United States Department of Agriculture
Forest Service

TEUI Geospatial Toolkit 5.1

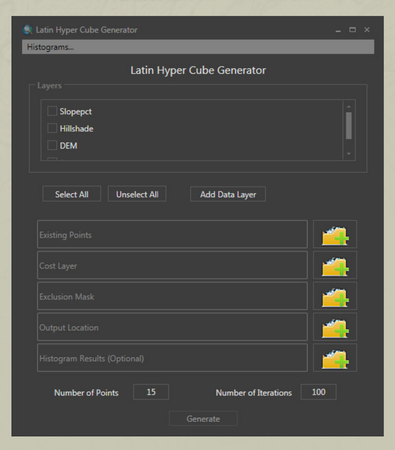
AN ARCGIS ADD-IN FOR NATURAL RESOURCE MAPPING

What is TEUI? Terrestrial Ecological Unit Inventory (TEUI) is a hierarchical land survey and resource inventory system developed and used by the United States Forest Service. TEUI products include ecological type descriptions, maps, interpretations that provide baseline information for forest plan revisions, timber and range management decisions, ecological and watershed assessments, and project level planning.

What is the TEUI Toolkit? 

The TEUI Geospatial Toolkit is an ArcGIS 10.1+ extension that accelerates TEUI, Soil Survey, and other natural resource mapping efforts. The Toolkit utilizes raster data (e.g. slope, aspect, elevation), polygon data (e.g. map units), and point data (e.g. soil pedon or vegetation plots), and displays descriptive statistical information in a tabular and graphical format. The Toolkit's focus and strengths are to assist users with creating new and consistent map units as well as characterizing established map units.

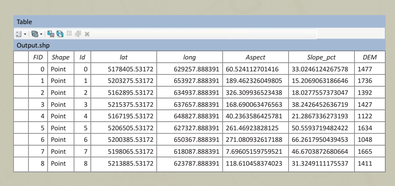
SAMPLE DESIGN



Simple and intuitive user interface allows anyone to create sample points.

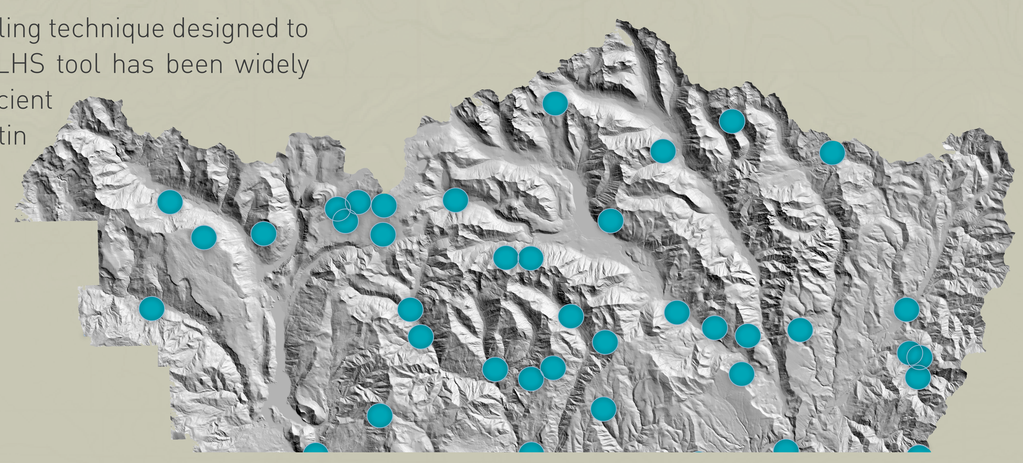
Conditional Latin Hypercube Sampling (cLHS) is a stratified random sampling technique designed to ensure balanced selection of sites across feature or data space. The cLHS tool has been widely adopted within the digital soils mapping community for the selection of efficient field sampling locations. Roudier, P. cLHS: a R package for conditioned Latin hypercube sampling.

Sample points are plotted on individual raster histograms to show where selected points are distributed.

