Objective: In 2005 and 2006, the Federal Emergency Management Agency (FEMA) procured approximately 144,000 travel trailers, park model trailers, and mobile homes for residents displaced by Hurricanes Katrina and Rita. Early on there were complaints of irritating odors and health effects which were linked to the formaldehyde emitted from the trailer construction materials and fittings. This presentation focuses on a graphical and statistical analysis of the formaldehyde measurement data collected by federal and state agencies, trailer manufacturers, a public advocacy organization, and various consultancies.
Methods: The datasets were evaluated for anomalous entries and then combined, resulting in over 10,000 measurements with over 3,200 measurements coming from government sources. Graphs and tables were produced that permit a comparison of the data by source, manufacturer (given surrogate names in this analysis), model, and time period. Statistical tests were used to compare the data to various limits for formaldehyde. Exposure decay models were fit the data to predict levels at the time of manufacturer and initial occupancy.
Results: The majority of the measurements were collected from units that were 1.5 and 2.5 years old at the time of sampling. The median level for most manufacturers was approximately 0.1 ppm. Both parametric and non-parametric statistical tests strongly suggest that the levels in these travel trailers were consistently high relative to authoritative guidelines for public formaldehyde exposure. Decay models suggest that formaldehyde levels in new trailers were considerably greater than the measured levels and that several more years would be required for decay to arguably acceptable levels.
Conclusions: The datasets were consistent in terms of spread and central tendency, regardless of data source and manufacturer, measurement method, and measurement averaging time. Each of these datasets indicate that formaldehyde levels in travel trailers of this period tended to be elevated, relative to the various guidelines.

SR-121-03
Air Contaminants Inside and Outside Rural Homes Near Biosolids-Applied Agricultural Farm Fields

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Objective: The study evaluated air quality inside and outside three study and three control homes selected based on proximity (up to 1 km for study and 10 km for control homes) to farm fields applied with biosolids as fertilizer.
Methods: Homes were sampled in pairs (one study, one control) simultaneously for 72-hours at a time. Each home was sampled 6 separate occasions providing a total of 36 home visits. Real-time integrated and instantaneous monitoring instruments were used to sample air contaminants at 2 stations, one inside and one outside each home. Instruments were set up 1m above the floor inside and 1.5m above the ground outside with the instruments' inlets facing into the dominant wind direction. Integrated data were logged at one-minute intervals. A weather station monitored climatic factors outside homes.
Results: The levels (ppm) of volatile organic compounds (VOCs) ranged up to 21 inside and 52 outside homes. The mean levels of VOCs were higher inside than outside both study and control homes and were significantly lower inside study compared to control homes. The levels of hydrogen sulfide were generally non-detected inside or outside homes. The levels of ammonia (ppm) ranged up to 3.5 inside and 14.6 outside homes. On average, the levels of ammonia were lower inside than outside in both study and control homes and were significantly higher inside study homes than those in control homes. The levels of carbon dioxide (400- 2823 ppm), carbon monoxide (0.0-4.9 ppm) and ultrafine particles (802-128000 count/cc) were not significantly different inside or outside study homes compared to those in control homes.
Conclusions: The results indicated that home proximity to biosolids-applied agricultural farm

fields did not significantly contribute to higher air contamination but the issue deserves further investigation.

SR-121-04
Evaluation of Carbon Monoxide Exposures during the Operation of Recreational Watercraft

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Objective: The purpose of this study was to document the potential for adverse human exposure to carbon monoxide (CO) emissions during recreational activities associated with ski boats. The specific aim of this the study was to monitor the range of CO concentrations emitted from a boat's propulsion engine at idle and under load conditions that mimicked the towing of a wake surfer five feet behind a boat.

Methods: CO emissions from six boats were monitored, three having inboard propulsion engines and three having outboard propulsion engines. During engine idling, real-time CO concentrations were monitored at thirty locations adjacent to and behind the stern of a boat using a real-time Bacharach Monoxor® II CO analyzer. This same analyzer was used to monitor CO concentrations in the breathing zone of an individual situated on a floatation device being towed behind a boat at speeds ranging from 5–10 miles per hour. During the monitoring of each boat a TSI® QTrak™ was fixed to a passenger seat location to monitor atmospheric temperature, relative humidity, carbon dioxide (CO_2), and CO concentrations. Wind direction and speed was documented using an Inspeed™ Vortex Visual Vane and Vortex Wind Sensor anemometer, respectively.

