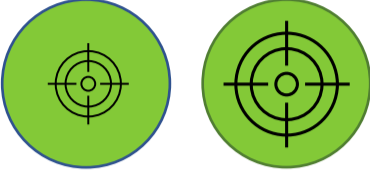


# Is a Replicability Crisis on the Horizon for Environmental & Resource Economics?

## 33%

Median measure of statistical power in recent environmental & resource economics empirical studies



Statistical power is the likelihood that a research study will detect an effect of one variable on an outcome. Power depends on the sample size, the variability of the outcome, and the size of the true effect. The conventional target for statistical power in research is

### 80%

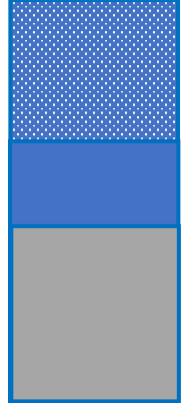
## LIMITED STATISTICAL POWER

## 56%

Estimated proportion of effects reported in environmental and resource economics studies that are exaggerated by a factor of two or more

35% of reported effects exaggerated by 4 times or more

21% of reported effects exaggerated by 2 to 4 times

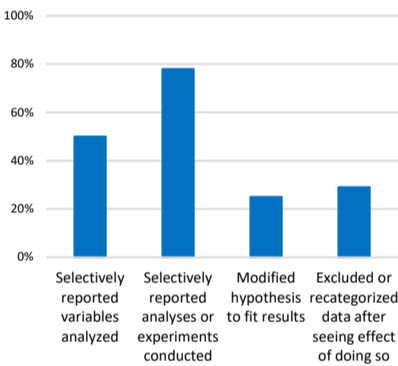


When studies with limited statistical power do detect an effect, the magnitude tends to be exaggerated. Publication bias favors reporting of these exaggerated results.

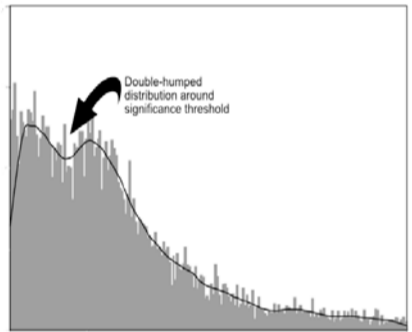
## EXAGGERATION BIAS

## 92%

Environmental and resource economists who reported engaging in one or more research practices that can result in misleading conclusions

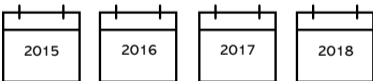


## QUESTIONABLE RESEARCH PRACTICES



Analysis of recent environmental and resource economics studies shows an unusual dip in the distribution of test statistics around the conventional threshold for statistical significance. This pattern is consistent with selective reporting of only statistically significant effects.

## UNUSAL DISTRIBUTION OF TEST STATISTICS



This study assessed the prevalence of research practices that could be symptoms of a looming replication crisis in environmental and resource economics by examining 307 recent studies (2015-2018) from four top journals in the field.



American Economic Review  
 Environmental & Resource Economics  
 Journal of the Association of Environmental & Resource Economists  
 Journal of Environmental Economics & Management

## METHODS

These findings, which are not unique to this field, might reduce confidence in the reliability of research. But the authors do not believe we are in a crisis yet.



The findings do, however, highlight how norms and incentives might skew researchers' behaviors. To avert a replication crisis, the authors suggest some remedies:

*Emphasize research designs and questions, not results.*

*Foster a culture of constructive criticism.*

*Encourage pre-registration of studies.*

*Reward replication of influential, innovative, and controversial empirical studies.*

*Encourage full reporting and avoid punishing authors for transparency.*

*Raise awareness and change norms about research practices.*

## CAN WE AVERT A CRISIS?

Want to learn more?

[Ferraro, P.J., P. Shukla, 2020. Review of Environmental Economics and Policy 14\(2\)](#)

