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# WildFireSat

## La mission GardeFeu

GOFC GOLD Fire IT

Mark de Jong / Alan Cantin

Contributions from:

Josh Johnston, Colin McFayden, Morgan Crowley, Dan Thompson, Matthew  
Ansell, Julia Harvey, Geoff Goetz

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# WildFireSat Update – Background



- WildFireSat must provide **high quality data on a routine basis** that can be relied on for fire management in Canada.
- WildFireSat will likely consist of **several satellites**.
- Along with other sources (e.g., VIIRS), will form a **virtual constellation**.
- WildFireSat will provide an **unprecedented portrait of all active wildfires at least twice daily, in near real time**

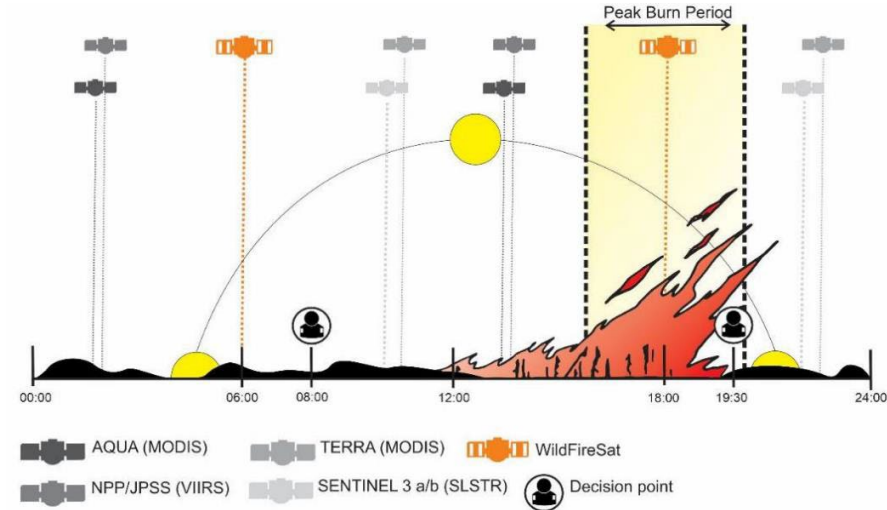


Image adapted with permission: Johnston et al. "Development of the user requirements for the Canadian WildFireSat Satellite Mission." *Sensors* 20, no. 18 (2020): 5081.

# WildFireSat Update – Canadian Operational Mission



- Stage 2 of the RFP is complete
- Recommendation for a winner provided
- Award and Announcement expected end of 2024 / early 2025
- Happy to give a full update of the system virtually to all members in early 2025



# WildFireSat Update – Global Mission



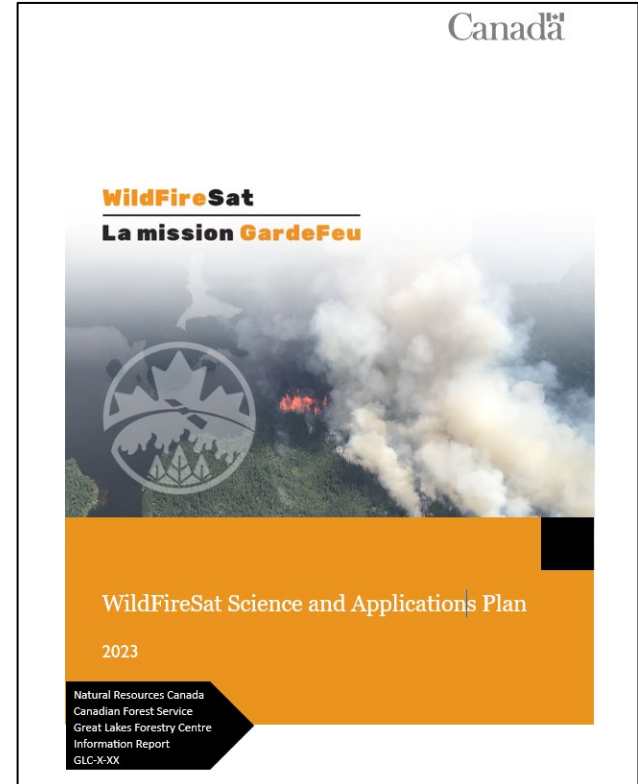
- Pursuing global mission
- Soft engagement with international partners (this mtg in particular)
- Anyone opposed to making this a global, free mission?
- Near real-time may be different from Canadian access



