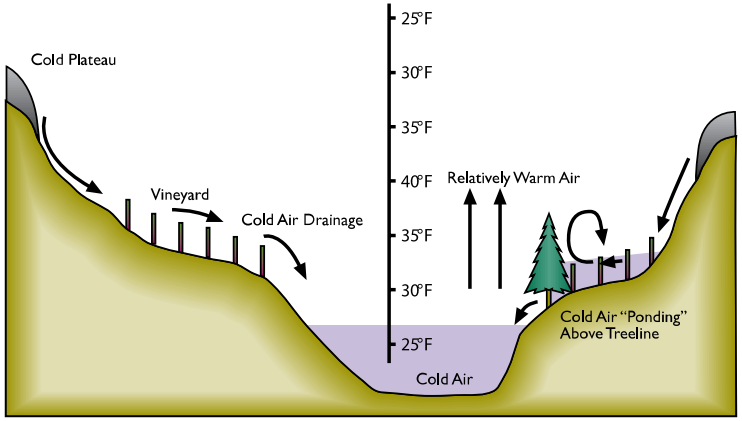
Suitability Analysis for Vineyards in Finger Lakes Region, New York

This week, we have two main practical goals. First, we'll introduce you to a visual scripting program in ArcGIS called MODEL BUILDER. It lets you make digital versions of your workflow plans that ArcGIS can implement. Second, we'll introduce you to a method for scoring and combining criteria for qualities of locations that make a site suitable for a purpose or phenomenon. It's based on McHarg's method and sometimes formally called "Multi-Criteria Evaluation," or MCE.

Our first task is to develop a workflow to model two additional criteria: (1) distance from nearest lake and (2) elevation above nearest lake. To do this, we'll need a new tool that tells us the identity of the nearest Figure for every location of Ground, called EUCLIDEAN ALLOCATION.

Second, we also need to clean up our work last week that got affected by the resampling error in the DEM. These artifacts basically *propagated error* through our entire analysis. So we're going to need to run a small part of the analysis again.

Third, we'll use the results of our two models to score the following thematic qualities that make a location *suitable* for vineyards: aspect, slope, distance from nearest lake, elevation above nearest lake, terrain roughness. We'll combine criteria in order to identify suitable locations. We'll also look at a visual method to exclude one quality of space that constrains suitability independently for vineyards: whether the land is public or private.



Cold air sinks, warm air rises and is trapped below the top of the valley. Image from Virginia Cooperative Extension. Vineyard Site Selection.

TUTORIAL WORKFLOW

1	Create a model	**Model Builder** FEATURE TO RASTER
2	Select large lakes (that don't freeze)	**Model Builder** ZONAL GEOMETRY RECLASSIFY
3	Find elevation above nearest large lake	INT → EUCLIDEAN ALLOCATION
4	Error propagation: concept and strategies	MINUS, Metadata, Result history
5	Calculate suitability scores	**Model Builder**, RECLASSIFY
6	Combine suitability scores	**Model Builder,** RASTER CALCULATOR

Scores used in 0406 video

Slope

0 – 6	10
6 – 12.5	7
12.5 – 17.5	3
17.5 – 26	1
26 – 9999	0

Aspect

-1	0
0 – 42	5
42 – 142	10
142 – 252	3
252 – 360	6

Roughness

0 – 5.5	10
5.5 – 9	5

Distance from nearest large lake

0 – 20	NoData
20 – 1550	10
1550 – 5000	5
5000 – 13000	3
13000 – 28000	1
28000	0

Height above nearest large lake

-999 - -6	1
6 – 10	10
10 – 68	5
68 – 120	10
120 – 212	5
212 – 330	1
330 – 999	0