Thoughts on the Economics of Nutrient Use Efficiency in Florida Citrus

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UF-CREC Citrus Nutrition Day, Lake Alfred

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Situation & Outlook

Looking at the margins…for SW FL 2023/2024 Early/Midseason

Table 3. Break-Even Price per Box and per Pound Solids for Processed Oranges Grown in Southwest Florida, 2023/24

A. Early and Mid-Season Oranges

	Yield (boxes per acre)								
	50	75	100	125	150	175	200	225	250
	dollars per acre								
Cost of Production per acre	2687	2687	2687	2687	2687	2687	2687	2687	2687
Pick and Haul per acre ($4.49/box)	225	337	449	561	674	786	898	1010	1123
FDOC assessment ($0.12/box)	6	9	12	15	18	21	24	27	30
Total Delivered-in Cost per acre	**2918**	**3033**	**3148**	**3263**	**3379**	**3494**	**3609**	**3724**	**384**
Break-even Price:	$ per box								
On-tree	53.74	35.83	26.87	21.50	17.91	15.36	13.44	11.94	10.75
Delivered-in	58.35	40.44	31.48	26.11	22.52	19.97	18.05	16.55	15.36
Break-even Price:[1]	$ per pound solids								
On-tree	11.94	7.96	5.97	4.78	3.98	3.41	2.99	2.65	2.39
Delivered-in	12.97	8.99	7.00	5.80	5.01	4.44	4.01	3.68	3.41

Assumes 4.50 pound solids per box based on Florida Department of Citrus (FDOC) Processor Statistical Report for the 2023/24 season

Sources: Cost of Production for Processed Oranges in Southwest Florida in 2023/24, by Dr. Ariel Singerman (right) and Florida Department of Citrus Final Field Box Reports, 2023-2024 (below).

FLORIDA CITRUS FDOCGROWER.COM

ORANGE UTILIZATION, PRICES & YIELD * -- TOTAL FOR SEASON

WEEK ENDING: 2/10/2024 REPORT NO. : 19

LAST EARLY & MIDSEASON REPORT FOR THE 2023-24 SEASON

ORANGES - PRICED as of Week of Delivery	Boxes		Price per Box		Price per Pound Solid		Total Pound Solids		Pound Solids per Box	
	Week	Season	Week	Season	Week	Season	Week	Season	Week	Season
A. Final Prices Known Week of Delivery										
Spot & Contract, Current Season	4,272	187,5[illegible]2	$ 15.147587	$ 11.323060	$ 2.875156	$ 2.513835	22,507	844,610	5.268440	4.504297
Contract, Long Term (Multiseason basis)	-	-	$ -	$ -	$ -	$ -	-	-	-	-
Final Priced, Combined	4,272	187,512	$ 15.147587	$ 11.323060	$ 2.875156	$ 2.513835	22,507	844,610	5.268440	4.504297
B. Fruit with Intermediate prices only as of Week of Delivery	40,584	4,621,850	$ 14.439514	$ [illegible]	$ [illegible]	2.449882	211,214	20,863,360	5.204366	4.514071
A & B Combined	44,856	4,809,362	$ 14.506950	$ 11.069241	$ 2.784193	$ 2.452371	233,721	21,707,970	5.210468	4.513690
ORANGES NON-PRICED as of Week of Delivery										

Situation & Outlook

Looking at the margins…for SW FL2023/2024 Valencias

Table 3. Break-Even Price per Box and per Pound Solids for Processed Oranges Grown in Southwest Florida, 2023/24

B. Valencia Oranges

	Yield (boxes per acre)								
	50	75	100	125	150	175	200	225	250
	dollars per acre								
Cost of Production per acre	2687	2687	2687	2687	2687	2687	2687	2687	2687
Pick and Haul per acre ($4.53/box)	227	340	453	566	680	793	906	1019	1133
FDOC assessment ($0.12/box)	6	9	12	15	18	21	24	27	30
Total Delivered-in Cost per acre	**2919.7**	**3036**	**3152**	**3268**	**3385**	**3501**	**3617**	**3733**	**3850**
Break-even Price:	$ per box								
On-tree	53.74	35.83	26.87	21.50	17.91	15.36	13.44	11.94	10.75
Delivered-in	58.39	40.48	31.52	26.15	22.56	20.01	18.09	16.59	15.40
Break-even Price:[1]	$ per pound solids								
On-tree	10.52	7.01	5.26	4.21	3.51	3.01	2.63	2.34	2.1
Delivered-in	11.43	7.92	6.17	5.12	4.42	3.91	3.54	3.25	3.01

