

Using ArcGIS Pro to Map *Salix* Patches and Plant Communities

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Introduction

Understanding how the tundra is changing has implications for the health of the Arctic as well as global climate change. As the tundra warms, the abundance of shrubs has increased at many locations. Increases in shrubs have important ecosystem implications (Mekonnen et al., 2021).

Methods

We used aerial imagery captured via drone during the field season of 2022 to document the distribution of shrubs and other land cover types near Utqiagvik, Alaska. Individual images were mosaicked together to create a raster image of the 1 square kilometer study site. The images were captured at a resolution of 4.14 cm/pixel with a RedEdge-M sensor in RGB and multispectral wavelengths.

Analysis of the raster took place in ArcGIS Pro. A custom classification schema was created in the classification manager window (Ponomarenko et al., 2019). Training samples of each class were then made from known locations to train the schema. The schema was then run on the raster using the imagery classification wizard to classify pixels into one of the schema classes.

Results

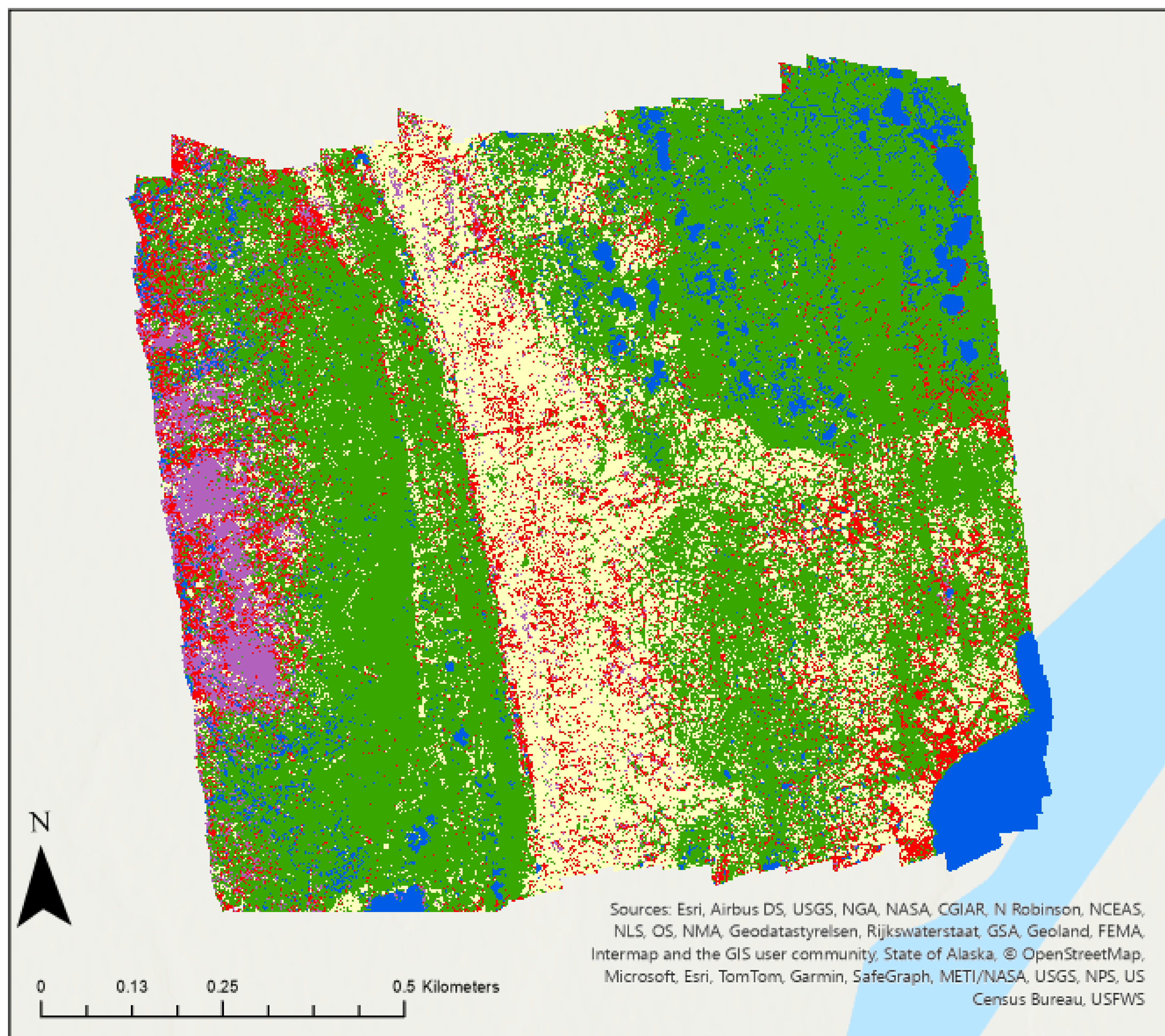


Figure 1. The output is a map with each pixel set to a chosen color based on which class it was classified into (above). The total accuracy of this model was 54%. The individual accuracy and hectares for each category are summarized in Table 1. To the left is a map showing the location of the field site near Utqiagvik, Alaska.

Table 1. Legend and summary of area and accuracy values for classes used in this analysis.

Legend	Class	Hectares	Accuracy
■	SALIX	3	33%
■	DRY HEATH	34	49%
■	WET MEADOW	53	90%
■	WATER	10	97%
■	MOSS	7	41%

Conclusion

This methodology is planned to be used in future research to document the distribution of *Salix* in relation to other plant communities in the region. The accuracy will be much higher with ground truthing data that is planned to be completed in the summer of 2024 (Kentsch et al., 2021). A map of the *Salix* on the grid will help us understand the scope of its spread through the years.

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