

## Curriculum Vitae

### Kirti Rajagopalan

Assistant Professor, Department of Biological Systems Engineering

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### **Executive Summary**

My research interests are at the interface of water and agricultural resource management, with a current focus on the Columbia River basin and more broadly Western United States. I enjoy collaborative multi-disciplinary projects both as a member and leader, and work with colleagues from a broad range of disciplines including engineering, economics, entomology, physiology, statistics, and agronomy. I am passionate about applied research that translates to rich decision support tools for a variety of stakeholders, and lead multiple ongoing efforts developing management-oriented climate-change decision support systems for agriculture. I deeply value interactions with stakeholders, and close engagement with a diverse range of stakeholders including growers, consultants, irrigation districts, and agencies, has provided me context for issues relevant to them.

### **Educational Background**

Ph. D., 2016, Civil Engineering, Washington State University (Advisor: Jennifer Adam)

M. B. A., 2005, Iowa State University (Advisor: Sridhar Ramaswamy)

B. E., 2000, Civil Engineering, National Institute of Technology, Nagpur, India

### **Honors and Awards**

- 2017 John Roberson Dissertation Award, Department of Civil Engineering, WSU
- 2015 Outstanding Teaching Assistant, Department of Civil Engineering, WSU
- 2012 Best paper award, Proceedings of American Marketing Association
- 2008 OSCORE Performance Excellence Award, Deere and Co.
- 2004 Reiman Scholar in Entrepreneurship, Iowa State University
- 2000 Engineering Design National Award, Indian Society for Technical Education

### **Appointments**

- 2020 – Assistant Professor, BSE, Washington State University
- 2017 – 2019 Assistant Research Professor, CSANR, Washington State University
- 2015 – 2016 Associate in Research, CSANR, Washington State University
- 2010 – 2014 Graduate Assistant, Civil Engineering Dept., Washington State University
- 2008 – 2011 Private Consultant, Marketing Analytics/Marketing Research
- 2005 – 2008 Analyst, Credit Division Marketing Analytics, Deere and Co.
- 2003 – 2005 Graduate Assistant, College of Business, Iowa State University
- 2001 – 2002 Software Engineer/Technical Lead, Magnasoft Consulting India Pvt. Ltd.

## Grants

Role	Agency	Total \$ Amount	Rajagopalan \$ Amount	Duration	TITLE OF PROJECT
<b>ACTIVE/RECOMMENDED FOR FUNDING</b>					
PI	WSDA Specialty Crop Block Grant	\$249,971	\$103,109	9/30/2018-8/29/2021	Decision support for managing climate related risks in tree fruit and grapes.
PI	USGS (through WRC)	\$30,000	\$30,000	4/1/2020-3/31/2021	Farmer adaption to climate change through double cropping may increase water use: an exploratory analysis.
PI	USFS	\$12,500	\$12,500	7/1/2019-6/30/2021	Statistical analogs for rangelands.
PI	Microsoft	\$5,000	\$5,000	11/1/2019-10/31/2020	Compute grant for quantifying double cropping extent in eastern WA state.
Co-PI (PI Yoder)	USDA NIFA Water for Ag	\$5,166,223	\$551,548	4/1/2018-3/31/2022	Technology for Trade: New tools and new rules for water use efficiency in agriculture and beyond
Co-PI (PI Adam)	Bonneville Power Administration	\$436,255	\$173,429	11/13/2018-4/14/2020	2020 Modified Flows Irrigation Depletion Calculation
Co-PI (PI Adam)	WA State Department of Ecology	\$1,500,000	\$128,000	10/1/2019-6/30/2022	2021 Columbia River water supply and demand forecast.
Co-PI (PI du Toit)	USDA SCRI	\$4,000,000	\$155,577	9/30/2019-9/29/2023	Stop the rot: Combating onion bacterial diseases with pathogenomic tools & enhanced management strategies.
Co-PI (PI Yorgey)	Appendix A	\$60,000	\$29,000	1/20/2020-12/31/2021	Improving the Potential for Nutrient Recovery to Contribute to Improved Nutrient Export and Nutrient Management By Dairies
<b>Total</b>		<b>\$11,459,949</b>	<b>\$1,188,163</b>		

