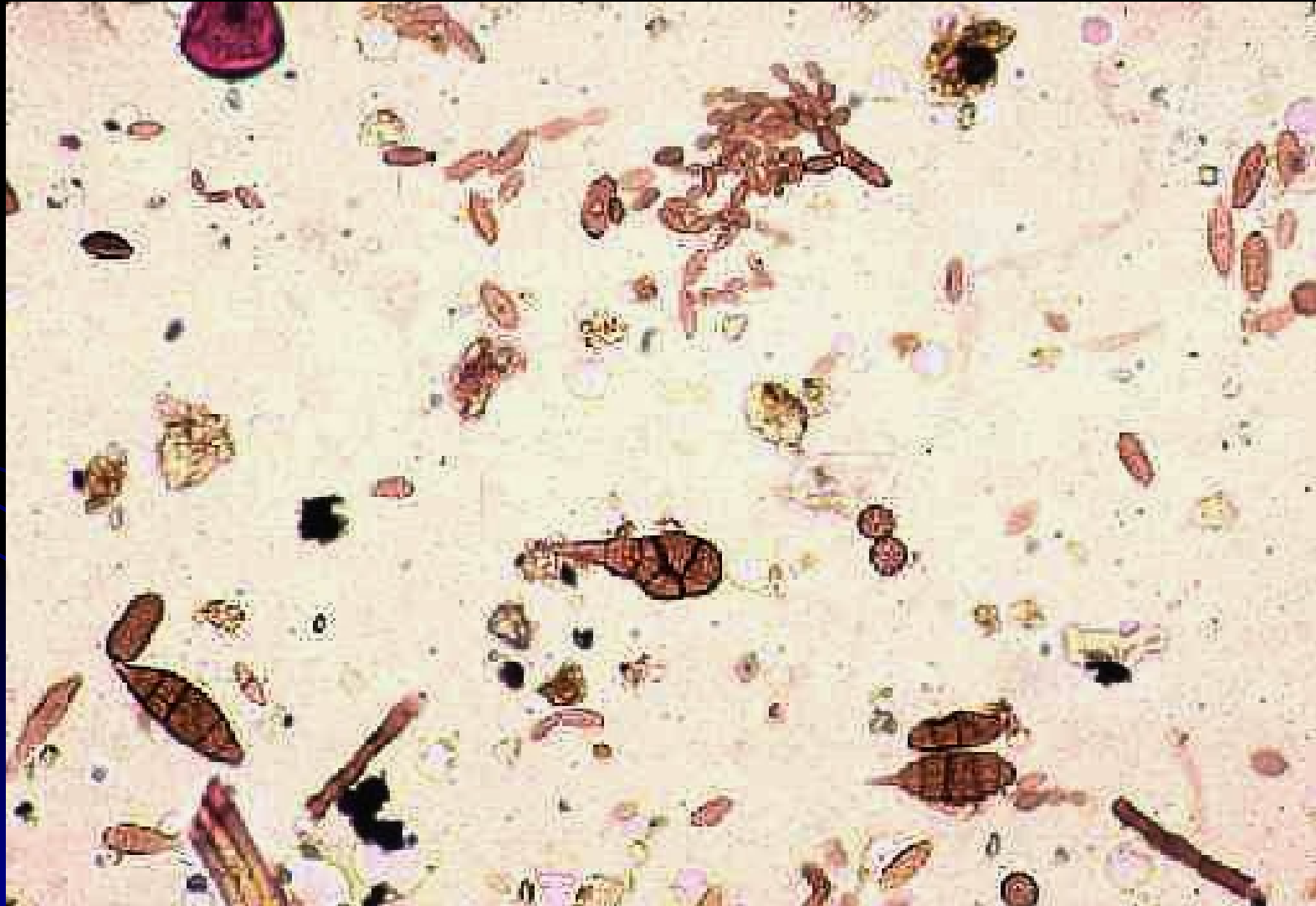


# An analysis of Outdoor Penicillium/Aspergillus concentrations

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Environmental Microbiology  
Laboratory




