



HDR/FM NOMAD ANALYZER

Data Recording Key Features:

HD Radio Receiver Demodulator Powered by DaySequerra Market Area Monitor (MAM) 2, decoding the following key metrics:

- HD Acquired, Digital Audio Acquired, Program QI, Program DAAI
- Additional metrics provided by MAM2 can be implemented upon customization
- Up to 4 MAM2 can be recorded simultaneously

FM/RF Receiver powered by Signal Hound USB-SA44B Spectrum Analyzer:

- Full FM RF Spectrum band recording
- Supports up to 4 simultaneous channels, with 1st and 2nd adjacent sidebands recording
- Noise floor: -144 dBm @ 100 MHz

High Accuracy GPS receiver: 5 Hz, with WAAS/EGNOS enhancement

Mobile Acquisition speed at 100 km/h: up to 1 point every 50m.

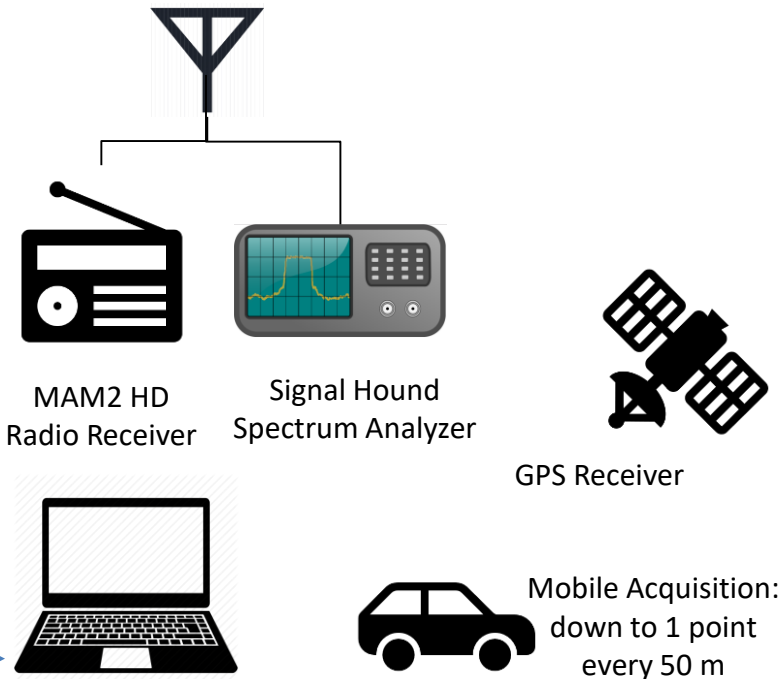
Data Analyzer Features:

Pre-analysis of all stations (up to 4) under test, which includes:

- Propagation analysis (CRC-Predict or Longley-Rice) of the main station, including all surrounding potential interferer from lower 2nd adjacent to upper 2nd adjacent.
- Supports FCC, ISED and Mexico database
- Can detect in real-time: signal variation between simulations and recorded levels, potential interferer
- Can analyze the HD Radio demodulator (including interference) for: digital signal acquired and digital audio decoding levels
- Can analyze SFN repeaters (identify analog ratios and surrounding 1st adjacent interferers)
- Can evaluate potential host interference from SFN repeaters

Basic Operating Principles

User connects to Octave Server and uploads the campaign pre-analysis file (up to 4 stations) under test



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Real-time analysis: identification of unexpected propagation problems (transmitter/antenna issues, interferer, host interference, etc)



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Post-Campaign Analysis:

- Export to Google Earth or CSV
- Antenna analysis report
- FM host quality analyzer
- SFN analyzer

