Episode 43c to 43h
October 8, 2022

Episode 43c, 1 of 2, Science Magazine's supralinear PM2.5, Public Comments, and Cobb, Georgia

Mary noted that Science Magazine, in an article titled "How low can you go?" measured the supralinear concentration-response relationship between outdoor PM2.5 and mortality at very low (less than 5 micrograms per meter cubed) concentrations. Researchers wrote that an "updated global concentration-response function incorporating supralinear new information suggests an additional 1.5 million deaths globally attributable to outdoor PM2.5 annually compared to previous estimates. The global health benefits of meeting the new W H O guideline for outdoor PM2.5, of 5, are greater than previously assumed and indicate a need for continued reductions in outdoor air pollution around the world." Mary noted very informative and detailed maps in the study, from around the world, which showed that PM2.5 even below W H O standard of five micrograms per meter cubed would affect mortality. Supralinear means greater than the line, or above the line of what was expected. So Science Magazine found actual outdoor PM 2.5 and actual mortality had a greater than expected-by-probability relationship even at PM2.5 concentrations below 5 micrograms per meter cubed.

As explained in detail in Episodes 42 and 43a, Mary noted that Public Comment was now being solicited by the American Lung Association (A L A) for U S citizens to sign an A L A letter to the E P A requesting lowering the E PA standard of PM 2.5 from 12 to 8 micrograms per meter cubed, and Public Comment was now being solicited by U S Treasury notices and at U S Treasury online meetings open to the public regarding funding from the Inflation Reduction Act for Incentives for Homes and Buildings, which incentives could include PurpleAir PM 2.5 Particulate Monitors for near neighbors of residential wood burners in order for enforcement of laws, and alternative heating appliances, such as Dual Fuel Heat Pumps which are effective down to -20 degree Fahrenheit, to replace residential wood burning appliances. Mary also noted that Episode 43 gave instructions on how to create Excel Spreadsheet evidence of hyper-localized residential wood burning PM 2.5 emissions above 12, 8 or 5 micrograms per meter cubed in a 24 hour period, using data from a neighbor of a residential wood burner, using the neighbor's PurpleAir PM2.5 monitor.

Mary noted an announcement that the Cobb Georgia, outdoor wood burning season had begun. There were some restrictions on outdoor wood burning. Only clean wood may be burned. Clean wood means natural wood which has not been painted. Mary did not think these restrictions made much difference in the amount of PM2.5 that would be emitted by this allowed outdoor wood burning. In Episode 43, the Courtenay, British Columbia, Canada, engineer poster presentation concluded that the way to lower PM2.5 emissions was to regulate excessive wood smoke from a chimney to measure emissions, instead of regulating components of the fire. Georgia had a warm climate. Central heating with alternatives to wood burning could eliminate residential wood burning to heat a home. Why was outdoor wood burning considered necessary, and why was there a season for outdoor wood burning? If outdoor wood burning was considered necessary to burn farming stubble, as was done in India and in the San Joaquin Valley, that stubble could be hauled away by the government and used for mulch or other purposes as was being done in the San Joaquin Valley recently. If it was considered necessary to have bonfires at sporting events during the school year that recently began, that was fallacious reasoning. The bad effect of outdoor wood burning on the air quality outweighed any arguments for traditional-event-related wood burning. Mary did not think it was necessary to build a wood fire to melt a marshmallow. That could be achieved with a propane gas portable stove on a picnic table.

Episode 43c, 2 of 2, Dogwood Alliance Postcards, in North Carolina, allege environmental racism by Drax, in alliance with President Biden

