

AIR QUALITY RESEARCH PROGRAM

**Texas Commission on Environmental Quality
Contract Number 582-22-20017
Awarded to The University of Texas at Austin**

**Annual Report
September 1, 2024 – August 31, 2025**

Submitted to

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December 16, 2025

The preparation of this report was financed through a grant from the Texas Commission on Environmental Quality (TCEQ), administered by The University of Texas at Austin (UT) through the Air Quality Research Program (AQRP). The contents, findings, opinions, and conclusions are the work of the author(s) and do not necessarily represent findings, opinions, or conclusions of the TCEQ.

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Texas Air Quality Research Program

Annual Report

September 1, 2024 – August 31, 2025

OVERVIEW

The goals of the State of Texas Air Quality Research Program (AQRP) are:

- (i) to support scientific research related to Texas air quality, in the areas of emissions inventory development, atmospheric chemistry, meteorology, and air quality modeling,
- (ii) to integrate AQRP research with the work of other organizations, and
- (iii) to communicate the results of AQRP research to air quality decision-makers and stakeholders.

PROGRAM ACTIVITIES FOR THE QUARTER

AQRP focused on financial oversight, research project monitoring, and program planning activities. AQRP Grant Manager audited Financial Status Reports (FSRs) submitted by Subawardees and corresponded with awardee institutions to address expense-related questions and concerns. Primary AQRP FSR-Invoices were prepared and submitted to TCEQ.

Monthly Technical Reports (MTRs) were collected from Subawardees and reviewed by both AQRP and TCEQ Project Managers. AQRP Project Managers also worked directly with Subawardees to address research-related questions arising from MTR content and ensure timely clarification of technical issues.

AQRP and TCEQ Project Managers reviewed and discussed upcoming biennium milestones, research priorities, and technical and advisory council rosters. In addition, Budget Revision Review Forms (BRRFs) for projects under the 10% threshold requiring no TCEQ approval were reviewed and processed.

The 2025 AQRP Workshop was held on August 26, 2025 at the UT Austin West Pickle Research Campus from 9:00 AM to 4:00 PM CT. The workshop presentations can be viewed here:

<https://aqrp.ceesa.utexas.edu/workshops/presentations/2025-presentation>. The Workshop was recorded and archived on the AQRP website here:
<https://utexas.box.com/s/uyyrm10cn0d0xtdoklvmire7dfc9gt5y>.

The TCEQ approved the Carry Forward balance from the 2023-2025 biennium into the 2025-2027 biennium in early December 2025. The total Carry Forward balance approved is \$76,262.92, with \$60,678.27 dedicated to increased Research/Contractual budget for projects and \$15,584.65 allocated to Administrative expenses. The Carry Forward balances will be reflected in the Financial Status Report section of this report.

Throughout the year, the AQRP Program Manager maintained weekly meetings with the TCEQ Project Manager to discuss the status of projects, administrative deliverables, and ongoing program updates.

BACKGROUND

Section 387.010 of House Bill (HB) 1796 (81st Legislative Session), directs the Texas Commission on Environmental Quality (TCEQ) to establish the Texas Air Quality Research Program (AQRP). The University of Texas at Austin (UT) was selected by the TCEQ to administer the program. A contract for the administration of the AQRP was established between the TCEQ and UT. Consistent with the provisions in HB 1796, up to 10% of the available funding is to be used for program administration; the remainder (90%) of the available funding is to be used for research projects, individual project management activities, and meeting expenses associated with an Independent Technical Advisory Committee (ITAC).

The AQRP contract was executed for the 2023-2025 biennium and funding of \$750,000 per year was awarded.

RESEARCH PROJECT CYCLE

The Research Program is implemented through a nine-step cycle each biennium. The steps in the cycle are described from project concept generation to final project evaluation for a single project cycle.

