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HIRI NEWS



Biogenic Emissions and Large-Scale Tree Planting, Cool Roofs in CA, Toronto Heat Island Summit, Policy Adoption, and HIRI Update

Call participants

Hashem Akbari, LBNL

(h_akbari@lbl.gov)

Alex Camacha, Tucson

(camadesal@aol.com)

Kathy Diehl, Region 9

(boston.sandra@epa.gov)

Niko Dietsch, EPA

(dietsch.nikolaas@epa.gov)

Jerriann Ernten, Salt Lake City

(jernstse@dced.state.ut.us)

Jeff Luvall, NASA

(luvall.jeff@msfc.nasa.gov)

Lisa Gartland, Sacramento Cool

Communities Program

(lisa@pstvnrg.com)

Lucie Griggs, Atlanta Cool

Communities Program

(lwgriggs@hotmail.com)

John Karlick, University of California

Cooperative Extension,

Bakersfield

(jfkarlik@ucdavis.edu)

Gordan Kenna, Atlanta

(gkenna@mindspring.com)

Kris Kiehne, Sacramento Cool

Communities Program

(kriskiehne@yahoo.com)

Ash Lashgari, California Air

Resources Board (CARB)

(klashgar@arb.ca.gov)

Ronnen Levinson, LBNL

(rmlevinson@lbl.gov)

Eva Ligeti, Toronto Atmospheric

Fund

(eligeti@city.toronto.on.ca)

Craig Muccio, Florida Power & Light

(C_V_Craig_Muccio@fpl.com)

Steve Marquardt, Region 5

(marquardt.steve@epa.gov)

Chris Patton, Los Angeles

(cpatton@ead.lacity.org)

Mel Pomerantz, LBNL

(m_pomerantz@lbl.gov)

Meryl Redisch, Tree Utah

(mredisch@treelink.org)

Maria Sanders, ICLEI

(msanders@iclei.org)

Fran Stewart, Louisiana DEQ

(frans@deq.state.la.us)

Ray Tretheway, Sacramento

Tree Foundation

(ray@sactree.com)

Arthur Winer, University of

California Los Angeles (UCLA)

(amwiner@ucla.edu)

Eva Wong, EPA

(wong.eva@epa.gov)

Jim Yarbrough, Region 6

(yarbrough.james@epa.gov)

Andy Youngs, California

Cement Promotion Council

(ayoungs@sunset.net)

Biogenic Emissions Briefing

Professor Arthur M. Winer from UCLA and Dr. John Karlick from the University of California's Cooperative Extension Program

spoke about the importance of considering biogenic emissions in large-scale urban tree planting programs.

Dr. Winer began investigating the connection between biogenic hydrocarbon emissions and the urban heat island effect in the 1990s. He collaborated with Hashem Akbari (at LBNL) and others in 1995 to study how low-emitting tree species could be integrated into a comprehensive strategy to offset increasing summertime urban temperatures. Dr. Winer believes it is important to consider a tree's biogenic emission rate in addition to other common metrics (e.g., pesticide resistance, hardiness, sequestration, ease of maintenance, canopy size, and stormwater absorption) when evaluating planting options.

Biogenic emission rates are plant species specific and can vary by orders of magnitude. The cumulative contribution to ambient ozone varies greatly by geographic region, but it is especially important in areas with few anthropogenic sources. Large biogenic emission fluxes occur in the East Coast and Pacific Northwest, where extensive forest land is present.

Dr. Winer said that a portion of his work on biogenic emission has been funded by the California Air Resources Board (CARB) and the California Institute for Energy Efficiency (CIEE). However, he noted that much of this research remains in peer-reviewed journals with limited opportunity to influence policy. Dr. Winer stressed the importance of making biogenic emissions research available to a wide audience that includes NGOs, advocacy groups, and government officials.

