Oral Testimony - May 29 2014 for the Hearing "Examining the UN Intergovernmental Panel on Climate Change Process for the Process for the Fifth Assessment Report"

The Need To Assess the Skill at the NCA multi-decadal climate models at projecting changes in regional climate statistics

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The IPCC WG1 and the NCA assessments reports have not adequately tested the skill of the climate models to project changes in regional climate statistics on multi-decadal time scales when tested by using the observed human activities including fossil fuel emissions over the last several decades.

Indeed, even when these models are run using observed initial conditions on decadal time periods, they have, at best, only very limited regional skill. The parts of the reports based on these model results is misleading the impact community and policymakers on the confidence that can be placed on regional climate impacts in the coming decades.

This issue is independent of how important one has concluded is the addition of CO2 to the atmosphere. Model projection skill should be a concern (and addressed) regardless of one's views on mitigation and adaptation.

Summary of my Main Points

- The 2013 IPCC GG1 report and the 2014 US National Climate Assessment presents a set of projections from global and downscaled regional climate models as the basis for projecting future societal and environmental impacts, and thus is offered as a guide to the future for decision makers.
- However, these projections have not been robustly shown to be accurate guides to the future. In fact, we are unable to accurately quantify their reliability. The IPCC and NCA did not adequately discuss the skill run in hindcast predictions over the last several decades when the human activity including fossil fuel emissions are actually known.
- Except for limited exceptions the models cannot accurately predict, in hindcast runs over the last several decades, the temporal evolution of major atmospheric circulation features over multi-decadal time periods such as El Niño and La Niña, the Pacific Oscillation, and the North Atlantic Oscillation. These major factors determine which regions have drought, floods, tropical cyclone tracks, and other societally and environmentally important weather events.
- The models have an even greater challenge in accurately predicting changes in the statistics of these major atmospheric circulation features over multi-decadal time scales.

- The IPCC and NCA should have reported such model limitations that were available to them in the peer reviewed literature. Without this information, decision makers, who face decisions at the regional and local level, will have a false sense of certainty about the unfolding climate future.