Fantasy Football Projections vs Actuals Full PPR (2022–2024)

PYTHON • DATA ANALYSIS • VISUALIZATION

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Project Overview

- Goal: Compare fantasy football projections vs actual performance in Full PPR scoring.
- Scope: NFL seasons 2022–2024, all offensive skill positions plus K and DST.
- Focus: Accuracy over time (by week), by position, and by team.

Data & Tools

- Data: Weekly projected and actual fantasy points for QB, RB, WR, TE, K, DST.
- Timeframe: Regular-season weeks across 2022–2024.
- Tools: Python (pandas, numpy), visualization libraries, AI and PowerPoint for storytelling.

Methodology

- Pulled weekly projected and actual Full PPR fantasy points (2022–2024).Cleaned, merged, and standardized data across positions (QB, RB, WR, TE, K, DST).
- Used pandas (python) to structure player-week datasets and calculate error metrics.
- Built an OLS regression model (Projected Points - Actual Points). R^2 (overall predictive power). Slope (relationship between projected and actual performance).
- **MAE (Mean Absolute Error):** Measures average miss in projected points
- **RMSE (Root Mean Square Error):** Captures size of large misses/volatility.

Regression Analysis

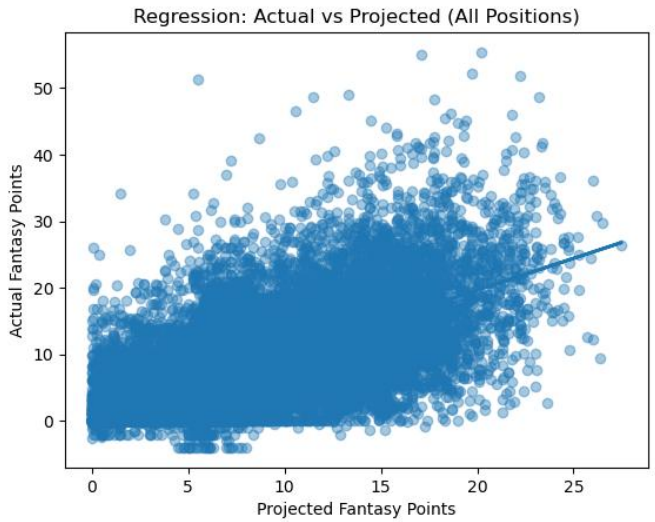
- Ran a Regression Model in Python to see Projects vs Actuals
- Fantasy Football projects explain about 46% of actual fantasy performance.
- The slope is 0.953, meaning projected fantasy points closely scale with actual performance.

OLS Regression Results

Dep. Variable:	Acc_fpts	R-squared:	0.458
Model:	OLS	Adj. R-squared:	0.458
Method:	Least Squares	F-statistic:	1.500e+04
Date:	Tue, 09 Dec 2025	Prob (F-statistic):	0.00
Time:	11:46:20	Log-Likelihood:	-56283.
No. Observations:	17735	AIC:	1.126e+05
Df Residuals:	17733	BIC:	1.126e+05
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	0.5981	0.074	8.090	0.000	0.453	0.743
Proj_fpts	0.9532	0.008	122.455	0.000	0.938	0.968

Omnibus:	3221.828	Durbin-Watson:	2.008
Prob(Omnibus):	0.000	Jarque-Bera (JB):	8351.959
Skew:	0.996	Prob(JB):	0.00
Kurtosis:	5.708	Cond. No.	16.3



Regression Analysis by Position

- RBs are the easiest position to project Highest R^2 (0.50)
- QBs and WRs are moderately predictable R^2 around 0.41
- TEs are unpredictable but projections still help, Highly TD-dependent R^2 = 0.38
- 4. Kickers and DSTs are nearly random week-to-week R^2 of 0.01 (K) and 0.07 (DST) Should NOT be heavily projected, streaming strategies make sense

