Wildfire Season Forecast 2023

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Forecast 2023

June 6, 2023
Whoa! What’s going on this year?!!

CWFIS interactive map, June 2, 2023

• Already at/above mean area burned for an entire year
Statistics to date

“I don’t want to comment on that since the numbers are changing so fast they are quickly outdated.”

Numbers from the June 5, 2023 CIFFC Situation Report:

- Fires: 2266
- Area burned: 3,571,727 ha
- 10-year averages for early June: (~1700 fires, 270,000 ha)

- CIFFC National Preparedness Level (NPL) at 5 since May 11 (earliest on record)
  - International crews in from USA, AUS, NZ, ZA,
  - CIFFC situation report web page has been reworked
1989 vs 2023

• 1989 featured most area burned in our modern records
  • ~7.5 million hectares burned; about 43% in Manitoba

• Were 1989 weather patterns similar to 2023?
  • Both years featured fading La Nina; 1989 persisted later
  • 1989-early 1991 had long extended ENSO-neutral period
  • Drought prevalent

• Add 30 years of climate warming

• Better detection and suppression methods in 2023
Unprecedented area burned increase

Source: Canadian Wildland Fire Information System / Système canadien d’information sur les feux de végétation
Hotspot and Fire Progression

June 3, 2023
Why might this have happened?
Facts and Anecdotes

• Transition speeds of ocean/atmosphere indexes may be more important than phase maxima/minima

• Warmest May on record in Washington state

• Similar in western Canada? Numbers not assessed yet
Drought Progression

- Drought intensified in late 2022; few areas of improvement
2022 Spring start-up conditions

Snow depths
• Affects spring more than summer

April 26, 2023

May 10, 2023

May 17, 2023
La Nina faded

El Nino developing

Are we getting the “worst” of each???

Cold north Atlantic favoring high pressure in east?
## Fire problems in ENSO Springs

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### El Niño:
- Warm, windy, dry in western Canada

### La Niña:
- Arctic surface high bring dry air, strong wind around edges
- Temperature may be cool

### Summer fire problems may depend on other influences
Pacific Decadal Oscillation


http://climate.ncsu.edu/climate/patterns/PDO.html
North Atlantic Oscillation

http://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/nao.timeseries.gif

Quebec Area Burned
(NFDB, ha*1000)

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NRCan-CFS Prediction: April run, for May and June

This is not the most recent forecast

Anomaly

*Predicted values normalized against average weather*
NRCan-CFS Prediction: May run, for May and June

Anomaly

_Predicted values normalized against average weather_

This is not the most recent forecast
Why did April and May Forecasts Differ?

Canadian Seasonal to Interannual Prediction System:
- CanCM4i + GEM5-NEMO
Climate Ensemble Data: CanSIPS

• Models developed by Canadian Centre for Climate Modeling and Analysis
  • CanCM4i
  • GEM-NEMO: Global Environmental Multiscale – Nucleus for European Modeling of the Ocean

• 10-member ensembles producing 12-month forecasts

• NRCan uses temperature and precipitation data

• Skill of climate forecasts often best in coastal areas, poorer in lee of mountain ranges
Canadian Forest Fire Weather Index (FWI) System

Seasonal forecasts use the severity rating anomaly

Fire Weather Observations

Fuel Moisture Codes

Fire Behavior Indexes

Temperature, Humidity, Wind, Rain

Temperature, Humidity, Rain

Temperature, Rain

FFMC
Fine Fuel Moisture Code

DMC
Duff Moisture Code

DC
Drought Code

ISI
Initial Spread Index

BUI
Buildup Index

FWI
Fire Weather Index

DSR/MSR/SSR
Severity Rating

Snow depth
Barometric Pressure
Horizontal Visibility
Cloud cover and type
Upper air data
2023 Seasonal Predictions

What happens now???
ENSO Forecasts

Moderate/strong El Nino looking likely by late summer

May 19, 2023
North American Multi-model Ensemble

NMME

June Precip

Dry central regions?
North American Multi-model Ensemble
NMME

July Precip

Rainfall increases in July?
North American Multi-model Ensemble (NMME)

August Precip

Dry signal strongest in central-eastern Canada
NMME Skills Maps

Two month lead (July forecast)

Temperature

Precipitation
2023 NRCan-CFS Seasonal Prediction
NRCan-CFS Prediction: June run, for June and July

Anomaly

Predicted values normalized against average weather
NRCan-CFS Prediction: June run, for August and September

Anomaly

Predicted values normalized against average weather
Canadian Wildland Fire Information System (CWFIS)

Note: CWFIS website will change, likely in 2023-24
Conclusions and Reminders

• Model consensus points to warm summer with many dry areas, but possible respite in July with better rainfall

• Serious fires can occur in any year

• Fire activity depends on ignitions; our forecast only predicts where potential exists
Remember to check updates ...

- Seasonal forecast: first working day each month on CWFIS
- Daily conditions: provincial and/or CWFIS web sites
Questions?

Contact:

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