

# Google Earth .KML Output Files

Tutorial #6

Last Revision: August 2006

## Introduction

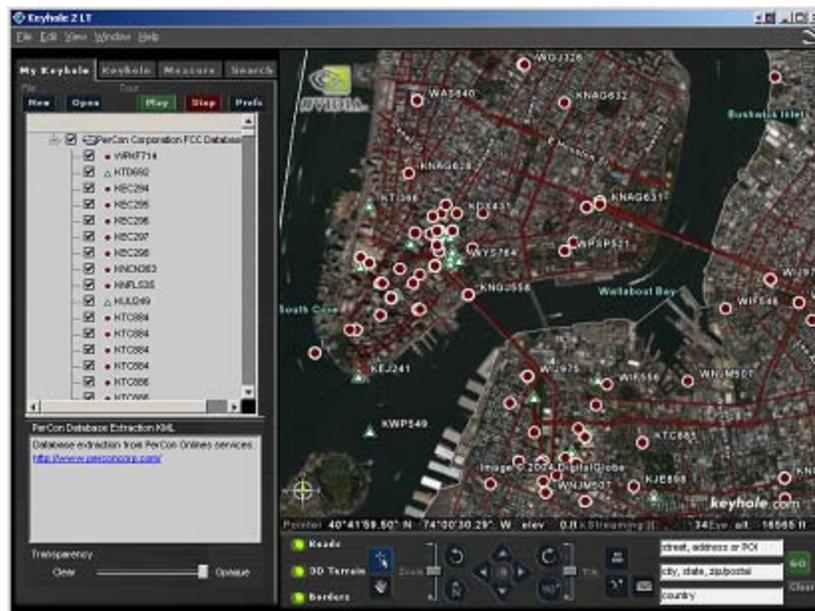
This tutorial was designed to introduce users to the new .KML output option found in several PerCon online database searches. The new .KML output file format allows users to create a file for use with the Google Earth mapping and satellite imagery viewer. Data extracted from a variety of PerCon databases can be displayed using the .KML output and Google Earth.

## INSIDE THIS TUTORIAL

- 1 Introduction
- 1 Overview
- 2 Creating A Google Earth .KML File
- 3 Using A Google Earth .KML File
- 4 Advanced .KML Applications & Analysis

## Overview

The .KML output option allows DataLinks and Spectrum: Online users to display point data from several databases with the Google Earth viewer software. Google has developed an application for viewing satellite imagery for the entire planet. The viewer software combines satellite images with various forms of point and polygon overlays including roads, country, state and local boundaries and popular locations. PerCon online database users using the Google software and with .KML output can now map data in a way previously only available in costly, high-end GIS systems. The viewer software used in conjunction with PerCon data will allow users to better visualize search results. For example, customers can gain a new perspective on a tower line of site or the area surrounding a transmitter in terms of marketing or planning. For more information on the Google software, please go to [earth.google.com](http://earth.google.com).



Sample image of Google Earth application with transmitters in New York City area displayed.

# Creating A Google Earth .KML File

To create a Google Earth .KML file, do the following:

**Step 1:** Log in to a PerCon online search system.

**Step 2:** Select an FCC Frequency Database.

**Step 3:** Select the desired search.

**Note:** For help on performing any of the previous steps, please see the introductory tutorials provided on this site.

**Step 4:** After entering the search criteria, select the Google .KML output option.

**Transmitters in a City**

[Transmitter City](#)  
[Transmitter State](#)  
[SEQUENCE](#)  
[OUTPUT FORMAT](#)  
[ACTIVE ONLY](#)  
[NO NEXTEL](#)  
[EXACT MATCH](#)  
[STATISTICS](#)  
[Client / Project Code](#)

Buffalo  
NY - NEW YORK  
Frequency  
**Google Keyhole - KML Beta**

Submit Reset

**Step 5:** When the search is complete, a download link will be provided. To save a file in Internet Explorer, right-click on the file name and select Save Target As. To save a file in Netscape Navigator, right-click on the file name and select Save Link As. After the file download is complete, select the appropriate application to open the file from the hard drive. Save the .KML file to a location where it can easily be found.

**The results of your search are in the following file:**

**[KML file](#)**

**Step 6:** After naming the file, the search results will be saved to the specified location on the user's computer. The file will be ready for use with the Google Earth software.

