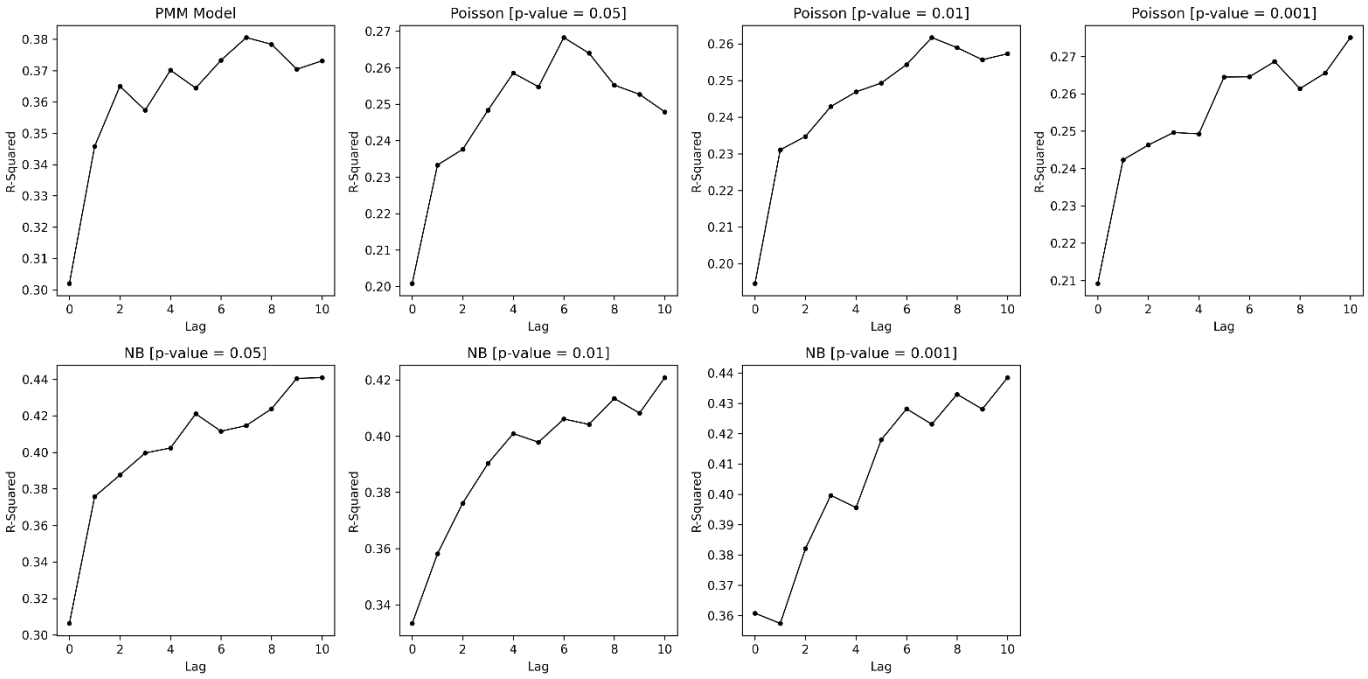
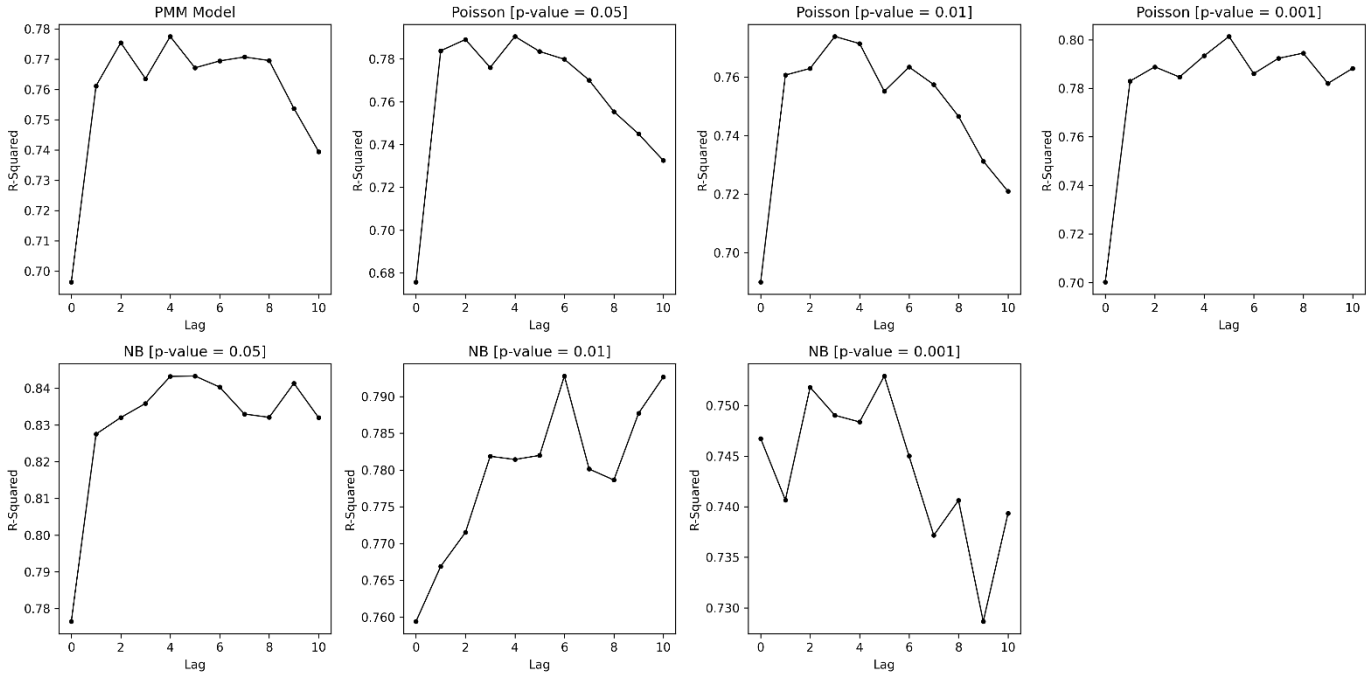
ADDITIONAL RESULTS

