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MCTA Air Conference
Air Dispersion Modeling: When and Why?

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Discussion Points

- What is the purpose of air dispersion modeling?
- What are the types of models and general procedures?
- When is modeling needed?
- What do you do if you do not "pass"?

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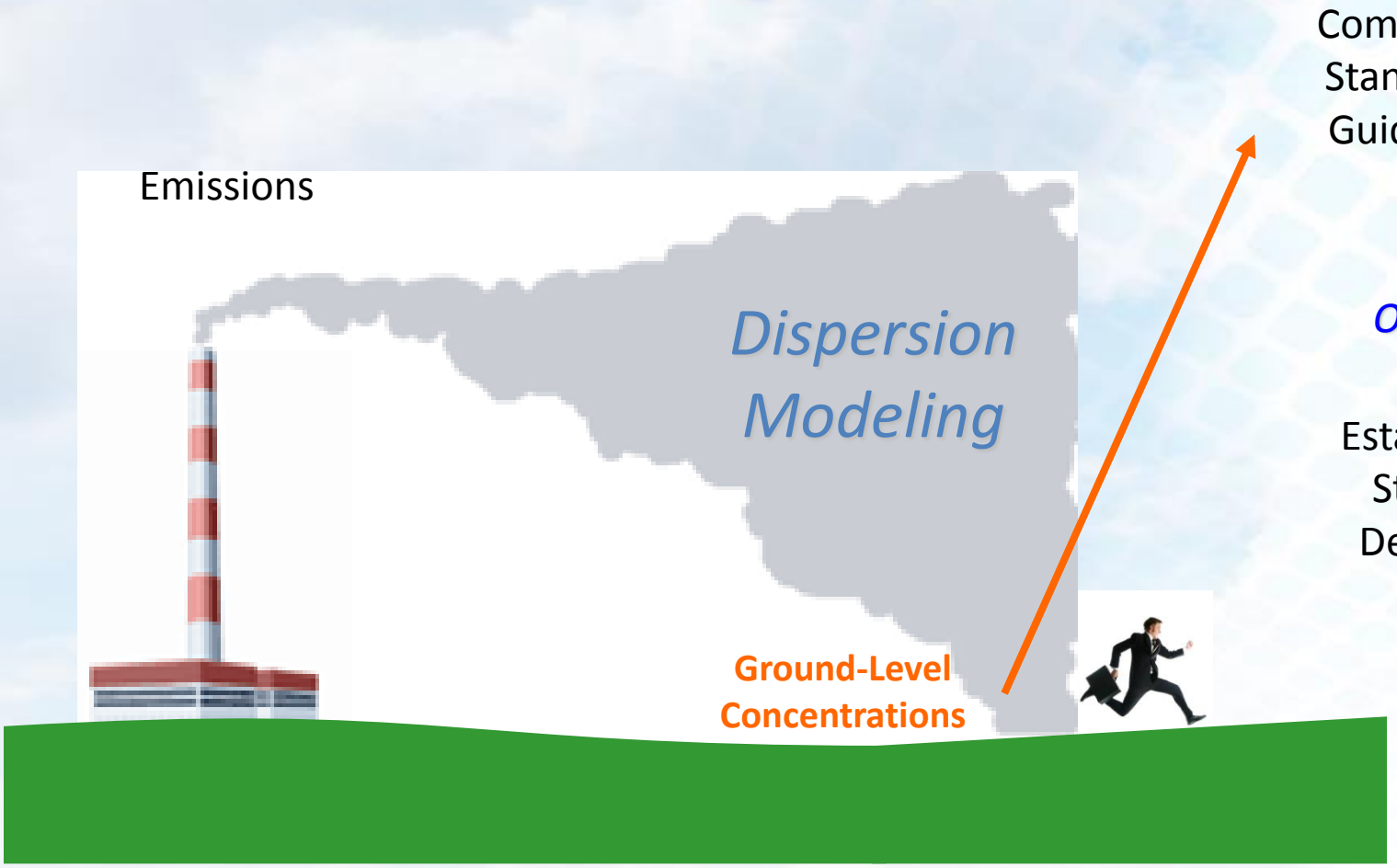
Purpose of Dispersion Modeling



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What are the types of models and general procedures?