# Using A Google Earth .KML File

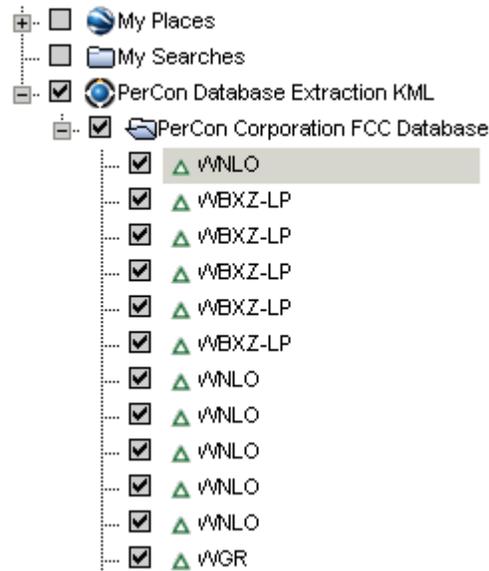
To use a Google Earth .KML file, do the following:

**Step 1:** Double-click on a Keyhole .KML file created using the PerCon online search. Double-clicking the file will automatically load the Google Earth software and display the point data from the search results.

**Note:** Users should consult the Google Earth website or program documentation for help using the Google Earth viewer software if necessary.

**Step 2:** After the program and data are loaded, users will be able to perform a variety of functions using the search results.

- My Places Tab: The My Places tab contains a listing of places or searches based on the user's previous searches and program usage. When the Google Earth software is launched using an output file created using a PerCon search, a PerCon Database Extraction entry is also added to the My Places tab.

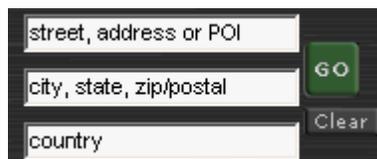


Click on the PerCon entry to expand the tree and view a list of all points found in the search results. The points are listed by Callsign. By right clicking on a Callsign the user can quickly go to that location by selecting GoTo View from the right-click menu.

- Point and Zoom: Users can use the pointer mode to zoom in to the area around the search results.



- Address Search: Users can use the address/location search to fly to the location near or within the search results.



