



## Statewide climate education effort kicks off at Yale

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NEW CANAAN, CT - More than 60 scientists, researchers and educators from science and education, research and planning centers from across Connecticut gathered Wednesday, October 13<sup>th</sup> at Yale University to discuss public global warming education programs as part of statewide bid to help reduce greenhouse gas emissions.

Participants heard Dean James Gustave Speth from the Yale Forestry and Environmental Sciences school, note that the scientific content of policy decisions in the US is increasing rapidly, citing genetic modification of food crops, stem cell research, and environmental sciences as examples, while, at the same time, "the scientific literacy of the American public seems to be going down, and this is a threat to the success of our democracy."

"This is not a political thing, it's not a way-out thing, not a speculative thing; this is an emerging crisis that people must be made aware of."

Speth, who lives in Guilford, noted that his town will hold a meeting on the potential effect of global-warming driven sea level rise on the community. "It is good to see that this issue is reaching the local level."

"We have increased the CO<sub>2</sub> level by a third, so that it is now higher than it has ever been in the last 450,000 years, as a result of burning fossil fuel. It is an uncontrolled experiment on the planet." He then read a long list of recent stories about global warming, and referred to a soon-to-be-released study of Arctic ice that indicates there may be a rise of three feet in sea level "within the lifetimes of today's young people."

He noted that the solution to air quality, mercury pollution, and global warming are all in the same direction.

Speth recommended that centers educate the public about the ppm of CO<sub>2</sub> in the atmosphere, because this is a real marker, and it's going up at very significant rate. "We need to cap this at 450ppm or less, but even if we do, we will see huge changes and temperatures increasing in the 4 to 5 degrees C. We will lose all of the coral reefs and the life on them.

"We need to watch the freshening of the oceans in northern latitudes as a result of melting ice," he said. "This is interesting because it does have the potential to disrupt ocean currents."

"All the projections I've seen have the fall foliage moving out to the north by the latter part of the century, and in fact a huge proportion of land in the US will not be able to support the plants and animals that are there now. I'm from the southeast, and projections are for that forested region to become a grassland, a savannah so hot and dry it can't support trees."

He noted the Kyoto agreement "is not a strong agreement, it is not the kind of agreement that got rid of chlorofluorocarbons and saved the ozone layer. It is a very preliminary agreement. McCain-Lieberman is not as aggressive even as that, and the

Administration opposes that. But there is a lot going on in the states and communities, and we have a pretty rigorous climate law in Connecticut now.”

“If you want to take action and empower people to take action there is a great deal of material out there about what to do. What we need is a group like yours to ignite public action. You have a huge opportunity.” He suggested engaging science and nature centers with land trust organizations.

Adam Markham, executive director of Clean Air - Cool Planet, which organized the meeting along with the New England Science Center Collaborative, noted the initiative was nine months in the making. “The primary goal is to get good science out to people so they can begin making informed decisions about taking action.”

“There are quite a lot of changes taking place locally, and we can show them what’s happening,” Markham said. “It’s not just flooding in Bangladesh; this is flooding in our marshes here. It’s not about deserts in Africa, it’s about droughts here. This is a local issue, and it’s not very high on people’s agendas because they aren’t aware of the local importance.”

Markham introduced Professor Xuhui Lee from the Yale School of Forestry, who presented an overview of climate and the potential affects of climate change on Connecticut’s forests. He explained that scientists are not interested in predicting weather conditions in the future, but climate, which is the average condition of temperature, precipitation, and other factors over long periods of time.

Lee stressed that, our willingness (or unwillingness) to change our emissions will determine our climate, showing a number of models featuring different amounts of emissions and corresponding scenarios for changes in surface temperatures. He explained that while natural systems have a natural balance, where they absorb a little more carbon than they emit, human activities generate carbon but currently don’t absorb any. And as temperatures rise, natural systems will be forced to emit more carbon in what scientists call a feedback mechanism.

He also pointed out that the complexity of natural systems has created an atmosphere where, when you look in the news media, you see a debate on this issue, giving the impression that there is uncertainty. “But that is not a true situation. There is not debate about the reality of global warming, and that is not true.”

Lee said that Connecticut forests would be severely affected by climate change, because the dominant maple, beech, birch forest in the Northeast is likely to be decimated and replaced by oak and hickory, resulting in a complete collapse of the maple products industry. He explained that warming temperatures thwart sap flow in the maples, and eventually the trees die.

Assistant Professor Michelle Bell detailed potential affects of climate change on human health, noting that this has only been understood in the recent years. In the Northeast, the greatest susceptibility is from smog formation, she said, chiefly from vehicle emissions. But she said an increase in heat-related deaths and illness is also expected, as well as the likelihood of more waterborne diseases as a result of heavy rainfall and runoff or flooding, resulting in release of untreated sewage. Another problem that shows up in the models, Bell said, is a broader range of vector borne diseases because of the increase in length and duration of warm weather.

Climate change may result in a 60 percent change in bad air days, resulting in a corresponding increase in asthma and other respiratory problems and deaths. Very unhealthy air quality days—where even healthy, young adults need to stay indoors – begin to show up in the models by 2050, she noted, as a result of warming surface temperatures, with disadvantaged inner city populations particularly at risk.

Stewart Hudson, president of the Emily Hall Tremain Foundation, which funded the initiative to create a science center collaborative in Connecticut, speaking while introducing Theodore S. Sergi, President and CEO of the Connecticut Center for Science and Exploration, urged participants to do three things.

“You have to educate about the dangers. Quickly tell people that solutions are available, and that there are very real costs and benefits, but they need to have hope,” he

said, "and continue to educate about the wonder of nature and connect that with science and math and English. And make sure that awareness leads to action."

Sergi, former Commissioner of Education for the State of Connecticut, discussed the importance of creating attractive and entertaining science programs, especially for young people.

"Three times more young people in Japan and Germany choose science and technology studies than young people here in the US. Tests show our young people are not competitive, and by 12<sup>th</sup> grade, our students score at the bottom internationally" he pointed out, noting that there is a role for all of us to play in the solution.

"Youngsters and parents need to be engaged, scientists and educators need to be engaged, we all need to get involved and find ways of making this happen. We need to insure we pass this world along in better condition than we received it in." He said the new Connecticut Center for Science and Exploration being developed and built in Hartford will play a role with its exhibit hall, and by working with other science and nature centers to develop exhibits and programs that will travel to centers around the state.

"I'm very excited about that, and I think there are a lot of possibilities," he said. "Together we can reach even more people, and all boats will float a little higher."

A panel of educators, charged with a discussion of options for climate education, was introduced by Richard Polonsky, of the New England Science Center Collaborative (NESCC). He noted the Collaborative grew out of a need to educate the public about global warming.

"The policymakers told us people didn't know enough about global warming, because constituents weren't aware of the issue. We looked and saw that there was a network of science and nature centers ready-made to help with this effort," Polonsky said, noting the organization included institutions in all of the New England states "now including Connecticut."

The panel, moderated by Chris Bruhl, president of the Southwest Area Commerce and Industry Association, included Ken Elkins, of the Connecticut Audubon Society; Hank Gruner, of the Science Center of Connecticut; Kathy Rhodes, of Sound Waters; M.J. Morse, program manager for Emerging Science and Technology Issues at the Museum of Science in Boston; and Jon Scoones, of the Mystic Aquarium and Institute for Exploration. Bruhl summarized the discussion, acknowledging the need "for delivering public education on global warming through the existing, credible network in a way that asks people to take action that will produce a result—in this case, reducing the threat of global warming."