

Crop Residue Burning Program Support: Daily Authorizations and Permitting Based on Weather Conditions

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Prepared by
Andrew Nadler, Peak HydroMet Solutions

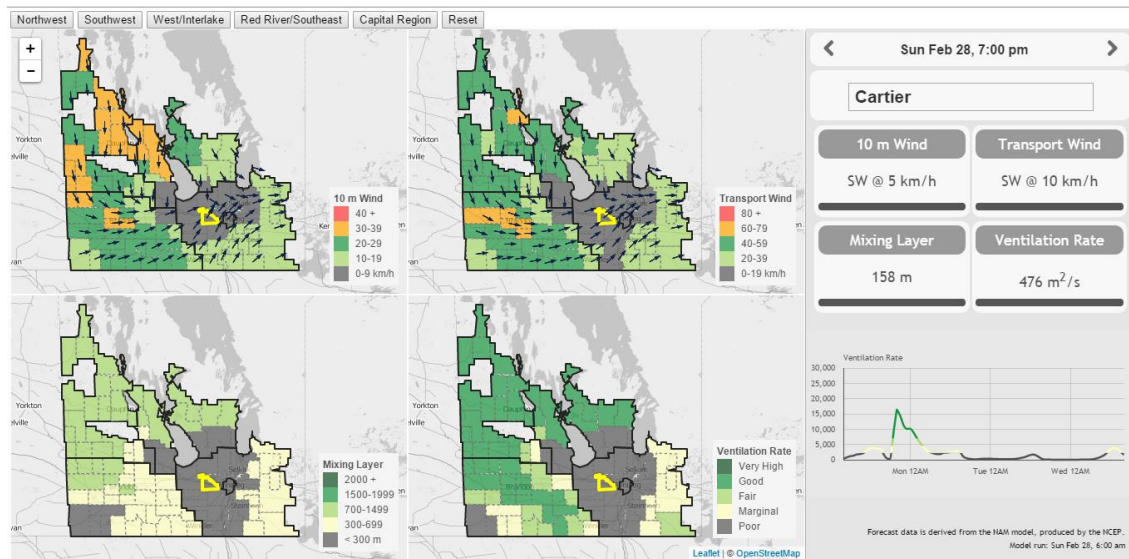
Purpose and Scope

The Crop Residue Burning (CRB) Program was introduced in 1993 to protect public health and safety while allowing producers to deal with difficult crop residue-related problems. The *Burning of Crop Residue and Non-Crop Herbage Regulation* addresses the legal aspects of crop residue burning. Currently, the Program is administered by Manitoba Agriculture, Food and Rural Development (MAFRD), requiring a substantial amount of staff time throughout late-summer and fall. This is mainly due to an authorization and permitting system that is somewhat manual and not streamlined. There are also no set guidelines related to authorizations and permit approvals. The intent of this project was to improve the current system by automating routine tasks and by incorporating decision support tools into the process. This was accomplished by improving and standardizing the acquisition of meteorological data for authorizations, by providing MAFRD staff with some support and guidance on interpreting the meteorological information, and by developing a permitting system that would assist with routine tasks related to issuing burn permits.

Activities

Acquisition and Display of Meteorological Forecast Data: Prior to 2015, forecast information was acquired through a number of disparate sources, often lacking specific output for atmospheric dispersion. A key priority of the project was to construct a standardized system that would supply all necessary atmospheric variables to the delegate who is issuing the authorization. This was accomplished by building an online tool whereby the user can access detailed forecast data specific to smoke dispersion (<http://crb.peakhydromet.ca/>). These variables include surface (10 m) wind speed/direction, transport wind speed/direction, mixing layer height, and ventilation rate. Each parameter is output hourly for the first 36 hours, then in three-hour increments to 86 hours. Each parameter is averaged and displayed by rural municipality. This provides a numerical and graphical indication of which RM's are forecast to have suitable or unsuitable atmospheric conditions for burning. The forecast data is acquired from the North American Mesoscale Model (NAM) produced by the US National Centers for Environmental Prediction (NCEP). The model is updated four times per day.

While the forecast tool was initially designed for internal government use by a limited number of users, expanding this tool for public access is quite possible. This would mainly involve scaling server and bandwidth capacity, as well as insuring appropriate government display guidelines. Hosting could either be done on the existing external platform or within the government hosting environment. If done within government, access to the raw forecast file would need to be arranged. All necessary files and code have been provided to MAFRD.



Screenshot of crop residue burning forecast tool

Support and Guidance for Daily Authorizations: Consistency in authorizations is imperative, particularly as different delegates may be responsible for authorizations on different days. One of the objectives of this project was to work closely with MAFRD delegates as they decide on daily burn authorizations and review permit applications. During the initial part of the season, the contractor provided daily recommendations on authorizations and permit applications based on the forecast tool. Within a short time, delegates would compile and distribute their own assessments for review by the contractor and other delegates. In most cases, assessments were in close agreement. For the second part of the season, authorizations were done solely by the MAFRD delegates with very little intervention by the contractor.

Online Permitting System: Historically, permitting has been an onerous and time-consuming task, requiring at least one delegate to be fully engaged through the burn season. While parts of the permitting process do require some critical assessment, much of the process consists of repetitive tasks that should be automated. For this reason, an operational proof-of-concept online permit application and review system was developed. This system allows farmers to apply for a permit from their computer or smartphone and the delegate is able to review the application, issue or reject the permit, and view valid permits and other pending applications. The permitting system is fully operational and could be deployed live at any time. However, restrictions related to protection of personal information as well as hosting requirements may dictate that the system be hosted by government hosting services. This would likely require some further development and testing prior to deployment. All necessary files and code have been provided to MAFRD.

Step 4/5. Details per Field

Provide residue information for each field

Field #1

Legal land description 01-01-01-W	Quarter NE	Acres to burn 7 <small>Approximate area of field that will be burned.</small>
Crop type Other	Residue is Other	Applicant is Owner
Requested burn date <small>Anticipated date of the burning. (Format: mm/dd/yyyy)</small>	Burn date unknown <input type="radio"/> Unknown <input type="radio"/> As Soon As Possible <small>Click if you have no anticipated burn date in mind.</small>	
Farmer comment none		

[Go to next step](#)

Screenshot of permit application form

Recommendations

Use of forecast tool: The forecast tools that was developed under this project has greatly enhanced the consistency, intuitiveness, and transparency of daily authorizations. MAFRD is strongly advised to continue using this tool for authorizing crop residue burning.

Public access to the forecast tool: Allowing the public to independently evaluate forecast conditions for burning would likely encourage more responsible and safer burning by producers. If the forecast tool is to be offered to the public, an educational component to promote awareness and understanding would be recommended.

Extension activities on alternatives to burning: While the intent of the program is to minimize the negative effects of crop residue burning, reducing the amount of burning is also a desirable outcome that should help achieve the primary goal. Over the years, several initiatives and incentives have targeted reducing crop residue burning. These types of activities are worthwhile and should be continued.

Update of the regulation: The recent amalgamation of certain rural municipalities, including ones that were previously in two separate burn zones, requires that the zones in the regulation be amended. This would also require that the zone boundaries be redrawn slightly.

Reconvene the Crop Residue Burning Advisory Committee: The Crop Residue Burning Advisory Committee is comprised of various stakeholders from the agricultural sector, Manitoba Conservation, and public health. This committee was instrumental in the initial establishment of the program. Previous meetings of the committee have been helpful in assessing the program and setting program priorities. Annual committee meetings are recommended.