Wildfire Sciences with AlbertaSat’s Ex-Alta 2 Satellite
We are a student group who builds satellites

Ex-Alta 1
Ex-Alta 2: the wildfire camera

The scientific purpose of Ex-Alta 2 is to track and assess wildfires, and to predict the behaviour of future wildfires.
IRIS, Ex-Alta 2’s imager
Satellites take images one strip at a time

Rather than taking one big picture, satellites like Ex-Alta 2 take images in strips, often known as swaths.

The individual swaths are combined to create a larger image.
By looking at vegetation, flame intensity, and smoke, scientists can learn a lot about the behaviour of a wildfire, and alert communities that may be at risk.
Ex-Alta 2 studies wildfire properties

01 Active burn detection
How bright a wildfire is
Ex-Alta 2 studies wildfire properties

02 Vegetation analysis

How loaded a region is
Ex-Alta 2 studies wildfire properties

Vegetation analysis

02

How loaded a region is

Aspen Poplar
Lodgepole Pine
Black Spruce
Ex-Alta 2 studies wildfire properties

Post burn effects

The change in a region caused by a wildfire

Pre-burn
mostly invasive grasses

Immediately after burn

9 months post burn
grasses return
Ex-Alta 2 studies wildfire properties

Smoke and aerosol detection

How much light is reflected by smoke
What wildfire properties can Ex-Alta 2 study?

- Active burn detection
- Vegetation analysis
- Post burn effects
- Smoke and aerosol detection

Check your understanding
Determining wind direction

Where are the flames?

Where is the smoke?

Which direction is the smoke going?
You are a weather analyst for CSA who specializes in wildfire imaging. You are using images from Ex-Alta 2 to predict the behaviour of an ongoing wildfire. Your job is to figure out where the flames are and which direction the smoke is headed to alert towns which may be affected by the fire.
1. Assemble the swaths into an image.

Determine:
2. The direction of the smoke.
3. Which towns may come into contact with the flames? (red circle)
4. Which towns will be affected by smoke? (yellow circle)
Why is wildfire imaging important?

- Wildfire imaging provides scientists with the proper data to study wildfires and protect us from them.
- Images of smoke plumes can help firefighters know where wildfires are occurring.
- Vegetation regrowth can also be monitored through satellite imaging.
Humans effect on wildfires

62% of Alberta wildfires were caused by humans in 2021
Do your part to prevent wildfires

Soak it. Stir it. Soak it again.
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