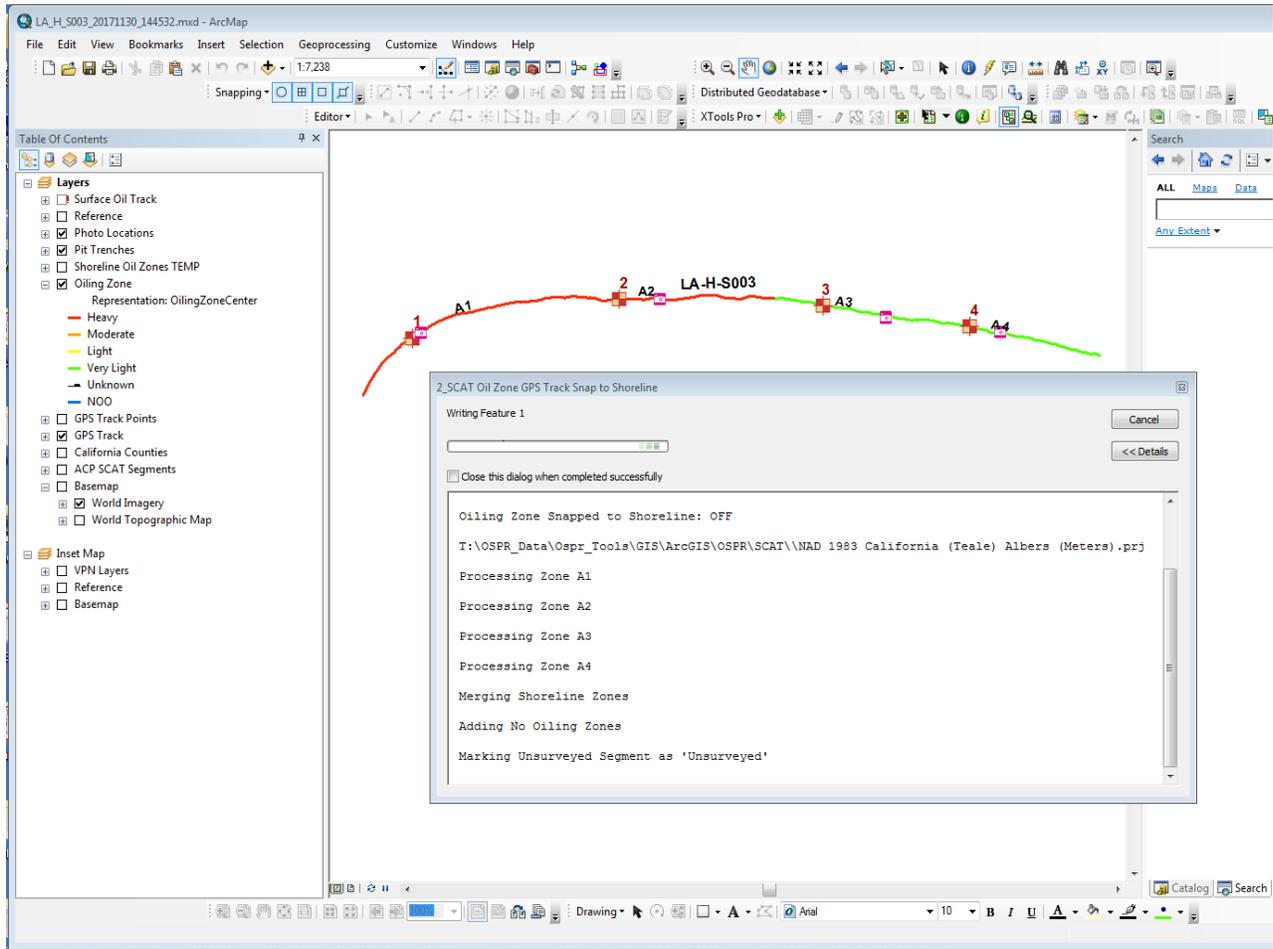


SCATalogue GIS Processing Guide



This document will cover the processing of SCATalogue data using the ArcToolbox scripts/tools written by the California Department of Fish and Wildlife's, Office of Spill Prevention and Response's (CDFW-OSPR) GIS Unit. The ArcToolbox is fully functional, but subject to updates and further development as necessary. As of this writing (11/12/2019) there is a public packaged version available at: <https://www.wildlife.ca.gov/OSPR/Science/GIS/SCATalogue>

Note that this version of the ArcToolbox will be compatible with ArcMap 10.7.x. An ArcGIS Pro version is currently in development.

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SCATalogue Data Transfer

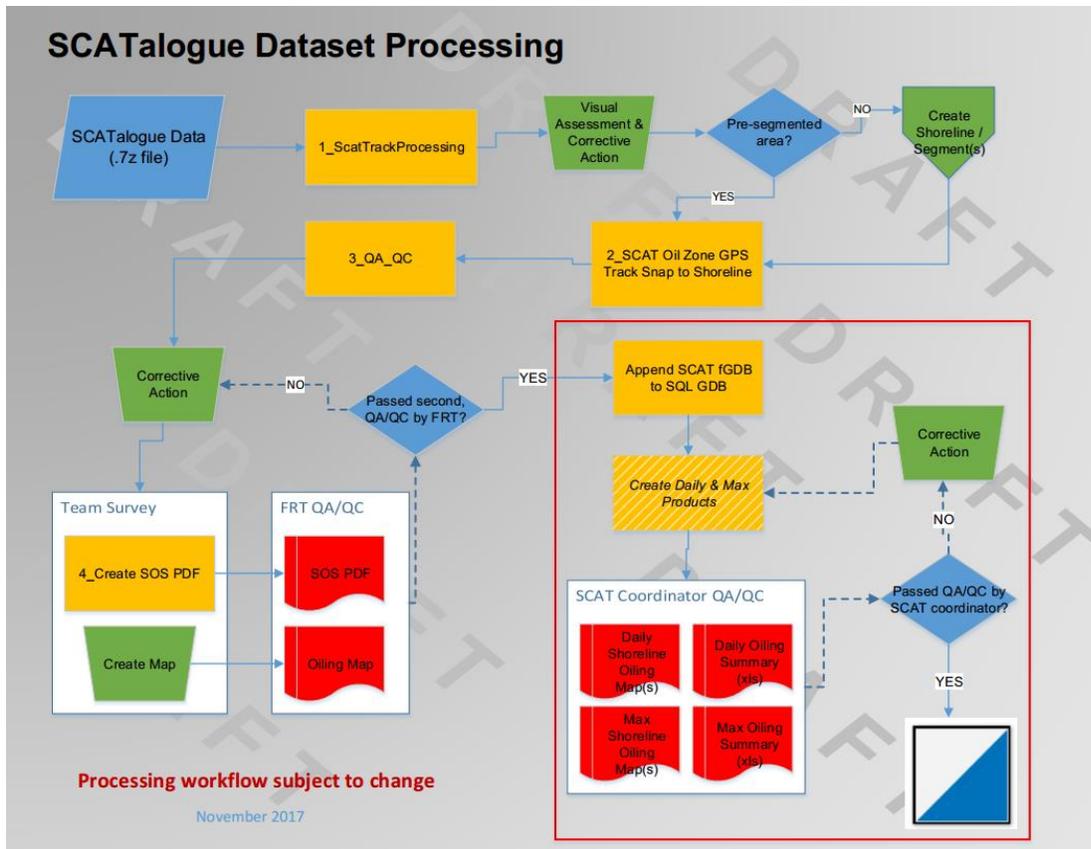
SCATalogue data can arrive via various methods. The most familiar to date, is via email. An email from SCATalogue is initiated from the user's iPad. The subject line will be, "SCATalogue:" followed by the name of the survey (for example, "SCATalogue: **2017-DRILL-1 LA_H_S001_20171025_140257**"). This identifies the Spill ID, Segment ID, and the date_time string when the survey was initialized.

Emailed SCATalogue data can have two zip file attachments. The first being the textual data (all the data usually on the paper SOS form). The second will contain any sketch, signature form, or photos from the survey. If the second attachment is too large for CDFW email (20 MB or greater), the second attachment will not be included and will have to be retrieved by other methods (AirTransfer). There will be references to the photos in the textual data so you will know if that is the case.

There is also transfer via the CDFW SharePoint/OneDrive app. This will not have the size limit for attachments, so all the data will be zipped into one file.

SCATalogue GIS Processing

OSPR GIS staff have and continue to develop ArcGIS tools for processing the SCATalogue data. The general workflow is:



Note that on the SCATalogue Dataset Processing (workflow diagram) the elements/processes NOT in the red box represent the processing of individual SCATalogue dataset to a single file geodatabase. Once properly vetted, data from the individual file geodatabase may be appended to the cumulative SCAT SQL geodatabase.

The goal of the ArcGIS tools for SCATalogue is to minimize the amount of “manual” GIS and non-GIS work required, thereby moving the data thru the workflow faster and producing output. However, there are always unanticipated events and situations that cannot be handled by automation. This especially true in a chaotic and high-pressure environment like an oil spill. Automation cannot replace a composed skilled GIS professional.

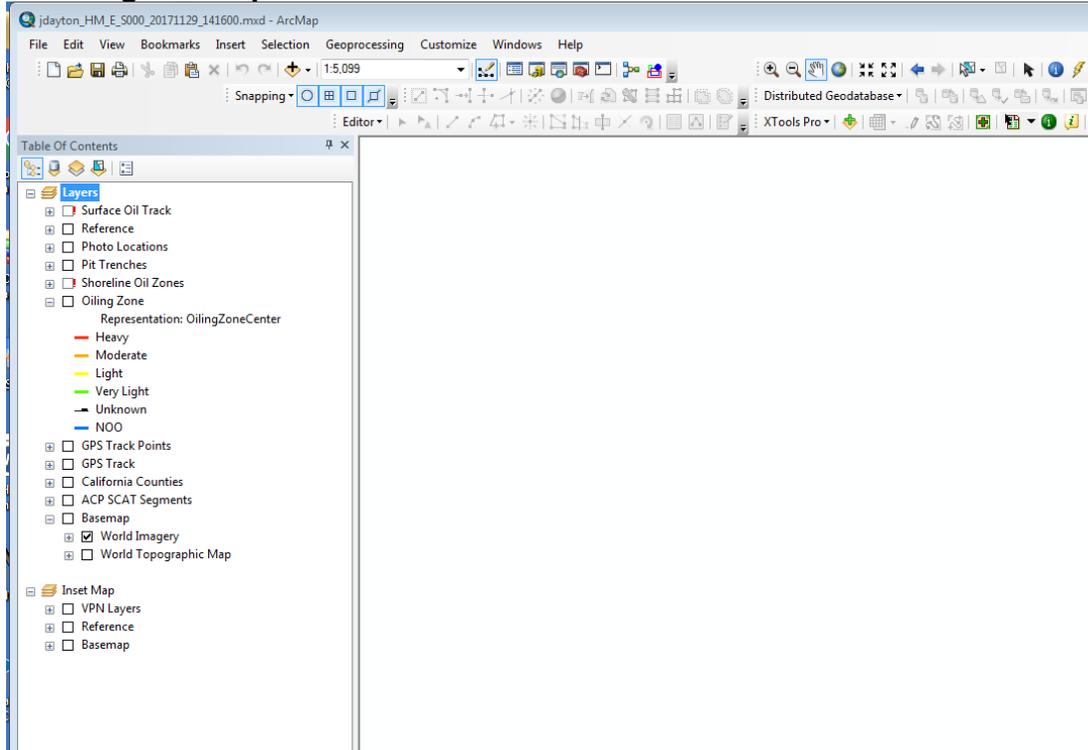
There are currently about two dozen tools in five toolsets. These tools along with necessary data and templates are located at:

T:\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT

T:\ is an OSPR GIS shared drive and is synced/mirrored on the OSPR GIS NAS drives.

