

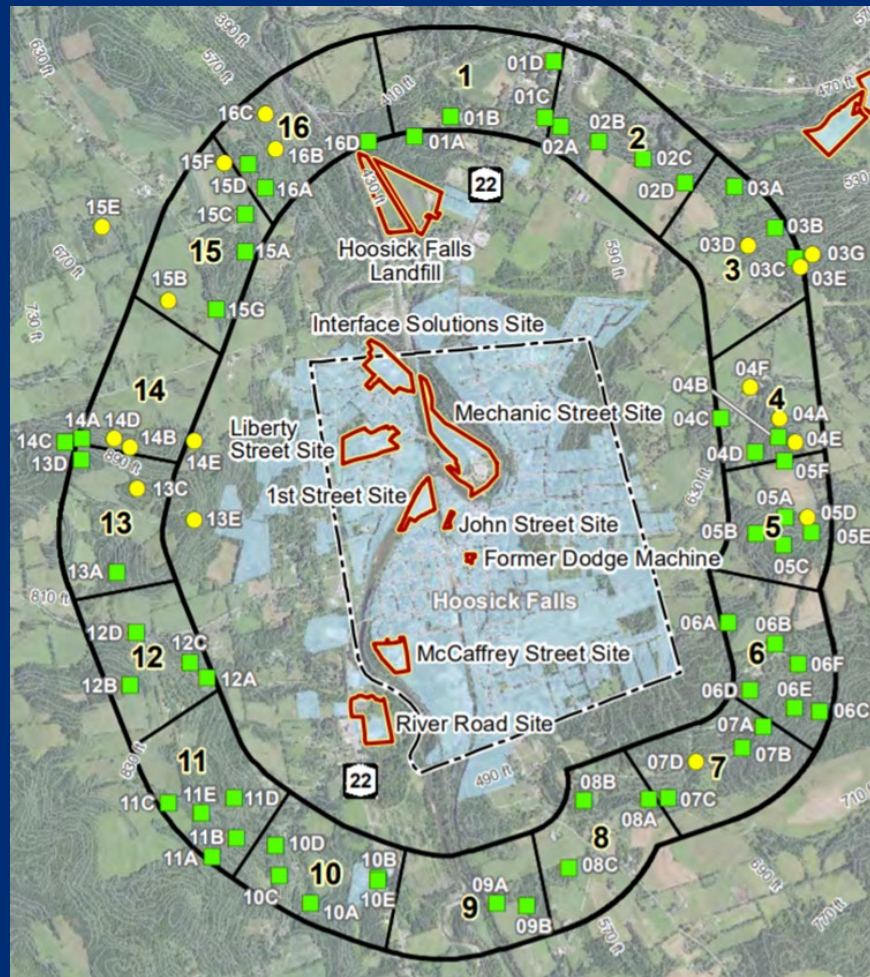


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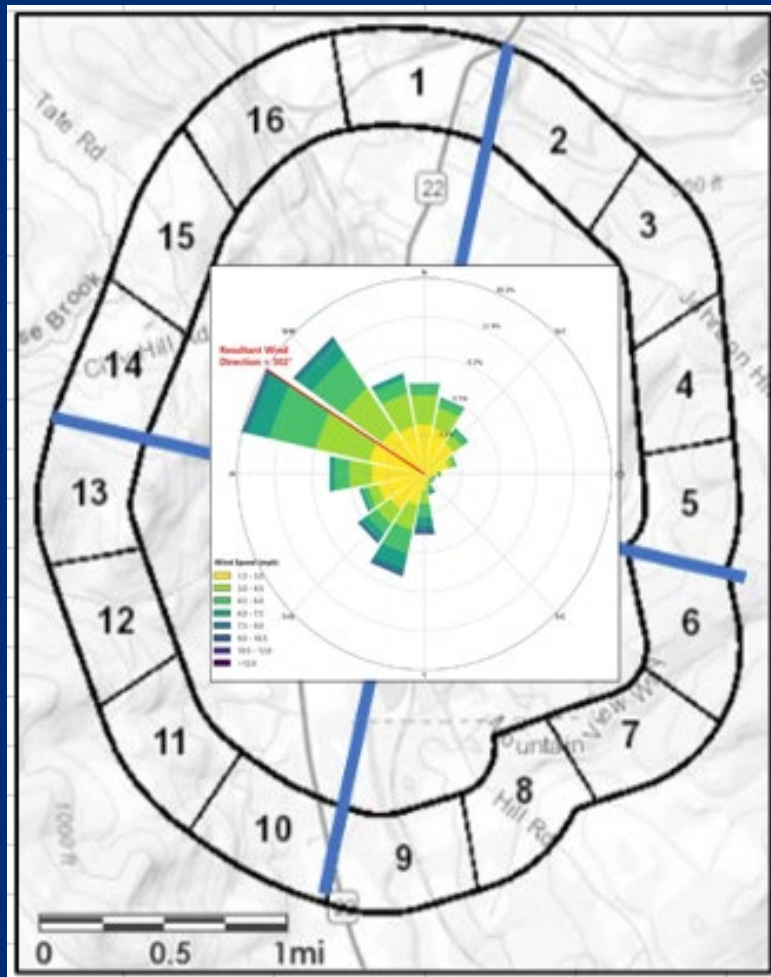
# Investigating Evidence for Aerial Transport and Deposition of PFAS through Soil Sampling

**Donald Ward Jr., Ph.D.; NYS Department of Environmental Conservation**  
**NEWMOA's Science of PFAS: Public Health & Environment Conference**  
**Track 1: Environmental Behavior**  
**Session 1: Air Emission Impacts to Soil & Groundwater**  
**April 5, 2022**

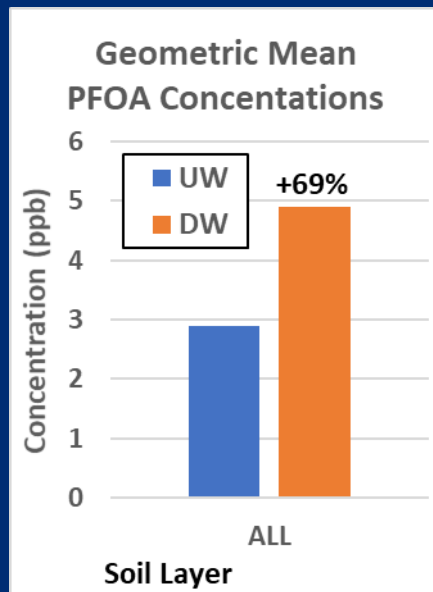
# Hoosick Falls Environmental Sampling Study Design



