UNIVERSITY OF CALIFORNIA, BERKELEY
DEPARTMENT OF AGRICULTURAL
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ACADEMIC POSITION

S.V. Ciriacy-Wantrup Postdoctoral Fellow (2018 – Present)
Department of Agricultural & Resource Economics, UC Berkeley

DOCTORAL STUDIES

Massachusetts Institute of Technology (MIT)
PhD, Economics, Completed June 2018
DISSERTATION: "Essays on the Economics of Water"

REFERENCES

Professor Maximilian Auffhammer
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Professor Christopher Knittel
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Professor Benjamin Olken
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PLACEMENT OFFICERS

Prof. Sofia Villas-Boas
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Ms. Diana Lazo
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PRIOR EDUCATION

Brown University, 2010
Sc.B., *magna cum laude*, Physics (with honors) and Economics

FIELDS

(Primary) Environmental & Natural Resource Economics

(Secondary) Development Economics, Public Finance, Agricultural Economics

TEACHING EXPERIENCE	Mentor, Undergraduate Research Program, MIT (3 students)	2017-18
	Kaufman Teaching Certificate Program, MIT	2016
	14.41 Public Finance and Public Policy (Undergraduate) Teaching Assistant to Professor Jonathan Gruber	2015
PREVIOUS POSITIONS	Research Assistant to Professors Esther Duflo, Michael Greenstone, and Rohini Pande	2011-12
	Research Assistant, Council of Economic Advisers	2010-11
RESEARCH GRANTS	Weiss Family Program Fund	2019
	International Growth Centre	2018
	George and Obie Shultz Fund, MIT	2018
	Abdul Latif Jameel Water and Food Systems Lab, MIT	2017
	International Growth Centre	2017
	Abdul Latif Jameel Water and Food Systems Lab, MIT	2016
	Weiss Family Program Fund	2015
	J-PAL Urban Services Initiative	2014
FELLOWSHIPS AND AWARDS	S.V. Ciriacy-Wantrup Postdoctoral Fellowship, UC Berkeley	2018-20
	Tata Fellowship, MIT Tata Center for Technology & Design	2013-15
	Honorable Mention, NSF Graduate Research Fellowship Program	2013
	MIT Energy Fellowship, MIT Energy Initiative	2012-13
	Honorable Mention, NSF Graduate Research Fellowship Program	2012
	Mildred Widgoff Prize for Excellence in Thesis Preparation, Brown University Department of Physics	2010
REFEREE SERVICES	*American Economic Journal: Applied Economics, American Economic Journal: Economic Policy, American Economic Journal: Macroeconomics, American Economic Review, American Journal of Agricultural Economics, Association of Environmental & Resource Economists Summer Meeting, Environment and Development Economics, Land Economics, Journal of Public Economics, Water Resources and Economics*	
ACTIVITIES	Co-organizer, Reading Group in Water Economics, UC Berkeley	2018-20
INVITED PRESENTATIONS	Stanford (Environmental and Energy Policy Analysis Center)	2019
	Occasional Workshop, UC Santa Barbara	2019
	Heartland Environmental and Resource Economics Workshop	2019
	Agricultural & Applied Economics Association Annual Meeting	2019
	AERE Summer Meeting (Sponsored Session)	2019
	Tinbergen Institute (Spatial Economics Seminar)	2019
	Public Policy Institute of California	2019
	Occasional Workshop, UC Santa Barbara (egg-timer)	2018
	UC Berkeley (Environmental & Energy Economics Seminar)	2018
	NBER Summer Institute, EEE Workshop (egg-timer)	2018
	Interdisciplinary Workshop on Sustainable Development (Columbia)	2018
	UC Davis Agricultural & Resource Economics	2018
	Environmental Defense Fund	2017

RESEARCH PAPERS

"The Scope for Climate Adaptation: Water Scarcity and Irrigated Agriculture in California" (Job Market Paper)

