

Research Statement

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My research aims to inform the scholarly and policy communities on how to design global regulations to incentivize private actors to provide environmental public goods. I analyze the design of international institutions and the conditions for cost-effective environmental regulation across different markets. In my book project, I explain how governments regulate international pollution from oligopolistic and competitive markets. In separate research, I explain how governments have managed and protected regional watersheds from different pollution sources and characterize the dynamics of conflict and cooperation in regional river basins. In my collaborative work, I seek to explain the institutional characteristics of international environmental cooperation. And in a new collaborative project, I am studying the strategies of civic mobilization campaigns against shale gas drilling in Pennsylvania.

Methodologically, I combine data analytic methods to explain policy and regulatory choices. My book project employs mixed survey methods (field and online), participant observations at global environmental negotiations, elite interviews, primary documents, content analysis of agreement texts, and official records from global environmental meetings. My collaborative work employs a before-after research design involving field surveys and online surveys to study what government negotiators believed during United Nations negotiations, and what they believed after the negotiations. My new collaborative project will employ surveys and field experiments to study community mobilization strategies against shale gas drilling in multiple US cities. And my research on regional water management analyzes new panel data I collected on over 200 rivers, lakes, and seas with survival analysis techniques.

Regulating Markets for Global Environmental Protection (Oxford University Press)

What explains the design of global environmental governance? My book, *Regulating the Polluters: Markets and Strategies for Protecting the Global Environment*, outlines how governments have sought to reduce transboundary pollution across different markets. I find that the strategies for pollution abatement vary depending on the markets that produce the pollution. When markets consist of oligopolistic producers and differentiated downstream consumers, the prospects of technological innovation and diffusion raise the cost-effectiveness of government regulation. However, when markets consist of many producers and price-sensitive consumers, governments cannot rely on stakeholder-led innovation and diffusion of new practices and technologies. In these situations, the strategies of global regulation often involve multiple independent and overlapping rules and institutions. In particular, managing pollution from industrial processes, shipping, and chemicals has prompted governments to form integrated and

legalized international regulations. By contrast, managing pollution from agriculture, forestry, and energy has prompted them to form international regulations consisting of legally binding and non-binding rules without a coherent institutional framework.

My book adds to a long history of research that shows small groups are able to achieve their preferred policy outcomes better than large ones by highlighting the ironic circumstances of oligopolies in international environmental regulation. I find that governments are unlikely to have cost-effective measures and rules when polluters are in competitive markets (e.g. energy, forestry, agriculture). However, they are able to capitalize on the industrial and economic characteristics of oligopolistic markets (e.g., chemicals, shipping) to adopt an integrated and legalized set of international regulations. Although oligopolies have greater lobbying capacity than their competitive counterparts, they are also able to turn regulation into profitable opportunities that enable governments to regulate the problem cost-effectively and with minimal public resource investments. Consequently, oligopolistic markets induce narrow regulatory mandates with integrated rules and institutions, but competitive mass markets induce broad regulatory mandates with un-integrated and non-binding rules and institutions. Large and wealthy corporations in oligopolistic markets are able to provide environmental public goods more efficiently than their smaller and less wealthy counterparts in competitive markets, making them attractive targets for regulations intended to encourage public goods provision.

Protecting Watersheds and Promoting Peace (2012-present)

How have governments managed and protected regional watersheds? My research on water management focuses on the international governance of transboundary water bodies, particularly rivers, lakes, and seas. Transboundary access to water poses a challenge for national governments because water is a common-pool resource that can be degraded or depleted from misuse or overuse by individual stakeholders. Although governments have sought to address this problem with international agreements, some attempts have proven more effective than others. I find that the structure of interdependence in managing the water shapes the form of institutional development because interdependence conditions preferences over water usage. Large rivers with more than two riparian states tend to generate divergent preferences over mutual management, compared to lakes and seas, which tend to encourage convergent preferences. Nonetheless, strategies for overcoming divergent preferences can be applied across situations. The key is to provide selective incentives when states are asymmetrically interdependent in using the water, to harmonize national preferences.