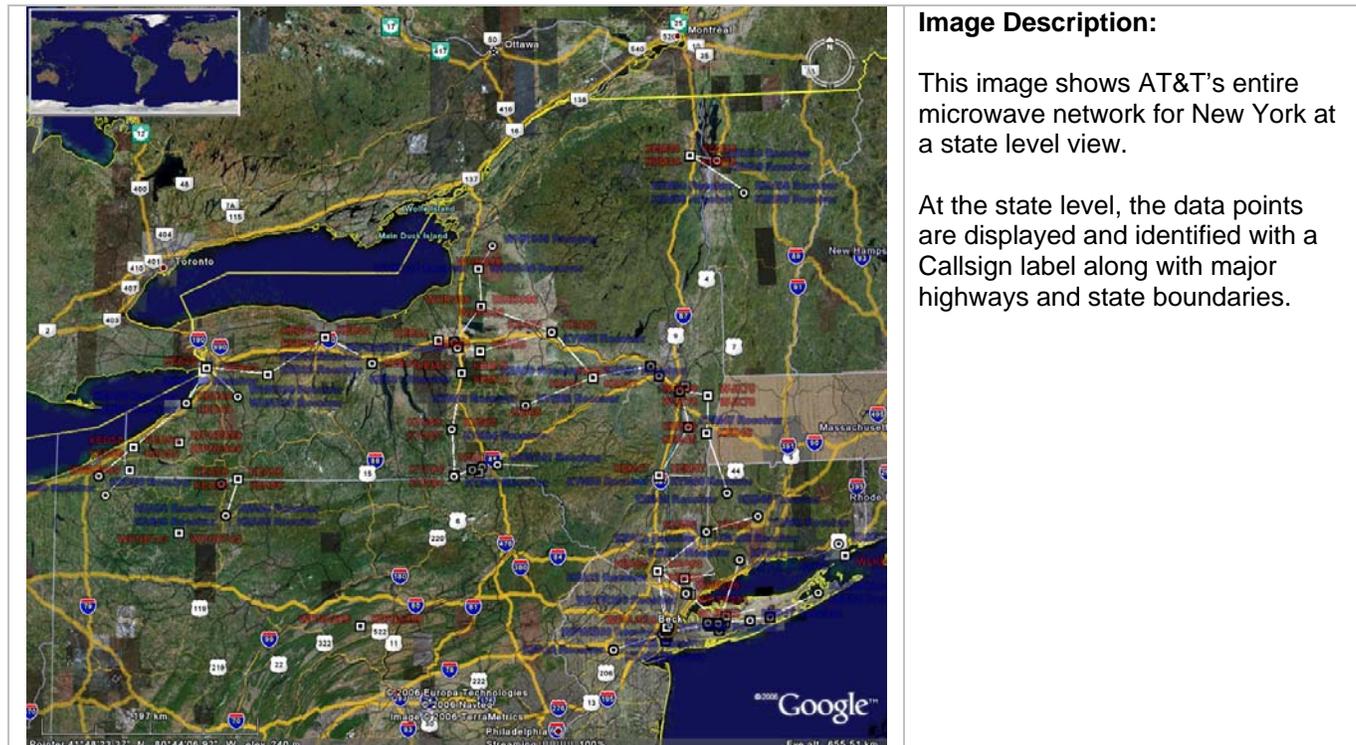
# Advanced .KML Applications & Analysis

As previously stated, the ability to import .KML data files into Google Earth allows users to perform sophisticated visual analysis previously found only in high-end GIS software. Google Earth can be used to visualize FCC data for engineering, marketing and planning in an entirely new way. With Google Earth, users can still view transmitter point data in the traditional manner found in most mapping applications with various road and boundary overlays and in 2-D. However, users can also view their data in conjunction with aerial and satellite imagery and can tilt the map between overhead and side views for viewing in 3-D. Some potential applications for using PerCon FCC data with Google Earth include:

- Companies can view potential problems and gain a new perspective on their project
- Google Earth presents a single view to quickly analyze geographies for Customers before embarking on projects
- Impress clients and planning commissions with live interactive fly-through that show aerial tours of a project and its environment.

## Advanced .KML Sample #1 – AT&T New York State Microwave Network

### AT&T New York State Microwave Network – Sample Image #1:



**AT&T New York State Microwave Network – Sample Image #2:**

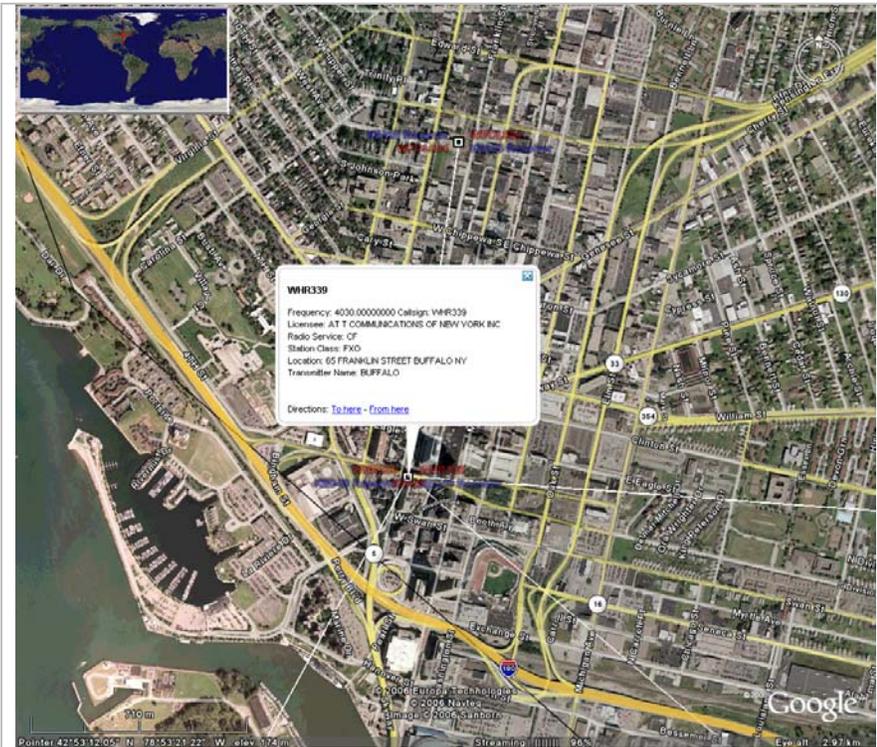


**Image Description:**

This image shows the AT&T's microwave network for New York zoomed in to the Buffalo, NY region.

By clicking on a data point, the user can see detailed information for that point. The type of data displayed for that point varies depending on which database the .KML file is created from.

