Science as a Contact Sport: Inside the Battle to Save Earth's Climate

Q&A with author Stephen Schneider

1. **If climate change is such a global threat, why do so many "deniers" still exist; and why do they get so much airtime?**

All good scientists are "skeptics" who rethink and test their beliefs with available evidence. When a strong preponderance of evidence warns of dangerous possibilities, good scientists and decision makers act on it. "Deniers" claim that until every detail or uncertainty is resolved, we should take no policy actions and maintain the status quo. Inaction is neither good science nor responsible policy in the face of a mountain of scientific evidence just because there are a few unexplored ridges on the mountain.

2. **Over the past decades, have you seen climate evolving away from a conservative/liberal issue to one with greater consensus from both sides of the political aisle?**

In California, a Republican Governor and a Democratic legislature were able to agree on the threat of climate change and fashion a strong policy response. Why? Because melting the Sierra snowpack weeks earlier threatens floods in the early spring, droughts in the late summer, fires in much greater abundance, and health-damaging air pollution. In essence, there is no such thing as a Republican flood or a Democratic wildfire. Cooperation is the only answer.

Unfortunately, that cooperative attitude has hardly crept inside the Washington Beltway. There, recent opposition of most Republicans to Democratic proposals for climate legislation is harsh and ideological—opposing any governmental constraint on entrepreneurial activities, even those that threaten the common welfare. This strategy seems aimed at showing a political difference with the majority to make stark differences for the next electoral cycle, thereby making bi-partisanship at a national level a still elusive necessity. This behavior chooses to hold the sustainability agenda of the country—and the planet—hostage to some perceived ideological belief, or it is simply political convenience.

3. **Climate science has evolved over the past 40 years; in fact in the beginning, some scientists thought the earth might be cooling—could the science evolve further to show us that cooling might be the overall long-term trend?**

In 1970 I was one of those who saw cooling as a more likely possibility, but as evidence accumulated, the science has indeed changed. In fact, I am very proud to have been the first in the early 1970s to point out what was wrong with my own 1971 cooling theories after extensive reading and traveling exposed me to new science that showed a

strong preponderance of accumulating evidence pointing out that warming from human activities would very likely overwhelm cooling influences in the foreseeable future. Since some of the CO_2 added to the atmosphere hangs around for a millennium, it is very unlikely that a sustained cooling trend is in our climatic future over that time scale. Over many thousands of years, however, natural forces could again push the Earth back toward an ice age, as has happened many times before on ten thousand year time scales. But by that time in the future it is likely that—presuming human society is still organized, technologically sophisticated and cooperative—such natural changes toward an ice age will be offset by human interventions—so called geoengineering.

4. **You first testified about global warming to Congress in 1976 and fundamentally the science hasn't changed in its continuing projection of serious warming in the 21st century—why then has it taken so long for us to take action? Why was it so easy for the world to see the danger of CFCs and initiate a global ban?**

In the late 1970s we were quite confident that continuing to use the atmosphere as a free dump for our tailpipe and smokestack wastes would cause considerable warming. Though our belief was primarily based on the theory of heat trapping (the so-called greenhouse effect), most of us felt it was pretty compelling. In the 30 years since, Nature has, unfortunately, proven the theory and many of the projections made then—dangerous heat waves, melting glaciers, rising sea levels, more wildfire, intensified droughts and floods, among others—are now being observed. How many heat waves or melting glaciers does it take to convince society it is a "smoking gun" of human-induced climate change? Since heat waves occur naturally, we have to weigh the statistics to show attribution to human causes—and that takes decades. So rather than being precautionary, defenders of the status quo in energy and transportation systems used uncertainty as a pretext to "wait and see" before acting. Even now, many special interests continue to say since the climate problem isn't completely understood yet, we should not take actions that reduce their market share. But the world has finally accepted for the most part that we are way past the time when we should have acted to try to avoid serious damages.

In the case of ozone depletion, after a dozen years of industry opposition to banning ozone depleting substances—also based initially in the early 1970s on theory—a smoking gun emerged in the mid-1980s in the form of an Antarctic ozone hole. That was media worthy enough to finally overcome the forces protecting the status quo. In addition, the same companies that opposed banning their products were quietly working on substitutes. When the smoking gun finally appeared, they were ready to accept limits on their own products since they had by then invented the substitutes. Like climate change, had we acted in the mid-1970s when the chemical theory was discovered, we would have had much less ozone depletion.

5. **You say "Cap and Trade" is important, but you advocate that there are other steps we need to take before cap and trade becomes policy. Can you clarify how you feel about this—aren't you challenging what the Obama administration is pushing for?**

Cap and trade is only part of a comprehensive climate protection strategy. Other elements include performance standards—energy efficiency—for buildings and machines, investment incentives for green technology deployment, and adaptation assistance for those having difficulty in coping with climate impacts. The Obama Administration and Democratic leaders in the House who brought about the historical passage of the Waxman-Markey climate and energy bill included all of these factors. However, the opponents of the bill focused criticism primarily on the cap and trade aspects, calling it "cap and tax." The media love a battle and the resulting dogfight got their attention. So the other elements of the bill got submerged beneath the political debate over only one component that had warring ideological sides and thus was made for prime time contention. Personally, while I agree all four components of climate policy are necessary and that none by itself is sufficient, I might have started with efficiency and technology development and their linkage to sustainable jobs and energy independence, and done the cap and trade part after that. However, that is only a tactical question, and I have no strategic argument with the Obama approach to climate policy—a dramatic positive departure from the previous eight years of denial and delay.

