MARAMA 2017

2017 ANNUAL REPORT

Helping Members Improve Air Quality

A voluntary association of ten state and local air pollution control agencies, MARAMA strengthens the skills and capabilities of member agencies and helps them work together to prevent and reduce air pollution impacts in the Mid-Atlantic Region.

This report highlights our accomplishments from October 2016 through September 2017.

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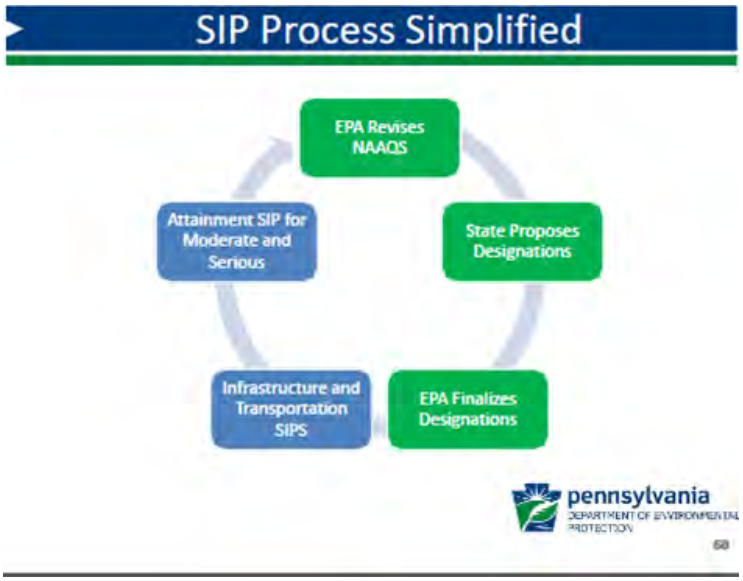
MARAMA SIPs Training Workshop

MARAMA hosts two to three workshops every year. The workshops go beyond classroom learning to allow state agency staff to meet and compare notes on current topics for the purpose of training and coordination. MARAMA's goal is to have both experienced and new staff from all MARAMA agencies attend and learn from each other, as well as from knowledgeable presenters.

In FY 2017, MARAMA held a State Implementation Plan (SIP) Training Workshop on February 22-23, 2017. MARAMA chose a SIPs workshop since member agencies were facing a need to prepare SIPs to address visibility and criteria pollutant nonattainment for ozone and fine particulate matter.

This two-day workshop provided an overview of SIPs and their role as roadmaps for meeting health-based National Ambient Air Quality Standards (NAAQS) and regional haze goals. The goal was for state air quality staff to understand the general structure of the Clean Air Act (CAA), major statutory and regulatory requirements that drive the SIP, inherent challenges in SIP planning, and how state policy, technical, and field work is interrelated and critical to the SIP and clean air goals.



The target audience was broad, and the workshop was designed to inform staff interested in: (1) making connections between their work and SIP requirements, (2) understanding the legal requirements and overarching framework for developing SIPs, and (3) getting a refresher on CAA SIP requirements and related policies.

Day one covered overarching requirements, roles, responsibilities, and tasks for ozone SIP planning, and EPA's legal authority over SIPs. Day two focused on other pollutant plans, key regional issues such as regional haze and transport, informative topics such as the challenges of SIP planning and how to submit a SIP, and included two panel discussions. Workshop materials were developed and presented by a combination of the instructor and MARAMA, state, and US Environmental Protection Agency (EPA) staff. Each session provided opportunity for questions, discussion, and sharing of experiences and ideas.

Fifty-nine participants attended with 41 staff members from all ten MARAMA agencies. In addition, there were 13 staff members from the EPA, 3 from MARAMA, 1 from the OTC, and 1 instructor (Leah Weiss).

