

Random Forest - 'All' dataset

883 samples

14 predictor

No pre-processing

Resampling: Cross-Validated (10 fold, repeated 5 times)

Summary of sample sizes: 794, 794, 795, 794, 795, 795, ...

Resampling results:

RMSE	R^2	MAE
0.008593839	0.6392664	0.003683088

Tuning parameter 'mtry' was held constant at a value of 5.

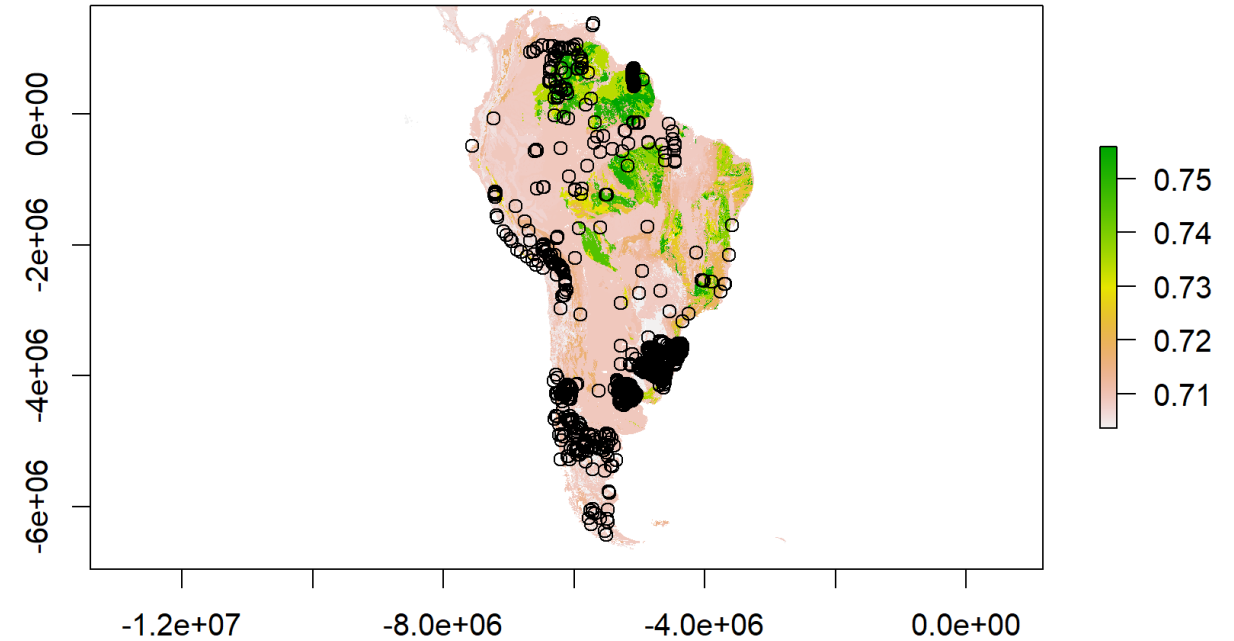


Fig. S1: 'All' dataset sample distribution

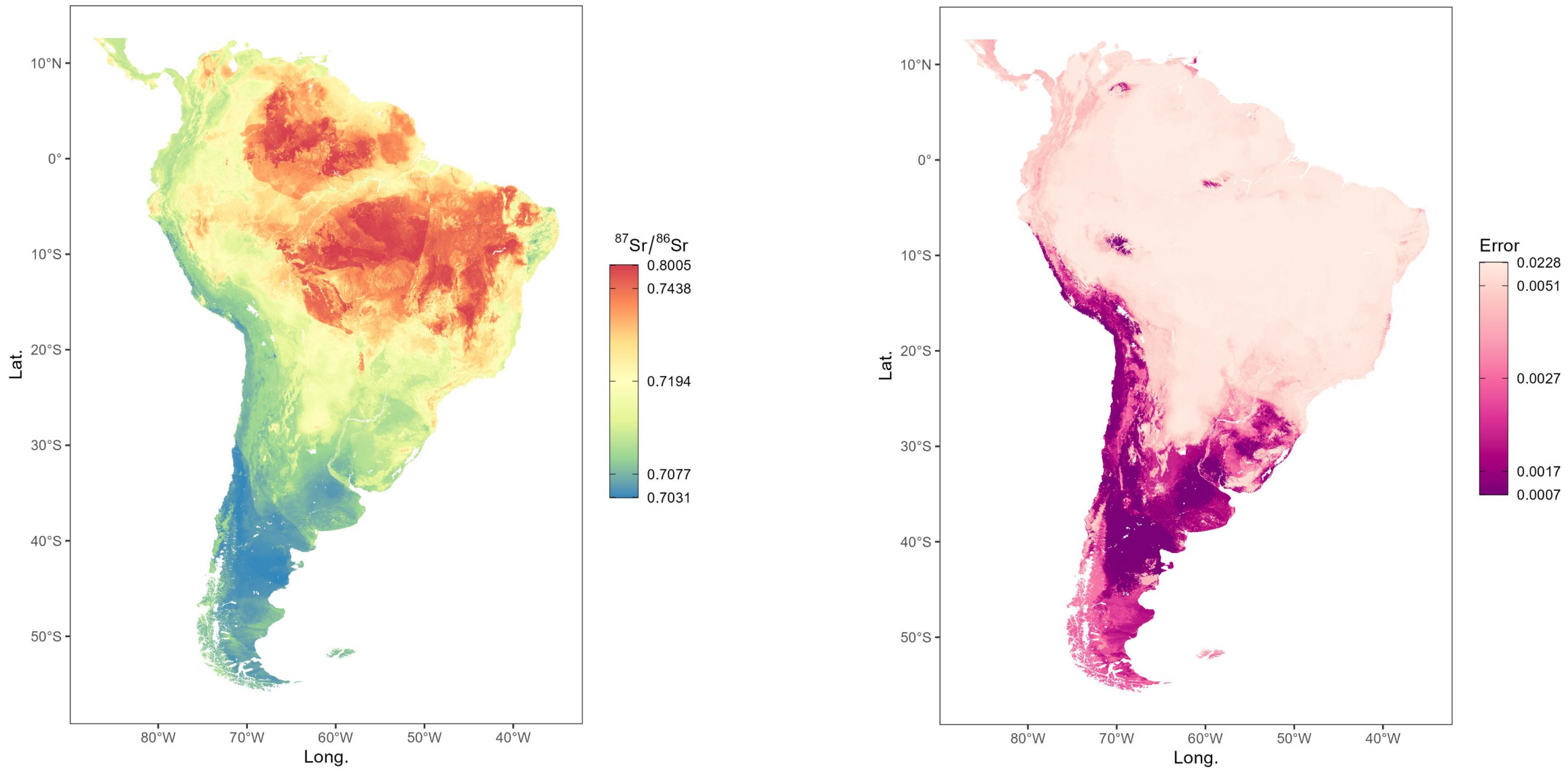


Fig. S2: Spatial distribution of strontium isotopes in South America based on all samples (883 sites). Isoscape RF model (a) and associated spatial uncertainty map (b).

