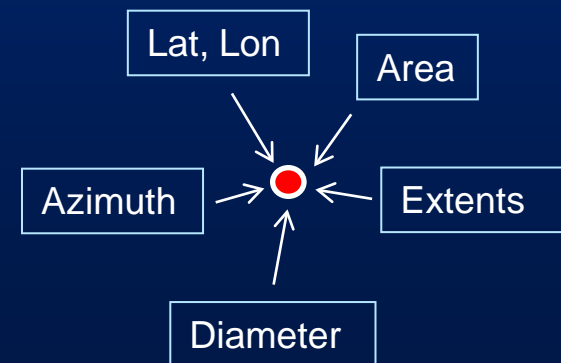
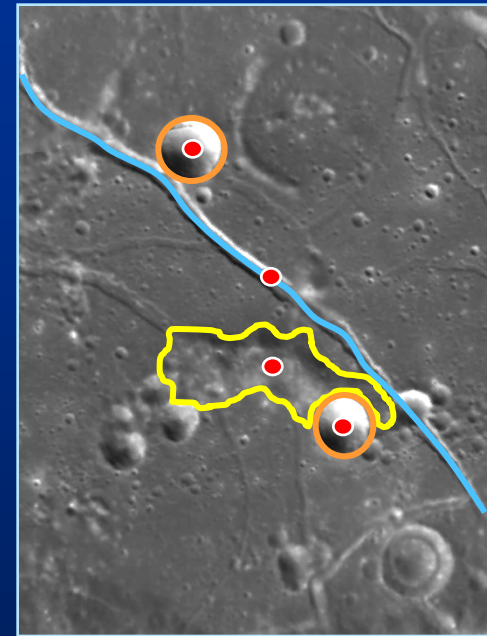


Crater Helper Tools (or the Crater/Feature tools) for ArcMap

Richard A Nava

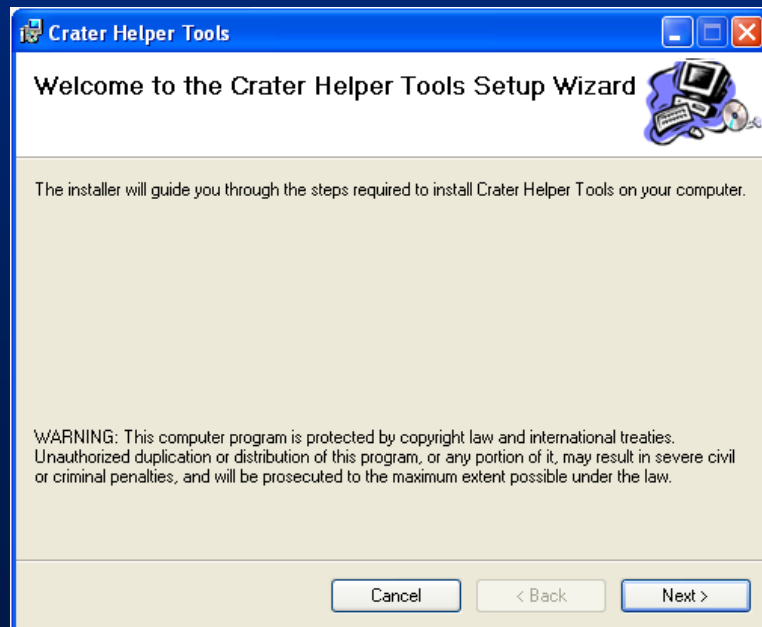
What for?

- Originally for “nomenclature”
- To digitize craters and other features
- Store several attributes about each feature on creation
- Geodesic length and area measurements
- Any projection
- All information is stored in point features
- Show measurements as graphics, or create polylines
- Link polylines to points



Download & Installation

1. Download from “**PIGWAD**” web-page
2. Requires ArcMap .Net Support ([pdf link](#))
3. Double-click: “CraterHelperSetup.msi”, follow dialog

