



# KITCHEN 2.0: Smoke Feng Shui for Exposure Reduction



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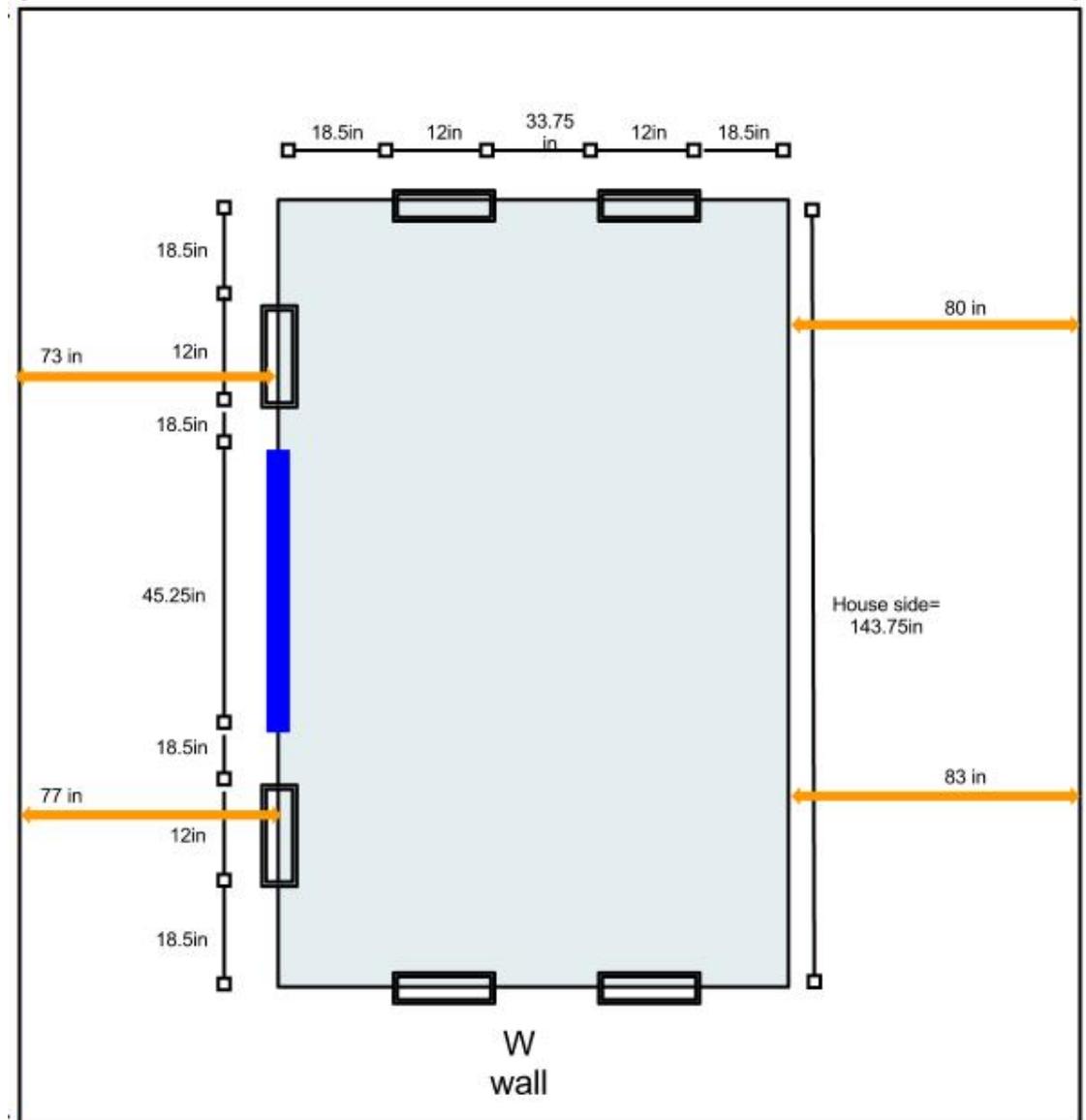
# About Kitchen 2.0

- EPA P3 Competitor (2013)
- Three aspects:
  - 1 Qualitative
  - 2 Quantitative
  - 3 Computational Modeling



