

Center for American Progress

**Moderator: Suzi Emmerling
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Operator: Ladies and gentlemen, thank you for standing by. And welcome to the Press Call on the Climate Science. All lines have been placed on mute to prevent any background noise. After the speakers' remarks, there will be a question-and-answer session. If you would like to ask a question during this time, simply press star and the number one on your telephone keypad. If you would like to withdraw your question, press the pound key.

Thank you. Ms. Emmerling, you may begin.

Suzi Emmerling: Good morning, everyone, and thank you for calling in to our press call today, climate Science, setting the record straight. I am Suzi Emmerling and I would like to first give you my contact information in case you have follow-up questions after the call. I can be reached at 202-481-8224 or my e-mail address is semmerling@americanprogress.org. Today, we have Professor Michael Mann, Dr. Gavin Schmidt, Professor Michael Oppenheimer and Dr. Joseph Romm.

I would like to start today's call by passing the floor to Dr. Joseph Romm.

Joseph Romm: Hi. I am Dr. Joseph Romm, a physicist who runs the blog climateprogress.org for the center. We've gathered some of the top climate scientists in the country because those who have spent decades attacking and misrepresenting the scientific understanding of climate science redoubling their efforts based on a misrepresentation of some illegally hacked e-mails.

As the journal Nature editorialized yesterday, nothing in the e-mails undermines the scientific case that global warming is real or that human activities are almost certainly the cause. As Nature noted, that case is supported by multiple robust lines of evidence, including several, that are completely independent of the climate reconstructions debated in the e-mails.

Let me add, scientists have been predicting for decades that pouring more and more heat trapping greenhouse gases into the atmosphere would change the climate, it's happening now. As NOAA's climate monitoring chief pointed out in October, the last ten years are the warmest ten-year period in the modern record, even if you analyze the trend during that ten years, the trend is actually positive, which means warming.

I would add several studies released this year show that most of the warming is going where scientists expected it to go, which is into heating the ocean, which continues to reach record levels both at the surface and down to two kilometers.

Global warming is about as fast as the scientists had predicted. Ice appears to be melting around the globe faster than scientists had predicted in the Arctic, in the Greenland and even Antarctica where recent study even suggests we maybe seeing ice melting in East Antarctica which is quite unexpected. And all of this is a key reason that sea level rise has accelerated in the past decade.

These observations are unequivocal. The question is what will happen in the future and that is still in our hands. On the eve of the Copenhagen conference, the latest science tells us one thing about the future with high confidence. If we stay on our current emissions path of more and more emission, then greenhouse levels will achieve dangerously high levels. Serious impacts like ocean acidification are quite impervious to political rhetoric and can only be addressed by sharply and quickly reducing emissions.

Let me introduce the three climate scientists here Professor Michael Mann is Director of Penn State Earth System Science Center. He is the author of more than 120 studies in professional journals and a new book Dire Predictions.

Dr. Gavin Schmidt, he is a Climate Modeler at NASA's Goddard Institute for Space Studies. He is the author of more than 60 studies and in recent book *Climate Change: Picturing the Science*.

And lastly, Professor Michael Oppenheimer he is Director of the Program in Science, Technology and Environmental Policy of Princeton. He has authored more than 100 articles.

Dr. Mann?

Michael Mann: Yes. Thanks. I'd like to point out that I'm just a member of a very large community. There are thousands of scientists around the world who've been working hard for decades to understand our climate system and to provide decision makers the scientific information that they need to make informed policy.

The result of the research – again decades of researches – as (Joe) Romm has already said, there is a very robust consensus that humans are warming the planet and altering earth's climate. And this consensus is shared by virtually every professional scientific society in the U.S., the National Academy of Sciences, the national academies of all the G8, all the major industrial nations.

The changes in our climate are already disrupting our environment and further increases in greenhouse gas emissions will lead to increasingly greater disruption. The world's governments are at the cusp of a crucial conference to take place in Copenhagen in just days and in advance of this meeting, two dozen climate scientists, including myself, produced a report called, "The Copenhagen Diagnosis." And if you Google those words, you can find the report online.

That summarizes the current state of our scientific understanding, and goes into detail about many of the scientific points that (Joe) Romm already talked about, including the fact that we now know that the major ice sheets, just over the past few years, we have now learned for the first time that the two major ice sheets are indeed melting and that will likely contribute to a faster rate of sea level rise than we had previously thought would be the case.