- 1) The project cycle is initiated by developing (in year 1) or updating (in subsequent years) the research priorities. The Air Quality Research Program (AQRP) Director, in consultation with the Independent Technical Advisory Committee (ITAC), the Advisory Council (the Council), and the Texas Commission on Environmental Quality (TCEQ), develop research priorities; the research priorities are released along with a Request for Proposals (RFP).
- 2) Project proposals relevant to the research priorities are solicited. The RFP will be found at <https://aqrp.ceesa.utexas.edu/> once released.
- 3) The ITAC performs a scientific and technical evaluation of the proposals.
- 4) The project proposals and ITAC recommendations are forwarded to the TCEQ. The TCEQ evaluates the project recommendations from the ITAC and comments on the relevancy of the projects to the State of Texas's air quality research needs.
- 5) The recommendations from the ITAC and the TCEQ are presented to the Council and the Council selects the proposals to be funded.
- 6) All Investigators are notified of the status of their proposals, either intent to fund, not funded, or contingent (not funded at this time, but being held for possible reconsideration if funding becomes available).
- 7) Intent to fund projects are assigned an AQRP Project Manager at UT Austin and a Project Liaison at TCEQ. The AQRP Project Manager is responsible for ensuring that project objectives are achieved in a timely manner and that effective communication is maintained among investigators involved in multi-institution projects. The AQRP Project Manager has responsibility for documenting progress toward project measures of success for each project. The AQRP Project Manager works with the researchers, and the TCEQ, to create an approved work plan for the project.

The AQRP Project Manager also works with the researchers, TCEQ, and the Program's Quality Assurance officer to develop an approved Quality Assurance Project Plan (QAPP) and Work Plan for each project. Subaward Agreements are issued. The AQRP Project Manager reviews monthly, quarterly, annual, and final reports from the researchers and works with the researchers to address deficiencies.

- 8) The AQRP Director and the AQRP Project Manager for each project describe progress on the project in the ITAC and Council meetings dedicated to on-going project review.
- 9) The project findings are communicated through multiple mechanisms. Final reports are posted to the AQRP web site (<https://aqrp.ceesa.utexas.edu/>); research briefings are developed for the public and air quality decision makers; and a bi-annual research conference/data workshop is held.

During this period, the AQRP performed step 7, 8, and 9.

Research Projects
FY 2024-2025 Projects

Project 24-003 (University of Houston)

Title: Improving Emission Rates Estimates of Commercial Marine Vessels	Status: COMPLETE 08/12/2024 – 08/31/2025
PI: James Flynn (University of Houston)	Funded Amount: \$242,048
Co-PI: Christian Lindhjem (Ramboll)	AQRP Project Manager: Vincent Torres
Co-PI: Jerker Samuelsson (FluxSense)	TCEQ Project Liaison: Cody McClain

Abstract: The Texas Commission on Environmental Quality (TCEQ) relies on emission inventories to shape the State Implementation Plan (SIP), crucial for managing air pollutants such as nitrogen oxides (NO_x) and ozone (O₃). Recognizing the significance of reliable data, the team of the University of Houston (UH) and Ramboll proposed this research project to address the research priority identified by the Air Quality Research Program (AQRP) to improve emission inventories for commercial marine vessels (CMV).

CMV emissions, particularly NO_x, constitute a substantial portion of coastal NO_x emissions. In the Houston-Galveston-Brazoria nonattainment area, CMVs accounted for approximately 18% of NO_x emissions in 2019, with a continued significant contribution expected for years to come. Among different vessel categories, smaller commercial vessels, notably towboats, were responsible for about 42% of CMV NO_x emissions in Texas in 2019 (TCEQ, 2023). Towboat and tugboat emissions have greater uncertainty than other CMV categories due to the lack of information on engines and the uncertainties of engine loads and operating parameters. This project aims to improve our understanding of commercial marine exhaust emissions, focusing on NO_x, volatile organic compounds (VOC), PM_{2.5}, and hydrocarbon speciation. The emphasis on smaller vessels will improve our ability to intercept their exhaust plumes.

Employing the instrumented UH research boat, our approach involves sampling emission plumes from vessels downwind of busy shipping lanes in Galveston Bay. Plumes will be identified by elevated levels of carbon dioxide (CO₂), NO_x, and other compounds. The research team expects to sample plumes from hundreds of towboats to meaningfully constrain the emission inventory. Leveraging real-time Automatic Identification System (AIS) transponder data, which reports vessel identification, position, speed, and draft, enhances our ability to connect measured plumes to individual vessels and ascertain engine information.

