

USING THE METFETCH TOOL

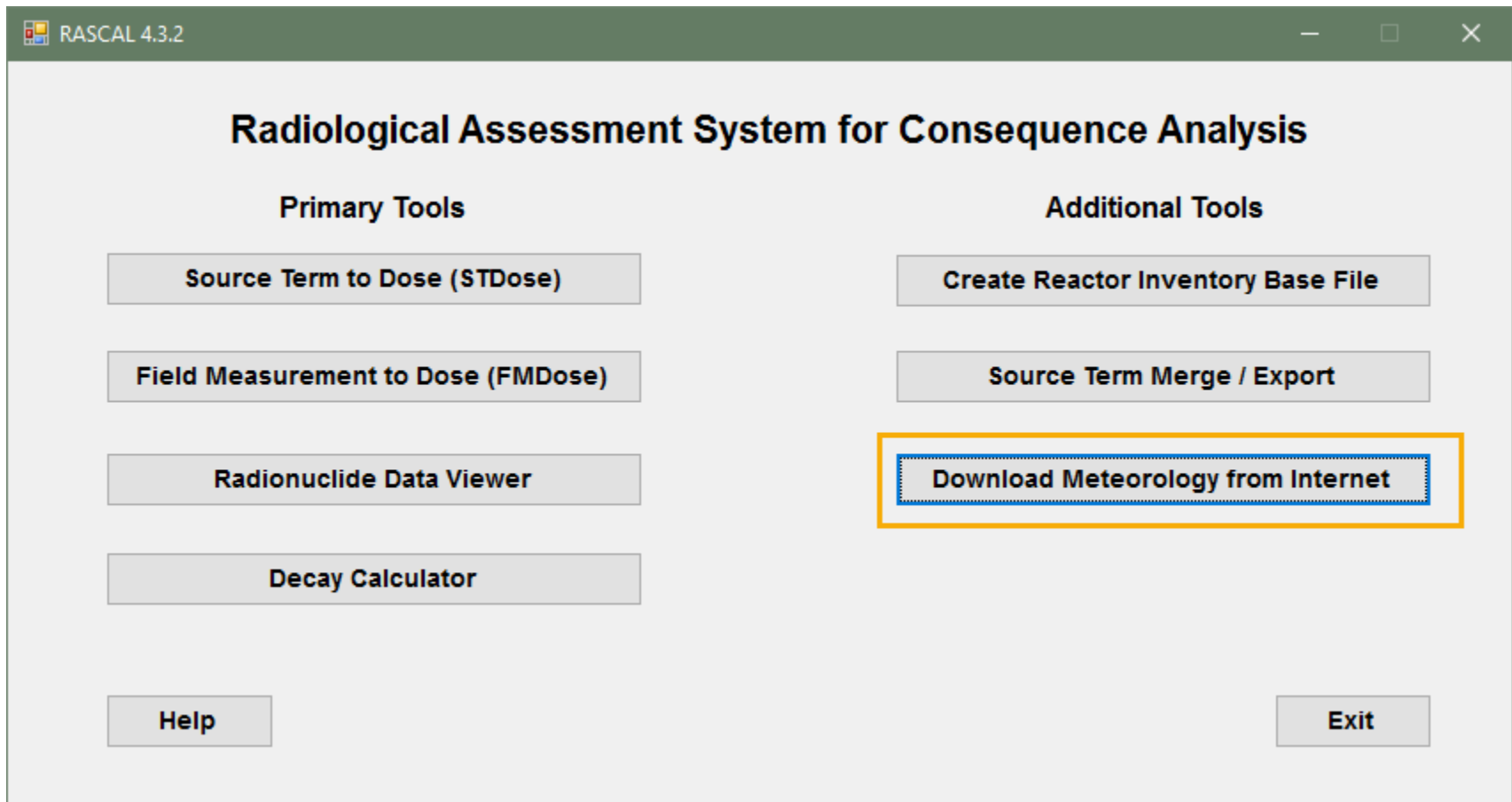
Part of the RASCAL Instructor-led Training

IN THE PAST, ALL THE METEOROLOGICAL DATA RETRIEVAL AND ENTRY INTO RASCAL HAD TO BE DONE MANUALLY.

