The Weather and Climate Toolkit

Steve Ansari
Physical Scientist
NOAA National Centers for Environmental Information

Overview:

- The Weather and Climate Toolkit (WCT) is free, public domain desktop software
- First released in 2008
- Windows, Mac and Linux
- User interface and command-line script support

- Why?

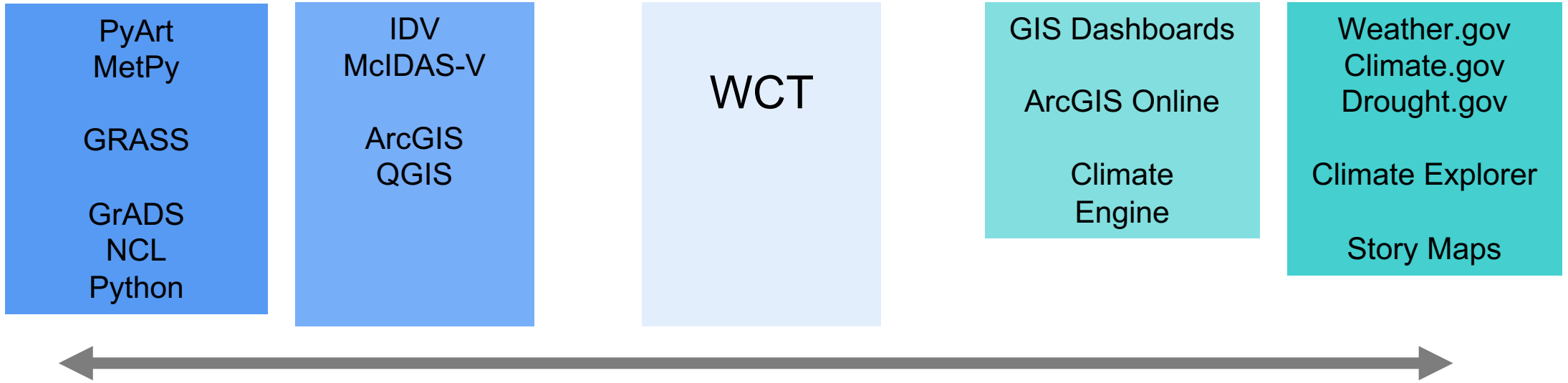
  Easier access to weather and climate data in complex formats (including lots of NOAA data)

- A tool that complements other tools

- Works on cloud environments
- Works with local or remote data
- Can run offline

Supports 2 of 5 NESDIS Strategic Objectives

Where does the WCT fit?



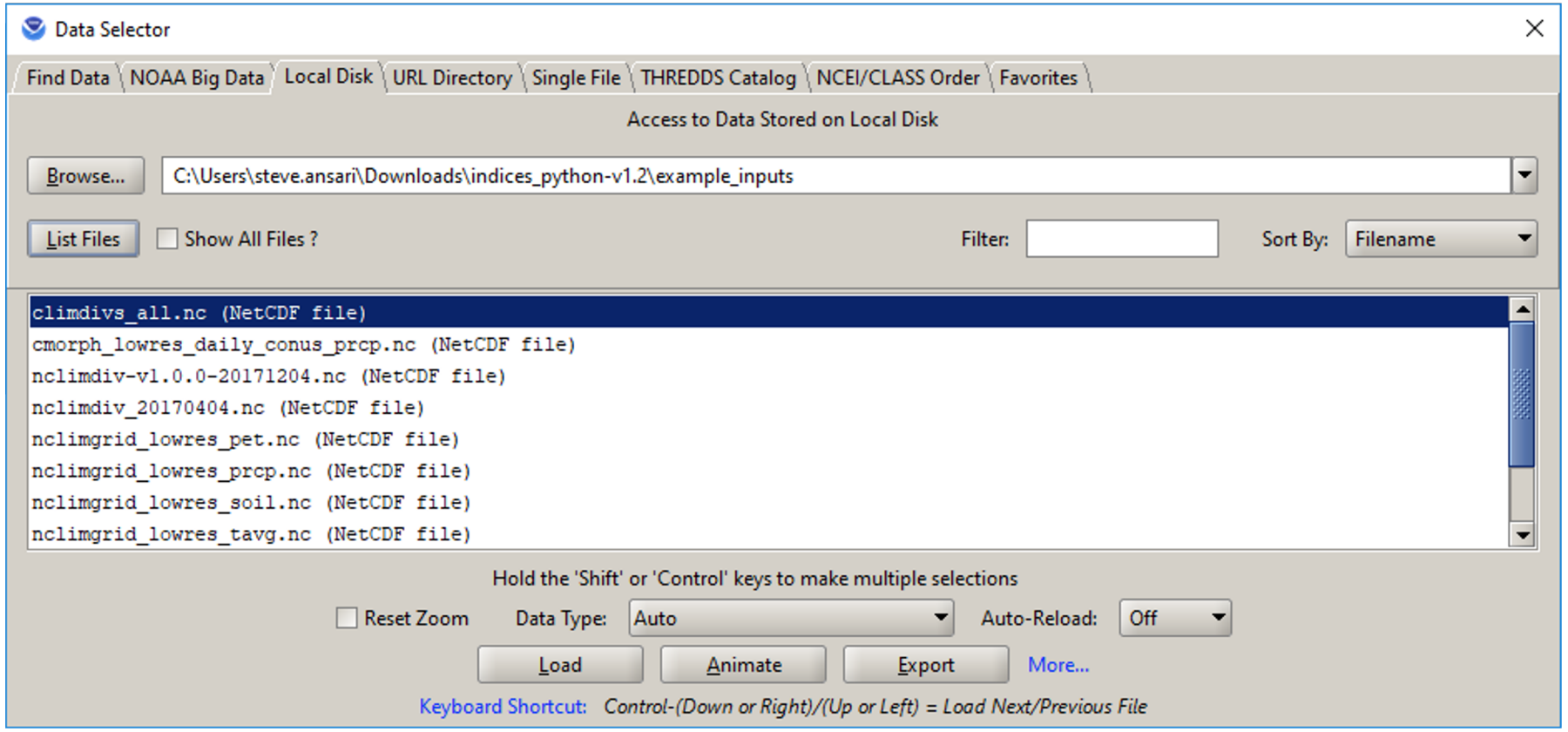
Complex
Technical
Flexible
Software

Simple
Public-focused
Specific
Web-based

Supported Data Sources:

Local computer / disk

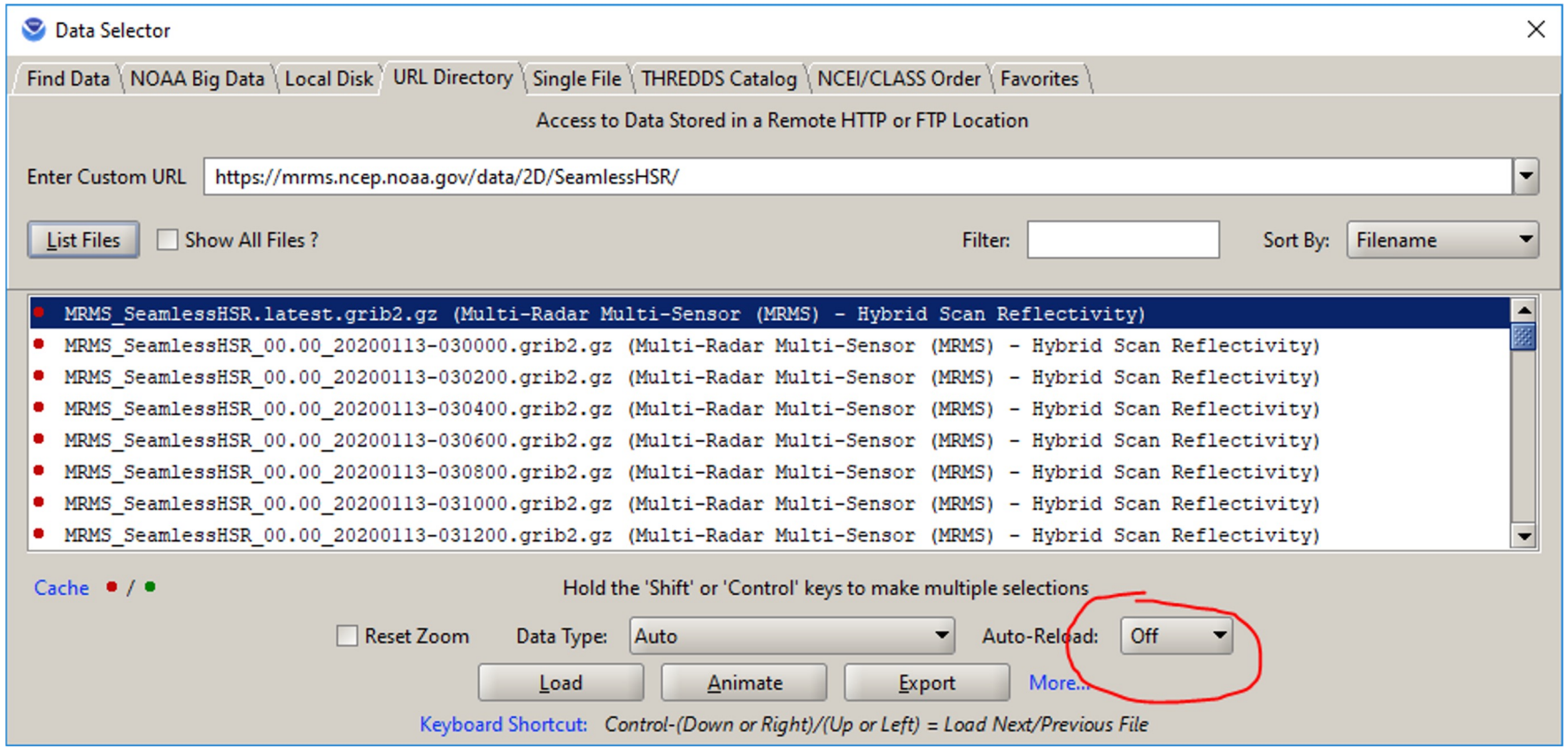
Example: I made some NetCDF files



Supported Data Sources:

Remote files – HTTP(s), FTP

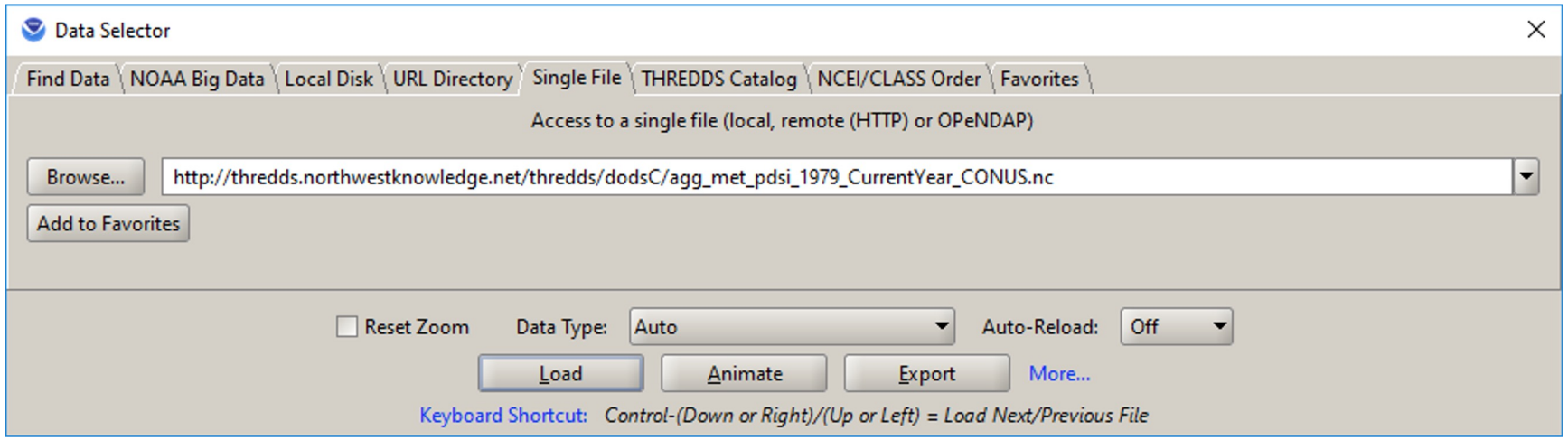
Example: MRMS data from NOAA NCEP, with auto-reload



Supported Data Sources:

Remote endpoints – HTTP(s), FTP, OPeNDAP

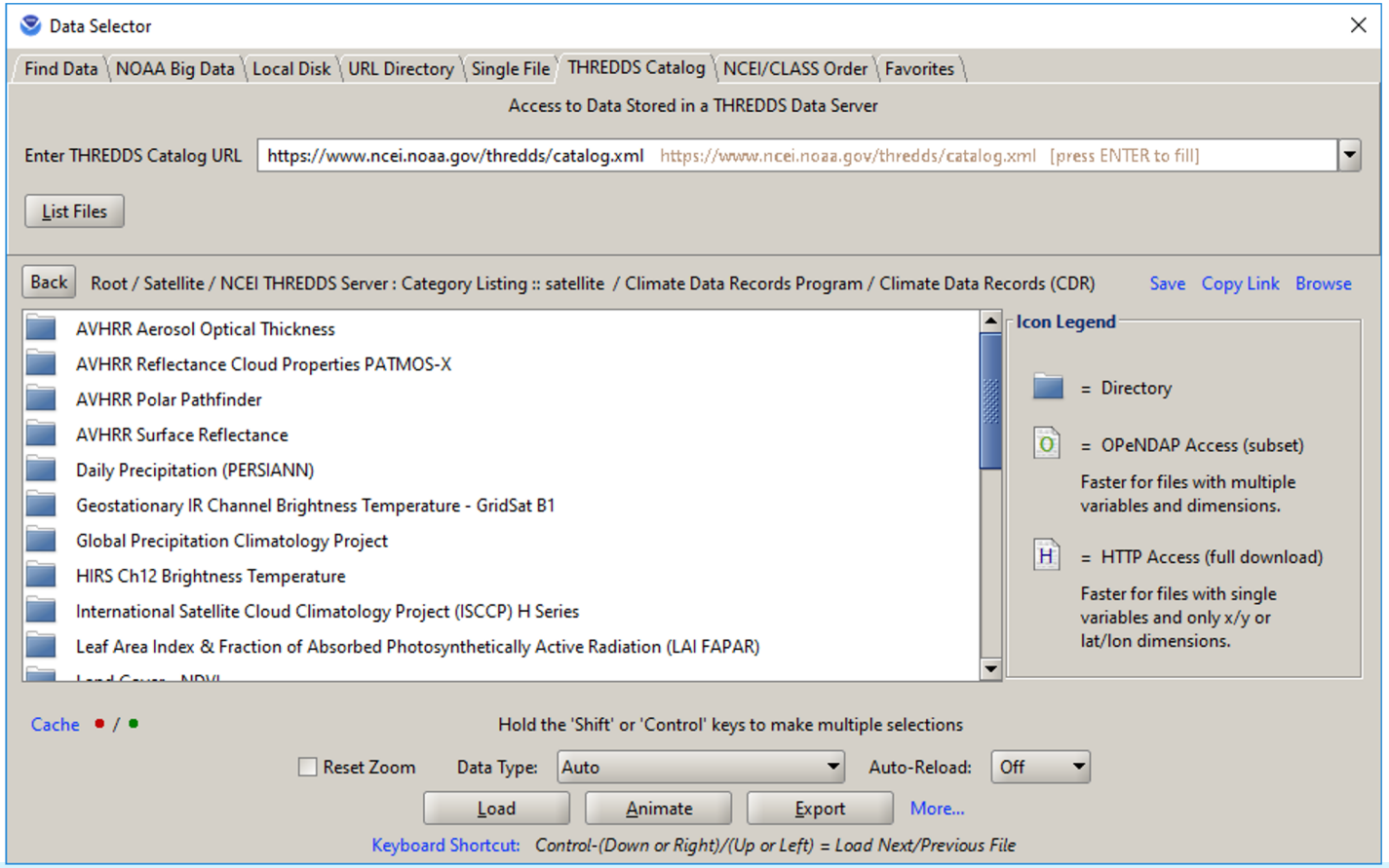
Example: 40 year Palmer Drought Severity Index aggregation