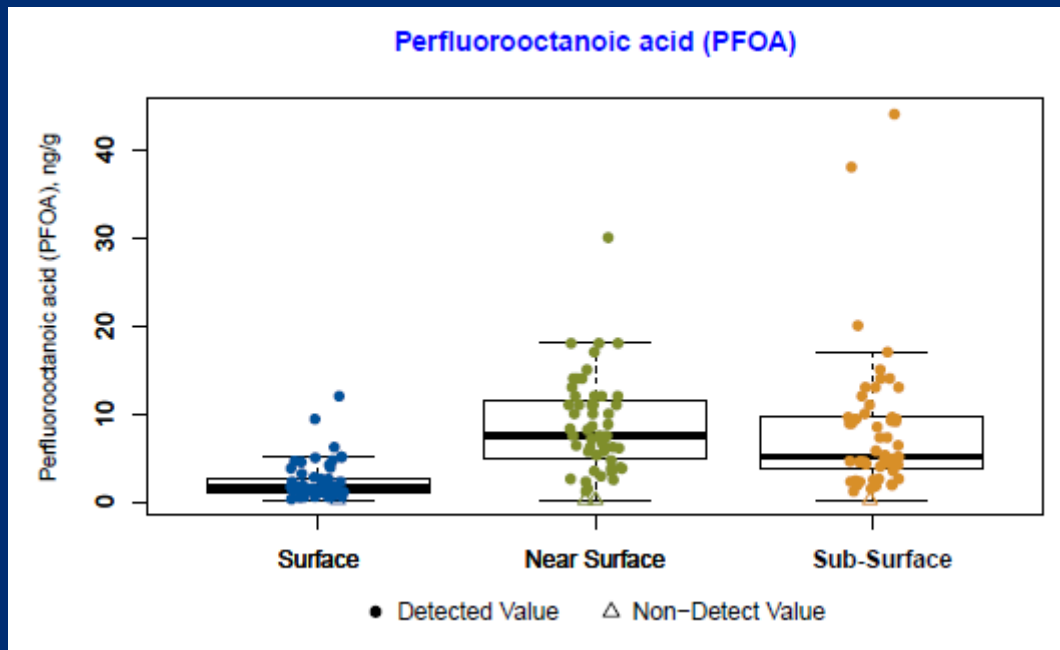
# Hoosick Falls Environmental Sampling Study Design



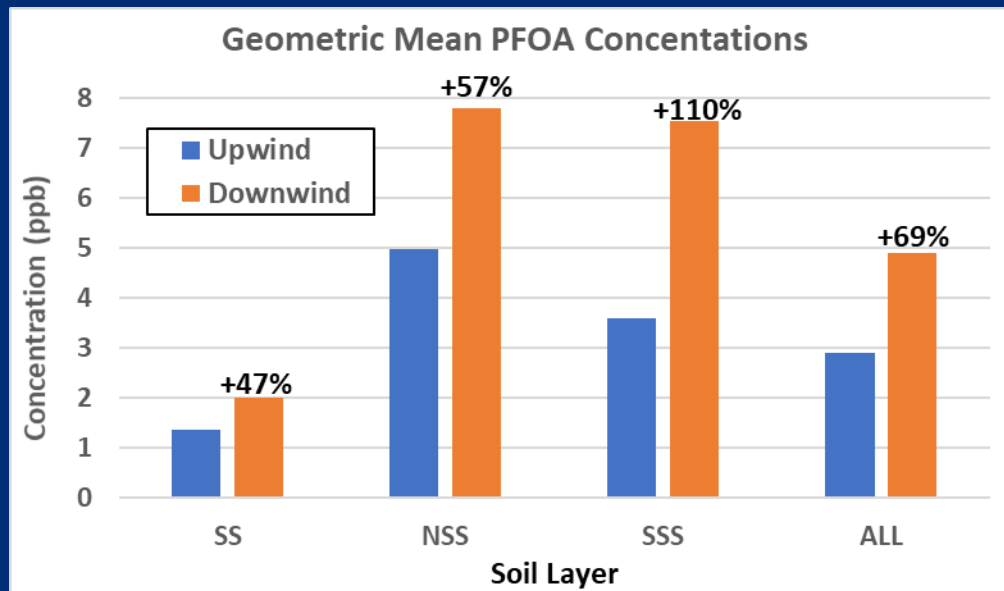
# Soil PFOA Concentrations Upwind vs Downwind



