



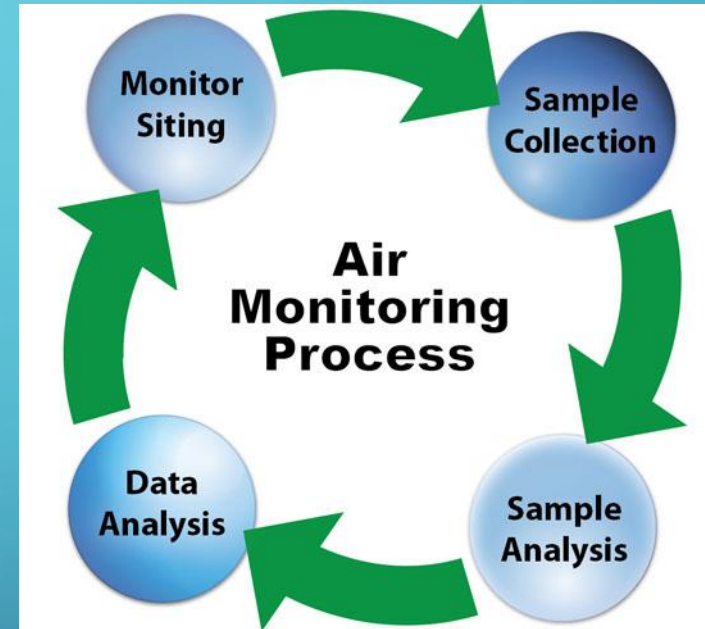
AMBIENT AIR MONITORING: COMMON METHODOLOGIES ON HOW TO IMPLEMENT AIR MONITORING NETWORKS

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BASIC AIR MONITORING PROCESS



WHY MONITOR?

- Monitoring networks are established for different reasons based on the monitoring objectives.
- Provide historical data
- Provide answers to ongoing air quality issues
- Provide data as supporting documentation to comply with a State Implementation Plans
- Establish air quality baselines
- Answer local pollutions concerns



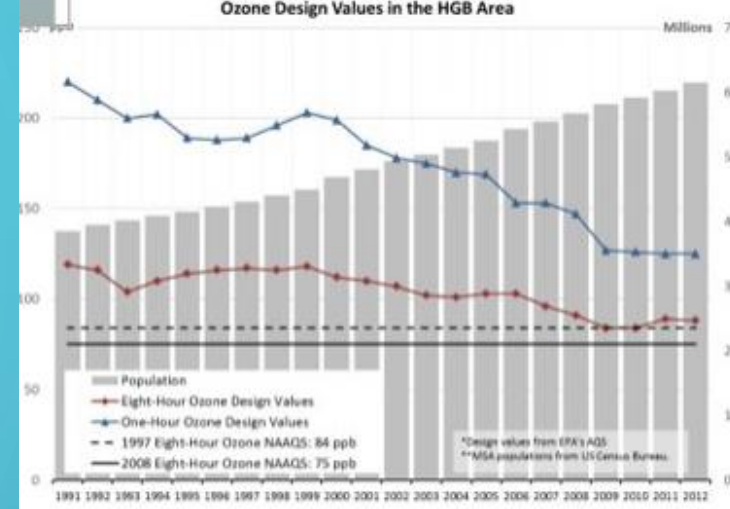
WHERE TO MONITOR?

- Monitoring sites are established for different reasons based on the monitoring objectives.
- Improperly located sites will provide unsuitable results for the intended purpose of monitoring and will in turn lead to incorrect decisions.



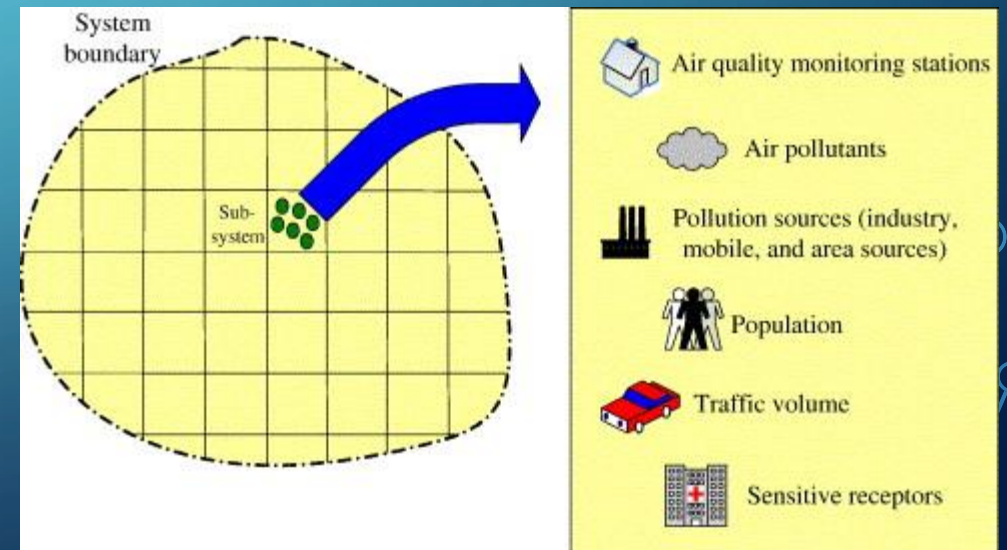
MONITORING OBJECTIVES

- Each monitor is sited to achieve specific monitoring objective(s).
- Monitoring objectives may include:
 - assessing regional or area-wide pollutant concentrations;
 - measuring pollutant concentrations in populated areas; or
 - measuring pollutant concentrations near specific emission sources based on source type or size.



