

Canadian Fire Resource Demand System



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Wildland Fire 2010
October 10, 2010



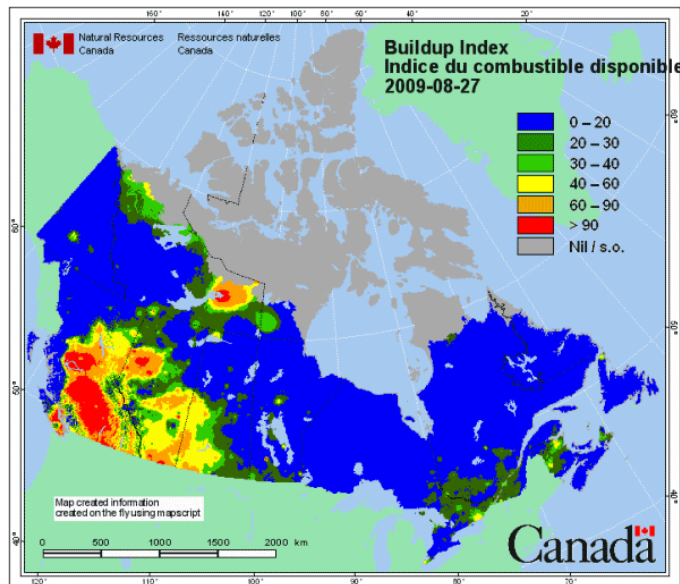
Natural Resources Canada Ressources naturelles Canada
Canadian Forest Service Service Canadien des forêts

What kind of toast?

Daily decisions about requests for resources or response to request

Projection of fire load, fire resource demand and availability over the deployment period for scenario planning.

50+ 'toastmasters' can make toast the way they like in real time

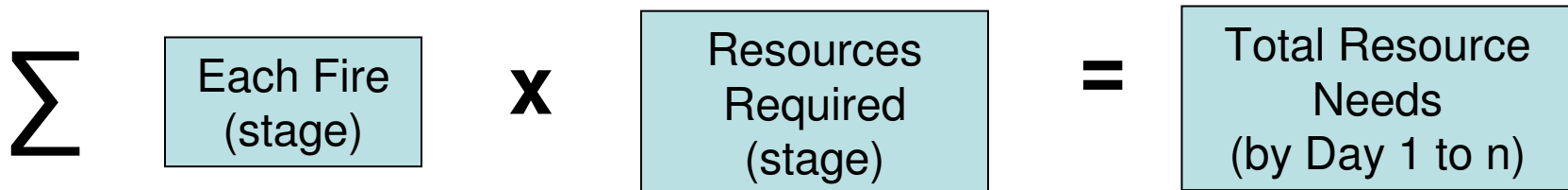
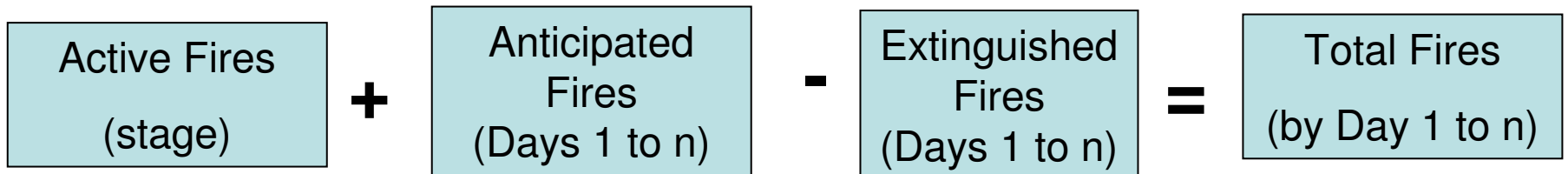
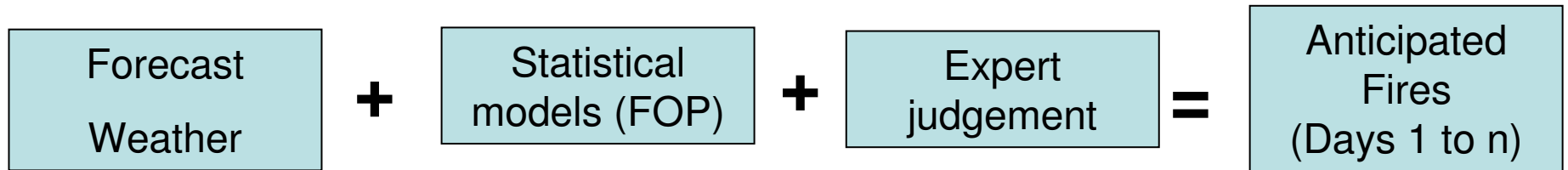


