CECS 450 PROJECT

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HONEY PRODUCTION IN THE US 1998-2022

INTRODUCTION

OUR OBJECTIVE IS TO ANALYZE THE FACTORS THAT INFLUENCE THE SUCCESS RATE AND DOWNFALL OF HONEY PRODUCTION. WE COLLECTED DATA RELATED TO HONEY PRODUCTION FROM 1998 TO 2022.

OUR DATASET INCLUDES DATA FROM 1998 TO 2022, YIELDING 24 YEARS OF HONEY PRODUCTION DATA. (THE DATASET SAMPLE SIZE MAY BE TOO SMALL TO ACCURATELY PROJECT TRENDS ON MULTI-YEARLY BASIS)

INTRODUCTION

LINK TO DATA:
HTTPS://USDA.LIBRARY.CORNELL.EDU/CONCERN/PUBLICATIONS/HD76S004Z?LOCALE=EN#RELEASE-ITEMS

DATAS

Releases

Filter by Date

Date	Download	Details
Mar 17, 2023	PDF TXT ZIP	
Mar 18, 2022	PDF TXT ZIP	
Mar 18, 2021	PDF TXT ZIP	
Mar 19, 2020	PDF TXT ZIP	
May 16, 2019	PDF TXT ZIP	
Feb 6, 2019	PDF TXT	
Mar 14, 2018	PDF TXT ZIP	
Mar 22, 2017	PDF TXT ZIP	
Mar 22, 2016	PDF TXT ZIP	
Mar 20, 2015	PDF TXT ZIP	

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DATAS

[Colonies which produced honey in more than one State were counted in each State]

State	Honey producing colonies [1]	Yield per colony	Production	Stocks December 15 [2]	Average price per pound [3]	Value of production [4]
	(1,000)	(pounds)	(1,000 pounds)	(1,000 pounds)	(dollars)	(1,000 dollars)
Alabama	7	39	273	66	5.52	1,507
Arizona	25	36	900	360	2.38	2,142
Arkansas	20	49	980	176	1.85	1,813
California	320	43	13,760	2,752	1.95	26,832
Colorado	30	41	1,230	455	2.39	2,940
Florida	192	46	8,832	883	2.24	19,784
Georgia	101	34	3,434	412	2.52	8,654
Hawaii	15	105	1,575	79	1.70	2,678
Idaho	107	35	3,745	637	1.76	6,591
Illinois	10	52	520	156	5.65	2,938
Indiana	9	55	495	149	3.91	1,935
Iowa	35	58	2,030	1,259	2.54	5,156
Kansas	8	62	496	164	3.25	1,612
Kentucky	7	33	231	58	5.76	1,331
Louisiana	33	69	2,277	228	2.46	5,601
Maine	10	30	300	78	3.36	1,008
Michigan	95	47	4,465	1,384	2.95	13,172
Minnesota	108	55	5,940	2,495	1.80	10,692
Mississippi	25	73	1,825	146	1.99	3,632
Missouri	9	41	369	100	3.59	1,325
Montana	110	81	8,910	3,208	1.61	14,345
Nebraska	37	52	1,924	250	1.69	3,252
New Jersey	14	31	434	91	4.32	1,875
New York	58	56	3,248	844	3.13	10,166
North Carolina	12	38	456	123	5.50	2,508
North Dakota	495	78	38,610	8,108	1.59	61,390
Ohio	16	75	1,200	576	3.50	4,200
Oregon	95	29	2,755	1,102	2.40	6,612
Pennsylvania	19	48	912	392	4.12	3,757
South Carolina	16	46	736	66	3.44	2,532
South Dakota	245	61	14,945	8,668	1.77	26,453
Tennessee	7	51	357	54	4.23	1,510
Texas	157	57	8,949	1,253	2.00	17,898
Utah	28	34	952	171	2.02	1,923
Vermont	6	47	282	96	3.94	1,111
Virginia	5	40	200	54	6.03	1,206
Washington	98	37	3,626	798	2.51	9,101
West Virginia	6	46	276	58	3.81	1,052
Wisconsin	45	50	2,250	855	3.11	6,998
Wyoming	38	40	1,520	608	1.71	2,599
Other States [5] [6]	33	42	1,375	303	4.68	6,435
United States [6] [7]	2,706	54.5	147,594	39,715	2.10	309,947

[1] Honey producing colonies are the maximum number of colonies from which honey was harvested during the year. It is possible to harvest honey from colonies which did not survive the entire year.