NETWORK DESIGN PLAN

- Who will use the data?
- What format will the data be reported and stored?
- How and when will data be collected and reported?
- Where will the data be hosted?
- How many monitoring sites are needed?
- What is the implementation timeline?
- For how long do we need to monitor?
- Who is sponsoring the monitoring efforts?



STAKE HOLDERS

- Purpose of data
- Data quality objectives
- Data quantity
- Data reports



What Do You Need?



QUALITY ASSURANCE PLAN (QAP)

- Document project objectives
- Document quality objectives
- Document approval signatures



TIMELINES



- The purpose of timelines are to keep the project moving and ensure monitoring network is established to meet set objectives.
- Develop with them with stakeholders and take into account procurement processes to ensure realistic goals.



AIR MONITORING DATA

- Federal Compliance
- State Initiative
- Special Study
- Continuous
- Non Continuous



FEDERAL COMPLIANCE

- Air Monitoring Rules
- Criteria Pollutants
- National Standards
- Ambient Monitoring
- National Schedule

EPA Sampling Schedule 2019

Important Dates

Notes

3-Day schedule is shown in orange, green, and purple

6-Day schedule is shown in green and purple

12-Day schedule is shown in purple

January

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

March

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

April

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

SELECTING MONITORING SITES

- Developing and understanding
 - the monitoring objectives
 - proper quality objectives
- Identifying the appropriate spatial scale
- Identifying the general locations where the monitoring should be placed
- Identify specific monitoring sites

6.0 Monitoring Network Design

The selection of a specific monitoring site includes four major activities:

1. Developing and understanding the monitoring objective and appropriate data quality objectives.
2. Identifying the spatial scale most appropriate for the monitoring objective of the site.
3. Identifying the general locations where the monitoring site should be placed.
4. Identifying specific monitoring sites.

SELECTING MONITORING SITES (CONTINUED)

- Spatial Scale
 - Will depend on monitoring objective(s)
 - How far apart do we place monitoring sites?



SELECTING MONITORING SITES (CONTINUED)

- General considerations where the monitoring should be placed
 - Meteorology
 - Property
 - Logistics



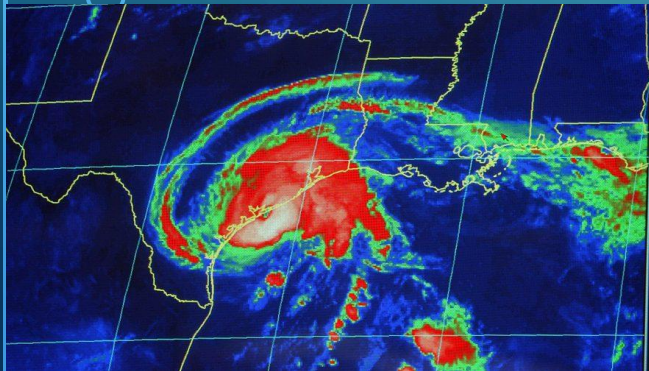
METEOROLOGY

- Very Important
 - Seasonal patterns
 - Wind patterns



SEASONAL PATTERNS

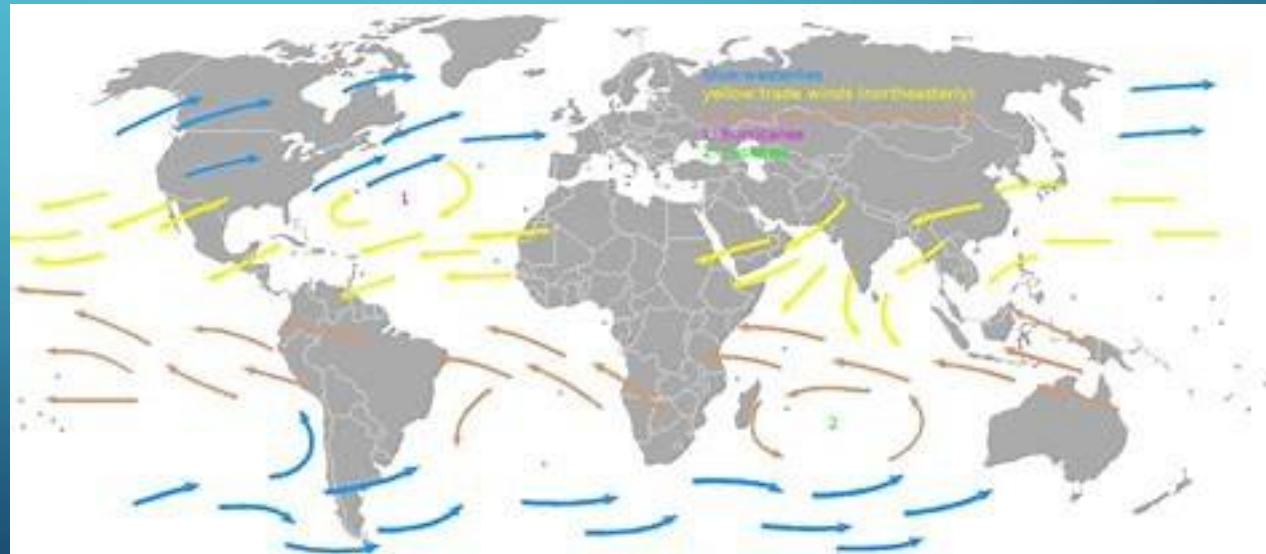
- Need to understand the wind weather patterns of the area that will be monitored.
- Winter cold fronts and wind shifts
- High temperatures during summer months
- Hurricane season



