Modeling Economic and Climate Outcomes

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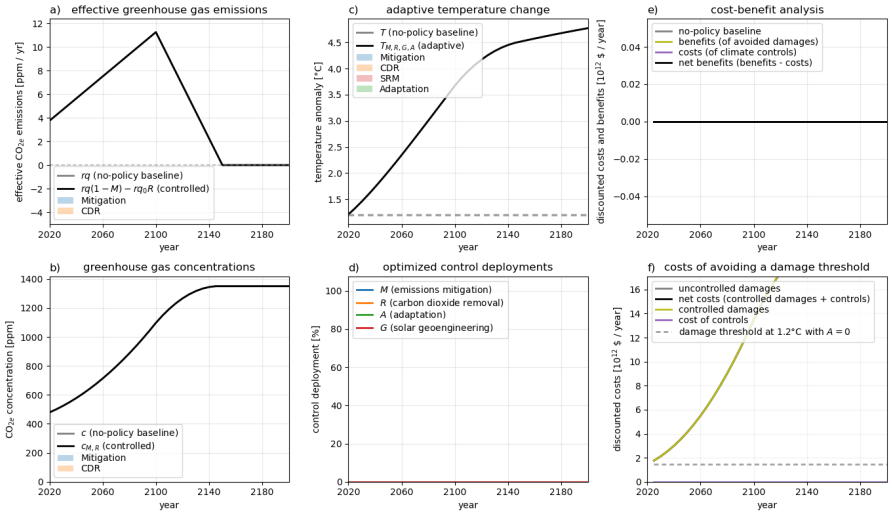
With Margo and Julia

By: Matthew Conlen

This is the introduction to the Julia-based article.

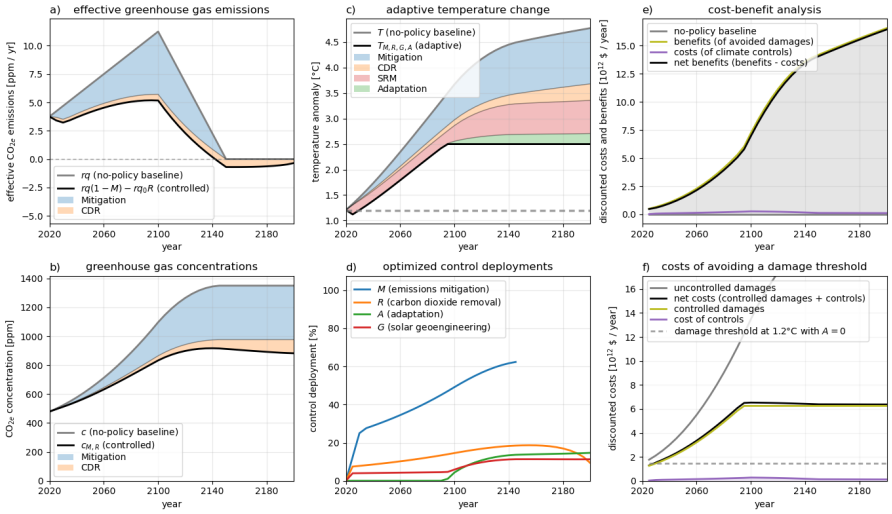
ClimateMargo is a climate-economic model that helps us understand possible pathways to limiting global warming to.

Here's an overview of what MARGO gives us. The graphs show typical metrics like greenhous gas emissions and concentration, and temperature change. They also include the suggested optimal deployments of mitigation strategies, and a cost-benefit analysis. Currently the graphs just show what is expected to happen if no mitigation is done. That is, no mitigation strategies are deployed.

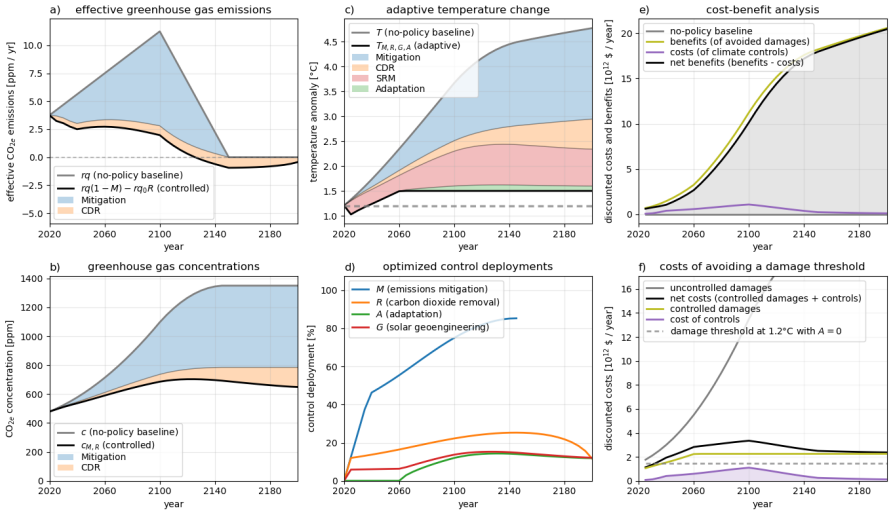


Now we ask MARGO what the optimal approach is to limit warming to 2.5 degrees celcius. Notice that overwhelmingly the algorithm suggesets that we