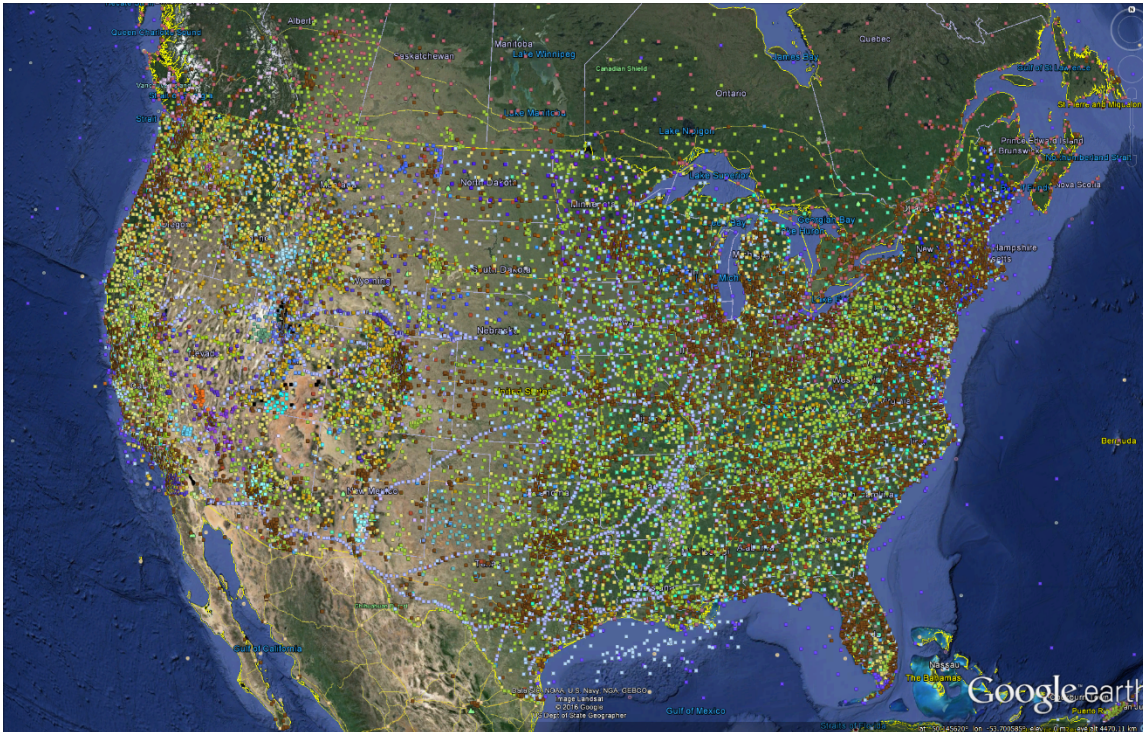
This meant:

- Identifying surrounding weather stations if the site was not in RASCAL
- Finding a source for the weather data, e.g. ERDS, NWS website
- Capturing the data for observations and forecasts; copying the numbers or printing
- Entering that data item by item into the RASCAL meteorological data processing program
- Periodically repeating the full process

**TO PARTIALLY AUTOMATE THIS PROCEDURE RASCAL HAS A TOOL
TO *DOWNLOAD METEOROLOGY FROM INTERNET* (METFETCH).**



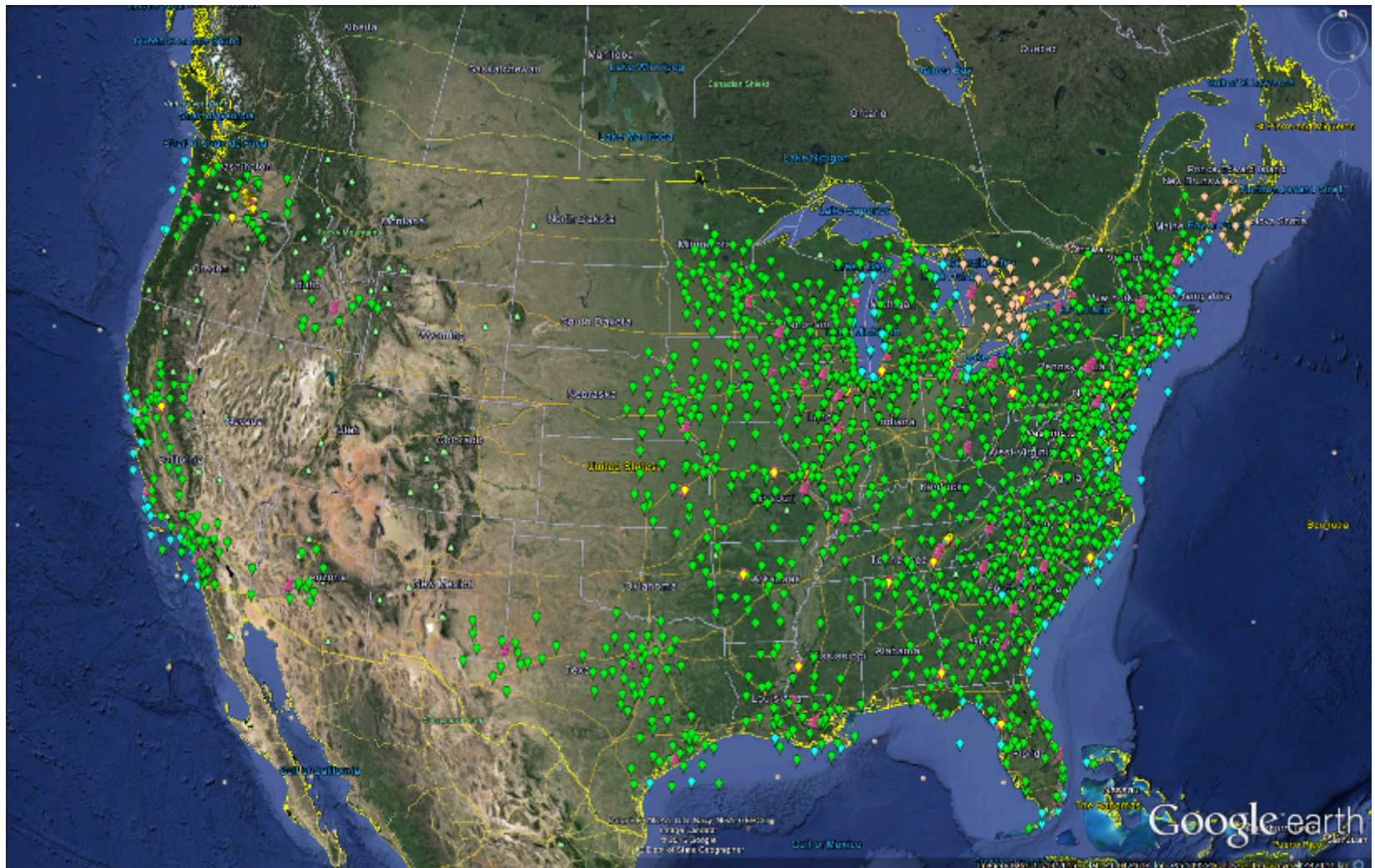
THERE ARE LITERALLY THOUSANDS OF SOURCES FOR OBSERVED WEATHER DATA ONLINE.



