Wrangling Natural Factors data

Daymetr package and Raster images

Variables of Interest

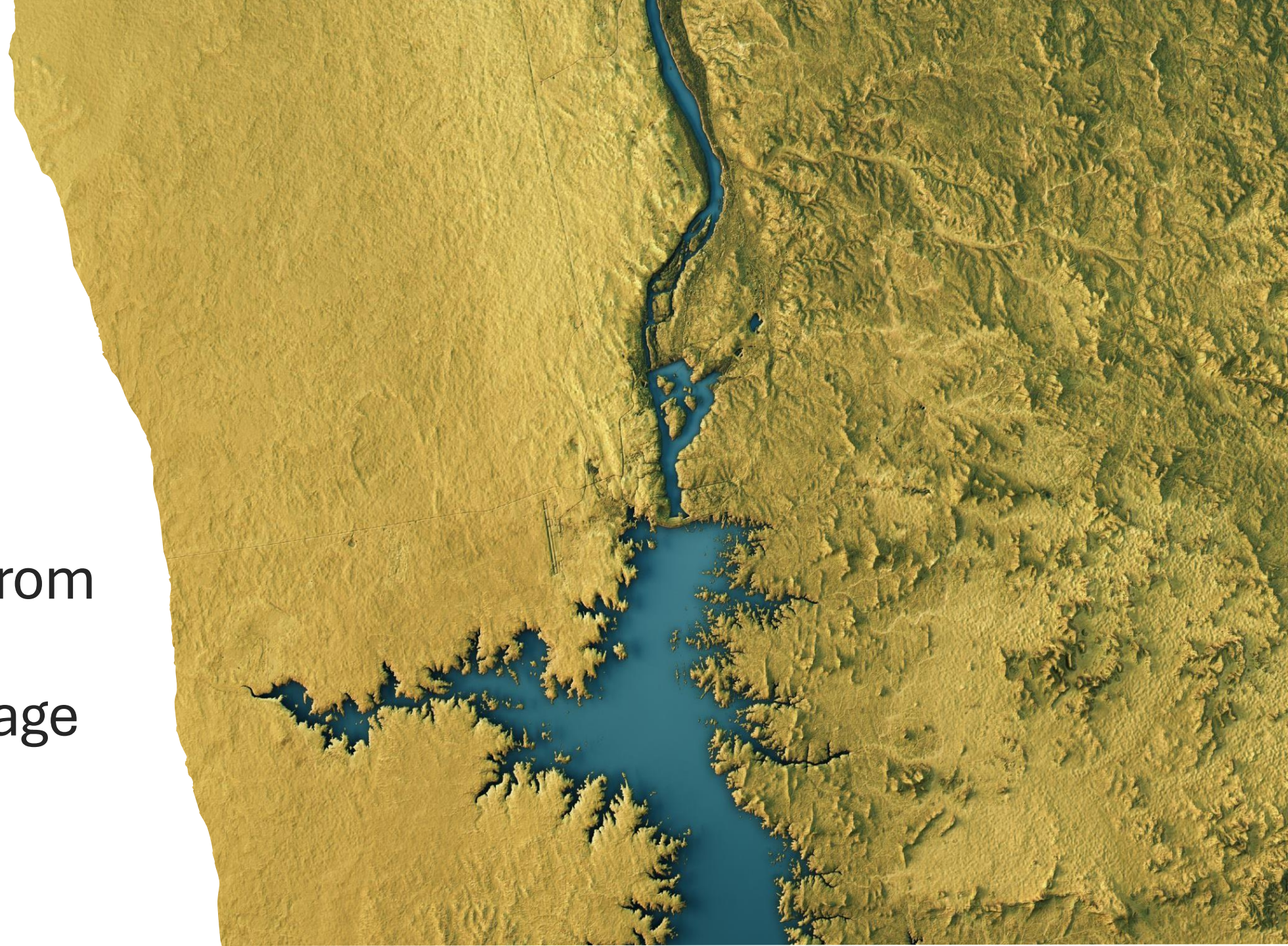
PRECIPITATION

