

# Lessons from Castlegar

Donna Schmidt Lung Cancer Prevention Society

<http://dsradonprevention.org/>

Presentation 25 April, 2017  
CARST National Radon Conference  
Banff, Alberta



# Background

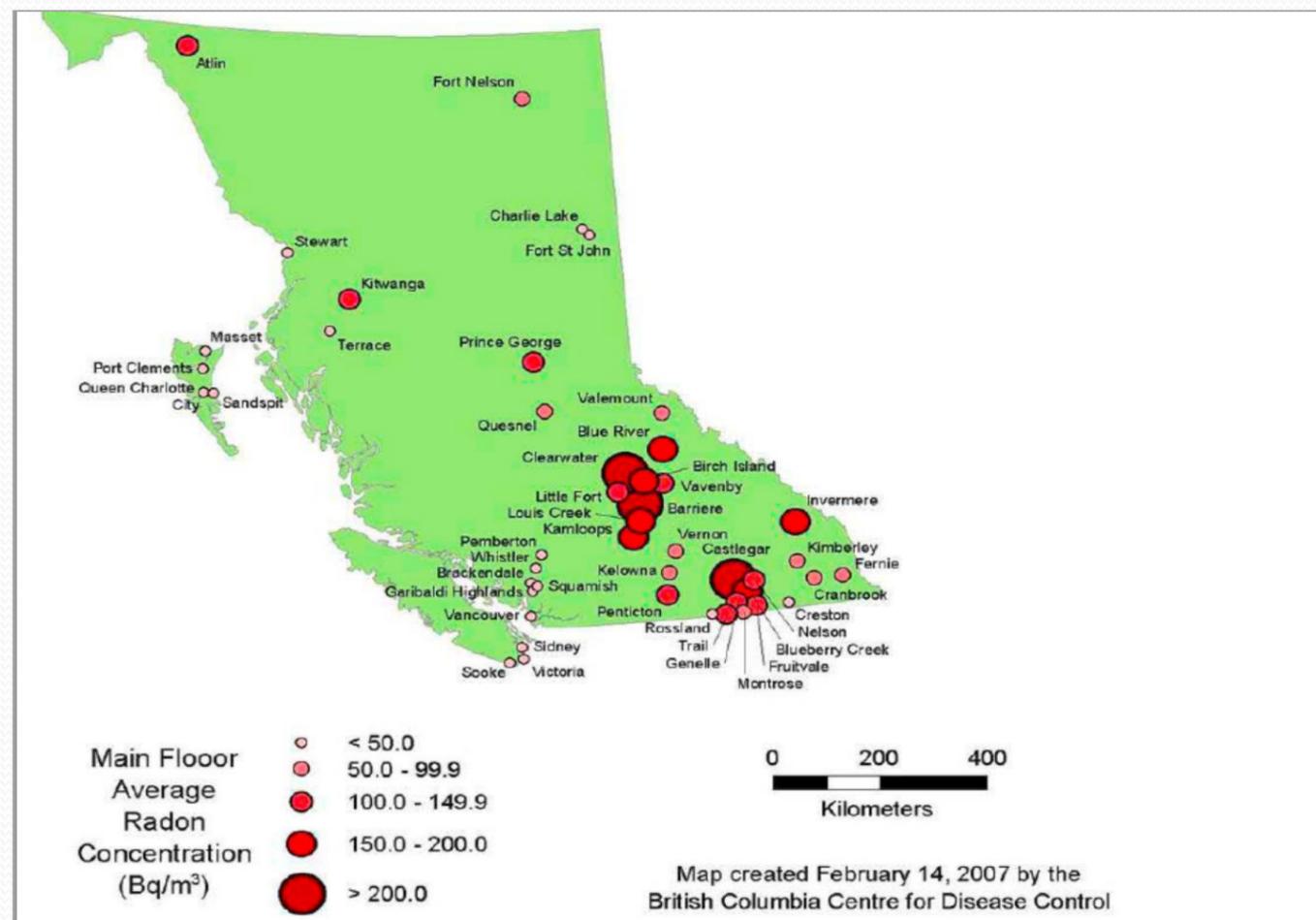
- The Donna Schmidt Lung Cancer Prevention Society was set up to promote radon testing and awareness in Castlegar and was established by Dana Schmidt and his son, Brian Schmidt (2011 Nobel Laureate Physics), following the death of their spouse/mother in 2009.
- The Society has worked with the Castlegar Rotary Club and Golder Associates Ltd. Associates in Castlegar to promote awareness of radon dangers.
- The Society makes testing kits available to the public in Castlegar and other communities in the West Kootenays through the RDCK offices for a suggested donation of \$20
- Recipients are offered the option of making results of the testing known to the Society