[1]Assumes 5.11 pound solids per box based on Florida Department of Citrus (FDOC) Processor Statistical Report for the 2023/24 season

Sources: Cost of Production for Processed Oranges in Southwest Florida in 2023/24, by Dr. Ariel Singerman (right) and Florida Department of Citrus Final Field Box Reports, 2023-2024 (below).

LAST FIELD BOX REPORT FOR THE 2022-23 SEASON.

FLORIDA CITRUS FDOCGROWER.COM

ORANGE UTILIZATION, PRICES & YIELD * - TOTAL FOR SEASON WEEK ENDING: 5/27/2023 REPORT NO. : 34

ORANGES - PRICED as of Week of Delivery	Boxes		Price per Box		Price per Pound Solid		Total Pound Solids		Pound Solids per Box	
	Week	Season	Week	Season	Week	Season	Week	Season	Week	Season
A. Final Prices Known Week of Delivery										
Spot & Contract, Current Season	286	746,640	$ 19.250000	$ 15.764556	$ 3.697830	$ 3.121756	1,489	3,769,952	5.205756	5.049900
Contract, Long Term (Multiseason basis)	-		$ -	$ -	$ -	$ -	-	-	-	-
Final Priced, Combined	286	746,54	$ 19.250000	$ 15.764556	$ 3.697830	$ 3.121756	1,489	3,769,952	5.205756	5.049900
B. Fruit with Intermediate prices only as of Week of Delivery	-	10,133,106	$ -	$ 11.107077	$	$ 2.308079	-	49,162,213	-	4.851643
A & B Combined	286	10,879,646	$ 19.250000	$ 11.511326	$ 3.697830	$ 2.366031	1,489	52,932,165	5.205756	4.865247
ORANGES NON-PRICED as of Week of Delivery										

Situation & Outlook

And all the people say…

OJ HH Purchasing Trends

Year	Household Penetration	Buying Rate	Purchase Frequency	% Purchased on Perceived Deal
2010	68.6	5.9	7.9	31
2011	67.4	5.7	7.7	31
2012	65.1	5.6	7.7	30
2013	64.9	5.4	7.5	32
2014	62.4	5.2	7.3	31
2015	62.7	4.8	6.9	29
2016	61.3	4.6	6.6	28
2017	59.5	4.3	6.4	24
2018	56.9	4.1	6.2	23
2019	54.8	3.9	6.1	22
2020	57.5	4.3	6.6	18
2021	56.2	3.9	6.1	16
2022	57.6	3.7	6.2	13
2023	51.3	3.4	5.9	15

