

## Drumlin Extraction Toolbox for ArcGIS (v1.0)

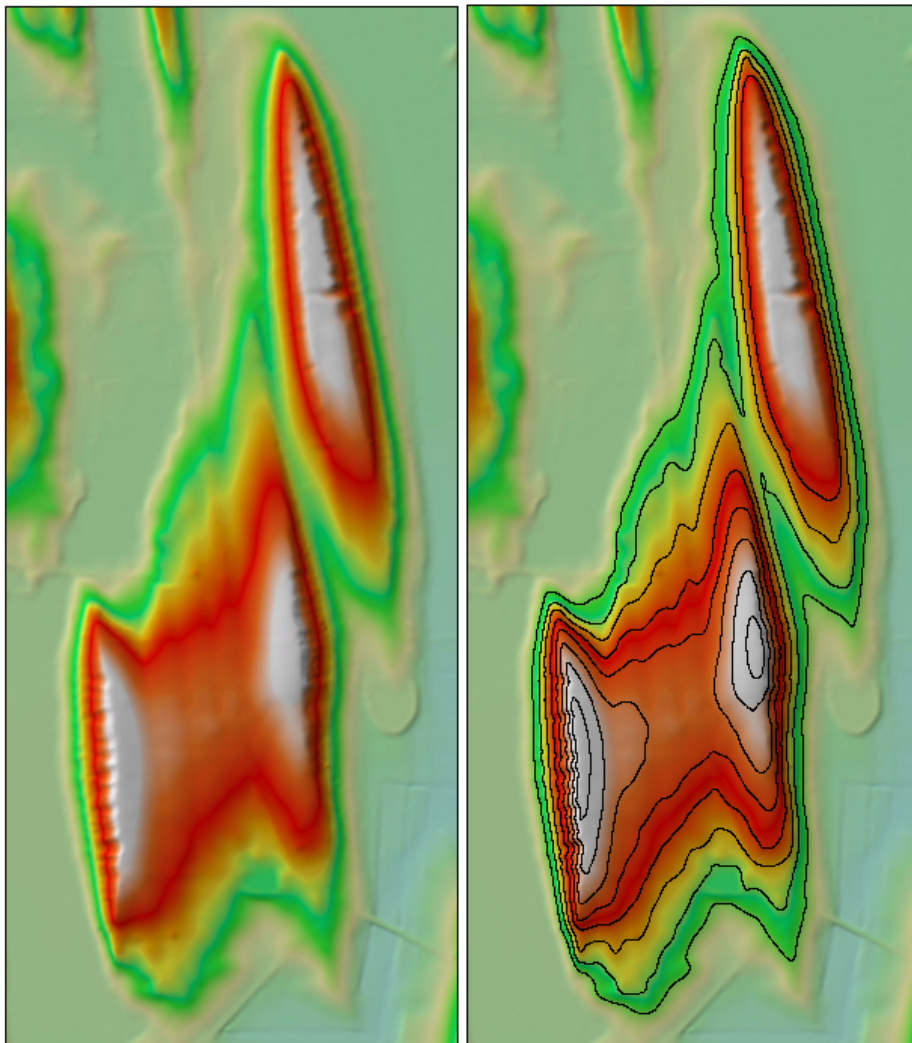
### About this document

This document provides details on a drumline extraction toolbox that delineates hierarchical drumlins from a LiDAR DEM using a contour tree algorithm. Geometric properties such as drumlin size, height, length, width, volume, etc., can also be derived. The program has been tested on ArcGIS 10.4.1 with numpy v1.11.3.

NOTE: This program is for testing purposes, and subject to change. Please send feedback to Dr. Qiusheng Wu (<https://wetlands.io>)

### Data

1-m LiDAR DEM and shaded relief.



