PNNL-SA-153185

Impact of Civilian Nuclear Emissions

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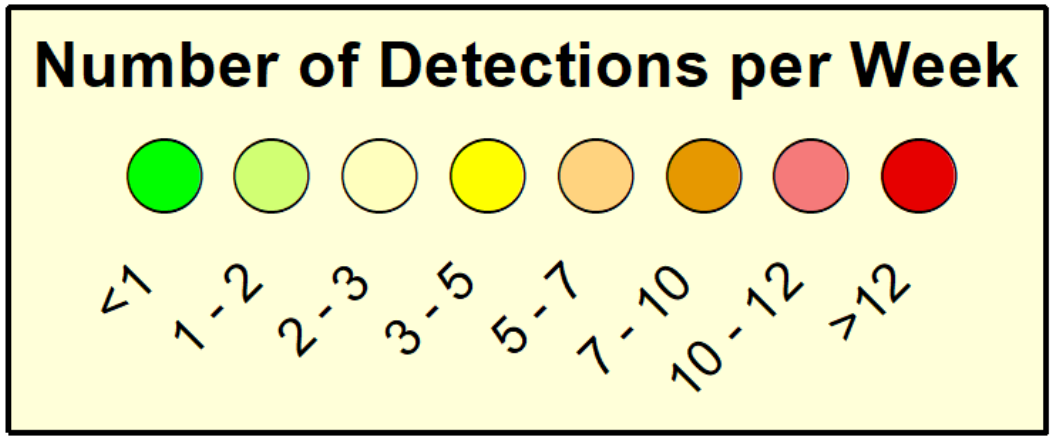
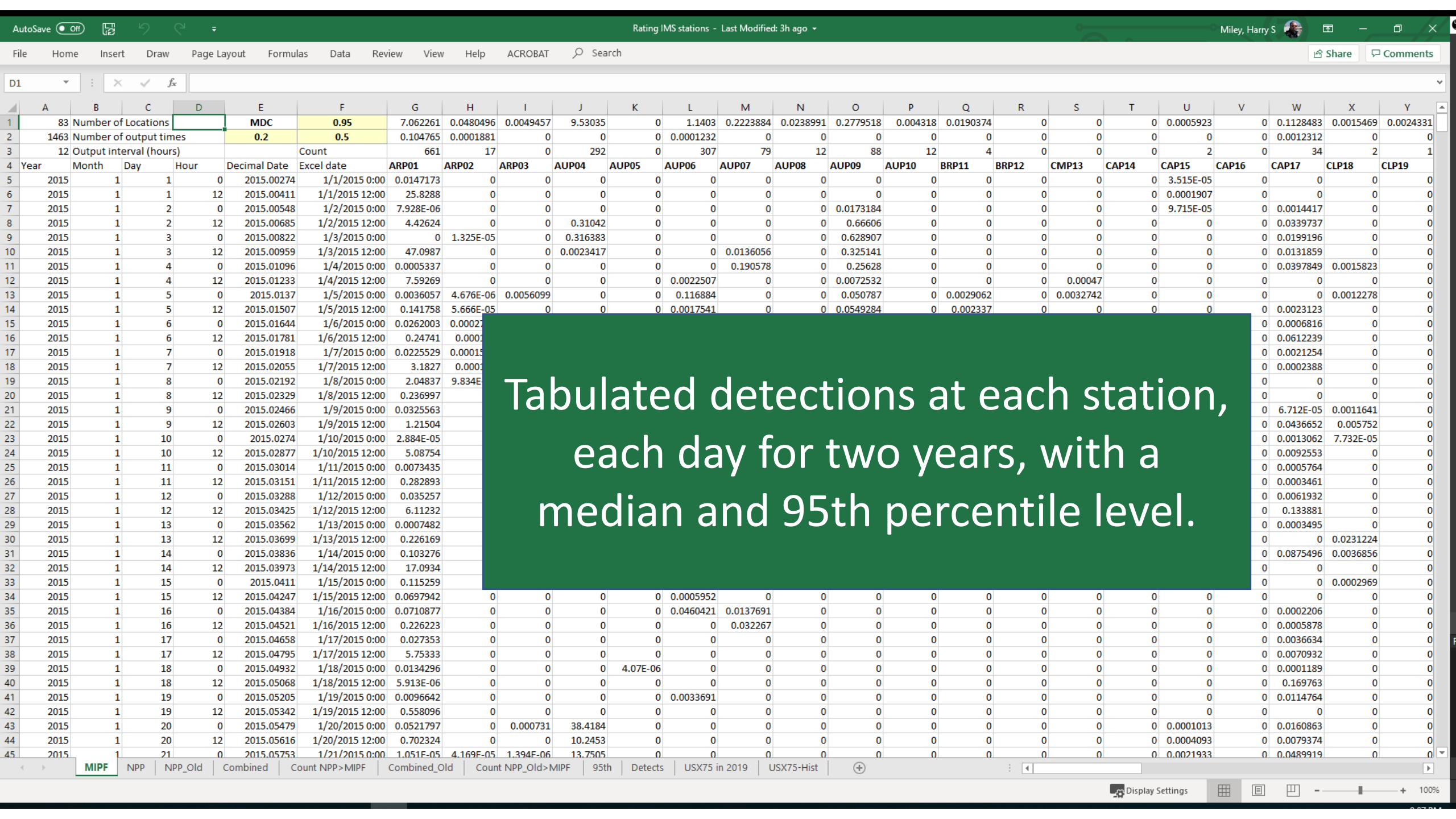
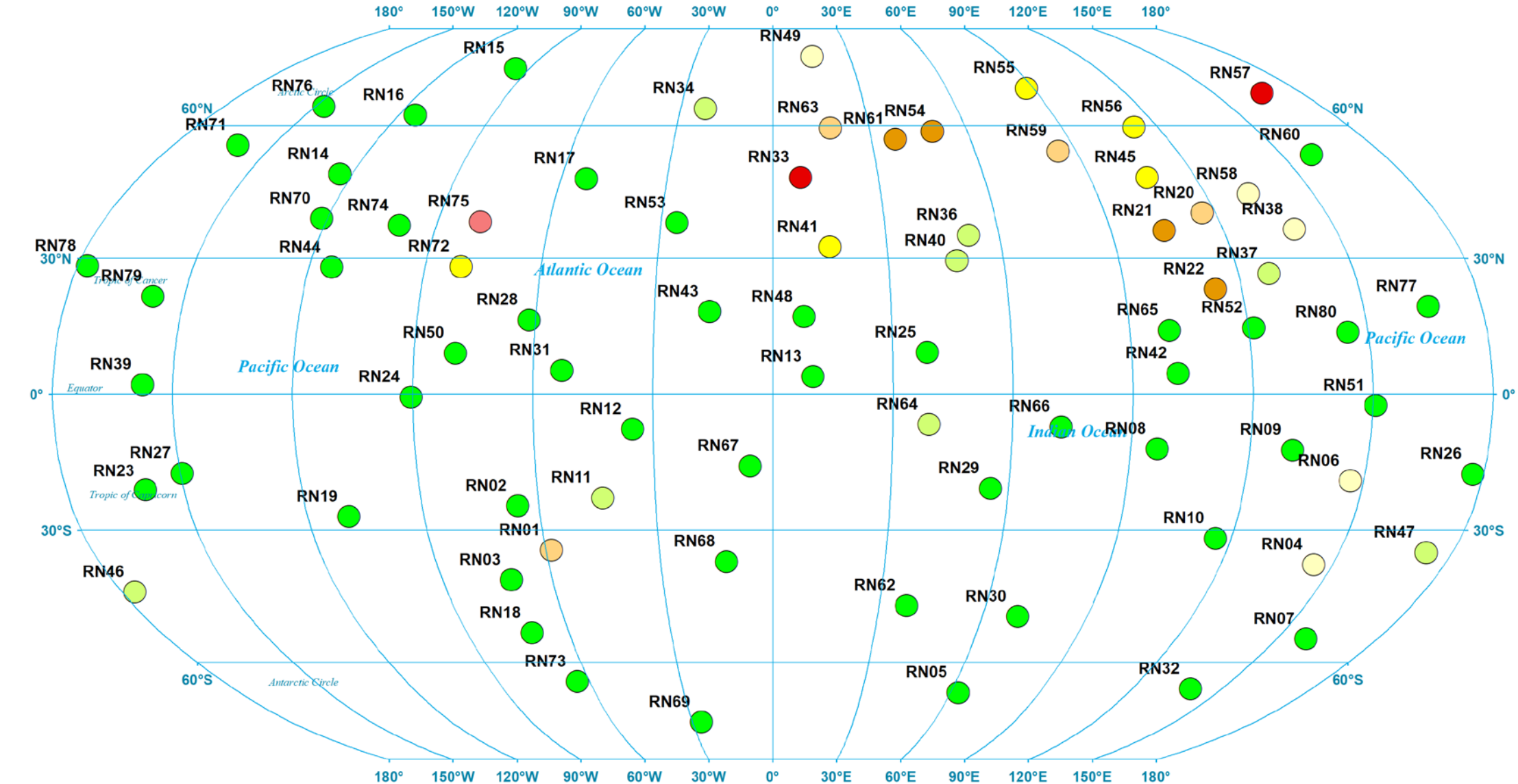


