

Wildfire Threat Analysis

Analyzing wildfires to protect your assets



Introduction

- Every year, hundreds of wildfires in the province of British Columbia pose a threat to buildings, assets and human life. Wildfires are unpredictable and can move fast due to wind conditions and other factors.
- Wildfires can move as fast as 6 miles per hour in forests and 14 miles per hour in grasslands.
- Active wildfire information is updated on a daily basis by the British Columbia Wildfires Branch.
- Emergency Managers use the data to determine if a wildfire presents a threat to FortisBC asset.

The presentation discusses FortisBC's implementation of a GIS Web solution to analyze the impact and threats of wildfires on its pipelines, stations and other assets.

Learning Objectives

Learning Objectives

- Integrating daily updated wildfire data with asset data
- Viewing active wildfire data and analyzing impact on asset vulnerability
- Providing analysis and reporting tools in the hands of non-GIS users i.e. Emergency and Operations Managers

FortisBC Company Overview

FortisBC Companies

- Formerly known as BC Gas, Terasen Gas
- 2,200 employees
- Gas Distribution 1,000,000 customers
- Electric Distribution 168,000 customers
- Serve 160 communities & 100 Indian reserves in British Columbia
- 48,000 km (30,300 miles) gas pipelines
- 7,000 km (4,500 miles) electric cable

GIS Applications

- Smallworld applications for Gas Distribution and Transmission
- Geo Spatial Analysis for analysis and risk modelling, Mobile GIS, Tensing
- Interfaces to SAP and Filenet
- ArcGIS, ArcFM and Arc Mobile for Electric Distribution and Transmission
- FME, FME Server and SBS plugin
- Over 1,000 GIS Users

FortisBC Service Territory



Wildfire Damages

The Insurance Bureau of Canada says insured **damage** caused by the wildfires in **Fort McMurray**, Alta., totalled \$3.58 billion, making it the most expensive disaster for insurers in the country's history. Jul 7, 2016



[Fort McMurray wildfire: \\$3.6B in damage, says Insurance Bureau of ...](http://globalnews.ca/.../fort-mcmurray-wildfire-cost-of-damage-from-alberta-disa...)
globalnews.ca/.../fort-mcmurray-wildfire-cost-of-damage-from-alberta-disa...

Former Process

The screenshot displays the BC Wildfire Service web map interface. The header reads "BC Wildfire Service | Active Wildfires". Below the header, there is a navigation menu with a "Back to menu" link. The main content area is titled "BC Active Wildfires" and lists three categories of active fires: "Active Fires", "Fires of Note (click for more details)", "New Fires (less than 24hrs old - not fires of note)", and "Active Fires (not fires of note)". A map of British Columbia is shown with several orange markers indicating fire locations. A popup window for fire G80046 is open, displaying the following information:

| | |
|------------------------------|---------------------------------|
| G80046 | |
| <i>Date of discovery:</i> | 00:00:00 04/18/2016 |
| <i>Suspected Cause:</i> | Person |
| <i>Approximate Location:</i> | Beaton Airport Road 15739 HA |
| <i>Estimated Size:</i> | 160 sq. km 60 sq.ml |
| <i>Fire Status:</i> | Active |
| <i>Fire of Note Page:</i> | Beaton Airport Road |
| Wildfires of Note | |

The popup also includes a search bar with "Where am I?" and a map showing the location of the fire in Alberta, Canada.

1. Each morning Emergency Operations review the active and new wild fires for that day using the BC Wildfire Service web map.
2. They zoom into a wild fire location on the map.
3. They use the location and go to the GIS to plot the wild fire location.
4. They determine the impact of the fire on any FortisBC asset (stations, pipelines, towers and buildings).
5. If a wild fire is close to an asset they notify the Operations Managers so they can take immediate action.
6. It is a cumbersome manual process and staff may overlook a wild fire being close to an asset that may pose a threat

<http://apps.gov.bc.ca/pub/dmf-viewer/?siteid=5131184402955244847>

New Process

The screenshot displays the British Columbia Data Catalogue interface. At the top, the logo for British Columbia is on the left, and the text 'Data Catalogue' is in the center. A search bar on the right contains the text 'Search datasets...'. Below the header is a navigation menu with links for 'What is DataBC?', 'Data Catalogue', 'Geographic Services', 'Blog', 'Developers', and 'Contact'. A secondary menu includes 'Datasets', 'Organizations', 'Groups', 'Stay Up To Date', and 'About'. A 'Log in' link is located on the far right. A large search bar is positioned below the navigation. The breadcrumb trail reads: Home / Organizations / Ministry of Forests, Lands and ... / BC Wildfire Service. Below this, there are icons for 'Dataset', 'Groups', 'Activity Stream', 'Share this Record', and 'Permalink'. The main title of the dataset is 'Fire Perimeters - Current', with a 'Geographic Dataset' badge to its right. The publisher information is 'Published by the Ministry of Forests, Lands and Natural Resource Operations - BC Wildfire Service'. A 'Data and Resources' section is highlighted with a blue header and contains three items: 'Fire Perimeters - Current - Custom Download' with an 'Explore' button, 'Download Shapefile of Current Fire Perimeters' with a fire icon and an 'Explore' button, and 'WMS getCapabilities request' with a truncated link and an 'Explore' button.