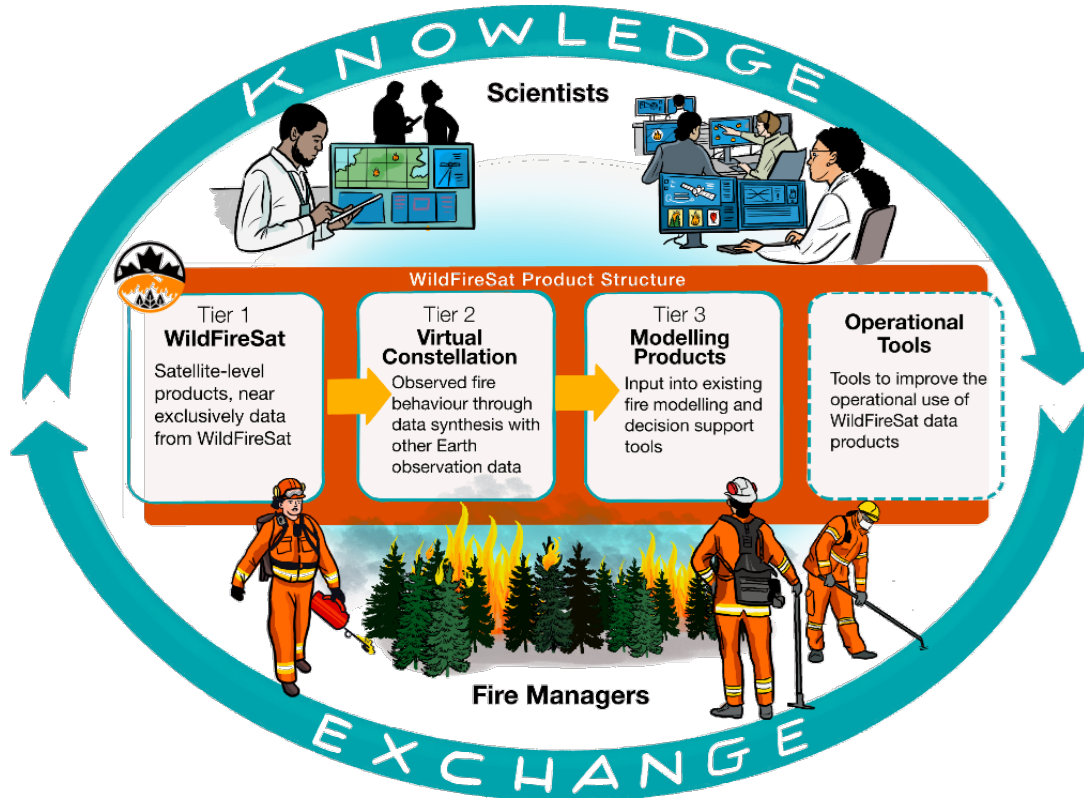
# WildFireSat Update – Science



- Science Plan is now expected 2024Q4 / 2025Q1
- Peer review: ~18 reviewers (thanks!), substantially improved
- Final draft, needs translation / accessibility checks before publication



# WildFireSat Product development



**Tier 1** fire detection and characterisation  
**Tier 2** leverage other Earth observation data to create products from a virtual constellation (e.g. VIIRS, SLSTR Landsat).

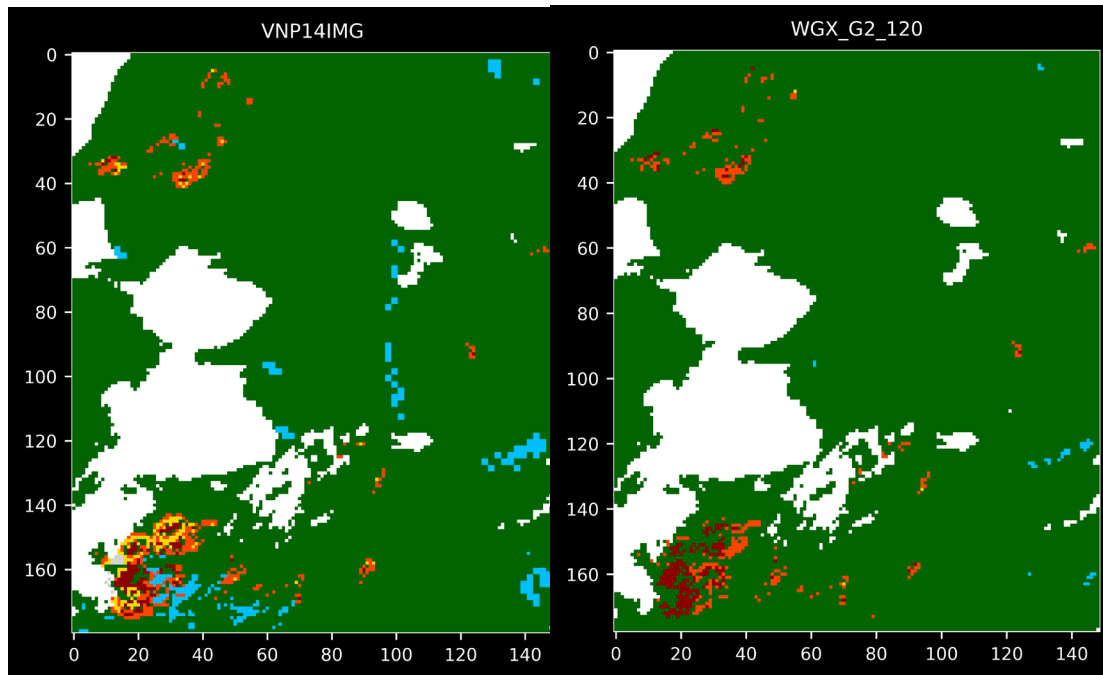
**Tier 3** insights to fire managers about fire characteristics and behaviour at event level

