

Combining Climate Information and Decision-Making Paradigms for Adaptation Support

Andrew Blohm

PNNL/University of Maryland

Aspen Global Change Institute

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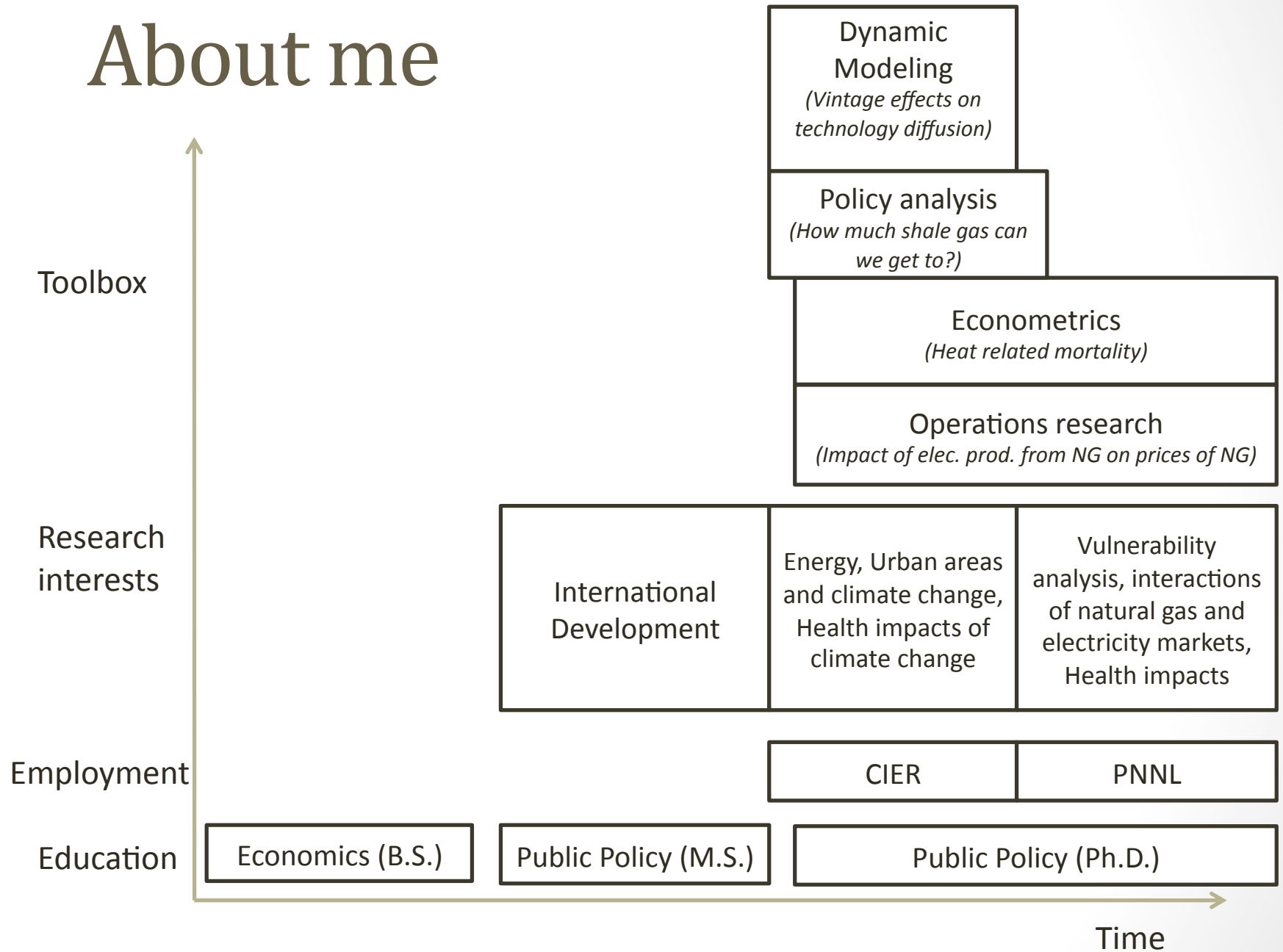
Observations and hypotheses for future study

