Preston Hudlow

GEOG 419

Tom Allen

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Lab 1: Benthic Image Analysis and Submerged Aquatic Vegetation (SAV) Mapping

Q1: The blue band (Band 1) appears to penetrate and reflect from the bottom of the water the best. This is because shorter wavelengths, such as blue light, penetrate deeper into the water column compared to longer wavelengths like red or infrared, which are quickly absorbed by water.

Q2: The near-infrared (NIR) band (Band 4) best contrasts land vs. water. This is because water absorbs almost all NIR light, making it appear very dark, whereas land reflects NIR strongly, creating a clear contrast.

Q3: The dark, blocky areas near the creek mouth in visible bands likely represent submerged aquatic vegetation or aquaculture structures like clam beds, absorbing more light and appearing darker than the surroundings.

Q4: Ponds and shadows on land resemble open water in the Bay and creek due to their similar infrared absorption, appearing dark in the image.

Q5: When utilizing clumping it groups the pixels with similar values into a larger region which helps identify distinct features. With sieving it then isolates the small patches to remove extra noise within the image.

Q6: The image reveals clear depth and bottom type variations, with darker channels and distinct reflectance in sandbars and SAV beds. It enhances the interpretation of underwater features by depth and substrate type.

Q7-8:

SAV (VIMS): The classification detects SAV but may confuse it with other shallow-water features.

Deep channels: Well-defined, with lower reflectance in deeper areas.

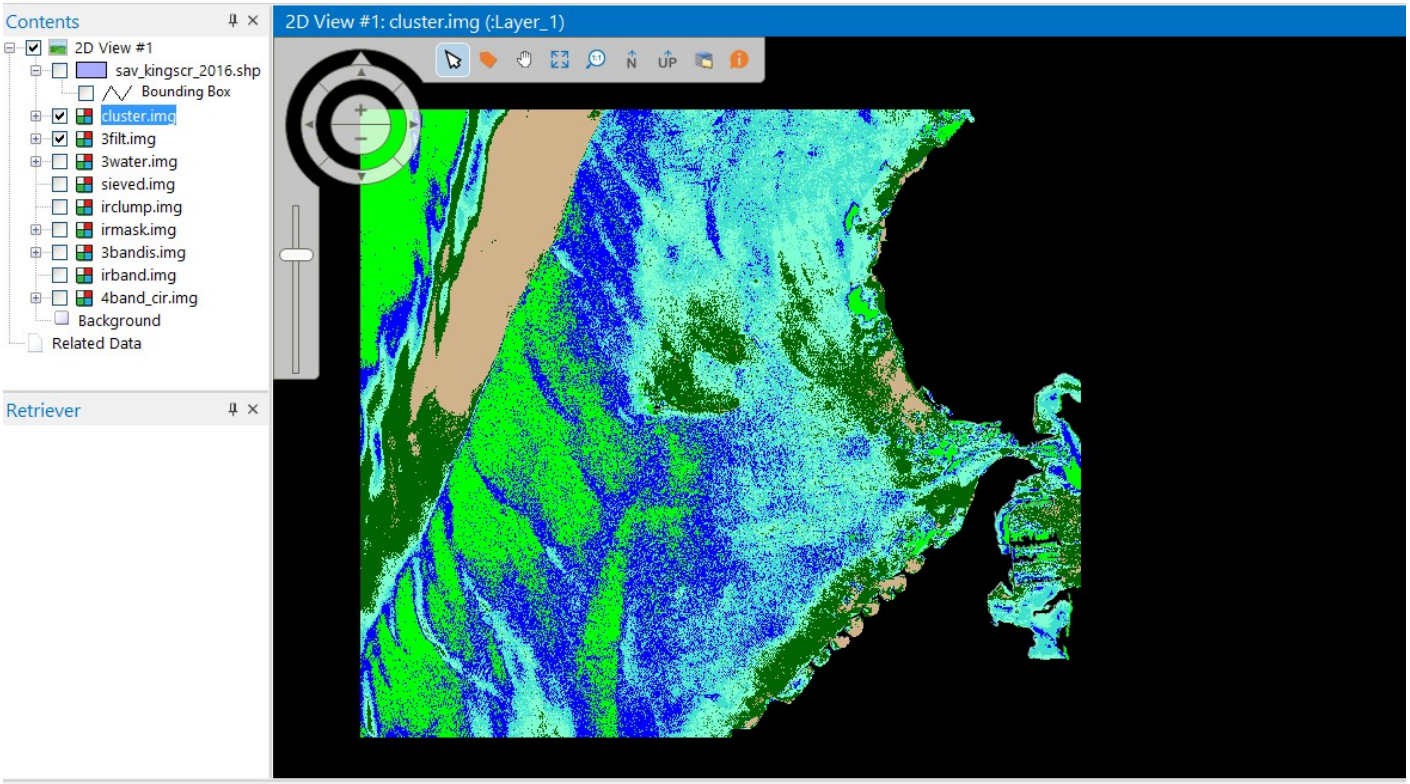
Clam aquaculture beds: Appear as distinct clusters due to unique spectral properties.

Water around marina docks: Some misclassification may occur due to mixed reflections from boats and structures.

Shallow areas: Clearly distinguishable from deeper regions.

Sandbars: Visible but may blend with other shallow-water features.

Q9-10: The classification effectively distinguishes depth and benthic features, but areas like marina waters and aquaculture sites may require more spectral data or supervised classification. Higher-resolution imagery or additional spectral bands could enhance results.



cluster.img : Layer_1

Row	Histogram	Color	Red	Green	Blue	Opacity	Class_Names
0	1298486		0	0	0	0	Unclassified
1	912887		0	1	0	1	Sav and deeper
2	992357		0	0	1	1	Medium Depth
3	967565		0.251	0.878	0.816	1	Medium Shallow
4	779244		0.498	1	0.831	1	shallow water
5	656396		0	0.392	0	1	Mixed seagrass amd c;a,s amd darker deeper areas
6	377145		0.824	0.706	0.549	1	Sandbars/shallow