Unfortunately, despite this very strong consensus that exists, there are a handful of people and organizations that have tried to clout the debate, and they've frankly - they've not contributed to an honest scientific discourse but have engaged in this 11th hour smear campaign where they've stolen personal e-mails from scientists, mined them for single words or phrases that can be taken out of context and misrepresent what scientists are actually saying.

And I think this is rather telling, the scientific evidence for the reality of the problem and the need to do something about it is overwhelming. Those advocating inaction don't have the science on their side, so they've turned to this last minute to smear campaign. And I hope to correct the record with regard to a number of the specious claims that have been made in recent days as a result of those stolen e-mails and I will be happy to entertain questions about that later.

Joseph Romm: Gavin?

Gavin Schmidt: Hi. My name is Gavin Schmidt. I'm a climate modeler at the NASA Goddard Institute for Space Studies. And while I – briefly go through is the six reasons why we think that this – the climate change is currently a problem and it's currently a problem that we are causing and why it is going to be a problem.

Those six steps are not affected by anything in these e-mails, and I think it behooves us to know exactly where that science comes from and where we need to be focusing on when we are trying to workout what the uncertainties are and what's going to happen in the future.

So the first thing that you need to know is that there is a natural greenhouse effect that's what keeps the planet livable, without the greenhouse effect, it would be much, much colder by 33 degree Celsius colder than we are. This is something that's been known for hundreds of years.

We know that carbon dioxide and the other trace gases, including methane and ozone and water vapor all contribute to that greenhouse effect. We've been measuring that from space for a number of decades, we've been – we worked out the theory of that you know 50 years ago and we understand why those trace gases impacted the greenhouse effect.

We know that the carbon dioxide levels have increased by more than 30 percent in the industrial period. We know that methane has more than doubled; nitrous oxide has been up 15 percent, tropospheric ozone has also increased – other compounds that didn't even exist in nature CFCs and HFCs are all adding to the greenhouse effect.

We know that the amount that these are adding to the greenhouse effect is significant and we are getting up to the point where the total amount of forcing from these greenhouse gases is equivalent to if the Sun brightened by about a percent. Now that's a very, very big number indeed.

We know that the climate is sensitive to those kinds of changes. We can go back in past climate, we can go back to the last, Ice Age, we can go back to the early Holocene and lots of other periods in the past and we can work out why the climate changed and for what reasons and that gives us this range of sensitivity of around 2-1/2 to five degree Celsius for a doubling of CO₂ that the IPCC has talked about for many years.

The best guess for that sensitivity is about three degrees for doubling of CO₂ and we will likely get to a doubling of CO₂ under business as usual scenario, some time in the middle of this century.

When you add up what we've done and what impact that is likely to have, we end up with scenarios for climate change in the future that put our planet in a position that it hasn't been in for maybe millions of years. The Pliocene three million years ago was maybe three degrees warmer than today and was associated with sea level rises of 20 meters higher than today.

Now that's a very long-term change but we're pushing the planet towards that kind of level of change and that's not something that policymakers, citizens, or scientists ever want to see happen. So that's it.

Joseph Romm: Dr. Oppenheimer.

Michael Oppenheimer: I'm Michael Oppenheimer, I'm an Atmospheric Scientist at Princeton University. From my point of view, the most issue is whether

anything has been added to or subtracted from the scientific picture of global warming that's emerged gradually over several decades of careful analysis by thousands of experts. And the answer is simple, from a scientific point of view, nothing has changed, it remains true that it has warmed more than a degree Fahrenheit over the past century, largely due to the human made buildup of greenhouse gases.

It remains true, that the global average sea level has risen about seven inches over the past century and that's enough to erode or submerge about 60 feet of sand along the typical east coast beach. It remains the case that both major ice sheets as was just mentioned are losing ice at their peripheries rapidly. Making a substantial and I would say surprising contribution to sea level rise. And it remains true that the ocean is more acidic than it used to be due to the buildup of carbon dioxide. Finally, it remains a case that the projections of future climate change are every bit as discouraging as they were before the recent (blab) began.

Nevertheless, it's important to recognize and I think most of my colleagues in the scientific community do recognize that public confidence in science in the manner in which it's conducted is and always has been crucial for assuring that governments will actually use the advice that scientists provide them. We know that our success in discovering the truth depends on our openness with each other and I think we also understand that the transparency of science to the public is a key to maintaining confidence in us as experts.

