2023 BURN SEVERITY MAPPING (SAME YEAR CLASSIFICATION)

Burn severity mapping is performed using either Landsat-8, Landsat-9, or Sentinel-2 satellite imagery to classify burned areas into four severity classes (unburned, low, medium, and high). This year Forest Analysis and Inventory Branch (FAIB) began acquiring imagery in mid-September. Image acquisition ended in late October when cloud cover and snow made further imagery unusable for the burn severity mapping. Image processing and burn severity mapping and quality control was completed by FAIB.

BACKGROUND:

- Burn Severity classification runs are done each year in the fall for fires greater than 100 hectares.
- Burn severity mapping is not done during the most active part of the fire season due to changing fire boundaries, smoke, and the possibility of new or expanding fires enveloping existing smaller fires.
- Pre-fire imagery is collected for up to 2 years before the fire occurred, during the June 1 to September 30 window. If pre-fire imagery is from the same year that the fire occurred, it must be sourced from June 1 to the day before the fire started.
- Post-fire imagery is always from the same year the fire occurred, ideally after the fire is declared out; otherwise, after it has stopped growing & smoking; Ideally between June 1 and September 30, though early October imagery may be acceptable, assuming there is no snow cover and seasonal vegetation die off is not a concern. In situations where the fire was still active in late September and pervasive cloud cover inhibits post-fire image acquisition, early to mid-November imagery may be used, these fires will be noted.
- Imagery must be free of cloud, shadow, smoke, and snow.
- Imagery from the same sensor is used for pre- and post-fire images for the same fire (i.e., Landsat-8 & Landsat-8 or Sentinel-2 & Sentinel-2).
- Potential sources of error include: sporadic patches of snow and cloud cover, topographic shadow, underestimated fire severity in grassland ecosystems (i.e. if pre-fire imagery contains dry/brown grass), seasonal variability (i.e. pre- and post-fire imagery acquired at different points in the growing season).
- The standard output products include a file geodatabase and a symbolized layer file, as well as georeferenced PDF maps and a kmz file for each fire.
- This information will be made available as per attached availability document.
- The historical burn severity dataset is available via the BC Data Catalogue (https://catalogue.data.gov.bc.ca/dataset/fire-burn-severity-historical) is NOT the "same year" classification; it is the "one year later" classification – a separate burn severity run that will be run in fall 2023 on the 2022 fires.
- The burn severity methodology is based on the Burned Area Reflectance Classification (BARC) product developed by the United States Department of Agriculture (https://fsapps.nwcg.gov/baer/faq).
- Project lead: Marc Rousseau, Vegetation Update Group Team Lead (marc.rousseau@gov.bc.ca).

METHODOLOGY:

- Select suitable pre- and post-fire imagery or create a cloud/snow/smoke-free composite from multiple images,
- Calculate normalized burn severity ratio (NBR) for pre- and post-fire images,
- Calculate difference NBR (dNBR) where dNBR = pre NBR – post NBR,
- Apply a scaling equation,
- Apply BARC thresholds and create a 4-class image (unburned, low severity, medium severity, and high severity),
- Apply region-based filters to reduce noise,
- Confirm burn severity analysis results,
- Produce a vector dataset and apply Euclidian distance smoothing, and

- Publish the standard output products via Shared drive location access for internal (BC government) users, and FTP access for external (non-BC government) users.

2023 POST-FIRE PRODUCT ACCESS: HIGH-RESOLUTION POST-FIRE IMAGERY & BURN SEVERITY

HIGH-RESOLUTION POST-FIRE IMAGERY

INTERNAL AND EXTERNAL ACCESS (First Nations, Local Governments, Land/Resource Tenure Holders, etc)
2023 Post-fire imagery will be available (until approximately October 2024) by contacting Marc.Rousseau@gov.bc.ca

BURN SEVERITY (2023 FIRES, SAME YEAR CLASSIFICATION)

- Products available: file geodatabase, ArcGIS 10.x layer file, KMZ, and PDF map
- As of November 1st, 2023 the majority of the fires will be available for download, provided acceptable post fire imagery is available
- BCGW: https://catalogue.data.gov.bc.ca/dataset/fire-burn-severity-same-year

Internal Access (BC Gov)
\\spatialfiles.bcgov\work\!Shared_Access\BARC\2023

EXTERNAL ACCESS (First Nations, Local Governments, Land/Resource Tenure Holders, etc)
https://catalogue.data.gov.bc.ca/dataset/fire-burn-severity-same-year

CONTACT

If you have any questions, concerns please contact Marc.Rousseau@gov.bc.ca.