Emissions rates, derived from the field measurement data, will be compared with EPA expected values for each of the sampled and identified vessel engines. Multiple encounters with the same vessel over the sampling period will provide insights into emission variability. The analysis results have the potential to enhance the accuracy of the commercial marine emission inventory and

speciated VOC reactivity. Such improvement can be integrated into various modeling frameworks, including those utilized for SIP modeling that support air quality planning efforts.

Final Report: https://aqrp.ceesa.utexas.edu/images/Reports%20PDF/24-003_FinalRpt.pdf

Project 24-004 (Ramboll)

Title: Evaluating Updates to CAMx and NO _x Emission Inventories Using TEMPO Measurements over Texas	Status: COMPLETE 08/12/2024 – 08/31/2025 Funded Amount: \$229,691 AQRP Project Manager: Elena McDonald-Buller
PI: Jeremiah Johnson (Ramboll)	TCEQ Project Liaison: Robert Kierstead

Abstract: Nitrogen oxide (NO_x) emissions are critical to ozone formation in Texas and consequently accurate NO_x emission inventories are essential to air quality planning using the Comprehensive Air Quality Model with Extensions (CAMx). Previous work by our team showed that highly resolved (sub 1 km) NO₂ column measurements by the National Aeronautics and Space Administration (NASA) Geostationary Coastal and Air Pollution Events (GEO-CAPE) Airborne Simulator (GCAS) aircraft can constrain the CAMx NO_x emission inventory for Houston with source-category specificity. In this project, research team will evaluate whether NO₂ column measurements by the new NASA Tropospheric Emissions: Monitoring of Pollution (TEMPO) satellite can constrain CAMx NO_x emission inventories as successfully as the GCAS aircraft. At the same time, the research team will investigate how improving the CAMx NO_x chemistry (i.e., particle nitrate photolysis), NO₂ vertical distribution and soil NO_x emission inventory influence CAMx agreement with measured NO₂ columns. This project will determine how the new Tropospheric Emissions: Monitoring of Pollution (TEMPO) satellite can be used for NO_x emission inventory evaluation. Lessons learned and techniques developed for this project could be applied to other areas in the United States.

Final Report: https://aqrp.ceesa.utexas.edu/images/Reports%20PDF/24-004_FinalRpt.pdf

Project 24-007 (University of Houston)

Title: Texarkana Intensive Campaign	Status: COMPLETE 08/12/2024 – 08/31/2025
PI: James Flynn (University of Houston)	Funded Amount: \$309,703
Co-PI: Sascha Usenko (Baylor University)	AQRP Project Manager: Vincent Torres
Co-PI: Edward Fortner (Aerodyne Research Inc.)	TCEQ Project Liaison: Chola Regmi

Abstract: The Texarkana Texas (TX)-Arkansas (AR) metropolitan area has recently become an area of concern due to elevated fine Particulate Matter (PM_{2.5}) aerosol loadings. The area is forested and contains a few large paper mills which are one potential source of the PM. These paper mills are located in Texas, Arkansas, and Louisiana. There are other possible industrial sources of PM_{2.5} and it is possible that the PM_{2.5} is being advected into the area from sources well outside of the area. The upcoming changes to regulatorily acceptable PM_{2.5} levels necessitate a better understanding of the cause of these enhanced PM_{2.5} levels in the Texarkana area. A comprehensive study of the particle and gas phase chemical species associated with these PM_{2.5} exceedance episodes will assist in interpreting the source of these air masses.

A three-week field deployment in Texarkana, TX during the February-March 2025 time period to examine the sources of high PM_{2.5} loadings in the Texarkana area will be conducted. This study obtained information regarding the chemical species present in these high-loading events in both particle and gas phase. This information will better inform policymakers with respect to the health hazards associated with these higher aerosol loading events.