Xenon Backgrounds

- Goal
  - Estimate the xenon background and variability for the 79 IMS RN stations
  - From nuclear power plants (NPP) and from medical isotope production (MIP)
- Approach
  - Rates of leakage from scientific literature
  - Two years of forward calculations from all known locations
  - Assume the same xenon monitoring system at each place (SAUNA)

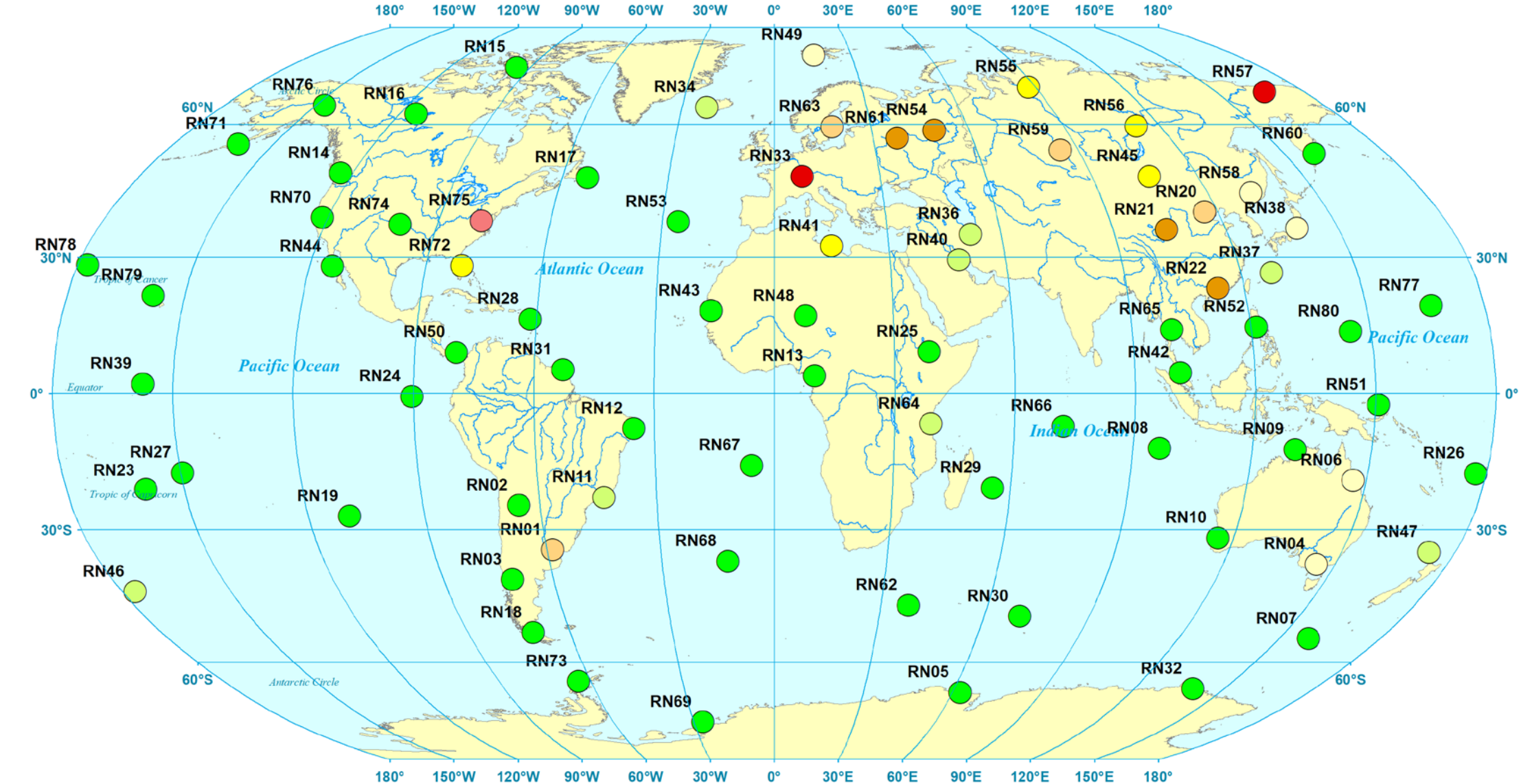

AutoSave Off
Rating IMS stations - Last Modified: 3h ago
Miley, Harry S
File Home Insert Draw Page Layout Formulas Data Review View Help ACROBAT Search
Share Comments
D1
Tabulated detections at each station, each day for two years, with a median and 95th percentile level.
MIPF NPP NPP_Old Combined Count NPP>MIPF Combined_Old Count NPP_Old>MIPF 95th Detects USX75 in 2019 USX75-Hist
Display Settings
100%



Number of Detections per Week

<1 1 - 2 2 - 3 3 - 5 5 - 7 7 - 10 10 - 12 >12

Number of Modeled ^{133}Xe Concentrations from Combined MIPF and NPP Releases per Week that Exceed a Detection Limit of 0.2 mBq/m^3 in 12-hour Samples