<https://catalogue.data.gov.bc.ca/dataset/fire-perimeters-current>

Wildfire data is GIS ready

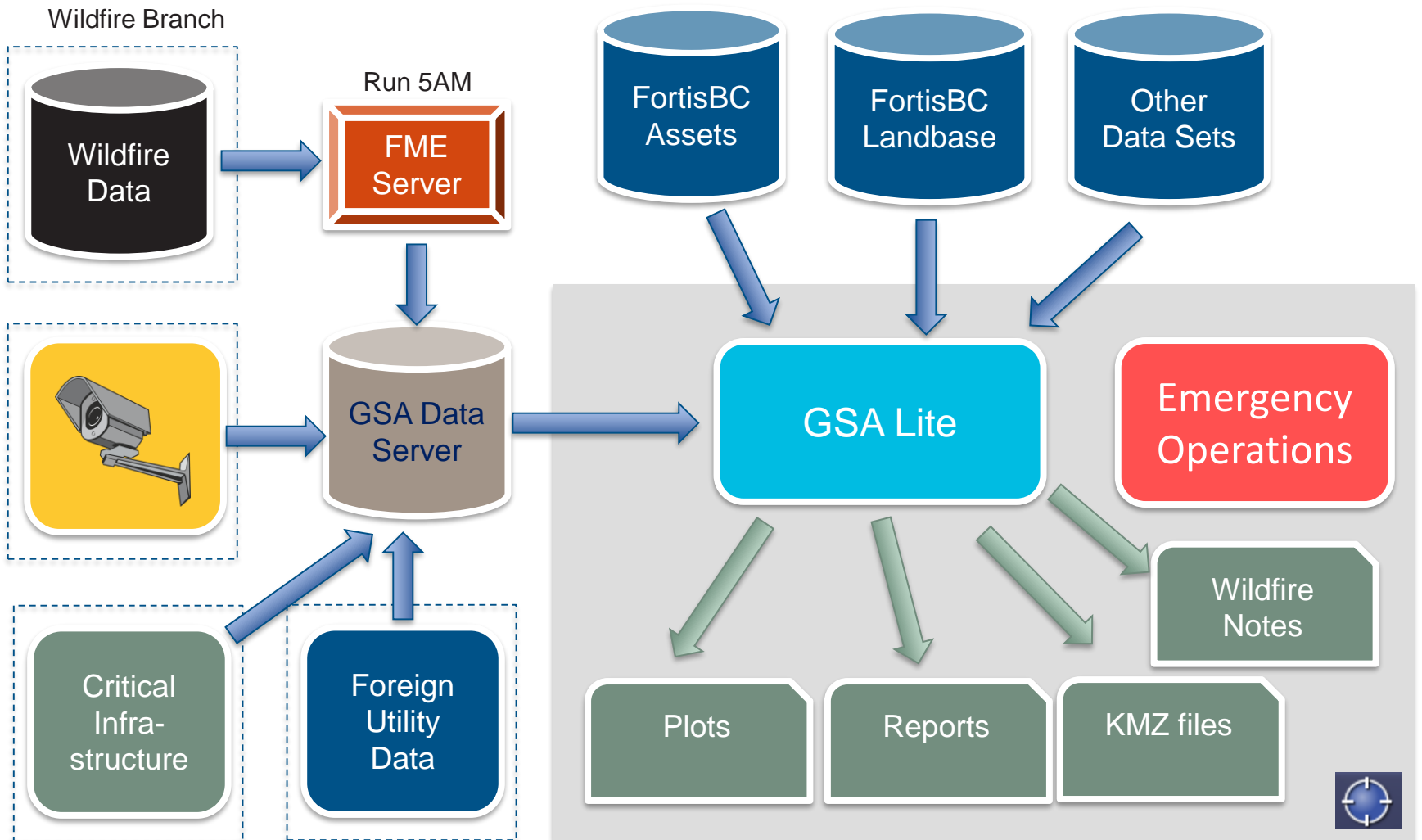
Data Format

| | | |
|--|-------------------|---------------|
| prot_current_fire_point_buffers.dbf | 2/6/2017 7:05 AM | DBF File |
| prot_current_fire_point_buffers.prj | 2/6/2017 7:05 AM | PRJ File |
| prot_current_fire_point_buffers.shp | 2/6/2017 7:05 AM | SHP File |
| prot_current_fire_point_buffers.shx | 2/6/2017 7:05 AM | SHX File |
| prot_current_fire_points.dbf | 2/5/2017 10:00 PM | DBF File |
| prot_current_fire_points.prj | 2/5/2017 10:00 PM | PRJ File |
| prot_current_fire_points.shp | 2/5/2017 10:00 PM | SHP File |
| prot_current_fire_points.shx | 2/5/2017 10:00 PM | SHX File |
| prot_current_fire_points_2_Polygon_shape2shape.fmw | 5/17/2016 8:08 AM | FMW File |
| prot_current_fire_points_2_Polygon_shape2shape.log | 1/19/2017 8:29 AM | Text Document |
| prot_current_fire_polys.dbf | 2/5/2017 7:45 PM | DBF File |
| prot_current_fire_polys.prj | 11/6/2016 7:45 PM | PRJ File |
| prot_current_fire_polys.shp | 2/5/2017 7:45 PM | SHP File |
| prot_current_fire_polys.shx | 2/5/2017 7:45 PM | SHX File |

Data Structure

| FIRE_NUMBE | VERSION_NU | FIRE_SIZE_ | SOURCE | TRACK_DATE | LOAD_DATE | FEATURE_CO | FIRE_STAT | FIRE_NT | FIRE_NT_NM | FIRE_NT_LK |
|------------|------------|------------|--------------|------------|------------|------------|------------|---------|--------------|--|
| G80046 | 2016051902 | 15739.20 | Non-correcte | 19/05/2016 | 23/05/2016 | JA70003000 | Active | 586 | Beatton Airp | /WildfireNews/OneFire.asp?ID=586 |
| G80051 | 2016041901 | 390.90 | Non-correcte | 19/04/2016 | 19/04/2016 | JA70003000 | Not Active | 585 | Attachie | /WildfireNews/OneFire.asp?ID=585 |
| G80065 | 2016041901 | 251.00 | Non-correcte | 19/04/2016 | 19/04/2016 | JA70003000 | Not Active | 582 | Charlie Lake | /WildfireNews/OneFire.asp?ID=582 |
| G80068 | 2016060201 | 84574.40 | Non-correcte | 02/06/2016 | 02/06/2016 | JA70003000 | Active | 593 | Siphon Creek | /WildfireNews/OneFire.asp?ID=593 |
| G80074 | 2016052201 | 5635.70 | Non-correcte | 22/05/2016 | 22/05/2016 | JA70003000 | Not Active | 596 | Halfway Rive | /WildfireNews/OneFire.asp?ID=596 |

