

New HEI Studies Advancing Satellite-Derived Air Quality Data and Approaches for Use in Health Studies

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BACKGROUND AND RATIONALE

Satellite-based estimates of ground-level air pollution have emerged as an important source of information on human exposure to air pollutants.

HEI hosted a public workshop in spring 2022 that identified opportunities to improve satellite-derived air quality products and to characterize the inherent uncertainties.

Workshop resources: <https://tinyurl.com/HEISatelliteWorkshop>

The workshop outcomes informed development of *RFA 25-1, Advancing Satellite-Derived Air Quality Data and Approaches for Use in Health Studies*.

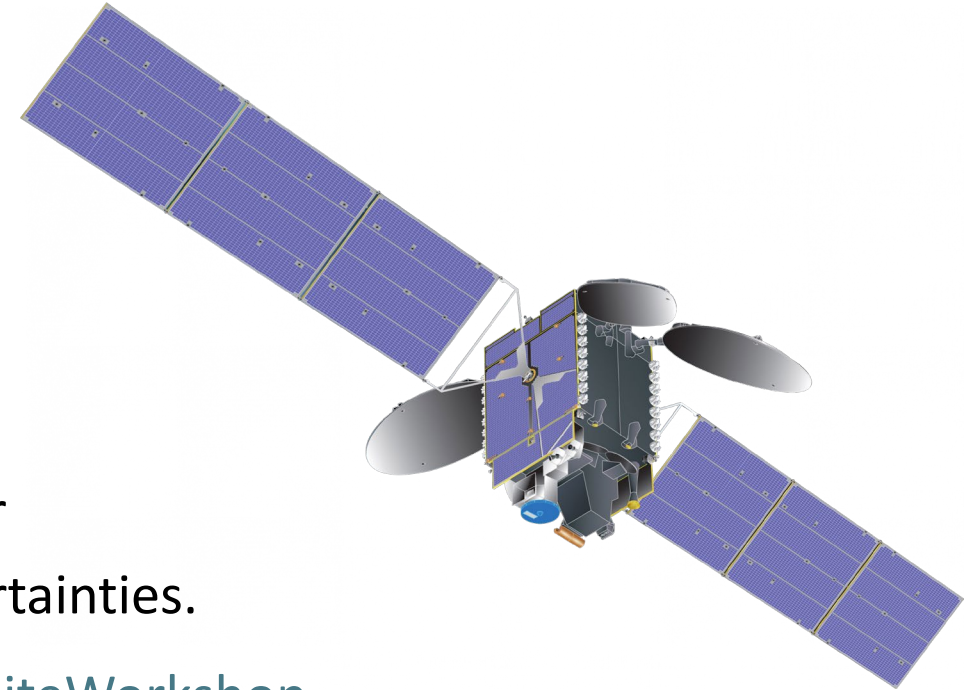


Image source: NASA

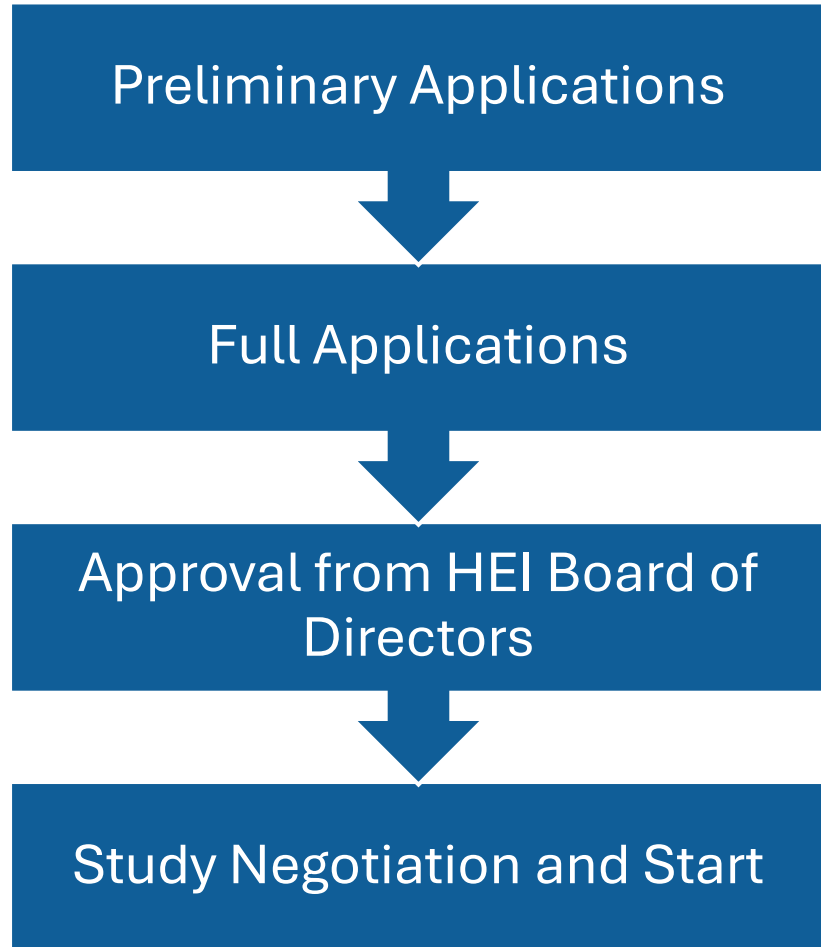
SPECIFIC OBJECTIVES OF RFA 25-1

Develop a resource for health research that links satellite-derived air quality products to quantified uncertainties and strengthens the understanding of the implications of such uncertainties for exposure, epidemiological, and health assessment research.

1. Develop new approaches, satellite-derived air quality data products with quantified uncertainties, or tools to produce and share satellite-derived air quality data products and their associated uncertainties.
2. Evaluate regional and local accuracy of the new approaches, satellite-derived air quality data products, or tools.

The focus should be on air quality in the United States, especially in rural areas or areas where ground monitoring is lacking.

HEI STUDY SELECTION PROCESS



Evaluation Criteria



Relevance to the aims of the RFA



Scientific merit and rigor



Personnel and facilities



Reasonableness of the proposed budget

NEW SATELLITE STUDIES JUST INITIATED

Marianthi-Anna Kioumourtzoglou (Brown University) will develop a novel Bayesian ensemble that integrates data from TROPOMI and TEMPO satellite instruments along with other data that can be used to (a) predict daily NO₂ concentrations and (b) rigorously quantify spatiotemporal uncertainty for use in health studies.

Longxiang Li (Emory University) will create a harmonized database that integrates satellite retrievals from TROPOMI and VIIRS and generate daily NO₂, O₃, and PM_{2.5} surfaces with Bayesian pixel-level posterior uncertainty estimates.

EXPECTED OUTCOMES OF THE NEW HEI STUDIES

Provide resources for use in studies of health effects of air pollution over the contiguous United States

- 1-km gridded concentrations and estimates of uncertainty

- Data, code, examples, and tutorials

Use Bayesian approaches to assess accuracy, precision, and bias

Engage with multiple sectors that provide and use data

- NASA HAQAST and ARSET

- State and federal agencies

- Research institutions

Results expected in 2028

Thank you!

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