That is why the scientific community's broad participation in IPCC and other similar institutions and by the way, I am proud – I am proud to have been associated with IPCC for 20 years. That's why that participation by the community that broad participation is so important. IPCC provides a powerful example of how scientists could make themselves and their research openly available and exceedingly useful to policy makers as well as to the general public while maintaining the highest standard of quality and scientific integrity.

That's all I have to say, and I don't want to repeat what other people have said, and I am happy to answer questions later.

Joseph Romm: We are ready to take questions, yes.

Suzi Emmerling: Yes.

Operator: At this time, if you would like to ask a question press star one on your telephone keypad. We will pause for just a moment to compile the Q&A roster. Our first question comes from the line of Andrew Revkin with New York Times.

Andrew Revkin: Hey, thanks for holding the call. One question and this is for Gavin and Mike. Do you think given the – you guys have worked really hard to kind of keep yourselves separate from political process and just state clearly the science including on your blog. Is there a reason this call is being handled through the Center for American Progress, which is a very strong agenda, as opposed to let's say the AGU, the AAAS or some other scientific entity?

Michael Mann: Up, this is (Mike) Mann. I can take a first stab at that. They chose to organize and they asked us if we would participate and we thought it was wonderful then you – for us to try to get out what the science actually has to say and to address some of this specious allegations that have been made, be it to you or any other organization had asked us to participate in a similar conference.

I can only speak for myself, but I think that we all would have been happy to participate in that as well. But the Center for American Progress is the first one that came to us and asked us if we would be interested in doing this and I personally have no problem doing this with them.

Andrew Revkin: Gavin, do you have any problem with it?

Gavin Schmidt: No. People all over the spectrum asked me to talk to them and I am perfectly willing to talk to anybody and through anybody.

Andrew Revkin: OK. Cool. Thanks.

Operator: Your next question comes from the line of (Jim Motawali) with CBS.

(Jim Motawali): Yes. I would like to ask the analysts what do you think that we will see either a cap-and-trade system or a carbon cap and what's the timeline of that? Maybe it seems unlikely that's going to come out of Copenhagen, but we would like to just see it. What would be your timeline for when some form of carbon regulation is enacted?

Michael Oppenheimer: Let me take that. This is Michael Oppenheimer. I think that what we already know, there isn't going to be a binding agreement at Copenhagen because the governments have so indicated. There will instead be a political or agreement in principle. I would – the major reason that Copenhagen isn't expected to reach closure is that the U.S. Congress hasn't yet acted in.

The President hasn't signed any legislation. There are different views on how quickly that can happen. I'm – my own personal view although is no better than anybody else's is that it'll probably happen in the spring. And if that does happen, then I would expect that there would be a global binding agreement some time within six months or a year thereafter. But those are just you know political guesses aren't worth that much. Anyone else while I look at that?

Joseph Romm: This is (Joe) Romm. I'm happy to say I – you know to I think that the President Obama, Senator Reid, Senator Baucus, Senators Kerry, Graham and Lieberman have made clear that that we're going to see a climate bill debated in the Senate in March or April.

And I think that it's going to lead to a climate bill and I think that it will be part of the two-step process that the biggest emitters stated Copenhagen is the first step and I expect that you know a domestic climate bill will ultimately lead to finalization of an international climate deal. But that's just my estimation.

Operator: Your next question comes from the line of Stephen Spruiell with National Review.

Stephen Spruiell: Hi. Thanks for doing the call. My question was regarding some of the passages in the e-mails. One in which Dr. Mann wrote we have to stop considering Climate Research as a legitimate peer-reviewed journal. And another in which – which concerned the Journal Geophysical Research letters

in which Tom Wigley wrote of getting a particular editor ousted. I was wondering if you could comment on those passages and whether these e-mails call into question the peer review process.

Michael Mann: This is (Mike) Mann and I'll be happy to address that question. So it's important to understand what peer review actually is. Peer review is not a license for anybody to publish in the scientific literature, an article that doesn't meet the basic standards of quality that are required for publication in the scientific literature. That is to say an article which makes credible arguments for, provides credible evidence for the conclusions that it reaches.