# The outdoor aerosol



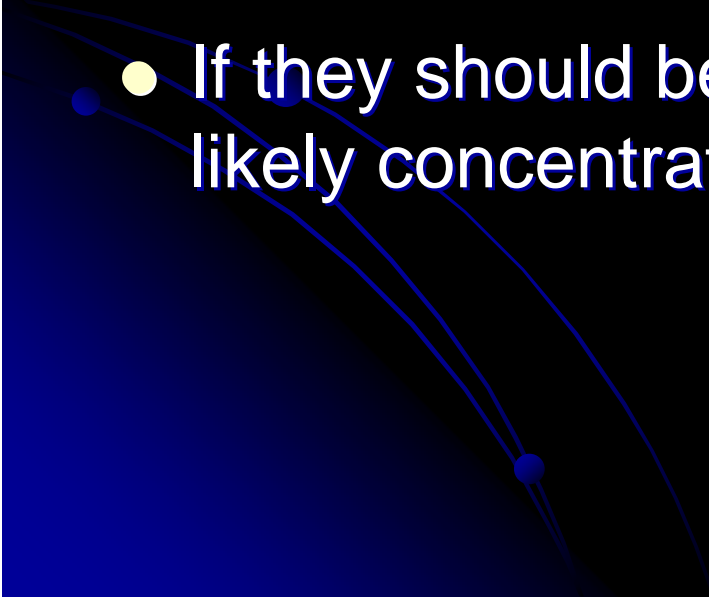
# The outdoor aerosol



# Introduction

- Outdoor spore populations vary widely over short periods of time especially during changes in weather.
  - Understanding this variability is crucial if indoor/outdoor ratios are to be used for data interpretation.
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# Example

- Penicillium type spore count zero outdoors
  - 200 Penicillium type spores collected indoors
  - Are the indoor spores from an indoor source?
  - Given outdoor aerosol variability, how likely is it that there are no Penicillium spores outdoors?
  - If they should be present outdoors, what is the likely concentration?
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# MoldRange

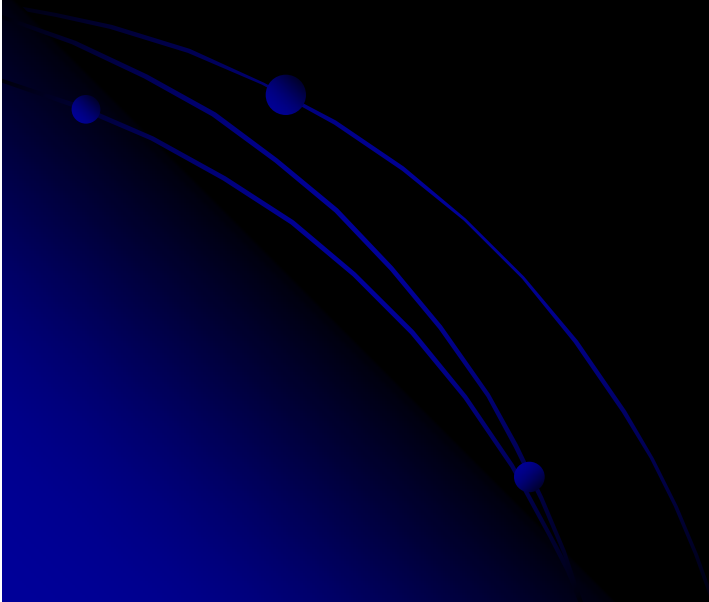
- We have developed a database compiled from outdoor spore trap samples collected across the country and throughout the year.
- We have used the data to enable comparisons by spore type with individual outdoor spore trap samples