# Presentation Summary

- Radon in Castlegar a Brief History
- Community Awareness and Local Government
- Science and Radon Denial – A tribute to Earth Day and Science Awareness

# Castlegar and Radon

- Castlegar seems to have a relatively unique combination of high concentrations of Uranium with soils that allow the Radon gas to move from the rocks into people's houses.



# Castlegar Radon Levels

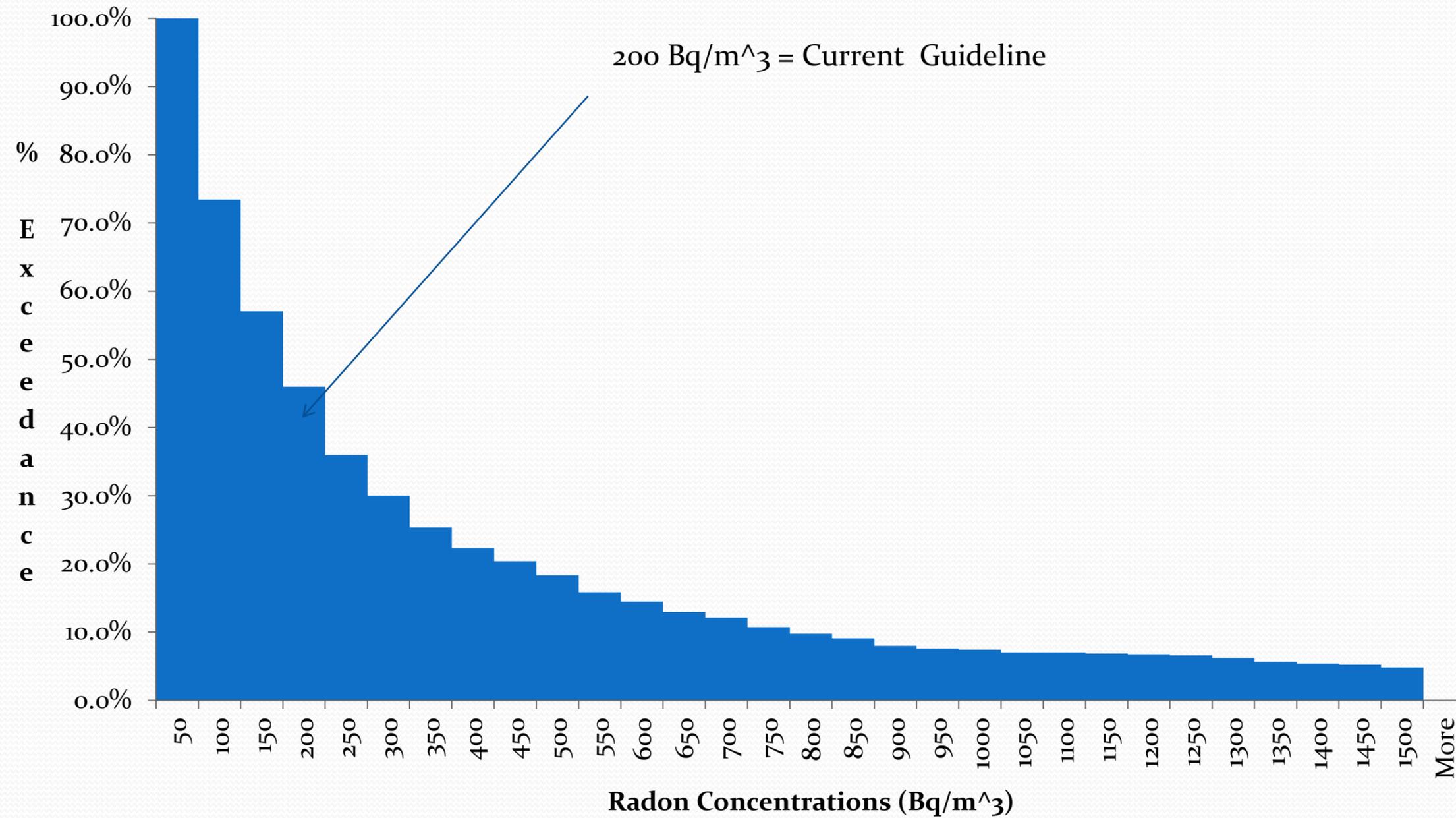
More than 1000 Detectors have been distributed and tracked (others given without tracking information)

