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DEPARTMENT OF COMMERCE

National Institute of Standards and Technology

Earth and Space-Based Sensors for Environmental Measurements: Calibration, Standards, and Testbeds

AGENCY: National Institute of Standards and Technology (NIST), Commerce.

ACTION: Notice of workshop; request for comments.

SUMMARY: The National Institute of Standards and Technology (NIST), an agency of the United States Department of Commerce, is planning a gaps analysis workshop to assess the present state-of-the-art of sensors used to measure and quantify the local, regional, and global state of the environment and how it is changing in time and in response to natural and anthropogenic forcings. In advance of the workshop, NIST is seeking public input on agenda topics and priorities. Such topics may include, but are not limited to, needs in the following areas of environmental measurement: measurement capabilities, sensors, modeling, documentary and artifact standards, calibration services, traceability, and testbeds. Additionally, NIST is interested in assessing whether there is a need for new measurement technologies, testbeds, calibration services, Standard Reference Materials (SRMs), and documentary standards to advance the breadth, accuracy (short-term and long-term), sustainability (including cost factors), and comparability of environmental measurements [nationally, internationally, and over time aided by measurement traceability to the International System of Units (SI)].

DATES: NIST will accept written responses to this request for information until 10 p.m. (EST) on August 31, 2024. Submissions received after that date may not be considered. All submissions, including attachments and other supporting materials, may become part of the public record and may be subject to public disclosure. NIST reserves the right to publish relevant comments publicly, unedited and in their entirety. Personal information, such as account numbers or Social Security numbers, or names of other individuals, should not be included. Do

not submit confidential business information, or otherwise sensitive or protected information. Comments that contain profanity, vulgarity, threats, or other inappropriate language or content will not be considered.

A public workshop will be held from Tuesday, September 10, 2024, to Thursday, September 12, 2024, from 9 a.m. to 5 p.m. eastern time, both in person at the National Cybersecurity Center of Excellence in Rockville, MD, USA and virtually by web conferencing. Interested parties will need to register for the workshop. A fee will be required for in-person attendance. Please email e-sensor@nist.gov prior to midnight (EST) August 16, 2024 if you are interested in attending in person or virtually. If you would like to present at the meeting, please indicate your interest and the subject of your presentation in the email.

ADDRESSES: Comments should be submitted to Ms. Amy Grafmuller, Administration Specialist, Mail Stop 8400, 100 Bureau Drive, Gaithersburg, MD or by electronic mail to e-sensor@nist.gov.

FOR FURTHER INFORMATION CONTACT:

Mail: Dr. Julia Marrs, Special Programs Office, Mail Stop 2100, 100 Bureau Drive, Gaithersburg, Maryland 20899. Email: julia.marrs@nist.gov Phone number: 301 975–2379.

SUPPLEMENTARY INFORMATION: Multiple concurrent environmental challenges presently exist, driven by human activity. Environmental challenges include global warming, biodiversity loss, disease emergence and spread, topsoil loss, environmental contamination, altered biogeochemical cycling, and habitat range shifts. These challenges have documented economic impacts reaching into the hundreds of billions of dollars annually and are highly relevant to business interests, due to the continued need for access to the natural resources and ecosystem services on which industrial profitability relies. Furthermore, many of these challenges present broader threats to society, including the potential for food shortages, pandemics, and extreme weather. NIST seeks to advance the science and artifact and documentary standards for the measurement of the physical, chemical, biological, and ecological

parameters needed for understanding complex, natural systems undergoing short and long-term change. Such understanding will improve the forecasting of the rate and extent of change and aid the mitigation of such change if intervention is implemented.

Engagement of NIST, the environmental sensor industry, and the sensor user community is critical to ensure the adoption of effective standards to promote a competitive and resilient market and to enable optimal investment in tackling environmental challenges. The standards must include the development of best practices for measuring key parameters and methodologies for ensuring the accuracy of the measurements. Without effective standards, organizations wishing to invest in addressing environmental challenges will be unable to effectively direct resources. To address these needs, NIST is planning a gaps analysis workshop for the environmental measurement community, to learn more about current limitations in making measurements of the environment, including terrestrial and aquatic ecosystems, coastal zones, agriculture, and managed and urban areas. This workshop will entail a community dialogue on needs related to new and improved sensors, standardized measurement methods, measurement testbeds, and artifact and documentary standards for ecosystem measurement.

The workshop aims to facilitate engagement among sensor manufacturers, calibration laboratories, standards organizations, academic researchers, Federal agencies, nonprofits, and regional and state agencies. NIST is seeking public comments on current gaps in the field of environmental measurement and on priorities for the upcoming workshop agenda. Sensors of interest for workshop discussion may include point and area sensors (including imaging systems) deployed in aquatic (e.g., buoys, submersibles), subsurface, surface, air (e.g., conventional aircraft, drones, and balloons), and space (small CubeSat-style satellites to large environmental satellites) environments. In addition to these proposed topics, NIST is soliciting public input on gaps in measurement capabilities for other physical, chemical, biological, and ecological parameters relevant to environmental monitoring, management, and hazard mitigation applications. Focal areas of particular interest may include environmental measurement testbeds,

including gaps in current measurement capabilities at available testbeds, and discrepancies between sensor performance in laboratory versus field settings. Additionally, we solicit community input on current gaps and future needs related to standards development for new and emerging sensor technologies used to monitor aspects of environmental change, including the particularly difficult task of measuring extremely small annual changes in the environment over decadal time periods, a significant challenge for sensors and data analysis protocols given the large diurnal and seasonal changes in temperature, humidity, and precipitation seen in many environments of interest.

The above-listed agenda topics are not intended to limit the areas that may be addressed by respondents so long as they address a topic that would be useful in NIST's planning relative to our future work on supporting the environmental measurement community. When addressing the topics above, respondents may describe the practices of their organization or organizations with which they are familiar. Providing such information is optional and will not affect NIST's full consideration of the comment.

Alicia Chambers,

NIST Executive Secretariat.

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