HawkEye 360

A NEW WAY OF SENSING GROUND RF

ADAM BENNETT, PRODUCT MARKETING DIRECTOR
CHRIS GREGORY, VP ENGINEERING

COMPANY OVERVIEW

Radio frequencies (RF) are fundamental to the operation of modern civilization. Until now, this activity has been invisible.

But HawkEye 360 now delivers a new data layer — visibility and precise mapping of spectrum emissions around the globe.

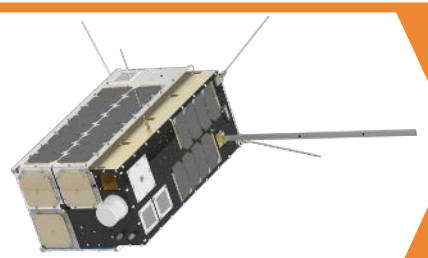
STORY IN BRIEF

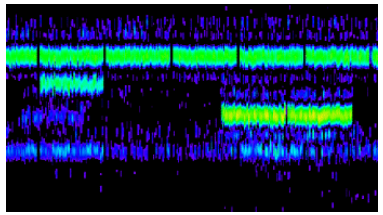
- Realization that small satellites could revolutionize RF surveys
- HawkEye 360 was incorporated in 2015 and has ~40 employees
- Backed by high-quality investors and strategic partners
- The first set of satellites were launched December 2018

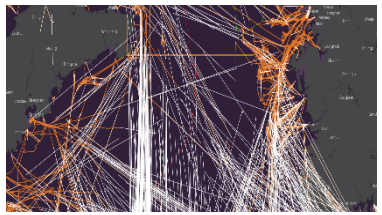
TECHNOLOGICAL APPROACH

We operate a constellation of radio frequency sensing satellites for identifying signals that we convert into actionable information.

SIGNALS → SENSORS → PROCESSING → ANALYTICS → PRODUCTS







Satellite Constellation

- Worldwide coverage
- Software Defined Radios
- Broad spectrum coverage

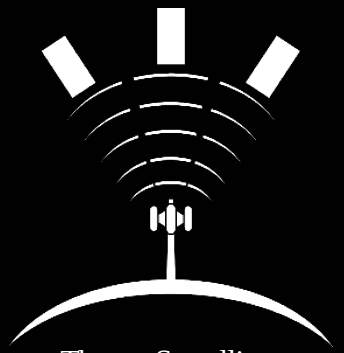
Precision Geolocation

- Time Difference of Arrival
- Frequency Difference of Arrival
- Blind coherent integration