Next, Dr. Karlick talked about his field research in places like Phoenix and Santa Barbara. He said that the best possible application of his work would be influencing tree planting projects in their early stages, when information on biogenic emissions from trees could help make planting decisions. Dr. Karlick emphasized that he does not believe existing high-emitting trees should be cut down and replaced by low emitting species.

When considering tree planting options, the net effect on ambient pollution – that is, a tree's ability to capture pollutants compared to its natural emissions – is ultimately what matters. The potential for a tree species to act as a pollutant sink is an especially important factor in the low and medium categories of emitters. (In the case of high-emitting trees, it is unlikely that captured pollutants will offset emissions.) Ash Lashgari from CARB also mentioned that Dr. Micheal Benjamin and Klaus Scott from CARB are examining the net effects of trees and are developing a comprehensive rating method.

Dr. Karlick added that biogenic deposition can have a readily observable effect on microclimates. Emission rates do not change with geographic location, and effects on microclimates are observed mainly

in conjunction with a high concentration of certain species. In addition, Dr. Karlick noted that scientists know significantly more about isoprene than monoterpene emissions.

Even though most research to date has focused on Californian species, there is still much to learn about trees endemic to this state. There are over 6,000 plant species in CA alone, and direct emission rates have been measured for only a few hundred tree and shrub species.

Based on the finding that only certain plant families emit biogenic hydrocarbons, several researchers have employed a taxonomic methodology for assigning emission rates to species for which no measurements exist. Dr. Winer and his colleagues used measured isoprene and monoterpene emission rates for 124 tree and shrub species in the California South Coast Air Basin (SoCAB) to assign emission rates to 253 other species, for which there were no emission rates. The results were presented in *Atmospheric Environment*, and the methodology can be applied to other geographic areas to assist in planting low-emitting urban forests.

Ash suggested that people use remote sensing or GIS in their tree planting efforts to provide scientists and planners with ground-truthed data, which has important implications for urban planning and policy-making. The Forest Service, recognizing this, is doing urban canopy analysis work for the first time.

Update on CA's Cool Roof Retrofit Program

Dr. Lisa Gartland from PositivEnergy and a Cool Roof Retrofit Program Administrator, provided an update on the California Energy Commission's (CEC) Cool Roof Retrofit Program in California. The CEC has made several changes to the program, including renaming it the "Cool Savings Program."

Lisa described the major changes. First, roof insulation is no longer the primary determinant of the rebate-level. New guidelines for determining rebates are based on the type of building under consideration. Second, the CEC raised the rebate levels. The highest rebate – \$0.25 sq. ft. – applies to refrigerated-building roofs, while rooftop ducts and other non-residential buildings are eligible for \$0.20 sq. ft. Third, the deadlines have been extended, and rebates are in effect until September 30, 2001, after which they decrease by \$0.05. The program ends at the end of November, 2002.

Lisa also mentioned that the length of coverage in the program's warranty is now a minimum of two years on installation, and a minimum of five years on materials. She stated that the short warranty period has the effect of sending the message that cool roofs are not as durable as their traditional counterparts. Lisa believes that the reflective and emissive roofs covered under AB 970 can last at least as long as traditional roofs.

Kris Kiehne from the Sacramento Cool Communities Program (SCCP) followed up by noting that qualifying reflective roofs are certified Energy Star products that generally have their own extended warranties. Thus, program warranty may be superceded by the manufacturer's

provision. Energy Star, however, does not have an emissivity requirement, whereas the Cool Savings Program does.

Lisa also mentioned that Senate Bill 5X (SB 5X) provided an additional \$14.5 M of program funding, bringing the total to \$24.5 M. Of this, approximately \$2 M has been committed. The CEC and Cool Savings Program Administrators believe progress has been slow mostly because the program hasn't been widely advertised. Cool roof products generally cost the same as traditional roofs and save money on summer cooling. Thus, lack of information probably explains much of the low participation levels. To address this problem, the CEC is launching a statewide marketing campaign that will include radio and business-journal announcements, in August.

