The following tables list projects that are relevant to the Charge Questions and supported through the Science to Achieve Results (STAR) extramural grants and other supplemental internal ORD programs.

Science Needs Related to Air Toxic Sources and Emerging Contaminants (CQ1)

Solicitation or Project Title (PI, Institution)	Project Type[1]	Start Date	# Journal Articles
Solicitation: Measurement and Monitoring Methods for Air Toxics and Contaminants of Emerging Concern in the Atmosphere			
N/A	STAR	April 2022 (anticipated)	

Supplemental ORD Project Title	Lead Region	Project Type[1]	Fiscal Year(s)
Ambient Air Monitoring and Emissions Controls for PFAS	Region 3	ROCS-Net	2019
Understanding PFAS Deposition	Region 1	ROCS-Net	2019
Evaluating PFAS Waste Treatment and Disposal Technology Effectiveness	Region 9	R2P2	2019
Ethylene Oxide: Developing Enhanced Monitoring Capabilities	Region 5	R2P2	2020
Advanced fugitive measurements of ethylene oxide emissions	Region 5	RARE	2019
Equipment Familiarization and Development of Real Time Ethylene Oxide (EtO) Analyzer Deployment Parameters	Region 7	R2P2	2020
Characterization of EtO Emissions Downwind of a Chemical Facility Using Innovative Realtime Measurement Technologies	Region 7	RARE	2021
Comparison of Particulate Metals Passive Air Samplers Against Semi-Continuous Metals Monitor near Steel Mills and Other Metal Emitting Facilities	Region 5	RARE	2021 2022
In-Source Monitoring at the Port of New York and New Jersey	Region 2	RARE	2011
Measurement of combustion efficiency of enclosed combustor devices (ECDs) at oil and natural gas production facilities	Region 8	RARE	2020
Next Generation Emissions Measurements and Source Modeling at Gasoline Bulk Terminals	Region 4	RARE	2021
Development and testing of fenceline sensor systems in EPA Region 6	Region 6	RARE	2017
Demonstration of advanced fenceline VOC monitoring systems in New Mexico	Region 6	RARE	2020
Community Participation in Classifying Odors from Air Pollution Emissions	Region 4	RESES	2018
Utilizing low-cost Next Generation Emissions Measurement (NGEM) tools to develop a near-source monitoring and modeling approach for air toxics emissions	Region 4	R2P2	2020

[1] Project types are defined at the end of this document.

Science Needs to Understand Climate Change Impacts (CQ2)

Solicitation or Project Title (PI, Institution)	Project Type	Start Date	# Journal Articles
Solicitation: Particulate Matter and Related Pollutants in a Changing World			
Wildfires in the Rocky Mountains Region: Current and Future Impacts on PM2.5, Health, and Policy (PI: Yan Liu, Georgia Institute of Technology)	STAR	January 2016	5
Rethinking the Formation of Secondary Organic Aerosols (SOA) Under Changing Climate by Incorporating Mechanistic and Field Constraints (PI: Jose Jimenez, University of Colorado- Boulder)	STAR	January 2016	52
Ensemble Analysis of Global Change Projections for US Air Quality Using a Novel Combination of Lagrangian and Gridded Air Quality Models (PI: Brian Lamb, Washington State University)	STAR	January 2016	N/A
Particulate Matter Prediction and Source Attribution for U.S. Air Quality Management in a Changing World (PI: Xin-Zhong Liang, University of Maryland)	STAR	April 2016	6
Quantifying Risks from Changing U.S. PM2.5 Distributions Due to Climate Variability and Warming with Large Multi-Model Ensembles and High-Resolution Downscaling (PI: Arlene Fiore, Columbia University)	STAR	January 2016	9
Integrated Analysis of Land Use-Based Policies for Improving Air and Water Quality: A Focus on Agricultural Reactive Nitrogen and Wildland Fire Emissions as Climate, Land Use and Anthropogenic Emissions Change (PI: Ted Russell, Georgia Tech)	STAR	January 2016	16
Effects of Ammonia on Secondary Organic Aerosol Formation in a Changing Climate (PI: Donald Dabdub, University of California-Irvine)	STAR	January 2016	8
Interplay Between Black and Brown Carbon from Biomass Burning and Climate (PI: Shane Murphy, University of Wyoming)	STAR	January 2016	2
Effects of Changes in Climate and Land Use on U.S. Dust and Wildfire Particulate Matter (PI: Loretta Mickley, Harvard University)	STAR	January 2016	7
Planning for an Unknown Future: Incorporating Meteorological Uncertainty into Predictions of the Impact of Fires and Dust on US Particulate Matter (PI: Emily Fischer, Colorado State University)	STAR	January 2016	8
Solicitation: Air, Climate And Energy (ACE) Centers: Science Supporting Solutions			
SEARCH: Solutions to Energy, AiR, Climate, and Health (PI: Michelle Bell, Yale University); (Project 3: Air Quality and Climate Change Modeling: Improving Projections of the Spatial and Temporal Changes of Multipollutants to Enhance Assessment of Public Health in a Changing World)	STAR	October 2015	69
Regional Air Pollution Mixtures: The past and future impacts of emissions controls and climate change on air quality and health (PI: Petros Koutrakis, Harvard University); (Project 1: Regional Air Pollution Mixtures: The Past and Future Impacts of Emission Controls and Climate Change on Air Quality and Health)	STAR	December 2015	162