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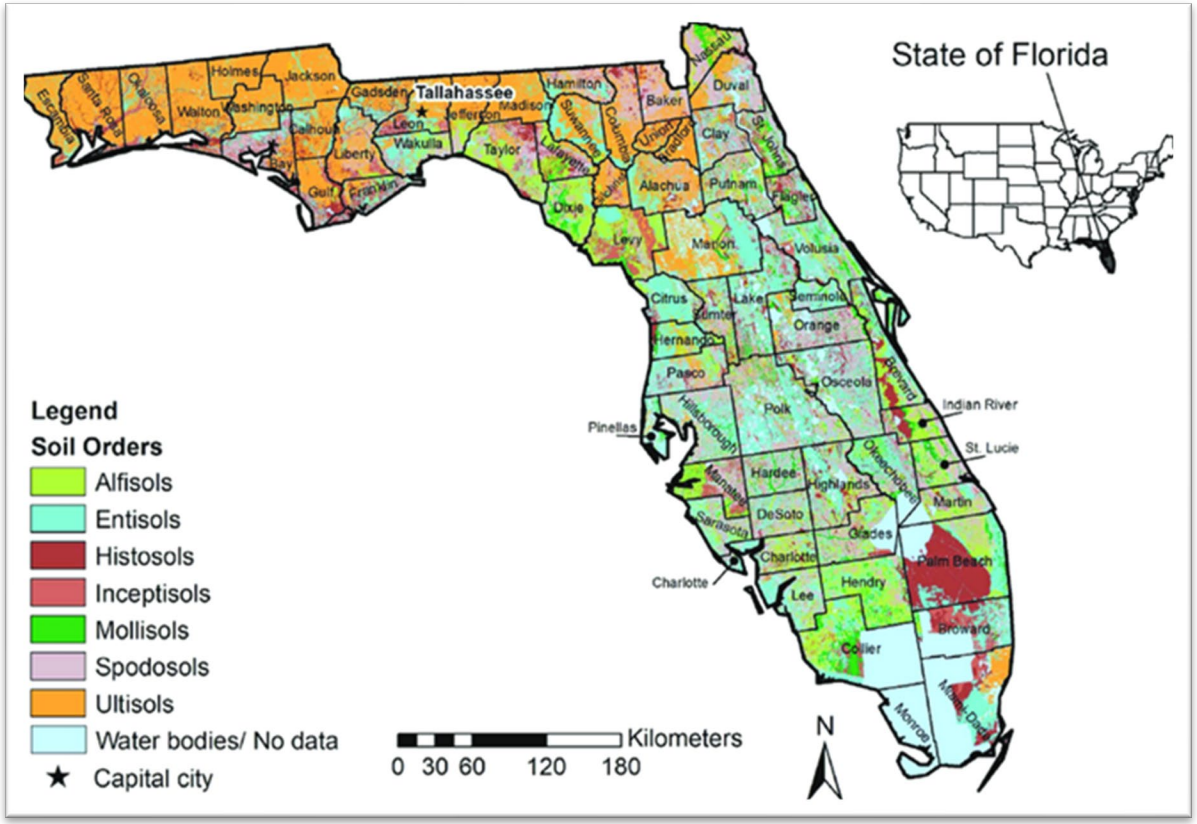
Household Purchase Dynamics in the Beverage Category, Nielsen HomescanHousehold Purchase Analysis, Florida Department of Citrus, March 2024 link: https://fdocgrower.app.box.com/s/i81411zspf0wsof41wd85amkf0eb6kdi/file/1525561811677

Situation & Outlook

Nitrogen and phosphorus residues have been found in groundwater, surface water, and drinking water in various areas throughout this state at levels in excess of established water quality standards.



Mikhailova, E. (2023, April). *Figure 2.* https://www.researchgate.net/figure/General-soil-map-of-Florida-USA-Latitude-24-27-N-to-31-00-N-Longitude-80-02-W_fig2_370124621