Regression for Position: RB

OLS Regression Results

Dep. Variable:	Acc_fpts	R-squared:	0.501
Model:	OLS	Adj. R-squared:	0.501
Method:	Least Squares	F-statistic:	3764.
Date:	Tue, 09 Dec 2025	Prob (F-statistic):	0.00
Time:	11:50:43	Log-Likelihood:	-11916.
No. Observations:	3755	AIC:	2.384e+04
Df Residuals:	3753	BIC:	2.385e+04
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	0.3748	0.155	2.421	0.016	0.071	0.678
Proj_fpts	0.9644	0.016	61.355	0.000	0.934	0.995

Regression for Position: WR

OLS Regression Results

Dep. Variable:	Acc_fpts	R-squared:	0.414
Model:	OLS	Adj. R-squared:	0.413
Method:	Least Squares	F-statistic:	4134.
Date:	Tue, 09 Dec 2025	Prob (F-statistic):	0.00
Time:	11:50:43	Log-Likelihood:	-19056.
No. Observations:	5864	AIC:	3.812e+04
Df Residuals:	5862	BIC:	3.813e+04
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	0.4102	0.142	2.888	0.004	0.132	0.689
Proj_fpts	0.9555	0.015	64.293	0.000	0.926	0.985

Regression for Position: QB

OLS Regression Results

Dep. Variable:	Acc_fpts	R-squared:	0.412
Model:	OLS	Adj. R-squared:	0.412
Method:	Least Squares	F-statistic:	1203.
Date:	Tue, 09 Dec 2025	Prob (F-statistic):	2.94e-200
Time:	11:50:43	Log-Likelihood:	-5770.4
No. Observations:	1719	AIC:	1.154e+04
Df Residuals:	1717	BIC:	1.156e+04
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	2.0008	0.400	4.998	0.000	1.216	2.786
Proj_fpts	0.8805	0.025	34.687	0.000	0.831	0.930

Accuracy by Week

```
===== MAE & RMSE BY WEEK =====
    week       MAE      RMSE  Count
0      1  4.085070  5.652716   1065
1      2  4.045438  5.698575   1074
2      3  4.077003  5.889094   1061
3      4  4.303484  6.022942   1062
4      5  4.387393  6.085972    936
5      6  3.957190  5.334892    911
6      7  4.157765  5.653776    895
7      8  3.973424  5.541136   1031
8      9  4.199887  5.873767    883
9     10  3.996811  5.621463    878
10    11  4.181949  5.882200    903
11    12  3.978512  5.547233    968
12    13  4.101569  5.779486    956
13    14  4.014486  5.815213    856
14    15  4.211727  5.920298   1083
15    16  4.241127  5.860406   1065
16    17  4.357667  6.146336   1063
17    18  4.196459  5.794585   1045

===== ERROR BY SEASON PERIOD =====
  season_period       MAE      RMSE  Count
0   Early (1-6)  4.141922  5.790378   6109
1  Late (13-18)  4.194644  5.892093   6068
2    Mid (7-12)  4.077546  5.683034   5558
```

- Computing MAE/RMSE by week to understand where projections miss most.
- Weekly Accuracy Results. Most weeks are extremely consistent, On average, projections are off by ~4 points every week.
- Best Weeks (lowest error): Week 6 3.957-Most predictable week of the season, Week 1–2 ~4.04-Very strong prediction weeks, Week 7 4.15-Comfortable accuracy zone
- Worst Week (highest error): Week 9 4.199-5.87-Highest variance week, Weeks 14, 15, and 18 also show slightly elevated error.

