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How will the Copenhagen Accord Affect the Challenge of Invasive Species?

**Presentation on Invasive Species and Climate Change
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Introduction

I will address two separate issues in this talk. First, I want to give you some picture of what actually happened in the Copenhagen climate negotiation, as opposed to what you might have heard about it. In doing so, I also hope to draw out some of the implications of the resulting Copenhagen Accord for the international effort to constrain climate change. Second, I'd like to talk about some features of the climate change problem that I believe are meaningfully related to the challenge of controlling and managing biotic invasiveness, and to discuss how what happened in Copenhagen may affect those features, and to what extent the Copenhagen result may impact our ability to manage biotic invasions in the future.

Structural Similarities between the Problems of Climate Change and Invasiveness

It is worth noting at the beginning that although climate change and invasiveness are quite different problems, from the policy point of view, they share certain structural features. Both problems have impact on a wide variety of natural systems and social sectors, from forests and rivers to deserts and ocean environments, and from the energy sector to sectors such as agriculture and urban health. Both problems are complex, and neither is automatically visible to the public in the way that more traditional environmental issues, such as water pollution or toxic dumping have been. Addressing either will require actions of different types in different domains – in the case of climate, mitigation through emissions reduction in the energy sector and adaptation through changes in the management of infrastructure and natural resource assets, and in the case of invasiveness, inhibition through the effective management of commerce and the use of

quarantine systems, and management of existing invasive species through means designed to reduce the extent and impact of their presence in the new environment. Additionally, neither problem can be solved by nations acting alone -- both require the evolution of shared practices among nations with highly different circumstances, both will require a significant enhancement of capacity, particularly in the developing world, and the solutions to both will involve new standards and practices for international trade.

What Happened in Copenhagen

Most press accounts have depicted Copenhagen as a failure. This is unsurprising given that the substantive result, in terms of the emission reduction targets and the specifics regarding the major policy elements of the accord, fell so far short of expectations. I want to paint a somewhat more positive picture, and yet still acknowledge the distance we have to travel to achieve an adequate set of policies.

The Copenhagen discussions began on a promising if controversial note as a number of small island states pointed out that efforts under the Kyoto Protocol, and even the overall target advanced by the European Community of holding warming to 2° C, were insufficient to prevent unacceptable impacts. The visibility of radical changes in the Arctic and in world oceans at a global warming of less than 1° lent credence to their arguments.

Unfortunately, the dysfunction of the UN negotiating process that followed shoved aside such serious discussion in favor of days of parliamentary maneuvering through which a small group of delegates from Sudan, Venezuela, Bolivia, and Saudi Arabia effectively blocked further progress. Their procedural barricades were backed for a time by leading developing countries, including China, India, and Brazil, who sought to thwart any move away from the Kyoto Protocol. The procedural wrangles got so bad that several days of ministerial-level consultations failed to resolve them, and they even delayed for a time the beginning of national statements by heads of state. In the end, it took extraordinary personal efforts by President Obama, working directly with the leaders of China, India, Brazil, and South Africa, to fashion a unified agreement. In doing so, a number of long-sought goals, including a 2050 global emissions reduction target, were indeed sacrificed.

What was gained in what became known as the Copenhagen Accord is perhaps less visible, but more important, than what was lost, and that is universality of effort. The Copenhagen Accord is the first operational agreement on climate change that includes commitments from all parties. It includes four major elements that have generally been considered as critical to any long-term effort to address climate change: a clear long-term goal, mitigation commitments by both developed and developing countries, basic standards for reporting on national actions, and for reviewing national progress, and a new and significant financial commitment through which developing countries will receive assistance for both mitigation and adaptation. Importantly, it also includes as priorities the reduction of emissions from forests and the acceleration and sharing of technology for cleaner energy production and for adaptation. Finally, the accord is

structured with enough flexibility to accommodate the need for strengthened efforts in the future.