DATAS

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"CA",330000,33,10890000,2505000,2.11,22978000,2013
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"VA",5000,35,175000,42000,4.50,788000,2013
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VARIABLES

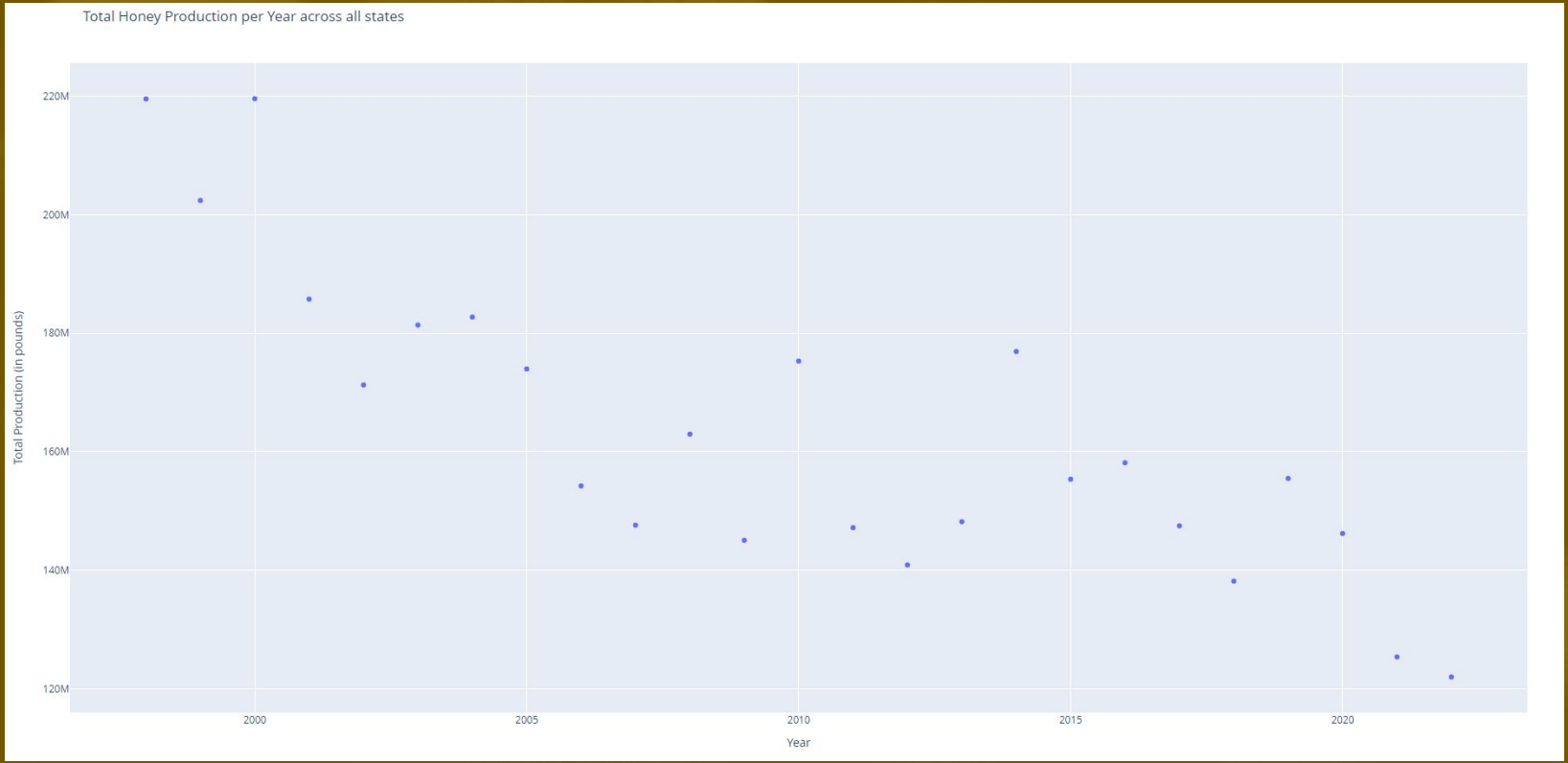
EACH VARIABLE PROVIDES IMPORTANT INSIGHTS INTO THE HONEY PRODUCTION INDUSTRY.
HERE'S A BRIEF OVERVIEW OF WHAT EACH VARIABLE IN THE DATA REPRESENTS:

STATE	THE STATE IN THE US WITHIN WHICH THE HONEY IS PRODUCED
NUMCOL (NUMBER OF HONEY PRODUCING COLONIES):	THIS MEASURES THE MAXIMUM NUMBER OF BEE COLONIES THAT WERE USED FOR HONEY PRODUCTION DURING THE YEAR. IT INCLUDES COLONIES FROM WHICH HONEY WAS HARVESTED, EVEN IF THEY DID NOT SURVIVE THE ENTIRE YEAR.
YIELDPERCOL (HONEY YIELD PER COLONY):	THIS INDICATES THE AVERAGE AMOUNT OF HONEY, IN POUNDS, PRODUCED BY EACH COLONY.
TOTALPROD (TOTAL PRODUCTION):	CALCULATED AS NUMCOL MULTIPLIED BY YIELDPERCOL, THIS REPRESENTS THE TOTAL HONEY PRODUCTION IN POUNDS.
STOCKS (STOCKS HELD BY PRODUCERS):	THIS REFERS TO THE QUANTITY OF HONEY, IN POUNDS, THAT IS HELD IN INVENTORY BY PRODUCERS.
PRICEPERLB (AVERAGE PRICE PER POUND):	THIS IS THE AVERAGE MARKET PRICE PER POUND OF HONEY, CALCULATED BASED ON EXPANDED SALES. IT'S A REFLECTION OF THE MARKET VALUE OF HONEY.
PRODVALUE (VALUE OF PRODUCTION):	THIS IS THE TOTAL MONETARY VALUE OF THE HONEY PRODUCTION, CALCULATED AS TOTALPROD MULTIPLIED BY PRICEPERLB. IT REPRESENTS THE TOTAL REVENUE GENERATED FROM HONEY PRODUCTION.
YEAR	YEAR DATA WAS TABULATED