Mary noted, after learning of President Biden's focus on Drax's environmental racism of placing it's PM2.5 polluting wood pellet plants in disadvantaged communities in the U S South, that the Dogwood Alliance was a community organization behind many of the ideas brought up by President Biden. The materials that dogwoodalliance.org had on its website encouraged people to be part of the solution of the PM 2.5 pollution in their North Carolina community caused by the companies Enviva and Drax. The website said Passing an anti-biomass resolution, ordinance or moratorium in your city or county will send a strong message to industry executives and policymakers that we stand united in demanding a clean and sustainable future. Dogwood Alliance Organizing Resources include a Community Toolkit This toolkit provides a framework for passing an anti-biomass resolution or ordinance. Each community is unique and will require differing and creative strategies and approaches. Campus Organizing Guide Community Voices Rising Up with Richmond County The people of Richmond County North Carolina are already suffering the impacts of environmental injustice from dirty industries. Now they are fighting back against an Enviva wood pellet plant that would be built in their

community. Selling Out Sampson County A community in eastern North Carolina opposes the construction of an Enviva wood pellet facility in their neighborhood. Injustice in Northhampton Residents living near Enviva's wood pellet facility in Garysburg, North Carolina, speak about the disruptive impact of the plant on their community. Resources include Organize Your Community Voices From Frontline Communities Biomass Air Quality Fact Sheet Mary thought the postcard project was something that anyone could do to help. https://www.dogwoodalliance.org/actions/postcards/ Postcards from Polluted Places North Carolina exports more wood pellets than any other state in the nation. North Carolina Governor Roy Cooper claims to be a climate champion. He's passed several executive orders on climate change and environmental justice. Yet his Administration keeps handing out taxpayer funding and greenlighting permits for the expansion of the wood pellet industry. The Impacted Communities Against Wood Pellets Coalition (I C A W P C) is leading the movement to oppose this dirty industry in North Carolina. We've sent thousands of "Postcards from Polluted Places" to Governor Cooper urging him to halt the expansion of the wood pellet industry. Now the coalition wants to take the campaign global, and you can help. Send Governor Cooper a message to stop the wood pellet industry. Then you can download your free postcard, personalize it, and mail it to his office. Mary noted that wood pellet plant expansion targets the North Carolina environmental justice community. A logging truck enters the Enviva plant at Ahoskie, in Hertford County, North Carolina. The small town of Ahoskie sits on the edge of Hertford County, in the rural northeastern corner of North Carolina. The mostly Black county is among a cluster of the poorest in the state and is part of the South's Black Belt, a region that before the Civil War was shaped by the plantation system and now by poverty, disparities in education, and poor health outcomes. Hertford has been ranked one of the state's unhealthiest counties, at 89th out of 100, with heart disease and cancer posing the greatest risks for residents. For the past 18 years, Ahoskie residents have faced another health challenge from the local operations of Enviva, the world's largest producer of industrial wood pellets. The process of manufacturing wood pellets, from cutting down trees to transporting logs to be dried, compressed into pellets, then shipped overseas, releases massive amounts of carbon dioxide, volatile organic compounds, and other air pollutants. The emissions have been linked to health problems including cancer, respiratory illness, birth defects, and organ damage. The North Carolina state Department of Environmental Quality is now considering whether to issue an air quality permit allowing Enviva to increase pellet production at its Ahoskie facility from 481,800 tons to 630,000 tons per year. Fighting the plan is a coalition called Impacted Communities Against Wood Pellets (I C A W P) that includes affected local residents as well as Dogwood Alliance, a Southern forest advocacy group based in Asheville, North Carolina. In its permit application, Enviva promises to upgrade equipment to cut dangerous air emissions by burning them. But the increased capacity would result in 47% greater greenhouse gas emissions from the plant, which is already emitting 163,000 tons of greenhouse gas emissions annually. Among North Carolina residents who testified against the permit request at an August hearing, one resident described how when she visited a friend who lives near the plant she woke up the next morning with a cough, burning eyes, and a runny nose. She doesn't think it's mere coincidence that companies like Enviva are operating in communities like hers. "We're undervalued. The poor communities are always shafted" she said, "And they (Enviva and Drax) don't care."

