Eyre Peninsula Carbon data exploration

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Carbon data for 70 soil cores, 50cm depth. Data imported and each column changed to be correct data type

Numeric variables were centred and rescaled, and checked for the shape of the distribution of values hasn’t changed with correlation and histogram

Value reported as zero as levels were below instrument detection, need to remove so gamma can be used in model to prevent negative predictions

## # A tibble: 3 × 5  
## Vegetation Elev\_av Elev\_sd Elev\_min Elev\_max  
## <fct> <dbl> <dbl> <dbl> <dbl>  
## 1 Intertidal 0.594 0.158 0.366 0.933  
## 2 Mangrove 0.442 0.115 0.317 0.712  
## 3 Supratidal 1.18 0.377 0.684 1.93

## # A tibble: 3 × 5  
## Vegetation TOC\_av TOC\_sd TOC\_min TOC\_max  
## <fct> <dbl> <dbl> <dbl> <dbl>  
## 1 Intertidal 70.1 34.1 12.2 125.  
## 2 Mangrove 116. 51.7 57.0 211.  
## 3 Supratidal 42.6 28.3 5.47 102.

## [1] 5.468 102.161

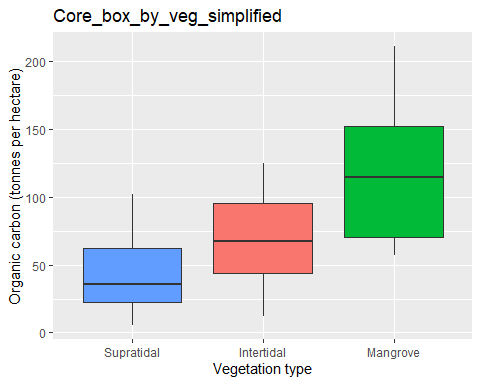
## [1] 12.236 124.821

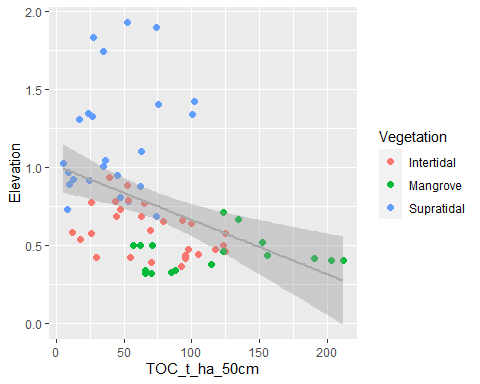
## [1] 57.046 211.298

## # A tibble: 7 × 5  
## Site TOC\_av TOC\_sd TOC\_min TOC\_max  
## <fct> <dbl> <dbl> <dbl> <dbl>  
## 1 Acraman Creek 24.2 23.7 5.47 62.4  
## 2 Cape Missiessy 79.9 22.5 47.4 102.   
## 3 Davenport Creek 28.9 22.6 8.59 53.2  
## 4 Franklin Harbour 63.3 14.9 52.8 73.8  
## 5 Mount Young 31.3 5.26 27.6 35.0  
## 6 Nadias Landing 44.6 15.7 34.6 62.7  
## 7 Tumby Bay 22.9 5.01 17.3 27.1

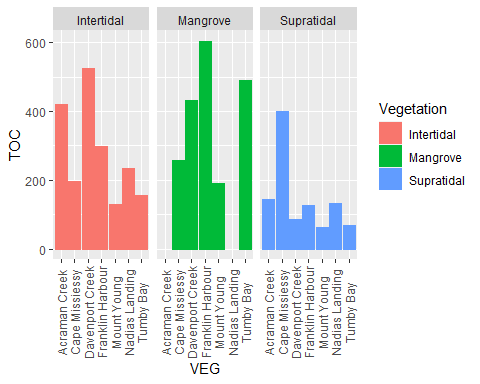
## # A tibble: 7 × 5  
## Site TOC\_av TOC\_sd TOC\_min TOC\_max  
## <fct> <dbl> <dbl> <dbl> <dbl>  
## 1 Acraman Creek 70.1 56.6 12.2 124.   
## 2 Cape Missiessy 49.5 4.54 44.1 53.5  
## 3 Davenport Creek 87.6 27.7 44.1 125.   
## 4 Franklin Harbour 99.2 5.18 95.4 105.   
## 5 Mount Young 43.7 19.9 26.3 65.4  
## 6 Nadias Landing 78.3 14.8 63.2 92.8  
## 7 Tumby Bay 51.7 20.8 29.5 70.6