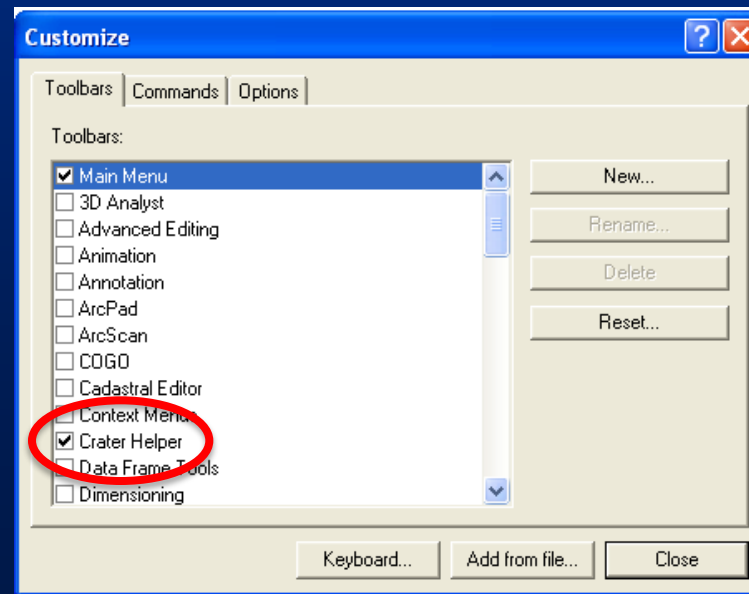


Default installation
location:

C:\Program Files\USGS Astro

Crater Helper in ArcMap

- It is an add-on toolbar
- After install:
 - Tools menu > Customize > Toolbars tab > “Crater Helper” checkbox



Interface

Toolbar

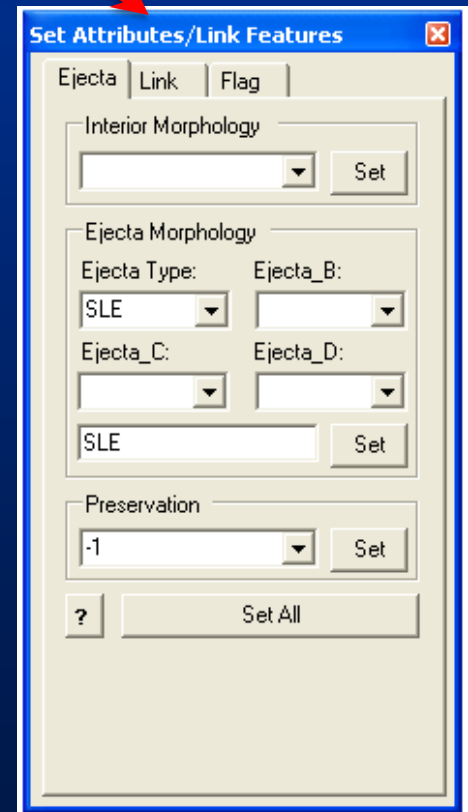


19
Modes

- Move Point
- Create Point
- Calculate Diameter
- Move Point/Calculate Diameter
- Create Point/Calculate Diameter
- Create Polyline
- Create Polyline/Move Point/Diam
- Create Polyline/Create Point/Diam
- Calculate Minor-axis Diameter
- Calculate Major-axis Azimuth
- Calculate MinA Diam/MajA Azim
- Calculate Central Peak Diameter
- Calculate Central Pit Diameter
- Calculate Ejecta Extent 1
- Calculate Ejecta Extent 2
- Calculate Ejecta Area 1
- Calculate Ejecta Area 2
- Calculate EjExtent/EjArea 1
- Calculate EjExtent/EjArea 2

7
Digitizing
Tools

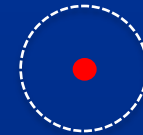
Dockable
Window



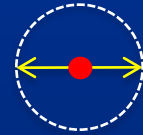
“Modes” (19)



- Move Point
- Create Point
- Calculate Diameter
- Create Polyline
- Calculate Axis Length
- Calculate Axis Azimuth
- Calculate Central Peak Diameter
- Calculate Ejecta Extent
- Calculate Ejecta Area
- ... and combinations of these



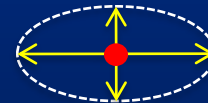
Lat, Lon



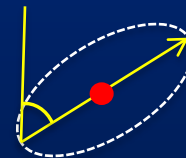
Km



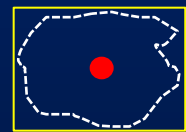
(polyline)



Km



Deg.