Episodes 43d and 43e

Episode 43d In Oregon, Air Purifiers are handed out

Wendy noted that, in California, the San Joaquin Valley is now acclaimed for how it is tackling PM 2.5 pollution. Wendy noted that, in Oregon, Air Purifiers are being handed out to residents in Oakridge and Westfir. Summer wildfires often blanket the region with smoke, while winter wood-burning prolongs the problem of PM 2.5 pollution. Smoke obscures traffic traveling on Highway 58 on the east side of Oakridge. An initiative enabled by Oregon Senate Bill 762 will help some Oakridge and Westfir residents breathe easier. A sign identifies the Oakridge Air offices on the eastern side of town. The Oakridge area has recurring issues with clean air. Oakridge Air. Is partnered with Oregon Health Authority to distribute air purifiers for locals on Medicare or Medicaid. "I don't want to put a cap on it but as long as we're being inundated with smoke, we're confident we can meet the need," the program manager for Oakland Air said. An air purifier unit is in Oakridge Air's office. Besides people with sensitive respiratory or cardiac conditions, the program manager added that they're also working to protect children. "We've partnered with the Oregon Health Authority (O H A) and the Oregon Department of Human Services to get large air scrubbers to the school districts, because when the children are in school, they're in buildings that can trap smoke in throughout the days," said the program manager. "And then some small individual room purifiers, to keep the air pure in the school." Oakridge and Westfir residents can

inquire at Oakridge Air's website or office between 8 to 11 A M on weekdays to see about procuring their own purifier. Wendy noted that a new study showed lower test scores from wildfire smoke exposure. Wendy noted that a new study showed anemia caused by PM2.5 for women of reproductive age.

Episode 43e Failed Ordinance versus Fire Pits in New Jersey

Noel noted that, in New Jersey, in a demonstration of government dysfunction, Lavallette Officials Didn't Reach a Consensus on Regulating Fire Pits. Noel feels that Lavallette Officials should follow the science, rather than weighing all viewpoints equally, no matter how nonsensical. A long-discussed measure to regulate the use of fire pits in Lavallette is no closer to being passed since viewpoints among officials differ greatly in terms of the scope of the would-be ordinance. Even among residents who have spoken at borough council meetings, there is no true consensus regarding the breadth of potential regulations, or whether there should be regulations at all. A few residents have occasionally brought the matter up to the governing body, normally with the complaint that smoke from wood-burning fire pits can enter their homes and become bothersome. A smaller number of residents have said fire pits should be banned outright due to fire risk. Lavallette, like all towns in New Jersey, defaults to state statutes when dealing with fire pits. While uncontrolled bonfires are not permitted, fire pits are legal as long as any "open flame container" is located 25 feet from a structure, which could mean a home, garage or deck. Some fire pits may require anti-flame matting so the surfaces on which they stand do not catch fire. Some on the council have called for more stringent local regulations via ordinance, but others have questioned whether such an ordinance would be enforceable over the state statute, and whether such additional regulations constitute a "nanny state" nuisance that could pit neighbor against neighbor. "It's not an easy solution to say, 'you can't have something,'" said a Councilwoman who leads the borough's ordinance committee. "The exception would be for open flame, wood-burning fire pits." She envisions an ordinance that would allow "smokeless" fire pits but prohibit wood-burning fire pits with open flames. "The problem ones are those with an open flame, primarily wood-burning, that cause the issues." The issue, of course, is that "someone will have to go out and enforce it." "There was a suggestion where we institute a licensing scheme where people need to obtain a license, and if they violate the rules the license could be revoked," said the Lavellette Mayor. Councilman David Finter said he supported a ban on wood-burning fire pits, "period." Resident David Geer said he was in favor of regulations. "The state law is 25-feet. We don't have 25-feet," he said, referencing the size of lots in Lavallette. "Whether it's a lot of smoke or a little bit of smoke doesn't matter. If it's coming into your backyard, it's still an annoyance. It's also a safety hazard." The leader of the ordinance committee said the ordinance committee may re-investigate the issue for a later recommendation.