Supported Data Sources:

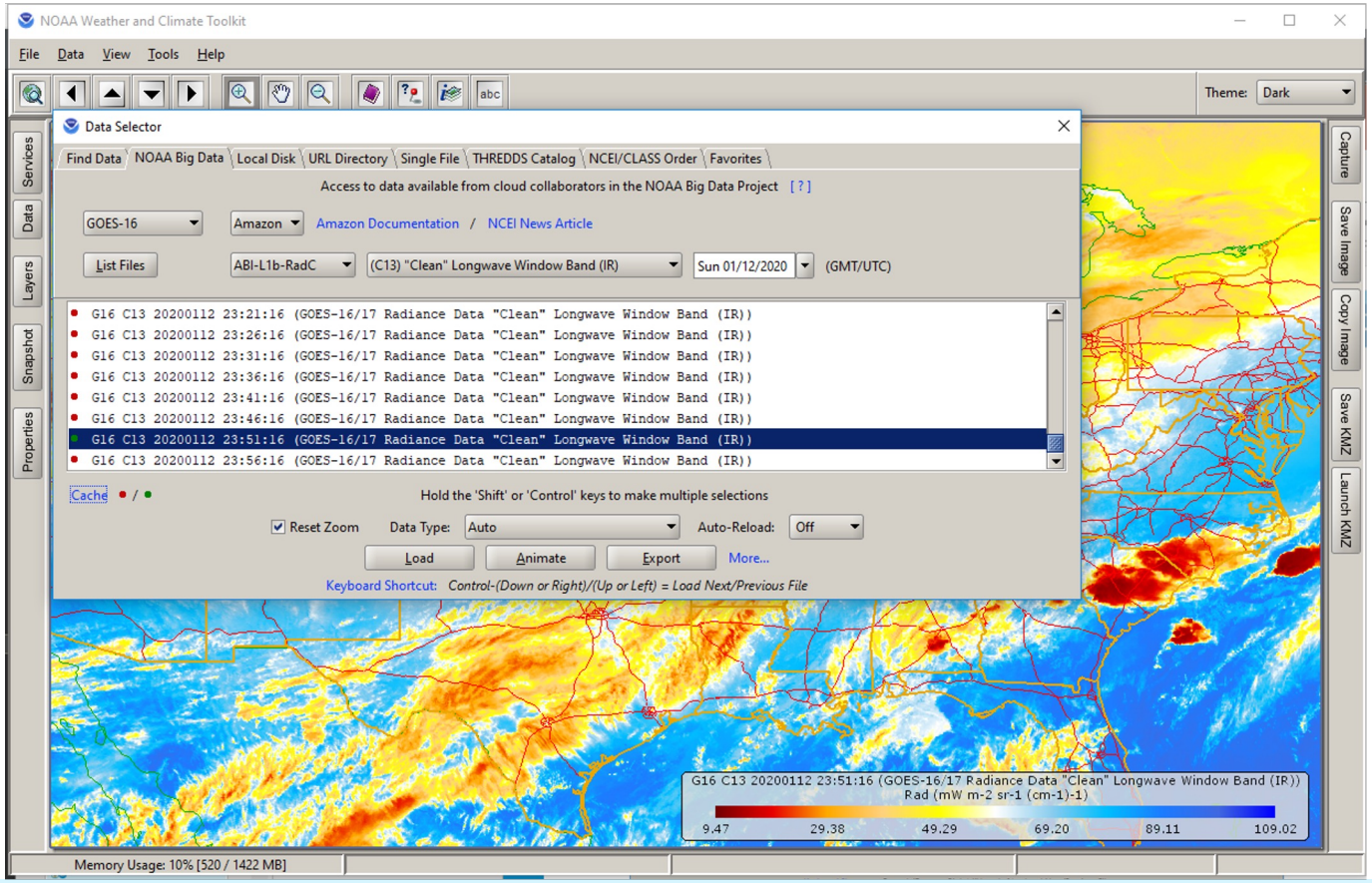
Remote endpoints – THREDDS

Example: Satellite data at NCEI



Supported Data Sources:

Data in the NOAA Open Data Dissemination project: Ex) NEXRAD, GOES data from Amazon



Simple Time Saving Features:

1. Copy/paste map into PowerPoint or Email

1. Map Themes

1. A series of map ‘screen captures’

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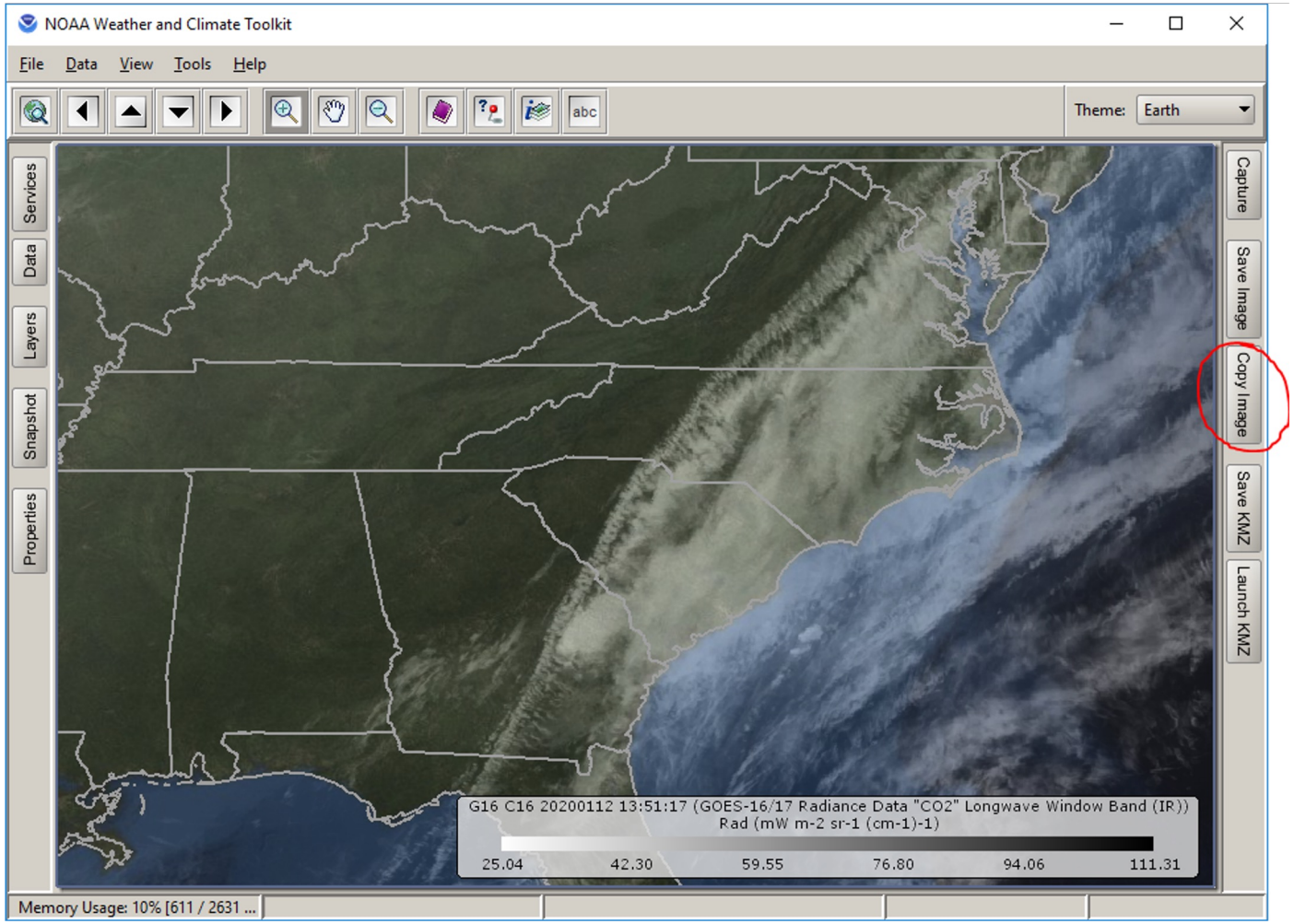

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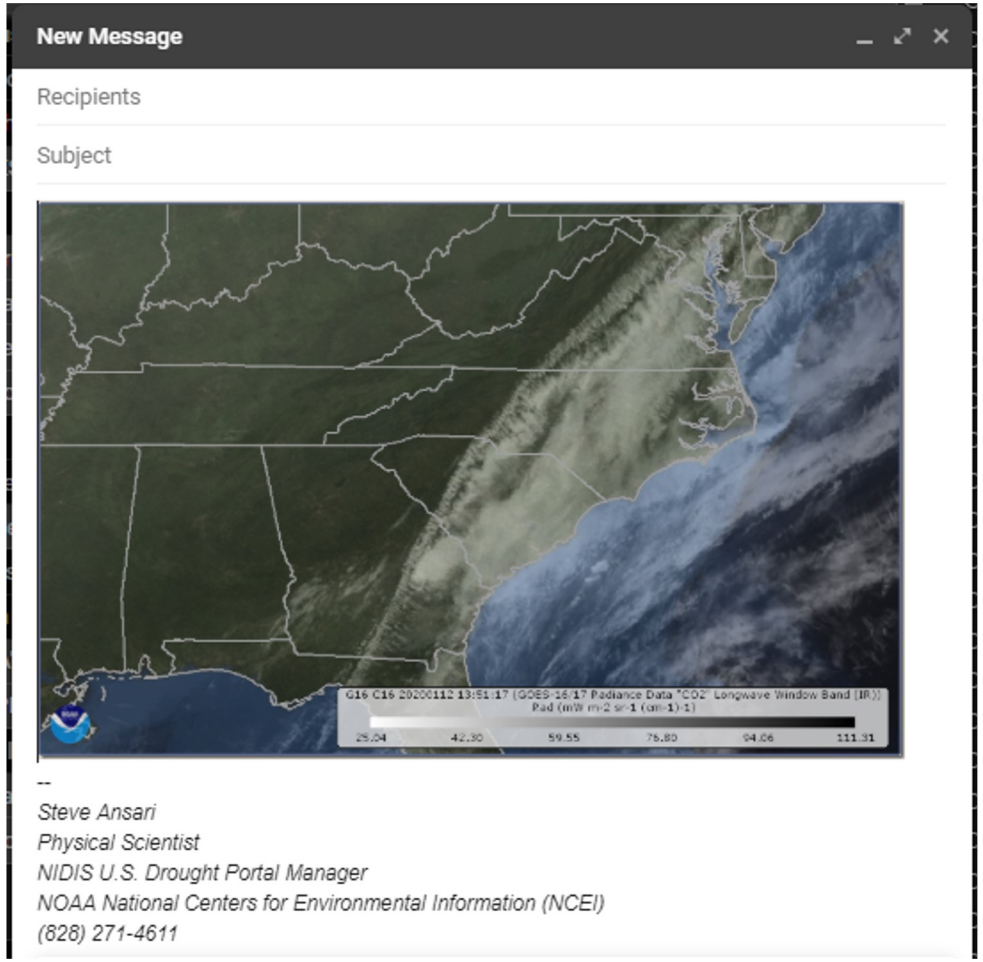
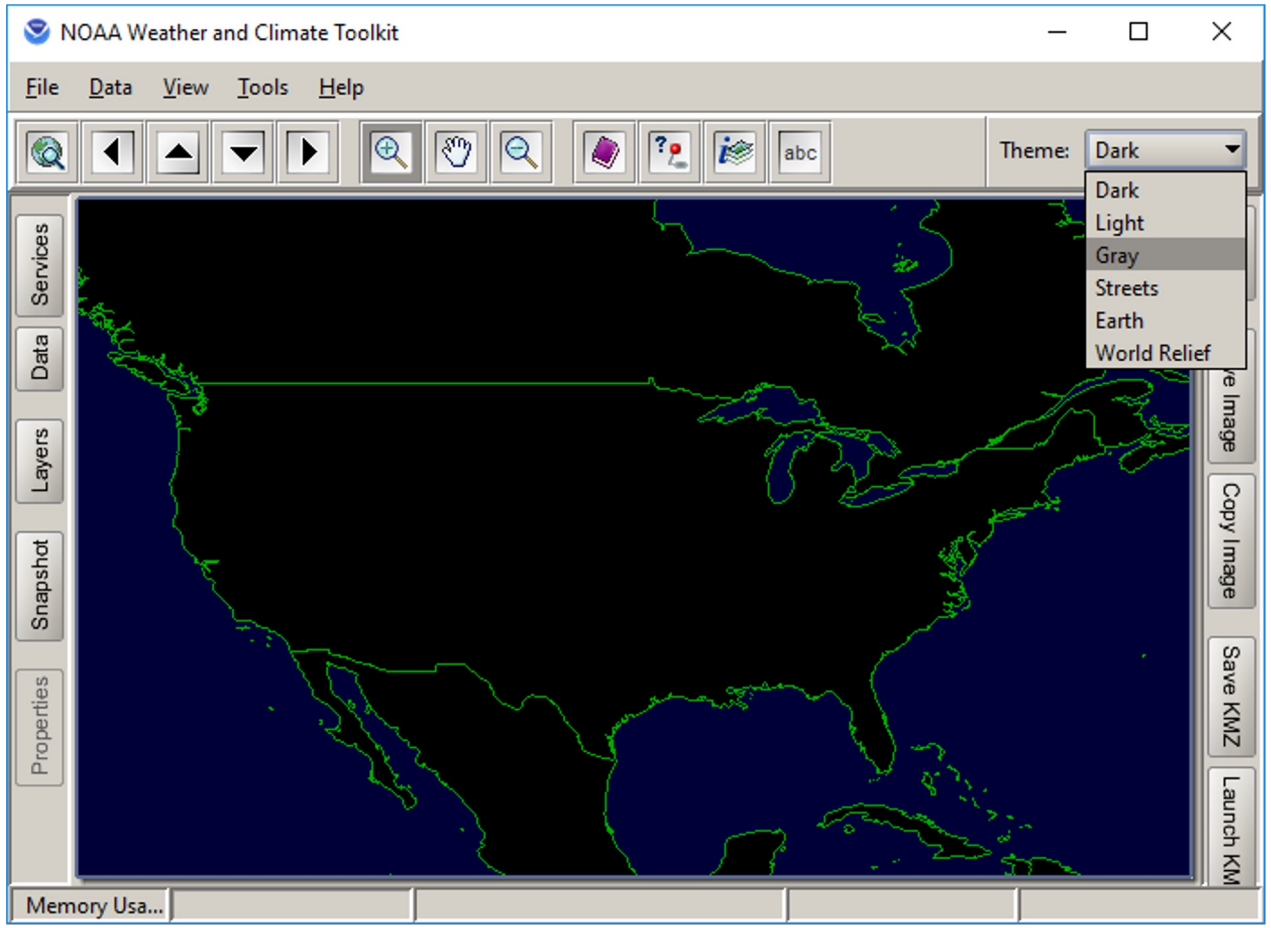


Simple Time Saving Features:

2. Map Themes



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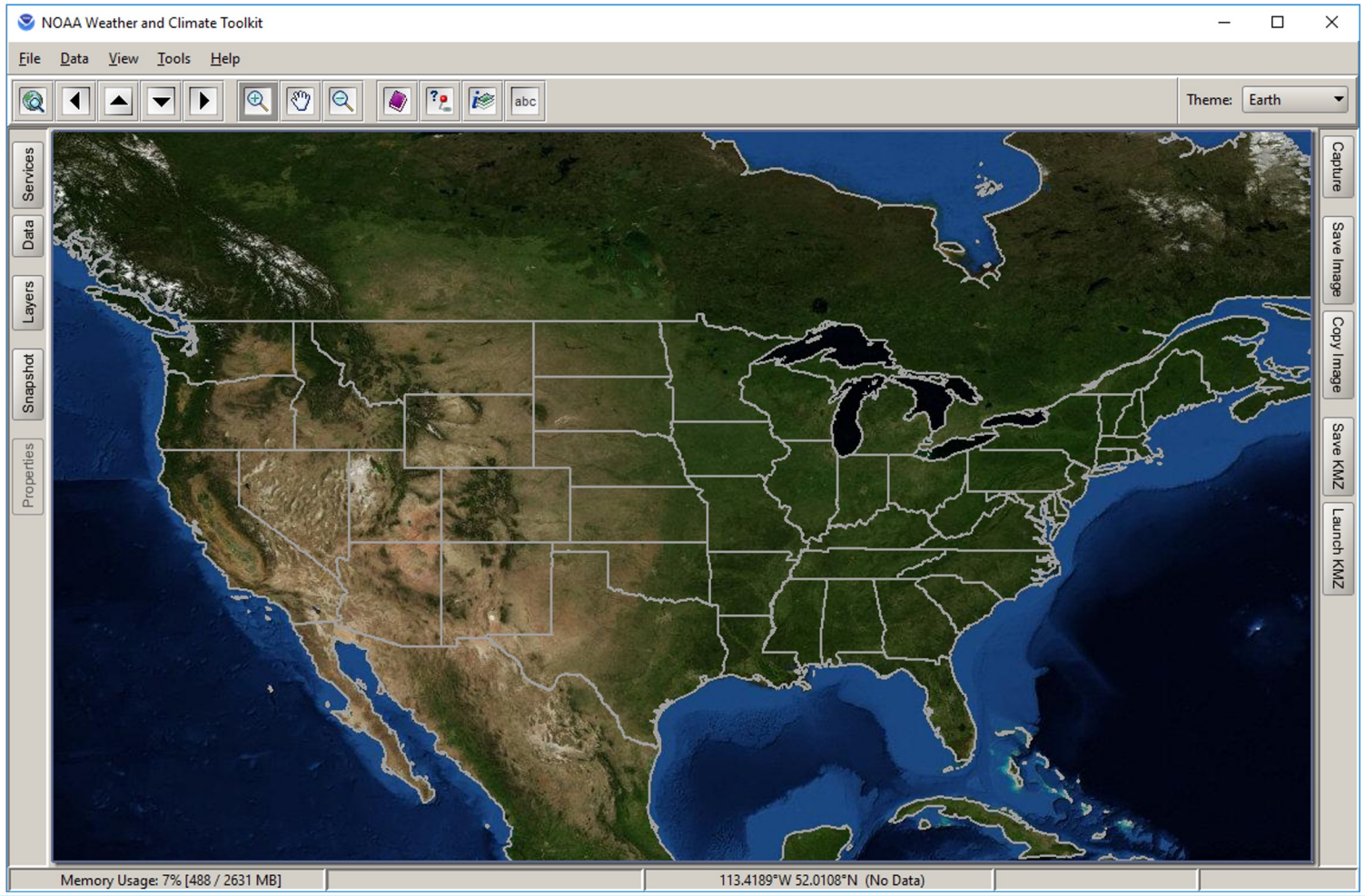

Animations:

1. A NetCDF file with a time dimension

2. A series of GRIB files

1. A series of map ‘screen captures’

2. NEXRAD files from Hurricane Ian

3. Comparing Hurricane Ian and Charley

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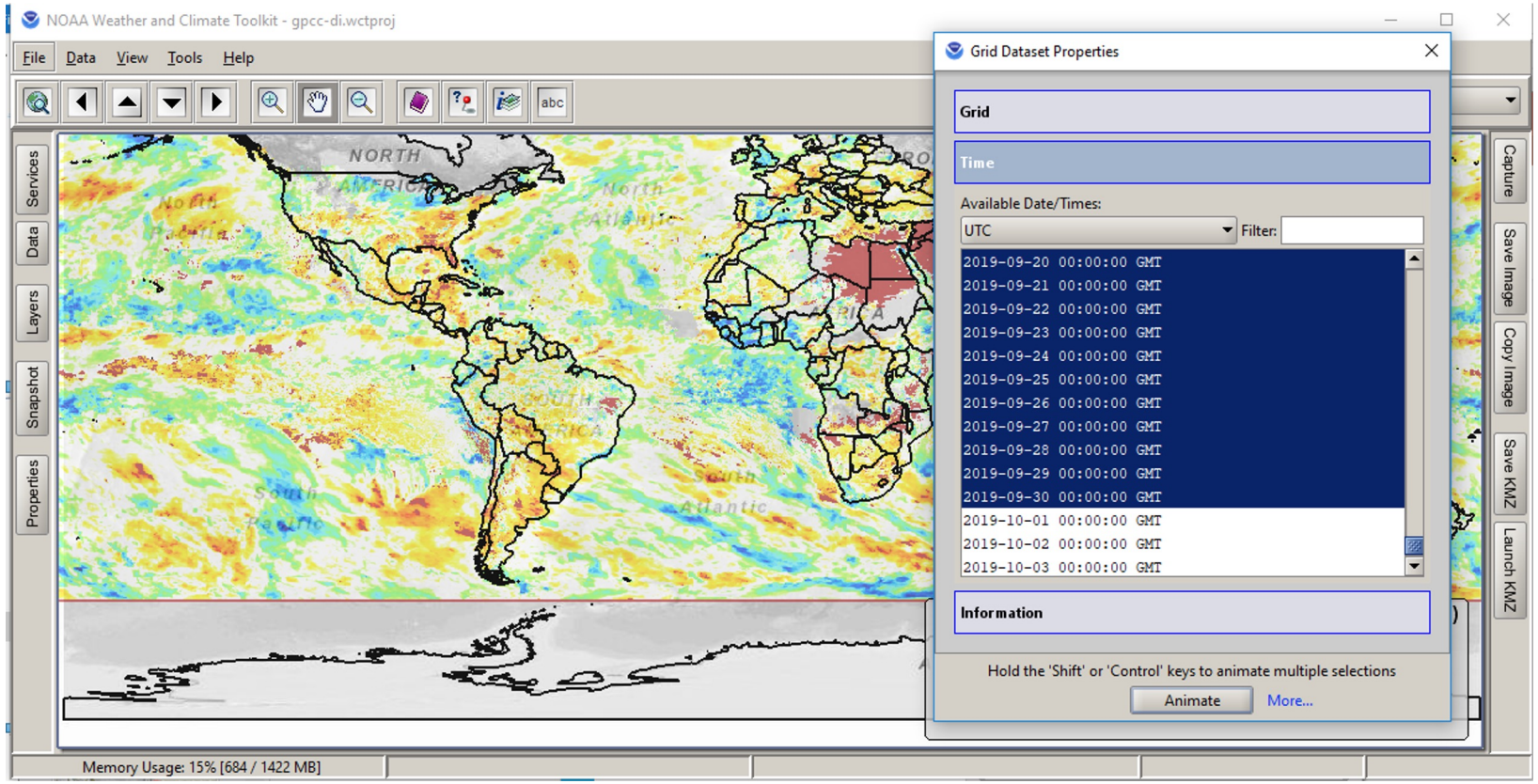

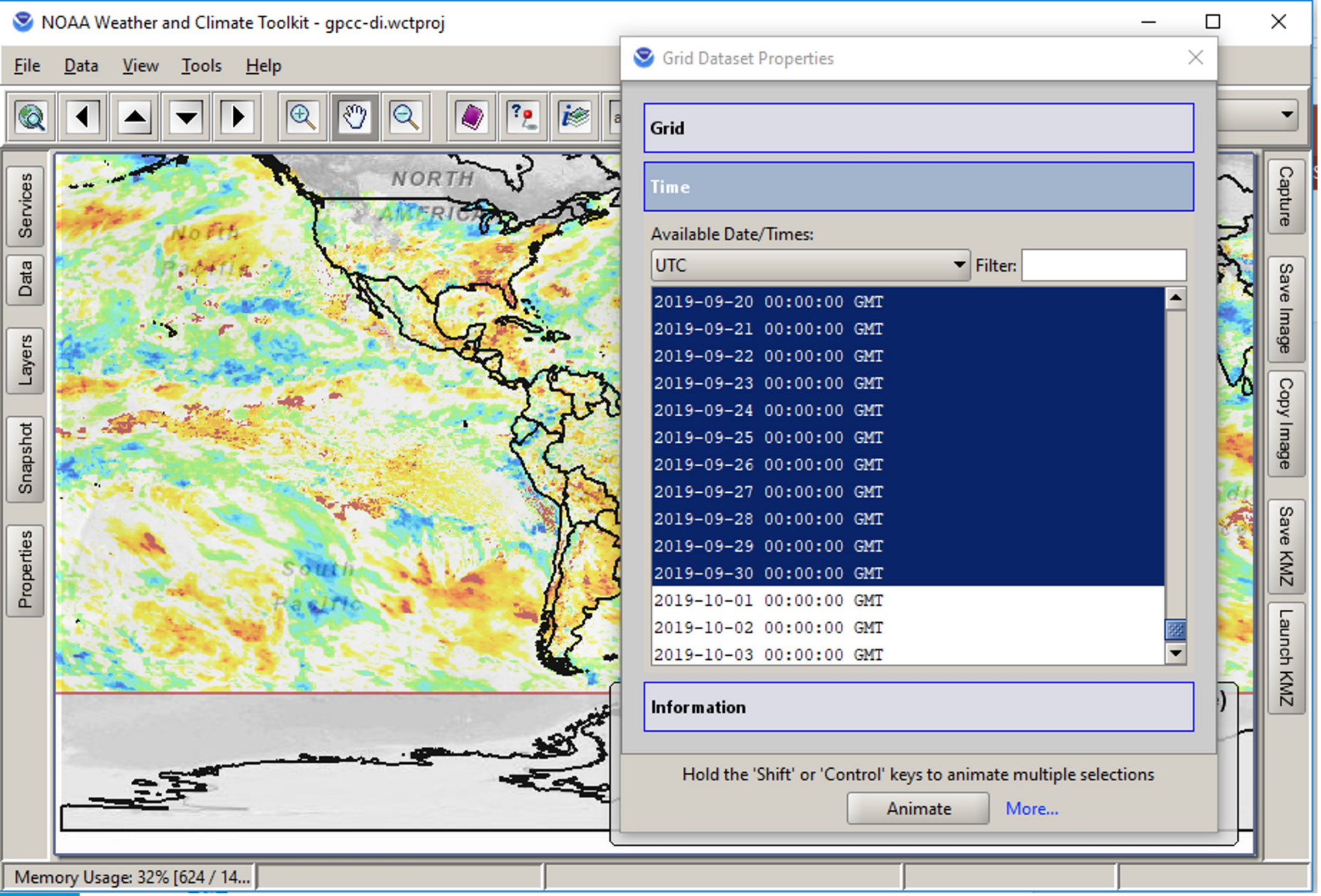
NOAA Weather and Climate Toolkit - gpcc-di.wctproj
File
Data
View
Tools
Help
Services
Data
Layers
Snapshot
Properties
Capture
Save Image
Copy Image
Save KMZ
Launch KMZ
Grid Dataset Properties
Grid
Time
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UTC
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2019-10-03 00:00:00 GMT
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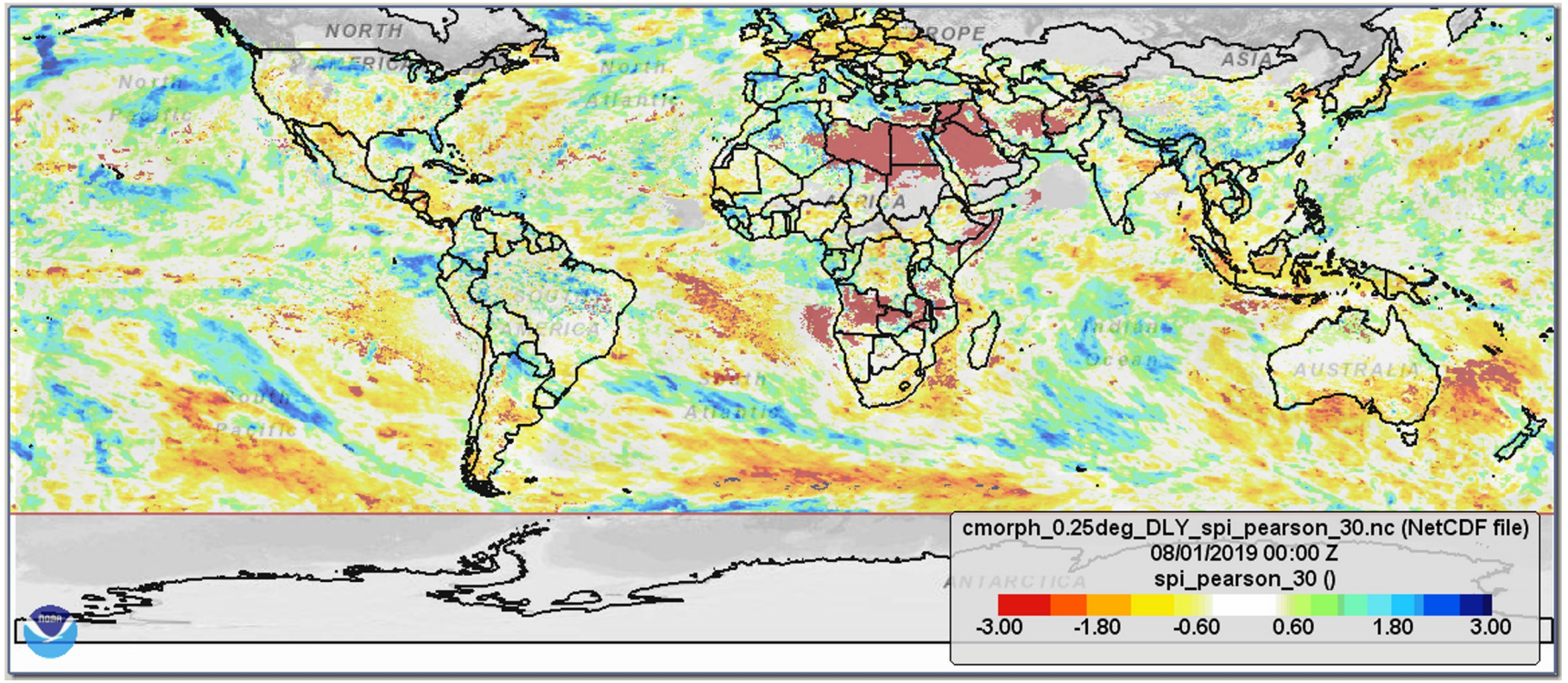
Animate
More...
Memory Usage: 32% [624 / 14...