1. Research call design will need to change in order to facilitate truly interdisciplinary project designs (my own experiences).
2. The cost of extreme events will be less, as compared to changes in the operation and maintenance costs from changes to routine events (i.e. nuisance events).
3. Knowledge of historical climate is heterogeneous across even small installations and thus, knowledge of current climate vulnerabilities is as well.
4. Given advances in the distribution and quality of sensor networks it is possible to project exposure from afar. This is not to say that thresholds can necessarily be identified from afar but tools such as LIDAR are improving this capability.
5. Climate model output is not very accessible to non-climate scientists.

How has global research changed in your career?

- Adaptation is no longer a four letter word (had been seen as giving up on mitigation). So it's now okay to discuss adaptation alternatives. But the question very much remains, how?
- Climate science is 'sticking' outside of the community.
- The term interdisciplinary is omnipresent. Not sure the incentives have caught up ...
- Climate model output is becoming more salient (term to be defined).

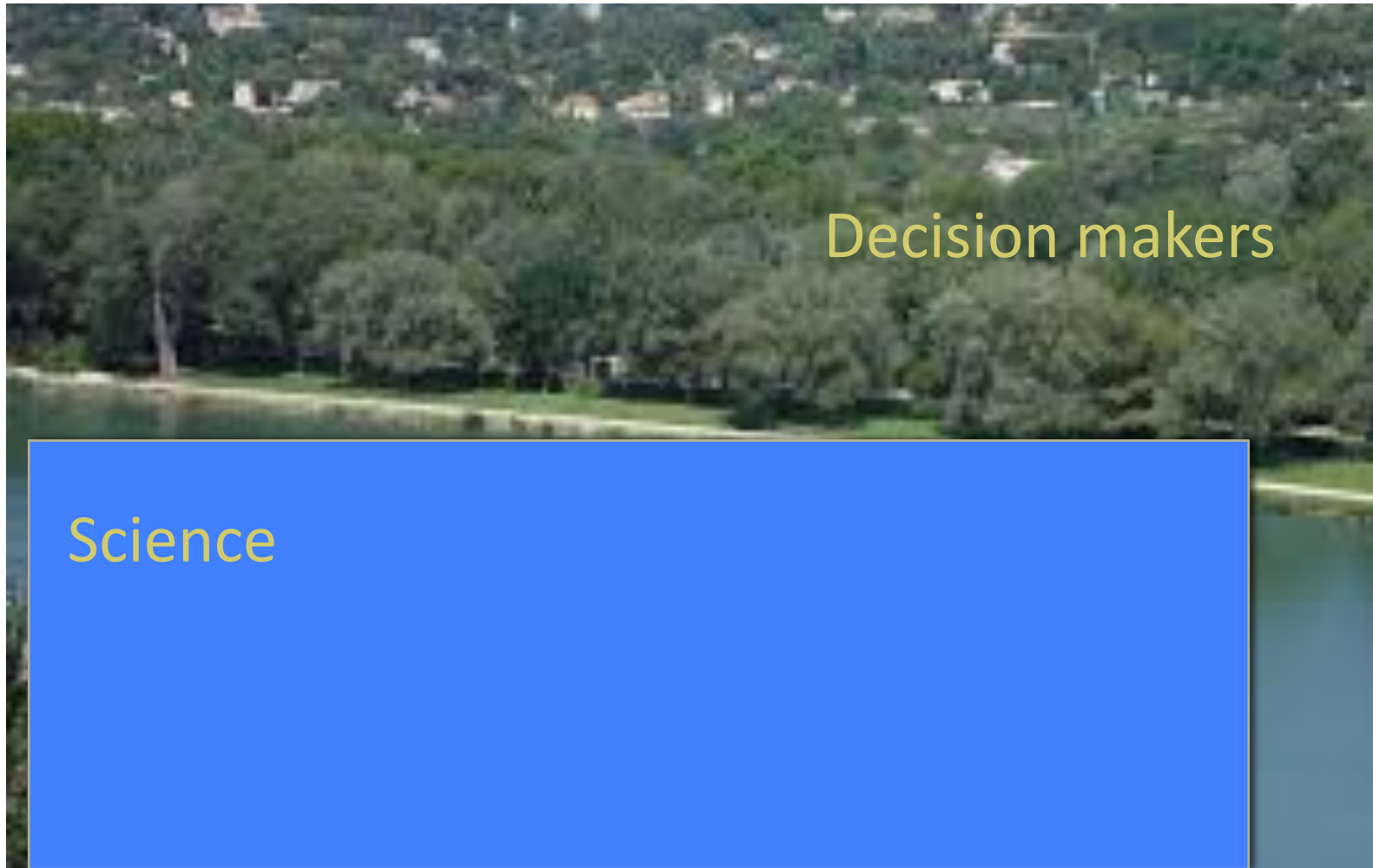
