What explains the impact of ecosystem services knowledge on decisions?

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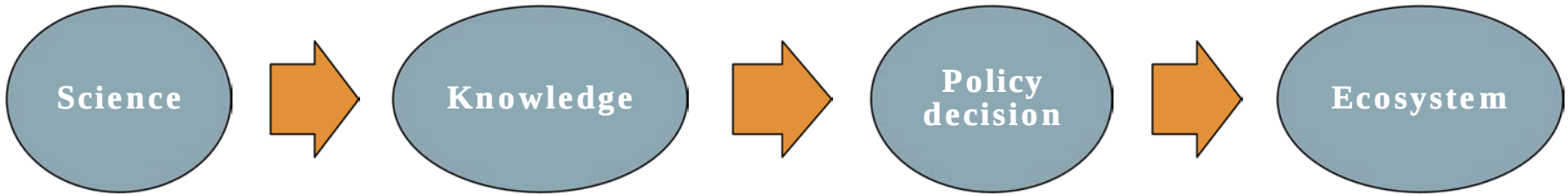
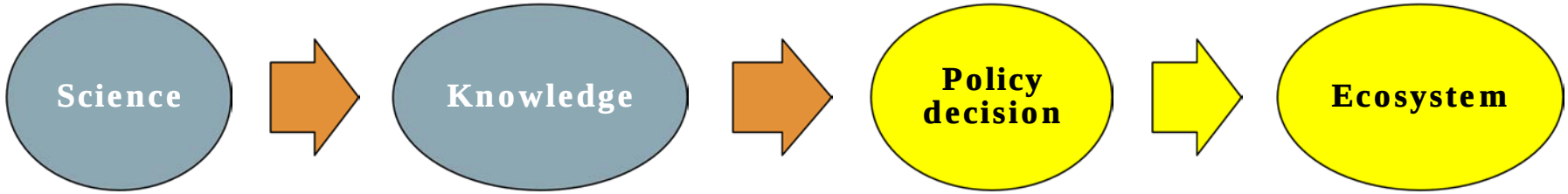
GUND INSTITUTE FOR ECOLOGICAL ECONOMICS