Objectives for this study include:

1. Characterize selected PM_{2.5} and Volatile Organic Compound (VOC) point sources in the Texarkana area.
2. Evaluate background PM_{2.5} conditions in the vicinity, including upwind of the Texarkana TX-AR metropolitan area. Given the location of the metropolitan area this will likely involve measuring areas outside of the state of Texas but would not emphasize detailed emission factors for out-of-state sources.
3. Any highly local effects which might be present and impacting the measurement of PM_{2.5} at the Texarkana New Boston Station (C1031) will be examined.

The University of Houston, Baylor University, and Aerodyne are nationally recognized for their experience in development and deployment of mobile air quality labs. These customizable, comprehensive, and dynamic platforms provide on-the-go monitoring and analysis of aerosol, VOCs, trace gas, boundary layer height, and meteorological parameters. Texarkana's air quality is impacted by local sources, photochemical processing, and transport from multiple regions. This complexity can be overcome with the deployment of mobile air quality laboratories which have

several advantages in study areas such as Texarkana. These advantages include real-time monitoring, flexibility in sampling location and time, response to plumes or events (e.g., potential aerosol or precursor plumes), source characterization (e.g., upwind vs downwind), repeat measurements, and accessibility in complex environments.

Final Report: https://aqrp.ceesa.utexas.edu/images/Reports%20PDF/24-007_Final%20Report.pdf

Project 24-021 (University of Houston)

Title: Improving WRF representation of coastal, marine, and residual boundary layers and quantifying the effects on ozone prediction

Status: COMPLETE
08/12/2024 – 08/31/2025
Funded Amount: \$186,978

PI: Yuxuan Wang

AQRP Project Manager:
Elena McDonald-Buller
TCEQ Project Liaison: Gabriel Lee

Abstract: This AQRP project continues our efforts of modeling the 2021-2023 offshore field campaign data in the Houston-Galveston-Brazoria (HGB) area, with a focus on the evaluation and improvement of the meteorological model representation of coastal, marine, and residual boundary layers. The models to be investigated are the Weather Research and Forecasting (WRF) and Comprehensive Air Quality Model with Extensions (CAMx), the state’s regulatory photochemical model. The field campaigns include the Tracking Aerosol Convection Experiment-Air Quality (TRACER-AQ) studies during July – October 2021 (TAQ1) and April – October 2022 (TAQ2) and the 2023 Mobile and Offshore Air Quality Monitoring Project during May-Oct 2023. They collected unprecedentedly rich observations of meteorological factors and atmospheric composition including planetary boundary layer (PBL) and ozone (O₃) over diverse offshore locations, such as the Houston Ship Channel, Galveston Bay, and the Gulf of Mexico. Utilizing these observations to evaluate and improve models, the project will focus on the following primary science questions:

How well does mesoscale meteorological and photochemical grid modeling replicate coastal/maritime boundary layers observations from the 2021-2023 offshore observations?

How sensitive is WRF prediction of coastal/maritime boundary layers to model parameters? To what extent do the 2021-2023 offshore observations constrain those parameters?

How will the simulation of residual layer ozone be improved by explicitly parameterizing the entrainment of free tropospheric ozone into the residual layer?

What are the effects of improved PBL and residual layer (RL) simulation on offshore ozone prediction and source attribution in CAMx?

Perturbed physics ensembles (PPEs) will be conducted to the WRF model to explore parameter uncertainties and identify parameter combinations that yield simulations most consistent with observations. As boundary layer dynamics are crucial for the diffusion, accumulation, and deposition of ozone and its precursors, the project will improve our predictability of ozone in the HGB and better understand the sources of high offshore O₃ that may relate to ozone exceedances.

The project specifically targets the AGRP Priority Research Priorities FY2024-2025:
Photochemical air quality models concerning model improvements to WRF PBL schemes, and
TRACER-AQ and over-water measurements concerning additional analyses of those campaign
data.

