

2023 Illinois Farm Economics Summit

Farmland Price and Interest Rate Outlook



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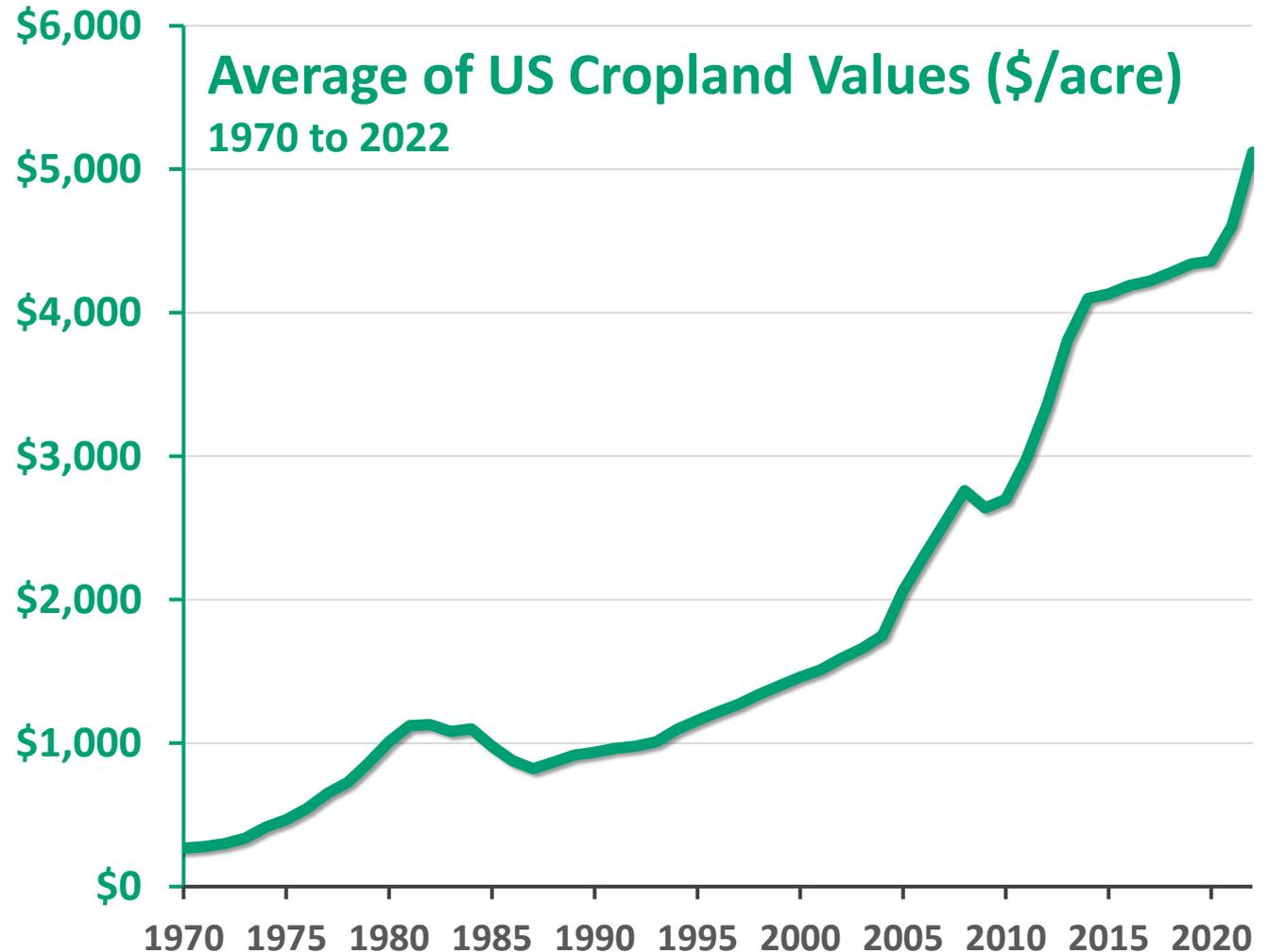
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Farmland Price and Interest Rate Outlook

Purpose:

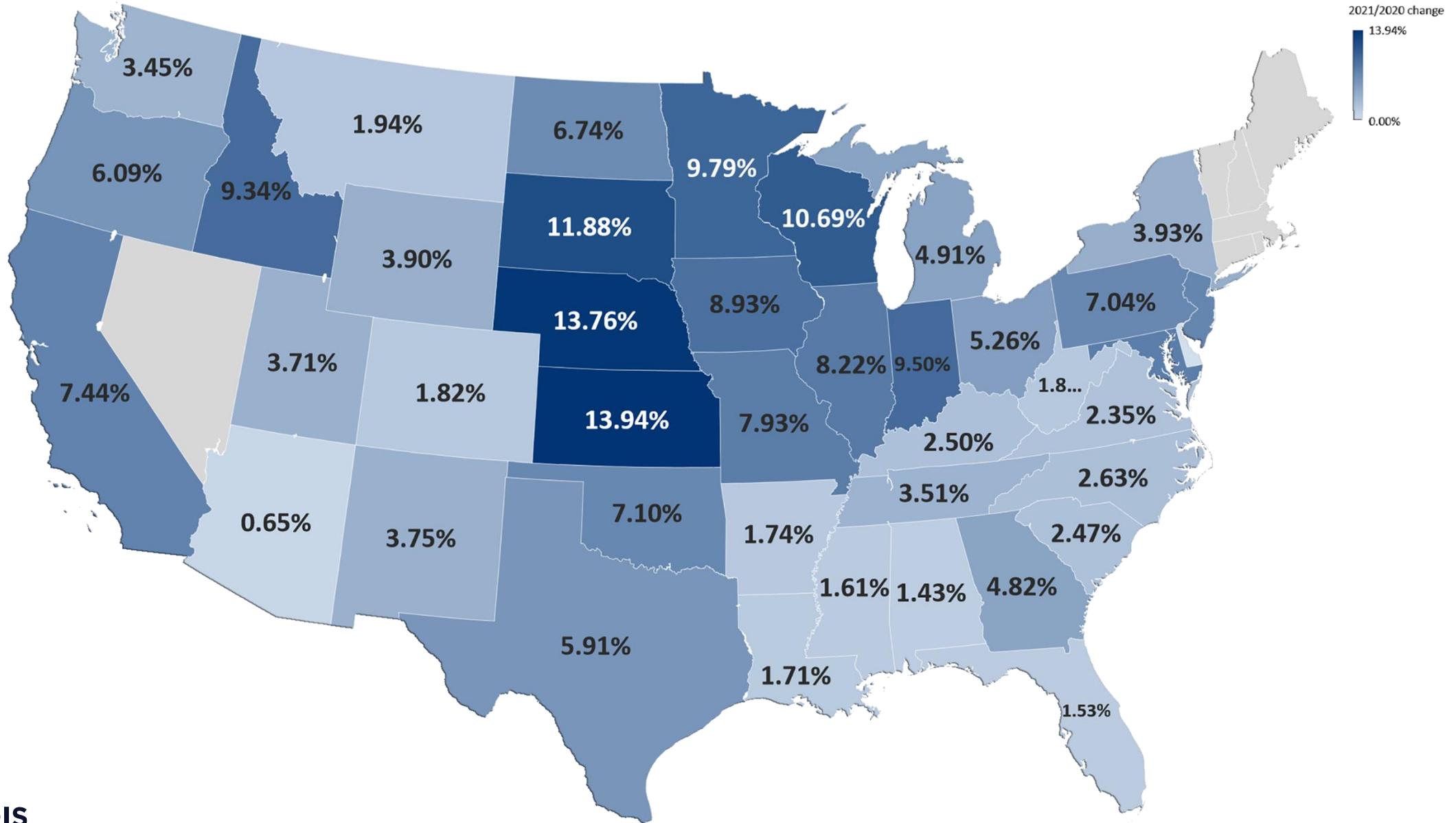
- Identify broad economic and farm-level factors that drive farmland values and returns.
- Provide context/interpretation of macro-market linkages including interest rate and inflation prospects and their impacts on farmland markets.



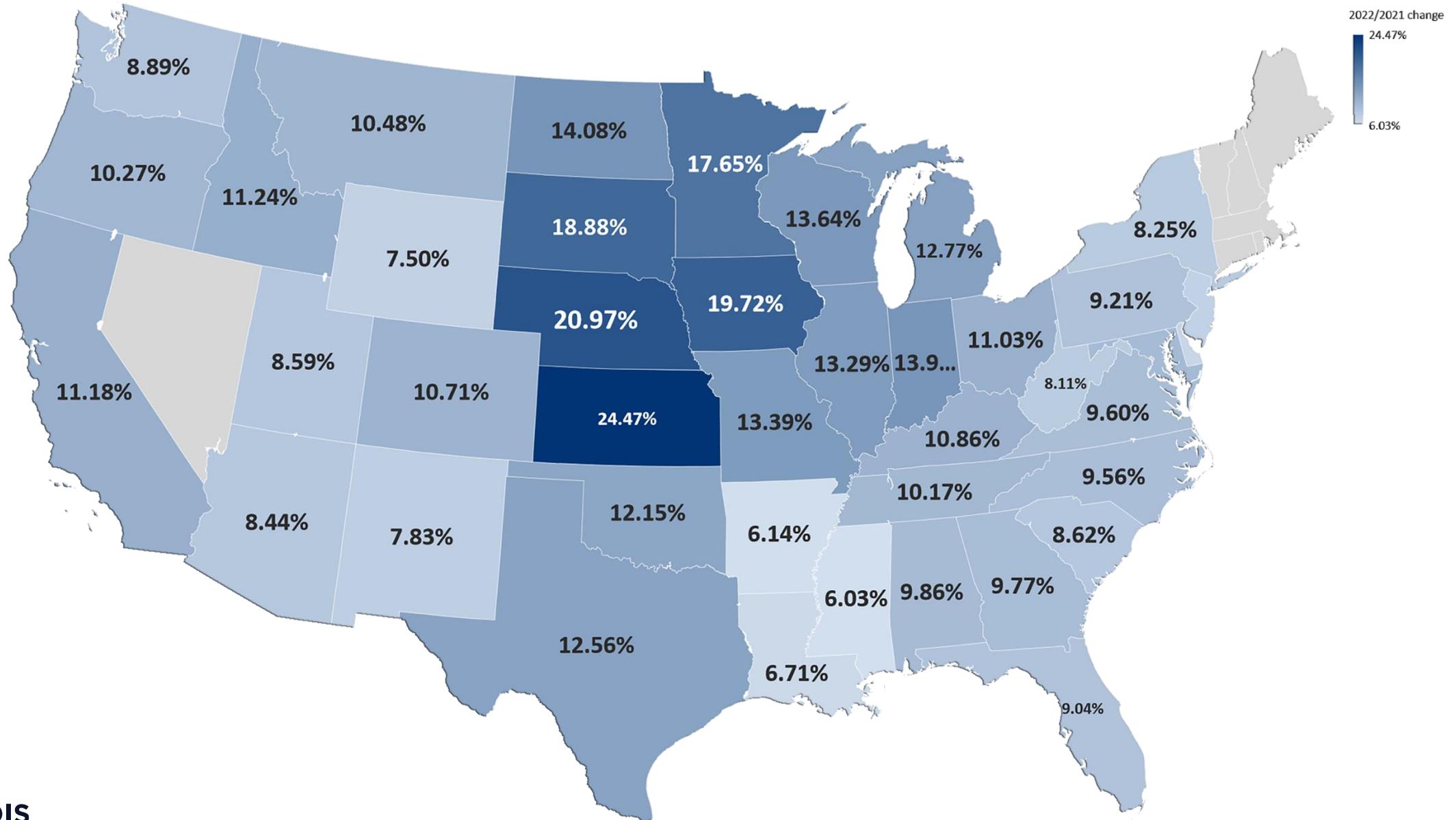
The Usual Suspects, and some New Actors

- *Income & commodity prices*
- *Interest rates (and the Fed) vs.*
- *Inflation (and the Fed)*
- *International trade/conflicts*
- *Policy and Farm Bill focus*
- *Stimulus payments and temporary programs + ad hoc*
- *Carbon/Climate/Conservation (IRA+)*
- *Consumer preferences for food attributes*
- *Pandemic impacts/structural response*
- *Crop Insurance changes/conservation tie*
- *Alternative investment characteristics*
- *ROW Demand expansion and demographic patterns through time*