Required Hardware System

GPS: US Global Sat BU-353-S4

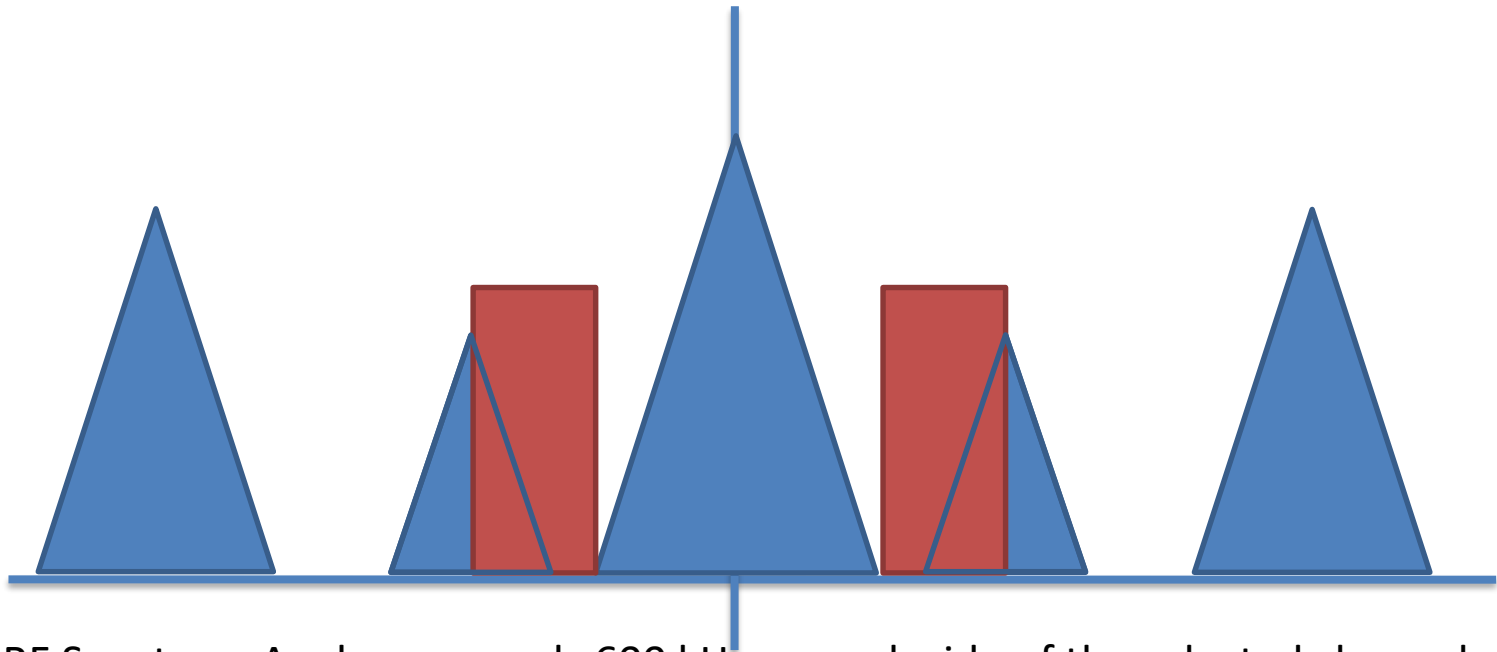


HD Radio Receiver: DaySequerra
Market Area Monitor MAM2



Spectrum Analyzer: Signal Hound
USB-SA44B

RF Analyzer



The RF Spectrum Analyzer records 600 kHz on each side of the selected channel (up to 4 simultaneous channels). The system provides the channel power for each band, from lower 2nd adjacent, lower 1st adjacent, lower HD Radio (MP1 or MP11), Main Analog, upper HD Radio, upper 1st adjacent and upper 2nd adjacent.

Octave HDR / FM Nomad Analyzer - New Job

File Reports Options Help

GPS Latitude: Longitude: Status: Locked (10 satellites)

Spectrum Analyzer Status: Online (766 sweeps)

HD Receivers Status: Online (1)

Results

KNDD-FM 107.7

Name	Data	Average	Simulation	Delta
HD Acquired	False	False		
Digital Audio Acquired	False	False		
Analog Signal	False	False		
Multipath	3	4		
RSSI	48	49		
SNR	21	20		
Analog RF Level	119.84	120.34		
-400 kHz Analog	NOISE	NOISE		
-200 kHz Analog	NOISE	35.86		
Main HD Lower Band	48.52	48.46		
Main Analog	66.33	70.96		
Main HD Upper Band	41.14	43.73		
+200 kHz Analog	NOISE	35.70		
+400 kHz Analog	NOISE	NOISE		