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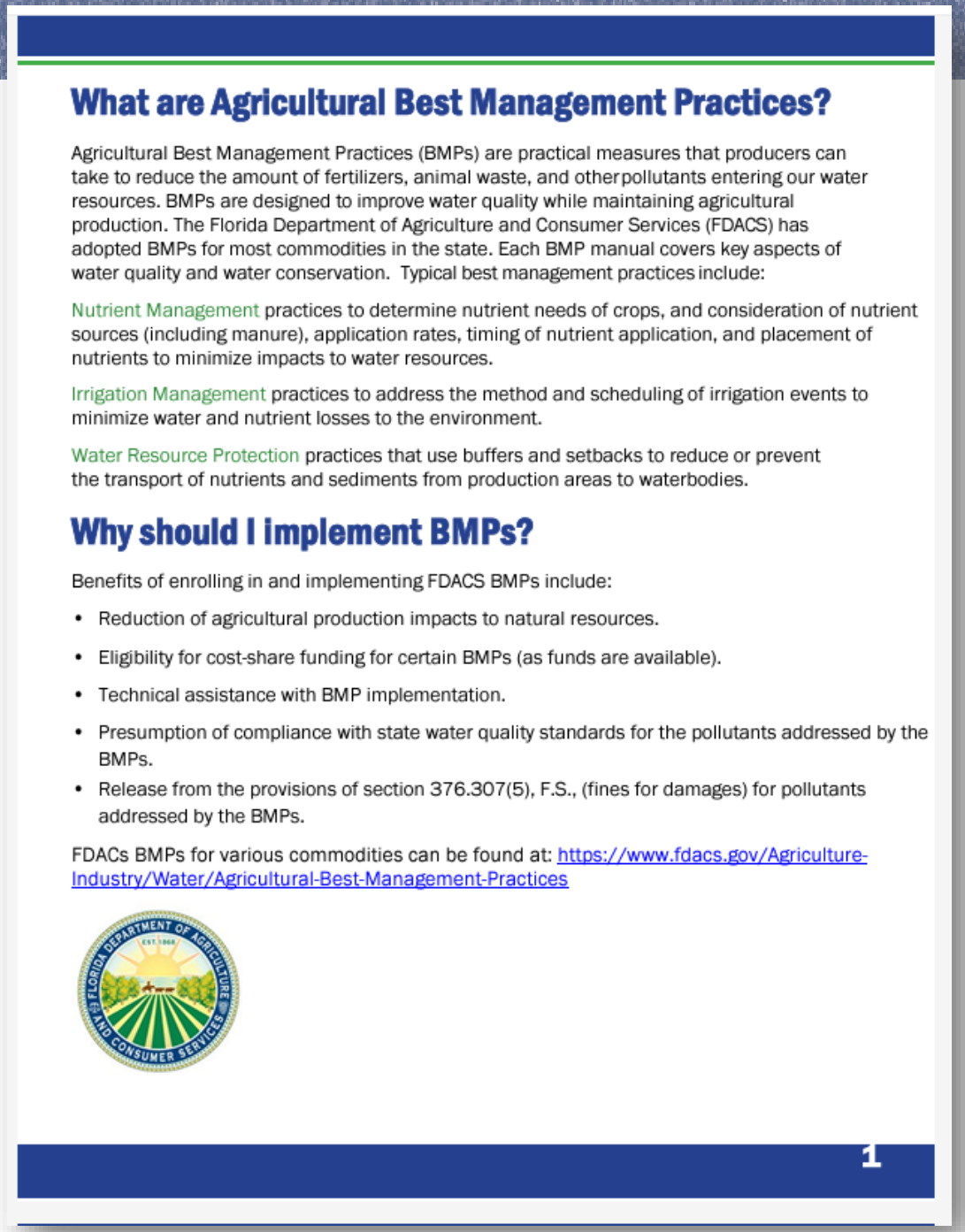
Policy v. Practice

In 2023, Florida statute Title XXXV "576.045 Nitrogen and phosphorus" which aims to:

- Improve fertilization management practices
- Protect state's water resources
- Preserve viable agricultural industry



What are Agricultural Best Management Practices?

Agricultural Best Management Practices (BMPs) are practical measures that producers can take to reduce the amount of fertilizers, animal waste, and other pollutants entering our water resources. BMPs are designed to improve water quality while maintaining agricultural production. The Florida Department of Agriculture and Consumer Services (FDACS) has adopted BMPs for most commodities in the state. Each BMP manual covers key aspects of water quality and water conservation. Typical best management practices include:

Nutrient Management practices to determine nutrient needs of crops, and consideration of nutrient sources (including manure), application rates, timing of nutrient application, and placement of nutrients to minimize impacts to water resources.

Irrigation Management practices to address the method and scheduling of irrigation events to minimize water and nutrient losses to the environment.

Water Resource Protection practices that use buffers and setbacks to reduce or prevent the transport of nutrients and sediments from production areas to waterbodies.

Why should I implement BMPs?