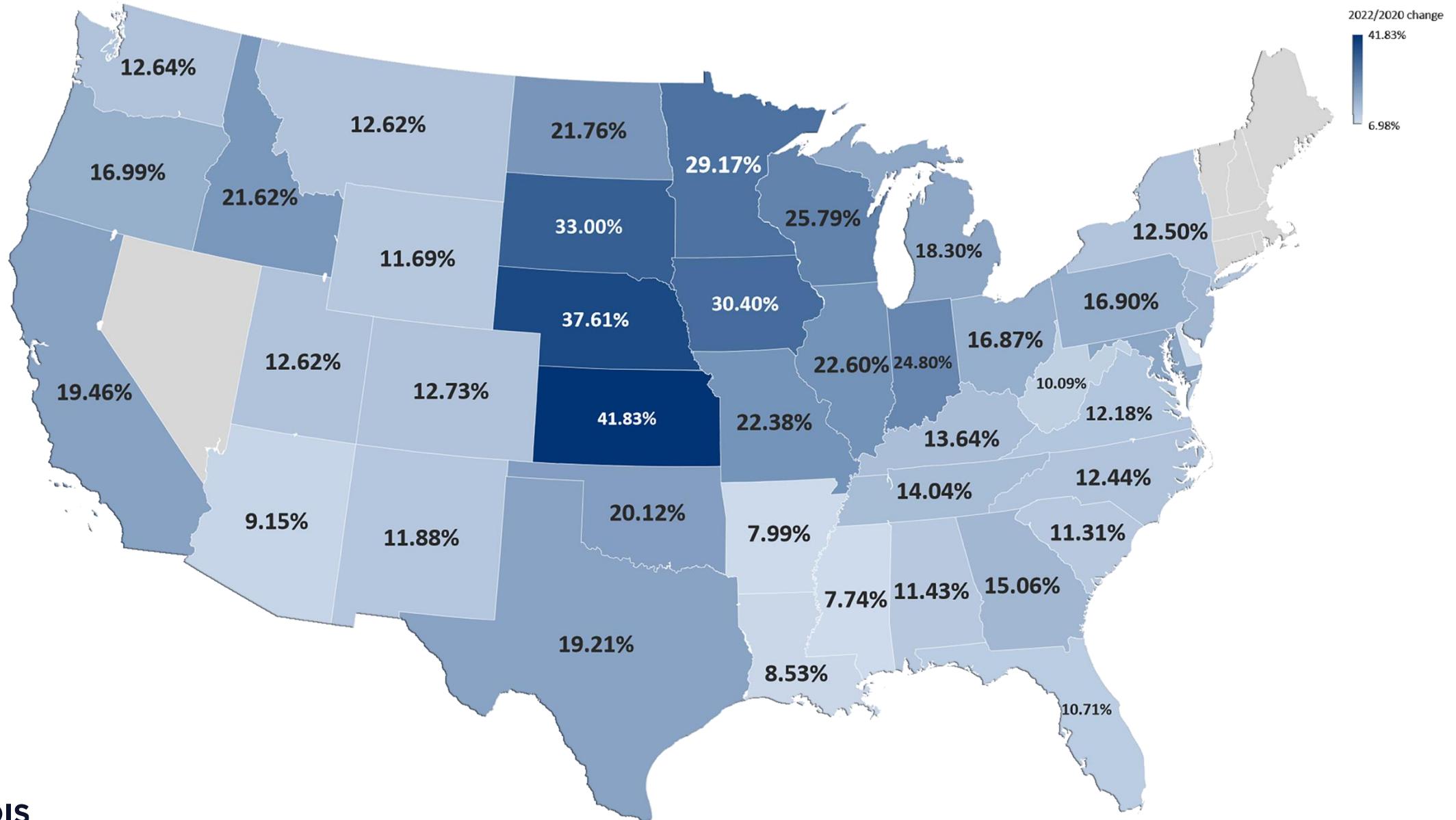
Cropland % change \$/Acre 2020-2021 *(mid-year USDA)*



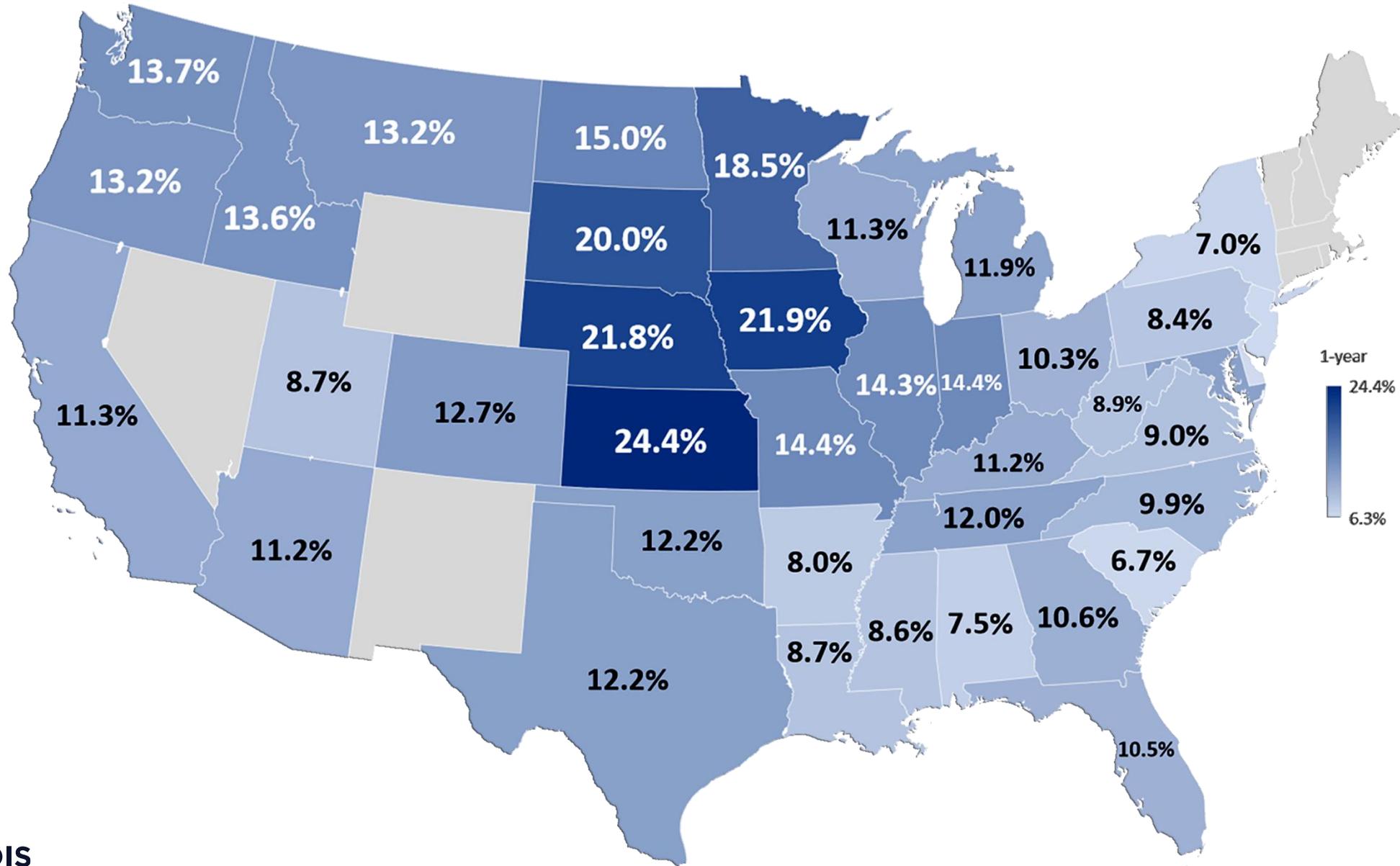
Cropland % change \$/Acre 2021-2022 *(mid-year USDA)*



Cropland % change \$/Acre 2020-2022 *(mid-year USDA)*

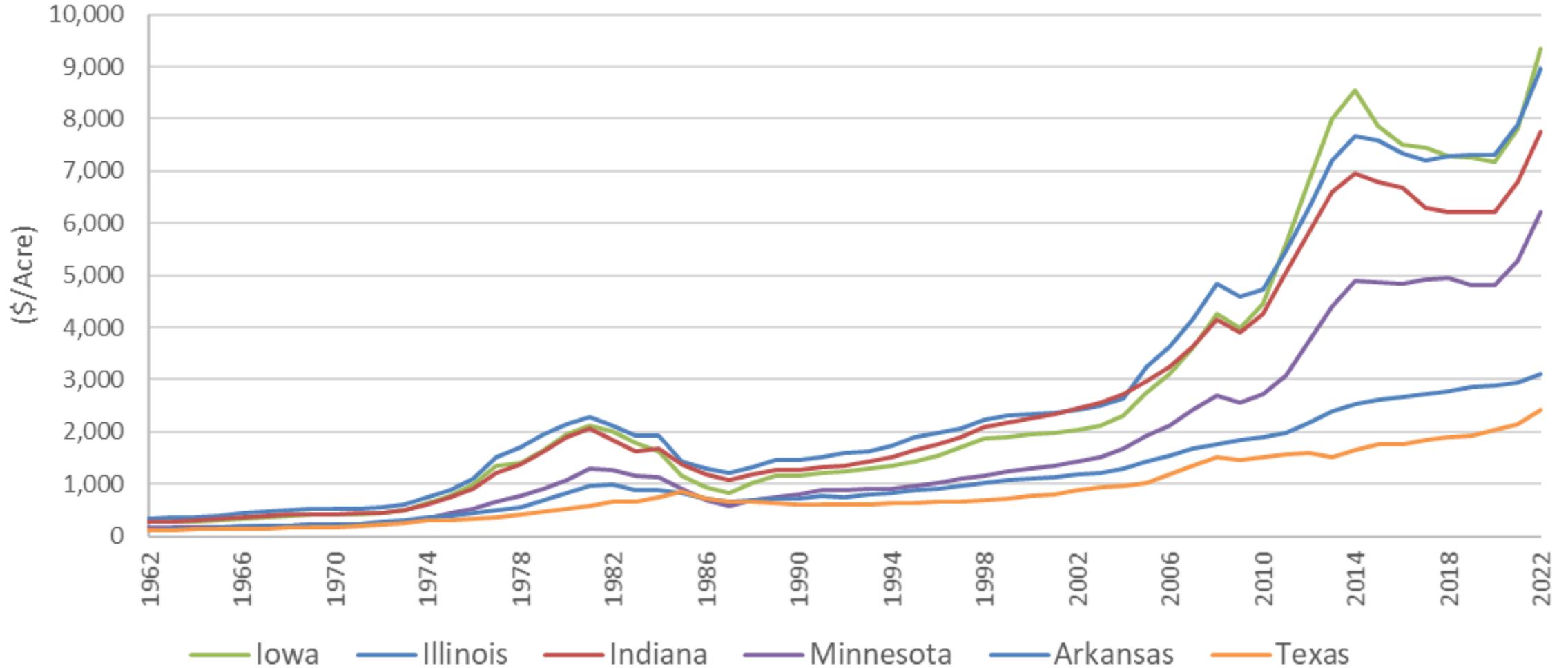


Cropland total return – 2022 (USDA, Center est.)