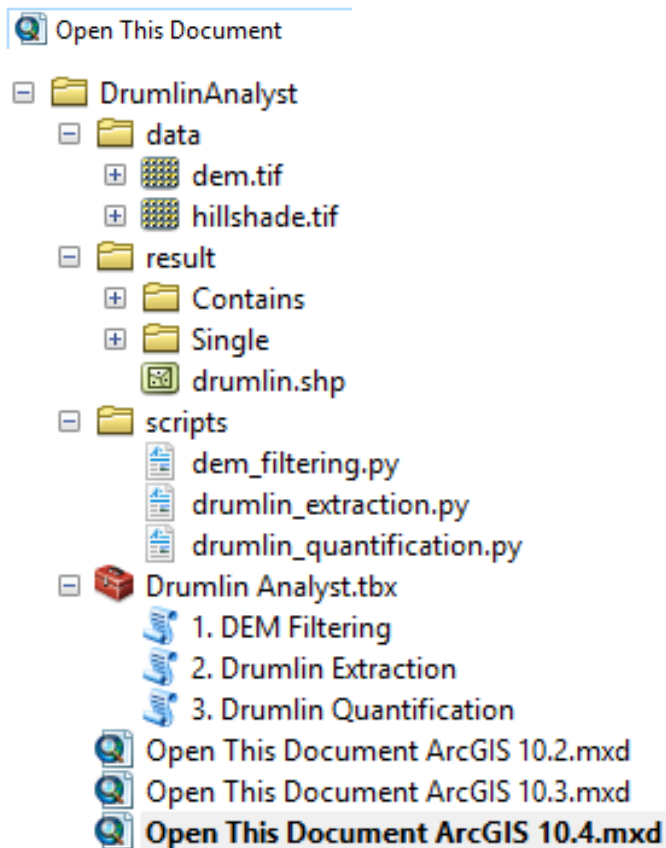
# Usage

Given below are instructions on how to derive hierarchical drumlins using the toolbox.

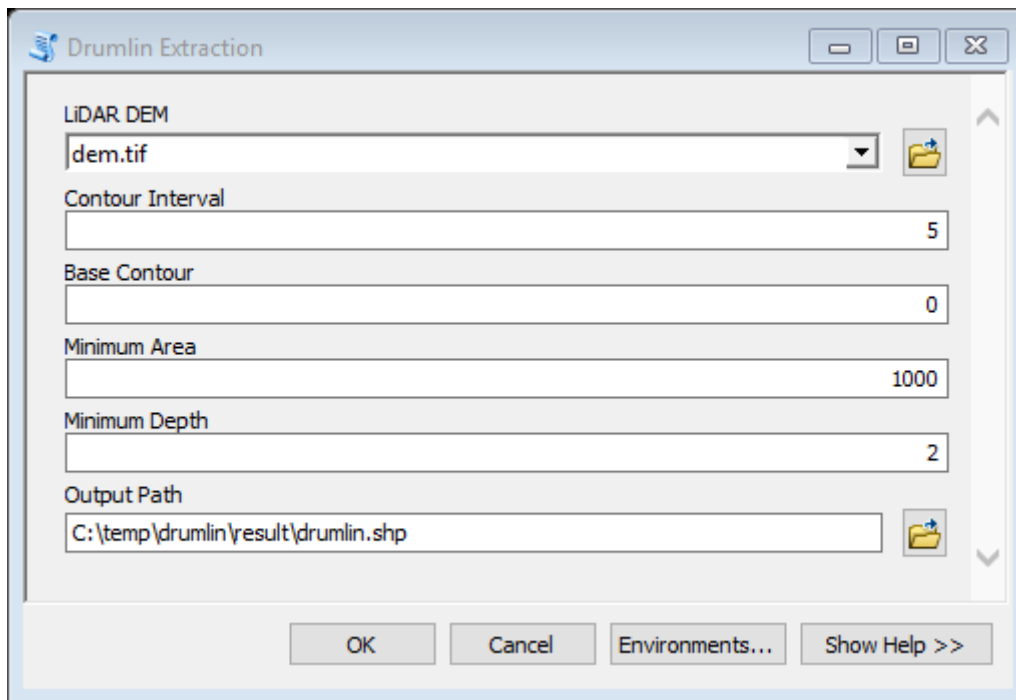
- **Toolbox file structure**

Name	Date modified	Type	Size
data	6/5/2017 3:47 PM	File folder	
result	6/5/2017 3:47 PM	File folder	
scripts	6/5/2017 3:47 PM	File folder	
Drumlin Analyst.tbx	6/5/2017 3:42 PM	ArcGIS Toolbox	33 KB
Open This Document ArcGIS 10.2.mxd	6/5/2017 3:50 PM	ArcGIS ArcMap D...	297 KB
Open This Document ArcGIS 10.3.mxd	6/5/2017 3:50 PM	ArcGIS ArcMap D...	297 KB
Open This Document ArcGIS 10.4.mxd	6/5/2017 3:50 PM	ArcGIS ArcMap D...	297 KB
Tutorial.docx	6/5/2017 3:42 PM	Microsoft Word D...	908 KB

- **Open the ArcMap Document.** The testing data and toolbox should be automatically loaded.