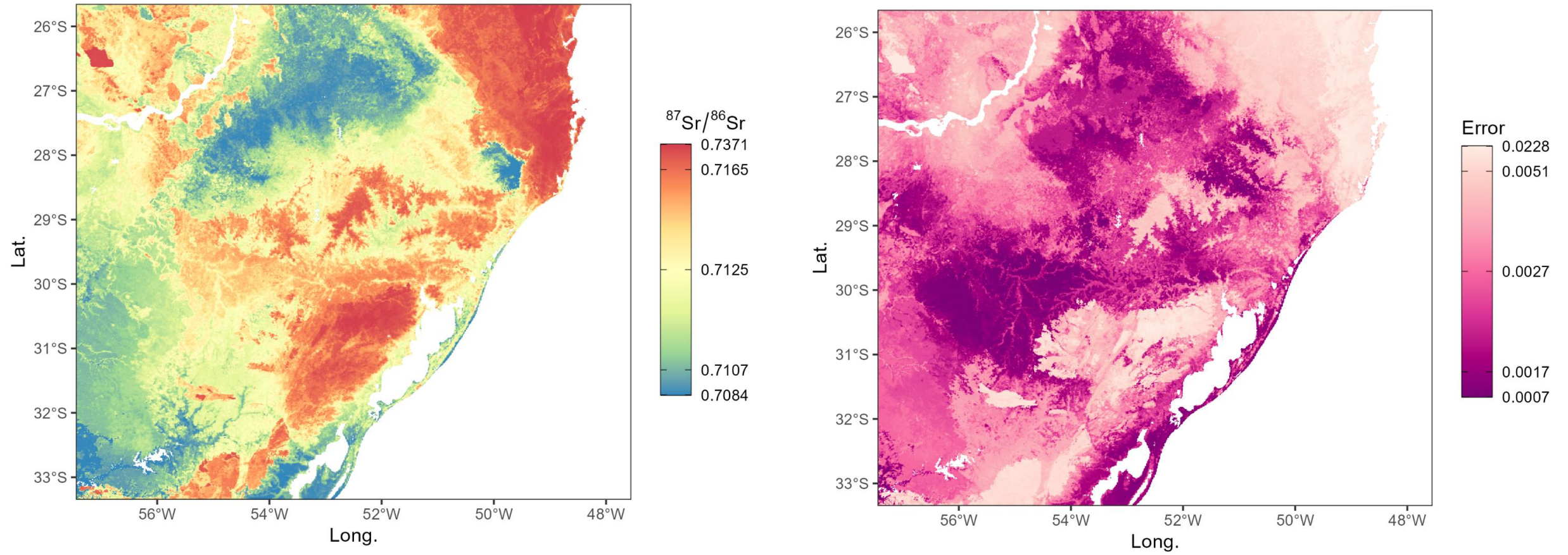


Fig. S3: Spatial distribution of strontium isotopes in Santa Catarina and Rio Grande do Sul states based on all samples (883 sites). Isoscape RF model (a) and associated spatial uncertainty map (b).