Work Flow



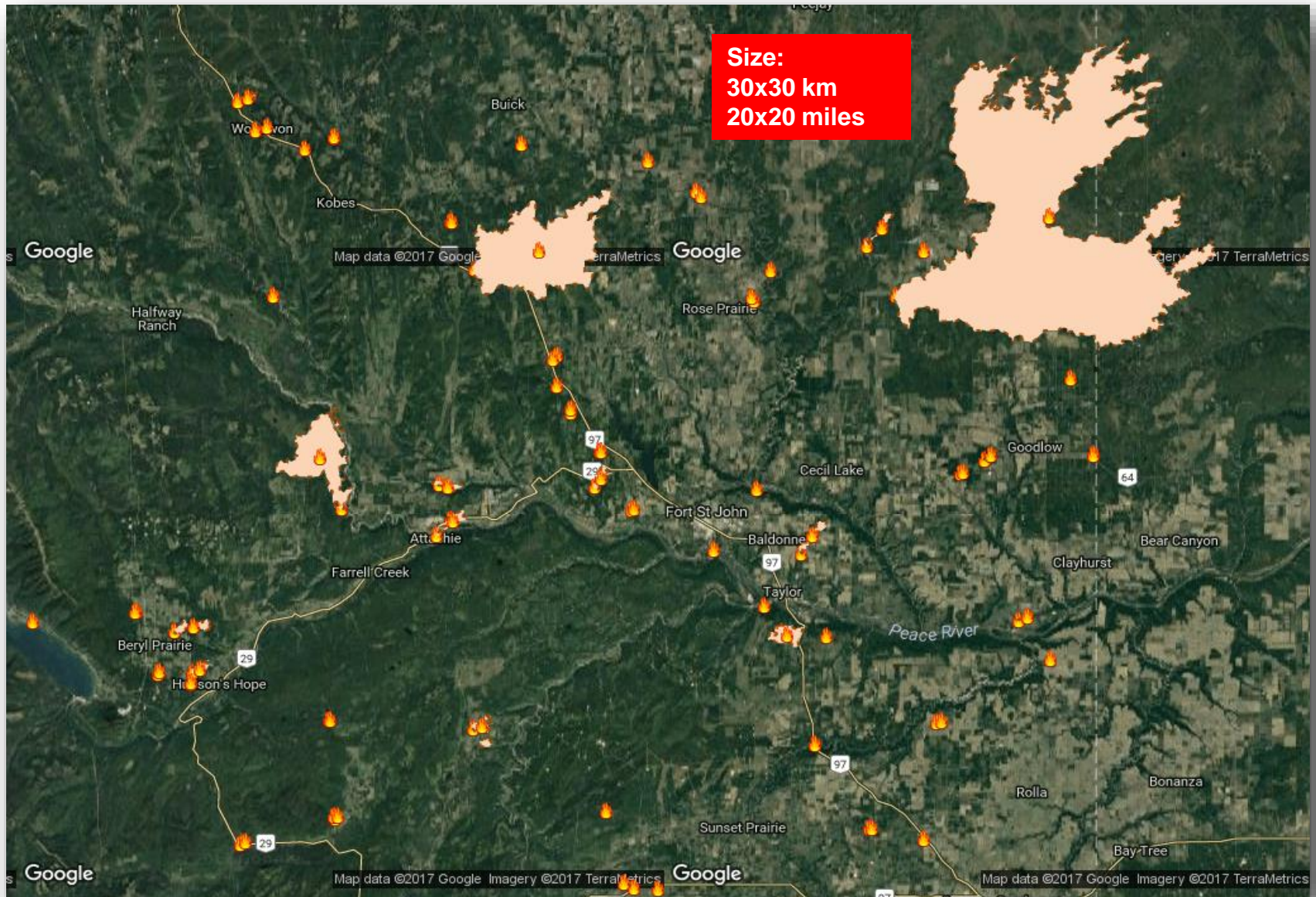
FME Work Space

The screenshot displays the FME Workbench 2016.1 interface. The main workspace area contains a workflow with the following components:

- Text Boxes:**
 - "This Workspace pulls BC's Provincial Fires database from <https://pub.data.gov.bc.ca/datasets/173593>"
 - "the data is placed here for further processing \\Bcgasdom\dfs\bcg\GasInc\General\Forest Fires\2017 Forest Fires\Maps"
 - "FortisBC GIS Department (Gas Division) - for more information contact Oscar Huang or Ted Norcott"
- Workflow:**
 - Creator** → **HTTPCaller_prot_current_fire_points.dbf** → **HTTPCaller_prot_current_fire_points.dbf_Output**
 - Creator_2** → **HTTPCaller_prot_current_fire_points.prj** → **HTTPCaller_prot_current_fire_points.prj_Output**
 - Creator_3** → **HTTPCaller_prot_current_fire_points.shp** → **HTTPCaller_prot_current_fire_points.shp_Output**
 - Creator_4** → **HTTPCaller_prot_current_fire_points.shx** → **HTTPCaller_prot_current_fire_points.shx_Output**
 - Creator_5** → **HTTPCaller_prot_current_fire_polys.dbf** → **HTTPCaller_prot_current_fire_polys.dbf_Output**

The left sidebar includes the **Navigator** and **Transformer Gallery** panels. The **Navigator** shows a tree structure with categories like **Transformers (24)**, **User Parameters (17)**, and **Workspace Properties**. The **Transformer Gallery** lists various transformer types such as **All (492)**, **Categorized**, and **Recent (10)**.


