

Emissions Inventories Curriculum

Goal: To help state, local, and tribal air professionals build their knowledge base and capacity to develop emission inventories in compliance with the applicable Clean Air Act requirements.

Audience: The primary audience is states, local, and tribal air professionals. This curriculum is also useful for EPA staff. The curriculum presumes students will have taken some, or all, of the courses in the Air Pollution Basics curriculum before taking the courses under Emissions Inventories.

Learning Objectives: Learning objectives in this curriculum follow Bloom's Taxonomy.¹ The learning objectives for the "foundational" level courses are focused on helping students remember and understand key concepts; the "intermediate" level is intended to help students apply and analyze concepts; and the "advanced" level is intended to help students create and evaluate key concepts, as well as master the curriculum.

Foundational

- Define an emissions inventory
 - Explain differences between different emissions inventories, such as NEI and TRI, and greenhouse gas inventory
- Describe the goals, purpose, and uses of the National Emissions Inventory (NEI)
- Explain the types of emissions inventories and their purposes, including:
 - Air quality modeling for SIPs
 - Future-year emissions projections basics
 - The use of emission inventories for EPA rulemakings (transport analysis and cost/benefit analysis)
 - Modeled attainment demonstrations (for SIPs)
 - Source-based dispersion modeling
 - NAAQS and Regional Haze planning
 - Pollutant-specific inventories
 - Seasonal versus annual emissions inventories
 - Emissions trends for state, local, and tribal planning
 - Variability
 - Air toxics
 - Toxic release inventory (use of TRI in developing the NEI)
 - NATA (risk)
 - Risk and Technology Review (RTR) Modelling and files used to enhance NEI/TRI data
 - Greenhouse gases
 - Greenhouse Gas National Inventory
 - Greenhouse Gas reporting program
 - Compliance Inspections

- NEPA analysis
- List sources covered under inventory data categories
 - Onroad/nonroad (developed using the MOVES and/or EMFAC models)
 - Point/Facility
 - Nonpoint
 - Events (wildfires, prescribed fires, ag burning)
 - Biogenic and Geogenic
- Describe sources of data for building emissions inventories
 - Stationary source emission factors
 - WebFIRE (emission factors from stack tests, Electronic Report Tool (ERT), WebFIRE Template)
 - Other sources (e.g., literature reviews, GHG program, ISIS Air)
 - Continuous Emissions Monitors (CEMs)
 - SPECIATE database overview
 - Overview of emissions data tools for nonpoint, mobile, and fire sources
 - EPA's emissions inventories webpage
- Describe the greenhouse gas (GHG) reporting program
- Describe streamlining efforts under E-Enterprise:
 - CAER (combined air emissions reporting)

Intermediate

- Apply the Air Emissions Reporting Requirement (AERR) Rule (purpose of the EI)
 - Who is covered by the AERR
 - State/Local air programs
 - Tribal air programs
 - Requirements under the AERR for each data category versus optional data
 - Schedule of data submissions under the AERR
 - Confidential business information (CBI)
- Select Emissions Inventory Reporting Tiers and Codes
 - Overview
 - How to select a Source Classification Code
 - How to request a new Code
 - Best practices

- Employ emissions data available on EPA’s inventory homepage
 - Locate facility specific emissions data
 - Retrieve data for particular sectors
 - Customize emission retrievals by specific geographic areas
- Employ the Emissions Inventory System (EIS)
 - EIS basics for SLT and MJOs
 - Accessing and downloading code tables
 - EIS summary reports: Focus on SLT’s and MJO’s needs
 - EIS summary reports: Focus on EPA needs (Regional Offices and HQ)
- Develop an inventory plan
 - Identify inventory type
 - Identify important sources for planning purposes
 - Create an Inventory Preparation Plan (IPP) and/or Quality Assurance Project Plan (QAPP)
- Use emission modelling framework (EMF)
 - To manage inventories
 - Use the CoST tool for control strategy development
 - To run emissions models
- Describe how EPA develops Emissions Factors using the Emissions Factors Procedure document
- Explain the requirements for SIP emissions inventories for NAAQS and Regional Haze attainment plans
- List and define the parts of EPA’s emissions modeling platforms
- Identify priority source categories for inventory review and development
- Describe how to develop scientific research that meets the requirements needed to support the National Emissions Inventory, SPECIATE, and Emissions Factors development
- Develop an emissions fees program

Advanced

- Create an emissions inventory database and collection programs that comply with EPA requirements

- Develop data for nonpoint sources
 - EPA Wagon Wheel tool for selected Nonpoint categories
 - Tool specific trainings:
 - Development of emissions inventory for oil and gas (this will probably need to be several modules)
 - 1 training per sub-category. (note: this would be dozens of trainings, and could be used for tribal emissions calculations)

- Develop data for point sources
 - Facility inventory development
 - Estimating point source emissions and quality assurance
 - The importance of the quality of data (e.g., stack and fugitive release parameters and Lat/lon of the releases can have a significant impact on point source health risk modeling like NATA and OAQPS RTR program.)
 - EPA process for NEI point: EPA augmentation, completeness, EPA feedback, and providing comments
 - Integrate with the CAER Common Emissions Form System and its web services
 - Best practices for handling confidential business information (CBI)

- Develop data for mobile sources
 - Developing vehicle miles traveled (VMT) and vehicle population data
 - Developing other MOVES inputs for submission to the NEI Program via EIS
 - MOVES (note: using MOVES is a 2-day training for which OTAQ already has an ongoing program)

- Develop data for events sources
 - SMARTFIRE/Bluesky Framework for wildfires and prescribed burning
 - Agricultural fires methods
 - EPA process for NEI fires: providing inputs, review, and comments

- Create Biogenics emissions data
 - Running and evaluating results from the BEIS model
 - Running and evaluating results from the MEGAN model

- Create future-year emissions projections
 - Integrated Planning Model (IPM) – (note: need to coordinate with CAMD on this)
 - ERTAC EGU model
 - Onroad and nonroad sources using MOVES
 - Non-EGU stationary sources (both point and nonpoint in general)

- Conduct emissions modeling
 - Spatial allocation surrogates development
 - Running the Spatial Surrogates Tool and Spatial Allocator
 - Running the Speciation Tool
 - Temporal allocation factor development
 - Running SMOKE
 - Emissions modeling QA
 - EPA's emissions modeling platforms: understanding SMOKE run scripts and input files
- Develop inventory for SIP
 - Advanced inventory development for SIP, such as:
 - PM condensable emissions
 - VOCs and semi volatile organic emissions
 - Develop Emissions inventories at the sub-county scale
- Evaluate sources of uncertainty in emissions inventories
 - Point sources
 - Stationary nonpoint sources
 - Onroad mobile sources
 - Nonroad mobile sources
 - Events
 - Biogenic sources
 - Geogenic sources
- Submit data for NEI through EIS Gateway
 - QA versus Production environment
 - Required fields and how to edit them
 - Staging tables
 - Bridge tools
 - Web client
 - Node to node
 - How to review errors and warnings in feedback file
 - How to interpret and complete the nonpoint survey
 - Using the Gateway to make emissions inventory edits
- Analyze EIS outputs
 - Using comparison reports for inventory QA
 - Advanced emissions inventory reports

- Use the CAER Common Emissions Form

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