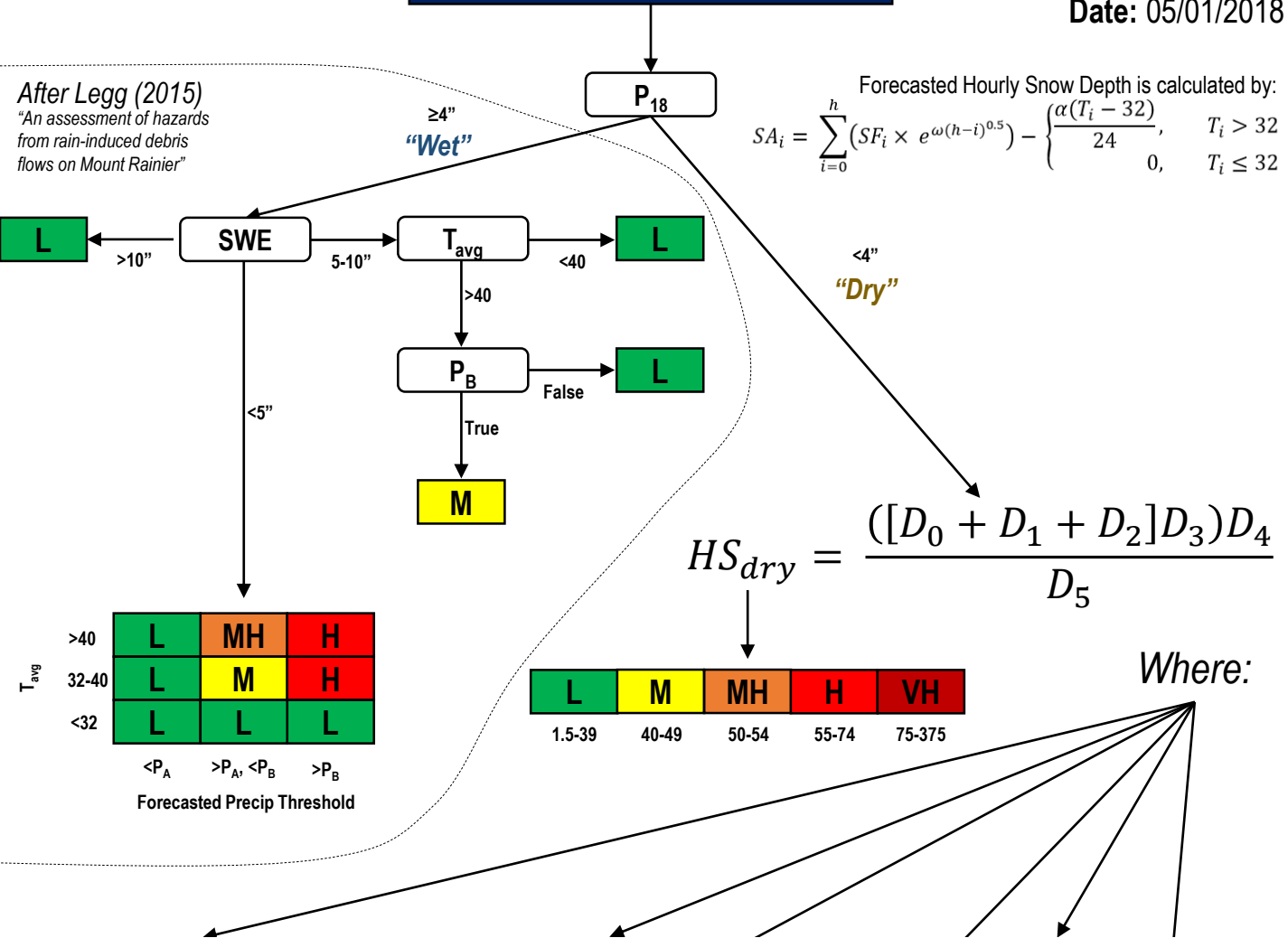


Daily Debris Flow Hazard

Version: 2.1.0
Date: 05/01/2018

After Legg (2015)
"An assessment of hazards
from rain-induced debris
flows on Mount Rainier"



- $D_0 = 1-5$, based on T_{max} percentile, where:
 - 0.000 - 0.249 = 1
 - 0.250 - 0.499 = 2
 - 0.500 - 0.699 = 3
 - 0.700 - 0.849 = 4
 - 0.850 - 1.000 = 5
- $D_1 = 1-5$, based on days since July 11, where:
 - 191 - -1 = 1
 - 1 - 33 = 2
 - 34 - 66 = 3
 - 67 - 99 = 4
 - 100 - 124 = 5
 - 125 - 139 = 4
 - 140 - 149 = 3
 - 150 - 159 = 2
 - 160 - 173 = 1

July 11 = average melt out date at Paradise between 1917-2017
- $D_2 = 1-5$, based on 18-day cumulative DD_{32} , where:
 - 0 - 199 = 1
 - 200 - 399 = 2
 - 400 - 499 = 3
 - 500 - 599 = 4
 - >600 = 5

To Calculate:
<http://dfh.morageology.com/trange.php>

- $D_3 = 1-5$, based on P_3 , where:
 - 0.00 - 0.09 = 1 (Walder and Driedger, 1994)
 - 0.10 - 0.49 = 2
 - 0.50 - 0.99 = 3
 - 1.00 - 1.50 = 4
 - >1.50 = 5
- $D_4 = 1-5$, based on SWE, where:
 - >10.00 = 1
 - 5.00 - 9.99 = 2
 - 2.50 - 4.99 = 3
 - 0.01 - 2.50 = 4
 - 0.00 = 5
- $D_5 = 1-2$, based on T_{max} , where:
 - $\geq 68 = 1$
 - $< 68 = 2$

(Walder and Driedger, 1994)

Variables:

DD_{32} = Degree day above 32°F (dimensionless)
 P_A = Precipitation threshold A, $P_3 = 2.5 - 0.67P_{15}$
 P_B = Precipitation threshold B, $P_3 = 4.5 - 0.67P_{15}$
 P_3 = 3-day (D1-D3) cumulative precipitation at Paradise (in)
 P_{15} = 15-day cumulative precipitation at Paradise prior to 3-day period (D4-D18) (in)
 P_{18} = 18-day cumulative precipitation at Paradise (in)
 SWE = Snow water equivalent at Paradise (in)
 T_{avg} = Average temperature at Paradise (°F)
 T_{max} = Maximum temperature at Paradise (°F)
 $T_{max\ Percentile}$ = Maximum temperature as a percentile compared to the historic temperature (1917-2017), (dimensionless)