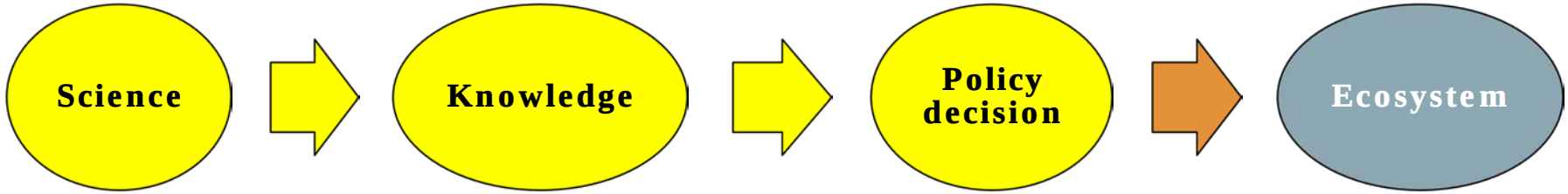
Science ←→ Policy



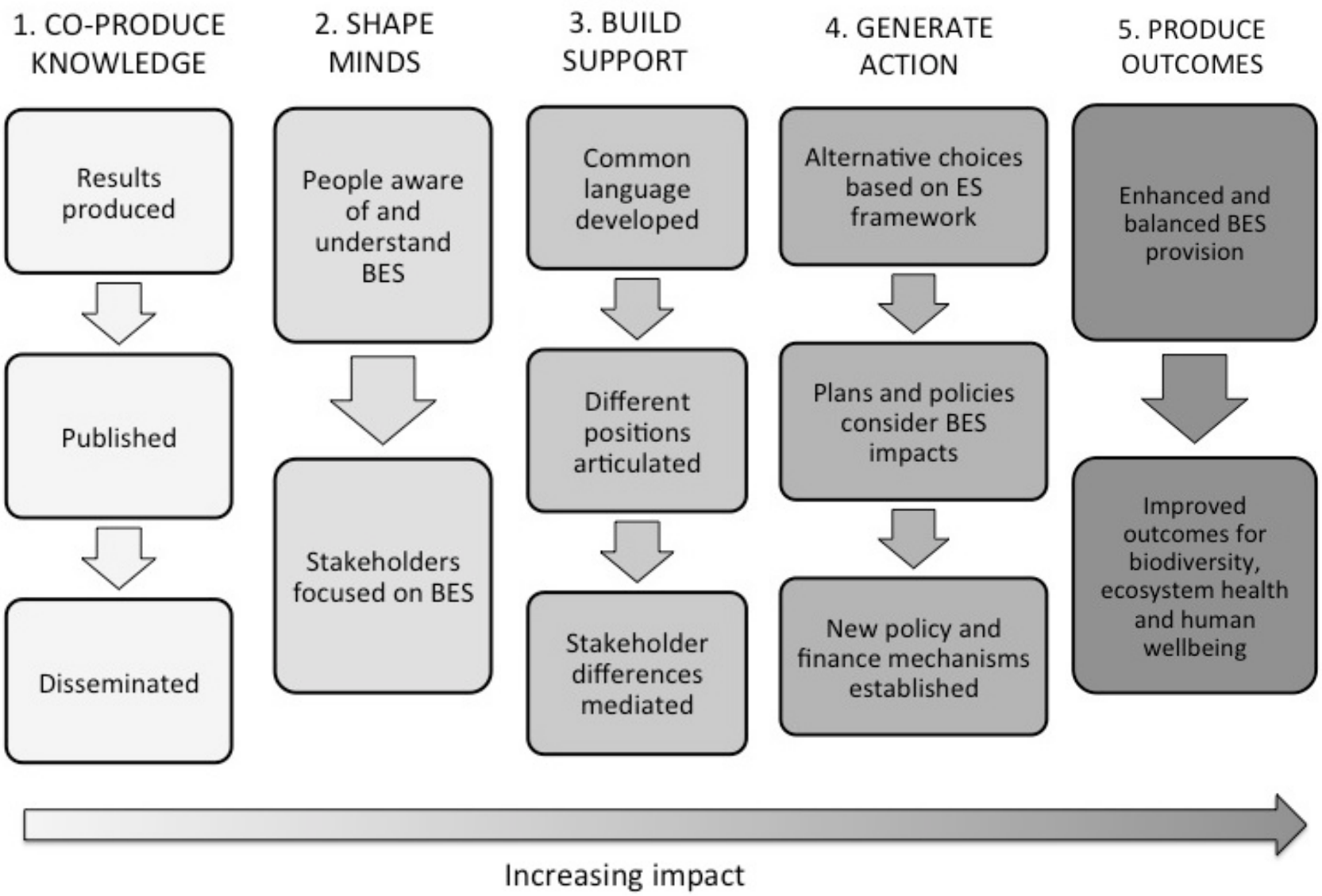
Science ←→ Policy



Science ←→ Policy



Science ←→ Policy



Based on: Ruckelshaus, M., McKenzie, E., Tallis, H., Guerry, A., Daily, G., Kareiva, P., . . . Bernhardt, J. (2013). Note from the field: Lessons learned from using ecosystem service approaches to inform real-world decisions. *Ecological Economics*, in press.

Research question

What factors explain the impact of ecosystem service knowledge?

1) Measure impact
2) Measure explanatory variables
3) Compare across cases

McKenzie, E., Posner, S., et al. 2014. Understanding the use of ecosystem service knowledge in decision-making: Lessons from international experiences of spatial planning. *Environment and Planning C: Government and Policy*, 32(2): 320-340.

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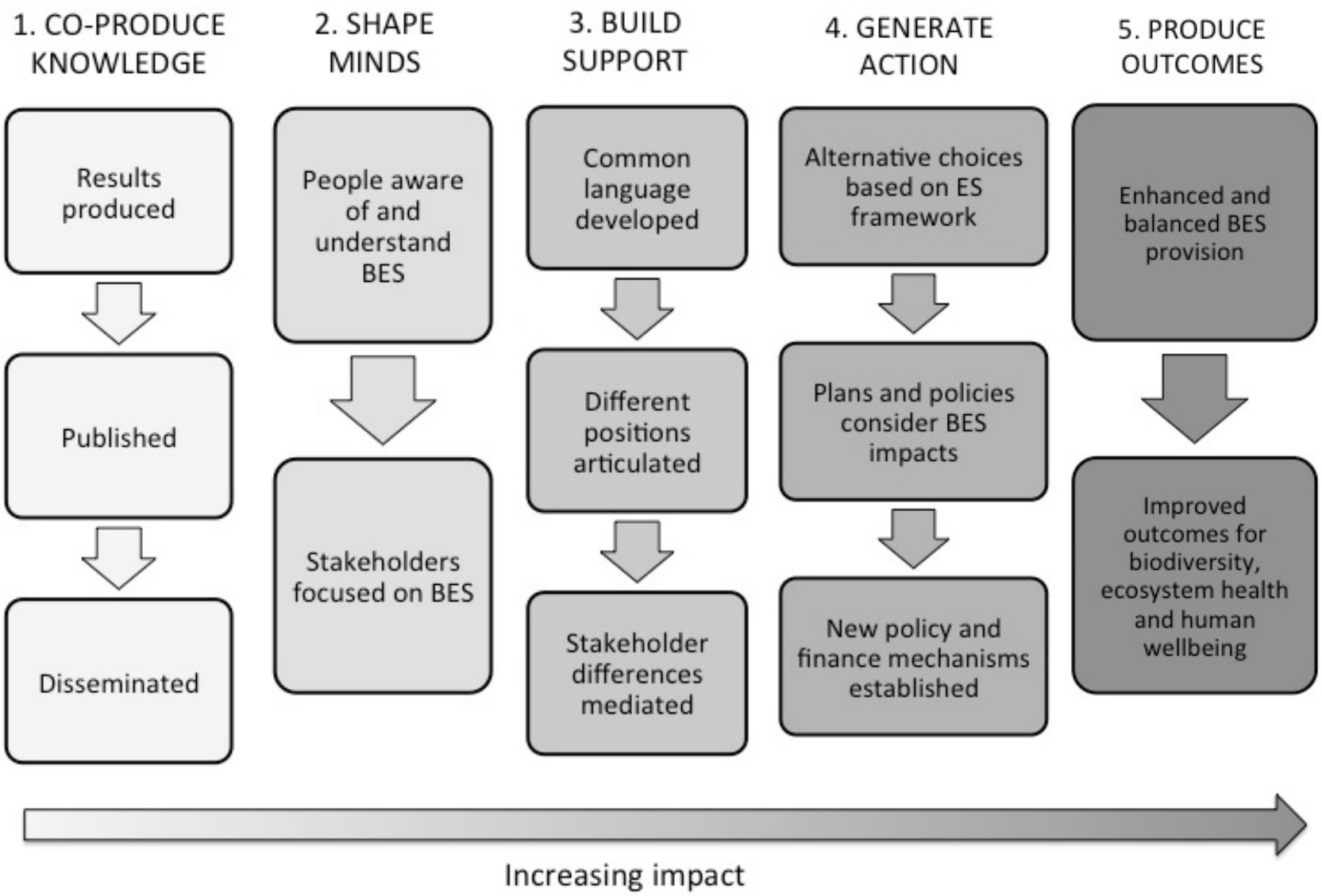
Impact pathways