Comments MARAMA received from the SIPs Training Workshop:

"I now have a better understanding of the key tasks, road blocks, and EPAs acceptance/ understanding of issues. Good to know other states have similar obstacles to contend with." **Anonymous**

"I really liked the discussions after the lessons between everyone (other states and the EPA). It showed different perspectives on the topics." **Anonymous**

Valuable Training Opportunities

In fiscal year 2017, MARAMA organized numerous training events to help member agency staff understand pollution control requirements and monitoring methods. **MARAMA hosted thirteen in-person courses and two workshops.**

- **FTIR Training on Natural Gas Compressor Engines** - 15 participants attended in Charleston, WV
- NACT 221 **Continuous Emissions Monitoring** - 27 participants attended in Richmond, VA
- NACT 285 **Landfill Gas Control Facilities** - 35 participants attended in Richmond, VA
- NACT 272 **Stationary Gas Turbines & Power Plants** - 36 participants attended in Richmond, VA
- NACT 284 **Volatile Organic Compound Control Devices** - 22 participants attended in Richmond, VA
- **Part 75 Monitoring and Reporting Training** - 38 participants attended in Glen Allen, VA
- **MARAMA Monitoring Committee Training Workshop** - 67 participants attended in Greenbelt, MD
- APTI 452 **Principles and Practices of Air Pollution** - 32 participants attended in Newark, DE
- **MARAMA SIP Training Course and Workshop** - 59 participants attended in Gettysburg, PA
- **Statistics for Quality Assurance of Monitoring Data** - 37 participants attended in Philadelphia, PA
- **Using and Understanding Boiler (5D) and RICE (4Z) Rules** - 43 participants attended in Richmond, VA
- NACT 299 **Theory and application of Air Pollution Control Devices** - 34 participants attended in Norristown, PA
- NACT 273 **Industrial Boilers** - 33 participants attended in Norristown, PA
- NACT 224 **Observing Source Tests** - 34 participants attended in Norristown, PA
- NACT 334 **Permitting Practices and Principles** - 32 participants attended in Norristown, PA

MARAMA hosted seven on-line webinars with a total of 635 participants. Topics included:

- MARAMA Training Program Overview
- Intro to Compliance and Emissions Data Reporting Interface (CEDRI) & Electronic Reporting
- A Brief Introduction to the Clean Air Act
- AERMOD for Non-Modelers (Parts 1 and Part 2)
- EPA's Guideline on Air Quality Modeling and Related Guidance
- Modeling Case Histories

Susan Wierman 2017 Monitoring Committee Workshop

MARAMA also helped 115 members travel to attend sixteen national and regional conferences or meetings.

1,168 MARAMA Agency Staff Attended MARAMA Events in FY 2017

Allegheny County	32	New Jersey	65	Philadelphia	72
Delaware	101	North Carolina	145	Virginia	271
District of Columbia	59	Pennsylvania	213	West Virginia	70
Maryland	140				

MARAMA Receives SmartWay Award

In April 2017, MARAMA received a ***2017 SmartWay Affiliate Challenge Award.***

The award recognized MARAMA's efforts to recruit SmartWay partners through work with dray truck owners and carriers.

MARAMA Hosted Three Mid-Atlantic Diesel Collaborative Webinars

State VW Settlement Coordination Call (Dec 2016)

Pittsburgh: Downtown Diesel Study Results. Invited speaker, Jane Clougherty Associate Professor in the Department of Environmental and Occupational Health at Drexel University. (Feb 2017)

VW Mitigation Discussion with the Mobile Sources Committee (Sept 2017)

MARAMA Diesel Projects Active in 2017

VA DERA 3 (Go Green Program)
The 3-year VA DERA program ended in September 2017. MARAMA completed 13 truck replacements and 6 truck retrofits. A total of 7 trucks were replaced in FY 2017. A Final Report was submitted to VA DEQ.

Allegheny County Health Department (ACHD) – Build It With Clean Diesel
Four engines were retrofitted and two engine rebuilds were completed on construction equipment operating in Pittsburgh and Allegheny County from 2011 to 2017. One bulldozer completed an engine upgrade during FY 2017 helping to reduce diesel emissions and improve air quality in the Pittsburgh area. A Final Report was submitted to ACHD.