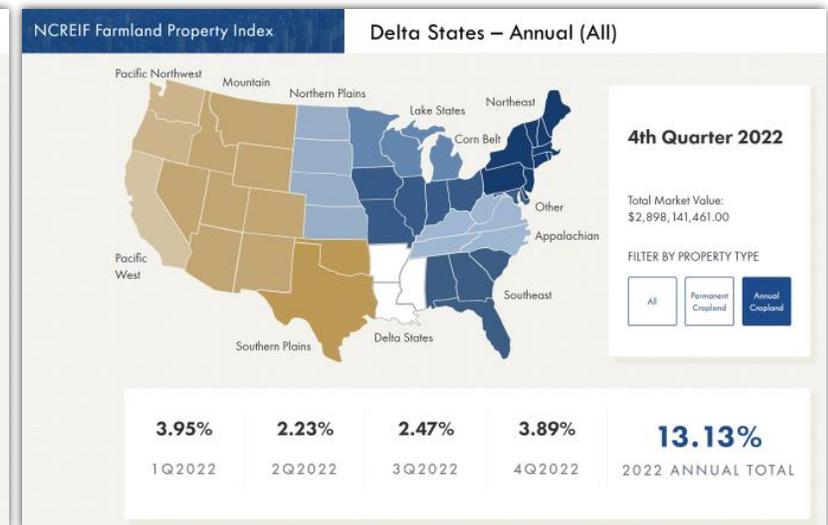
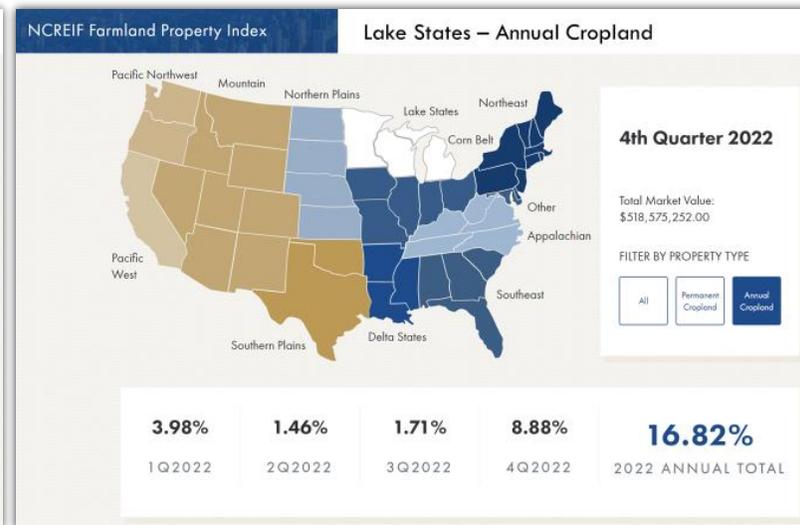
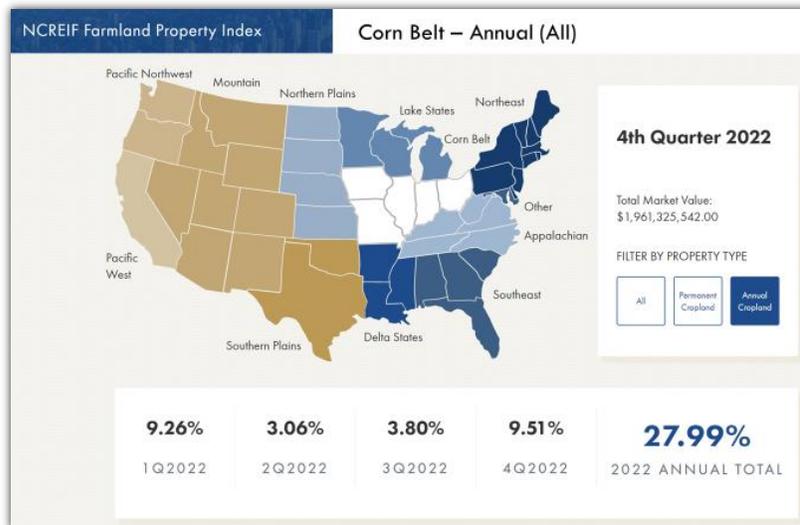
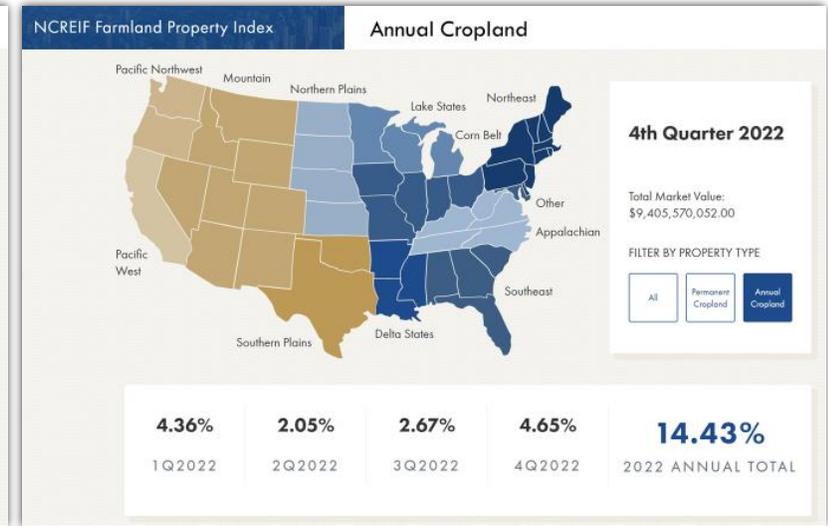
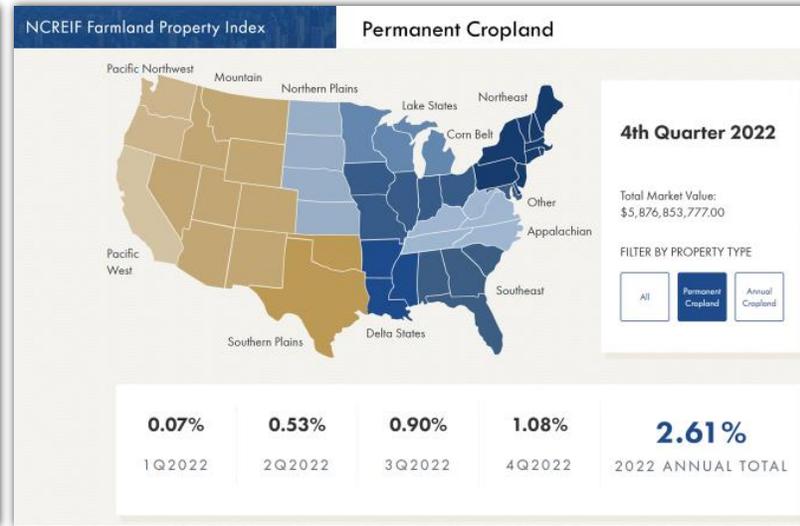
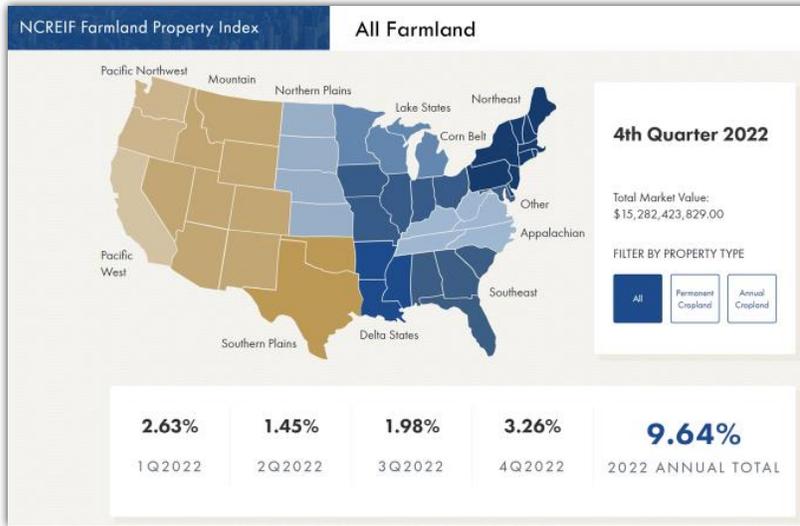
Cropland Values – selected states