And in the case of Climate Research, what had happened here was that there was an editor who appeared to be in essence gaming the system to allow through papers that did not meet the basic standards of science, simply because they expressed a contrarian viewpoint about climate. And there is absolutely no problem in the publication of papers that express skeptical viewpoints. Some of my papers have been cited by climate change skeptics as supporting a skeptical viewpoint. For example the work that I have done suggesting that natural variability on longtime scales may be more important than once thought.

So there is nothing wrong with skeptical science being published, but skepticism works both ways. A true skeptic, which all scientists should be, is somebody who looks at both sides of a problem who looks for weaknesses in both sides of an argument, not somebody who simply ignores the evidence on one side of the argument so that they can reach a pre-ordained conclusion.

And it was the judgment of the Editor-in-Chief, Hans von Storch that the – in essence the violations of those basic standards of quality in the peer review process had been compromised at this journal, Climate Research, that led to the resignation of the Editor-in-Chief, Hans von Storch, and it led to the resignation of half of the editorial board of that journal. And that's very unusual. For something like that to happen, that indicates that there really is a major problem with the journal.

Even the publisher, who originally was resistant to allowing von Storch, the Editor, to write an editorial commenting on how the peer review process had failed, even after von Storch quit because he was not allowed to write that editorial, the publisher said, indeed, the peer review process had failed here.

Stephen Spruiell: And the issue with Geophysical Research letters?

Michael Mann: Well, that appeared to be a somewhat analogous situation where there were a number of papers that were published that did not meet those basic quality standards. They did not make a credible case for the conclusions that were reached, and there were a series of such papers, and the frustration with the fact that, once again the peer review process which is supposed to filter out papers that do not make credible cases for the conclusions that they reached had failed here.

And Tom Wigley was expressing his frustration with that.

Gavin Schmidt: Let me add a couple of points. In the Tom Wigley case, the editor involved wasn't pressured to resign. Tom Wigley is just going through official channels if there had been failures in peer review. And that was never pursued. Not ever happened and the guy did his full rotations as editor and then just – and then just kind of rotated off when his time was done.

I'd like to also stress that scientists care very much about the quality of the journals that they publish, because if a journal is perceived to have a lax reviewing standard. Then you are kind of tarred with the same brush. If you publish in that journal, and then people think that that journal will just allow anything to go in then your work becomes devalued, and so scientists spend a lot of time trying to make sure the standards of the journals that they publish in are withheld, because that reflects very strongly on the quality of their work, that's why it's so hard and so desirable to get into nature or science, because they have very, very high standards of peer review.

So it makes a difference that you are publishing there rather than in you know the journal of Upper Woop Woop. You know, these things do make a difference and so scientists are concerned about standards of peer review.

Now that's certainly not undermining peer review, it's asking for peer review to be maintained, and I think it's very important that that point be stressed.

Suzi Emmerling: Thank you. Next question?

Operator: Your next question comes from the line of (Richard Harris) with (NTR).

(Richard Harris): All right. Thanks for taking the call. Pardon me, Mike, first of all, I would like to ask you what – how you see the investigation at Penn state playing out, what does that look like? What's involved in that? And also I would like you to address the – one of the more disturbing e-mails there was the request from one of your colleagues for people to delete anything any e-mails related to AR4, which is presumably the forth assessment of the IPCC. I think that's drawn a fair amount of attention, so thanks.

Michael Oppenheimer: Sure. So with regard to the first question, there seems to be a fair amount of confusion out there about what Penn state is doing. There is no investigation. Penn state is simply and to my understanding reviewing the evidence that is out there to determine if there is any reason for an investigation and in fact I welcome that.

I have nothing to hide, I have done nothing wrong and you know my work has been held to the highest quality standards. The National Academy of Sciences specifically reviewed my work and said that our basic 10-year old conclusions still hold after multiple independent studies have tackled the same problem, and that there was absolutely no indication of anything inappropriate in the science we've done. So I think my record stands for itself and I welcome any scrutiny of that record.

Now as far as that e-mail that you referred to – well, that you know – frankly that – I think that the sending of that e-mail demonstrated unfortunate judgment on the part of the scientist who sent it. To my knowledge, nobody acted on that request. I don't think any e-mails were deleted. I certainly did not delete any e-mails in response to that request. I felt uncomfortable in receiving that request. And again that showed perhaps a lapse in judgment.

Suzi Emmerling: Thank you. Next question?

Operator: The next question comes from the line of John Boehner with New York Times.