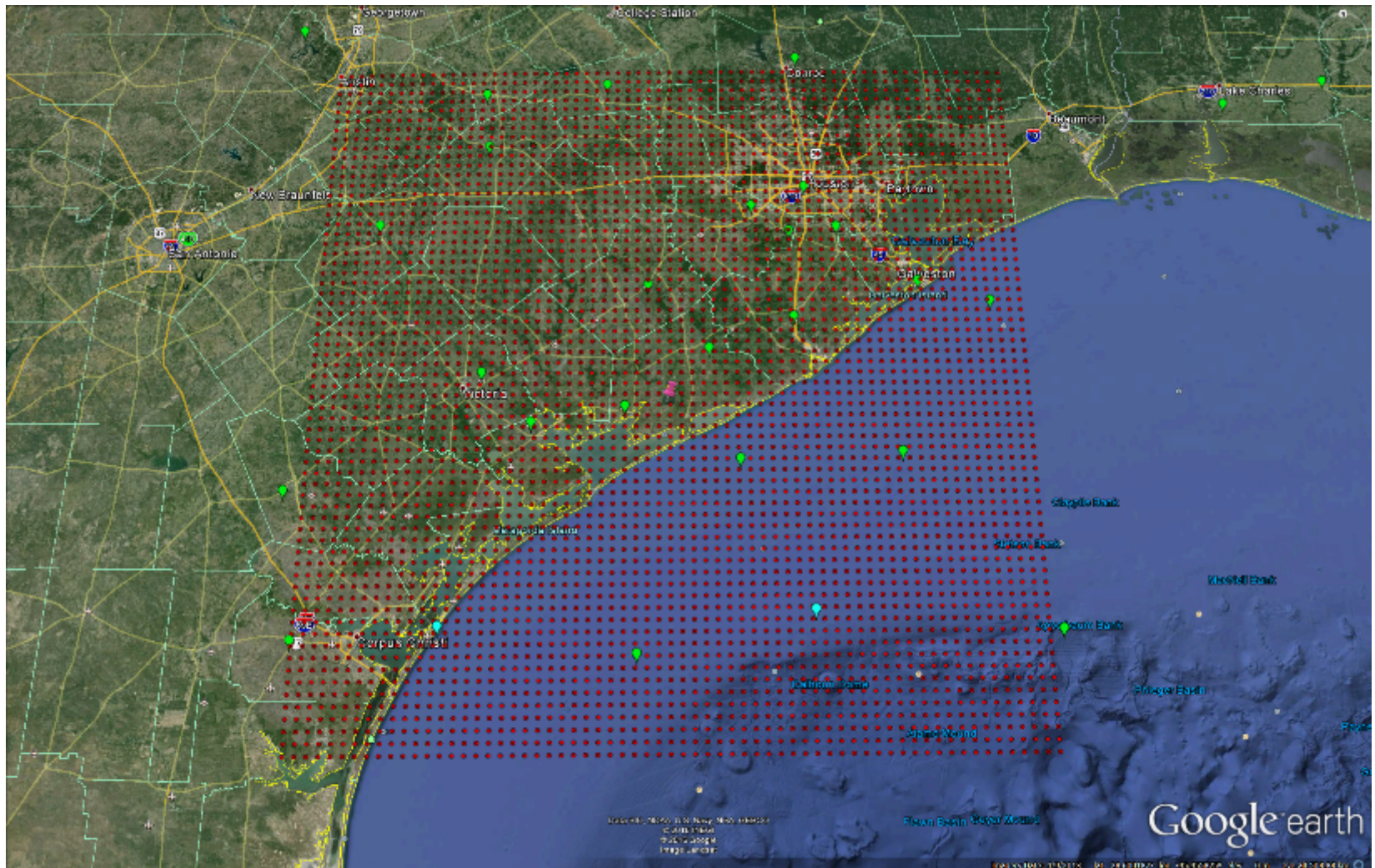
We started with all the stations that are available from the MesoWest data source of observations.