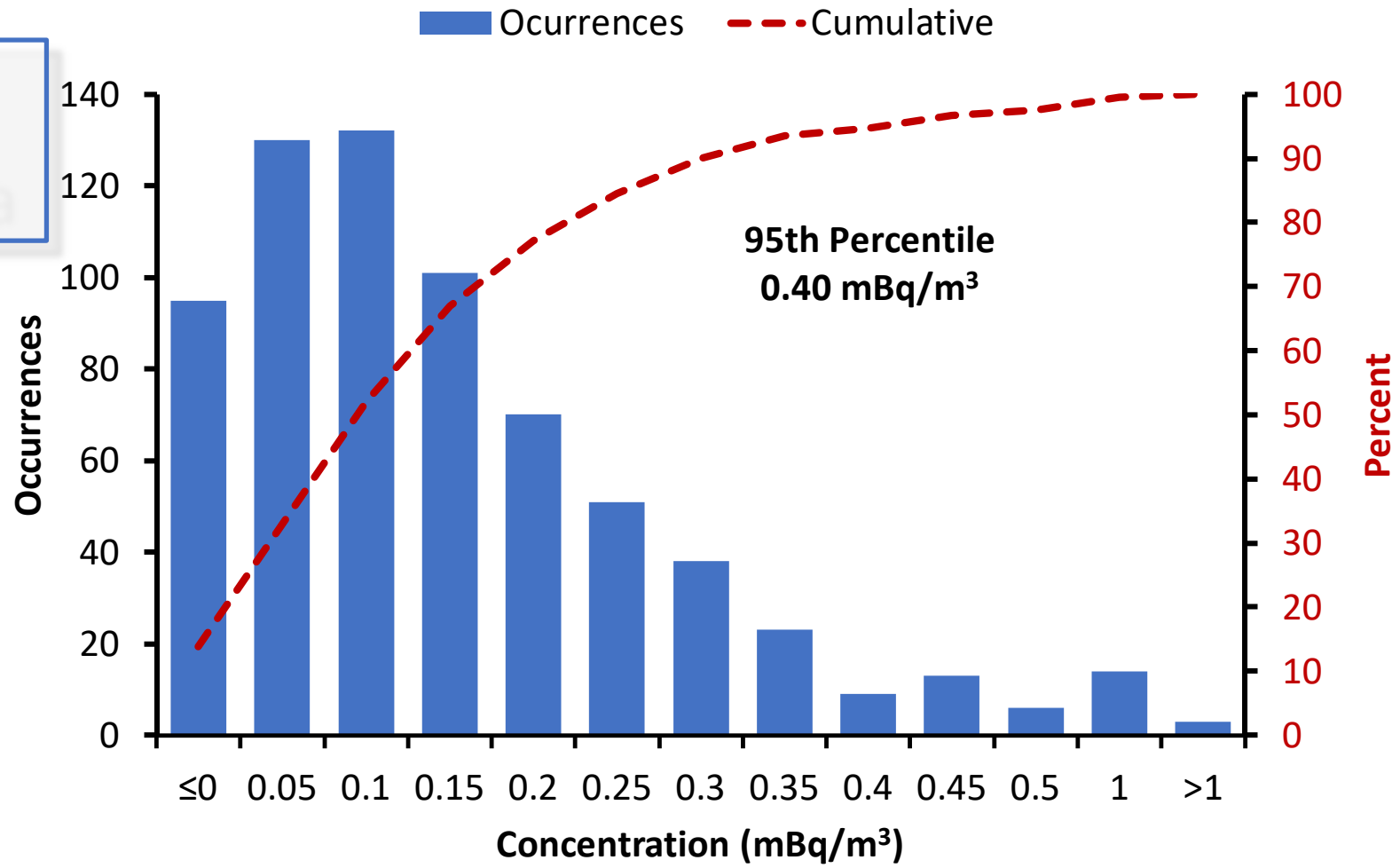


Number of Detections per Week

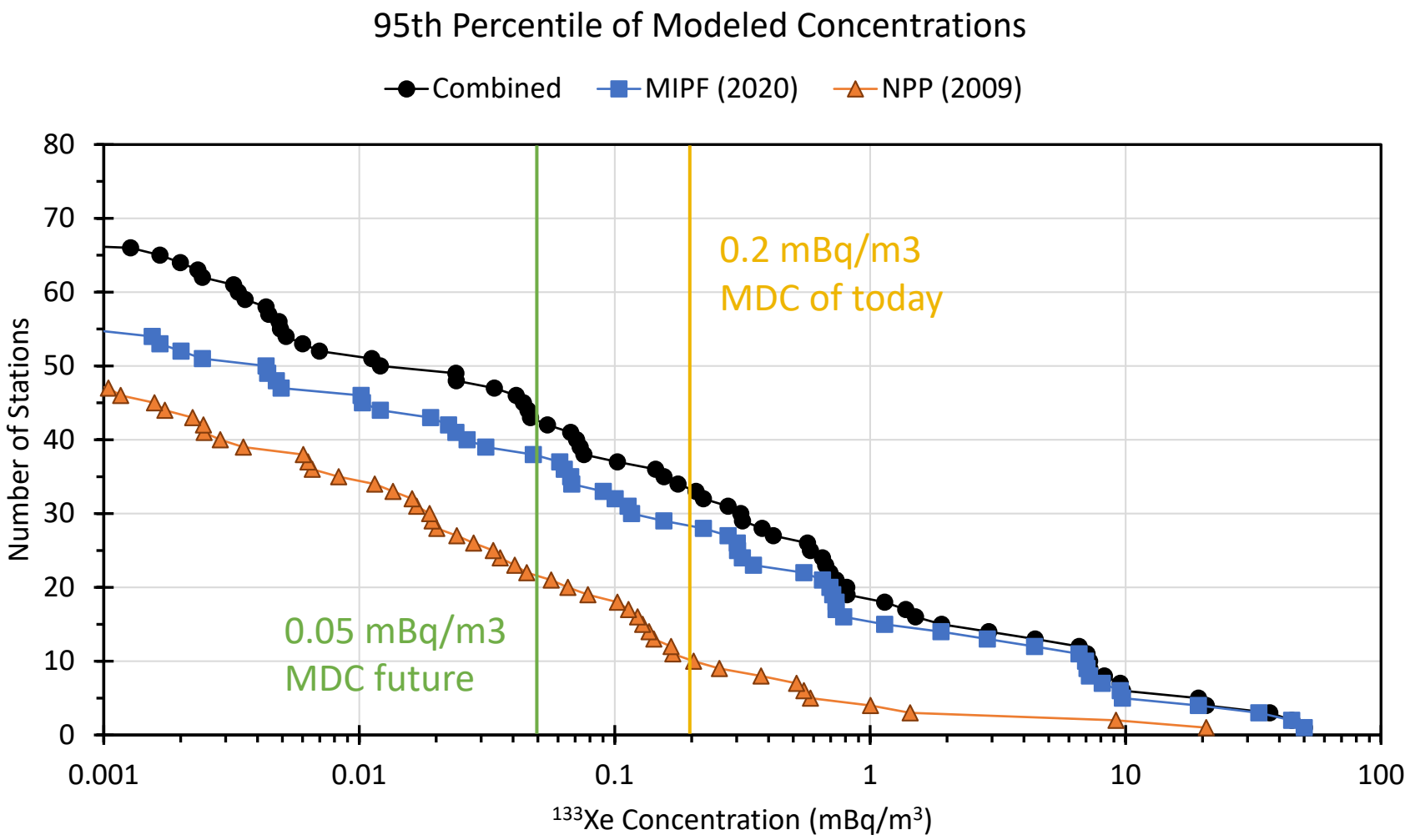
Number of Modeled ^{133}Xe Concentrations from Combined MIPF and NPP Releases per Week that Exceed a Detection Limit of 0.2 mBq/m^3 in 12-hour Samples