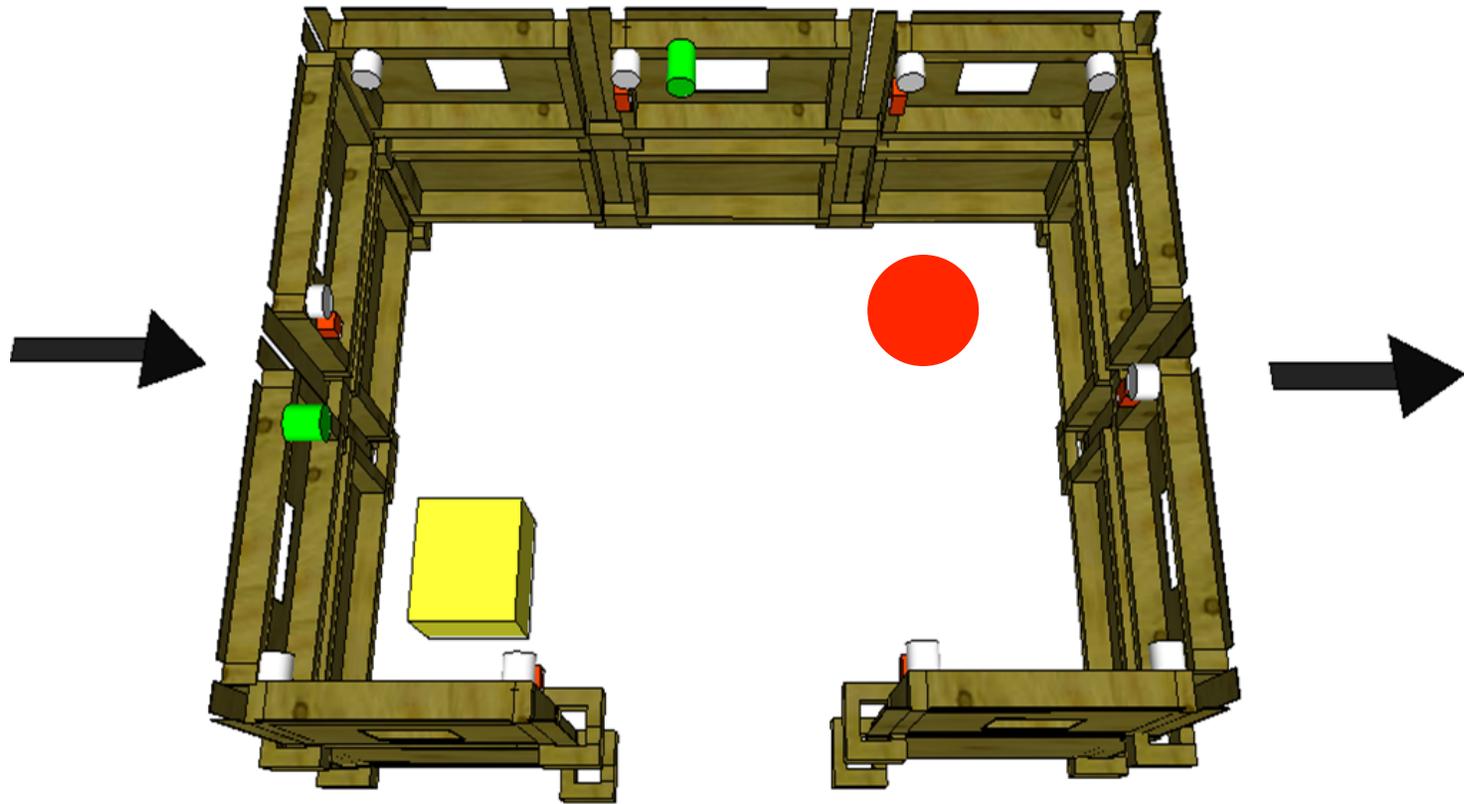
## “Field” Testing: Keweenaw Research Center

- UCB(PM2.5)
- MicroDAQ (CO)
- Dust-Trak (PM2.5)
- Q-Trak (CO)
- APS (Particulate)
- Wind speed anemometer
- EC/OC
- Others