MesoWest contains observations for a wide range of places besides NWS sites; national labs, highways, oil rigs, and so on. Not all the data has the same quality and availability.

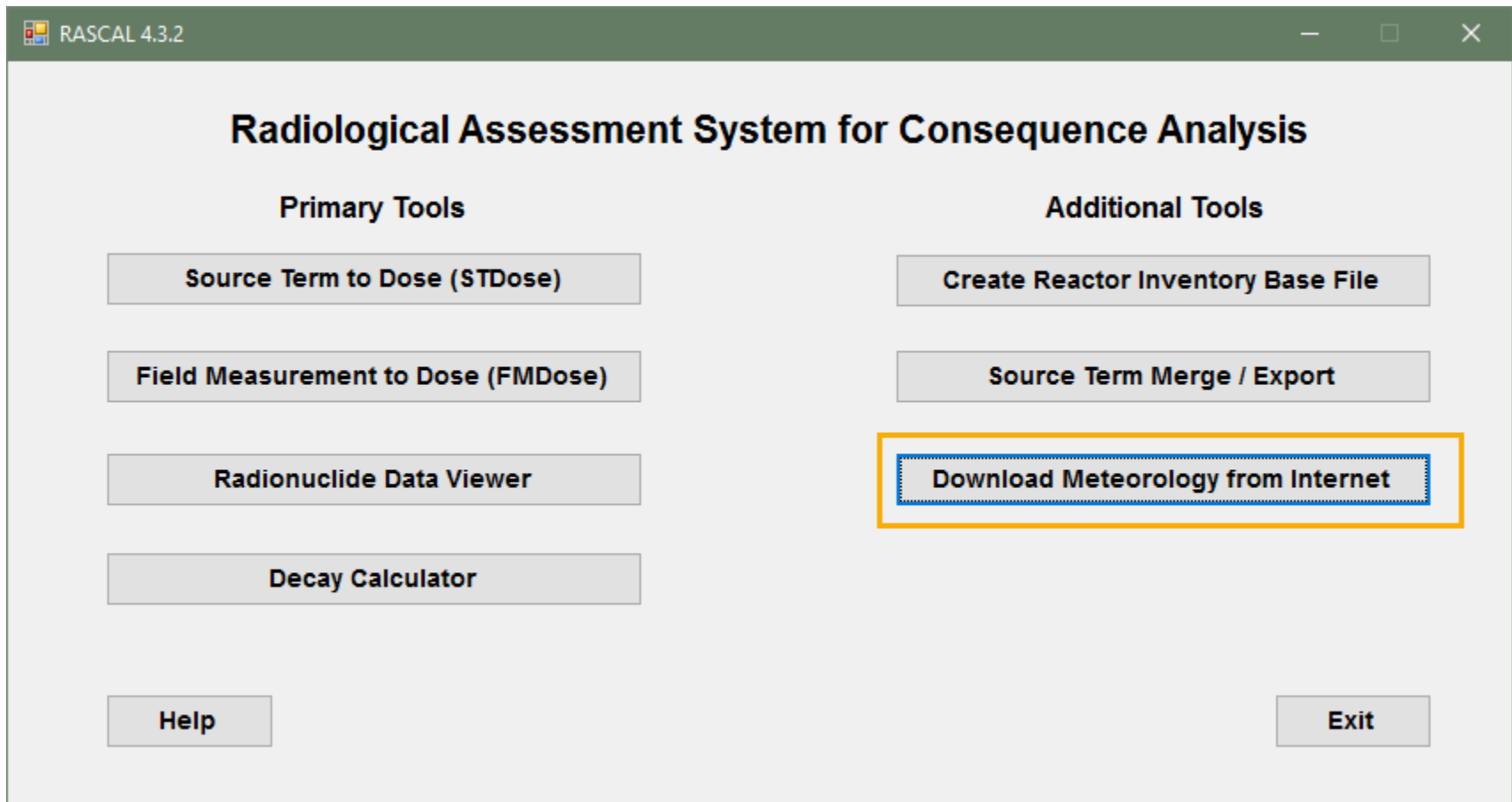
FROM THE MESOWEST STATIONS, UP TO 40 WERE SELECTED FROM THE FIRST ORDER STATIONS AROUND ALL THE SITES IN THE RASCAL FACILITY DATABASE.