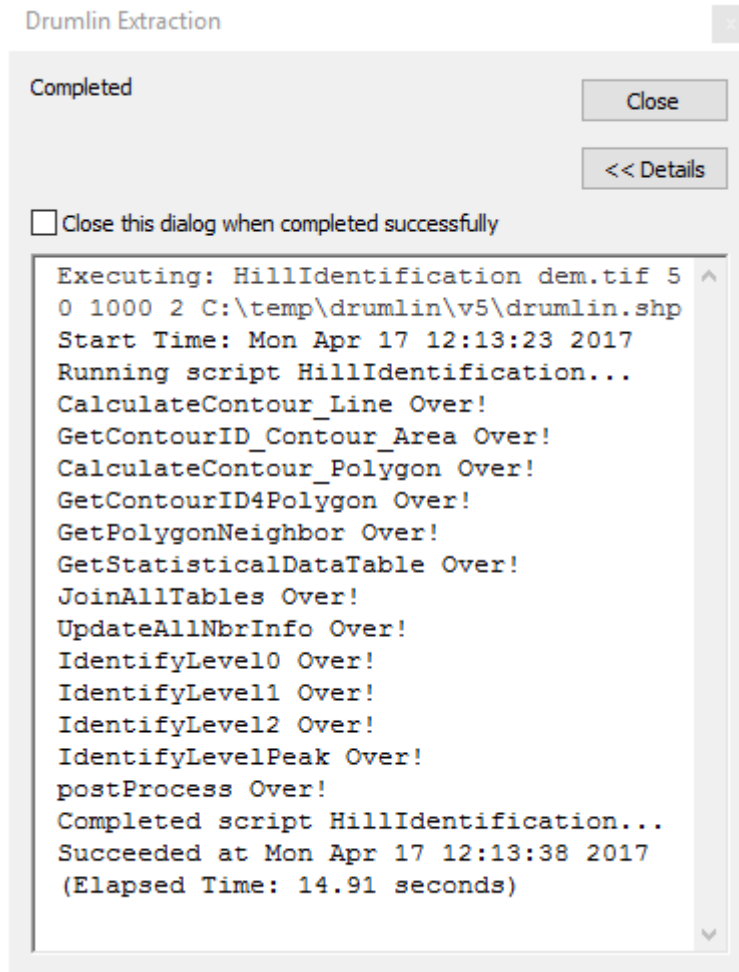


- **Extract drumlin hierarchy.** The results can be saved as Shapefile or Geodatabase Feature Dataset.