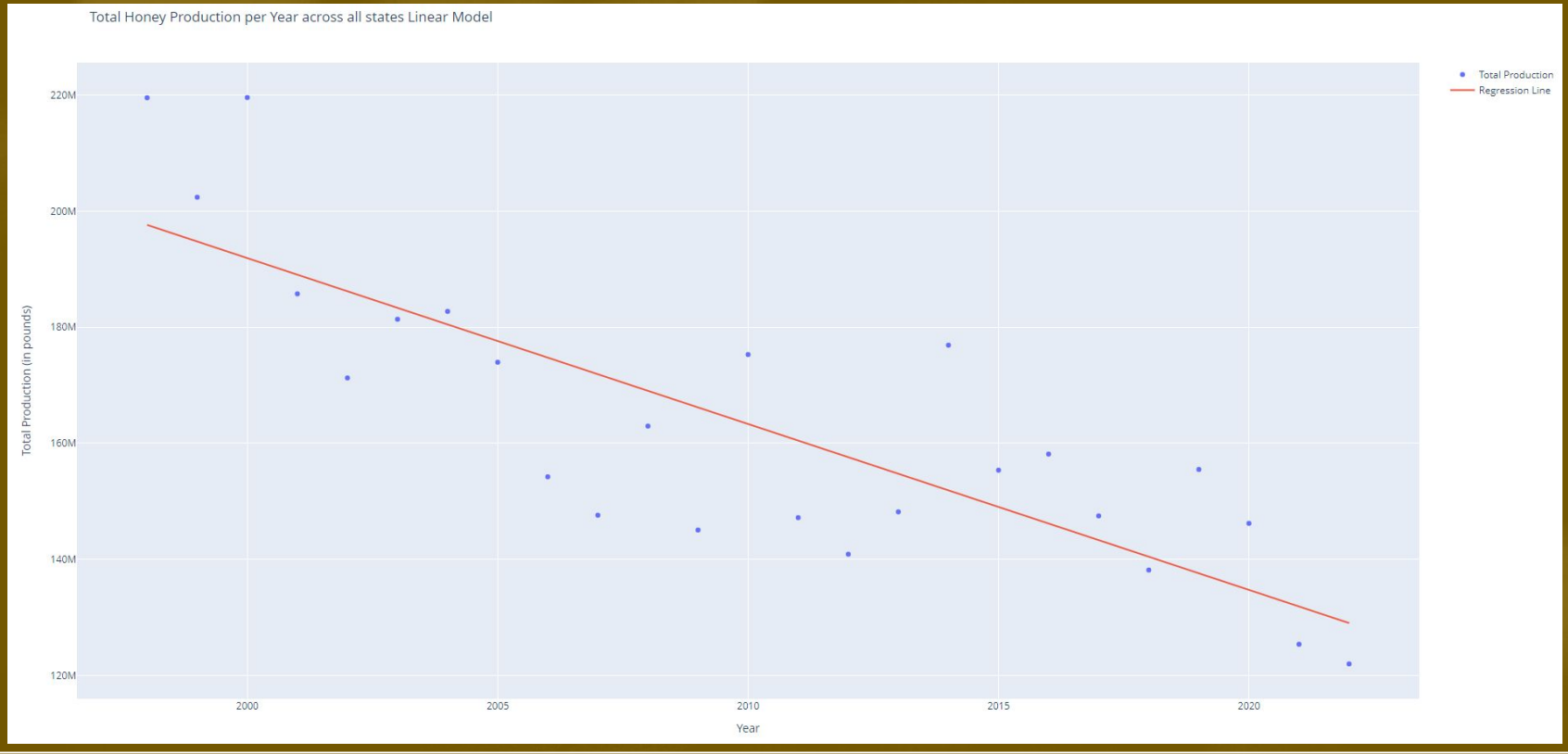
QUESTIONS

- HOW DOES THE TOTAL HONEY PRODUCTION LOOK OVER THE YEARS?
- WHAT FACTORS ARE CAUSING DECREASE IN HONEY PRODUCTION?
- WHAT DOES THE DATA AND ITS TREND TELL US ABOUT HONEY PRODUCTION 5, 10, 20 YEARS FROM NOW?
- ARE THE OUTLIER DATA ISOLATED INCIDENTS OR ARE THE CHANGES REPRESENTED FOR ALL DATA POINTS FOR THAT DATA SET? (WHOLE DATA SET SHIFT VERSUS OUTLIER)