John Boehner: Anybody who wants to tackle this one, but you all seem to agree that nothing in the e-mail traffic that we've seen recently undercuts the basic scientific argument for global warming and its human causes. Do you think though that it undercuts some of the political and policy justification for what's about to happen in Copenhagen or in the United State's Senate or that it will be used that way?

Michael Oppenheimer: Let me answer that. This is Michael Oppenheimer. As far as Copenhagen is concerned, I don't think this will have any effect. I don't see it even registering on the meter. On the other hand, in terms of what the debate in Washington maybe on the climate legislation, I would expect the – those opposing action to throw everything, including the kitchen sink into the debate and this will be one of the things that gets aired, it already has been on the floor of the Senate. So yes, one can expect this to come up, do I think it will be a significant effect on either the judgment of the lawmakers or public opinion, no I don't, but you never know with these things.

Joseph Romm: Yes and this is (Joe) Romm of Climate Progress. I think one of – and I've said on the Climate Progress many times. I think one of the surprising and unfortunate occurrences in U.S. politics in the last two or three years is that the opponents of climate action and clean energy have not only not moved their position in response to the overwhelming science, which was articulated and summarized in the 2007 IPCC report and then has clearly strengthened in the last two years.

Not only haven't the opponents of action but they have in fact redoubled their you know, disinformation campaign, whether it's funded by the American Petroleum Institute or the polluters, whatever it is. I don't think there was any chance whatsoever that they were going to stop misrepresenting the science and claiming that global warming is not a problem.

So, what's you're hearing now is just a different variation of what they have been – the opponents of action have been saying for two years. So I don't

expect it will move them. Anyone who can be moved by science is getting more concerned about the need for action based on the science and you know, I think fortunately as we saw in the U.S. House of Representatives and I think as we will see in the Senate the majority of members of Congress understand how strong the science is and the urgent need for action.

Suzi Emmerling: Thanks. Next question please.

Operator: Your next question comes from the line of Daniel Stone with Newsweek.

Suzi Emmerling: Next question please.

Daniel Stone: Can you hear me. Oh! I think I was muted for a while there. Dan Stone here with Newsweek. One of the things that a lot of us have been trying to figure out is the correlation really between the U.S. domestic policy and the international, or any international agreement in Copenhagen. Interested in some thoughts on – on how any of you see the two related, how each will impact each other which can and will come first and how that will impact the other.

Michael Oppenheimer: Well, this is Michael Oppenheimer. I think the President made quite clear that that there is only so far he can go, whether the U.S. can go in Copenhagen until there is congressional action. So that that's on the table and the President put a U.S. position which for instance indicated a range of reductions while citing the same number in terms of the 2020 and 2050 targets that are in the House bill.

On the other hand, the administration has also indicated that there are some things that can be done by executive power without waiting for the Congress to act. So I think over the next few months there is going to be an interesting set of actions and positions taken that will see progress at the international level, progress in the Congress and action on regulation at the executive level, which will all sort of interact with each other and eventually dance toward, both the domestic U.S. and global policy on dealing with climate change.

Daniel Stone: But, does one happening first may get you know pave the road with the other to make it easier.

Michael Oppenheimer: Well, I think they'll interact. You know it's a little late to talk about one happening, for its clear there isn't going to be a binding agreement at the international level until there is Congressional action in the United States. On the other hand, there is also executive action happening in the U.S., for instance, this tightening (inaudible) to come through economy of scale. And you know these, these three things are going to march together. They are going to be tightly related I think. I don't think one can get all that far out ahead of the other.

On the other hand, you have to realize that even if the Congress passes legislation, even if there is an international agreement, it maybe sometime before any international agreement is actually ratified by them. So, another thing that's going to be going on is the U.S. is going to be developing policy and moving along in parallel with whatever other countries do, both inside and outside the context of the treaty. So it's a complex world that we are moving into. There are a lot of different levels of control of climate change that already happening and more that are going to happen in the future. I think people have to get used to the fact that this, the multilayered situation, where progress has to be made on many fronts at once.

Joseph Romm: If I could – this is Joe Romm, if I could add, I think that, you know, the big emitters said that the Copenhagen would be the first step in a two-step process. Obama has said he will come to the table with targets, obviously once that Congress ultimately has to approve. The – but I think it is – it is – I think the timing is actually very good. I think that Congress and the American public need to see, need to learn that the other countries of the world are prepared to take serious action, if the U.S. takes action.

