

Accountable Regulation from A Multi-pollutant Perspective

Presentation to the NARSTO-ONE-ATMOSPHERE MULTIPOLLUTANT
MANAGEMENT
MINI-WORKSHOP

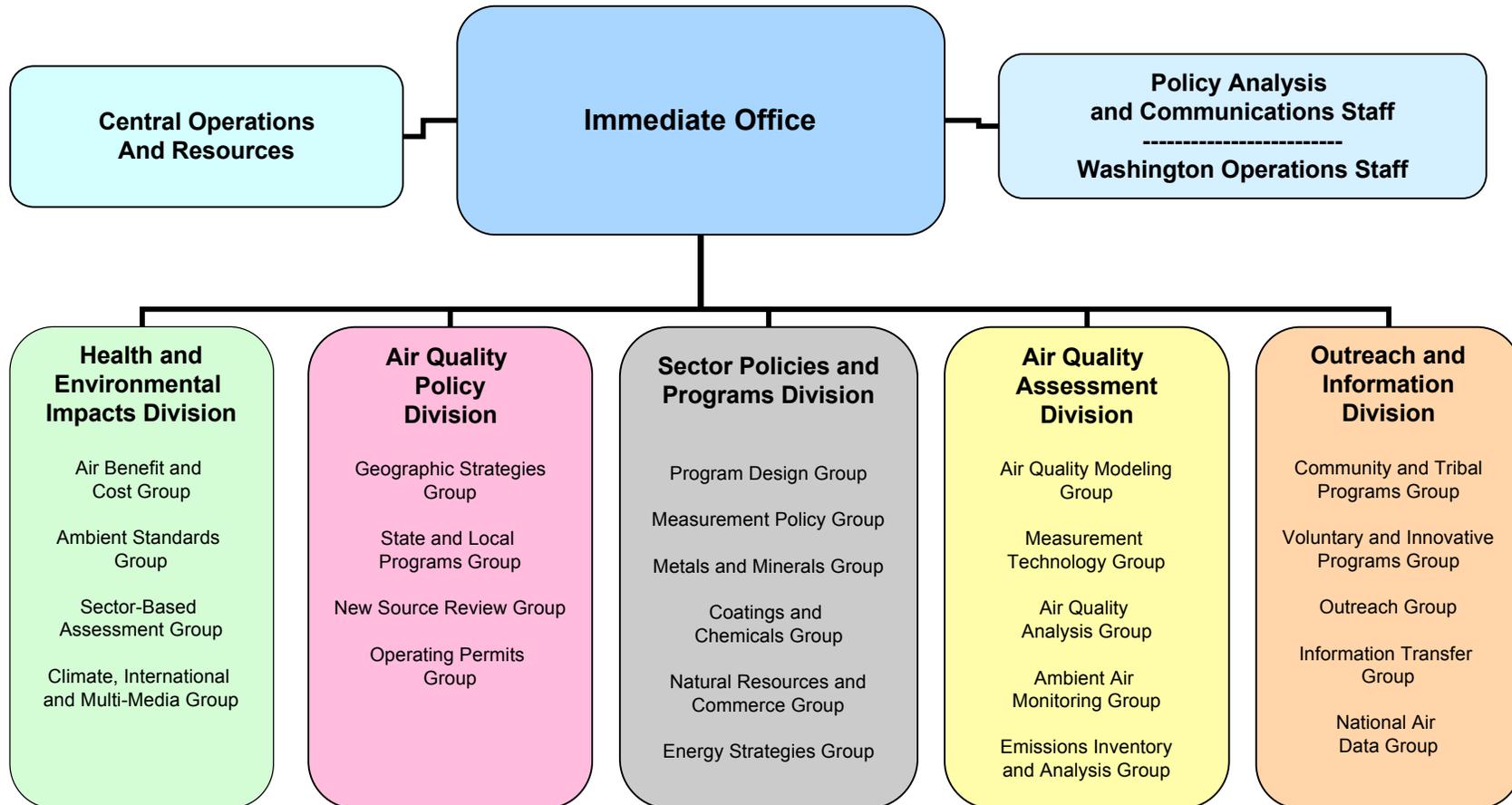
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Overview

- OAQPS focus is on multipollutant approaches for impact assessment
- Examples of results based assessment approaches
- Intersection of OAQPS activities and NARSTO assessment objectives
- What does OAQPS hope to learn from the NARSTO assessment?
- What OAQPS can do to help

The OAQPS Reorganization



How do OAQPS activities relate to the Principal Tasks of the NARSTO Assessment?

1. *Identify health and exposure related air accountability assessment needs*

- ✓ Development of National Air Pollution Assessment – next phase of NATA that includes air toxics and criteria pollutants, and will include ecosystem and multi-media impacts
- ✓ Longer term investments in the development of integrated toxics and criteria pollutant benefit-cost assessments
- ✓ National-Scale Activity Survey (N-SAS): Joint project with ORD to collect a variety of data to measure the effectiveness of the Air Quality Index (AQI) regarding the public's awareness of and response to air pollution in general, focusing on particulate matter (PM) and ozone
- ✓ New NAAQS review process which emphasizes timely review of new science

How do OAQPS activities relate to the Principal Tasks of the NARSTO Assessment?

