

Managing Post-Normality in Contentious Science Policy

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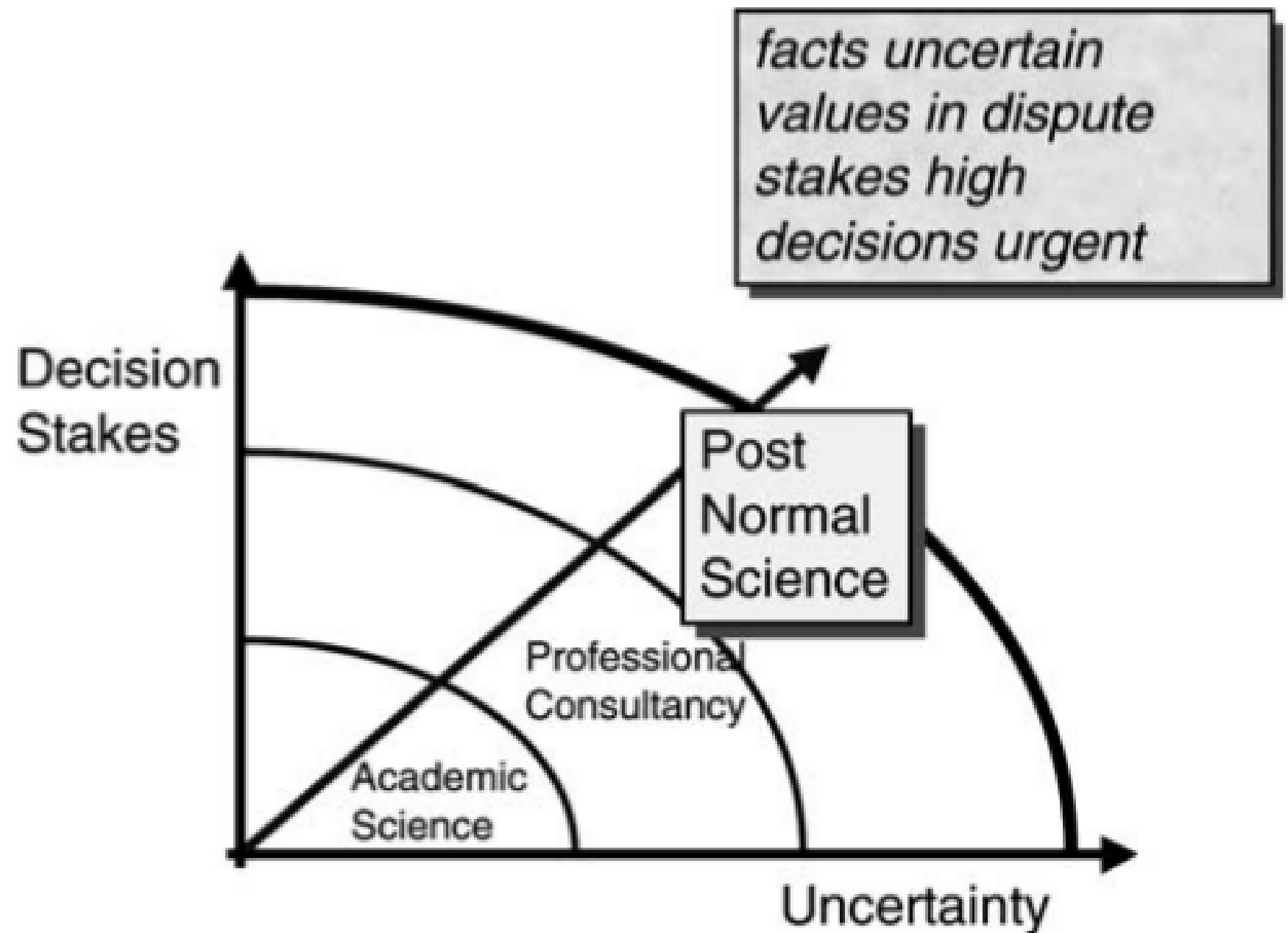
Guest Research, Biodiversity Conservation – iDiv, Leipzig, Germany

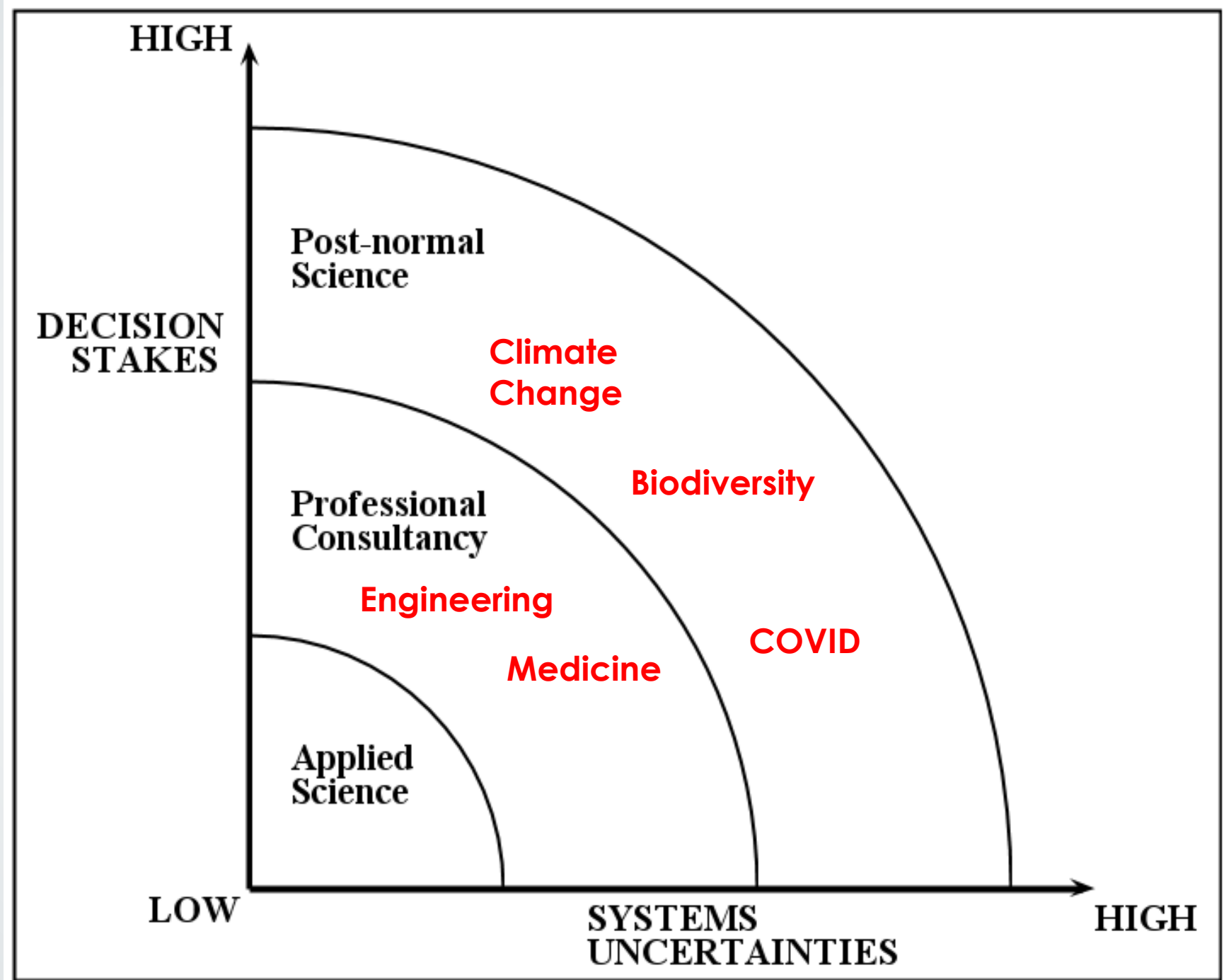
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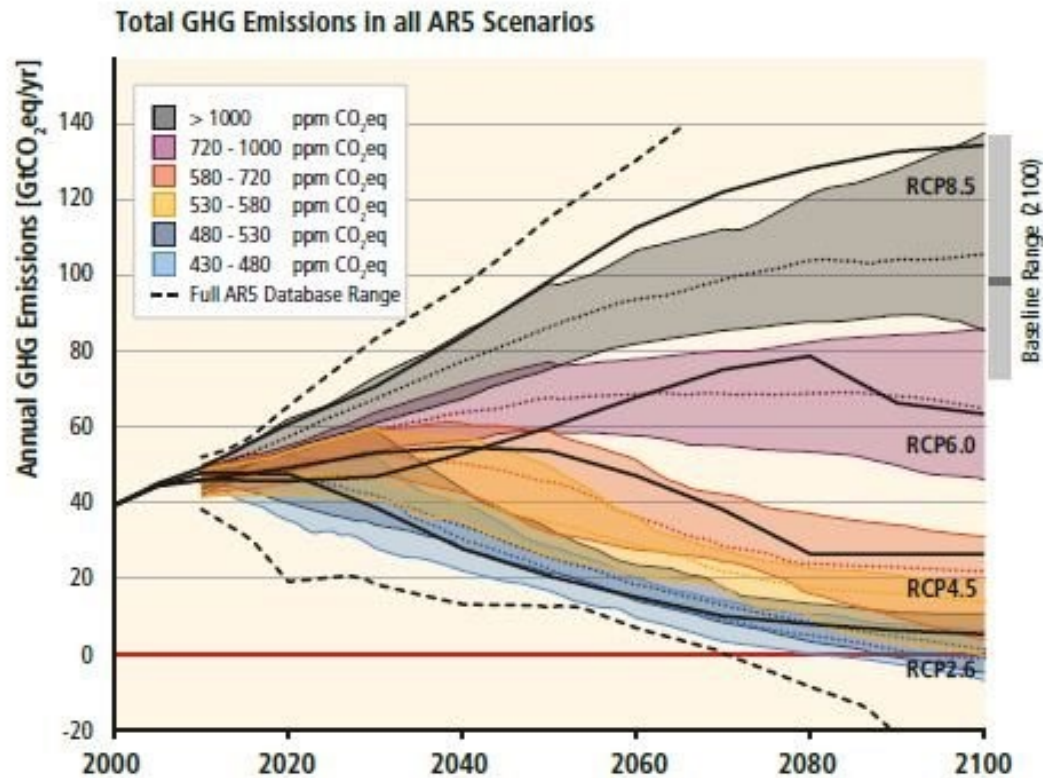
How to Better Resolve Political Conflicts Involving Science?