Wildfire Data



Wildfire GIS Ready Data

- ▶ Gas Distribution
- ▶ Gas Transmission
- ▶ Land
- ▶ Leaders Hub Map
 - ▶ Airports
 - ▶ BC Ferries Webcams
 - ▶ BC Hydro
 - ▶ **BC Wildfires**
 - ▶ Census
 - ▶ Earthquake Data USGS
 - ▶ Emergency Response Routes
 - ▶ Flood Zone
 - ▶ FortisBC Asset & Document
 - ▶ FortisBC Building
 - ▶ FortisBC Electric
 - ▶ FortisBC Gas
 - ▶ FortisBC Locations
 - ▶ FortisBC Office and Building
 - ▶ FortisBC Webcams
 - ▶ Geo Notes
 - ▶ Highway Webcams
 - ▶ Hydrometric Data
 - ▶ Oil and Gas Pipeline
 - ▶ Railroad
 - ▶ Shaw
 - ▶ Telus





BC Wildfire Service

- Report a Wildfire
- Current Wildfire Situation
- Fire Bans and Restrictions
- Information Bulletins
- Fire Danger
- Wildfire Prevention
- Wildfire Statistics

Home / Public Safety & Emergency Services / Wildfire Status / Current Wildfire Situation / Wildfires of Note

Wildfires of Note

• Choose another wildfire of note

Siphon Creek (G_0068)

This is the final update for the 'Siphon Creek' fire; no further updates will be posted on this website as it is no longer considered to be a Wildfire of Note. If you require updated information on this fire, please contact the Prince George fire centre.

Last updated: Monday, June 13, 2016 at 11:03 AM

Location: Siphon Creek Road; four kilometres east of the Doig River First Nations community

- See **approximate** location of this wildfire on a [interactive map](#).
- View an [interactive map](#) of all active Wildfires of Note. (This fire has been archived so it will no longer be displayed on the interactive map.)

Discovered: Monday, April 18, 2016

Size: 85,300.0 hectares (estimated)


Status: Active

- 80% contained

The estimated breakdown of fire size on the BC and Alberta side of the border is as follows:

- BC - 62,700ha
- Alberta - 22,600ha

The change in size reflects better mapping and a more accurate assessment of the fire's extent.

Interface:  Interface Fire

Previous evacuations have been **rescinded**.

More information

Contact:


- Amanda Reynolds
- Fire Information Officers
- 250-565-6129

Cause: Under Investigation

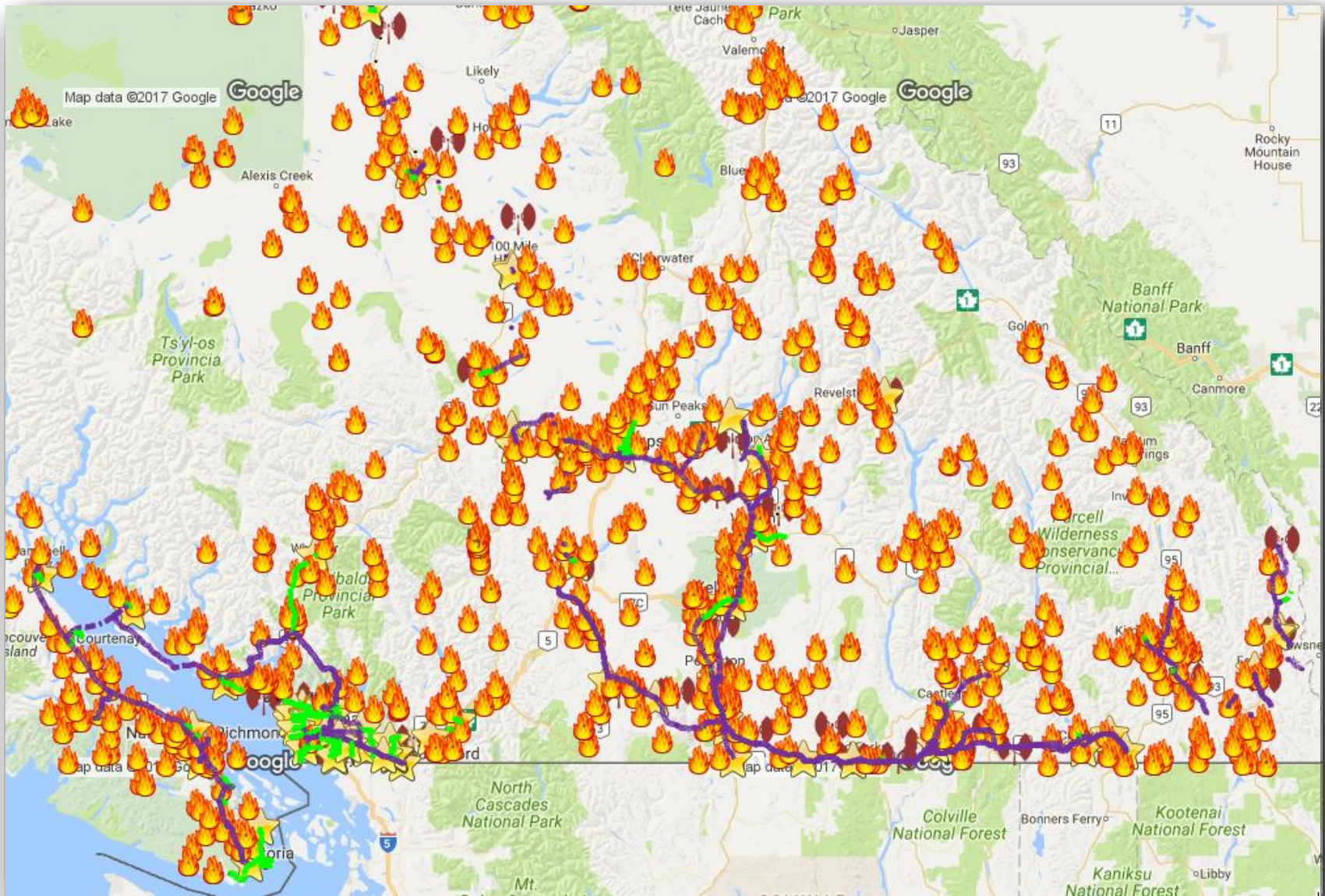
Resources

- 20 firefighters
- 1 helicopters

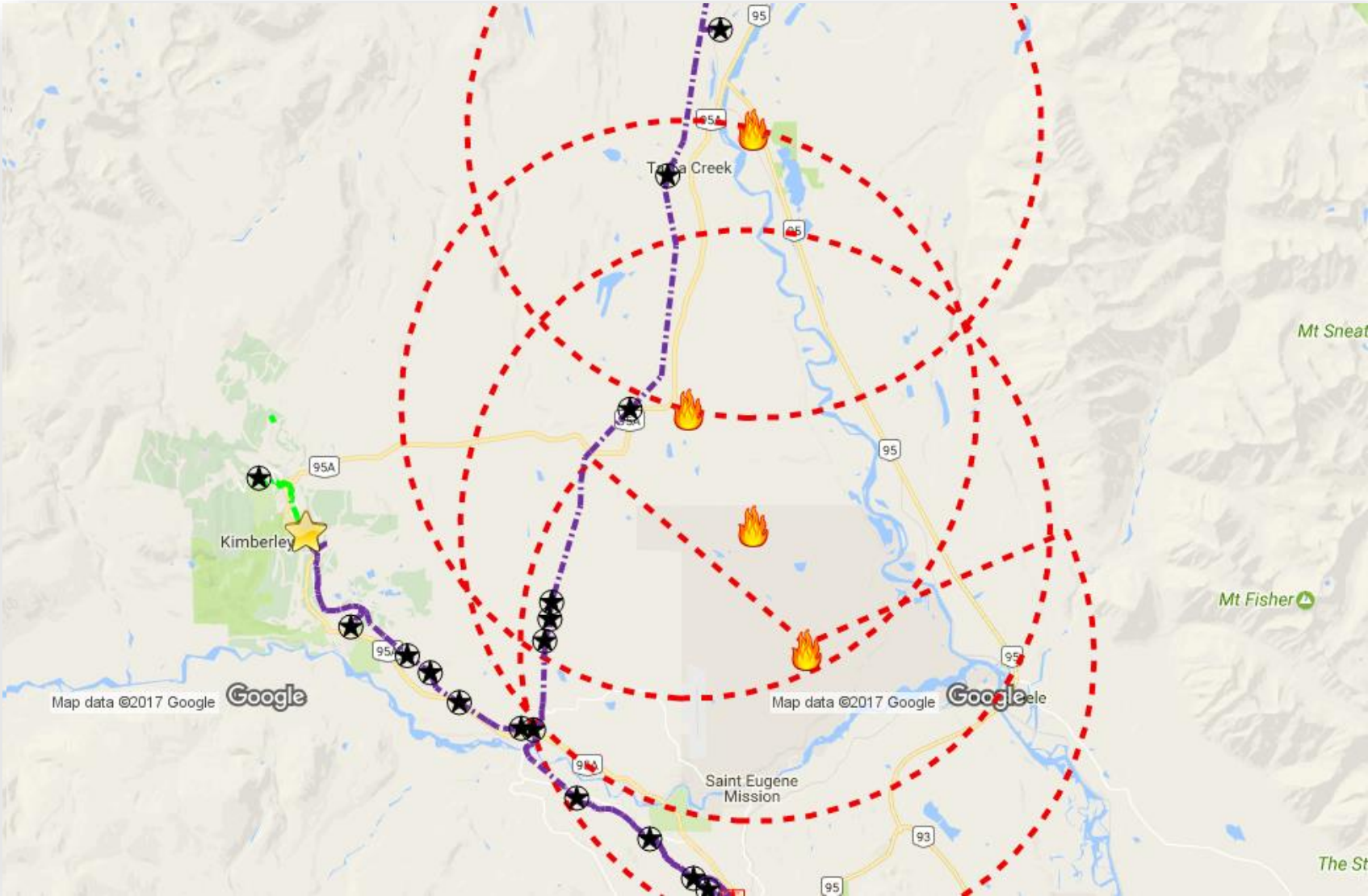
Both the BC and Ontario team continue to work collaboratively.



