PREDICTING CO_2 EQUIVALENT FROM U.S. FOOD SUPPLY

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WHAT'S THE PROBLEM?

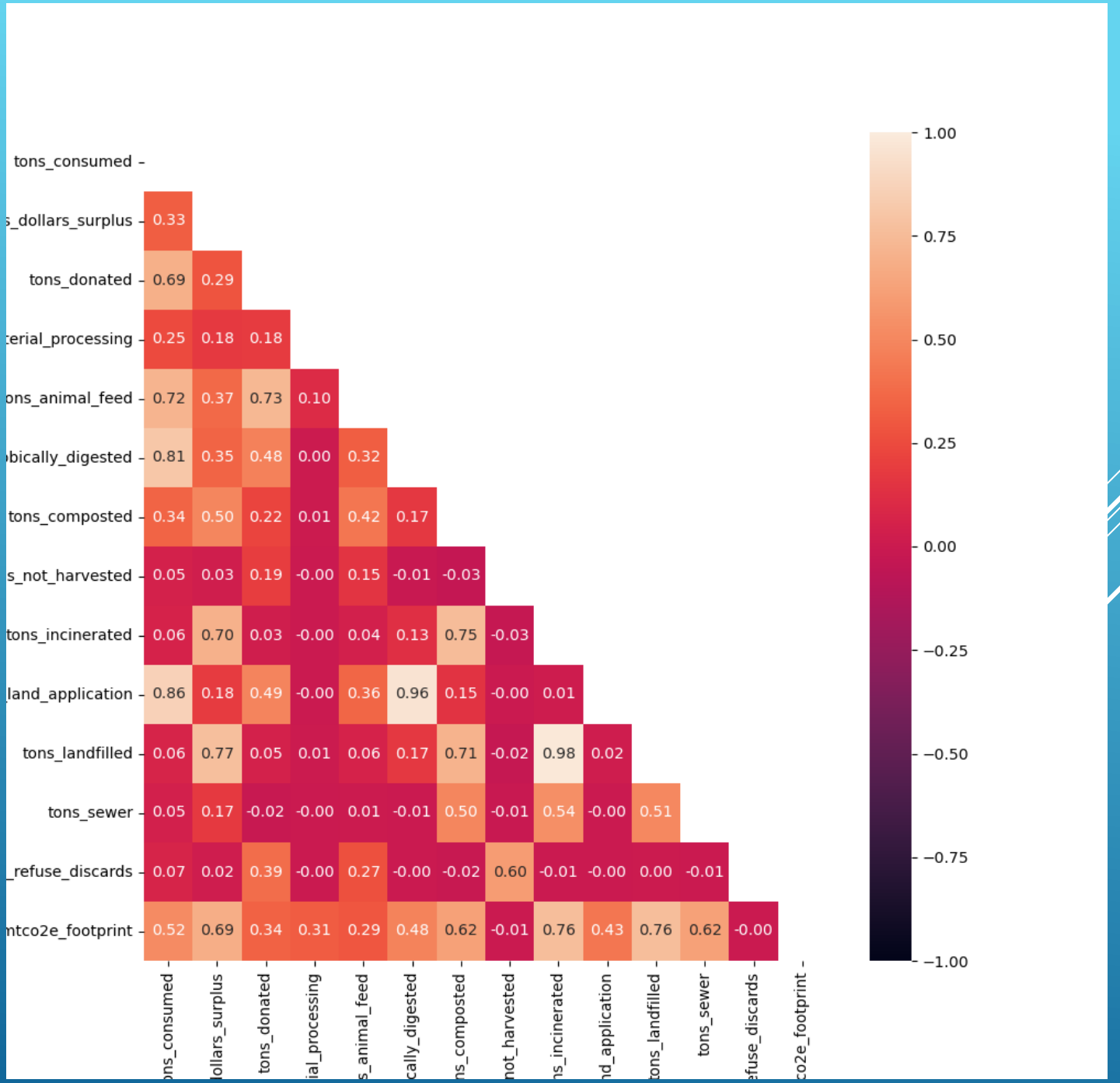
- 88.7 million tons of surplus food produced in 2022
- About 1/3 of surplus either reused or recycled
- 57.6 million tons, or about 2/3, dumped, incinerated, or unharvested

