‘Agrivoltaics’ as a Food, Energy, and Water Solution for Resilience Under a Changing Climate

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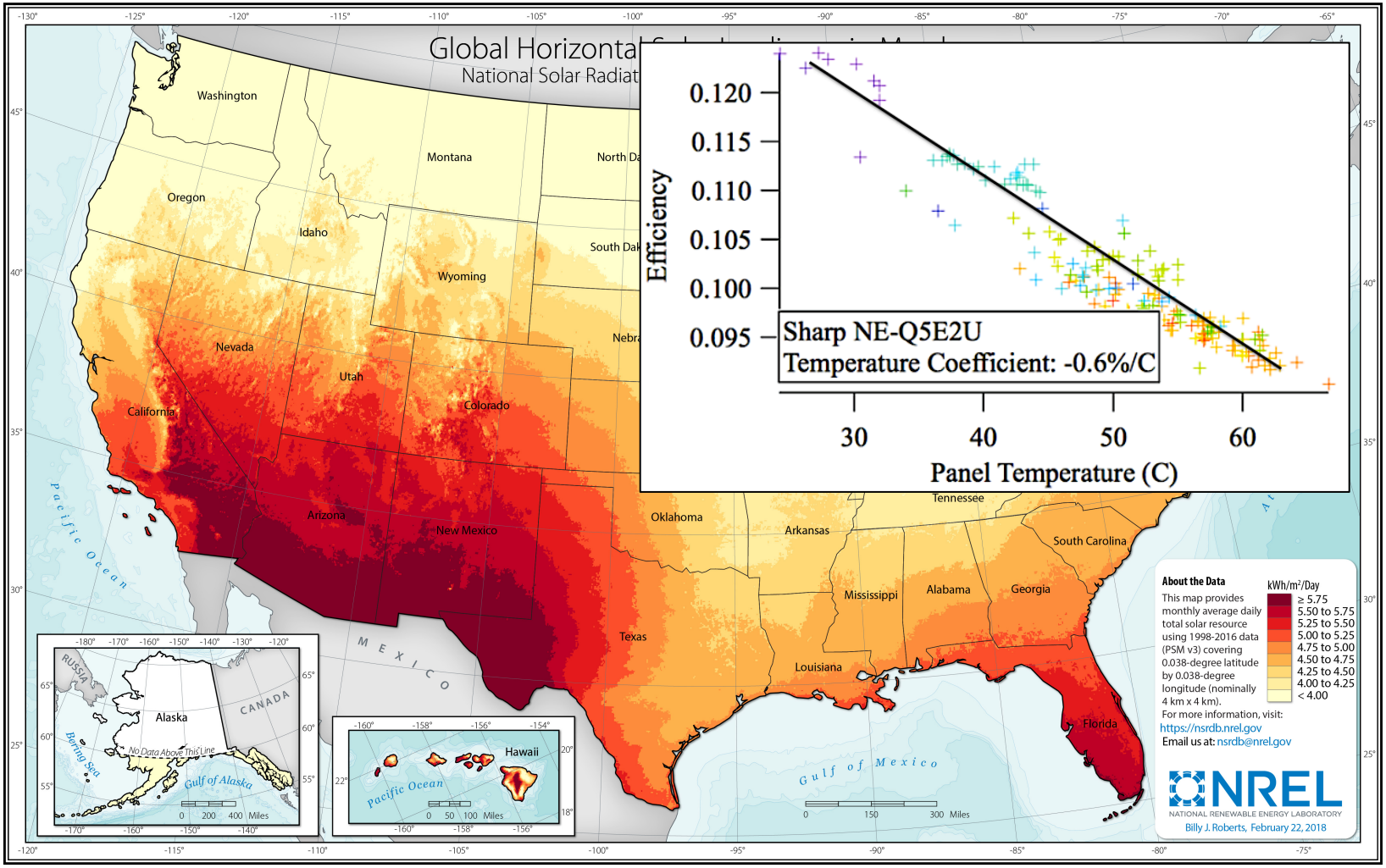
Climate change is pushing our water resources towards a tipping point

