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The future of sea level: More knowledge, more uncertainty

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Sea level rise is one of the most indisputable effects of global warming with important consequences for current decisions concerning mitigation and adaptation. A few evolutions in the climate and decision making fields have recently increased the concerns of sea level information users about the potential impacts of future sea level. We identify four main evolutions:

- Most countries are not on track to reach their Paris agreement emission pledges, making the goal of staying well below 2°C less and less attainable.
- New climate model simulations from the Coupled Model Inter-comparison Project 6 (CMIP6) have both a higher average climate sensitivity and a larger spread between models compared to CMIP5.
- The Greenland and Antarctic ice sheets are melting faster than expected in previous IPCC reports and future projections from a recent structured expert judgment show larger expected melt and more uncertainty than both current numerical models and a previous expert judgment.
- Decision makers are more and more interested in events with a large impact and a small probability to build robust infrastructure and design robust long term strategies concerning relocation of coastal communities.

While these four evolutions are fundamentally deeply uncertain, to explore their combined effect we build a subjective probabilistic framework that allows to propagate the uncertainty through the different components and obtain sea level rise projections. In this presentation we present this framework, the results and their sensitivity to multiple hypothesis and we discuss implications for different uses and users of sea level rise information.