Cropland Value \$/acre

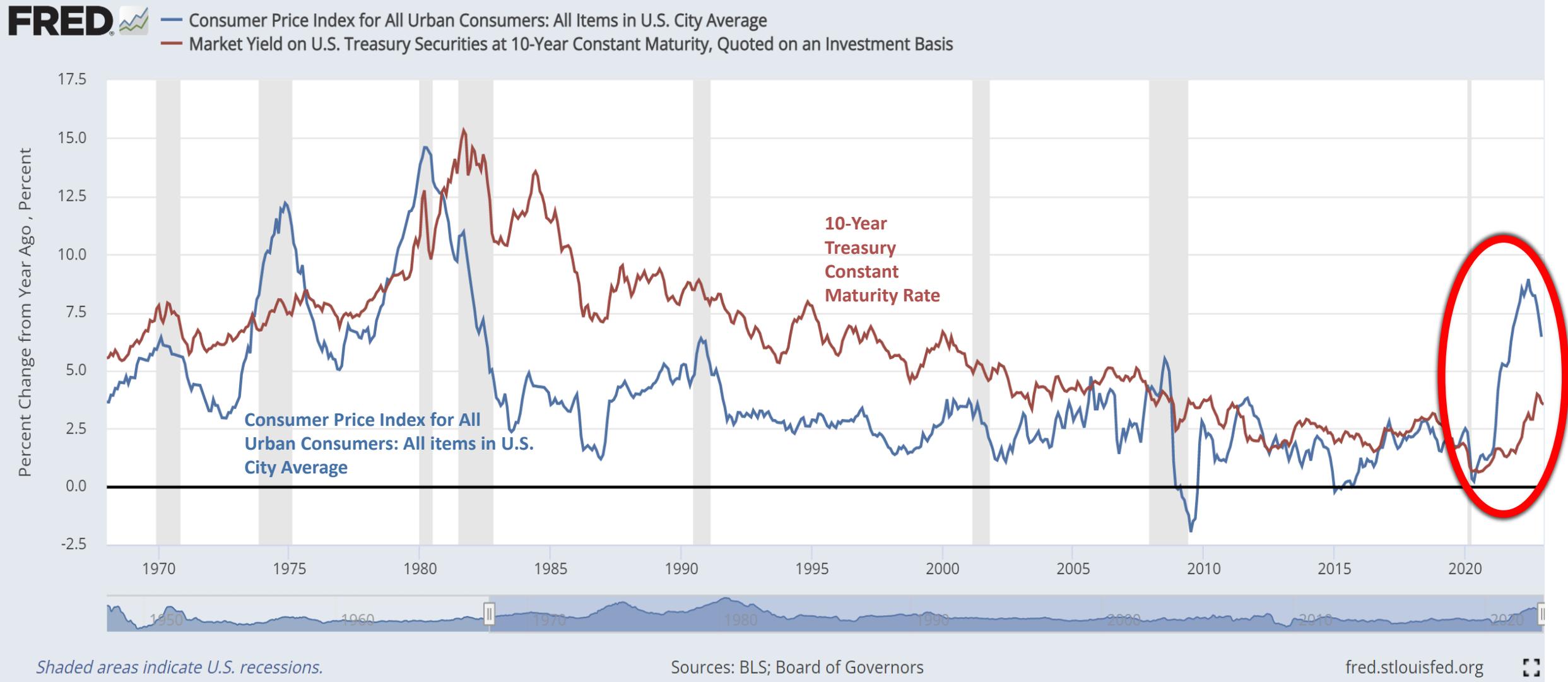


Farmland Returns by region Q4-2022 (NCREIF 4Q rolling)

1,300+ properties, \$15.3 Billion

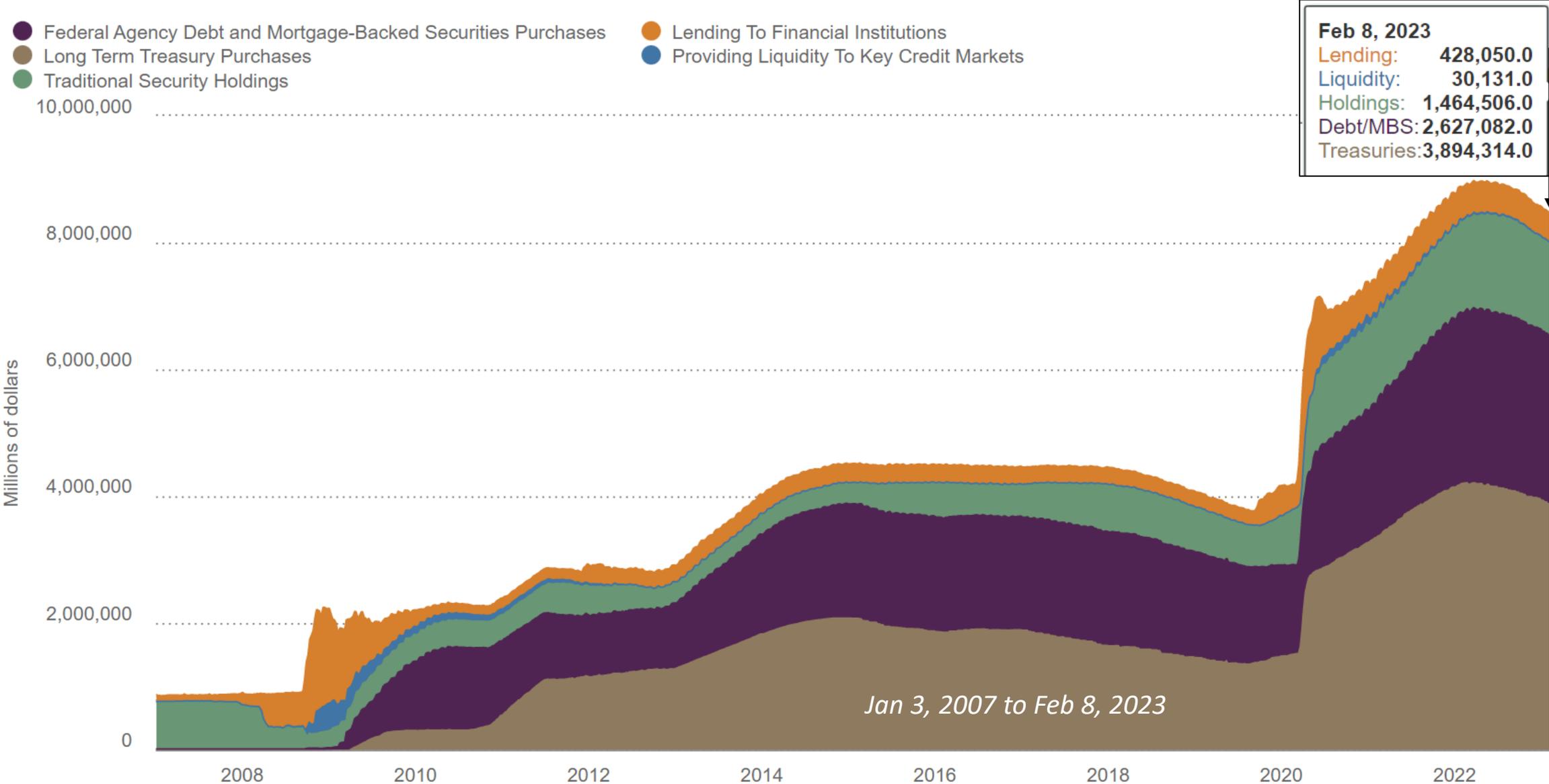


Inflation and Interest Rate Relationships (to 1/30/2023)

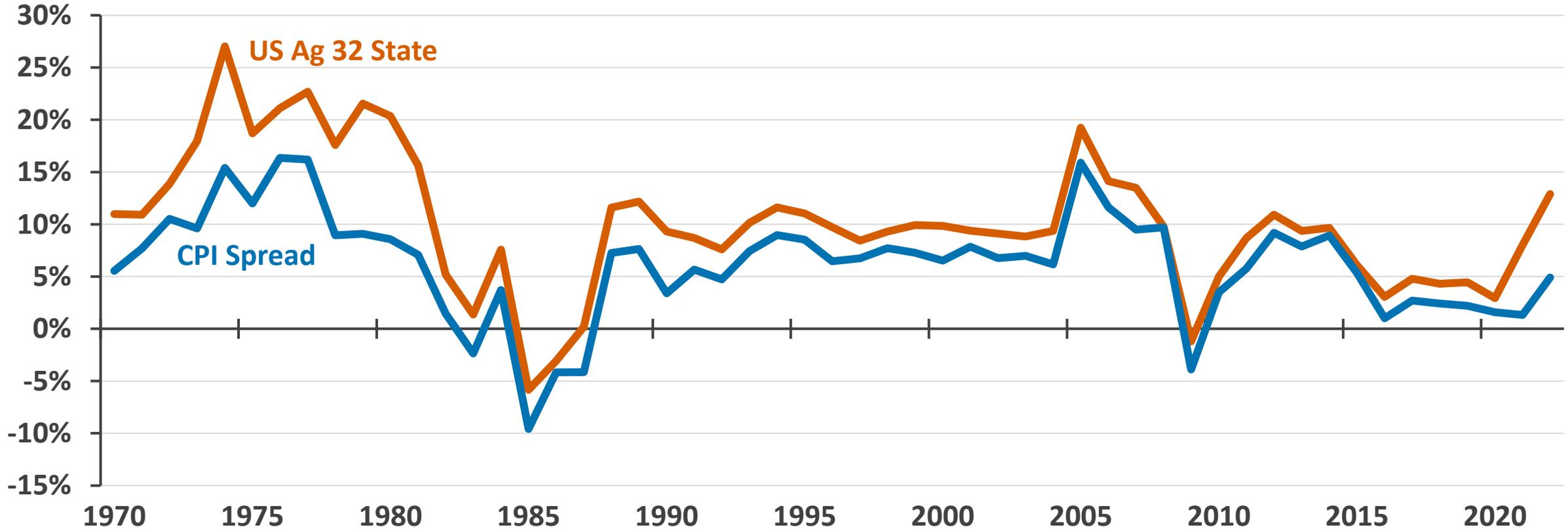


Inflation and the Fed Balance Sheet – the unwinding effect to come

“Shrinking by \$2.5 Trillion over a few years has roughly same impact as raising rates by 1/2 percent.” Economist Feb. 11, 2023



Farmland Returns and farmland returns minus inflation (spread)



Decade	Farmland to CPI Spread
1970 to 1979	11.1%
1980 to 1989	1.5%
1990 to 1999	6.7%
2000 to 2009	7.7%
2010 to 2019	4.9%
1970 to 2022f	6.2%

- Farmland returns have been remarkably stable with positive alpha
- Perfect Storm in 1980s – still relatively good performance
- Low volatility annual returns, appreciation positive except 1980s
- Positive Inflation effect has been incredibly reliable – new forms?

Balance Sheet of Ag Sector -- US

Table 1. Selected Balance Sheet Characteristics of US Agricultural Sector

	1970	1980	1990	2000	2010	2018	2020	2022
	<i>(\$ millions, except ratios - source ERS-USDA)</i>							
Farm Assets	278,823	1,000,422	840,609	1,203,215	2,170,832	3,026,679	3,174,623	3,835,151
Real Estate	202,418	782,820	619,149	946,428	1,660,114	2,510,163	2,640,942	3,188,219
Non Real Estate	76,405	217,602	221,459	256,787	510,718	516,515	533,681	646,931
Farm Debt	48,501	162,432	131,116	163,930	278,931	402,606	441,254	496,025
Real Estate	27,238	85,272	67,633	84,724	154,065	245,774	288,645	341,914
Non Real Estate	21,263	77,160	63,483	79,206	124,865	156,832	152,608	154,111
Equity	230,322	837,990	709,493	1,039,285	1,891,902	2,624,073	2,733,369	3,339,125
Selected Indicators								
Debt/Equity	21.1%	19.4%	18.5%	15.8%	14.7%	15.3%	16.1%	14.9%
Debt/Assets	17.4%	16.2%	15.6%	13.6%	12.8%	13.3%	13.9%	12.9%
Real Estate/Equity	87.9%	93.4%	87.3%	91.1%	87.7%	95.7%	96.6%	95.5%
Real Estate/Assets	72.6%	78.2%	73.7%	78.7%	76.5%	82.9%	83.2%	83.1%
Real Estate D/Total D	56.2%	52.5%	51.6%	51.7%	55.2%	61.0%	65.4%	68.9%