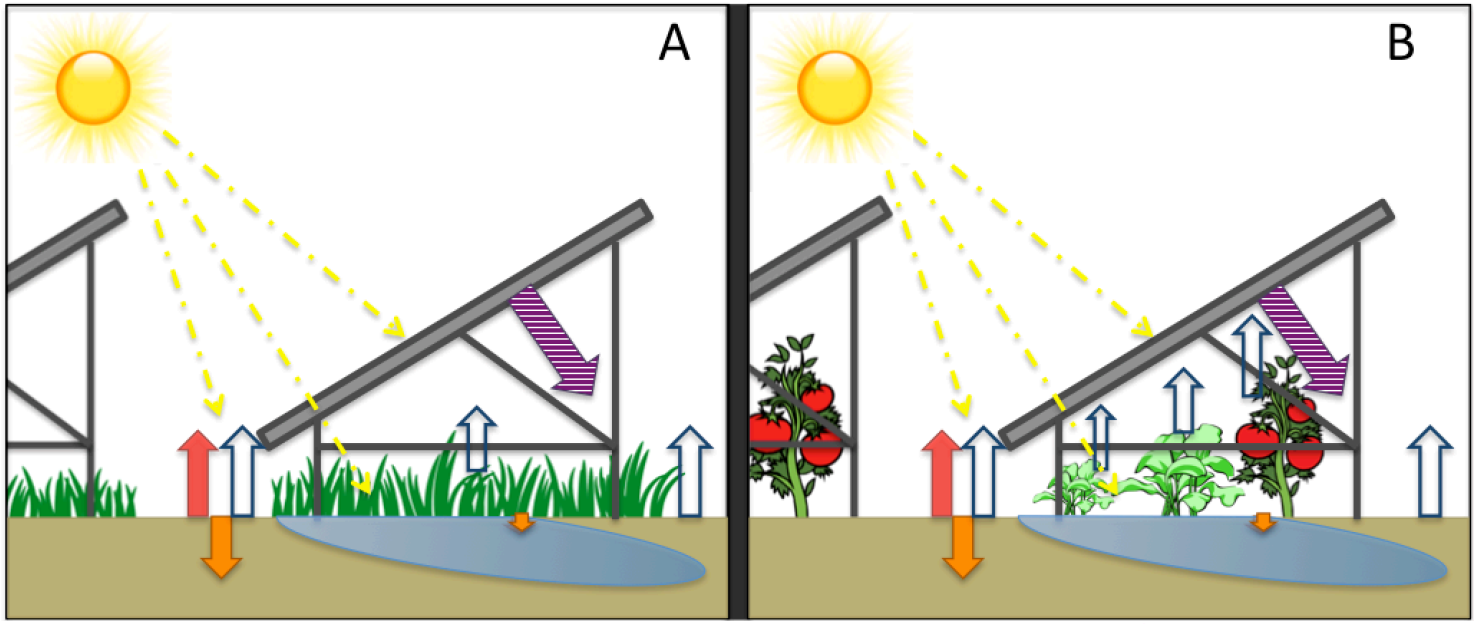
LOW ON WATER, CALIFORNIA FARMERS TURN TO SOLAR FARMING

August 6, 2019 / in All News, San Joaquin Valley / by News Article Repost

We want increase renewables, but those may also be vulnerable

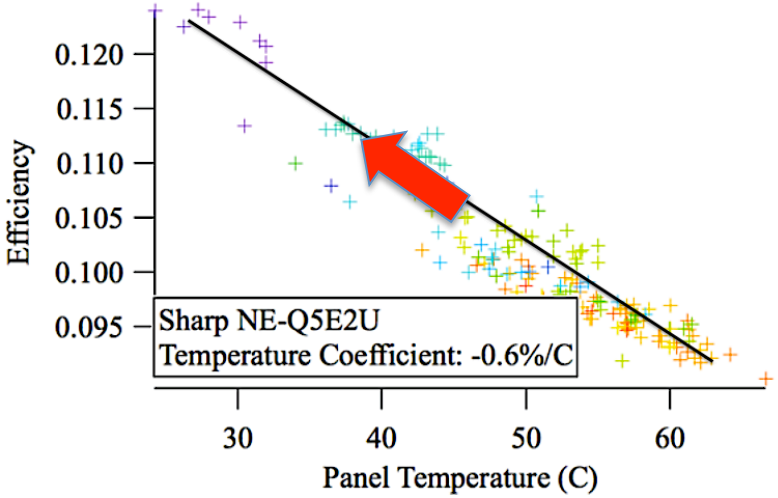


Co-locating agriculture + renewable energy could = food, energy, and water benefits

