



**Climate Action and Education Forum**  
**May 9, 2014**  
**1:00 – 3:00 PM**  
**Lane Community College Longhouse**

## **QUESTIONS AND ANSWERS**

**QUESTION:** How do we ensure that CO<sub>2</sub> measurements are accurate over 650,000 years? It is from ice core samples?

**ANSWER (PAUL):** Yes, mostly, with some other proxies also becoming helpful as well. The IPCC report of Working Group 1 covers all of this in great detail.

**QUESTION:** I want to learn more about fracking, including its effects on drinking water so that I can better educate others.

**ANSWER (PAUL):** I don't have a good objective source for you here. Most of what I read about fracking is too polarized pro or con.

**QUESTION:** Is there a toolkit on teaching about climate change for educators?

**ANSWER (PAUL):** Earth Exploration Toolbox is excellent! <http://serc.carleton.edu/eet/index.html>

**QUESTION:** Can you clarify what climate change is and compare it to ozone?

**ANSWER (PAUL):** Climate change is due to heat absorption by carbon dioxide and other "greenhouse gases" in the atmosphere, where heating occurs due to outgoing infrared radiation (heat from Earth's surface). Ozone is in fact a greenhouse gas, but of minor impact here. In the stratosphere (between 25-50 km above the ground it protects us from the most harmful ultraviolet wavelengths in incoming solar radiation. But chemicals like CFCs break it down. They are very different examples of atmospheric chemistry at work. We have gone a long way to fixing the "ozone hole" problem, but not nearly enough to fix the greenhouse gas problem.

**QUESTION:** Will global society and industry find equilibrium with the environment? How?

**ANSWER (PAUL):** Only through true energy cost pricing can this happen. Industry in the US appears to be dead set against it as an economic non-starter. Without visionary leaders in industry, there will be no political will to do this I fear.

**ANSWER (DON):** Yes. Overshoot and contraction will likely result in a recalibration of consumptive requirements to renewable resource capacity – unless or until the technological singularity plays out and all of our problems are solved. In the meantime, let’s hope that we can consciously reduce our numbers and rate of consumption per capita so that we experience the most compassionate period of adjustment possible. This would demonstrate, I think, “conscious evolution” (conscious adaptation) as a species – showing our human ability to rise above instincts with intelligence.

**QUESTION:** What can one personally do that is ensured to have the positive impact that was intended?

**ANSWER (PAUL):** I would recommend energy conservation at home, at work and in transit decisions as real things that can make a small difference. And then tell two other people what you have done.

**ANSWER (DON):** Unfortunately, there are no guarantees. This is one of the “givens of existence” which we all must deal with.

**QUESTION:** What new methods of childhood (young adult) education are necessary to enable a paradigm shift in the newly globalized culture?

**ANSWER (PAUL):** I often see “scary scenarios” used to try to gin up environmental interest even in schools – but that I think turns off people who are skeptical (like the child’s parents). So I like environmental success stories. Talking about the reversal of river pollution and the slow but real gains made in reducing “ozone hole” problems by eliminating CFCs, or reduction of acid rain by regulating sulfur dioxide are examples of these successes that could not have been done without first science, then public understanding, and then responsible government action.

**QUESTION:** What is the most efficient alternative fuel source? What about ethanol? Thorium?

**ANSWER (PAUL):** I’m not a renewable energy expert here. I’ve heard people talk about thorium reactors as being potentially transformative in terms of nuclear energy without the serious waste issues. Ethanol is very inefficient (the way it is done in the US). Corn is not viable in the long term as an ethanol source. Sugar cane, tulip poplar wood, switchgrass, and hemp are all far more efficient. Also biodiesel from algae will get more attention as well.

**QUESTION:** Sea level rise: Is there an estimate of how long until all Pacific Islands are submerged? When is it too late?

**ANSWER (PAUL):** It is probably too late now for islands like the Maldives (thinking 100 years from now). But this answer depends on how high the land is in these islands. More troubling and impactful are many of the world’s largest and poorest cities, located on or near river deltas and very shallow elevations in very flat terrain. In many respects it is too late because greenhouse gases emitted today are only reduced by about half in 55 years. So we (today) are still feeling the effects of emissions of our grandparents.