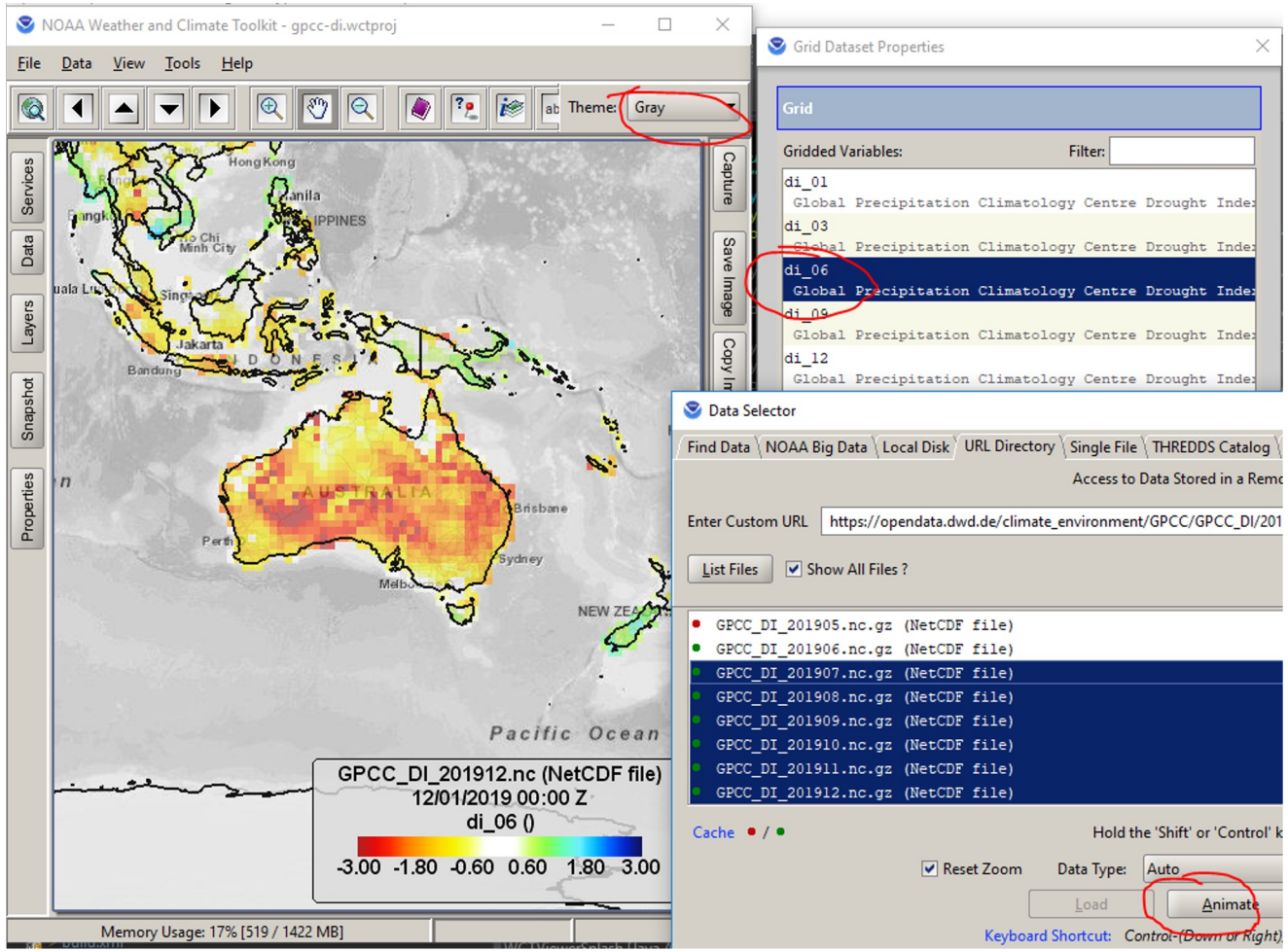
Animations:

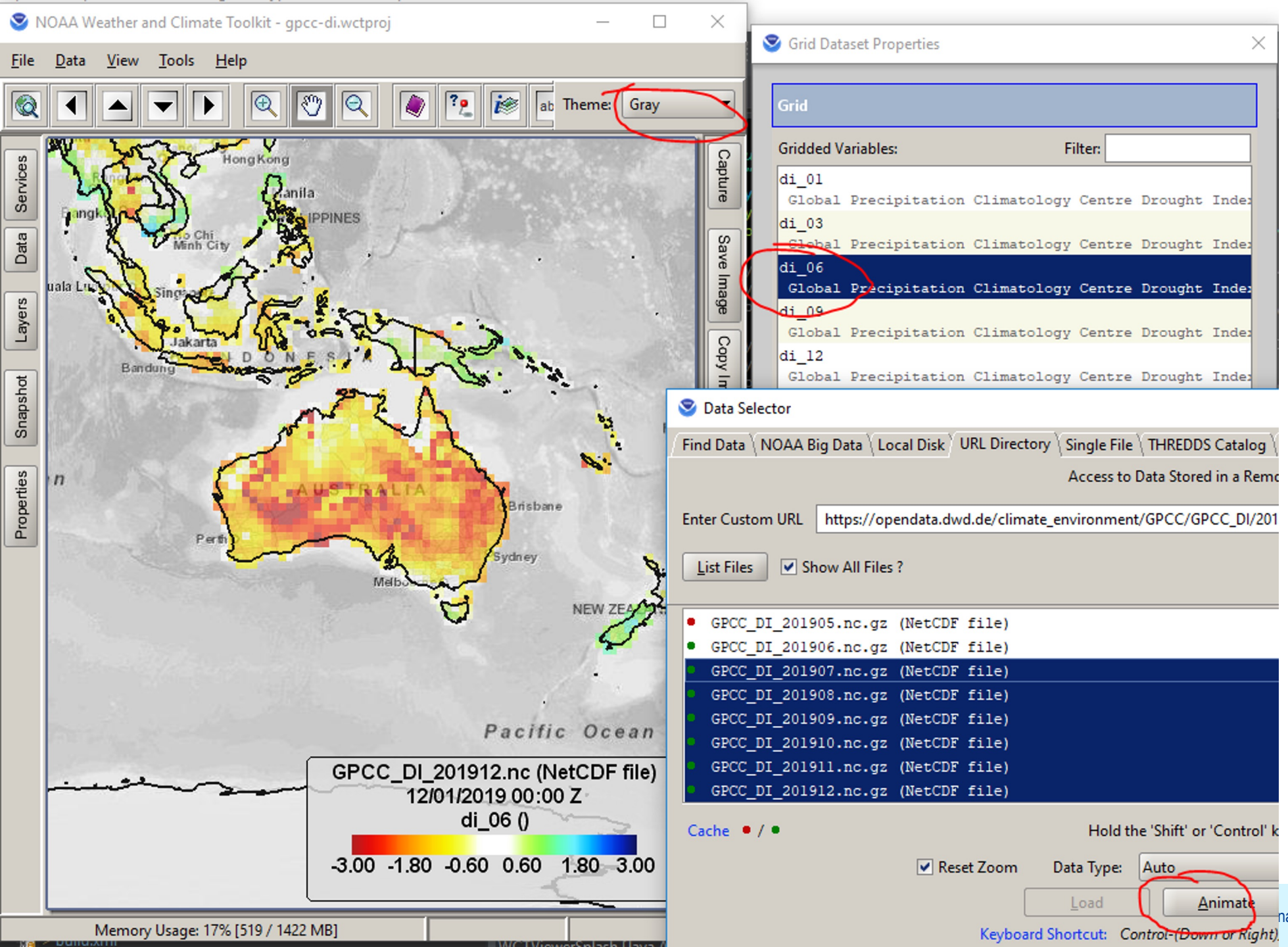
1. A NetCDF file with a time dimension



Animations:

2. A series of GRIB files




NOAA Weather and Climate Toolkit - gpcc-di.wctproj
File Data View Tools Help
Theme: Gray
Services
Data
Layers
Snapshot
Properties
Capture
Save Image
Hong Kong
Manila
Ho Chi Minh City
Singapore
Jakarta
Bandung
INDONESIA
AUSTRALIA
Perth
Brisbane
Sydney
Melbourne
NEW ZEALAND
Pacific Ocean
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Grid Dataset Properties
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Global Precipitation Climatology Centre Drought Index
di_03
Global Precipitation Climatology Centre Drought Index
di_06
Global Precipitation Climatology Centre Drought Index
di_09
Global Precipitation Climatology Centre Drought Index
di_12
Global Precipitation Climatology Centre Drought Index

Data Selector
Find Data
NOAA Big Data
Local Disk
URL Directory
Single File
THREDDS Catalog
Access to Data Stored in a Remo
Enter Custom URL
https://opendata.dwd.de/climate_environment/GPCC/GPCC_DI/201
List Files
Show All Files ?
GPCC_DI_201905.nc.gz (NetCDF file)
GPCC_DI_201906.nc.gz (NetCDF file)
GPCC_DI_201907.nc.gz (NetCDF file)
GPCC_DI_201908.nc.gz (NetCDF file)
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GPCC_DI_201910.nc.gz (NetCDF file)
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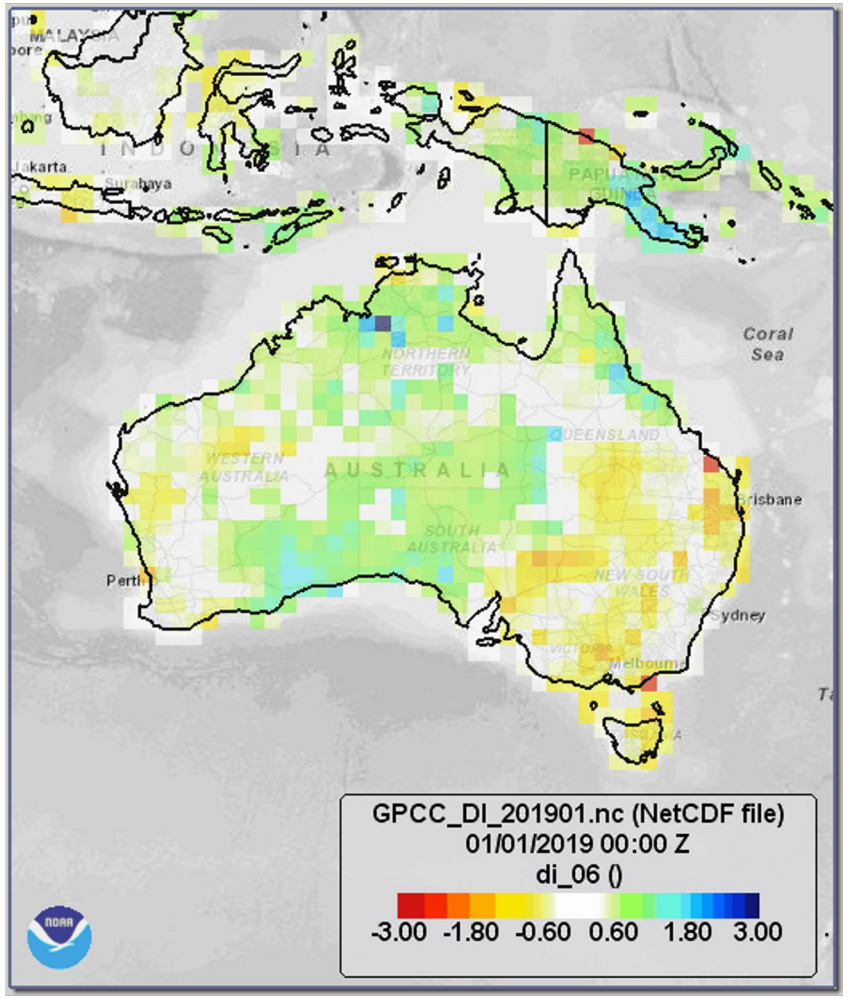
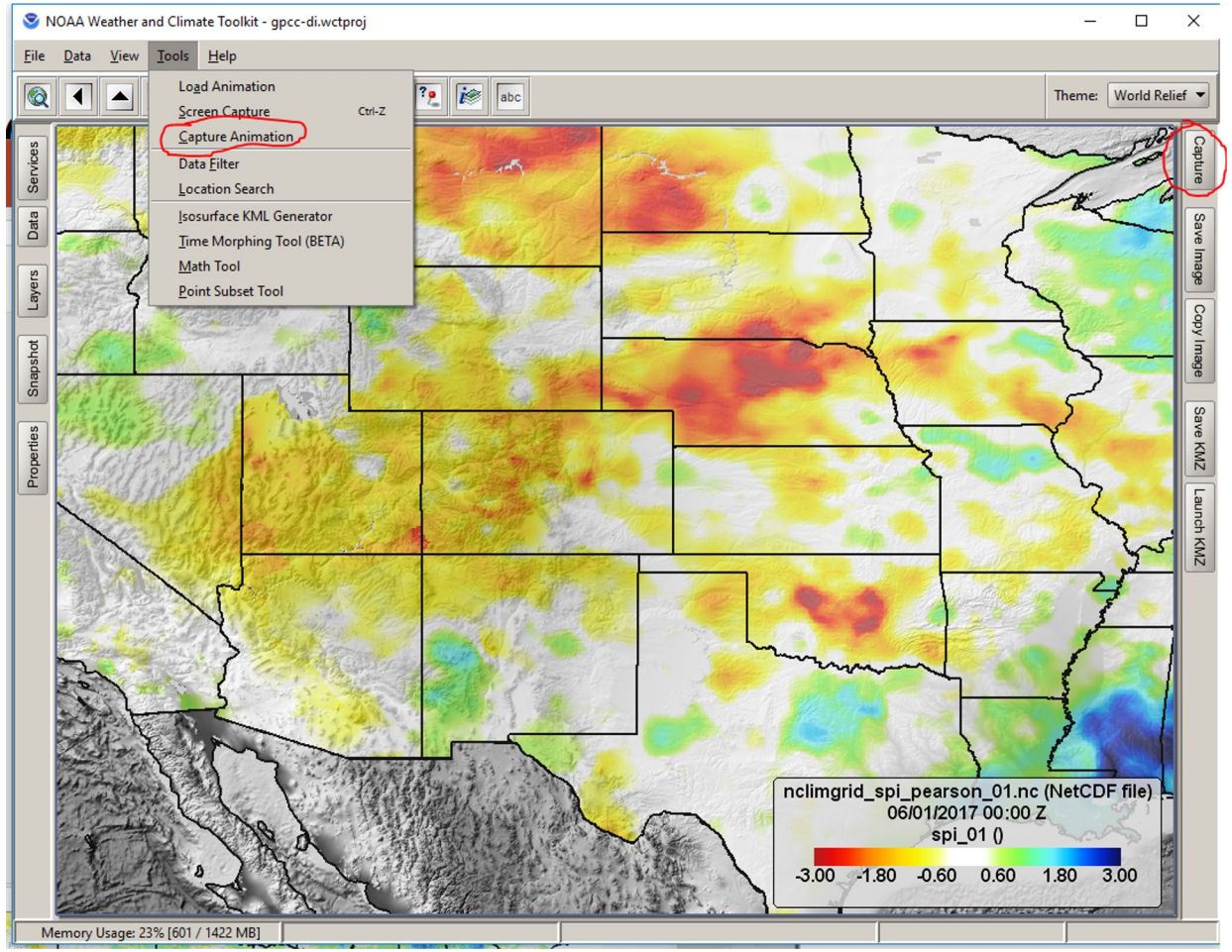
Animations:

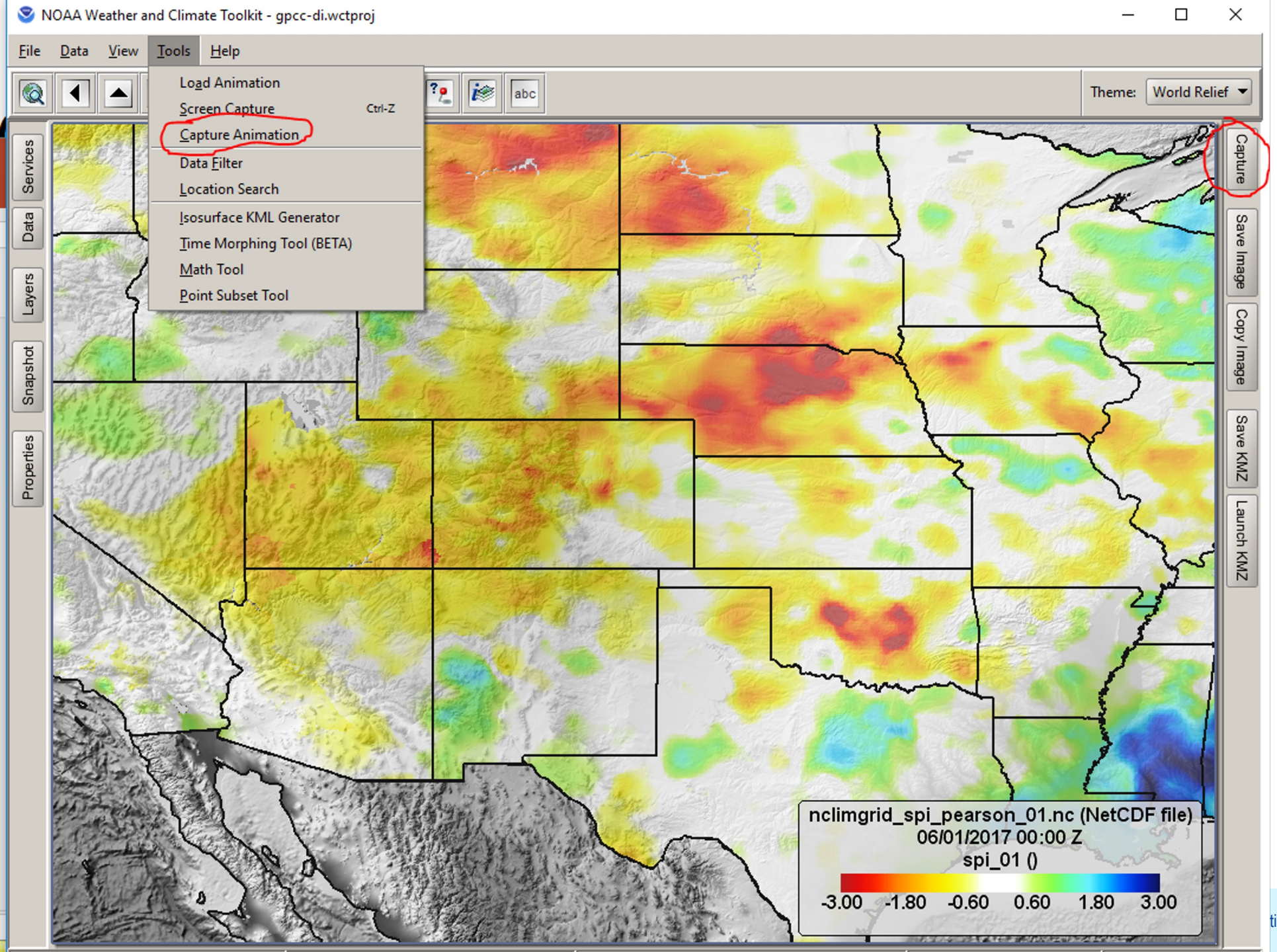
2. A series of GRIB files



Animations:

3. A series of map ‘screen captures’




NOAA Weather and Climate Toolkit - gpcc-di.wctproj
File
Data
View
Tools
Help
Load Animation
Screen Capture
Ctrl-Z
Capture Animation
Data Filter
Location Search
Isosurface KML Generator
Time Morphing Tool (BETA)
Math Tool
Point Subset Tool
Theme:
World Relief
Services
Data
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Properties
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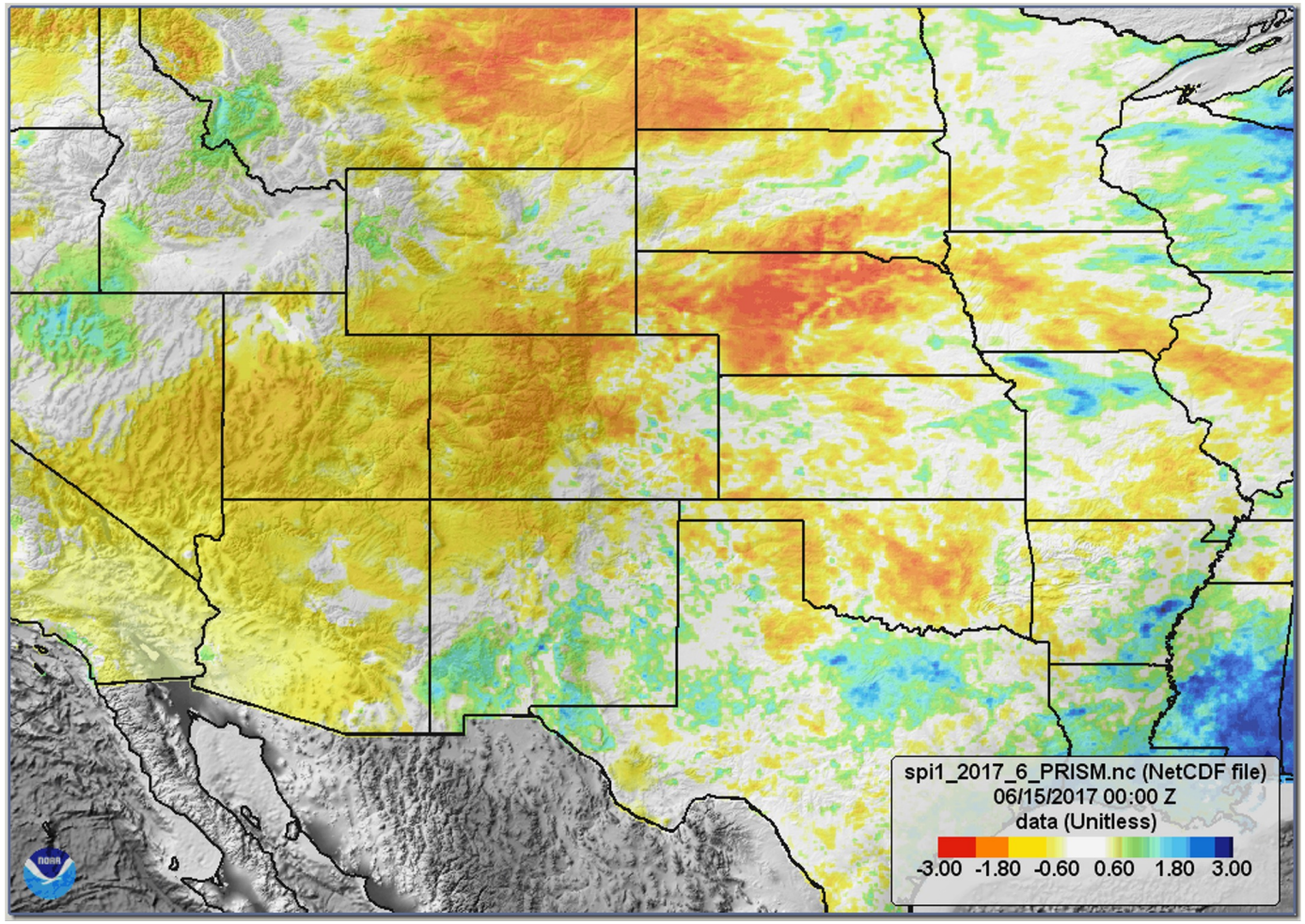
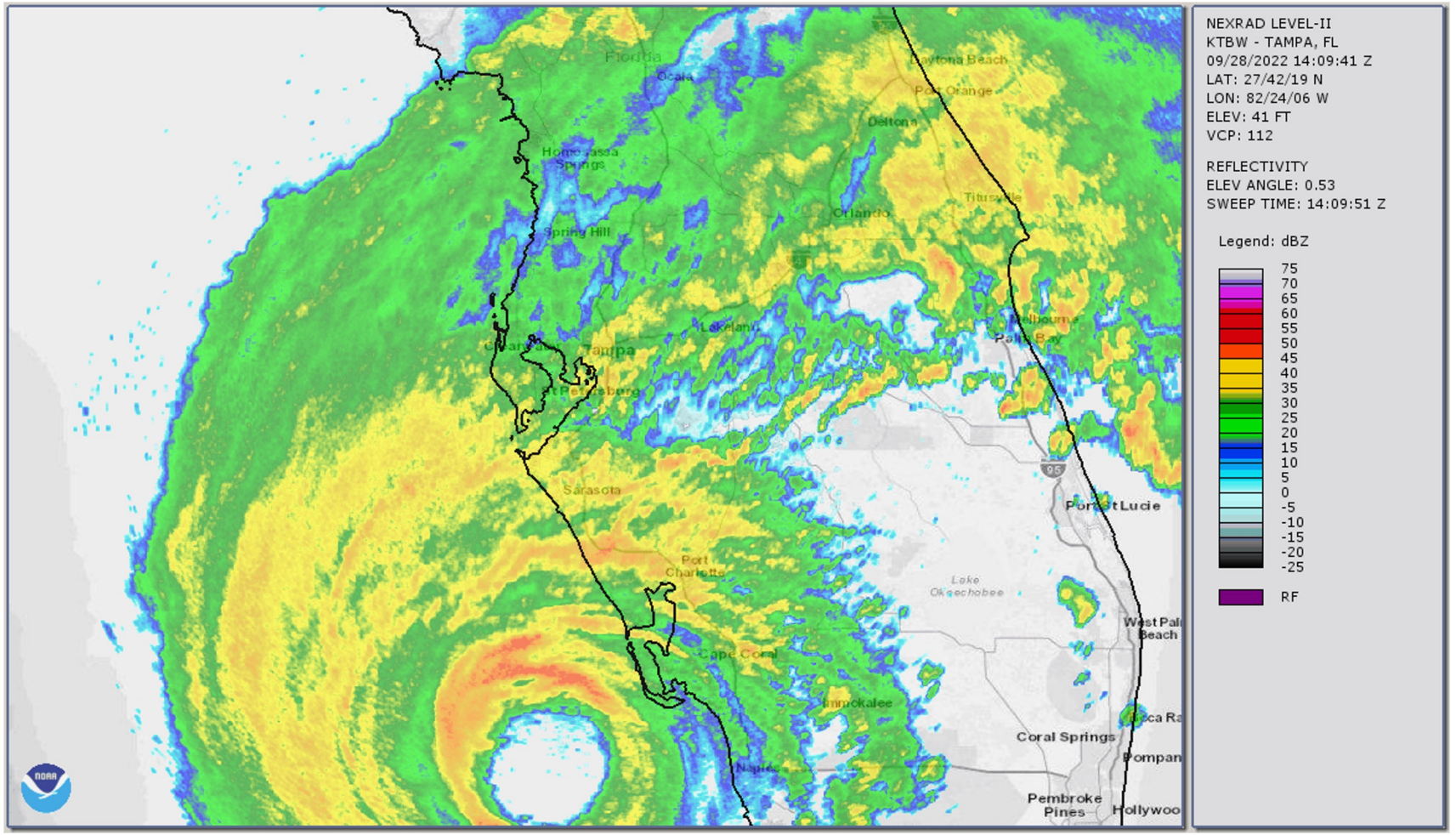


Animations:

4. NEXRAD Radar from Hurricane Ian



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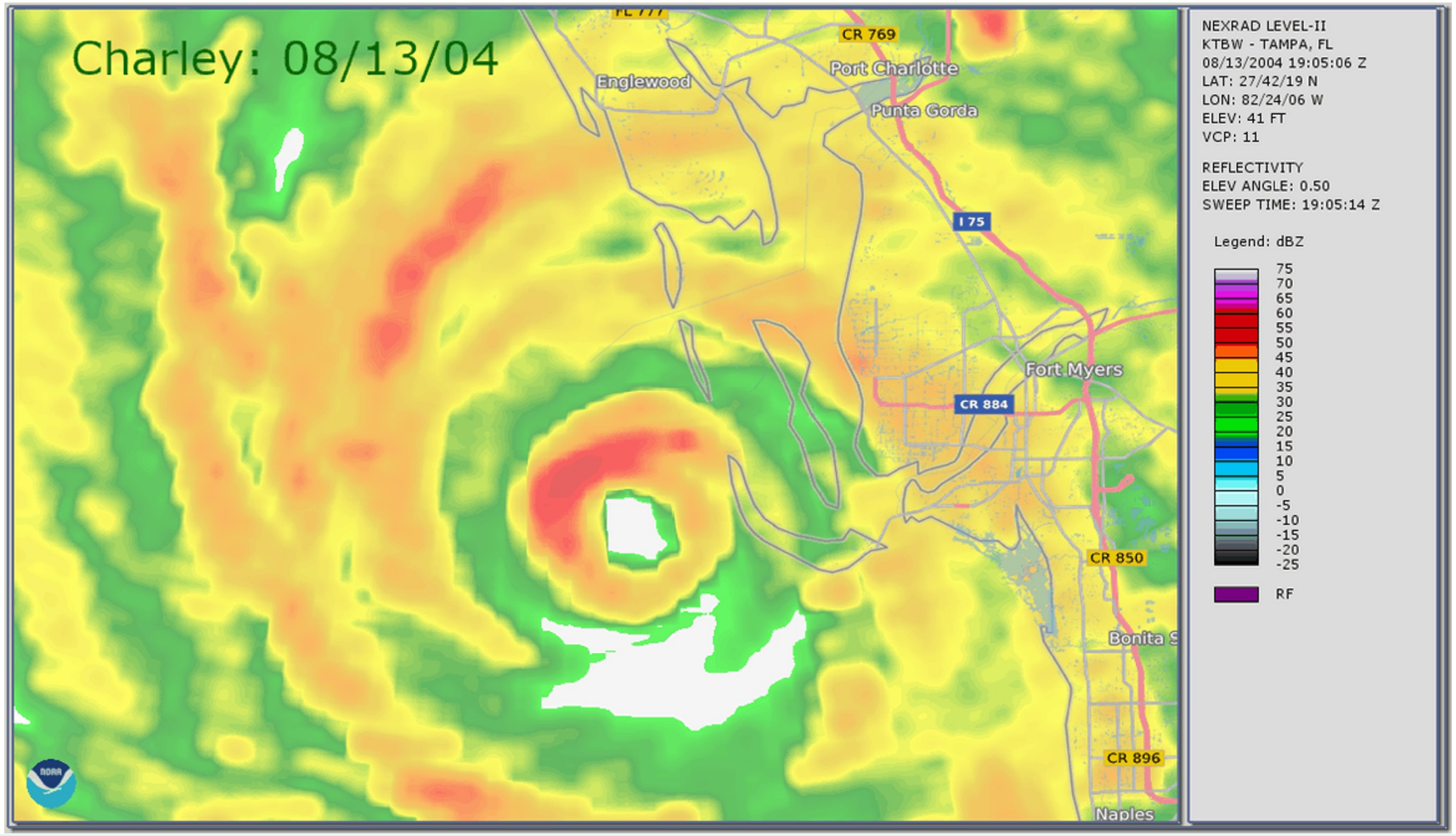


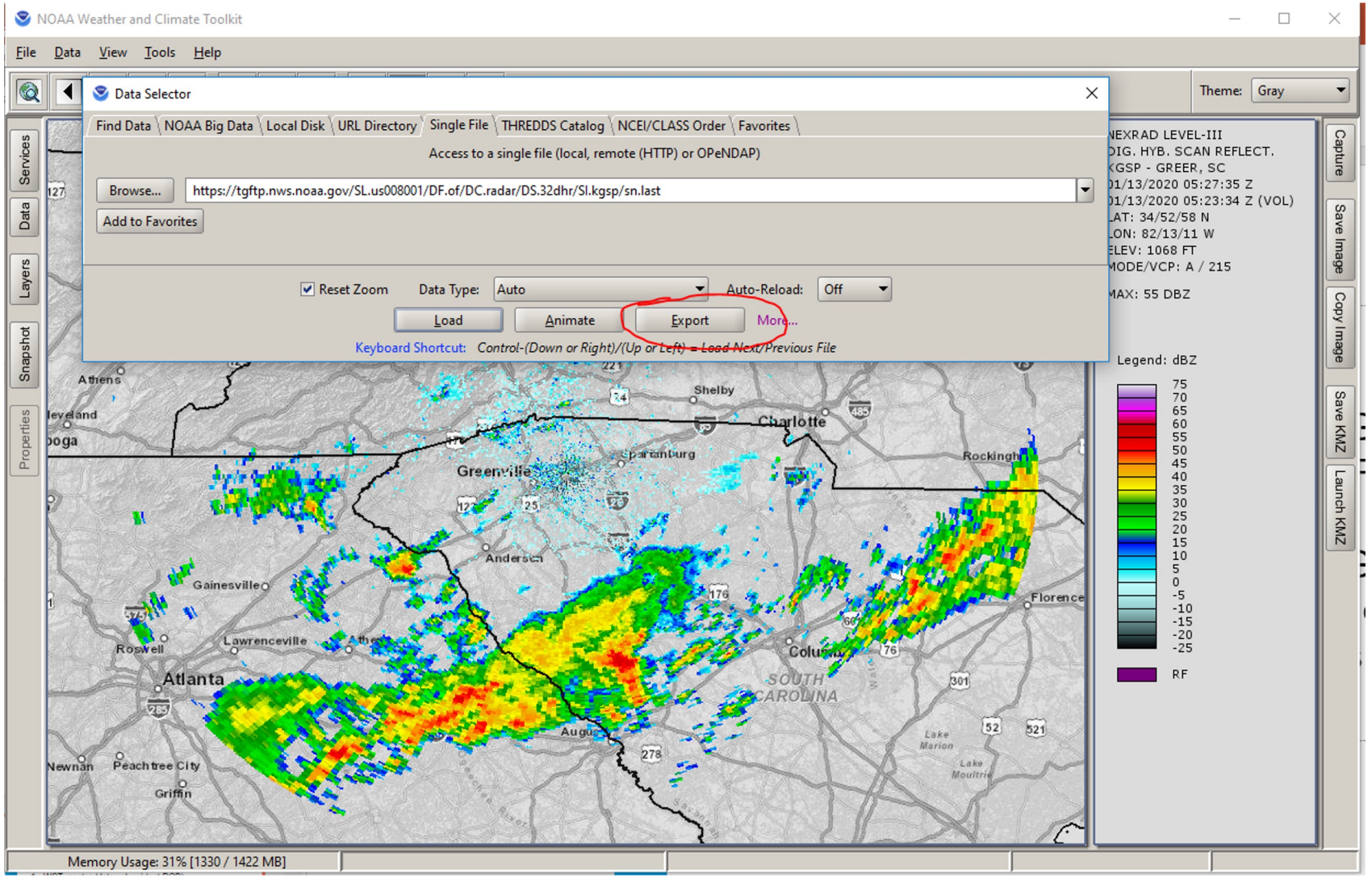
Interoperability with GIS tools:

The WCT converts NOAA data into common formats, such as Shapefile, JSON, CSV, NetCDF, GeoTIFF and more.