COMPLETED					
PI	USDA NW Climate Hub	\$70,000	\$32,658	6/1/2017-7/30/2019	Building Resilience of NW Tree Fruit to Changing Pest Pressures Under Climate Change.
PI	USDA Western ERME	\$49,892	\$37,748	1/1/18 – 9/30/19	Decreasing winter chill: risks and implications for Northwest tree-fruit producers.
PI	Whatcom Conservation District through USDA NRCS	\$29,000	\$27,000	11/15/2018-9/30/2019	Exploration of changing lagoon storage needs/risks in Whatcom and surrounding counties.
PI	Snohomish Conservation District	\$14,976	\$14,976	7/19/2017-7/31/2018	Extension of online CSANR Climate Visualization Tool to Western WA.
Co-PI (PI Adam)	Bonneville Power Administration	\$135,686	\$47,125	1/16/2018-9/15/2018	Irrigation Depletion Methodology Development for Umatilla Basin.
Co-PI (PI Gaolach)	CEREO/WRC/CS ANR WSU Internal Planning Grant	\$10,000	\$0	1/1/2016-7/31/2016	Promoting Urban FEW Resource Resilience via the Regional Food System.
<b>Total</b>		<b>\$309,554</b>	<b>\$159,507</b>		

## Teaching/Mentoring

### Teaching

BYSE 552 Hydroclimatology

Fall 2020

BYSE 552 Agroecosystems: Data and Modeling  
Fall 2020 (co-taught with Claudio Stockle)

CE 351 Water Resources Engineering

Spring 2014 Class size: **56**; # of credits: **3**

Overall Instructor Evaluation Rating: **4.35/5** (above department average)

### Mentoring

#### Postdoctoral associate:

Hossein Noorazar (February 2019 – present)

Siddharth Chaudhary (July 2020 -present)

#### Ph. D. student:

Chen Xu (co-advised with Jennifer Adam) (August 2018 – present)

Ashish Kondal (co-advised with Jennifer Adam) (January 2019 – present)

#### Research associate:

Giridhar Manoharan (January 2018 – December 2018) (now with Google Inc.)

Hao Li (June 2020– present)

Vladisav Oles (April 2020 – August 2020)

#### Undergraduate Researcher

James Fleharty (July 2020 -present)

**Undergraduate Senior Design project team:** Voiland College of Engineering and Architecture (2016 – present)

## **Publications. Refereed (published and under review: \*corresponding author)**

### **Journal**

- H. Noorazar, L. Kalcsits, V.P. Jones, L. Kalcsits and **K. Rajagopalan\***. (2020) “The risk for insufficient chill accumulation: a climate change perspective for *tree-fruit production risks in the Pacific Northwest*.” *Climate* (under review)
- Malek K., C.O. Stöckle, M. Brady, J.C. Adam and **K. Rajagopalan**. (2018) “*When should irrigator invest in more water-efficient technologies as an adaptation to climate change?*” *Water Resources Research*. 54(11), pp.8999-9032.
- Rajagopalan K.\***, K. Chinnayakanahalli, C.O. Stöckle, R. Nelson, C. Kruger, M. Brady, K. Malek, S. Dinesh, M.E. Barber, G. Yorgey and J. Adam. (2018) “*Impacts of near-term regional climate change on agriculture in the Columbia River basin*.” *Water Resources Research*, 54, 2125-2182. <https://doi.org/10.1002/2017WR020954>.
- Malek K., C. Stöckle, J.C. Adam, **K. Rajagopalan**, M. Liu. (2017) “*VIC-CropSyst: A regional-scale modeling platform to simulate the nexus of climate, hydrology, cropping systems, and human decisions*.” *Geoscientific Model Development*, 10, 3059-3084. <https://doi.org/10.5194/gmd-10-3059-2017>.
- Yorgey, G., C.E. Kruger, S.A. Hall, E. Allen, E.M. Whitefield, N. Embertson, V.P. Jones, B.R. Saari, **K. Rajagopalan**, G. Roesch-McNally, B. Van Horne, J. Abatzoglou, H.P. Collins, L. Houston, C. Seavert, and T. Ewing. (2017) “*A Collaborative Approach to Identifying Priorities for U.S. Northwest Agriculture Related to Climate Change*.” *Frontiers in Environmental Science*, 5, 55. <https://doi.org/10.3389/fenvs.2017.00052>.
- Liu, M., **K. Rajagopalan**, S. H. Chung, X. Jiang, J. Harrison, T. Nergui, A. Guenther, C. Miller, J. Reyes, C. Tague, J. Choate, E. P. Salathe, C.O. Stöckle, and J.C. Adam. (2014) “*What is the importance of climate model bias when projecting the impacts of climate change on land surface processes?*” *Biogeosciences*, 11(10), 2601-2622. <https://doi.org/10.5194/bg-11-2601-2014>.
- Adam J.C., J.C. Stephens, S.H. Chung, M.P. Brady, R.D. Evans, C.E. Kruger, B.K. Lamb, M.L. Liu, C.O. Stöckle, J.K. Vaughan, **K. Rajagopalan**, J.A. Harrison, C.L. Tague, A. Kalya-naraman, Y. Chen, A. Guenther, F.Y. Leung, L.R. Leung, A.B. Perleberg, J. Yoder, E. Allen, S. Anderson, B. Chandrasekharan, K. Malek, T. Mullis, C. Miller, T. Nergui, J. Poinsatte, J. Reyes, J. Zhu, J.S. Choate, X. Jiang, R. Nelson, J.H. Yoon, G.G. Yorgey, K. Johnson, K.J. Chinnayakanahalli, A.F. Hamlet, B. Nijssen, V. Walden. (2014) “*BioEarth: Envisioning and Developing a New Regional Earth System Model to Inform Natural and Agricultural Resource Management*.” *Climatic Change*, 129(3-4), 555-571. <https://doi.org/10.1007/s10584-014-1115-2>.