Farmland Returns in Context

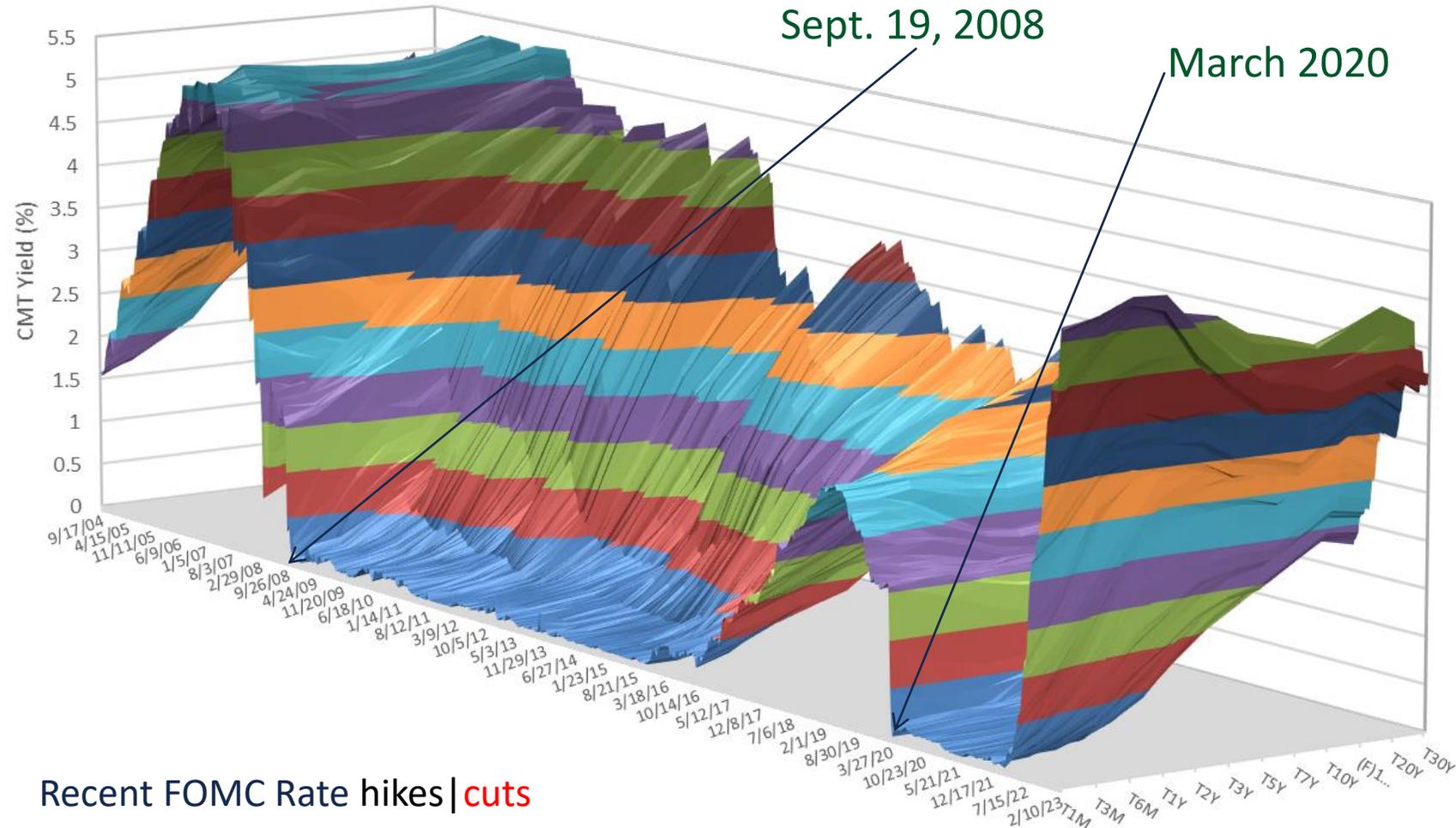
Table 1. Asset Return Characteristics

Asset/Index	Annual Ave. Return	Standard Deviation	Coefficient of Variation	US Ag 32 States Correlation	Minimum Return	Maximum Return
	----- 1991 - 2022 -----					
US Ag 32 States	8.5%	3.7%	0.43	1.00	-1.2%	19.0%
NCREIF Ann Crop	10.1%	4.8%	0.47	0.68	4.2%	23.6%
NCREIF Cornbelt Ann	10.9%	8.0%	0.74	0.50	-4.6%	28.0%
Illinois	9.4%	5.6%	0.59	0.81	0.8%	26.0%
Iowa	11.1%	7.4%	0.67	0.65	-5.3%	24.9%
Indiana	9.2%	5.0%	0.54	0.65	-1.0%	22.0%
Minnesota	10.6%	5.5%	0.52	0.78	-1.8%	20.3%
California	8.2%	5.0%	0.61	0.55	2.5%	30.7%
Washington	11.9%	3.5%	0.29	0.46	5.4%	24.1%
Oregon	10.9%	4.8%	0.44	0.57	-1.6%	23.5%
Composite REITS	9.6%	18.9%	1.96	-0.13	-47.5%	33.7%
TCM10Y	4.1%	1.9%	0.45	0.30	0.9%	7.9%
S&P500	7.7%	17.3%	2.26	-0.13	-48.6%	29.3%
Gold	4.8%	13.8%	2.86	0.06	-31.9%	27.7%
CPI	2.5%	1.3%	0.54	0.27	0.1%	6.8%

Yield Curve through Feb 10, 2023 (weekly)

- Credit easing events *since 2008, and start of pandemic*
- Natural Multiple expansion/contraction
- Massive stimulus on top is a somewhat different effect
- Fed Purchases from Treas. to manage interest rates (new)
- Massive reversal in 2022
- Fed B/S debate settling on managed chaos

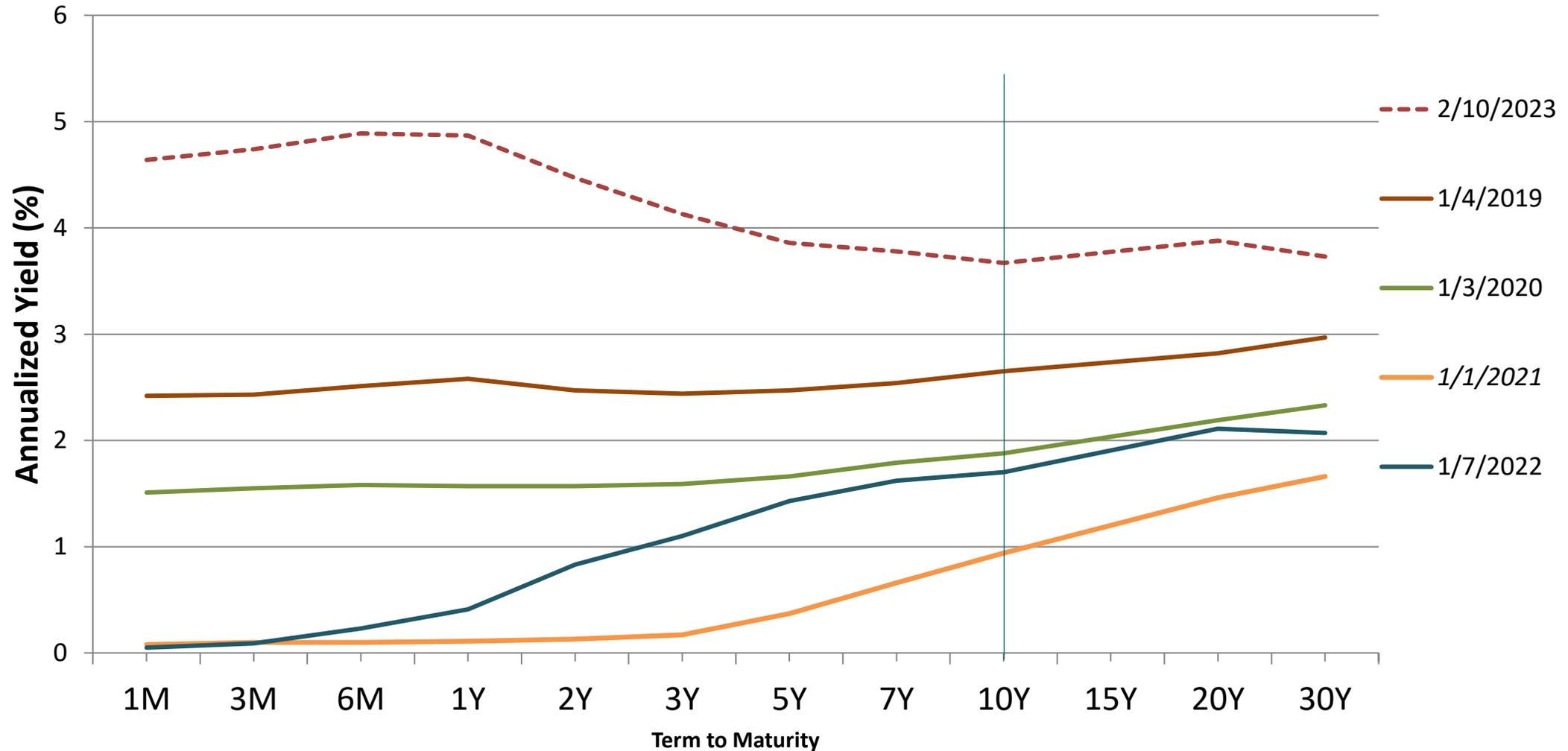
IMPACT ON REAL ESTATE via Inflation vs. Cap Rate effect?