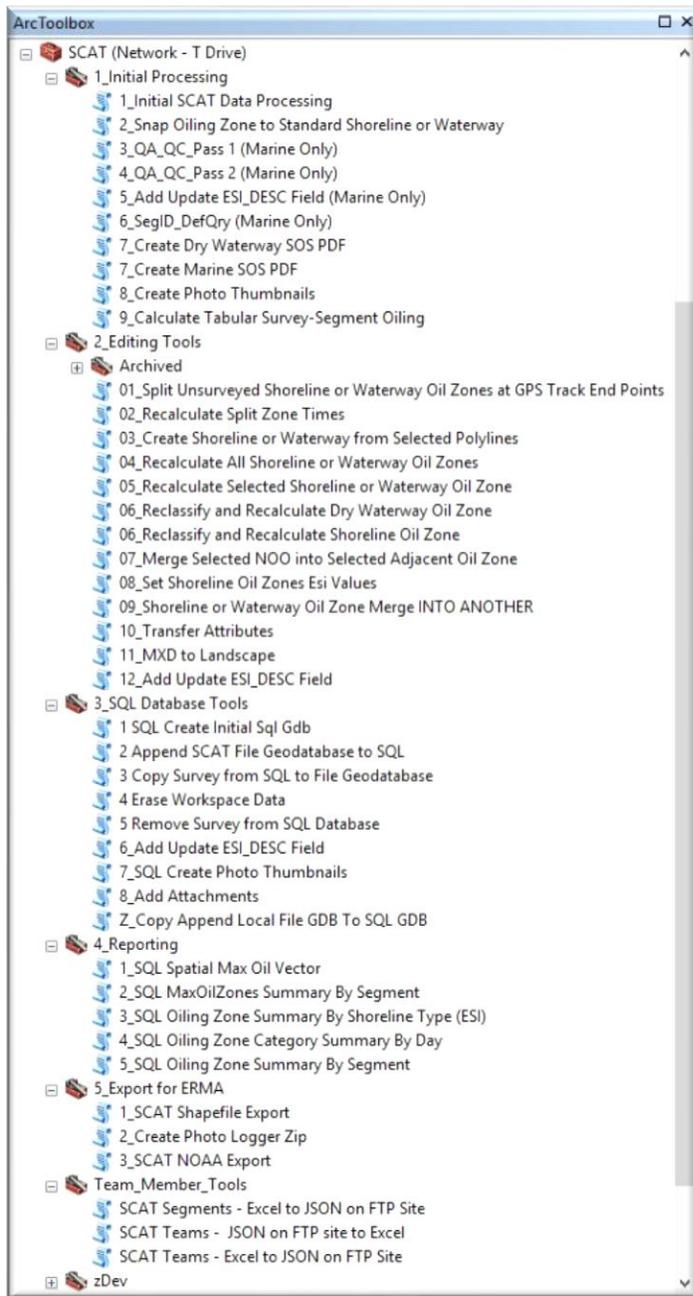
TIP FOR OSPR EMPLOYEES: if you need to do SCATalogue processing and will not have access to the T: drive and/or the OSPR GIS NAS, then copy the T:\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT folder to your laptop locally.

This SCAT folder also contains an ArcMap template MXD that you need to use: **Current Scatalogue_template.mxd**



Scat processing will run faster if the dataset being processed has been copied to a folder on your local computer. The best practice is to create a folder for each dataset being processed, and to name the folder with an appropriate name reflecting its contents. The template MXD should be copied to this folder and given the same name as the dataset (i.e. HM_E_S001_20181031_131313.mxd).

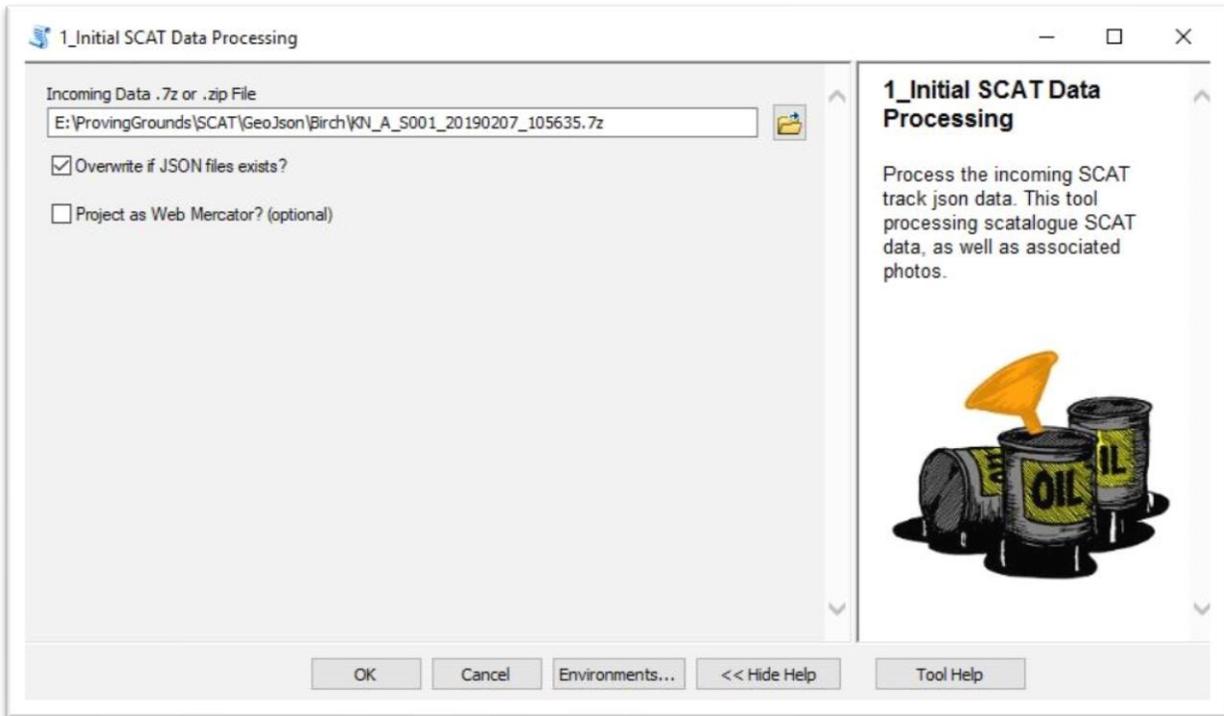
The following toolsets have been developed to assist in the processing of SCATologue data:



See Appendix 2 for individual tool descriptions.

Data Processing Workflow

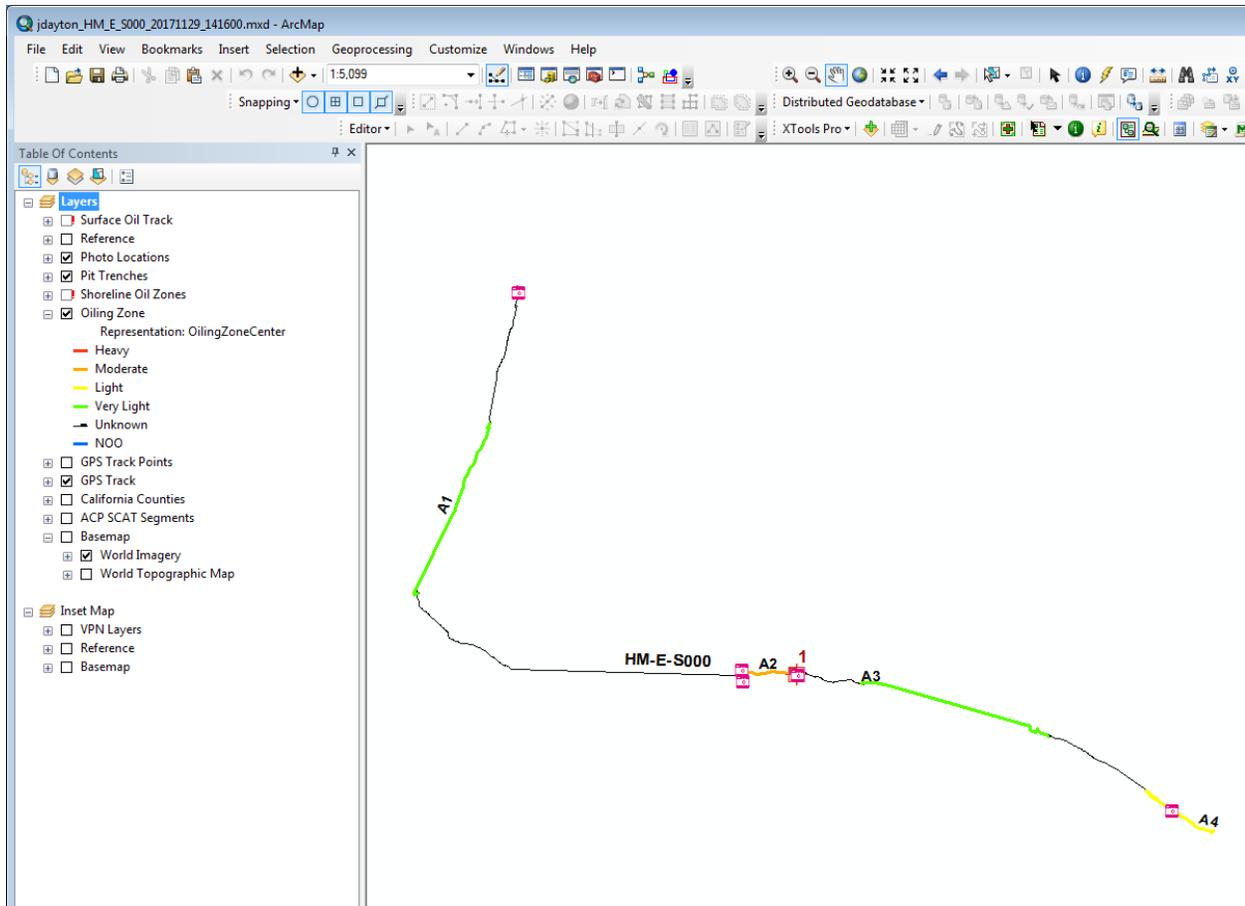
In order to process data, each tool in the Initial Processing toolset should be run in sequence (some tools are only for marine surveys and should be skipped when processing inland dry waterways), beginning with 1_Initial SCAT Data Processing.



This tool converts incoming zipped data (.7z format) from the SCATalogue app into a geodatabase format, processes associated photographs and sketches. When run from a copy of the template MXD, it will load the newly created data into the appropriate layers in the ArcMap Table of Contents. To run the tool, open it from ArcToolbox and select the zipped data folder you wish to convert (the associated photo zip file will also be processed if they are in the same location).

This tool takes the primary SCATalogue zip file as input (NOT the _photo.7z). By default, the “**Overwrite if JSON files exist?**” parameter is checked. Uncheck this if there is problem running this tool *and* the fix involved manually editing one or more of the previously unzipped JSON input files. Also by default, all output GIS data will be projected into a California Teale Albers NAD83 projection. There is a checkbox if you wish to project results into Web Mercator.