Accuracy by Week

```
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```
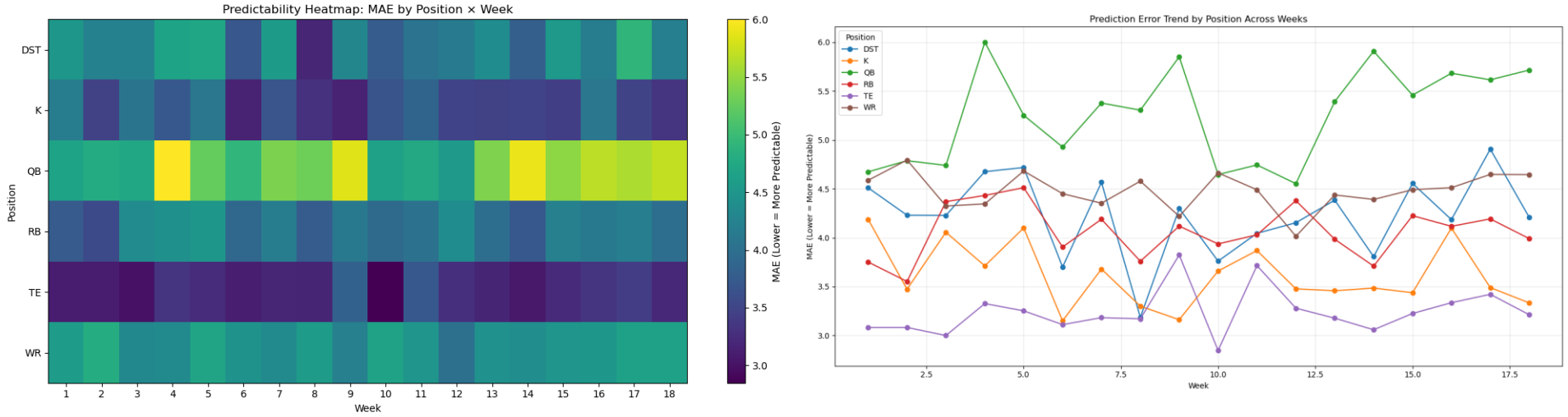

- Early vs Mid vs Late Season Accuracy: Early (1–6)-4.1419-5.790-Very stable predictions
- Mid (7–12)4.0775 5.683-Most accurate period of the season.
- Late (13–18)-4.1946-5.89-Least accurate period, but still solid.
- Mid-season weeks (7–12) show the strongest accuracy, likely due to stable player usage and reduced early-season uncertainty.
- Late-season weeks (13–18) show slightly higher error, reflecting injuries, role changes, and increased volatility.

Position-Level Predictability



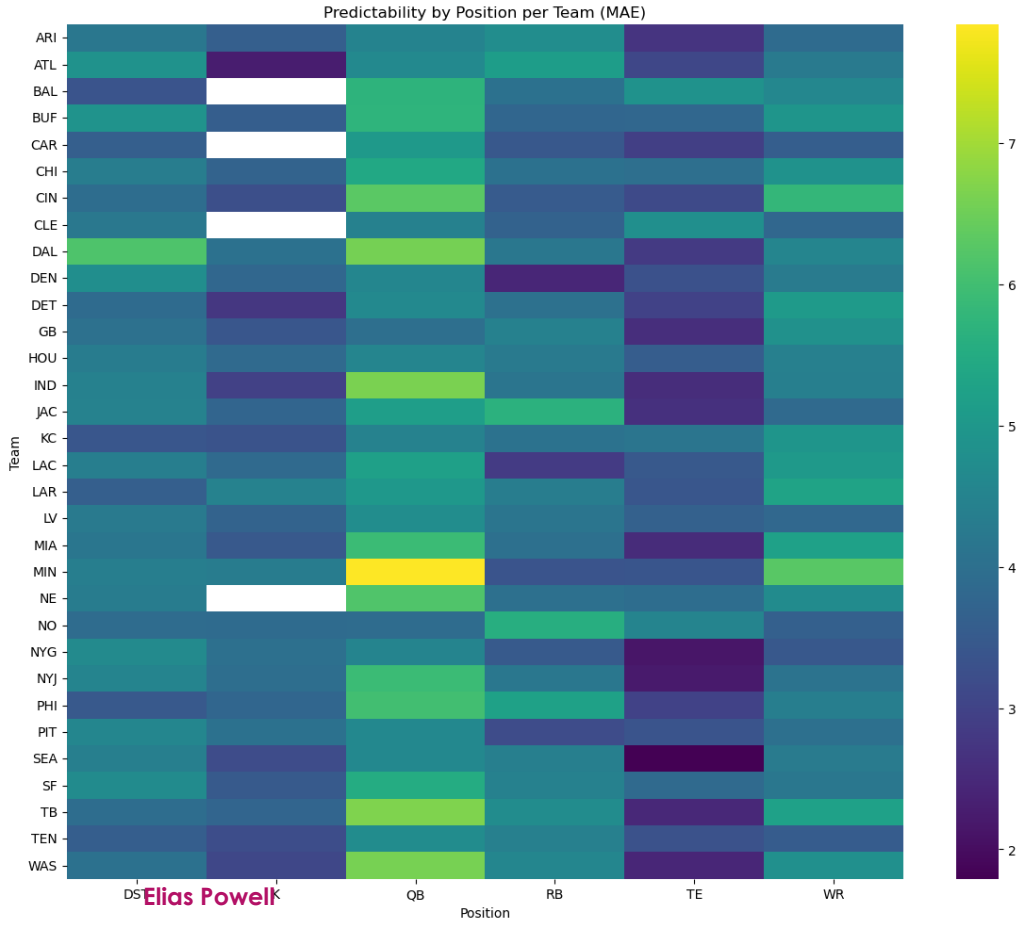
- The fantasy positions with the most stable projections over the season are TE and RB, while QB and DST show the highest volatility.
- Mid-season (Weeks 7–12) is consistently the most predictable window across all positions.
- RB & TE - lowest and flattest MAE curves (best prediction consistency).
- QB - highest error overall and largest spikes (injuries + game scripts).
- DST/K - middle of the pack overall.
- WR trends closely to RB but slightly higher error.

Team-Level Insights

	team	MAE	RMSE	Bias	Count
20	MIN	4.513919	6.425915	0.365201	546
28	SF	4.276341	5.994742	0.365750	727
2	BAL	4.551930	6.333888	0.429474	570
14	JAC	3.876471	5.443732	0.471197	493
11	GB	4.111111	5.720116	0.540171	585
9	DEN	3.594571	5.220136	0.604378	571
27	SEA	3.878557	5.641688	0.627835	485
6	CIN	4.350845	6.334879	0.685980	592
29	TB	4.326195	6.138145	0.755258	523
10	DET	4.072253	5.939876	0.770950	537