**QUESTION:** What is the worst case scenario? Is it too late to go back?

**ANSWER (PAUL):** Given this week’s news about the loss of west Antarctic ice accelerating, the worse case that is somewhat realistic is probably a 8-10 ft sea level rise by the year 2100 and warming of 4-6.5°C globally.

**ANSWER (DON):** Humans become extinct. No.

**QUESTION:** What part does air travel play in CO2 emissions?

**ANSWER (PAUL):** Air travel is particularly inefficient, and it is not just air miles traveled but the number of takeoffs and landings.

**QUESTION:** What is the impact of electronic devices?

a. Resources

**ANSWER (PAUL):** If everyone kept their phones and computers one more year instead of upgrading every other year like most do now, we could save a LOT of energy and reduce waste, too

b. Waste

**ANSWER (PAUL):** All electronics should be recycled and there can be rare metals recovered and materials reused

c. CO2 emissions from data centers

**ANSWER (PAUL):** Many companies have gone to renewable sources – I'm sorry I can't name them but some of the big ones (Google and Apple I think) are among them.

**QUESTION:** Is it possible to get carbon levels down to 350 ppm?

**ANSWER (PAUL):** Yes, theoretically – good information is available at [350.org](http://350.org).

**QUESTION:** What is the environmental cost of electric and hybrid cars?

**ANSWER (PAUL):** a complicated issue and one I can't measure directly. But perhaps at [grist.org](http://grist.org) or at Tesla Motors web site there might be some help.

**QUESTION:** Is it too late to reverse climate change – have we reached the tipping point?

**ANSWER (PAUL):** This is a tough one that is still subject to lots of scientific research. The tipping point has apparently been reached insofar as West Antarctica is concerned. But overall, I'm not sure yet.

**QUESTION:** How do we start a negative feedback system?

**ANSWER (PAUL):** Geoengineering solutions have been proposed, for example, to pollute the atmosphere, thus reducing sunlight absorption and then reducing the warming. There are other negative feedbacks such as volcanic eruptions; many of these have obvious undesirable effects, too!

**QUESTION:** How can we learn about fracking and other environmental concerns?

**ANSWER (PAUL):** I would not rely on natural gas or oil company web sites, or for that matter, those of very polarized environmental organizations. The state geological departments in states where fracking is active (like Arkansas, Pennsylvania, and New York) may be among the best sources. Texas is too invested in it to have a rational explanation of impacts, I think.

**QUESTION:** Why are we (and scientist) losing this argument?

**ANSWER (PAUL):** We lose because we often don't put things into terms that the public can accept or understand. If we can get some help from economists to value the efforts at taking long range action and publicize that we'll do better! It is beginning to happen. Tying things to public health is also helpful.

**ANSWER (DON):** Fear/Anxiety = Denial. Cultural distractions. Misinformation.

**QUESTION:** What needs to be in our toolkit to discuss climate change?

**ANSWER (PAUL):** Great question – I would recommend this one – Earth Exploration Toolbox - <http://serc.carleton.edu/eet/index.html> .

**ANSWER (DON):** Awareness (in the moment, of the moment) and compassion, along with accurate data and intentional communication strategies.

**QUESTION:** In a worse case scenario, how long can humans survive?

**ANSWER (PAUL):** Too long. Sorry, that was flippant. Sorry I'm no expert there. I'd recommend reading some of the important books by Jared Diamond here – you might start with *Collapse* (not as well known as *Guns, Germs, and Steel*), but very compelling.

**ANSWER (DON):** Humans are highly intelligent and highly adaptive, and, in our present form, humans may not be the end of the evolutionary story of intelligence on this planet.

**QUESTION:** What controls are being used to study climate change?

**ANSWER (PAUL):** I'm not sure that I understand this question. By controls if you mean experiments done to be sure they are realistic, climate models are calibrated by starting them during periods for when we have good data and then integrating into the future and trying to replicate similar climates to what we observe today, or in 1980, or whatever.

**QUESTION:** What is the best way to reduce the toxicity of polluted waterways, i.e.:

- Tacoma;
- Africa?

