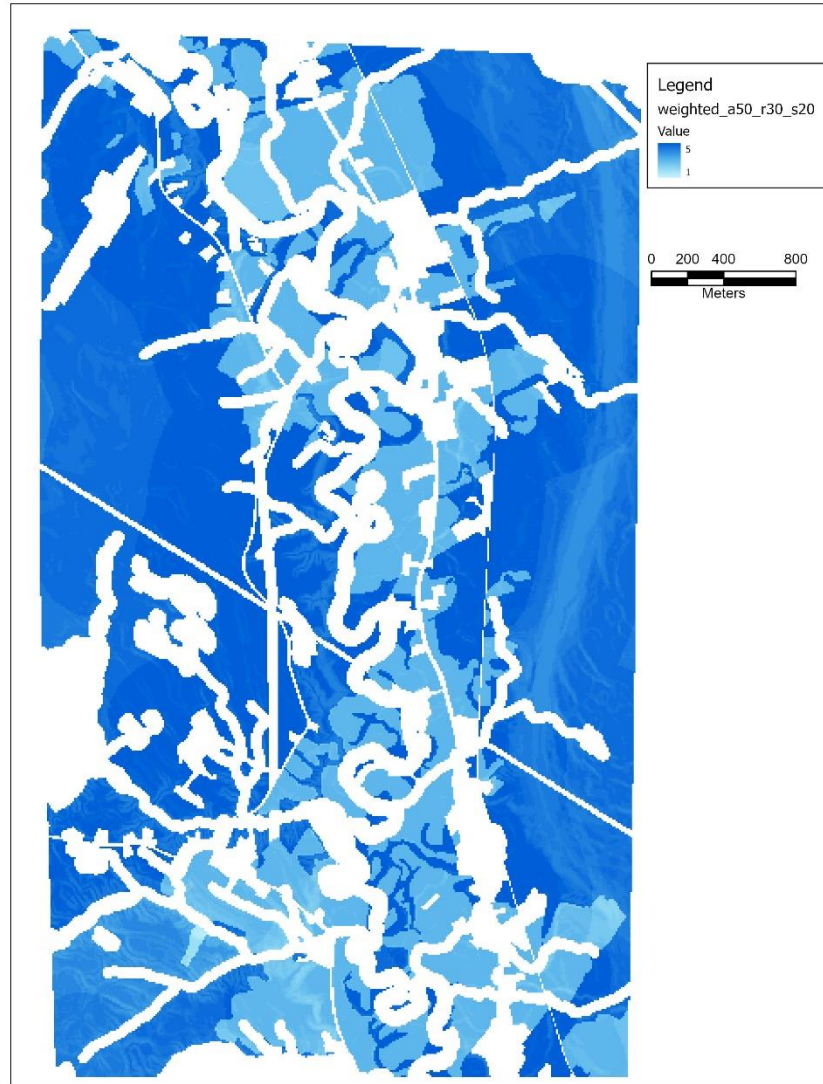# Suitability Index 1

Weights: Agriculture - 0.2, Roads - 0.4, Slope - 0.4
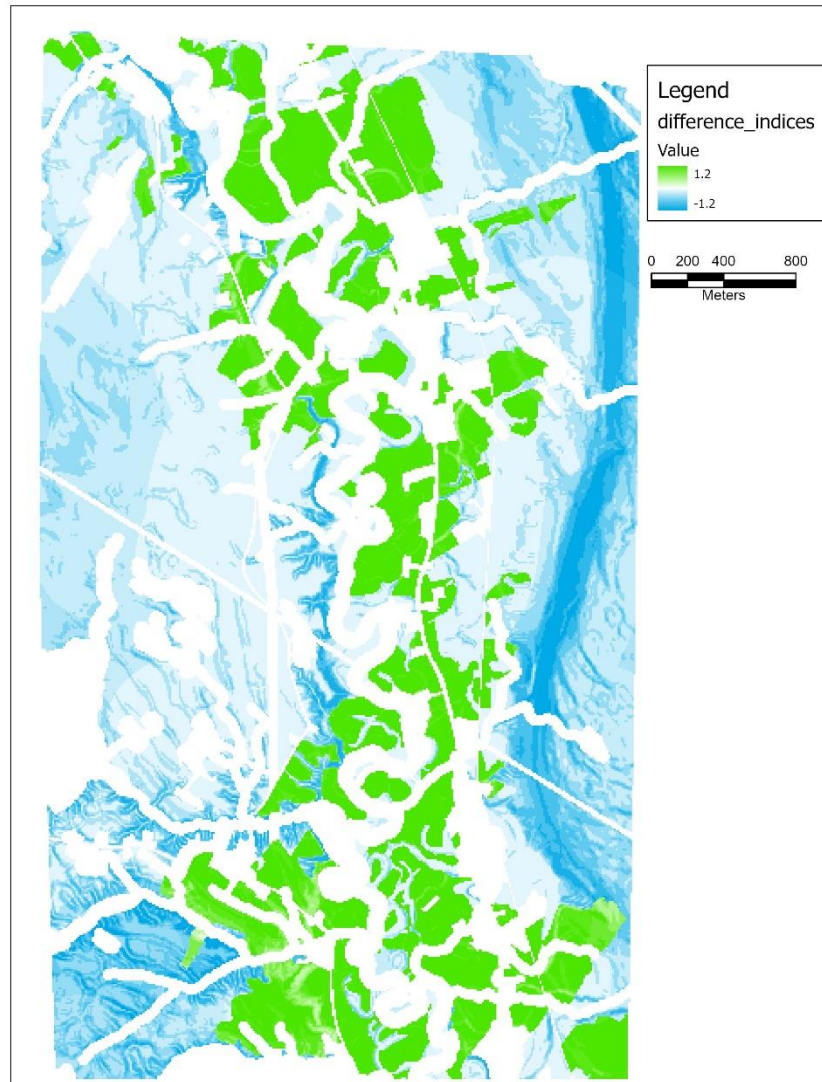
Suitability Index 2