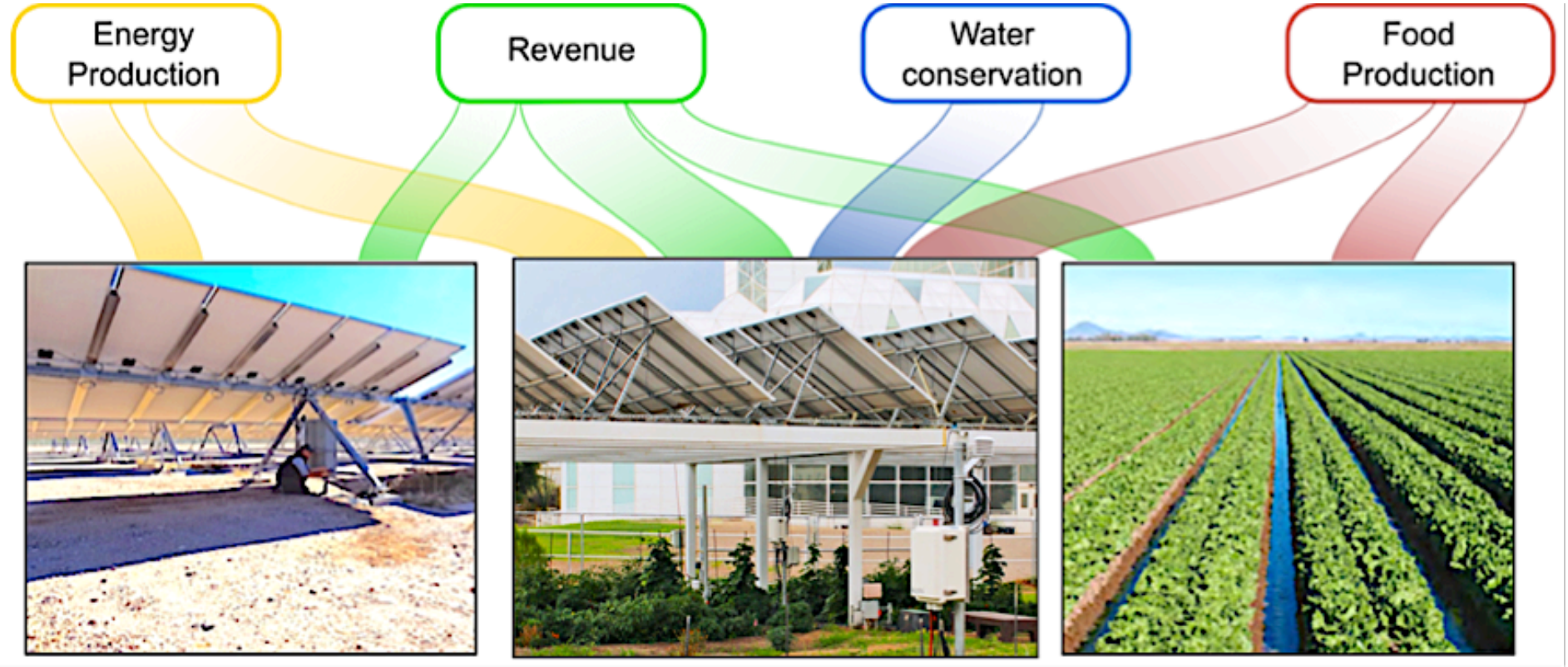


Create '*agrivoltaics' systems* to:

1. Adapt food systems to survive drought and temperature stress
2. Improve renewable energy production through transpiration
3. Ease our dependence on irrigation