**ANSWER (PAUL):** It is often argued that the solution to pollution is dilution. Not very practical. The Willamette was cleaned up by reducing industrial waste.

**QUESTION:** Why are the climate models underestimating the amount of change?

**ANSWER (PAUL):** We just don't have the models good enough, and we also have not measured some of the things we need to measure very well just yet. We work hard to create new observational datasets and better models, but this takes time. The observations are indeed troubling but they tell us when we have it wrong, and what we have to focus on to get better results. Note here – we do not force the models to get the right answer, we run the models and then get results from the observations.

**QUESTION:** I'd like to find a way to communicate directly with corporate leaders – 2 questions – how to physically reach them (do they read their mail?) and how to communicate in a way that reaches their hearts?

**ANSWER (RUSS):** Quick thoughts: the best way to reach a particular leader is going to vary from person to person, company to company. There are many examples out on the internet of customers receiving personal replies to emails from Steve Jobs when he was at Apple, and there are other executives who really do read emails from the "outside world". You're likely to get the best response if you're actually a customer of the company whose executive you're trying to reach, and you may have to go at it through whatever customer service mechanism the company has in place.

**ANSWER (DON):** Part A – THESE ARE ALL GENERALIZATIONS. That said, because of the way in which the current economic system separates people into class levels, unless you find yourself in their same ("upper") class, you're unlikely to cross paths on a casual, unintended basis. In a world where everyone is (supposedly) within six degrees of separation, finding someone-who-knows-someone within their sphere can sometimes be an intentional way of trying to meet them in a non-professional setting, which is what I would recommend. In their professional world, they exist in a "Have your people contact my people" world, which means you're less likely to get through the layers of bureaucracy that separate you in order to have a word with them. And the "them" that you would meet in this setting would be one that would require a (very) brief glossy pitch of your best idea before being shown the door (in a polite manner). By crossing paths with them outside of their "power realm" you're more likely to get a few more minutes of their attention, and a more "human" response.

PART B – THESE ARE ALL GENERALIZATIONS. That being said, what we might use as beginning hypotheses (in trying to figure out how to reach their hearts) would be something like this: Character Structure = more likely to be one of the more aggressive, extraverted, leadership-oriented styles. (It's less likely that they would get so far professionally if they were excessively fearful, timid, introverted, melancholy, etc.) Worldview = more likely to be operating from a "Might Makes Right" or "Industrious Achievement" approach to life – going for the spoils or the advantage. Main existential struggle = often "separation" and "aleness". It's lonely at the top. It's sometimes hard for individual's functioning at this level to be "authentic" in their relationships ("Hey, you never know when you might need to fire or sue somebody – so don't reveal too much.") Lonely. This is often the "soft spot" that can be reached – taking an interest in them as a person (not a resource).

Formulate hypotheses ("It seems like they ...") then test them for confirmation/disconfirmation ("If my hypothesis is correct, then if I say \_\_\_ they should reply with something like \_\_\_\_.") Then apply the techniques that get through their (character) defenses without snagging, that appeal to their current worldview, and that set their existential concern at ease.

**QUESTION:** How do you talk about climate change to someone who is older and a part of a logging family?

**ANSWER (RUSS):** There are lots of opportunities for common ground with this type of person. They probably love the natural environment, and if they're honest, they may well have seen some effects of climate change over their lifetime (though they may be reluctant to use that phrase). For example, I toured Yellowstone National Park last year with the former and current Park Directors and the Chief Scientist and they pointed out the terrible problem they're having with a particular beetle that is killing trees. The beetle has always been present in the park, but now winters are often so mild that the beetles aren't dying off on an annual basis.

**ANSWER (DON):** THESE ARE ALL GENERALIZATIONS. That being said, one's hypotheses might be along the lines of: "older" and "logging" (resource extraction) indicate the possibility of a conservative, "Order and Authority" worldview. We don't have enough information to guess at their character type, and it would possibly depend on whether they were spending a lot of time in the woods, or making the business enterprise go. Their main existential concern is possibly in the "uncertainty" realm, since the structure in their lives was likely the result of a strong work ethic, and to losing that the changing times, they are probably experiencing uncertainty about the future. (Aren't we all?)