# Methods

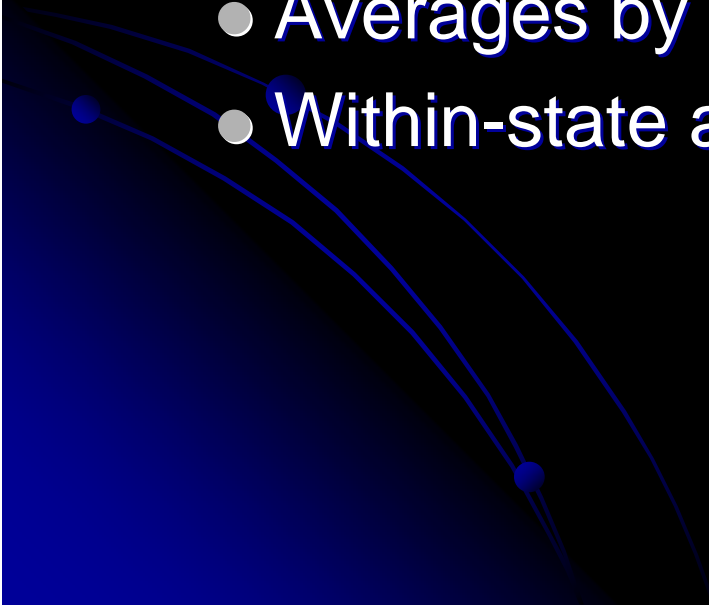
- All samples were
  - collected by field investigators
  - analyzed in our lab following our standard protocols and subject to our quality control processes.
    - Spores were identified and tabulated by genus or higher grouping, and relative amounts of background debris were noted.
    - Tabulations were entered directly into a database, compiled by date and state, and analyzed for range and percentiles by state and by month.
- The database differentiates between sampler types and provides some information on local weather conditions during sampling.

# MoldRange

- We have been collecting data for 5.5 years
- The database includes approximately 125,000 samples collected from 47 states, and for every month of the year.