MARAMA DERA 14 – Dray Truck Replacement in VA, Philadelphia, PA and Wilmington, DE
A competitive grant award, the final truck replacement for this grant was completed in October 2016, just at the start of FY 2017. A total of 21 trucks were completed under this grant project, exceeding the program goal of 18 trucks. A Final Report was submitted to EPA in March 2017. All but one of the truck replacements were completed during FY2016.

MARAMA DERA 16 – Dray Truck Replacement in Philadelphia, PA and Wilmington, DE
MARAMA completed its commitments under this competitive multi-year grant by January 2018, well before the December 2018 end of the grant period. The first year of the grant ended September 30, 2017, with 27 truck replacements completed out of a goal of 28. Three months into FY 2018, four more were completed, for a total of 32.

James Wommack from MD with his dray truck replacement.

DERA 2017 RFP
During FY 2017, MARAMA prepared for the 2017 DERA announcement by posting a request for potential project information on the website. In May 2017 MARAMA held a conference call with member states to seek ideas and projects.

MARAMA submitted two DERA proposals for Region 3 projects. One project was awarded $1.38M – the proposal to replace an additional 40 dray trucks in PA and DE in Fiscal Years 2018 and 2019. MARAMA will collaborate with local owner operators and trucking companies to implement this project. MARAMA has ongoing working relationships with the University of Maryland Environmental Finance Center, the Delaware Valley Planning Council (DVRPC), and Wilmington Area Planning Council (WILMAPCO) which are supporting this project.

Data Confirms Pittsburgh Attains 2006 24-hour NAAQS for $PM_{2.5}$

Reflecting many years of successful efforts to improve Pittsburgh's air quality, on May 10, 2017 EPA published its final determination that the Liberty-Clairton, PA area had attained the 24-hour $PM_{2.5}$ National Ambient Air Quality Standard of 35 ug/m3. The determination relied on data for 2013-2015 to show compliance with the 2006 standard by the applicable attainment date of December 31, 2015. The Liberty Clairton area retained a moderate nonattainment designation for the 2012 annual $PM_{2.5}$ standard of 12 ug/m3.
For further information: https://www.epa.gov/particle-pollution-designations.

Pittsburgh, PA has improved air quality.

2008 Ozone NAAQS Attained in Several Areas: Clean Data Determinations

By late 2017 EPA had issued determinations that many of the ozone nonattainment areas in the MARAMA region had met the 75 ppb 2008 National Ambient Air quality Standards (the 2008 ozone NAAQS). The areas were required to meet the NAAQS by July 20, 2016. The 2017 determinations were based on ambient air quality monitoring data for 2013–2015 and were for:

- The Pittsburgh-Beaver Valley, Pennsylvania area,
- The Philadelphia-Wilmington-Atlantic City area, and
- The Washington, DC-MD-VA area.

Previous clean data determinations had been published in 2015 based on earlier data for the Baltimore area, the Charlotte-Gastonia-Rock Hill, NC-SC area, and the Seaford, DE area, as well as the Allentown-Bethlehem-Easton, Lancaster, and Reading, PA areas.

These "clean data determinations" do not constitute a redesignation to attainment, but they suspend requirements for the affected states to submit attainment demonstrations and additional control measures as long as the areas continue to meet the NAAQS.

EPA previously had determined the New York-New Jersey-Connecticut area failed to meet the July 20, 2015 attainment deadline for marginal ozone nonattainment areas, and in May 2016 EPA reclassified the greater New York area as a moderate nonattainment area. In November 2017 the New York DEC requested reclassification to serious with an attainment deadline of July 20, 2021. EPA had not completed nonattainment designations for the 2015 ozone NAAQS (70 ppb) in FY 2017. For further information: https://www.epa.gov/ozone-designation

MARAMA Regional Emissions Inventory Development

In FY 2017 and early FY 2018, MARAMA continued to support regional air quality modeling by improving regional emissions inventories. MARAMA's 2011 base year inventory was updated to a "GAMMA" version, and emission projections were developed for 2020 and 2023. This project helped members of MARAMA and MANE-VU use an integrated, one-atmosphere air quality modeling platform to assess strategies for meeting national ambient air quality standards and reducing regional haze.

