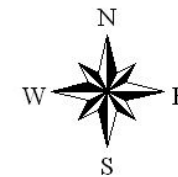
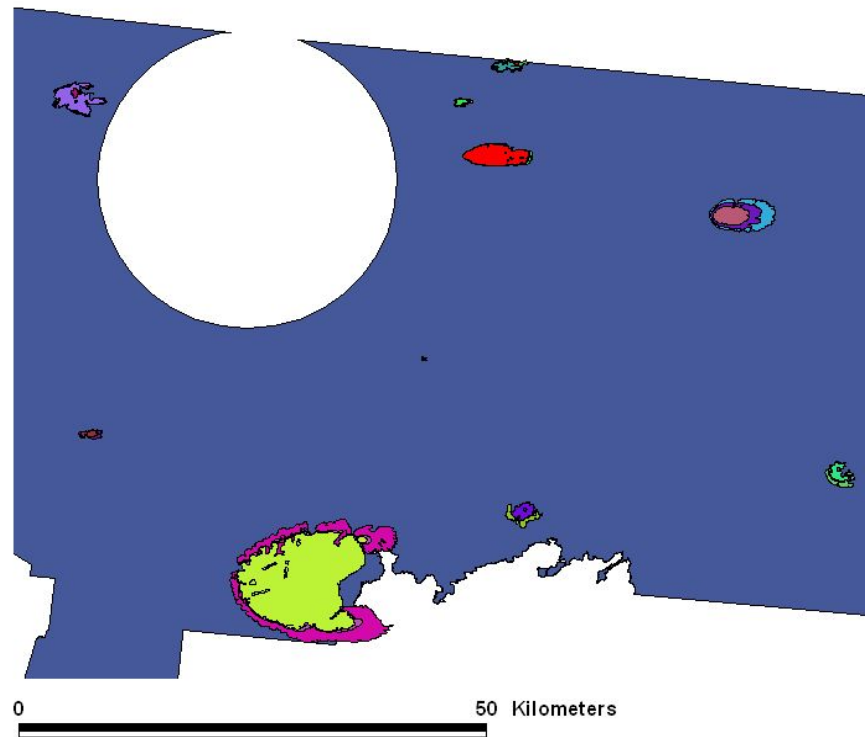


What if we couldn't fight fire?



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For Wildfire Canada
2012
Kananaskis, AB



Introduction

Why fire is different from “natural disasters”

Study

Some non-fighting scenarios

Implications

Imagining if we couldn't fight fire

Introduction

Typical lists of natural disasters include wildfires

Study

Wikipedia: A natural disaster is a major adverse event resulting from natural processes of or effecting the Earth, for example floods, tsunami, tornadoes, hurricanes and cyclones, volcanic eruptions, earthquakes, heatwaves and droughts, **wild fires**, landslides, blizzards, ice storms and avalanches.

Implications

Introduction

But the Canadian government does not

The following maps and data reveal the locations, types and magnitudes of significant natural disasters that have affected Canada during a 150-year period

Study

Blizzards

Earthquakes

Floods

Hail

Icebergs, sea ice and fog

Landslides and snow avalanches

Tornadoes

Tsunamis and storm surges

Volcanic eruptions

Implications

Introduction

On this list, fire alone can be fought

Study

Wikipedia: A natural disaster is a major adverse event resulting from natural processes of or effecting the Earth, for example floods, tsunami, tornadoes, hurricanes and cyclones, volcanic eruptions, earthquakes, heatwaves and droughts, **wild fires**, landslides, blizzards, ice storms and avalanches.

Implications

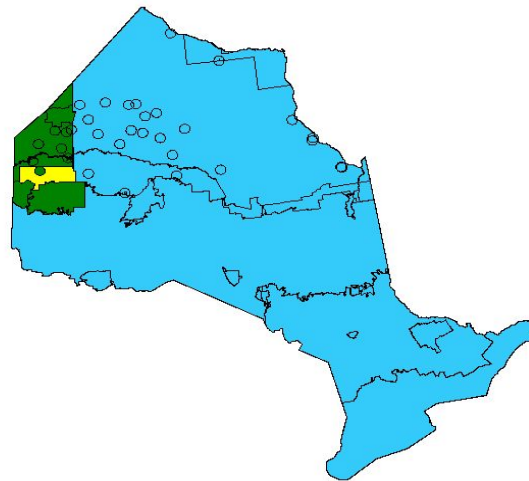
What if it could not?

