Increasing the Resiliency and Reach of National Fire Information: The Recent Experiences of the CWFIS

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The **CWFIS** provides current national information (maps, data) including:

- Fire danger and behavior
- Fire and smoke locations
- Weekly statistics
- Links to provincial agencies
- Provides access to archived fire data in Canada

The CWFIS supports **emergency preparedness programs** of:

- NRCan
- Other federal departments
- Canadian Interagency Forest Fire Centre (CIFFC)
Canadian Wildland Fire Information System (CWFIS)
Interactive Web-map / Synthesis of Fire Data Layers

Sample Data Layers:
- Active fires – collected from fire management agencies
  - Point & perimeter maps
  - Standard attributes
Drivers of need to modernize CWFIS

- Data availability
- Decision support system maintenance
- Standards for data and systems
- Cyber-security…coming to an IT department near you
- New users: DND, Weather Network, INAC, CBSA, Bluesky, Firework
- Big data
CWFIS Redevelopment and Resilience

50k visitors, 200k pages, 66GB data

May 2016 Statistics

430 000 visitors
2 040 000 pages
558 GB of bandwidth
SFMS Redevelopment and Resilience

Before

SFMS – ArcInfo

• Closed source and proprietary file formats
• Programmed in AML and Avenue – abandoned by ESRI
• Platform dependent -- Windows
• FWI (1984) and FBP (1996)
• What is source code management??
• ODBC database connection
• Well documented but AML and Avenue code are no longer supported by ESRI

• **GRIDs are inaccessible directly from the web**

After

Redevelopment and Resilience

• *Only* open source libraries and file formats
• Programmed in C++
• Platform independent (Windows, Linux)
• FWI (1984) and FBP (2009 – GLC-X-10)
• Source code managed using git
• ODBC database connection
• Well documented – installation, building, SOP, troubleshooting

• Geotiffs are uploaded to Geoserver which stores, manages, and shares the raw data using open standards (WMS, WFS, WCS)

**FY 15 – 16**
National Emergency Preparedness Program Support

- CIFFC
  - Map products and data
  - National short, medium, and seasonal fire weather briefings

Current, historical national data:
- Fire danger and behavior
- Short-term to seasonal forecasts
- Weekly statistics
- Links to provincial agencies
- Fire locations
- Smoke modeling

- NRCan -- DEOC
  - Fire situation reports – phone/video briefings
  - Connections to GOC, Ministers’ offices, industry

- Public Safety Canada -- GOC
  - Rotating SMEs deployed to Ottawa
  - Connections to OGDs and minister’s offices
Making Data Available:

- Use GeoServer to publish data layers (fire danger/fwi/fbp, hotspots, active fires, fire perimeters, wx stn data, smoke fcst, fuels, fire history)
- Data available in OGC standard formats (wms/wfs)
- Users bring data into their own systems
Using standard requests, users can access CWFIS data layers

Sample request:
Sample Tools for web mapping and data sharing

Making data available to clients:

- Many tools available for interactive web mapping and data serving
  - Eg: GoogleEarth, Openlayers, Leaflet, Mapbox, CartoDB, ESRI ArcGIS online etc..
- Serve data in many formats (wms/wfs, shp, kml etc)
- Use of OGC standards for data sharing and interoperability enable data to be easily brought into systems
New features - Grass curing
Canadian Wildland Fire Information System (CWFIS) Interactive Web-map / Synthesis of Fire Data Layers

Sample Data Layers:
• Fire Weather Calculations (Actual, short term (2 day) and long term (14 day) forecasts)
  • At weather station location
  • Interpolated surface
  • At hotspot location
  • At any given location (as a service)
Sample Data Layers:
- Satellite detected hotspots (MODIS, AVHRR, VIIRS, ATSR, LANDSAT-8)
  - Hotspot point location
  - Buffered hotspot polys – (provide burned area estimates for large fires)
  - Hotspot progressions (useful for research/analysis)
Using Hotspots for area burned estimates

Cumulative area burned in Canada
by year estimated from satellite hotspots

Estimation de la superficie cumulative brûlée au Canada par année réalisée par Points chauds
Sample Data Layers:

- **Smoke daily peak values** (Bluesky Canada current day and 2 day forecast)
- **Fire growth modelling** (short and long term prediction)
- **Fuels**
Thank you