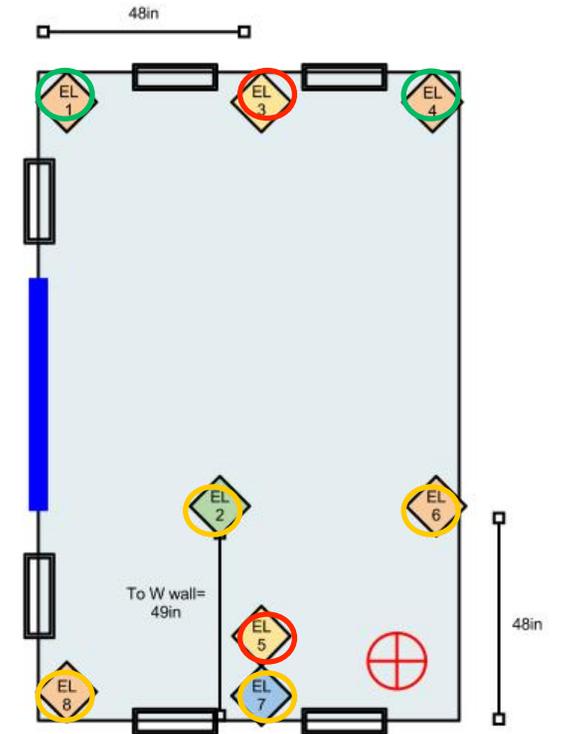
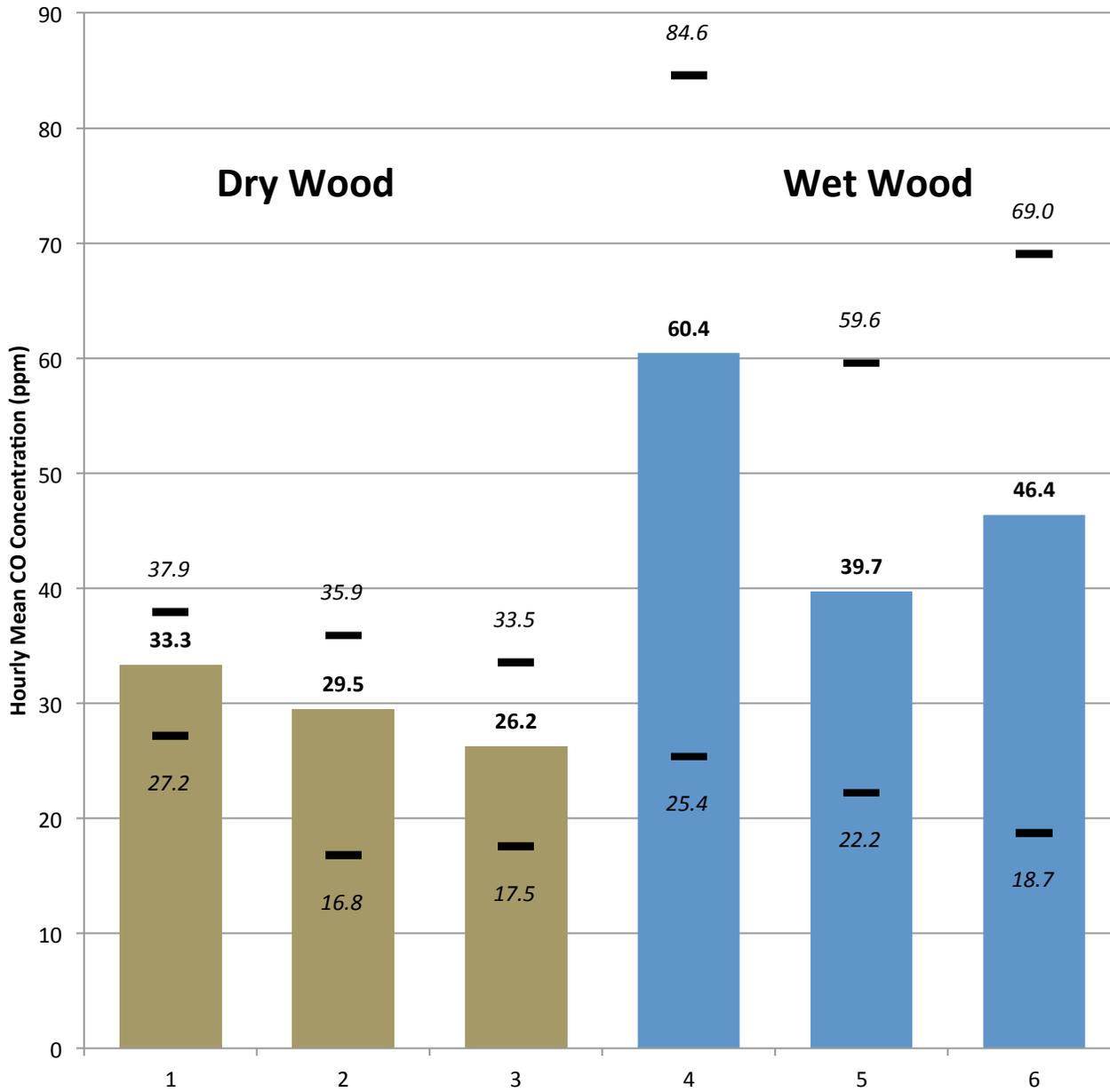


<p><b>Stoves:</b></p> <ul style="list-style-type: none"> <li>• Three Stone</li> <li>• Envirofit</li> <li>• Stove Tec</li> </ul>	<p><b>Roof Materials:</b></p> <ul style="list-style-type: none"> <li>• Corrugated Metal</li> <li>• Thatch</li> </ul>	<p><b>Ventilation:</b></p> <ul style="list-style-type: none"> <li>• All closed</li> <li>• Eaves only</li> <li>• Cross</li> <li>• All Open</li> <li>• Two Panels</li> <li>• Three Walls</li> </ul>
<p><b>Wind:</b></p> <ul style="list-style-type: none"> <li>• No Fans</li> <li>• Fans High</li> <li>• Fans Low</li> </ul>	<p><b>Stove Placement:</b></p> <ul style="list-style-type: none"> <li>• SW corner</li> <li>• By Door</li> <li>• NE Corner</li> </ul>	<p><b>Fuel Quality:</b></p> <ul style="list-style-type: none"> <li>• Dry Wood</li> <li>• Wet Wood</li> </ul>