Upon completion of this tool, the map frame will zoom to the extent of the processed data and the GPS Track, Oiling Zones, Pit Trenches, and Photo Locations layers will be updated with current data. The following is an ArcMap screenshot after running the first intital processing tool:

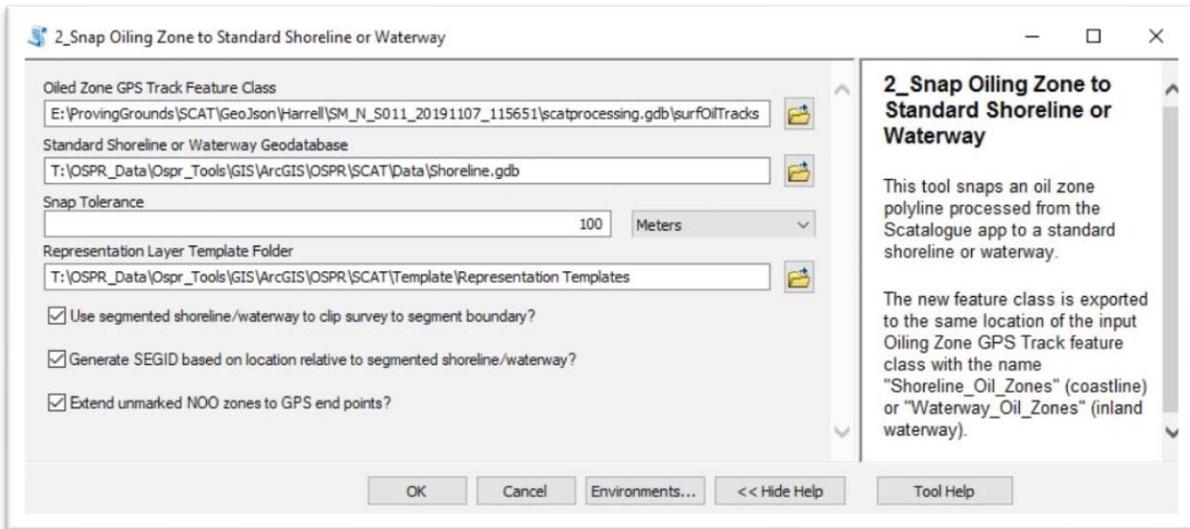


The Oiling Zones layer represents recorded oil zones based on the GPS track data (the path SCAT surveyor walked while collecting SCAT data).

CDFW-OSPR developed pre-segmented shorelines for California marine spill response which are the standard shoreline for oil spill reporting mapping, statistics, and reporting. The tracked based zones need to be snapped to the pre-segmented shoreline.

NOTE: For inland spills or other situations where a pre-segmented shoreline polyline is not available, one will need to be created. Use the Create Shoreline from Selected Polygons tool in the QA/QC Processing Tools toolkit (see Appendix for description) to create one before the next step

The next tool, “**2_Snap Oiling Zone to Standard Shoreline or Waterway**”, snaps the processed Scatalogue oiled zone GPS track to the standard shoreline or waterway line.

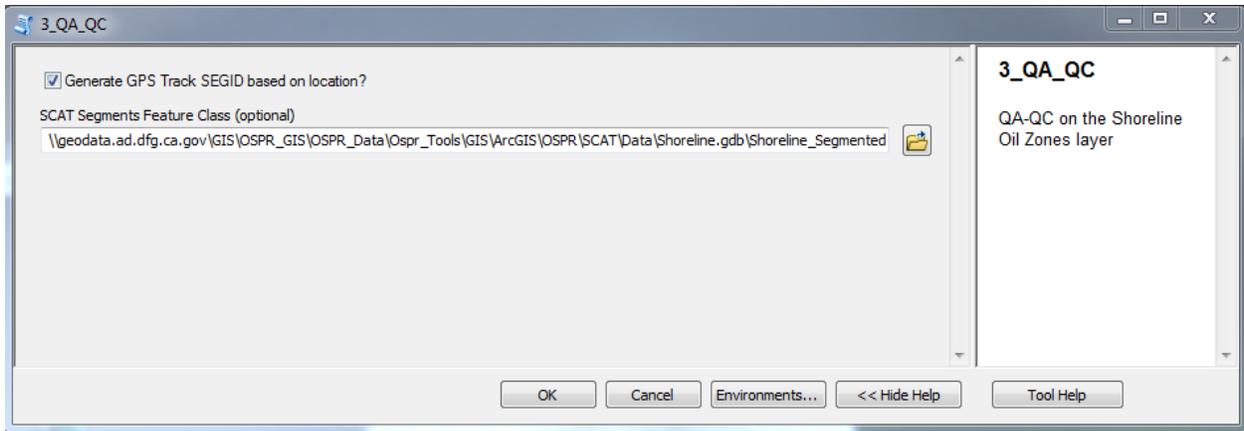


This tool snaps the features of the Oiling Zones layer to the standard shoreline and marks areas in between oiled zones as NOO (No Oil Observed). By default, areas between the end points of the GPS track in a shoreline segment and the end point of that segment are marked as Unsurveyed parts of the segment. This default can be overridden if necessary. See the tool description in Appendix 2 for details.

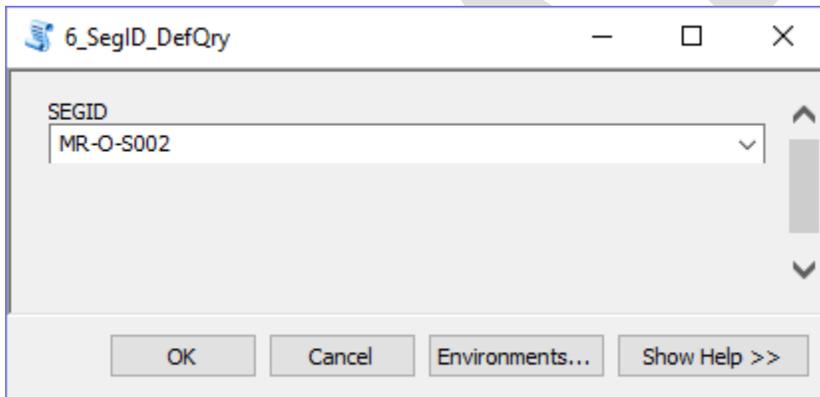
If the SCATologue survey has multiple segments (eg. SB-N-S001 & SB-N-S002, etc...), then ensure the following.

- Rename the “X” zones to the next available letter (eg. X1 -> B1).
- Only unsurveyed zones should be prefixed with “Z” (eg. Z01).
- The entire lengths of segments should be accounted, if needed; add unsurveyed zones.
- Ensure NOO zones have actual zone ID's and not Z0# ID's
- Check that all zones have esi zonetype except Z0# that are unsurveyed

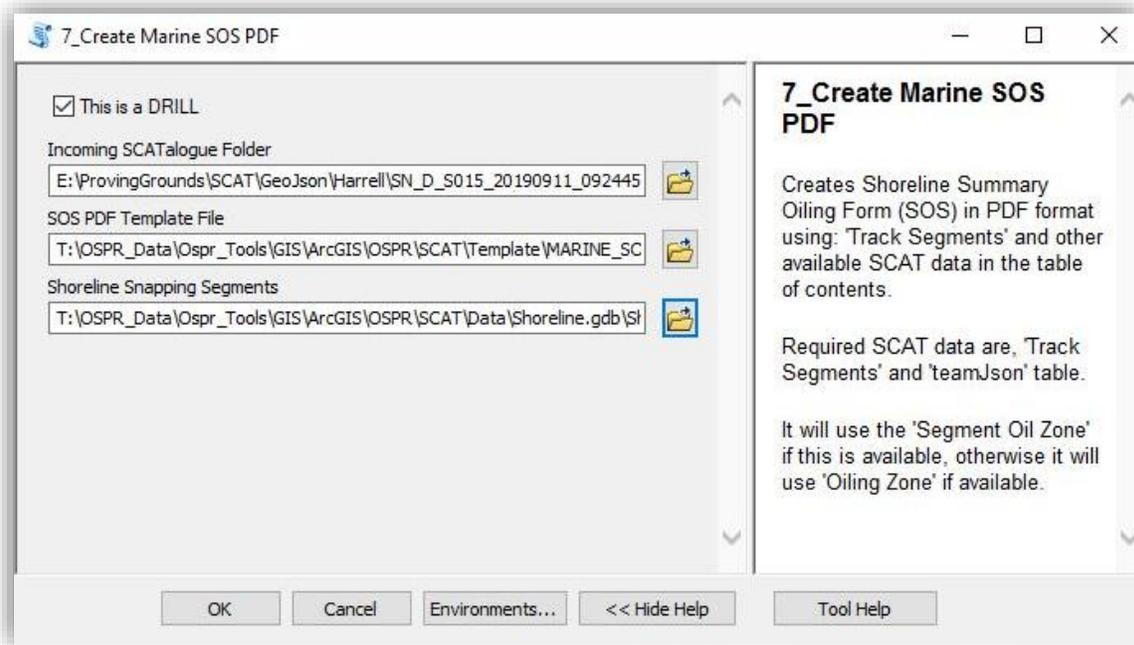
For marine surveys only, run the “**3_QA_QC**”, “**4_QA_QC_Pass_Two**”, “**Add Update ESI_DESC Field**”, and “**6_SegID_DefQry**” tools. Tool 3 analyzes processed Shoreline Oil Zones data, adds and updates some fields, and gives suggestions for possible edits to the data. The tool includes an option to update the SEGID field of the GPS Track layer based on the location of the closest shoreline segment centroid. This is the default. If checked, a location for the SCAT Segments Feature Class must be provided. **NOTE:** *If the “Generate SEGID based on location?” checkbox in the prior tool was checked, then the “Generate GPS Track SEGID based on location?” checkbox should be checked in this tool as well.*



Tools 4-6 continue to perform data enhancements. Tools 4-5 have no parameters and should simply be run in sequence. Tool number six is optional. It prompts the user to select the Segment ID for which to query for map display and output to the SOS form. There will only be multiple choices available if the survey crosses shoreline segment boundaries. If this tool is skipped, portions of the survey that may fall outside of the segment that contains the majority of the survey will be prefixed with the letter X.



The 2 versions of the seventh tool, either “7_Create Marine SOS PDF” or “7_Create Dry Waterway PDF” generate a PDF version of the NOAA Shoreline Oil Summary (SOS) (for dry waterways this is the Substrate Oil Summary) form. Use the Marine version for marine SCAT surveys and the Dry Waterway version to process inland dry waterway surveys. The SOS form is the analog template for recording hand-written SCAT data in the field; the PDF version generated by this tool serves an easy-to-read synopsis of SCAT survey data collected by the SCATologue app.