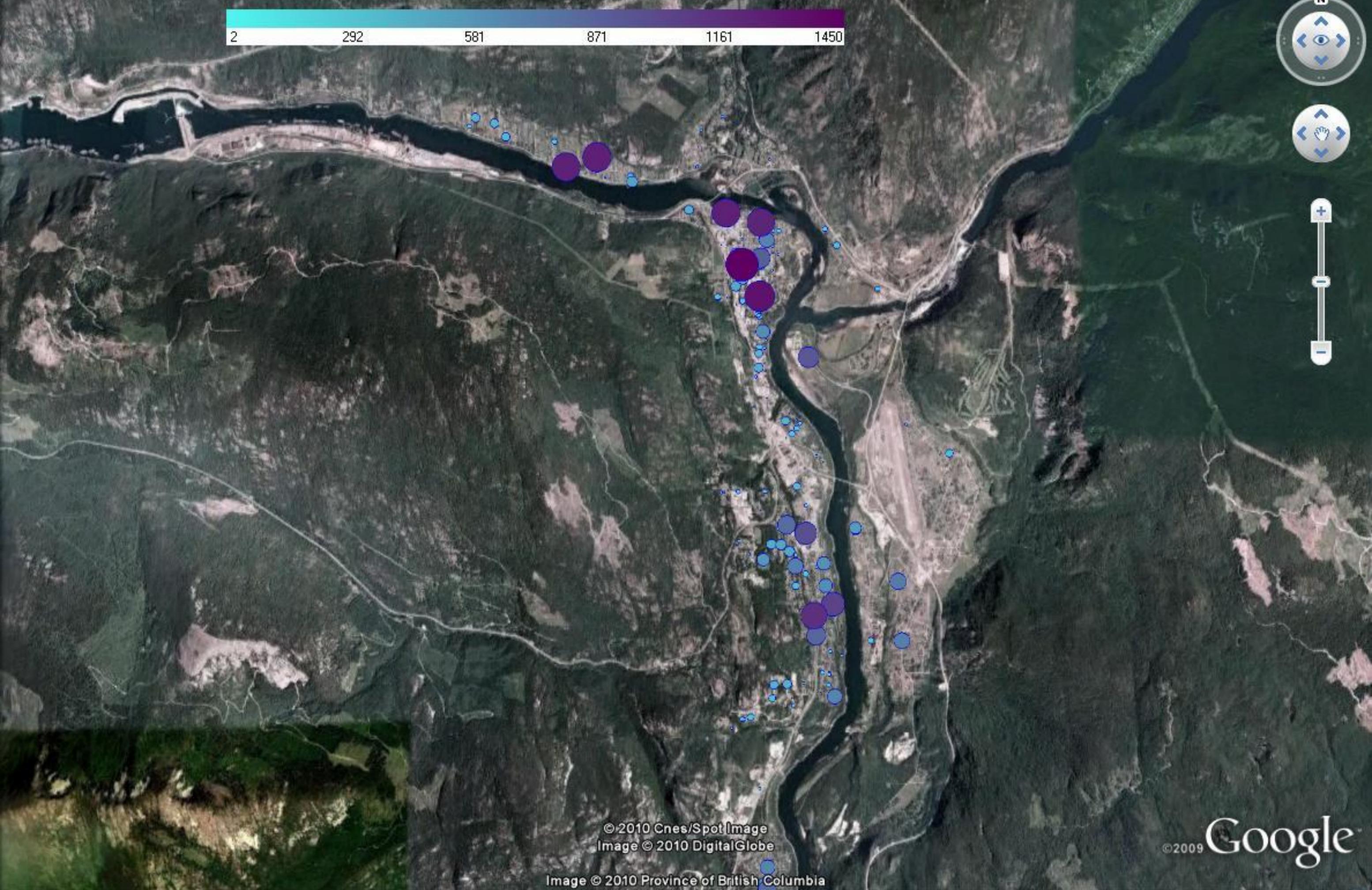
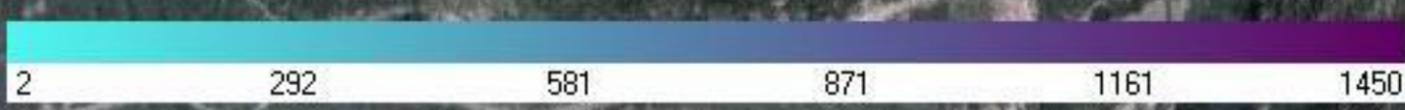
More than 80% Returned and entered into the database;

