Harvesting Insights: A Fiery Oat Economy

Data 512 - Project Presentation

Shweta Manjunath

Wildfires: A Threat to Our Sustenance

Assessing the Socio-Economic Ramifications

Why Agriculture and how Oats...

AGRICULTURE IS A CHIEF REVENUE SOURCE

OATS IS ABUNDANT IN AND AROUND BISMARCK, ND

PROJECT INSPIRATION

Research Questions

- IS THE WILDFIRE IMPACT STATISTICALLY SIGNIFICANT TO THE AGRICULTURAL YIELD?
- HOW DOES THE SMOKE ESTIMATE IMPACT THE YIELD?

Estimating the Wildfire Impact

Data Deep-Dive

PREDICTORS

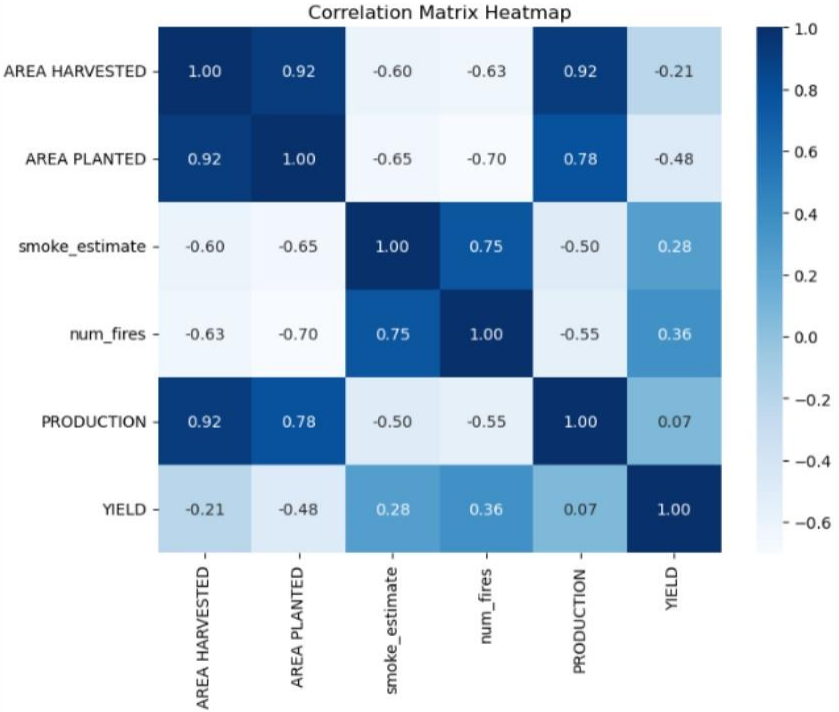
- AREA PLANTED
- AREA HARVESTED
- NUMBER OF FIRES
- SMOKE ESTIMATE

TARGET

- YIELD

DATA COLLECTED AND PREPROCESSED FOR THE ASSSIGNED COUNTY AND TIMEFRAME

Statistical Significance of Smoke Estimate on Yield



OLS Regression Results

Dep. Variable:	YIELD	R-squared (uncentered):	0.928
Model:	OLS	Adj. R-squared (uncentered):	0.922
Method:	Least Squares	F-statistic:	173.0
Date:	Fri, 01 Dec 2023	Prob (F-statistic):	4.21e-30
Time:	09:51:31	Log-Likelihood:	-228.44
No. Observations:	58	AIC:	464.9
Df Residuals:	54	BIC:	473.1
Df Model:	4		
Covariance Type:	nonrobust		