DATA PREPARATION

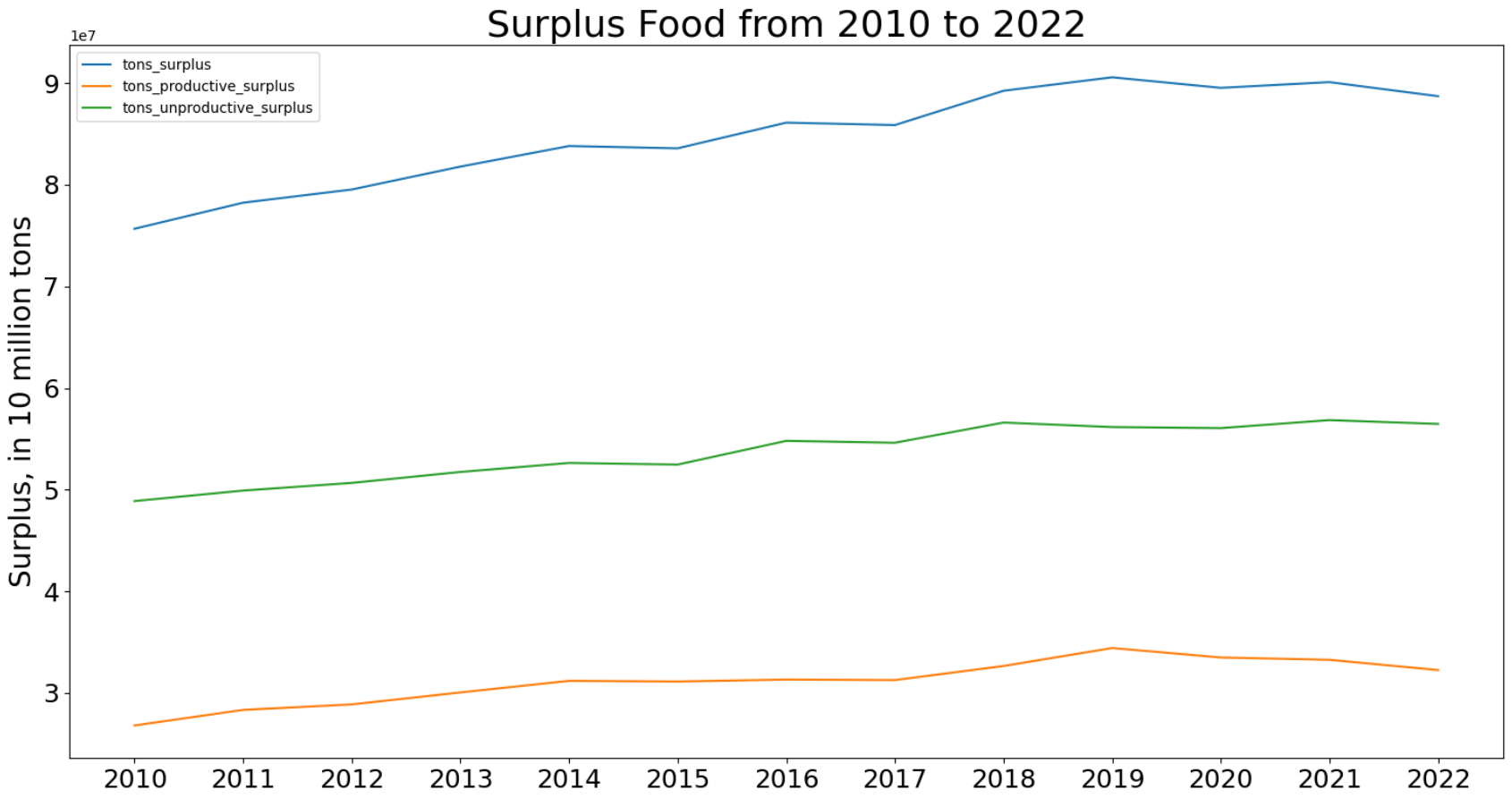
- Data was collected from ReFED (https://insights-engine.refed.org/food-waste-monitor?view=overview&year=2022)
- Primarily null or redundant features removed
- Some aggregate or derivative features created

HOW IS THE DATA RELATED?

- More "common" modes of surplus food disposal more closely related to greenhouse gas footprint
- More common modes tend to also be the most impactful, like composting, incineration, and landfill and sewer dumping



HOW HAS FOOD SURPLUS CHANGED OVER TIME?



MODELS TESTED AND SELECTED

- Tested LR, LASSO, Ridge, Decision Tree, and Random Forest
- Initial selection was Random Forest, but Decision Tree outperformed Random Forest on unseen data

	Training Accuracy	Test Accuracy	MAE	MSE	RMSE
Linear Regression	0.949913850558376	0.96708519062423	129392.97973561047	78096135565.33041	279456.85814688896
LASSO	0.9499138503102171	0.9670853222598297	129391.15781300806	78095823236.87306	279456.2993329602
Ridge	0.949904819105736	0.9670669157194531	129404.57601155559	78139495969.59738	279534.42716344865
Decision Tree	0.9999999999986454	0.994362614056355	13918.248849523467	13375683020.454878	115653.28797943826
Random Forest	0.9989292792528752	0.9968740601764776	11302.720374139919	7416838342.882326	86121.06793858473

CONCLUSIONS

- Greenhouse gases predicted based on destinations of surplus
- Insight into destinations of U.S. food surplus
- Many destinations that cause emissions not reusing or recycling food