**AT&T New York State Microwave Network – Sample Image #3:**

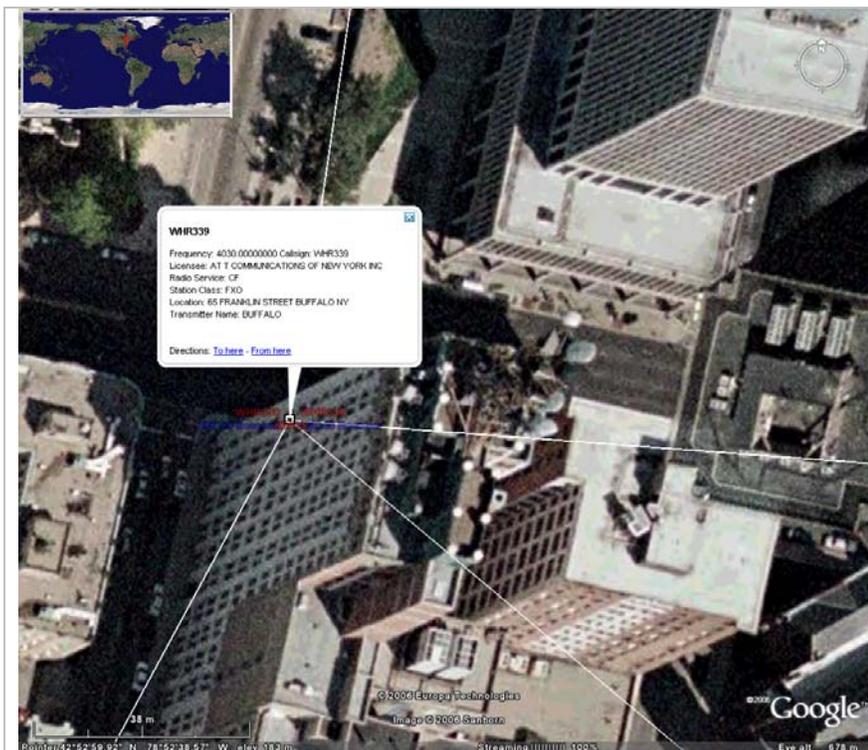


**Image Description:**

This image shows the AT&T's microwave network for New York zoomed further in to the Buffalo, NY region.

Detailed information for a specific point is shown again in a pop-up window. In addition, at this altitude, satellite imagery is show along with highways and major roadways and geographic boundaries.

#### AT&T New York State Microwave Network – Sample Image #4:



#### Image Description:

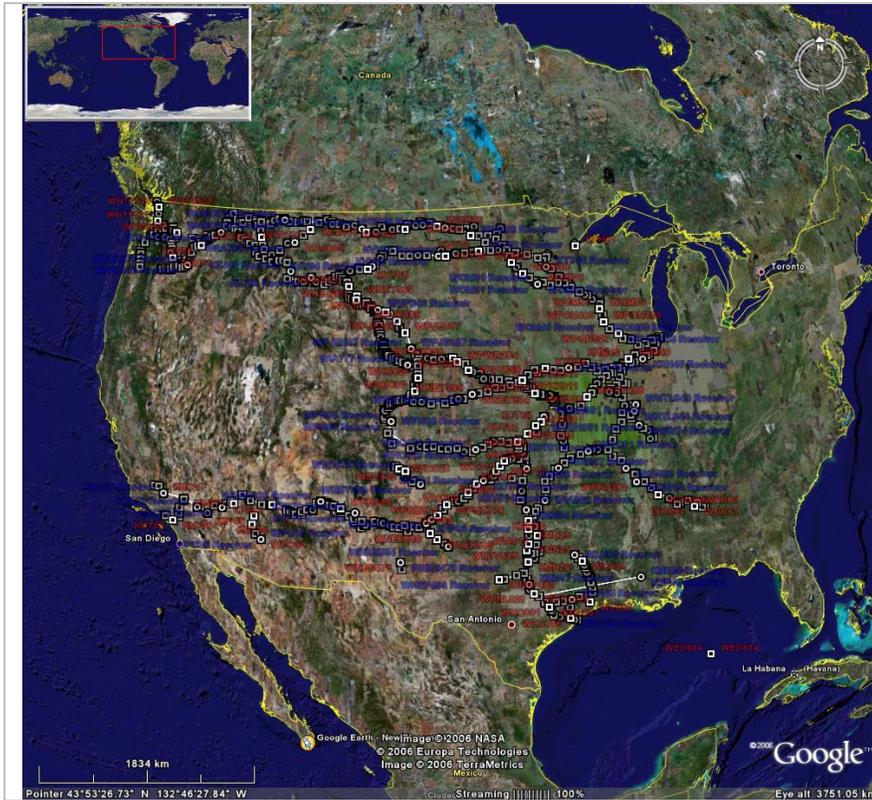
This image shows the AT&T's microwave network for New York zoomed down to a street level view of Buffalo, NY.

The building in the center of the image is an AT&T building. Note the large collection of microwave antennas on the roof.

Detailed information for a transmitter located on top of that building is shown.