And I think that the statements in recent weeks or days by China and India, but you know especially China which as the Chief Economist at the International Energy Agency said last week, China's commitment alone would be responsible “for more than 25 percent of the reductions the world need to limit planetary warming to two degrees Celsius. That is to say, its 2020 target, 1 billion gigaton off of business as usual and that's the most important thing to get us of business as usual.

So I'm expect that what will come out of Copenhagen is a framework for a deal and a clear sign that the rest of the world is, in fact, going to be taking action, if the U.S. takes action. And I expect that U.S. will – Congress will agree to take action and then there will be a global deal.

Suzi Emmerling: Thank you. Next question please.

Operator: Your next question comes from the line of (Neil Moran) with National Journal.

(Neil Moran): Thanks very much for doing this. You guys – I – look, I understand that scientists are happy to investigate the quality of the data that they rely on. But this scandal about CRU is about the public's trust and the Climate Science Community. The – there's a lot of people judging by Google and others who frankly have seized on these e-mails and to dismiss the creditability of your claims as you can see it in Congress, et cetera.

So you know, Dr. Mann a minute ago you said you would welcome a scrutiny. But can you say if any of you – can you say if each of you would rebuild public trust in science by calling for group of expert outsiders to test stations or database experts but not mining engineers to publicly verify the quality of your database and see how you use database and software. Because it's not just the e-mails, it's the reports about the database that are bolstering the confidence of your political opponents.

Michael Mann: Gavin, do you want answer first or do you want...

Gavin Schmidt: Can I first say that the CRU are not the only people with whole databases on these things. NASA, the GISS, it's not a project that I am involved in directly, but it's in the building I work in. Nowhere NCDC maintain their own databases and update them every month from reports from the national MET services. Those databases are completely public domain. You can go into them and look at anything that you want to look at, the temperature records that you get from the GISS Temp or from NCDC or from the Japanese effort which is also another independent effort or from the reanalysis projects which

come from ECMWF in Europe or from NCEP in the U.S. Or, again from the Japanese. All of them show the same information.

The issues that CRU has with – you know the fact that they've been working at this longest than I think have the you know 30 years of efforts that they put in to build in that database, you know they have their own database management issues obviously. But that isn't the only data that's out there you can verify the differences between their estimates of the temperature changes and the estimates that the other groups get is completely minimal.

And the impact of the extra data that they have is really – maybe it's important in the kind of 19th century. They have more of the old data than the other databases have. But anything that comes to the trends over the 20th century over the last 30 or 40 years, that is very, very solid and completely verifiable by anybody who wants to verify it. All of this stuff is out there. The GISS Temp code is freely available. There is number of open source projects that have taken it and tried to make it better. Go ahead and knock yourselves out. The answer is it never change, because there is plenty of existing evidence that's completely independent of the Met stations that demonstrates that the planet has been cooling, earth has been (Michael Mann laughs).

That the planet has been warming over the last 40 years, (I don't know where that came from). We have ocean temperatures, completely independent. We have melting glaciers, that's independent. We have changes in phenology, that's the drift of you know plants when they bloom in the spring, when birds migrate. There is so much information that tells us that the planet has been warming, and substantially that no independent – no independent investigation is going to come up with anything other than what we've already concluded.

So, yes, you know anybody can look at it and anybody is welcomed to. They're not going to find anything different.

Michael Oppenheimer: It's important to point out that the date - most of the data has been freely available for decades, and there have been plenty of opportunity for people who wanted to take a look at it, and reach a different conclusion to do

so. And they haven't. I don't whether they haven't look at it or they haven't been able to reach a different conclusion, I suspect the latter.

Joseph Romm: And I would just add that the people who are saying that they don't trust scientists now are you know please comb, you know, LexisNexis, they have made the same precise statements for two decades and they simply latch on to whatever recent thing they can find and misrepresent it to say the same thing.

I think every time an independent body has reviewed the science, including the National Academy back in 2001, when George Bush asked for review, you know the warming is unequivocal and the fact that humans are likely to be the principal cause you know is very well established science.

And I just think – and I would add you know just this year 13 federal agencies published the major report, which review the science that Gavin went through and explained what is going to happen on our current emissions path to this country, which is potentially warming of as high as nine-degree Fahrenheit across much of the country and widespread increases in sea level rise and the southwest becoming far more arid.

So the science you know keeps getting clear and clear. Those who analyze the science keep coming to the same answer and those who never believed the science keep coming up with something new to use as an explanation for why they simply don't believe what the science says.