**Operational tools** non-WFS based complementary products adding value to WFS data e.g. easily accessible visibility / cloud forecasts

# WildFireSat Update – Tier 1



- Prototype FDC algorithm running on 'simulated WFS data' (modified VIIRS I-band)
- Working on refinements to detection algorithm
- scaling up from case study fires -> all Canada -> global regions

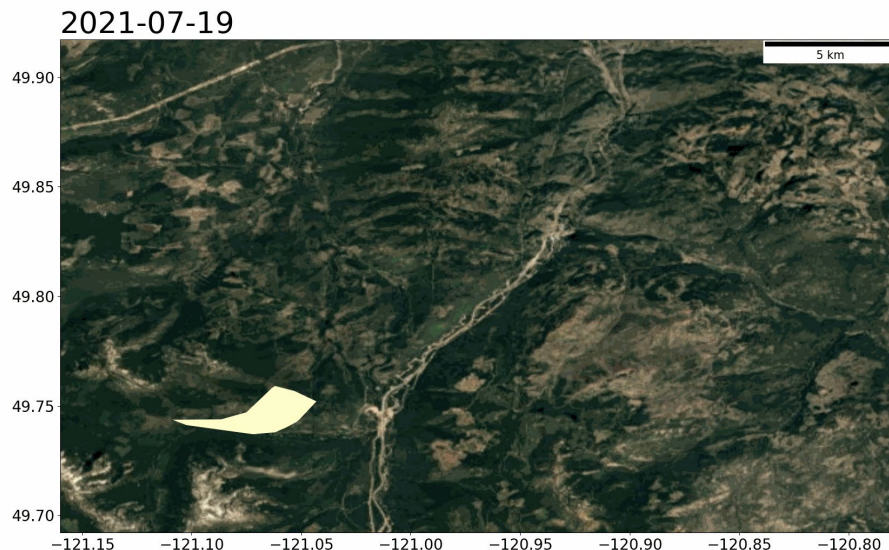




# WildFireSat Update – Tier 2



- Developed algorithm for generating ‘Multi Source Fire Events’ and calculating ‘Observed Fire Arrival Time’
- Expanding a fire event dataset of spatiotemporally clustered hotspots Canada wide
- Starting work on algorithms for observed rate and direction of spread, and observed fire line intensity



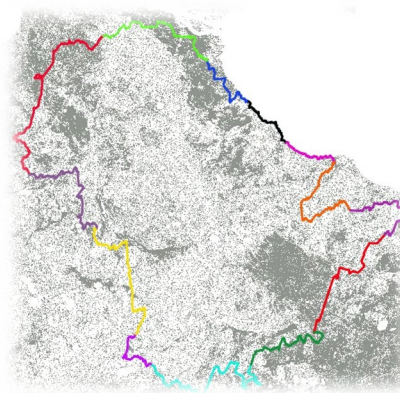
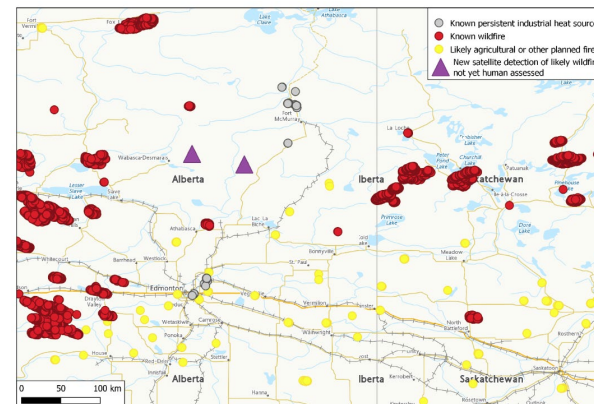
*Observed fire arrival time product prototype,  
July Mountain, BC*