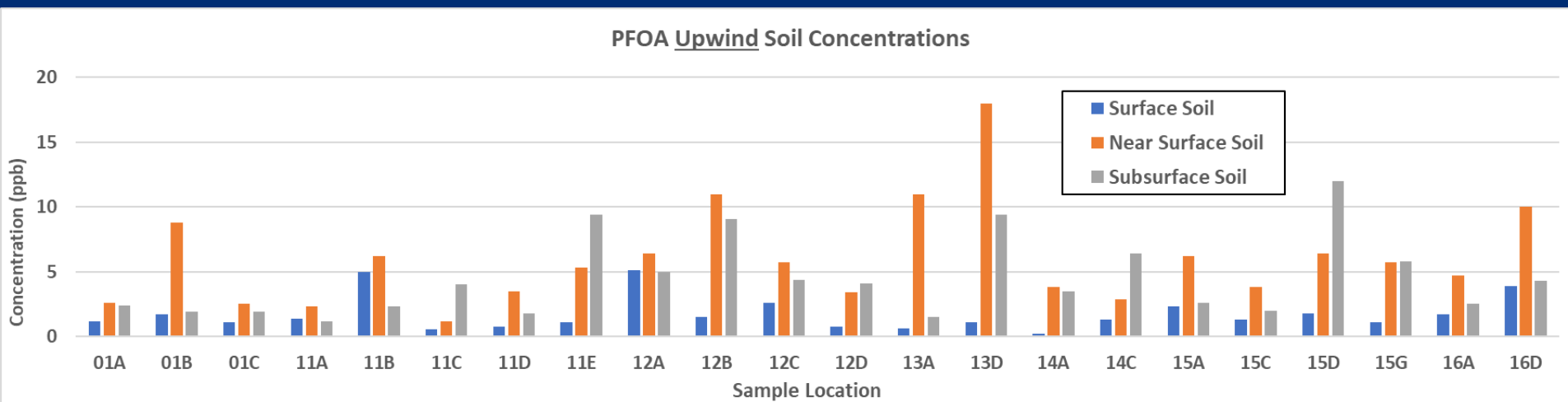
# Soil PFOA Concentrations by Layer



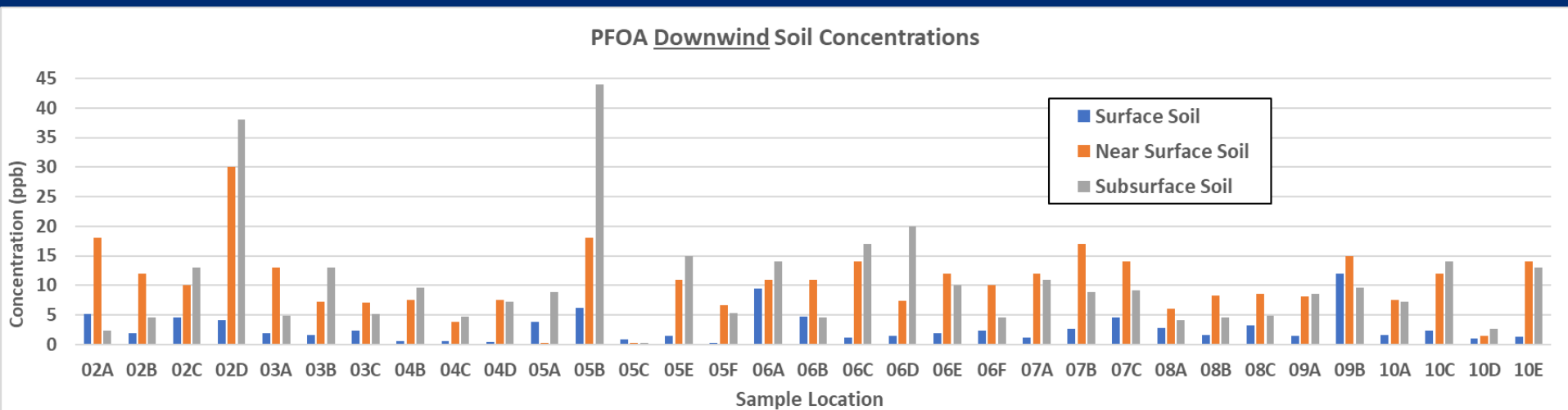
# Soil PFOA Concentrations Upwind vs Downwind