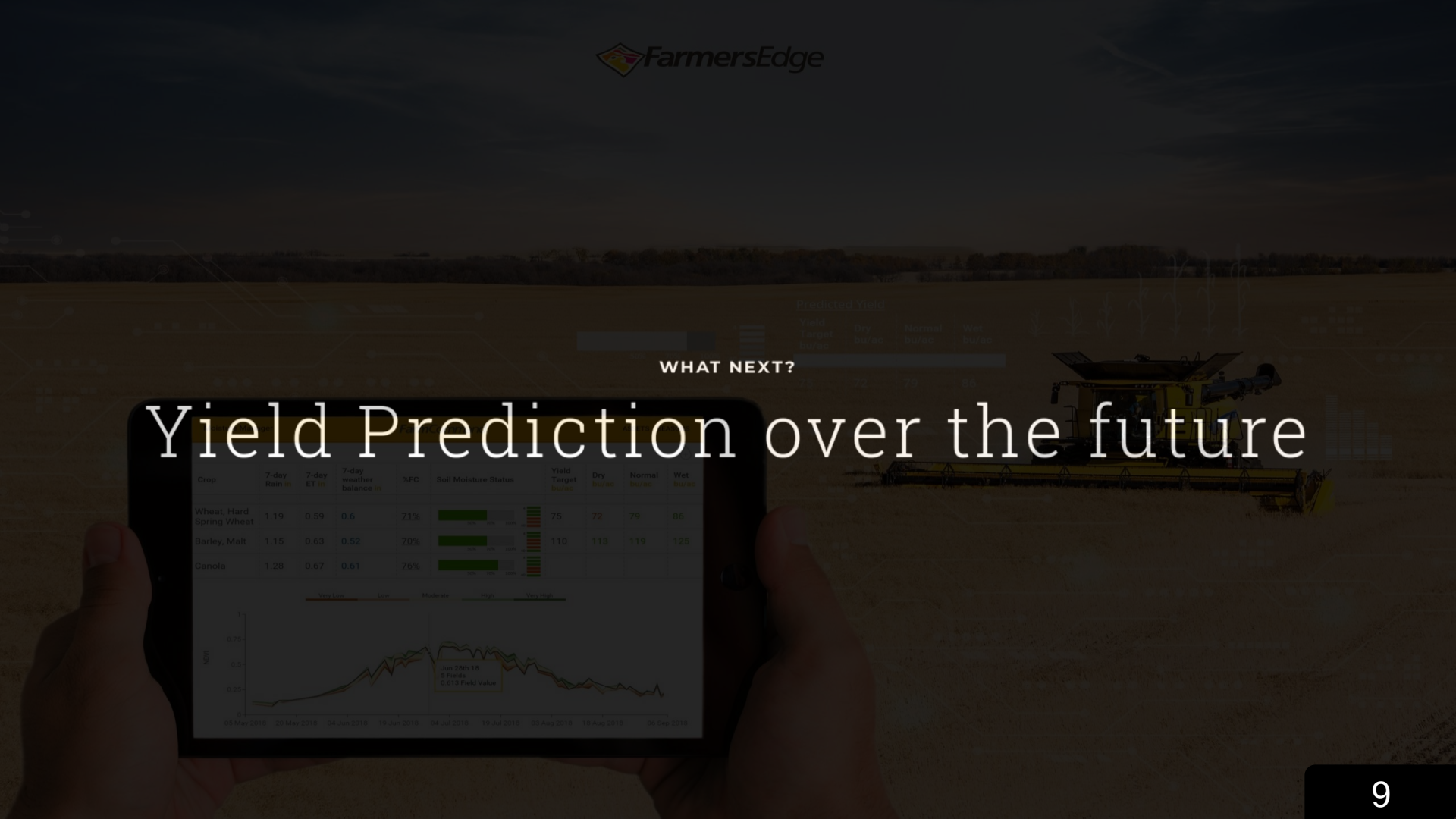
	coef	std err	t	P>|t|	[0.025	0.975]
AREA HARVESTED	0.0012	0.000	4.752	0.000	0.001	0.002
AREA PLANTED	-0.0012	0.000	-4.398	0.000	-0.002	-0.001
smoke_estimate	5.2889	0.761	6.946	0.000	3.762	6.816
num_fires	-0.0005	0.002	-0.193	0.847	-0.005	0.004

Omnibus:	14.905	Durbin-Watson:	1.488
Prob(Omnibus):	0.001	Jarque-Bera (JB):	20.124
Skew:	0.943	Prob(JB):	4.27e-05
Kurtosis:	5.184	Cond. No.	2.22e+04

Notes:
[1] R^2 is computed without centering (uncentered) since the model does not contain a consta
[2] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[3] The condition number is large, 2.22e+04. This might indicate that there are
strong multicollinearity or other numerical problems.

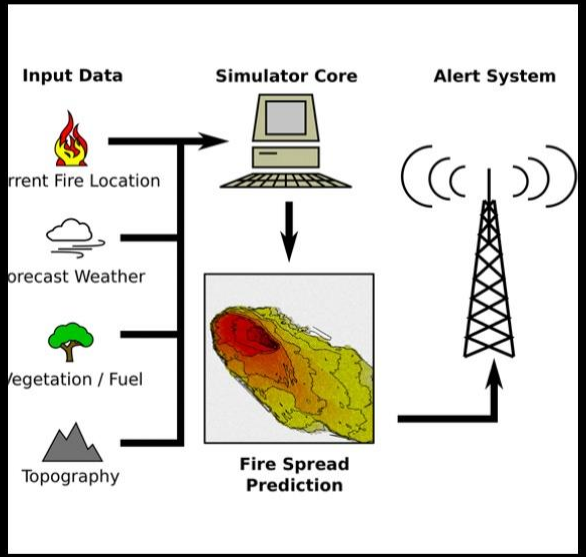
WHAT NEXT?

Yield Prediction over the future




DECODING THE SOCIO-ECONOMIC IMPACT
Result Interpretation

Actions Translating to Improvement



EARLY WARNING SYSTEMS

COMMUNITY EDUCATION AND TRAINING

INSURANCE AND FINANCIAL SUPPORT