It's important, I think, to approach such individuals with a genuine appreciation for the lifetime of hard work and productive contribution that they have made to society. They lived in an era when natural resources were more plentiful, and the number of people demanding them was far fewer. So what they did to feed their families and forward the progress of society was an honorable thing to be doing. Let them know that you see this. Then leave a lot of silence, and see if they don't begin to talk about how hard it is to see all of the changes around them. Listen and appreciate. Listen and appreciate. And let them unravel their concerns (and wrath), and then...leave silence. Smile at them. Appreciate them. They worked really hard at something that made sense to them in the world they grew up in. They wanted the best for their family, and there was honor in what they did (in their eyes). Don't invalidate them and don't move too quickly toward the ecological devastation that has been left behind. It won't appeal to their worldview, and it will only increase their existential anxiety (impermanence and uncertainty) which will make them more defensive in whatever characterological manner they rely on. Go for common ground – kids, grandkids, "doing the right thing" for society, etc.

**QUESTION:** If people are willing to admit chemicals harm human lives, why are they not willing to admit that those same chemicals could be harming the planet or altering the planet?

**ANSWER (RUSS):** Truthfully, we all "pick and choose" our science to some degree. Think about all the controversy around fluoride in water or childhood vaccinations. And science has both given us those chemicals as a "benefit" as well as determined their levels of toxicity! Many people still have trouble believing the vastness of the earth and its ecosystem can't accommodate our bad behavior. One of the best ways I know to engage this kind of conversation is to talk about the "precautionary principle".

**ANSWER (DON):** Denial. Fear. Conditioned to put their attention on other things, e.g., the latest "news" distraction or pop-culture spectacle.

**QUESTION:** How to change the fundamental foundation of their thinking? (in reference to a loved one who just doesn't get it).

**ANSWER (RUSS):** Don is the expert here; my only suggestions are that you'll want to be prepared for a long conversation (relational dialogue is essential); you want to seek to understand their positions and their frame of reference (the worldviews Don talks about)—you can't ask them to understand where you're coming from unless you're willing to do so yourself; and at some point this will require some disassociation on their part—which can be painful and may cause withdrawal.

**ANSWER (DON):** This is an ambitious goal! And, it's not our job.

A person's way of thinking ("How") is largely determined by their conditioning over time. Thus the role of education that stretches our cognitive capacity and helps us learn to think in different, and increasingly abstract ways.

"What" a person thinks is largely determined by the current worldview. It tends to "color" everything. It's how observations add up to a particular conclusion.

Of these two – a person's worldview is much more malleable than their character structure. Thus the exasperated acknowledgment of futility in trying to "change" some people by saying, "Oh, that's just who they are." Meaning, that's their character/personality - engraved in their thinking and behavior as a result of their childhood experiences, or their "nature" (which also has some validity). These attributes are best left to the professionals (character analysts) with highly motivated (to change) individuals.

Worldview, on the other hand, might be considered something that has always been faster evolving and continues to evolve as new input "adds up" to new conclusions. It's going to be pretty hard to deny climate change in the decades ahead, I think. This will require a different (or adapted) worldview for a number of people. Many of us will find ourselves in the position of watching these formerly difficult loved ones coming to the realization, and would do well to be compassionate and just smile (like the cat that swallowed the canary) rather than saying, "Told ya so." Then offer to help and get them involved in action – mitigation and preparation.

**QUESTION:** How can we (frame) make the data received by people, profound enough for real personal change?

**QUESTION:** How do we spread this ecologically sensitive way of thinking globally?

**QUESTION:** How do you separate climate change from government?

**QUESTION:** What is the easiest way for one person to get involved and fight climate change?

**QUESTION:** Many people still believe that global warming is not real, calling it a myth itself. Is there a shift in language that needs to take place so that we don't get mired in language disagreements, as to avoid the bickering (i.e. misconception vs. myth)?

**QUESTION:** How can we prevent deforestation in Oregon?

**QUESTION:** How can we disconnect logging from school/county incomes (especially in rural areas)?

**QUESTION:** Are we replanting trees in Oregon fast enough (can we make it so logging/replanting is truly equal, unless it already is ☺)?