



## Nutrient Sensor Action Challenge

### ***FREQUENTLY ASKED QUESTIONS*** **and Supplemental Resources**

Last revised: August 9, 2017

Please direct any requests for clarifications and additional information about this challenge to [NutrientSensorActionChallenge@erg.com](mailto:NutrientSensorActionChallenge@erg.com).

#### **FAQs**

- **What is the Challenge?**

The **Nutrient Sensor Action Challenge** builds upon the 2014 [Nutrient Sensor Challenge](#), which helped accelerate the development of next-generation in situ nutrient sensors and analyzers. The **Nutrient Sensors Action Challenge** aims to help integrate affordable, high-performing, and real-time nutrient sensors into existing water monitoring efforts to pilot use of continuous sensors and associated data.

- **Why this challenge?**

Nutrient pollution management is costly and complex. The diverse crowd of solvers reached through this challenge will provide important information, feedback and experience pertaining to the use of sensors and resulting information. This challenge also provides a mechanism for connecting organizations in the nutrient space with partners from other disciplines such as data management and communication.

#### **Why are next generation sensors important to managing nutrient pollution?**

Nutrients exist in a variety of forms and vary with space and time in aquatic ecosystems. Current methods for detecting and measuring nutrients do not capture this complexity and are expensive. More spatial and temporal data are needed to inform decisions to reduce nutrient loads on land,

in the air, and in waterways. Affordable, accurate, and reliable sensors will help improve measurement; expand monitoring and forecasting of nutrients in lakes, rivers, streams, estuaries and coastlines; and track progress.

- **How long is the Challenge open?**

*Stage 1:* 8 weeks (Opens July 26<sup>th</sup> 2017. Closes September 20<sup>th</sup> 2017)

*Stage 2:* March 2018 - October 2018; participants have flexibility to determine the 6-month window during which they will participate.

- **What are the stages of the Challenge?**

Stage 1: The Action Plan!

Stage 2: Sensors in Action!

- **What is the prize / how many prizes?**

Stage 1: Up to 5 winning applications will win \$10,000 each. Winners will also have opportunities for recognition and participation in workshops and webinars.

Stage 2: \$100,000 is available for prizes in Stage 2. Prizes may be awarded to 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place.

- **How is the prize winner determined?**

Stage 1: Submissions will be judged based on the action plan requirements (see challenge description).

Stage 2: Winners will be selected based on demonstrated success in monitoring and data collection over 6 months as well as demonstrating the potential use of the continuous data.

- **Who will determine the winner(s)? How many judges will be there? Who are they (generally)**

The judging panel will consist of 6-8 experts representing the partner agencies and other experts and stakeholders.

- **What is a decision-maker or representative?**

A decision-maker can be anyone who can demonstrate use of the information to make decisions that will improve water quality with respect to nutrients. This may include individuals or groups at the local, regional, state, or national level.

- **Which nutrients are within the scope of the challenge?**

Nitrates and Phosphorous

- **What are the price constraints for the sensors?**

The purchase price of each sensor should not exceed \$15,000.

- **Who is eligible to participate?**

The challenge is open to companies, organizations, and/or communities interested in deploying two or more low cost (priced at less than \$15k per device) continuous nutrient monitoring sensors to address an important nutrient-related topic or problem. Groups should be currently engaged in

water quality monitoring and already have some level of sophistication with water monitoring, data management, and communication. Team leads must be a United States citizen.

- **When will awards be made?**

Stage 1 awards - Fall of 2017

Stage 2 awards - Fall of 2018

- **Who can I contact if I have questions?**

Please direct any requests for clarifications and additional information about this challenge to

[NutrientSensorActionChallenge@erg.com](mailto:NutrientSensorActionChallenge@erg.com).

**Who are the partners in the challenge?**

U.S. Environmental Protection Agency (EPA)

U.S. Geological Survey (USGS)

NOAA-directed U.S. Integrated Ocean Observing System (IOOS)

Alliance for Coastal Technologies (ACT)

U.S. Department of Agriculture (USDA)

National Institute of Science and Technology (NIST)

- **Where can I find additional informational resources?**

An informational webinar for the Nutrient Sensor Action Challenge was held on August 2, 2017. A recording is available to view at: <http://epawebconferencing.acms.com/p5cu3fezyus/>

View Supplemental Resources (see below FAQs)

- **Is participation in Stage 1 a prerequisite for participating in Stage 2**

No, although it is recommended

- **Is there a minimum/maximum requirement regarding the number of sensors?**

Solvers must submit plans to deploy 2 or more sensors

There is no maximum limit of sensors.

- **How long should the submission be for Stage 1?**

8 - 10 pages not including images or photos

- **Can funding be allocated directly to government agencies and organizations?**

Awards and prizes can be paid to employees working at state or local organizations, non-profit organizations, universities or private companies.

- **What brand of nutrient sensor does this program recommend or endorse?**

This challenge does not recommend or endorse any brand of nutrient sensor. Information about sensors that were evaluated as part of the 2014 Nutrient Sensor Challenge can be found at

<http://www.act-us.info/evaluations.php> . Additionally, a list of sensor developers from the 2014 Challenge can be found at: <http://www.act-us.info/nutrients-challenge/Participants.php> .

Participants in this challenge are not limited to the sensor brands/developers mentioned above.

- Do sensors need to be acquired from U.S.-based organizations/companies?  
No.

## Supplemental Resources

- 1) [Manual for Real-Time Quality Control of Dissolved Nutrients Observations \(QARTOD\)](#)
  - Provides real-time quality control (QC) of DN measurements
  - Describes tests that operators can incorporate into practices and procedures for real-time QC of in situ DN measurements in coastal environments
- 2) [Optical techniques for the determination of nitrate in environmental waters: Guidelines for instrument selection, operation, deployment, maintenance, quality assurance, and data reporting](#)
  - Provides information on the selection and use of UV nitrate sensors
  - The report includes operating principles, key features, and sensor design and approaches for sensor deployment
- 3) [Ocean Data Standards and Best Practices Project \(ODSBP\)](#)
  - To achieve broad agreement to adopt a number of best practices related to ocean data management
  - Maintain an online catalogue of best practices
- 4) [Handbook of Automated Data Quality Control Checks and Procedures](#)
  - Describes the automated quality control
  - Describes the data flow, processing, real-time quality control checks and flags
- 5) [Data Elements for Reporting Water Quality Monitoring Results for Chemical, Biological, Toxicological, and Microbiological Analytes](#)
  - Describes a set of data elements which the NWQMC believes are the minimum elements
  - Lists these data elements as modules in a framework that addresses who, where, when, why, and how data are collected
- 6) [NEMI.gov](#)
  - Index of useful environmental methods
  - Information on populations, toxicity, and statistical data
- 7) [Nutrient Sensor Challenge participants](#)
  - Nutrient Sensor challenge participants
  - Info on participants, awards, and reports
- 8) [Protocols for the operation of nutrient sensors and QA of sensor data](#)
  - Protocols for the operation of nutrient sensors

- Evaluation of continuous water quality monitoring nutrient analyzers