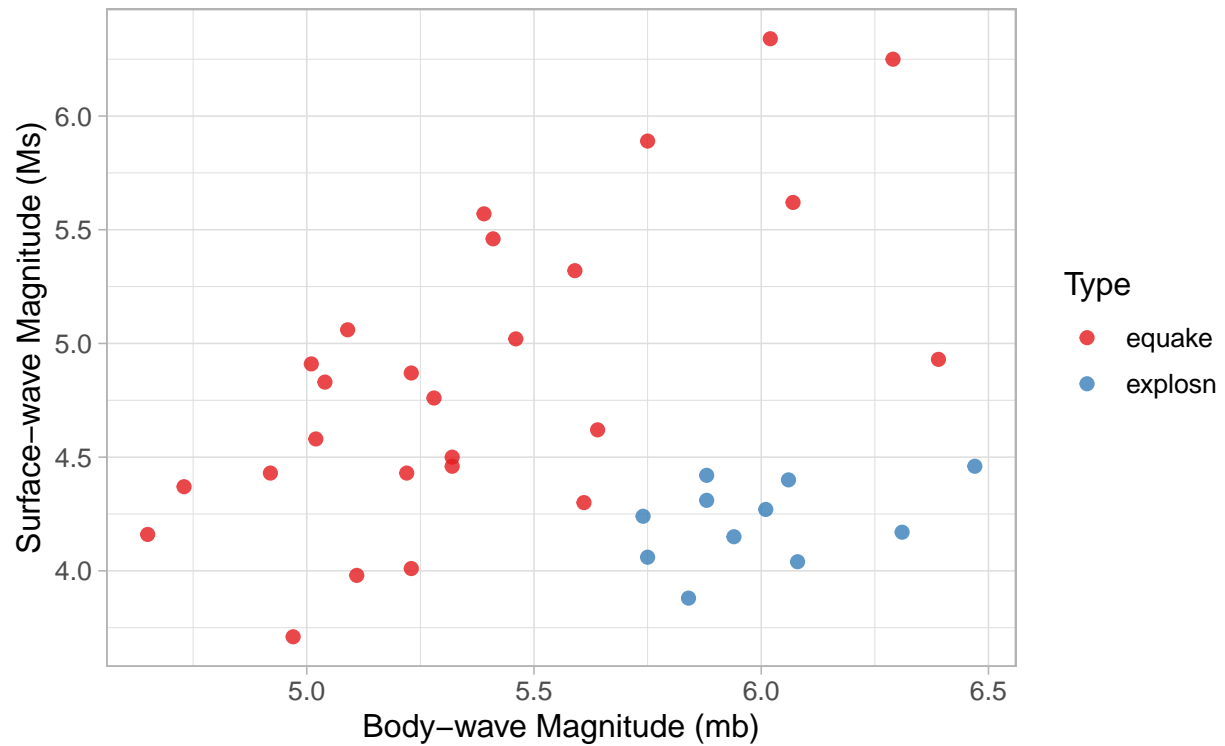# Report_10883408

10883408

2024-04-08
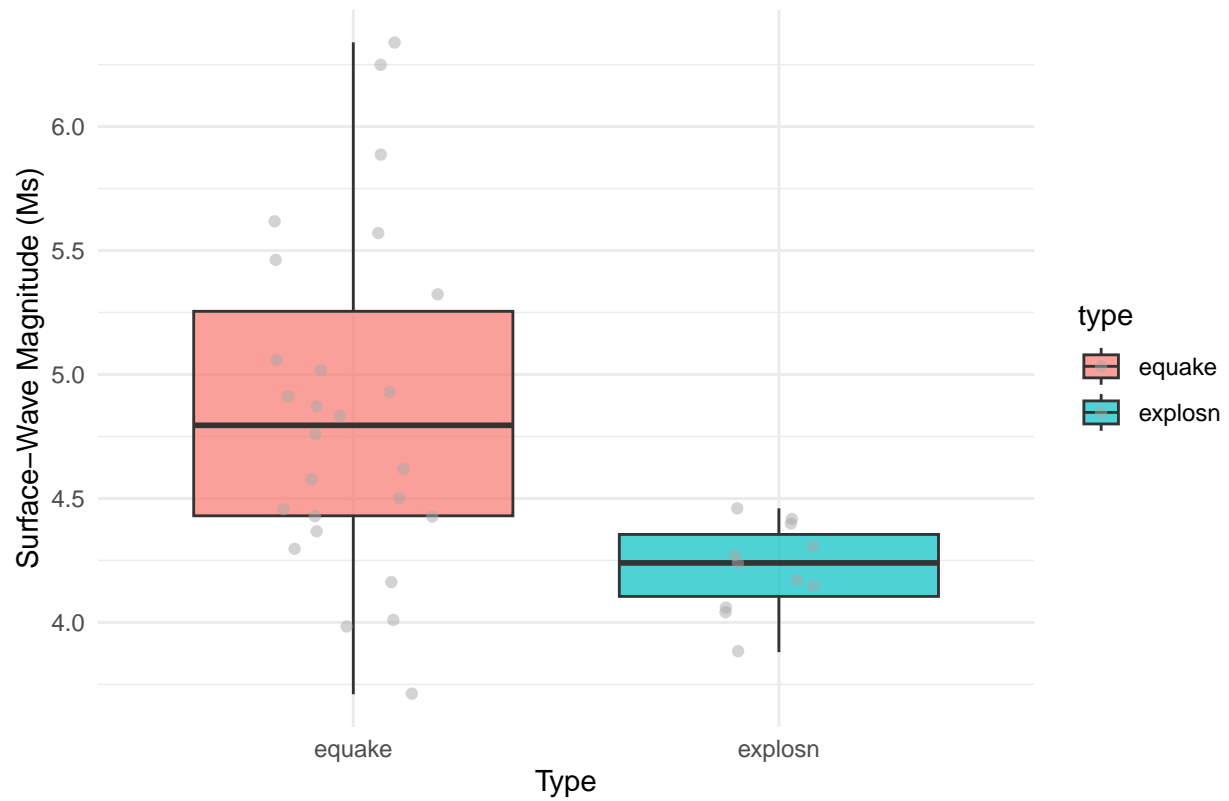
ML part A