Introduction

Choose an area with full fire protection

Study

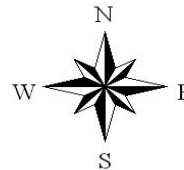
Ontario FMZ - Study area



Part of Red Lake district

Size: 921 000 ha

Implications



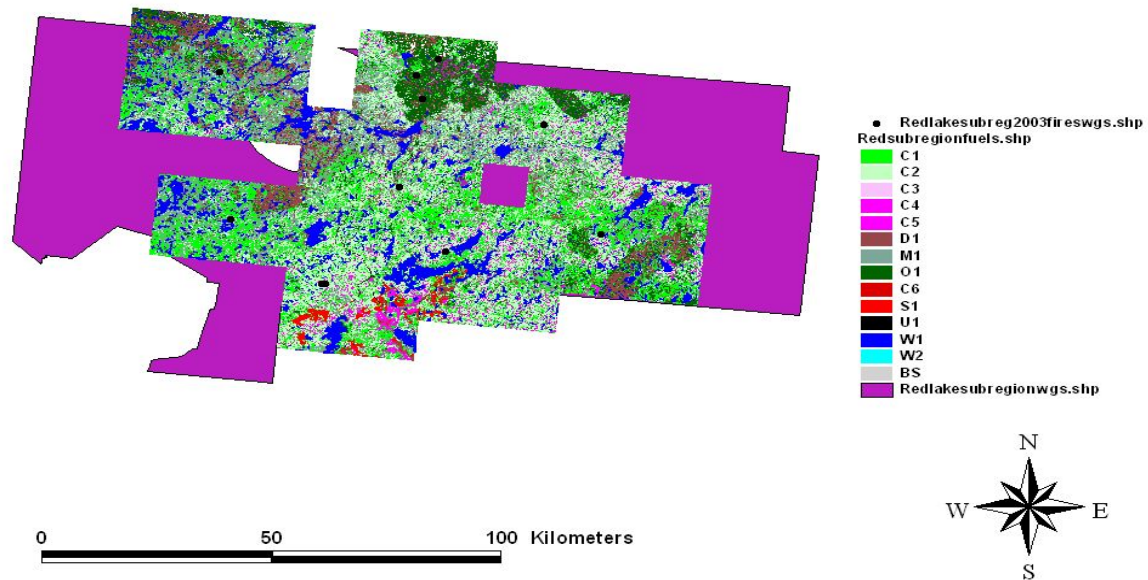
Introduction

Begin with a single fire season (2003) and the OMNR fuels map

Study

10 small 2003 fires in the Red Lake study area

Implications



Introduction

Make some simplifying assumptions

Actual fires: all contained below 1 ha within a day

Study

Fire growth model: PROMETHEUS

Burning period: 10am – 6pm

Implications

Spread event: 3 days from start date

Weather stream: interpolated to the centroid of the ecoregion (BM Wotton)