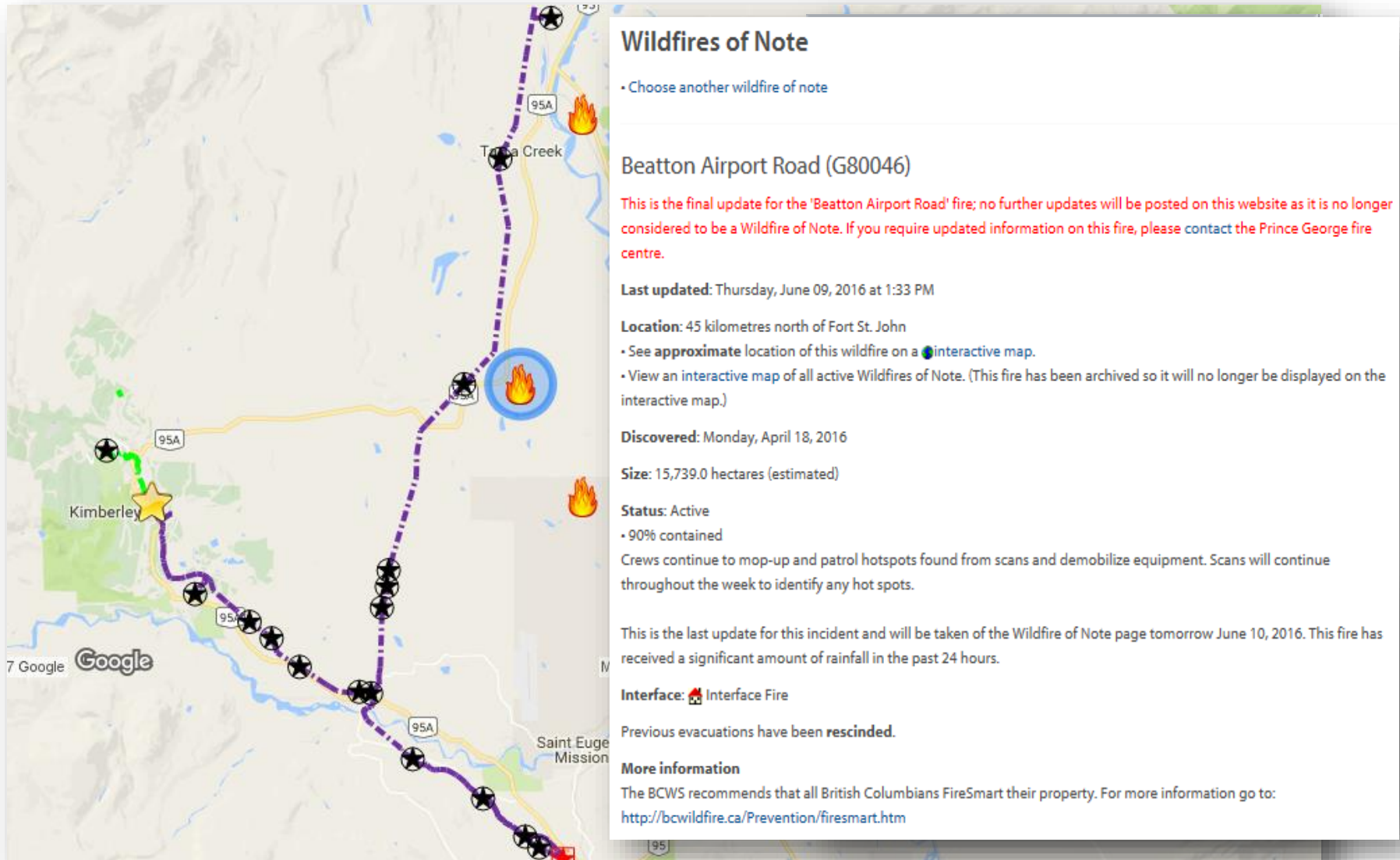
FortisBC Pipelines, Stations and Towers



Wild Fires within 10 km of an Asset



Wild Fires Analysis



The image displays a map of British Columbia, Canada, with several wildfire locations marked by black star icons. A prominent purple dashed line traces a path through the region, starting near Kimberley and extending north towards Tumbler Ridge. A specific wildfire location is highlighted with a blue circle and a flame icon. The information panel on the right provides details for this wildfire.

Wildfires of Note

- Choose another wildfire of note

Beatton Airport Road (G80046)

This is the final update for the 'Beatton Airport Road' fire; no further updates will be posted on this website as it is no longer considered to be a Wildfire of Note. If you require updated information on this fire, please [contact](#) the Prince George fire centre.

Last updated: Thursday, June 09, 2016 at 1:33 PM

Location: 45 kilometres north of Fort St. John

- See **approximate** location of this wildfire on a [interactive map](#).
- View an [interactive map](#) of all active Wildfires of Note. (This fire has been archived so it will no longer be displayed on the interactive map.)

Discovered: Monday, April 18, 2016


Size: 15,739.0 hectares (estimated)

Status: Active

- 90% contained

Crews continue to mop-up and patrol hotspots found from scans and demobilize equipment. Scans will continue throughout the week to identify any hot spots.

This is the last update for this incident and will be taken of the Wildfire of Note page tomorrow June 10, 2016. This fire has received a significant amount of rainfall in the past 24 hours.