Typical exposures were for 120 days beginning in March.

44% above Canadian Standards (200 Bq/m<sup>3</sup>; 57 % above US EPA standard (150 Bq/m<sup>3</sup>)

# Castlegar Radon Exceedance





© 2010 Cnes/Spot Image  
Image © 2010 DigitalGlobe

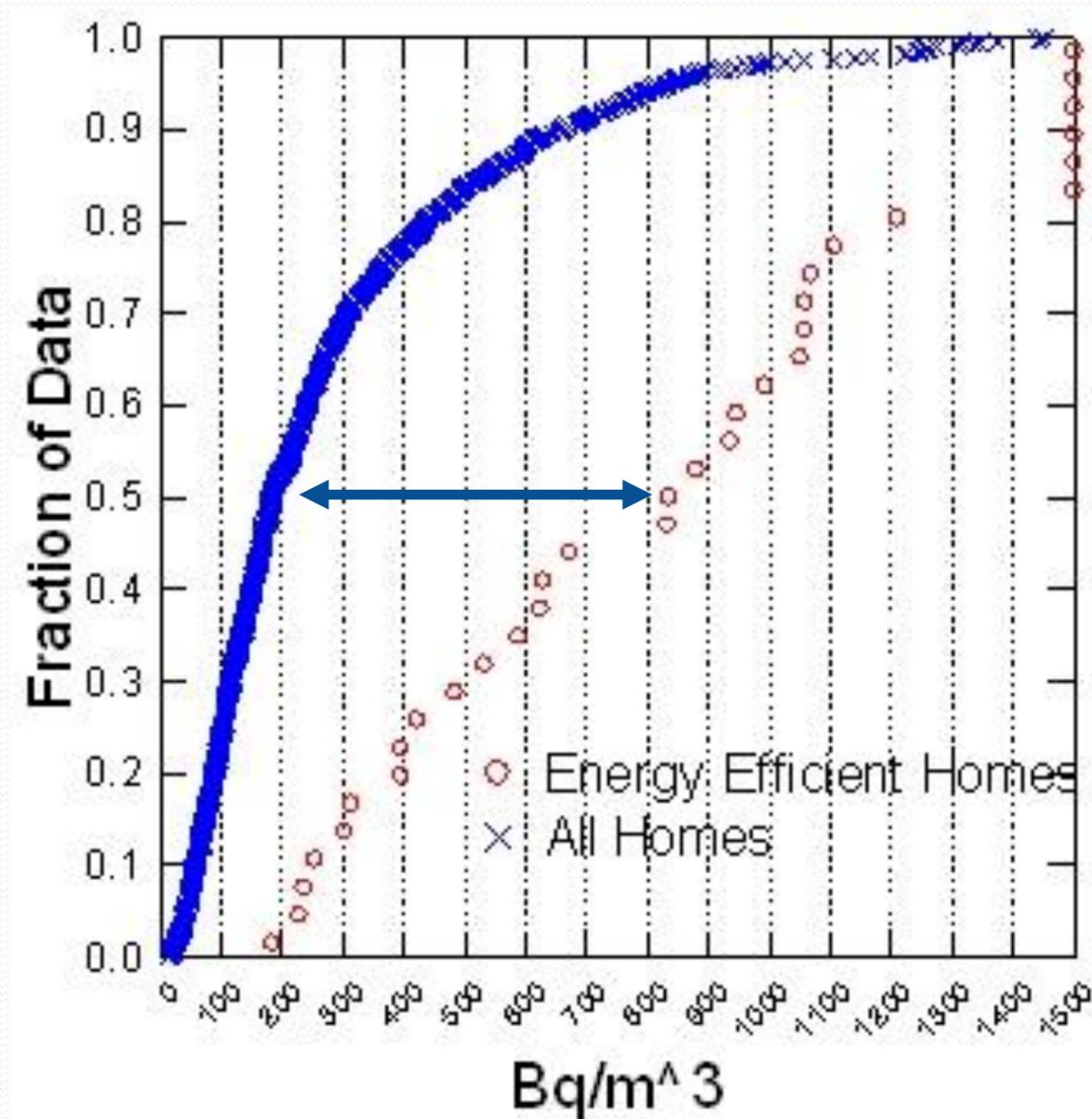
Image © 2010 Province of British Columbia