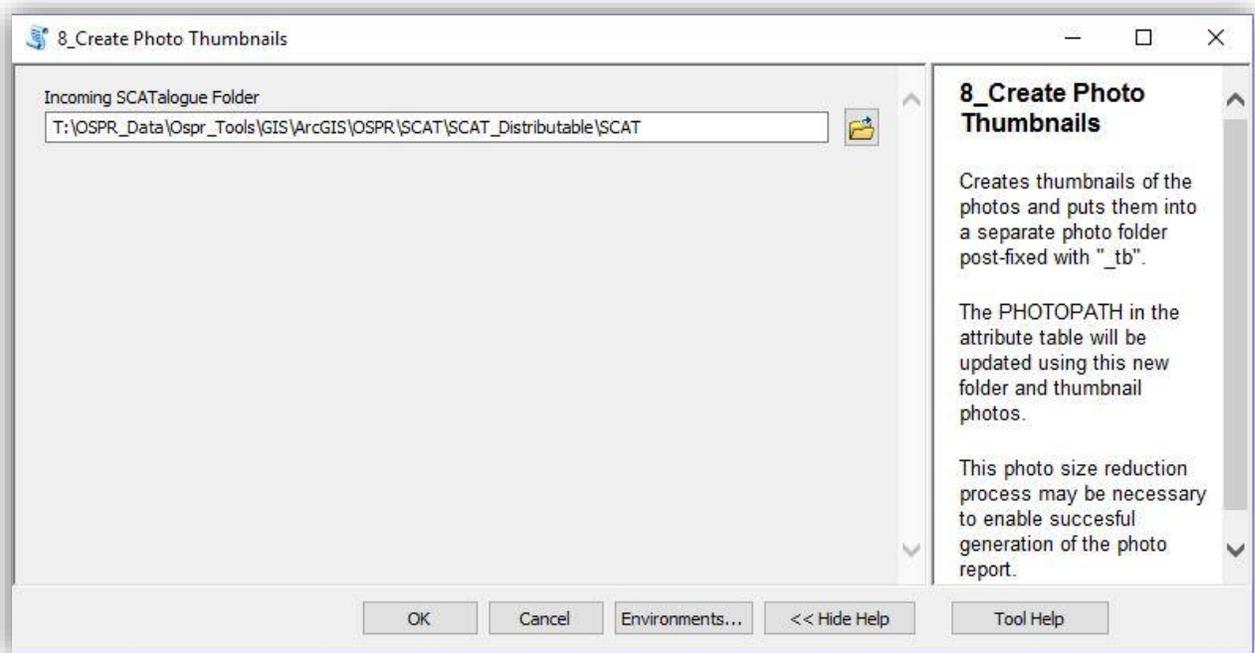


The user must indicate the folder containing the scatprocessing.gdb file geodatabase, the location of the template SOS pdf, and the location of the feature class representing the standard shoreline segments. Be sure to uncheck “This is a Drill” in the case of an actual event – checking this box embeds a drill watermark on the output SOS form.

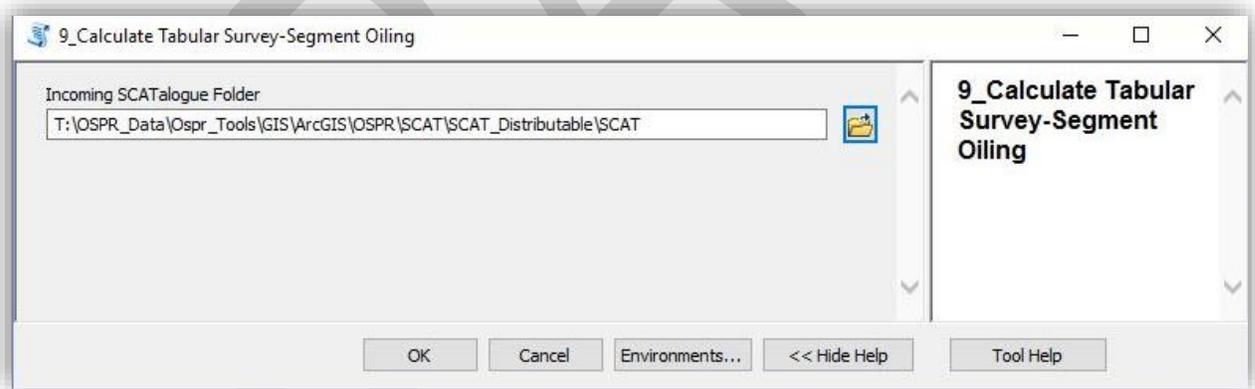
NOTE: *For marine surveys, if the user generated a new shoreline using the Create Shoreline or Waterway from Selected Polygons tool (see Appendix 2, in the QA/QC Processing Toolkit), then the Shoreline Snapping Segments entry on the tool should be directed to the Shoreline_Segmented feature class within the current scatprocessing.gdb geodatabase.*

For inland dry waterway surveys, if the user generated a new waterway using the Create Shoreline or Waterway from Selected Polygons tool (see Appendix 2, in the QA/QC Processing Toolkit), then the Waterway Snapping Segments entry on the tool should be directed to the Waterway_Segmented feature class within the current scatprocessing.gdb geodatabase.

The eighth tool is an optional tool that will create a folder of photo thumbnails of all survey photos. This is included because sometimes it is unwieldy to include the larger raw photos from the app within ArcMap documents.



The last (also optional) tool in the Initial Processing toolkit is the 9_Calculate Tabular Survey-Segment Oiling tool. Enter the folder location of the current scatprocessing.gdb file geodatabase.



An Excel file will be generated in the same folder as the SCATologue folder with the same name as the survey name. It will contain data representing the length totals of each degree of oiling captured within the active segment.

General Products

All Phases

Overview Map Showing Operational Divisions and Shoreline Segments

Initial

Overview Map of Surface Oiling
Summary Table of Surface Oiling

Operational Periods

Planning

Overview Map of Surface Oiling Categories
Summary Table of SCAT Survey History
Summary Table of Surface Oil Categories by Substrate Type
Overview Map of Oiled Substrate Type

Operations

SOS form printouts
Sketch maps
Oiling Maps for Single Shoreline Segment(s)

Additional Products

Overview Map of oil category from Initial Response Surveys
Detailed oiling maps for a given Shoreline Segment
Overview map of Surface Oil Categories
Overview map of oil zone substrate types
Overview map of Remobilization Potential
Overview map of Oil Persistence
Overview map of Subsurface Oil Category
Overview map of Subsurface Oil State
Summary map of Surface Oil Categories
Summary map of Oil Substrate Types
Summary maps of oil volume
Overview map of Work Status

Summary table of oil category from Initial Response surveys
Oiling summary for a single Shoreline Segment
Summary table of treatment recommendations
Summary table of SCAT Survey History

Summary tables of Surface Oil Category
Summary Table of Work Status

SOS Forms Printouts
Sketch Maps
Treatment Recommendation Transmittal Form

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Appendix 1 - Prerequisites

Note: that that these directions reference ArcGIS 10.7.1. If using a different version, change the path in the directions accordingly.

Directions for installing the prerequisites for Scatalogue python scripts and ArcToolbox tools.

1. Update Pip, a python site package installer. It is the easiest way to add and upgrade the python add-ons necessary to run some of these tools.
 - a. Open a command prompt in windows. From the windows start menu, type CMD in the search box and hit enter.
 - b. Type “C:\Python27\ArcGIS10.7\scripts\pip.exe install pip --upgrade” and hit enter. This verifies that you have the most version of the Pip installer and updates if necessary.
2. Install Pillow, an image processing extension for python.
 - a. In the windows command prompt, type “C:\Python27\ArcGIS10.7\scripts\pip.exe install pillow” and hit enter.
3. Install XlsxWriter, a python package that allows reading and writing to Excel files.
 - a. In the windows command prompt, type “C:\Python27\ArcGIS10.7\scripts\pip.exe install xlsxwriter--upgrade” and hit enter.
4. Install PyUnpack, a python site package that allows unpacking of various formats of zipped files.
 - a. In the windows command prompt, type “C:\Python27\ArcGIS10.7\scripts\pip.exe install pyunpack” and hit enter.
5. Install PaTool, the Python package index for some forms of compression. Check to make sure it is installed by attempting to reinstall.
 - a. In the windows command prompt, type: “C:\Python27\ArcGIS10.7\scripts\pip.exe install patool” and hit enter. If it is already installed, attempt to upgrade by typing the following into the command prompt and hitting enter: “C:\Python27\ArcGIS10.7\scripts\pip.exe install patool --upgrade”
6. Install fdfgen, the Python package for generating a precursor format to populate a PDF form. In our case, this is a Shoreline Oiling Summary (SOS) Form. Check to make sure it is installed by attempting to reinstall. “C:\Python27\ArcGIS10.7\scripts\pip.exe install fdfgen --upgrade”
7. Install T:\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT\Install\pdftk_server-2.02-win-setup.exe This executable is called from python and takes the format from fdfgen and populates the values into the PDF form.

Future location for public SCATologue documentation, tools, and information. California Department of Fish and Wildlife, Office of Spill Prevention and Response link to [SCATologue support web page](#).

11/12/2019

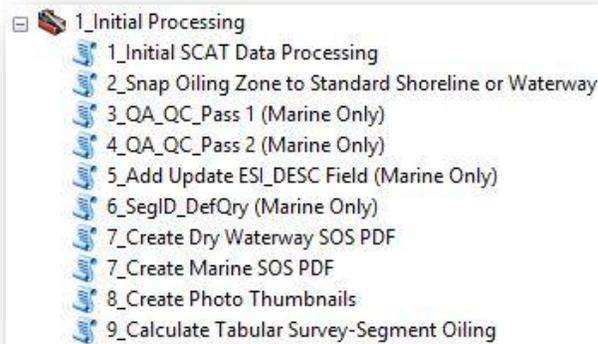
Appendix 2 - Individual Tool Descriptions

All SCAT processing must be run from a current copy of the *Current Scatalogue_template.mxd* located at: \\geodata.ad.dfg.ca.gov\GIS\OSPR_GIS\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT\Template\Current Scatalogue_Template.mxd

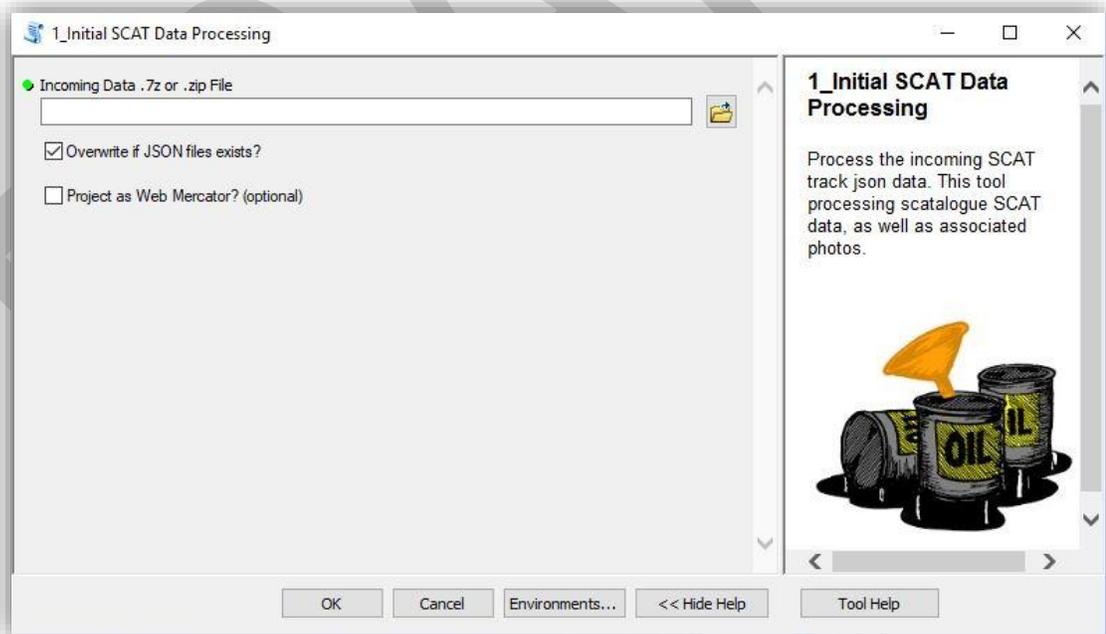
All SCAT processing tools are found within the *SCAT (Network – T Drive) ArcToolbox* found at: \\geodata.ad.dfg.ca.gov\GIS\OSPR_GIS\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT\SCAT.tbx