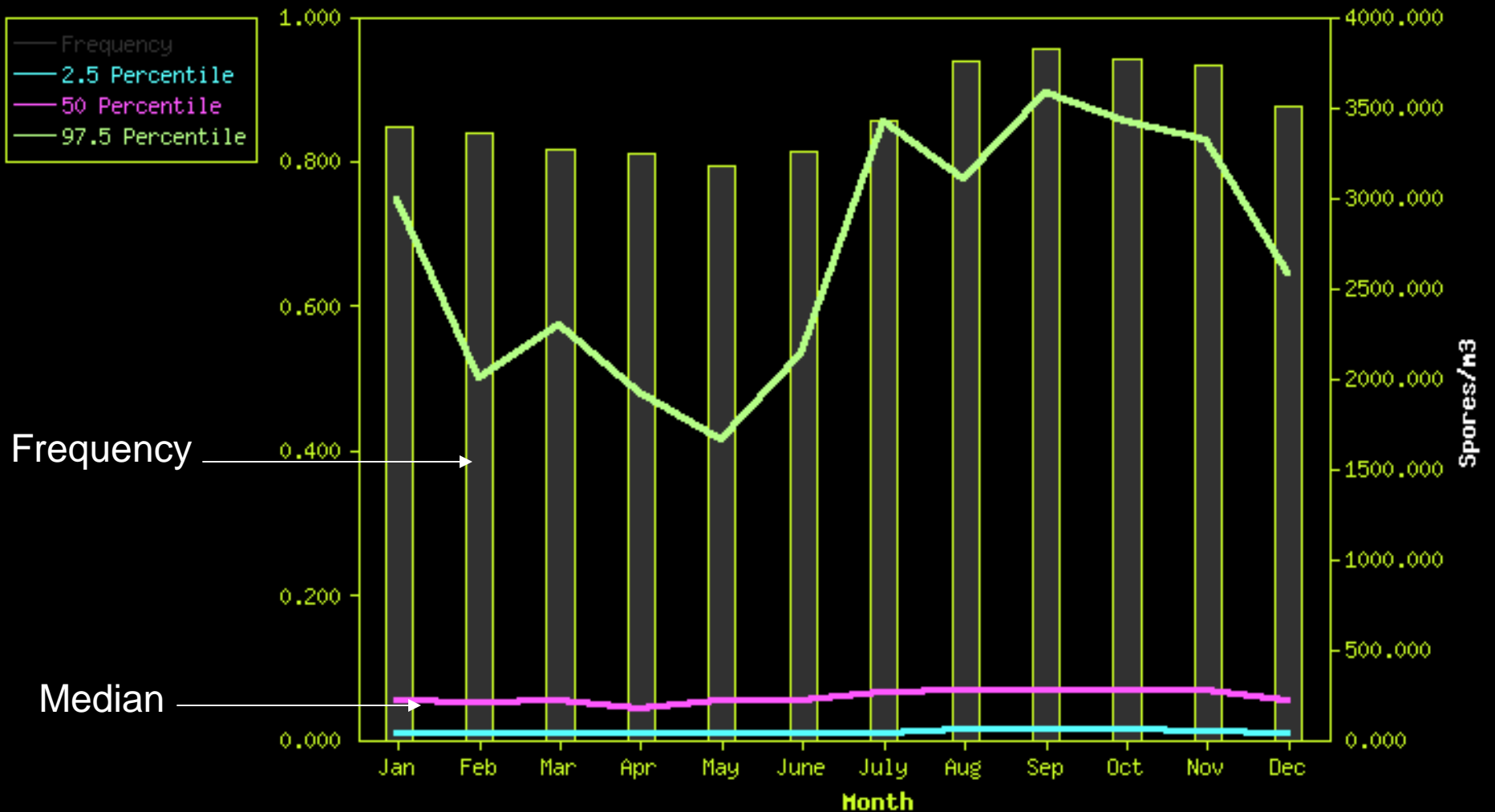


# Analyses to advance the science

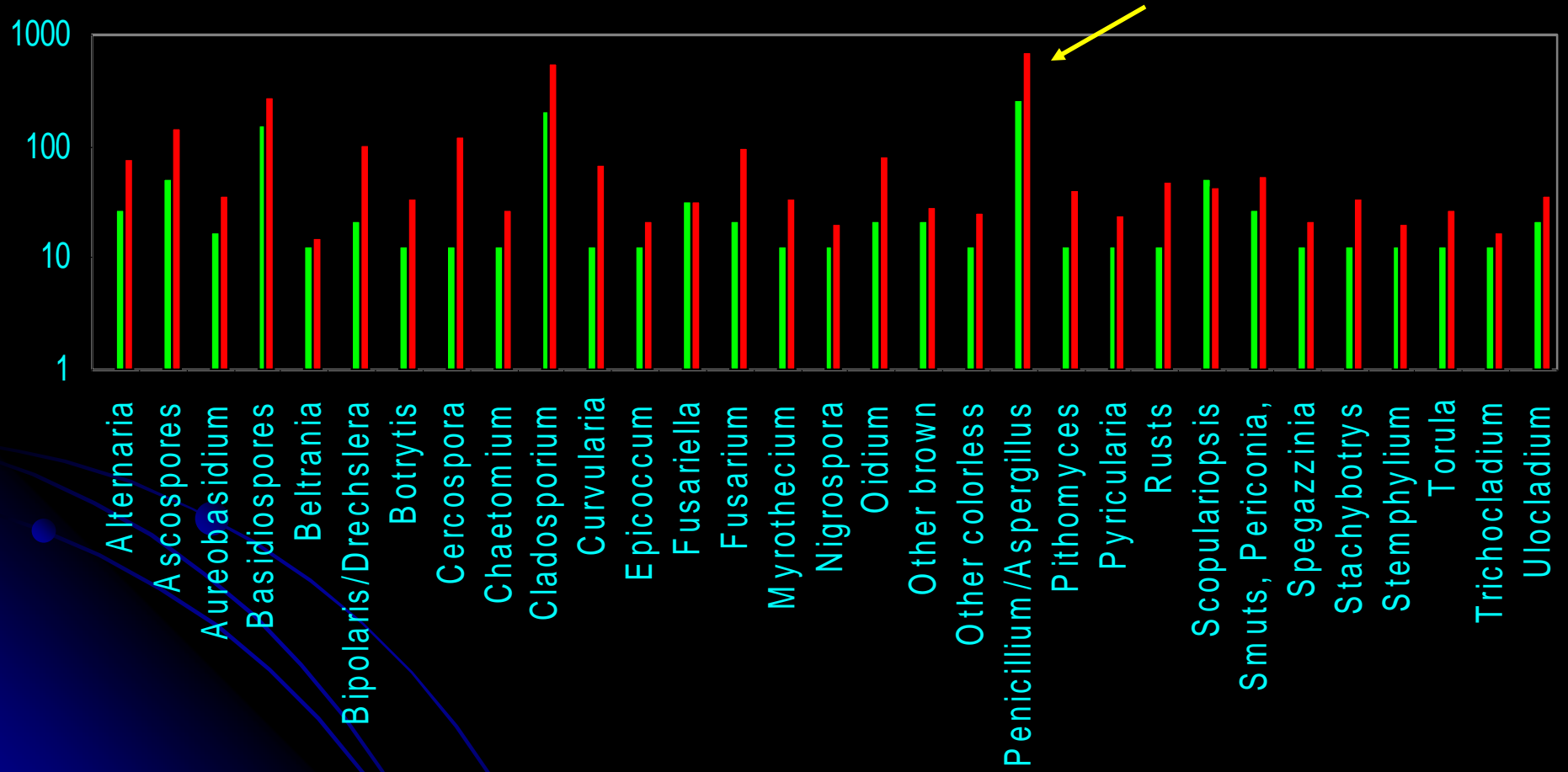
- This presentation focuses on Penicillium/Aspergillus concentrations
  - Analyses
    - Averages by month across all states
    - Averages by state across all months
    - Within-state averages by month
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# Penicillium types across all states

