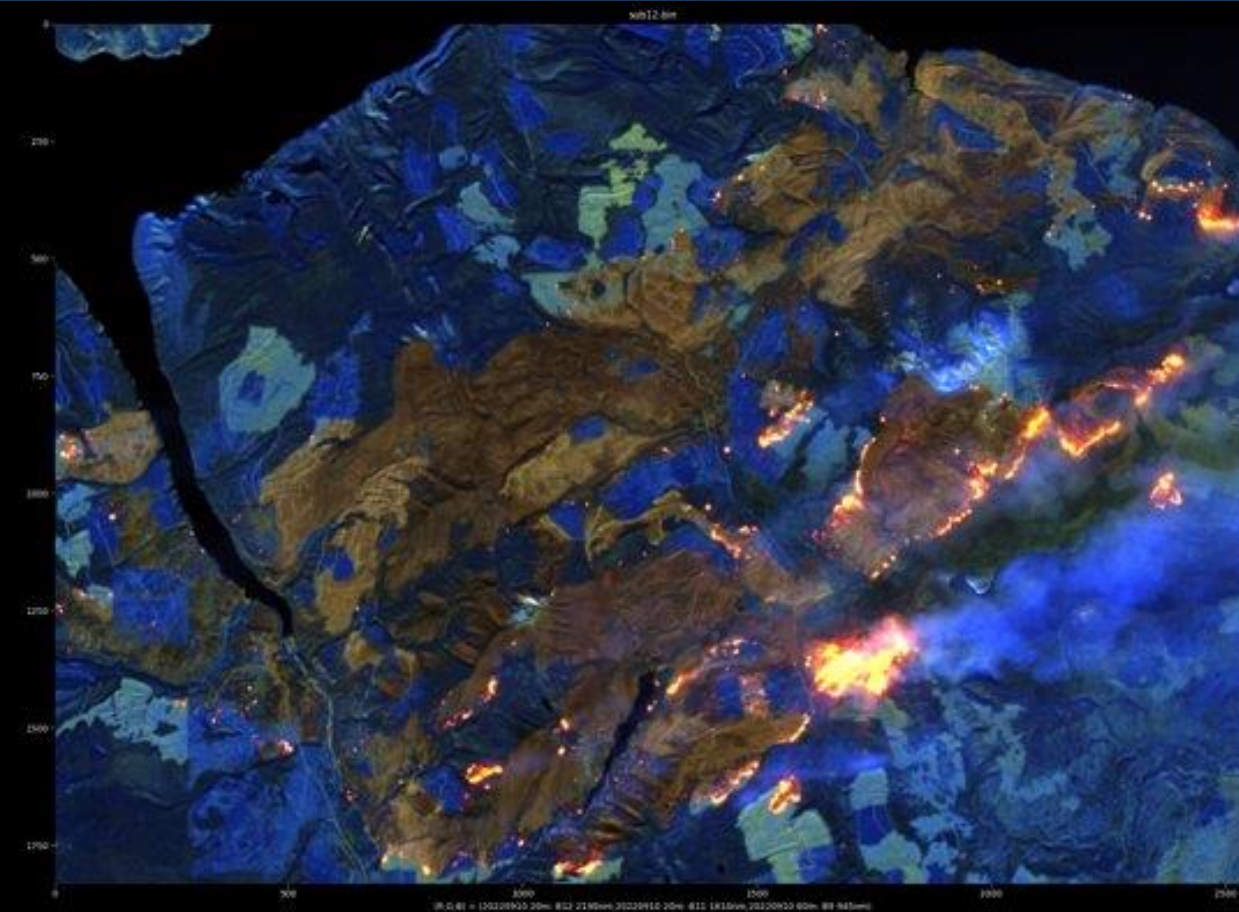