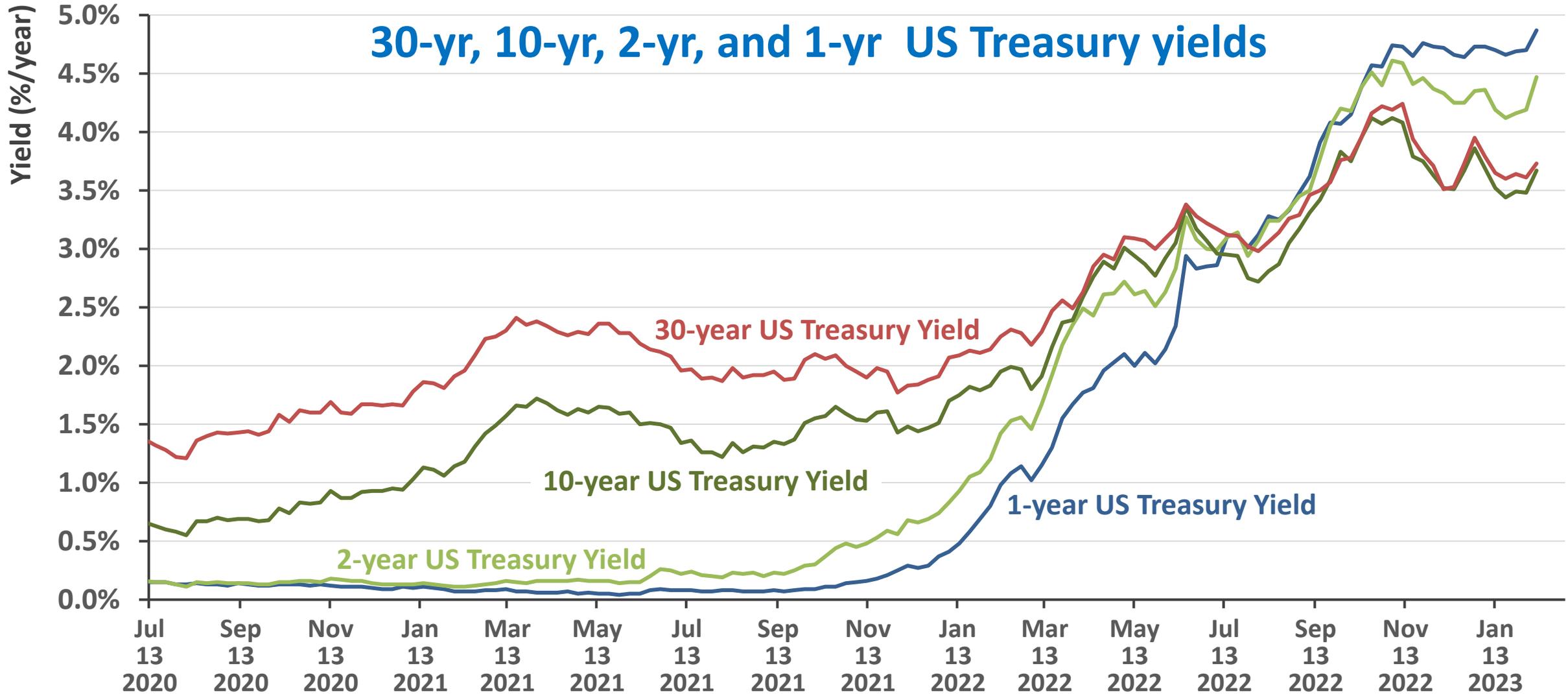
(12/15, 12/16, 3/17, 6/17, 12/17, 3/18, 6/18, 9/18, 12/18, 7/19, 9/19, 10/19, 3/20, 3/20, 3/20, 3/22, 4/22, 6/22, 7/22, 9/22, 11/22, 12/22, 2/23 ..)

Expected future rates, and the discount rate for Ag

US Treasury Yield Curves



Significant inversion signals market beliefs in reversal



How to think about “Capitalized Values”

A very simple (and reasonably accurate) capitalization formula to look at income or marginal effects of changes in income

$$\textit{Capitalized Value} = \frac{\textit{income}}{(r - g)}$$

Example:

Cash rent change and new payments = \$80 per acre income

r = 6.5% (required rate of return)

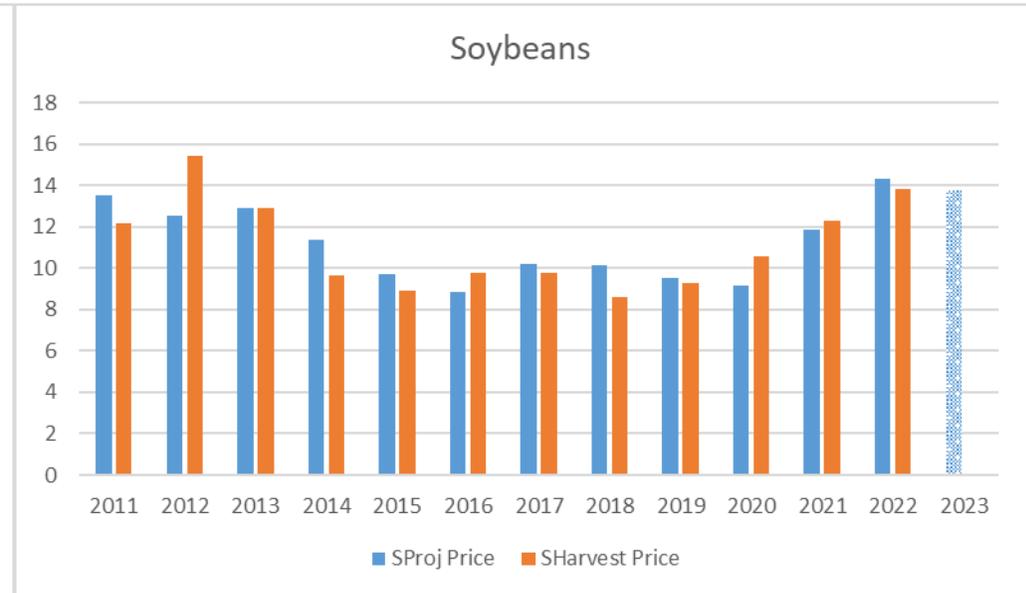
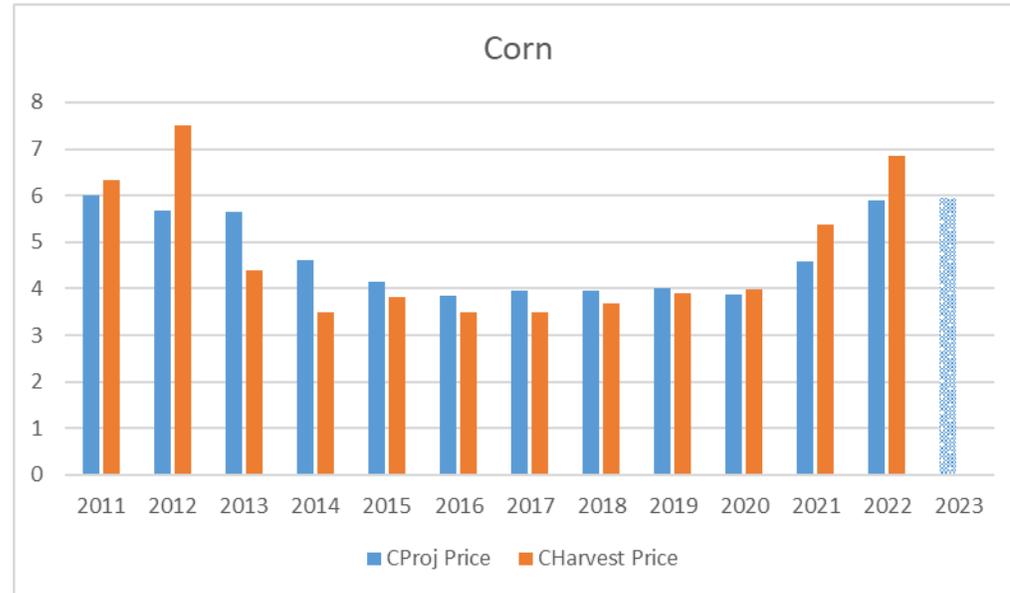
g = 4.5% (growth rate in return or asset appreciation)

Capitalized value impact = increase of \$4,000 = \$80 / .02

Historic insurance prices and 2023 prospects

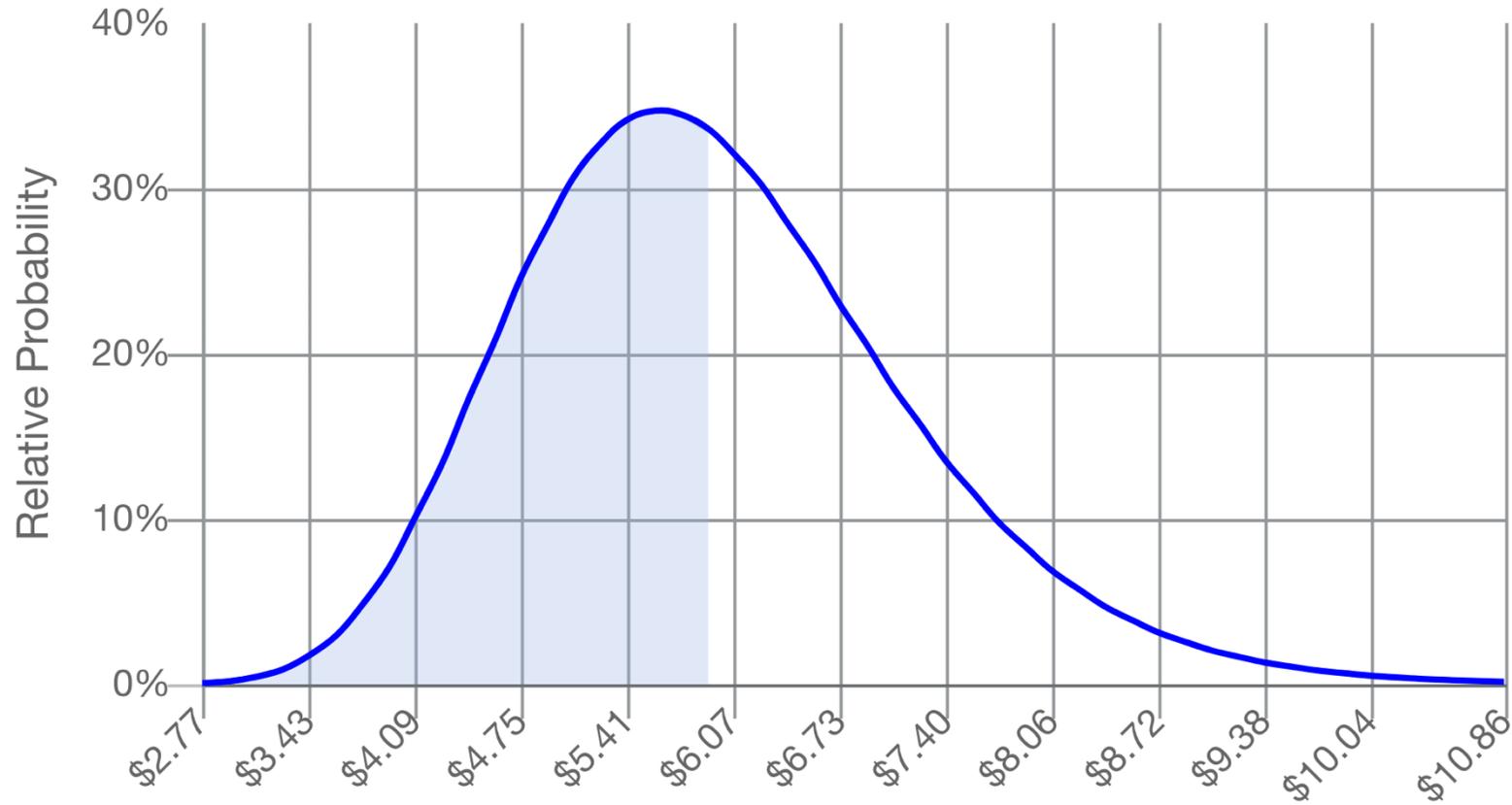
Projected Prices, Harvest Prices, and Volatilities, Corn and Soybeans, SCD 3/15 (RMA, and forecasted)

Corn	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023 (f)
Proj Price	6.01	5.68	5.65	4.62	4.15	3.86	3.96	3.96	4.00	3.88	4.58	5.90	5.96
Harvest Price	6.32	7.50	4.39	3.49	3.83	3.49	3.49	3.68	3.90	3.99	5.37	6.86	
Volatility	0.29	0.22	0.20	0.19	0.21	0.17	0.19	0.15	0.15	0.15	0.23	0.23	0.20
Soybeans													
Proj Price	13.49	12.55	12.87	11.36	9.73	8.85	10.19	10.16	9.54	9.17	11.87	14.33	13.79
Harvest Price	12.14	15.39	12.87	9.65	8.91	9.75	9.75	8.60	9.25	10.55	12.30	13.81	
Volatility	0.23	0.18	0.17	0.13	0.16	0.12	0.16	0.14	0.12	0.12	0.19	0.19	0.14