© 2009 Google

# Castlegar New Homes Radon Summary

- 1000 homes have been sampled with radon levels recorded(44% > 200 Bq/m<sup>3</sup>)
- A subdivision with 33 new homes samples resulted in unexpected high radon levels
- (32 of 33 ~97% were > 200 Bq/m<sup>3</sup>)
- Probable Causes
  - High Radon Level in Soil
  - Energy Efficient Homes with Low Air Exchange Rates

# Comparison of Castlegar Energy Efficient Homes with All Homes Sampled



# Castlegar Bylaw

- Proposed bylaw would require radon resistant construction (passive mitigation) in addition to compliance with 2006 National Building Code.
- Prompted because new homes had higher radon levels than older homes in Castlegar.
- Radon risks to Castlegar citizens were increasing faster than mitigation as new home construction radon levels exceeded mitigation of older homes.
- We were losing ground !

# Radon Resistant Construction-What is it?

- A Building code modification that requires the builder to build radon out.
- Why is it needed? Over 90% of new homes (>30 sample size) tested in Castlegar are above standard. 15% are > 7 times the standard (>1500 Bq/m<sup>3</sup>)
- Castlegar is a radon hot spot, second highest in BC.

# What does it entail?

- Supplements existing building code by requiring sub slab vented pipe connecting to radon pipe through the slab of new homes.
- Requires the pipe to be run through the heated portion of the home to vent through the roof like existing sewer gas pipes.
- Requires an outlet in attic to potentially add fan to vent pipe.
- Costs less than \$300 to a new home

JAN 25 2011

Mr. Phil Markin  
Director of Development Services  
City of Castlegar  
460 Columbia Avenue  
Castlegar, B.C., V1N 1G7

*Holder Associates*

Dear Mr. Markin:

Thank you for your January 5, 2011 letter regarding the City of Castlegar's request to amend the building bylaw to increase standards related to control of Radon gas ingress in buildings.

As you may be aware, the current BC Building Code (2006) is based substantially on the model National Building Code of Canada (NBC 2005). The 2010 NBC contains new requirements relating to control of soil gases, including radon. The NBC lowers the threshold for radon mitigation from 800 to 200 Bq/m<sup>3</sup> which is in line with the current Health Canada guidelines and will require both an air barrier and a rough-in for a subfloor depressurization system.

While Radon is clearly a significant health issue, I note that the presentation to your city council by Dana Schmidt characterized 200 Bq/m<sup>3</sup> as "35 times the acceptable standard", which appears contrary to the published standards of Health Canada and the NBC.

The new NBC requirements are being considered for inclusion in the next edition of the BC Building Code for communities where there is a proven or probable radon risk. They were posted for public comment in September 2010 as part of a package of proposed building code changes for BC. The Building and Safety Standards Branch is currently analyzing feedback received during this public review.

# Rejection of Bylaw followup:

- Area 1 (East of cascade mountain range) was initially targeted for 2012 building code radon mitigation (requiring subslab gas permeable gravel, sealant, and capped potential vent pipe in foundation).
- Following a meeting of myself and other technical representatives, the Lung Association, regulators, and several representatives of the Building Industry, with the Ministry in Victoria, several studies were initiated on the effects of passive mitigation.
- Results and presentations from Castlegar experience and input from many others resulted in changes to the Building Code effective in December 19 2014, resulting in required passive ventilation of all new construction in area 1, essentially encoding Castlegar' rejected bylaw across the Province in "high" potential radon areas.

