.7 points), while DC_s has a better correlation ($r = 0.91$, bias = 49.91, and RMSE = 80.22 points). Fluctuations FFMC_s and DC_s value shows similar pattern of DC_{obs} and FFMC_{obs} value. Nevertheless, FFMC_s and DC_s show an overestimation value than that FFMC_{obs} or DC_{obs}, particularly during dry season. In this study also indicated that DC_s and FFMC_s can describes fire occurrence within a period of 3 months before fire occur, particularly for DC parameter. These results show that remote sensing data can be used for monitoring and early warning fire in Indonesia as a complementary of observation data.

Keyword: Early warning, remote sensing, fire