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## Optimal policies with tipping points and uncertainties

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Global warming generates the possibility of 'abrupt' or 'irreversible' changes, associated with tipping points. Uncertainties are however sometimes invoked as an argument against political action. The Tipping Points in the Earth System (TIPES) project includes a workpackage whose goal is to rationalise the effects of uncertainty on what should be regarded as an 'optimal policy', given the possibility of tipping points.

To this end, we rely on two disciplinary fields. On the one hand, climate models integrate the dynamical principles, which determine the existence of 'tipping points'. On the other hand, formal decision theory defines the concept of optimal policies and allows us to compute them.

The current contribution outlines the implications and hypotheses needed for combining both frameworks. To exemplify this, we use a simple ice sheet model coupled to both carbon and aerosol models. The coupled system provides us with the formal basis to define the notions of control, irreversibility, and commitment. From this basis, we sketch out the mathematical problem of finding an optimal policy, with emphasis on what needs to be defined to pose the problem properly.