Gavin Schmidt: And I'll just add to that something new can be often completely inconsistent with what they used just last week. So you know the same people that are saying that the climate is cooling, they are relying on the HADCRU dataset to say that, because that isn't true and the GISSTemp and NOAA datasets and they are the same people who are now saying that HADCRU is – can't be trusted. And so you know the consistency of the argument I think is one of those tests that you can apply to judge whether somebody is being credible enough.

Male: I'd add on that...

Suzi Emmerling: Thank you. Can we go to the next question please?

Operator: Your next question comes from the line of Jeff Tollefson with Nature Magazine.

Jeff Tollefson: Thanks for holding this gentlemen. I am just kind of curious, there have been some accusations that scientists are merely circling the wagons on this issue. I guess I am more curious in a general manner. Are there lessons that can be learned as far as behavior or policies or procedures or openness that you can draw from this scandal?

Michael Mann: I'd like to take a first stab at that. This is Michael Mann. Now, I think what you have to keep in mind, it's easy for people sort of on the outside within the community to sort of cast stones against those whose e-mails have been stolen and misrepresented. But you have to recognize that a lot of these e-mails are 10 years old and they are sort of a window into an earlier point of evolution of our science when we didn't have the huge database storage facilities to upload very large datasets to a journal's Web site or anybody who read the paper would have access to the full data.

The disclosure requirements at the time by the National Science Foundation, by the journals, now that published scientific articles, we're very different from what they are today. So I think you should look at what scientists are doing today. And as an example, we published a paper in the journal Science last week where we uploaded I think about 30 megabytes of supplementary information to Science's Web site.

So that anybody read the paper had access to every scrap of raw data that we used, every code that we wrote to do our analysis which by the way the National Science Foundation has said is our intellectual property, but we make it available anyways, to help move the field forward, to provide our colleagues with the information that they need to help further the science.

And so I think what you've seen in recent years in part, in response to the accusations that we have something to hide, which we don't is that the community has become much more forthcoming and providing as much information as anybody could possibly want and Gavin has already spoken to that.

Anybody who wants to run that NASA Goddard Institute for Space Studies climate model, one of the models used in the IPCC assessments can download that model and run it at least if they have a powerful enough computer. They – anybody who wants to rebuild the surface temperature record themselves has access to the raw data that NASA Goddard uses in the GISS temp record.

And one footnote I was going to add to the previous round of discussion is that in fact, there is a contrarian, a fairly prominent contrarian Anthony Watts, a weatherman from California who runs a Web site that is critical of climate research and climate researchers and he organized a huge effort to get all the raw data off the public data basis and reanalyze the record to show that it was wrong, that it was hopelessly comprised by factors such as the so called urban heat bias.

And it turns out when he and his large group of interested amateurs joined in on this project and produced their own surface temperature record, throwing out all of the data that they claimed was suspect, based on the sighting of the meteorological stations or other factors. They – guess what they came up with pretty much the same answer. There was barely any difference at all and then they got very quite because that wasn't very interest to them. They had simply reaffirmed what we already knew.

Michael Oppenheimer: I want to add to what Michael said that, you know, from my point of view as a scientist, as an individual, transparency is a good thing. How transparent you have to be is changing overtime. We all live including you guys live in a different world. And the scientific endeavor is evolving in our institutions and the individuals involved in them are learning how to be more transparent all the time.

IPCC for instance as a adapted procedure – adopted procedures which makes much more of the internal mechanism and internal discussions for instance the review of reports available online, so people can read them and make their own judgments about how effective the process is at reading out things that shouldn't be – that are good sciences versus not so good science.

So I think we are all but moving into a world which is much more transparent and that's a great thing. I think the idea of experts making judgments and just telling people what's the case without people having access and being able to take a look at it and other experts make their own judgments, I think that's not the kind of world we want to be in. We do want to be in an open world and we are getting there.

Suzi Emmerling: Well, thank you. Let's go to our last question please.

Operator: Our final question comes from the line of David Biello with Scientific American.

David Biello: Hi, guys. Thanks for having this. I guess my question is about the broader public. What do you make of the polls and other kinds of things that have been released of late. You know, showing declining acceptance of global warming, and declining I guess public trust in – in the scientific methods in general. And I guess the foot side of that question is, do you think anything good will come out of this release of e-mails? Thanks.