# Advanced .KML Sample #2 – Burlington Northern Sante Fe Railway Network

## BNSF Railway Network – Sample Image #1:

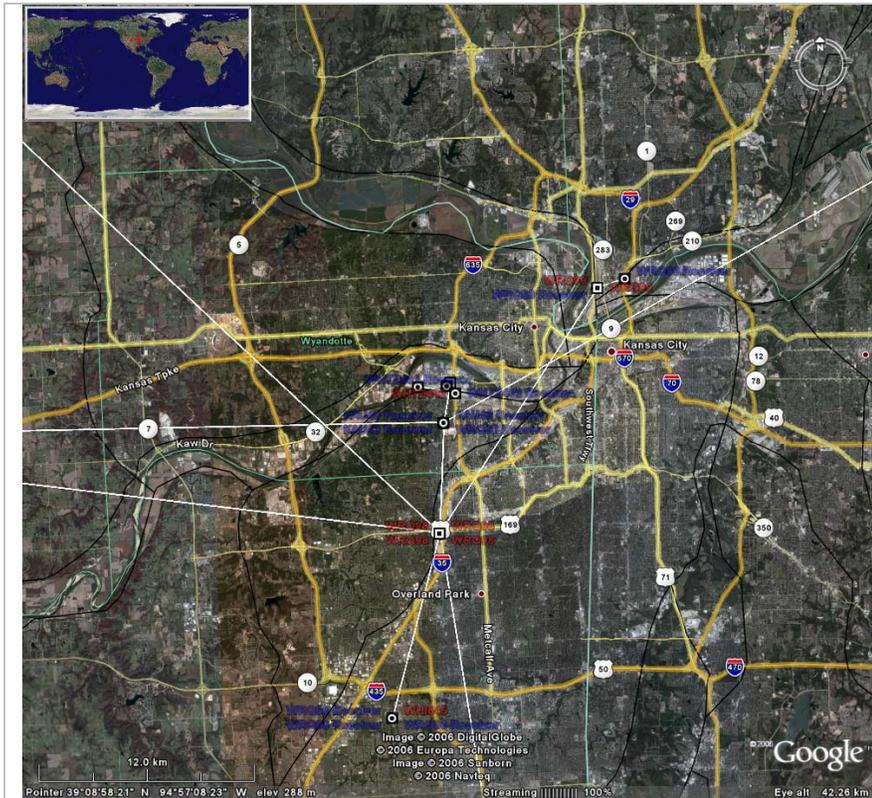


### Image Description:

This image shows the BNSF network for at the national level.

At the national level, the data points are displayed and identified with a Callsign label. Geographic boundaries separating countries are shown in yellow.

## BNSF Railway Network – Sample Image #2:



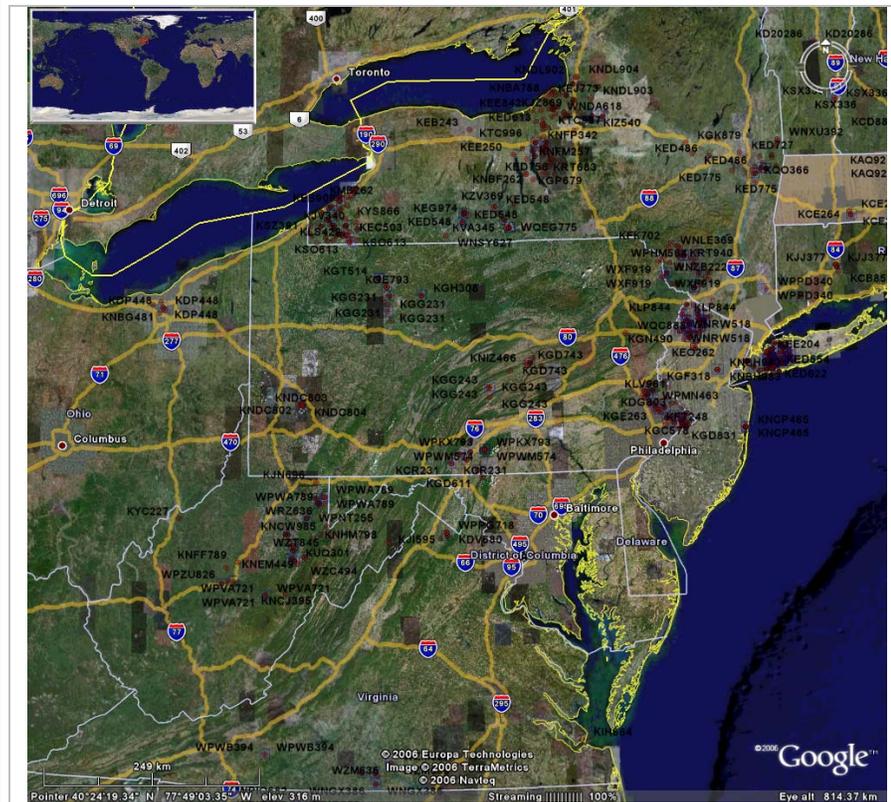
### Image Description:

This image shows the BNSF network zoomed in to the Kansas City metro area.

At this level, the data points are displayed and identified with a Callsign label. In addition, low-resolution satellite imagery is shown along with highways and county boundaries.

