# **User's Guide**

# for the

# Geospatial Risk Analysis Tool

V 1.0.1

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Prepared for the Department of Energy National Nuclear Security Administration

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# **1** General Information

### 1.1 System Overview

Performing back trajectory and forward trajectory using the Hybrid Single-Particle Lagrangian Integrated Trajectory Model (HYSPLIT) is a reliable approach for assessing particle transport after release among mid-field atmospheric models (Draxler et al. 2020; Stein et al. 2015). HYSPLIT has an externally facing online interface that allows non-expert users to run the model trajectories without requiring extensive training or programming. However, the existing HYSPLIT interface is limited if simulations have a large amount of meteorological data and timesteps that are not coincident. The existing HYSPLIT Graphical User Interface (GUI) does not easily permit computations of trajectories of a dataset of meteorological data in high temporal frequency. To improve the performance of trajectories computation from a large dataset and enhance risk analysis of the accidental release of material at risk, a Geospatial Risk Analysis Tool (GRAT-GUI) is created to allow large data sets to be processed instantaneously and provide ease of visualization (Hou et al., 2023). In order to perform safety analysis properly, the DOE standard recommends that at least five-years of meteorological data be used (DOE, 2014), therefore the ability to handle big data is highly necessary (Zhou et al., 2022).

The Geospatial Risk Analysis Tool (GRAT) is developed by the Pacific Northwest National Laboratory (PNNL) in collaboration with Oak Ridge National Laboratory (ORNL). This software package is designed to enable batch processing of the Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT), an open source software developed by the <u>National Oceanic</u> and Atmospheric Administration (NOAA) Air Resources Laboratory and the Australian Bureau of Meteorology Research Center in 1998 for computation of air parcel trajectories, transport, and dispersion. Specifically, the function of trajectory prediction is used in this tool. PSDF is an improved statistical function based on the well-known Potential Source Contribution Function (PSCF) in establishing the air pollutant source and receptor relationship (Pekney et al., 2006; Ren

et al., 2019). Performing this analysis requires a range of meteorological and pollutant concentration measurements to be statistically meaningful.

GRAT is used to batch process meteorological data into ARL format to permit more rapid trajectory calculations. While the HYSPLIT GUI limits users to convert meteorological data up to six time stamp points per operation, GRAT allows users to convert a significantly large amount of data within one operation. For example, 10 years of meteorological data can be converted within 5 minutes using a standalone personal computer. When coupled trajectory results with the Potential source distribution function (PSDF), GRAT can be used to determine the areas influenced by the emission of hazardous chemicals.

### **1.2 Software Requirements**

The GRAT will run using any of the following operating systems:

- Windows 10 64bits Software:
- Python 3. x with the following packages:
- numpy oopenpyxl o scipy

matplotlib o
basemap o
basemap-datahires o daal4py

## **1.3 Hardware Requirements**

Systems running the SFC software require:

- At least Pentium 233-megahertz (MHz) processing
- At least 64 megabytes (MB) of RAM (128 MB recommended)
- At least 1.5 gigabytes (GB) of available space on the hard disk.

# 2 System Installation

## 2.1 System Pre-Installation

To assure proper performance of GRAT, HYSPLIT and Python need to be installed in the computer that will be used for using GRAT. Users can download HYSPLIT from <a href="https://www.ready.noaa.gov/HYSPLIT.php">https://www.ready.noaa.gov/HYSPLIT.php</a> and extract it to C:\HYSPLIT. They can also download Python from <a href="https://www.python.org/downloads/">https://www.ready.noaa.gov/HYSPLIT.php</a> and extract it to C:\HYSPLIT. They can also download Python from <a href="https://www.python.org/downloads/">https://www.python.org/downloads/</a>, and follow installation instructions. Then they can use PIP to install the following Python packages: numpy, openpyxl, scipy, matplotlib, basemap, basemap-data-hires, daal4py.

# 2.2 Geospatial Risk Analysis Tool Installation

A compressed file will be provided for the GRAT program installation.

Step 1: Navigate to the installation file location.

Step 2. Unzip the compressed file to a local folder. Two files are required for installation:

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4	🖂 🔄 setup.exe		8/23/2022 1:47 PM	Application
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2 items	1 item selected 526 KB			

Figure 1. The setup.exe file for GRAT installation.