# Upwind Soil PFOA Concentrations by Layer

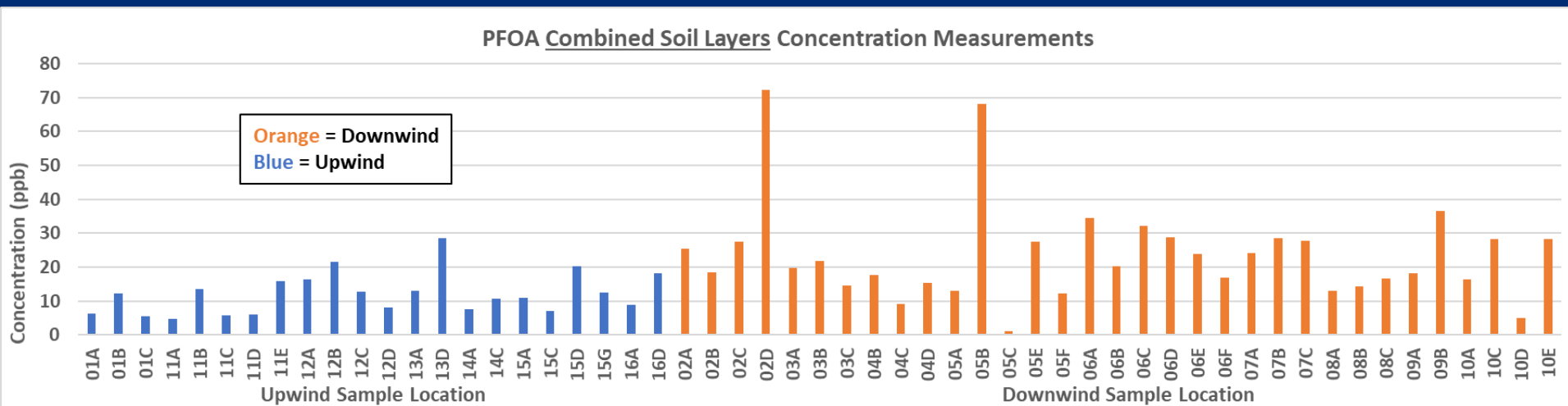


# Downwind Soil PFOA Concentrations by Layer

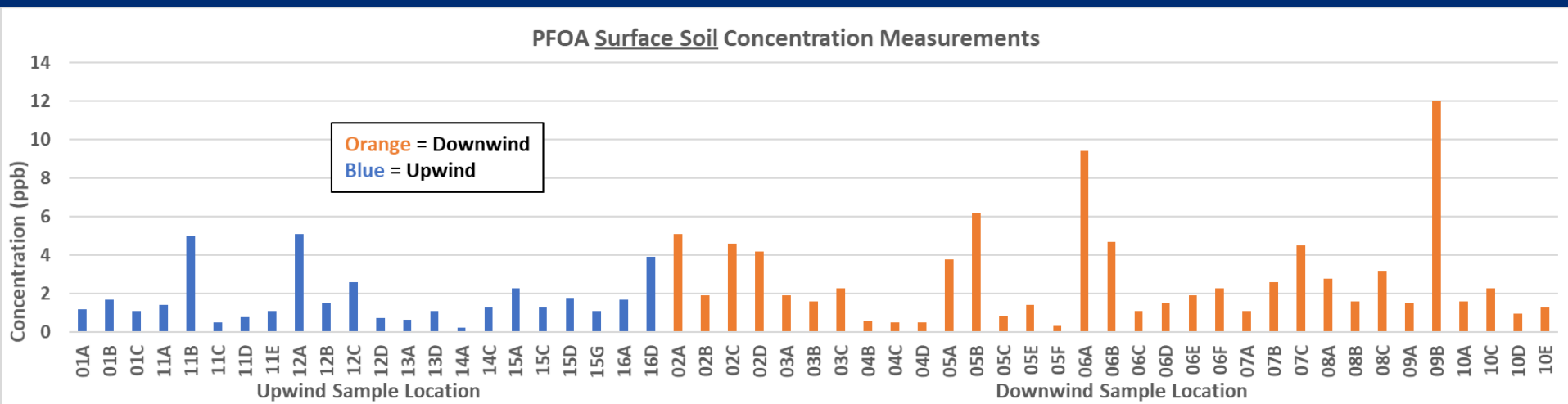




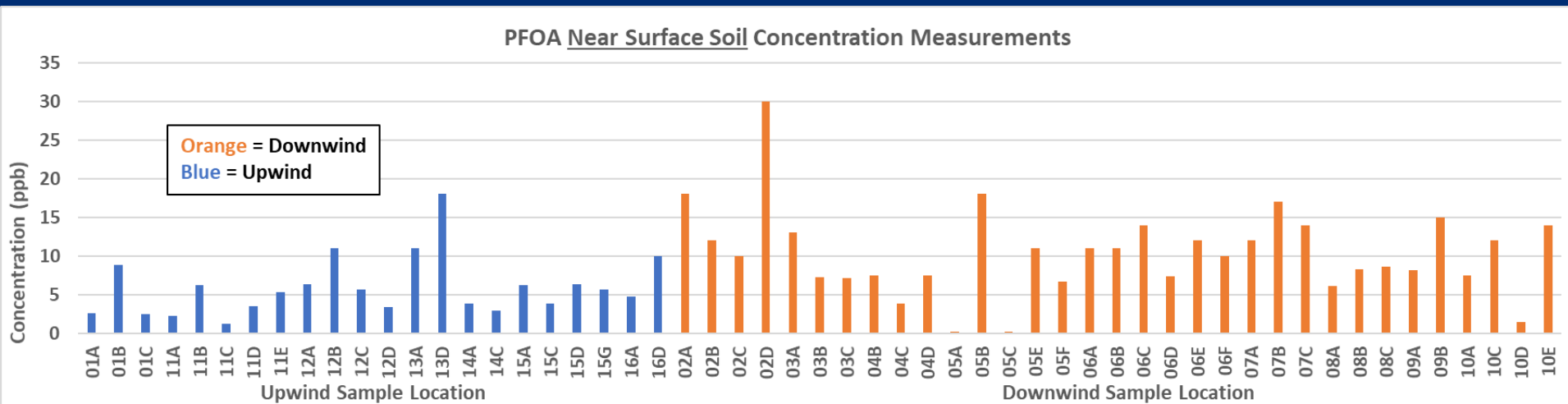
# Combined Soil Layers PFOA Conc.s by Location



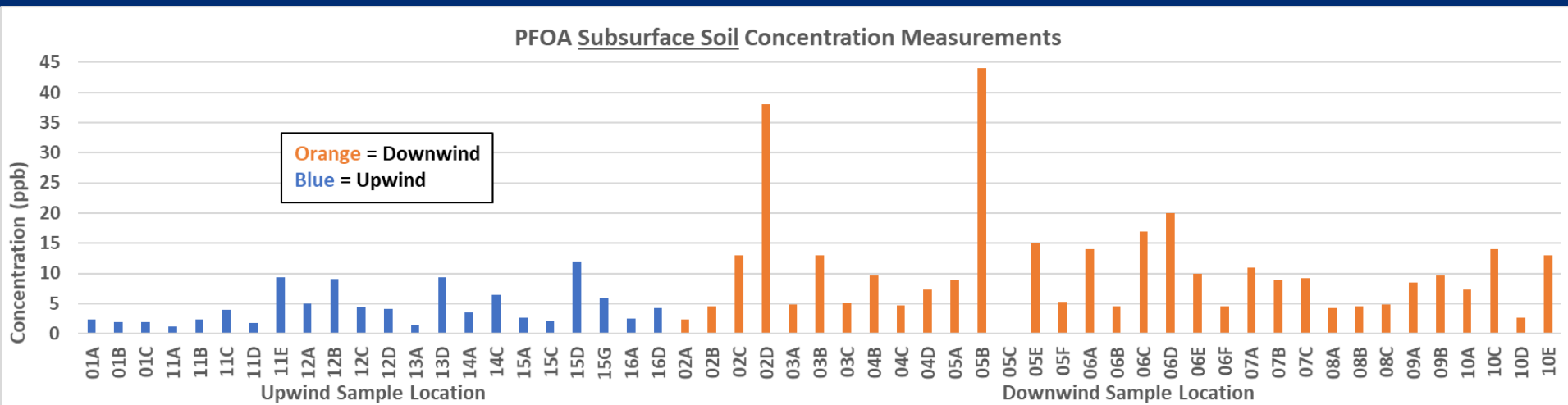
# Surface Soil Layer PFOA Conc.s by Location



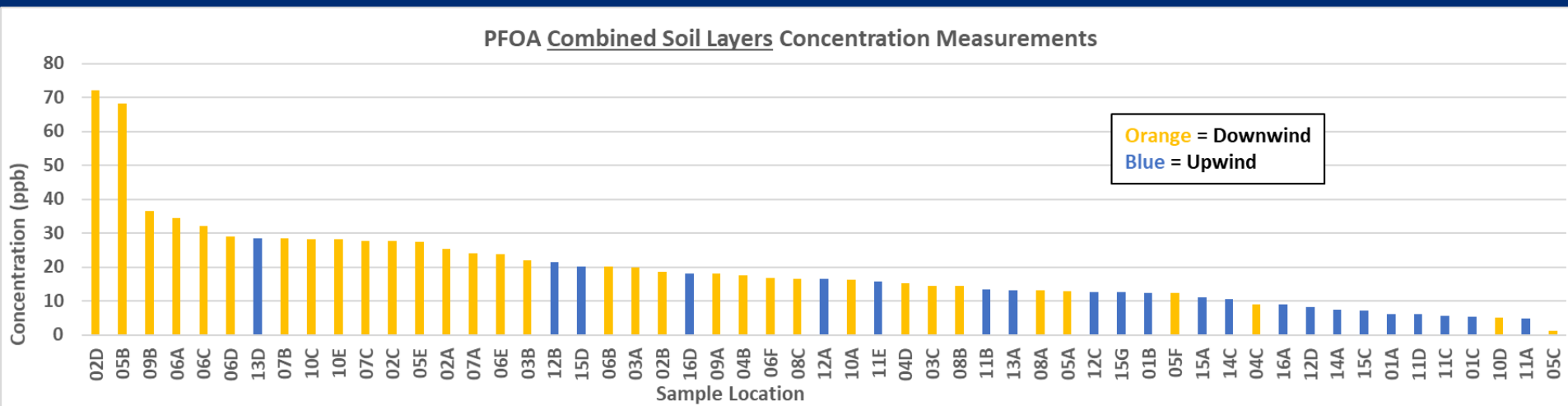
# Near Surface Soil Layer PFOA Conc.s by Location