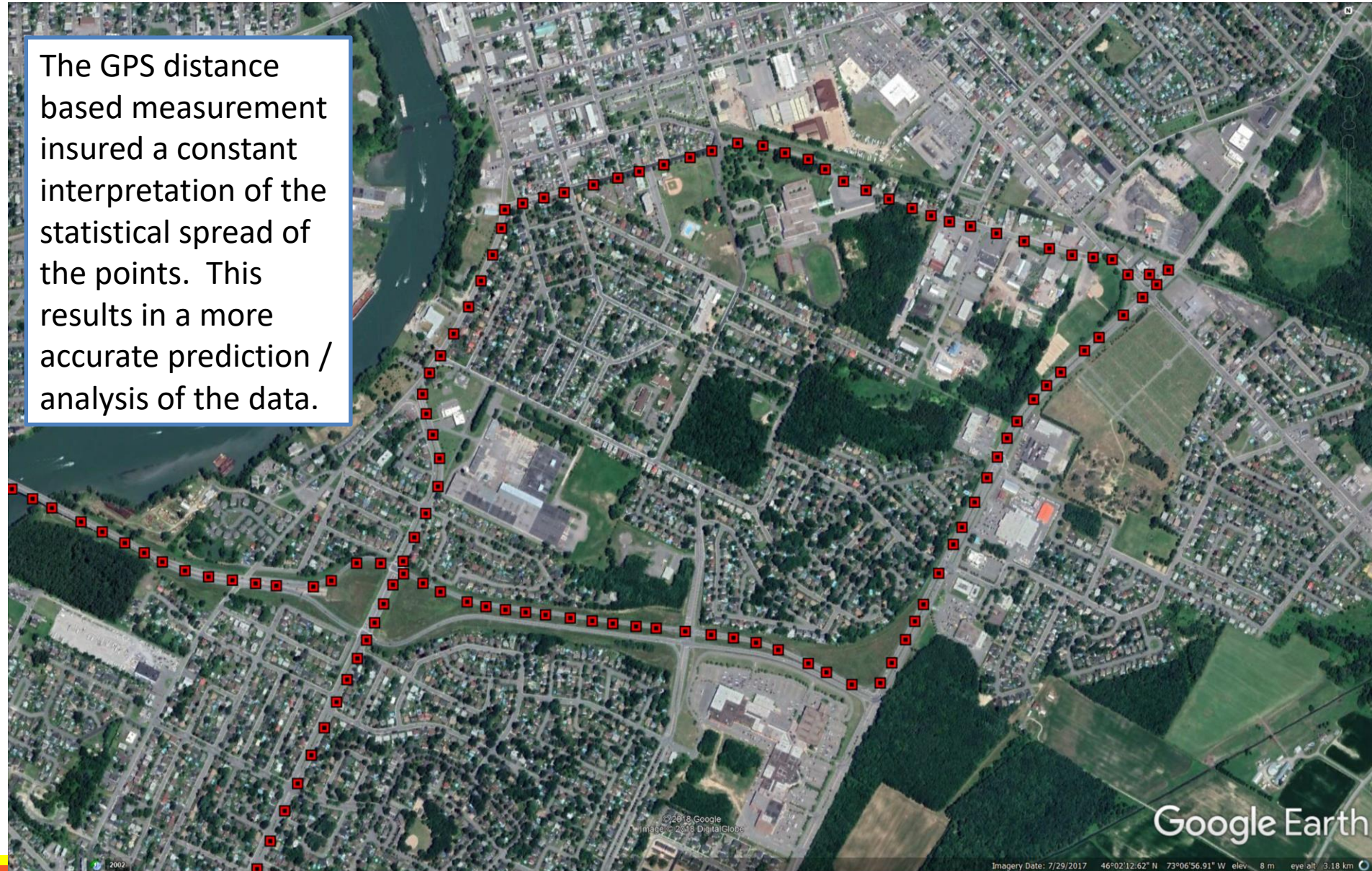
Alerts

[4/19/2018 2:52:39 PM] ERROR: HD Receiver 1 not found.
 [4/19/2018 2:55:57 PM] ERROR: HD Receiver 1 not found.

Data Recording

Status: Last Record Time: Last Record Distance:

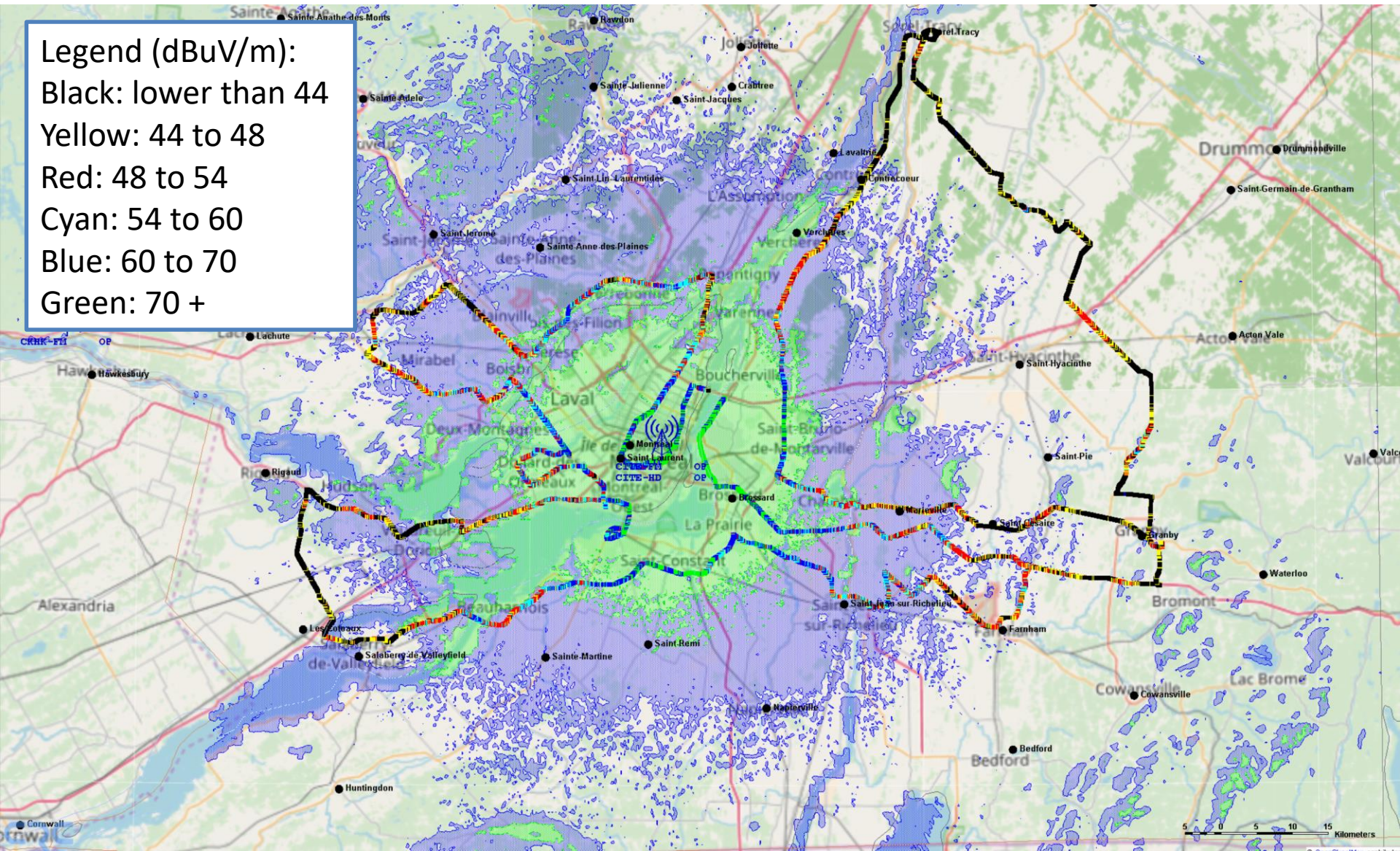
The GPS distance based measurement insured a constant interpretation of the statistical spread of the points. This results in a more accurate prediction / analysis of the data.



Post Analysis Reports

- Output in CVS or Google Earth Format
- Antenna performance evaluation
- Comparison with propagation models
- Power Ratio comparison:
 - Total HD to Analog
 - Lower HD to Analog
 - Upper HD to Analog
 - Lower HD to Upper HD

Legend (dBuV/m):
 Black: lower than 44
 Yellow: 44 to 48
 Red: 48 to 54
 Cyan: 54 to 60
 Blue: 60 to 70
 Green: 70 +



Legend:

Black: -20

Yellow: -20 to -10

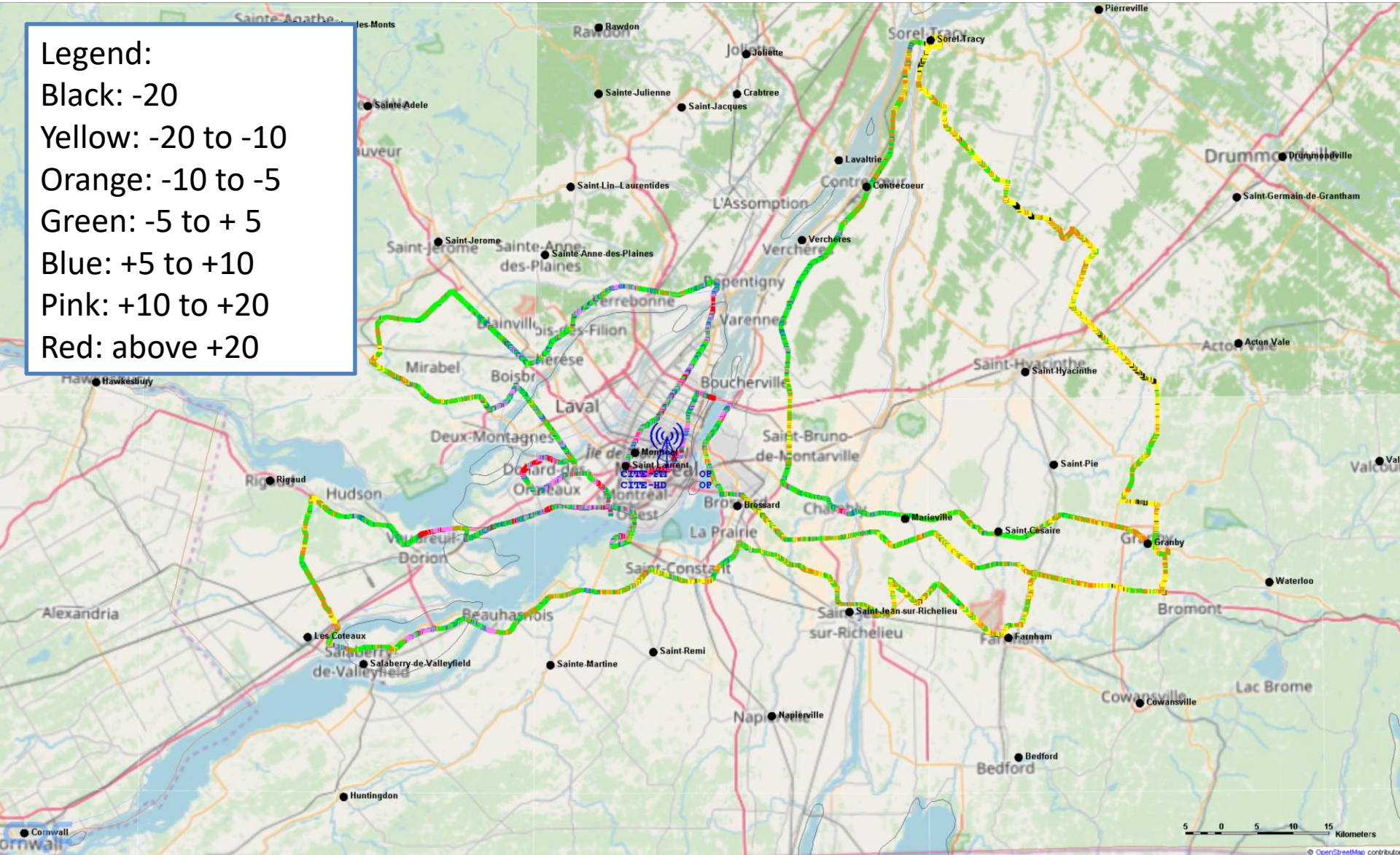
Orange: -10 to -5

Green: -5 to +5

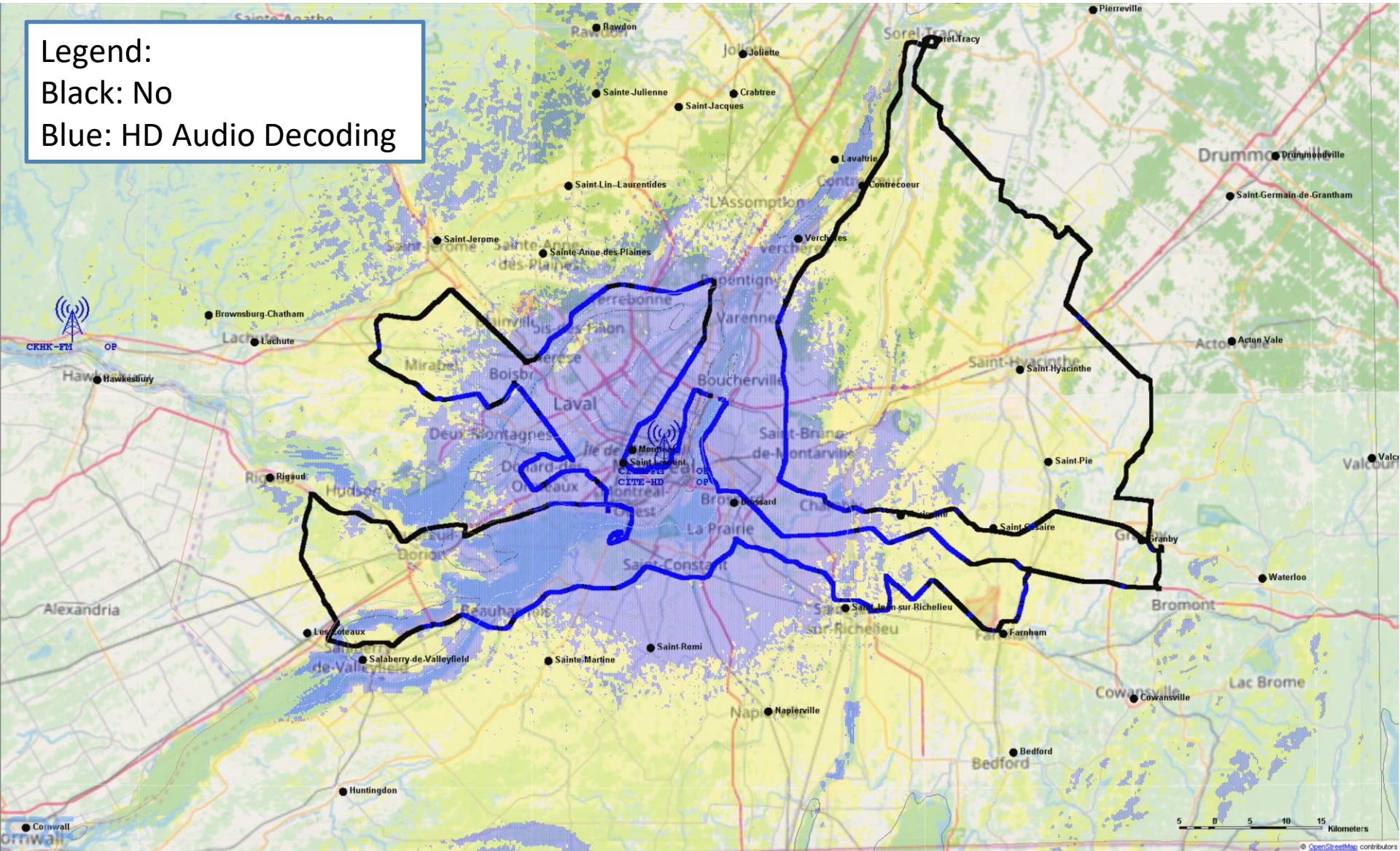