**Step 3:** Double-click the "setup.exe" file to begin the installation process. The Setup Wizard will begin the installation process, as depicted in the following figures.

🛃 GeospatialRiskAnalysisTool	1999 - 1997 1999 - 1997		×
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The installer will guide you through the steps required to insta computer.	ll GeospatialRiskAnaly:	sisTool or	n your
WARNING: This computer program is protected by copyright Unauthorized duplication or distribution of this program, or any or criminal penalties, and will be prosecuted to the maximum e	y portion of it, may resu	lt in seve	re civil
< <u>B</u> ack	<u>N</u> ext>	Can	cel

Figure 2. The GRAT installation wizard welcome page.

GeospatialRiskAnalysisTool		· 🗆 👌
Select Installation Folder		Ę
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o install in this folder, click "Next". To install to a different fo	lder, enter it below	or click "Browse".
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Eolder: C:\GeospatialRiskAnalysisTool\		B <u>r</u> owse
		B <u>r</u> owse <u>D</u> isk Cost
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**Figure 3.** The GRAT installer folder page.

🔀 GeospatialRiskAnalysisTool			_		×
Confirm Installation					5
The installer is ready to install Geospatial Click "Next" to start the installation.	RiskAnalysisTool c	on your computer.			
		25			
	< <u>B</u> ack	<u>N</u> ext >		Car	ncel

Figure 4. The GRAT installation page.

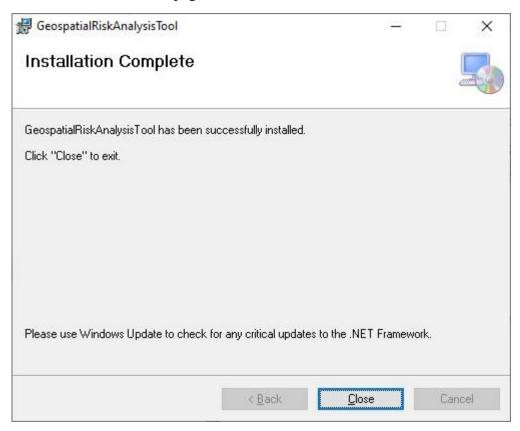


Figure 5. The GRAT installation complete information.

# 3 Getting Started

# 3.1 Launching the Application

There are two ways to start the GRAT application:

- Click the Windows Start icon<sup>(2)</sup>. Select "All Programs" and navigate to and select "GeospatialRiskAnalysisTool".
- Go to the installation file specified when installing the program (Section 2.2).

#### The startup screen will open:

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Figure 6. The GRAT setup page.

## 3.2 Data Preparation

The expected input files for GRAT should be in .csv format. Each file should contain at least three columns, including wind direction, wind speed, and the timestamp values obtained from meteorological measurements. Here is an example:

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	1/1/2017	0	12	WYEB	5.103342733		-5.611111111		NULL	1/1/2017 0:00	
	1/1/2017	0		GABL	2.535963403		-6.3333333333		NULL	1/1/2017 0:00	
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0	1/1/2017	0	3	ARMY	4.772311951	1.236810667	-4.518518519	0	NULL	1/1/2017 0:00	
1	1/1/2017	0	5	EDNA	5.071926806	2.40284	-5.944444444	NULL	NULL	1/1/2017 0:00	
2	1/1/2017	0	7	200W	3.717114974	0.771144	-4.625	0	NULL	1/1/2017 0:00	
3	1/1/2017	0	8	BVLY	NULL	NULL	NULL	NULL	NULL	1/1/2017 0:00	
4	1/1/2017	1	1	PROS	3.948807433	1.352296	-4.805555556	0	NULL	1/1/2017 1:00	
5	1/1/2017	1	10	YAKB	1.708677338	2.000504	-5.194444444	0	732.9805	1/1/2017 1:00	
6	1/1/2017	1		300A	4.969825045	2.369312	-6.694444444	0	744.2835	1/1/2017 1:00	
7	1/1/2017	1	13	100N	3.19002554	1.665224	-4.541666667	0	742.442	1/1/2017 1:00	
8	1/1/2017	1	14	WPPS	5.794493117	1.810512	-7.138888889	0	NULL	1/1/2017 1:00	
9	1/1/2017	1	15	FRNK	0	0	-5.722222222	NULL	NULL	1/1/2017 1:00	
0	1/1/2017	1	17	RING	0.937241808	1.933448	-6.138888889	0	NULL	1/1/2017 1:00	
1	1/1/2017	1	18	RICH	NULL	NULL	NULL	0	NULL	1/1/2017 1:00	
2	1/1/2017	1	19	PFP	4.783074815	1.531112	-4.902777778	NULL	735.838	1/1/2017 1:00	
3	1/1/2017	1	20	RMTN	4.366377456	13.109448	-4.902777778	0	NULL	1/1/2017 1:00	
4	1/1/2017	1	21	HMS	1.727439627	1.296416	-5.097222222	0	734.06		
5	1/1/2017	1	22	PASC	4.771293843	1.28524	-3.625	0	NULL	1/1/2017 1:00	
6	1/1/2017	1	27	VSTA	2.604903909	1.128776	-3.611111111	0	NULL	1/1/2017 1:00	
7	1/1/2017	1	28	SURF	NULL	NULL	NULL		NULL	1/1/2017 1:00	
8	1/1/2017	1	3	ARMY	4.775220833	1.385824	-4.833333333	0	NULL	1/1/2017 1:00	
9	1/1/2017	1	30	HAMR	4.78220215	1.776984	-5.430555556	NULL	NULL	1/1/2017 1:00	
0	1/1/2017	1	5	FDNA	3 929317923	2 250101333	-5.62962963	NUU	NUU	1/1/2017 1.00	
1	E.	met	datHanford	$( \mathbf{+} )$			3 4	1			F.

Figure 7. An example of measured meteorological data as input to use in GRAT.

## 3.3 Choose the Meteorological Data

Select the "Trajectory data processing" tab, and click the "Browse" button in "Step 1", then select the desired data file and click the "Open" button in the pop-up window:

		ing Potential so	irce density fur	nction (PSDF)			
reate	input file Step 1	: Choose mete	orological fi	le	Step 2: Ma	p attributes from file	
		Browse	ou <mark>rly_Site_1</mark> SiteName_PROS_	Weather_Data.csv	Wind di	rection	~
						speed	~
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	Sele	ct station	Latitude 46.	39175309	-	er settings	
	PROS	ι – Γ	ongitude -11	9.4117946	Layer depth	n (m) 700.0	Process
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'ear	Month	Day Hour	Minute	Wind direction	Wind speed	Mix layer depth	Stability Class
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onverl	t to ARL f	ormat	Minute	Wind direction	Wind speed	Mix layer depth	Stability Class
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Figure 8. The "Trajectory data processing" tab.

### 3.4 Select Map Attributes from the File

Click the combo box on the immediate right of the "Wind direction" label and choose the column which contains the measured wind direction data. Make similar selections for wind direction and time stamp.

About	Help							
ajectory	data process	ing Pote	ential sour	ce density fun	nction (PSDF)			
Create	input file Step 1	: Choos	e meteo	rological fi	le		p attributes from file	
		Brow		u <mark>rly_Site_1</mark> teName_PROS_	Weather_Data.csv	Wind di Wind	rection "WindDir" speed "WindSpeed"	~
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Figure 9. The meteorological data selection tab.

### 3.5 Input the Measurement Station Information

Click the combo box right below the "Select station" label and select the station where data was measured. If there is no matching item in the combo list, input the station and fill in the corresponding latitude and longitude.

ectory data processing Potential source density function (PSDF)	
Step 1: Choose meteorological file         Image: Step 2: Step 3: Set global position of station         Select station         Latitude       46.39175309         Image: Step 3: Set global position of station         Select station       Latitude         Image: Step 3: Set global position of station	Step 2: Map attributes from file         Wind direction         Wind speed         Wind speed         Wind Speed"         Sample date time         "Index"         Step 4: Other settings         Layer depth (m)         700.0
Year Month Day Hour Minute Wind directi	ion Wind speed Mix layer depth Stability Class
onvert to ARL format Step 5: Convert to ARL file	

Figure 10. Input the measurement station information.