Contextual Activity

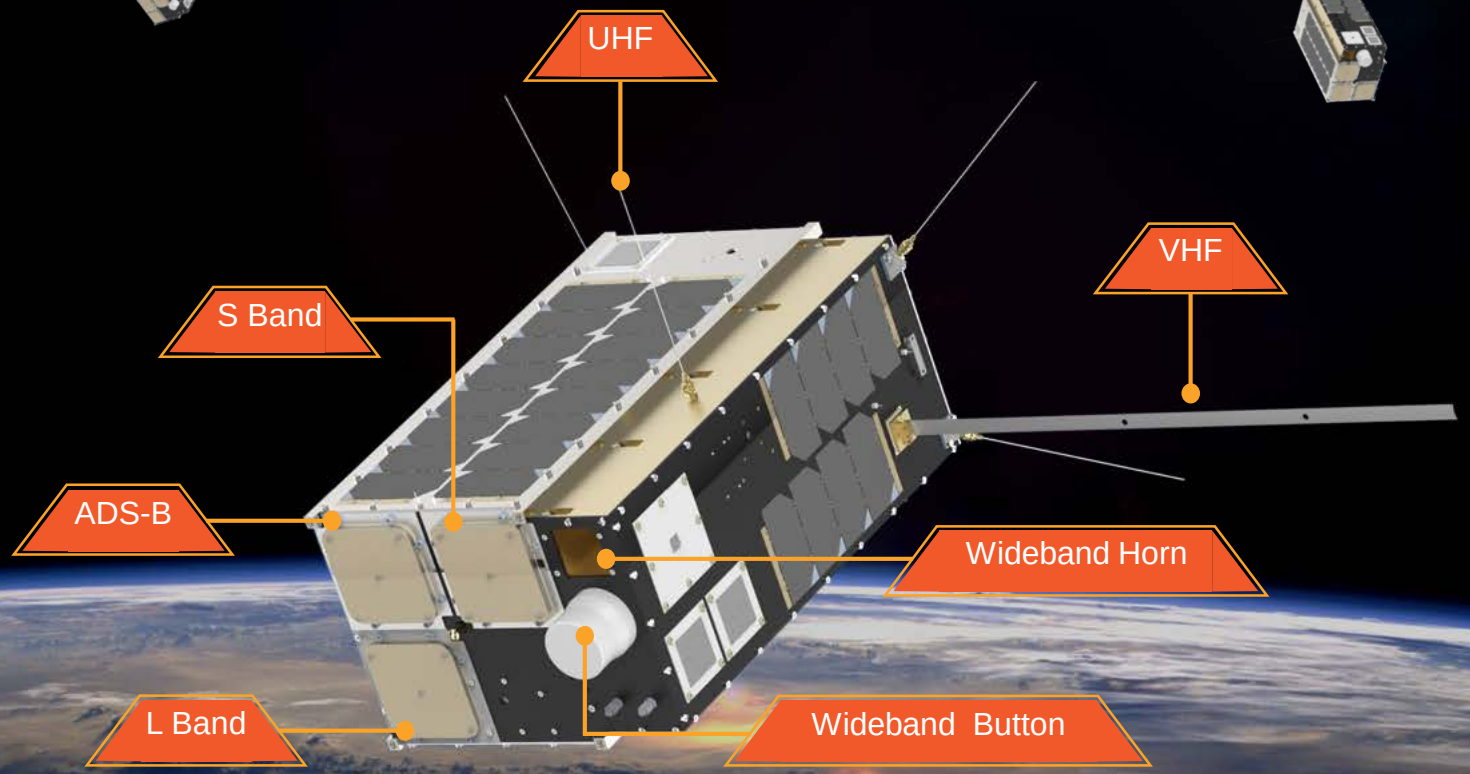
- Object based analysis
- Multi -INT data fusion
- Trends and forecasting