About me



The Bridge



The Bridge



Decision makers

Science

The Bridge



Science and decision support

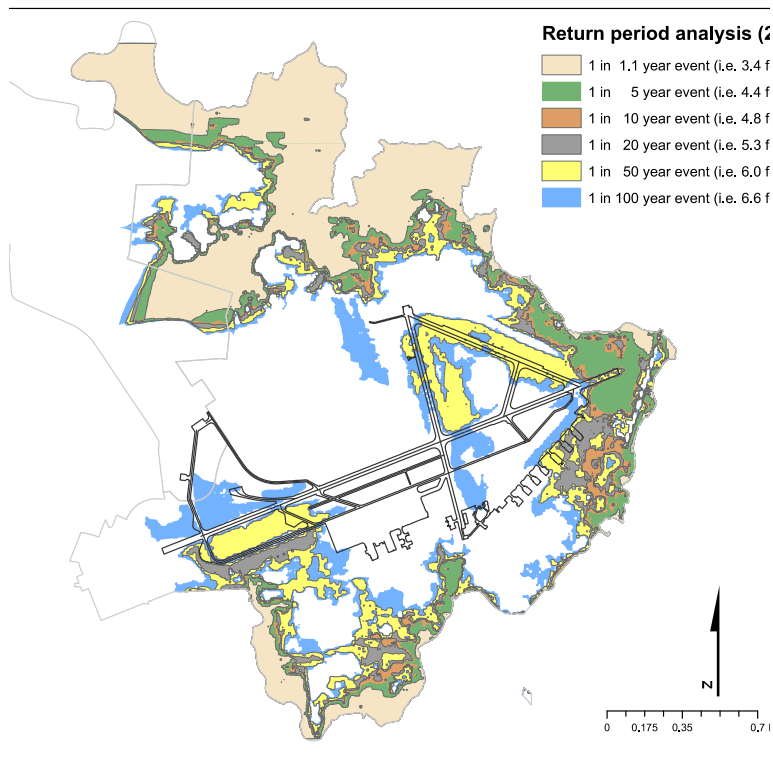
- There is a disconnect between the supply of and demand for science, which is caused by traditional views on the role and place of science in society.
- It has been a long-standing assumption that research should be divorced from society in order to help it best (i.e. the linear model).
- The linear model (aka the loading dock approach) assumes that more science is equivalent to more societal benefit.
- It assumes that decision-makers are waiting for the information (and can interpret it) and that the questions answered by researchers are the same as those asked by decision-makers.
- By design the linear model is necessarily one-directional (i.e from producer to consumer with no feedback loops). It is the design of the model that perpetuates the lack of communication between researchers and decision-makers and prevents the uptake of scientific information in decision processes.
- In particular, researchers (do or have) not understand the context under which decisions are made, which directly leads to research that the decision-maker cannot incorporate.