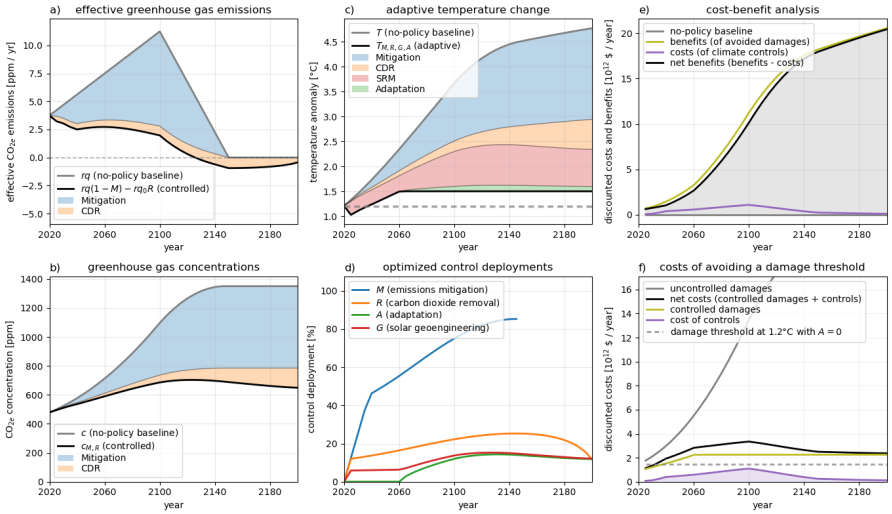
should focus on reducing emissions, but some amount of carbon dioxide removal and geoengineering is helpful too.



If we want to keep warming to 1.5 degrees, the amount of emissions reduction needs to increase sharply.



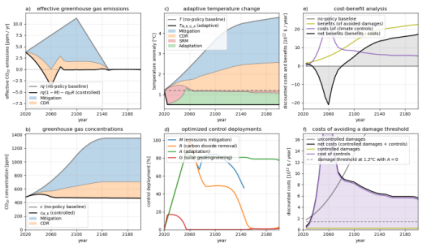
Use the controls to see what MARGO suggests is the best path to limiting warming to a specific temperature. You can also change what exactly MARGO optimizes for. Optimizing for net-benefit considers the cost-benefit analysis. Optimizing for temperature is optimizing only for limiting the warming under a certain temperature, while optimizing for `adaptiv_temp` is a slightly looser constraint that allows for adaptation to higher temperature.



tempGoal

optimizeFor adaptive_temptempnet_benefit

Appendix Scene 1



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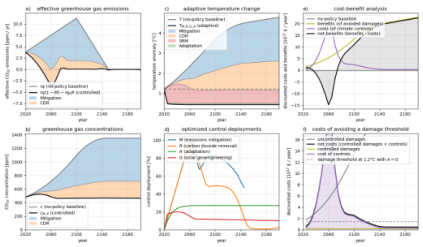

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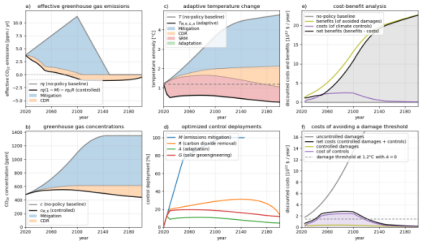

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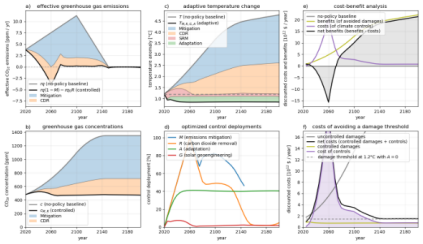

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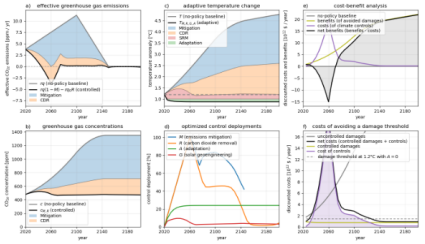

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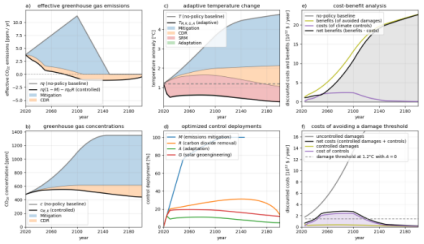

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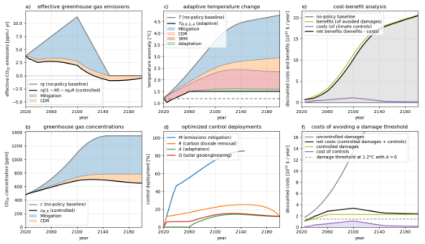

