Wildfire risk prediction in Indonesia with the soil water by the numerical meteorological simulation WRF

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In Indonesia, the rain decreases in the El Nino year, and it is said that wildfire increases. When a lot of tropical peat is distributed over Indonesia, and ground water level(GWL) is deepened than 15cm, it is said that the wildfire increase at a stretch. Around Palankalaya city of the middle southern Kalimantan Island, a plan to develop peat area about 1,500,000ha from 1995 through 1999 as a rice field was pushed forward, but, as a result, was over for failure. The land which was about to be developed was left as the farming inappropriate ground. Drainage is continuing now, and the desiccation of the peat goes ahead through the artificated stream which was made to lower GWL.
In this study, we perform the systems construction with the goal of predicting GWL of around 5 days later with the numerical meteorological simulation WRF. The study area was around the GWL observation point that BPPT set up in the suburbs of parang Kalla-ya city under the ground and used data in August, 2017 as application of the simulation by data in August, 2015 and February, 2017 for simulation construction. Weather simulation WRF assumed NCL data of NCEP as initial data and calculated adomains, in mesh size 27km, 9km, 3km, and 1km, for each 31*31 mesh and calculated the soil mousiture of four levels. And we made a correlative expression with the GWL of the target day and decided to use it for a prediction.
The calculation result of August, 2015:
$y=0.5877x_1-1.9520x_2+25.6019x_3+181.4307x_4-54.4165$ Eq(1)
where y :ground water level (cm), x_1 - x_4: the soil moisture contents of between lebel 1 and 4 by WRF.
As for the coefficient, it was certainly revealed that it was predicted by 0.9639 and very good correlation with this expression.
Similarly, the calculation result of February, 2017:
$y=0.082993x_1+25.97913x_4-7.90892$ Eq(2)
where y :ground water level (cm), x_1 and x_4:the soil moisture contents of level 1 and 4 by WRF.
As for the coefficient, it was certainly revealed that I could predict it by 0.9267 and the correlation that after all was very good when I used this expression.
A form, expression coefficients are totally different when Eq(2) with Eq(1) is compared. Therefore, we performed three following calculations to inspect simulation-style generality: at first Eq(1) to data of February, 2017; secondary, Eq(2) in August, 2015; and thirdly to apply to the data of August, 2017. As a result, the correlation had low all cases, and it turned out that it was not usable in a prediction.
As a result, it was revealed that we must make a prediction type every short term and must apply it without being able to make the expression that generalized time to predict the water level of this study point under the ground. However, absolute calculation understood that the expression that we could predict approximately surely more than 0.9 was put up if we made a short-term predictive expression in this way. The point that we intended for calculates only for three months during one spot, the period, but it will be thought that a characteristic to be seen in a prediction-type coefficient is clarified in future by performing that we lengthen a period and increase target points.

Keywords: wildfire, Indonesia, the numerical meteorological simulation WRF

