# Classification of PNW Wetlands by Carbon Sink Potential

## Using K Nearest Neighbors Classification

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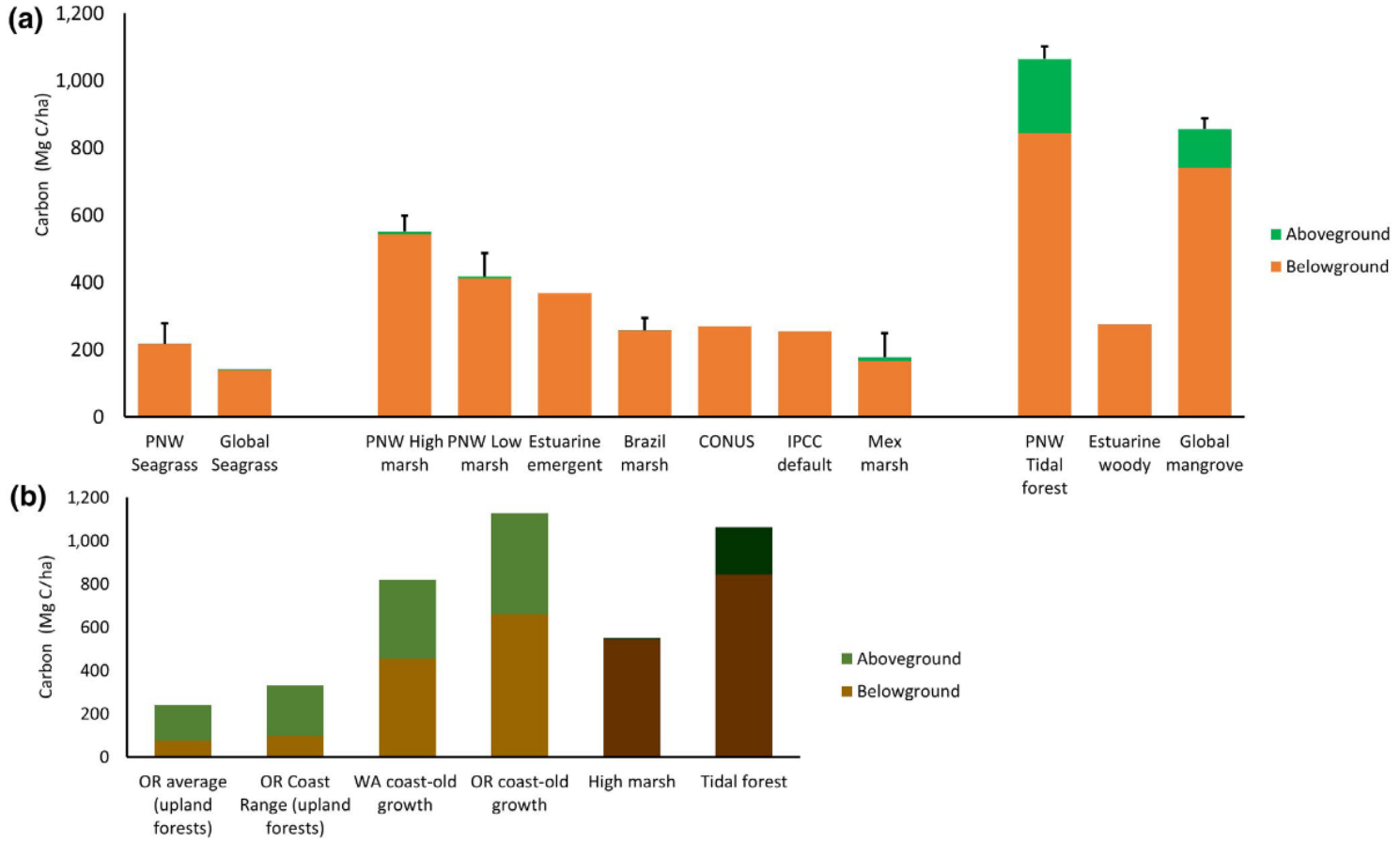
# Coastal Wetlands and Blue Carbon

