

Tuesday, March 26, 2019

## Report of Findings:

### Land Area by Category above 1500', 2000' and 2500' Elevations in Vermont

#### *OVERVIEW & RESULTS*

These results represent a rerun of a 2014 model using all the exact same data inputs but adding a 2,000' elevation threshold to compliment the original objective to calculate the overall acreage of land, equal to or above both the 1500' and 2500' elevations within the VT state boundary and produce a breakdown of "Federal", "Municipal", "Other/Unknown", "Private" and "State" land acreages using the 2012 conservation lands data.

Summary Table 1 has been distilled from modeling output feature datasets resulting from the intersection of the VCLDB with all areas above 1500', 2000' and 2500', respectively.

<b>Table 1: Land Area by Category above 1500', 2000' and 2500' Elevations in Vermont</b>			
<b>Sector</b>	<b>Acres_1500</b>	<b>Acres_2000</b>	<b>Acres_2500</b>
Federal	383,426.7	266,653.3	97,832.8
Municipal	27,165.5	11,387.5	2,358.4
Other/Unknown	2,699.1	922.5	0.4
Private	226,501.3	97,772.1	18,519.8
Public	4,159.0	1,856.1	992.8
State	211,820.0	110,509.1	41,908.6
<b>Total</b>	<b>855,771.6</b>	<b>489,101</b>	<b>161,612.9</b>

This analysis uses the 2012 Vermont Conserved Lands Database (VCLDB) updated by The Nature Conservancy (TNC) for "CONSPUB" and the raster elevation dataset "ElevationDEM\_DEM10M" for the 20' contours.

The two primary input datasets were:

1. ElevationDEM\_DEM10M - USGS National Elevation Dataset (NED) 10 meter DEM; and
2. Vermont Conserved Lands Database – Version (2012) provided by The Nature Conservancy.

***METHODOLOGY***

Tables 1 and 2 from the original analysis are included for use in comparison to table 3 created using the exact same methodology and data.

***Project directory:***

Areas at or above 1500’ and 2500’elevation were iteratively extracted from the VGIS “ElevationDEM\_DEM10M” digital elevation model and converted into a polygon shapefile for use in clipping the TNC 2012 data. Subsequently, these eight unique values were reassigned to a “Sector” field that contained six unique values as outlined below. Finally, a summary operation was done on the “SECTOR” field and aggregated acreage (“AreaAcres” field” by “SECTOR” to product the final output.

<b>Table 2: Translation Table</b>		
<b>FEE_ORGTYP</b>	<b>Desc</b>	<b>Sector</b>
FED	Federal	Federal
LOC	Local	Municipal
PFP	Private for profit	Private
PLO	Private Land Owner	Private
PNP	Private Non Profit	Private
STP	State Park	State
TNC	The Nature Conservancy	Public
UNK	Unknown	Other/Unknown

***ERRATA***

- 15 records in the 2012 dataset had “unknown” values for the “FEE\_OWNER” attribute used to assign the SECTOR categories. Eight records are New England Forestry Foundation Easements, two are Green Mountain Club Easements, one Dover Deer Meadow, one Gilman Housing Trust and three unnamed. Those areas above 1500’ are reflected in the category “Other/Unknown”.
- Final step to summarize sectors by acreage was done manually as no model option for this readily available.

***QA/QC***

Conducted visual review of data in ArcMap using the following data:

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C:\Users\john.e.adams\Desktop\Report\_LandSectorByElevationCategories\_2000ft\_Addendum\_032519.doc

1. EGC\_services\MAP\_VCGI\_USTOPO\_SP\_CACHE;
2. GDB\_VCGI.VCGI\_ADMIN.BASEMAPOTHER\_GMNFMAPS; and
3. \*BASEMAPOTHER\_GMNFMAPN USGS raster maps.

## ***APPENDIX A: PYTHON CODE***

Only the code from scripts relating to the 1500' elevation are included below as they are identical to 2500' analysis except for elevation cutoff value used.