## 3.6 Set the Boundary Layer Height

The users can input the estimated boundary layer height within which the wind direction and wind speed are assumed to be constant. Based on the HYSPLIT user's guide (Draxler et al 2022), the default value is 150 meters; and it is related to the typical vertical resolution of the meteorological data. A resolution near the surface of 15 hPa is typical of pressure-level data files. This suggests that it is difficult to infer a mixed layer depth of less than 150 m (10 m per hPa) for most meteorological input data.

About ajectory d	Help ata processi	ng Potential	source density fur	nction (PSDF)				
	Step 3:	Choose mo	eteorological fi Hourly_Site_1 SiteName_PROS_ position of sta Latitude	Weather_Data.csv	Step 2: Map attributes from file         Wind direction         Wind speed         Windspeed         Sample date time         "Index"         Step 4: Other settings         Layer depth (m)         1500.0			
Year	Month	Day Ho	our Minute	Wind direction	Wind speed	Mix layer depth	Stability Class	
	to ARL fo Convert to		o ARL					
Step 5: Comput	Convert to	ARL file Convert t ry I run model		Starting hour: 00 Total run time (hrs)	Trajectory direction	Starting minute:00	) Backward	

Figure 11. User's input of the boundary layer height in the meteorological data tab.

After clicking the "Process" button, the GRAT software will prepare an associated input file from the select meteorological data file for conversion. The stability class for each measurement will be automatically assigned to 4. Please refer to the following page for more information: <u>https://www.ready.noaa.gov/READYpgclass.php</u>:

A corresponding row will be created for each row from the selected data file:

	Risk Analysis Tool				×	
Mark About	Help					
Trajectory	data processing Potential source densit	ty function (PSDF)				
Create	e input file Step 1: Choose meteorologic: Browse Houry_Ste_1 Step 3: Set global position of Select station Latitude PROS Longitude	ROS_Weather_Data.csv	Step 2: Map attributes from file         Wind direction         Wind speed         "WindSpeed"         Sample date time         "Index"         Step 4: Other settings         Layer depth (m)         1500.0			
	Month Day Hour Minut 03 01 00 00 03 01 01 00 rt to ARL format 5: Convert to ARL file	te Wind direction 262.69999971 9.2249997996	Wind speed 1.54228800 2.58165600	Mix layer depth 1500.0 1500.0	Stability Class	
	Starting date: 3/27/2022 - Every (Minutes)	Starting hour: 00 Total run time (hrs)	Trajectory directio	Starting minute:00	Backward	
	60 ~					

Figure 12. The processed meteorological data depicted in the user interface.

## 3.7 Convert to ARL file

Next, the users can click the "Convert to ARL" button to convert the dataset produced in section 3.6 to the ARL format. GRAT uses the executable stn2arl.exe from the HYSPLIT program to accomplish this. This process is time-consuming, and it takes approximately 4 minutes to convert a 10-year of hourly meteorological data file. The following pop-up window will show after the conversion is done.



Figure 13. The pop-up window showing completion of data conversion to the ARL format.

### 3.8 Set up and Run the Model

The following shows the steps to set up and run the model:

- 1. Select the start date and start time, for example, 8/29/2017 at 23:00.
- 2. Set the value for "Every (Minutes)" as the measurement interval of the data file, such as 60 minutes, and so on.
- 3. Input the expected hours of data to run. For example, 312 hours for data for the duration of December.
- 4. Choose the "backward" trajectory or "forward" trajectory depending on applications.
- Click the "Browser" button to choose the ARL file, for example: "C:\HYSPLIT\working\Hourly Site 1 SiteName PROS Weather Data H1.bin".
- 6. Fill in the output file name prefix. For example, "tj.PNNL.PROS.".
- 7. Click the "Run model" button.

About	Risk Analysis T	001								
		ing Pot	ential sour	ce density fu	nction (PSDF)					
	input file		childi Soul	ee density id						
oreate		: Choos	Ho	urly_Site_1 teName_PROS	_Weather_Data.csv	Wind di	p attributes from file rection "WindDir" speed "WindSpeed"	×		
		ect statio	ייייייייייייייייייייייייייייייייייייי		ation .39175309 19.4117946	Sample dat Step 4: Oth Layer depth	ner settings	Process		
Year	Month	Day	Hour	Minute	Wind direction	Wind speed	Mix layer depth	Stability Class	^	
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	C	Conv	ert to Al	RL						
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		(ARL file	)					[]		
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Figure 14. The panel to set up and run the model.