Why is 95th percentile so important?
-- *Or* --
What is an anomaly?

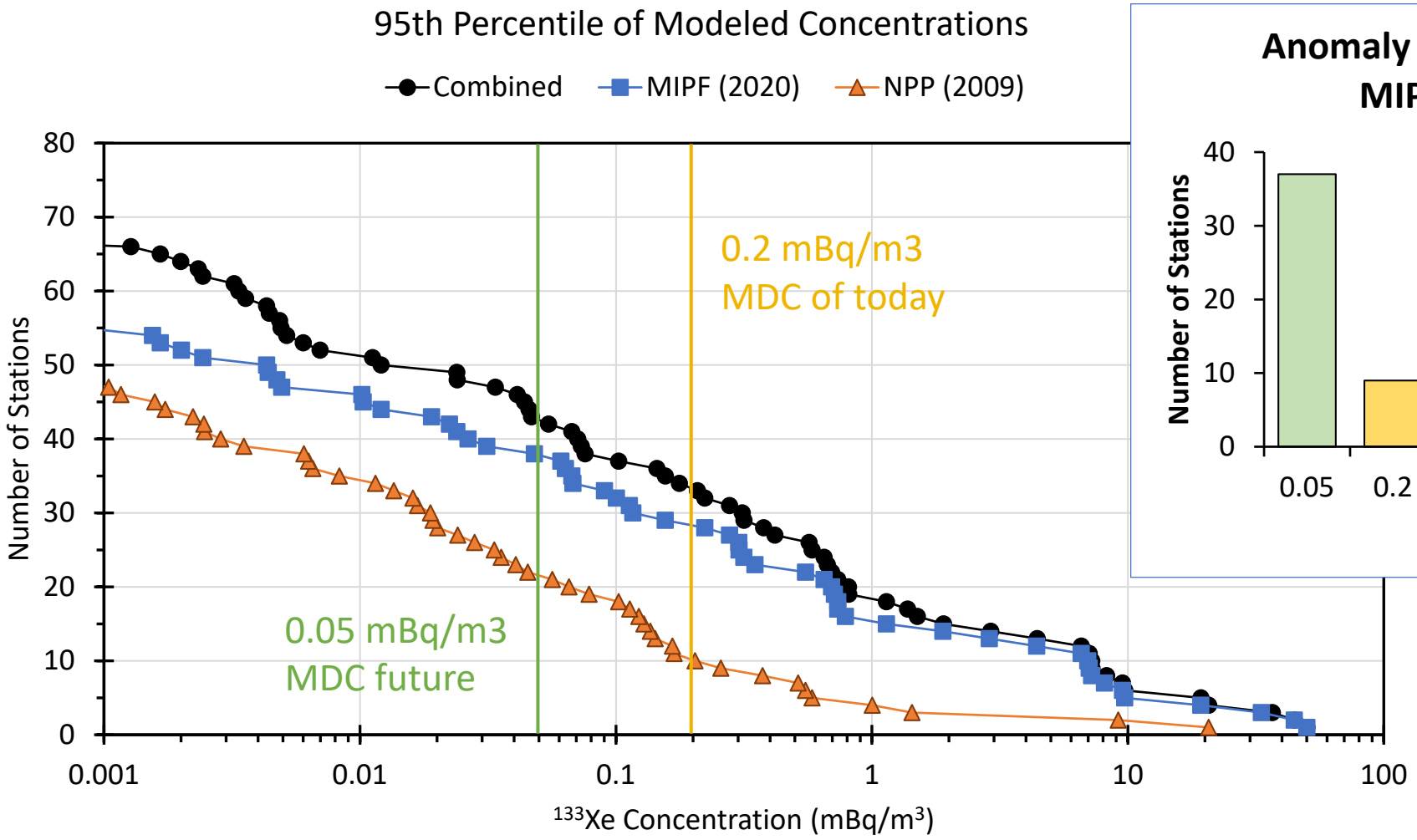
JPX38 Takasaki, Japan
One year of ^{133}Xe data