### **Proceedings**

- Potter N., **K. Rajagopalan**, and M. Brady. (2018) “*Using Climate Analogues to Obtain a Causal Estimate of the Impact of Climate on Agricultural Productivity*.” *Proceedings of Agriculture and Applied Economics Association Annual Meeting*, Washington D.C.

## **Publications. Non-Refereed (\*corresponding author)**

- K. Hills, M. Pruett, K. Rajagopalan\*, J. C. Adam, M. Liu, R. Nelson, F. Scarpore, C. O. Stockle (2020) Calculation of 2020 Irrigation Depletions for 2020 Level Modified Streamflows. Technical report submitted to the Bonneville Power Administration.
- E. Allen, S.A. Hall, G.G. Yorgey, K. Rajagopalan, J.C. Adam, M.P. Brady, M.E. Barber, C.O. Stöckle, M. Barik, C.E. Kruger (2018) Modeling Environmental Change: A Guide to Understanding Scenarios. Washington State University Extension Publication, Pullman, WA.
- E. Allen, K. Rajagopalan, G.G. Yorgey, C. E. Kruger (2015) “*Modeling Environmental Change: A guide to understanding results from models that explore impacts of climate change on regional environmental systems.*” WSU Extension Fact Sheet.
- G.G. Yorgey, K. Rajagopalan, K. Chinnayakanahalli, M.P. Brady, M.E. Barber, R. Nelson, C.O. Stöckle, C.E. Kruger, S. Dinesh, K. Malek, J. Yoder, and J.C. Adam (2011) “*Columbia River Basin Long-Term Water Supply and Demand Forecast.*” Washington State Legislative Report.
- M. Barik, J.C. Adam, J. Yoder, M.P. Brady, D. Haller, M.E. Barber, Hall, S.A., C.E. Kruger, G.G. Yorgey, M. Downes, C.O. Stöckle, B. Aryal, T. Carlson, G. Damiano, S. Dhungel, C. Einberger, K. Hamel-Reiken, M. Liu, K. Malek, S. McClure, R. Nelson, M. O’Brien, J. Padowski, K. Rajagopalan, Z. Rakib, B. Rushi, W. Valdez (2017). 2016 “*Technical Supplement for the Columbia River Basin Long-Term Water Supply and Demand Forecast.*” Publication No. 16-12-008. Washington Department of Ecology, Olympia, WA. 216 pp. Available online at: <https://fortress.wa.gov/ecy/publications/SummaryPages/1612008.html> •
- Hall, S.A., J.C. Adam, M. Barik, J. Yoder, M.P. Brady, D. Haller, M.E. Barber, C.E. Kruger, G.G. Yorgey, M. Downes, C.O. Stöckle, B. Aryal, T. Carlson, G. Damiano, S. Dhungel, C. Einberger, K. Hamel-Reiken, M. Liu, K. Malek, S. McClure, R. Nelson, M. O’Brien, J. Padowski, K. Rajagopalan, Z. Rakib, B. Rushi, W. Valdez (2016) “*2016 Washington State Legislative Report. Columbia River Basin Long-Term Water Supply and Demand Forecast.*” Publication No. 16-12-001. Washington Department of Ecology, Olympia, WA. 216 pp. Available online at: <https://fortress.wa.gov/ecy/publications/SummaryPages/1612001.html>
- Yorgey, G., C. E. Kruger, S. Brooke, S. A. Hall, E. Whitefield, N. Embertson, V. P. Jones, K. Rajagopalan, E. Allen, G. Roesch McNally, B. Van Horne, J. Abatzoglou, H. Collins, L. Houston, C. Seavert, T. Ewing (2017) “*Agriculture in a Changing Climate: Research and Extension Priorities in the Northwest.*” Technical Publication from the Agriculture in a Changing Climate Workshop, held in Kennewick, WA, March 9-11, 2016. Published February 28, 2017.