Joseph Romm: This is Joe Romm. I am going to answer that first and then – and then I would ask each – each of the three to answer that, since this the last question. I would say the following. I think that the – the disinformation campaign about Climate Science and global warming has been ratcheted up and that those, I think the polling shows that it is – it is more conservatives and conservative leaning independents who tend to get information from the newsgroups that repeat the disinformation that have gotten more skeptical.

I also think it is the case that if you do an analysis you find statistically there is less belief in global warming if it has recently been on the coolish side in October for those who believe the temperature record, October in the U.S. was the third coolest in the Continental U.S. And I will say that the – personally, I think the scientist community has not done a good job of going out and explaining the science which is one of the reasons that – that I helped organize this phone call.

So I do think that a good outcome of – of making lemonade out of lemons is that to the extent that you reporters are interested in talking to climate

scientists and this is an opportunity for climate scientists to talk to you and explain the science and explain why our confidence in it has grown and why our concern about the cost of inaction has grown?

Michael Mann: I'm Mike Mann. I can take the next stab here. I think that those polling results unfortunately do demonstrate that it's much easier for – for a cynical individuals in organizations to tear things down and to build them up, which is to say there are many of us in the climate research community who consider it very important to discuss in a very frank and open way with the public what the scientific evidence holds, what it shows, because we believe that if the public does come to understand the reality of the science, if we can communicate what the science actually shows, how robust the scientific conclusions behind climate change being a reality and a threat to our future if we don't confront it. If we can explain that to the public then I believe we will have an informed electorate that can make the right policy choices.

There is – we are fighting a headwind in that effort a stiff headwind. There is as Joe and others have referred to a concerted disinformation effort to disinform. So we're trying to educate the public, but against the headwind of others who are trying to confuse them and frankly this latest Smear Campaign, this 11th hour Smear Campaign demonstrates the intellectual bankruptcy of those opposed to taking action to combat the climate change. They don't have any scientific arguments on this side. They are not even challenging the science. All they have got this – innuendo and Smear campaigns and twisting the individual words and phrases used by scientist in their private individual correspondences.

Gavin Schmidt: OK let me kind of finish up. I think we've – whether there is anything there is good that's going to come out of these e-mails. And I think the answer is yes. It might be surprising to my colleagues. What is going to happen, once all the – once all the gotcha just stuff has worn out and the context has been established, there is not going to be any – there is not going to be any scientific misconduct associated with this, there is not going to be any fraud, there is not going to be any hoax.

But what there will be is a record when you actually look at these e-mails in detail of how science is actually, scientists talking to their colleagues arguing with their colleagues, being critical of each others papers both to the – both directly and indirectly. And how the process of you know putting together these assessments actually work and how we actually progress through disagreements have emerged. And I think that's a very interesting sociology of science that people don't often see, because what they see are the scientific papers and press releases associated with them and the cover art on nature.

And to some extent you know that's an artifice that – we – our scientific papers as (Peter Meduwa) very eloquently said in an essay that he – I think in 1964 the narrative that we put into scientific papers is not a fair description of how we came up with the answers in the first place. And coming up with the science progressing science is much messier than the classic mythology of how science works that a lot of people have.

And so I think in time, this and other ways that people are going to see more openness and transparency in the science. They'll see that you know scientists are human, they'll see how science progresses despite how are human failing and why science as an enterprise works despite the fact that scientists aren't perfect.

Michael Oppenheimer: And I would add to that that I think the public may come to appreciate that science is not monolithic, but you have people approaching these problem with different views and different approaches, and that despite those differences they are able to agree and reach a consensus on a very substantial body of what we do know. And that despite all the fighting and the healthy disagreements, there is enough that we do know for policymakers to be able to move forward on the problem.

I think that the more that scientists are able to draw on the lessons of this episode and be able to be – willing to be more transparent about how we do the businesses as Gavin said, and about what the differences are, and about how we nevertheless can reach agreement on the critical elements of a problem like this, I think that the public and the public debate and all of us are better off.

Suzi Emmerling: Thank you. At this time, I'd like to end the call and let you all know that we will have transcript and audio available later this afternoon. Again, my contact information is 202-481-8224, and my e-mail address is semmerling@americanprogress.org. I'd like to thank Professor Mann, Dr. Schmidt, Dr. Oppenheimer, and Dr. Romm for participating in our call today. Thank you.

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