Use Cases:

1. Compare with census data in GIS tools
2. Upload data into ArcGIS Online for use in StoryMaps or online map viewers
3. Create map tiles for high-performance visualizations
4. Use the command-line WCT version to convert data to web-ready GeoJSON in an automated script running on the cloud.

Data Export: User Interface Workflow



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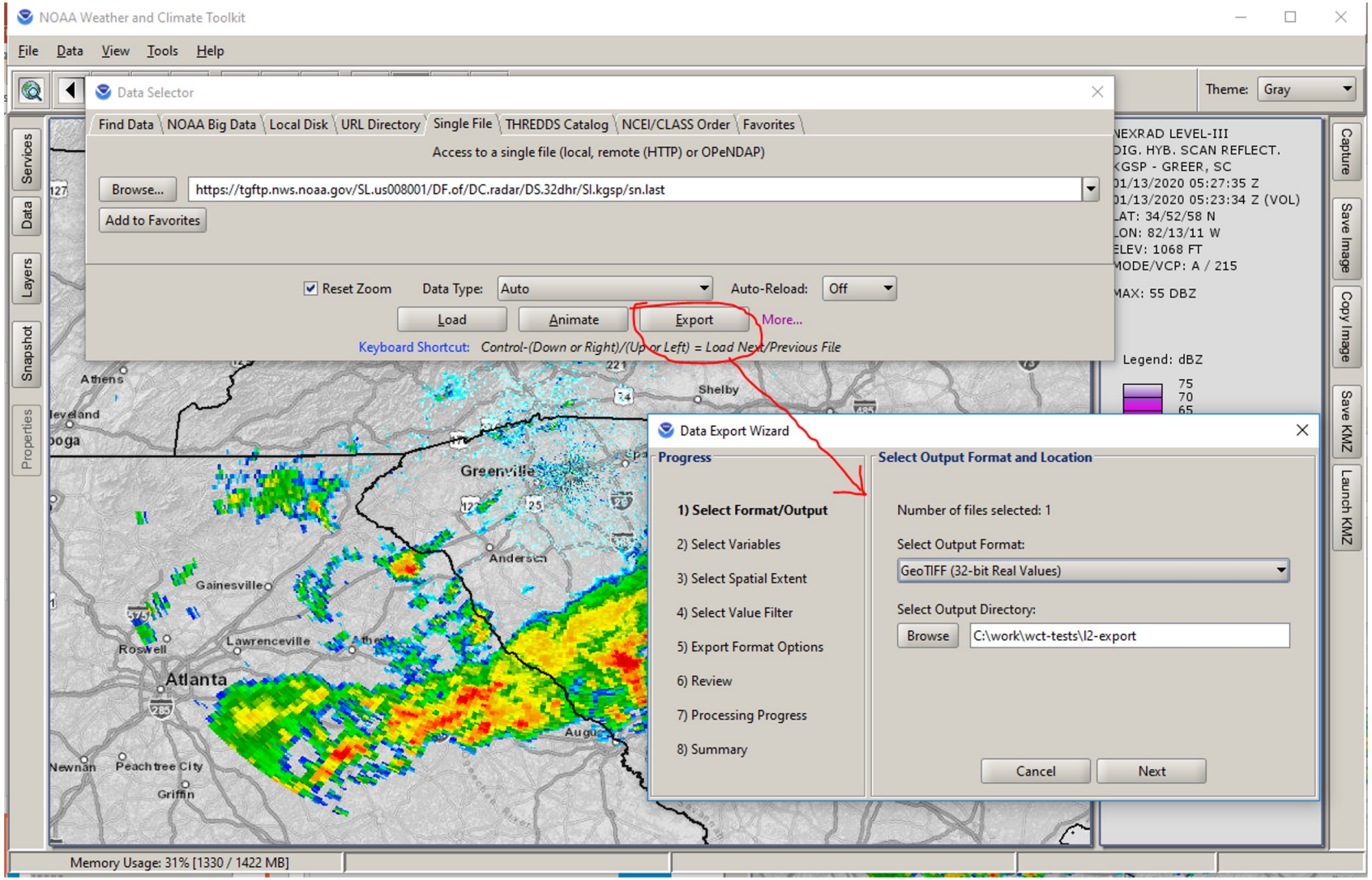

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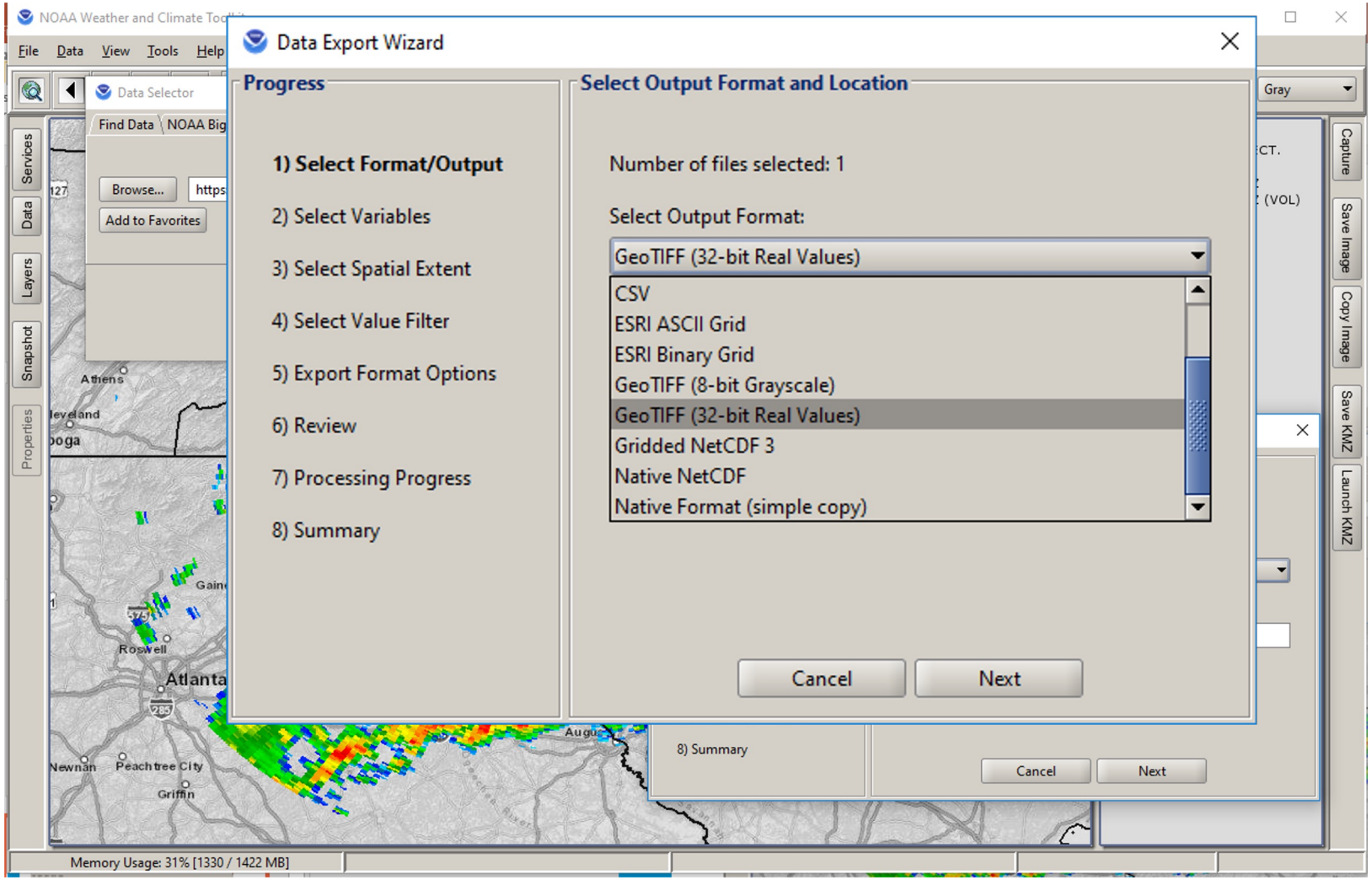
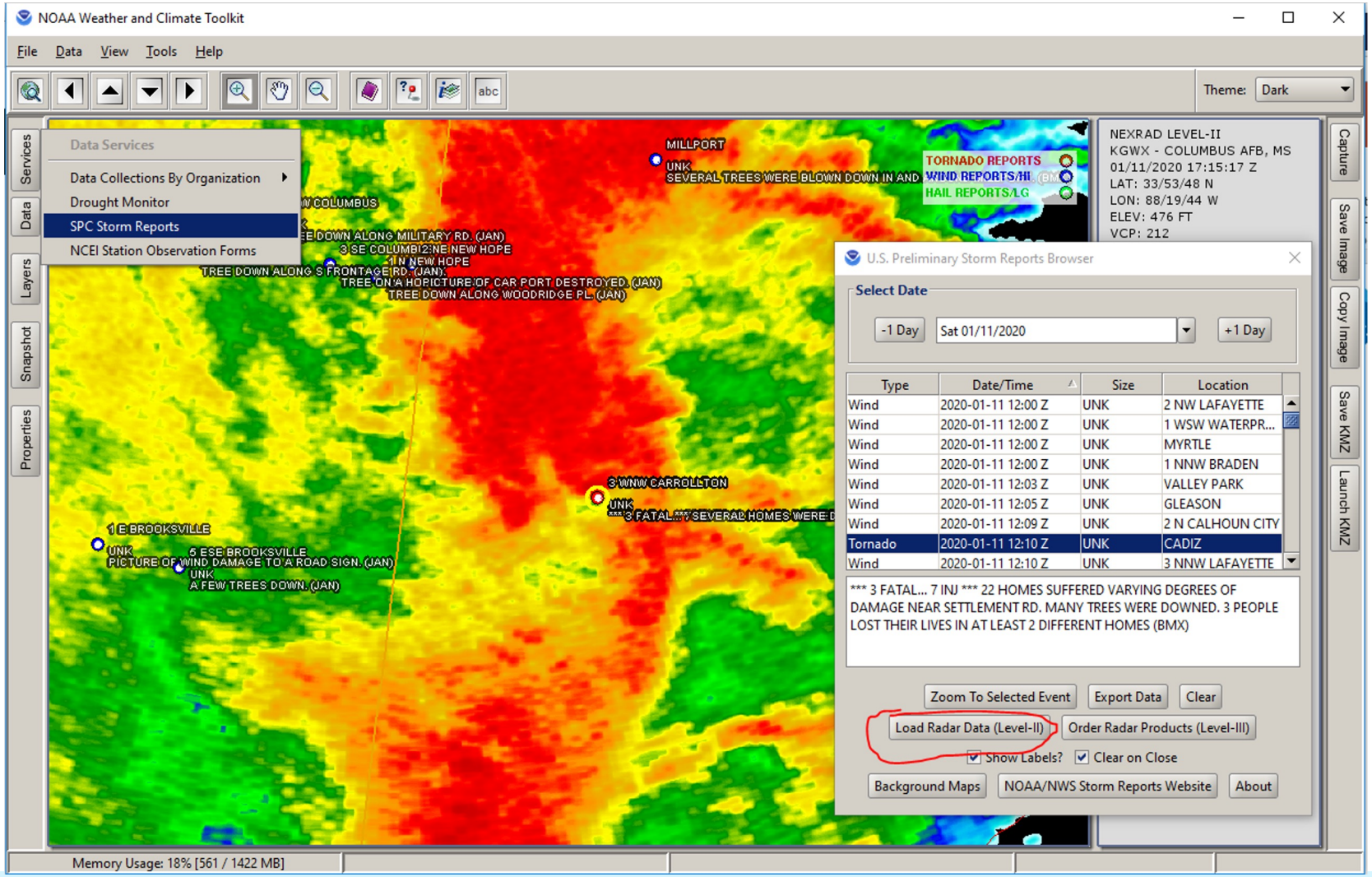


Data Visualization

Severe Weather in Google Earth



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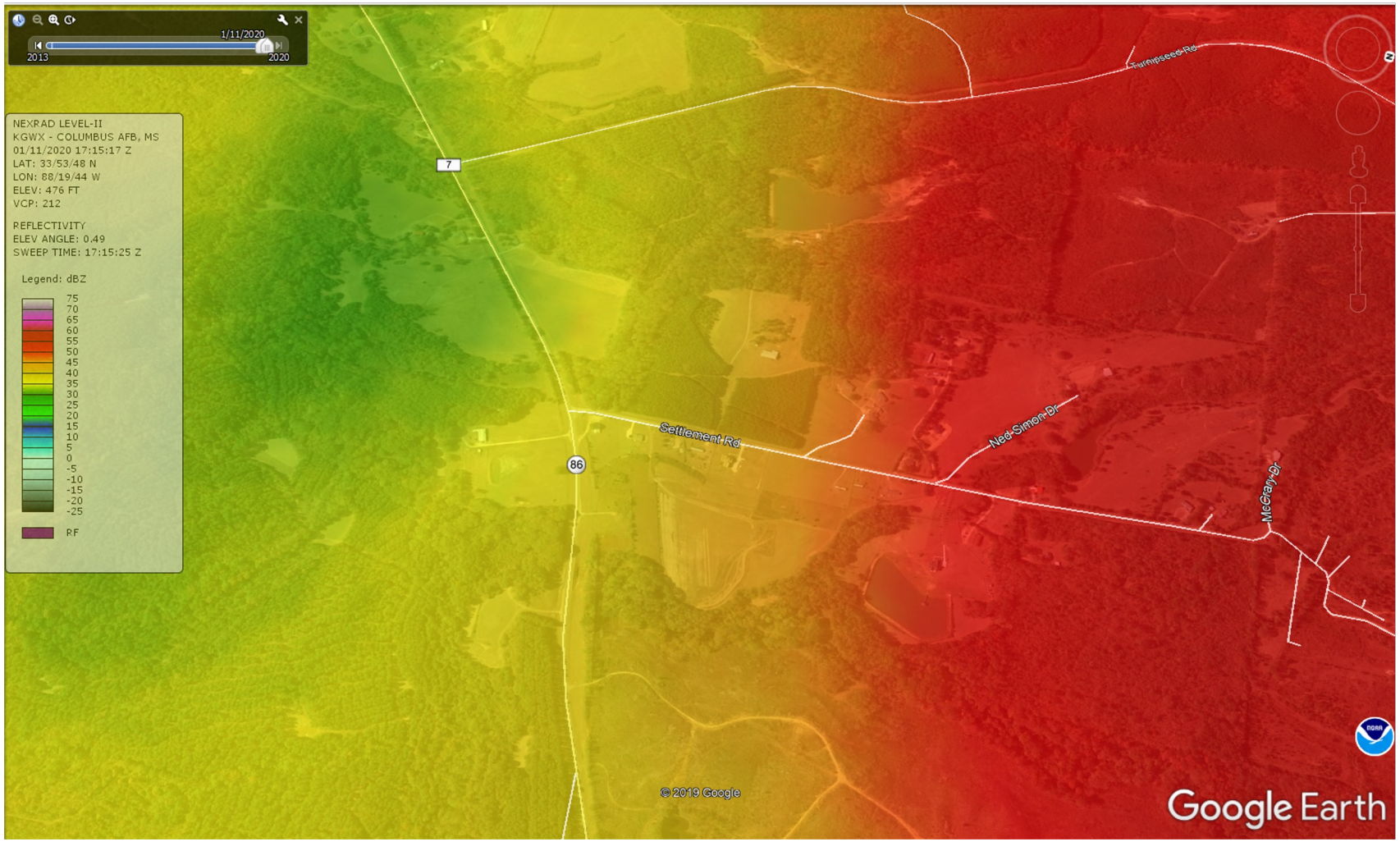