Policy Use of Measures, Models, Indicators Often “Post-Normal”



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Do Democrats want to take away Americans' hamburgers?

1 March 2019

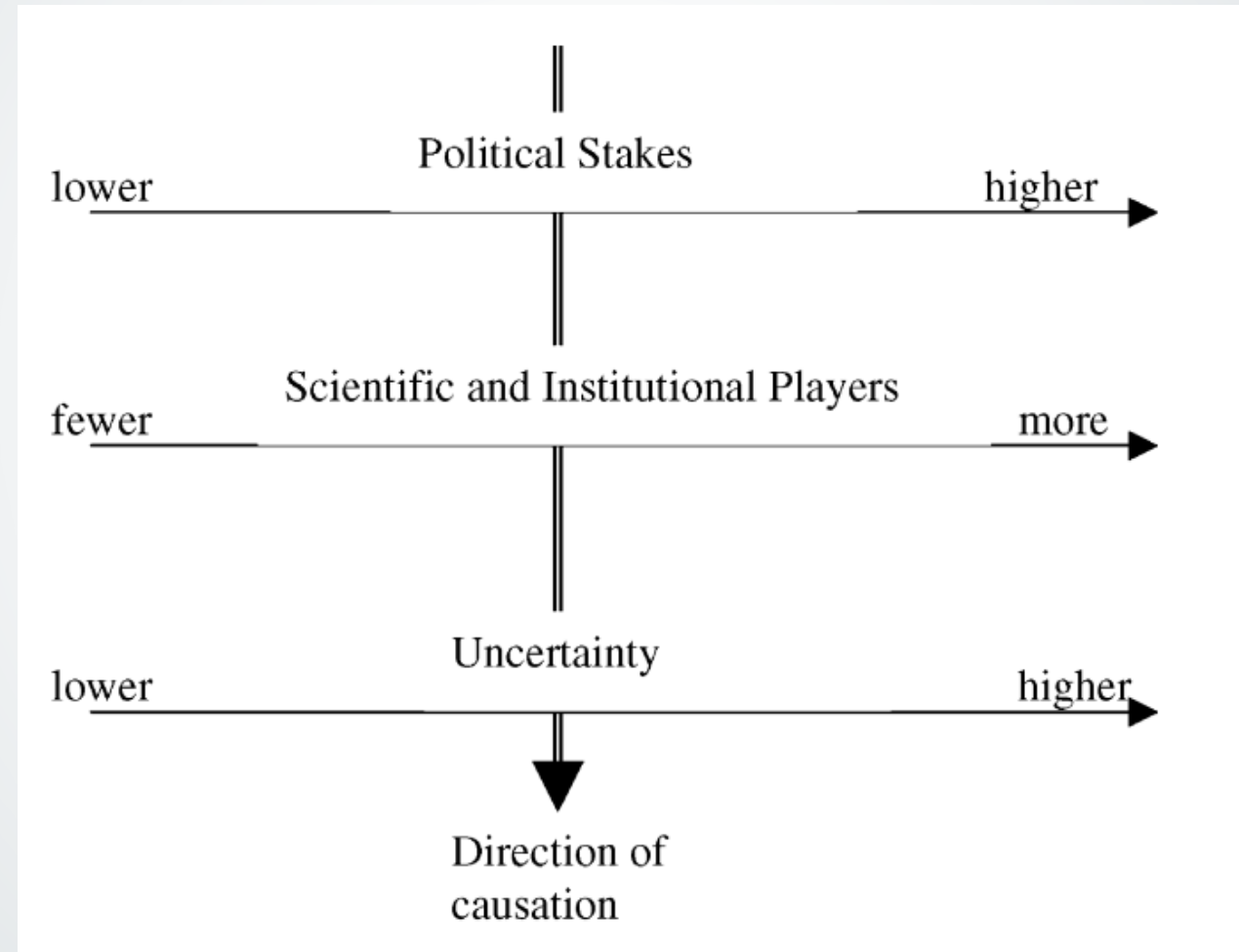


'Almost out of time': stark warning from scientists on climate disaster

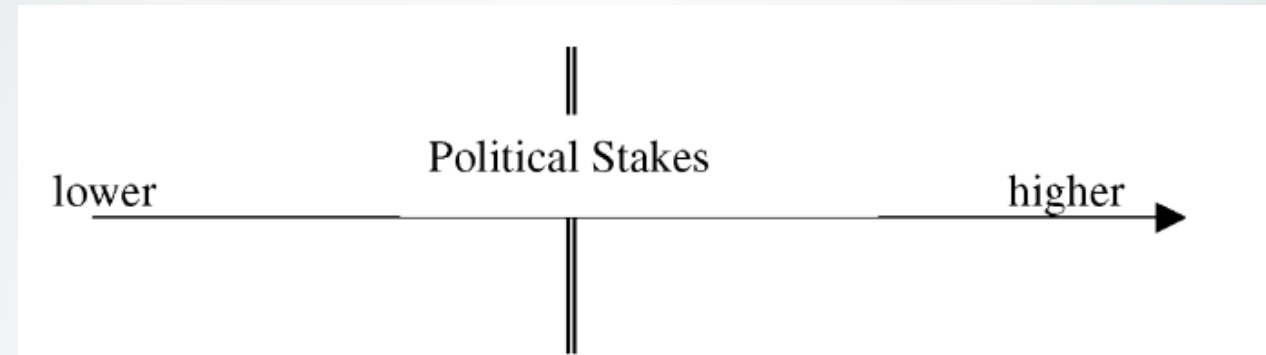
Complications

- Stakes and Uncertainties = $\sum(\text{perceptions})$
 - Therefore trust is in important variable
- Stakes and Uncertainties not totally independent

Complications



Complications

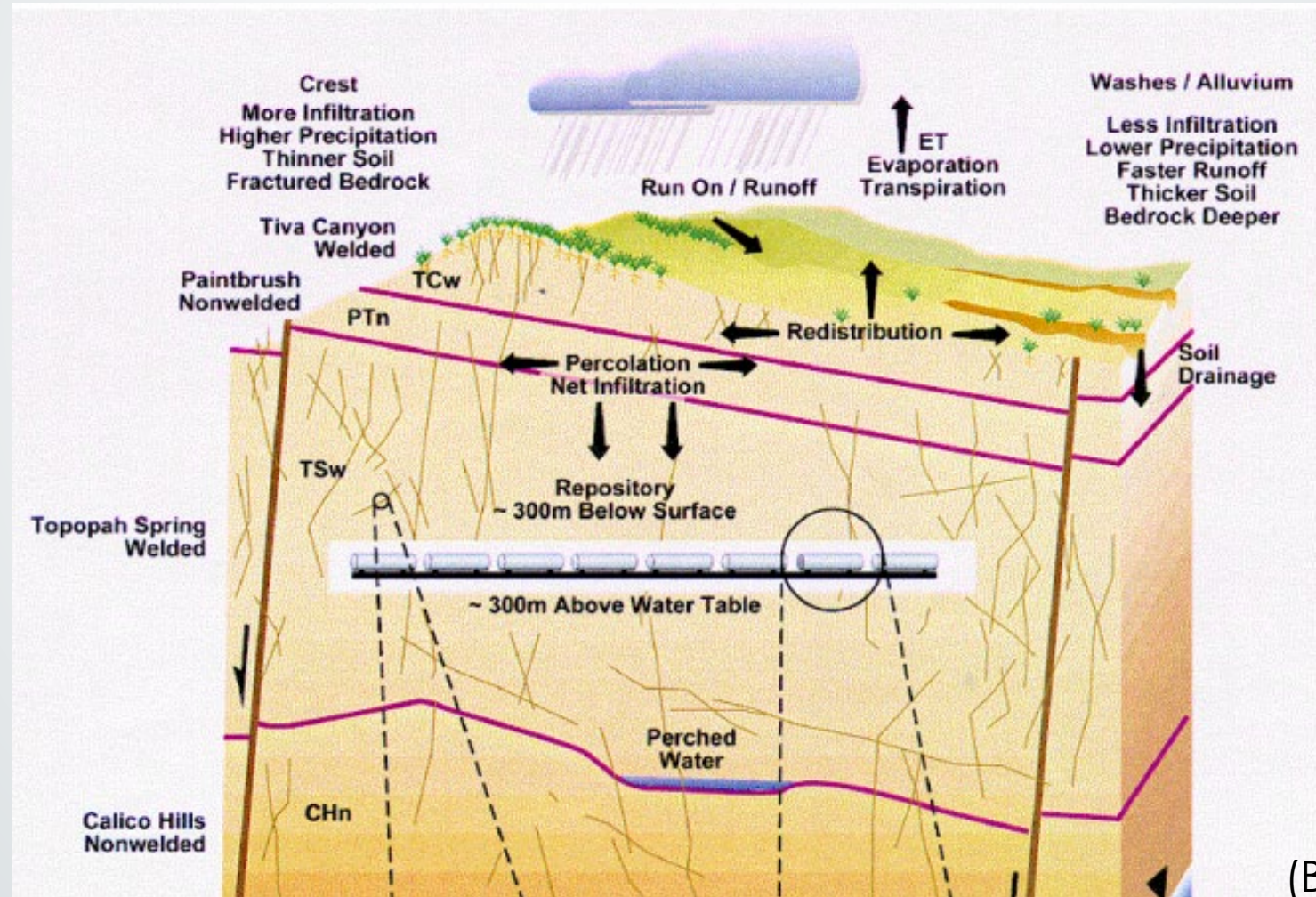


**The higher the stakes, the greater the demand on science to deliver “authoritative” answers
BUT...more players/skepticism leaves science
unable to “deliver”**