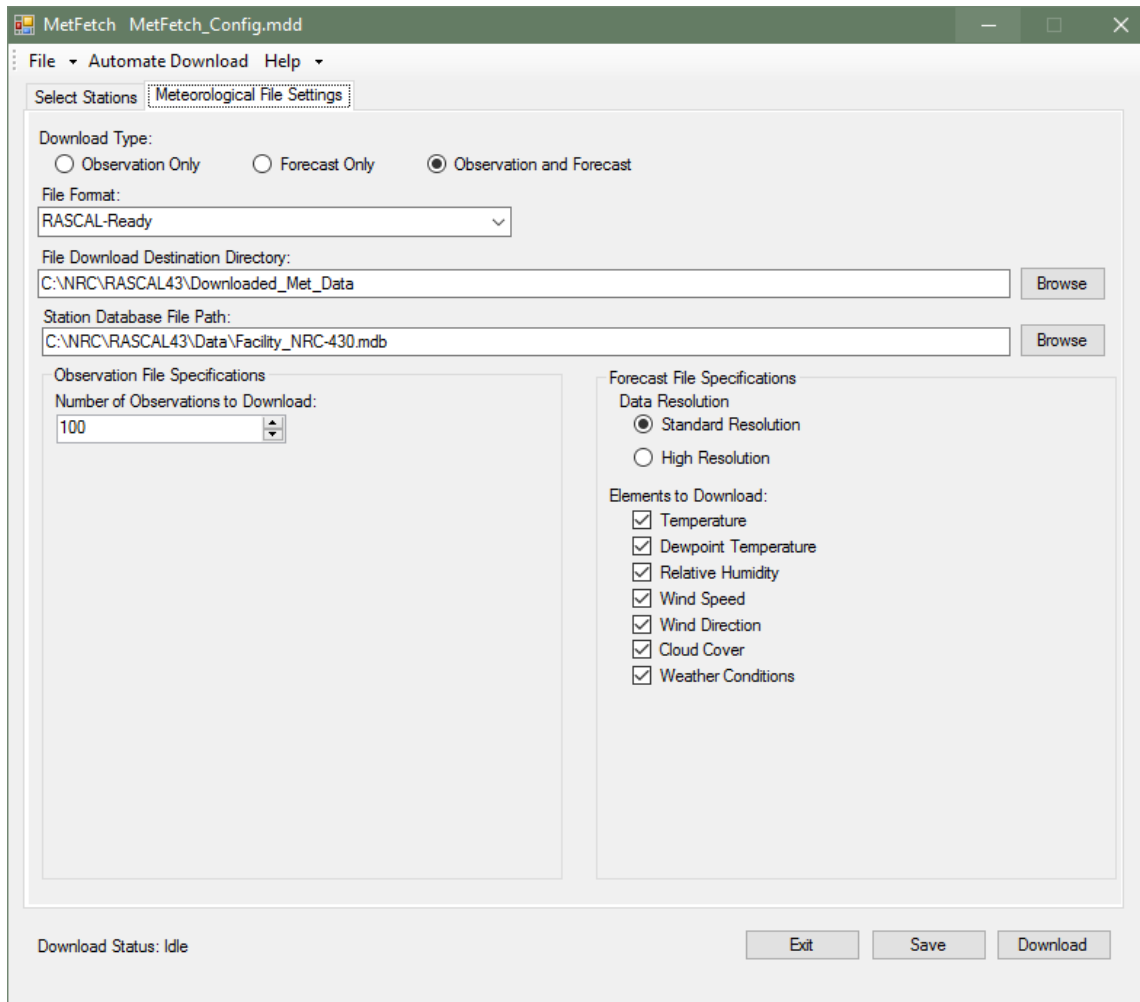
OBSERVATIONS ARE FROM WEATHER STATIONS, FORECASTS ARE FROM THE CLOSEST FORECAST MODEL POINT TO THE STATION.



RASCAL HAS A SEPARATE TOOL TO HANDLE THE DOWNLOAD OF WEATHER DATA FROM THE INTERNET.



THE FIRST TIME YOU START UP METFETCH, CHECK ALL THE SETTINGS.



The settings shown here are those recommended for routine use of the MetFetch tool with the RASCAL STDose model.

BEGIN BY USING THE BROWSE SITE BUTTON TO SEE A LIST OF ALL THE FACILITIES IN THE RASCAL DATABASE

The image shows a software window titled "MetFetch MetFetch_Config.mdd". It has a menu bar with "File", "Automate Download", and "Help". Below the menu bar are two tabs: "Select Stations" (active) and "Meteorological File Settings".

Select Stations Tab:

- Search Criteria:**
 - Site Location:** A text box containing "Arkansas Nuclear". To its right is a "Browse Site" button.
 - Site Latitude:** A text box containing "35.31" followed by "degrees".
 - Site Longitude:** A text box containing "-93.231389" followed by "degrees".
 - Search Radius:** A dropdown menu showing "125 miles (200 km)".
- Station Type:**
 - ☒ Preferred Stations for RASCAL
 - ☐ National Weather Service (NWS) Stations Only
 - ☐ All Available Stations
- Find Stations:** A button.

Below the search criteria are two large empty rectangular areas for station lists, each with a header row:

- Stations Available for Download:** Header row: ID, Type, State, Distance, Direction.
- Stations Download List:** Header row: ID, Type, State, Distance, Direction.

Between these two lists are two buttons: ">>" and "<<".

At the bottom of each list area are three buttons: "Remove Selected", "Unselect All", and "Select All".