Script descriptions:

**“1\_DEM10M\_gt1500.py”** – Isolates all areas equal to or above 1500' (2500') elevation from the source raster, exports to output raster and then converts to polygon feature class for use in clipping VCLDB; and

**“2\_VLCDB\_GT1500.py”** – Uses output from script #1 to clip the VCLDB, then joins a table assigning the various sectors and finally recalculates the acres on clipped features.

```
# -----  
# 1_DEM10M_gt1500.py  
# Created on: 2014-07-22 13:53:13.00000  
# (generated by ArcGIS/ModelBuilder)  
# Description:  
# -----  
  
# Import arcpy module  
import arcpy  
  
# Check out any necessary licenses  
arcpy.CheckOutExtension("spatial")  
  
# Local variables:  
GDB_VCGI_VCGI_ADMIN_ELEVATIONDEM_DEM10M =  
"GDB_VCGI.VCGI_ADMIN.ELEVATIONDEM_DEM10M"  
Input_true_raster_or_constant_value = "1"  
DEM10M_gt1500Value1 =  
"G:\\users\\mikeb\\outreach\\VT2500ft\\GTEQ1500.gdb\\Data\\DEM10M_gt1500Value1"  
DEM10M_gt1500Value1_Dissolve =  
"G:\\users\\mikeb\\outreach\\VT2500ft\\GTEQ1500.gdb\\Data\\DEM10M_gt1500Value1_Dissolve"  
DEM10M_gt1500Value1_Dissolve1 = "DEM10M_gt1500Value1_Dissolve1"  
DEM10M_gt1500Value1_Dissolve1__2_ = "DEM10M_gt1500Value1_Dissolve1"  
DEM10M_gt1500Value1_Dissolve1__3_ = "DEM10M_gt1500Value1_Dissolve1"  
DEM10M_gt1500Value1_Dissolve1__4_ = "DEM10M_gt1500Value1_Dissolve1"  
DEM10M_gt1500FNL =  
"G:\\users\\mikeb\\outreach\\VT2500ft\\GTEQ1500.gdb\\Data\\DEM10M_gt1500FNL"
```

```
DEM10M1500CON_img = "G:\users\mikeb\outreach\VT2500ft\DEM10M1500CON.img"
DEM10M1500CON_to_1_img = "G:\users\mikeb\outreach\VT2500ft\DEM10M1500CON_to_1.img"

# Process: Con
arcpy.gp.Con_sa(GDB_VCGI_VCGI_ADMIN_ELEVATIONDEM_DEM10M,
GDB_VCGI_VCGI_ADMIN_ELEVATIONDEM_DEM10M, DEM10M1500CON_img, "", "Value >=1500")

# Process: Con (2)
arcpy.gp.Con_sa(DEM10M1500CON_img, Input_true_raster_or_constant_value,
DEM10M1500CON_to_1_img, "", "\"Value\" >= 1500")

# Process: Raster to Polygon (2)
arcpy.RasterToPolygon_conversion(DEM10M1500CON_to_1_img, DEM10M_gt1500Value1,
"NO_SIMPLIFY", "VALUE")

# Process: Dissolve
arcpy.Dissolve_management(DEM10M_gt1500Value1, DEM10M_gt1500Value1_Dissolve, "gridcode", "",
"SINGLE_PART", "DISSOLVE_LINES")

# Process: Make Feature Layer
arcpy.MakeFeatureLayer_management(DEM10M_gt1500Value1_Dissolve,
DEM10M_gt1500Value1_Dissolve1, "", "", "gridcode gridcode VISIBLE NONE")

# Process: Add Field (2)
arcpy.AddField_management(DEM10M_gt1500Value1_Dissolve1, "AreaSqMtrs", "DOUBLE", "10", "1", "",
"", "NULLABLE", "NON_REQUIRED", "")

# Process: Calculate Field (2)
arcpy.CalculateField_management(DEM10M_gt1500Value1_Dissolve1__2_, "AreaSqMtrs",
"!Shape.area@squaremeters!", "PYTHON_9.3", "")

# Process: Select Layer By Attribute
arcpy.SelectLayerByAttribute_management(DEM10M_gt1500Value1_Dissolve1__3_, "NEW_SELECTION",
"\"AreaSqMtrs\" > 200")

# Process: Copy Features
arcpy.CopyFeatures_management(DEM10M_gt1500Value1_Dissolve1__4_, DEM10M_gt1500FNL, "", "0",
"0", "0")
```