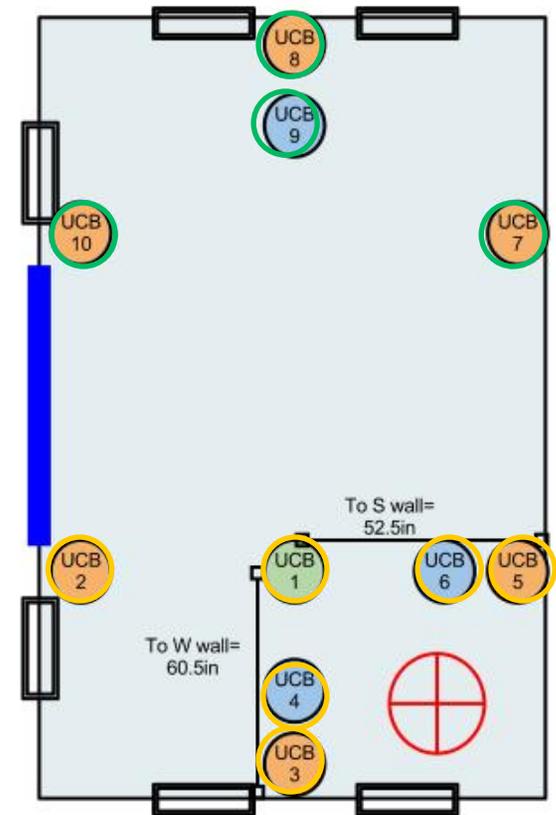
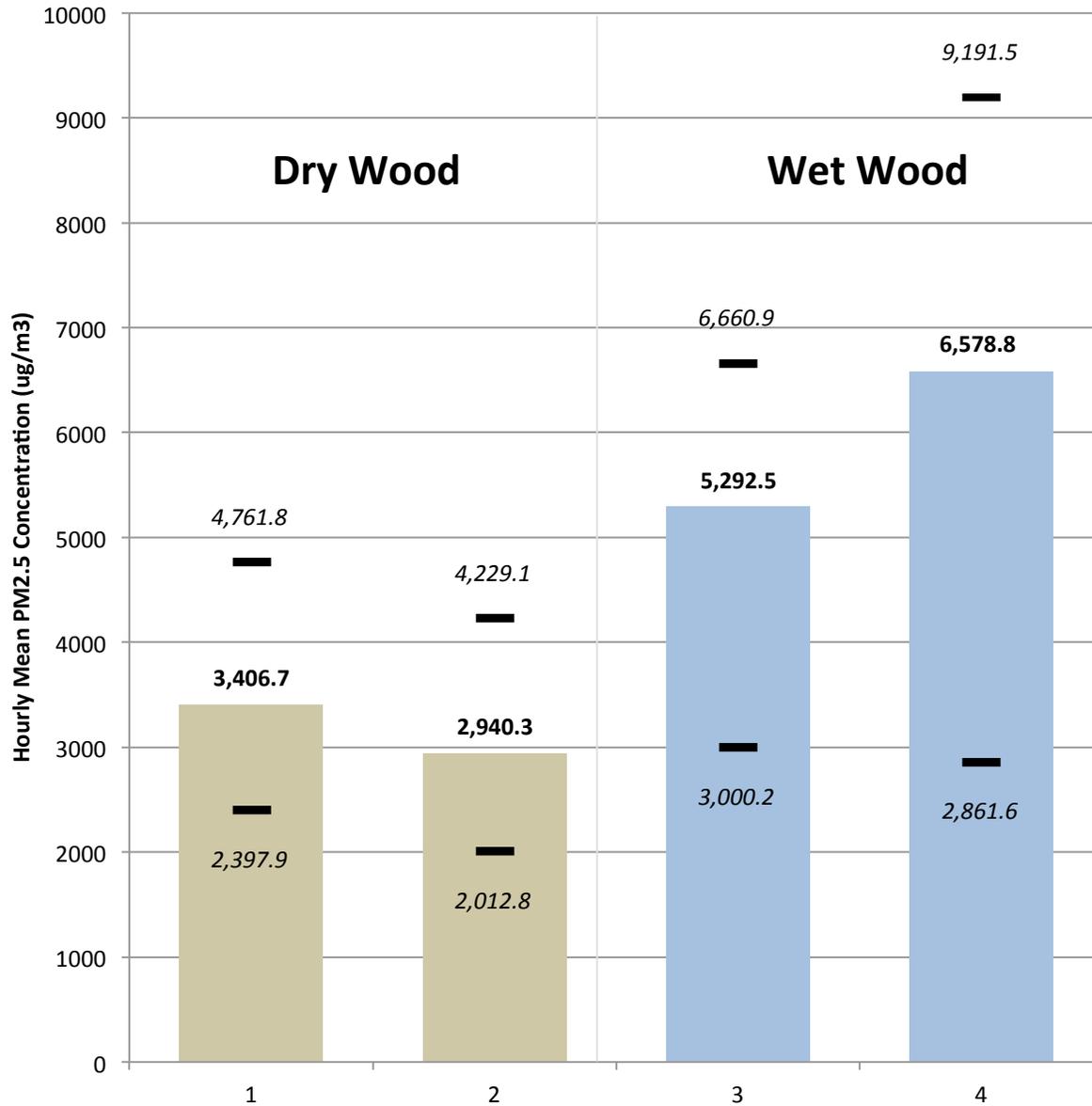




