

‘Firecaster’ peers into the smoky future

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By Rhiannon Coppin *News Reporter*



Jan Stewart/Yukon News

Don Green keeps his eyes on the skies as meteorologist for the Yukon's Wildland Fire Management service.

When lightning strikes in the Yukon, meteorologist Don Green knows — often five days before it happens.

He never ventures into the field.

He doesn't feel the wind, hear the crack and rumble of thunder or taste the rain. Yet he forecasts forest fires as would an oracle.

Sitting back in his windowed corner cubicle in the wildland fire management branch, Green shows off the tools he uses to divine the risk of lightning-caused forest fires in the territory.

Instead of gazing into crystal balls for clues, he consults three liquid-crystal displays.

One is filled with columns of data; another shows all the lightning strikes detected during the last 24 hours as little blue blips on a digital map.

The third, however, plots out Green's estimation of where lightning will strike this weekend — even though it's only Wednesday.

“It's really getting big and chunky-looking – it's not as accurate as the two-day, but what's its telling us is on Saturday there's going to be lighting through the central Yukon,” he says.

Green is Yukon's firecaster.

Though he has no control over human-caused forest fires, he can usually inform the duty officer — who works just a few feet away in the territory's central wildfire command centre — if nature is brewing trouble.

With the scripts and algorithms he and meteorologist-turned-programmer Michael Purves designed and implemented, Green has developed a five-day, lightning-risk predictor to assist in fire response planning. And it's working, at least according to his own after-the-fact look-and-see verification system.

“We're watching it, and it's working out pretty well,” he says.

Already in June — during which Yukon saw a higher-than-average number of lightning strikes according to Environment Canada — the wildland fire management team used Green's advice to plan for a conflagration of fires.

With Green's help, the duty chief is able to take firefighting into the future, engaging in proactive rather than reactive efforts.

With predictive algorithms, reams of good, hard environmental data, and powerful number crunching, the duty officer, Michael Templeton, can decide in advance where to position fire crews.

“This way we're ahead of the game, ready for those fires to start,” says Templeton.

On June 24, five new active fires were burning in “action” areas near Dawson and Minto while 12 other fires burned in the backcountry.

Two teams of 19 and an air tanker crew were ordered up from British Columbia in anticipation of the onslaught, and they arrived in time to make a major difference.

“Everybody was wrapped up (and ready to go); as soon as the actual call came in, everything went,” says Templeton.

“Based on weather and how it can influence fire behaviour, we make decisions on where to put people and resources in preparation for a fire starting.”

Templeton traces a hand over the floor-to-ceiling Yukon map, lit up in an otherwise darkened command room.

Numbered pushpins dot the map, marking the year's fires. Pink pins are fires of concern near populated areas and highways.

Red pins are fires in the hinterlands that are being watched, but not tackled. Black pins mark the dead ones.

“He gives us the weather briefings and tells us if weird stuff is going to happen in the weather,” Templeton says, nodding towards Green.

“If we didn't have that ability we'd basically have to sit here and wait for somebody to call in a smoke.”

The central fire team would then have to co-ordinate with field offices to, first of all, to evaluate the validity of the report, and then locate the actual fire.

Then, they would co-ordinate manpower.

In that time, the fire could get out of control.

Green has been the territory's official meteorologist since April 2003. For a few years he's had a moderately detailed three-day lightning forecast up-and-running. It's only this year that he's been stretching the program to extend two extra days.

The shell of the software was purchased commercially. The data feeds — precipitation, ground temperature, higher atmosphere temperature, and relative humidity, to name a few — come from Environment Canada and other meteorological sources.

Environment Canada tracks lightning strikes across the country with an international network of electromagnetic pulse detectors. The sharp impulse-nature of a lightning strike registers as a voltage spike.

Three detectors need to pick up a strike in order to triangulate its position using separate timestamps.

In 40 seconds, central computers in Arizona have it figured out, and send the data to tracking agencies.

By correlating historical weather and lightning data, Green and Purves designed equations and flowcharts to map incoming into a meaningful graphic that is a general representation of areas with a high-likelihood of lightning activity.

When expected lightning activity matches up with hot, dry and windy conditions, Green sends out the alert.

This year he has also started tracking a number from one to six called the Haines Index.

An index of six means danger for ground crews tackling an inferno — it means dryness and upper atmosphere instability have co-created a bellows effect.

“When you see a thunderstorm, you know there's winds coming,” he says.

“When it's unstable while it's dry, you get your updrafts and downdrafts just as you would with thunderstorms, but there's no cloud. The firefighters can't see things coming.”

While we're talking, the fire alarm goes off.

It's just a test.

Green begins to describe a typical day in terms of weather in Whitehorse (“sunny in the morning, clouds up in the afternoon and you may get a shower”) before realizing he was being asked to describe his typical day.

It's an honest misunderstanding: much of his career before 1998 was with Environment Canada's Yukon weather service.

So it's not surprising that his voice falls easily into rolling cadence of a weather broadcaster when he's put in front of a map.

“The probability of lightning ... tonight it's a little bit farther to the north, back around Faro and Ross River.

“Tomorrow, not much in the south, except maybe a little around Watson Lake. Friday, it's mainly in the area north of Dawson. Saturday, it's going straight through Dawson and Mayo, and then its shifting southward

again on Sunday.”

(That being said, the weekend forecast is actually fairly good in fire-starting terms.)

These days, he's in at 6:30 a.m.

In at 6:30 a.m. every day, and sometimes of particularly hairy summer weekends, “the morning is quite a rush, trying to get the forecast ready,” he says.

Besides uploading detailed weather reports to the territory's intra-office network for first-thing distribution, Green delivers a weather report twice daily in the boardroom, sometimes for just an audience of one: the wildfire duty officer.

Green enjoys his job even though his responsibilities are a bit stretched.

Larger provincial agencies often employ three to five wildfire weather forecasters. Here, it's just him.

“Part of the problem is there's too few hours and too much to do,” says the oracle, turning back to his machines.