Body−wave Magnitude vs. Surface−wave Magnitude
Comparing earthquake types

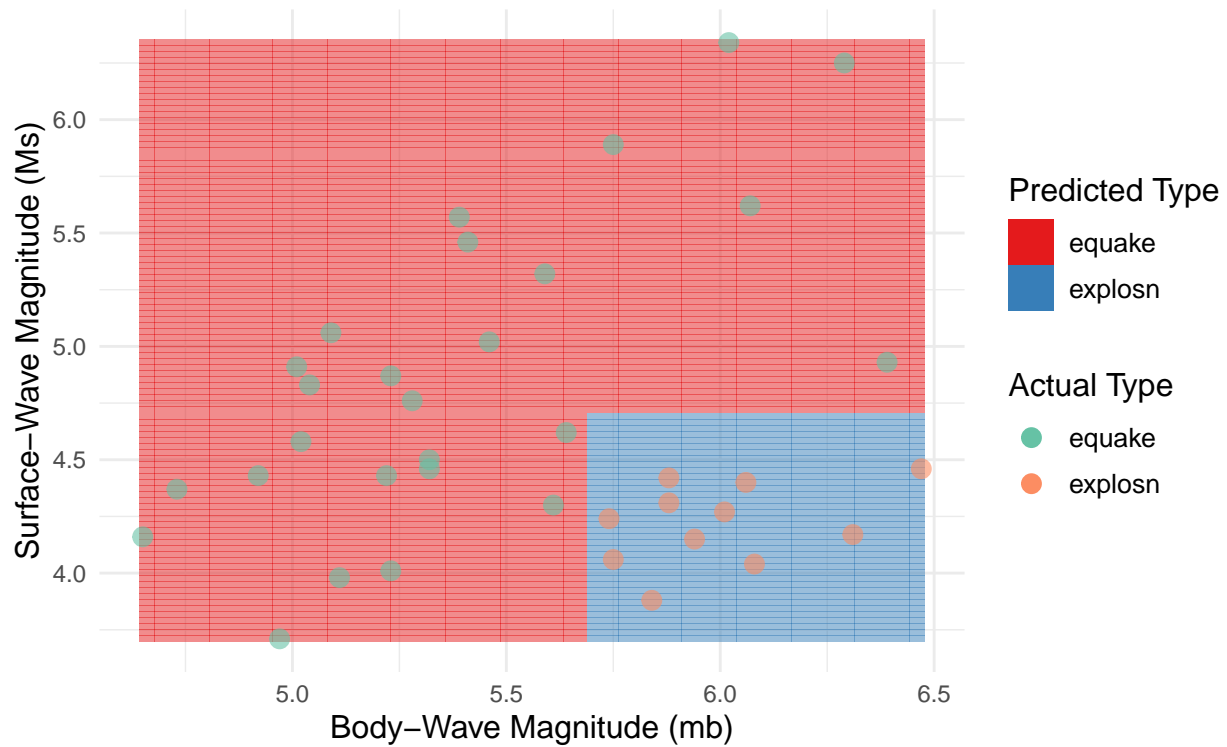Box Plot with Jitter of Body−Wave Magnitude by Type