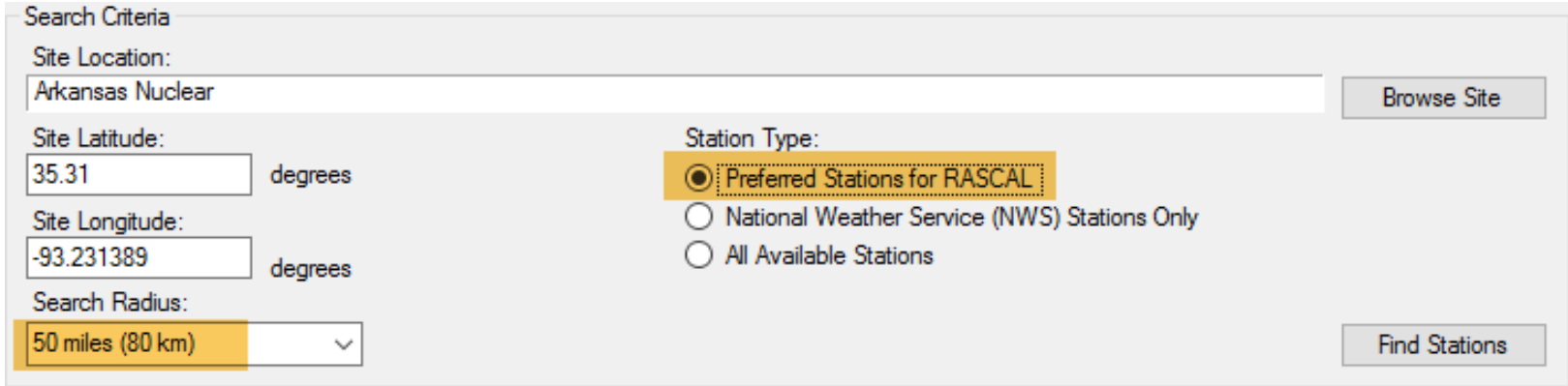
At the very bottom of the window are three buttons: "Exit", "Save", and "Download".

Bottom left status text: "Download Status: Idle".

Select the desired site.

That will load the site latitude and longitude.

NEXT, SET THE STATION TYPE AND THE SEARCH RADIUS



The screenshot shows a web form titled "Search Criteria". It contains several input fields and a set of radio buttons. The "Site Location" field is filled with "Arkansas Nuclear". The "Site Latitude" field is filled with "35.31" and followed by the text "degrees". The "Site Longitude" field is filled with "-93.231389" and followed by the text "degrees". The "Search Radius" field is a dropdown menu with "50 miles (80 km)" selected. The "Station Type" section has three radio buttons: "Preferred Stations for RASCAL" (which is selected and highlighted with a yellow box), "National Weather Service (NWS) Stations Only", and "All Available Stations". There are two buttons: "Browse Site" next to the location field and "Find Stations" at the bottom right.

Search Criteria

Site Location:
Arkansas Nuclear Browse Site

Site Latitude:
35.31 degrees

Site Longitude:
-93.231389 degrees

Search Radius:
50 miles (80 km) ▼

Station Type:
☒ Preferred Stations for RASCAL
☐ National Weather Service (NWS) Stations Only
☐ All Available Stations

Find Stations

Station type should always be set to Preferred Stations for RASCAL. That will include NWS stations and the site.

For our example, we reduce the radius to 50 miles to limit how many stations are found around the site.

CLICK THE FIND STATIONS BUTTON

Search Radius:
50 miles (80 km) v

Find Stations

Stations Available for Download:

ID	Type	State	Distance	Direction
☐ ARKA	NRC	AR	000(miles) :	N
☐ KCCA	NWS	AR	048(miles) :	ENE
☐ KRUE	NWS	AR	009(miles) :	ESE

>>
<<

Remove Selected Unselect All Select All

Stations Download List:

ID	Type	State	Distance	Direction
----	------	-------	----------	-----------

Remove Selected Unselect All Select All

Set a checkmark for each station and then click the arrow to move them to the Stations Download List.

Stations Available for Download:

ID	Type	State	Distance	Direction
☒ ARKA	NRC	AR	000(miles) :	N
☒ KCCA	NWS	AR	048(miles) :	ENE
☒ KRUE	NWS	AR	009(miles) :	ESE

>>
<<

Stations Download List:

ID	Type	State	Distance	Direction
----	------	-------	----------	-----------

FINALLY, CLICK THE DOWNLOAD BUTTON

Stations Available for Download:

ID	Type	State	Distance	Direction
----	------	-------	----------	-----------

Stations Download List:

ID	Type	State	Distance	Direction
☐ ARKA	NRC	AR	000 (miles)	N
☐ KCCA	NWS	AR	048 (miles)	ENE
☐ KRUE	NWS	AR	009 (miles)	ESE

>>

<<

Remove Selected

Unselect All

Select All

Remove Selected

Unselect All

Select All

Download Status: Idle

Exit

Save

Download

WHAT HAPPENS DURING THE DOWNLOAD?

- A warning will be displayed that MetFetch cannot download observations for the site station.
 - That is normal – NPP sites do not provide their met data to NWS
 - It is a reminder to you to manually get site observations
- Observations are downloaded for the other stations
- Forecasts are downloaded from the nearest point to each of the stations

WHAT DO I DO AFTER THE DOWNLOAD?