Benefits of enrolling in and implementing FDACS BMPs include:

- Reduction of agricultural production impacts to natural resources.
- Eligibility for cost-share funding for certain BMPs (as funds are available).
- Technical assistance with BMP implementation.
- Presumption of compliance with state water quality standards for the pollutants addressed by the BMPs.
- Release from the provisions of section 376.307(5), F.S., (fines for damages) for pollutants addressed by the BMPs.

FDACs BMPs for various commodities can be found at: https://www.fdacs.gov/Agriculture-Industry/Water/Agricultural-Best-Management-Practices

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Source: https://www.fdacs.gov/Agriculture-Industry/Water/Agricultural-Best-Management-Practices

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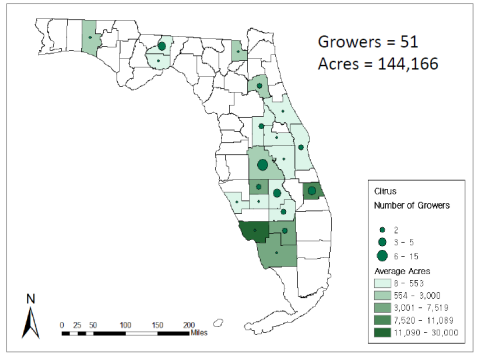
What We Know about Economic Impacts of Citrus BMPs

- Individual grower's choices are key (Singerman and Rogers, 2020).
- Strategic uncertainty may lead to self-reliance and lower payoff (Singerman and Useche, 2019)
- Most growers think BMPs are profitable yet unsure if they increase yields (Wade and Soh, 2021)

Survey Methods and Data Description

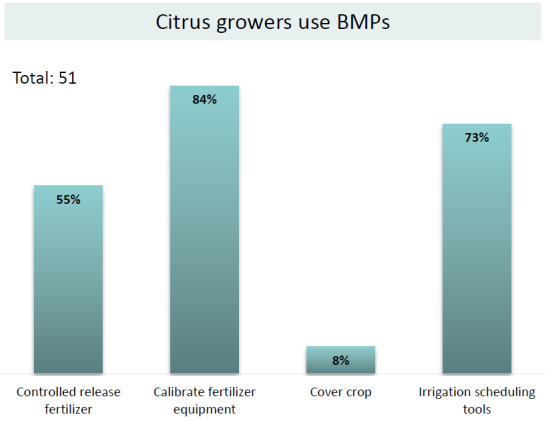
Grower Distribution for Citrus Crops



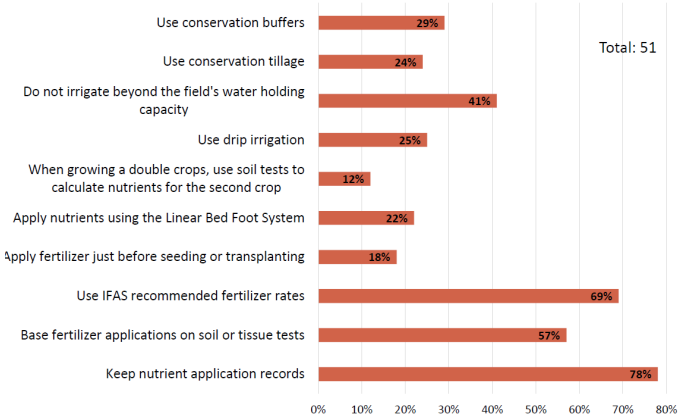
Notes

- Usable surveys: 51
  - Total Acres: 144,166
  - Mean: 2,827
  - Median: about 300
- Farm size categories:
  - Small: 17
  - Medium: 15
  - Large: 19
- Counties: 20

Citrus Growers' Adoption Rates of Four Core Best Management Practices



Citrus Grower's Adoption of Other BMPs



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What We Know about Economic Impacts of Citrus BMPs

Not as simple as swapping dollars for sense (me)