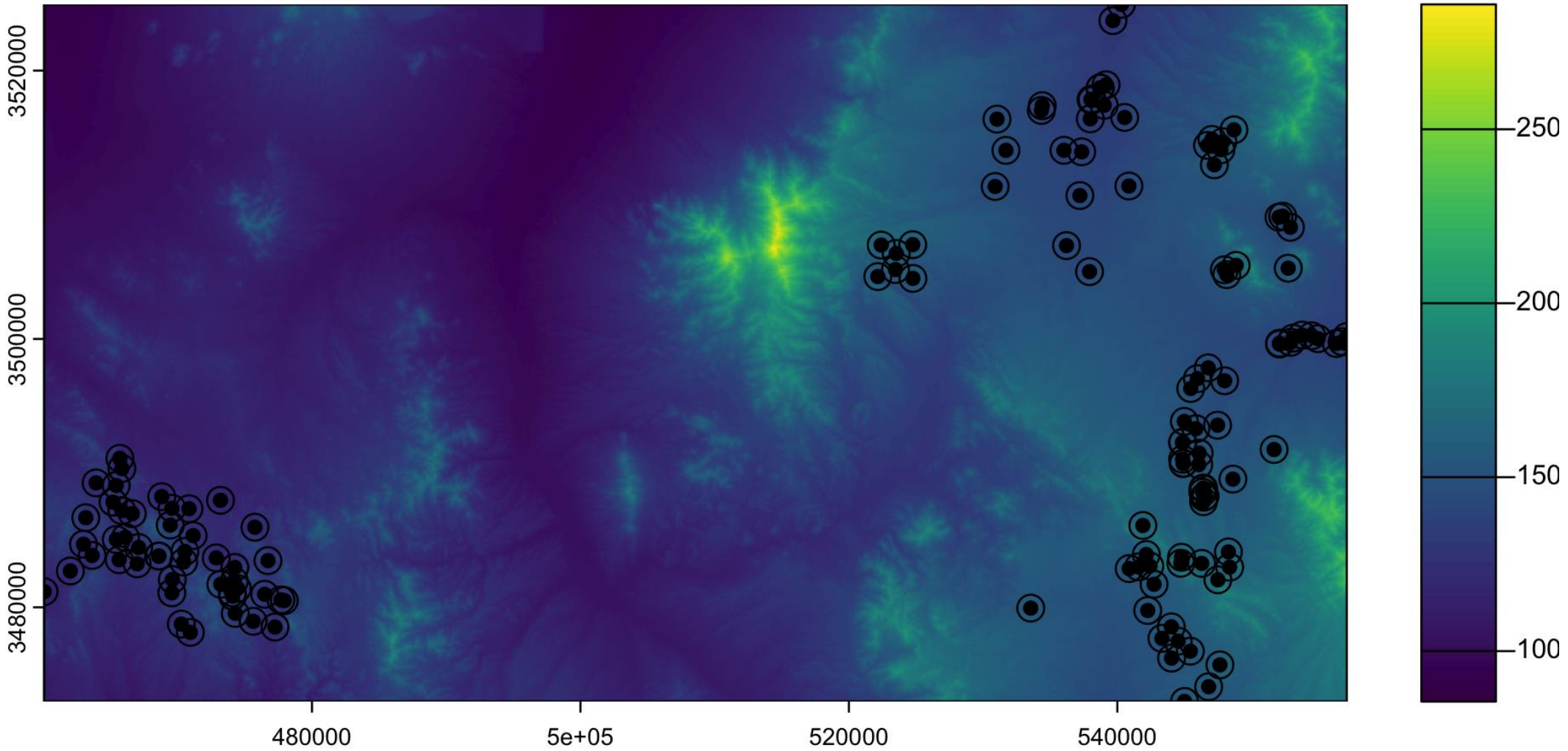
TEMPERATURE

TOPOGRAPHY

VEGETATION

Extracting from local raster satellite image