Direction of
causation

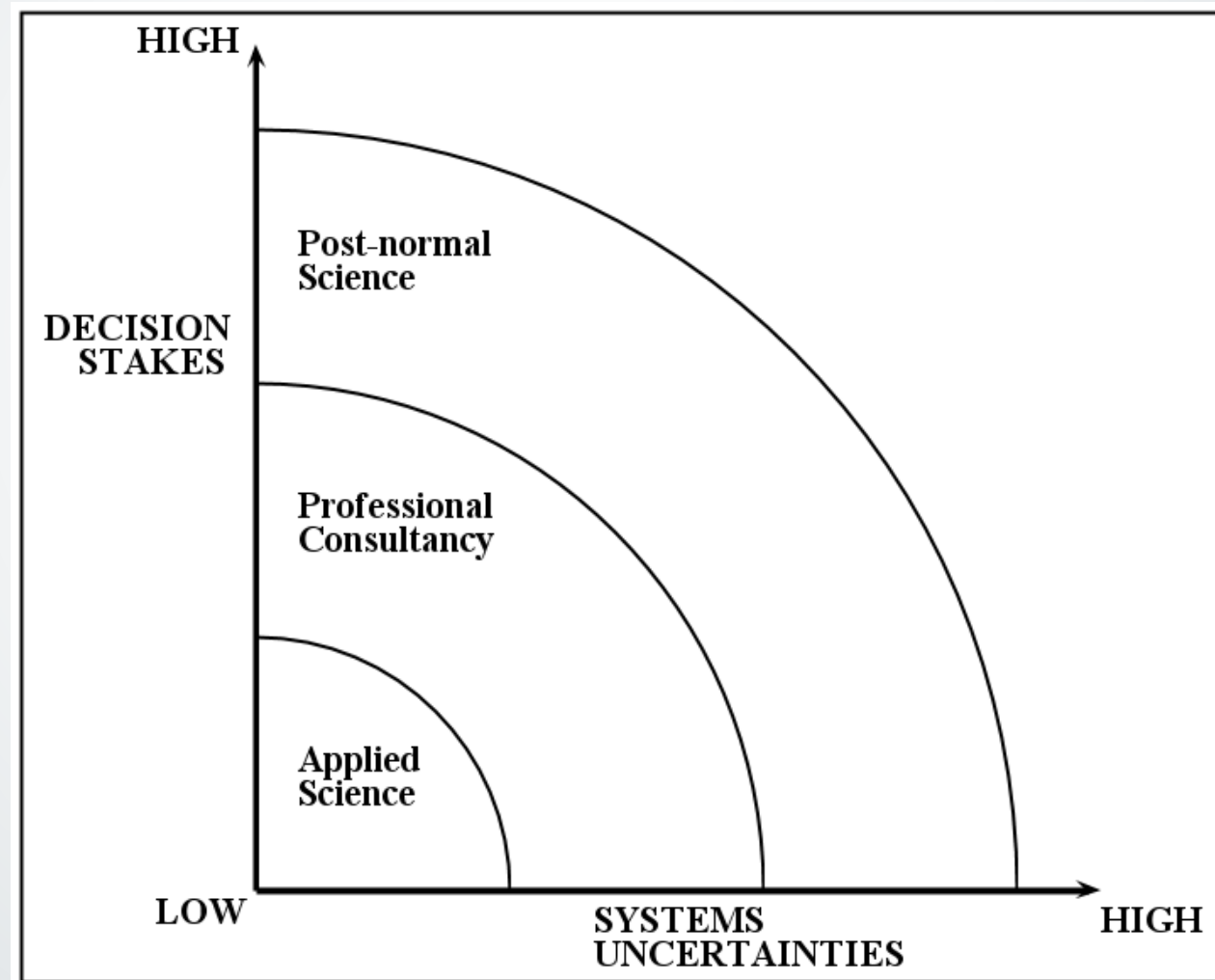
Ex: Nuclear Waste Storage at Yucca Mountain

Is Yucca Mountain “Dry”?

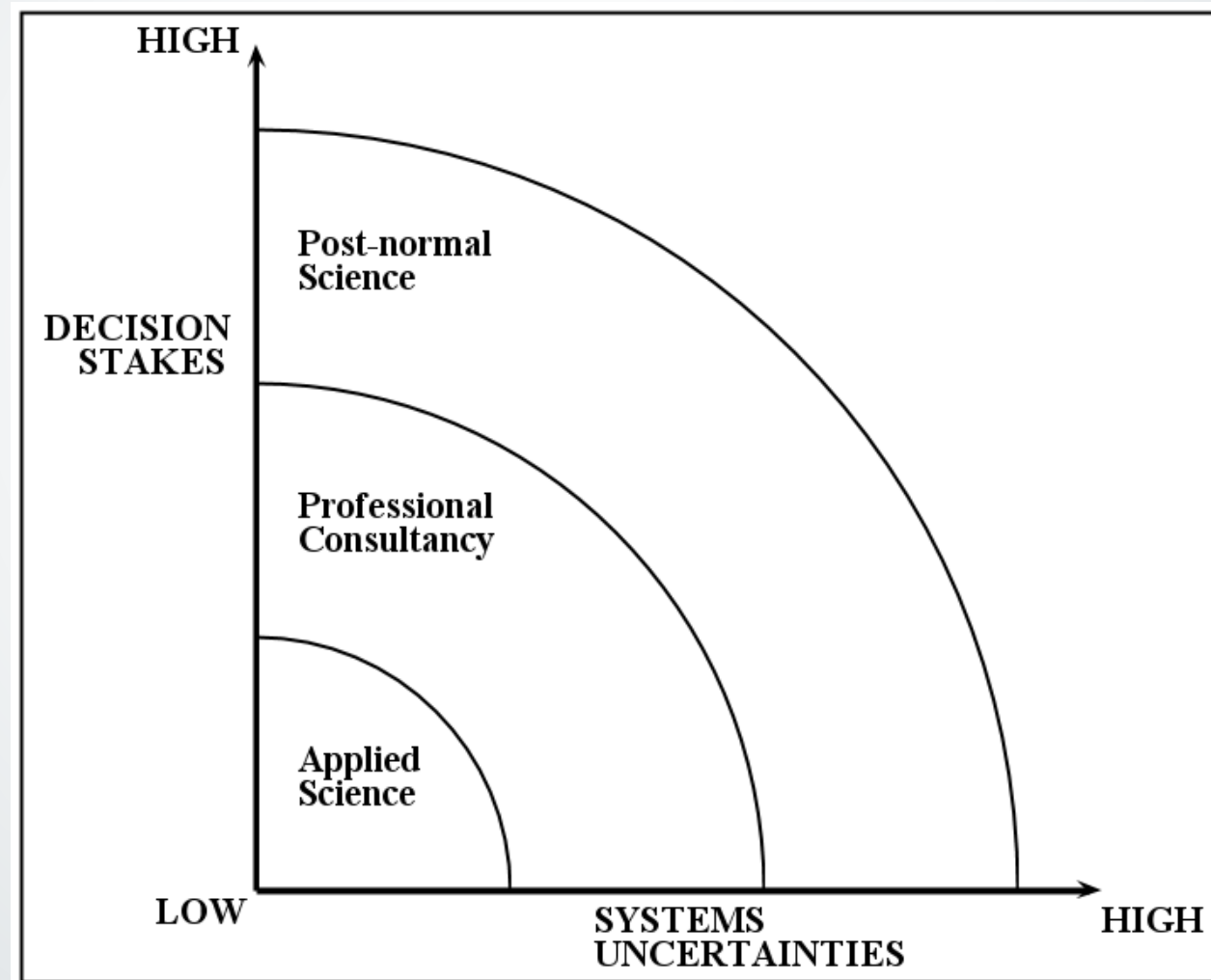


(Byerly, Prediction, 2000)