X_{\min} , Y_{\max}



Km²

Digitizing tools (7)



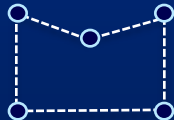
← By Point



← By Line



← By Circle



← By Polygon



← By 3-Point Circle



← By 6-Point Ellipse



← By Multi-Point Line

Enable Extents & Erase Graphics



Enables extent computations to be stored in the point feature, and graphics to show on the map

Erases all graphics from the map with one click



Creating/Measuring Features

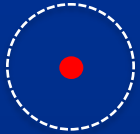
Select a mode

+

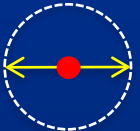
Select a tool

=

Create/measure
on map



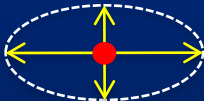
Lat, Lon



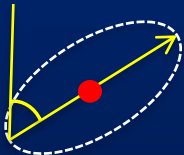
Km



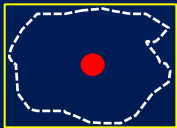
(polyline)



Km



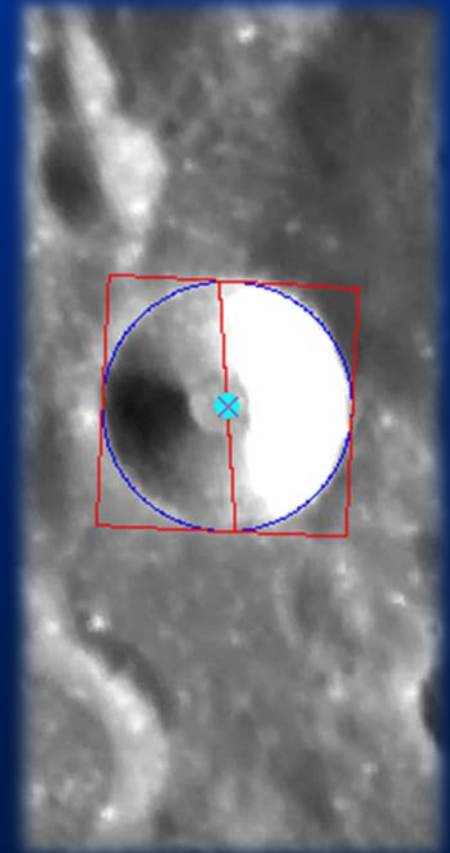
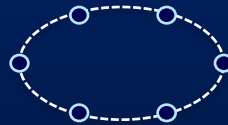
Deg.



X_{\min} , Y_{\max}



Km^2



Example 1:

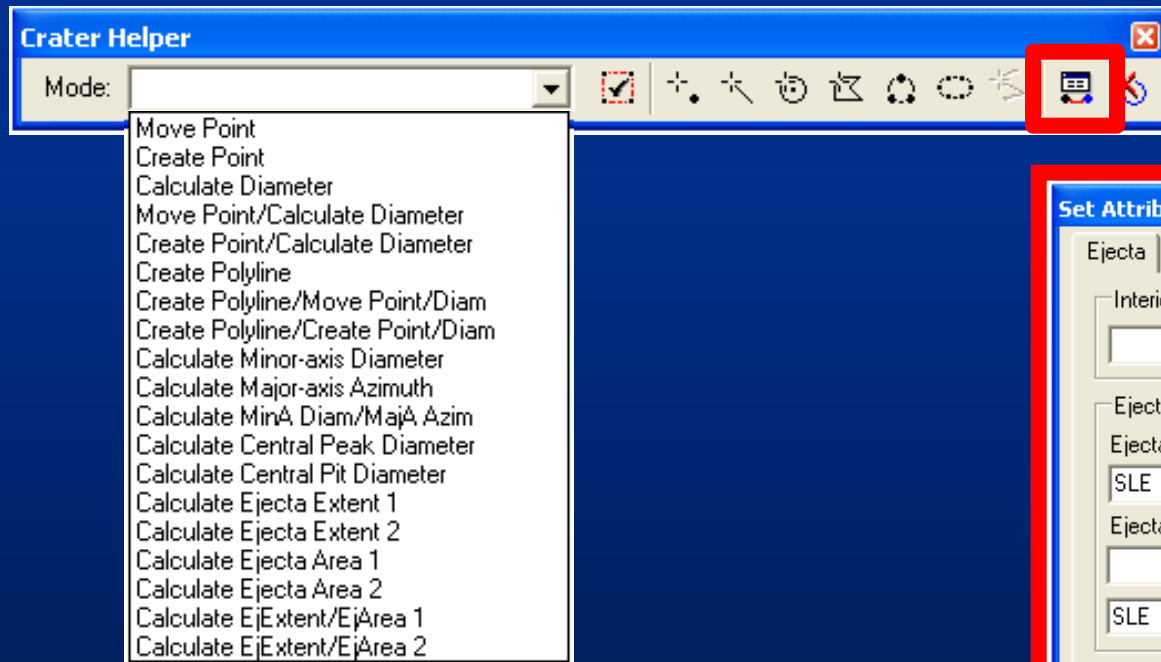
Mode: Create Point/Calculate Diameter

The screenshot shows the 'Crater Helper' software interface. At the top, a blue toolbar contains a dropdown menu set to 'Create Point/Calculate Diameter' and several icons. A red arrow points to the toolbar. In the center, a grayscale image of a lunar crater is shown with a red rectangular bounding box and a blue circular outline. A cyan 'x' marks the center of the crater. Yellow arrows point from the 'Rim Diameter' and 'Location' labels in the table below to the blue circle and the cyan 'x' respectively. Another yellow arrow points from the 'Extents' label to the red bounding box. At the bottom, a table titled 'Selected Attributes of FS_Crater_points' displays the following data:

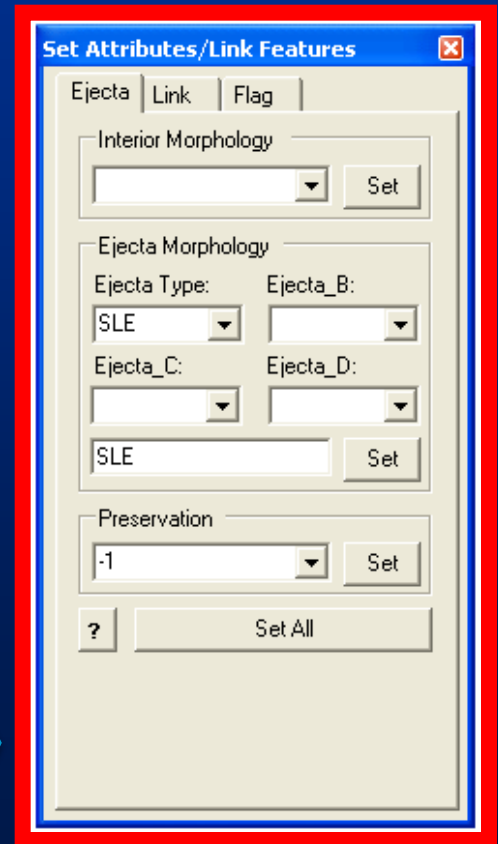
OBJECTID ^	SHAPE ^	X_MIN	X_MAX	Y_MIN	Y_MAX	RIM_DIA	LAT	LOI	FLAG
960	Point	-93.147183	-92.552584	55.856427	56.188731	10.076551	56.022579	-92.849882	1

Labels 'Extents', 'Rim Diameter', and 'Location' are positioned below the table, with yellow arrows pointing to the corresponding columns in the table. The 'Record' field shows '0' and 'Show' is set to 'All Selected'.