- Nature-based climate solutions
- Potential of PNW wetlands as carbon sinks
- Mining data to inform restoration decisions

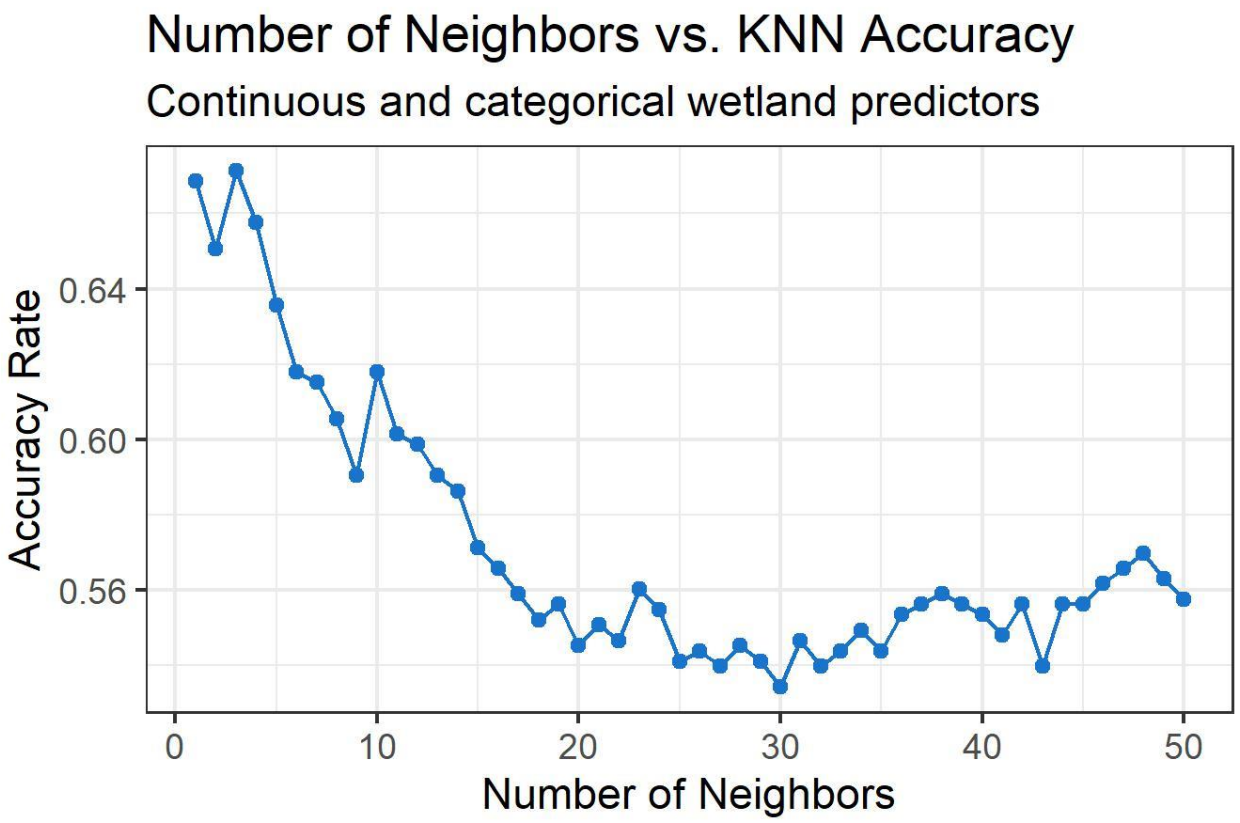
Kauffman et al. (2020)