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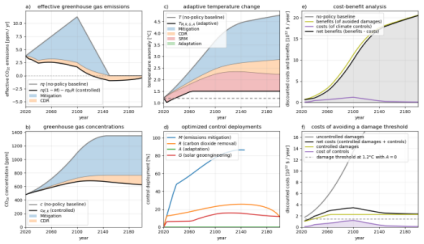

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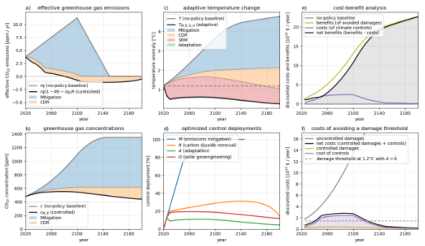

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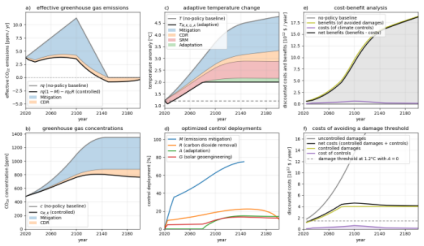

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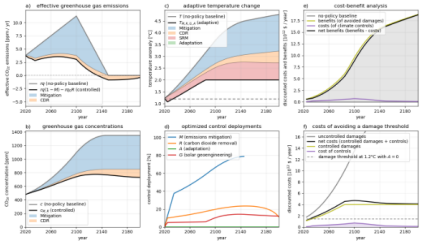

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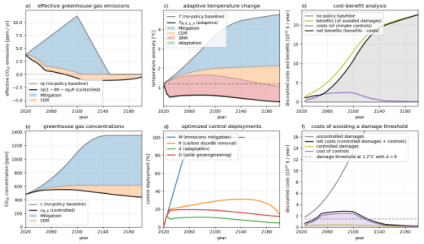

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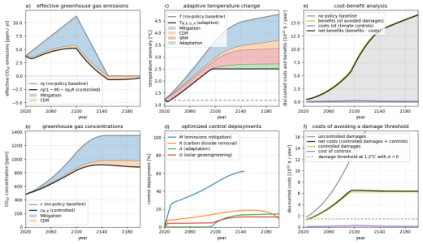

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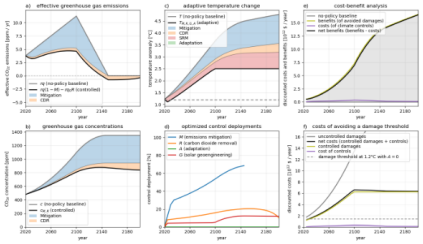

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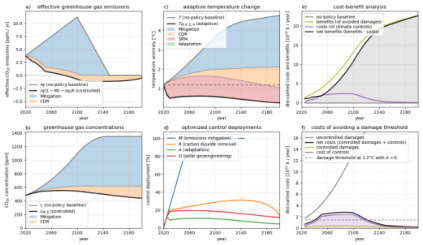

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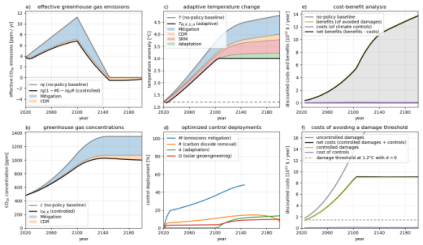

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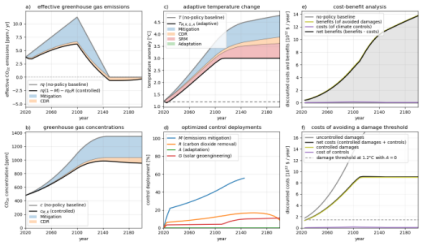

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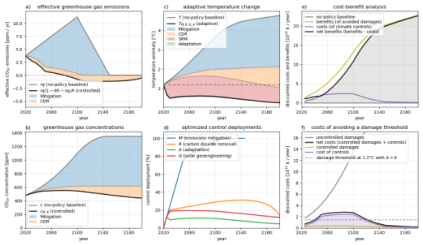

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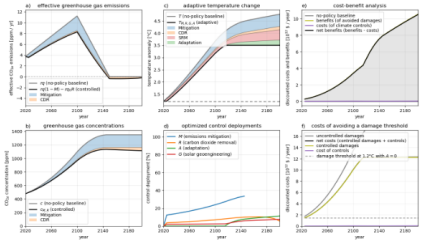

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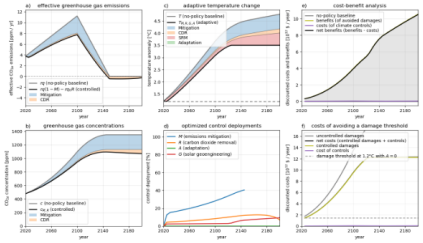

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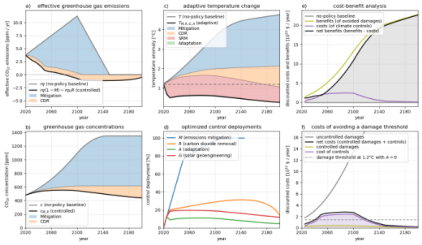

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