Dec '23 Corn futures (best guess for 2023 PP)

Probability of Prices at Expiration



Price Evaluated: \$5.96

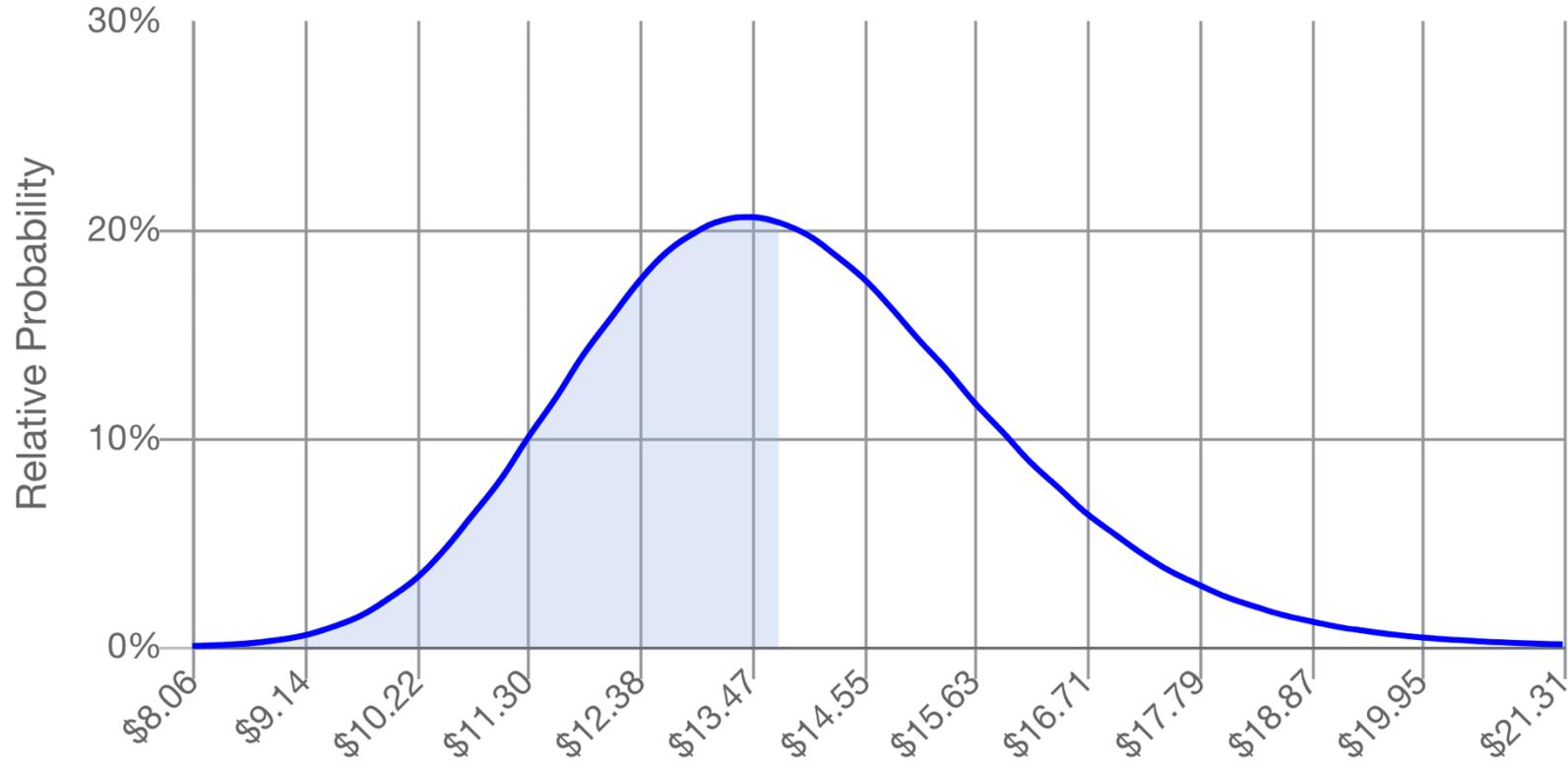
The implied distribution indicates that there is a 53.88% probability that the price will be below \$5.96 at expiration.

Accessed on February 14, 2023, 12:02 AM

Probability Below	Price at Expiration
5%	\$4.20
15%	\$4.75
25%	\$5.11
35%	\$5.41
45%	\$5.70
50%	\$5.84
55%	\$5.99
65%	\$6.31
75%	\$6.69
85%	\$7.20
95%	\$8.13

Nov '23 SB futures (best guess for 2023 PP)

Probability of Prices at Expiration



Price Evaluated: \$13.84

The implied distribution indicates that there is a 52.74% probability that the price will be below \$13.84 at expiration.

Accessed on February 13, 2023, 11:57 PM

Probability Below	Price at Expiration
5%	\$10.84
15%	\$11.82
25%	\$12.45
35%	\$12.97
45%	\$13.46
50%	\$13.71
55%	\$13.95
65%	\$14.48
75%	\$15.09
85%	\$15.89
95%	\$17.33

Key Value Drivers (and brakes) for Farmland

- Ag Policy impacts and changing emphasis of US Federal policy
- Additional spending in non-traditional titles and direct interventions
- “Climate” as proxy for payment linkages in ag
 - Ex., IRA spending both directly on ag and through energy programs
- Crop Insurance features and extensions to guarantee increasingly higher coverage levels
- ROW Demand expansion via population and standards of living

Key Drivers ... *(continued)*

- Low debt usage and lower relative credit spreads compared to other real assets, but increasing rates still pressure prices
 - Likely favors farmer buyers
 - Blended financing impact still fairly low compared to housing for example
- Input prices (somewhat more responsive to farm conditions)
- Low turnover, thin market support
- Recent high incomes, strong balance sheets
 - 2023 sector level likely to exceed \$4 trillion for first time

Inflation Reduction Act spending – as stated

Inflation Reduction Act

Economic Sector Spending

Energy	\$250.6 Billion
Manufacturing	\$47.7 Billion
Environment	\$46.4 Billion
Transportation & Electric Vehicles	\$23.4 Billion
Agriculture (direct)	\$20.9 Billion
Water	\$4.7 Billion
TOTAL	\$393.7 Billion

Wind Energy Demand Impacts - example

Installed wind generation capacity (TW)	3.07
---	------

MW produced per wind turbine	2.75
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Total turbines installed	1,116,364
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Percentage of turbines installed on farmland	80%
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Total turbines installed on farmland	893,091
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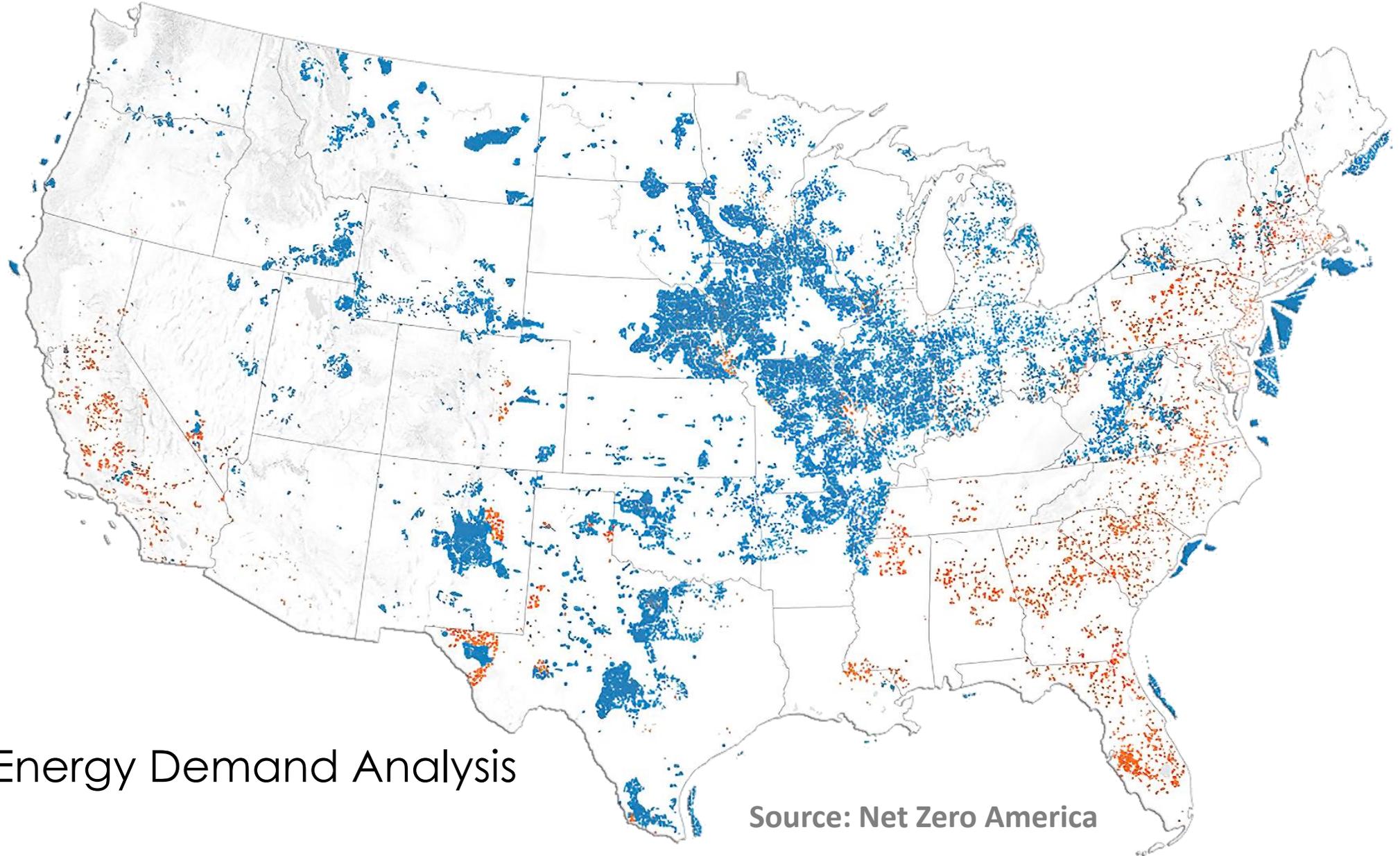
Average annual lease rate per farmland turbine	\$10,000
--	----------