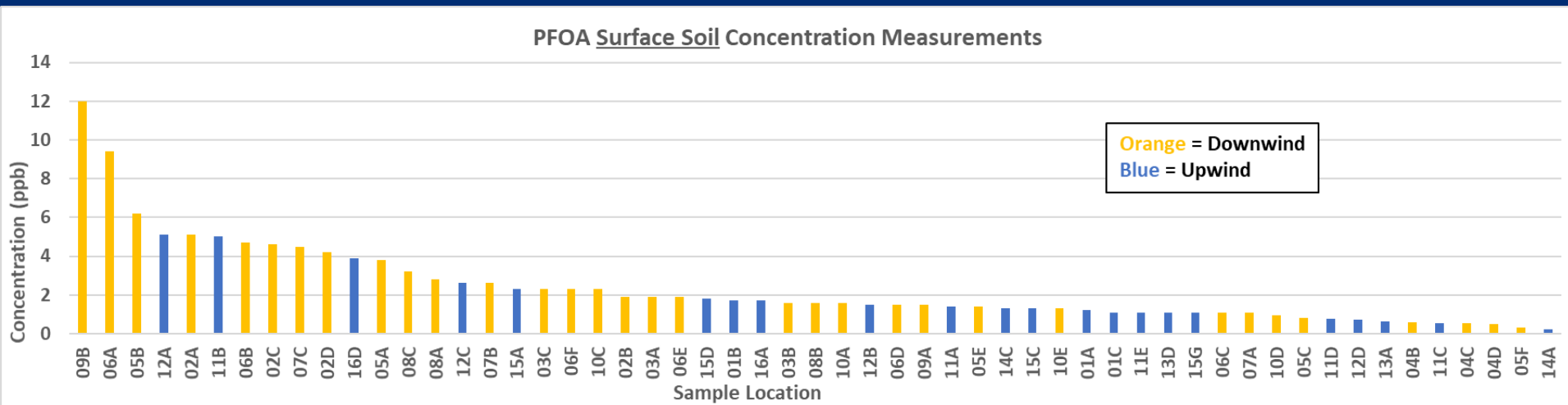
# Subsurface Soil Layer PFOA Conc.s by Location



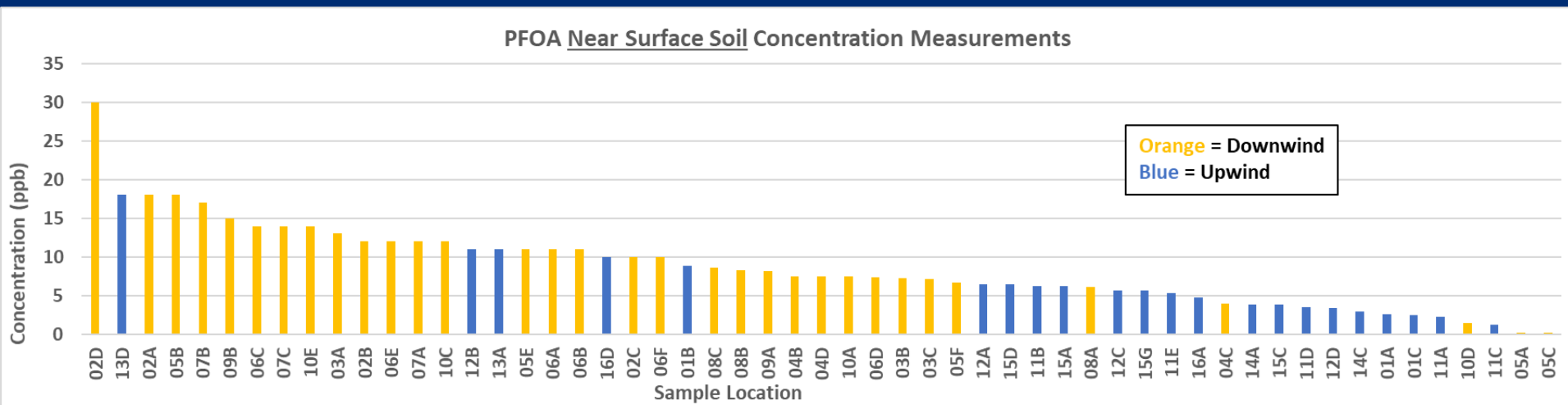
# Sorted Combined Soil Layers PFOA Conc.s by Loc.



