

Abstract: Networks of Scientific Expertise and US Federal Environmental Agencies

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Scientific expertise is central to the state's capacity to address environmental problems. And yet, though there has been a great deal of excellent scholarship describing the workings of science in particular environmental agencies or in particular domains, there has been relatively little research into the macro-level contours of scientific capacity within the environmental state. In this project, I describe the overall scientific capacity of the US environmental state in terms of its employment of scientific human capital, as well as how it has changed over time. I also show how environmental agencies are networked with each other through the movement of scientific personnel. In this way, I take a step towards a big-picture description of both the size and shape of science in the US environmental state.

To do this, I use a novel data set containing almost every civilian employee of US federal agencies over the period between 1973 and 2019 to identify historical trends in the employment of scientific personnel in environmental agencies. I also create a network graph showing the movement of scientific employees between federal agencies over the course of their careers, and I use a clustering algorithm to identify the distinct scientific networks that agencies draw upon for expertise.

I show that environmental agencies have a much higher proportion of scientific personnel than the rest of the federal government, but that their scientific capacity has fluctuated over time and is not evenly distributed across agencies. I further show that the environmental state is split between two different, but linked, scientific networks: one network that is dominated by environmental agencies, and another larger and more diverse network in which environmental agencies represent only a small fraction of the members. These two networks differ in terms of the disciplinary makeup of their scientific workforces, perhaps reflecting differences in agency missions. These results show that the US federal environmental state is highly reliant on science, but that it is far from monolithic in terms of the quantity and type of science it carries out. I conclude with some remarks about future directions for this line of research.