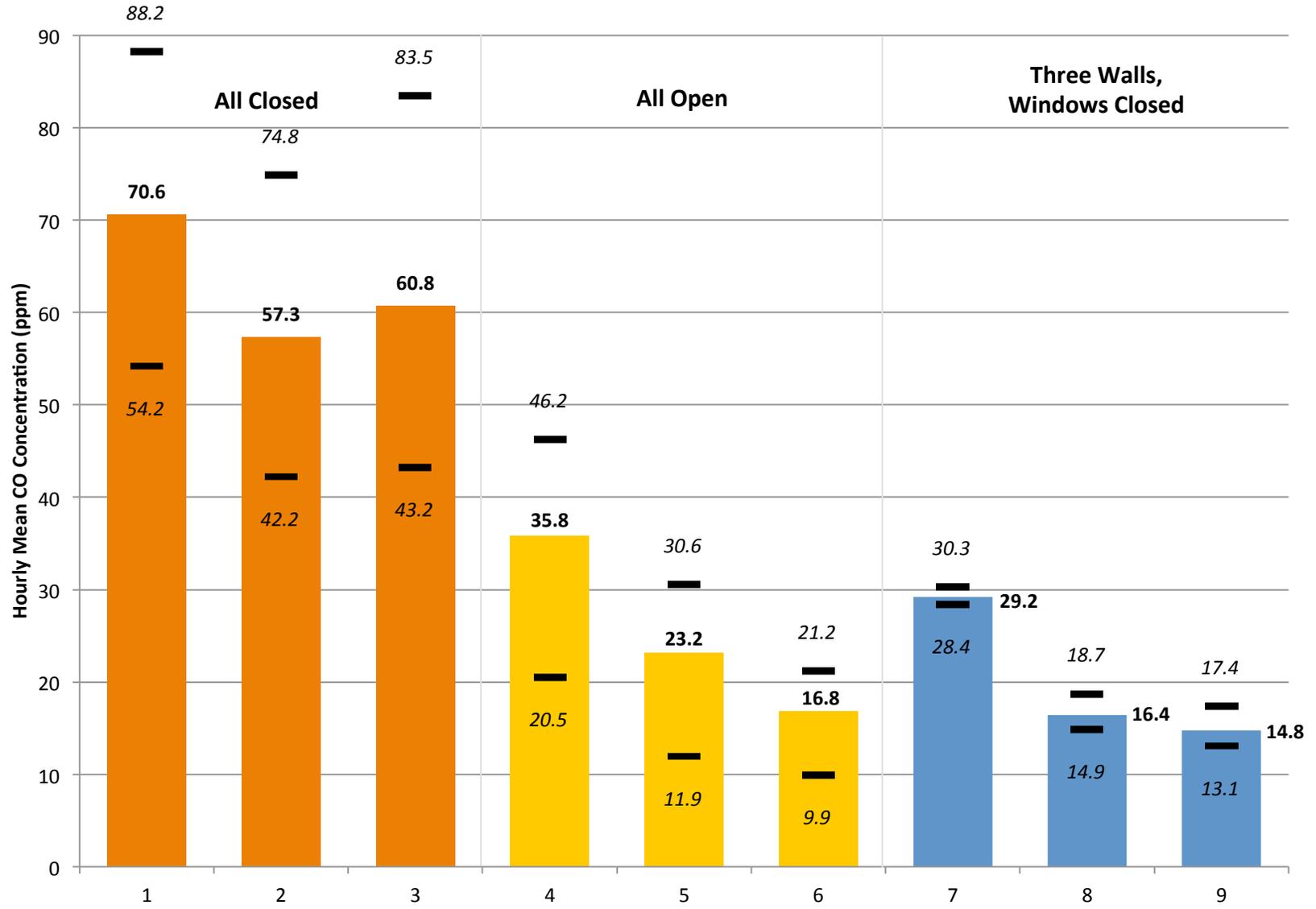
# Fuel Quality Using a Three-Stone Fire Cookstove



