New Science of Climate Change Impacts on Agriculture Implies Higher Social Cost of Carbon (SCC)

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Selected Paper prepared for presentation at the International Agricultural Trade Research Consortium's (IATRC's) 2016 Annual Meeting: Climate Change and International Agricultural Trade in the Aftermath of COP21, December 11-13, 2016, Scottsdale, AZ.

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now known as SC-GHG

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IATRC Theme Day, December 11th 2016

Motivation: Why **SCC** is so important

- Substantively
  - because it places an theoretically justifiable range of values ($ per mt of CO_2 emitted) on the nonmarket effects of GHG emissions
- Politically
  - because it provides a scientifically based way to offset the pressures to drill baby drill or dig up more coal
- Criticisms
  - The models EPA has been using are seriously reduced form with a lot buried in a few parameters whose origins are less than clear.
- Paper is a welcome contribution to the modeling
  - Transparency
  - Vastly improved detail on ag sector

Politics of SCC

- 2014
  - Federal district court decision, *High Country Conservation Advocates v. U.S. Forest Service*, stopped the Bureau of Land Management's (BLM's) approval of a coal exploration plan for failure to justify why the SCC was not used to quantify the costs associated with the mining exploration.
- 2016
  - U.S. Court of Appeals for the D.C. Circuit (D.C. Circuit), upheld FERC environmental review under NEPA that did not use the SCC to quantify potential GHG impacts. FERC acknowledged the availability of the SCC tool but explained that it would not be "appropriate" or "informative" because of significant variation in output, lack of incremental impact measurement— criteria related to NEPA environmental reviews. The court concluded that FERC acted reasonably in finding that the SCC was "inadequately inaccurate" to use its environmental review of a liquid natural gas facility conversion project. (https://fas.org/sgp/crs/misc/carbon.pdf)
  - 7th U.S. Circuit Court of Appeals upheld DOE use of SCC in its analysis of standards for commercial refrigeration equipment - http://www.eenews.net/stories/1060041382
  - SCC was recently renamed the Social Cost of Greenhouse Gases (SC-GHG) to account for GHGs other than CO_2

Colorado Roadless Rule Exemption, Arch Coal wants to build new roads in Forest Service roadless area above Paonia in western Colorado

- Original EIS said no problem because emissions small share of total
- Supplemental EIS does include SCC calculations but still …
  - it is not appropriate to resolve that the proposed action is responsible for a certain percentage of total State or National emissions. However, it is useful information that puts this project in a meaningful context.
  - This alternative would likely have no effect on climate change impacts in CRAs, or other NFS lands. Anthropogenic climate change is not the result of any individual activity, but rather it is the result of many activities spanning many decades.
- NPV is still positive even if SCC included
- Criticisms of methodological decisions by FS
  - http://columbiaclimatelaw.com/files/2016/10/comments_-_sdeis_for_north_fork_coal_mining_exception-compressed.pdf

Trump transition team targeting DOE researchers who worked on SCC

- One question [to DOE] zeroed in on the issue of the "social cost of carbon," …The transition team asked for a list of department employees or contractors who attended interagency meetings, the dates of the meetings, and emails and other materials associated with them.
- At Thursday's Heritage meeting, senior fellow David Kreutzer [member of Trump's EPA transition team] attacked the idea of using the social cost of carbon during the regulatory process. He said it "actually can be considered a fiction, the way it's produced in the [Environmental Protection Agency] right now," adding that it "is supposedly a measure of the damage done to the world economy for each ton of carbon emitted in a given year."

Source: https://www.washingtonpost.com/news/energy-environment/wp/2016/12/09/trump-transition-team-for-energy-department-seeks-names-of-employees-involved-in-climate-meetings/?utm_term=.42275c812e3e

Reduced form versus process models

- *All* models are reduced form in some degree.
- The relevant question is whether the process of ‘reduction’
  - hides important interactions in the (explicit or implicit) error term
  - distorts the results.
  - There is no easy way to tell this a-priori for many modeling efforts
- Comparison with AgMIP is useful but,
- haven’t asked *why* there is such a big difference between your results and theirs.
  - Does your functional form choice introduce biases/parameter constraints that the process based models don’t have?
  - Does the process based modelling approach, especially with their inclusion of some suspect models, not capture the full effects of climate change. I’d lean towards the latter but would be good to have a careful look at this.