# Advanced .KML Sample #3 – Transmitters on 46.10 MHz in the Northeastern U.S.

## Northeast 46.10 MHz Transmitters – Sample Image #1:

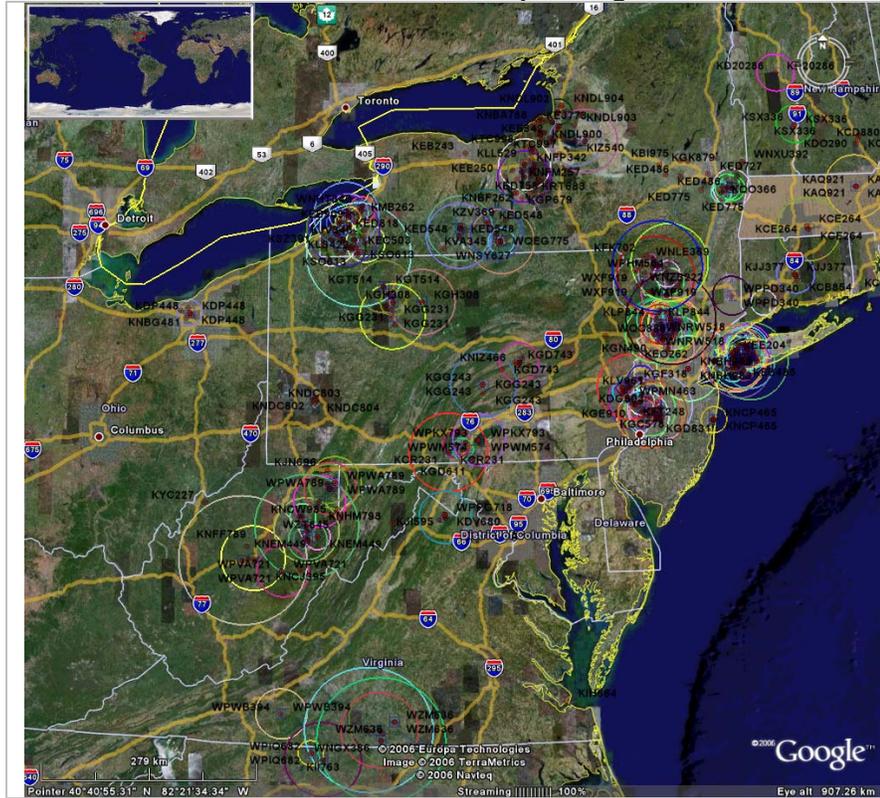


### Image Description:

This image shows the results for a search on transmitters operating on 46.10 MHz in the Northeastern United States.

At the national level, the data points are displayed and identified with a Callsign label. Geographic boundaries separating countries are shown in yellow.

**Northeast 46.10 MHz Transmitters – Sample Image #2:**



**Image Description:**

This image shows the 46.10 MHz search results for the same transmitters at the same altitude as the previous image, but with radius circles for each transmitter displayed.

**Northeast 46.10 MHz Transmitters – Sample Image #3:**

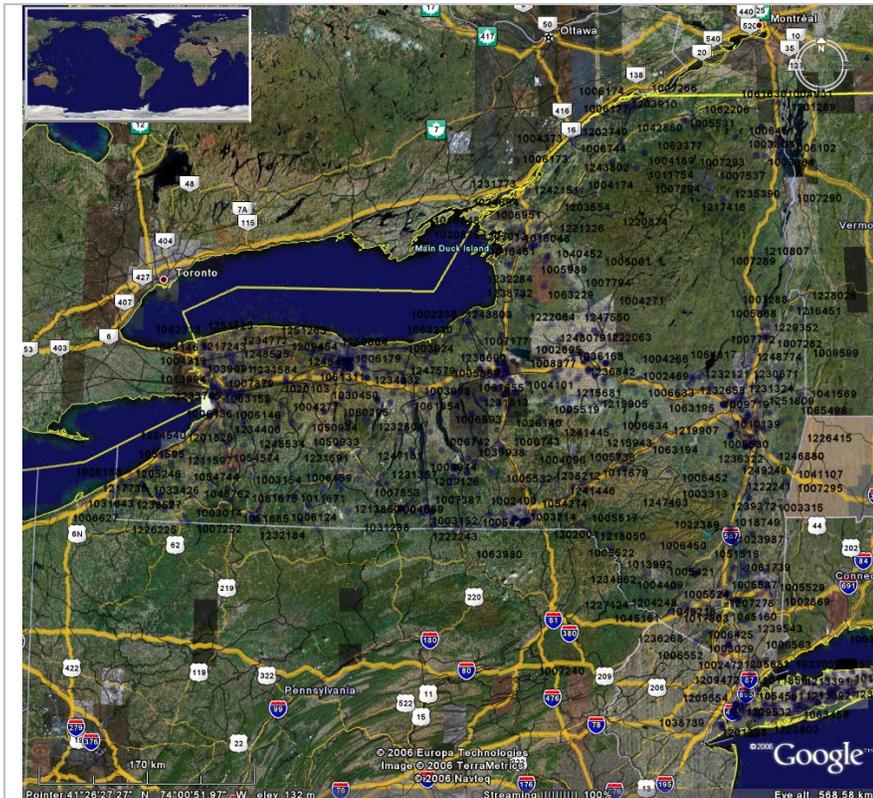


**Image Description:**

This image shows the 46.10 MHz search results zoomed in to Western New York state and with radius circles for each transmitter displayed.