- 14 day outlook approximating deployment period
- fire centre is the basic planning unit, summed to P/T and nationally

How to make toast

- Working team
- Conceptual model
- Express as mathematical relationships
- Design database model
- Build the views
- Delivery in open source, distributed system

Conceptual model



Compared With

Resource Availability (by Day 1 to n)

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Fire Weather Index ON-Western

Select a reporting area:

ON-Western

	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu
	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09	Oct 10	Oct 11	Oct 12	Oct 13	Oct 14
FFMC	34.9	51.9	70.4	78.2	81.2	82.2	82.3	82.3	82.4	78.3	76.3	76.1	75.7	77.9
DMC	1.0	1.0	2.0	2.0	3.0	4.0	4.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0
DC	81.0	82.0	85.0	88.0	91.0	94.0	97.0	99.0	101.0	103.0	104.0	106.0	107.0	109.0
ISI	0.0	0.4	1.5	1.6	2.7	3.1	3.3	3.1	2.9	2.2	1.8	1.6	1.4	1.6
BUI	2.0	2.0	3.0	5.0	6.0	7.0	8.0	8.0	9.0	9.0	10.0	10.0	10.0	11.0
FWI	0.0	0.1	0.6	0.7	1.8	2.5	2.9	2.8	2.8	2.0	1.3	1.0	0.9	1.2

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Active Fires ON-Western

Select a reporting area:

ON-Western

Grouped Active Fires - Fire Count by Stage

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8	Stage 9	Stage 10	Stage 11	Stage 12	Stage 13	Stage 14
No Sweat	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Challenging	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Sector	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Project A	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Project B	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Project C	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Project D	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Complex	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

Individual Active Fires

Category and Status fields are mandatory.

Id	Description	Category	Stage	Status	Rel_Size	Start	Finish	Notes
new	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

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Planned and Predicted Fires ON-Western

Select a reporting area:

ON-Western

Planned Fires

	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09	Oct 10	Oct 11	Oct 12	Oct 13	Oct 14
Lightning	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3
People	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.4
Total	0.5	0.5	0.7	0.7	0.8	0.9	0.9	0.7	0.7	0.8	0.7	0.7	0.6	0.7
No Sweat	0.5	0.5	0.7	0.7	0.8	0.9	0.9	0.7	0.7	0.8	0.7	0.7	0.6	0.7
Challenging	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sector	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Complex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.5	0.5	0.7	0.7	0.8	0.9	0.9	0.7	0.7	0.8	0.7	0.7	0.6	0.7

Update New Fires!

Predicted Fires

	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu
	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09	Oct 10	Oct 11	Oct 12	Oct 13	Oct 14
Lightning	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3
People	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.4
Total	0.5	0.5	0.7	0.7	0.8	0.9	0.9	0.7	0.7	0.8	0.7	0.7	0.6	0.7
No Sweat	0.5	0.5	0.7	0.7	0.8	0.9	0.9	0.7	0.7	0.8	0.7	0.7	0.6	0.7
Challenging	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sector	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Complex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.5	0.5	0.7	0.7	0.8	0.9	0.9	0.7	0.7	0.8	0.7	0.7	0.6	0.7

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Fire Load ON-Western

Select a reporting area:

ON-Western

	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu
	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09	Oct 10	Oct 11	Oct 12	Oct 13	Oct 14
No Sweat	0.5	1.0	1.2	1.4	1.5	1.7	1.8	1.6	1.4	1.5	1.5	1.4	1.3	1.3
Challenging	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sector	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Project D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Complex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.5	1	1.2	1.4	1.5	1.7	1.8	1.6	1.4	1.5	1.5	1.4	1.3	1.3

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Resource Demand ON-Western

Select a reporting area:

ON-Western

	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu
	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09	Oct 10	Oct 11	Oct 12	Oct 13	Oct 14
Fire Fighters Type 1	2.63	2.63	3.68	3.68	4.2	4.73	4.73	3.68	3.68	4.2	3.68	3.68	3.15	3.68
Fire Fighters Type 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Airtankers Large	0.04	0.04	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.06
Helicopters Light	0.04	0.04	0.06	0.06	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.06
Helicopters Medium	0.07	0.07	0.09	0.09	0.1	0.12	0.12	0.09	0.09	0.1	0.09	0.09	0.08	0.09
Pump	1.0	1.0	1.4	1.4	1.6	1.8	1.8	1.4	1.4	1.6	1.4	1.4	1.2	1.4
Pack Pumps	1.5	1.5	2.1	2.1	2.4	2.7	2.7	2.1	2.1	2.4	2.1	2.1	1.8	2.1
Hose Lengths	24.0	24.0	33.6	33.6	38.4	43.2	43.2	33.6	33.6	38.4	33.6	33.6	28.8	33.6
Sprinkler kits	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transport Aircraft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gagets Gidgets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tents	1.0	1.0	1.4	1.4	1.6	1.8	1.8	1.4	1.4	1.6	1.4	1.4	1.2	1.4
Chain Saws	1.0	1.0	1.4	1.4	1.6	1.8	1.8	1.4	1.4	1.6	1.4	1.4	1.2	1.4
Burnout Units	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Division Supervisors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sector Leaders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fire Behaviour Analysts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incident Management Teams Long	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incident Management Teams Short	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Area Fire Bosses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Base Camps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Fire Load ON-Total

Select a reporting area:

ON-Total

	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu
	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09	Oct 10	Oct 11	Oct 12	Oct 13	Oct 14
No Sweat	1	3	3	3	3	4	4	4	3	3	3	3	3	3
Challenging	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sector	0	0	0	0	1	1	1	1	1	1	1	1	1	1
Project A	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project D	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Complex	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	3	3	3	4	5	5	5	4	4	4	4	4	4
Eastern	1	2	2	2	2	2	3	3	3	2	2	2	2	2
Western	1	1	1	1	2	2	2	2	1	2	2	1	1	1

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Planned Fire Starts CA-National

Select a reporting area:

CA-National

Planned Fires

	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu
	Oct 01	Oct 02	Oct 03	Oct 04	Oct 05	Oct 06	Oct 07	Oct 08	Oct 09	Oct 10	Oct 11	Oct 12	Oct 13	Oct 14
British Columbia	13	14	13	22	432	26	21	15	13	15	16	14	13	15
Alberta	444912	186482	77419	148081	371157	406378	296896	342362	348976	307863	376094	309875	409673	252223
Saskatchewan	2	5	3	4	3	3	3	3	3	2	2	2	2	2
Manitoba	17	16	22	16	11	14	11	11	9	7	7	7	6	5
Ontario	1	1	2	2	2	2	2	2	2	2	2	2	2	2
Quebec	0	0	1	2	6	6	7	2	2	2	2	2	2	2
New Brunswick	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prince Edward Island	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Newfoundland and Labrador	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yukon Territory	3491	130	294690	422264	99268	729	56	18	11	14	15	29	18	29
Northwest Territories	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parks Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	448436	186648	372150	570391	470879	407158	296996	342413	349016	307905	376138	309931	409716	252278

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Benefits: improved situational awareness at longer and larger scales

Opportunities: FOP and other statistical modeling add uncertainty

Challenges: system integration (with P/Ts)
need active fires and resources