# WildFireSat Update – Tier 3



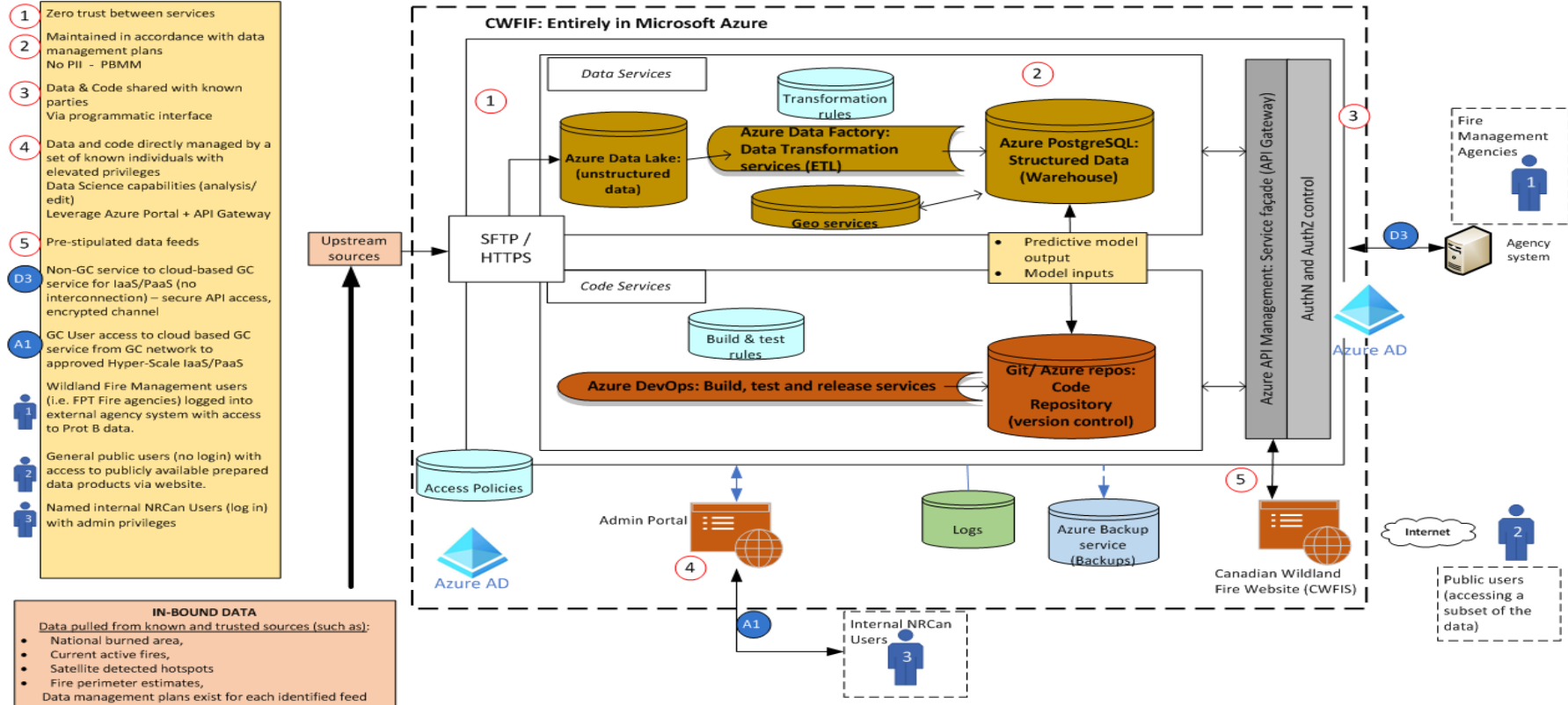
- Fire event classification model
  - E.g. wildfire, PB, agricultural; flag fires unknown to agencies
- Fire perimeter segmentation and characterisation
  - Sensible perimeter delineation based on environment, report segment behaviour/weather – good for growth modelling
- Fire detection probability forecasting
  - Cloud/clear sky likelihood at WFS overpass for next 3 days
- Next steps: adding fire weather fields to hotspots, fire growth assessment



*Top: fire event type classification (mock up)*

*Left: perimeter segmentation*

# WildfireSat Update - Architecture



# Summary



- Technical mission details can be disclosed in the new year
- Working on making WFS mission global in scope
- Product development and technical architecture are going well, MVPs and sandbox expected in 2025

**WildFireSat**

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**La mission GardeFeu**



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