Weights: Agriculture – 5, Roads – 0.3, Slope – 0.2

Difference of Indices

Suitability Index 1 (Green) - Suitability Index 2 (Blue)

Effect of Changing Weights

At location 1, the large increase in weight (+0.3) for agriculture when moving from index 1 to index 2 only causes a small increase in the differences of indices (+0.3). This is because the suitability value for agriculture is low (1), reducing the effect of any changes in its weight.

However, the smaller decreases in roads and slope (-0.1 and -0.2) causes larger decreases in the difference index (-0.5 and -0.8). This is because the suitability values for roads and slope are quite high (5 and 4), increasing the effect of any changes in their weights.

Together, the small increase in the differences of indices caused by the increase in agriculture weight is outweighed by the large decrease in differences of indices caused by the decreases in road and slope weights.

Location 1	Suitability Values	Suitability Index 1	Suitability Index 2
Agriculture	1	0.2	0.5
Roads	5	0.4	0.3
Slope	4	0.4	0.2
Weighted Sum		3.8	2.8
Difference Index (Index 1 – Index 2)		1	

At location 1, the large increase in weight (+0.3) for agriculture when moving from index 1 to index 2 only causes a large increase in the difference index (+1.5). This is because the suitability value for agriculture is high (5), increasing the effect of any changes in its weight.

Counterbalancing this are the smaller decreases in roads and slope (-0.1 and -0.2) which caused some decreases in the differences of indices (-0.5 and -0.2). While the suitability value for Roads is high (5), the suitability value for slope is low (1). The low suitability value for slope reduces the impact of lowering its weight.

Together, the large increase in the differences of indices (+1.5) caused by the increase in agriculture weight is only partly balanced by the decrease in differences of indices (-0.7) caused by the decreases in road and slope weights.

Location 2	Suitability Values	Suitability Index 1	Suitability Index 2
Agriculture	5	0.2	0.5
Roads	5	0.4	0.3
Slope	1	0.4	0.2
Weighted Sum		3.4	4.2
Difference Index (Index 1 – Index 2)		-0.8	

Areas of Further Study
Suitability Index 1
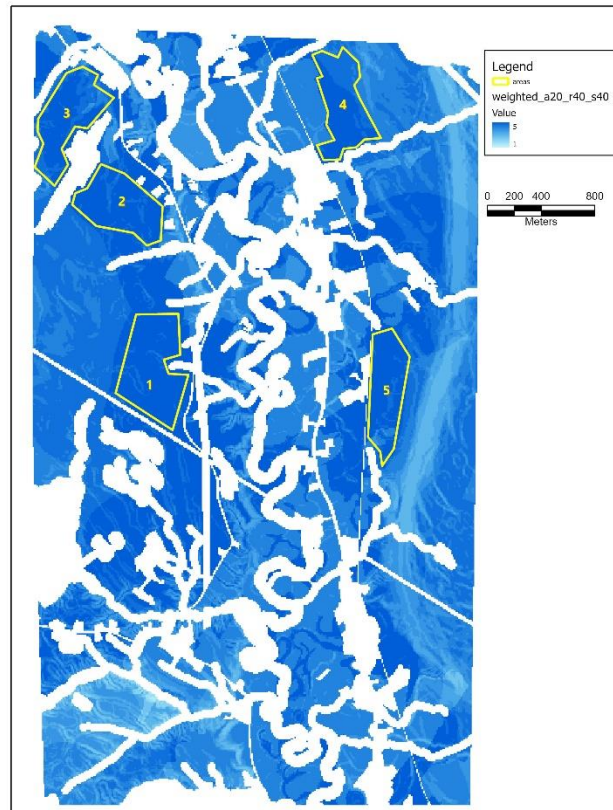
Zonal Statistics

OBJECTID *	OBJECTID_1	COUNT	AREA	MIN	MAX	RANGE	MEAN	STD	SUM	MEDIAN	PCT90
1	1	2982	298200	4.2	5	0.8	4.967941	0.112013	14814.399977	5	5
2	2	2325	232500	4.2	5	0.8	4.93428	0.158539	11472.199964	5	5
3	3	2344	234400	3.4	5	1.6	4.812457	0.27022	11280.399903	5	5
4	4	2246	224600	3.8	5	1.2	4.839715	0.2164	10869.999914	5	5
5	5	2098	209800	3.8	5	1.2	4.896091	0.245986	10271.999956	5	5

I believe parcel 1 is the most promising. It has the highest mean suitability index, indicating that on average, it has a higher suitability score than the other parcels.

Each of the parcels chosen have very high scores and are on unrestricted areas. They are all close to roads, on relatively flat areas, and not on agricultural areas. Parcels 1, 2, and 3 are particularly close to the road, but the 4 and 5 are also close enough that it doesn't make a large difference. The small variations in mean are caused by the small places with slightly lower slope suitability. In choosing these parcels I aimed to minimize these variations to maximize average suitability.