WIND PATTERNS

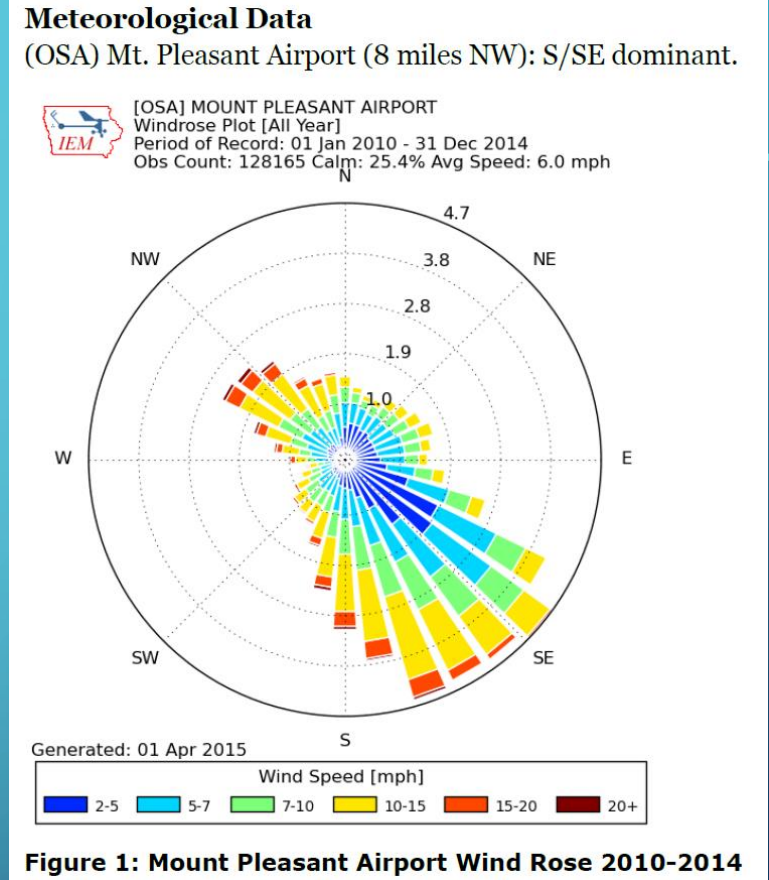


- Another critical component to ensure monitoring objectives are met
- Prevailing winds
- Wind roses



WIND ROSE

- Shows distribution of wind speed & wind direction from one location
- Presented in a circular format, the wind rose shows the frequency of winds blowing usually from particular directions.
- Each "spoke" around the circle is related to the frequency that the wind blows from a particular direction per unit time.
- Wind roses typically use 16 cardinal directions, such as north (N), NNE, NE, etc., although they may be subdivided into as many as 32 directions.
 - Source: Wikipedia



UP WIND VS DOWN WIND



PROPERTY

- Considerations when accessing the area to place a monitoring sites
 - Open space
 - Accessibility
 - No obstructions
 - Availability



MONITORING PLACEMENT

- Down wind
- Up wind
- Local contribution
- Complementing existing network



LOGISTICS

- Site preparation
- Power
- Phone service
- Internet accessibility
- Cellular service
- Safety



REPORTS

- How will the data be presented?
- Who will receive the data?
- How will the data be used?
- When will the data be available?



RESOURCES



- Appropriate funding and staff are critical to implementing a successful air monitoring network.
- Procurement of goods
 - Timelines
 - Equipment
 - Site preparation and logistics
 - Utilities services
 - Ongoing operations
- Staff
- Investment return
 - Data is meeting planned monitoring objectives



TAKE AWAY



- New Monitoring Considerations

- Monitoring Objectives
- Resources
- Wind patterns
- Siting criteria
- Data Quality
- Data use

- Existing Monitoring Considerations

- Assessments
 - Still meeting objectives?
 - Geographical assessment
 - Historical data
 - Still needed?

A decorative graphic on the left side of the slide, consisting of a network of white lines and circles on a blue background, resembling a circuit board or data flow diagram. The lines are vertical and horizontal, with some diagonal connections, and the circles are of varying sizes, some acting as nodes or endpoints.

QUESTIONS?

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