TOTAL HONEY PRODUCTION



LINEAR MODEL

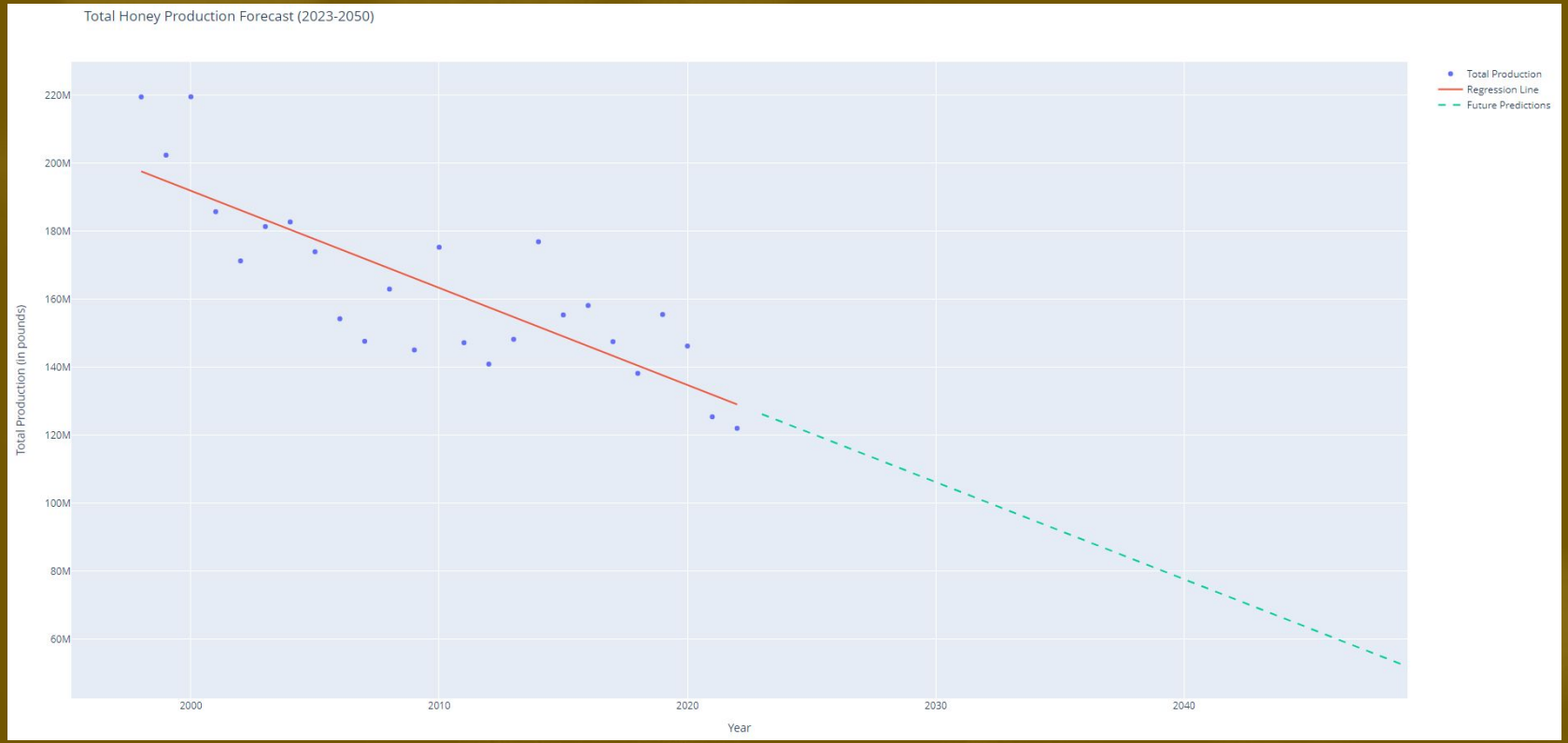


FUTURE PREDICTIONS

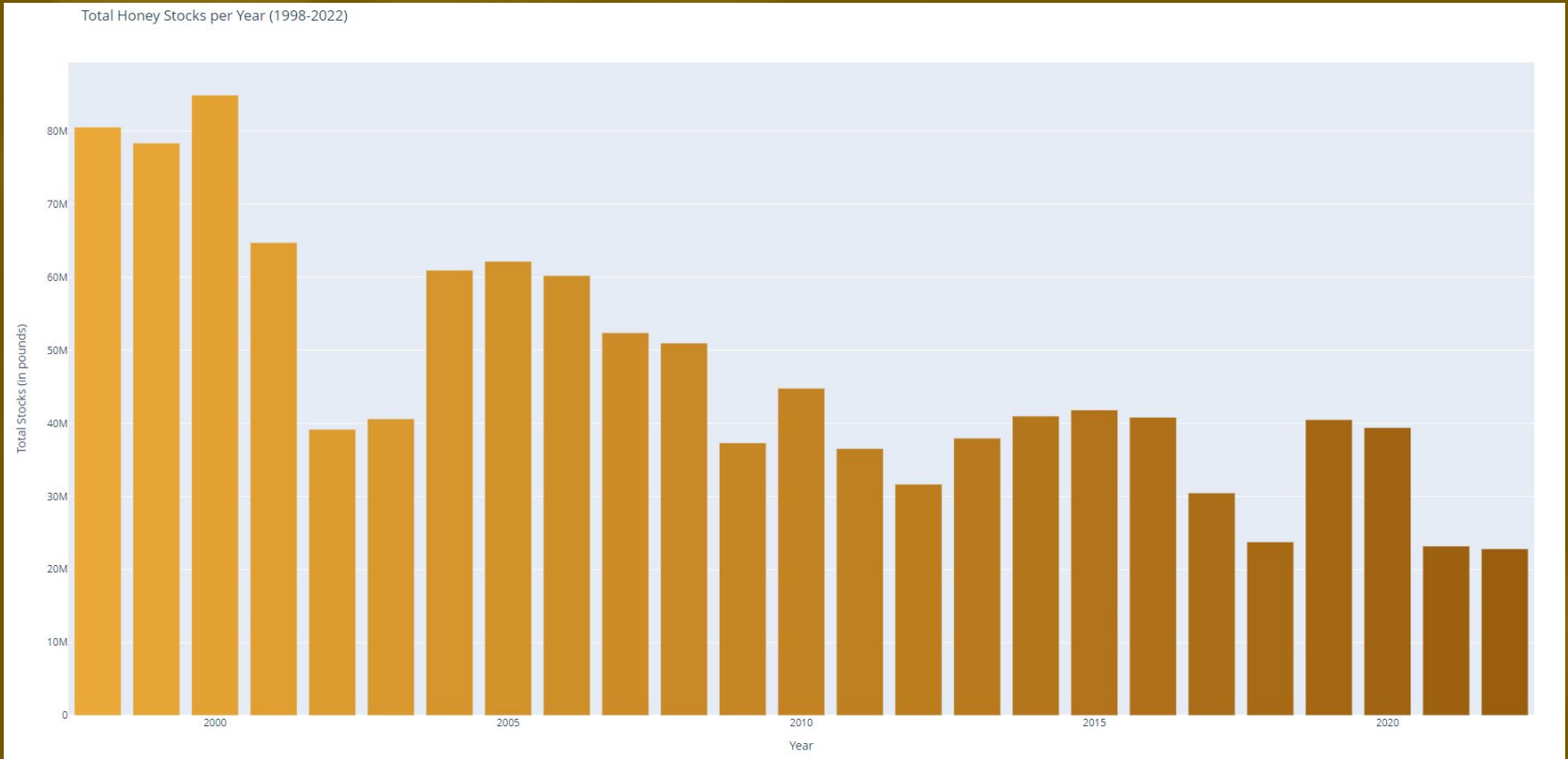
USING THE DATA ON PAST HONEY PRODUCTION
FITTING THE DATA INTO A LINEAR MODEL
CALCULATE FUTURE PREDICTIONS
PROVIDE A VISUAL REPRESENTATION OF THE TREND AND POTENTIAL FUTURE SCENARIO ACCORDING TO THE LINEAR MODEL.

