FireSTARR

Canada

Projecting burn probability across Canada

Information current as of April 1, 2026

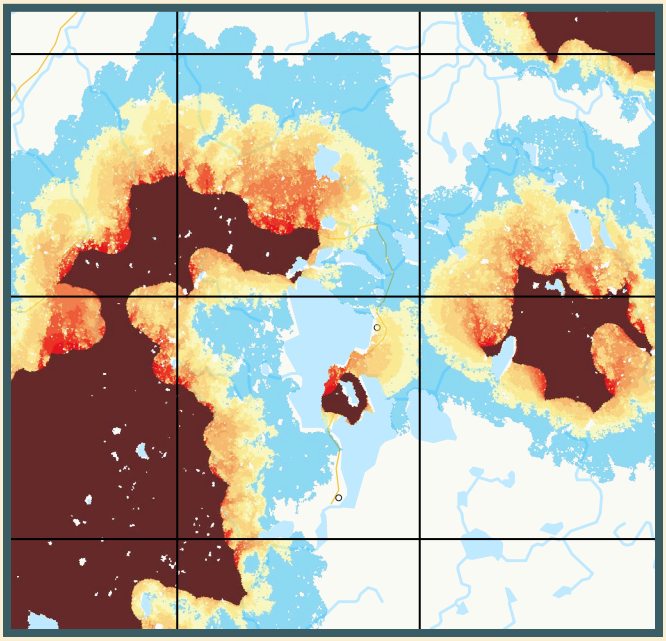
> FireSTARR (Fire, Space-Time Alternating Recursive Rapid Growth) is a daily probabilistic growth model for all fires in Canada. It produces coarse **burn probability** maps, projecting the potential spread of a fire over a given time frame. The model helps answer the question: "given the weather forecast and what we know about on-ground conditions, **how likely is it that this fire will spread to this location over a given timeframe?"**

Model Characteristics

Probabilistic fire growth modeling: Burn probability outputs from thousands of replicated stochastic simulations.

Grounded in CFFDRS fire behaviour science: Built on the Canadian FBP System with detailed behaviour outputs.

Fast, efficient and scalable: Optimized for high-volume simulations, low memory use and cross-platform deployment.



Typical Uses

Supports strategic decisions of fire managers and operational units looking to:

- Determine initial containment objectives.
- Prioritize new fires.
- Identify need for inspection.
- Assess points of concern on a landscape within a timeframe.
- Assess the potential size distribution and spread of a fire.

Key Considerations

- The model output does **not** represent a projected burn perimeter.
- FireSTARR is still under development, and some features may change.
- Input weather is applied to the entire scene. There is no interpolation or elevation adjustment.
- It cannot use vector fuel breaks (e.g., creeks); these barriers must appear in the fuel grid.
- Does not model suppression, spotting, plume dynamics or extinguishment.
- Assumes fuel, slope, and aspect are homogeneous within each cell.
- Detailed on-site assessments of fire behaviour are still required for fire operations.

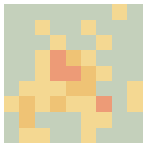
How it Works

Inputs

Fuel (uses the Fire Behavior Prediction (FBP) Fuel Model), topography, ignition, and weather forecasts available through the Canadian Wildland Fire Information Framework (CWFIF).

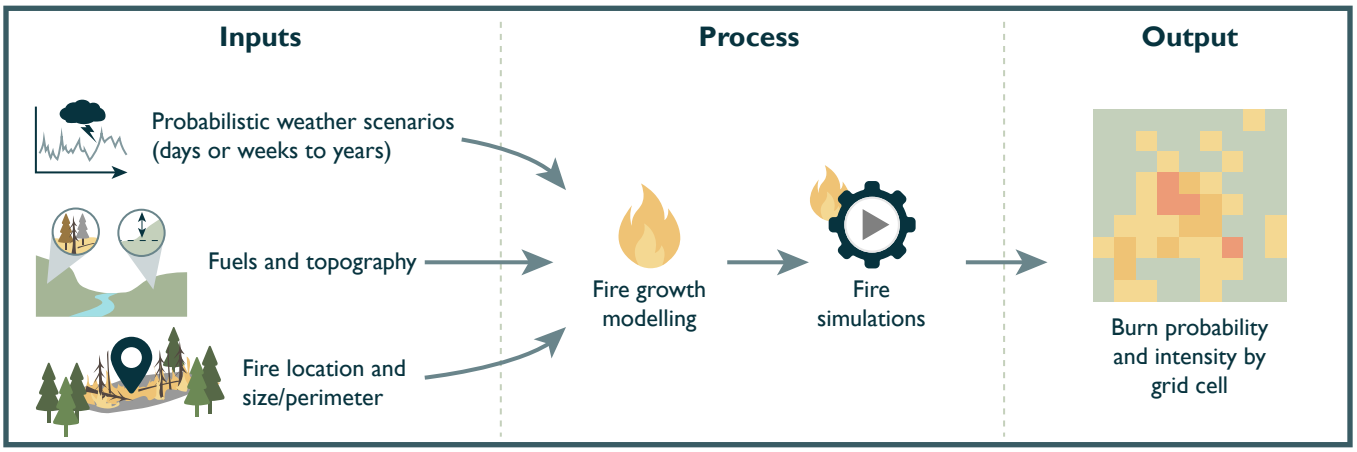
Process

The growth of the fire over a specified time interval is simulated thousands of times to capture the variation in inputs. The proportion of simulations in which a given cell burned determines its probability (e.g., a cell that burned in 900 out of 1000 simulations has a projected burn probability of 90%).



Output

A map displaying daily probabilistic spread. Colour contours indicate cells with equal relative risk of burning (**not** a projected fire boundary).



This summary is part of a six-part series introducing Wildfire Intelligence and Predictive Services (WIPS), its suite of data products and three key tools.

We acknowledge the collaboration and data sharing between NRCan, CIFFC and fire management agencies through the Canadian Wildland Fire Information Framework.