Box Plot with Jitter of Surface−Wave Magnitude by Type

ML part B

Earthquake vs. Nuclear Explosion Prediction

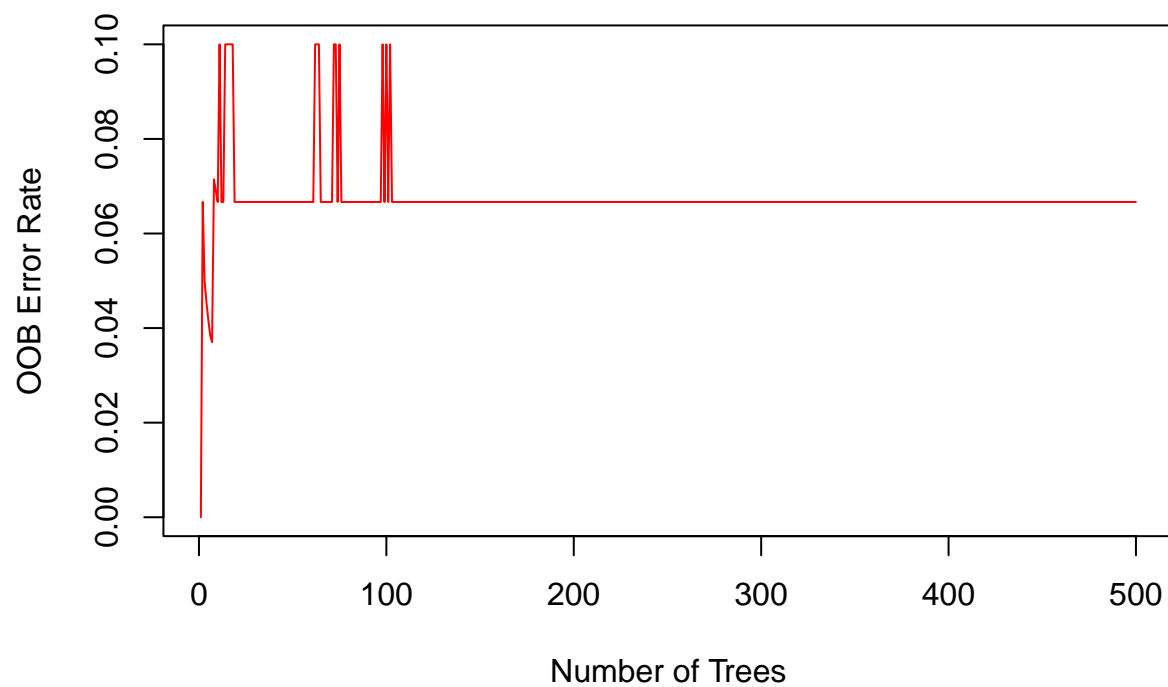Random Forest Model Predictions vs. Actual Data
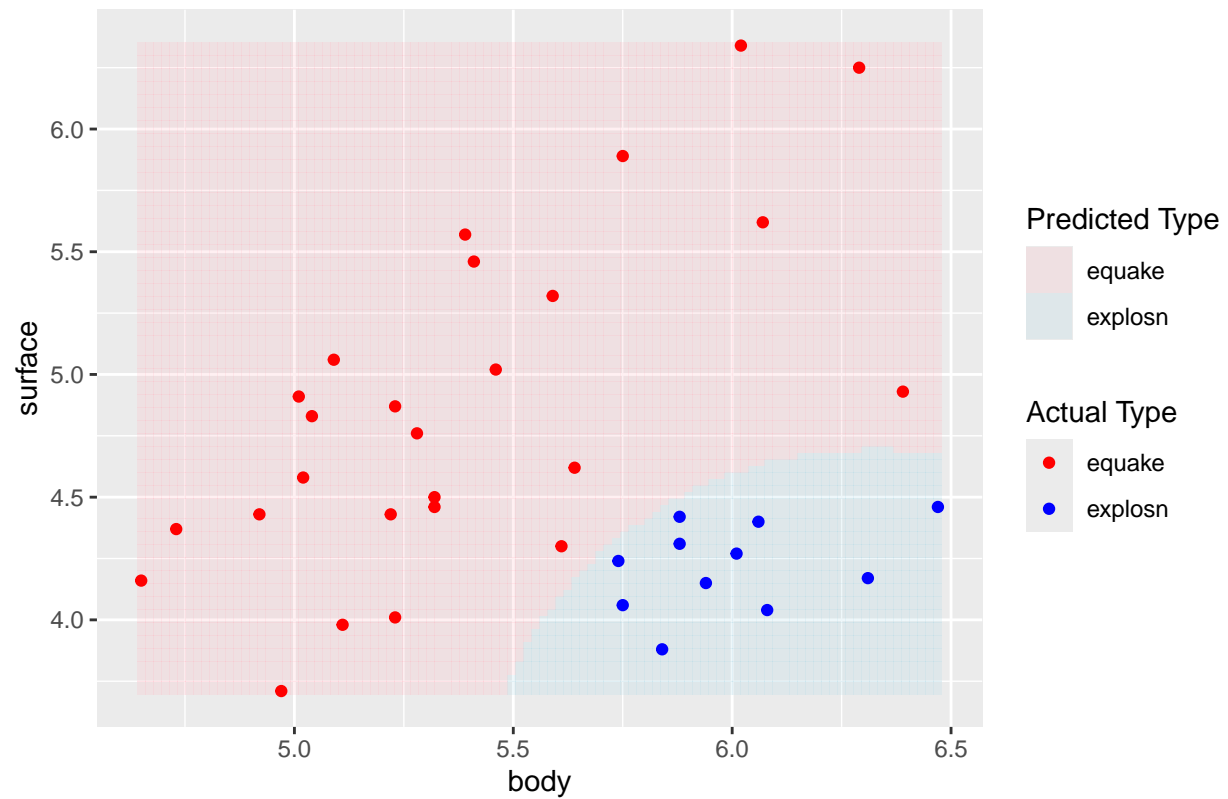

error rate

```
# Extract the Random Forest model from the caret object
rf <- rfModel$finalModel

# Error rate plot
plot(rf$err.rate[, "OOB"], type = "l", col = "red",
     xlab = "Number of Trees",
     ylab = "OOB Error Rate",
     main = "OOB Error Rate vs. Number of Trees")
```