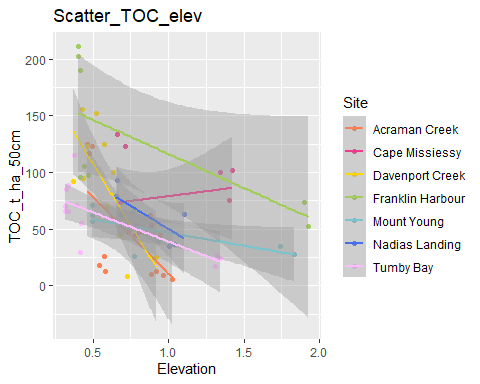
## # A tibble: 5 × 5  
## Site TOC\_av TOC\_sd TOC\_min TOC\_max  
## <fct> <dbl> <dbl> <dbl> <dbl>  
## 1 Cape Missiessy 129. 7.64 123. 134.   
## 2 Davenport Creek 144. 17.6 123. 156.   
## 3 Franklin Harbour 201. 10.6 190. 211.   
## 4 Mount Young 63.3 7.03 57.0 70.9  
## 5 Tumby Bay 81.6 18.8 65.6 115.

 Histogram showing expected relationship of carbon increasing from supratidal > intertidal > mangrove



Scatter plot of TOC and elevation coloured by veg type showing expected relationship of carbon increasing as elevation decreases.

 Carbon values for the same veg type vary significantly between sites

 Scatter of Elevation vs TOC by site. all sites except Cape Missiessy show the expected relationship.

Elevation difference between sites

## # A tibble: 7 × 3  
## Site Elev\_av Elev\_sd  
## <fct> <dbl> <dbl>  
## 1 Acraman Creek 0.730 0.224  
## 2 Cape Missiessy 0.929 0.302  
## 3 Davenport Creek 0.594 0.164  
## 4 Franklin Harbour 0.797 0.691  
## 5 Mount Young 0.944 0.547  
## 6 Nadias Landing 0.858 0.213  
## 7 Tumby Bay 0.602 0.439

## Clay\_Loam Clay\_Peat Clay\_Sand Loam\_Peat Loam\_Sand   
## 22 10 16 6 15

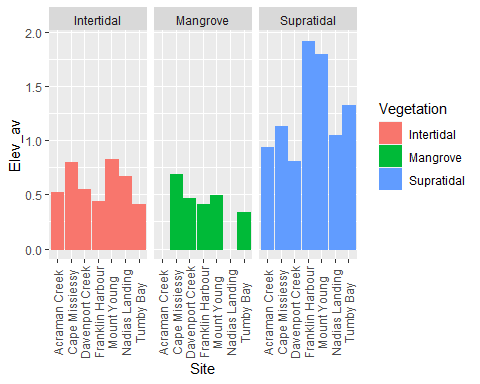
## # A tibble: 3 × 3  
## Vegetation CSE\_min CSE\_max  
## <fct> <dbl> <dbl>  
## 1 Intertidal 0.028 47.7  
## 2 Mangrove 0.0295 65.1  
## 3 Supratidal 0.0073 10.4

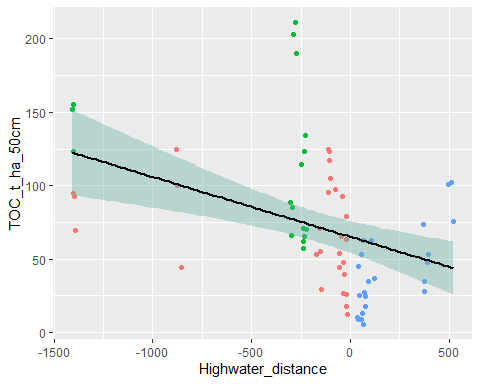
## # A tibble: 3 × 3  
## Vegetation TidalCreek\_min TidalCreek\_max  
## <fct> <int> <int>  
## 1 Intertidal 1 39  
## 2 Mangrove 1 97  
## 3 Supratidal 26 517