GRAT uses the executable hyts\_std.exe from HYSPLIT to accomplish this. This process can be time consuming; and it takes about 12 minutes for the data for the whole of December using the Hanford meteorological measurement from one monitoring station.



Figure 15. The pop-up window showing that the trajectory modeling is completed.

The converted trajectory files are stored under C:\HYSPLIT\working directory:

# 3.9 Run the Potential Source Density Function (PSDF)

The users can use the following steps to run PSDF in the software.

1. Choose the PTR-MS<sup>1</sup> data file, then choose the chemical from the list:

<sup>&</sup>lt;sup>1</sup> The computed particle transport trajectories, combined with the online Proton Transfer Reaction-Mass Spectrometry (PTR-MS) data (<u>https://doi.org/10.5281/zenodo.7369298</u>), can be used to identify and quantify the sources and influenced area of the hazardous chemicals' emission using the PSDF.

Geospatial Risk Analysis Tool			>
About Help			
ajectory data processing Po	otential source density function (PSDF)	Hereard Street Str	
Step 1: Map PTR-MS da	ata to trajectory files		
PTR-MS fi	ile location:	Choose emission nam	e
	andardAlone\DataFileBuilder		
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1	File name	PTR-MS Value	
Submit			
Step 2: Run PSDF			
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	eckades needed: numpy, opennyst s	scipy, matplotlib, basemap, basemap-data-hires, daal4py	<b>(Q)</b>
	set global position of station	supy, matplottib, basemap, basemap data mies, dad-py	
	-		
Selects	station Latitude 46.39175309		
PROS	✓ Longitude -119.4117946	S Run	

Figure 16. Selection of measurement data of hazardous chemicals.

2. Click "Submit", and it will generate the file containing the trajectory file names and the corresponding PTR-MS value for the selected chemical.

About Help	Potential source density function (PSDF)		
ajectory data processing	otential source density function (FSDF)		
Step 1: Map PTR-MS	data to trajectory files		
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	tj.PNNL.PROS.2017081601.txt	2.004810797	
	tj.PNNL.PROS.2017081602.txt	1.874956714	
	tj.PNNL.PROS.2017081603.txt	1.807482808	
	tj.PNNL.PROS.2017081604.txt	1.620813549	
	tj.PNNL.PROS.2017081605.txt	2.014365799	
Submit	tj.PNNL.PROS.2017081606.txt	2.754887444	
	tj.PNNL.PROS.2017081607.txt	3.775386953	
	tj.PNNL.PROS.2017081608.txt	3.526763494 3.073214686	
	tj.PNNL.PROS.2017081609.txt tj.PNNL.PROS.2017081610.txt	1.994484195	
	ti.PNNL.PROS.2017081612.txt	1.806972368	
	ti.PNNL.PROS.2017081613.txt	1.876327406	
	tj.PNNL.PROS.2017081614.txt	1.716558595	
	tj.PNNL.PROS.2017081615.txt	1.699961337	
	+: DAINI DDAC 2017001010 +++	1 E1000000	~
Step 2: Run PSDF			
Python installation path:	C:\Users\houh226\AppData\Local	I\Programs\Python\Python310\python.exe	<b>_</b> ,
-	1		<u> </u>
Python	backages needed: numpy, openpyxl, sc	cipy, matplotlib, basemap, basemap-data-hires, daal4py	
Step 3:	Set global position of station		
Select	station Latitude 46.39175309		
PROS	Longitude -119.4117946	COP Run	

Figure 17. An example showing PSDF calculations using PTR-MS measurements.

3. Choose the full path of the executable "python.exe", then choose the monitoring station. Click "Run". This process may take several minutes. A plot will show up once the execution is done.