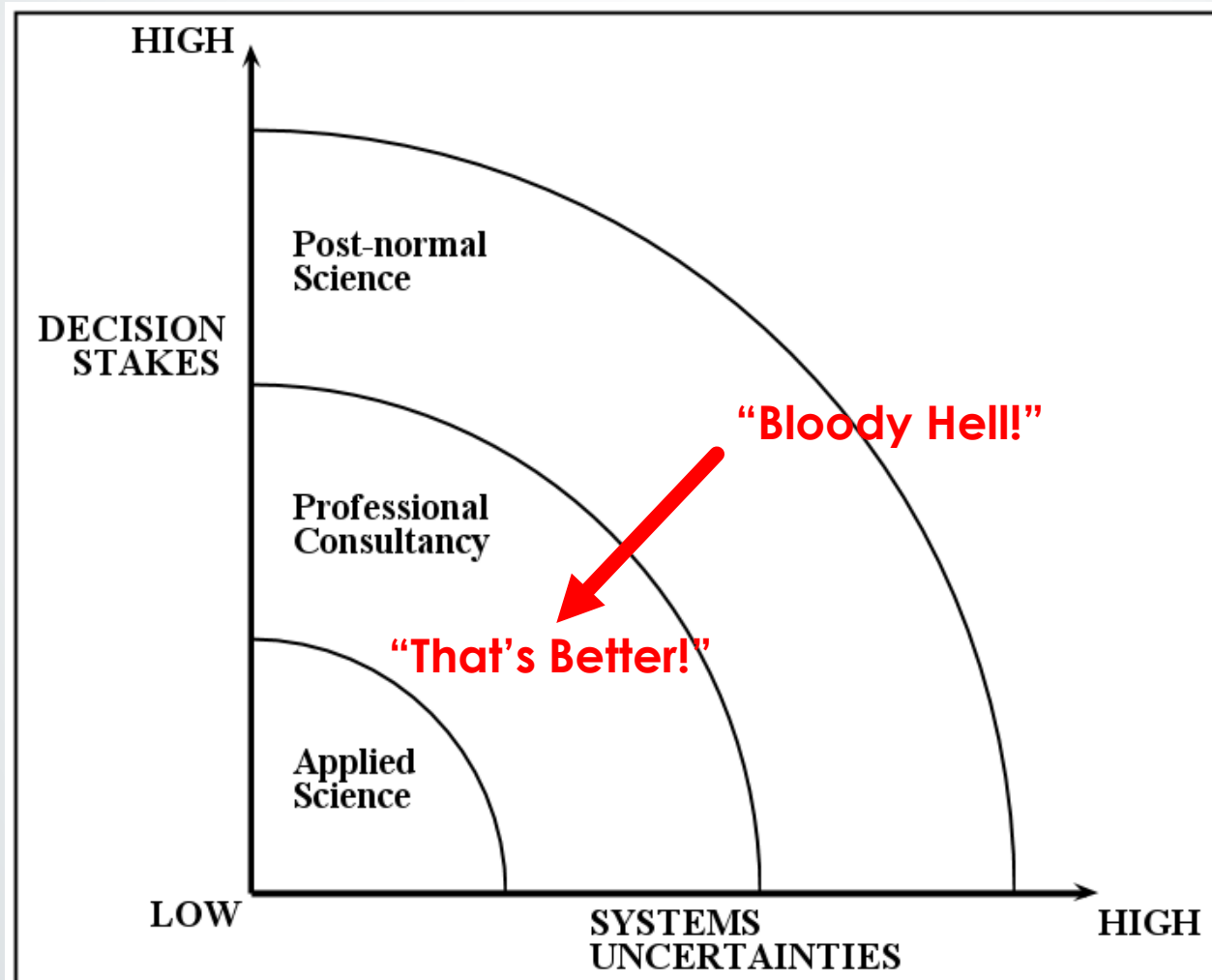
Claim:



Claim: Science Conflicts Characterized by
Effort to *Cope with* or *Escape* Post-Normality



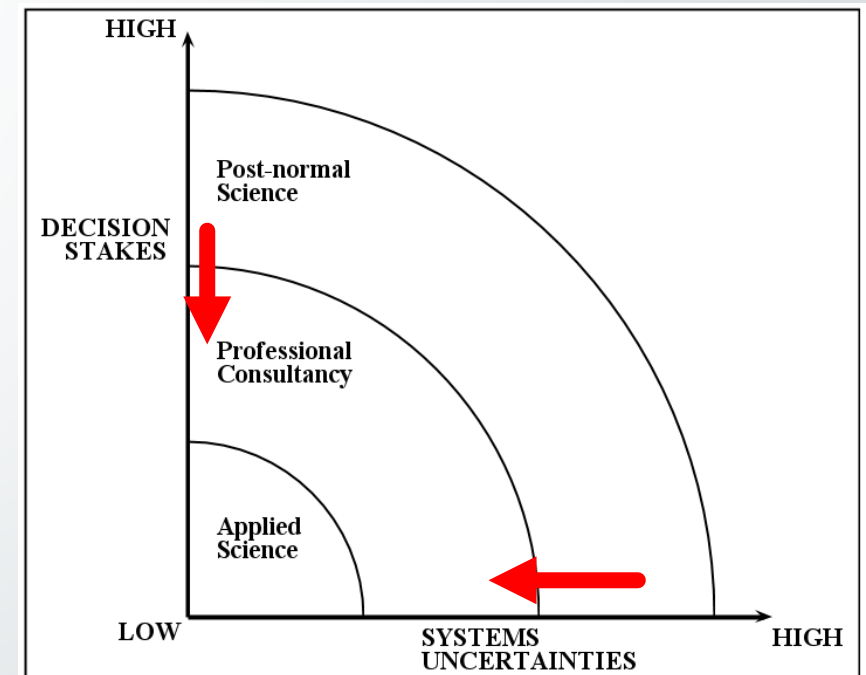
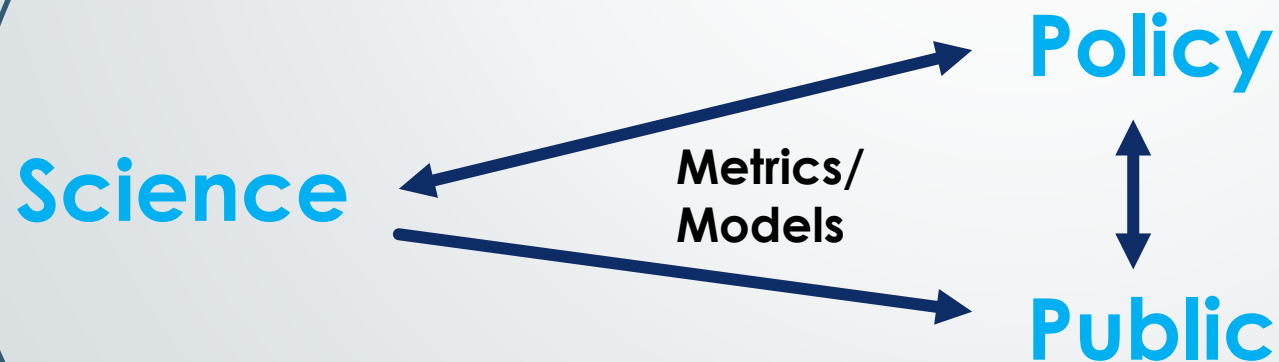
Claim: Science Conflicts Characterized by Effort to *Cope with* or *Escape* Post-Normality



Sometimes
perverse,
polarizing, or
productive

Why Metrics, Models, and Indices Matter?

- ▶ Not just **scientific** but **communicative**
 - ▶ Perceived uncertainty (Reality -> Simplifying quant. represent.)
 - ▶ Implied Stakes
 - ▶ Policy frame



Approach 1: Simplify Uncertainties

How to simplify uncertainties?

a) Exclusion or deprioritization of certain complexities in metric, model, index

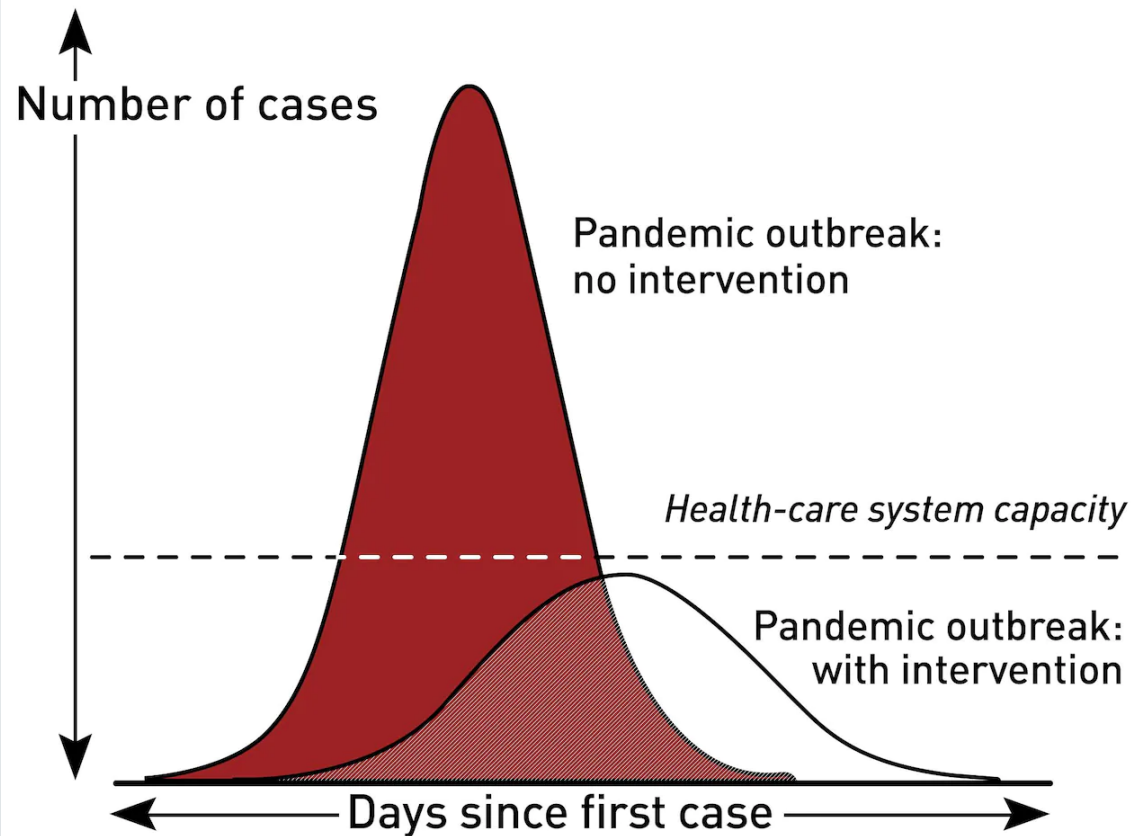
e.g., Focus on outputs more than impacts

b) Very Lucky: Science clarifies unambiguously (e.g., Cancer and Tobacco?)

