



Abstract Details

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Title: A coupled dynamic gaming simulation on global carbon management regime formation

Abstract:

The challenge for the carbon cycle related Earth System Science is to integrate the process understandings of coupled carbon-climate-human system. Especially important is the in-depth understanding of the anthropogenic drivers and human responses in this system. The overall success of carbon management will depend on the effectiveness in carbon emission reduction, positive environmental effects and the human welfare. The effectiveness will be realized through a complex set of technological, organizational and institutional factors. Valuable insights can be obtained by modeling different institutional structures for managing global carbon cycle. The analyses will provide insights into what works and what does not work, and will also enable adoption of learning-by-doing strategies. In this study, we have constructed a simple dynamic coupled carbon-climate-human system model. We have modeled the successive international negotiation process for carbon management as differential games. This model allows us to assess how the vulnerability of global carbon cycle, the human welfare change due to climate change and the carbon management regime will interact with each other. The simulation with this model shows that the effectiveness of carbon management regime would be critically depending on the heterogeneity and risk averseness of agents.

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