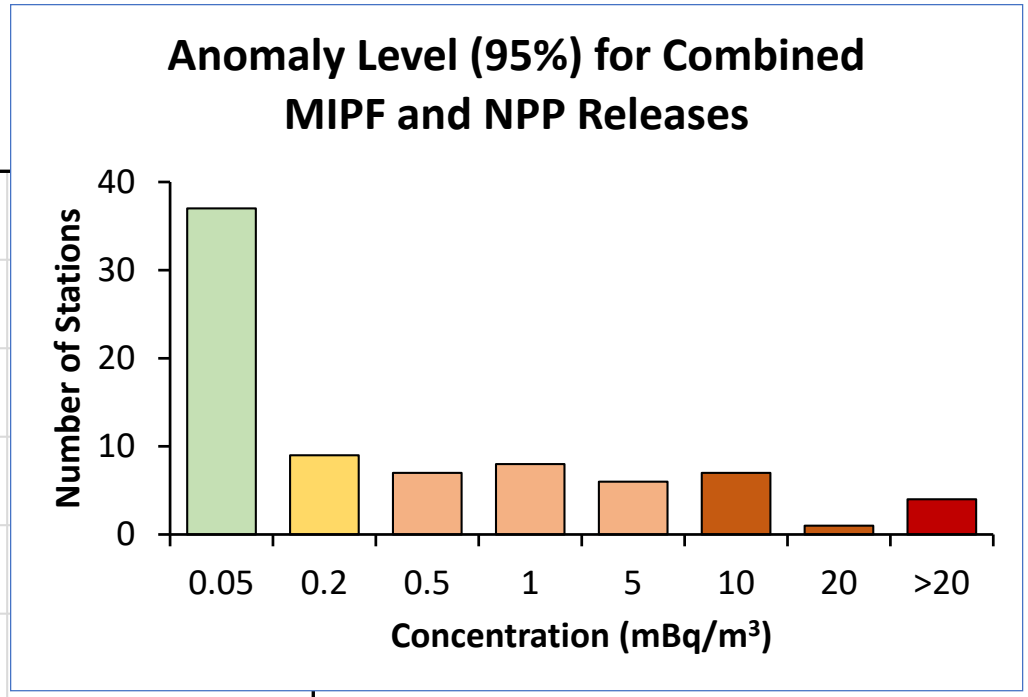


How much xenon is needed for an anomaly?



How much xenon is needed for an anomaly?





Summary/Conclusions

- We tested an approach to examine the challenges at IMS station locations.
- Today we have a clearer picture of where NPP emissions are important, and where the greatest background challenges are.
- In future work we can consider adjustments to improve data collection and analysis.