Blue: +5 to +10

Pink: +10 to +20

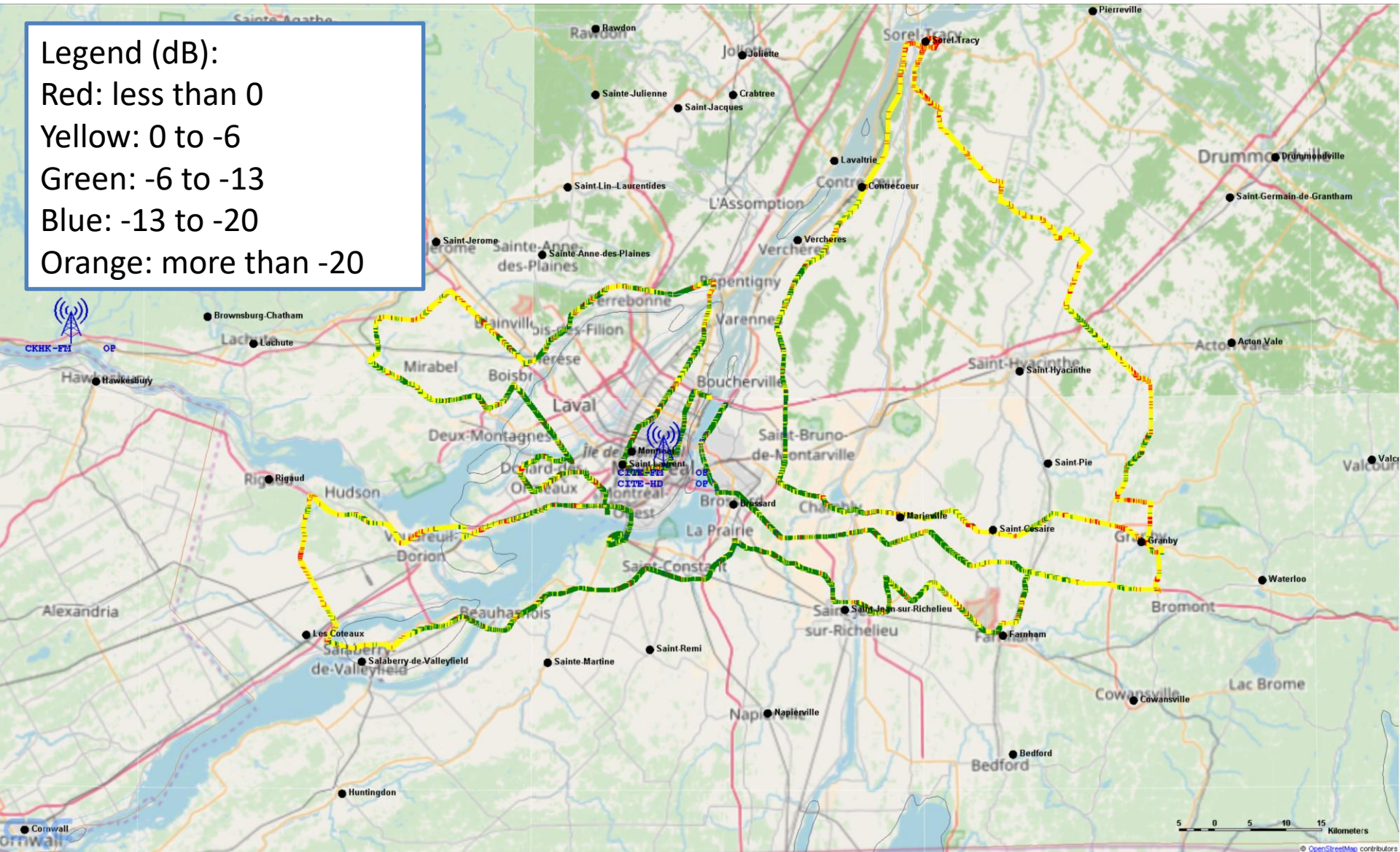
Red: above +20



Legend:
Black: No
Blue: HD Audio Decoding



Legend (dB):