A. Initial Processing Tools

All initial processing tools can be found under the 1_Initial_Processing toolkit



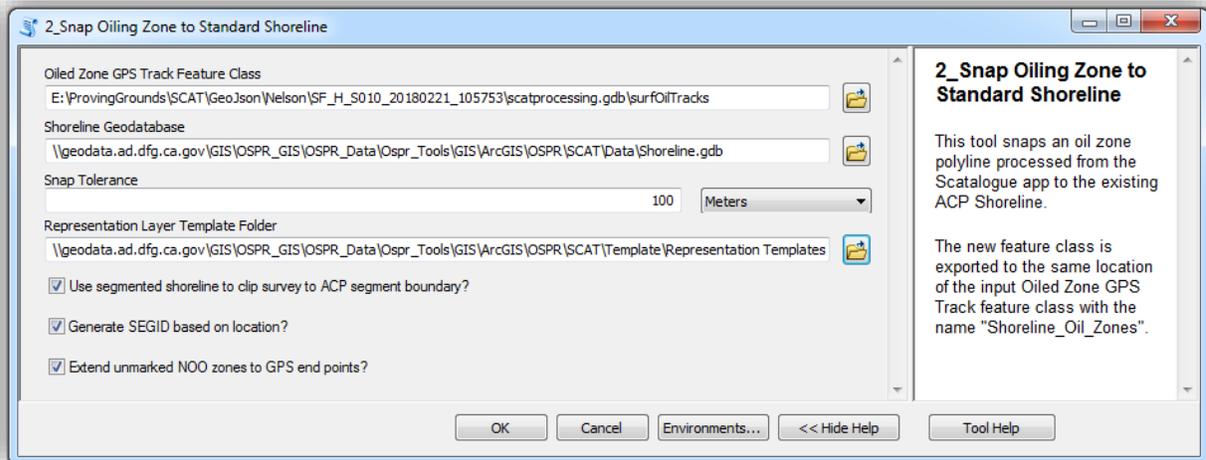
1. Initial SCAT Data Processing



Purpose: This should be the first tool used to unpack compressed .7z files that are exported from the SCATalogue app. It creates a *scatprocessing.gdb* file geodatabase within the same folder as the .7z files and creates feature classes representing oiling zones, GPS track points, GPS track line, pit trenches, and photo locations. Oiling Zone, GPS Track, GPS Track Points, Pit Trenches, and Photo Locations layers in the current MXD have their sources updated to the corresponding feature classes created within the *scatprocessing.gdb* geodatabase.

Use: Enter the location of the .7z file exported from SCATalogue. Only uncheck the “Overwrite if JSON files exist” checkbox if you have made corrections to a previously unpacked JSON file and need to preserve changes. All data will be processed in the projection California Teale-Albers NAD83 unless the “Project as Web Mercator” box is checked.

2. Snap Oiling Zone to Standard Shoreline



Purpose: This is usually the 2nd tool to be run to process SCATalogue data. The tool snaps oil zones recorded by GPS in SCATalogue to a standard shoreline. A standard shoreline is used in order smooth out erratic or irregular GPS tracks and to be able to overlay and compare data from subsequent surveys. The output is a feature class entitled shorelineOilZones within the scatprocessing.gdb geodatabase. The Shoreline Oil Zones layer in the current MXD is updated to this feature class.

Use: This tool has several inputs.

- Oiled Zone GPS Track Feature Class* – this input represents the oil zones as recorded by GPS in SCATalogue. It is represented by the surfOilTracks feature class within the corresponding scatprocessing.gdb geodatabase.
- Shoreline Feature Class Location* – this input is the location of the geodatabase containing 2 feature classes representing the standardized shoreline. The default should usually be accepted if working on the California coast. There are specific requirements for feature classes within this geodatabase. For further detail on how to create these feature classes, go to the description of the Create Shoreline from Selected Polyline tool under QA/QC Processing Tools.
- Snap Tolerance* – This is the distance from the end points of the Oiling Zone GPS tracks within which the tool will search for the standardized shoreline polyline. The default should be accepted unless the survey was conducted more than 100 meters from the shoreline.
- Representation Layer Template Folder* – this is the location of layer files necessary for creating cartographic representations. The default should be accepted unless working offline, in which case the local location of the representation templates should be selected.
- Use segmented shoreline to clip survey to ACP segment boundary?* – **IMPORTANT** This checkbox significantly modifies the output of this tool. Checked is the default. If checked, output shoreline oiling zones are split at segment boundaries of the standard shoreline. The primary segment is defined as the shoreline segment closest to the centroid of the entire oil zone GPS track feature class. Within the primary segment, zones that are between oiled zones are labeled as No Oiling Observed (NOO) and zones between the segment end points and the closest oiling zone are labeled as Unsurveyed. Any oil zones (or portions of oil zones) that were recorded outside of the primary segment

are given a new ZONEID that replaces the first character of its prior ZONEID with the letter “X”. If portions of areas marked as unsurveyed should be marked as NOO, there are tools available in the QA/QC Processing Tools toolkit (i.e. Split Unsurveyed Shoreline Oil Zones at GPS Track End Points, etc).

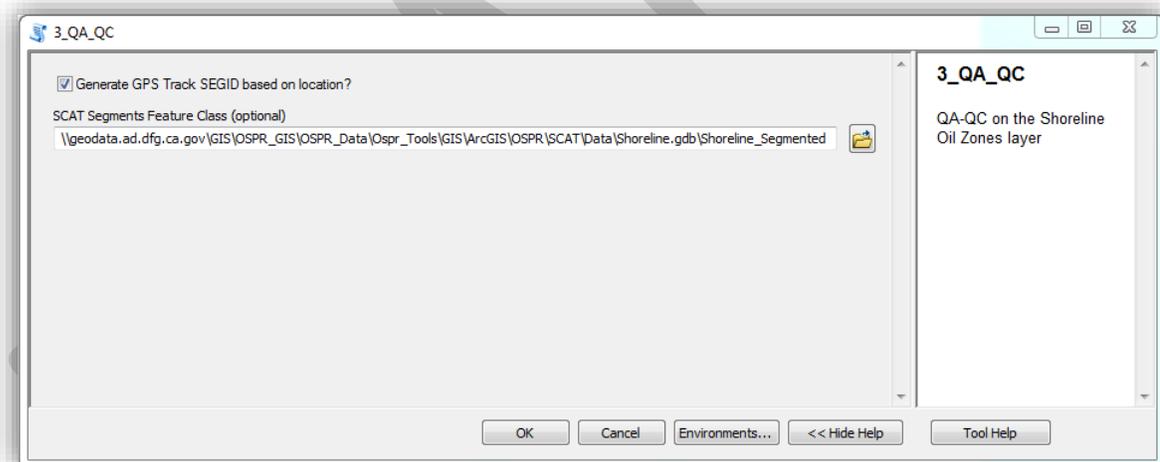
If unchecked, output shoreline oiling zones are snapped to a generalized shoreline without segment boundaries. Zones that are between oiling zones are labeled as No Oiling Observed (NOO). Features for unsurveyed areas are not created. This option may be best for inland response or where a pre-segmented shoreline has not been previously developed.

- f. *Generate SEGID based on location?* – This checkbox controls whether to update the segment ID field (SEGID) in the output feature class with the segment label of the standard shoreline segment within which the feature falls. If unchecked, the SEGID field is unaltered from the segment ID that was recorded in the SCATologue app in the field. Checked is the default.
- g. *Extend unmarked NOO zones to GPS end points?* – This checkbox controls how the tool handles areas within the GPS track before the first oil zone and after the last oil zone.

If checked, any shoreline segment adjacent to the GPS track that is not assigned as an oil zone we be considered as No Oil Observed (NOO). Shoreline before or after the GPS track will be considered Unsurveyed.

If unchecked, any part of the shoreline segment before the first marked oil zone or after the last marked oil zone will be considered Unsurveyed.

3. QA_QC_Pass 1 (Marine Only)



Purpose: Checks for common errors or concerns in marine processing data, updates segment ID (SEGID) field in Shoreline Oil Zones and GPS Track layers. There is an option to update the SEGID field in the GPS Track layer based on its location relative to standard shoreline segments.

Use: If *Generate GPS Track SEGID based on location?* is checked, the SEGID field of the GPS track will be updated based on the Label field of the *SCAT Segments Feature Class*. If unchecked, the GPS Track SEGID will be derived from its SURSEGID field (which is based on Scatalogue app entries) and the *SCAT Segments Feature Class* entry is ignored.

4. QA_QC Pass 2 (Marine Only)

Purpose: Processes marine data and adds fields where necessary.

Use: This tool has no parameters and should simply be run on marine surveys after Tool #3.

5. Add Updates ESI_DESC Field (Marine Only)

Purpose: Updates ESI_DESC field in marine surveys.

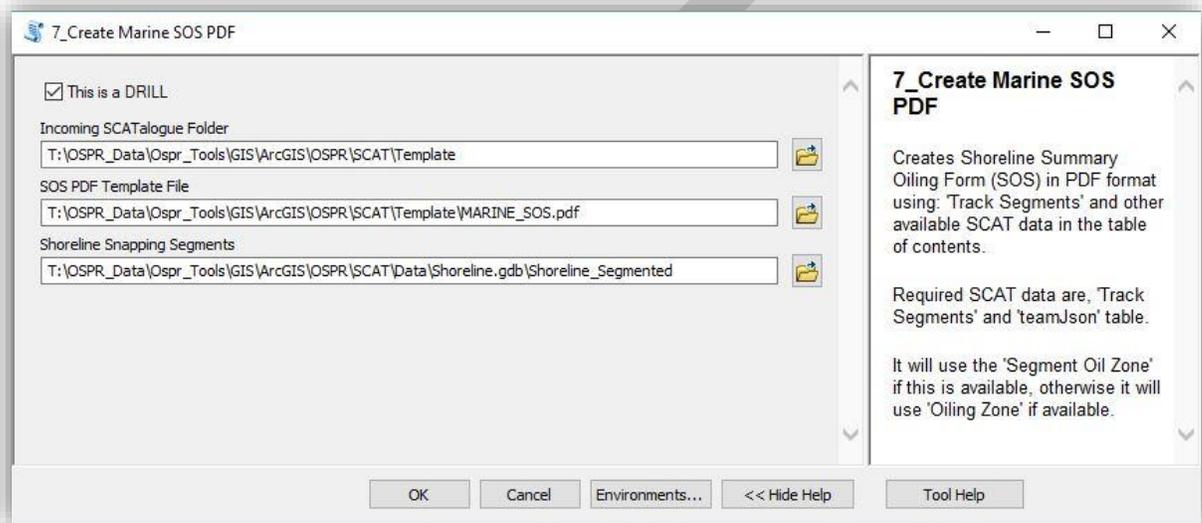
Use: This tool has no parameters and should simply be run on marine surveys after Tool #4.