2. *Identify ecosystem related air accountability assessment needs*

- ✓ Major focus on recognizing multipollutant nature of atmospheric chemistry, deposition, and impacts beginning with the upcoming review of the NO_x/SO_x standards
- ✓ Support for ReVA ecological mapping tool to map national sensitive ecosystem areas vulnerable to air pollutant deposition
- ✓ Developing analytical approach that combines national scale deposition models with local multimedia models
- ✓ Developing new approaches to analyze multi-pollutant impacts, especially through multimedia pathways, with emphasis on indicators, benchmarks and analyses.

How do OAQPS activities relate to the Principal Tasks of the NARSTO Assessment?

3. *Identify air quality accountability assessment data requirements, tools, and procedures*

- Development of multipollutant assessment tools
 - ✓ ASAP control strategy benefit-cost assessment tool
 - ✓ Collaborative development of response-surface modeling of CMAQ outputs
 - ✓ Collaborative development of improved economic forecasts for emissions growth and control technology implementation
- Collaboration on Detroit Multipollutant Pilot Study – Goal of the Detroit Pilot Study is to develop and test an approach for developing a multi-pollutant control strategy in the Detroit area. The findings gained from the study will be used to: 1) inform the guidance being developed for the states, localities, and tribes; 2) demonstrate and evaluate an analytical framework for multi-pollutant assessments; and 3) identify where additional/improved data and/or tools are needed.

Do Multipollutant Approaches Always Make Sense?

- Certainly, a multipollutant framework is appropriate in framing research and characterizing potential interactions
- But is the benefit of such an approach greater than any costs in terms of increased need for analytical resources, paperwork, control costs, or compliance and implementation issues?
- In other words, does a multipollutant approach just result in a more complex set of analyses and choices for the decision-maker, or does it also make us more effective and efficient in achieving environmental benefits?

All Emissions are Not Equal...

- For example, in the complex atmospheric environment, a ton of NO_x reduced is not equivalent to a ton of SO₂ in affecting ambient PM levels.
- Where (and when) a ton of emissions is reduced can matter as much or more as how many overall tons are reduced.
- Some emissions contribute to multiple environmental outcomes, e.g. NO_x contributes to ozone, PM, and deposition.
- In some cases, reducing a specific pollutant like NO_x can increase environmental concentrations of one pollutant (ozone) while decreasing another (nitrogen deposition)
- We would like to be able to analytically consider these tradeoffs.

All Pollution is Not Equal...

- Clearly, some pollutants contribute to greater overall levels of human or ecological risk than others
 - Transported pollutants (ozone and secondarily formed PM) can have more widespread health and ecological impacts compared to pollutants with primarily local dispersion (certain air toxics and carbonaceous PM)
 - Ozone, PM, and air toxics have differing toxicity to humans and different impacts on ecosystems, some complementary, some antagonistic
 - Impacts are not necessarily linear – having high levels of both ozone and PM might cause more impacts than the sum of high levels of each individually
- Development of methods to balance the competing or complementary risks will be critical to evaluating multipollutant programs.

What would OAQPS like to learn from the NARSTO Assessment?

- Can the report support and leverage work on developing multi-pollutant indicators – for example, what can we learn from Canada's efforts?
- Under a multipollutant framework, how can we incorporate risk-risk tradeoffs in our decision-making framework? Can we develop tools to identify win-win policies?
- What are the existing data and tools that can support ecosystem risk and benefits assessments?
- What data and tools are available to measure accountability?
- What investments in data and methods would be most valuable today to move us towards multipollutant and accountability based assessments in 1 year, 5 years, 10 years?
- How should we account for climate impacts (some known, some uncertain) as we develop these tools and assessments?

Health Indicators for Measuring Tradeoffs Between Pollutants Need Enhancement and Refinement

- Traditional risk assessments may not provide the right metrics for comparing risks – focus has been on individual risk or single effects like cancer, rather than on population incidence estimates
- Common metrics for comparison need to be developed and tested
- How can tradeoffs be made between lifetime risks (cancer) and short term risks (respiratory symptoms)?
- How do we assess the incremental impact of multi-pathway pollutants (e.g. lead) relative to pollutants with primarily air exposures (e.g. ozone)
- Can we develop multi-pollutant air quality indicators that reflect relative toxicity and synergistic effects?

Standards and Indicators for Ecosystem Impacts are still Nascent

- This is an area where NARSTO inputs can help in both defining the standards and in helping us to assess whether programs to meet those standards are achieving significant ecological improvements
- We are looking beyond simple atmospheric concentrations for standards to critical load based approaches and/or indices that incorporate location specific data and multiple pollutants, e.g. an index that reflects NO_x, SO₂, and NH₃ concentrations
- Measuring the effects of air toxics on ecosystems (both immediate effects on plants and animals and bioaccumulative impacts through the food web) is not well captured in our assessment models
- We are developing screening methods using TRIM-fate for prioritizing ecosystem effects from HAPs
- We are interested in improving our understanding of appropriate benchmarks for measuring progress on ecosystem protection and look to this report to fill important gaps – what system of information do we need to have to move forward with ecosystem assessments?

What we can do to help

- OAQPS has a number of databases, models, and tools that might be of use in the NARSTO assessment
- For example, monitoring data, emissions inventories, and modeling outputs for a variety of scenarios are available.
- In addition, EPA has developed a number of assessment tools, such as BenMAP, which can be helpful in beginning to incorporate benefits tradeoffs in design of multipollutant strategies.
- We would like to follow your work closely so we can inform your assessment with policy insights as the information and analysis evolves.