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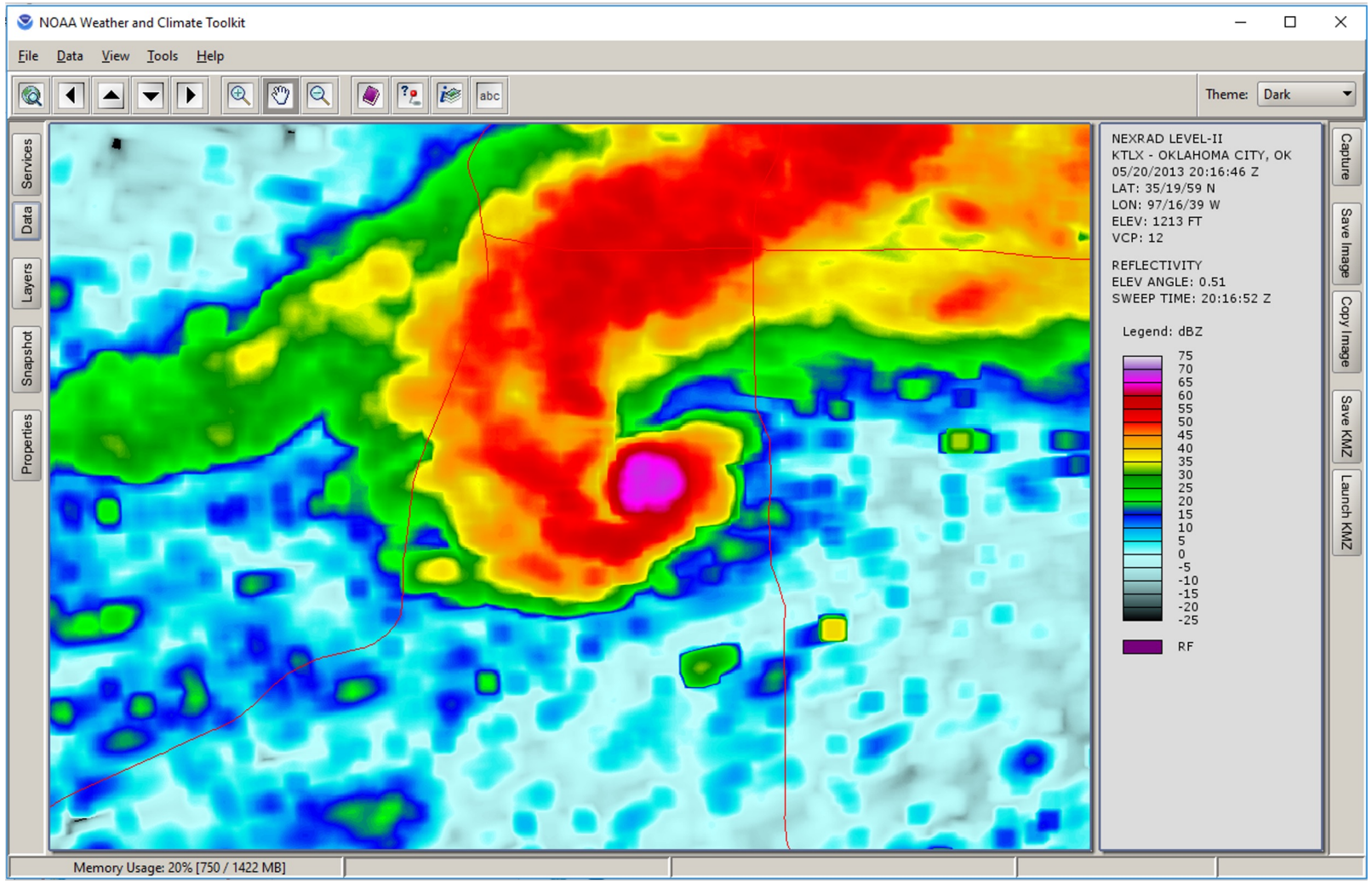

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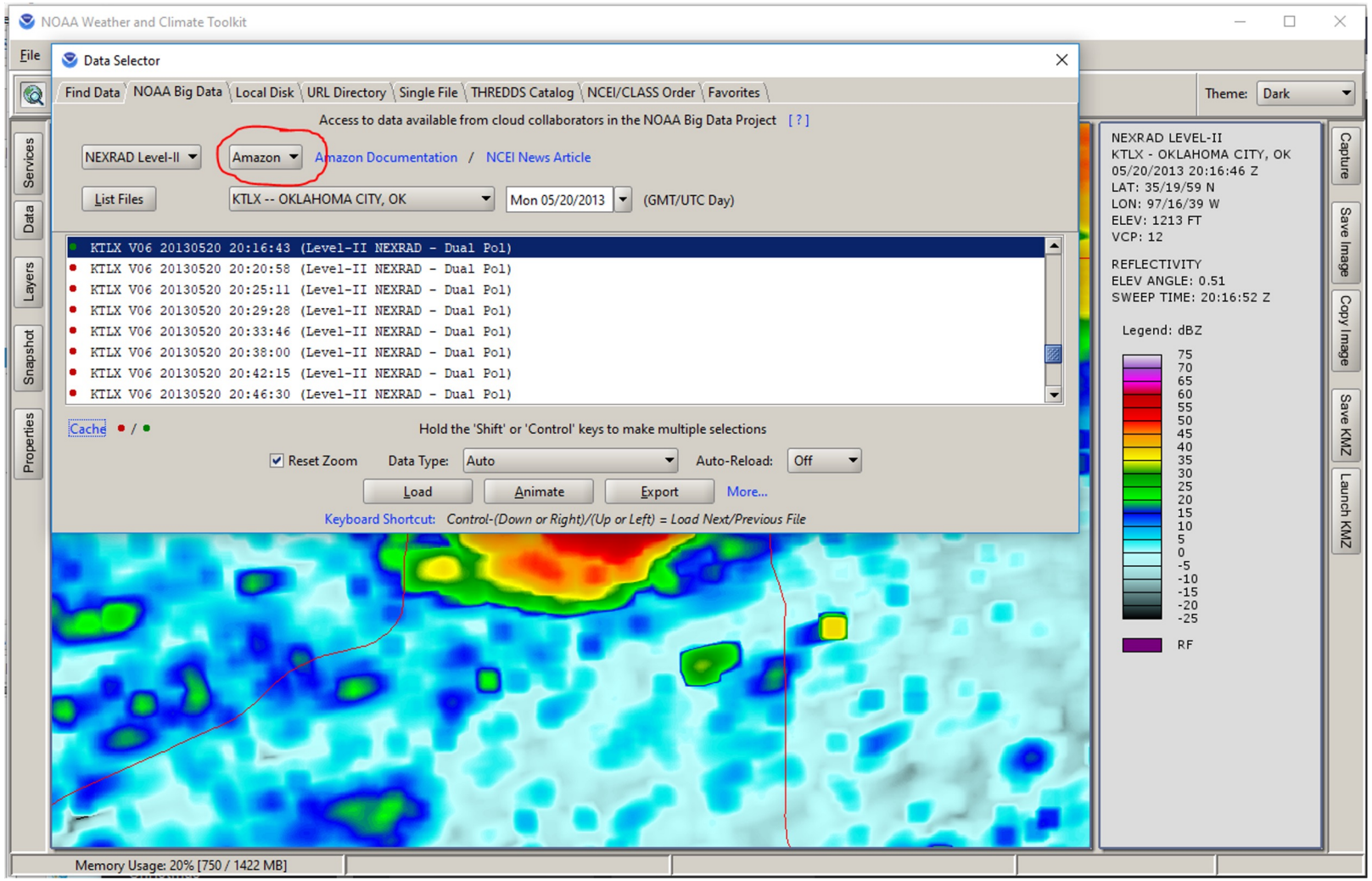

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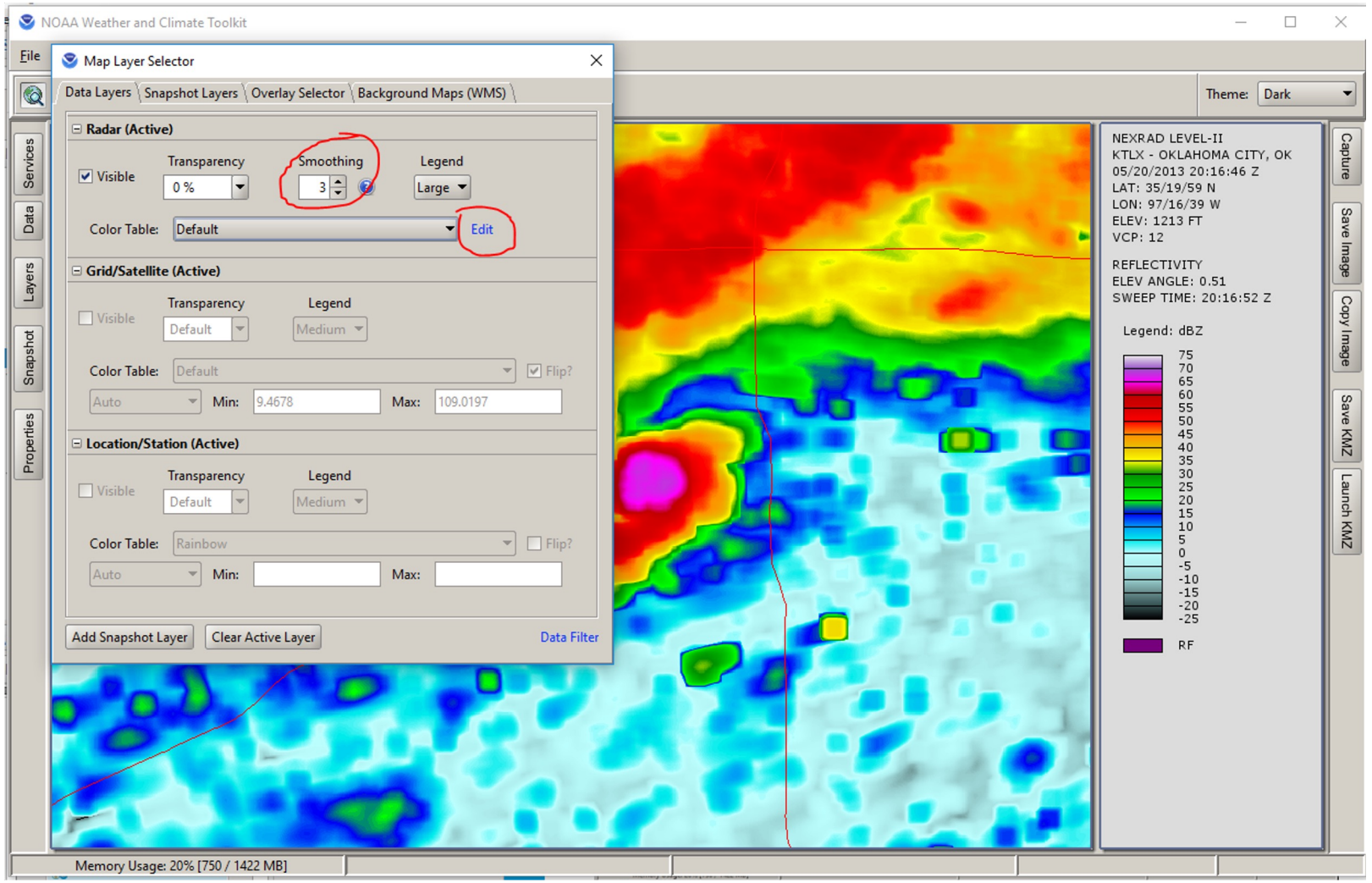

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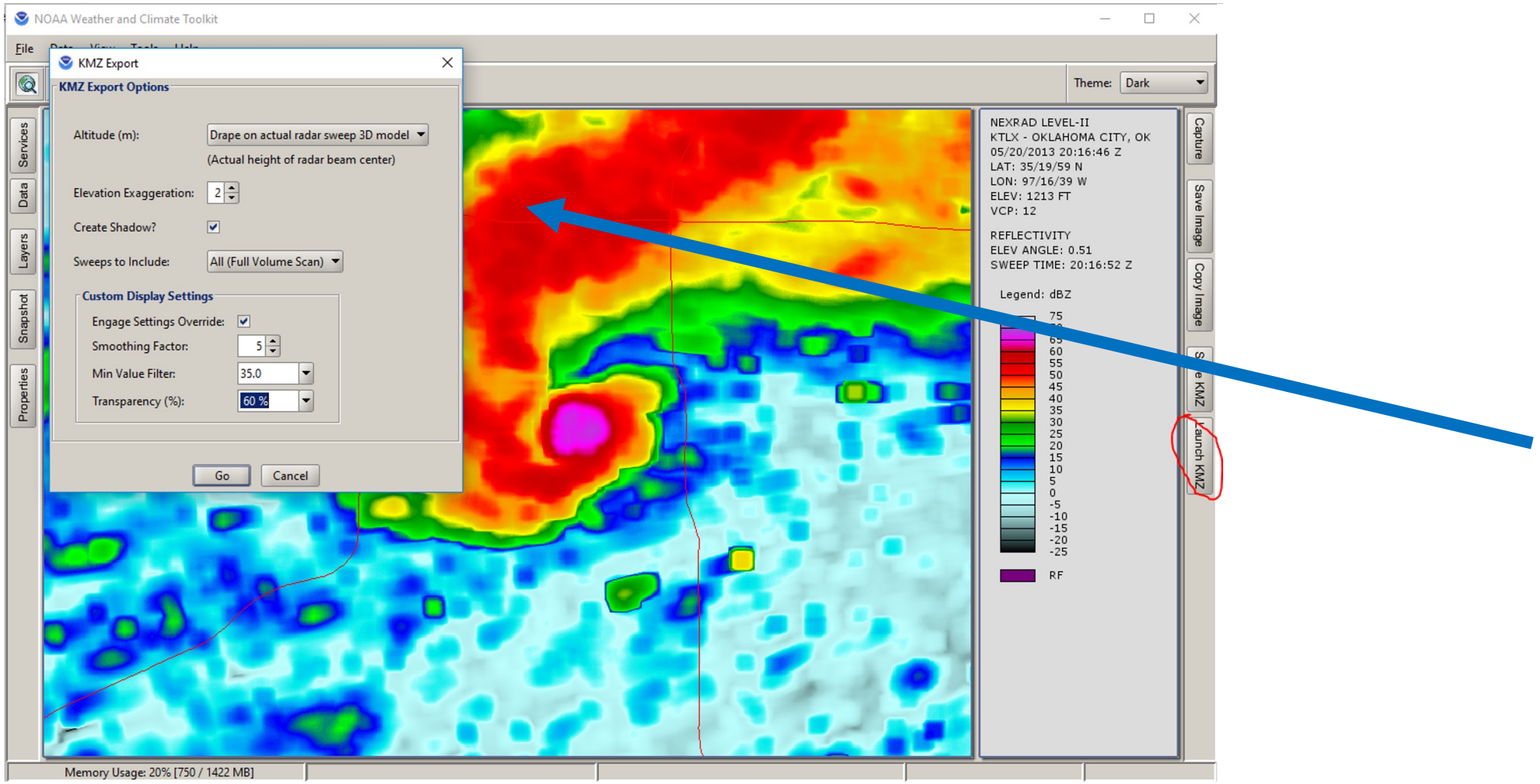