6. SegID_DefQry (Marine Only)

Purpose: To select which Segment ID from which to display and process marine SCAT data. Do not use this tool if you wish to display map data that falls across two shoreline segments.

Use: Select the shoreline segment for which you want to process and display data. Parts of the survey which do not fall into the chosen segment will be omitted from the map and SOS form.

7. Create Dry Waterway SOS PDF or Create Marine SOS PDF

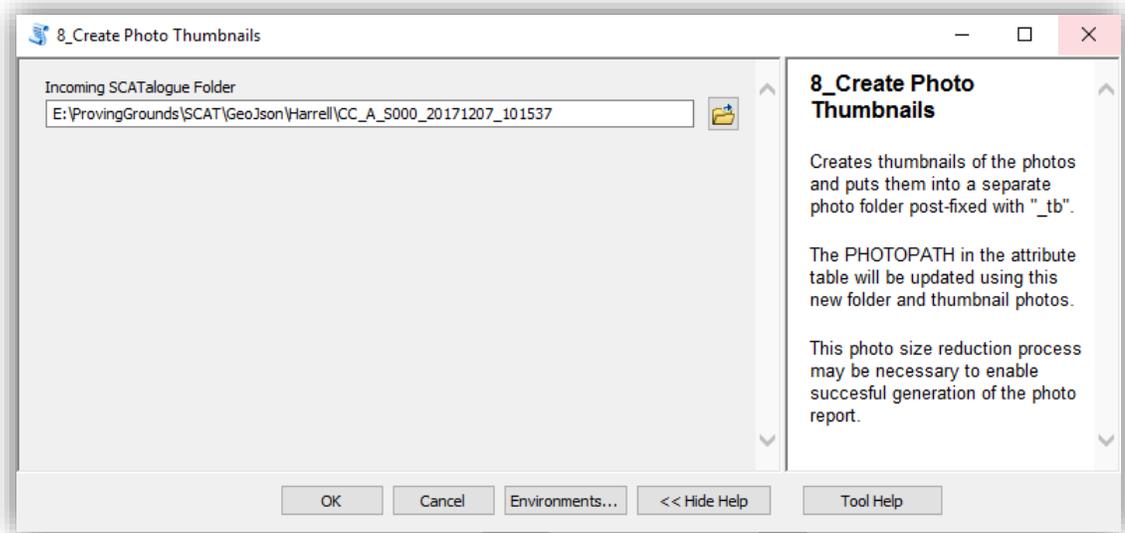


Purpose: These tools generate a pdf of a NOAA Shoreline Oiling Summary (SOS) form based on data in the current scatprocessing.gdb geodatabase. It is saved in the same location as the original .7z SCATologue files (i.e. the location of the Incoming SCATologue Folder).

Use: This tool has 4 inputs:

- a. *This is a DRILL* checkbox – if checked, the output PDF is marked with the words “THIS IS A DRILL” in red. This is the default. Uncheck for use during actual incidents.
- b. *Incoming SCATologue Folder* – this input should be the file location of the current scatprocessing.gdb geodatabase.
- c. *SOS PDF Template File* – location of the template PDF. Accept the default unless working offline. If offline, navigate to local copy of the sos.pdf template.
- d. *Shoreline Snapping Segments* – This input should be the Shoreline_Segments feature class within the geodatabase that contains the standard shoreline polylines to which the oiling zones were snapped while using tool #2 (Snap Oiling Zone to Standard Shoreline). The default is appropriate in most cases on the California coast if connected to the CDFW network.

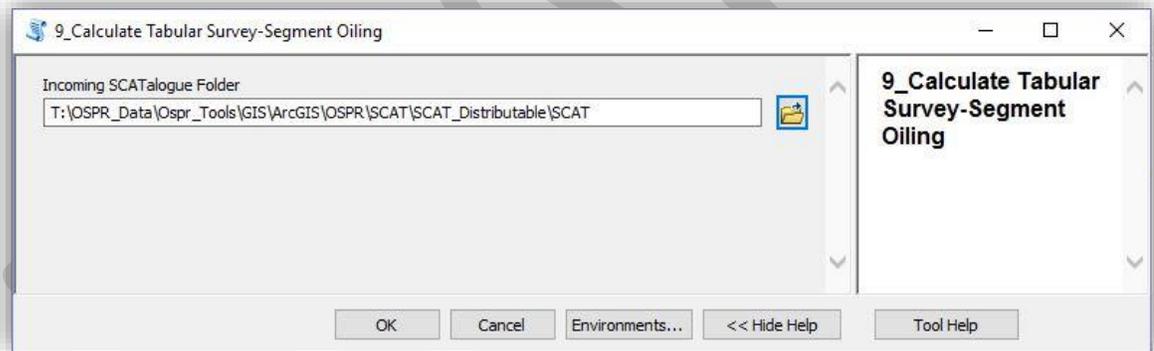
8. Create Photo Thumbnails



Purpose: Creates a folder at the same level as the folder containing the scatprocessing.gdb geodatabase with same survey name but with a suffix of “_photos_tb”. Within this folder smaller thumbnail versions of the survey photos will be created.

Use: Select the folder containing the current scatprocessing.gdb geodatabase.

9. Calculate Tabular Survey-Segment Oiling

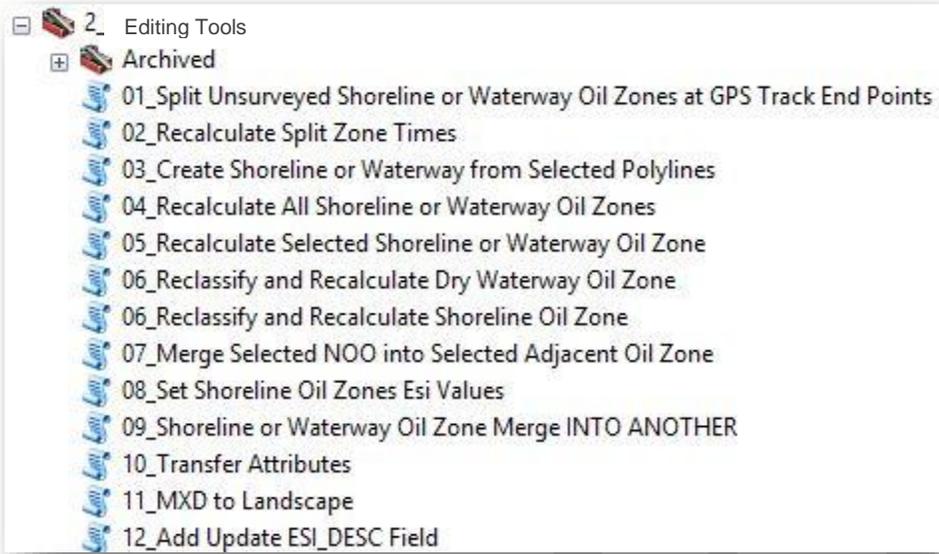


Purpose: Creates an Excel spreadsheet containing the sums (in meters) of the lengths of each degree of oiling in the current segment.

Use: Select the folder containing the current scatprocessing.gdb geodatabase.

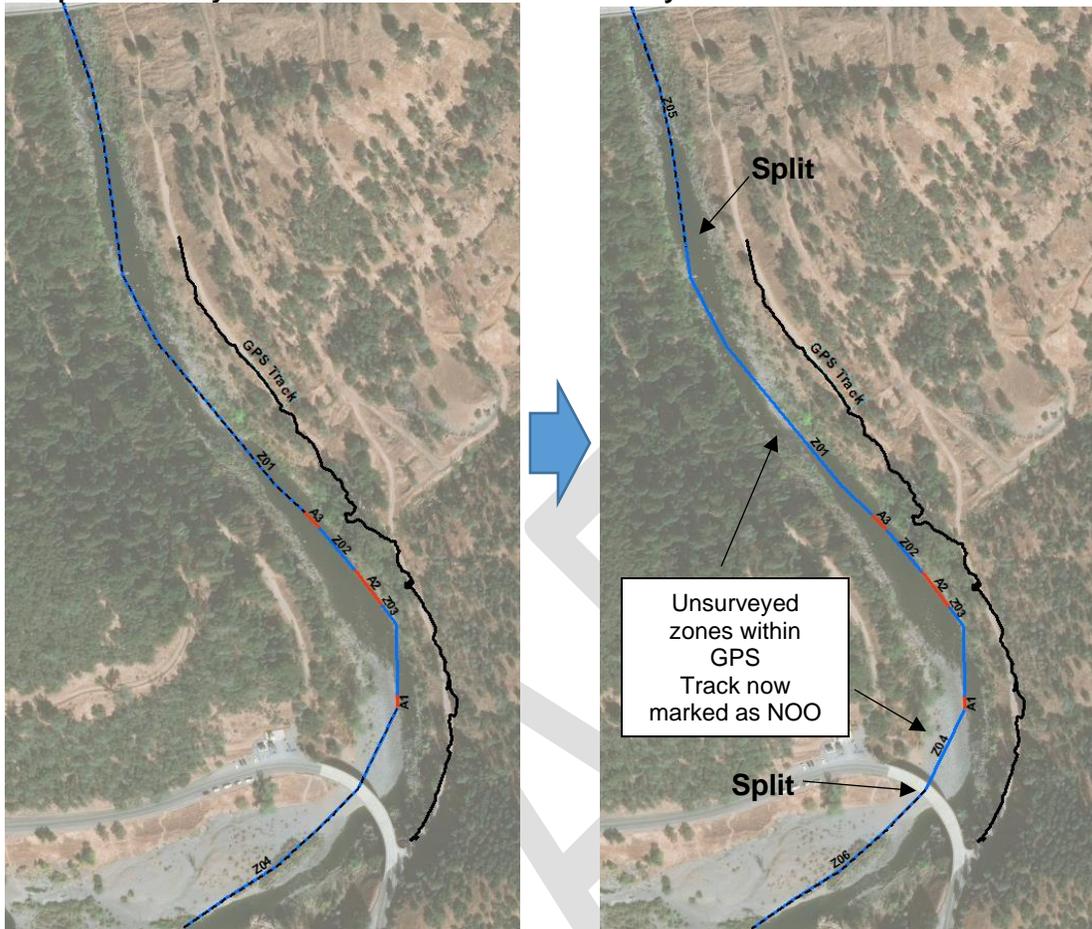
B. Editing Tools

This toolkit contains several optional tools to facilitate processing and updating of data.



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1. Split Unsurveyed Shoreline Oil Zones or Waterway Oil Zones at GPS Track End Points



Purpose: If the beginning or end points of the GPS Track layer extend within the Shoreline Oil Zones layer features labeled as Unsurveyed, this tool will reclassify the Unsurveyed areas between the GPS Track end points and the closest oil zone as No Oil Observed (NOO).

Use: Completion of Initial Processing tools #1 and #2 is a prerequisite.