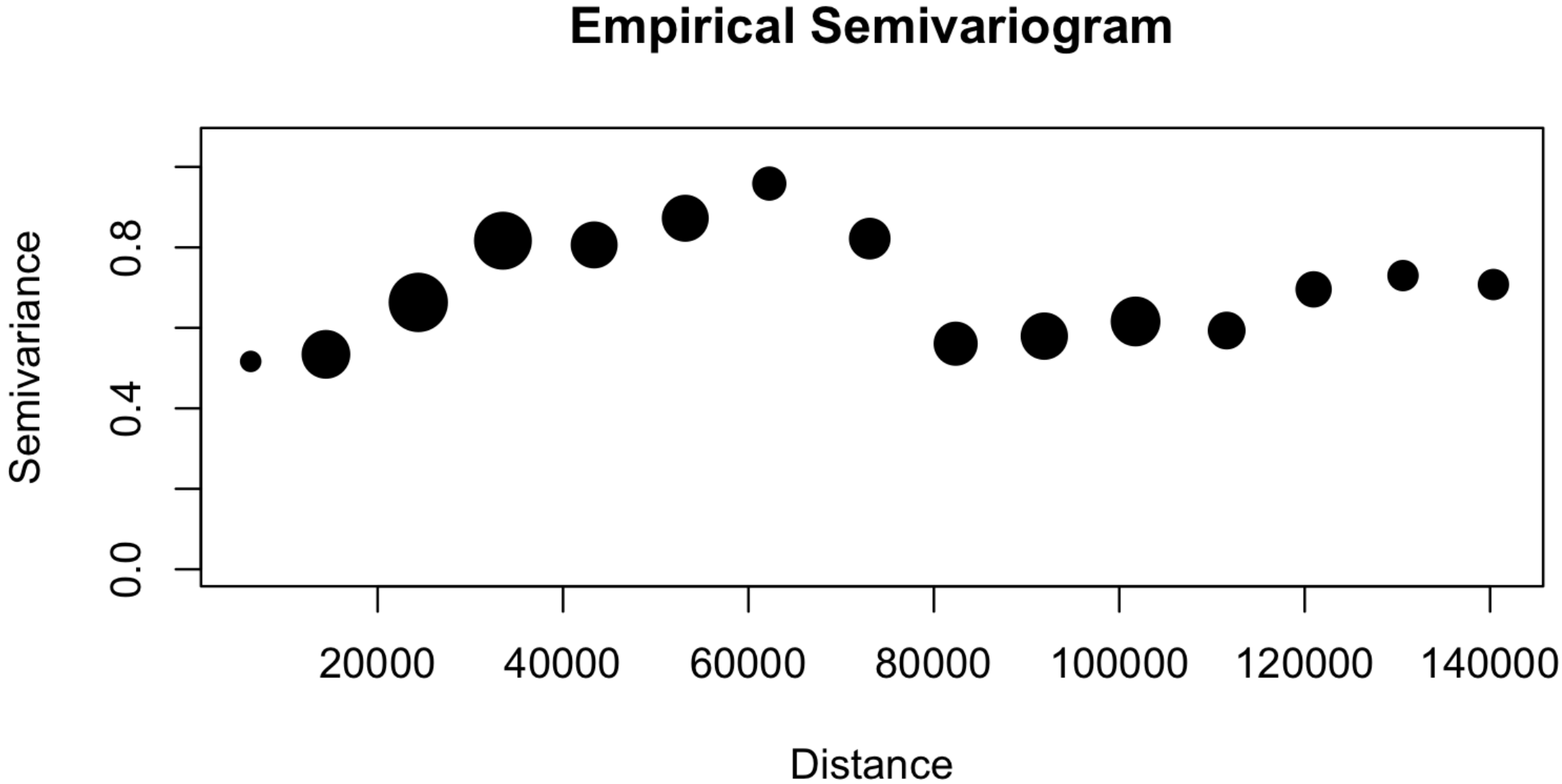



3520000
3500000
3480000
480000
5e+05
520000
540000
250
200
150
100

Daymetr package for precipitation and temperature