Fifteen jurisdictions in the Northeastern U.S. (from ME through VA and WV) as well as additional states, Canadian provinces, and offshore sources are included in the emissions inventory for the Northeastern modeling domain.

MARAMA develops modeling inventories through an iterative process, releasing improved versions as files are corrected and refined to account for improved interpretation of existing rules or application of state-specific rules and controls. In general, the EPA national emissions inventory is the starting point, and MARAMA encouraged use of best practices for state inputs to EPA's modeling inventory. MARAMA relied on EPA's data for most source categories, particularly mobile sources, and for states outside the Mid-Atlantic and Northeast region.

Projection of emissions to future years was key to air quality technical and policy support work. MARAMA, together with participating state agencies, used the EMF to develop growth and control factors specifically for this effort, and coordinated with EPA to provide the updated growth and control factors for use in national modeling.

The projection of emissions from electricity generating units (EGUs) was the primary area where MARAMA's regional inventory differed from EPA's. MARAMA used the ERTAC EGU Forecasting Tool to project electricity generation and emissions from EGUs. Development of the Tool was a collaborative effort among the Northeastern, Mid-Atlantic, Southeastern, and Lake Michigan area states along with industry representatives and representatives of multi-jurisdictional planning organizations. The ERTAC EGU Forecasting Tool calculates future emissions of NO_x and SO_2 based on projections of future electricity generation, the 2011 base year emission rates, and known future year emission controls, fuel switches, retirements, and new units. The future year emissions for other pollutants (CO, NH_3, PM_{10}, $PM_{2.5}$, and VOC) were calculated for each unit using emissions factors along with ERTAC generation projections for each unit.

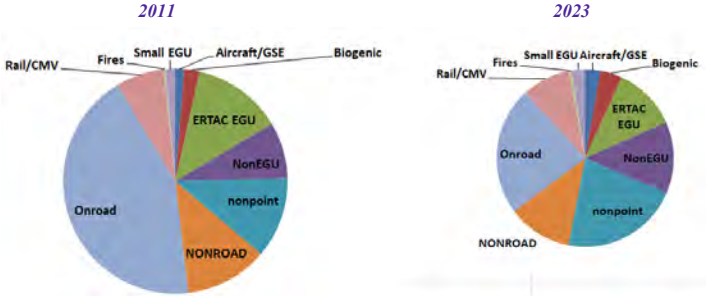
MARAMA's GAMMA inventory used EGU estimates from the ERTAC EGU CONUS v2.7 runs completed in September 2017 using input file updates for states current as of June 2017. The regional inventory is described in detail in the Technical Support Document posted on the MARAMA website. (http://www.marama.org/images/stories/documents/TSD_GAMMA_Northeast_Emission_Inventory_for_2011_2023_20180131.pdf

Technical Tools Spotlight: MARAMA's Emissions Modeling Framework System

MARAMA's Emissions Modeling Framework (EMF) software system helps manage and assure the quality of emissions inventories and emissions modeling-related data. Within the EMF are several modules that can be used to create various inventory data products.

The Control Strategy Tool (CoST) module within the EMF system is used to project emissions from area sources and from point sources other than electricity generating units (non-EGUs point sources), accounting for growth in activity, emissions controls, and source closures. The Temporalization module allows users to estimate emissions for different time periods and resolutions (e.g., creating an ozone season weekday inventory from an annual inventory). The EMF can also be used to set up and run SMOKE (to create model-ready gridded emissions), MOVES (to create mobile source emission factors), and SMOKE-MOVES (to create gridded emissions from mobile source emission factors).

MARAMA continues to make extensive use of its Emissions Modeling Framework (EMF) system to store, analyze, and grow its emissions inventories.



