National Interface Mapping for Canada

Wildland Fire Canada 2016
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Interface Maps

Wildland-Urban Interface
Wildland-Industrial Interface
Infrastructure Interface
Wildland Fire
Wildland Fire

Data: National Fire Database
Wildland Fire

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Wildland Fire

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Wildland Fire

Data: National Fire Database
Wildland Fire
Evacuations

Data: Beverly and Bothwell (2011)
Evacuations

Evacuation and Structural Loss
Evacuation

Data: Beverly and Bothwell (2011)
Wildland-Urban Interface?
Wildland-Urban Interface

Industrial Interface
Wildland-Urban Interface

Industrial Interface

Infrastructure Interface

Wildland-Human Interface?
Research Objective

Produce maps of interface areas across Canada.

also...

Provide basic statistics on the interface and perform analysis of spatial patterns.
Mapping the Interface Area

**Fuels**
- Data source: LandCover 2000 land cover types and CanVec+

**Values**
- Data source: CanVec+

**Calculate interface area**

**Product:** three national maps of interface areas

- Wildland-urban interface
- Infrastructure interface
- Wildland-industrial interface

Data source: LandCover 2000 land cover types and CanVec+
Fuels and values:
Cost distance:
Cost distance:
Cost distance:
Cost distance:
Cost distance:
Cost distance:
Wildland-Urban Interface:
Interface Maps

Wildland-Urban Interface
Wildland-Industrial Interface
Infrastructure Interface

116.5 million hectares
Interface Maps

116.5 million hectares
Interface Maps

32.3 million hectares
Interface Maps

108.9 million hectares
Provincial/Territorial Maps
Provincial/Territorial Maps
Provincial/Territorial Maps
Local Interface Maps

- Wildland-Urban Interface
- Wildland-Industrial Interface
- Infrastructure Interface
Local Interface Maps
Local Interface Maps

- Wildland-Urban Interface
- Wildland-Industrial Interface
- Infrastructure Interface

The map shows the distribution of different interface types around the cities of Kelowna and Penticton.
Local Interface Maps
Local Interface Maps

- Wildland-Urban Interface
- Wildland-Industrial Interface
- Infrastructure Interface
Local Interface Maps
Provincial/territorial Choropleth Maps
Provincial/territorial Choropleth Maps
Provincial/territorial Choropleth Maps
Fuels

Wildland Fuels
Relative Fuel Weight

1
2
3
4
5
6
7
Fuels

Burnable wildland fuels: 562 million hectares = 67% of total land area
6% of burnable wildland fuel is wildland-urban interface

2% of burnable wildland fuel is wildland-industrial interface

**Fuels**

**Wildland Fuels**

<table>
<thead>
<tr>
<th>Relative Fuel Weight</th>
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**Wildland-Urban Interface**
Fuels

6% of burnable wildland fuel is wildland-urban interface.
6% of burnable wildland fuel is wildland-urban interface

2% of burnable wildland fuel is wildland-industrial interface

Fuels

Wildland Fuels
Relative Fuel Weight
1
2
3
4
5
6
7

Wildland-Urban Interface
Wildland-Industrial Interface
6% of burnable wildland fuel is wildland-urban interface.

2% of burnable wildland fuel is wildland-industrial interface.

20% of burnable wildland fuel is infrastructure interface.
Structures
Structures
Of all “Populated Places” across Canada…

60%

have at least 500 hectares of wildland-urban interface within 5 km
Wildland Fires
Wildland Fires
Wildland Fires

[Map showing the distribution of wildland fires in Canada, differentiated by color: green for non-urban interface fires and red for urban interface fires.]
Wildland Fires

17% of fire polygons from 1980-2014 are "wildland-urban interface fires"
Wildland Fires

17% of fire polygons from 1980-2014 are "wildland-urban interface fires"

but 6% for lightning-caused fires
and 39% for human-caused fires
Wildland Fires
Wildland Fires

Map showing the distribution of wildland and industrial interface fires across Canada.
Wildland Fires

6% of fire polygons from 1980-2014 are "wildland-industrial interface fires"
6% of fire polygons from 1980-2014 are “wildland-industrial interface fires”

but 3% for lightning-caused fires and 12% for human-caused fires
Wildland Fires
38% of fire polygons from 1980-2014 are "infrastructure interface fires"
Wildland Fires

38% of fire polygons from 1980-2014 are "infrastructure interface fires"

but 25% for lightning-caused fires
and 65% for human-caused fires
Future Work

Fire Risk in Interface Areas

Change Detection and Future Prediction

Risk

Detailed fuel information
Structure Value/Potential Loss
Ignition Probability
Historic Fires
Burn Probability
Homogenous Fire Regime Zones (HFZ)
Suppression/Values Protection Capacity
Structure Ignition
Topography

Past

Current

Future
Applications of the Interface Maps

The three maps of interface areas (urban, industrial, and/or infrastructure) will be freely available.

Can easily be combined with other spatial data.

Can be used in multiple applications:

- **Wildfire Mitigation Planning**
  - FireSmart
  - Fuel treatments
  - Building codes
  - Municipal bylaws
  - Industrial fire regulations
  - Infrastructure fire mitigation

- **Decision Support**
  - Resource prepositioning
  - Fire prioritization
  - Interface fire alerts
  - Values protection
  - Incorporate into risk models

- **Long-term Planning**
  - City planning
  - Evacuation planning
  - Insurance
  - Fire management budgeting, purchases
  - Railway policy/planning
  - Powerline safety
Thank You!

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Questions?