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Dispersion Models

- For most applications:
  - SCREEN Models
    - AERSCREEN, CALPUFF Screen
    - Models that give worst-case first-cut concentration
  - Refined Models
    - AERMOD
    - CALPUFF
  - Special Case Models
    - CTDM – Complex Terrain Dispersion Model
    - SCICHEM – Reactive Plume Model
    - SDM – Shoreline Fumigation
    - DEGADIS – Dense Gas Model
    - OCD – Offshore and Coastal Dispersion Model

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Typical Modeling Procedures

- Obtain and process representative *meteorological data*
- Develop or obtain a site plan (*sources, structures, boundary*)
- Characterize emission sources (*area, volume, point, etc.*)
- Define *modeling domain, receptor locations*, and obtain/process terrain *elevation data*
- Input building data and obtain downwash information
- Develop model input files and select processing options
- Run model and analyze results

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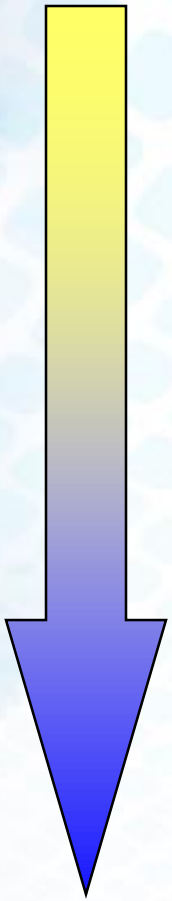
40 CFR Part 51 Appendix W Models

- AERSCREEN
  - Fast, conservative “screening model”
  - Typically used for small projects
- AERMOD
  - Near-field (<50 km) regulatory model
  - Run by applicant
- CALPUFF
  - For visibility and long-range impacts
  - Run by applicant
  - Usually for Federal projects only



Complexity

Cost

Time

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How Long Will it Take?

- Highly dependent on results, but…
  - Significance analysis – ***1 to 4 weeks***
  - NAAQS/Increment – ***2 to 10 weeks***

    (start after significance analysis)
    - Inventory development
    - Large inventory runs may take long run times for a single year of met data (need to run 5 years)
  - Class I Impacts – ***8 weeks*** (if complicated models are required)
    - Can run parallel with Class II (above analyses)

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When is Modeling Needed?