The GAMMA inventory estimates reductions of ~44% in regional NO_x emissions between 2011 and 2023

MARAMA 2017 Board Members

From left to right: Julie McDill, Frank Steitz, Jayme Graham, Cecily Beall, Tad Aburn, Susan Wierman, Ali Mirzakhalili, Fred Durham, Mike Abraczinskas, Krish Ramamurthy, Chuck Turner (alternative at meeting for Mike Dowd), and Kass Sellassie

Coordination Keeps Members in Touch

MARAMA staff members led and participated in a range of calls and meetings that helped keep our members in touch with each other and enabled them to work together. Julie McDill and Susan McCusker held regular monthly emissions inventory calls to brief the staff from MARAMA and NESCAUM states. These calls facilitated state review and use of MARAMA's work products.

Julie McDill also organized frequent national calls with EPA mobile source experts using interactive video conferencing. These MJO MOVES calls helped states understand EPA's plans for estimating mobile source emissions and provided opportunities to comment on EPA's work and explain states' needs and concerns.

Julie McDill's leadership was instrumental in the inter-regional coordination of emissions inventory development for modeling, development of the ERTAC EGU emissions forecasts, and improving estimates of emissions from oil and gas activities.

Susan Wierman and Julie McDill also gleaned information from national and regional meetings and calls that helped MARAMA staff organize workshops and briefings for MARAMA members and encouraged collaboration with other regions and EPA.

Julie McDill leading a national MJO MOVES call.

Trends in Energy Production Contribute to Regional Air Quality Improvement

MARAMA uses information from the US Energy Information Administration (EIA) to help members predict future emissions from energy generation in the region.

Energy production and use is directly related to air quality. The type of fuel, as well as the amount of energy produced and consumed, influence emissions from electricity generation, transportation, industrial activity, and other sources in our region. EIA expects electricity use overall to increase through 2050 (according to the US Energy Information Administration's *Annual Energy Outlook 2018*). As ever, predicting what fuels will be used to produce this growth entails significant uncertainty, and EIA presents scenarios with either smaller or larger growth in natural gas and oil as opposed to coal-fired generation. In general, an increase in generation from renewables is anticipated, and low prices for natural gas are expected to result in continued construction of new natural gas-fired power generators. Coal production is expected to continue to decline due to retirements of coal-fired power plants, even if EPA's Clean Power Plan is not implemented.

Importantly, EIA indicates that 2017 appears to have been a peak in energy consumed by transportation. EIA predicts that for the US as a whole, increased fuel economy will reduce emissions from light and heavy duty vehicles enough to offset increases in vehicle miles traveled. This trend reflects stricter fuel economy standards scheduled to come into play through 2025 for light duty vehicles and 2027 for heavy duty vehicles. EIA expects growth in jet fuel consumption, and sales of electric vehicles are predicted to grow.

MARAMA States Energy Profiles are Evolving

Most MARAMA states have adopted **renewable portfolio standards** to promote the use of renewable energy sources such as solar and wind. Huge energy demands have been created by the data centers that power the modern internet and "cloud" services. In 2017, solar energy farms in Virginia and wind energy from North Carolina provided power to Amazon computer data centers in northern Virginia (Source: EIA 1/9/17 article by Daniel Cusick in E&E News Climate Wire).

