

Policy for Environmental Change: Info-Gap Response to Uncertainty

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Abstract

History is full of surprises: the Fukushima tsunami and nuclear disaster (March 2011), the tsunami in the Indian Ocean (December 2004) where it was not at all expected (unlike the Pacific Ocean where tsunamis are far more common), the rapid market penetration of Sports Utility Vehicles (SUVs) in the US with resulting higher CO₂ emissions, surprisingly acidic rain in hardwood forests of New Hampshire in the 1960s, and so on. Uncertainty, ignorance, and the potential for surprise are all unbounded, and the unknown future is a major challenge in strategic planning and policy prioritization.

There is a moral imperative to do one's best when making high-consequence decisions. However, our understanding is often wrong and we are frequently surprised by innovations and events. Using our faulty models in trying to optimize policy outcomes is infeasible, even irresponsible. The practical implication of severe uncertainty is that we must ask: What outcomes are required? What performance is essential? How can we be robust against surprise? We consider two examples: the innovation dilemma in remediation, and the paradox of optimal monitoring and surveillance.