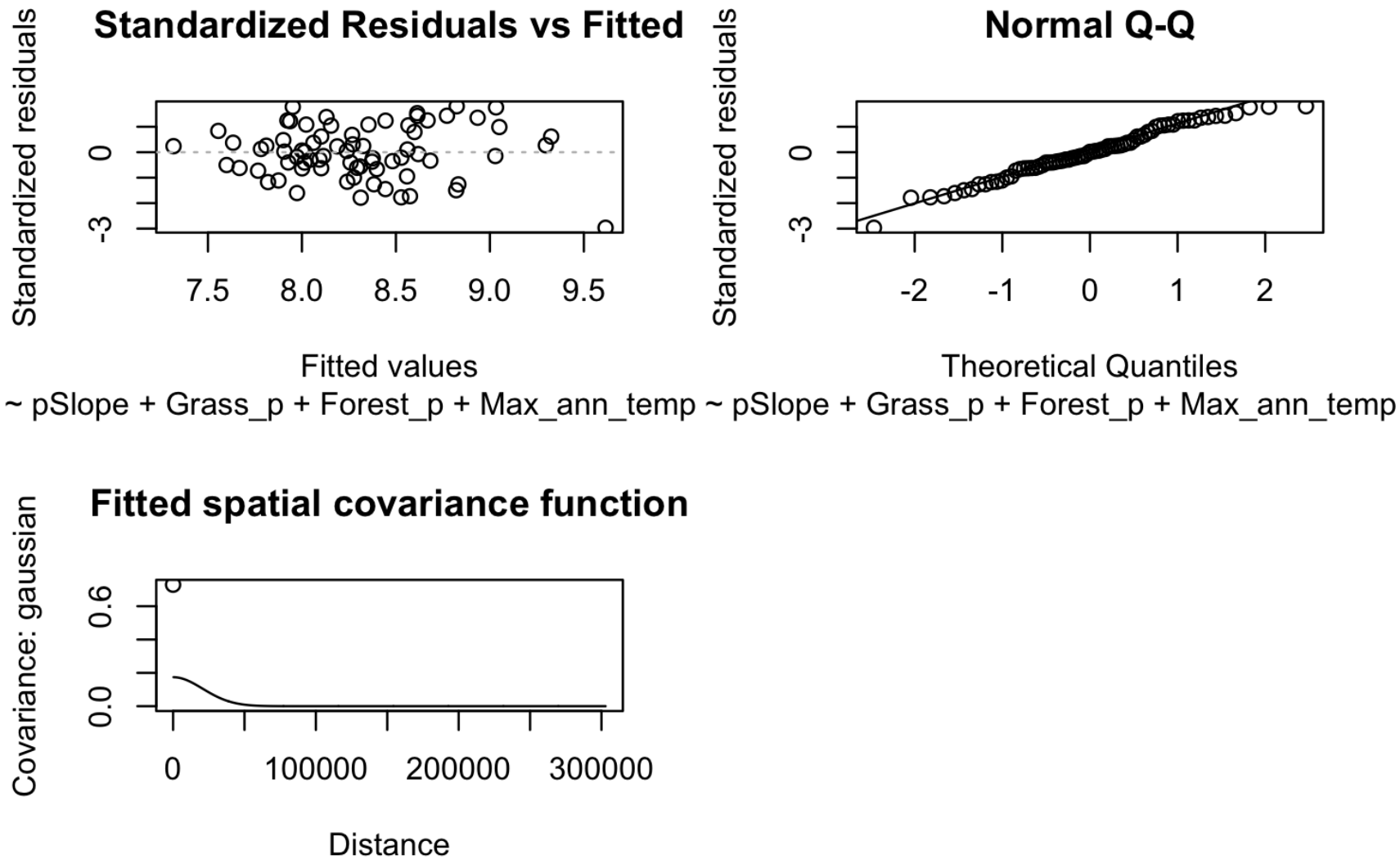
Choosing best model AIC

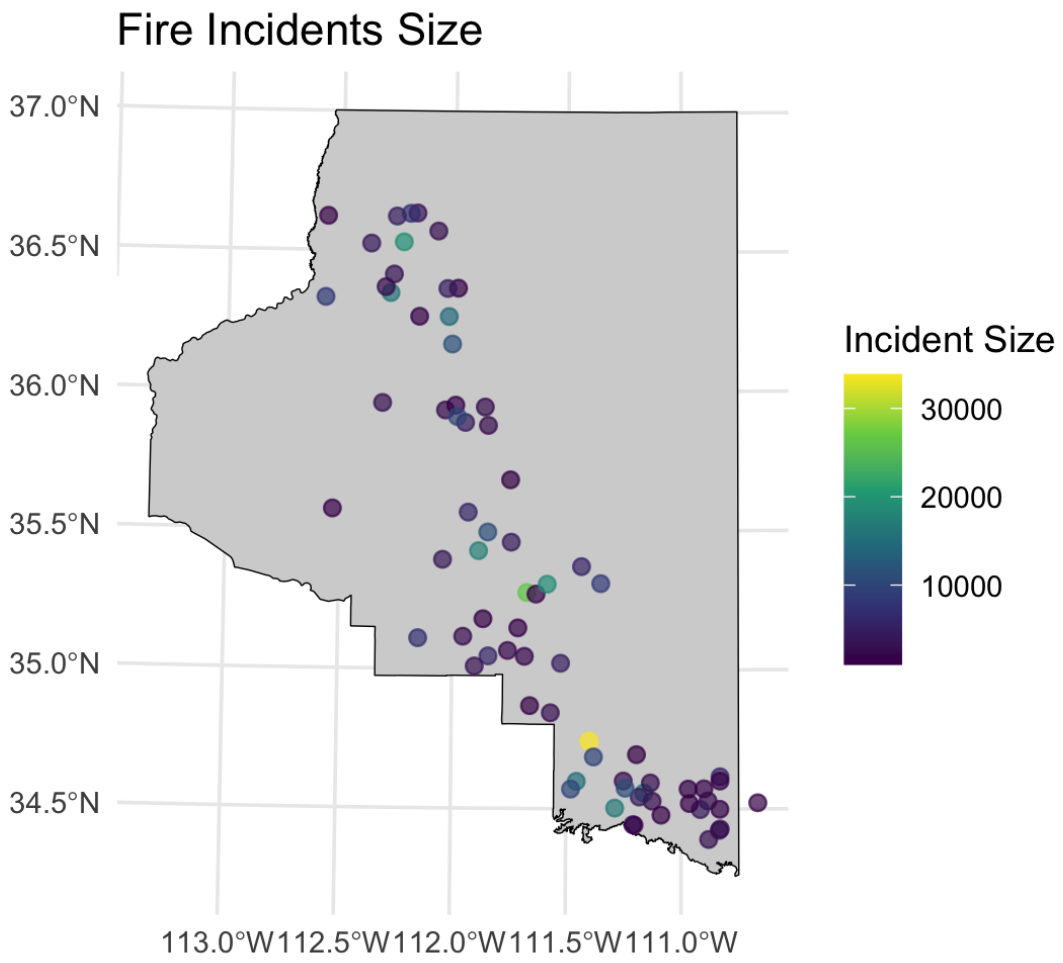
- spmod <- `splm(log(Size) ~ pSlope + Grass_p + Forest_p + Max_ann_temp + Min_ann_temp + Prcp_ann + pop_density + Population + Pri_rd, data = coconino_sf, spcov_type = "gaussian")`