# Castlegar Experience:

- New energy efficient homes are higher than older homes on average, that have been built with the new radon mitigation building codes
- Radon Resistant construction in the recent new homes initiated by the developer have kept radon levels at about 100 Bq/m<sup>3</sup> without a fan installation (~ 5 new homes-numbers provided by contractor).
- Radon resistant construction is less than \$200 additional per home when compared with costs of following current National Building Codes and works with energy efficient homes without increasing heating costs. This compares to \$2500 or more for retrofitting.

# Rotary and Radon

- The Castlegar Rotary Club completed a demonstration mitigation project with the cooperation of Paul Muntak, a local mitigator with Interior Radiation Protection Service
- We mitigated a home with about 2,000 Bq/m<sup>3</sup> for a single mother where mitigation costs would have exceeded \$10K.
- Included 3 separate large earth based crawl spaces, a root cellar and 2 floor drains.
- Required 4 separate entry points into the primary exterior pipe, which was connected to the exterior fan.
- Moved about 4 tonnes of material by hand out of the crawl spaces.
- 5-7 volunteers worked 6-8 hours on Saturdays over 7 weeks.
- Supplies cost \$3200.
- Reduced basement radon levels by 98% to 40 Bq/m<sup>3</sup>.
- **Project indicated that some homes with dangerous radon levels will never be mitigated without regulatory authority requiring mitigation for real estate transactions or government subsidies.**

# DSLCPs and Castlegar Rotary Project



# Future: What is needed to further reduce lung cancer deaths from radon

- Mandatory reporting of radon levels required for real estate transactions.
- Mandatory mitigation if radon levels exceed Guidelines.
- Without these measures older homes will remain a health hazard as incentives for radon reduction are minimal.
- CARST efforts at Real Estate short term testing guidelines are welcome.

# Science Denial and Radon- A Tribute to Evidence Based Science and Earth Day

- Primary three areas where the public and the overwhelming view of scientists are at odds?
  - GMO's are/are not safe.
  - Vaccines are/are not safe.
  - Climate Change is real/not real and primarily caused/not caused by human activity

# Radon has its own Science Denial Experts

- Examples:
  - Radon Today-The Role of Flimflam in Public Policy-CATO Institute
    - Philip H. Abelson (Famous nuclear scientist)
    - <https://object.cato.org/sites/cato.org/files/serials/files/regulation/1991/10/v14n4-10.pdf>
    - COMMENTARY: Should Homeowners Consider the Radon Threat a False Alarm?  
By Stephen Moore.-CATO Institute
    - <https://www.cato.org/publications/commentary/should-homeowners-consider-radon-threat-false-alarm>

# Science and Radon Denial cont.

- Radon Risk and Cancer (<http://www.forensic-applications.com/radon/reviews.html>)
  - Caoimhín P. Connell
    - Forensic Industrial Hygienist
- One of the most cited websites by opponents of radon testing and mitigation.
  - *“.....Most people are not aware of the fact that there are actually no conclusive studies that have ever demonstrated that exposure to indoor radon, as commonly seen in the overwhelming vast majority of houses, increases the risk of cancer by any amount, and in fact, in the larger and better studies, what we see is that the risk of cancer actually goes down with increasing radon concentrations; to a critical elevated level (not seen in houses) wherein the risk then begins to rise. But those kinds of radon levels where risk increases is virtually never seen in houses.”*

# Science and Radon Denial cont.

- Rebuttals have been presented by various academics of all of the major points made by Mr. Connell, but the overall methods and characteristics he uses are common by Science Deniers.
  - Claim there argue no valid studies to support current government policies concerning radon, climate change, vaccinations, GMO's.
  - Claim that the government regulators responsible for agriculture, human health, environment, are political and don't use science
  - Either select only studies that support view or invalidate all other data as not relevant unless it supports their "fringe" views.
  - Uses sarcasm, personal attacks, etc.
  - Never publish in peer reviewed journals with high credibility in the science community
  - No particular outstanding expertise in the subject matter
- Not surprising Mr. Connell also supports "global warming" as a myth:
  - ([http://www.inspectorsjournal.com/forum/topic.asp?TOPIC\\_ID=4248](http://www.inspectorsjournal.com/forum/topic.asp?TOPIC_ID=4248))