The vernacular: Language of decision support

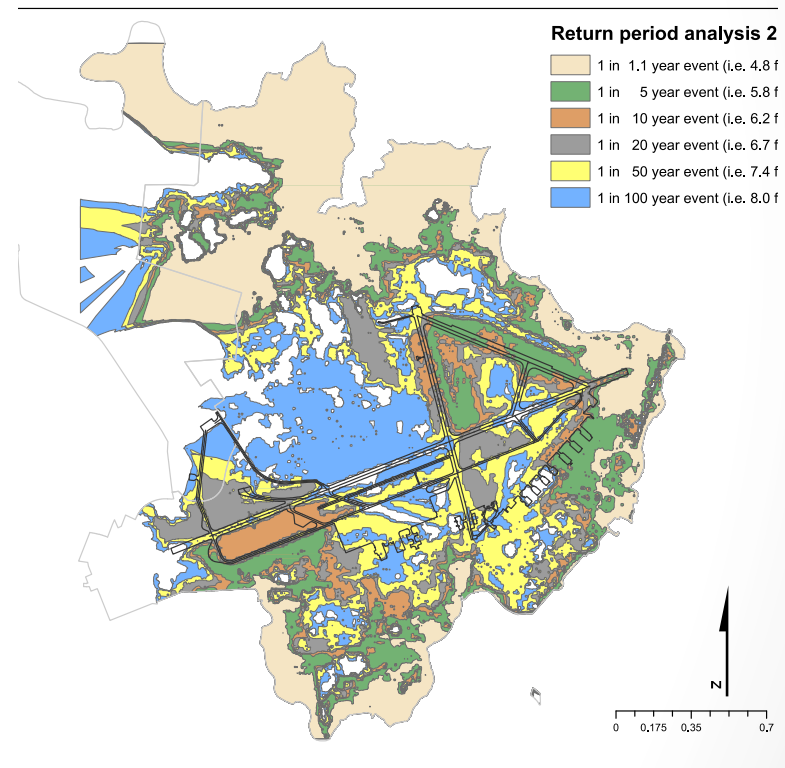
- To be useful information needs to be salient, credible, and seen as legitimate.
- Salient – requires that information is provided at the proper temporal and spatial scale *and also requires an understanding of the decision-making context (e.g. constraints, opportunities, timing, etc.)*.
 - Climate products have tended to be produced at spatial scales too large or too aggregated (temporally) to be of use to decision makers at many levels (e.g. annual rainfall totals, etc.).
 - To be salient, not only does the information need to be at the appropriate scale, but it must also be provided at such a time as it can be incorporated into decision processes.
 - We need to know the control knobs that decision makers can actually change *before* we conduct the research.
- Legitimate – the information needs to be perceived as unbiased and as having the interests of the stakeholders at heart.
- Credible – the information needs to be perceived as accurate and verified.

So what do decision makers need?

Return period analysis based upon historical data



Return period analysis (2055) [Tebaldi method]



Discussion of future research topics

- Research proposal design will need to change in order to facilitate truly interdisciplinary project designs.
 - It has been my experience (working with engineers) that interdisciplinary integration within the project has fallen well short of the ideal in that the proposals are stapled together with everyone on their own island.
- The cost of extreme events will be less, as compared to changes in the operation and maintenance costs from routine events (i.e. nuisance events).
 - There has been a focus on extreme events in the climate literature, which has created a focus on spectacular events (e.g. Katrina's, Sandy's, Isabelle's, etc.).
- Knowledge of historical climate is heterogeneous across even small installations and thus, knowledge of current climate threats can be as well.
 - Institutional knowledge can be transient and knowledge of climate vulnerability is correlated with occupation.
- Given advances in the distribution and quality of sensor networks it is possible to project exposure from afar. This is not to say that thresholds can necessarily be identified from afar as well but tools such as LIDAR are improving this capability.
- Climate model output is not very accessible to non-climate scientists.
 - There is a significant cost of entry to effectively using climate model information.

Questions?