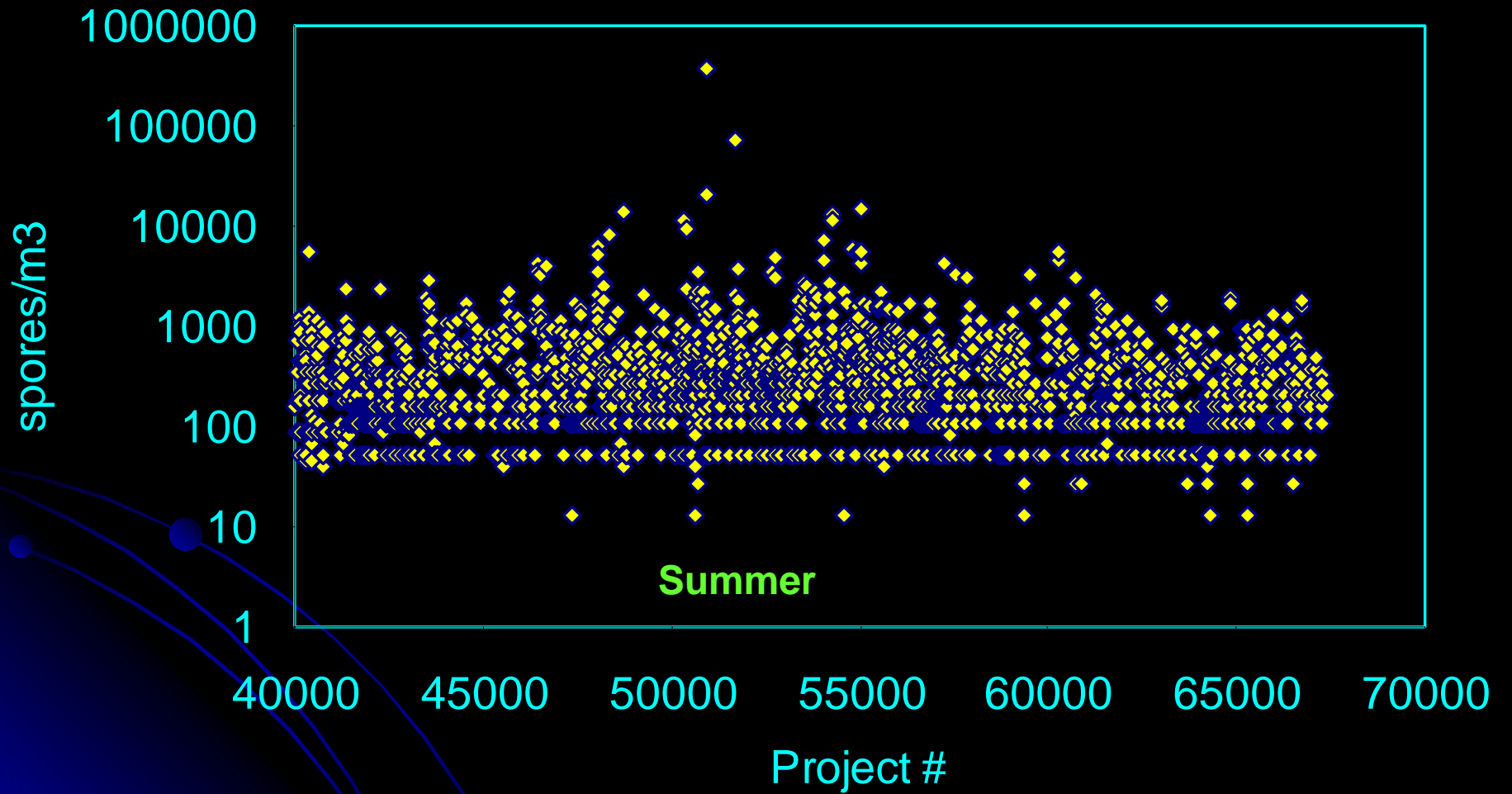
Penicillium/Aspergillus types By Month



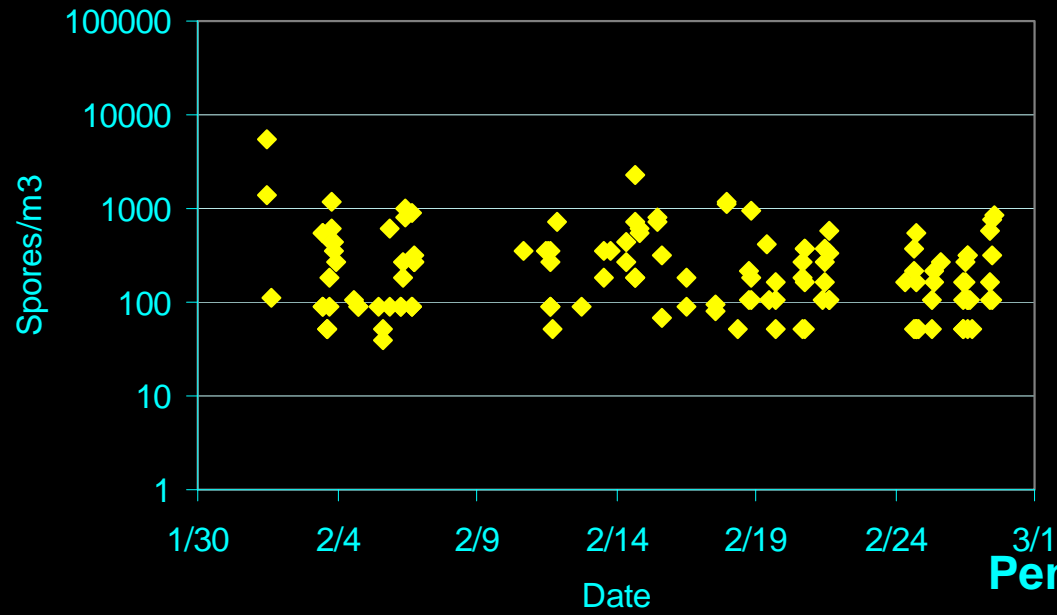
## Arizona: Medians(green), means (red)