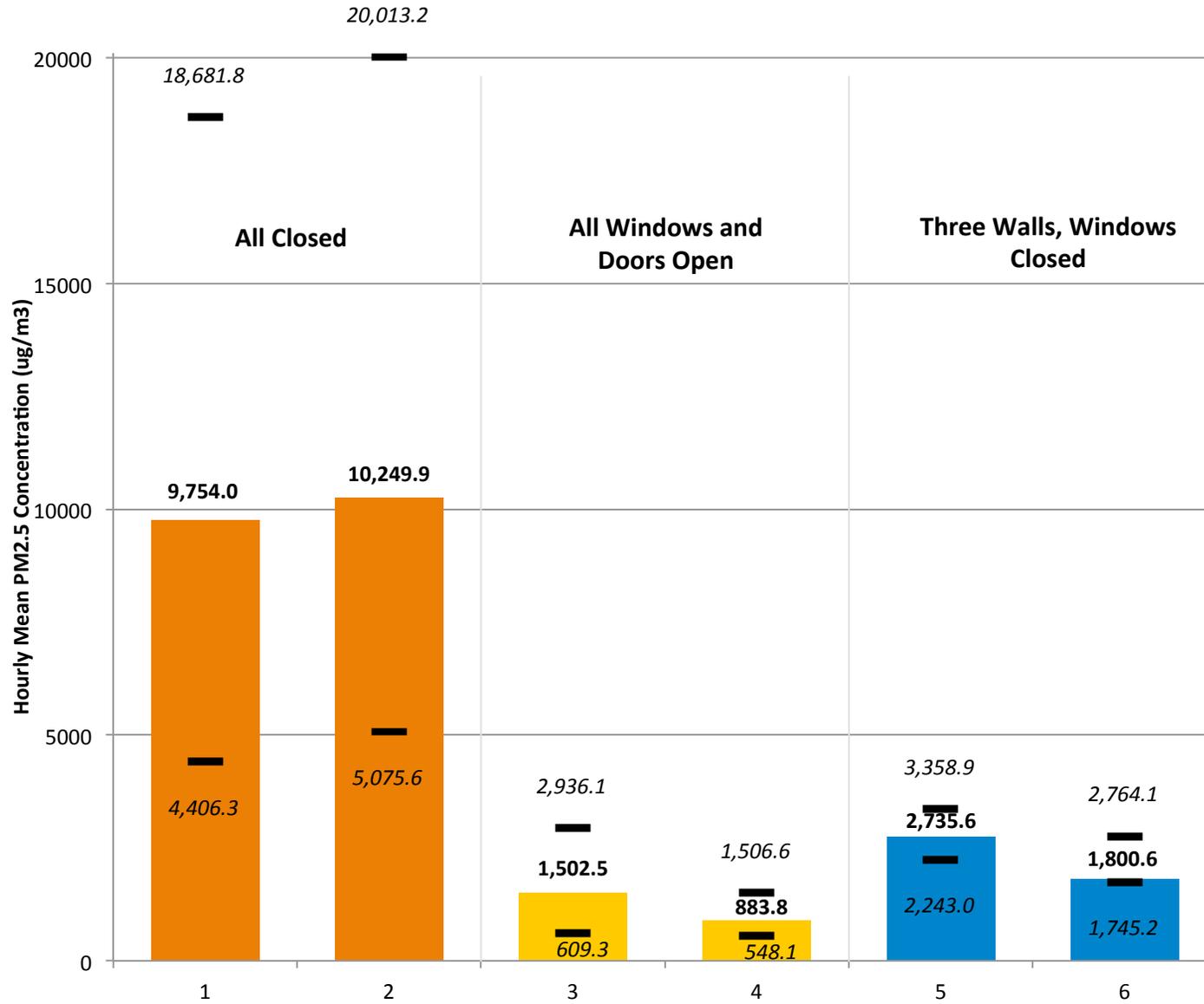
## Fuel Quality Using a 3 stone Cookstove



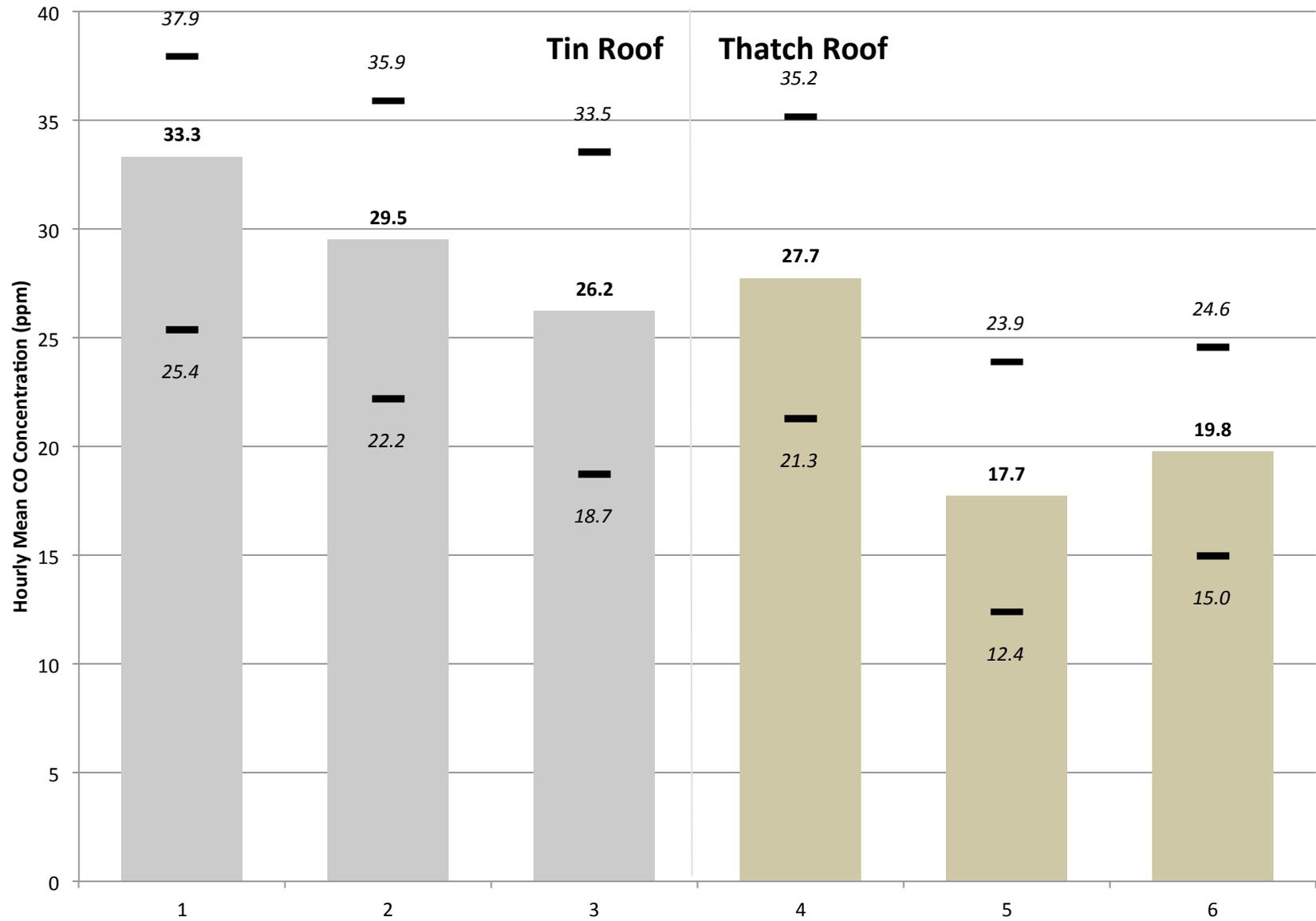
# Ventilation Quality Using a Envirofit Cookstove