CLUSTER 1 SPECIFICATIONS

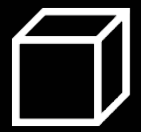


Three Satellites
Formation Flying
250 km Spread

144 MHz to 15 GHz
Frequency Range



Polar Orbit
575 km

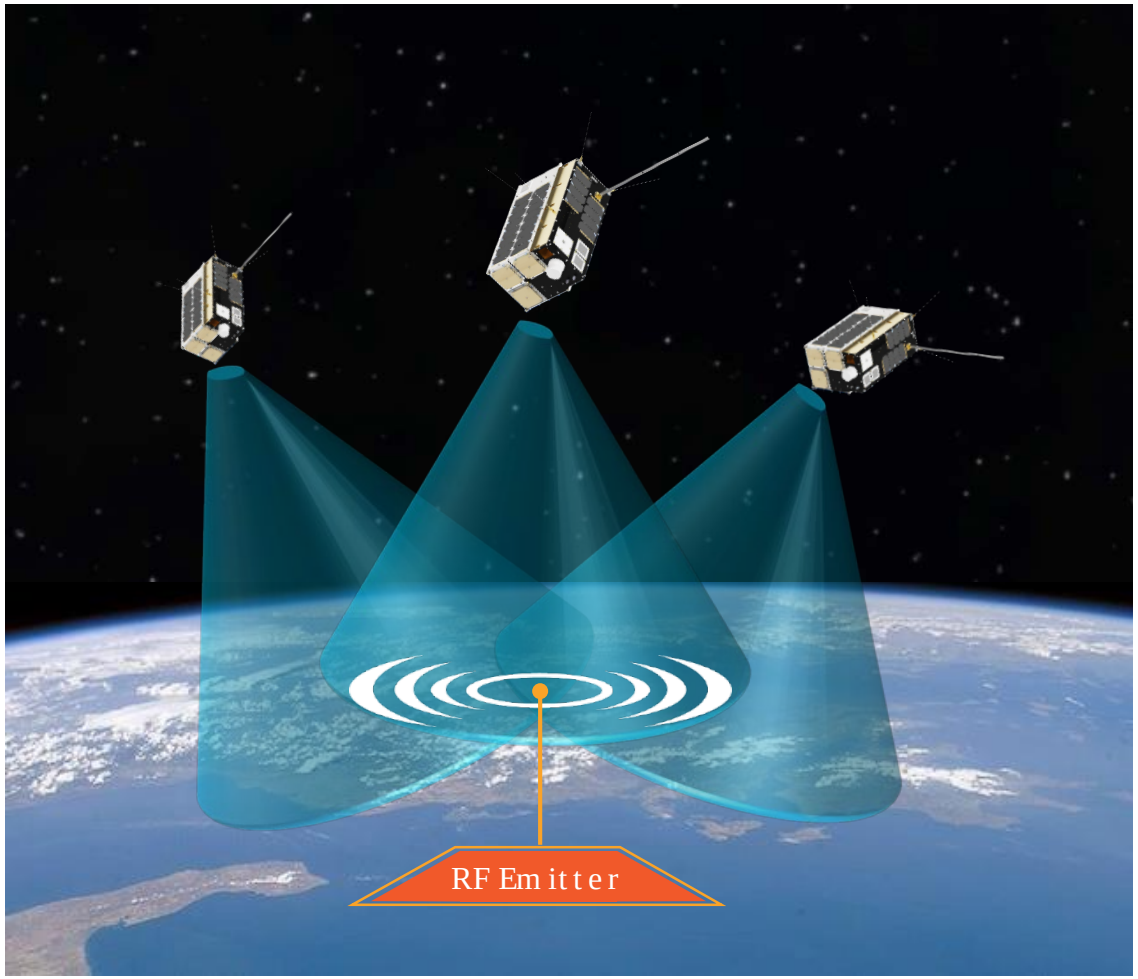


Dimensions
27 x 20 x 40 cm
Mass 15 kg

Satellite Cluster Successfully Launched December 3, 2018

Public Release

GROUND-BASED TRILATERATION



- Three Satellite Cluster Flies in Formation
- Independently Geolocate a Variety of Radio Signals
- Identifies and Describes the Behaviors of Signals of Interest
- Patented Processing Methods and Proprietary Algorithms

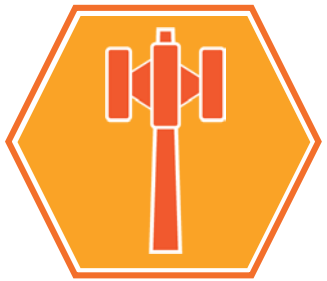
SIGNAL EXAMPLES

Push-to-Talk Radios

Satellite Phones

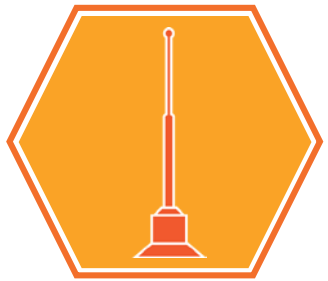
Maritime Radars

Very Small Aperture Terminals



Cellular Towers

Automatic Identification System (AIS)