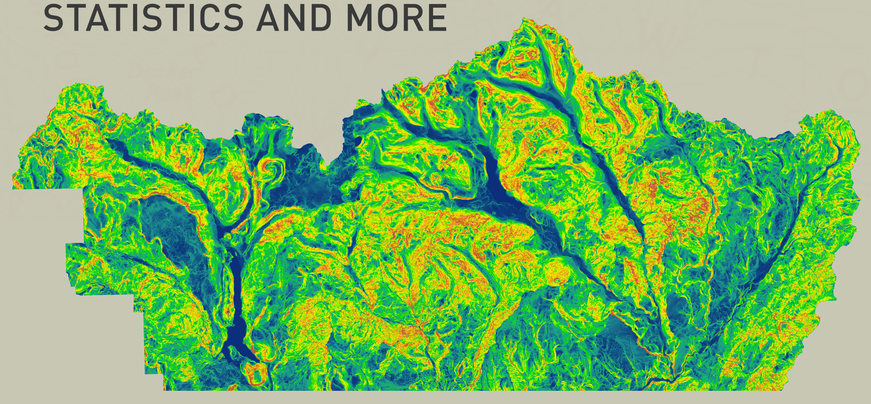


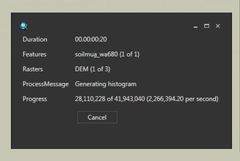
FID	Shape	Id	lat	long	Aspect	Slope_pct	DEM
0	Point	0	5178405.53172	629257.888391	60.524112701416	33.0246124267578	1477
1	Point	1	5203275.53172	653927.888391	189.462326049805	15.2069063186646	1736
2	Point	2	5162895.53172	634937.888391	326.309936523438	18.0277557373047	1392
3	Point	3	5215375.53172	637657.888391	168.690063476563	38.2426452636719	1427
4	Point	4	5167195.53172	648827.888391	40.2363586425781	21.2867336273193	1322
5	Point	5	5206505.53172	627327.888391	261.46923828125	50.5593719482422	1634
6	Point	6	5200385.53172	650367.888391	271.080932617188	66.2617950439453	1048
7	Point	7	5198065.53172	618087.888391	7.69605159759521	46.6703872680664	1665
8	Point	8	5213885.53172	623787.888391	118.610458374023	31.3249111175537	1411

Sample points are returned with coordinates and underlying raster values.

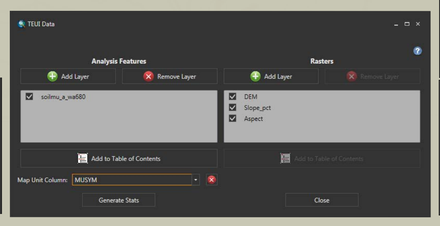


STATISTICS AND MORE

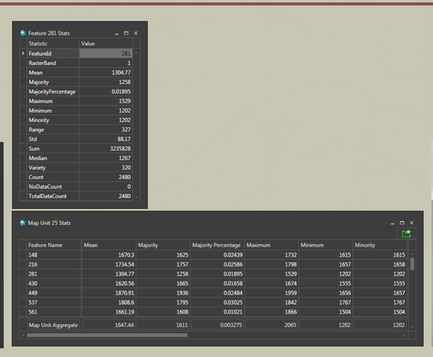




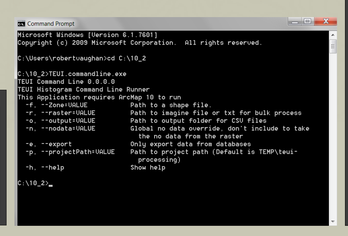
Fast Statistics Generation.



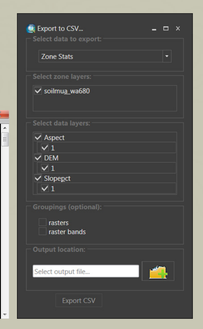
Simple Data Manager gives users flexibility on generating statistics. Users can run statistics on many unique sets of polygons and rasters all at once.



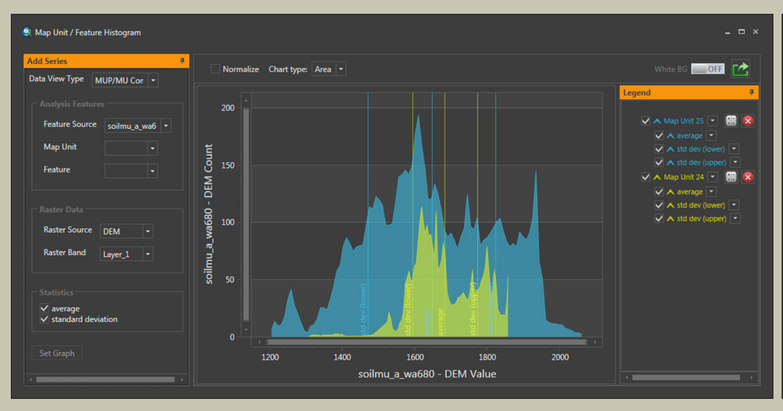
Descriptive statistics can be displayed and exported in a tabular format. Statistics are displayed for individual polygons and for map units.