The Copenhagen result appears to meet the bottom-line objectives of the Obama Administration, in the sense that it does not create new impediments to the Congressional approval of pending climate legislation, and that it includes commitments from China, the world's most dynamic economy and now the top emitter of greenhouse gases, in a manner that will be subject to reporting and review.

Implications of the Copenhagen result for the Evolution of Climate Policy

The Copenhagen Accord, and the process that led to it, have many implications for the future evolution of climate policy. These implications stem both from the substantive results – it appears clear that the initial array of Copenhagen commitments, taken in the aggregate, is unlikely to be fully effective in preventing further damaging climate change – and also from the policy trend embodied in the result, and the geopolitical realities that these trends reflect.

First, there is the question of the direct impact of the Copenhagen commitments on the international effort to reduce emissions. Assuming, for a second, that the commitments pledged in Copenhagen are implemented, where does that leave the overall effort to constrain climate change? The policy models run by Climate Interactive conclude that if all commitments on the table at Copenhagen are honored, the world will still warm by 3.9° C or 7° Fahrenheit, by 2100. This result is quite daunting, from an ecological perspective, and yet not surprising. As Martin Parry, the former chairman of the IPCC's working group on Impacts and Adaptation has observed, "even the toughest and most robust measures will not achieve 2° C. We should hope for 2° C but realistically expect 3-3.5° C, and then plan for 4° C."¹

In effect, we have no choice but to consider the Copenhagen Accord a starting point and foundation for further and more strenuous efforts. But we had also better start planning for a more severe level of warming than we wish we had in store.

Second, the implications of the Copenhagen process for future multinational cooperation. The Copenhagen negotiation ultimately rested on the U.S. and China. Without the participation of the world's top economy – the U.S. – and the world's top emitter – China – no climate change agreement can be successful. So President Obama struck a critical compromise in accepting the pledge of a target for a reduction in carbon intensity that clearly recognizes China's ongoing need to develop and at the same time satisfying the Congress that China will participate in the global emissions reduction effort in a transparent manner. At the same time, the new framework for action, which is more flexible than Kyoto, and will include a wider variety of disparate national actions, almost ensures a growing entanglement of climate and trade policies. This is because the major economies will need to measure each others' relative level of effort and will be tempted, if not compelled, to balance perceived disparities through trade adjustments and at times the application of trade measures.

Implications of the Copenhagen result for Future Management of Invasive Species

What are the implications of the Copenhagen result for the future efforts to manage invasive species? Again, they are of two types: the implications of the likely significant warming which policy thus far has failed to avert, and the implications of the policy approaches that are emerging as the most likely strategies for constraining climate change in the future.

As to the likely implications of the significant warming which analysts project will result even with the full implementation of Copenhagen commitments; people more expert than I will spend a lot of effort to understand and map them. For now, all that is possible is to make some preliminary observations.

First, the vulnerability of ecosystems, and in some cases, of whole regions to invasions will increase as the world warms. Among other things, many ecosystems will experience unprecedented levels of stress in the new environment. Heavily impacted regions, such as the marine Arctic, will experience both climate stress and new activities, such as increased shipping and tourism, which can also be expected to increase the likelihood of introduction of invasive species.

Second, freshwater environments will be the locus of many of climate change's most dramatic impacts, and will therefore become more vulnerable to disruption by invasives. As the probability of extreme drought and flooding events increases, and as the buffering reservoir capacity of snow packs and glaciers decreases, we can expect changes in the quantity and timing of water delivery as well as in water temperature which will stress native species and increase the competitive advantage of potential invaders.

Third, forests, grasslands, and deserts will become more vulnerable to invasions of weedy plants. Even though many crop plants may enjoy a competitive benefit from higher CO₂ levels, weeds are generally more efficient than crop plants in their use of water and nutrients, and more adept at exploiting disturbed environments than endemic grassland and forest species.² One example of this is the rapid invasion of African buffelgrass in the Sonoran Desert, transforming a previously fire resistant desert ecology into a fire prone exotic grassland.³

Fourth, the influence of pests and pathogens can be expected to grow. Already many of our western forests are being afflicted by bark beetles whose destructive range is expanding as winters warm.