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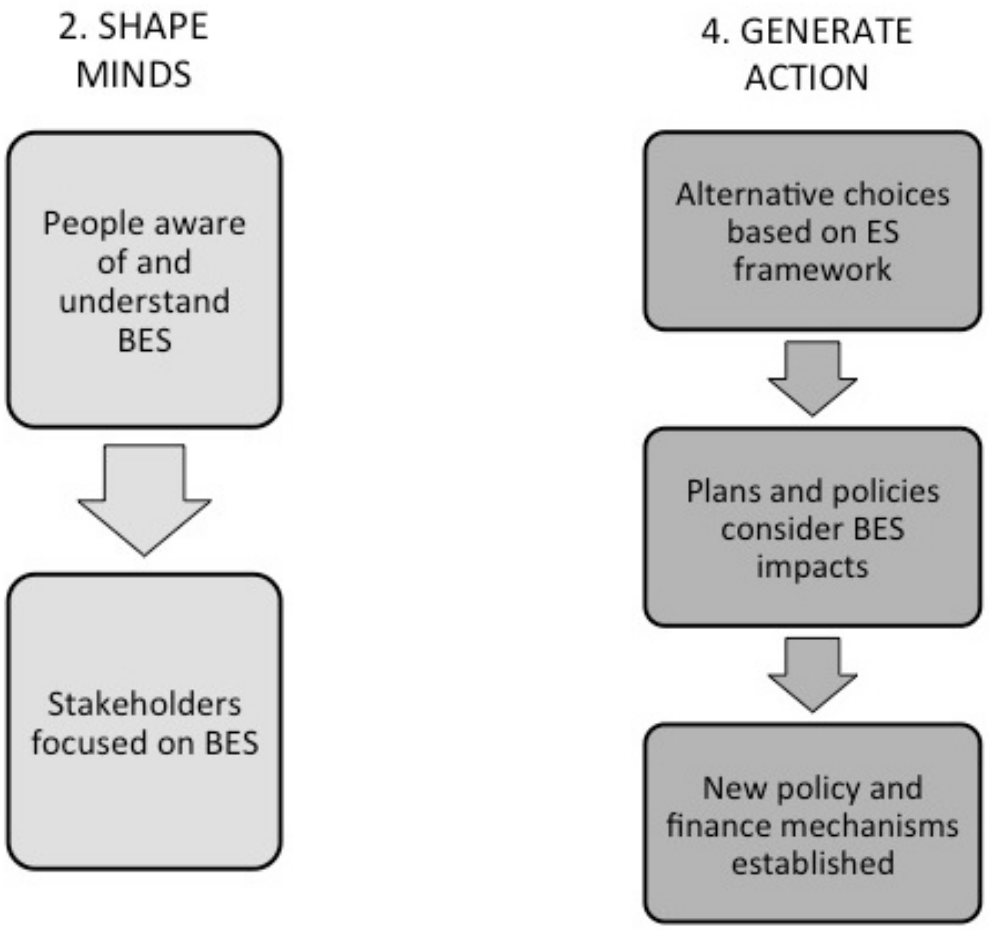

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Ecosystem Service Knowledge **Impact**...

Change perspectives

- People become aware of and understand ecosystem services.
- Conversations and language shifts.

Change plans or policies

- A new policy or finance mechanism is established based on an ecosystem service framework.

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Ecosystem Service Knowledge can be...

Salient

Relevant to the needs of decision-makers

Credible

Scientific arguments are trustworthy and expert-based

Legitimate

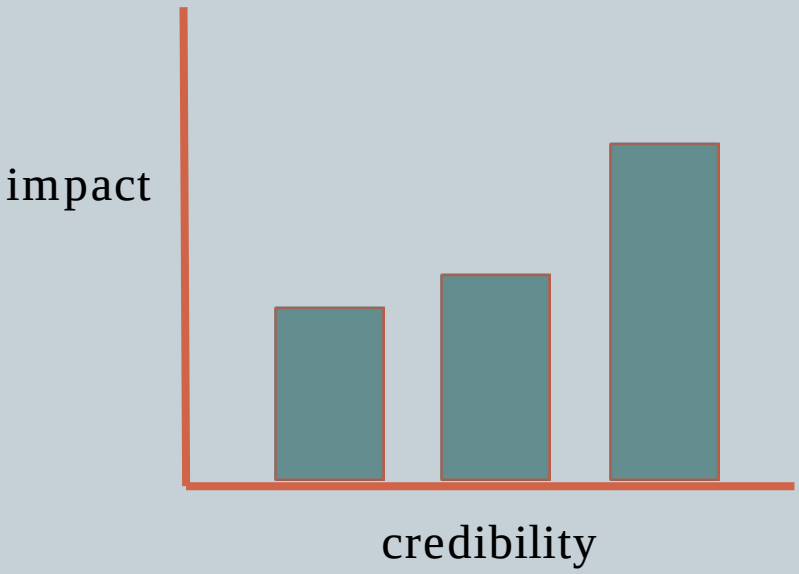
Produced in an unbiased way that fairly considers different points of view

Cash, D. W., Clark, W. C., et al. (2003). Knowledge systems for sustainable development. *PNAS*, *100*(14), 8086-8091

Rowe, A., & Lee, K. (2012). Linking Knowledge with Action. Palo Alto, CA: Packard Foundation.