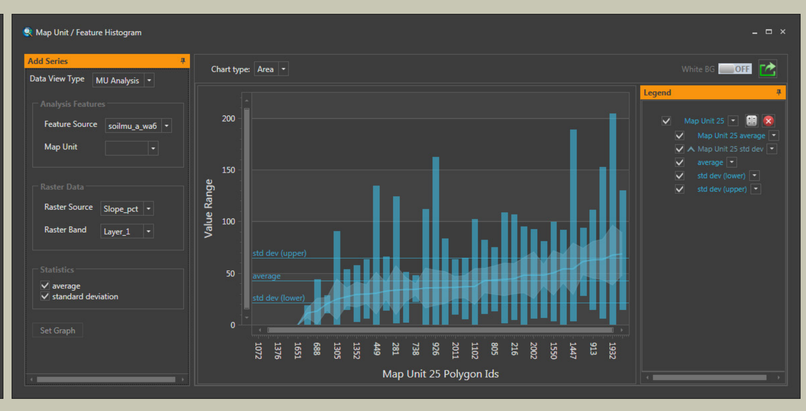
Command-line version allows users to easily integrate core Toolkit statistical functionality directly into scripts using Python or other languages.



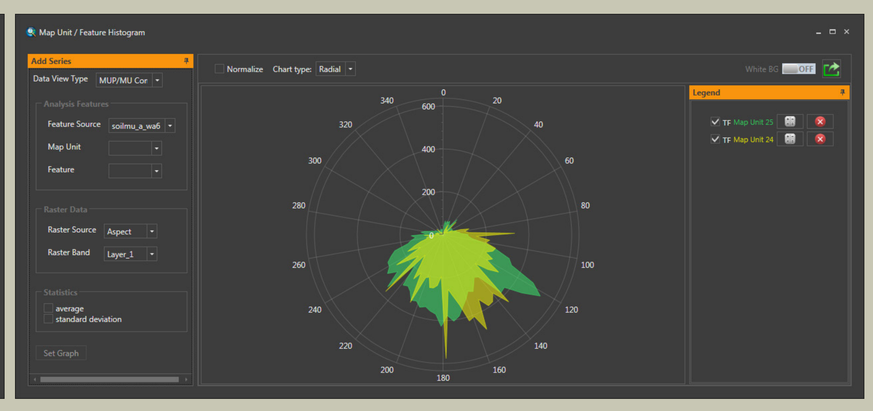
Export statistics as a text file for use in other programs such as R.



Visualize descriptive statistics for individual polygons or map units using graphs or tables. Comparisons can easily be made between individual polygons and map units and for one or more raster layers or bands.



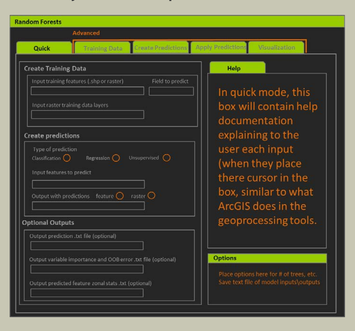
Map unit graphs allow users to easily compare all individual polygons within a map unit to identify potential outliers. Map unit mean and standard deviation lines are plotted on the graph to give users a greater sense of how individual features compare to a map unit.



The Toolkit provides users with several graph types for proper data visualization. For example, graphs are provided for radial data types (e.g. aspect). Other types include: line, point, and bar graphs.

FUTURE DEVELOPMENT ADDITIONS

*Currently under development



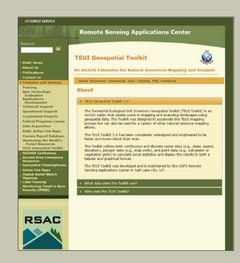
Quantitative Approach Machine Learning Tools

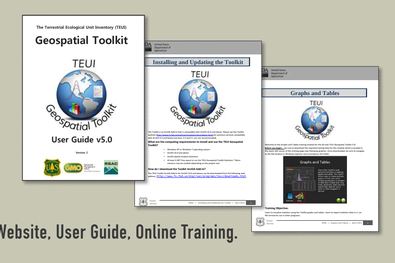
- Random Forests and Support Vector Machines*
- Radial Data Statistics

Statistical Approaches to Map Unit Development

- Non-Metric Multidimensional Scaling (NMDS) and Others*
- Imagery and Topographic Data Tools

TRAINING AND SUPPORT





Website, User Guide, Online Training.

For more information visit http://www.fs.fed.us/eng/rsac/programs/teui/about.html
Contact: Kevin Megown, Program Lead, Resource, Mapping, Inventory and Monitoring; USDA Forest Service Remote Sensing Applications Center (RSAC), 2222 West 2300 South, Salt Lake City, Utah, 84119 USA; www.fs.fed.us/eng/rsac or Robert Vaughan, robertvaughan@fs.fed.us, 805-440-2549, contractor, RedCastle Resources Inc. | Reference Number 10102-Post1 | Learn, Share, Recycle ♻ USDA is an equal opportunity provider and employer.