Evaluation Of Models Results Summary

Column groups: **Model Results With Census Data Only** (Standard Features, Engineered Features, Delta Models (E-S)) · **Model Results With Previous Electoral History** (Standard Features, Engineered Features, Delta Models (E-S)) · **Model Comparison** (% Delta Test Standard / Engineered — Without to with Previous History)

Model	Metric	Census Std Train	Census Std Test	Census Std % Delta (Test-Train)	Census Eng Train	Census Eng Test	Census Eng % Delta (Test-Train)	Census Δ Models (E-S) % Train	Census Δ Models (E-S) % Test	Prev Std Train	Prev Std Test	Prev Std % Delta (Test-Train)	Prev Eng Train	Prev Eng Test	Prev Eng % Delta (Test-Train)	Prev Δ Models (E-S) % Train	Prev Δ Models (E-S) % Test	% Delta Test Standard (Without to with Prev History)	% Delta Test Engineered (Without to with Prev History)
Initial Logistic Regression	F1	0.9296	0.8629	-7.17%	0.9286	0.8713	-6.17%	-0.11%	0.97%	0.9934	0.9490	-4.48%	0.9852	0.9453	-4.05%	-0.83%	-0.39%	9.97%	8.49%
Initial Logistic Regression	Accuracy	0.9287	0.8657	-6.79%	0.9270	0.8706	-6.08%	-0.18%	0.57%	0.9934	0.9502	-4.34%	0.9851	0.9453	-4.04%	-0.83%	-0.52%	9.77%	8.57%
Logistic Regression GS	F1	0.9172	0.8917	-2.78%	0.9035	0.8571	-5.13%	-1.49%	-3.88%	0.9752	0.9512	-2.46%	0.9767	0.9455	-3.20%	0.16%	-0.61%	6.67%	10.30%
Logistic Regression GS	Accuracy	0.9160	0.8944	-2.36%	0.9020	0.8571	-4.98%	-1.53%	-4.17%	0.9751	0.9503	-2.54%	0.9767	0.9441	-3.34%	0.16%	-0.65%	6.25%	10.14%
Logistic Regression GS - Polynomials	F1	0.9923	0.9277	-6.51%	0.9410	0.8727	-7.26%	-5.17%	-5.93%	0.9969	0.9448	-5.23%	0.9709	0.9390	-3.28%	-2.61%	-0.61%	1.84%	7.60%
Logistic Regression GS - Polynomials	Accuracy	0.9922	0.9255	-6.73%	0.9393	0.8696	-7.43%	-5.33%	-6.04%	0.9969	0.9441	-5.30%	0.9705	0.9379	-3.36%	-2.65%	-0.66%	2.01%	7.86%
K Nearest Neighbors GS	F1	1.0000	0.8250	-17.50%	1.0000	0.8304	-16.96%	0.00%	0.66%	1.0000	0.9080	-9.20%	0.8920	0.7974	-10.61%	-10.80%	-12.18%	10.06%	-3.98%
K Nearest Neighbors GS	Accuracy	1.0000	0.8261	-17.39%	1.0000	0.8199	-18.01%	0.00%	-0.75%	1.0000	0.9068	-9.32%	0.8927	0.8075	-9.55%	-10.73%	-10.96%	9.77%	-1.52%
Decision Trees - No Limits	F1	1.0000	0.7051	-29.49%	1.0000	0.7778	-22.22%	0.00%	10.30%	1.0000	0.9290	-7.10%	1.0000	0.9172	-8.28%	0.00%	-1.27%	31.75%	17.93%
Decision Trees - No Limits	Accuracy	1.0000	0.7143	-28.57%	1.0000	0.7764	-22.36%	0.00%	8.70%	1.0000	0.9317	-6.83%	1.0000	0.9193	-8.07%	0.00%	-1.33%	30.43%	18.40%
Decision Trees - Limits GS	F1	0.8519	0.7482	-12.17%	0.8519	0.7482	-12.17%	0.00%	0.00%	0.9392	0.9620	2.43%	0.9392	0.9620	2.43%	0.00%	0.00%	28.58%	28.58%
Decision Trees - Limits GS	Accuracy	0.8631	0.7826	-9.33%	0.8631	0.7826	-9.33%	0.00%	0.00%	0.9393	0.9627	2.49%	0.9393	0.9627	2.49%	0.00%	0.00%	23.02%	23.02%
Random Forest	F1	0.8779	0.8026	-8.57%	0.8754	0.7947	-9.22%	-0.29%	-0.99%	0.9550	0.9494	-0.59%	0.9567	0.9494	-0.76%	0.17%	0.00%	18.28%	19.46%
Random Forest	Accuracy	0.8631	0.7826	-9.33%	0.8756	0.8075	-7.78%	-0.18%	-0.76%	0.9549	0.9503	-0.48%	0.9565	0.9503	-0.64%	0.16%	0.00%	21.43%	17.69%
XGBoost	F1	0.9640	0.8344	-13.44%	0.9534	0.8516	-10.68%	-1.10%	2.06%	0.9673	0.9689	0.17%	0.9689	0.9625	-0.67%	0.18%	-0.66%	16.12%	13.02%
XGBoost	Accuracy	0.9642	0.8323	-13.68%	0.9533	0.8571	-10.09%	-1.13%	2.98%	0.9673	0.9689	0.17%	0.9690	0.9627	-0.64%	0.17%	-0.64%	16.41%	12.32%