## Advanced .KML Sample #4 – All Towers in New York

### Towers in New York – Sample Image #1:

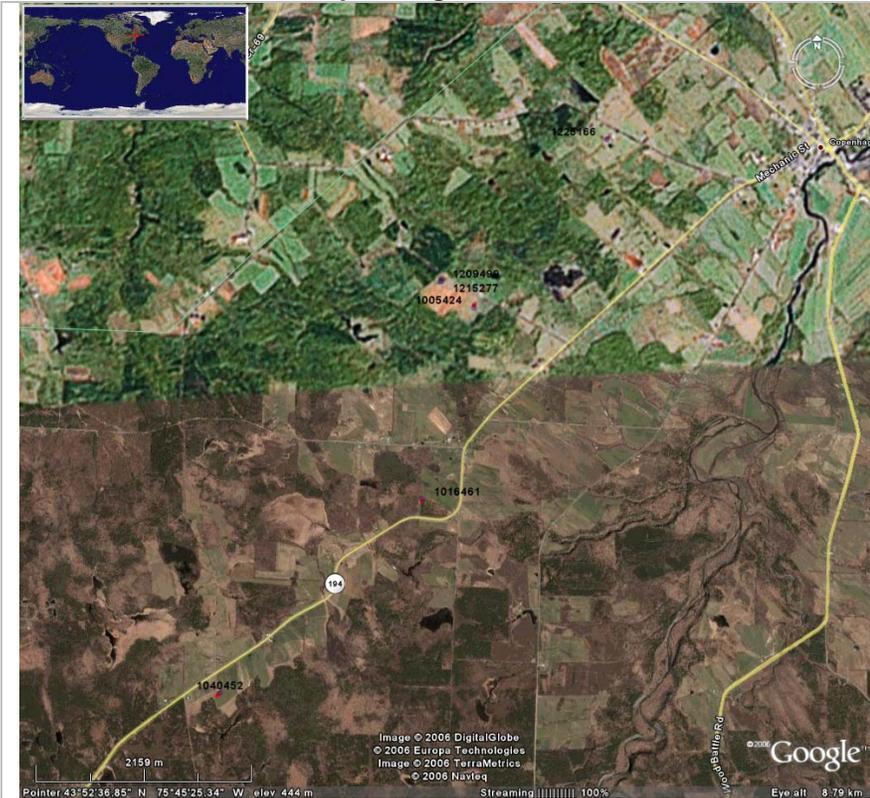


#### Image Description:

This image shows all towers in New York state.

Since this .KML file was created for a search using the Antenna Registration database and not the FCC Master Frequency database like the previous samples, the data points are displayed and identified with a Tower ID number instead of a Callsign label.