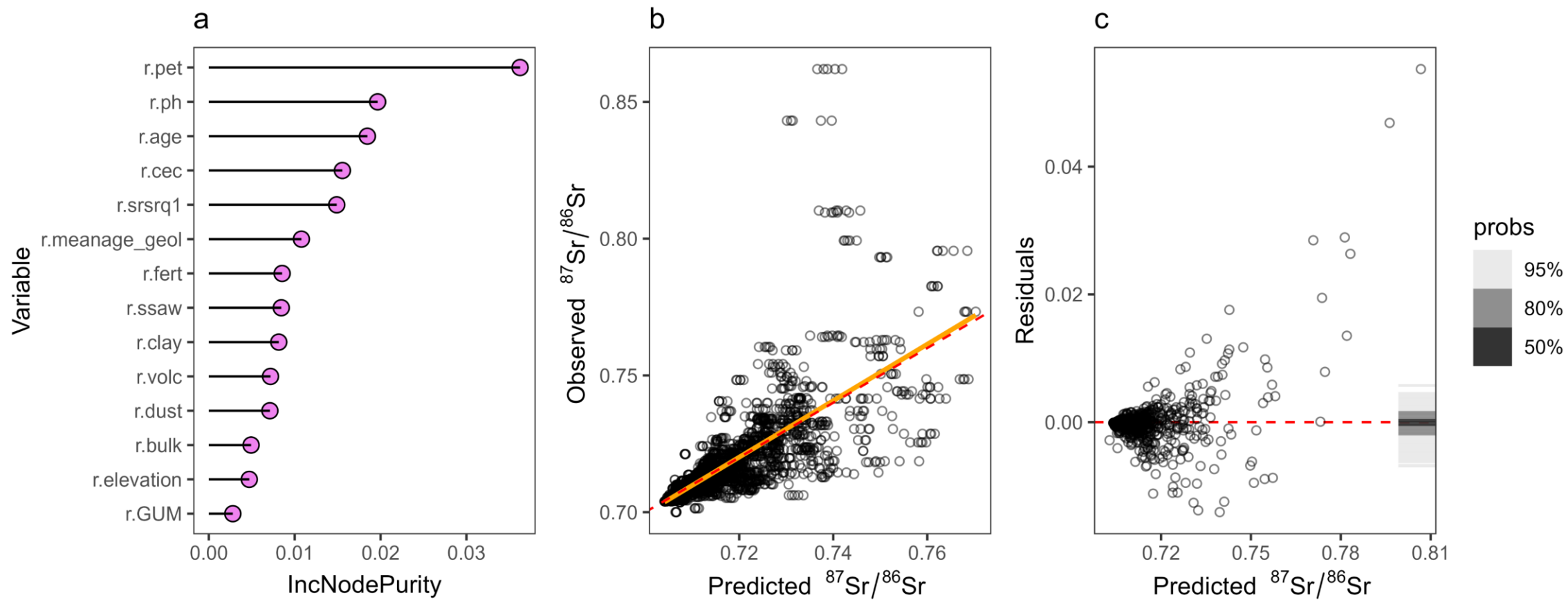


Fig. S4: Predictive variables and model accuracy for RF model based on plant samples. Increase in Node Purity (IncNodePurity) of the $n = 14$ external predictors (a); cross-validation scatterplot of observed vs. predicted $^{87}\text{Sr}/^{86}\text{Sr}$ values for the test-validation sample splits (b); model residuals vs. predicted $^{87}\text{Sr}/^{86}\text{Sr}$ ratios (c).

Random Forest - Fauna+Plant+Human+Lichen

661 samples
14 predictor

No pre-processing
Resampling: Cross-Validated (10 fold, repeated 5 times)
Summary of sample sizes: 595, 594, 594, 594, 596, 593, ...
Resampling results:

RMSE	R ²	MAE
0.004937307	0.7597129	0.002286145

Tuning parameter 'mtry' was held constant at a value of 5

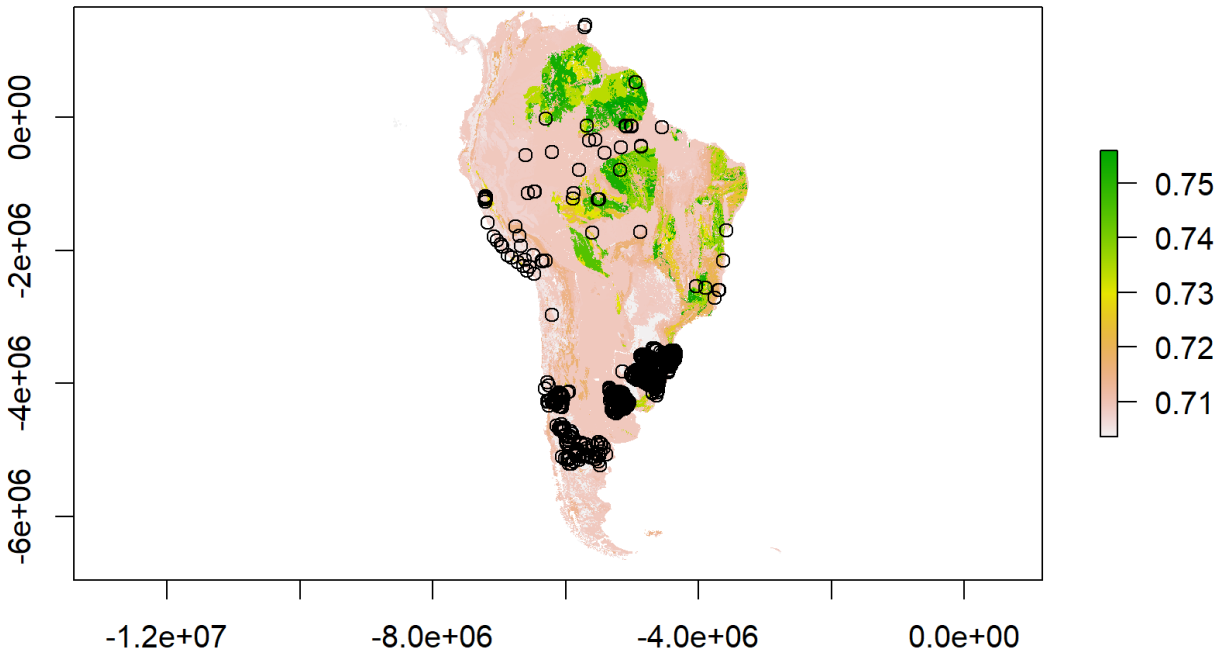


Fig. S5: Fauna+Plant+Human+Lichen dataset sample distribution

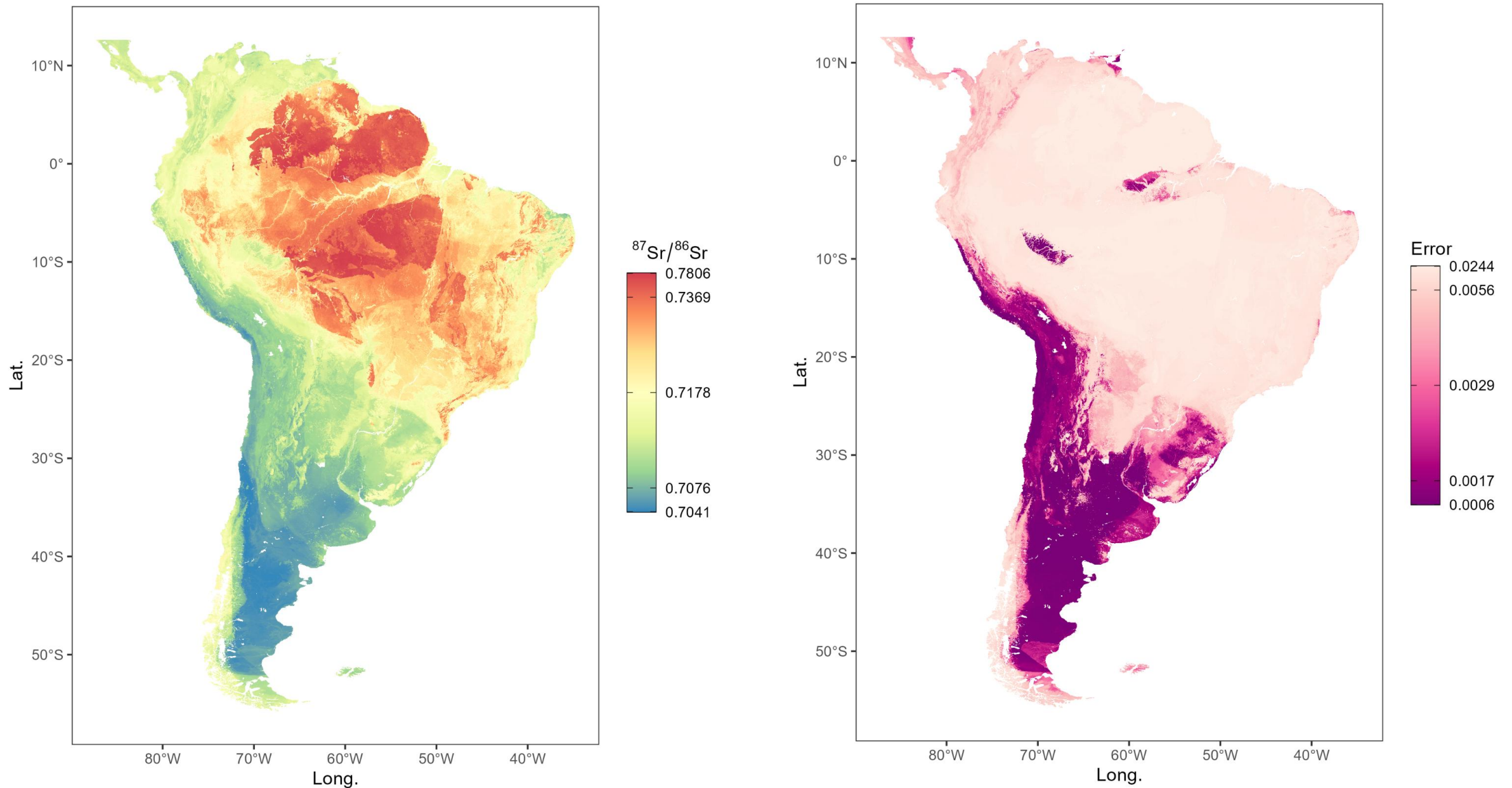


Fig. S6: Spatial distribution of strontium isotopes in South America based on Fauna+Plant+Human+Lichen