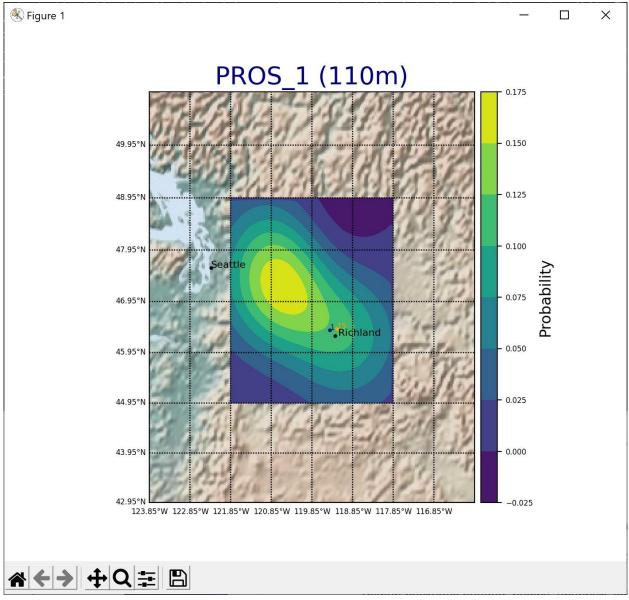


Figure 18. An example PSDF results depicted as a 2D plot superimposed on the map.

4. The "results.xlsx" file will be created under the "Results" subfolder of the installation path, which could be used to calculate the impacted area:

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3	43.15	-2.7E-13	-7.1E-13	-1.7E-12	-4.2E-12	-9.8E-12	-2.1E-11	-4.6E-11	-9.4E-11	-1.8E-10	-3.5E-10	-6.4E-10	-1.1E-09	-
i.	43.25	-6.4E-13	-1.7E-12	-4.2E-12	-1E-11	-2.4E-11	-5.1E-11	-1.1E-10	-2.3E-10	-4.4E-10	-8.5E-10	-1.6E-09	-2.7E-09	
5	43.35	-1.5E-12	-4.1E-12	-1E-11	-2.4E-11	-5.6E-11	-1.2E-10	-2.6E-10	-5.4E-10	-1.1E-09	-2E-09	-3.7E-09	-6.5E-09	
<b>.</b>	43.45	-3.5E-12	-9.3E-12	-2.3E-11	-5.5E-11	-1.3E-10	-2.8E-10	-6E-10	-1.2E-09	-2.4E-09	-4.7E-09	-8.6E-09	-1.5E-08	
7	43.55	-7.4E-12	-2E-11	-4.9E-11	-1.2E-10	-2.8E-10	-6E-10	-1.3E-09	-2.7E-09	-5.2E-09	-1E-08	-1.8E-08	-3.2E-08	
3	43.65	-1.6E-11	-4.2E-11	-1E-10	-2.5E-10	-5.8E-10	-1.3E-09	-2.8E-09	-5.7E-09	-1.1E-08	-2.1E-08	-3.9E-08	-6.8E-08	
9	43.75	-3.2E-11	-8.5E-11	-2.1E-10	-5.1E-10	-1.2E-09	-2.6E-09	-5.6E-09	-1.2E-08	-2.3E-08	-4.3E-08	-8E-08	-1.4E-07	-
0	43.85	-6E-11	-1.6E-10	-4E-10	-9.7E-10	-2.3E-09	-4.9E-09	-1.1E-08	-2.2E-08	-4.3E-08	-8.3E-08	-1.5E-07	-2.7E-07	
1	43.95	-1.1E-10	-3.1E-10	-7.5E-10	-1.8E-09	-4.3E-09	-9.3E-09	-2E-08	-4.2E-08	-8.2E-08	-1.6E-07	-2.9E-07	-5.1E-07	
2	44.05	-2E-10	-5.5E-10	-1.3E-09	-3.3E-09	-7.7E-09	-1.7E-08	-3.6E-08	-7.5E-08	-1.5E-07	-2.8E-07	-5.2E-07	-9.2E-07	
3	44.15	-3.5E-10	-9.3E-10	-2.3E-09	-5.6E-09	-1.3E-08	-2.9E-08	-6.2E-08	-1.3E-07	-2.5E-07	-4.9E-07	-9E-07	-1.6E-06	
4	44.25	-5.7E-10	-1.5E-09	-3.8E-09	-9.3E-09	-2.2E-08	-4.8E-08	-1E-07	-2.2E-07	-4.2E-07	-8.2E-07	-1.5E-06	-2.6E-06	
5	44.35	-9E-10	-2.4E-09	-6E-09	-1.5E-08	-3.5E-08	-7.6E-08	-1.6E-07	-3.4E-07	-6.7E-07	-1.3E-06	-2.4E-06	-4.2E-06	
6	44.45	-1.4E-09	-3.7E-09	-9.1E-09	-2.2E-08	-5.2E-08	-1.1E-07	-2.5E-07	-5.2E-07	-1E-06	-2E-06	-3.7E-06	-6.4E-06	
7	44.55	-2E-09	-5.3E-09	-1.3E-08	-3.2E-08	-7.6E-08	-1.7E-07	-3.7E-07	-7.6E-07	-1.5E-06	-2.9E-06	-5.4E-06	-9.5E-06	
8	44.65	-2.7E-09	-7.3E-09	-1.8E-08	-4.5E-08	-1.1E-07	-2.3E-07	-5.1E-07	-1.1E-06	-2.1E-06	-4.1E-06	-7.6E-06	-1.3E-05	
9	44.75	-3.5E-09	-9.6E-09	-2.4E-08	-5.9E-08	-1.4E-07	-3.1E-07	-6.8E-07	-1.4E-06	-2.8E-06	-5.5E-06	-1E-05	-1.8E-05	
0	44.85	-4.2E-09	-1.2E-08	-3E-08	-7.3E-08	-1.8E-07	-3.9E-07	-8.6E-07	-1.8E-06	-3.6E-06	-7E-06	-1.3E-05	-2.3E-05	
1	44.95	-4.7E-09	-1.3E-08	-3.4E-08	-8.5E-08	-2.1E-07	-4.6E-07	-1E-06	-2.2E-06	-4.3E-06	-8.4E-06	-1.6E-05	-2.8E-05	
2	45.05	-4.6E-09	-1.3E-08	-3.5E-08	-9E-08	-2.2E-07	-5E-07	-1.1E-06	-2.4E-06	-4.8E-06	-9.6E-06	-1.8E-05	-3.2E-05	
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Figure 19. The sample "results.xlsx" file in the Excel format.