The CEC also plans to examine consumer behavior in response to program interventions, media messages, price and rate changes, and triggers – such as the energy crisis. For the Cool Savings Program, the CEC will conduct interviews to identify reasons why consumers purchased or did not purchase cool roof products. Washington State University will perform this study.

ICLEI's Policy Adoption Campaign

Maria Sanders from the International Council for Local Environmental Initiatives (ICLEI) talked briefly about the organization's upcoming heat island policy adoption project. ICLEI plans to work with four or five cities to codify policies and ordinance language on heat island mitigation. The project goal is for cities to implement a local policy package, which ICLEI developed under a previous grant with EPA.

ICLEI plans to mail a solicitation to officials currently involved in its Cities for Climate Protection campaign this fall. Maria hopes to leverage local interest in addressing greenhouse gas emissions for the heat island policy adoption project. Several cities have already inquired about the policy adoption project.

Heat Island Summit in Toronto

Eva Ligetti, of the Toronto Atmospheric Fund (TAF), discussed the group's recent Smog Summit as well as next year's North American Heat Island Summit. Eva hopes to bring the excitement generated at the Smog Summit to the upcoming heat island event.

The Smog Summit, held in Toronto from June 17th-21st, brought together community, industry and government leaders from around the world to explore solutions to urban smog and showcase examples of best practices. Canadian federal, provincial, and municipal government leaders signed the 2001 Intergovernmental Declaration committing to the establishment of a Council to tackle smog and climate changing emissions. Representatives from 16 local governments (from 12 nations) including Copenhagen, Melbourne, St. Paul, Portland, and Glasgow also participated in the Smog Summit and signed the Toronto International Declaration. Smog Summit proceedings should be available this Fall. (Please contact TAF or HIRI for copies of the Declarations.)

The theme of the Heat Island Summit is "urban adaptation to extreme summer heat." The

Summit is scheduled for late March or April 2002. Eva plans to send out a call for papers soon and requested the group send suggestions for making the Summit a success. Visit TAF's website for more information on TAF's Cool Toronto Project: http://www.city.toronto.on.ca/taf/cool_toronto.htm.

New at HIRI

The Heat Island Reduction Initiative team – Eva Wong, Niko Dietsch, and Edgar Mercado – is working with Lawrence Berkeley National Laboratory (LBNL) and Tulane University to select seven to eight domains in the U.S. to evaluate the impact of heat island reduction measures (HIRM) on local meteorology and air quality. This "streamlining" effort will be research oriented as opposed to providing information that can be fed into a State Implementation Plan (SIP). LBNL and Tulane will perform meteorological modeling using PSU/NCAR MM5. Based on (1) the severity of current and expected near future ozone problem; (2) cities' diversity with regard to comparing HIRM affects; (3) cities' interest in HIRM as a potential ozone reduction strategy. The following domains are being considered:

(1) California: LA-Bakersfield-Fresno, San Joaquin Valley, Sacramento with San Francisco East Bay, Visalia-Tulare-Porterville, San Diego, and Merced; (2) Dallas-Ft. Worth and Tyler; (3) Grand Rapids and Detroit; (4) Phoenix and Tucson; (5) Washington-Baltimore-Philly; (6) Charlotte-Knoxville-Memphis; and (7) Baton Rouge and New Orleans.

Niko briefly discussed preparing a submission for the "Physical Fitness of Cities" building design exhibition in Salt Lake City, UT. Niko

requested the group send him good heat island-related photographs (e.g., images of urban shade trees, cool roofs, reflective paving material) for the application and for EPA's heat island website. The exhibition, which is an international combination of art and policy, will run concurrently with the 2002 Olympic Winter Games from Feb. 1-Mar. 30, 2002. If the HIRI application is accepted, information on heat island reduction measures would reach a wide and varied audience. For more information, see:
<http://www.fitcities.org/english/about.htm>.

**The next conference call
will be in September.
Stay tuned for the date,
call-in number, and
access code.**