# How to distinguish valid science from denial science:

- Are authors scientists with CV's indicating expertise in the field?
- Are the research or reviews of research published in peer review publications that have broad acceptance in the Scientific Community?
- Are the reviews objective and lack attacks of accusing alternative motives (e.g. financial, lie to get grants, political correctness)?
- Does the review include reports that don't support the final conclusions of the report (no data cherry picking)?

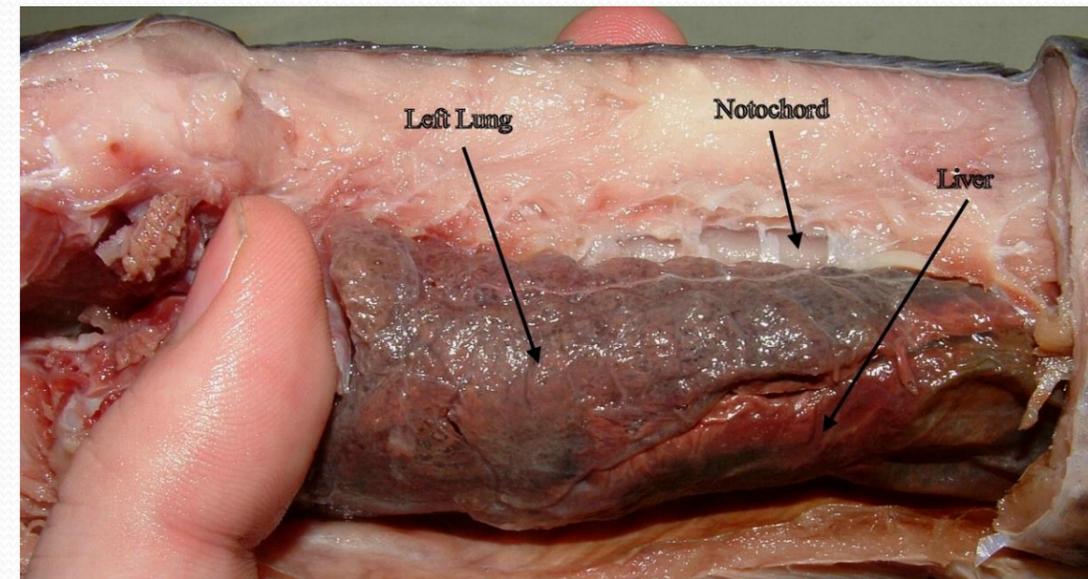
# Radon Health Effects Science Based Reviews

- US National Academy of Sciences “Biological Effects of Ionizing Radiation” Reports (BEIRS IV, VI, and VII) primarily address current status of literature and summarize and conduct independent analyses of lung and other cancer data related to radon.
- Most government studies used in developing radon guidelines are based on these reviews and others conducted and published in peer review journals (EPA, Health Canada)
- BEIRS reports are free and available online (<https://www.nap.edu/download/5499>) for BEIRS VI for example.

# Conclusions: Radon is a real and major health risk

- Be informed of Science Deniers arguments that attempt to invalidate the work of both government and professional radon mitigators and measurement specialists.
- Accept new valid science, even if it undermines your business. If science says new thresholds are supported or other methods less expensive are more cost effective, accept these findings and make them part of your business.
- Keep advocating for regulatory reform to reduce household and workplace radon!

# Radon Olympics - Controversy



- Some fish do have lungs!
- Like: the Lung fish: When in doubt, ask a fish biologist.

# Pick up your Free Radon Detector Here!!

<http://dsradonprevention.org/> (under construction)



Contact Dana Schmidt at  
[dschmidt@dsradonprevention.org](mailto:dschmidt@dsradonprevention.org)  
Stop in at Golder at 201 Columbia Avenue for free detectors  
in the Kootenays or presentations on Radon. Also are  
available at the City Offices.

250-305-8837