2. Recalculate Split Zone Times

Purpose:

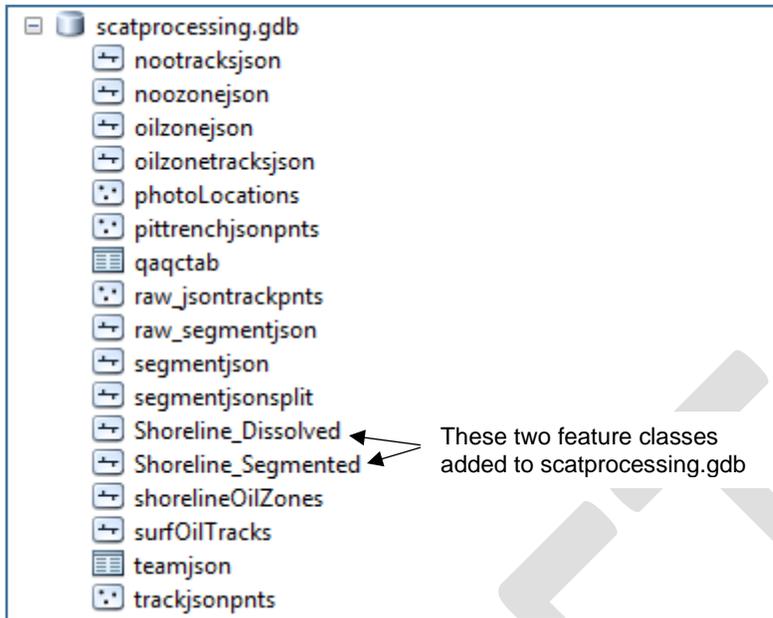
Use:

3. Create Shoreline or Waterway from Selected Polylines

Purpose: This fantastic tool creates the standard shoreline or waterway feature classes necessary to run the Snap Oiling Zone to Standard Shoreline or Waterway tool (in case they are not available).

Use: Select any number of contiguous, non-branching polylines from any one feature class in the current MXD. For inland response, this might include features from NHD or California Streams or a newly created polyline just for this purpose. With the features selected that you wish to use as a shoreline, run this tool.

When complete, two new feature classes will be created in the current scatprocessing.gdb geodatabase: Shoreline_Dissolved, and Shoreline_Segmented for marine surveys or Waterway_Dissolved and Waterway_Segmented for inland dry waterway surveys. When running Snap Oiling Zone to Standard Shoreline or Waterway (initial processing tool #2), for the Standard Shoreline or Waterway Geodatabase input, you can now select the current scatprocessing.gdb geodatabase. Oiling zones will be snapped to the new shoreline or waterway features.



Note that both the Shoreline_Segmented and Shoreline_Dissolved feature classes (or Waterway_Segmented and Waterway_Dissolved for inland dry waterways) will have Label and Length_m fields. If there was a Label text field in the source polyline, it will persevere in the Shoreline_Segmented feature class, but be truncated to 9 characters. The Label field must be filled in with a segment name if you want to label Shoreline/Waterway Oil Zone SEGIDs with the segment name based on GIS (per the last checkbox on the Snap Oiling Zone to Standard Shoreline tool).

4. Recalculate All Shoreline or WaterwayOil Zones

Purpose: This tool recalculates necessary fields and cartographic representations for the Shoreline Oil Zones layer in the current MXD. It is recommended to run this tool after making any edits to the Shoreline Oil Zones layer.

Use: Simply run within the current MXD. Recalculates length fields, coordinate fields, dates, UUID, SURSEGID, NSURFDOO, and cartographic representations in the Shoreline Oil Zones layer.

5. Recalculate Selected Shoreline or Waterway Oil Zone

Purpose: This tool recalculates necessary fields and cartographic representations for one selected feature of the Shoreline Oil Zones layer in the current MXD.

Use: Select one feature from the Shoreline Oil Zones layer and run this tool. Recalculates length fields, coordinate fields, dates, NSURFDOO, and cartographic representations in the Shoreline Oil Zones layer.

6. Reclassify and Recalculate Shoreline Oil Zone (for marine SCAT surveys)

Reclassify and Recalculate Waterway Oil Zone (for inland dry waterway SCAT surveys)

Purpose: This tool allows the user to reclassify the degree of oiling and tide zone for one selected feature of either the Shoreline Oil Zones layer or Waterway Oil Zones layer, as appropriate.

Use: Select one feature from the Shoreline Oil Zones or Waterway Oil Zones layer and run this tool. You will have the option to update the oiling category and/or tide zone from a drop-down list. Reclassifies ZSURFDOO and either TIDEZONE (marine surveys) or PWATERWAY (inland dry waterway surveys) fields and recalculates length fields, coordinate fields, dates, NSURFDOO, and cartographic representations for the selected feature in the Shoreline Oil Zones or Waterway Oil Zones layer.

7. Merge Selected NOO into Selected Adjacent Oil Zone

Purpose: This tool allows the user to merge a Shoreline Oil Zone or Waterway Oil Zone feature labeled as No Oil Observed (NOO) into an adjacent oiled zone. This is especially useful for dealing with very short NOO zones that may be unintentionally created between 2 oil zones. In these cases it is recommended to merge the NOO zone into the more severely oiled zone.

Use: Select one NOO feature from either the Shoreline Oil Zones or Waterway Oil Zones layer and one adjacent oil zone. The NOO feature will be merged into the oil zone. Length and coordinate fields will then be corrected for the combined zone.

8. Set Shoreline Oil Zones ESI Values

Purpose: Sets ESI Values for Shoreline Oil Zones feature class. For marine SCAT surveys only.

Use: This tool has no parameters to choose. Simply run the tool.

9. Shoreline or Waterway Oil Zone Merge INTO ANOTHER

Purpose: This tool allows the user to merge any Shoreline Oil Zone or Waterway Oil Zone feature into an adjacent zone.

Use: Select two adjacent features from either the Shoreline Oil Zones or Waterway Oil Zones layer. Alter the FLAG field for the feature into which you want the other feature merged. When you run the tool, the selected feature with the FLAG value of 1 will absorb the adjacent selected feature.

10. Transfer Attributes

Purpose: To transfer attributes from a source layer to a target layer.

Use: Input the source and target layers into the tool and run.

11. MXD to Landscape

Purpose: To create a landscape version of the currently open SCAT MXD.

Use: Input the source of the template landscape MXD file. Choose whether to open the new landscape MXD upon completion of the tool.

12. Add Update ESI_DESC Field

Purpose: Adds or updates the ESI_DESC field in the database.

Use: There are no parameters to choose. Simply run the tool.

C. SQL Database Tools

After processing and vetting each individual SCAT survey, the completed survey data may be uploaded into a central SQL Geodatabase for archiving and statistical analysis. Follow the instructions here to install and set up SQL Server Express on a computer:

\\geodata.ad.dfg.ca.gov\GIS\OSPR_GIS\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT\Documentation\SQL_Express_Setup_for_SCAT\oguide_data.docx

These instructions include directions on how to manually set up a SCAT geodatabase on the SQL server. Alternatively, once a blank SQL geodatabase has been created, you may use the “1_Load Schema into Blank SQL Geodatabase” tool to load template schema into the geodatabase.

After the SQL is set up, you can load Scatalogue surveys into the geodatabase. To load each individual SCAT survey into the SQL database, use the “2 Append SCAT File Geodatabase to SQL” tool *after* the survey has been through QA/QC and approved by the SCAT team leader.

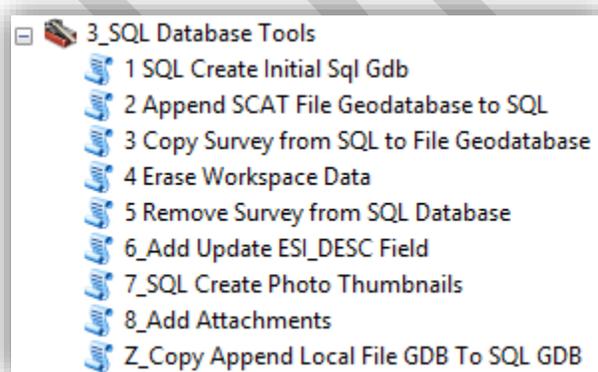
The following are the names of existing SQL servers on OSPR GIS laptops:

Isaac’s Laptop
LOSCND71648D5.ad.dfg.ca.gov\sqlexpress

Seth’s Laptop
LOSCND71648D0.ad.dfg.ca.gov\sqlexpress

Judd’s Server Laptop
LOS5CG52126TH.ad.dfg.ca.gov\sqlexpress

These tools are used to input and extract SCAT data to and from SQL geodatabases. The geodatabases must have feature classes with the same names and schema as incoming SCAT data. See tool #1 (Load Schema into Blank SQL Geodatabase) or #4 (Erase Workspace Data) for instructions for creating a new SQL geodatabase schema.



1. Load Schema into Blank SQL Geodatabase

Purpose: Loads either marine or inland dry waterway schema into a completely empty SQL geodatabase.

Use: Select the SQL Geodatabase connection into which a schema will be loaded. Then choose whether to import a Marine or an inland Dry Waterway database scheme.

2. Append SCAT File Geodatabase to SQL

Purpose: Appends all data in a scatprocessing.gdb geodatabase to corresponding feature classes in a SQL geodatabase. Allows simultaneous copy of associated photos to another location.

Use: Select an input file geodatabase, output SQL geodatabase and folder location for photos to be copied. Output SQL Geodatabase must have identical schema to Input File Geodatabase.

3. Copy Append Local File GDB to SQL GDB

Purpose: Appends all data in a scatprocessing.gdb geodatabase to corresponding feature classes in a SQL geodatabase. Allows simultaneous copy of associated photos to another location.

Use: Select an input file geodatabase, output SQL geodatabase and folder location for photos to be copied. Output SQL Geodatabase must have identical schema to Input File Geodatabase.

4. Copy Survey from SQL to File Geodatabase

Purpose: Allows user to copy all data from a single SCAT survey in an SQL geodatabase into a new file geodatabase. This output will be an almost exact replicate of a scatprocessing.gdb geodatabase created during initial processing of data produced by SCATologue.

Use: Select an SQL geodatabase containing SCAT data, then select the SURSEGUID of the survey you would like to export. Select an output folder for the exported scatprocessing.gdb file geodatabase. There is an option to export shapefiles as well. *Note that the destination folder cannot be on a NAS drive due to NAS limitations writing to file geodatabases.*

5. Erase Workspace Data

Purpose: This tool erases all records from all feature classes in the chosen workspace. The feature classes will remain with their schemas intact, but will have no records.

Use: This tool is useful for setting up an SQL SCAT geodatabase, especially if the SCAT data schema has been changed. To prepare a new SQL SCAT geodatabase, copy all feature classes (except for segmentjson) and tables of a current scatprocessing.gdb file geodatabase into the destination SQL geodatabase, and add the SURSEGUID_Index table from here:

`\\geodata.ad.dfg.ca.gov\GIS\IOSPR_GIS\IOSPR_Data\Ospr_Tools\GIS\ArcGIS\IOSPR\SCAT\Template\SQL_Template\SQL_Schema.gdb\SURSEGUID_Index`

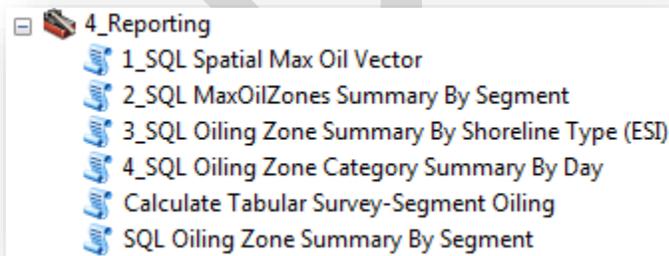
Now run this tool on that geodatabase to remove records but keep the schema.

6. Remove Survey from SQL Database

Purpose: This tool removes all records and features from all tables and feature classes within an SQL geodatabase for the chosen SURSEGUID.