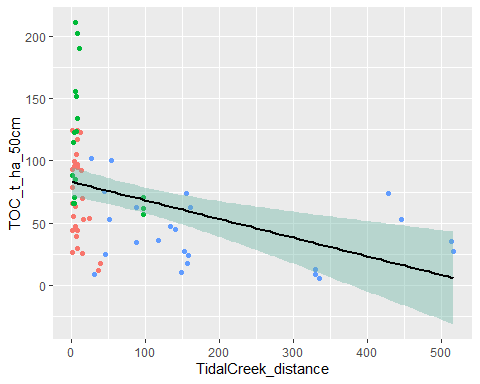
## # A tibble: 3 × 3  
## Vegetation Highwater\_min Highwater\_max  
## <fct> <int> <int>  
## 1 Intertidal -1400 -15  
## 2 Mangrove -1407 -225  
## 3 Supratidal 36 522

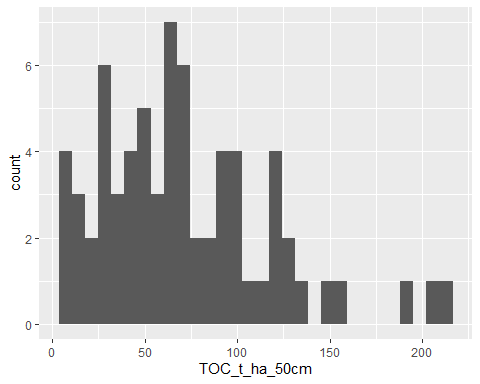
Elevation difference between sites within vegetation classes

## # A tibble: 19 × 4  
## # Groups: Vegetation [3]  
## Vegetation Site Elev\_av Elev\_sd  
## <fct> <fct> <dbl> <dbl>  
## 1 Intertidal Acraman Creek 0.521 0.0520   
## 2 Intertidal Cape Missiessy 0.797 0.0644   
## 3 Intertidal Davenport Creek 0.548 0.122   
## 4 Intertidal Franklin Harbour 0.442 0.0281   
## 5 Intertidal Mount Young 0.824 0.0941   
## 6 Intertidal Nadias Landing 0.666 0.0171   
## 7 Intertidal Tumby Bay 0.409 0.0168   
## 8 Mangrove Cape Missiessy 0.687 0.0354   
## 9 Mangrove Davenport Creek 0.470 0.0454   
## 10 Mangrove Franklin Harbour 0.407 0.00833  
## 11 Mangrove Mount Young 0.498 0   
## 12 Mangrove Tumby Bay 0.335 0.0218   
## 13 Supratidal Acraman Creek 0.938 0.0538   
## 14 Supratidal Cape Missiessy 1.13 0.356   
## 15 Supratidal Davenport Creek 0.809 0.0986   
## 16 Supratidal Franklin Harbour 1.92 0.0212   
## 17 Supratidal Mount Young 1.79 0.0643   
## 18 Supratidal Nadias Landing 1.05 0.0476   
## 19 Supratidal Tumby Bay 1.33 0.0185

 Elevation of the same veg type vary significacntly between sites

 Distance from sample to high water mark. Carbon values are lower in samples further from the High water mark, majority of samples are below high water and the further below they are the higher the carbon value

 Distance from Tidal creek data. Higher carbon values closer to tidal creeks.

 Histogram checking normality of data

ANOVA

## Df Sum Sq Mean Sq F value Pr(>F)   
## Vegetation 2 53737 26869 18.87 3.46e-07 \*\*\*  
## Elevation 1 43 43 0.03 0.863   
## Residuals 65 92574 1424   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Checking numeric variables for correlation