Episodes 43f and 43g

Episode 43f Drax in the U K

Island noted that many news outlets were covering the Drax wood burning power plant's PM 2.5 emissions, or its CO2 emissions. The U K news outlet Panorama released a 30 minute video titled "The Green Energy Scandal Exposed". The first few minutes explain burning wood creates more CO2 than coal burning (particulates of PM 2.5 size not mentioned, health effects not mentioned), but Greenhouse Gases created by Wood Burning don't have to be counted in the U K. The Professor John Sterman of Massachusetts Institute of Technology (M I T) says it seems intuitive that wood burning is better for the environment than fossil fuel coal burning, but that is just not true. The minutes into the video cataloged. 5.30 British Columbia, 9.0 Burns Lake, 11.00 Prince George, 12.30 furniture maker, 14.30 mostly paper grade wood, 15.30 Drax bought licenses to cut down primary forests, Drax outbid timber companies (paper and furniture making), Drax told reporter most of the trees were dead, 18.0 slash burned on site, 21.0 Meadowbank, 23.0 Drone footage of trees felled near a road (Drax says trees "near a road (unpaved road which Drax built)" can't be primary forest (but the forest meets U N definition of primary forest, six miles from paved road), 26.0 Drax admitted took whole logs but said timber industry didn't want them, 26.15 U K politicians are questioning financial and environmental costs of wood burning, 26.30 U K Chancellor of the Exchequer Kwasi Kwarteng's recorded words on sustainability of transporting wood pellets from North America saying "that doesn't make any sense to me at all.", but in public politicians say wood burning plays a key role in energy security, and "complies with our strict sustainability criteria". 27.30 subsidies of 6 billion paid by U K taxpayers already to Drax, and calling burning wood renewable helps U K meet its net zero targets. Some think big changes are needed in the U K Biomass Strategy to be published by the U K later this year. Other videos recently released on Drax and it's PM 2.5 pollution were "Drax accused of driving environmental racism after more pollution claims against its U S pellet mills" by Greenpeace on Youtube, and "Why wood from British Columbia (B C) forests is burning to fuel U K energy needs" by the Fifth Estate, also on Youtube.

Ep 43g Poland burning garbage, Romania caps firewood prices, and Ukraine gathers wood from Russian trenches

Gerda noted that, in Poland, residents of a suburb outside Warsaw said that they can smell trash burning everyday now, while some towns are noticing less garbage is being picked up. "We're seeing a significant drop in garbage collection, especially when it comes to materials that could at least in theory be suitable for burning, such as paper, cardboard and packaging," the mayor of one Polish town said. Gerda noted that people in Poland are burning garbage to keep warm as the energy crisis in Europe intensifies. Meanwhile, Romania is capping the price of firewood at about $80 per cubic meter. Russia's invasion of Ukraine has upended Europe's energy supply ahead of winter. The Romanian government set a price cap on firewood of 400 lei ($80) per cubic meter and 2,000 lei per ton of wood pellets. Romania previously capped prices for gas and power to help ease the surge that followed Russia's invasion of Ukraine. Romania pushed citizens to lean on firewood as a source of heat even before the Ukraine war started. Gerda noted Radio Free Europe reported that residents of liberated Ukrainian cities are gathering wood from vacated Russian trenches to burn for heat. With Power and Rail Stations Still Under Attack, Liberated Ukrainians In Northeast Ukraine Scramble To Fend Off Cold and Hunger. Residents of liberated Ukrainian cities are gathering wood from vacated Russian trenches to burn for heat, while power and rail stations are under continued shelling. Ukrainian aid groups rush to deliver food as locals do what they can to prepare for the colder days and nights to come.

Episode 43h Liberia sit-ins versus logging companies, and a long game toward solar power using cookstoves in Zimbabwe