Crater Helper Tools

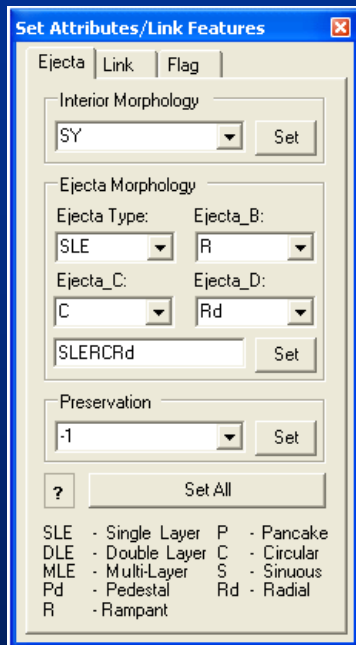


**Dockable
Window**



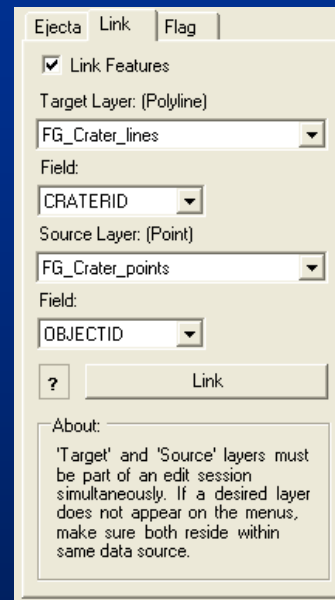
Set Attributes/Link Features

Ejecta tab



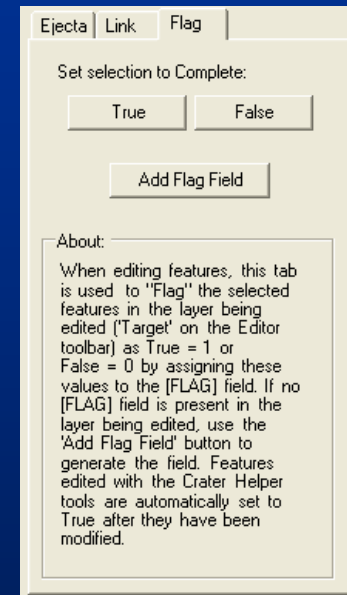
Set morphology
and preservation
attributes
(Nadine Barlow)

Link tab



Link feature
polylines to
points

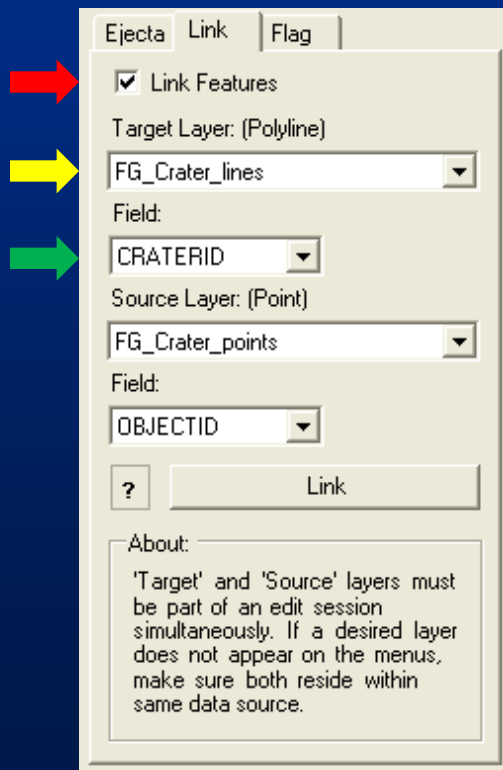
Flag tab



Flag selected
features as
complete or
incomplete

Using the Link tab

1. Check “Link Features”
2. Set Target and Source layers
3. Set Target and Source link fields



The screenshot shows the 'Link' tab in a software interface. It has three tabs: 'Ejecta', 'Link', and 'Flag'. The 'Link' tab is active. A red arrow points to the 'Link Features' checkbox, which is checked. A yellow arrow points to the 'Target Layer' dropdown menu, which is set to 'FG_Crater_lines'. A green arrow points to the 'Field' dropdown menu, which is set to 'CRATERID'. Below this, the 'Source Layer' dropdown menu is set to 'FG_Crater_points', and its 'Field' dropdown menu is set to 'OBJECTID'. At the bottom of the tab is a 'Link' button with a question mark icon to its left. An 'About' section at the bottom contains the following text: 'Target' and 'Source' layers must be part of an edit session simultaneously. If a desired layer does not appear on the menus, make sure both reside within same data source.

