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# Design of a New Thermal Cube

2016 Project Update

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# Background

- **Developing an instrument to measure wildfire intensity: a field-ready package**
  - Design driven by steering committee
    - AB, BC, YT, NWT, Parks Canada, CFS, UofT, UofA
- Original Design from UofA design project
  - Steering Committee design requests
    - Base plate removable, hole for anchoring, carry handle
    - 2 pole heights 100cm, 50 cm
    - High visibility paint

# 2016 Update

- 1<sup>st</sup> Design
  - 57.5 lbs
    - Not field ready!
  - Sensor uses Thermal Conductivity between 2 points
  - $q = K \frac{T_1 - T_2}{\Delta x}$
  - Requires 2 channel differential logger (DaqPro)



# 2016 Update

- 2nd Design
  - 2.5 lbs
    - Field ready!
  - Sensor uses Heat Capacity
$$q = m \times C_p \times \frac{\Delta T}{s}$$
  - Requires 1 channel logger (RoS, Hobo, etc)
  - Works after flame front passage
  - ~\$200 sensor
  - ~\$200 stand



# 2016 Update

- Next Steps
  - Obtain steering committee consensus with approach
    - Informal approval from 2 members
  - Build 12 units before 01 May 2017
- Future
  - Calibrate units for accuracy and consistency with controlled lab test
  - Integrate camera box
    - new in-fire standard for camera boxes?
    - Fire intensity kW/m?



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# Questions?



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