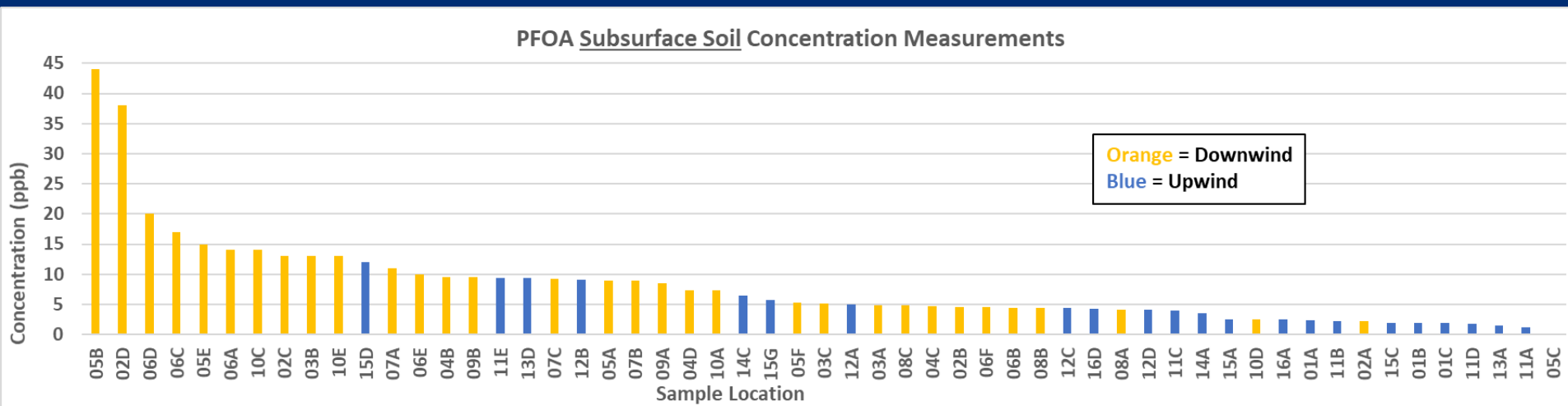
# Sorted Surface Soil Layer PFOA Conc.s by Loc.



# Sorted Near Surface Soil PFOA Conc.s by Loc.



# Sorted Subsurface Soil Layer PFOA Conc.s by Loc.





# Norlite Environmental Sampling Report: Study Design

- Soil Samples
- Water Samples



## Wind Roses

Ezra Wind data on South Albany and Ezra Site  
Aug 2017 - Nov 2018  
Hourly wind speed and direction

### Legend: Wind Speed

- 1.0 - 4.7 (mph)
  - 4.7 - 8.1 (mph)
  - 8.1 - 12.8 (mph)
  - 12.8 - 19.7 (mph)
  - 19.7+ (mph)
- < 1.0 mph are periods of low to no winds, and are not shown

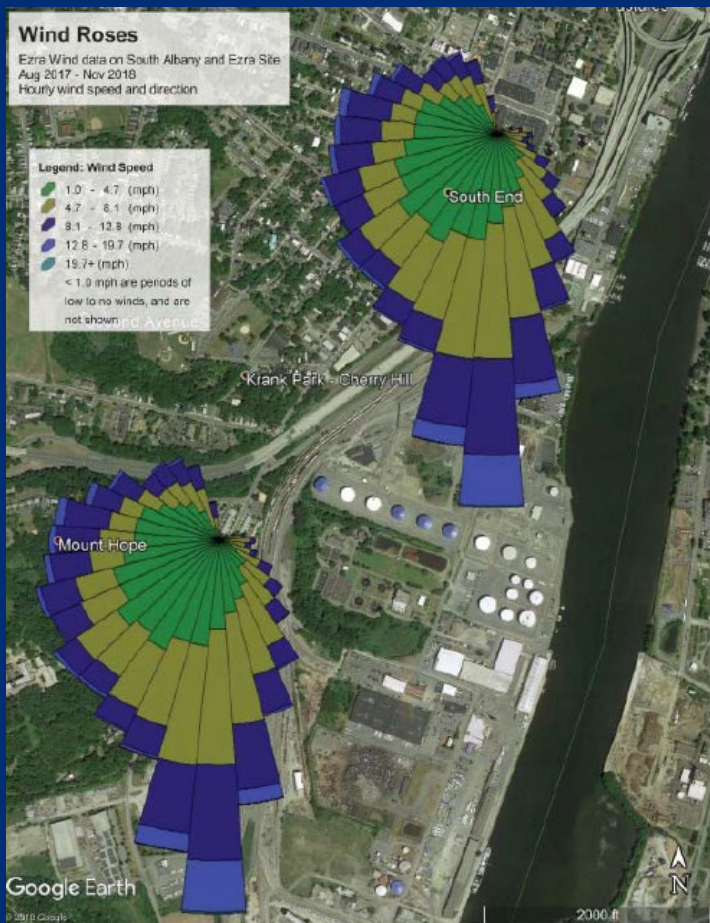
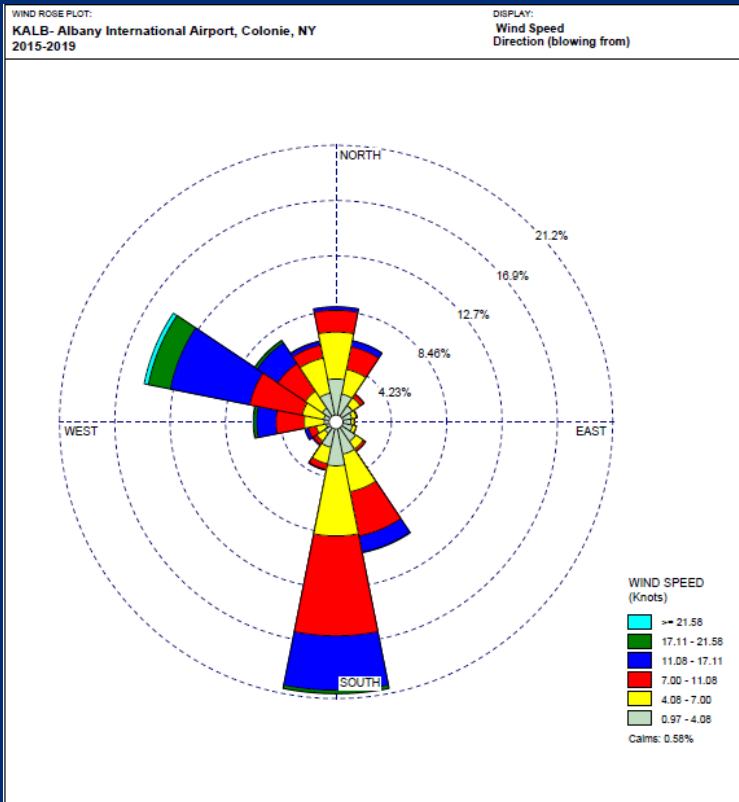