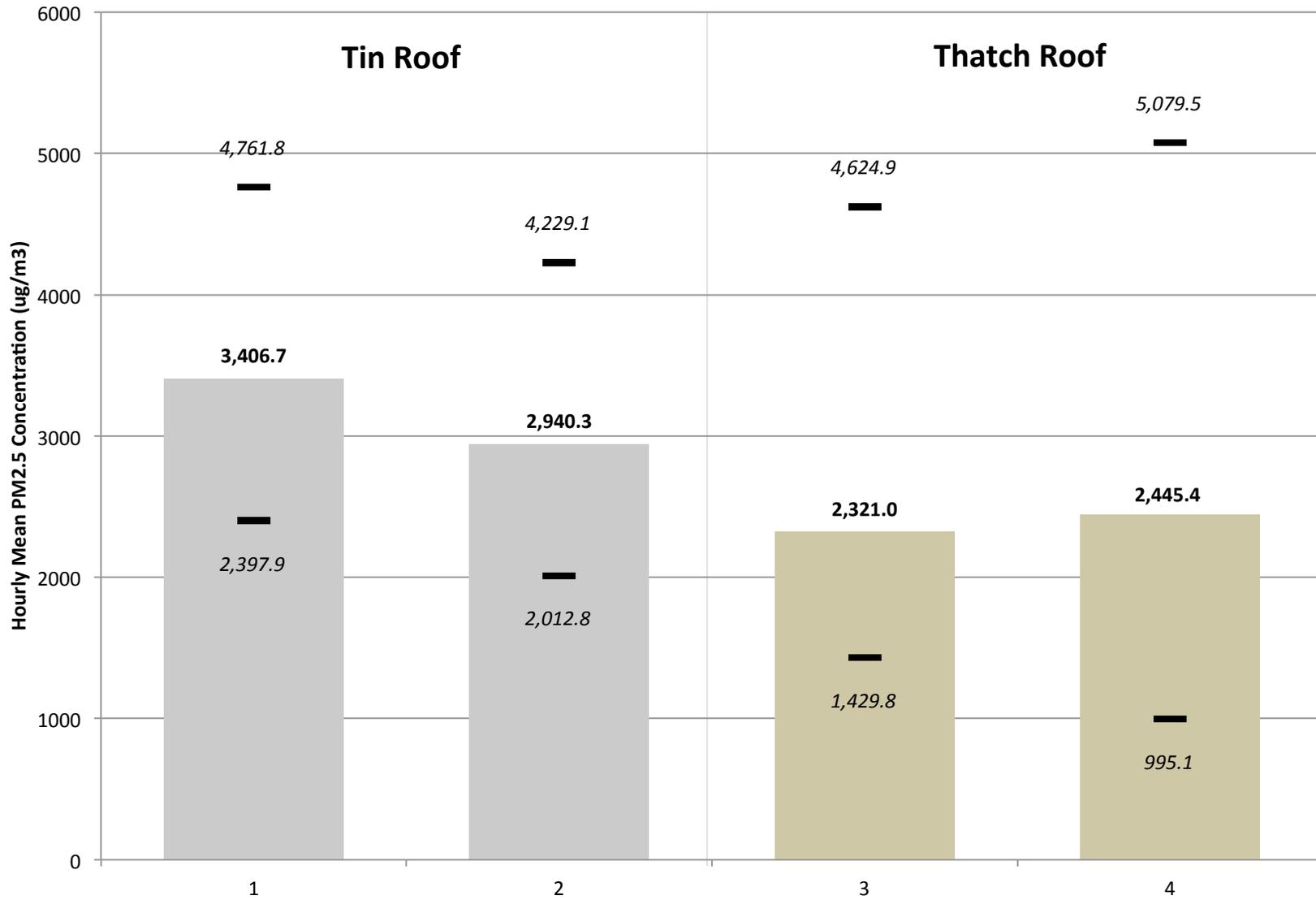
# Ventilation Quality Using a Envirofit Cookstove