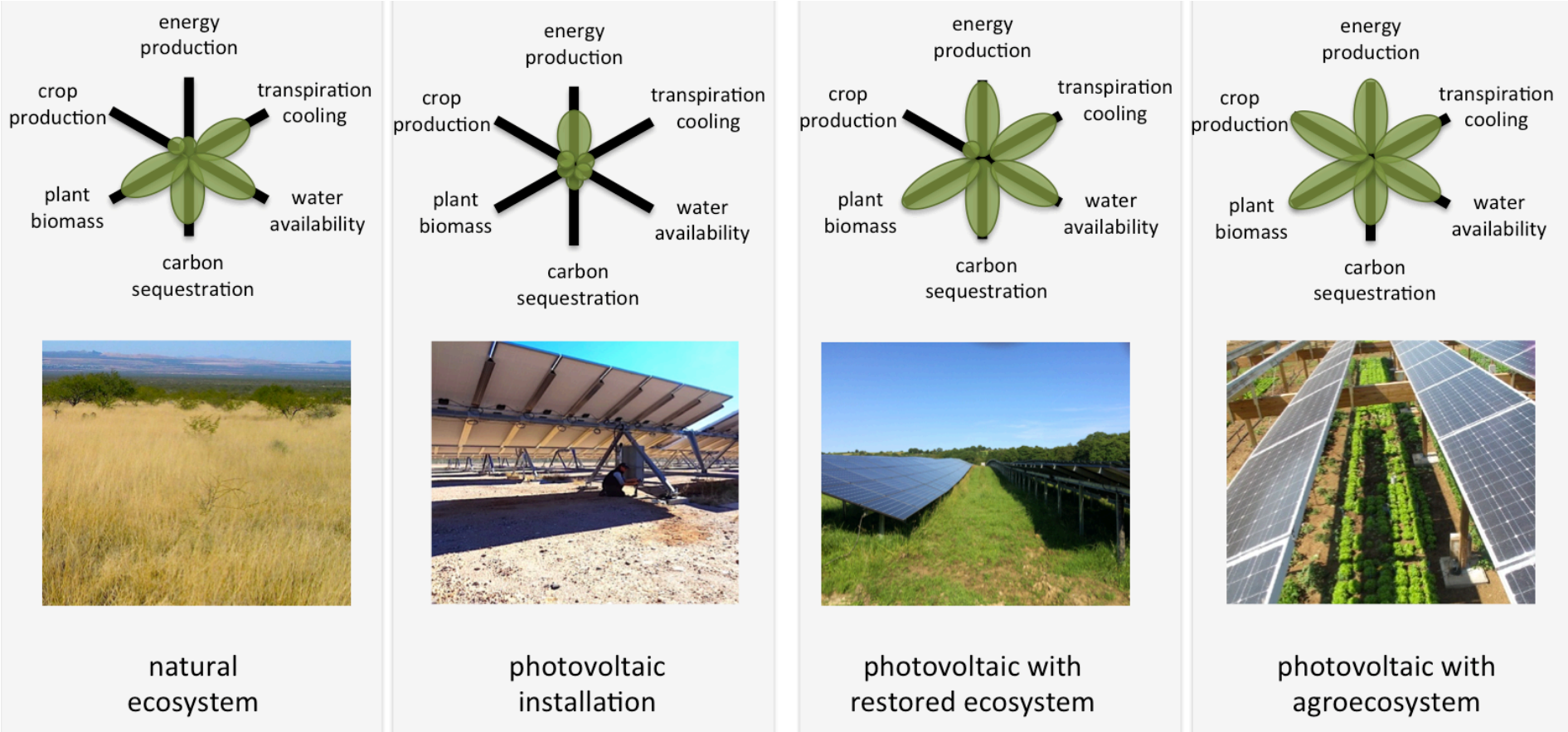


Agrivoltaics approach =
food, energy, and water benefits



We need to move past an "either-or" in terms of our land allocation to generate many important ecosystem services

Getting past an "either-or" in terms of our land allocation can open us to many important **ecosystem services**