Supplemental ORD Project Title	Lead Region	Project Type	Fiscal Year(s)
Quantification of Landfill Gas Emissions using next generation emission measurement (NGEM) approaches	Region 5	RARE	2021 2022

Science Needs for Impacts of Changing Energy Systems (CQ3)

Solicitation or Project Title (PI, Institution)	Project Type	Start Date	# Journal Articles
Solicitation: Particulate Matter and Related Pollutants in a Changing World			
Evaluating the Timeline of Particulate Matter Exposure from Urban Transportation and Land-Use Greenhouse Gas Mitigation Strategies Using aNovel Modeling Framework (PI: Greg Rowangould, University of Vermont)	STAR	January 2016	3
Optimal Energy Portfolios to Sustain Economic Advantage, Achieve GHG Targets, and Minimize PM2.5. (PI: Mike Kleeman, University of California-Davis)	STAR	April 2016	3
Solicitation: Air, Climate And Energy (ACE) Centers: Science Supporting Solutions			
SEARCH: Solutions to Energy, AiR, Climate, and Health (PI: Michelle Bell, Yale University); (Project 1: Modeling Emissions from Energy Transitions); (Project 4: Human Health Impacts of Energy Transitions: Today and Under a Changing World)	STAR	October 2015	69
Center for Air, Climate, and Energy Solutions (CACES) (PI: Allen Robinson, Carnegie Mellon); (Project 4: Air Pollutant Control Strategies in a Changing World)	STAR	May 2016	75

Supplemental ORD Project Title	Lead Region	Project Type	Fiscal Year(s)
State-level multi-pollutant planning using GLIMPSE	Region 3	RARE	2019
Improving State-Level Multi-Pollutant Planning in Connecticut with GLIMPSE	Region 1	RARE	2021

STAR and Other ORD Programs Providing Supplemental Funding

Extramural Research funded through EPA's Science to Achieve Results (STAR) grants provides invaluable engagement between the agency and scientific community, fostering a collaboration and knowledge-sharing platform. These grants not only engage top scientists throughout the U.S., resulting in a strong scientific foundation to support the Agency in meeting its mission, but the resulting funded research provides the underlying scientific and engineering knowledge needed to address environmental and human health issues and to improve decision-making, problem detection, and problem-solving.

EPA's Small Business Innovation Research (SBIR) Program is the small program with a big mission: to protect human health and the environment. Broad areas of focus typically stay the same and include clean and safe water, air quality, land revitalization, homeland security, sustainable materials management and safer chemicals. More specific subtopics under each of these broad areas change from year to year.

Regional Applied Research Effort (RARE) Program: The RARE program provides a mechanism for ORD and the regions to collaborate on near-term regional research priorities. RARE research addresses a wide range of environmental issues, from human health concerns to ecological effects of various pollutants. The RSLs coordinate RARE activities and ensure that research results are effectively communicated and used within the regions.

Regional Research Partnership Program (R2P2): R2P2 provides short-term training opportunities for regional technical staff to work directly with ORD scientists in ORD laboratories, centers, and offices. The program builds technical capacity in the regions, enhances the skills and knowledge of regional and ORD staff, and promotes the development of stronger ties between ORD and the regions. The RSLs and headquarters staff facilitate the process of soliciting applicants and helping candidates establish the necessary contacts throughout ORD.

The Regional Sustainability and Environmental Sciences (RESES) program, led by EPA's Office of Research and Development (ORD), matches Agency scientific and technical expertise with high-priority, short-term research needs in each of the Agency's ten Regions across the nation.

Regional/ State/ Tribal Innovation Projects: The RSTIP program provides competitive funding for regional/state/tribal projects that use innovative approaches to address regional, state, and/or tribal science priorities. The program encourages the use of innovative approaches – citizen science and crowdsourcing, advanced monitoring technologies, and social science – which can expand and diversify EPA's work, engage the public, and foster creative solutions to important environmental problems. This also provides a valuable opportunity to continue strengthening the relationship between ORD, regions, states, and tribes.

Pathfinder Innovation Projects (PIPs) challenge EPA scientists to explore the leading edge of environmental science and work to turn innovations in science and technology into new environmental protection capabilities. This internal competition provides staff with additional research time and funding in pursuit of high-risk, high reward research ideas.