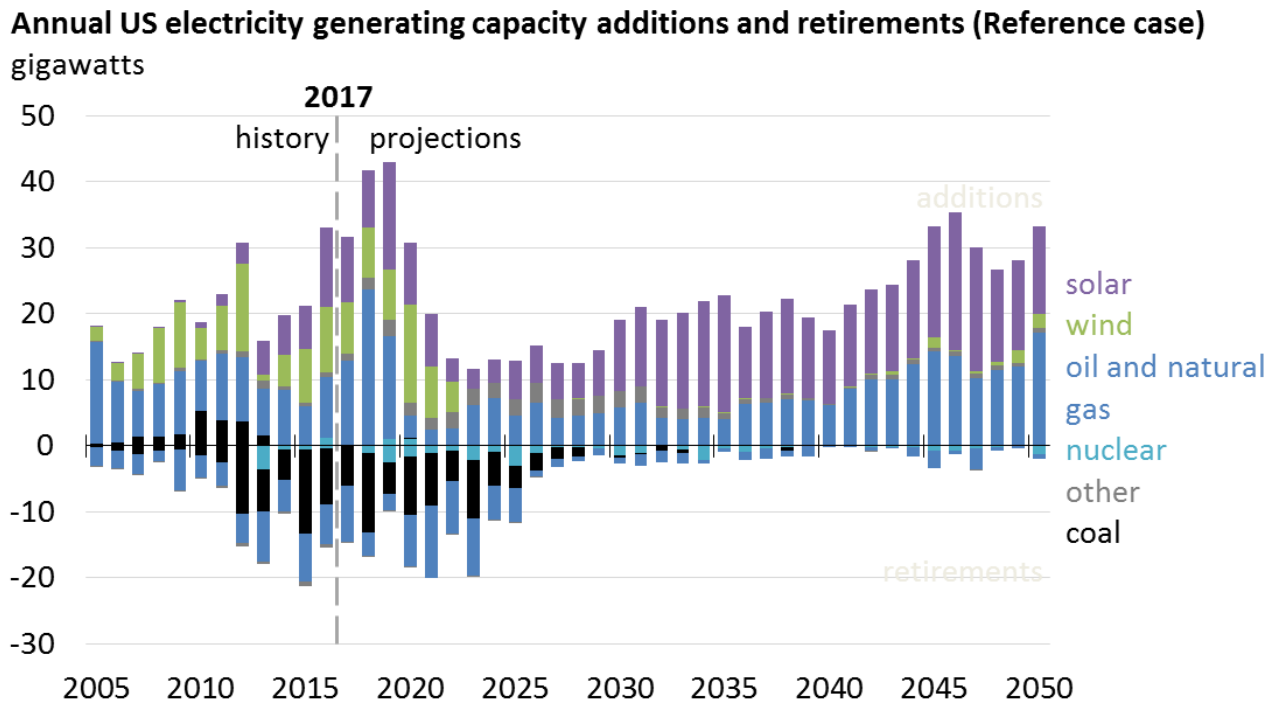
Solar Energy Farm

Natural gas production in so called "wet gas" areas such as western Pennsylvania produces liquids such as ethane, propane, and butane (among others). These liquids are refined and used in the production of plastics, fuels, and other products. EIA reported that US production of natural gas plant liquids hit a new high in 2017 and was projected to continue to increase through 2025 or later. EIA anticipated 70% of the growth in liquids production will occur in the Appalachian basin, and the Utica and Marcellus shale formations. Shell proposed to build a refinery (a cracker plant) in Beaver County, northwest of Pittsburgh beginning in late 2017, with operation expected by 2020. (Source: EIA)

New Jersey's energy sector has been transformed. According to EIA, 2016 was the first year that more than half the electricity generated in New Jersey was powered by natural gas. Looking forward, EIA also reports that although nuclear power provided 39% of New Jersey's electric generation in 2016, the Oyster Creek nuclear reactor is scheduled to shut down in 2019.

The Ports of Norfolk and Baltimore shipped the largest amounts of coal from US ports in 2017, and the natural gas import terminal in Baltimore was being modified to serve natural gas exports.

Annual US Electricity Generating Capacity Additions and Retirements (2005-2050)



Renewables and natural gas comprise most of the capacity additions through the projection period in the US EIA's

U.S. Energy Information Administration, Annual Energy Outlook 2018 with Projections to 2050. Overview, February 6, 2018. www.eia.gov/aeo

2017 MARAMA Outstanding Service Awards

MARAMA's success depends on collaborative efforts by staff from member agencies. Each year MARAMA presents an award to recognize those individuals whose contributions have been outstanding. The **2017 MARAMA Outstanding Service Awards** went to:

Nick Lazor, Pennsylvania Department of Environmental Protection

In recognition of his leadership as Chair of MARAMA's Monitoring Committee, and his service as organizer and moderator of MARAMA's Annual Monitoring Committee Workshop.

Nick Lazor and Susan Wierman

Yogesh Doshi, Virginia Department of Environmental Quality

In recognition of his work as an ambassador for successful diesel emission reduction projects and his support of MARAMA and the Mid-Atlantic Diesel Collaborative.