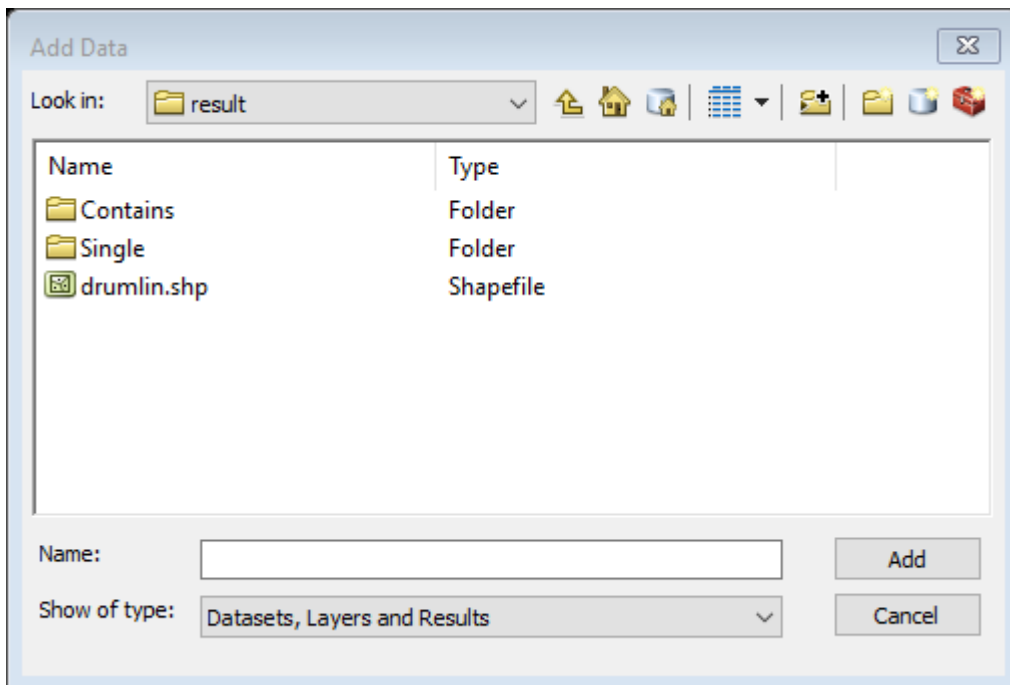


The image shows a software dialog box titled "Drumlin Extraction". It contains several input fields and buttons. The "LIDAR DEM" field has a dropdown menu showing "dem.tif" and a folder icon. The "Contour Interval" field is a text box with the value "5". The "Base Contour" field is a text box with the value "0". The "Minimum Area" field is a text box with the value "1000". The "Minimum Depth" field is a text box with the value "2". The "Output Path" field is a text box showing "C:\temp\drumlin\result\drumlin.shp" and a folder icon. At the bottom, there are four buttons: "OK", "Cancel", "Environments...", and "Show Help >>".

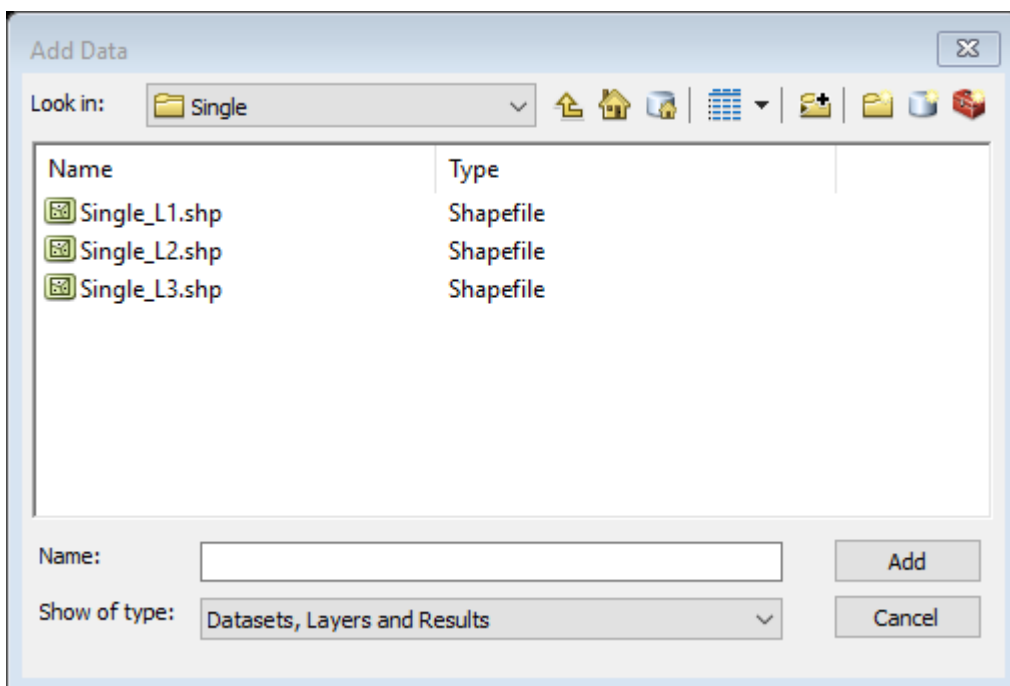
Parameter	Value
LIDAR DEM	dem.tif
Contour Interval	5
Base Contour	0
Minimum Area	1000
Minimum Depth	2
Output Path	C:\temp\drumlin\result\drumlin.shp



- Drumlin extraction results.



- **Polygons for each individual drumlin level**



- **Polygons for combined drumlin levels.** For example, Contain\_L2.shp is the union of Single\_L1.shp and Single\_L2.shp, Contain\_L3.shp is the union of Contain\_L2.shp and

Single\_L3.shp, and so on.

