Quantifying risks with confidence is often difficult. For the past thirty years, agencies and courts have struggled with the treatment of uncertainty in environmental impact statements. This problem is all the more important today. Climate change will require innovative solutions – new energy technologies, new adaptation strategies. These innovations will inevitably pose risks, often in the form of possible harm to human welfare or the environment. Climate change itself involves uncertainties. Evaluating these risks and informing decision makers and members of the public will be challenging.

From what I have been able to determine, agencies have widely differed in terms of the seriousness and candor with which they have approached these tasks. The Council on Environmental Quality attempted to rectify the situation with a relatively clear regulation that critics believed skewed the presentation in favor of emphasizing remote risks. It then replaced the regulation with a newer, perhaps more evenhanded regulation. The amended regulation's content seems reasonably sensible but seems to give too little guidance to agencies.

In a recent paper, I suggest six improvements in current practice:
• Where possible, confidence intervals should be provided for critical data.
• When the agency relies on formal modeling, validation issues should be directly addressed.
• Whether or not a formal model is used, the agency should discuss the limitations of current understanding of system dynamics and conflicting models found in the scientific literature.
• Rather than relying solely on model output as a basis for evaluating risk, the agency should give explicit attention to model uncertainty.
• The agency's reasoning should be transparent and model assumptions should be clearly stated.
• Where the agency has proposed a major project or regulatory initiative, and a possible catastrophic risk could attend that action, the agency should at least obtain a peer review of its analysis and ideally should procure a risk assessment from an independent body.
• Courts should not second-guess an agency's scientific judgments, but neither should they allow expertise to function as a smokescreen for any agency's failure to probe the relevant science in depth, explore opposing viewpoints, and candidly disclose analytic uncertainties.

This isn't exactly rocket science, which makes it all the more unfortunate that current agency practice doesn't meet these standards.