Challenging Nutrients Coalition

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US EPA Office of Research and Development
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Nutrient Sensor Challenge

EPA
Alliance for Coastal Technologies
University of Maryland
University of Louisiana
University of Michigan
University of Hawaii
Chesapeake Biological Laboratory
USGS
University of California

EPA
USGS
The Nature Conservancy

NO3
NH4
TN

EPA
USGS
NADP
USDA

Knight Foundation
The Everglades Foundation
The Scotts Miracle-Gro Foundation
Environment and Climate

ALLIANCE FOR COASTAL TECHNOLOGIES

Richard Farms LLC
University of Arkansas
University of Louisiana at Lafayette
University of Tennessee
Louisiana Master Farmer Program
Iowa
University
The Nature Conservancy
USDA
University of Wisconsin-Platteville
Hardwick Planting Company

TULANE UNIVERSITY
NITROGEN REDUCTION
GRAND CHALLENGE

WADeiN

THE GEORGE BARLEY WATER PRIZE

University of Maryland
University of Louisiana
University of Michigan
University of Hawaii
Moss Landing
Marine
Chesapeake
Biological
Laboratory
IOOS
USGS
University of California

American Biogas Council
American Society of Agricultural and Biological Engineers
Ben & Jerry's
Cabot Creamery Cooperative
Cooper Farms
CowPots
Dairy Farmers of America
Innovation Center for U.S. Dairy
Iowa
M
National Federation
National Council
Washington State University
Smithfield Foods
Tyson Foods
Department of Agriculture
Washington State University
Water Environment & Reuse Foundation
World Wildlife Fund
Department of Energy

 Government Challenges and Prizes

Inviting the public's help to solve perplexing problems

Over 740 challenges
Over $250M prizes

www.Challenge.gov

Nutrient Sensor Challenge

- **Affordable, accurate and dependable sensors -Nitrogen (N) and Phosphorous (P)**

- **Users provided requirements**

- **Available for purchase in 2017**

http://www.act-us.info/nutrients-challenge/

Nutrient Sensor Challenge

Evaluation and testing

Challenging Nutrients Coalition

Winner

Honorable Mention

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Part 2: Nutrient Sensors – In Action

**Deployment and *use* of nutrient sensors in a range of applications and settings**

- **Gulf of Mexico Pilot**
- **Baltimore Harbor Pilot (Village Blue)**
- **Long Island Sound**
- **TARGET OPPORTUNITY Anyone (state or local governments, watershed groups, etc.) may apply for the Nutrient Sensors in Action Challenge expected to be launched in early June 2017. The challenge will fund another pilot to test the use of nutrient sensors *(location TBD).***

Advanced Onsite Wastewater Utility Systems (OWTS) Sensor Challenge

Seeking design for an N sensor for use in advanced N removal OWTS to monitor long term performance.

https://www.challenge.gov/challenge/advanced-septic-system-nitrogen-sensor-challenge/
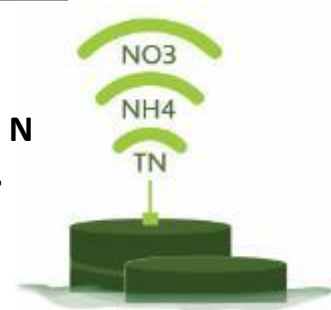
Phase I - Design

Collaborators:

CT, MA, ME, NH, NY and NJ, RI and VT regulators
Suffolk County Long Island, NY regulators
New England Onsite Wastewater Training Program
Massachusetts Alternative Septic System Test Center (MASSTC)

Status:

- Submissions under review
- Sensor Showcase Day in NYC in June, 2017
- **TARGET OPPORTUNITY**: We would like to know if any organizations are interested in working with the Nature Conservancy on promoting or participating in Phase 2.

https://www.challenge.gov/challenge/advanced-septic-system-nitrogen-sensor-challenge/
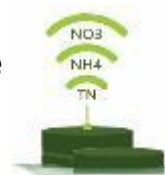
Harmful Algal Blooms (HAB) Sensors

- Testing sensors that can discriminate among different classes of marine and freshwater algae

- Testing current methods in HAB toxin detection (e.g. immunoassay, molecular, etc)

- Evaluation reports will be available in 2018

ALLIANCE FOR COASTAL TECHNOLOGIES

WADeIN

- Coordinate atmospheric deposition monitoring National Atmospheric Deposition Program (NADP) and water quality monitoring for nitrogen
  - NADP link: http://nadp.sws.uiuc.edu/

- Atmospheric deposition is important source of non-point nitrogen

- **TARGET OPPORTUNITY:** We are interested in learning about your communities and organizations experiences in this area, and we want to better understand your requirements

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TULANE UNIVERSITY
NITROGEN REDUCTION
GRAND CHALLENGE

- $1 million prize for Innovative in-field solutions to combat hypoxia

- Market-based solution which rewards innovation and risk-taking to create sustainable technologies

- Prize will be awarded in December 2017 to one of five finalist teams

https://www2.tulane.edu/tulaneprize/waterprize/

Everglades Foundation - George Barley Water Prize

The Grand Prize

The $10 million grand prize goes to the team who develops the most cost-effective, scalable technology that thoroughly removes and recovers phosphorus from freshwater bodies.

THE
GEORGE BARLEY
WATER PRIZE

Withstand the test of time

There are also multiple sub-prizes awarded at check-in points throughout the four year competition where each solution is tested in cold water, warm water and in a laboratory environment.

http://www.barleyprize.com/#/about/e9d00404-b169-8684-65a9-2163e5ace296

NUTRIENT RECYCLING CHALLENGE

- Technologies that extract nutrients and create products that farmers can use or sell

- Win-win for the environment, farmers and the economy

Challenging Nutrients Coalition

Nutrient Recycling Challenge Partners

www.nutrientrecyclingchallenge.org

https://www.challenge.gov/challenge/nutrient-recycling-challenge/

<u>NUTRIENT RECYCLING CHALLENGE – Phase 1 Concept Winners</u>

Slurry Separation with Coanda Effect Separator (by Ahimbisibwe Micheal of Bravespec Systems Ltd.)

Manure Convertor (by Ilan Levy of Paulee Cleantec Ltd.)

Producing Nutrients Concentrated Bio-solids via AnSBEARs (by Bo Hu, Hongjian Lin, and Xin Zhang of the University of Minnesota)

Removal of Dissolved N and P from Livestock Manure by Air Stripping (by Hiroko Yoshida of Centrisys Corporation)

Questions?

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