6. **Over the past 20 or so years we've seen a number of big world climate meetings come and go without a lot of change--the global temperature just keeps rising. Why is the December COP 15 meeting in Copenhagen so important?**

For the first time the world's largest economy and historically largest accumulated emitter of greenhouse gases is coming to the bargaining table sympathetic to the goals of international controls, not hostile to them, and with real actions happening at home at local, state and even now, national levels. Without US commitment it becomes politically difficult for others to convince their citizens to act decisively. In addition, China and India are major players now, and despite initial claims that they will only act after they catch up to the rich countries in per capita emissions—a disaster in the making given their large population sizes—a cooperative deal between the largest historical emitters and the largest future emitters is the most effective way forward. Despite all the asserted immovable initial positions of countries, with the whole world watching at Copenhagen it will be hard for individual countries to try to block international progress in protecting the planetary commons unnoticed. While Copenhagen won't immediately forge an effective protocol that will prevent decades more build ups in greenhouse gases, it could frame a long term effective strategy to peak sooner and at a lower level, thereby becoming a water shed for international action on climate disruption. Or, less

optimistically, if the special interests advocating for the status quo win the day, Copenhagen could earn a legacy of failure akin to the League of Nations. I will work with others to fight for cooperative and effective strategies for adaptation and mitigation beginning now, and ramping up in stringency and number of committed participants over the next two decades.

7. **With so many scientists weighing in (more than 1,000 contributors to IPCC reports) how can we possibly reach a "consensus" about best course of action for the US--and the world?**

First of all, “consensus” is not about conclusions—some are well established, some plagued by competing explanations and others still remain in the speculative realm. The consensus that IPCC tries to achieve is over the confidence that knowledgeable assessors assign to a host of conclusions, which then helps decision makers to make informed risk-management judgments on solutions.

Scientists in the IPCC process are asked by more than 100 governments to assess the nature and seriousness of the human-induced climate change problem, and to show how differently constructed policy solutions could affect the distribution of risks over time. But the scientists are not asked—in fact specifically asked not—to recommend which policies are preferable—a value judgment for the leaders of civil societies to make by weighing the vast array of differing concerns across sectors, regions and groups. The one thing that the scientists have shown with high confidence, is that staying on the current course leads to a high probability of major disruption to ecosystems, agriculture, water supplies and habitation of fire prone, flood prone or low lying coastal areas; many of these would lead a “reasonable person” to assess these risks as dangerous.

8. **Global warming can be a gloomy subject of worst-case scenarios—is there any reason for hope for the planet?**

Yes. Though we cannot undo the damage already in the pipeline, it does not preclude a vigorous adaptation program to reduce these harms and, as a co-benefit, help with needed sustainable development, especially in the poorer countries. Furthermore, while warming beyond a few degrees appears from the scientific literature to imply many more negative outcomes than benefits, a warming of more than two degrees Celsius above present would trigger many irreversible outcomes ranging from meters of sea level rise for millennia, to extinction of up to 40% of known species to displacement of coastal dwellers and those in the pathway of intensified hurricanes. Thus, while some dangerous climate changes are already built into the future by our inactions over the past 3 decades, many of the most dangerous and irreversible damages can still be averted with immediate and concerted action. One should never use the inevitability of some dangerous events as an excuse to back away from actions that could prevent an increasing number and scale

of harms as warming spirals upward in a world with no constraints on emissions and lacking a major transformation of the energy system to put it at long last on a sustainable track.

9. **Where do you see climatology in 40 years? And where do you see planet Earth? We figured out the problem relatively quickly, on an Earth-time scale. How long is it going to take to fix it?**

In 40 years I hope climatology no longer exists as a distinct intellectual area, but rather earth systems studies that integrate climate science with economics, biology, technological development, governance, equity and communications skills. This has been already a steady evolution in which the thought leaders in the disciplines are actually advocating more merging of the boundaries of the disciplines themselves into interdisciplinary groups better equipped to design, solve and communicate the issues. As Margaret Mead told me in 1974, "ideas move at the speed of transportation—instantly. But you are talking about cultural change, and that creeps at generational speeds." We have been evolving, in fits and starts, since the late 1970s towards a coherent set of policies to reduce risks from human-induced climate changes. Now, about a generation and a half from our early efforts, momentum is finally building for fashioning global scale solutions. This is right in the time frame that Mead suggested, and hopefully it won't lose too much momentum in the face of economic crises, terrorist attacks or a few random cold years that some will misinterpret as "falsification" of the overall decades of warming already in the pipeline. On the other hand, if somehow we gained the political will to make major investments in adaptation and mitigation policies, and sustainable developments, it would still take a generation or two to fully work out the bugs and deploy these systems at a scale that allows a growing quality of life for a still growing world population, where most of that population growth is in poorer areas. Thus an overshoot of "safe" greenhouse gas levels in inevitable; but we can make that peak lower, occur sooner and be eroded faster by cooperative strategies.