Final Report: https://agr.p.ceesa.utexas.edu/images/Reports%20PDF/24-021_Final%20Report.pdf

Project 24-024 (The University of Texas at Austin)

Title: Novel Observations of Quantified Source Apportionment of Ozone, Particulate Matter and Contributing Precursors in the El Paso Area	Status: COMPLETE 08/12/2024 – 08/31/2025 Funded Amount: \$280,810 AQRP Project Manager: Vincent Torres TCEQ Project Liaison: Celinda Vallejo-Rodriguez
PI: Pawel Misztal (UT Austin)	

Abstract: The United States Environmental Protection Agency recently lowered the annual National Ambient Air Quality Standard (NAAQS) for fine particulate matter or particulate matter small than 2.5 μm in diameter ($\text{PM}_{2.5}$) from 12 to 9 $\mu\text{g m}^{-3}$. This new annual standard brings the El Paso region to near non-attainment for $\text{PM}_{2.5}$, underlining the importance of understanding the composition and sources of $\text{PM}_{2.5}$ and O_3 in El Paso.

An improved understanding of El Paso organic aerosol and ozone is therefore essential and will directly benefit the Texas Commission on Environmental Quality (TCEQ) in guiding how to manage El Paso's air quality.

Project 24-024 will focus on improving our understanding of the contributions of volatile organic compounds (VOC) to formation of secondary organic aerosol (SOA). This work will contribute with spatiotemporal observations of SOA composition and its gas-phase organic precursors, measured by a comprehensive suite of state-of-the-science instrumentation deployed in the University of Texas electric mobile laboratory. Work will include analysis of recently collected data in El Paso, conducting novel comprehensive mobile and stationary measurements in El Paso region, and air quality modeling by the Comprehensive Air-quality Model with extensions (CAMx).

The proposed work is highly relevant to the TCEQ AQRP priority research areas and will contribute to knowledge about the sources contributing to high PM, O_3 and VOC (e.g. toluene) episodes in this region.

Final Report: https://aqrp.ceesa.utexas.edu/images/Reports%20PDF/24-024_Final%20Report.pdf

Independent Technical Advisory Committee

The Air Quality Research Program (AQRP) funding is to be used primarily for research projects, and one of three groups responsible for selecting the projects is the Independent Technical Advisory Committee (ITAC). The ITAC is composed of between 9 and 15 individuals with scientific expertise relevant to the AQRP. The ITAC is charged with recommending technical approaches, establishing research priorities, and reviewing, commenting, and advising on all projects to ensure that the projects facilitate air quality improvement in Texas. Members of the ITAC consist of the Texas Commission on Environmental Quality (TCEQ) Air Quality Deputy Director (or designee), and representatives with air quality expertise from research institutions with extensive expertise in air quality research in Texas. The members of the ITAC are listed in Table 1. The members of the ITAC are drawn from Texas universities active in air quality research, national laboratories that have participated in air quality studies in Texas, and institutions that have expertise not available in Texas and that have participated in air quality studies in Texas.

The ITAC membership is intentionally drawn from air quality researchers who have experience in Texas. These researchers and their colleagues will likely have interest in responding to the requests for research proposals issued by the AQRP. This raises potential confidentiality and conflict of interest issues, and the contract between TCEQ and the University of Texas at Austin requires that the AQRP maintain and implement an appropriate written policy on conflict of interest. Specifically, for the ITAC, all members are required to certify:

Confidentiality: As a member of Independent Technical Advisory Committee (ITAC), I understand that I will have access to proposals submitted to the Air Quality Research Program (AQRP). Subject to any legal requirements, I agree to keep the information in these proposals confidential until the selection process is completed and it is appropriate to release information to the public. I understand that there may be certain information that comes to me in my role as a member of ITAC that retains its confidential nature even after the process is concluded. I also understand that I will review said proposals and may have access to the reviews made by other ITAC members. I agree to keep these reviews and the identity of the reviewers confidential until such time as this information is released to the public. (NOTE: For the reviews and reviewers, this information may never be released.)

