

Learning from ROCIS monitoring results

ROCIS Stakeholder Meeting

26 February 2016

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Introduction

- I am one of the remote researchers, in deepest Canada
- I am running two Dylos and a Speck
- Canadian particle counts are similar to American (exchange rates vary)
- I have been working with Linda on air quality issues for 30 years
 - We still have not solved all the problems
- These are the most interesting issues with the monitoring that I have seen

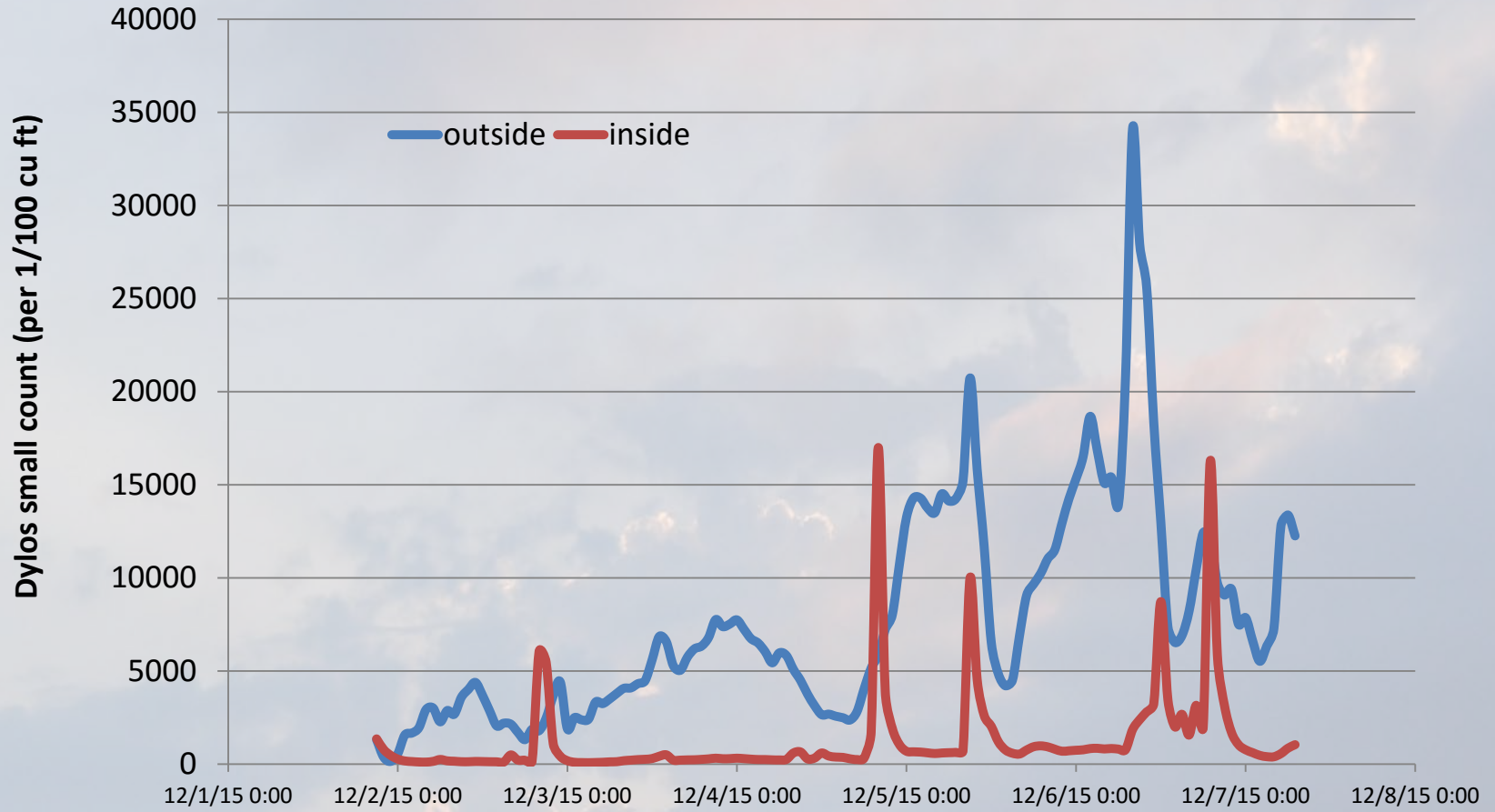
Are we different?