CURRENTLY THE DATA IS PROJECTED TO CONTINUE TO TREND DOWNWARDS IF STEPS ARE NOT TAKEN TO COMBAT THE ISSUE

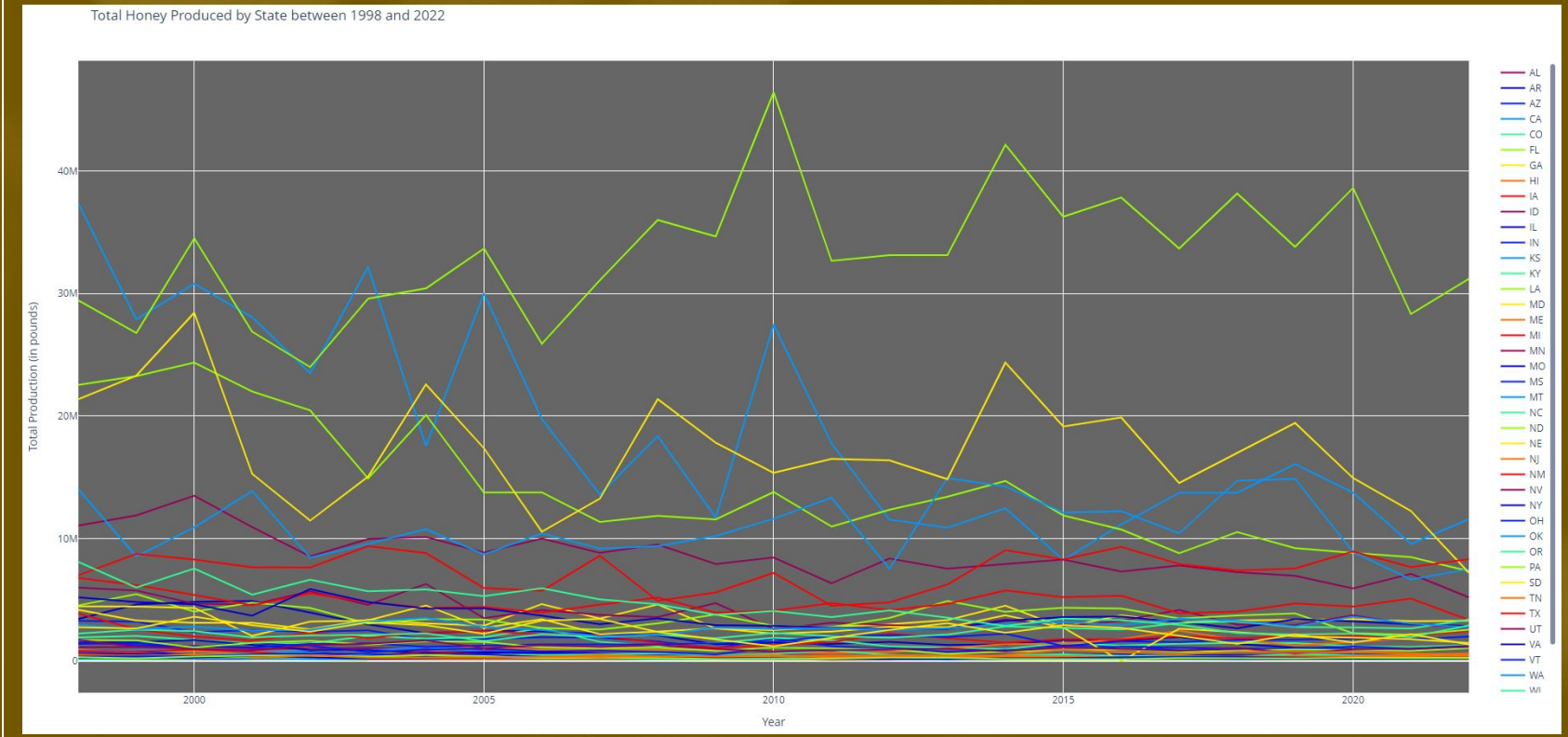
HONEY PRODUCTION PREDICTION



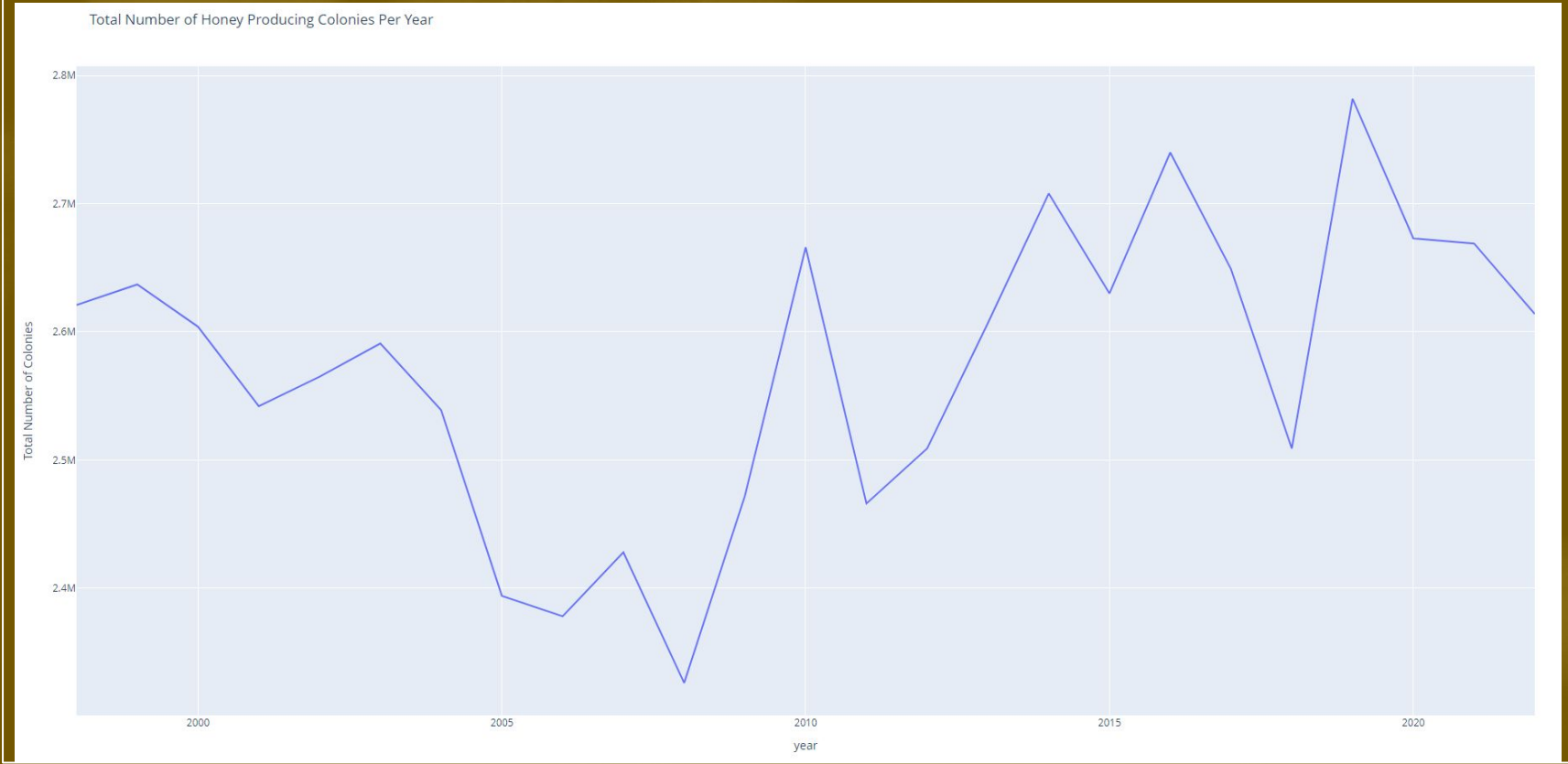
TOTAL HONEY STOCKS



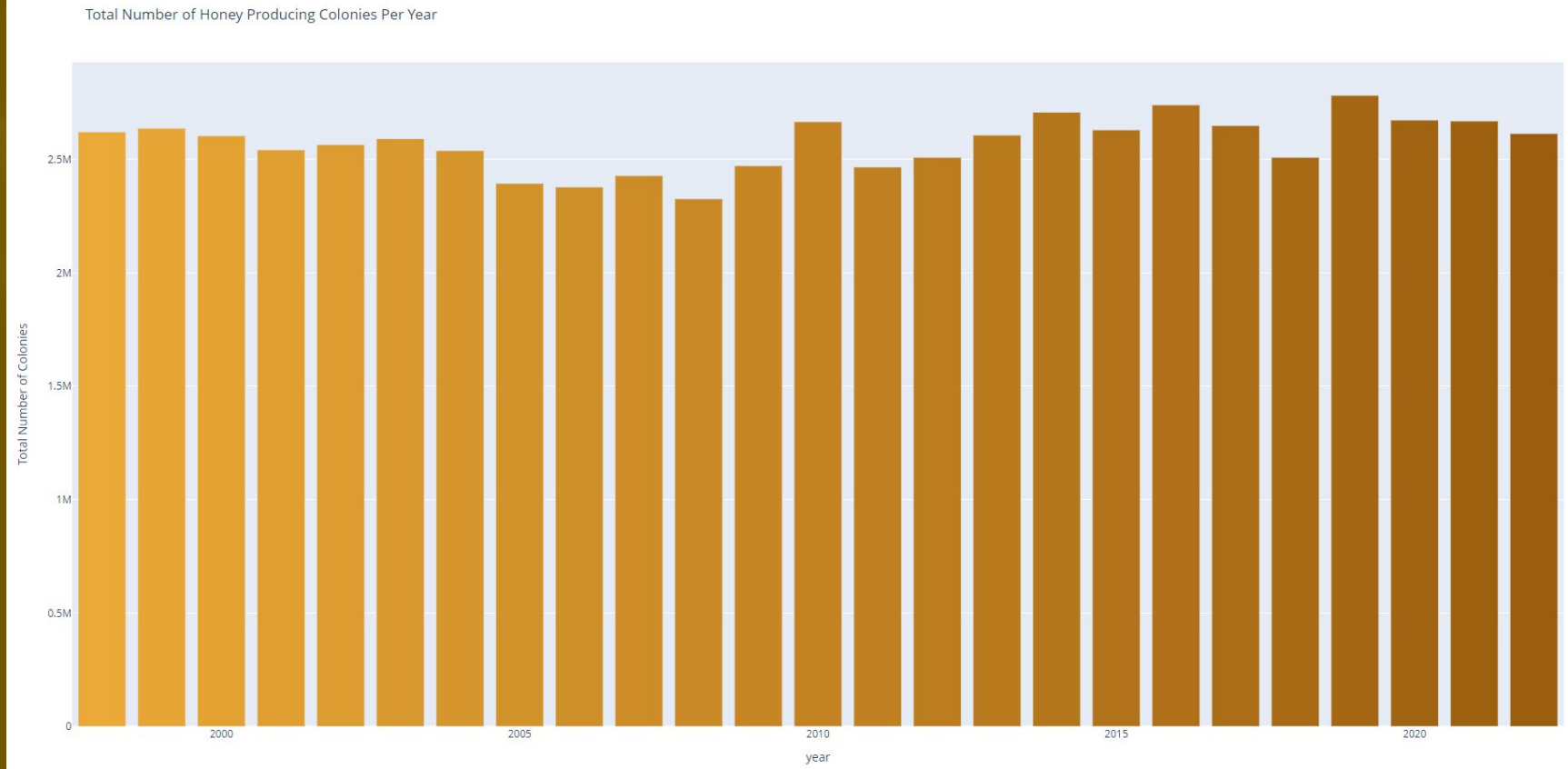
TOTAL HONEY PRODUCED



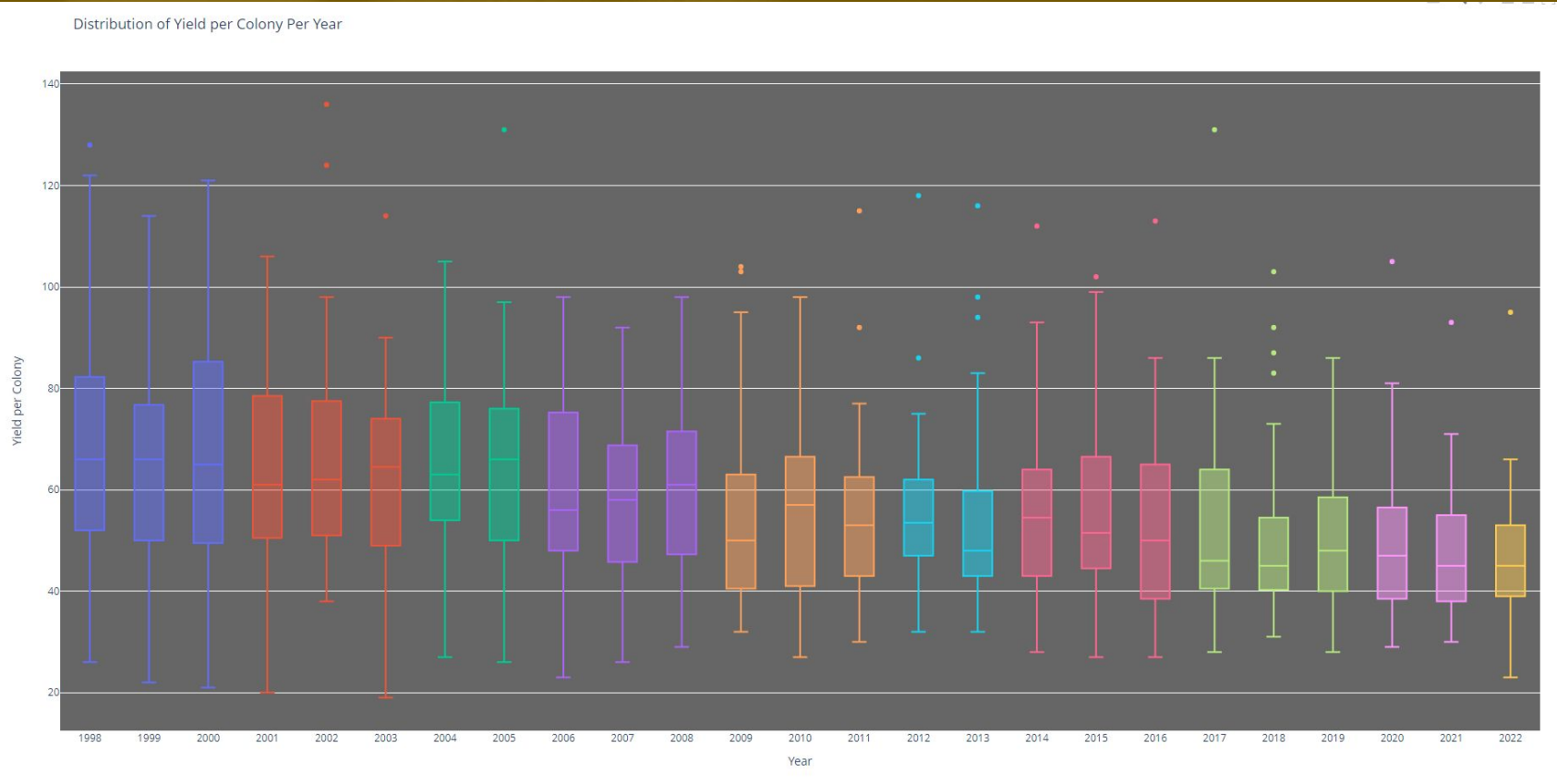
TOTAL HONEY PRODUCING COLONIES



A BETTER LOOK



DISTRIBUTION OF YIELD



FACTORS

- CLIMATE CHANGE
  - AFFECTS POLLINATION
  - MORE VULNERABLE TO DISEASE AND PEST
  - OVERWINTERING ENDS EARLIER DISRUPTING POLLINATION INTERACTION AMONG PLANT AND POLLINATOR