Hypothesis 1

More *salient/credible/legitimate* ecosystem services knowledge is associated with more impact.



Research question

What factors explain the impact of ecosystem service knowledge?

1) Measure impact
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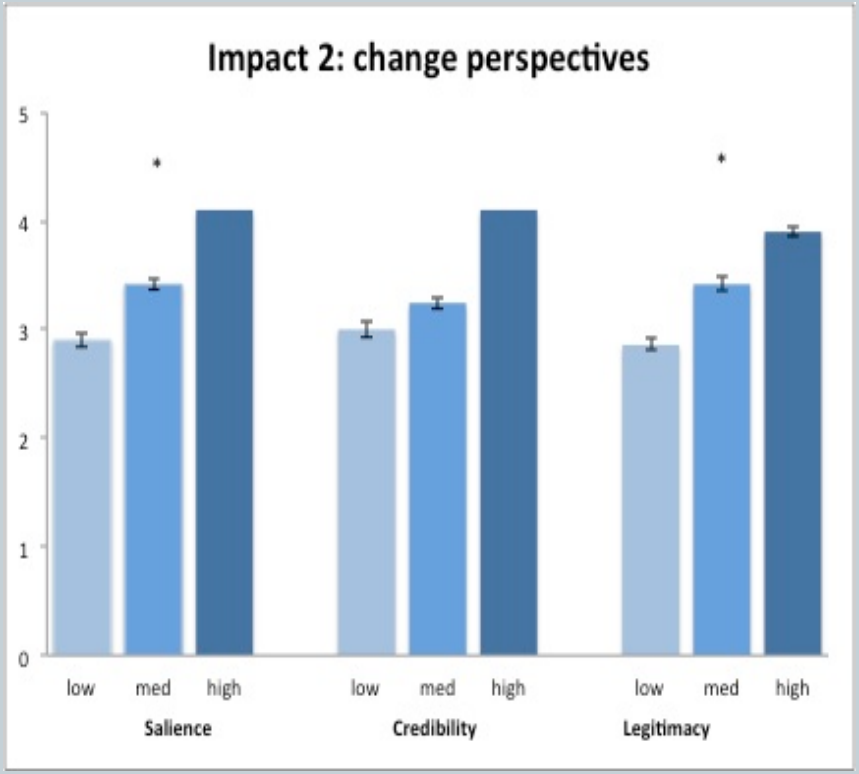
Sample from the Natural Capital Project

Results


Impact 2: change perspectives
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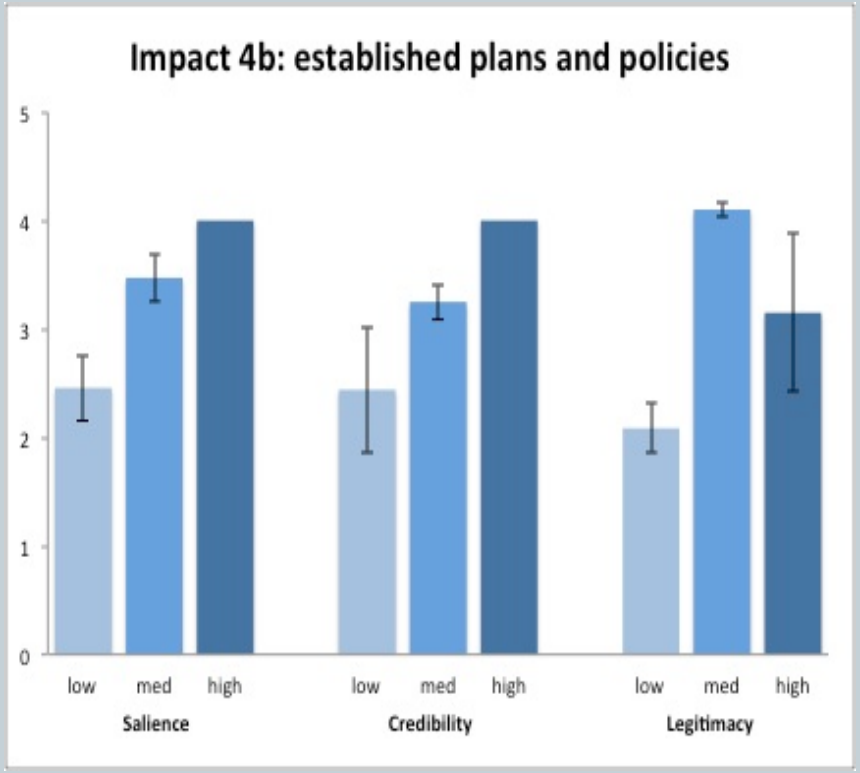
Salience
Credibility
Legitimacy