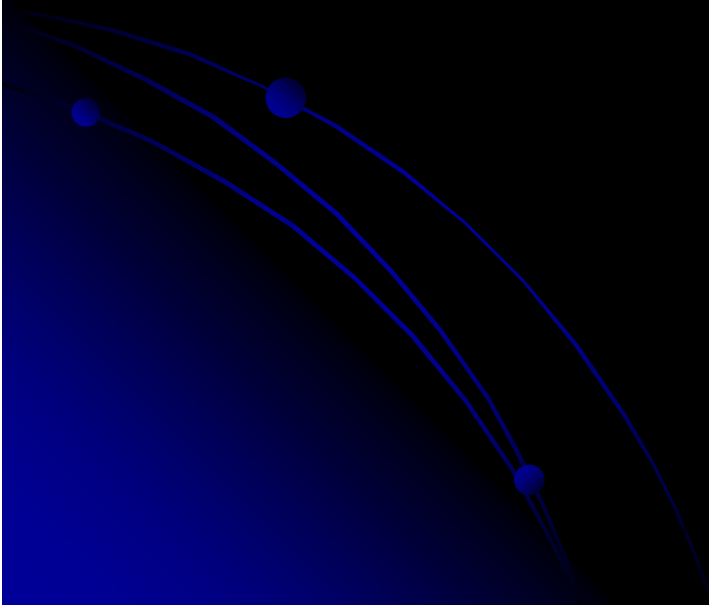
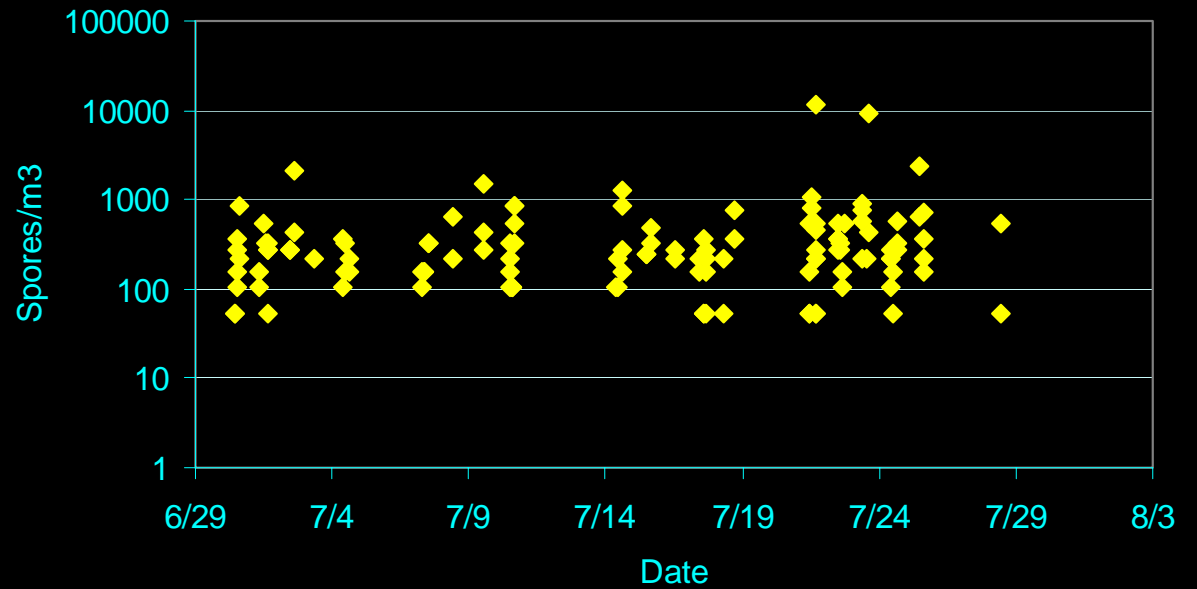
# Arizona, Pen/Asp, chronological



## Penicillium, Arizona, February



## Penicillium: Arizona, July



# Penicillium/Aspergillus

State	N (all samples)	Median (spores/m <sup>3</sup> ) (Pen+ samples)	Range (spores/m <sup>3</sup> ) (Pen+ samples)
Alabama	15	214	53-533
Alaska	38	67	13-52,907
Arizona	12,754	267	13-373,387
Arkansas	19	160	53-1600

# Conclusions

- MoldRange™ data allows comparison of incident outdoor counts to the range and percentiles for the state and for the month.
- In a broader sense, the data can be used for investigations of the prevalence of specific spore types across the US, and seasonality of fungal aerosol populations by state.
- Ongoing data collection will enable studies of trends in spore populations related, for example, to global warming.
- MoldRange™ is probably the largest outdoor spore database and the most consistently collected and analyzed. It should provide a valuable tool for increasing understanding of the outdoor fungal aerosol.