Five-fold cross validation results on matched outage and weather training data (hourly outages). Given a p-value threshold, we selected the model with the highest r^2 value using hourly customer outages (negative binomial: NB and Poisson mixture model: PMM).



Five-fold cross validation results on matched outage and weather training data (total outages). Given a p-value threshold, we selected the model with the highest r^2 value using the total number of customer outages (negative binomial: NB and Poisson mixture model: PMM).



Grid search CV results showing best hyperparameter configurations across storm regression models and counties for outages to weather matching scenarios. The values in the table show hourly customer outages predictions in terms of r-squared and rmse error metrics evaluated on the validation data.

OUTAGES TO WEATHER: Hyperparameter Grid Search Selection															
	Random Forest					**K-Nearest Neighbors**					**Poisson**				
County	**Gap**	**Conta**	**Lag**	**Metric**		**Gap**	**Conta**	**Lag**	**Metric**		**Gap**	**Conta**	**Lag**	**Metric**	
				R^2	**rmse**				**R^2**	**rmse**				**R^2**	**rmse**
Nassau	20	0.4	10	0.183	1470.756	8	0.1	1	0.114	882.056	20	0.4	20	0.328	868.245
Queens	5	0.5	1	0.178	740.78	1	0.3	0	0.335	674.549	1	0.1	1	0.134	763.384
Putnam	8	0.4	0	0.206	979.862	1	0.4	0	0.142	1359.41	20	0.1	0	0.282	863.417
Rockland	20	0.5	10	0.159	543.058	20	0.4	5	0.13	438.92	40	0.5	6	0.315	229.552
Washington	20	0.5	9	0.176	3106.045	5	0.3	4	0.122	3170.485	5	0.5	6	0.05	3203.083
Suffolk	8	0.2	7	0.088	1057.634	20	0.1	5	0.063	963.234	40	0.5	10	0.213	807.969
Westchester	1	0.5	10	0.35	561.528	20	0.2	10	0.316	477.796	1	0.1	8	0.491	371.083
Kings	5	0.5	9	0.232	256.559	8	0.2	10	0.157	218.585	8	0.1	4	0.401	138.334
New York	5	0.2	10	0.393	95.72	20	0.2	0	0.185	133.913	40	0.1	10	0.516	91.693
Bronx	1	0.4	3	0.15	328.069	8	0.2	0	0.096	307.038	5	0.1	0	0.188	280.23

Grid search CV results showing best hyperparameter configurations across storm regression models and counties for weather to outages matching scenarios. The values in the table show hourly customer outages predictions in terms of r-squared and rmse error metrics evaluated on the validation data.

WEATHER TO OUTAGES: Hyperparameter Grid Search Selection															
	Random Forest					**K-Nearest Neighbors**					**Poisson**				
County	**Gap**	**Conta**	**Lag**	**Metric**		**Gap**	**Conta**	**Lag**	**Metric**		**Gap**	**Conta**	**Lag**	**Metric**	
				R^2	**rmse**				**R^2**	**rmse**				**R^2**	**rmse**
Nassau	1	0.4	3	0.274	696.889	5	0.1	5	0.185	918.717	1	0.3	10	0.125	829.278
Queens	8	0.3	4	0.073	588.171	20	0.2	0	0.089	581.084	1	0.3	9	0.048	598.486
Putnam	40	0.5	1	0.159	780.442	20	0.1	1	0.177	859.562	5	0.1	7	0.092	851.337
Rockland	8	0.1	3	0.184	211.652	8	0.1	7	0.182	262.935	1	0.1	8	0.133	358.521
Washington	5	0.1	0	0.132	2128.323	8	0.5	3	0.148	2211.137	1	0.1	10	0.029	2246.361
Suffolk	8	0.4	10	0.146	957.286	5	0.2	10	0.127	969.572	8	0.5	10	0.113	985.807
Westchester	40	0.4	1	0.229	464.552	20	0.2	5	0.318	433.762	5	0.3	8	0.100	540.294
Kings	40	0.3	9	0.156	132.463	5	0.1	0	0.120	160.536	40	0.1	10	0.169	125.096
New York	8	0.4	5	0.096	76.214	5	0.1	10	0.140	185.680	20	0.4	10	0.075	56.063
Bronx	40	0.5	10	0.170	192.292	20	0.5	10	0.055	196.413	5	0.4	10	0.108	190.789