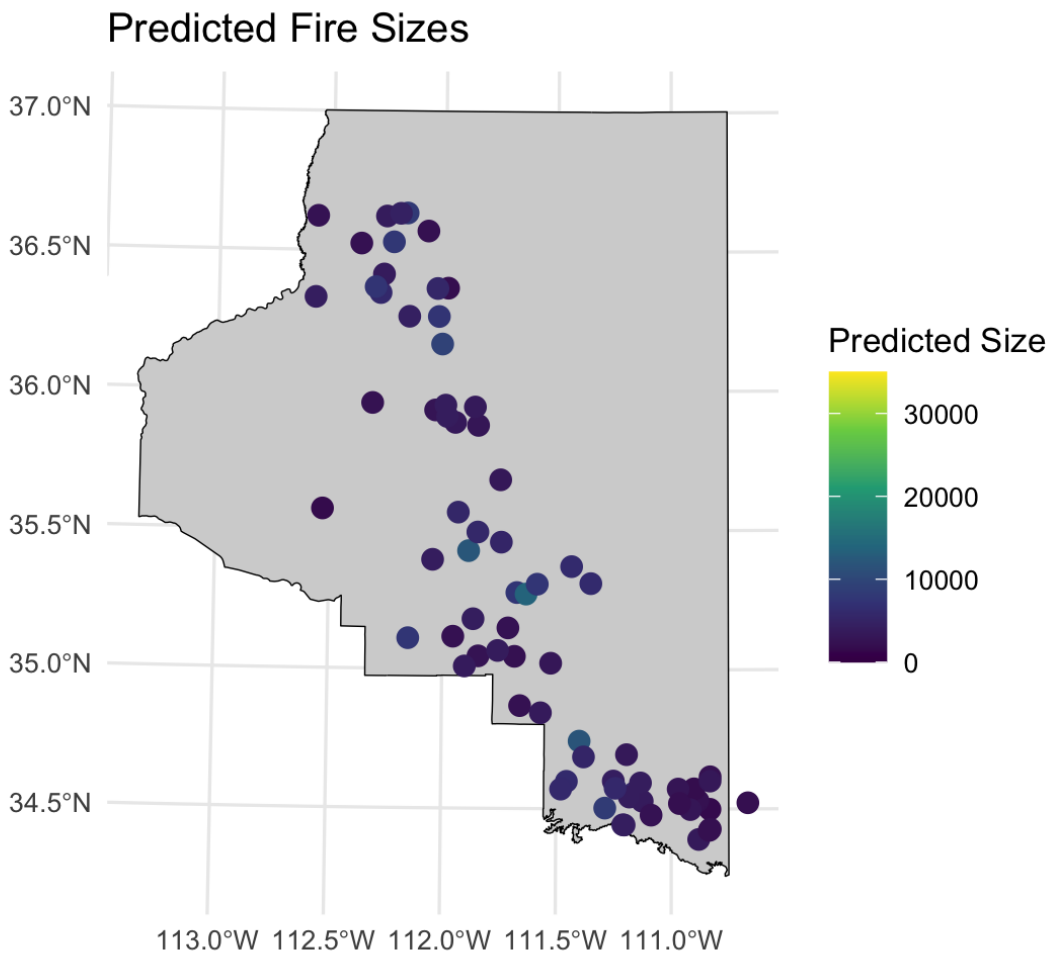

Empirical Semivariogram
Semivariance
0.0
0.4
0.8
20000
40000
60000
80000
100000
120000
140000
Distance