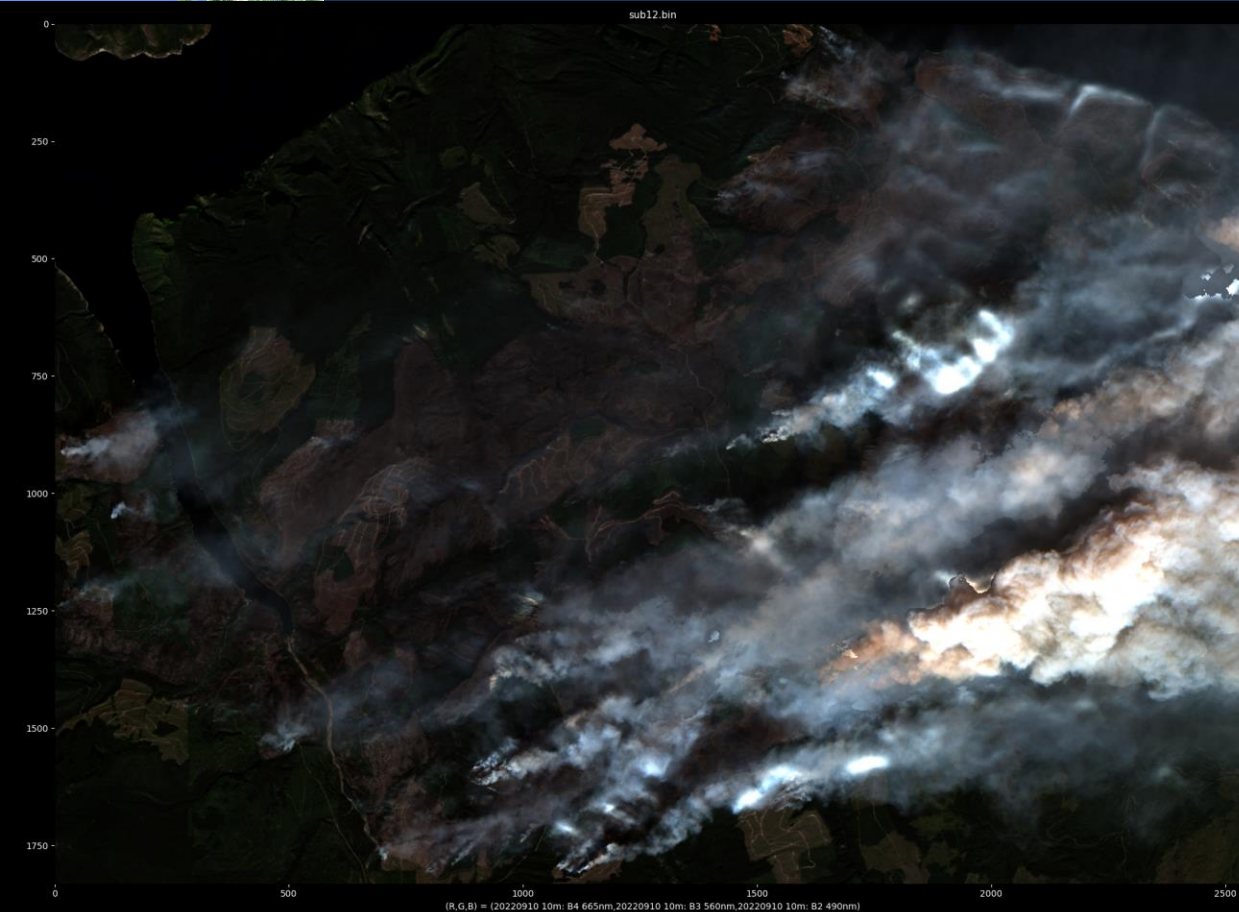