FM Radio Broadcast

Emergency Radiobeacons

SPECTRUM AWARENESS

HawkEye 360's Core Product Line

- **RFGeo™** — Signal identification and geolocation
- **RFMosaic™** — Visualize signal energy across regions
- **EmitterDB™** — Database of radio frequency emitters

RFGeo™
Available Now

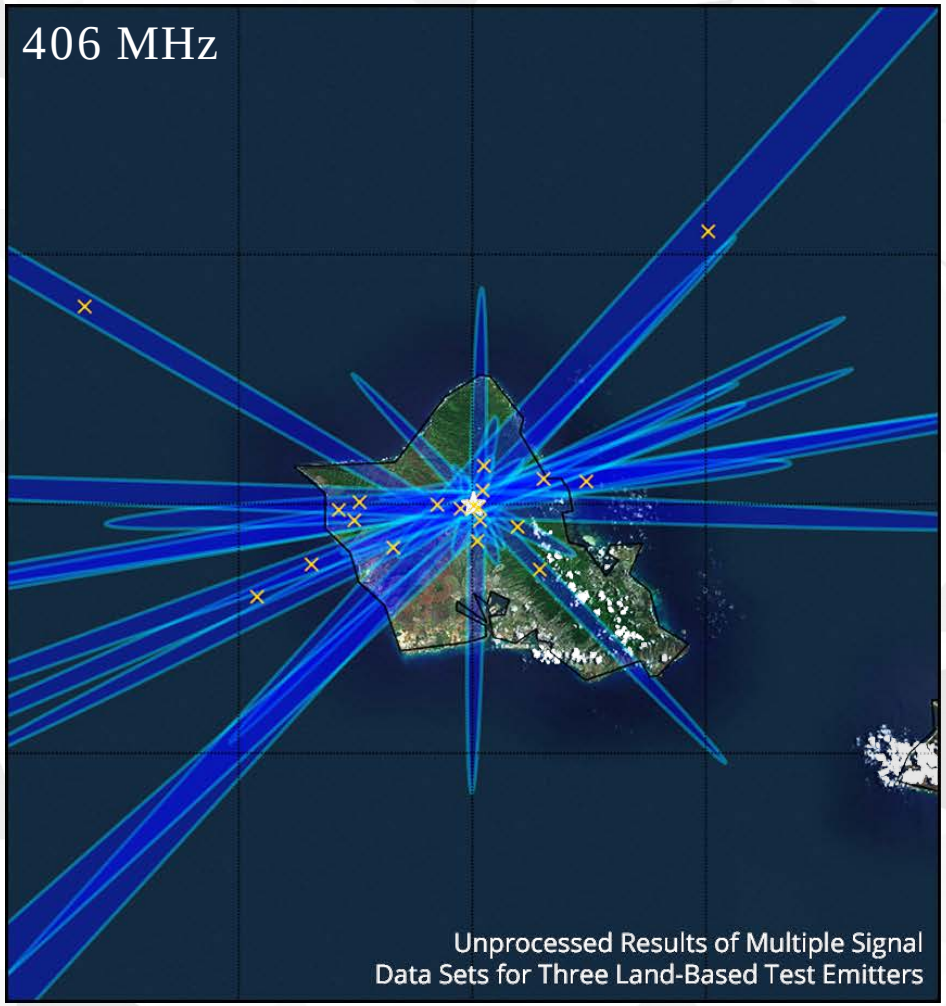
RFMosaic™
Coming July 2019

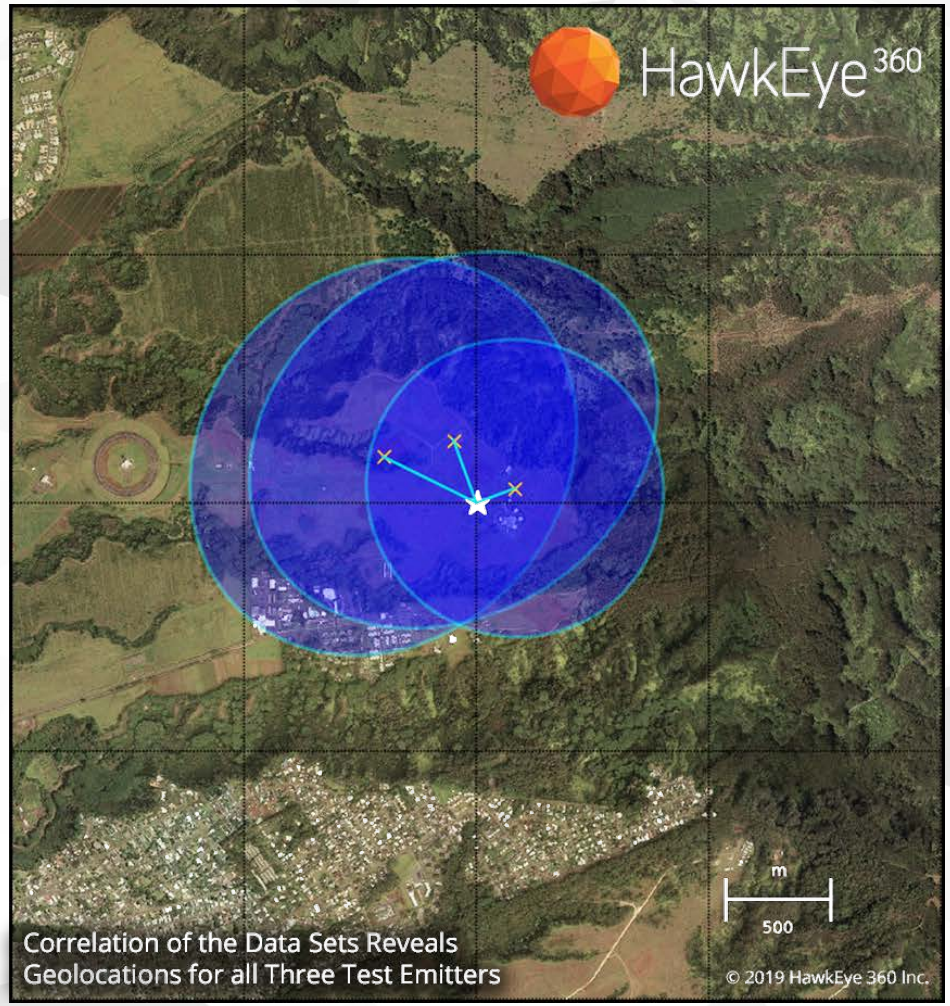
EmitterDB™
Coming October 2019

RADIO ASTRONOMY FREQUENCY BANDS

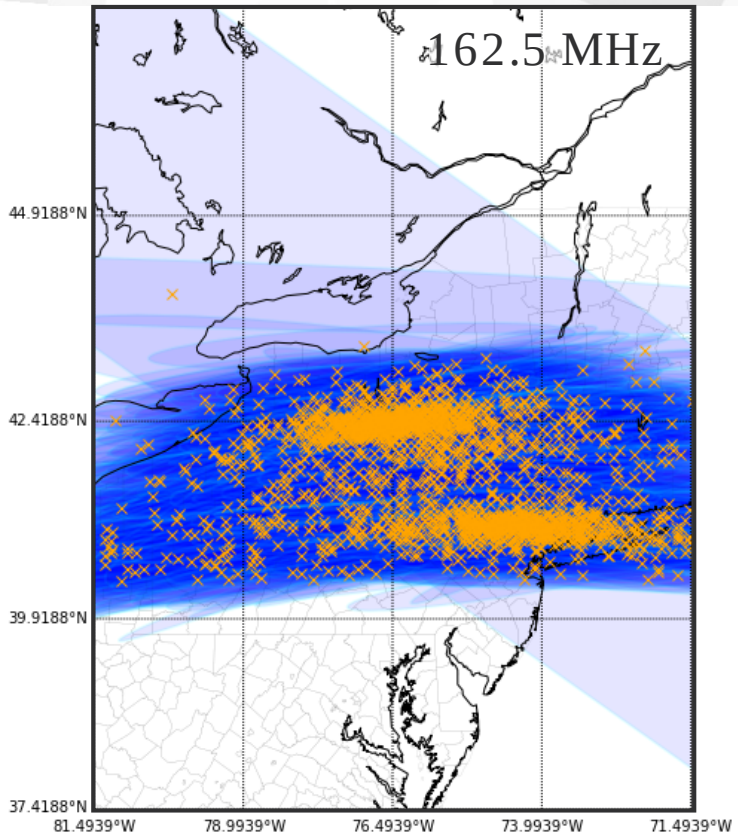
- **Many Radio Astronomy bands defined by the IAU are covered by Cluster 1:**
  - 150.05 - 153 MHz
  - 322 - 328.65 MHz
  - 406.1 - 410 MHz
  - 1400 - 1427 MHz
  - 1610.6 - 1613.8 MHz
  - 1660 - 1660.5 MHz
  - 1660.5 - 1668.4 MHz
  - 1668.4 - 1670 MHz
  - 2655 - 2670 MHz
  - 2670 - 2690 MHz
  - 2690 - 2700 MHz
  - 4800 - 4990 MHz
  - 4990 - 5000 MHz
  - 10.6 - 10.68 GHz
  - 10.68 - 10.7 GHz
  - 14.47 - 14.5 GHz
  - 14.8 - 15.35 GHz
- **Future clusters may include expanded range beyond 15 GHz**

