

PROPOSED

State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 12-10

January 26, 2012

Agenda Item No.: 12-1-1

WHEREAS, the Air Resources Board (ARB) has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code sections 39700 through 39705;

WHEREAS, the Research Division staff has reviewed and recommended this contract augmentation for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

Augmentation to Contract Number 08-328 entitled "Black Carbon and the Regional Climate of California," submitted by the University of California, San Diego, for a total amount not to exceed \$24,080.

NOW, THEREFORE, BE IT RESOLVED that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

Augmentation to Contract Number 08-328 entitled "Black Carbon and the Regional Climate of California," submitted by the University of California, San Diego, for a total amount not to exceed \$24,080.

BE IT FURTHER RESOLVED that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein, and as described in Attachment A, in an amount not to exceed \$24,080.

ATTACHMENT A

“Black Carbon and the Regional Climate of California – Contract Augmentation”

Background

In California, warmer temperatures, summer water shortages, and increased wildfires have received increasing attention. To address these environmental issues, ARB has adopted the nation's most sweeping greenhouse gas emissions reduction plan, outlining how the state will meet goals set forth by a landmark 2006 law (AB 32) that established the State of California as a leader on curbing the emissions of greenhouse gases. Black carbon (BC), as the main light-absorbing component of soot, has also been recognized as one of the largest contributors to global warming and tied to observed regional climate changes. Although there has been research suggesting that reduction of BC could be a viable strategy for helping mitigate global warming, it has not yet been the basis for actions to reduce climatic impact.

An augmentation to the ongoing research under contract 08-328 is proposed, as described below.

Objective

The objective of the augmentation to this ongoing study is to analyze surface solar radiation flux measurement data to explore the link between policies on diesel emissions and climate mitigation. The project has the potential to verify with observational evidence the total radiation benefit of combined BC and sulfur controls (which is thought to have a counteracting impact to BC) for the first time.

Methods

This research project will provide a unique data set for understanding black carbon radiative forcing from an observational perspective and thus provide a first of its kind data set to validate model predictions of BC radiative forcing and provide direct observational data for BC mitigation actions. The California Irrigation Management Information System (CIMIS) network provides hourly measurements of the surface solar flux at stations located throughout California. The investigators will use the CIMIS dataset in conjunction with Aerosol Robotic Network (AERONET) measurements to determine long-term trends in surface brightening or dimming. They will adopt a two-pronged approach to separate trends in clear-sky solar flux from the cloudy-sky solar flux. The Coefficient-of-Haze (COH) data provide a direct measurement of the visibility conditions constrained by carbonaceous aerosols. The investigators will also compare 20-year trends in COH and solar flux in each of the California air basins to provide a direct link between the expected surface brightening, observed solar flux, and reduction in BC emissions in California.

Expected Results

Inclusion of this solar flux data has the potential to greatly enhance the conclusions and results of the original research project by providing an observational tool for constraining

predictions of radiative forcing and surface brightening; and providing a metric for determining the relative significance and magnitudes of the direct, indirect, and semi-direct effects of BC.

The first set of results from the ongoing ARB funded research under contract 08-328 constitute a major finding and show that particulate matter control policies implemented by California have resulted in a reduction of atmospheric BC by 50 percent. The proposed augmentation, which leverages existing data sets and already-developed methods will involve analysis of additional unique surface solar radiation flux measurement data to explore the link between on diesel emission reduction and climate mitigation strategies. Results would further improve our understanding of the BC radiative forcing from an observational perspective, providing a first of its kind data set to validate model predictions of BC radiative forcing as well as direct observational data for BC mitigation actions.

Significance to the Board

Policy makers and air quality regulators need to be fully informed of the magnitude and importance of BC radiative impacts, and the subsequent climate response to help develop control strategies for mitigating the climate effects of BC emissions. The proposed two-year effort combining observational and modeling studies will provide insights on the role of BC aerosols in California's weather and climate, and help remove impedances to policy-making decisions.

Contractor:

Scripps Institution of Oceanography, University of California, San Diego (UCSD)

Contract Period:

6 months

Principal Investigator (PI):

Professor Veerabhadran Ramanathan

Contract Amount:

\$24,080

Basis for Indirect Cost Rate:

The State and the UC system have agreed to a ten percent indirect cost rate.

Past Experience with this Principal Investigator:

Dr. Ramanathan is the principal investigator coordinating and synthesizing the effort of other task leaders. He has led several major relevant research projects such as the Indian Ocean Experiment and the Earth Radiation Budget Experiment, and is known for his contributions to the area of atmospheric aerosol research. The USCD contract also includes a number of other experts with a wealth of knowledge regarding tasks to be performed in this study.

Prior Research Division Funding to University of California, San Diego:

Year	2011	2010	2009
Funding	\$0	\$114,751	\$1,451,403

BUDGET SUMMARY

Contractor: Scripps Institution of Oceanography, University of California, San Diego.

"Black Carbon and the Regional Climate of California – Contract Augmentation"

DIRECT COSTS AND BENEFITS

1.	Labor and Employee Fringe Benefits	\$	21,385
2.	Subcontractors	\$	0
3.	Equipment	\$	0
4.	Travel and Subsistence	\$	0
5.	Electronic Data Processing	\$	0
6.	Reproduction/Publication	\$	0
7.	Mail and Phone	\$	431
8.	Supplies	\$	75
9.	Analyses	\$	0
10.	Miscellaneous	\$	<u>0</u>
	Total Direct Costs		\$21,891

INDIRECT COSTS

1.	Overhead	\$	2,189
2.	General and Administrative Expenses	\$	0
3.	Other Indirect Costs	\$	0
4.	Fee or Profit	\$	<u>0</u>
	Total Indirect Costs		<u>\$ 2,189</u>

TOTAL PROJECT COSTS

\$24,080

