

# Forest Fires

- Taming the Flame in Canada's Forests -



## A Brief History

In Canada, where 40% of our landmass is covered by forests, fire has always been a concern.

But the great efforts that have been made to prevent forest fires over the last century have also led to a new understanding of how these fires can be beneficial – if not essential – to a healthy forest ecosystem.

## Forest Fire Research

To understand both the dangers and benefits of forest fires, Canada conducts world-class research in the areas of:

- prediction;
- monitoring;
- management;
- modeling; and
- ecology.



## A Canadian System

The Canadian Forest Service (CFS) developed the Canadian Wildland Fire Information System (CWFIS) to help its partners to

- Predict fire occurrence and behavior, and
- Monitor its consequences.

This system is used by fire management agencies across Canada.





## Predicting Fires

The CWFIS is an online system that creates and displays daily maps of:

- fire weather;
- fire behavior; and
- current active fires from satellite imagery.

The screenshot shows the CWFIS website with the following elements:

- Header:** Canadian flag, "Ressources naturelles Canada" / "Natural Resources Canada", and the "Canada" logo.
- Navigation:** Links for "English", "Contactez-nous", "Aide", "Recherche", "Site du Canada", "SCF Accueil", "Carte du site", "Quoi de neuf", "Liens", "RNCan Accueil".
- Map:** A small map of Canada with a red dot indicating the current location.
- Menu:** A vertical list of menu items including "PAGE D'ACCUEIL", "INTRODUCTION", "RENSEIGNEMENTS GÉNÉRAUX", "PUBLICATIONS", "CONDITIONS DU MOMENT", "Forêt-météo", "Comportement du feu", "Points chauds 'Fire H3'", "Images satellitaires régionales", "Résumés de la situation", "ANALYSES HISTORIQUES", "Normales de forêt-météo", "Normales de comportement du feu", and "Base de données sur les grands feux de forêt".
- Section: Analyse historique**
  - Normales forêt-météo pour août**
  - Choisissez une carte:** A dropdown menu set to "Indice forêt-météo" and a "Récupérez une carte" button.
  - Mois:** A dropdown menu set to "août".
- Map:** A large map of Canada showing the "Fire Weather Index" for August. A legend on the right indicates the index values: 0-1 (purple), 1-2 (light blue), 2-7 (green), 7-10 (yellow), 10-12 (orange), 12-16 (red), and 16+ (dark red). The map shows higher index values (red/orange) in the western and southern parts of Canada.
- Text:**

L'indice forêt-météo est une composante de la Méthode canadienne de l'Indice forêt-météo (IFM). Il s'agit d'une classification numérique de l'intensité du feu. Il combine l'Indice de propagation initiale ainsi que l'Indice du combustible disponible. Il s'inscrit comme un indice général du risque d'incendie dans toutes les régions boisées du Canada.

Les normales **Forêt-météo** représentent la valeur moyenne d'un code ou d'un indice forêt-météo sur une période de 30 ans soit entre 1971 et 2000.

De plus amples informations quant à la **Méthode canadienne de l'Indice forêt-météo (IFM)** ainsi qu'aux **Normales forêt-météo** sont disponibles à la rubrique [Renseignements généraux](#).

## Rating the Danger

The Canadian Forest Fire Danger Rating System, a key part of the CWFIS, uses weather data, topography, fuel types and emission factors to determine:

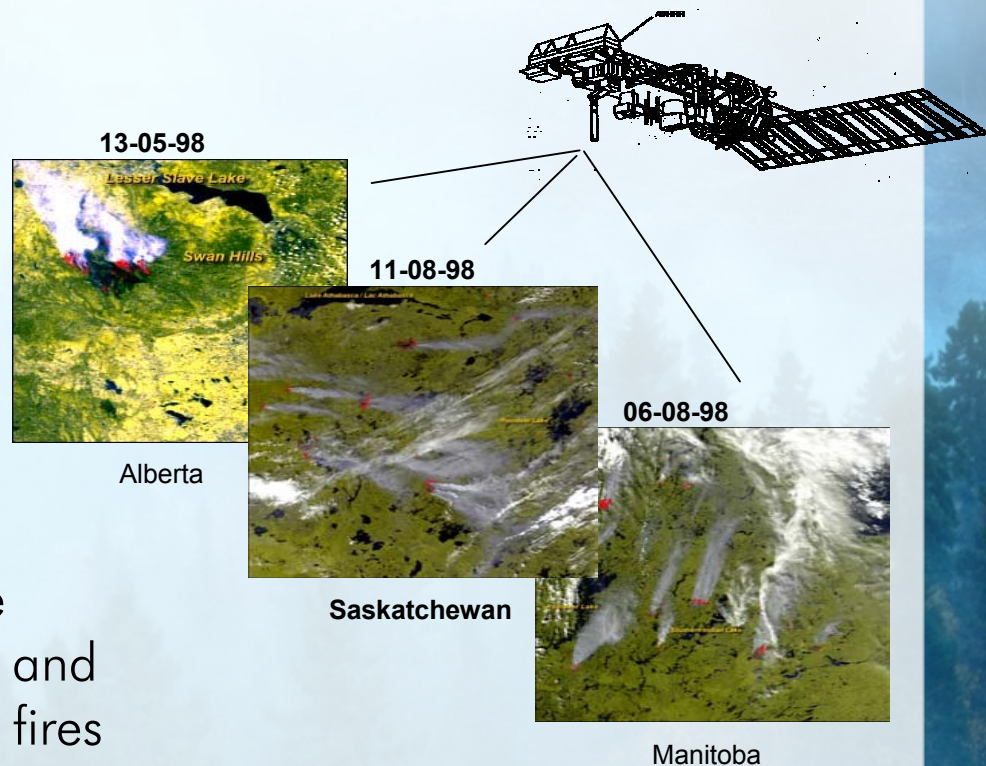
- how easily a fire can start;
- how difficult it would be to suppress; and
- how quickly it would spread and intensify.