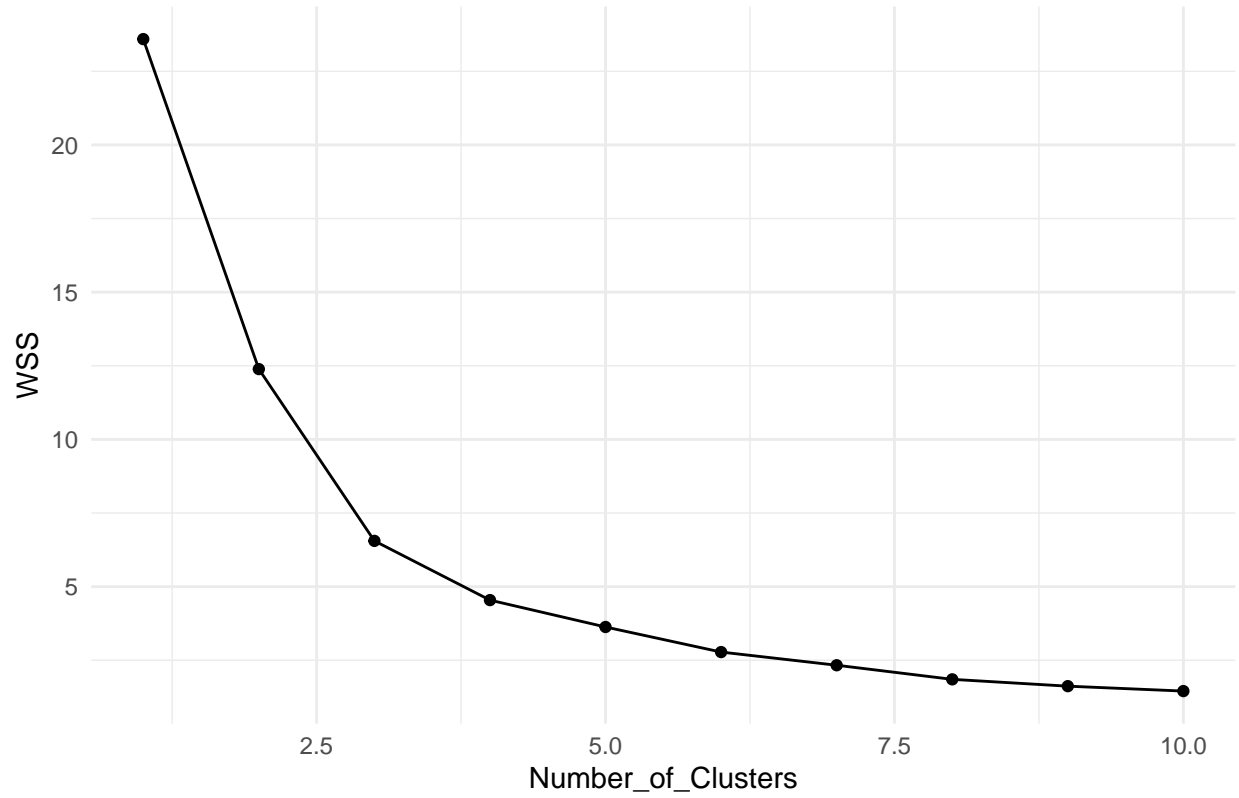**OOB Error Rate vs. Number of Trees**

SVM Classification of Earthquake and Nuclear Explosions

```
##   sigma   C
## 8   0.1 100
```

Part D

Elbow Method for Determining Optimal Number of Clusters


```
##    Number_of_Clusters       WSS
## 1                   1 23.592897
## 2                   2 12.387641
## 3                   3  6.553864
## 4                   4  4.542412
## 5                   5  3.629814
## 6                   6  2.777913
## 7                   7  2.330693
## 8                   8  1.851582
## 9                   9  1.620152
## 10                 10  1.453002
```

Cluster Plot of Seismic Data