- Most predictable teams: NYG, DEN, CAR, PIT, TEN, ARI, JAC, SEA, LAC. These teams stay within a tight error band (MAE ~3.5–4.0), meaning their weekly output matched projections closely
- Least predictable teams: BAL, MIN, BUF, DAL, LAR. These had the highest MAE (~4.5–4.6), meaning they consistently broke the model, boom/bust weeks, unexpected roles, or lots of variance.
- Teams that beat projections (underprojected): DET, TB, CIN, SEA, DEN, GB, JAC, BAL. These teams overperformed relative to projections (positive bias). Detroit being the strongest "value" (Bias ~0.77).
- Teams that UNDERperformed projections (overprojected): TEN, KC, WAS, ATL, LV, MIA

Team-Level Insights



- Teams with brightest/yellow QB cells: MIN – Chaotic QB, MAE near 7–8, extremely unstable, MIA – Chaotic QB.
- Teams with high MAE for WR: CHI, MIA , MIN,
- Predictable WR rooms: GB, DET
- RB Predictability Patterns: CAR, JAC
- Chaotic RB teams: SF , NO, MIN
- TE Predictability Most Predictable: CAR,SEA,GB

Key Takeaways & Next Steps

- Fantasy projections explained **~46%** of actual outcomes, meaning projections are useful but still leave room for volatility.
- Some positions are predictable, while others are just chaos. **Most predictable**: RB, TE. Moderately predictable: QB, WR.
- Weeks **7–12** consistently delivered the **best and most stable** projection accuracy. Early weeks = uncertainty. Late weeks = injuries + role shifts + volatility.
- **Most predictable offenses:** NYG, DEN, CAR, PIT, TEN, ARI, JAC, SEA, LAC. **Least predictable:** BAL, MIN, BUF, DAL, LAR.
- Next Steps: Import the 2025 season and compare to this analysis to see if any key metrics change.