Simplify Uncertainties: COVID

Flattening the curve

Slowing the spread of the virus



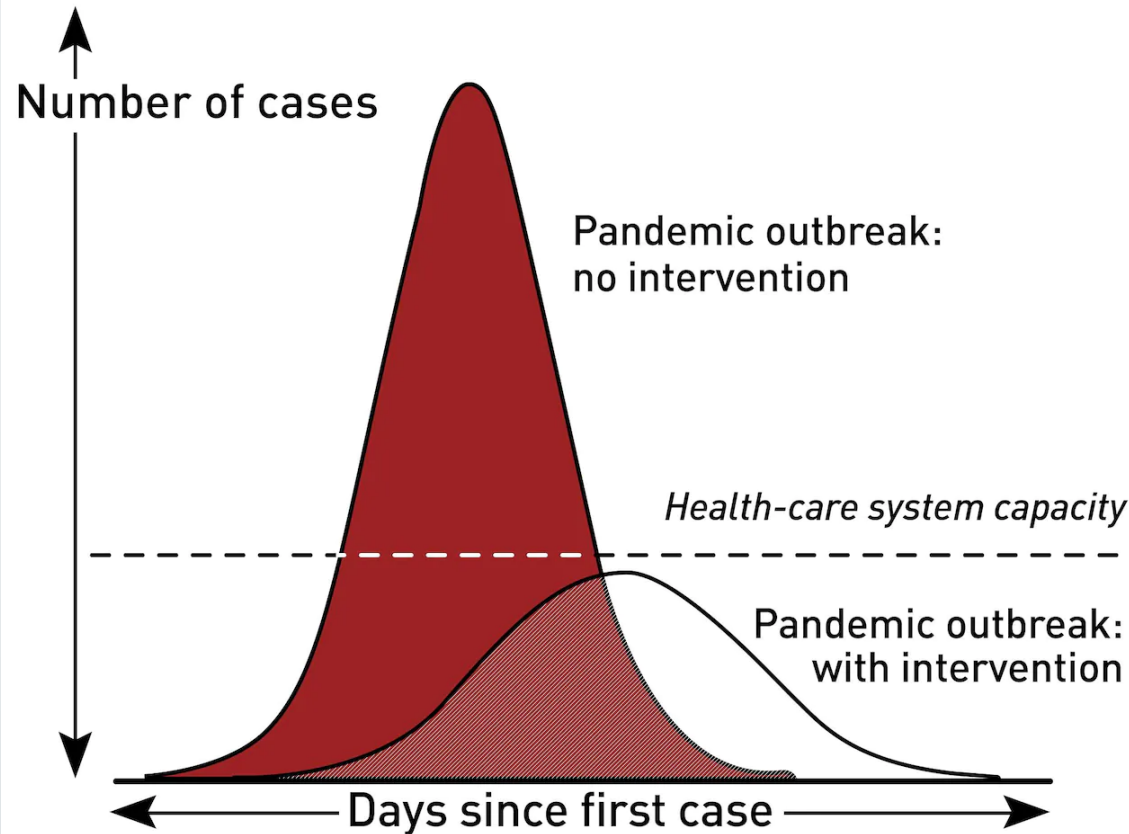
- Implication: Tolerate uncomfortable policy, this will be over soon

Simplify Uncertainties – Backfire

“Back to Post-Normality”

Flattening the curve

Slowing the spread of the virus



CBC NEWS

Source: CDC

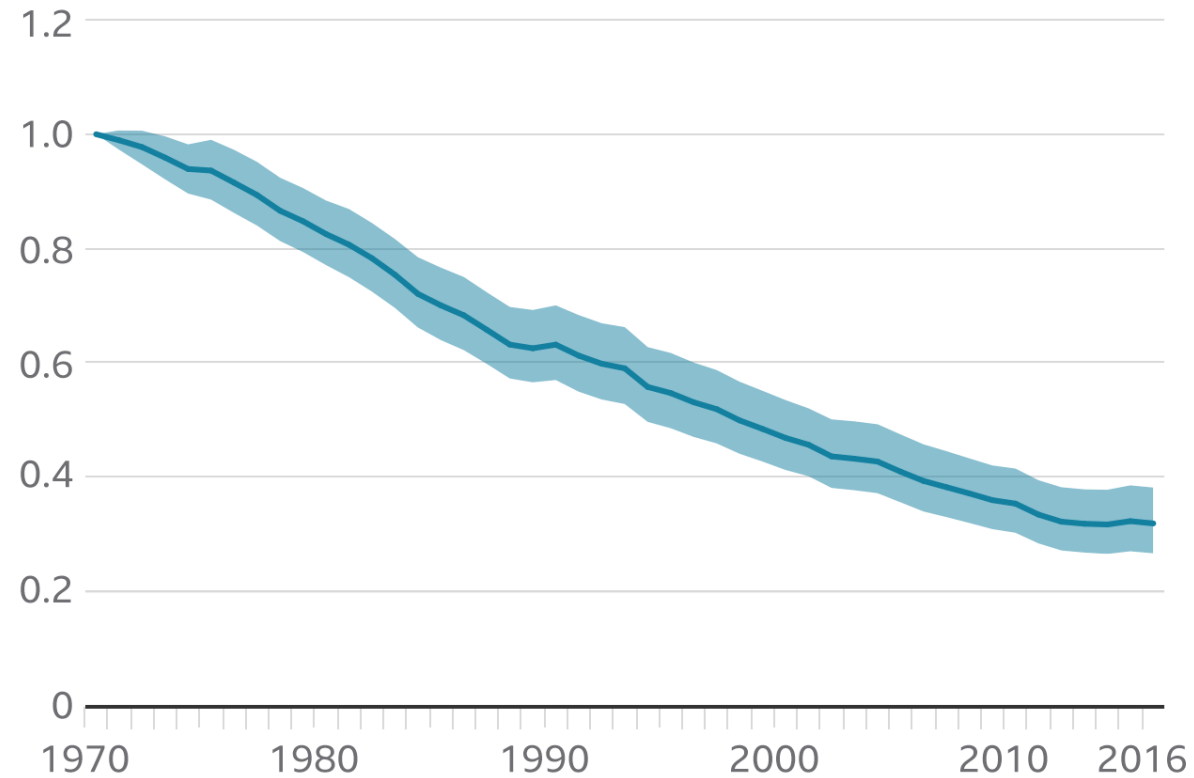
- Assumptions about dynamic of pandemic
- Reduced to concern of “avoid catastrophe” -> High-stakes policy
- Result: Lessened trust, distraction from “low stakes” policies

(Dotson, *The New Atlantis*, Summer 2022)

Similar for Biodiversity?

How wildlife has declined, 1970-2016

— Living Planet Index (measure of biodiversity)
■ Confidence limits



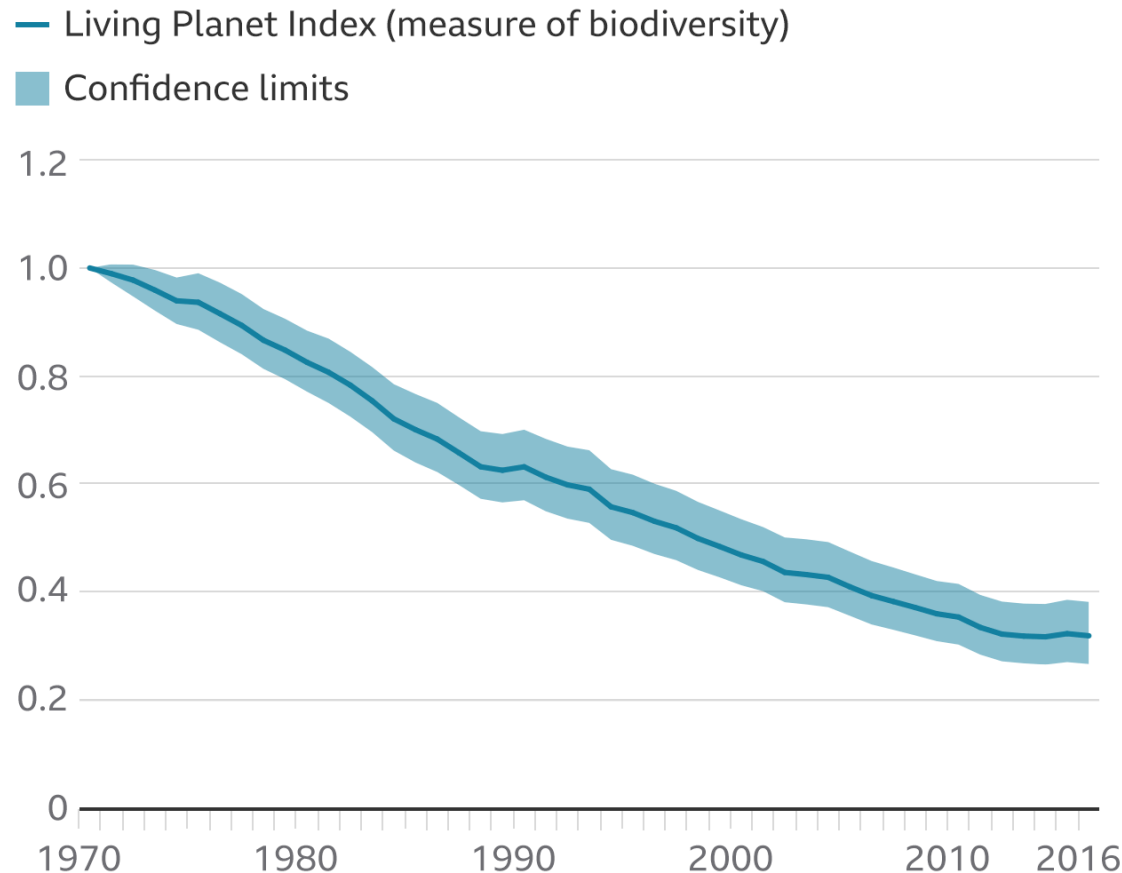
Source: ZSL

BBC

Similar for Biodiversity?