Figure 22. Wind Rose Plots for Ezra Prentice and ACHD

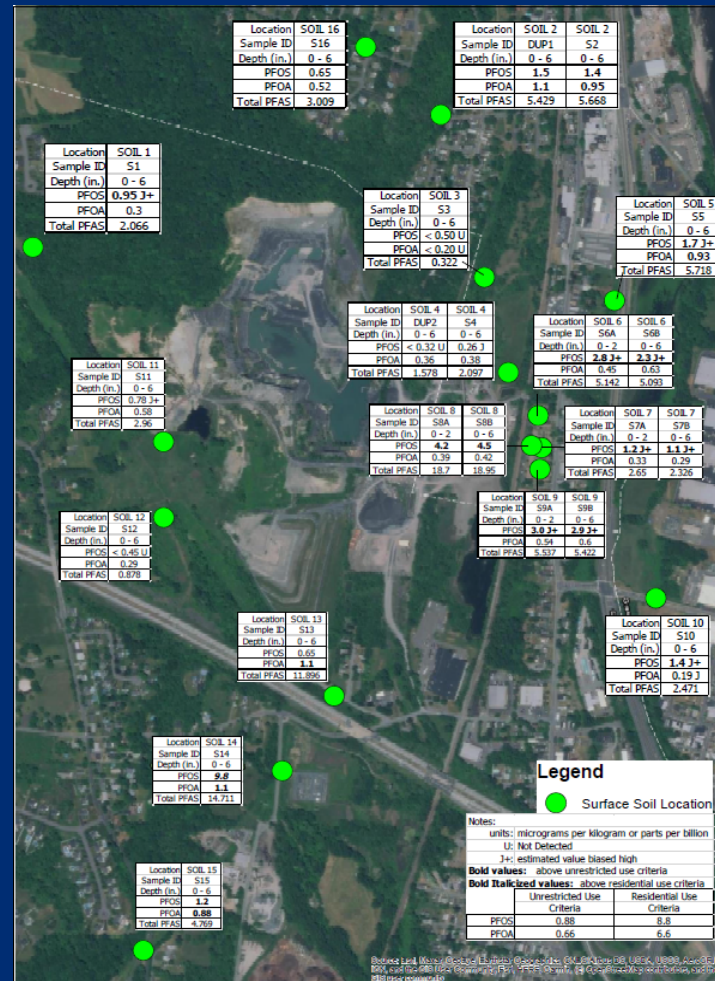
# Wind Rose Information



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# PFAS in Soils

- Low concentrations found in all samples.
- Concentrations of PFOA and PFOS in soils do not indicate a human health risk.
- Soil sample results at Saratoga Sites are all below residential guidance values.
- One sampling location was greater than the residential value; this location is not a residential property.



# Soil Concentrations Comparison

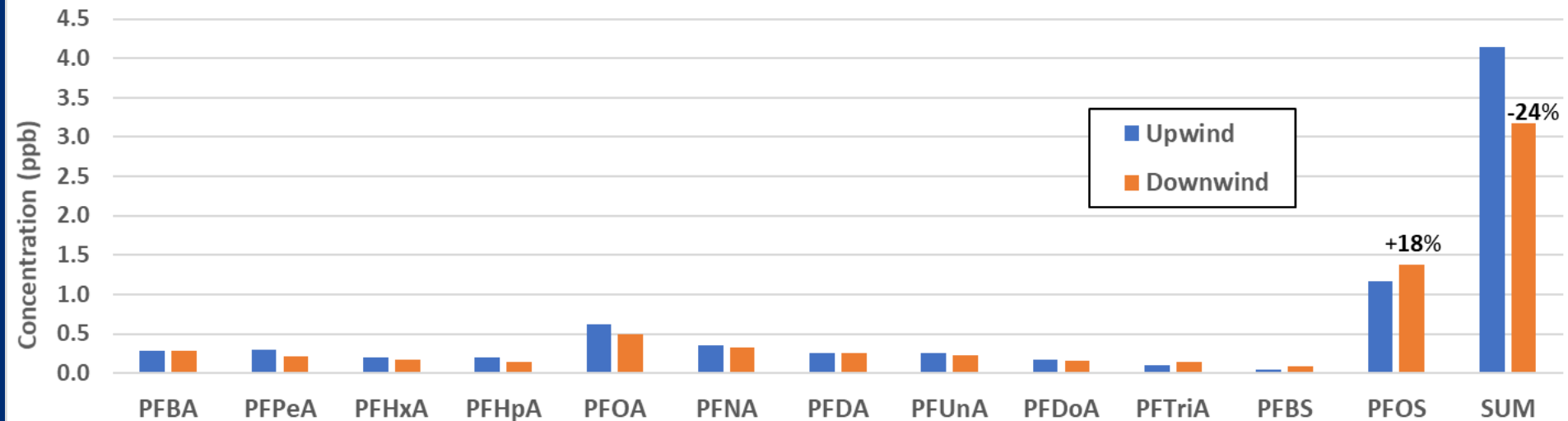
## Sampling Result Comparison:

- PFAS concentrations are consistent with background studies performed at other locations in the Northeast.
- No clear evidence of contamination detected from the incineration of AFFF.

Analyte	Vermont Range <sup>1</sup>	Norlite Environmental Sampling Report Range	Catskills/Adirondack Range <sup>3</sup>
PFBA	N/A	0.1 – 0.9	5
PFPeA	0.14 – 1.3	ND – 1.6	5
PFHxA	0.05 – 4.4	0.12 – 1.1	ND - 0.32
PFHpA	0.044 – 0.9	0.063 – 1.0	ND – 0.41
PFOA	0.052 – 4.9	0.19 – 1.1	0.26 – 1.1
PFNA	0.051 – 5.0	0.16 - 2.4	ND - 0.45
PFDA	0.043 – 7.6	0.073 – 2.1	5
PFUnDA	0.038 – 2.6	0.12 – 1.8	ND – 0.34
PFDoDA	0.10 – 0.69	ND - 0.35	ND
PFTTrDA	N/A - 0.13	ND - 0.264	5
PFTeDA	N/A	ND	5
PFHxDA	N/A	5	5
PFODA	N/A	5	5
PFBS	0.033 – 1.6	ND	5
PFHxS	0.076 – 0.88	ND - 1.5	
PFOS	0.106 – 9.7	0.26 – 9.8	ND – 1.4
PFDS	0.032 – 0.92	ND - 5.7	