Dynamic link

Done automatically when creating a polyline and a point after *filling link tab parameters*

Manual link

By selecting a polyline and point and clicking the “Link” button after *filling link tab parameters*

Example 2a:

Link (circle) polyline to point

The screenshot displays the 'Crater Helper' tool interface and two attribute tables. The tool is set to 'Create Polyline/Create Point/Diam' mode. The 'Set Attributes/Link Features' dialog is open, showing the 'Link' tab. The 'Target Layer' is 'FG_Crater_lines' and the 'Source Layer' is 'FG_Crater_points'. The 'Field' for the target layer is 'CRATERID' and for the source layer is 'OBJECTID'. A crater on the moon surface is highlighted with a yellow and cyan circle. A red arrow points to the 'Crater Helper' tool, and another red arrow points to the 'CRATERID' field in the 'Set Attributes/Link Features' dialog. A yellow arrow points from the 'OBJECTID' field in the 'Selected Attributes of FG_Crater_points' table to the 'CRATERID' field in the 'Selected Attributes of FG_Crater_lines' table.

Crater Helper
Mode: Create Polyline/Create Point/Diam

Points

Selected Attributes of FG_Crater_points

OBJECTID *	SHAPE *	X_MIN	X_MAX	Y_MI
960	Point	<Null>	<Null>	<Null>

Lines

Selected Attributes of FG_Crater_lines

SHAPE *	SHAPE_Length	CRATERID	FLAG
Polyline	2.288078	960	1

Set Attributes/Link Features

Ejecta Link Flag

Link Features

Target Layer: (Polyline)
FG_Crater_lines

Field:
CRATERID

Source Layer: (Point)
FG_Crater_points

Field:
OBJECTID

Link

About:
'Target' and 'Source' layers must be part of an edit session simultaneously. If a desired layer does not appear on the menus, make sure both reside within same data source.

Example 2b:

Unclosed polyline (ridge feature)

CraterHelper_Testing.mxd - ArcMap - ArcInfo

File Edit View Bookmarks Insert Selection Tools Window Help

Editor Task: Create New Feature Target: FG_Crater_points

Layers

- PolarN
 - FG_Crater_points
 - FG_Crater_lines
 - basemap

Crater Helper

Mode: Create Polyline/Create Point/Diam

Selected Attributes of FG_Crater_points

OBJECTID	SHAPE	X_MIN	X_MAX	Y_MIN	Y_MAX
960	Point	-76.876787	-76.109735	54.65	

Selected Attributes of FG_Crater_lines

OBJECTID	SHAPE	SHAPE_Length	CRATERID
1258	Polyline	0.821703	960

CraterHelper_Testing.mxd - ArcMap - ArcInfo

File Edit View Bookmarks Insert Selection Tools Window Help

Editor Task: Create New Feature Target: FG_Crater_points

Layers

- PolarN
 - FG_Crater_points
 - FG_Crater_lines
 - basemap

Crater Helper

Mode: Create Polyline/Create Point/Diam

Selected Attributes of FG_Crater_points

OBJECTID	SHAPE	X_MIN	X_MAX	Y_MIN	Y_MAX
960	Point	-76.876787	-76.109735	54.65	

Selected Attributes of FG_Crater_lines

OBJECTID	SHAPE	SHAPE_Length	CRATERID
1258	Polyline	0.821703	960

CraterHelper_Testing.mxd - ArcMap - ArcInfo

File Edit View Bookmarks Insert Selection Tools Window Help

Editor Task: Create New Feature Target: FG_Crater_points

Layers

- PolarN
 - FG_Crater_points
 - FG_Crater_lines
 - basemap

Crater Helper

Mode: Create Polyline/Create Point/Diam

Selected Attributes of FG_Crater_points

OBJECTID	SHAPE	X_MIN	X_MAX	Y_MIN	Y_MAX
960	Point	-76.876787	-76.109735	54.65	

Selected Attributes of FG_Crater_lines

OBJECTID	SHAPE	SHAPE_Length	CRATERID
1258	Polyline	0.821703	960

'Crater Helper Tools' Remarks



- Edit session always required
- The 'Enable Extent Computations' button can be used with most tools and works as a checkbox
- Cannot use all tools with all modes
 - Ex: Cannot create a polyline with the single point tool (some are disabled at times)
- Information is always stored in fields

Because of this, the user is prompted about adding several fields when selecting different tools/modes

Feedback

- If it's not that good or you find a problem, please send us feedback, OR.... you can always **uninstall** it 😊...

Uninstalling: Crater Helper

1. Open the Windows 'Control Panel'
2. Double-click 'Add/Remove Programs'
3. Find 'Crater Helper Tools'
4. Click 'Remove'
5. Follow instructions