 Red: less than 0
 Yellow: 0 to -6
 Green: -6 to -13
 Blue: -13 to -20
 Orange: more than -20



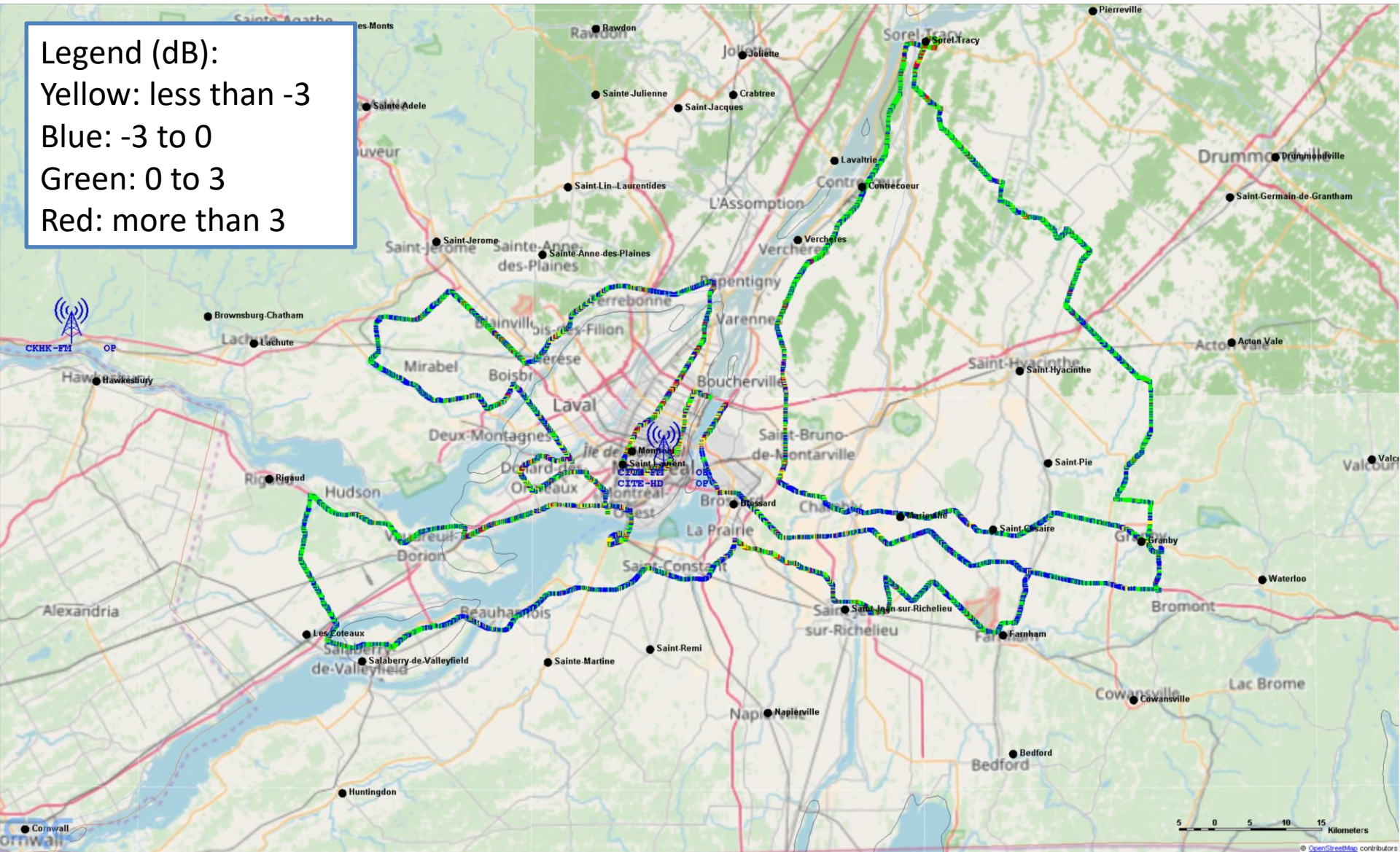
Legend (dB):