  - ALTERS SCENT OF PLANTS
- PESTICIDES
  - U.S ENVIRONMENTAL PROTECTION AGENCY (EPA)
  - NEONICOTINOIDS IMIDACLOPRID, THIAMETHOXAM, CLOTHIANIDIN, AND DINOTEFURAN
  - POLLINATOR PROTECTION ACT : REGULATES THOSE PESTICIDES
  - IN 2016, CALIFORNIA, CONNECTICUT, MARYLAND ENACTED THIS.
- DISEASES AND PATHOGENS
  - BEES ARE VULNERABLE TO PATHOGENS BECAUSE IT COULD BE TRANSMITTED DURING POLLINATION

CONCLUSION

THE DIMINISHING HONEY PRODUCTION OBSERVED OVER TIME SEEMS TO BE LINKED TO REDUCED YIELD PER COLONY RATHER THAN REDUCTIONS IN THE NUMBER OF COLONIES.

IT CAN BE OBSERVED AS A TREND THAT INDIVIDUAL BEE COLONIES HAVE BECOME LESS EFFICIENT OVER TIME, RESULTING IN THIS OBSERVED REDUCED YIELD.

IT IS A SUGGESTION THAT SOMETHING MAY BE DETRIMENTALLY IMPACTING THE POPULATION OF HONEYBEES IN THE UNITED STATES.
THERE COULD BE A FEW VARYING FACTORS THAT MAY CONTRIBUTE TO THE DOWNWARD TREND OF HONEY PRODUCTION BY HONEY BEES OVER THE LAST 10 YEARS, INCLUDING BUT NOT LIMITED TO CLIMATE CHANGE, HABITAT LOSS, AND HUMAN INTERACTION.

WITH OUR CURRENT DOWNWARD TREND, IT IS IMPERATIVE FOR US IN THE UNITED STATES TO MAKE CHANGES IN THE WAY WE PROTECT AND DISCUSS THE FUTURE OF OUR HONEY BEES AS THEY ARE AN IMPORTANT PART OF THEIR GLOBAL ECOSYSTEM.