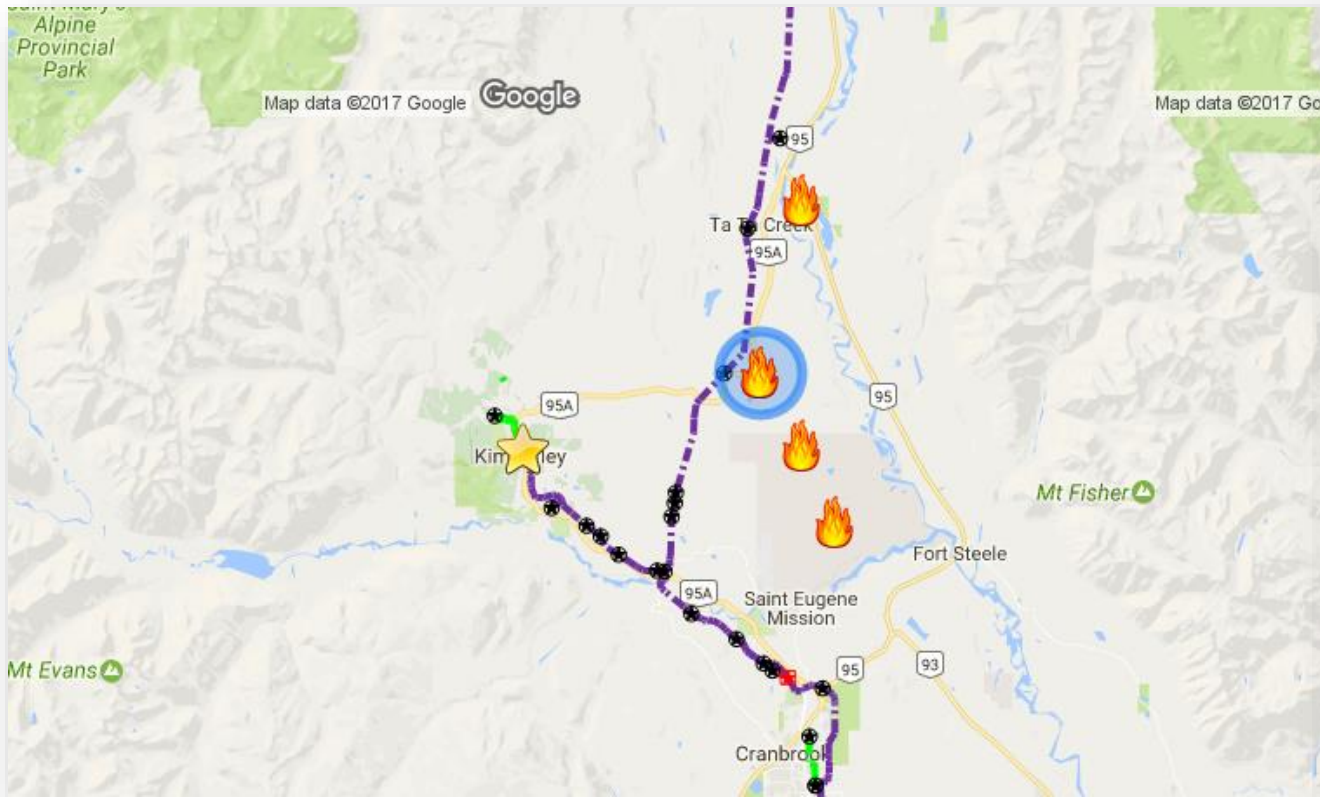
Interface:  Interface Fire














Previous evacuations have been **rescinded**.

More information

The BCWS recommends that all British Columbians FireSmart their property. For more information go to: <http://bcwildfire.ca/Prevention/firesmart.htm>

Export data to Excel and Kml



-  AutoCAD DWG
-  Csv
-  ESRI ArcShape
-  GeoJSON
-  GeoPackage
-  GML
-  Google Kml
-  Html
-  MapInfo MIF/MID
-  MapInfo TAB
-  Microsoft Excel
-  MicroStation DGN
-  TomTom POI

Result List

Forest Fire Area | Go To | Select | Export | Create Report | Objects: 4 | Re-Run

| Record Number | Geometry | Objectid | Fire Year | Fire Number | Version Nu | Fire Size | Source | Track Date | Load Date | Feature Co | Buffer | Communication T... | DP Station | Building | Pipeline | TP Station |
|---------------|----------|----------|-----------|-------------|------------|-----------|--------------------------|------------|------------|------------|------------|--------------------|-------------------|----------|------------------|-------------|
| 148 | 34.9 ha | 8470 | 2016 | N10002 | 2016060601 | 34.9 | Non-corrected ground GPS | 06/06/2016 | 27/06/2016 | JA70003000 | 337.86 km² | | MCGINTY ROAD ... | | SKOOKUMCHUCK ... | |
| 149 | 6.76 ha | 8568 | 2016 | N10004 | 2016040501 | 6.7 | Non-corrected ground GPS | 05/04/2016 | 24/08/2016 | JA70003000 | 222.64 km² | | 9006 WYCLIFFE ... | | SKOOKUMCHUCK ... | MOPHEE ROAD |
| 152 | 3.51 ha | 8458 | 2016 | N10037 | 2016051301 | 3.5 | Unknown | 13/05/2016 | 30/05/2016 | JA70003000 | 320.03 km² | | MOAN ROAD AN... | | SKOOKUMCHUCK ... | |
| 153 | 6.46 ha | 8518 | 2016 | N10143 | 2016080101 | 6.4 | Non-corrected ground GPS | 01/08/2016 | 05/08/2016 | JA70003000 | 322.32 km² | | TA TA CREEK, M... | | SKOOKUMCHUCK ... | |