Operational Wildfire Mapping w Sentinel-2 in British Columbia



BC Wildfire
Service



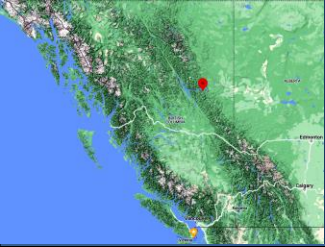
Battleship
mountain
(G72150)
20220910

Sentinel2: RGB = (665, 560, 490) [nm]

- "Usual RGB"
- SWIR penetrates smoke better

Sentinel2 RGB = (2190, 1610, 945) [nm] SWIR

- Start w rule-based approach: "Look for bright & red stuff"
- Bootstrap to more sophisticated Machine-learning (in A.I.)
- Identify pattern & (SWIR) spectral signature for active fires



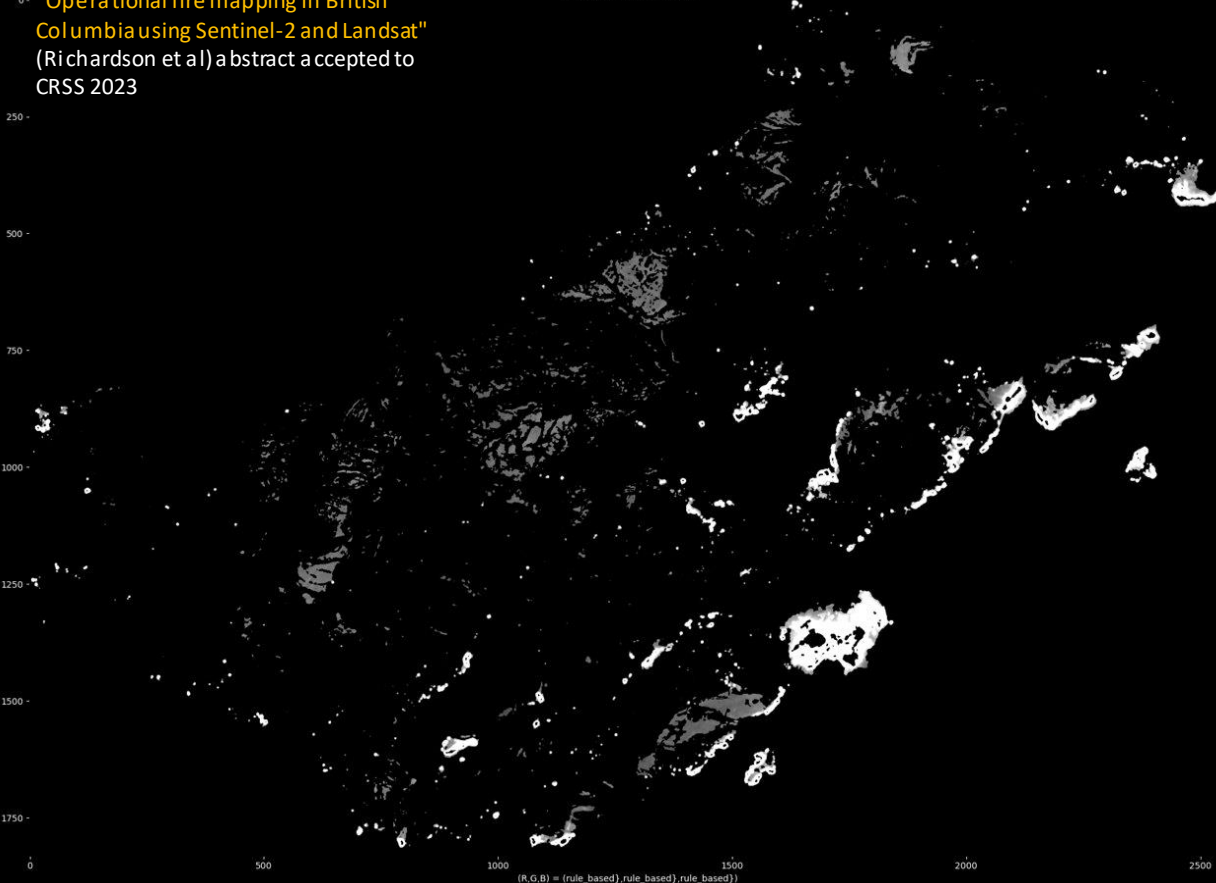
Operational Wildfire Mapping w Sentinel-2 in British Columbia