samples (661 sites). Isoscape RF model (a) and associated spatial uncertainty map (b).

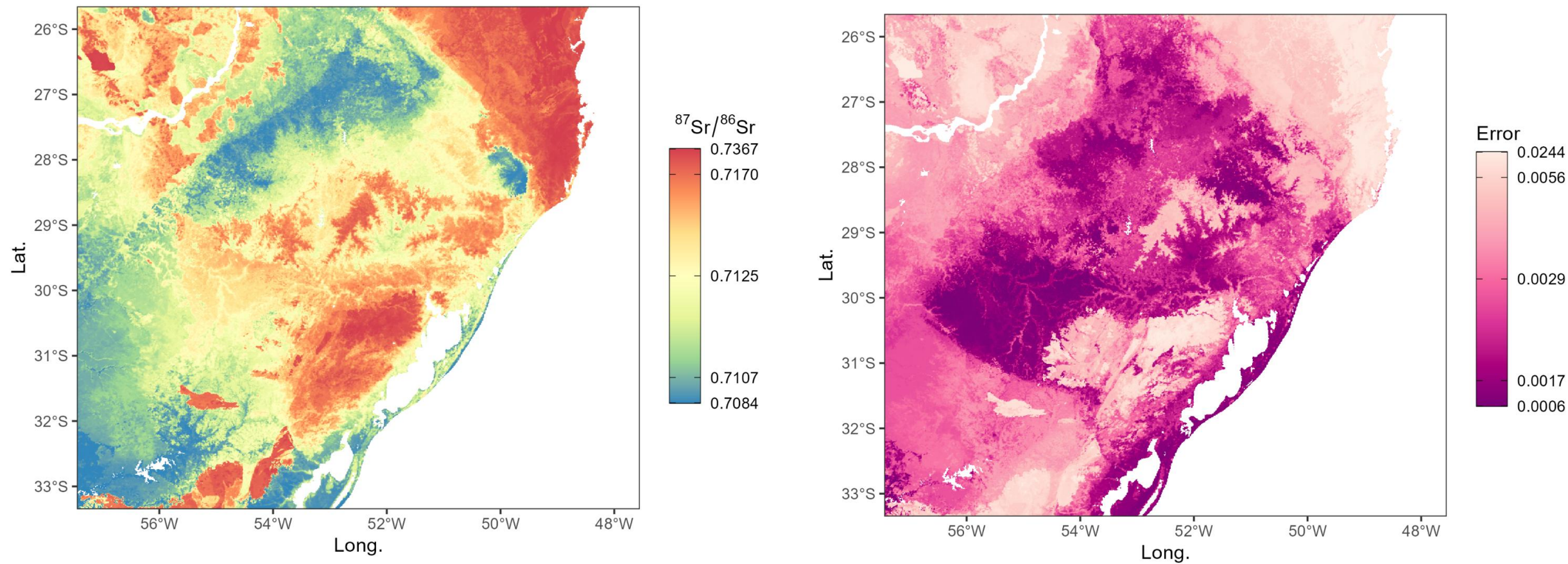


Fig. S7: Spatial distribution of strontium isotopes in Santa Catarina and Rio Grande do Sul states based on Fauna+Plant+Human samples (661 sites). Isoscape RF model (a) and associated spatial uncertainty map (b).