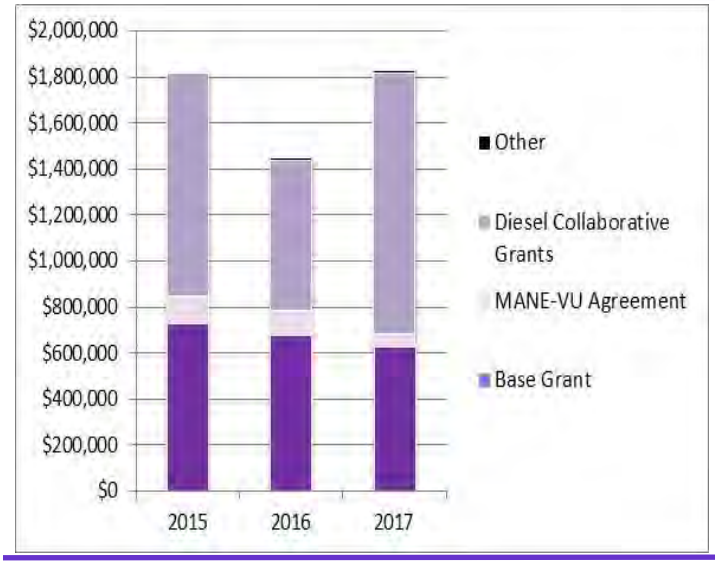
MARAMA - A Year in Review

Thanks to our member agencies, MARAMA received continuing primary support through our EPA Base Grant in FY 2017. Reflecting declining MANE-VU support, technical services contracts were a minor expenditure in FY 2017, and MARAMA relied on experienced staff and members, as well as collaboration with other regional organizations, to accomplish emissions inventory projects.

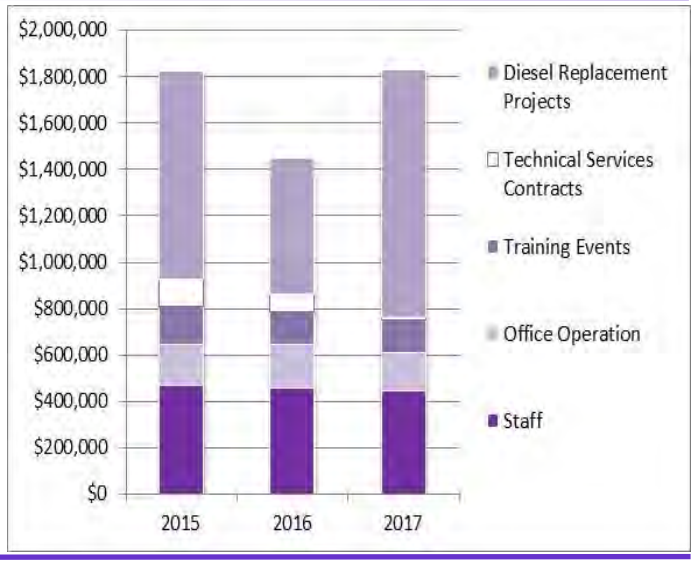
The training program was very active, with costs less than anticipated as a contractor retired and EPA took on the task of completing a major update of the course on quality assurance of air monitoring data. Training costs were also minimized through the use of many courses whose instructors were paid via EPA's National Air Compliance Training (NACT) project. Diesel Collaborative grants primarily supported pass-through funding of diesel drayage truck replacement projects. All grants and agreements helped support MARAMA's staff and office operation costs.

In October 2016, Megan McHargue joined MARAMA's staff as our Administrative Specialist. She replaced Sheri Buttarazzi.

FY 2017 Revenue



FY 2017 Expenses



MARAMA Directors and Staff

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Jackie Burkhardt, Co-Training Coordinator
Sue Dilli, Co-Training Coordinator
Deborah Thomas, Diesel Program Manager
Susan McCusker, Ph.D., Sr. Environmental Scientist
Megan McHargue, Administrative Specialist
Sharon Ray, Administrative Assistant

Design and text by Sharon Ray & Susan Wierman, May 2018