Nasha noted that Liberian communities affected by logging have staged a sit-in protest in front of the country's ministry of finance, demanding unpaid royalties. The forest communities are considering other actions to claim the full 30% they are owed by law, including a petition to the president and staging another sit-in at the Forest and Climate Resilience Forum taking place in Monrovia on Oct. 5th and 6th. Liberian forest communities were supposed to get a cut of logging fees. They say they got a sliver. In 2006 The National Benefit Sharing Trust (N B F T) was established to coordinate the collection and distribution of this logging money to communities. But the government has not honored its commitments, say the villagers, represented by the National Union of Community Forestry Development Committees (N U C F D C). In a press release, the N U C F D C said that in 2021, the government paid out only $200,000; by the union's calculations, the state owes communities $5.5 million from fees collected from logging companies between 2009 and 2019. The N U C F D C said more than $2.7 million in rental fees were allocated to communities in the national budget for 2022, but the trust created to disburse the money received only $100,000. "It's unfortunate and does not represent the aims of the anti-poverty program put in place by the authorities," said the president of the N U C F D C, "and it doesn't match the ambition of the government to support development and prosperity."
Nasha noted that, in Zimbabwe, energy-efficient wood stoves and regenerative wood lots are a first stage in a Non-Governmental Organizations' long-term vision to help Beitbridge communities move away from firewood to alternatives like solar power. Nasha noted that a Zimbabwean N G O says the energy-efficient wood stoves, imported from Kenya, use 70% less wood than open fires, channeling heat from burning twigs and small sticks through the center of the stoves to reduce cooking time. Nasha also noted that, in southern Zimbabwe, cookstoves and wood lots are the first step in a plan to halt deforestation. And a reforestation initiative experiments with providing Zimbabwean farmers seeds from indigenous trees rather than seedlings. Can cookstoves and wood lots halt deforestation in southern Zimbabwe? In Beitbridge, Zimbabwe, Conservation Non-Governmental Organization (N G O) Rangelands Regeneration says it plans to reach 4,000 households in southern Zimbabwe with fuel-efficient wood-burning stoves, part of a bigger project to protect forests in Beitbridge district. "Firewood collection is rampant in Beitbridge West," says the chief executive of Rangelands Regeneration (R R). Commercial loggers harvest timber in the district and carry it away on 5-ton trucks for resale to residents in the border town of Beitbridge. Demand for firewood is also high among locals who spend a lot of time searching for it, buying it from wood merchants, or hiring carts to collect it from elsewhere. The N G O says the stoves, imported from Kenya, use 70% less wood than open fires, channeling heat from burning twigs and small sticks through the center of the stoves to reduce cooking time. Rangelands Regeneration is distributing stoves as part of a long-term plan to help Beitbridge communities move away from relying on firewood. So far, around 3,000 stoves have been distributed in three administrative wards in Beitbridge West district. The Forestry Commission of Zimbabwe, the government body that oversees forests, and the country's Environmental Management Agency are helping with

coordination and technical support for the project. A local N G O, My Trees Trust (M T T), is supplying and helping to distribute the cookstoves. Alongside stoves to reduce pressure on forests for firewood, R R is backing the creation of wood lots aimed at increasing a sustainable supply of firewood. Starting in December, at least 6,000 tree seedlings will be distributed to 10 volunteers in each of three areas in the district. The volunteers will be paid a stipend over three years to establish and manage wood lots of purple-pod terminalia (Terminalia prunioides) and other indigenous species. The M T T representative says tree species were selected based on "what burns best." In three years' time, he says, the wood lots will be established. "It is up to the households at this point as to whether they want to harvest the trees." The stoves and the wood lots are a first stage in R R's long-term vision to help Beitbridge communities move away from firewood to alternatives like solar power. R R will also encourage the uptake of small-scale solar, clean cooking and other energy products using financing schemes that lower the barriers to acquire them. "There are some very interesting pay-as-you-go models from around the world that we think would have applicability in addressing energy needs, and we are exploring these and their applicability to the local context," the representative of M T T says. Meanwhile, My Trees Trust says it plans to distribute millions of indigenous tree seeds to encourage small-scale farmers to plant them. In addition, MTT will plant 320,000 seedlings in the next phase of its ambitious reforestation strategy. Reforestation efforts have typically relied on planting seedlings. Distributing seed packs is an experiment. My Trees Trust (M T T), set up in 2019, estimates the cost of putting a seedling in a farmer's hands at $2.50 per tree, and the cost of distributing a seed via a seed pack at less than a cent. The seed pack distribution venture is a gamble on farmers' willingness to read the instructions and correctly germinate the seeds. The hope is that they will plant them along field contours, and around field margins and homesteads. An M T T co-founder says the seeds will be distributed in packs of around 1,000 seeds that include five species of acacia and two species of Bauhinia. These are considered pioneer trees, he says. "When you see farmland that's regenerating naturally, these are the species that come back first." Zimbabwean farmers spend the whole of their lives planting, monitoring the seasons, and dealing with the depreciating quality of soil, and M T T is betting that planting an extra pack of seeds won't be too much of a stretch. "It's a very cheap way of getting trees in the ground," the M T T representative says. Deforestation is accelerating in Zimbabwe, and the country is losing much of its Brachystegia, or musasa woodlands to farmers who need firewood to cure tobacco in wood-fired barns, or as household fuel. The trust will carry out a survey in February to assess the effectiveness of the distribution program.