Conflict of Interest: As a member of ITAC, I agree that I will not evaluate, comment on, or vote on proposals in which I or my home institution is involved, including, but not limited to, any financial interest or in which I have another form of conflict of interest. I understand that ITAC members with conflicts of interest must leave the meeting room or the conference line when a proposal with which they have a conflict is discussed, voted on or otherwise being considered. I understand that I must recuse myself from participating in or attempting to influence at any time the ITAC's or the AQRP Council's consideration or decision concerning such proposals. I agree to bring any issues concerning a possible conflict of interest to the attention of the Director of the AQRP or the TCEQ Air Quality Deputy Director. If there is a question of interpretation regarding whether a conflict of interest exists, I agree that the decision regarding whether a conflict of interest exists will be made by the Director of the Air Quality Research Program or the TCEQ Air Quality Deputy Director.

All members of the ITAC agree to abide by these conflicts of interest and confidentiality provisions prior to participating in the review of proposals. Table 1 contains the 2024-2025 Biennium ITAC members.

Table 1. Independent Technical Advisory Committee Members

Name	Title	Institution
David Allen	Professor and Director, AQRP	The University of Texas at Austin
Doug Boyer	Technical Specialist	TCEQ, Office of Air Director
Brad Pierce	Director, Space Science and Engineering Center	Univ. of Wisconsin-Madison
Don Collins	Professor	University of California, Riverside
Joost de Gouw	Research Physicist, Cooperative Institute for Research in Environmental Sciences (CIRES) Senior Scientist and Fellow	National Oceanic and Atmospheric Administration (NOAA), University of Colorado Boulder
James Nolan	Technical Specialist	TCEQ, Office of Air Director
Lea Hildebrandt Ruiz	Associate Professor	The University of Texas at Austin
Rebecca Sheesley	Associate Professor	Baylor University
William Vizquete	Professor	University of North Carolina
Yuxuan Wang	Associate Professor of Atmospheric Chemistry	University of Houston
Greg Yarwood	Principal	Ramboll
Renyi Zhang	Distinguished Professor of Atmospheric Sciences, Harold J. Haynes Chair in Geosciences	Texas A&M University

TCEQ Relevancy Review

The Texas Commission on Environmental Quality (TCEQ) reviews proposals for relevancy to the State’s air quality research needs. TCEQ approval is required for a project to receive funding from the Program.

Advisory Council

The final group responsible for selecting Air Quality Research Program (AQRP) research projects is the Advisory Council (the Council). The Council consists of between 7 and 11 members. Two Council members with relevant scientific expertise are nominated by the Texas Commission on Environmental Quality (TCEQ). As defined in the AQRP contract, up to four members of the Council can be county judges from the Houston-Galveston-Brazoria (HGB) and Dallas-Fort Worth (DFW) non-attainment counties. Additional members should have a general background in air quality and business practices, and can include elected officials, business community representatives, environmental group representatives, and members of the general public. The Council’s responsibilities are to attend meetings with TCEQ Management and the AQRP to understand the statewide project goals for the funding period, to select for funding the projects reviewed by the Independent Technical Advisory Committee (ITAC) and ranked by the TCEQ, and to assist with the presentation of project final results at locations throughout the state. Table 2 contains the 2024-2025 Biennium Advisory Council Members.

Table 2. Advisory Council Members

NAME	TITLE	INSTITUTION
Dan Baker	Senior Partner	Environmental Reaction Engineering Experts (E REX)
Beata Czader	Air Modeling Team Leader	TCEQ
Andrew De Candis	Clean Cities & Clean Vehicles and H-GAC Cities Co-Director	Houston-Galveston Area Council (H-GAC)
Lyle Hufstetler	Clean Cities Coordinator	Alamo Area Council of Governments (AACOG)
Chris Klaus	Senior Program Manager	North Central Texas Council of Governments (NCTCOG)
Lindley Anderson	Senior Technical Specialist	TCEQ Air Quality Division
Chris Rabideau	Senior Technical Specialist	Chevron
Cyrus Reed	Conservation Director	Sierra Club

FINANCIAL STATUS REPORT

The Air Quality Research Program (AQRP) contract was awarded for FY 24-25 for \$750,000 per year. Funds were distributed across several different reporting categories as required under the contract with TCEQ. The reporting categories are listed below in detail.