- Comparing the data from everyone's Dylos small inside counts (mean for the week, based on recorded data to date)
 - Lowest = 30
 - Highest = 2308
 - Highest outside mean, for contrast = 9553
- Estimated (from memory) duration of cooking peaks over 5000 in Dylos small inside
 - 2 minutes to 4 hours
 - Precise comparison will be available soon when data all compiled

House Protection

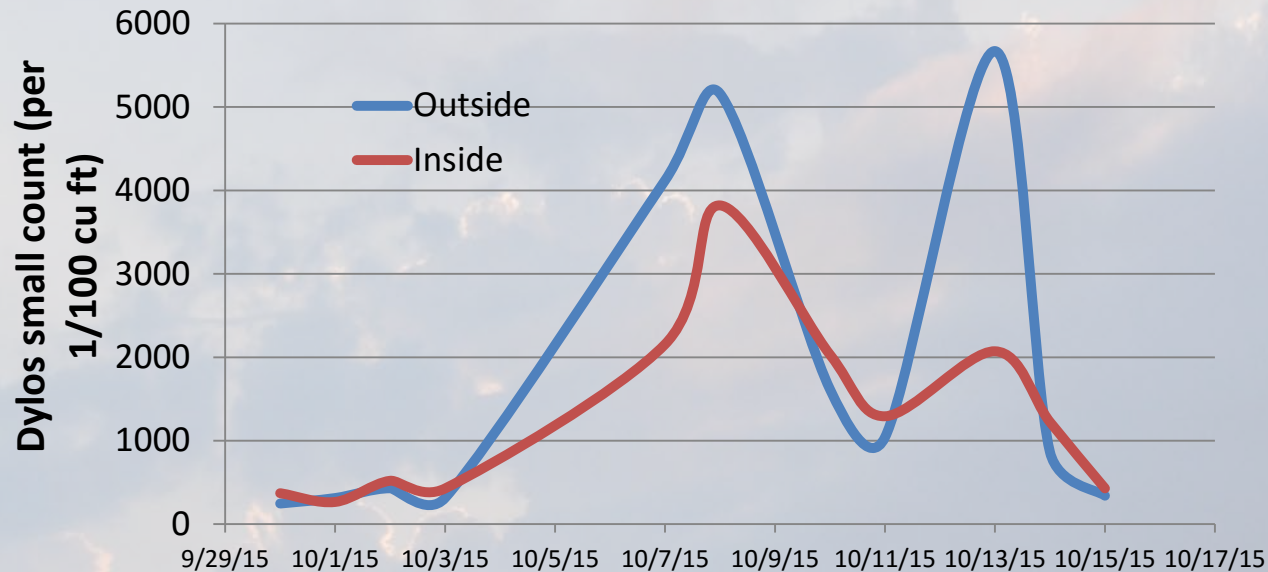
- Prof. Brent Stephens is right. He said houses of average airtightness still provide good protection to outdoors PM2.5
- I didn't fully believe him
 - Now I do
- One example is a moderately updated 110 year old house, faced with about the highest outdoor concentrations seen, with windows closed

House response to high outdoor concentrations



But in summer ...

- With windows wide open, outdoor and indoor concentrations are pretty much the same
- Chart below shows daily averages with windows open for an individual house in Sept/Oct