Some risk of simplifying to communicate “catastrophe”

How wildlife has declined, 1970-2016



Source: ZSL

BBC

Article

Clustered versus catastrophic global vertebrate declines

<https://doi.org/10.1038/s41586-020-2920-6>

Received: 28 January 2020

Accepted: 4 September 2020

Published online: 18 November 2020

Check for updates

Brian Leung^{1,2}, Anna L. Hargreaves¹, Dan A. Greenberg³, Brian McGill^{4,5}, & Robin Freeman⁷

Recent analyses have reported catastrophic global declines in vertebrates. However, the distillation of many trends into a global mean index of variation that can inform conservation measures and can be sensitive to decisions. For example, previous analyses have estimated a mean decline of more than 50% since 1970 (Living Planet Index²). Here we show, however, that this estimate is driven by less than 3% of vertebrate populations; if these declining populations are excluded, the global trend switches to an increase. The sensitivity of global mean trends to outliers suggests that more information are needed. We propose an alternative approach, which identifies clusters of decline (or increase) that differ statistically from the majority of populations.

Index -> Implicit Policy Frame

Matters arising

Do not downplay biodiversity loss

<https://doi.org/10.1038/s41586-021-04179-7>

Received: 12 January 2021

Accepted: 7 October 2021

Published online: 26 January 2022

 Check for updates

Michel Loreau¹✉, Bradley J. Cardinale², Forest Isbell³, Tim Newbold⁴, Mary I. O'Connor⁵ & Claire de Mazancourt¹

ARISING FROM B. Leung et al. *Nature* <https://doi.org/10.1038/s41586-020-2920-6> (2020)

Second, Leung et al.¹ claimed that their results “provide a reason to hope that our actions can make a difference”. Hope, however, will not come from downplaying biodiversity loss—hope will come only from new perspectives and approaches to resolve the current biodiversity crisis once the seriousness of this crisis has been fully acknowledged.

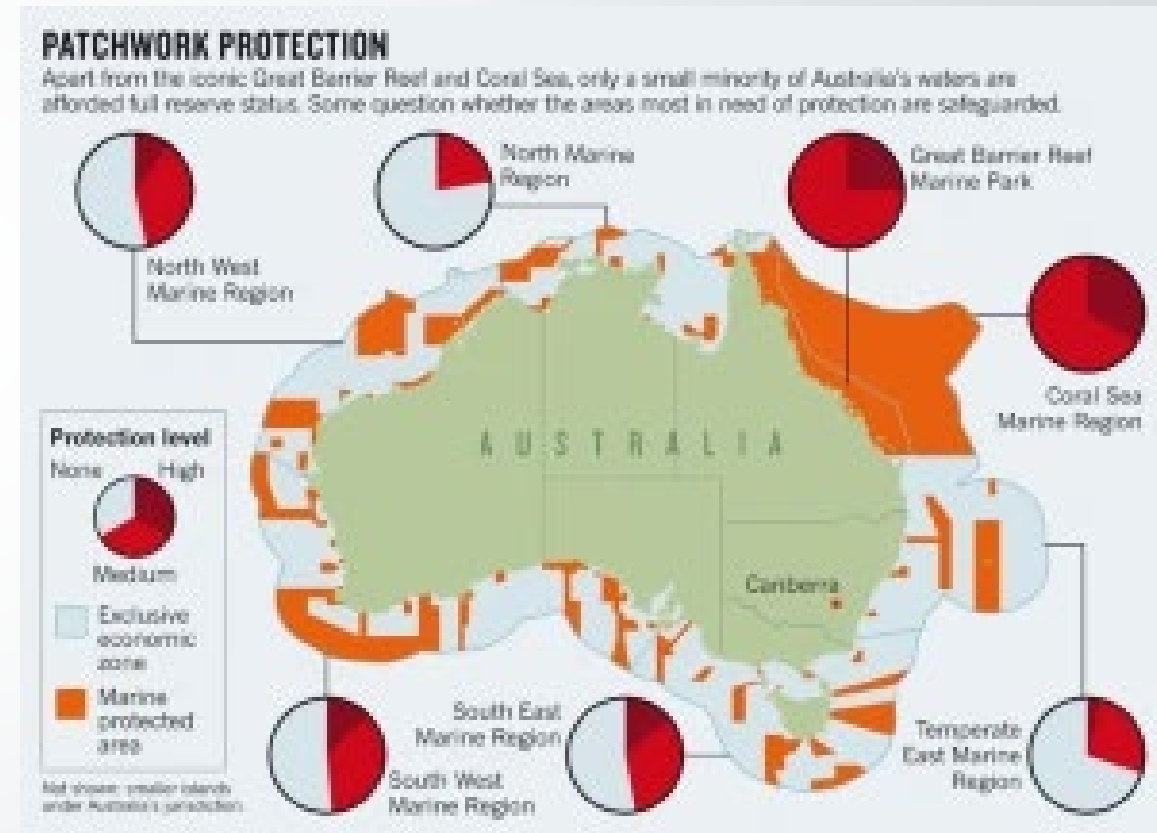
More Generally: What to Include/Exclude? What is Communicated?

- ▶ Balance between species that can “cohabitat” and those that can’t? Introduced species?
- ▶ Who might object to which exclusions/prioritizations? (I.e., metrics, indices create coalitions and opponents)
 - ▶ E.g., Are rural peoples “the problem” or “solution”? (Dotson and Pereira, OneEarth, 2022)
- ▶ What happens if indicator or metric is later perceived as exaggerating certainty, obscuring important complexities?

From Impacts to Outputs?

“Protected Areas”

- Simplifying by focusing on outputs
- But...protection via exclusion is **high stakes**, policy intentions get “short-circuited”



Cressey, Nature, 2013

Considerations

1) How to simplify uncertainties?

a) Exclusion or deprioritization of certain complexities in metric, model, index (e.g., epidemiological models, living planet index") **[Risks: Backfire, Mistrust, "High Stakes" politics]**

e.g., Focus on outputs more than impacts (e.g, "Protected areas") **[Risk: Perversity]**

b) Very Lucky: Science clarifies unambiguously

Approach 2: Lessen Stakes

How to reduce stakes?

- a) Prioritize lower stakes policy changes
- b) Lucky: Technological change obviates problem

TSCA vs. Toxics Use Reduction Act

- Response to polarizing, ineffective, “post-normal” federal Toxic Substance Control Act.