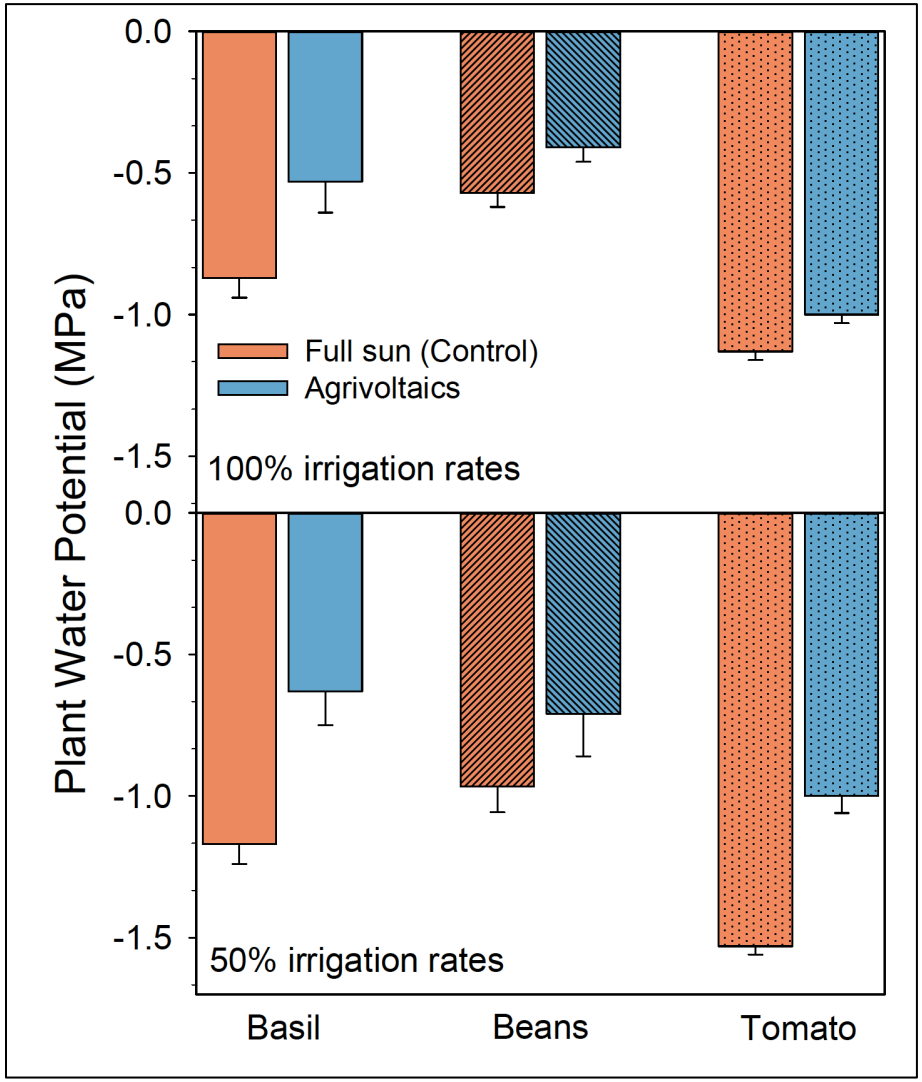
Designing 'optimal' agrivoltaic systems is based on the services we want to include and maximize

Plants grown under PV are less water stressed

Crops grown under agrivoltaics were less water stressed than those grown in traditional settings, despite equal irrigation rates!

We grew these same crops with only 50% irrigation under control and AV treatments, and we found no reduction in food production under AV!

Plant Water Stress
(More negative = More stressed)



Food - a win for food production!

Crop Type	Impacts from agrivoltaics
Basil	++
Bell peppers / Jalapeño	o
Broccoli	+ / -
Cabbage	+
Carrots	++
Chard	+
Chiltepin peppers	+
Lemmon grass	+
Lettuce	++
Marigolds (cut flowers)	+
Melon	o
Sweet potatoes	+
Tomatoes	++

nature sustainability

ARTICLES

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Agrivoltaics provide mutual benefits across the food–energy–water nexus in drylands

Greg A. Barron-Gafford[1,2*], Mitchell A. Pavao-Zuckerman[3], Rebecca L. Minor[1,2], Leland F. Sutter[1,2], Isaiah Barnett-Moreno[1,2], Daniel T. Blackett[1,2], Moses Thompson[1,4], Kirk Dimond[5], Andrea K. Gerlak[1], Gary P. Nabhan[6] and Jordan E. Macknick[7]

Can marginal lands now become arable lands?

Can we actually reduce our irrigation water use?

How might adding PV to farms allow them to stay in production?

The public is ready for a solution!

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University of Arizona researchers unveil new model for desert farming in warming world

Henry Brean Sep 12, 2020 Updated Sep 13, 2020

Greg Barron-Gafford, a biogeographer associate professor at the University of Arizona, and Alyssa Salazar, a research assistant and senior studying physical geography, weigh crops from a garden outside Biosphere 2, on Sept. 10, 2020. The gardens are part of an experiment on new crops and growing techniques for hotter, drier desert conditions expected as a result of climate change. This includes looking at the differences between full exposure gardening, utilizing shade of solar panels and various ranges of watering.

Josh Galemore / Arizona Daily Star