Results: Results from samples collected under idling conditions and behind the stern of a boat showed that CO concentrations ranged from 1800 ppm to 5000 ppm at swim ladder and swim platform locations. Breathing zone results collected while mimicking a wake surfer being towed five feet behind a boat ranged from 80 ppm to 500 ppm.

Conclusions: Results from this study suggest that exposures received by passengers performing typical recreational activities on ski boats have the potential to exceed World Health Organization 15-minute average concentration recommendations of 87ppm and NIOSH ceiling and IDLH recommendations of 200 and 1200 ppm, respectively.

SR-121-05
WITHDRAWN – The Association between Residential Proximity to Swine Animal Feeding Operations and Childhood Asthma

B. Pavilonis, The University of Iowa, Iowa City, IA.

CS-121-06
Bed Bugs – What to do About Unwanted Houseguests

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Situation/Problem: Infestations of bed bugs are increasing at an alarming rate and have become a major public health concern. Despite the attention given to bed bugs from the general public, researchers, government agencies, and pesticide companies, there is a lack of understanding about how to manage bed bugs.

Resolution: At a workshop conference session at the Canadian Public Health Association Conference in 2010, public health practitioners, researchers, and pesticide control companies came together to discuss the best management and control strategies to deal with bed bugs. We reviewed the scientific literature, US EPA bed bug summit documents, and best practice reports from various international health agencies to supplement information gleaned at the workshop session.

Results: Bed bug policy and practice can be changed at various levels: 1) On a national level, research can be done to identify effective but least toxic pesticides; 2) at all levels of government, bed bugs can be declared a health hazard, 3) at all levels of government, Public Health can be involved with surveillance of bed bugs, 4) at a local level, Public Health can facilitate collaboration and educate the public and others, and 5) at an individual level, the public can avoid picking up bed bugs, recognize signs of bed bug infestations, and implement best practices for dealing with bed bugs when

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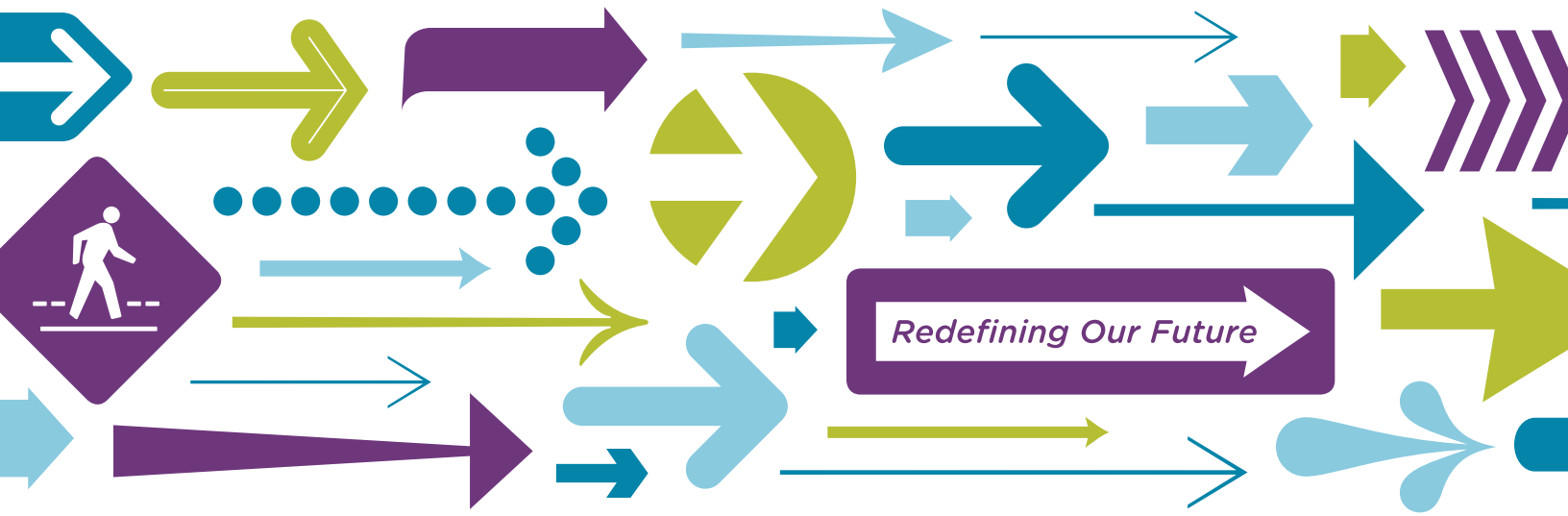

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