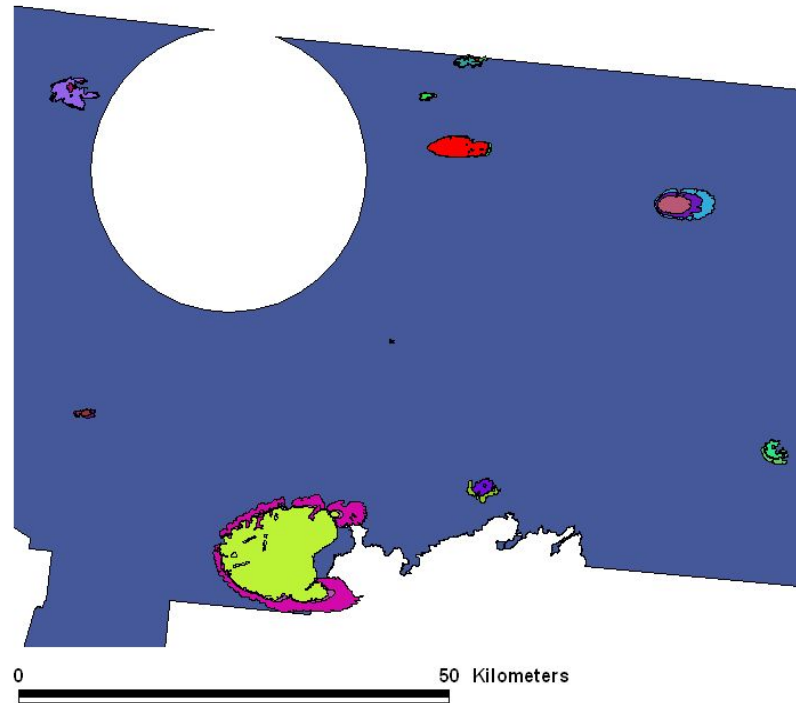
Introduction

New burn fraction: 0.014

10 simulated fires in the study area

Study

Implications



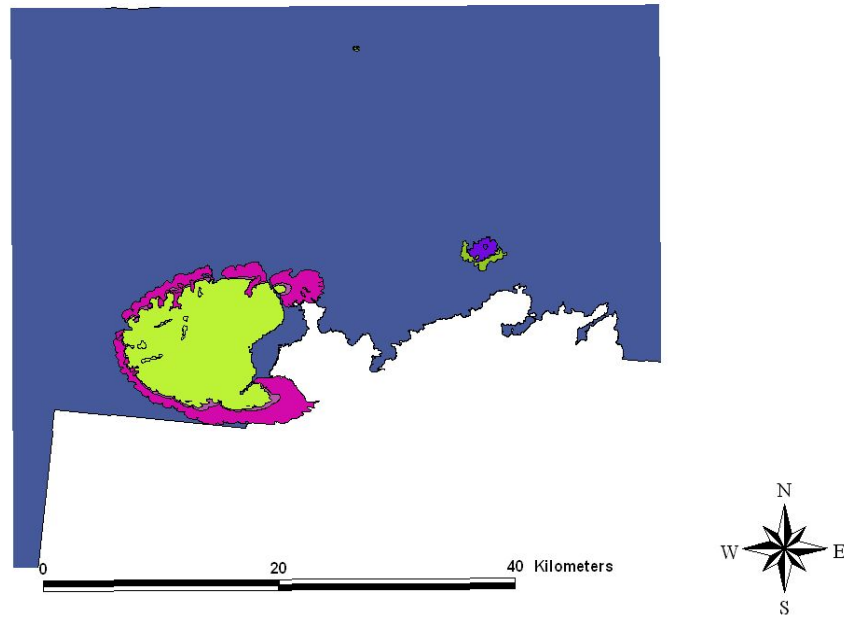
Introduction

Use the anomalies approach to modify the weather scenario

Study

Implications

2003, 2040, and 2090 simulated perimeters



A 2040 weather scenario (CCCB1, 2 x CO2)

A 2090 weather scenario (CCCB1, 3 x CO2)

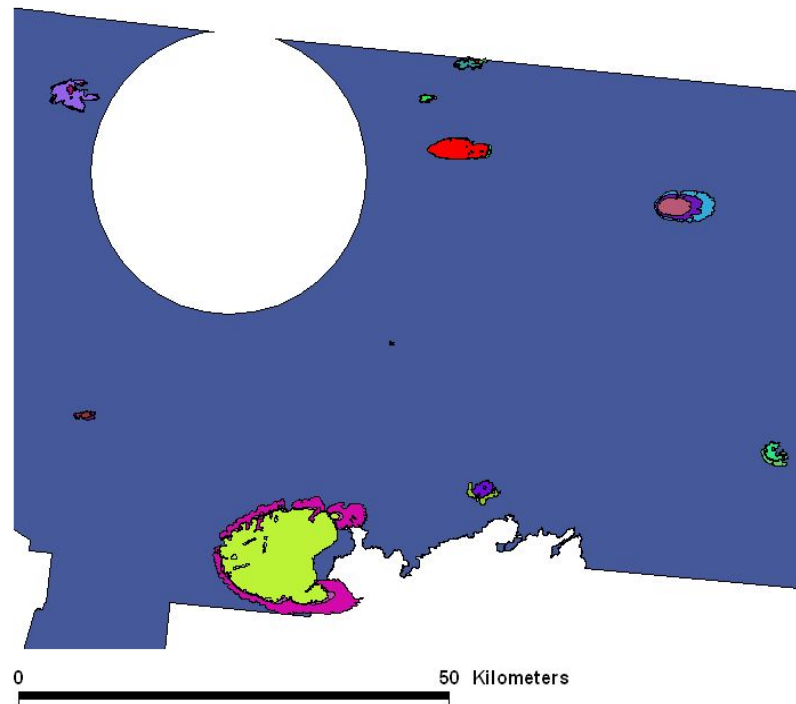
Introduction

New burn fractions: 0.014 (2003), 0.016 (2040), 0.022 (2090)

Study

10 simulated fires in the study area

Implications



Introduction

Some fires became very large

Study

Implications

Fire number	Start date	Stop simulation	2003 Final Size	2040 Final Size	2090 Final Size
RED 9	05/08/03 8:45	05/10/03 8:45	10131	10680	14935
RED 25	05/29/03 19:20	06/01/03 19:20	290	307	553
RED 31	06/04/03 12:00	06/07/03 12:00	223	280	497
RED 32	06/05/03 12:30	06/08/03 12:30	658	872	1334
RED 33	06/05/03 13:00	06/08/03 13:00	71	80	112
RED 34	06/04/03 11:00	06/07/03 11:00	175	220	307
RED 50	06/15/03 16:30	06/18/03 16:30	610	1192	1958
RED 109	08/23/03 13:00	08/26/03 13:00	85	92	167
RED 111	09/01/03 11:50	09/04/03 11:50	0.5	6	14
RED 113	09/07/03 10:30	09/10/03 10:30	1180	1238	1321
RED 115	09/06/03 20:00	09/09/03 20:00	862	957	1025

Introduction

The above are thoughts about if we *didn't* fight fire, not if we couldn't

Study

If we didn't fight fire, area burned would increase so much that landscape considerations would enter the picture: with burn fractions of 1-2%, the age structure of the forest would change

Implications

Free-burning fires under climate change will be bigger and more intense, but that need not mean that we can't fight fires

But if fire weather becomes increasingly severe and we can't fight high-intensity fires, fire could look more like a “natural disaster”

Introduction

Natural disasters can be mitigated, but not *fought*

Restoration of forests or swamps, permeable surfaces and dams mitigate floods

Study

Appropriate building materials mitigate earthquakes

Similarly, FireSmart management can mitigate wildfire

Implications

But managing for one disaster is often a tradeoff with the others (e.g. wooden buildings are good for earthquakes, bad for fire)