How much can societies adapt to climate change? I provide evidence on this question by studying surface water, which is critical to irrigated agriculture yet is projected to become increasingly scarce in many parts of the world. To identify adaptation, I compare the long-run and short-run effects of water scarcity on agriculture, which I estimate using institutional variation in water allocation in California. First, I estimate long-run effects using spatial discontinuities in average water supplies at the borders between neighboring water utilities, where farmland is otherwise similar. Then, I estimate short-run effects in the same sample using weather-driven fluctuations in water supplies from year to year. Using high-resolution satellite data on land use, I find that short-run water scarcity reduces crop area and crop revenue (as predicted by crop choices). In the long run, land use shifts in some ways, but predicted crop revenue falls by 85 percent as much as in the short run, implying adaptation is limited. Absent new investments or policy changes, future declines in surface water supplies are likely to notably reduce the land area and output of agriculture.

"Liquid Constrained in California: Estimating the Potential Gains from Water Markets"

Water markets may help societies adapt to rising water scarcity and variability, but their setup costs can be substantial and their benefits uncertain. I estimate the gains available from strengthening the wholesale surface water market in California, where conveyance infrastructure is well-developed yet transaction volume remains low. To do so, I develop a new empirical framework to analyze welfare in water markets that uses transactions data. First, I recover marginal valuations of water in the presence of unobserved transaction costs, by using particular price comparisons to find the incidence of both known and unknown cost determinants. Second, I estimate demand using yearly water endowments, which have rich variation driven by weather and amplified by historical rules. Then, I combine this demand model with a hydrological network model to simulate counterfactual outcomes. I find that efficient trading across regions and sectors would achieve benefits of only $86 to $278 million per year, without accounting for any environmental costs. These results suggest that promoting large-scale water markets may not achieve large gains without also reforming the policies and institutions that govern local water allocation.

"The Costs of Industrial Water Pollution to Agriculture in India" (current draft single-authored; revisions in progress with Anshuman Tiwari)

Industrial water pollution is high in many developing countries, but researchers and regulators have paid it less attention than air and domestic water pollution. I estimate the costs of industrial water pollution to agriculture in India, focusing on 63 industrial sites identified by the central government as "severely polluted." I exploit the spatial discontinuity in pollution concentrations that these sites generate along a river. First, I show that these sites do in fact coincide with a large, discontinuous rise in pollutant concentrations in the nearest river. Then, I estimate that agricultural revenues are nine percent lower in districts

immediately downstream of polluting sites, relative to districts immediately upstream of the same site in the same year, although confidence intervals exclude zero only when controlling for baseline characteristics. This effect appears to be driven by reduced yields per cropped land area and not factor reallocation. These results suggest that damages to agriculture could represent a major cost of water pollution and warrant further study.

RESEARCH IN PROGRESS

"Measuring Demand for Groundwater Irrigation: Experimental Evidence from Conservation Payments" (with Ariel Zucker)

We measure the price response of demand for groundwater and electricity in irrigated agriculture in Gujarat, India, where both resources are scarce and largely unregulated. To do so, we install meters and introduce a new program of payments for voluntary conservation through a randomized controlled trial. First, we use the price variation introduced by this program to estimate the price elasticity of groundwater demand, a key parameter required for efficient regulation by any means. Then, we evaluate conservation payments as a policy tool in itself. We measure treatment effects on water and energy consumption, as well as spillovers, mechanisms, and economic impacts. We also assess the program's cost-effectiveness, testing whether there is opportunity for mutual gain between irrigators and electric utilities. This project will provide the first experimental evidence on groundwater pricing and among the first on conservation payments. Pilot evidence confirms that conservation payments are feasible and suggests large effects on water use. Baseline data collection is complete and the intervention is scheduled to begin in 2020.

PUBLICATIONS IN PHYSICS

"Statistics of DNA capture by a solid-state nanopore" (with Mirna Mihovilovic and Derek Stein), *Physical Review Letters,* 2013.