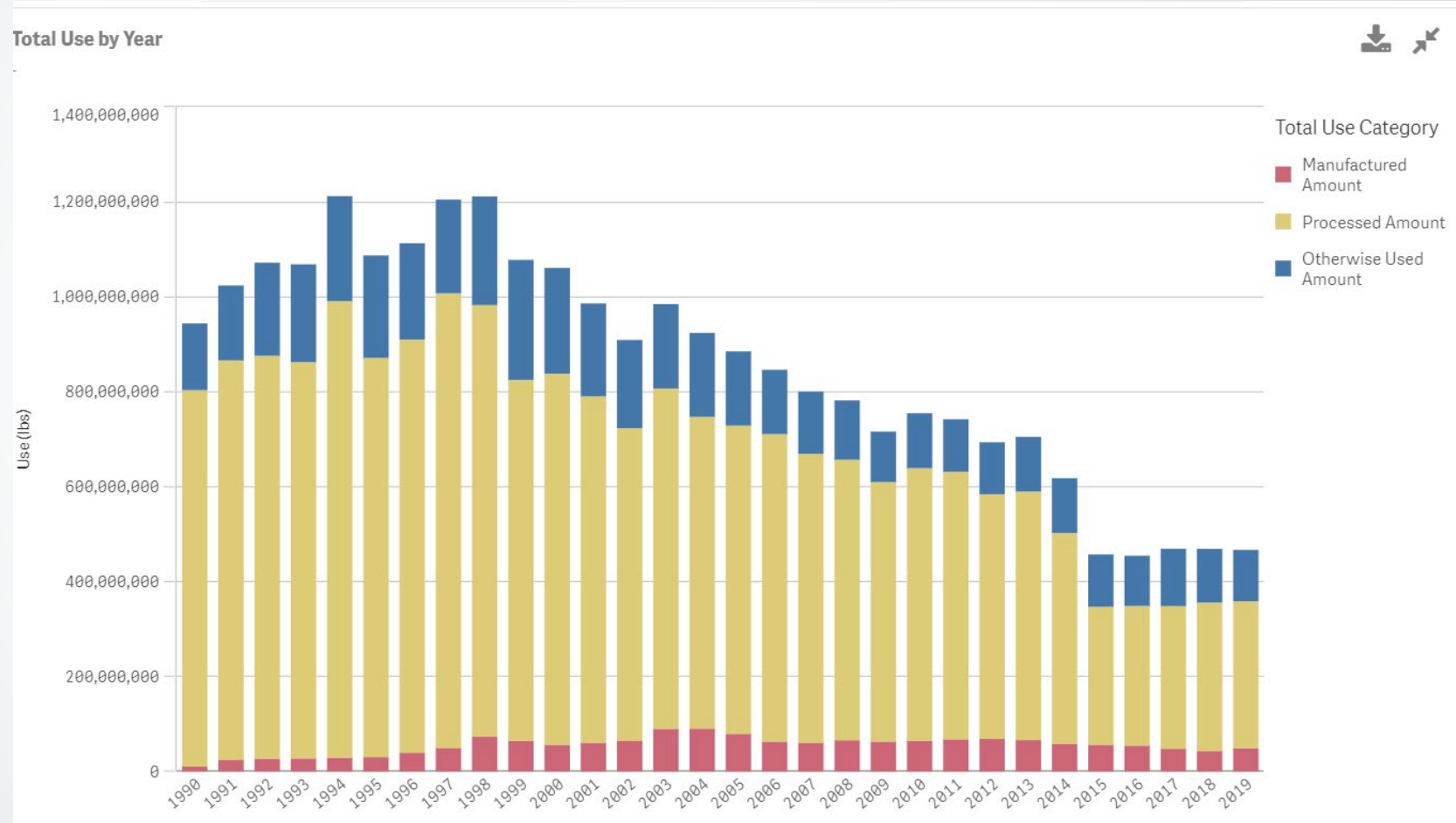


Toxics Use Reduction Act

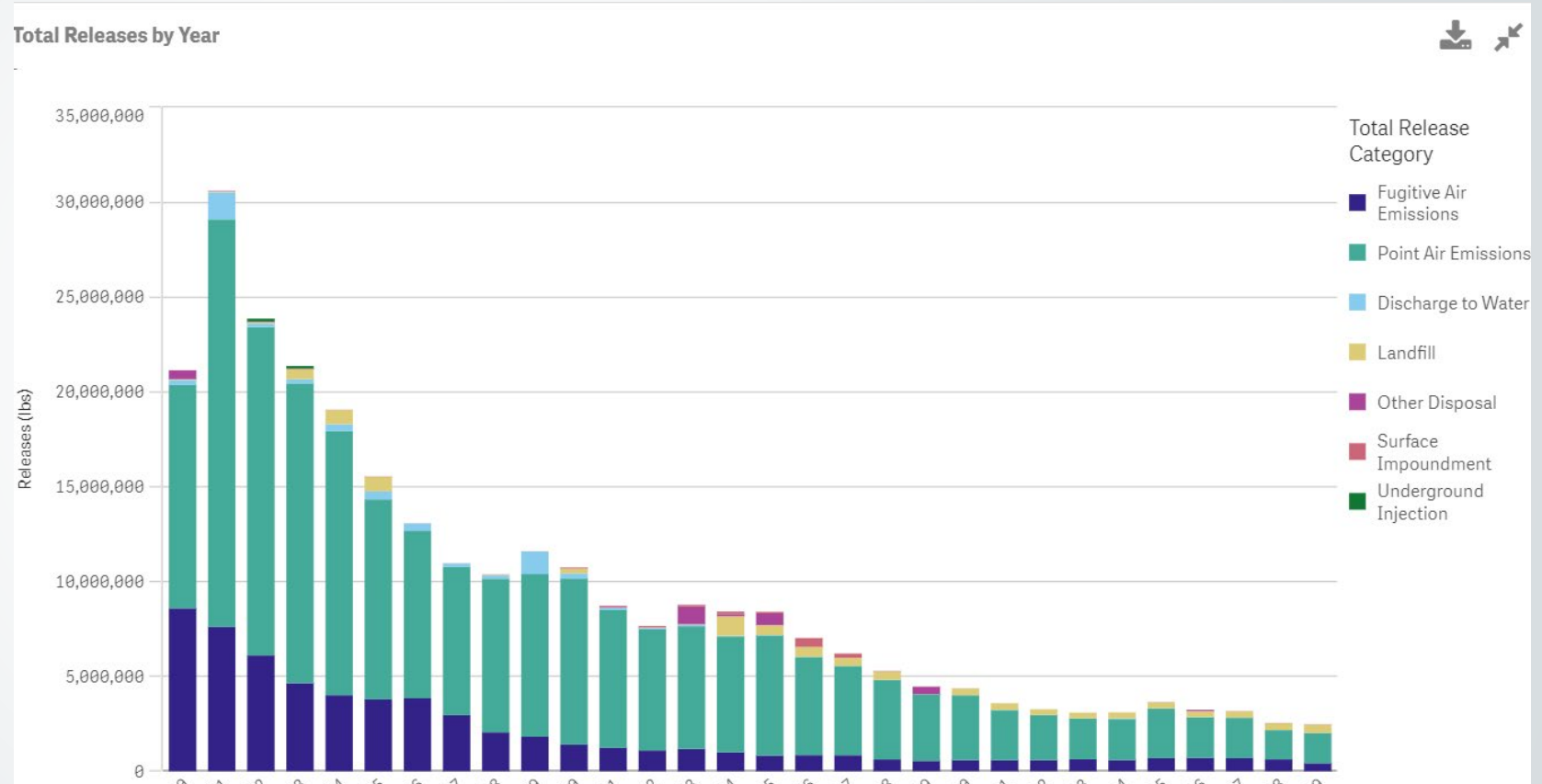
- Monitoring, fees, etc.
- Establishment of Toxics Use Reduction Institute (TURI)
 - Assists firms with evaluation, **alternative development**, planning
 - “Green Chemistry”



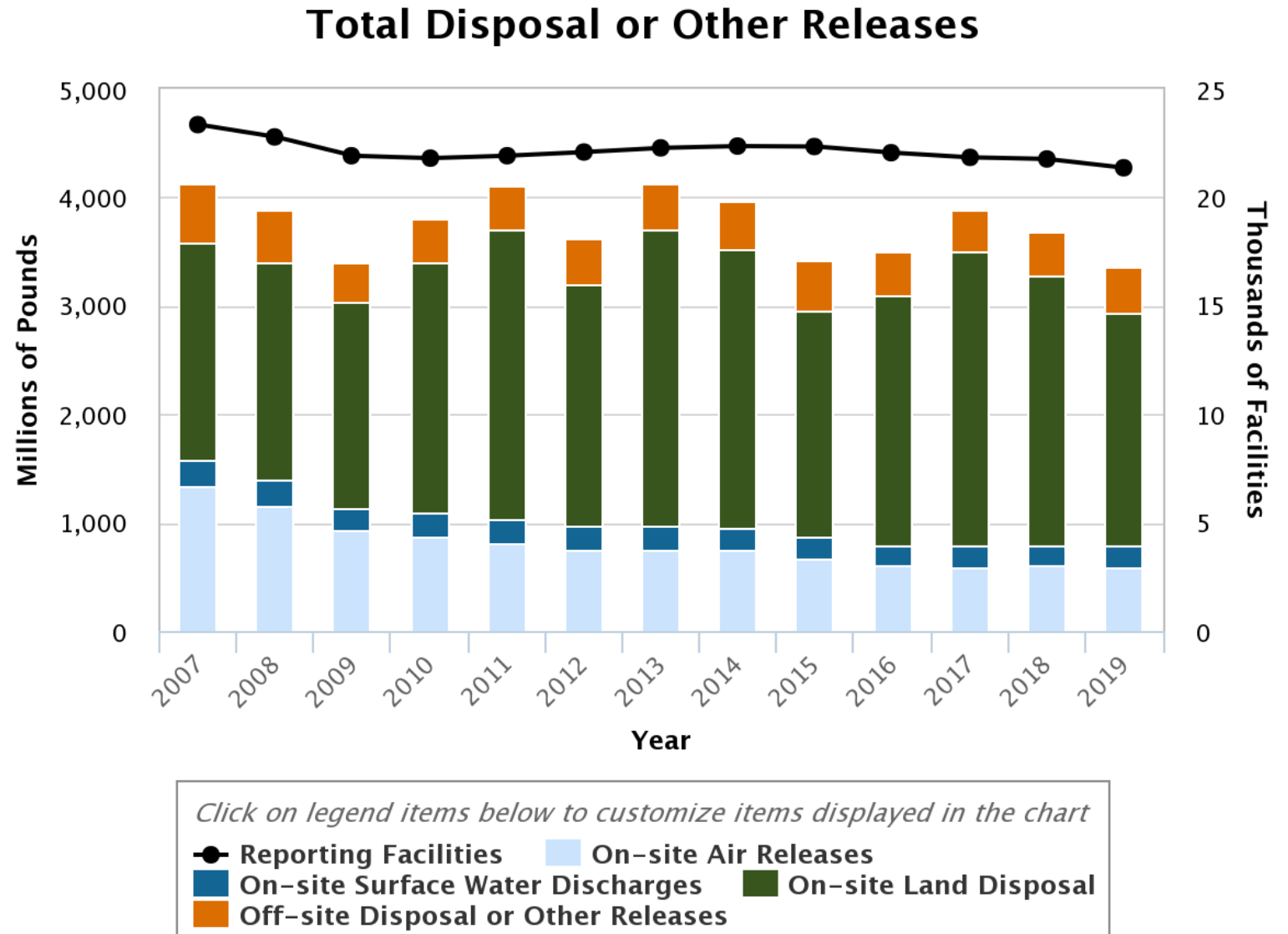
MA Toxics Use



MA Releases



United States Disposal/Release



Lessons of TURI

- ▶ Shift **from High-Stakes to Low-Stakes** (i.e., “Ban” to “Co-Develop Technological Alternatives”)
- ▶ But...eased by ability to focus on outputs
 - ▶ “Lessen **probable** hazards”
 - ▶ versus “Establish **certainty** of risks, then **ban**”

What is “Stakes Lowering” for Biodiversity?