- The Download status: Idle indicates the process is complete.
- You can leave the program open as you may come back to it later to get updated observations and forecasts.
- The data has been downloaded to a location on your computer where the RASCAL STDose model can find it. But you need to go and retrieve it.

NEXT STEP IS TO GET THE DOWNLOADED DATA INTO THE STDose MODEL

- Open a saved case or start running an STDose scenario that uses the same site as downloaded in MetFetch
- For our example, let's take a look at Cooper and some BWR specifics.

CLICK THE ENTER DATA BUTTON

Meteorological Data Processor

File Stations Help

Location:

Latitude:

Longitude:

Enter Data

Process Data

Return

Available meteorological stations

Station ID	Distance (miles)	Bearing (deg)
ARKA	0.0	0.
KFLP	77.3	27.8
KCCA	48.1	65.6
KBVX	93.4	71.7
KSRC	84.6	94.6
KM19	117.6	78.9
KRUE	8.6	114.4
KLRF	67.0	113.9
KSGT	106.6	117.4
KLIT	69.4	125.5
KPBF	107.9	136.6
KCDH	120.0	167.1
KHOT	58.0	172.4

Only stations within 124 miles are shown.

Observation Summary

Station Summary

View Dataset

Export Dataset

NOTE THE GREEN HIGHLIGHTING OF THE STATION IDs.

That indicates that there is downloaded weather data available for that station.

What it does not indicate is when that data was downloaded. That can be checked in the next step.

Meteorological Processor - Data Entry

Enter data for: Arkansas Nuclear

Retrieve Downloaded Data Change units or methods

Station ID	Type	Date	Time (24 h)	Wind Direct from (deg)	Speed (mph)	Stability Class	Precipitation	Air * Temp (deg F)	Air * Pressure (mb)	Dew Pt * (deg F)
ARKA										
KFLP										
KCCA	Obs	2016/02/08	00:00							
KBVX										
KSRC										
KM19										
KBUK										
KLRP										
KSGT										
KLIT										
KPBF										
KCDH										
KHDT										
KADF										
KMWT										
KMEZ										
KDEQ										
KRKR										
KISV										

*** Note:**

For UFG releases, air temperature, air pressure, and a measure of moisture are required.

For all other releases, air pressure and moisture are not required. However, air temperature is required if the precipitation type is snow.

Add record Sort records Delete record Delete all Print OK Cancel Help

WITH THE SITE SELECTED IN THE STATION ID LIST, CLICK THE RETRIEVE DOWNLOADED DATA BUTTON

The screenshot shows a software window titled "Meteorological Processor - Data Entry". Inside, there's a header area with the text "Enter data for: Arkansas Nuclear" and two buttons: "Retrieve Downloaded Data" (highlighted in orange) and "Change units or methods". Below this is a table with columns for "Station ID", "Type", "Date", "Time (24 h)", "Wind Direct from (deg)", "Speed (mph)", "Stability Class", "Precipitation", "Air * Temp (deg F)", "Air * Pressure (mb)", and "Dew Pt * (deg F)". The "Station ID" list on the left includes ARKA, KFLP, KCCA (highlighted in green), KBVX, and KSPC. The "Type" column has a value of "Obs", and the "Date" column has a value of "2016/02/08".

Station ID	Type	Date	Time (24 h)	Wind Direct from (deg)	Speed (mph)	Stability Class	Precipitation	Air * Temp (deg F)	Air * Pressure (mb)	Dew Pt * (deg F)
ARKA										
KFLP										
KCCA	Obs	2016/02/08	00:00							
KBVX										
KSPC										

Note: the site ID is actually colored green also. However, since it is currently selected the blue color hides the green.

THE RETRIEVE SCREEN SHOWS A FOLDER WITH FORECAST DATA FOR THE SITE BUT NO FOLDER FOR OBSERVED DATA.

Retrieve Downloaded Meteorological Data

Highlight folder name to be retrieved or select None

Observation Folder Name	First record	Last record	# recs
None			

Forecast Folder Name	First record	Last Record	# recs
None			
Forecasts_2016-02-08-15	02/08/2016 15:00	02/14/2016 18:00	34

☐ Release point is on Daylight Savings Time

Help Cancel Retrieve

That is correct as remember we mentioned earlier that MetFetch does not have access to observations made at the site.

TO COMPLETE THE RETRIEVAL OF THE DATA FOR THE SITE:

Retrieve Downloaded Meteorological Data

Highlight folder name to be retrieved or select None

Observation Folder Name	First record	Last record	# recs
None			

Forecast Folder Name	First record	Last Record	# recs
None			
Forecasts_2016-02-08-15	02/08/2016 15:00	02/14/2016 18:00	34

☐ Release point is on Daylight Savings Time

Help Cancel Retrieve

Click to select the available forecast data folder.

Check the DST box as needed depending on the time of year.

Click the Retrieve button.