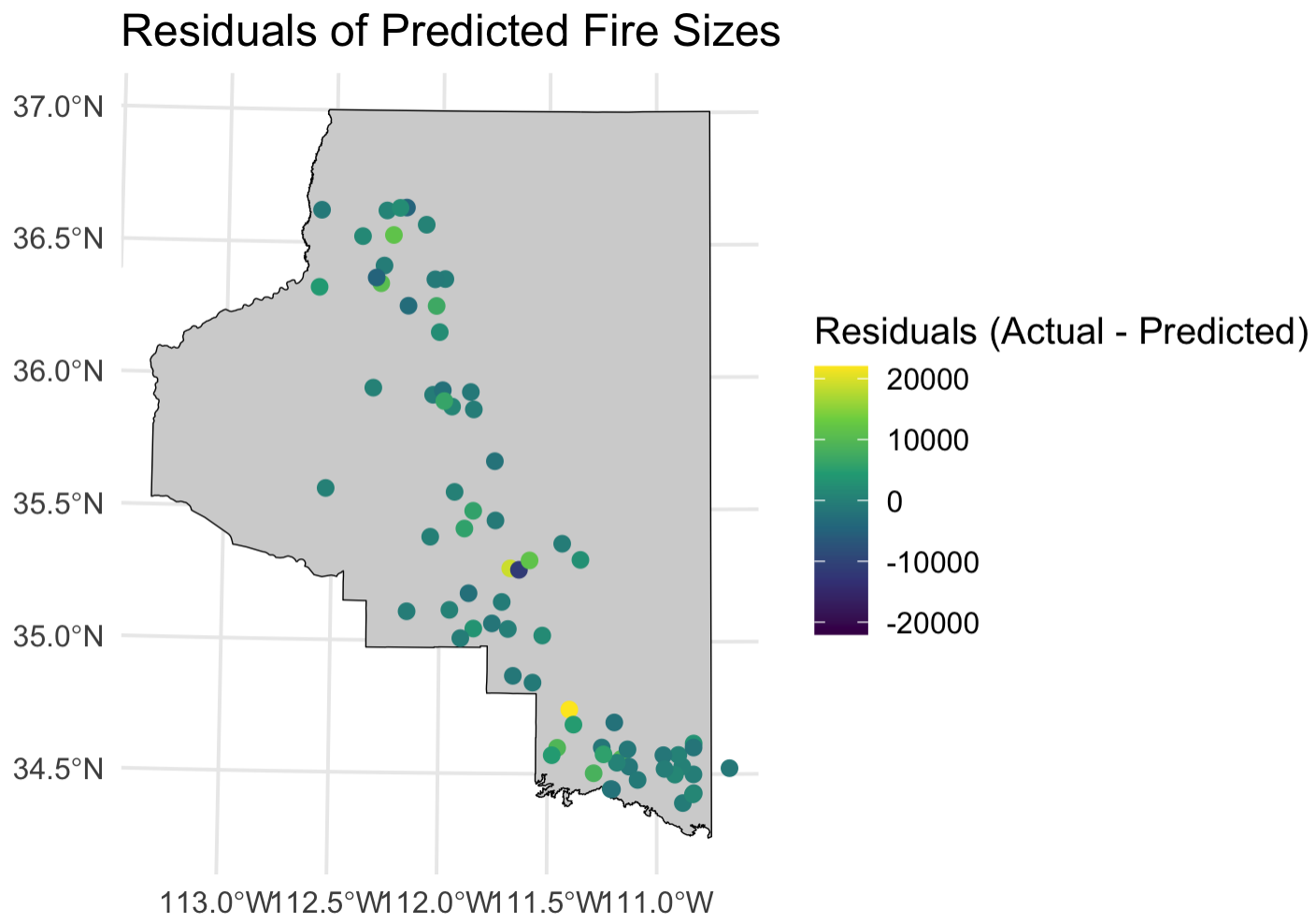
Variable	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	18.26	3.39	5.39	0.0000001
pSlope	0.009	0.012	0.76	0.4500
Grass_p	0.277	0.582	0.48	0.6338
Forest_p	-0.534	0.448	-1.19	0.2328
Max_ann_temp	**-0.516**	**0.177**	**-2.91**	**0.0036**
Min_ann_temp	0.226	0.165	1.37	0.1695
Prcp_ann	**-0.810**	**0.388**	**-2.09**	**0.0370**
pop_density	16400	108300	0.15	0.8796
Population	0.00007	0.0001	0.75	0.4542
Pri_rd	**-0.00001**	**0.000005**	**-1.91**	**0.0561**

de =0.174, ie = 0.555, range = 29119.613


Standardized Residuals vs Fitted
Standardized residuals
-3
0
7.5
8.0
8.5
9.0
9.5
Fitted values
~ pSlope + Grass_p + Forest_p + Max_ann_temp
Normal Q-Q
Standardized residuals
-3
0
-2
-1
0
1
2
Theoretical Quantiles
~ pSlope + Grass_p + Forest_p + Max_ann_temp
Fitted spatial covariance function
Covariance: gaussian
0.0
0.6
0
100000
200000
300000
Distance


Fire Incidents Size
37.0°N
36.5°N
36.0°N
35.5°N
35.0°N
34.5°N
113.0°W
112.5°W
112.0°W
111.5°W
111.0°W
Incident Size
30000
20000
10000


Predicted Fire Sizes
37.0°N
36.5°N
36.0°N
35.5°N
35.0°N
34.5°N
113.0°W
112.5°W
112.0°W
111.5°W
111.0°W
Predicted Size
30000
20000
10000
0


Residuals of Predicted Fire Sizes
37.0°N
36.5°N
36.0°N
35.5°N
35.0°N
34.5°N
113.0°W
112.5°W
112.0°W
111.5°W
111.0°W
Residuals (Actual - Predicted)
20000
10000
0
-10000
-20000