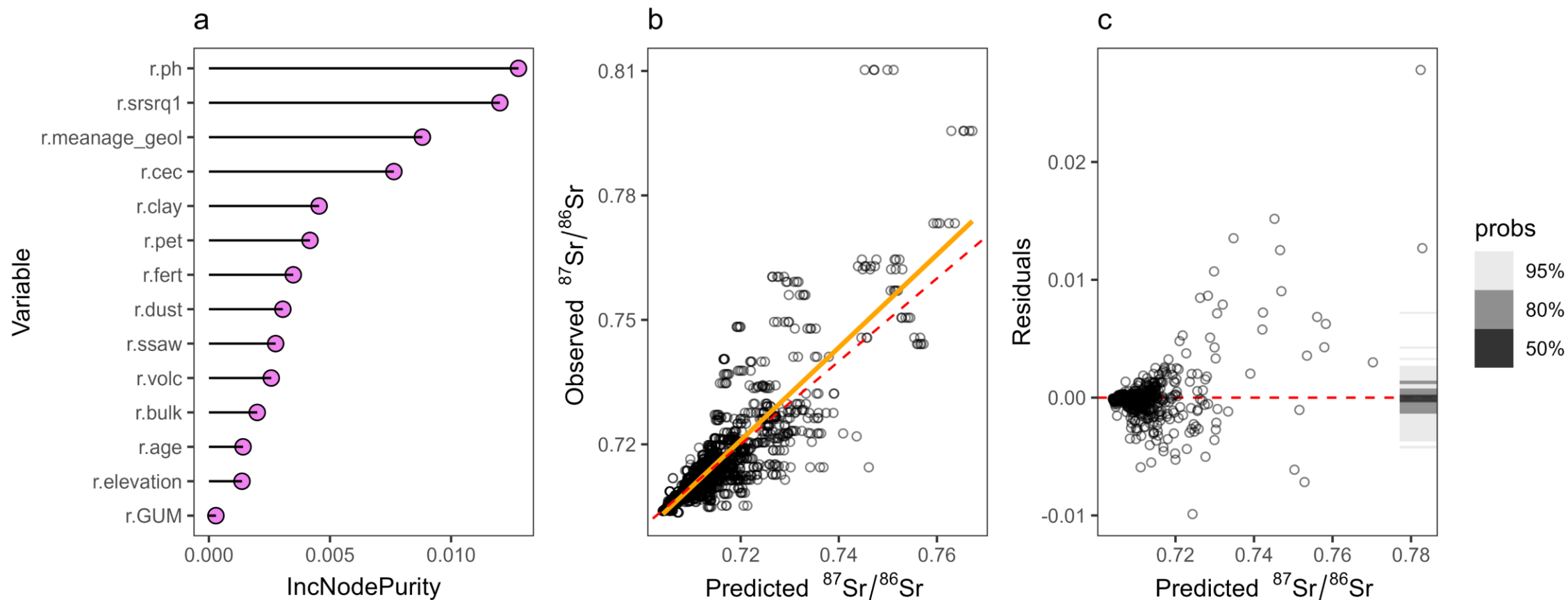


Fig. S8: Predictive variables and model accuracy for RF model based on plant samples. Increase in Node Purity (IncNodePurity) of the $n = 14$ external predictors (a); cross-validation scatterplot of observed vs. predicted $^{87}\text{Sr}/^{86}\text{Sr}$ values for the test-validation sample splits (b); model residuals vs. predicted $^{87}\text{Sr}/^{86}\text{Sr}$ ratios (c).