Create Wildfire Reports

FortisBC Wildfire Analysis

Wildfire Map with 10 km radius

FortisBC Assets within 10 km of the wildfire

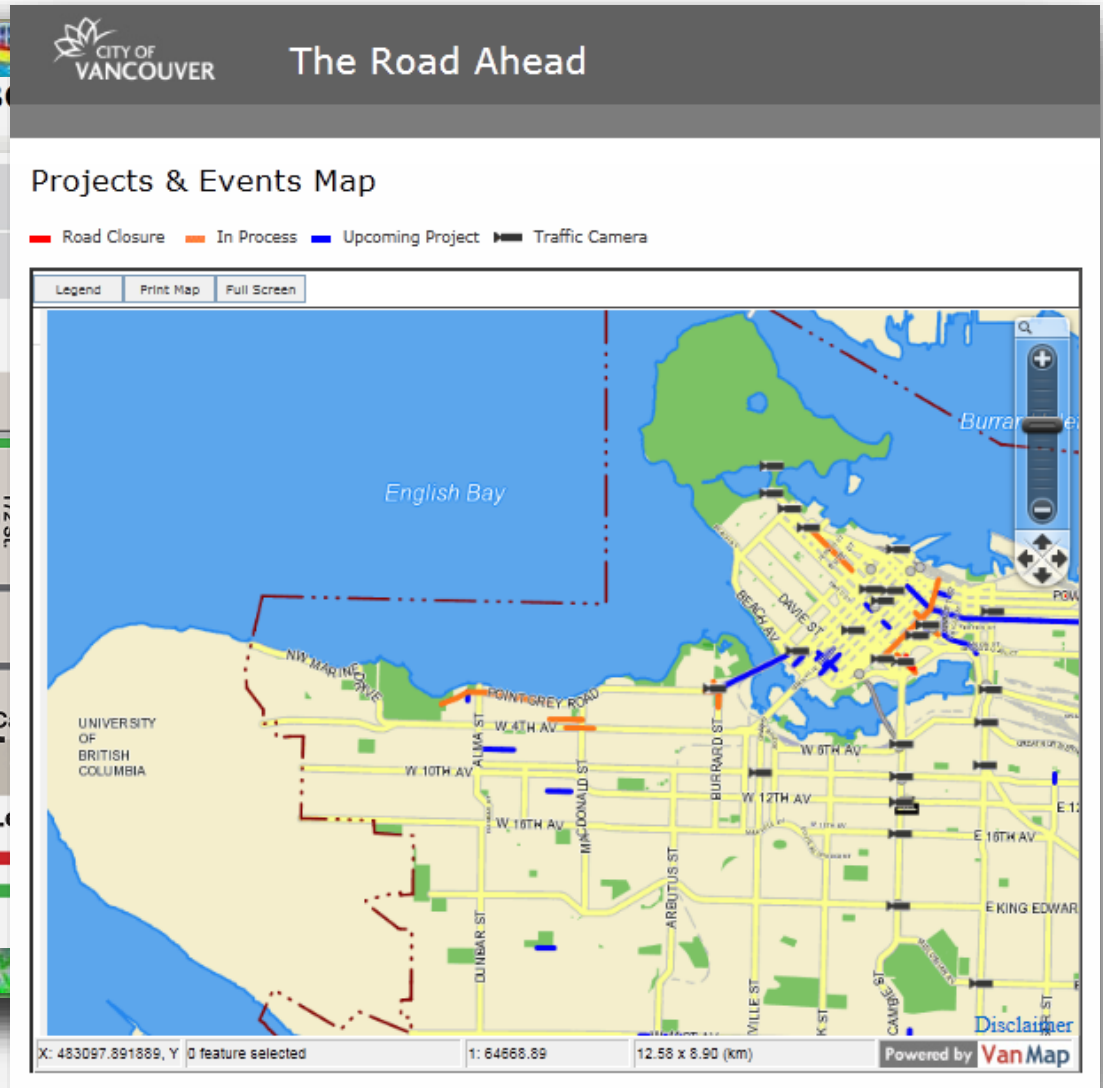
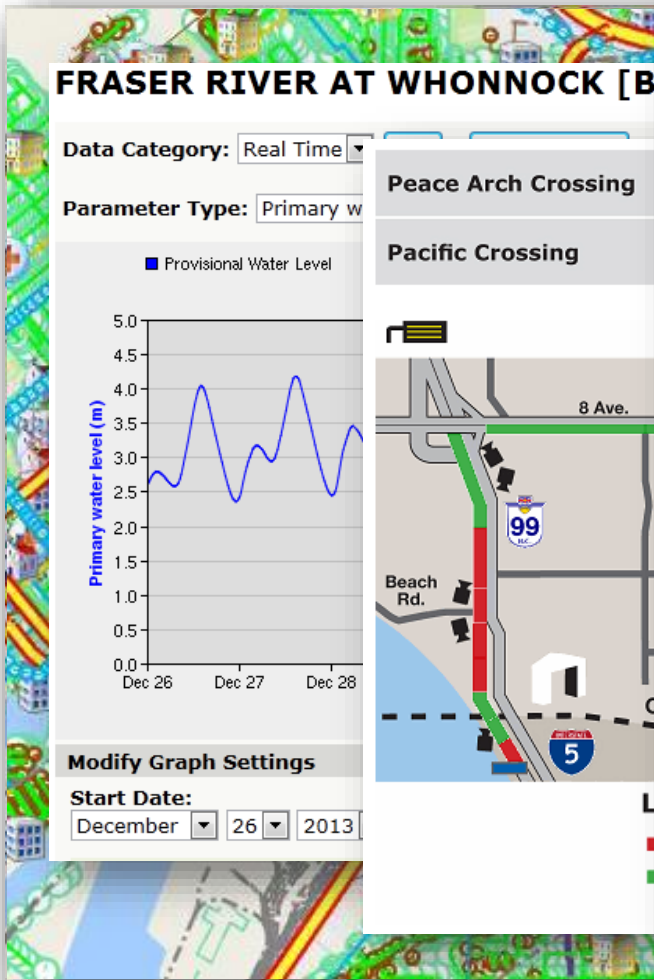
| | | | |
|---------------------------------|---|---------------------|-----|
| FortisBC Gas Assets | | | |
| Communication Sites: | 0 | DP Stations: | 0 |
| TP/IP Stations: | 0 | Critical Customers: | 3 |
| TP/IP Pipelines: | 0 | Gas Customers: | 484 |
| FortisBC Buildings: | 0 | | |
| FortisBC Electric Assets | | | |
| Transmission Oh: | 3 | Dist Oh Secondary: | 0 |
| Dist Oh Primary: | 0 | Dist Ug Secondary: | 0 |
| Dist Ug Primary: | 0 | | |

Name: Piet Nooij
08 August, 2017
3/11

Web Tools



Web Tools



Conclusion

- Wild fires pose a significant threat to pipelines, stations and building
- Wild fires can move very fast so analyzing the most current wild fire data is critical
- GIS Analysis tools provide great benefits to determine which fires could pose a risk
- Export the analysis and create reports and plots for first responders
- Provide up to date information on a daily basis
- Web cams and additional web tools can be very useful to assist with an emergency

Questions

Contact Information

Piet Nooij

FortisBC

GIS Technology Manager

Phone (604) 592-7622

Mobile (604) 250-6197

Email: piet.nooij@fortisbc.com

Resources

- British Government Wildfire Service

<http://www.bcwildfire.ca/Situation/interactive-maps.htm>

<https://catalogue.data.gov.bc.ca/dataset/fire-perimeters-current>

Wildfire of Note

<http://bcfireinfo.for.gov.bc.ca/hprScripts/WildfireNews/OneFire.asp?ID=>

FIRE_NUMBER=G80046

FIRE_NT_ID=586

FIRE_NT_NM=Beaton Airport

FIRE_NT_LK=web link