## 3.10 About

Selecting "About" on the menu bar reveals the software version information and disclaimer as depicted in the screenshot below.

#### Version 1.0.1

This computer software was prepared by Battelle Memorial Institute, hereinafter the Contractor, under Contract No. DE-AC05-76RL0 1830 with the Department of Energy (DOE). All rights in the computer software are reserved by DOE on behalf of the United States Government and the Contractor as provided in the Contract. You are authorized to use this computer software for Governmental purposes but it is not to be released or distributed to the public.

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Figure 20. The information and disclaimer page of the software.

#### 3.11 Help

Selecting "Help" in the menu bar will open a copy of the user manual associated with the software version.

# 4 Uninstall

To uninstall the GRAT program, select the Windows Start button, go to Settings, and select "Apps." In the program list, navigate to and select "GeospatialRiskAnalysisTool," click "Uninstall," and follow the provided instructions.

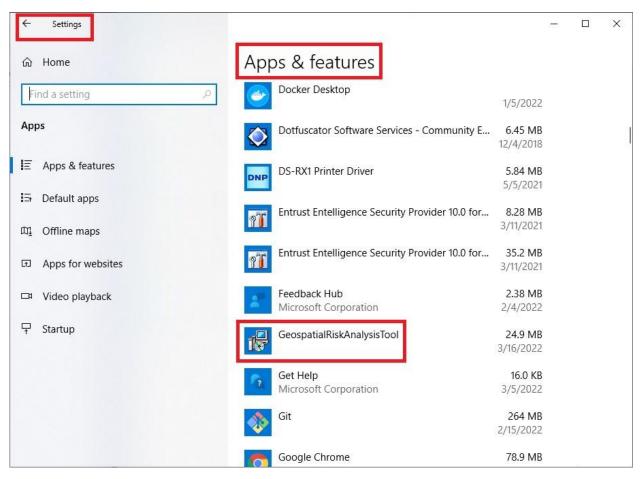


Figure 21. The uninstallation of the GRAT tool.

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