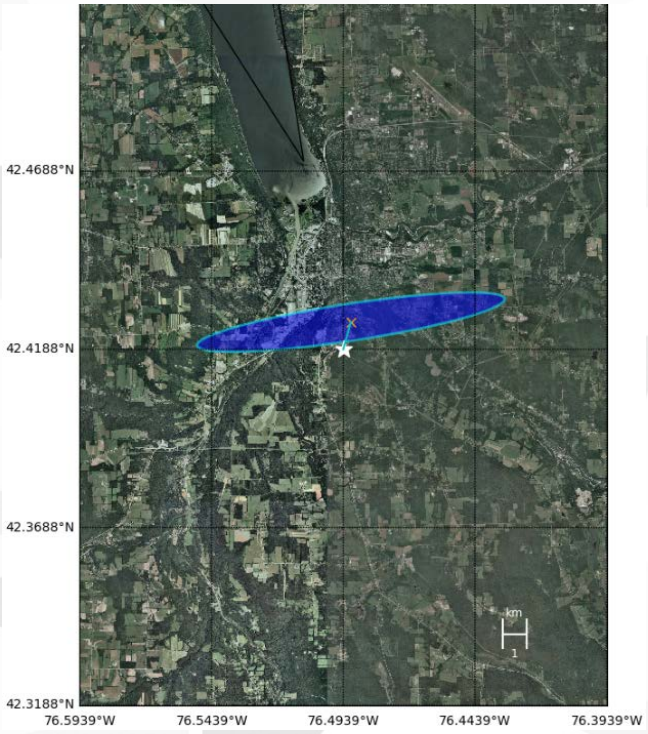
EXAMPLE- EPIRB SIGNAL GEOLOCATIONS



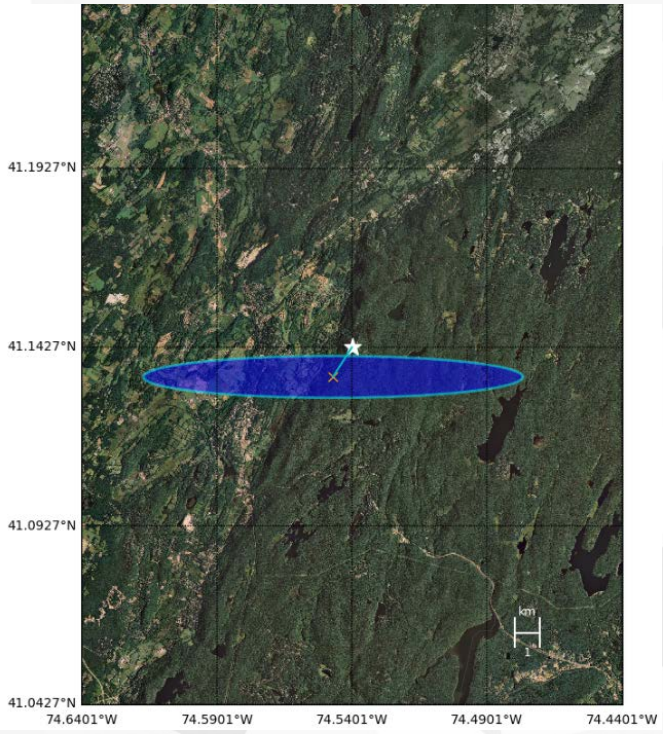


EXAMPLE- NOAA WEATHER SIGNAL GEOLOCATIONS