THE FORECAST DATA THAT WAS DOWNLOADED IS LOADED INTO THE GRID FOR THE SITE

Meteorological Processor - Data Entry

Enter data for: Arkansas Nuclear

Retrieve Downloaded Data Change units or methods

Station ID	Type	Date	Time (24 h)	Wind Direct from (deg)	Speed (mph)	Stability Class	Precipitation	Air * Temp (deg F)	Air * Pressure (mb)	Dew Pt * (deg F)
ARKA										
KFLP	Obs	2016/02/08	00:00							
KCCA	Fcst	2016/02/08	15:00	300	23.0	Unknown	No Precip	45		19
KBVX	Fcst	2016/02/08	18:00	310	15.0	Unknown	No Precip	40		17
KSRC	Fcst	2016/02/08	21:00	310	11.5	Unknown	No Precip	35		18
KM19	Fcst	2016/02/09	00:00	310	11.5	Unknown	No Precip	31		18
KRUE	Fcst	2016/02/09	03:00	310	10.4	Unknown	No Precip	29		18
KLRF	Fcst	2016/02/09	06:00	300	10.4	Unknown	No Precip	27		17
KSGT	Fcst	2016/02/09	09:00	310	13.8	Unknown	No Precip	30		17
KLIT	Fcst	2016/02/09	12:00	300	15.0	Unknown	No Precip	40		17
KPBF	Fcst	2016/02/09	15:00	300	16.1	Unknown	No Precip	45		17
KCDH	Fcst	2016/02/09	18:00	310	10.4	Unknown	No Precip	41		17
KHOT	Fcst	2016/02/09	21:00	310	8.1	Unknown	No Precip	34		18
KADF	Fcst	2016/02/10	00:00	310	6.9	Unknown	No Precip	31		18
KMWT	Fcst	2016/02/10	03:00	310	5.8	Unknown	No Precip	28		18
KMEZ	Fcst	2016/02/10	06:00	310	5.8	Unknown	No Precip	28		18
KDEQ	Fcst	2016/02/10	09:00	310	6.9	Unknown	No Precip	33		17
KRKR	Fcst	2016/02/10	12:00	310	6.9	Unknown	No Precip	41		16
KISV	Fcst	2016/02/10	15:00	310	6.9	Unknown	No Precip	45		16

* Note:
For UFG releases, air temperature, air pressure, and a measure of moisture are required.
For all other releases, air pressure and moisture are not required. However, air temperature is required if the precipitation type is snow.

Add record
Sort records
Delete record
Delete all

OK
Cancel
Print
Help

Note, you still need to enter the observations manually.

See that stability class is Unknown. That is correct as stability is not forecast by NWS. That is OK, RASCAL will estimate it when needed.

REPEAT THE PROCESS FOR OTHER DOWNLOADED STATIONS

Meteorological Processor - Data Entry

Enter data for: Clinton Memorial Airfield

Retrieve Downloaded Data Change units or methods

Station ID	Type	Date	Time (24 h)	Wind Direct from (deg)	Speed (mph)	Stability Class	Precipitation
KFLP	Obs	2016/02/07	05:15	0	0.0	Unknown	No Precip
KCCA	Obs	2016/02/07	05:35	0	0.0	Unknown	No Precip
KBVX	Obs	2016/02/07	05:55	0	0.0	Unknown	No Precip
KSRC	Obs	2016/02/07	06:15	0	0.0	Unknown	No Precip
KM19	Obs	2016/02/07	06:35	0	0.0	Unknown	No Precip
KRUE	Obs	2016/02/07	06:55	0	0.0	Unknown	No Precip
KLRF	Obs	2016/02/07	07:15	0	0.0	Unknown	No Precip
KSGT	Obs	2016/02/07	07:35	0	0.0	Unknown	No Precip
KLIT	Obs	2016/02/07	07:55	0	0.0	Unknown	No Precip
KPBF	Obs	2016/02/07	08:15	0	0.0	Unknown	No Precip
KCDH	Obs	2016/02/07	08:35	0	0.0	Unknown	No Precip
KHOT	Obs	2016/02/07	08:55	0	0.0	Unknown	No Precip
KADF	Obs	2016/02/07	09:15	0	0.0	Unknown	No Precip
KMWT	Obs	2016/02/07	09:35	0	0.0	Unknown	No Precip
KMEZ	Obs	2016/02/07	09:55	0	0.0	Unknown	No Precip
KDEQ	Obs	2016/02/07	10:15	0	0.0	Unknown	No Precip
KRRR	Obs	2016/02/07	10:35	0	0.0	Unknown	No Precip
KISV	Obs	2016/02/07	10:55	0	0.0	Unknown	No Precip

Add record Sort records Delete record Delete all OK Cancel Help Print

Note

You will have to select folders for both observations and forecasts.

Always pick the most recent folder

AFTER RETRIEVING DATA FOR ALL STATIONS

- Click OK to return to the main screen
- Note that all now we have a significant number of records for all stations.
- Click the Process Data button to create a dataset usable by the STDose ATD models.

CONCLUSIONS

- MetFetch makes it much easier to get both observed and forecast data for multiple sites.
- Since it is automated it reduces errors
- The entire download and retrieve process would be repeated at intervals
 - NWS makes observations every hour
 - Forecast are updated every 6-12 hours

FINAL WORD ON METFETCH

- At this time it works only for U.S. sites
- We are working to expand the tool to be able to get observations and forecasts for anywhere in the world.