Program Administration: Limited to 10% of the overall funding per fiscal year. This category includes all staffing, materials and supplies, and equipment needed to administer the overall AQRP. It also includes the costs for the Council meetings.

ITAC: Funds are to cover the costs, largely travel expenses, for the Independent Technical Advisory Committee (ITAC) meetings.

Project Management: Limited to 8.5% of the funds allocated for Contractual budget category. Each research project is assigned a Project Manager to ensure that project objectives are achieved in a timely manner and that effective communication is maintained among investigators in multi-institution projects. These funds are to support the staffing and performance of project management.

Research Projects / Contractual: Funds available to support awarded research projects.

Program Administration

Program Administration includes salaries and fringe benefits for those overseeing the program, as well as materials and supplies, travel, equipment, and other expenses. This category allows indirect costs in the amount of 10% of salaries and wages.

Dr. David Allen, Principal Investigator and AQRP Director, is responsible for the overall administration of the AQRP. RoseAnna Goewey, AQRP Program Manager, performs program and grant management. Mr. Vincent Torres, AQRP QAPP Manager, reviews and oversees AQRP approval of all project QAPPs.

The University of Texas at Austin’s federally negotiated fringe rates for full-time/benefits eligible employees is 30.5% in the current fiscal year. Rates are estimated to have a 0.5% increase for full/part-time benefits eligible employees in subsequent years. Remaining balance will be carried forward into the 2025-2027 biennium.

Table 3: Administration Budget (2024-2025 Biennium)

Budget Category	FY 23-25 Budget	Current Expenditures August 2025	Cumulative Expenditures	Remaining Balance
Personnel/Salary	\$106,388.68	\$7,706.90	\$95,687.75	\$10,700.93
Fringe Benefits	\$29,203.45	\$2,080.92	\$25,389.82	\$3,813.63
Supplies	\$26,526.19	\$38.10	\$8,920.76	\$17,605.43
Total Direct Costs	\$162,118.32	\$9,825.92	\$129,998.33	\$32,119.99
Authorized Indirect Costs (10% x Personnel/Salary)	\$10,638.87	\$770.69	\$9,568.78	\$1,070.09
Total Costs	\$172,757.19	\$10,596.61	\$139,567.11	\$33,190.08

ITAC

Table 4 details the 2024-2025 Biennium ITAC budget. Through August 2025, ITAC travel for members to attend meetings and the 2025 workshop is accrued. Remaining balance will be carried forward into the 2025-2027 biennium.

Table 4: ITAC Budget (2024-2025 Biennium)

Budget Category	FY 23-25 Budget	Current Expenditures August 2025	Cumulative Expenditures	Remaining Balance
Travel	\$10,000.00	\$2,627.73	\$3,573.70	\$6,426.30
Supplies	\$1,250.00	\$0.00	\$0.00	\$1,250.00
Total Direct Costs	\$11,250.00	\$2,627.73	\$3,573.70	\$7,676.30
Total Costs	\$11,250.00	\$2,627.73	\$3,573.70	\$7,676.30

Project Management

Table 5 details the 2024-2025 Biennium Project Management Budget. Expenses include Project Manager salaries, fringes, required supplies, and associated Indirect Costs. Remaining balance will be carried forward into the 2025-2027 biennium.

Table 5: Project Management Budget (2024-2025 Biennium)

Budget Category	FY 23-25 Budget	Current Expenditures August 2025	Cumulative Expenditures	Remaining Balance
Personnel/Salary	\$76,000.00	\$10,479.03	\$72,800.68	\$3,199.32
Fringe Benefits	\$20,862.00	\$2,746.75	\$19,110.02	\$1,751.98
Supplies	\$8,038.00	\$715.02	\$6,466.60	\$1,571.40
Other	\$3,750.00	\$0.00	\$0.00	\$3,750.00
Total Direct Costs	\$108,650.00	\$13,940.80	\$98,377.30	\$10,272.70
Authorized Indirect Costs (10% x Personnel/Salary)	\$7,600.00	\$1,047.90	\$7,280.07	\$319.93
Total Costs	\$116,250.00	\$14,988.70	\$105,657.37	\$10,592.63

Research Projects

Table 6 shows the 2024-2025 Biennium Research Project budget and expenditures. The budget allocates \$1,255,125.09 for research projects. The budget includes carry forward from the prior biennium. At the time of this report’s subaward contracts have not invoiced against the AQRP funding. Project 24-024 at The University of Texas was able to utilize funding due to internal financial processes at the University. Remaining balance will be carried forward into the 2025-2027 biennium.