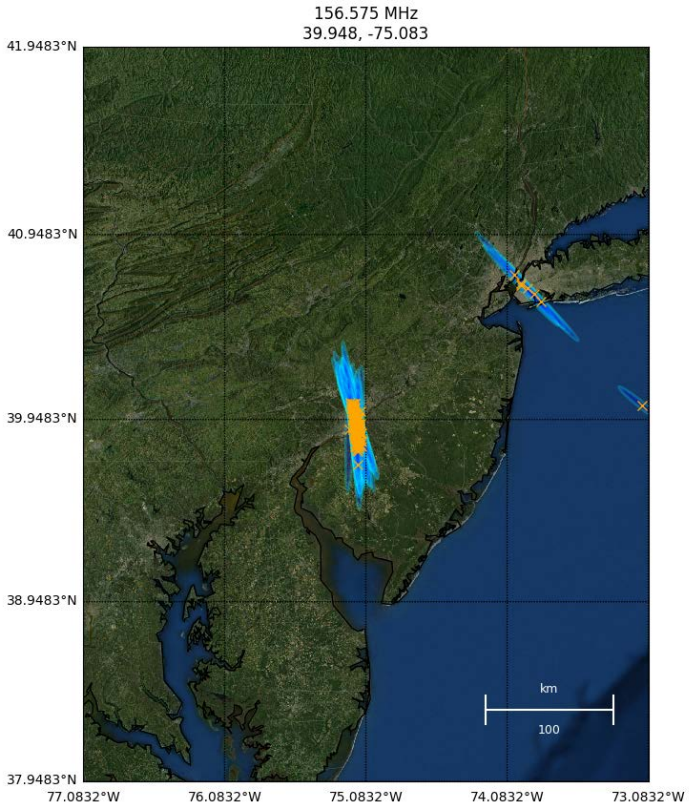


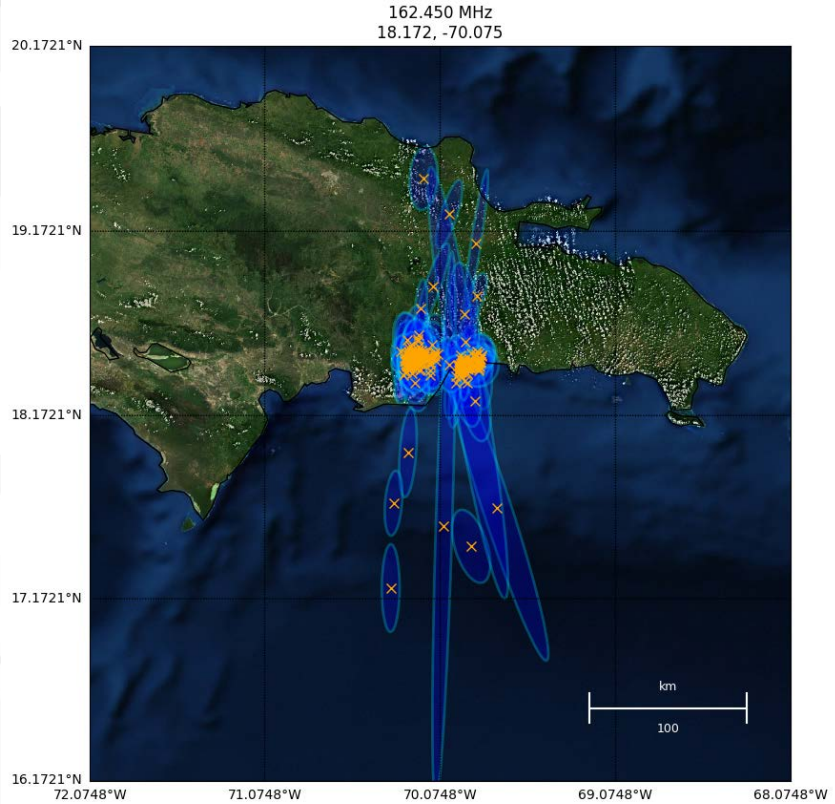
Ithaca, NY

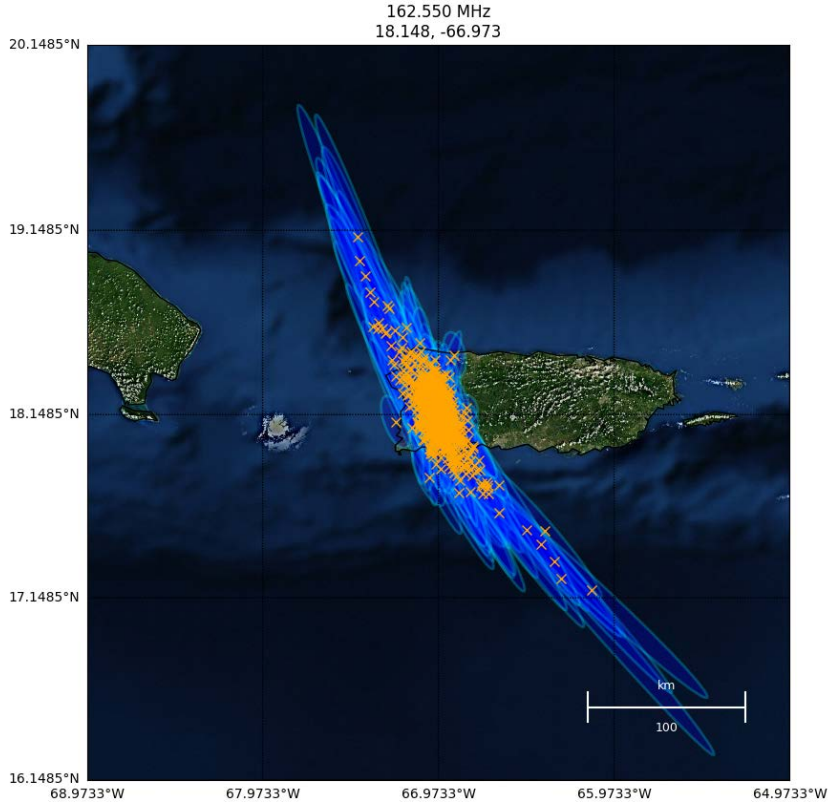


Hardyston, NJ

EXAMPLE – VHF SURVEYS







CONCLUSION

HawkEye 360's unique source of RF analytics may be able to help identify interference across Radio Astronomy bands

Contact HawkEye 360 if you'd like more information

www.he360.com