BC Wildfire Service

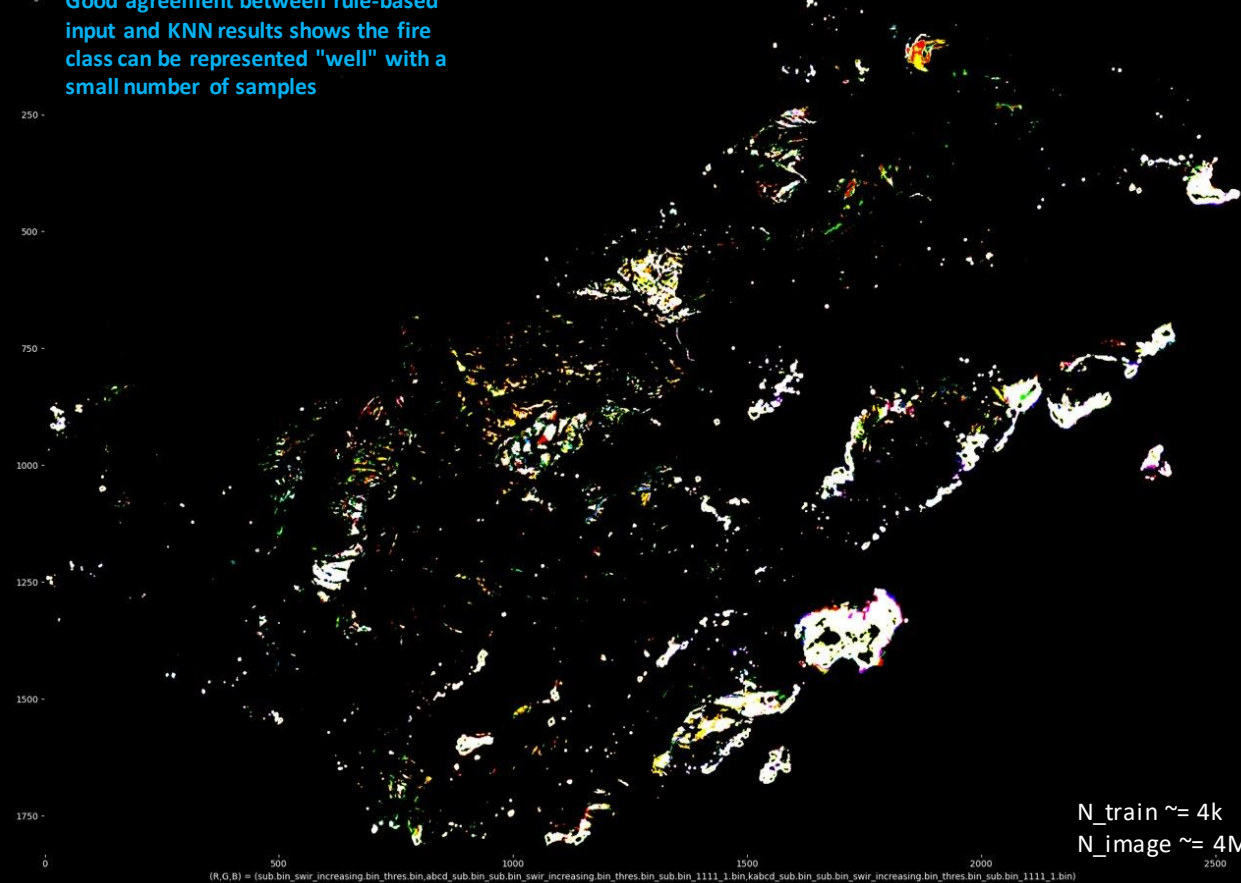
"Operational fire mapping in British Columbia using Sentinel-2 and Landsat" (Richardson et al) abstract accepted to CRSS 2023

sub_bin_swir_increasing.bin



Good agreement between rule-based input and KNN results shows the fire class can be represented "well" with a small number of samples

rgb.bin



N_train ~ 4k
N_image ~ 4M

Battleship mountain (G72150) 20220910

Classification rule: $RGB = (2190, 1610, 945)$ [nm]:

Rule = $B/G > 1.1 \ \&\& \ B/R > 1.1 \ \&\& \ S > .35 \ \&\& \ B > 2e3$

- S is from HSV encoding
- Above: $Rule * B$ (intensity of fire detection)

Machine/stat learn Approach (KNN inference)

- Training fraction = 0.09%. The three SWIR bands = predictor variable; The Rule = response variable.
- Above: $RGB = (Rule, KNN \text{ result } (K=1), Knn \text{ result } (K=11))$