Use: Once an SQL geodatabase is chosen, a drop-down menu will populate with SURSEGUID IDs that are available to remove from the SQL geodatabase.

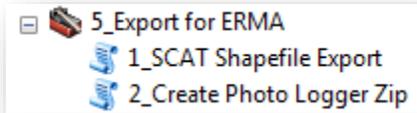
D. Reporting Tools



1. SQL Spatial Max Oil Vector
2. SQL MaxOilZones Summary By Segment
3. SQL Oiling Zone Summary By Shoreline Type (ESI)
4. SQL Oiling Zone Category Summary By Day

5. Calculate Tabular Survey-Segment Oiling
6. SQL Oiling Zone Summary By Segment

E. Export to ERMA



1. SCAT Shapefile Export

Purpose: To create shapefile versions of SCAT geodatabase feature classes for export to ERMA.

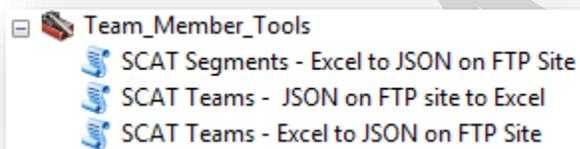
Use: A subfolder is created within the folder containing a scatprocessing.gdb geodatabase and is populated with shapefiles of every feature class in the scatprocessing.gdb. It also produces zipped versions of the shapefiles for easy export to ERMA.

2. Create Photo Logger Zip

Purpose: To process photo content of a SCAT survey into ERMA

Use: Produces an ERMA PhotoLogger formatted zip file suitable for batch upload to ERMA.

F. Team Member Tools



1. SCAT Segments – Excel to JSON on FTP Site

Purpose: This tool exports an Excel spreadsheet of ACP Segments, Segment lengths, and SCAT teams assigned to each Segment, and exports it to a JSON file on the FTP server for download by the SCATologue app.

Use: Select an Excel file for transformation to JSON and upload to FTP site.

2. SCAT Teams – JSON on FTP site to Excel

Purpose: This script takes the JSON file on the FTP site that is the source for SCAT team members for the Scatologue iPad app and saves it as an Excel spreadsheet.

Use: Select a location to save the SCAT Team Assignments Excel file. This allows the user to modify SCAT team assignments in Excel before transferring back to the FTP site.

3. SCAT Teams – Excel to JSON on FTP Site

Purpose: To send an Excel spreadsheet of SCAT teams to the FTP site in order to be downloaded by the SCATologue app.

Use: Select an Excel spreadsheet of SCAT teams in the proper format. The prior tool can be used to download one as a template.

Appendix 3 - Troubleshooting

This section is meant to address processing issues in general even though there will be specific examples. This first issue hopefully will illustrate.

JSON errors (segment.json)

I ran into this error whilst processing Ben Stewart's dataset: OR_B_S004_20181105_092119.7z

Note the SCATologue app version used for this collection was: 1.58,2.53,20180507.1312
This is important because subsequent app versions should not contain this specific error.

However, I am using this case as a general example of JSON type errors that you may see in the future and be able to correct and continue processing successfully. This example involves the segment.json file.

While running the initial script/tool, 1_Initial SCAT Data Processing; this error occurred:

```
1_Initial SCAT Data Processing
trackjsonpnts_temp
Close
<< Details
 Close this dialog when completed successfully

scatprocessing.gdb creation SUCCESSFUL!

converting json track to an intact raw feature class...
T:\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT\Data\NAD 1983 California (Teale) Albers (Meters).prj

raw_jsontrackpnts projected to T:\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT\Data\NAD 1983 California (Teale) Albers (Meters).prj

converting json track to feature class...
T:\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT\Data\NAD 1983 California (Teale) Albers (Meters).prj

trackjsonpnts projected to T:\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT\Data\NAD 1983 California (Teale) Albers (Meters).prj

D:\SCAT\alogue_DATA\bstewart_lx\OR_B_S004_20181105_092119\segment.json
converting json segment to intact raw feature class...
Failed script ScatTrackProcessing22...

Traceback (most recent call last):
  File "T:\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT\Scripts\ScatTrackProcessing_v15.py", line 1773, in <module>
    jsonToScatalogueProjected(jsonSegmentFile, "raw_segment.json")
  File "T:\OSPR_Data\Ospr_Tools\GIS\ArcGIS\OSPR\SCAT\Scripts\ScatTrackProcessing_v15.py", line 201, in
jsonToScatalogueProjected
    arcpy.JSONToFeatures_conversion(inputJson, tempJson)
  File "C:\program files (x86)\arcgis\desktop10.6\arcpy\arcpy\JSONToFeatures_conversion.py", line 602, in JSONToFeatures
    raise e
ExecuteError: ERROR 001558: Error parsing json file 'D:\SCAT\alogue_DATA\bstewart_lx\OR_B_S004_20181105_092119\segment.json'.
Failed to execute (JSONToFeatures).

Failed to execute (ScatTrackProcessing22).
Failed at Mon Nov 5 13:12:23 2018 (Elapsed Time: 1 minutes 20 seconds)
```

Note that it indicates an `arcpy.JSONToFeatures_conversion` error and also indicates the `segment.json` file as the file it is not able to process. Close, this window/dialog box.

JSON (JavaScript Object Notation) files are formatted text files like HTML, XML, etc... You can open JSON files using a text editor. I like to use Notepad++.

A small snippet of the `segment.json` file looks like this:

```
"SEGSTR": "Heavy Equipment",
"SENDLAT": 33.6377458647207,
"SENDLON": -117.974206628388,
"SENDACC": 5,
"SURLLENGTH": 2505,
"PHOTOACC1": 5,
"PHOTODIR1": 229,
"PHOTODATE1": "11/05/2018",
"PHOTOTIME1": "09:31:06",
"PHOTOLAT1": 33.62928487829271,
"PHOTOLON1": -117.9589384888466,
"PHOTONOTE1": "(compressed)",
"PHOTOSIZE1": "1662710",
"PHOTOACC2": 5,
"PHOTODIR2": 58,
"PHOTODATE2": "11/05/2018",
"PHOTOTIME2": "09:31:17",
"PHOTOLAT2": 33.62927632875147,
```

```
"PHOTOLON2": -117.9589126725848,  
"PHOTONOTE2": "(compressed)",  
"PHOTOSIZE2": "2844079",  
"PHOTOACC3": 5,  
"PHOTODIR3": 171,  
"PHOTODATE3": "11/05/2018",  
"PHOTOTIME3": "10:46:17",  
"PHOTOLAT3": 33.63764280922118,  
"PHOTOLON3": -117.9742647149767,  
"PHOTONOTE1": "(compressed)",  
"PHOTOSIZE3": "2765371",  
"PHOTOACC4": "",  
"PHOTODIR4": "",  
"PHOTODATE4": "",  
"PHOTOTIME4": "",  
"PHOTOLAT4": "",  
"PHOTOLON4": "",  
"PHOTONOTE4": "",  
"PHOTOSIZE4": ""  
},
```

The JSON files sent by SCATologue are specific for being processed by ESRI's ArcGIS software, but they still need to conform to the JSON standard. Therefore, in order to help diagnose issues with these files you can use online resources called validators or linters. My default choice is: <https://jsonlint.com/>

If you open the segment.json file, copy the entire content (select all or Cntrl+A), paste it into the validator/linter window, then click, "Validate JSON"; any errors will be highlighted for you.

In this case here are the results:

```
537      "PHOTODATE3": "11/05/2018",
538      "PHOTOTIME3": "10:46:17",
539      "PHOTOLAT3": 33.63764280922118,
540      "PHOTOLON3": -117.9742647149707,
541      "PHOTONOTE1": "(compressed)",
542      "PHOTOSIZE3": "2765371",
543      "PHOTOACC4": "",
544      "PHOTODIR4": "",
545      "PHOTODATE4": "",
546      "PHOTOTIME4": "",
547      "PHOTOLAT4": "",
548      "PHOTOLON4": ""
```

Results

SyntaxError: Duplicate key 'PHOTONOTE1' on line 541

The SyntaxError says that 'PHOTONOTE1' is a duplicate key. If you notice, the pattern; all the other "PHOTO" type entries are grouped by a post-fixed number (1,2,3,4). If you look at the snippet; you can see there was already a "PHOTONOTE1" entry.

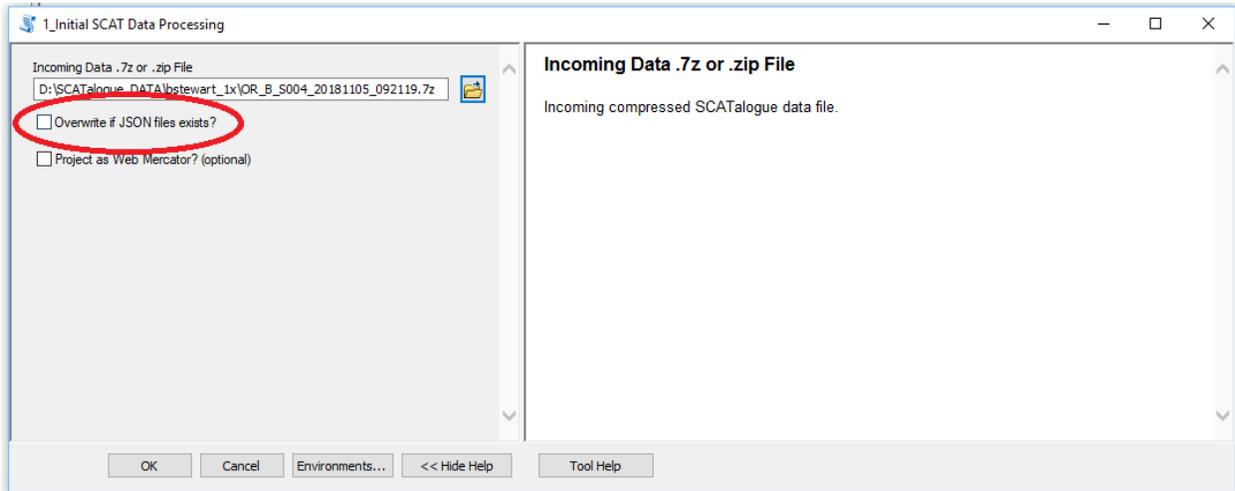
Note, that all the other "PHOTO" entries before and after the highlighted one are post-fixed with the number, 3. So, in a nutshell this is a typo in SCATatalogue's export coding. "PHOTONOTE1" in this line should be, "PHOTONOTE3".

You can test this by editing this in the JSON validator/linter window (change "PHOTONOTE1" to read, "PHOTONOTE3"). Then click, "Validate JSON" again. This time, in the Results section there will be no errors and it will say, "Valid JSON".

Now, you can go back to the text editor where you have segment.json open and do the same edit, save the file, close the file, and exit your text editor.

Finally, re-run the initial script/tool, 1_Initial SCAT Data Processing, but this time; UNCHECK the “Overwrite if JSON files exist?” option.

Since we have edited the segment.json file and corrected the error, we do not want the script to unzip the data again and overwrite our corrected, segment.json file.



Now, the 1_Initial SCAT Data Processing tool/script will complete without error.

The take home message here is that most JSON related processing errors will likely be a typo or formatting related error. These errors, you can usually track down using a JSON validator/linter, correct the error, then re-run the tool/script using the corrected JSON file.