Impact 4b: established plans and policies
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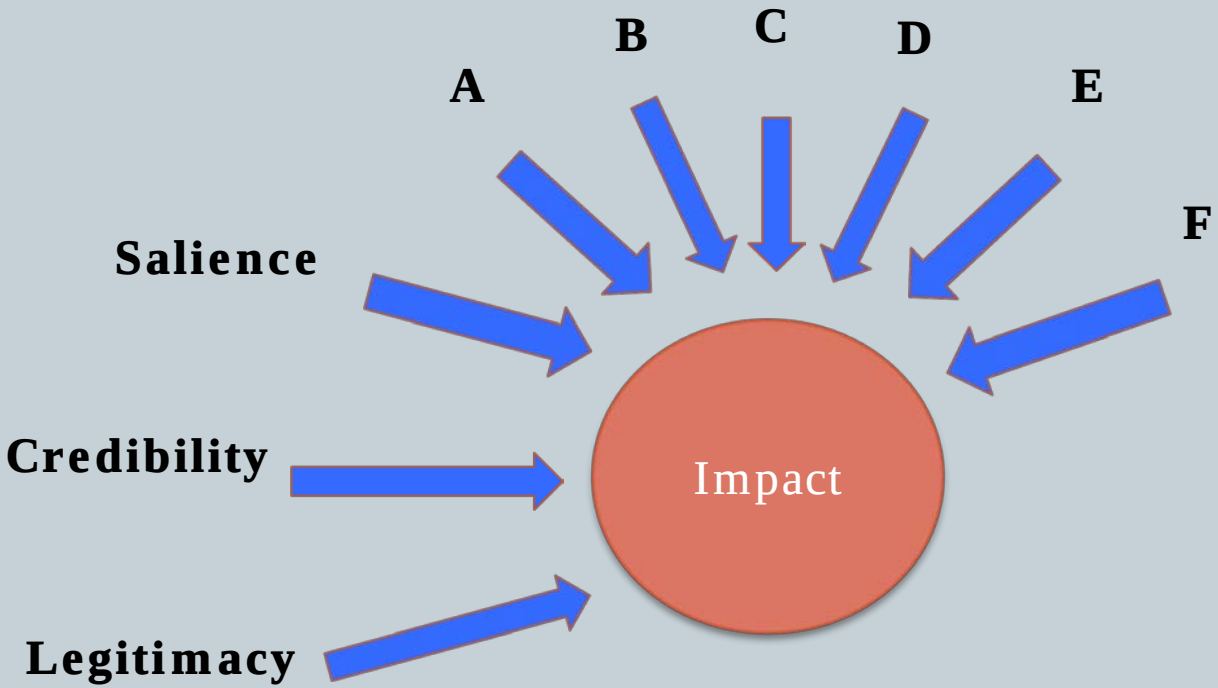
Salience
Credibility
Legitimacy

Hypothesis 2

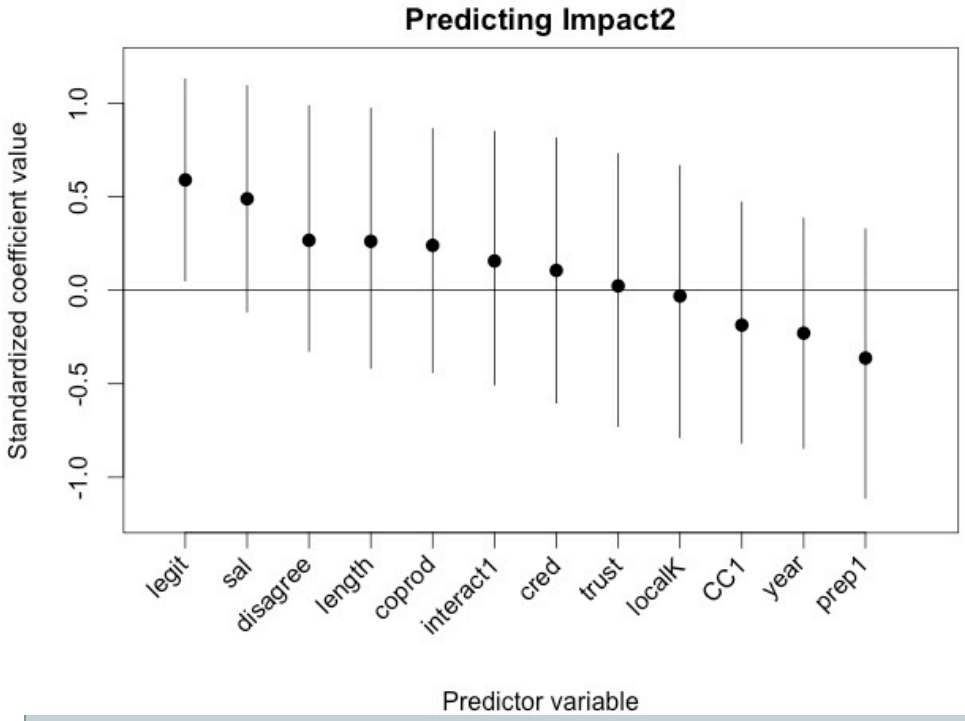
We measured and tested many more explanatory variables...



