

The Thirty-Mile Fire

Halstead Harrison

01-30-01

Last Friday I attended a good talk by Tom Leuschen on the 30-mile fire last year, the tragic one with four deaths. Here's my abstract of it. Any errors and all judgments are mine; Leuschen was careful to avoid both.

The chronology went something like this:

The weather was very hot and very dry, with noon humidities falling steadily during the several preceding days to less than 10%. The fire crews had for some days been fighting another large fire ["Libby"], some miles away.

Canadian observers in a light airplane spotted a new fire, close to the border on the US side, in the Pasayten Wilderness on the upper Chewuck river. This small river and valley drain into the Methow, near Winthrop. "30-miles", I think, refers to the distance above the junction.

The fire was reported to the US fire officers in the late afternoon. A first ground reconnaissance arrived near 6pm. The fire was then small and "spotty". [Later evidence suggests it had escaped from a camp fire.] Flames were 1-2 meters high, consuming low stuff only, but sparks had distributed it over a few acres. A "Hotshot" crew, who had been resting only a couple of hours from hard-hot work at the Libby fire, was brought in during the early evening to try to get the new fire out before it spread. They worked for a couple of hours, didn't make much headway, and were withdrawn sometime before midnight. The senior fire officers then spent more of the remaining night planning an attack for the next morning.

Everybody was tired.

Next morning, a base ["deployment"] camp was established downvalley from the new fire, and resources were brought in sequentially. Fire breaks were cut and efforts made to bring water in from the river. For reasons not well explained these were difficult and unsuccessful .. I gather that gear was breaking and hoses were burning. The effort was then redirected at fire-breaks,

Crew were sent up a valley-axis road towards its dead end, to locate any campers and bring them out. Three cars were found, but no people. Sometime in the early mid-morning a car ["the Hagemeyers"] passed upvalley and unnoticed by the fire crews at the base of the valley. At some other time in the mid-morning two fire trucks and their crews [about 12 people?] came into the base camp, talked with people there, and went further up the valley, a bit more than one km, to fight the fire at its head. That is, to keep it from moving further up the valley. There is conflicting testimony as to whether the chief fire officer at the base camp knew what those trucks were doing, or whether they indeed had checked in at all.

At this point the fire had spread some, but was still mostly low. In late mid-morning single trees started to flash off with crown-fire torches, and sparks from these started to spread the fire rapidly outside the fire breaks. At some later time, around noon, I think, a "crown fire" "blew

up" the south face of the canyon wall, not far [100 meters?] upriver from the base camp, and downriver [1 km?] from the crew that had gone to the head of the fire on the valley floor. This first blowout was large and obviously dangerous. No recall was ordered of that upvalley crew, nor did they retreat on their own. Their view was blocked somewhat by smoke and trees, but 1) that a blowout had occurred must have been obvious, and 2) people were chattering about it on radio phones.

After some appreciable time [a half an hour or more?] a second and larger blowout ran up the south face of the valley, more or less opposite the upvalley crew, or perhaps a bit further on. At about this same time, or maybe a little before it, spot fires had crossed the river and road to the north face of the valley, which runs more or less NE-SW, and the upvalley crew were cut off from their base camp. The Hagemeyers, father and son, I think, turned up soon after, driving downvalley from its head, and were stopped by the upper crew. At this point there were, I think, 14 people in the cutoff.

About half an hour after the cutoff event:

1. Three of the most junior people in the cutoff .. one young man and two women .. all about 25 and all with only a few hours training .. were sitting on a rock about 2 meters above the road. Not stated by Leuschen, but my guess is that they were waiting for instructions. And very likely taking pictures.
2. The 2nd senior guy of the people in the cutoff group, who had climbed about 15 meters up the north edge of the valley for a better view of what was going on, was called back to the road by the most senior guy, who yelled something like "Come back down on the road!" In later testimony, he understood this to apply also to the group on the rock. Not stated, but my guess is that they understood this to apply to the guy above them, only.
3. At this point a very hot blast of convective heat hit the group from the southeast, that is, across the axis of the valley, road, and river, and more or less at right angles to the moderately strong upvalley winds that before this had been driven by the two blowouts. One person [on the road?] testified that it "knocked me on my ass". Everyone then scrambled to get into protective tents. Most were on the road, as is correct doctrine, but the group on the rock [apparently flinching from that hot blast] retreated a few meters upslope to a small talus field. All of them died, together with a 4th and somewhat more experienced man of 30, who may .. or may not .. have been sitting on the rock too.
4. All on the road survived. One left his protective tent to shelter in one of the three vehicles [contrary to standard doctrine] and one survived in the river [also contrary: I'm not sure why]. The Hagemeyers survived in tents shared with the fire crew. [Some heroism here: those shelters are designed for one person, only.] Several of the survivors were burned, one quite seriously.

5. About this time the north face of the valley blew out also, above the group still on the road, Photos from several miles away show a "magnificent" bifurcated plume [one from each wall of the valley?], reaching up to 5-7 km, but not obviously above the tropopause. Kali is beautiful.

5. Post analysis of the fire showed large heat gradients. A meter-sized rock near the deaths cracked under heat, and smaller rocks showed heat-generated mineral coloration from temperatures of several hundred degrees. A pair of sunglasses a few meters away remained unmelted. Two of the three vehicles survived .. one lightly damaged, another still drivable. The third car left melted metal on the road. Evidence from tree-crown burning patterns suggest winds up to 30 m/s [60 knots], confined in a near-surface layer only 10-20 meters thick,

The tragedy had two components, one social, the other physical. Both are instructive.

Among the human errors, certainly, were the poorly supervised and casual heading off to the head of the fire by the two fire trucks, and the [amazing to me] failure to recall them at the first blowout, or of the upvalley crew to retreat by themselves. [Again, their view was obstructed somewhat, but radio chatter was continuous, and the blowout must have been superobvious.] Another and perhaps more interesting failure was with the cutoff crew, who .. it appears .. had half an hour to think about things but deployed their shelter tents only at .. no AFTER! .. the last minute.

Untrained people were waiting for supervision that never came.

The physical components of the "hot blast" are interesting too. As I reconstruct it [with broad hints from Leuschen, who was very careful not to finesse ongoing investigations], the first blowout sent up a sudden, big, hot, and dramatic smoke chimney that was seen to be rotating counter clockwise [seen from above]. The second, larger blowout, about 1 km upvalley, sent up a column clockwise. [It seems likely that the sense of this 2nd rotation was organized by that of the 1st column.] The heat from the second chimney set up a strong upvalley gust that knocked the 1st chimney over on its side. [Dramatic photos show this clearly.] The twist of the 1st column now had a surface component across the valley, from SE to NW. This was likely the source of the convective heat-blast that killed the young people at the cutoff.

Finally, for this note, I was at the time, and remain, personally grieving over the loss of the young people, who were so very like my own.

hh

```

*****
* Halstead Harrison                harrison@atmos.washington.edu    *
* Dept of Atmospheric Sciences      (206)-543-4596  voice + messages  *
* University of Washington 351640   (206)-543-0308  FAX           *
* Seattle, WA 98195-1640           (206)-543-4250  Dept office     *
*****

```