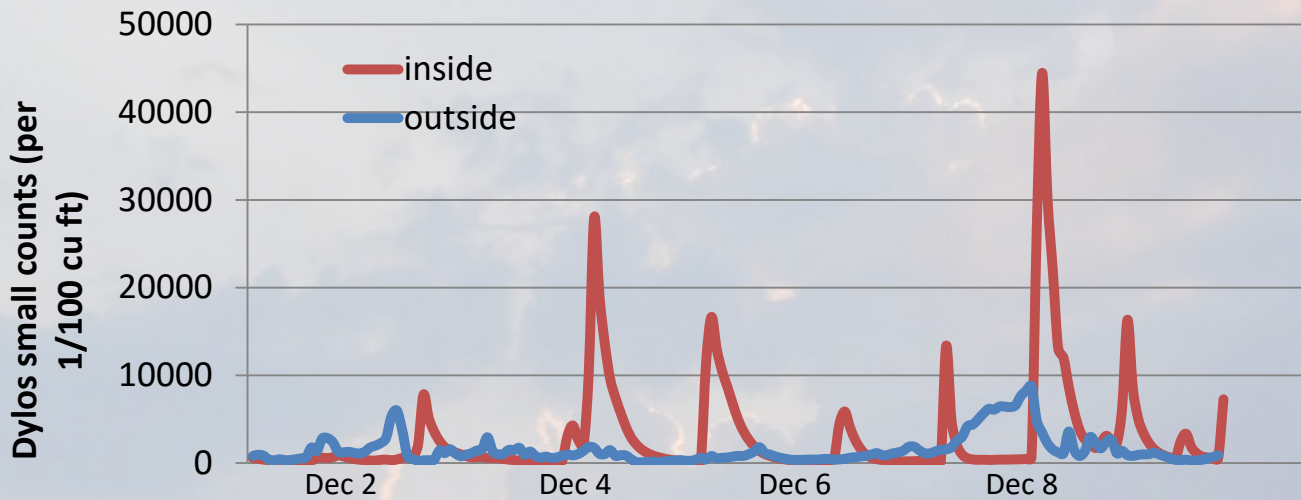
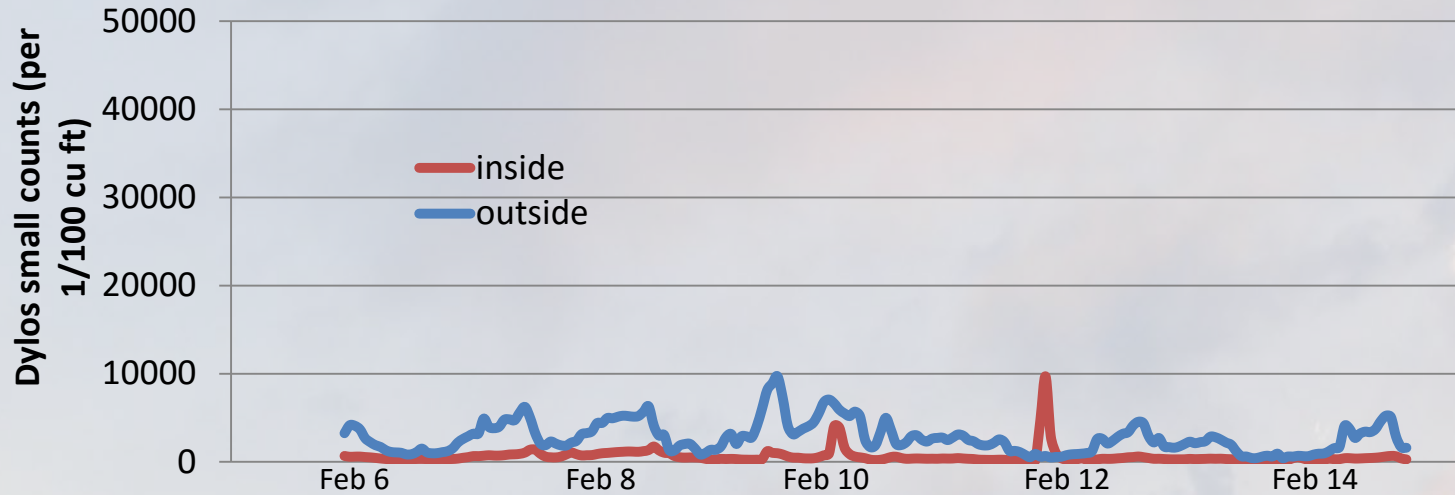
And if you have a ventilation system ...

- If you have a ventilation system (e.g. an HRV) with an unfiltered supply, you will find the same results
 - You can upgrade this filtration on an HRV
- If your ventilation system is an exhaust-only system (like a bathroom fan), the house envelope will filter outdoor air

Cooking lessons

- Most of the indoor small particle spikes seem to be due to cooking, but there are ways around this
- Participant at top uses the stovetop twice a day and the oven once a day. The range hood is used “Every time the stove is in use”
- Participant on bottom is more typical of the data we have seen
- Scales are the same for both graphs

Good kitchen range hood vs. recirculating



Can you cook without making a mess?

- Some answers we do not yet know
- It is clear that cooking will often create an indoor spike
 - We do not want to discourage cooking
- We have tried using lower element temperatures and induction cooking, so far with mixed results
- We hope to have better advice as ROCIS progresses

Other lessons

- Active vs. inactive periods
- Dusty humidifiers
- High radon in almost half the houses tested
- Not much CO observed in any houses

Other things I would like to know (which will come out in analysis)

- What do we do with the Dylos large counts or Speck readings? When are they useful?
- Can we see good reductions with a furnace filter in operation?
- How consistent are the outdoor readings from one house to another?
- What are the highest internal sources, other than cooking?

Questions?

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