My current project builds on data I collected while visiting the Rhine, Danube, and Baltic areas of Europe in 2012-13 for interviews with policy officials. Recently, governments have sought to use international cooperation on freshwater rivers to foster political reconciliation after conflict, often times after a military conflict. It is well known that the Balkan republics had

serious military conflicts during the 1990s, seeded in ethnic hatred. Nonetheless, the European Union sought to encourage political reconciliation between the Balkan republics with a legal regime on the Sava River that runs through all four Balkan countries. I plan to answer a specific question highlighted by this example: under what conditions does international cooperation on transboundary rivers have broader political consequences for national governments after they engaged in military conflict? I expect that the reason the Danube and Sava basins have been successful in using water interdependence for political conciliation is the intense and sustained involvement of international organizations and third parties ensuring that water cooperation leads to institutionalized conflict resolution and avoids a resumption of conflict. In Fall 2015, I intend to travel to the Danube and Sava river basins in Europe to conduct further interviews of officials on water management. I also plan to analyze a new panel dataset that I constructed consisting of 204 transboundary river basins to provide a general empirical understanding of the dynamic relationship between conflict and cooperation in those basins.

Civic Mobilization on Shale Gas Drilling in US Cities (begun in 2015)

How effective are the strategies of civic mobilization campaigns against hydraulic fracturing in the United States? My collaborative project with Patrick Bayer (Washington University in St. Louis) seeks to analyze the strategies of civic mobilization by community groups against shale gas drilling across US cities. The growth of shale gas production has begun a new “energy revolution” in the United States. Commentators, analysts, industry representatives, and elected officials have claimed that shale energy can potentially make the United States energy independent in the early 21st century. Falling gasoline prices and the rising value of the US dollar have been linked to the rapid development of shale-based energy resources in over a dozen states. Despite the economic and geopolitical advantages of shale gas, numerous US cities and towns have banned drilling for shale gas because of the potential environmental consequences for public water and the earthquakes linked to hydraulic fracturing.

Considering variation in the success of these civic mobilization campaigns, we seek to explain why some community organizations were successful in banning shale drilling but others were not successful in their efforts. In particular, we are planning to investigate the effects of different informational frames and messaging strategies shaping public views on shale gas drilling. This project will contribute to the social science literature on collective action and civic mobilization, and to practical considerations in local community campaigns to protect natural resources. In Fall 2015, we plan to implement a survey experiment representing the entire US population, followed by a field experiment in a county of Pennsylvania, where shale drilling has been a public policy issue. The environmental economics institute Resources for the Future (Washington, DC) is funding this project under the John Krutilla Research Stipend.

Relevant Works

Published

Regulating the Polluters: Markets and Strategies for Protecting the Global Environment. Oxford University Press (2017)

“Governing Oligopolies: Global Regimes and Market Structure” 2016. *Global Environmental Politics*. 16(3): 106-126.

“Regional Water Cooperation: Creating Incentives for Integrated Management” 2016. *Journal of Conflict Resolution*. 60(6): 1041-1070.

“The Global Climate Regime: Explaining Lagging Reform” *Review of Policy Research* 31(3): 173-198.

“Institutional Diffusion in International Environmental Affairs” (with Robert O. Keohane) 2012. *International Affairs* 88(3): 523-541

“Danube River Cooperation in Comparative Perspective.” *Danube Watch*. 2/2013. Published by the International Commission for the Protection of the Danube River (Vienna, Austria)

In progress

“The Local Economics and Politics of Shale Gas Production in the United States” (with Patrick Bayer) (*Funded by Resources for the Future*)

“Dynamics of Conflict and Cooperation in Transboundary River Basins”

“The Tragedy of the Commons in California: Modest Proposals”