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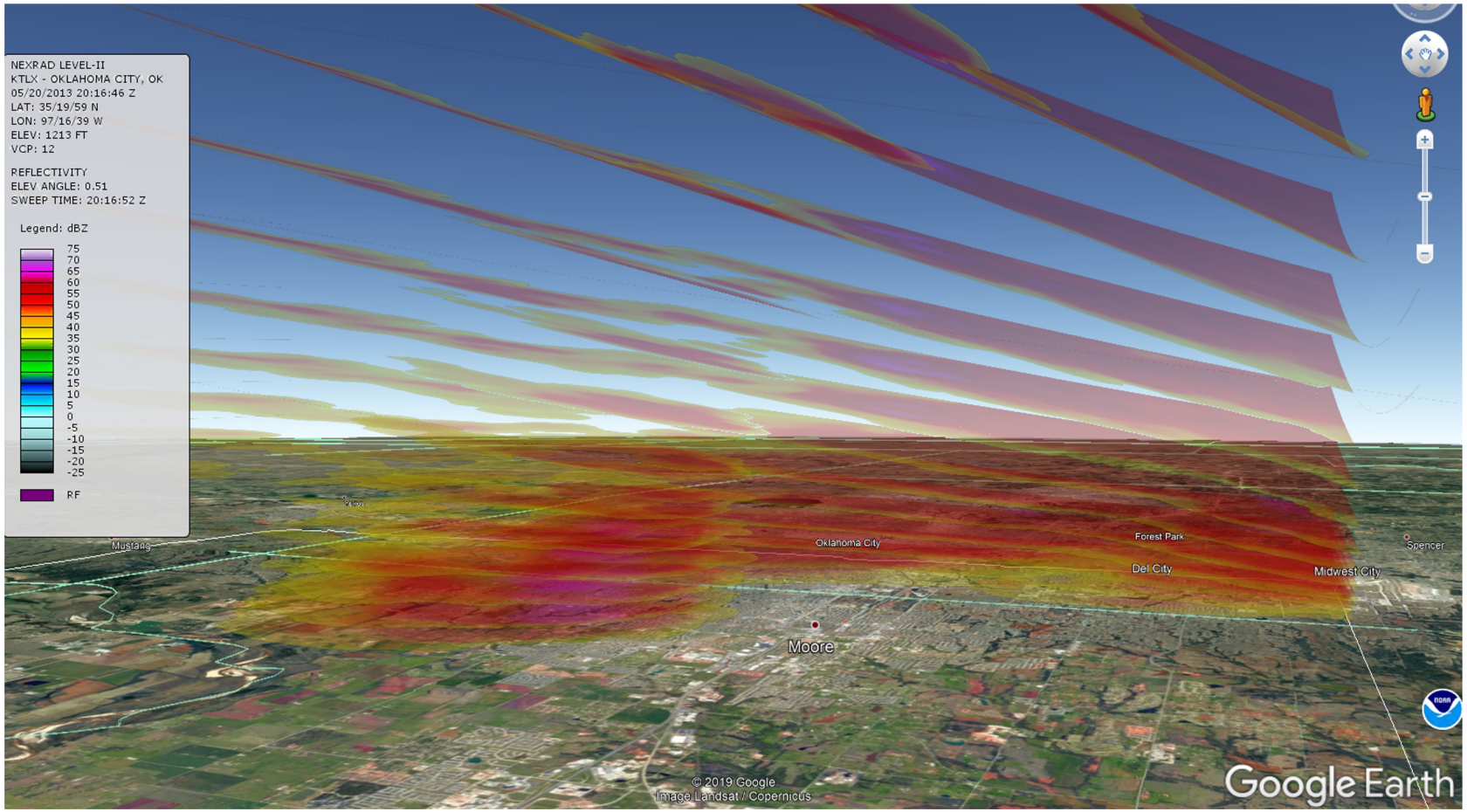

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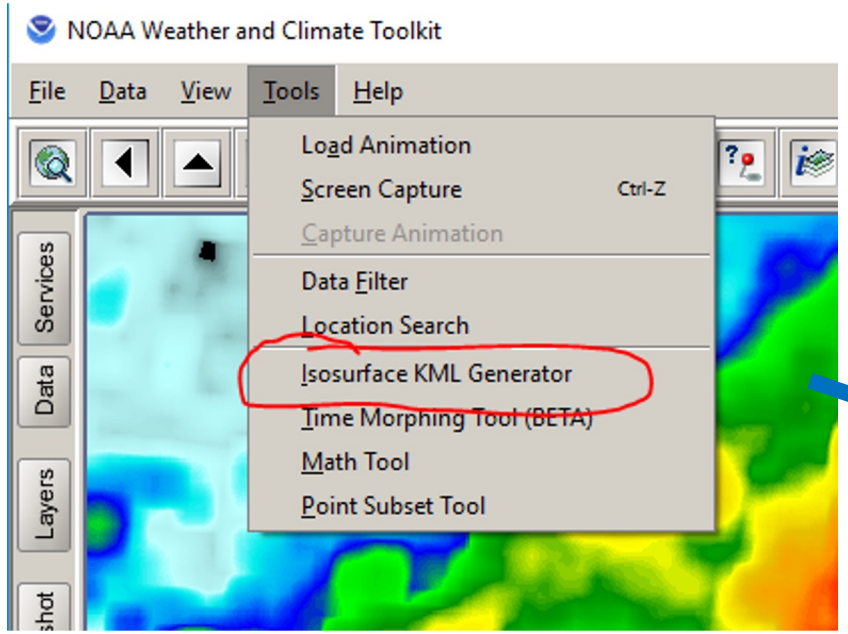

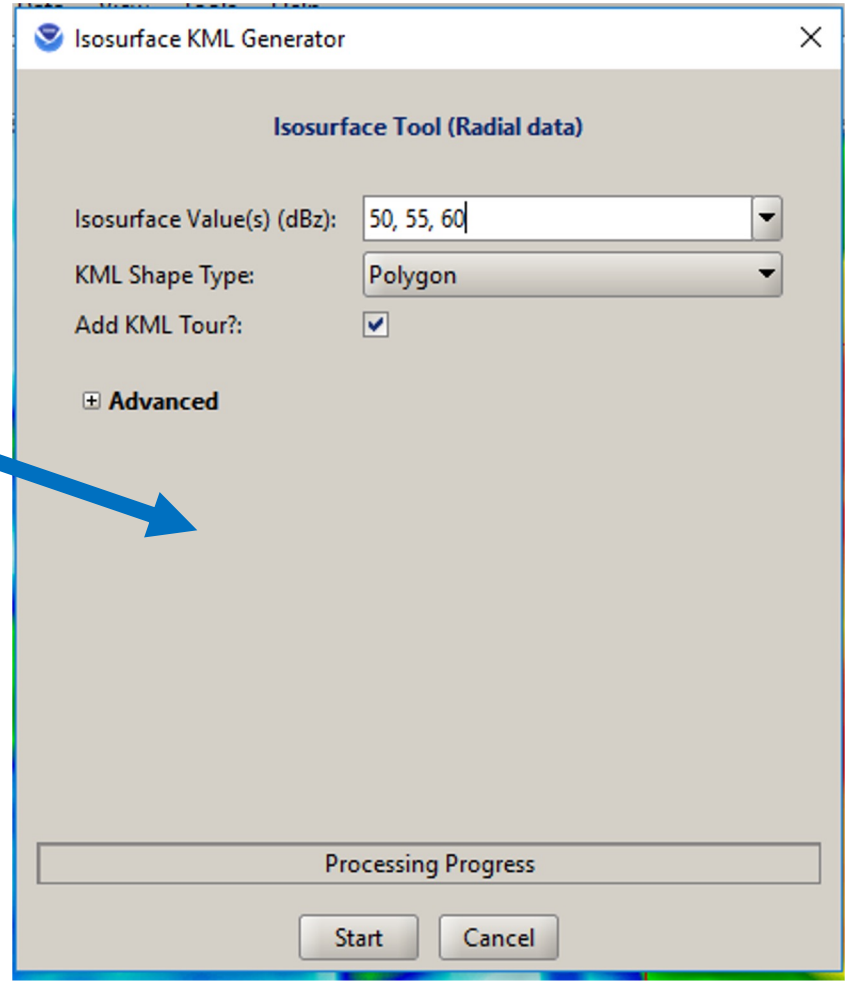

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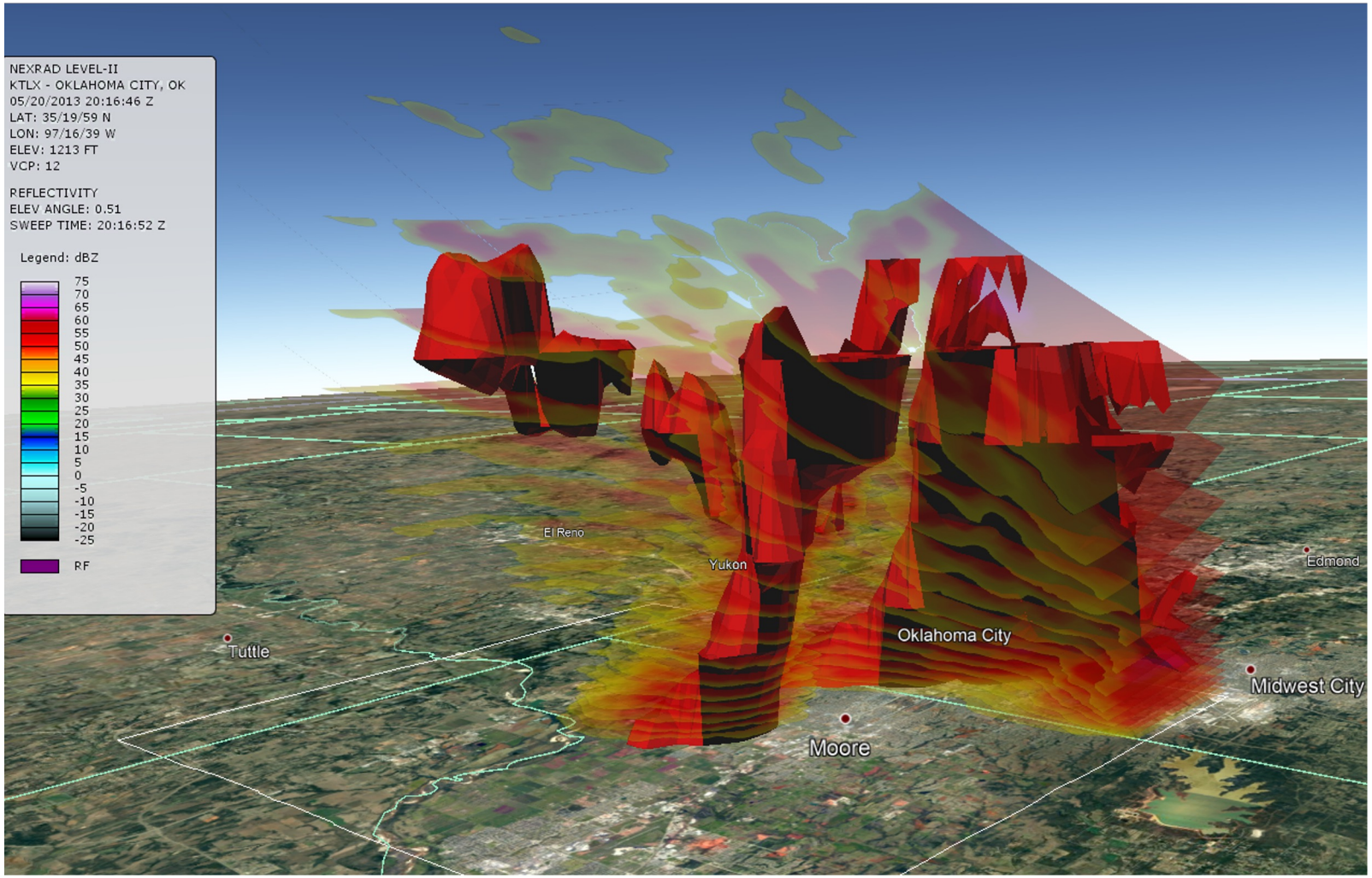

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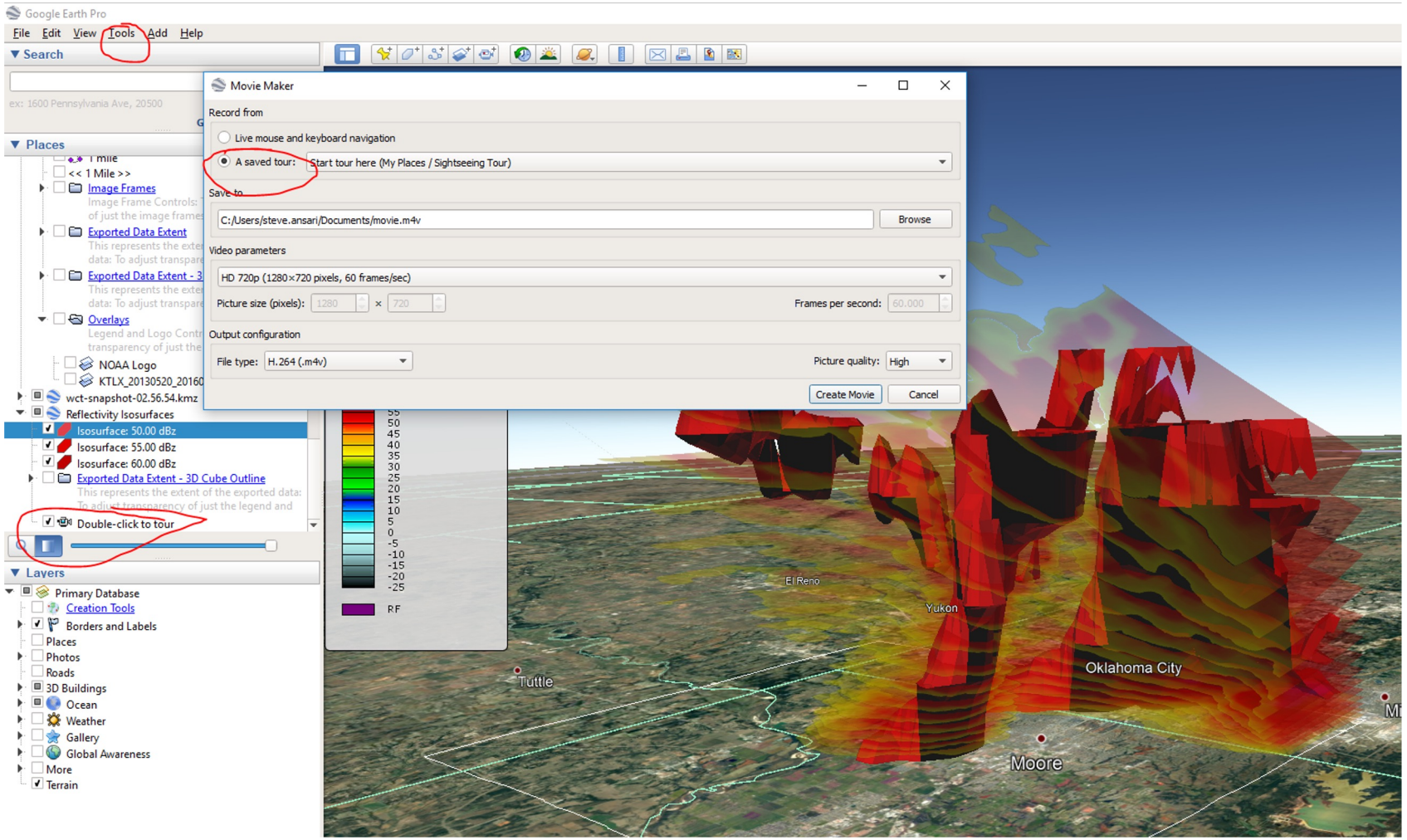

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Do you use the WCT? Please let me know how!

Thank you!

Steve.Ansari@noaa.gov

https://www.ncdc.noaa.gov/wct/

- Tutorials: https://www.ncdc.noaa.gov/wct/tutorials