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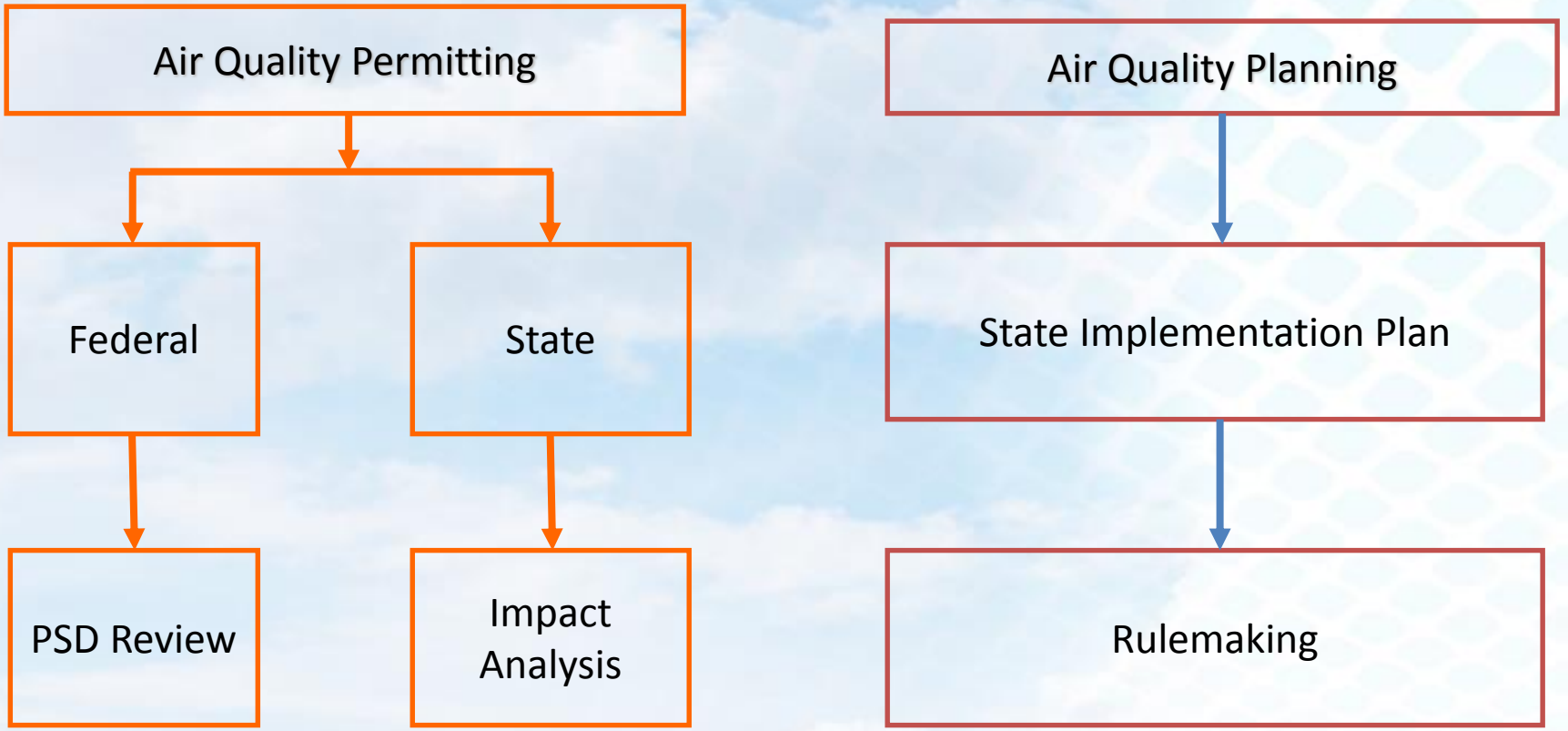
When is Modeling Required?

(1 of 3)



** For projects that do not trigger a Federal review, modeling for criteria pollutants (NAAQS) may be requested by state agency*

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When is Modeling Required?

(2 of 3)

- Other regulatory programs include
  - Designations for the new 1-hr SO_2 NAAQS
  - Visibility impairment (Regional Haze Rule/BART)
  - PSM/RMP Program (offsite consequence analysis)
  - RCRA Combustion Permits
  - Others …
- Non-regulatory uses include
  - Planning
  - Permit deviations and violations
  - Enforcement support

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When is Modeling Required?

(3 of 3)

- May be required when an ***air quality permit application*** is submitted
- Regulatory agency may perform preliminary ***screening*** modeling using a conservative approach
- If acceptable results are not obtained, the applicant is asked to perform ***refined*** modeling

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Models in Litigation

- Generally civil cases
- Torts
  - Civil suit to recover damages
  - Attempts to force abatement of the problem
- Nuisance
  - Intentional or negligent act resulting in unreasonable interference with enjoyment and use of one's property
  - Private claim
  - Public claim – class action
- Trespass
  - Physical violation of one's property

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What do you do if you do not “pass" the modeling?

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What do you do if you do not "pass"?

(1 of 2)

- Determine if project "causes or contributes" to exceedance
- If exceedance occurs when project is significant, review ***inventory sources***
- Review background NAAQS concentrations
- If exceedance is from your project
  - Isolate problem sources
  - Review/revise modeling parameters and assumptions

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What do you do if you do not "pass"?

(2 of 2)

- Use multi-tiered approach or deposition and plume depletion
- Batch versus continuous sources
- Different short term vs. long term emission rates
- Source changes to reduce impacts

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Importance of Modeling

- Can be the ***critical path*** item in permitting project timeline
- May ultimately determine ***emission limits*** or ***controls*** beyond BACT required for a new project or facility
- Members of the ***public*** may be concerned about modeling results

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Questions?

Thank You !!

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