There will also be much discussion over time of the implications of the policy approaches that appear to have emerged from the Copenhagen discussions. In respect to the invasive species problem, we might venture a few preliminary thoughts.

First, given that the level of commitment on the table in Copenhagen appears to be insufficient to restrain warming to anything like an acceptable level, it appears that

national commitments and objectives will have to become more stringent over time. This will require continued effort and coordination at the multilateral level, through such groupings as the Major Economies Forum (MEF) and the G-20, as well as through continued discussions in the UN Framework Convention on Climate Change (UNFCCC). The need to take continually more strenuous measures will likely be reinforced by the science, as more and more damaging impacts of warming come to light.

Second, the more open architecture of the Copenhagen Accord, as opposed to the Kyoto Protocol, means that national emissions reductions will use varied means to achieve a range of objectives. Both the means and the objectives will need to be assessed from the point of view of their efficacy in contributing to the overall goal of constraining future climate change, and also from the point of view of their appropriateness to national circumstances and their impacts on other economies. In this respect, adjustments and rebalancing through trade measures is likely to increase, and the reciprocal influence of climate and trade measures is likely to become more central to decision-making over time.

Third, the difficulty of reaching ambitious emissions reduction targets quickly enough to avert dangerous concentrations of greenhouse gases in the atmosphere will emphasize the need for more rapid development of transformative low-carbon energy technology, and will also encourage interest in geo-engineering as a “silver bullet” solution.

Finally, the need to take adaptation actions to reduce the impact of climate change will grow in importance, and will become clear in a wide variety of economic sectors. In many cases, reducing exposure to projected climate change impacts will require new types of coordination both within and across sectors, and at multiple levels of government and private sector decision-making. The ecosystem management issues raised by climate change will include vulnerability to invasions, and the increased attention of policy-makers at all levels to the adaptation question should provide a vehicle for attention to this aspect of the problem as well.

Conclusions and Recommendations

It's easy to be dismayed by the ecological dislocations that are projected in a warming world. And the fact that, fifteen years after the establishment of the UN Framework Convention, we are only just beginning a truly comprehensive coordinated effort to reduce emissions, and with great political difficulty at that, is not exactly reassuring.

Despite its defects, the Copenhagen Accord may yet emerge as the necessary foundation for the serious and continually more stringent efforts to reduce emissions, and the greater attention and investment in adaptation strategies which will likely be required in coming decades. As the international community grapples with these issues, it will inevitably focus attention on the linkages between national economic decision-making, trade and the competitive position of economies, and the health of the environment. This is an arena in which those concerned with the problem of invasive species must make their voices heard.

In the near term, there are a number of steps that might help lay the foundation for a more strategic approach to these issues in the future. Policy-makers would do well to:

- avoid mitigation strategies, particularly those involving forestation, reforestation, and land use, which exacerbate the problem of invasive species;
- ensure that the management of invasive species is an explicit consideration in national climate adaptation strategies;
- increase monitoring of vulnerable ecosystems, biomes, and regions;
- develop strategies for the management of invasions and restoration of ecosystem function that take account of projected warming trends;
- Increase international efforts, including through quarantine systems, to limit unintended transfer of invasives; and
- Carefully monitor trade/climate discussions for opportunities to increase the decision-making space of national authorities necessary for the proper use of quarantine systems to sanitize or inhibit movement of invasive species in trade.

¹ See his quotes in Nature, Vol.462:24/31 December 2009.

² See Mooney and Hofgaard, "Biological Invasions and Global Change," in Sandlund and Schei, Invasive Species and Biodiversity Management, Kluwer Academic, Dordrecht, 1999.

³ Ecological Impacts of Climate Change, National Academy of Sciences, National Academies Press, 2008.