Earth Syst. Dynam. Discuss.,
https://doi.org/10.5194/esd-2017-86-EC1, 2017

Earth System Dynamics
Discussions

Interactive comment on "The impact of uncertainty on optimal emission policies" *by* Nicola Botta et al.

M. Crucifix (Editor)

michel.crucifix@uclouvain.be

Received and published: 8 December 2017

Based on the review and my own reading I can see that the article as a welcome application of formal decision theory to the problem of optimal decision policies. Given that formal decision theory is not so well know in climate and earth system sciences, the article has partly a pedagogic function and it fulfills this role.

One possible hurdle (for many readers I suspect) is the functional language notation. It was not entirely clear to me what was standard functional language notation (if there is such a standard), and what was more idiosyncratic to the Idris language. The first serious hurdle is the expression of the monotonicity condition p.10. For example, the functional mapping `fmap` will be unknown to most readers, and in fact the whole ex-

Printer-friendly version

Discussion paper

pression will be challenging. It would be a shame to have readers abandoning reading at this point. I can see two (non-exclusive) solutions: spend more time in explaining the notation, the context and the fact that the article comes with a `git` repository with Idris code, and (2) put the formal expression of the monotonicity condition in an appendix, with due explanations. The authors may also point where, in the git code, this condition is expressed (file name and line number).

The authors do a good job in explaining the interest of formal decision theoretic approaches. As they correctly point out, the choice of a measure function mapping probabilities to a reward is subjective and important. There is a vast literature on this particular point which cannot be entirely reviewed here, but it would be useful to have a few more words making explicit the rationale for using the minimum, the maximum, or the expectation.

The fact that high emissions are always optimal at the last time step is interesting. It comes from the fact that there will not be a following time step: this is the end of the time line and future generations are infinitely discounted. It sounds like the proverbial prodigality of the one who just learned she is ruined (in French: "foutu pour foutu"). Perhaps this is a nice example (which deserves an observation) of the fact that convenience assumptions (like the finite number of decision steps) generate outcomes that ought to be rightly interpreted as consequences of these convenience assumptions. This is a surely trivial or extreme example of the more general fact that the output of a decision-support algorithm should not be delivered without further guidance to the decision-maker.

In a revised version, the authors may also want to introduce some of their own comments (response to a legitimate criticism), along with addressing the concerns of reviewer 1. The article is then likely to be acceptable for publication.

See some editorial comments in the attached document. There are a few more typos which will be corrected at the copy-editing stage.

Please also note the supplement to this comment:
https://www.earth-syst-dynam-discuss.net/esd-2017-86/esd-2017-86-EC1-supplement.pdf

---

Interactive comment on Earth Syst. Dynam. Discuss., https://doi.org/10.5194/esd-2017-86, 2017.

Printer-friendly version

Discussion paper