

**Testimony**  
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**Warming**  
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Thank you for the opportunity to testify about the relationship between tropical forests, and the Amazon in particular, to climate change. I am President of the Heinz Center for Science, Economics and the Environment -- a non-partisan and non-advocacy environmental policy center focused on global change. We specialize in bringing the perspectives of business, government, academia and environmental groups to our policy discussions. I personally have worked in the Amazon since 1965 on science and environmental policy.

No comprehensive approach to climate change can ignore the approximately 20% of annual greenhouse gas increase in the atmosphere that comes from tropical deforestation, and it, of course, has its own intrinsic importance from a biodiversity perspective. After China and the United States, the two biggest emitters (i.e, third and fourth) of greenhouse gases

are Brazil and Indonesia. So the Amazon and its deforestation loom large in these considerations: were the Amazon to be completely deforested it would produce greenhouse gas emissions equivalent to 15 years of annual global increases in green house gas concentrations.

In addition climate change can have a major impact on the Amazon. Current estimates from the Inter-Governmental Panel on Climate Change (IPCC) are that at 4.5 degrees Fahrenheit increase in global average temperature, Amazon dieback will occur -- not the entire Amazon but large parts of it. Indeed, the most severe drought in recorded Amazon history occurred in 2005, and was associated with changes in the circulation of the Atlantic that could, in a sense, have been a preview of what climate change could bring. This of course would be a positive feedback releasing yet more greenhouse gases to the atmosphere.

Amazon dieback is not that far a distant possibility: at current concentrations, we are currently automatically slated for 2.7 degrees Fahrenheit of increase in average global temperature because of the lag time between increase in greenhouse gas concentrations and radiant energy being

trapped by them, and most projections bring us close to 3.6 degrees Fahrenheit by 2030.

An important additional factor is that the Amazon has been known for more than 25 years (based on work originally done by Brazilian scientist Eneas Salati), to create something on the order of half its own rainfall. This is because the rain dropped by the westward moving air masses evaporates off the complex surfaces of the forest as well as being transpired by the trees, producing rain farther to the west. It has been obvious for some time that continuing deforestation will at some point undercut the hydrological cycle.

We now know the Amazon can be affected by El Niño events on the Pacific side of South America. This can create Amazon drought separate from the cause of that in 2005. It is also possible for deforestation, El Niño and the 2005 type of drought to occur simultaneously. This would essentially lead to super sensitivity to early climate changes effects.

The question, of course, is what can be done to stem the ongoing high rates of deforestation which often range as high as 20,000 sq. kilometers a

year – somewhat larger than the state of New Jersey. These are driven by economic forces including the expansion of soybeans and a major resurgence of cattle production.

Brazil produces respected and reliable annual estimates of deforestation. The other Amazon nations do not. But one of the things that is needed is real time remote sensing data that can be married with effective rapid response enforcement of government policies. At one point the state of Mato Grosso had such a system. That would suggest it is within the realm of the possible to establish this for the entire Brazilian Amazon.

Yet another part of the solution is suggested by the programs of the progressive government of Eduardo Braga, governor of the Brazilian state of Amazonas (2.3 times the size of Texas). His government in recent years has increased protected areas and areas set aside for sustainable development reserves (generally natural resource based). There also are important experiments in payments to communities that use but maintain the forest. This could be a useful foreshadowing of what might be possible once carbon payments are available through the mechanism related to the Kyoto Protocol.

What is clear is that Brazil should be a major partner in advancing rational management of the Amazon. Brazil has major scientific and technical capacity, and there is general public interest in Brazil in protecting the Amazon, although clearly there are some economic interests that work to the contrary. It has also now become very much in Brazil's immediate economic interest to control deforestation, because we now know that a significant portion of the rain that falls south of the Amazon in Mato Grosso and São Paulo states -- the center of their major agro-industry and some important hydroelectric power facilities -- comes from the Amazon. Brazil needs the Amazon rain machine.

The key will be to jointly design a true partnership that is respectful of Brazil's capacities and sovereignty so as to achieve real progress in this key element in the climate change and sustainable development agenda.