Table 6: 2024-2025 Biennium Research Project Budget

2024-2025 Biennium Total Contractual Funding		\$1,222,500.00		
FY 22-23 Contractual Carry Forward		\$32,625.09		
TOTAL CONTRACTUAL BUDGET		\$1,255,125.09		
Project Number	Institution (PI)	Amount Awarded	Cumulative Expenditures	Remaining Balance
24-003	University of Houston (Flynn)	\$159,221.00	\$158,718.64	\$502.36
24-003	Ramboll (Lindhjem)	\$47,827.00	\$47,827.00	\$0.00
24-003	Fluxsens (Samuelsson)	\$35,000.00	\$35,000.00	\$0.00
24-004	Ramboll (Johnson)	\$229,691.00	\$229,691.00	\$0.00
24-007	University of Houston (Flynn)	\$144,233.00	\$143,035.71	\$1,197.29
24-007	Baylor University (Usenko)	\$88,951.00	\$88,807.56	\$143.44
24-007	Aerodyne (Fortner)	\$76,519.00	\$75,161.15	\$1,357.85
24-021	University of Houston (Wang)	\$186,978.00	\$171,270.12	\$15,707.88
24-024	The University of Texas at Austin (Misztal)	\$280,810.00	\$280,810.00	\$0.00
FY 24 Total Contractual Funding Awarded		\$1,249,230.00		
FY 24 Contractual Funds Expended			\$1,230,321.18	
FY Contractual Funds Remaining to be Spent				\$24,803.91
Total Contractual Funding		\$1,255,125.09		
Total Contractual Funding Awarded		\$1,249,230.00		
Total Contractual Funding Contingency		\$5,895.09		
Total Contractual Funds Expended to Date			\$1,230,321.18	
Total Contractual Funds Remaining to be Spent				\$24,803.91

APPENDIX A. CONTRACTUAL RESEARCH PROJECTS APPROVED FOR FUNDING (BIENNIUM 2024-2025)

Project #	Project Title	Research Priority	Primary Institution: PI	Collab. Institution: Co-PI(s)	Total Budget	AQRP Project Manager	TCEQ Liaison
24-003	Improving Emission Rates Estimates of Commercial Marine Vessels	Improve emission inventories	<i>University of Houston:</i> Flynn	<i>Ramboll:</i> Lindhjem, <i>FluxSens:</i> Samuelsson	\$242,048	Vincent Torres	Cody McClain
24-004	Evaluating Updates to CAMx and NOx Emission Inventories using TEMPO Measurements over Texas	Photochemical air quality models	<i>Ramboll:</i> Jeremiah Johnson	n/a	\$229,691	Elena McDonald-Buller	Robert Kierstead
24-007	Texarkana Intensive Campaign	Development of an ozone and PM _{2.5} field study in El Paso	<i>University of Houston:</i> James Flynn	<i>Baylor University:</i> Usenko; <i>Aerodyne Research, Inc.:</i> Fortner	\$309,703	Vincent Torres	Chola Regmi
24-021	Improving WRF representation of coastal, marine, and residual boundary layers and quantifying the effects on ozone prediction	Photochemical air quality models	<i>University of Houston:</i> Yuxuan Wang	n/a	\$186,978	Elena McDonald-Buller	Gabriel Lee
24-024	Novel Observations and Quantified Source Apportionment of Ozone, Particulate Matter and Contributing Precursors in the El Paso Area	Development of an ozone and PM _{2.5} field study in El Paso	<i>The University of Texas at Austin:</i> Pawel Misztal	n/a	\$280,810	Vincent Torres	Celinda Vallejo-Rodriguez