It is used across Canada and has been adapted for Mexico, Indonesia, Malaysia, and New Zealand.

## Monitoring Fires

Once a forest fire has been set – whether by man or nature – it is essential that it be monitored.

Information from CFS and its partners is combined to determine whether the fire poses any danger and how it should be managed. Some fires are left to burn, some must be contained and others need to be extinguished.





## Fire Management

In Canada's national parks, forest fires are dealt with according to fire management plans. The plans help to determine what course of action should be taken in the event of a fire

Decisions are based on many factors, including information from the Canadian Forest Fire Weather Index System and the Canadian Forest Fire Behaviour Prediction System, fire location, the availability of resources, and the risk to people and property.

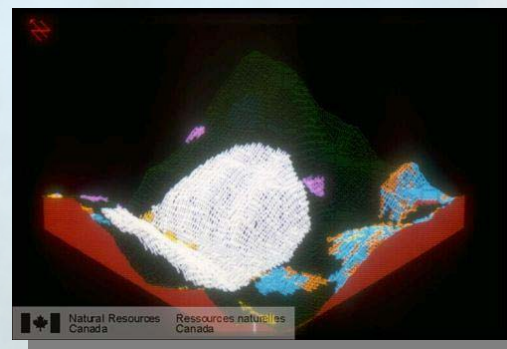




## Modeling

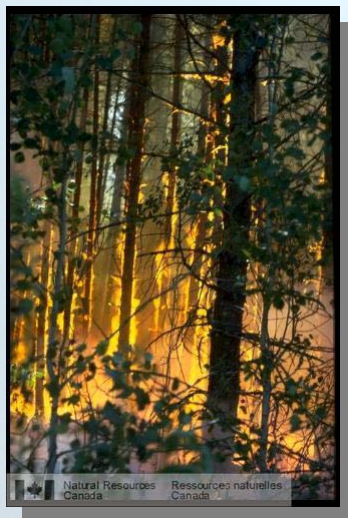
Modeling is an extremely useful tool to help determine how a fire is managed. For each incident, various fire attributes are modeled with the FWI and FBP systems.

Modeling can also be used to measure environmental impact. The CFS and the Canada Centre for Remote Sensing have started work on a model to predict the amount of greenhouse gas emissions from forest fires across Canada.



## Forest Fires and Ecology

As our knowledge of ecosystems has evolved, we have discovered that some forest fires can be a necessary and beneficial part of a forest's ecosystem.



Without these fires, debris can build up on the forest floor – choking out smaller plant life and leaving a dangerous amount of potential fuel for future fires.

## The Benefits of Fire

Fire can bring new life to a forest.

- Debris built up on the forest floor is reduced to mineral-rich ash, releasing and recycling nutrients.
- Sunlight reaches more areas, bringing new growth from trees and roots.
- Mixed vegetation (ages and varieties) creates a variety of habitats that attract and support different species of insects, mammals and birds.



## Prescribed Fires

Parks Canada is a pioneer and international leader in ecological fire management and prescribed burning.

It has brought fire back to our forests, under controlled conditions, to help rejuvenate and maintain Canada's forest ecosystems.



Many of our national parks now have active prescribed fire programs, offering a unique opportunity to study fires from ignition to extinction and, ultimately, regeneration.

## Sharing our Knowledge

Canada is considered a world leader in the area of forest fire management and this expertise reaches far beyond our borders.

For example, our knowledge of fire danger rating systems – which measure the risks of fire starting and spreading – has been instrumental in helping countries in Southeast Asia to anticipate and manage their wildfires.



## The Southeast Asia Project

Fires and associated haze have wreaked havoc with the economies, environment and health of citizens in four countries in Southeast Asia.

Five years ago, one monumental incident caused over US \$9 billion in damage.

Huge numbers of personnel and equipment were dispatched to manage the fire, but a lack of reliable information, training and infrastructure made these efforts largely ineffective.



## The Southeast Asia Project

Following the incident, the Canadian International Development Agency (CIDA) asked the CFS Northern Forestry Centre to help establish a fire danger rating system (FDRS) for the region. A successful prototype was created that currently operates daily via the Internet.

### Project Goals

- Expand the application of fire science in the area.
- Provide an enhanced early warning system for fire and haze events through an FDRS.
- Improve management of transboundary haze.

## Taming the Flame

Forest fires – natural, prescribed or accidental – are a fact of life. Managing these fires is a science at which Canada excels.

Our ongoing research will help further our understanding of the complex connections between fire, humans and the environment. And it will allow us to aid other countries with their own fire management needs.

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