Shrub establishment models

**One variable:**

Call: glm(formula = NewShrubEnd ~ ShrubProportionStart, family = binomial, data = shrubAdjacency)

Deviance Residuals:

Min 1Q Median 3Q Max

-0.5295 -0.5116 -0.4689 -0.4001 2.4414

Coefficients:

Estimate Std. Error z value Pr(>|z|)

(Intercept) -2.92810 0.01950 -150.1 <2e-16 \*\*\*

ShrubProportionStart 1.07137 0.02492 43.0 <2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 239539 on 357741 degrees of freedom

Residual deviance: 237498 on 357740 degrees of freedom

AIC: 237502

Number of Fisher Scoring iterations: 5

McFadden R squared: 0.008522 (df = 2)

**Two variables:**

Call: glm(formula = NewShrubEnd ~ ShrubProportionStart + SoilType, family = binomial, data = shrubAdjacency)

Deviance Residuals:

Min 1Q Median 3Q Max

-0.7007 -0.5090 -0.4733 -0.4010 2.4624

Coefficients:

Estimate Std. Error z value Pr(>|z|)

(Intercept) -2.979557 0.035367 -84.248 < 2e-16 \*\*\*

ShrubProportionStart 1.119812 0.026711 41.923 < 2e-16 \*\*\*

SoilTypeBottomland 0.619193 0.096168 6.439 1.21e-10 \*\*\*

SoilTypeGravelly and Calcic 0.060984 0.036118 1.688 0.09132 .

SoilTypeLoamy-Clayey 0.091500 0.032968 2.775 0.00551 \*\*

SoilTypeSandy and Deep Sand -0.002804 0.029297 -0.096 0.92376

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 239539 on 357741 degrees of freedom

Residual deviance: 237426 on 357736 degrees of freedom

AIC: 237438

Number of Fisher Scoring iterations: 5

McFadden R squared: 0.008823 (df = 6)

**Three variables:**

Call: glm(formula = NewShrubEnd ~ ShrubProportionStart + SoilType + yearType, family = binomial, data = shrubAdjacency)

Deviance Residuals:

Min 1Q Median 3Q Max

-1.0948 -0.4470 -0.4037 -0.3285 2.7808

Coefficients:

Estimate Std. Error z value Pr(>|z|)

(Intercept) -3.85503 0.04425 -87.122 < 2e-16 \*\*\*

ShrubProportionStart 1.23617 0.02755 44.864 < 2e-16 \*\*\*

SoilTypeBottomland 0.45177 0.10027 4.506 6.62e-06 \*\*\*

SoilTypeGravelly and Calcic 0.03261 0.03723 0.876 0.381

SoilTypeLoamy-Clayey 0.05378 0.03397 1.583 0.113

SoilTypeSandy and Deep Sand -0.03276 0.03018 -1.086 0.278

yearTypeNormal 0.48361 0.02635 18.354 < 2e-16 \*\*\*

yearTypeWet 2.01225 0.02715 74.103 < 2e-16 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 239539 on 357741 degrees of freedom

Residual deviance: 221384 on 357734 degrees of freedom

AIC: 221400

Number of Fisher Scoring iterations: 5

McFadden R squared: 0.07579 (df=8)

**The three variable model has the best fit, but adding drought year type made the Loamy-Clayey soil type insignificant**

**Three variables with interaction:**

Call: glm(formula = NewShrubEnd ~ ShrubProportionStart \* yearType + SoilType, family = binomial, data = shrubAdjacency)

Deviance Residuals:

Min 1Q Median 3Q Max

-1.0390 -0.4606 -0.4033 -0.3156 2.7271

Coefficients:

Estimate Std. Error z value Pr(>|z|)

(Intercept) -3.68828 0.10084 -36.574 < 2e-16 \*\*\*

ShrubProportionStart 1.02351 0.12211 8.382 < 2e-16 \*\*\*

yearTypeNormal 0.02992 0.10045 0.298 0.7658

yearTypeWet 2.22237 0.10092 22.022 < 2e-16 \*\*\*

SoilTypeBottomland 0.43709 0.10030 4.358 1.31e-05 \*\*\*

SoilTypeGravelly and Calcic 0.03105 0.03716 0.836 0.4034

SoilTypeLoamy-Clayey 0.04330 0.03398 1.274 0.2025

SoilTypeSandy and Deep Sand -0.03556 0.03013 -1.180 0.2379

ShrubProportionStart:yearTypeNormal 0.59172 0.12687 4.664 3.10e-06 \*\*\*

ShrubProportionStart:yearTypeWet -0.30453 0.12815 -2.376 0.0175 \*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 239539 on 357741 degrees of freedom

Residual deviance: 221098 on 357732 degrees of freedom

AIC: 221118

Number of Fisher Scoring iterations: 5

McFadden R squared: 0.07698 (df=10)

**Adding an interaction term improves the model’s fit, but also makes the effect of normal drought years insignificant.**