NONE;INT\_TYPE INT\_TYPE HIDDEN NONE;TNC\_INTRST TNC\_INTRST HIDDEN NONE;ST\_DESIG  
ST\_DESIG HIDDEN NONE;DESIGNAT DESIGNAT HIDDEN NONE;IUCN\_CAT IUCN\_CAT HIDDEN  
NONE;GAP\_ORIG GAP\_ORIG HIDDEN NONE;GAP\_TNC GAP\_TNC HIDDEN NONE;GAP\_STATUS  
GAP\_STATUS HIDDEN NONE;CONS\_INTNT CONS\_INTNT HIDDEN NONE;CONS\_TENUR  
CONS\_TENUR HIDDEN NONE;EF\_MGMT\_POT EF\_MGMT\_POT HIDDEN NONE;CON\_MGMT\_ST  
CON\_MGMT\_ST HIDDEN NONE;DATE\_CONSV DATE\_CONSV HIDDEN NONE;DATE\_PREC  
DATE\_PREC HIDDEN NONE;LEGAL\_ACRES LEGAL\_ACRES HIDDEN NONE;GIS\_ACRES  
GIS\_ACRES HIDDEN NONE;CLS\_MABRID CLS\_MABRID HIDDEN NONE;CLS\_TRACTID  
CLS\_TRACTID HIDDEN NONE;CLS\_TRACTNM CLS\_TRACTNM HIDDEN NONE;REST\_DATA  
REST\_DATA HIDDEN NONE;MAX\_MAP\_SC MAX\_MAP\_SC HIDDEN NONE;REST\_COMM  
REST\_COMM HIDDEN NONE;SOURCE SOURCE HIDDEN NONE;CHG\_GAP CHG\_GAP HIDDEN  
NONE;CHG\_ATTRIB CHG\_ATTRIB HIDDEN NONE;CHG\_GEOG CHG\_GEOG HIDDEN  
NONE;COMMENTS COMMENTS HIDDEN NONE;WOMABR WOMABR HIDDEN NONE;WOTRACTID  
WOTRACTID HIDDEN NONE;WOTRACTNM WOTRACTNM HIDDEN NONE;WO\_comments  
WO\_comments HIDDEN NONE;IDState IDState HIDDEN NONE;D\_AreaName D\_AreaName VISIBLE  
NONE;D\_Fee\_Owner D\_Fee\_Owner VISIBLE NONE;D\_Int\_Holder D\_Int\_Holder VISIBLE NONE;Perimeter  
Perimeter HIDDEN NONE;Area Area HIDDEN NONE;Acres Acres VISIBLE NONE;Hectares Hectares  
HIDDEN NONE;Shape\_Length Shape\_Length HIDDEN NONE;Shape\_Area Shape\_Area HIDDEN  
NONE;Shape\_length Shape\_length HIDDEN NONE;Shape\_area Shape\_area HIDDEN NONE;AreaAcres  
AreaAcres VISIBLE NONE")

# Process: Join Field

```
arcpy.JoinField_management(CONSPUB_2012_TNC_FEE_gt1500ft, "FEE_ORGTYP",  
VLCDB_2012_TNC_FEE_ORGTYP_sum__2_, "FEE_ORGTYP",  
"FEE_ORGTYP;Cnt_FEE_ORGTYP;Fee_Desc;Fee_Category")
```

# Process: Copy Rows

```
arcpy.CopyRows_management(CONSPUB_2012_TNC_FEE_gt1500ft__3_,  
VCLDB2012_AreaBySectorGT1500PreSummary_dbf, "")
```