Ishan noted that a new study in China found that PM 2.5 is linked to stroke.

Mary noted that Wood burning emits more CO2 than Coal burning. Mary calculated the CO2 emissions of Natural Gas burning are, at most, around half of the CO2 that Coal emits. Mary also did a calculation from the chart from Families for Clean Air, which compared the weight of PM 2.5 emitted annually. The weights were one sixth of a pound for Natural Gas, 27 pounds for a wood pellet stove, 97 pounds for a certified wood stove and 244 pounds for an uncertified wood stove. Also, the Natural Gas weights would not increase over time, but wood burning emissions might very well increase over time, as wood stoves aged or were not maintained under laboratory conditions. Given the weights from the Families for Clean Air chart, a wood pellet stove emits 16,200 times more PM 2.5 than a natural gas furnace, a certified wood stove emits 58,200 times more PM 2.5 than a natural gas furnace, and an uncertified wood stove emits 146,400 times more PM 2.5 than a natural gas furnace. Mary noted that the focus of Residents Against Wood Smoke Emission Particulates (RAWSEP) is on the health effects to near neighbors of living next to residential wood burning, in those hyper-localized areas where the source of particulate pollution, PM 2.5, is concentrated. PM 2.5, particulate matter of 2.5 micrometer size, is the perfect size to infiltrate the human lung, causing a cascade of human health problems. Wood smoke consists of 90% PM 2.5. Residential PM 2.5 monitors can be purchased by neighbors from PurpleAir for less than $300, and their locations are put on the online PurpleAir Map, along with data uploaded every 10 minutes, available to the general public, and of course to governmental authorities. Neighbors of Residential Wood Burners would like their PurpleAir PM 2.5 monitor data to be used to regulate and shut down Residential Wood Burning detected at neighbors' fence lines that exceeds the World Health Organization (W H O) standards of 5 micrograms per meter cubed or future US standards of 8 micrograms per meter cubed. There could even be court-ordered monitoring using a neighbor-owned PurpleAir PM 2.5 monitor as a "breathalyzer" (similar to car breathalyzers court ordered for repeat drunk drivers) to turn off the ignition of a neighboring indoor wood stove when levels of PM 2.5 in a near neighbor's yard is exceeded. In this way governmental authorities would not have to check the make and model of an appliance and would not have to rely on unreliable certification and other worthless assurances of levels of wood stove particulate emissions by the company that manufactured the wood stove. PurpleAir monitors also provide data every 10 minutes 24 hours a day, and data can

be downloaded from the map by governmental authorities the day after the PM 2.5 levels are exceeded, during normal government working hours. PurpleAir PM 2.5 monitors are so reliable and accurate they are put on U S AirNow Smoke and Fire maps alongside $100,000 Environmental Protection Agency (E P A) monitors, correlated to the EPA monitors with a simple mathematical formula. But to publicize this, it is necessary to point out that living hyper-localized next to a residential wood burner is essentially the same as living hyper-localized next to any kind of PM 2.5 emitting wood burning appliance, next to a PM 2.5 emitting wood burning wildfire or next to a PM 2.5 emitting industrial biomass (wood) burning facility.