Total farmland turbine revenue generated	\$8,930,909,091
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Cap rate assumption for turbine revenue	6.0%
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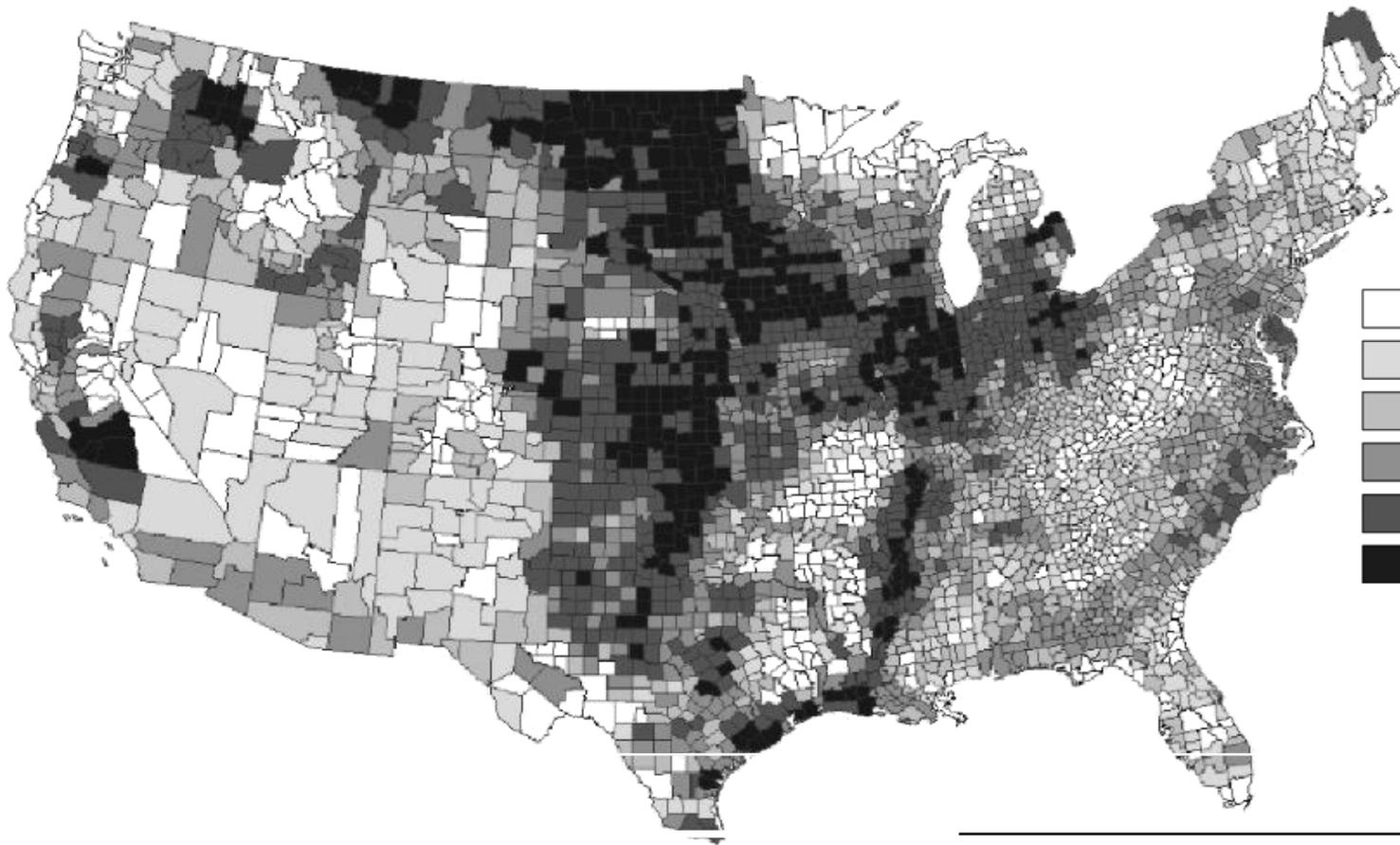
Total U.S. Farmland Value Impact	\$148,848,484,848
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Wind and Solar Needed by 2050

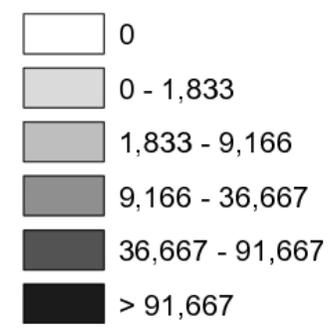


Wind Energy Demand Analysis

Source: Net Zero America

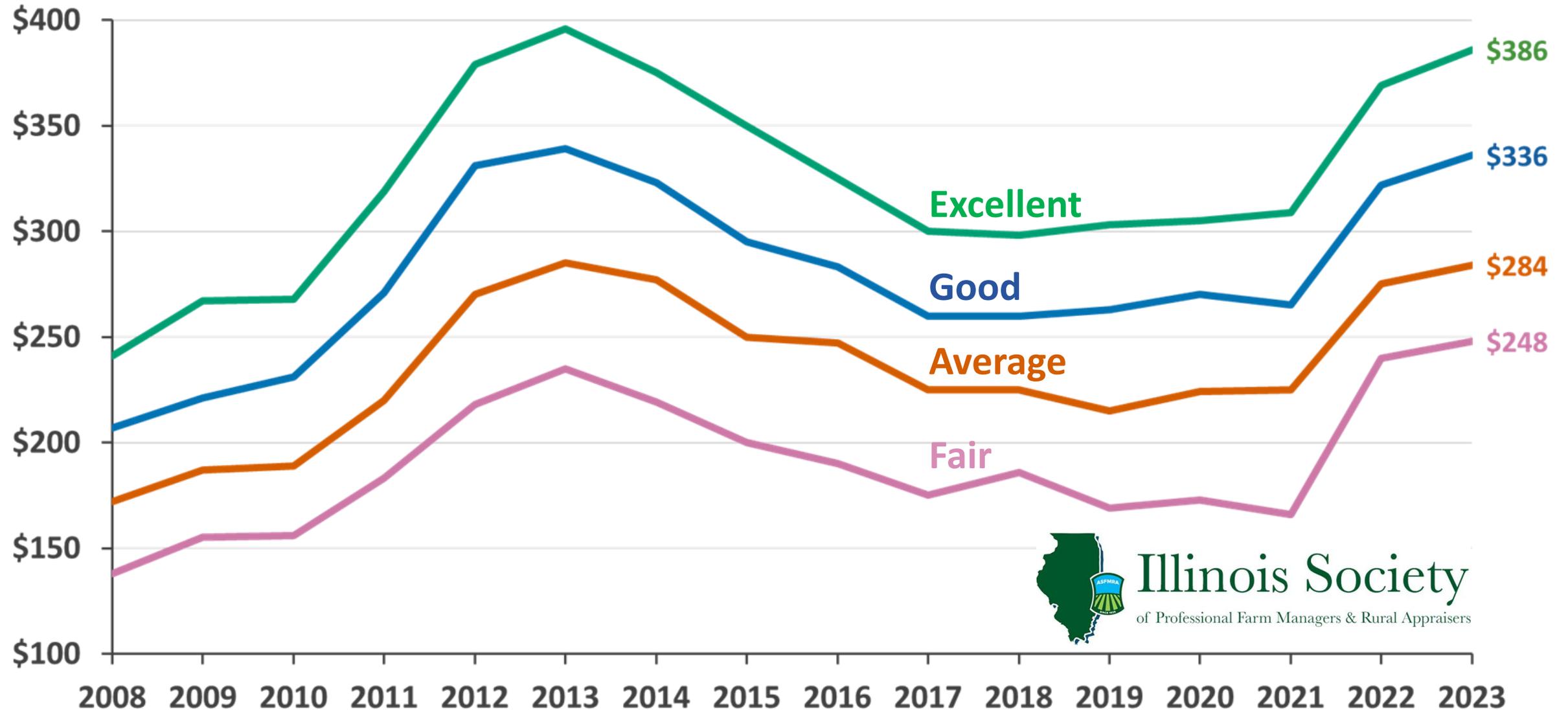


SOC
Sequestration
from **No Till**
(MTeq CO₂ /yr)



	Value Per MT Carbon		
	\$30	\$60	\$90
Annual CO ₂ Sequestration (MT)	200,000,000	200,000,000	200,000,000
Total Annual Value	\$6,000,000,000	\$12,000,000,000	\$18,000,000,000
U.S. Farmland Cap Rate	3.5%	3.5%	3.5%
U.S. Farmland Value Impact	\$171,428,571,429	\$342,857,142,857	\$514,285,714,286

Rental market responses (ISPFMRA survey)



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2023 Illinois Farm Economics Summit

Final IFES webinar

Thursday, February 23, 2023 @ 11am CT

Wrap up with the farmdoc team



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IFES Online: Grain Market Outlook for 2023
January 19 @ 11:00 am - 12:00 pm CST

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Presented by Joe Janzen and Scott Irwin



IFES Online: Enterprise Budgets and Farm Income Outlook for 2023

January 26 @ 11:00 am - 12:00 pm CST

[Watch Video](#) [Download Slides](#)

Presented by Gary Schnitkey and Nick Paulson



IFES Online: South America: Expectations for Agricultural Production, Markets, and Trade

February 2 @ 11:00 am - 12:00 pm CST

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Presented by Joana Colussi



IFES Online: Farm Bill Update

February 9 @ 11:00 am - 12:00 pm CST

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Presented by Jonathan Coppess

Other Upcoming Webinars

Registration information at farmdocdaily.illinois.edu/webinars



Crop Risk Management for 2023

by Gary Schnitkey

February 16 @ 9:00 am - 10:00 am CST

March 2 @ 9:00 am - 10:00 am CST

Many of the risk management decisions impacting 2023 crop production will be made soon. At the end of February, projected prices for crop insurance will be known.

We will cover decision related choices related to corn or soybeans, marketing, leasing, commodity title alternatives, & crop insurance alternatives



Top Ten Business Strategies 2023

by Bob Rhea and Brad Zwilling of Illinois FBFM

February 21 @ 11:00 am - 12:00 pm CST

As 2023 gets underway, several items deserve increased attention for farm businesses. FBFM presents a Top 10 list of forward looking strategies to consider for a successful year. Changes in cost, income, inflation, tax laws, and estate planning are some key topics discussed. Webinar will be presented by Bob Rhea and Brad Zwilling of Illinois...

2023 Illinois Farm Economics Summit

Please send any questions/comments to sherrick@illinois.edu or npaulson@illinois.edu

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Thank You!

Please send any questions/comments to:
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The screenshot shows the farmdocDAILY website interface. At the top, there is a navigation bar with the Illinois logo and the text "Our Sites: farmdoc farmdocDAILY Farm Policy News". Below this is a header for "farmdocDAILY" with a background image of a green field. The header includes links for "Market Prices", "Authors", "By Month", "Categories", "Series", "Tools", "Webinars/IFES", "Sponsors/Donate", and "About Us". Below the header, there is a section for "EDUCATIONAL PARTNERS:" listing "Dept of ACE", "FBFM", and "EXTENSION". A "Subscribe for Daily Email Updates" button is visible. Below this is a "Connect on Social Media" section with icons for Twitter, Facebook, Instagram, YouTube, and LinkedIn. The main content area is divided into several sections: "Latest Article" featuring a recap of the WASDE report, "All Day Ag Outlook" for Tuesday, March 7, 2023, and a "See the Latest News on Social Media" button. A "Sponsors" section lists various partners like TIAA, COMPEER FINANCIAL, CORTEVA agriscience, FARM CREDIT ILLINOIS, GROWMARK, and ILLINOIS SOYBEAN ASSOCIATION.

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