## **Presentations**

### **Invited Talks (First author, presenter)**

- “Tech for Trade: New Tools and Rules for improving water use efficiency.”* Law Seminars International Tribal Water in the Pacific Northwest, September 2019  
Seattle WA
- “Pest Pressures and Management: Implications for the Codling Moth under climate change”.* Entomological Society of America -Pacific Annual Meeting, San Diego, CA March 2019
- “Water availability in the Columbia River Basin: bringing demand into the discussion.”* Law Seminars International Tribal Water in the Pacific Northwest, July 2018  
Seattle WA
- “Climate Change: Outlook for agricultural production in the Columbia River Basin.”* Columbia Conservation District Annual Meeting, January 2018 Dayton WA  
Oregon State University Farm Fair, November 2017 Hermiston OR
- “Changing Codling Moth Pest Pressures in WA State.”*  
OSU Farm Fair, November 2017 Hermiston OR
- “Food for thought: Agricultural production in the Columbia River Basin under global change.”*  
Climate for Water Conference, January 2017, Skamania, WA
- “Forecasting Water Supply and Demand for the Columbia River Basin and beyond.”*  
WA County Leaders Conference. Skamania, WA, November 2015.  
WSWRA annual conference, Spokane, WA, December 2015

### **Other Talks (First author, presenter)**

- “Codling Moth Pest Pressures Under Climate Change: Management Implications.”*  
Pacific Northwest Climate Conference. Portland OR, October 2019
- “Tech for Trade: New Tools and Rules for improving water use efficiency.”* University Council of Water Resources Annual Meeting. Snowbird UT, June 2019
- “Climate Adaptation and Mitigation Opportunities for the Two Largest Solanaceae Crops in the US: Potatoes and Tomatoes.”*  
AGU Fall Meeting, Washington D.C., December 2018
- “2016 Columbia River Water Supply and Demand Forecast.”*  
Climate for Water Conference, Skamania, January 2017
- “Food for Thought: Strategies for Sustainable Agricultural Production in the Columbia River Basin in an Altered Future.”*  
NOAA's Annual Climate Prediction Applications Science Workshop, Las Cruces, NM, March 2015  
AWRA Annual Water Resources Conference, Long Beach, CA, November 2014
- “Impacts of climate change on irrigated agriculture in the Columbia River Basin through water rights curtailment.”*  
Pacific Northwest Climate Conference, Coeur d'Alene, ID, November 2015
- “An agricultural producer learning tool for the Columbia River Basin.”*  
Pacific Northwest Climate Conference. Coeur d'Alene, ID, November 2015

## **Service**

**Journal reviewer:** Water Resources Research, Journal of American Water Resources Association (2015 to present)

**Blog article contributor:** Ag Climate Network (2015 to present)

**Hackathons:** D1G1TAL AgATH0N 2020 (lead organizer)

**Conference session chair/convener:**

American Geophysical Union Fall Meeting, 2018, 2019

University Council on Water Resources Annual Conference, 2019