Explanatory variables

Attributes of knowledge	Characteristics of process	Contextual conditions
• Perceived credibility, legitimacy, and salience of the ecosystem service knowledge • How ESK is represented (monetary valuation vs. biophysical units vs. social variables; maps vs. indices; absolute vs. relative values) • Sources of ESK (traditional vs. expert opinion) • Model complexity (Tier 0, 1, or 2 InVEST models)	• Joint production of ESK (frequency and type of interaction btwn scientists and decision-makers) • Stakeholder representation (% represented) • Presence of conflict or consensus • Trust among stakeholders • Power distribution among decision-makers and stakeholders • Length of project	• Capacity to measure baseline ES and human activities • Capacity to monitor changes to ES and human activities • Capacity to implement policies • Year

Results


Predicting Impact2
Standardized coefficient value
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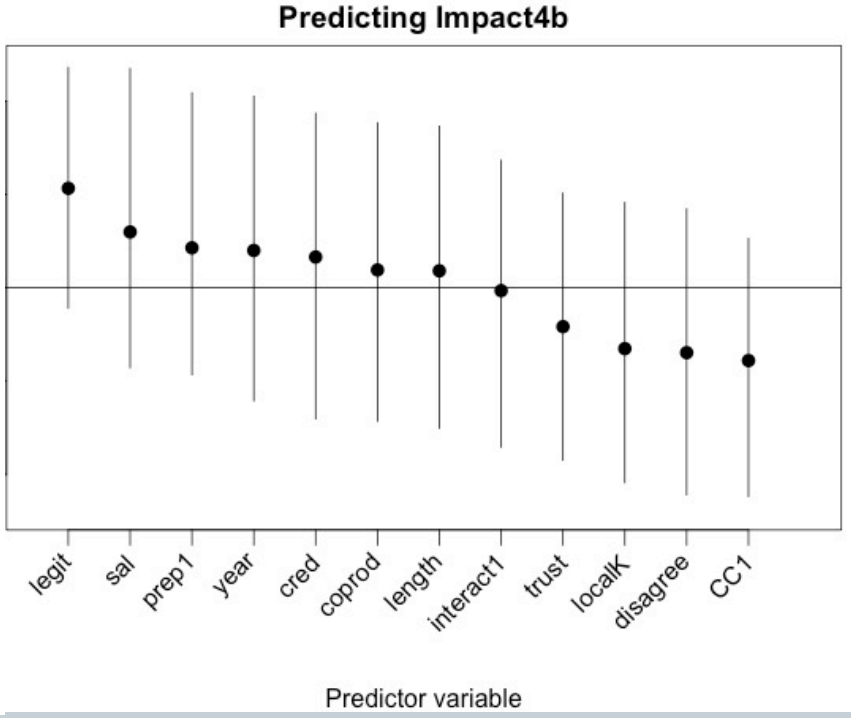
Predictor variable


Predicting Impact4b
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CC1
Predictor variable

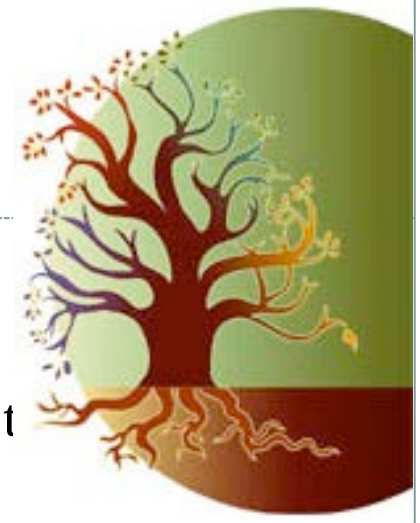
Summary

Ecosystem service knowledge is most often used conceptually and strategically.

Legitimacy of knowledge is more associated with impact than other variables.

To enhance the legitimacy needed for knowledge to stimulate action, researchers must engage meaningfully with stakeholders to incorporate diverse perspectives transparently.

Thanks



Taylor Ricketts, PhD advisor
Emily McKenzie, WWF UK and The Natural Capital Project