### Towers in New York – Sample Image #2:

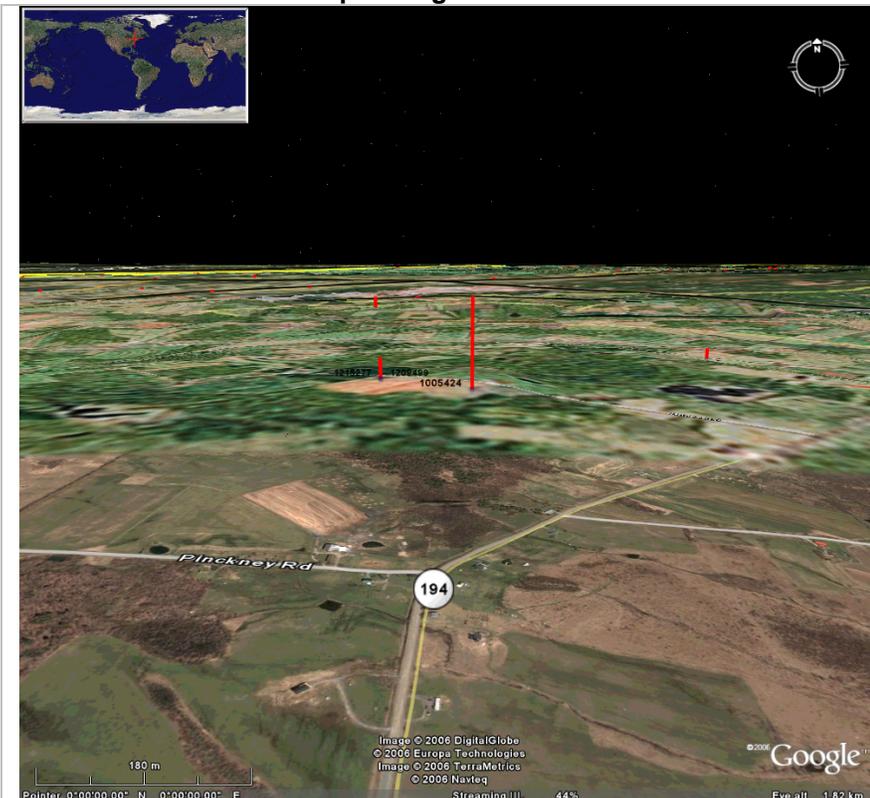


#### Image Description:

This image shows the results of the New York tower search zoomed in to a lower altitude.

The towers are identified with the red markers and Tower ID labels. In addition, low-resolution satellite imagery is shown along with highways.

### Towers in New York – Sample Image #3:



#### Image Description:

This image shows the results of the New York tower search zoomed in to an even lower altitude.

However, using Google Earth's tilt adjustment controls, the image is tilted. Instead of viewing points from directly overhead, users can now view objects that have been extruded from the side, such as the towers shown. The towers extrusion uses height data from the Tower & Antenna Registration database to accurately model the tower's height above other objects.



## ERS & BRS in New York – After

### Map:



### Layer Controls:

- [WNLQ249](#)  
Frequency: 4.43800000  
Callsign: WNLQ249
- [WNLQ249](#)  
Frequency: 5.00500000  
Callsign: WNLQ249
- [WNLQ249](#)  
Frequency: 6.76500000  
Callsign: WNLQ249
- [WNLQ249](#)  
Frequency: 7.30000000  
Callsign: WNLQ249
- [KNIL346](#)  
Frequency: 25.00000000  
Callsign: KNIL346
- [KNIL346](#)  
KNIL346 Area Operations Center Po  
Radius of Operation : 64.0 KM
- [KNIL346](#)  
Frequency: 25.00000000  
Callsign: KNIL346
- [KNIL346](#)  
KNIL346 Area Operations Center Po  
Radius of Operation : 64.0 KM
- [KEF941](#)  
Frequency: 25.99000000  
Callsign: KEF941
- [KEF941](#)

### Image Description:

The images above show the results of un-checking several transmitter records in the Layer Control window. The map uses the same .KML file as the previous map image, but now shows fewer transmitters. In addition, the radius circle map element for many of the transmitters has also been enabled for display.

# Advanced .KML Sample #6 – Transmitters in Chautauqua County, New York

## Transmitters in Chautauqua County, New York – Before



### Image Description:

This image shows all transmitters in Chautauqua County, NY at the county level. Each transmitter is identified with a Callsign label.

## Transmitters in Chautauqua County, New York – After

### Map:



### Layer Controls:

- Callsign: WNILQ249
- WNILQ249**  
Frequency: 4.43800000  
Callsign: WNILQ249
- WNILQ249**  
Frequency: 5.00500000  
Callsign: WNILQ249
- WNILQ249**  
Frequency: 6.76500000  
Callsign: WNILQ249
- WNILQ249**  
Frequency: 7.30000000  
Callsign: WNILQ249
- KNIL346**  
Frequency: 25.00000000  
Callsign: KNIL346
- KNIL346**  
KNIL346 Area Operations: Center Po  
Radius of Operation : 64.0 KM
- KNIL346**  
Frequency: 25.00000000  
Callsign: KNIL346
- KNIL346**  
KNIL346 Area Operations: Center Po  
Radius of Operation : 64.0 KM
- KEF941**  
Frequency: 25.99000000  
Callsign: KEF941
- KEF941**

### Image Description:

Like the previous sample, the images above show the results of un-checking several transmitter records in the Layer Control window. Again, the map uses the same .KML file as the previous map image, but now shows fewer transmitters. The radius circles map element for the transmitters have also been enabled for display.

## Company Information

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## DataLinks Tutorials

**Tutorial #1:**  
**Introduction To PerCon DataLinks**

**Tutorial #2:**  
**PerCon DataLinks Output Options**

**Tutorial #3:**  
**DataLinks Frequency Finder**

**Tutorial #4:**  
**PerCon DataLinks Co-Channel /**  
**Adjacent Channel Analysis**

**Tutorial #5:**  
**DataLinks Wildcard Searches**

**Tutorial #6:**  
**Keyhole .KML Output Option**

**Tutorial #7:**  
**SQL Query Builder & Editor**