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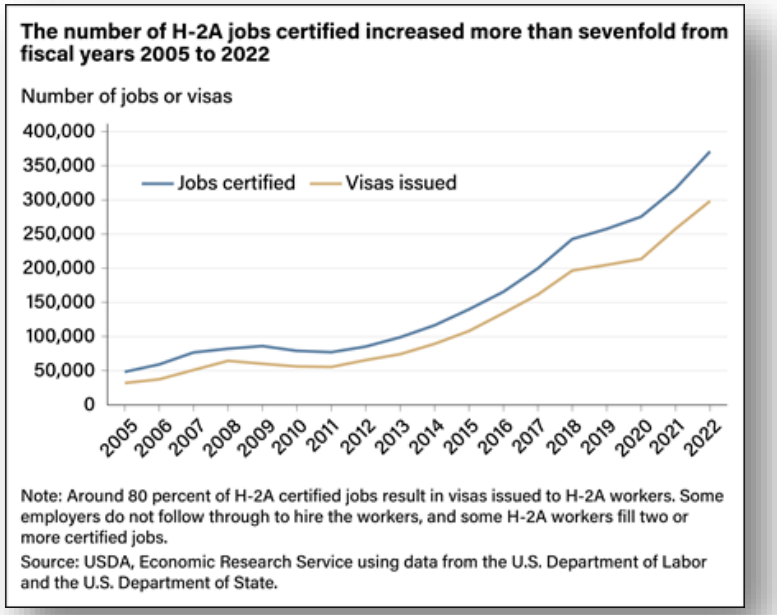
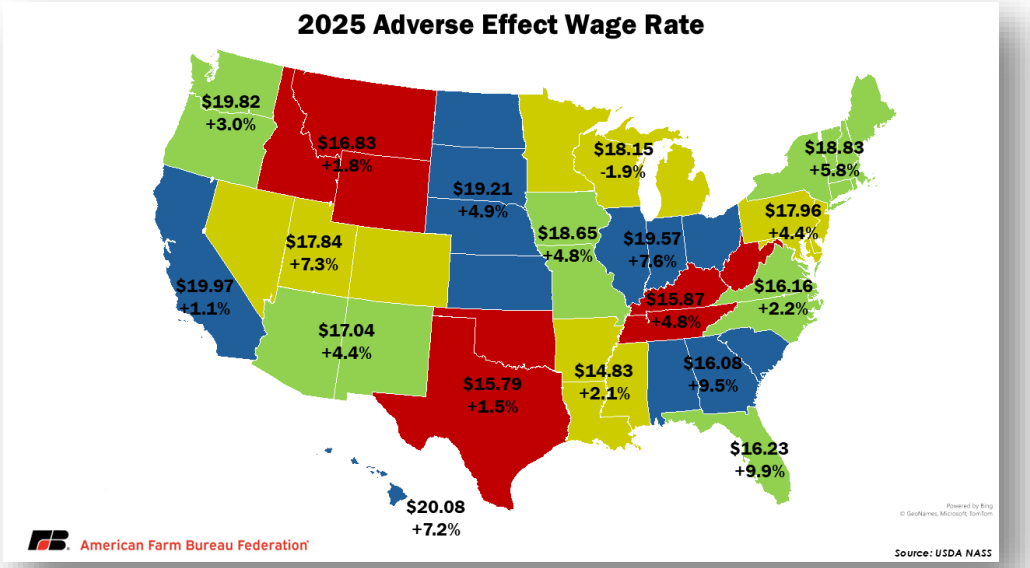
Economic Relevance

Policies overlap, and so do their impacts

- NAFTA 1995
- Government farm support programs, i.e. crop insurance, disaster relief, tree replacement programs
- Access to farmworkers
- Variability in AEWR
- Immigration/ e-VERIFY/Farmworker Protection Rule





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Economic Relevance

Markets and marketing matters

- Changing demographics
- Shifting landscapes of consumption
- Proximity to population and to water bodies
- Distribution and logistics
- Competition abounds, unbounded

Making the Call

Navigate Competitiveness

- Co-create human and machine learning environments
  - Choice sets
  - Capabilities
  - Consequences
- Build in resilience to climate events, i.e., pest, drought, hurricane
- Adopt and adapt
  - Always follow the markets
  - Maximize individual strengths
  - Utilize automation to shore up challenging areas

Thank You

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