WWF Valuing Nature Fellowship, UVM Office of Sustainability

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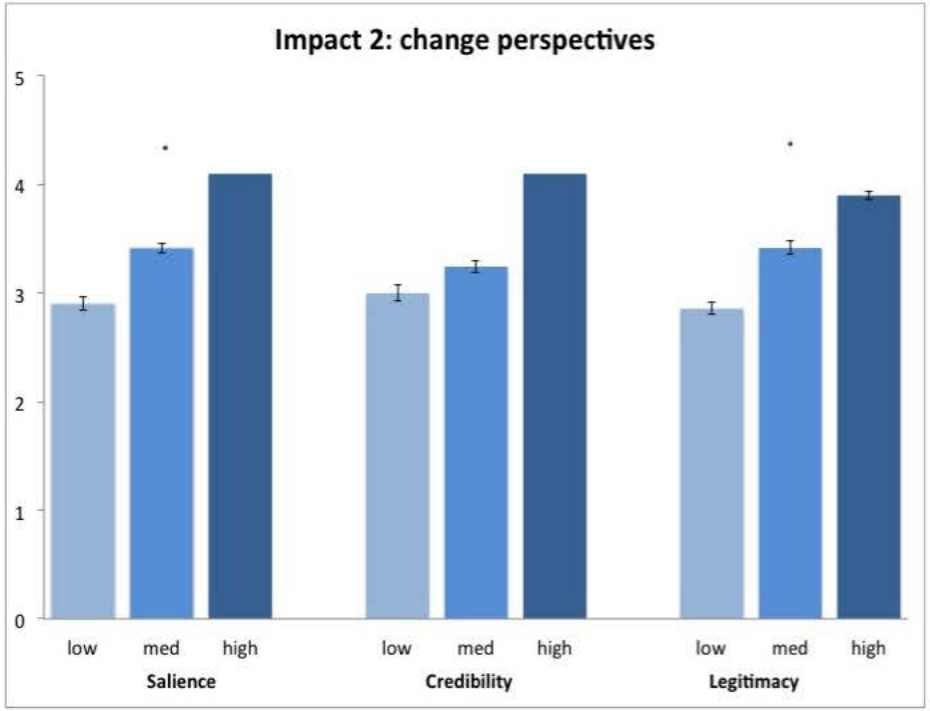
Impact 2: change perspectives
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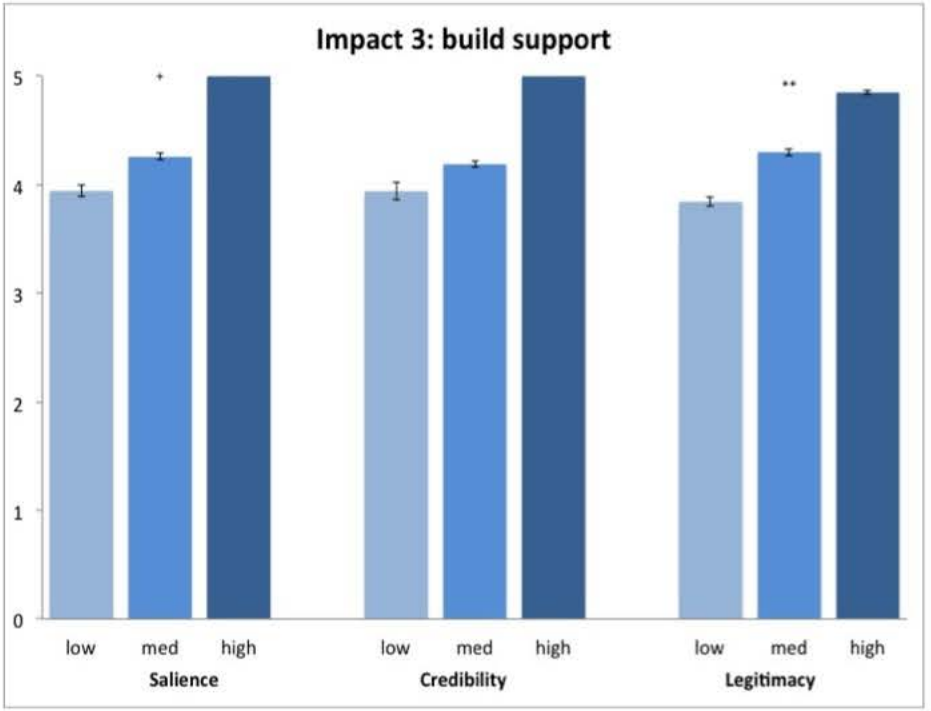
Credibility
Legitimacy


Impact 3: build support
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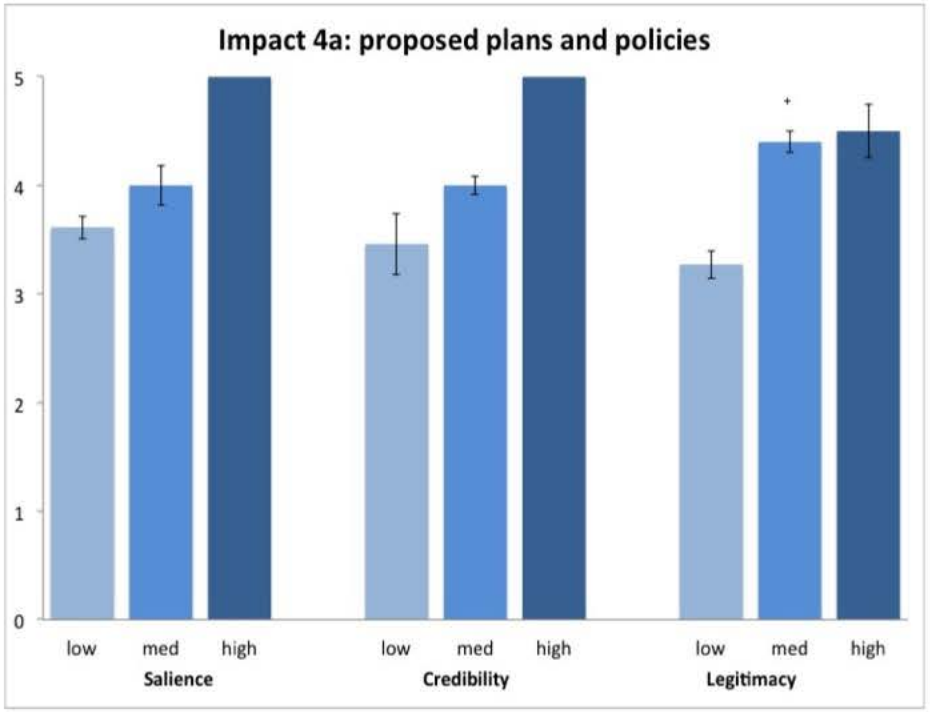
Credibility
Legitimacy