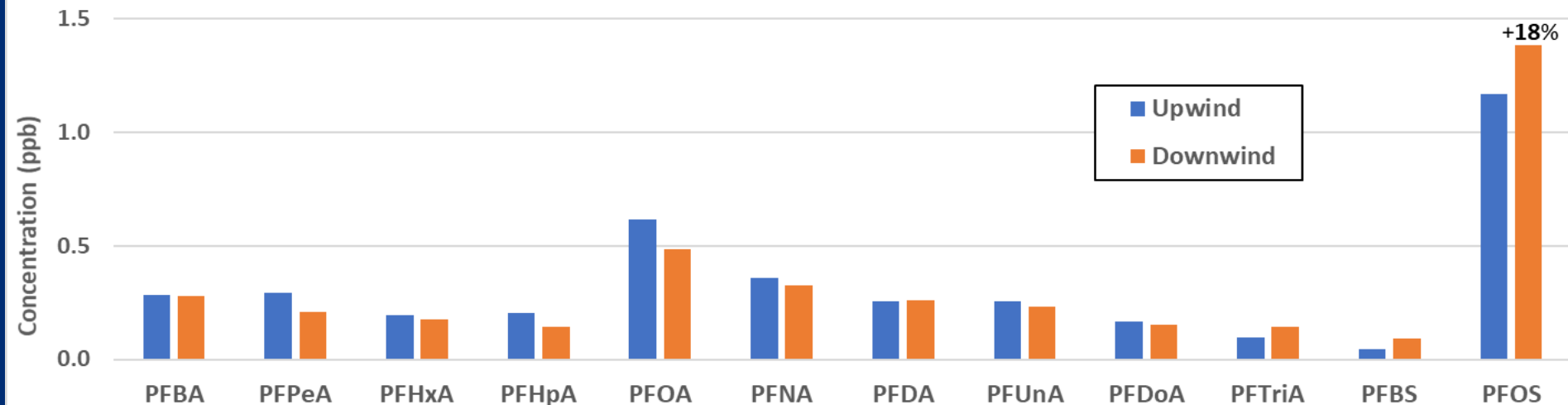
# Soil PFAS Concentrations Upwind vs Downwind

Upwind vs Downwind PFAS Concentration Geometric Means with Total PFAS (SUM)



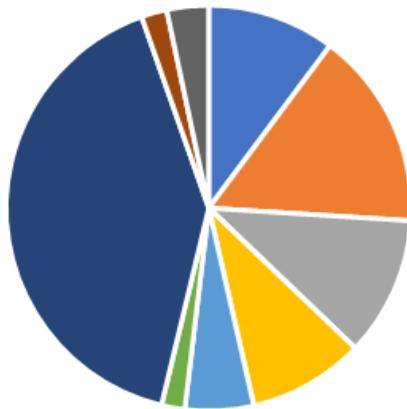
# Soil PFAS Concentrations Upwind vs Downwind

Upwind vs Downwind PFAS Concentration Geometric Means w/o Total PFAS (SUM)



# Surface Water PFAS Concentrations

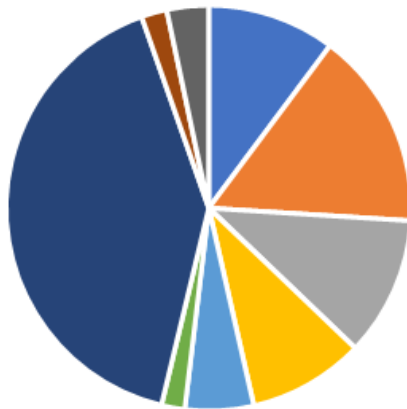
Initial Norlite Pond Sample



- PFBA
- PFPeA
- PFHxA
- PFHpA
- PFOA
- PFNA
- PFBS
- PFHxS
- PFOS

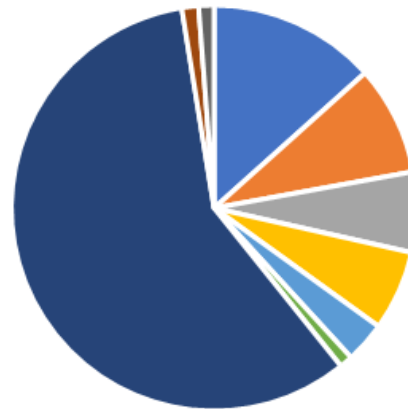
# Surface Water PFAS Concentrations

## Initial Norlite Pond Sample



- PFBA
- PFPeA
- PFHxA
- PFHpA
- PFOA
- PFNA
- PFBS
- PFHxS
- PFOS

## NYSDEC Norlite Pond Sample

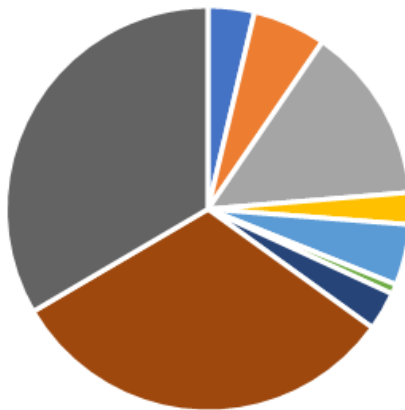


- PFBA
- PFPeA
- PFHxA
- PFHpA
- PFOA
- PFNA
- PFBS
- PFHxS
- PFOS



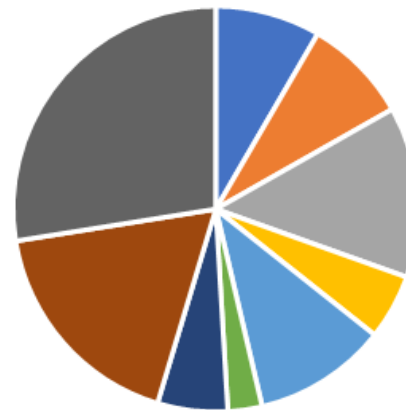
# Surface Water PFAS Concentrations

NYS AFFF Training Site#1 Averages



- PFBA
- PFPeA
- PFHxA
- PFHpA
- PFOA
- PFNA
- PFBS
- PFHxS
- PFOS

NYS AFFF Training Site#2 Averages



- PFBA
- PFPeA
- PFHxA
- PFHpA
- PFOA
- PFNA
- PFBS
- PFHxS
- PFOS

# Questions or Comments?



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