# Predicting Carbon Sink Potential

- Data-set on environmental conditions on wetlands across the PNW and California
  - 730 observations
  - 12 variables
- Classify wetlands by carbon sequestration potential using proxy data
- Use a K Nearest Neighbors (KNN) approach to make classifications

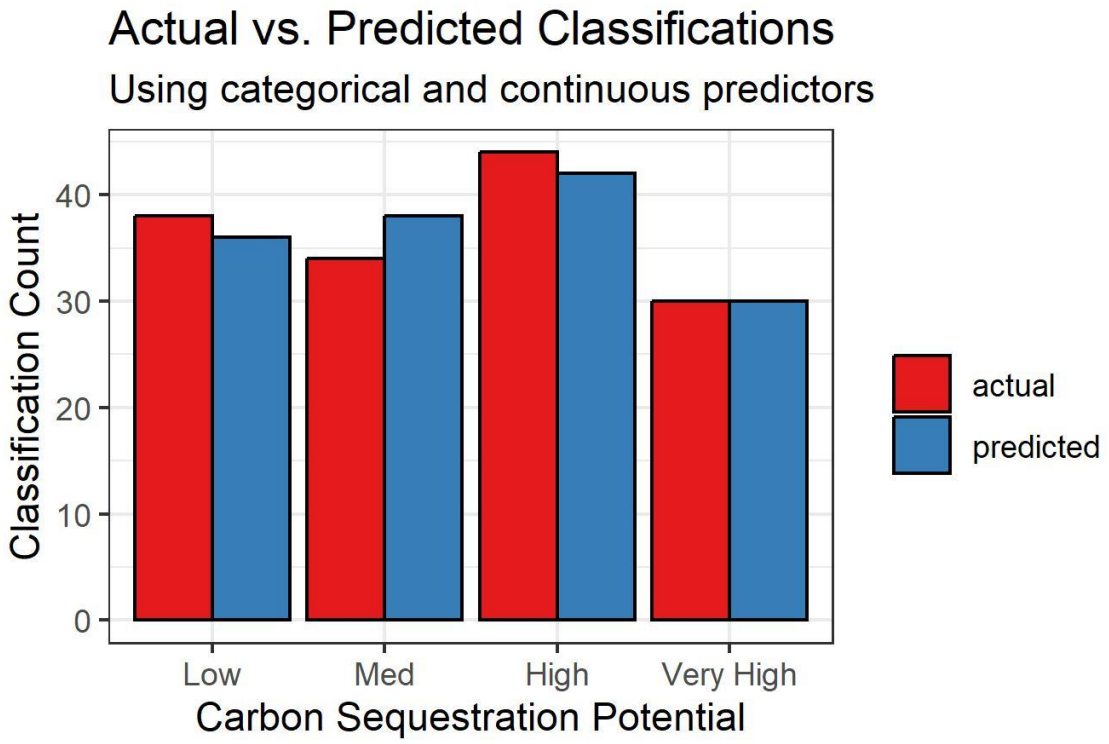
# Implementing KNN Classification



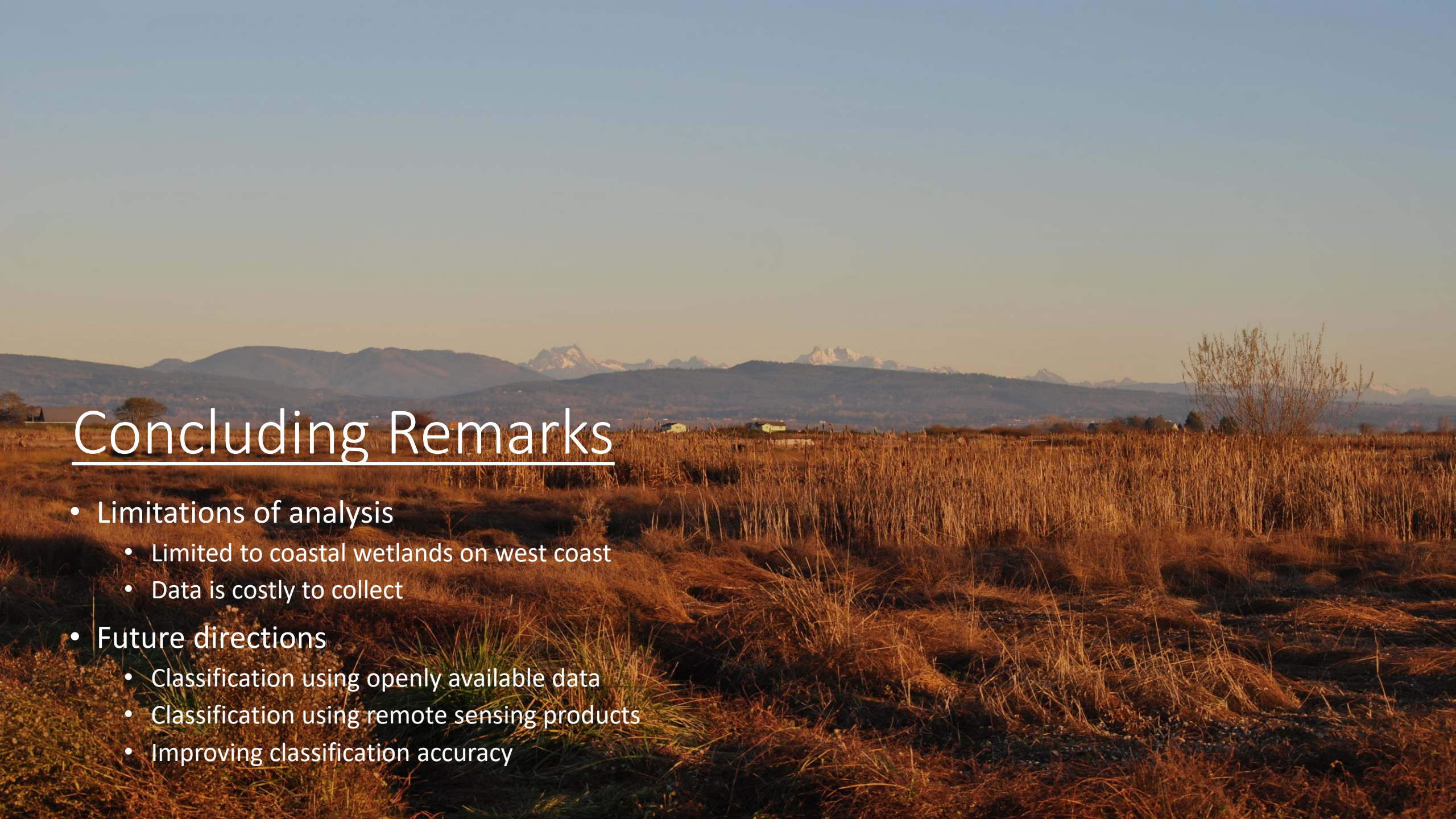

- KNN Algorithm
- KNN implemented using:
  - Only continuous variables
  - Continuous and categorical variables
  - Principal component analysis using continuous variables
- Number of neighbors chosen through cross-validation

# KNN Classifier Performance

- KNN with only continuous variables had highest classification accuracy
- Downfalls of KNN on this data
  - Categorical data
  - Correlation between variables
  - Not scalable




| | KNN Continuous | KNN Continuous and Categorical | KNN Continuous with PCA |
|---|---|---|---|
| **Maximum Accuracy** | 73.2% | 70.3% | 67.1% |
| **Optimal Number of Neighbors** | 9 | 3 | 3 |



# Concluding Remarks

- Limitations of analysis
  - Limited to coastal wetlands on west coast
  - Data is costly to collect
- Future directions
  - Classification using openly available data
  - Classification using remote sensing products
  - Improving classification accuracy

# Sources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- All pictures by Pat McCornack, 2020