Impact 4a: proposed plans and policies
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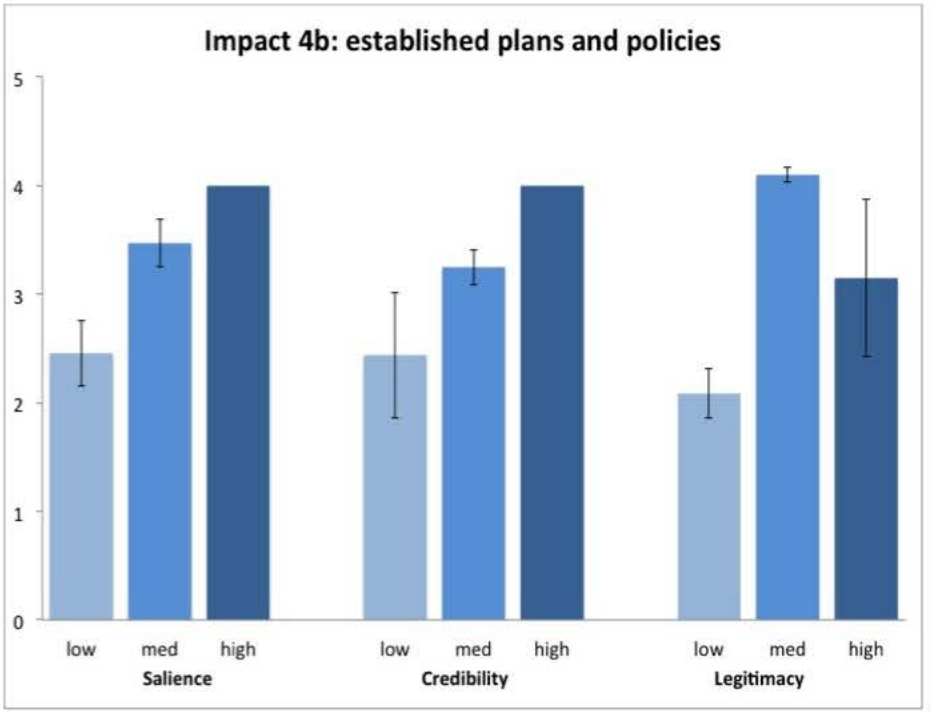
Credibility
Legitimacy


Impact 4b: established plans and policies
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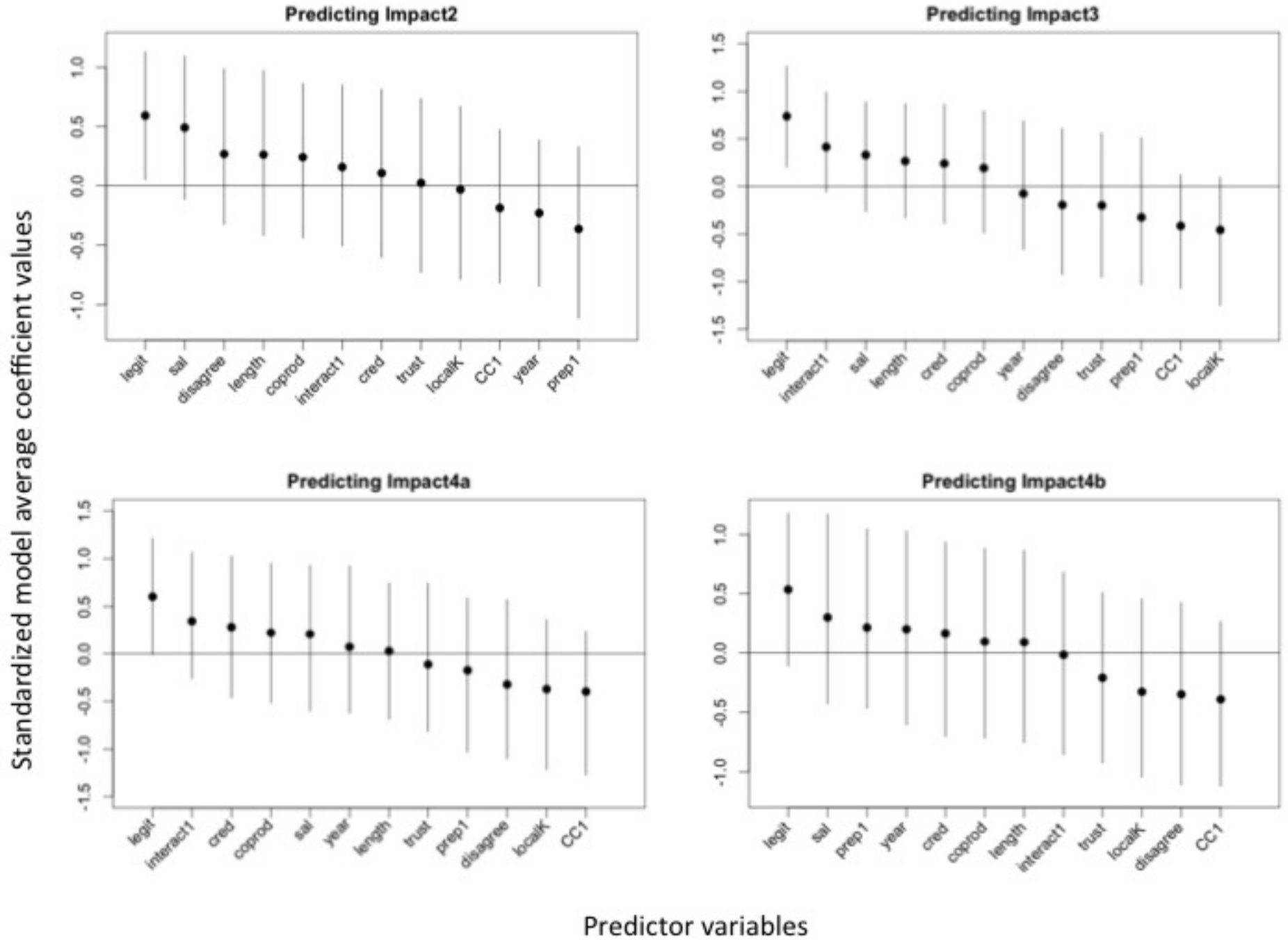
Credibility
Legitimacy


Predicting Impact2
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CC1
Standardized model average coefficient values
Predictor variables