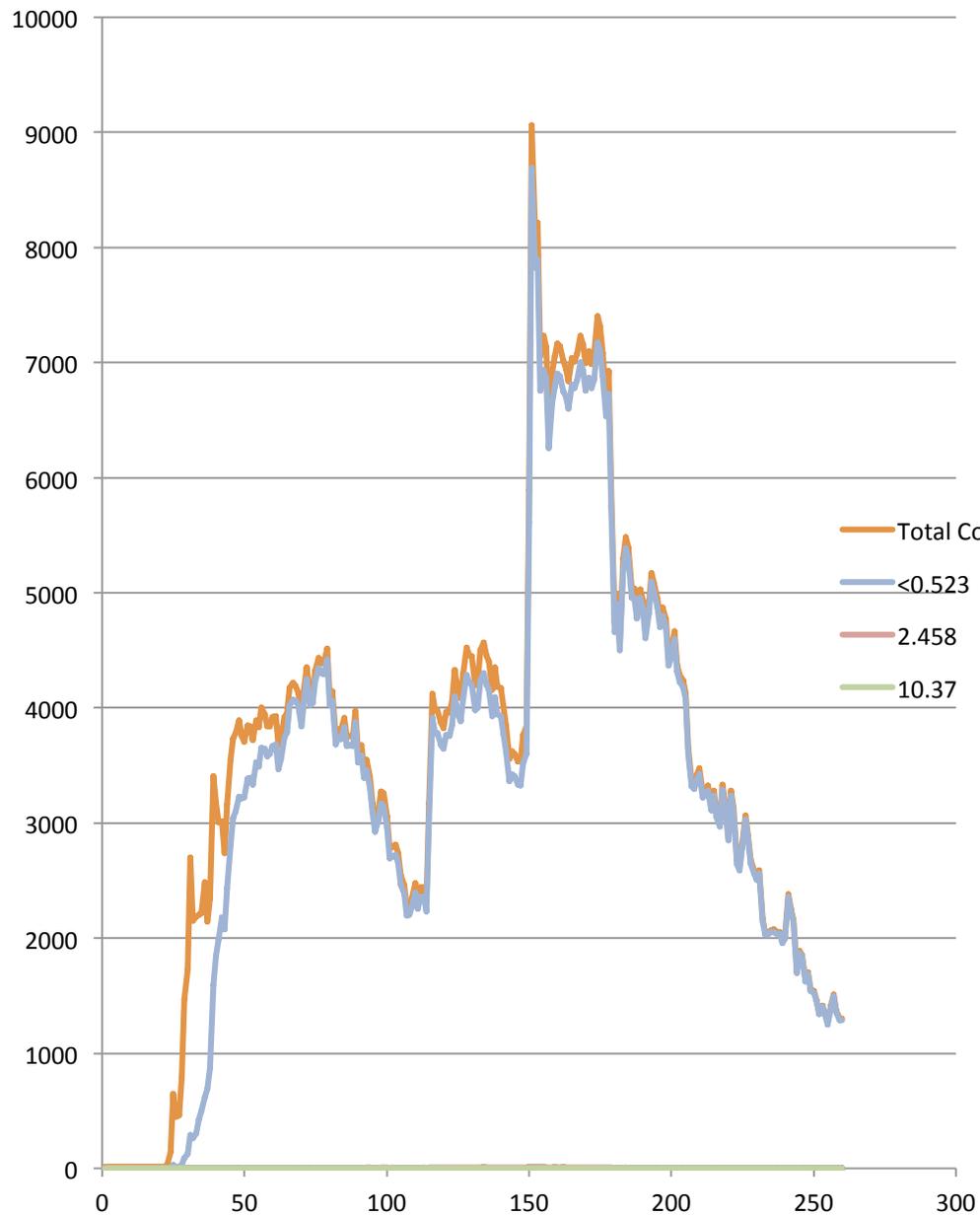


## Structure Materials Using a Three-Stone Cookstove



# Ventilation Quality Using a StoveTec Cookstove





### Conclusions and Future Work:

- ANY ventilation is better
- Statistical analysis of all monitors
- CONTAM calibration and verification
- Study of fine particulate emissions (left)
- MORE TESTING(!!!!)

**Special Thanks To:**

- US Environmental Protection Agency
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- Members of the A-Team: Jarod Maggio, Travis Wakeham, Jonathan May, Mollie Ruth, Abram Peterson

**For More Information or Collaboration:**

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