Yellow: less than -3

Blue: -3 to 0

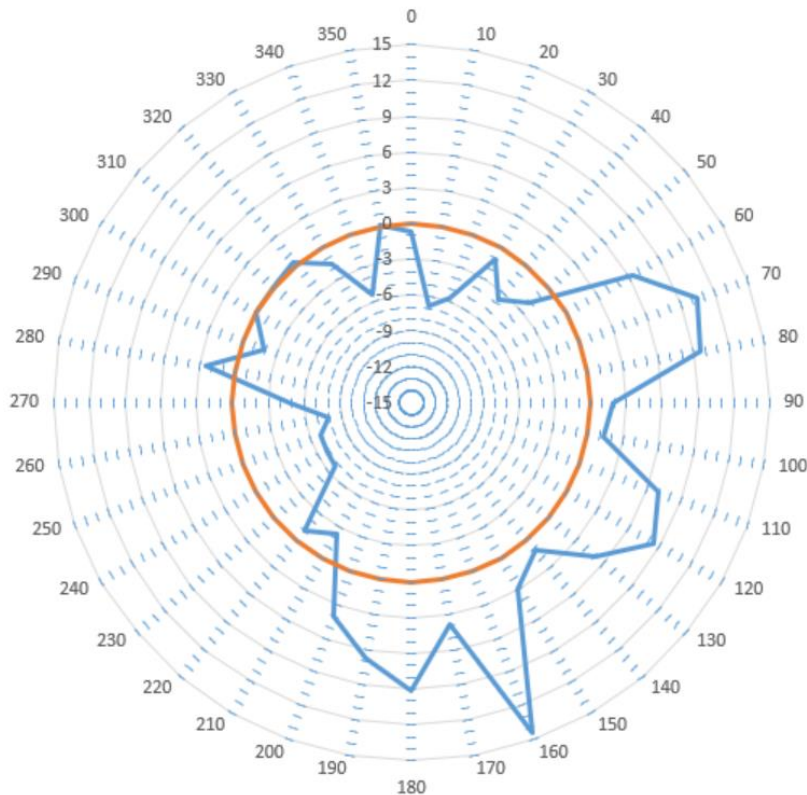
Green: 0 to 3

Red: more than 3



Antenna Validation

Measurements Differences Between Prediction vs Angle from Antenna



The system evaluate the average differences between the received levels and the predicted levels in the specific angle range (ex: 10 deg.).

A difference of 0 dB shows that the power received is proportional to the simulated antenna (directional or not).

Negative values means that the prediction is lower than the measured values (or that the antenna is under performing in this azimuth).

HDR/FM Nomad Analyzer

System	Rental	Basic	Pro
Hardware	Fully Provided and Configured (including Laptop)	Provided by user*	Fully Provided and Configured (including Laptop)
HD and FM Data recording	Included	Included	Included
CSV and KML Outputs	Included**	Included	Included
Propagation Data	Based on campaign requirements	1 st Campaign, additional at pay per use	Yearly***
Antenna Validation Module	Yes	Requires propagation data	Included
Certified Campaign****	Yes	1st Campaign	3 Campaigns
On Site System Calibration	No	No	Available
On Site Training	No	No	Available

* Users can decide to re-use existing hardware, such as HD Radio receiver (MAM2), Laptop, etc. Octave will assist in acquiring the missing hardware

** Some reports require the Propagation Data from Octave Server

*** Yearly subscription to Octave server is included for the first year

**** Campaign certification includes verification of the user's data vs propagation and validation that the data is reflecting the performance of the measurement system