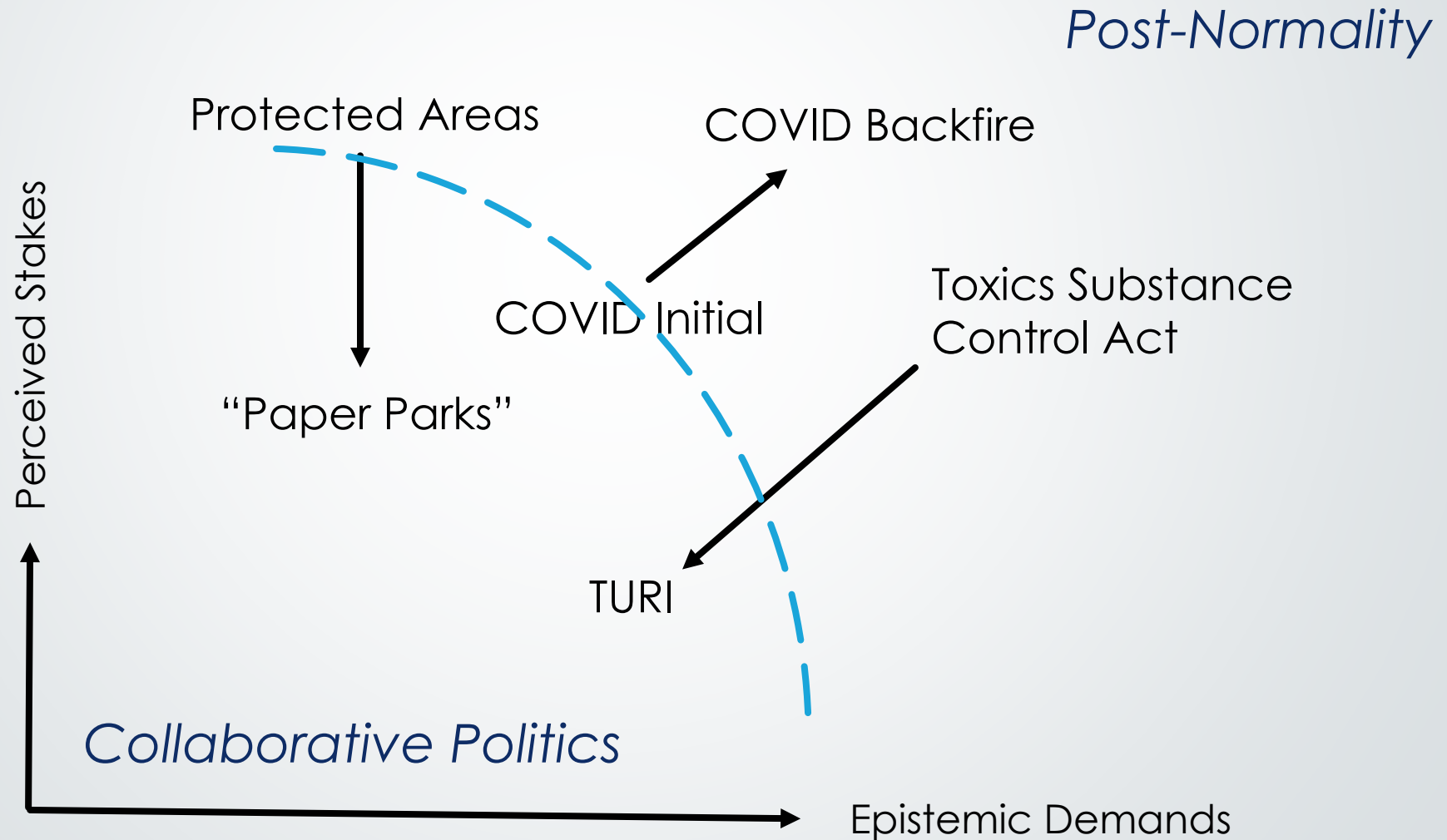
- ▶ Agro-Environmental Schemes via CAP funding?
- ▶ Something else?

Considerations

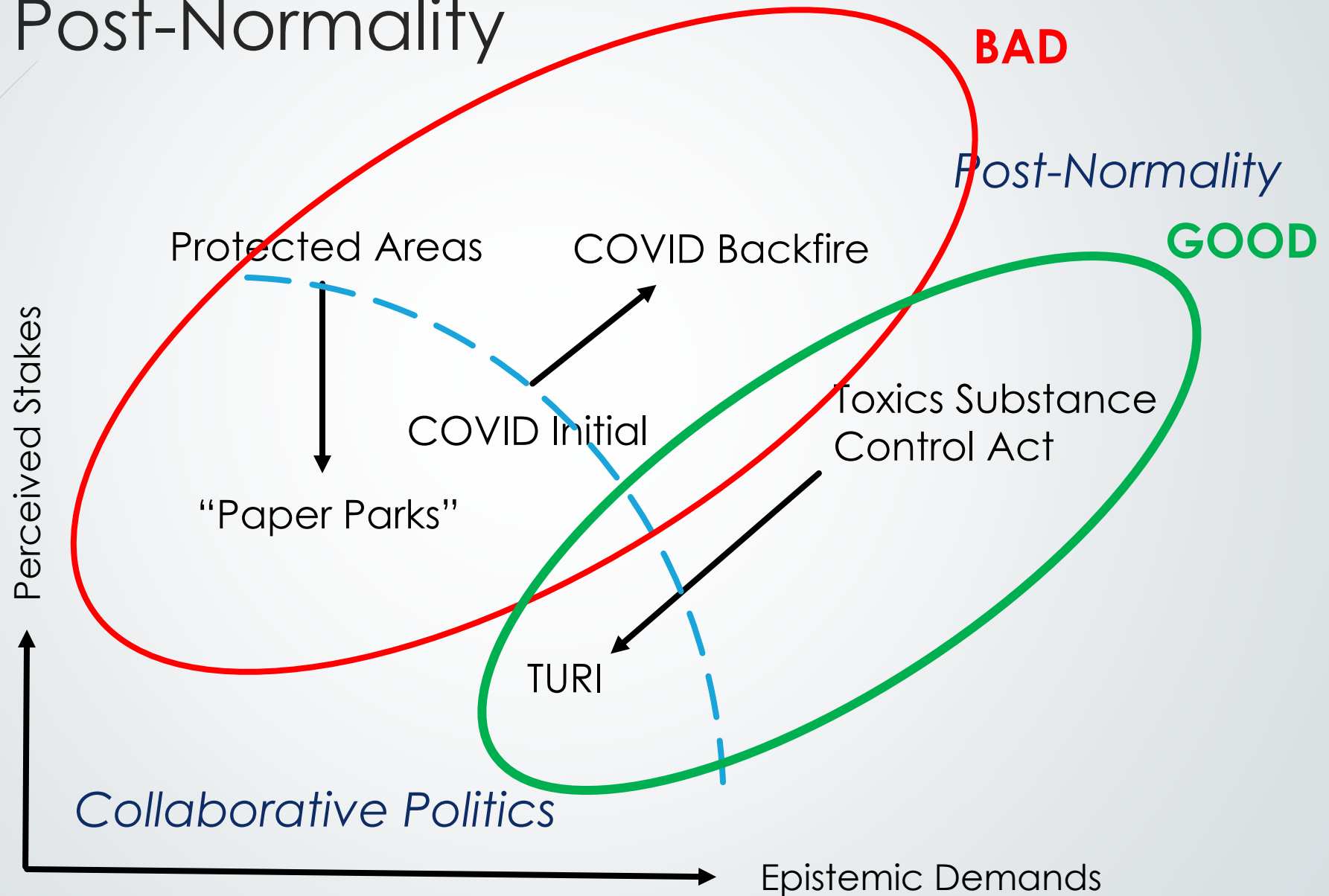
How to reduce stakes?

- a) Prioritize lower stakes policy changes **[Risk: Problem Unsolved]**
- b) Technological change to obviate problem (ex: TURI) **[Risk: New Tech, New Problems]**

Movement Toward and Away from Post-Normality



Movement Toward and Away from Post-Normality



Need to Understand **Dynamic** Relationship between Policy Stakes and Epistemic Demands

- Considerations

- Which simplifying indices, models, metrics?

- Oversimplification -> Perverse adaptations (e.g., “Paper parks”)

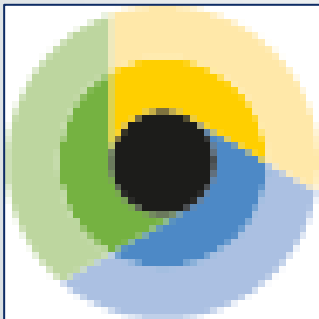
- Can backfire or foster mistrust

- Lessening stakes can lessen pressure on science to produce certainty

- Which metrics, models, and indicis for which political stakes?

Thank You

➡ Thoughts, Comments, Questions?



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