



The Nutrient Recycling Challenge

EPA Office of Water

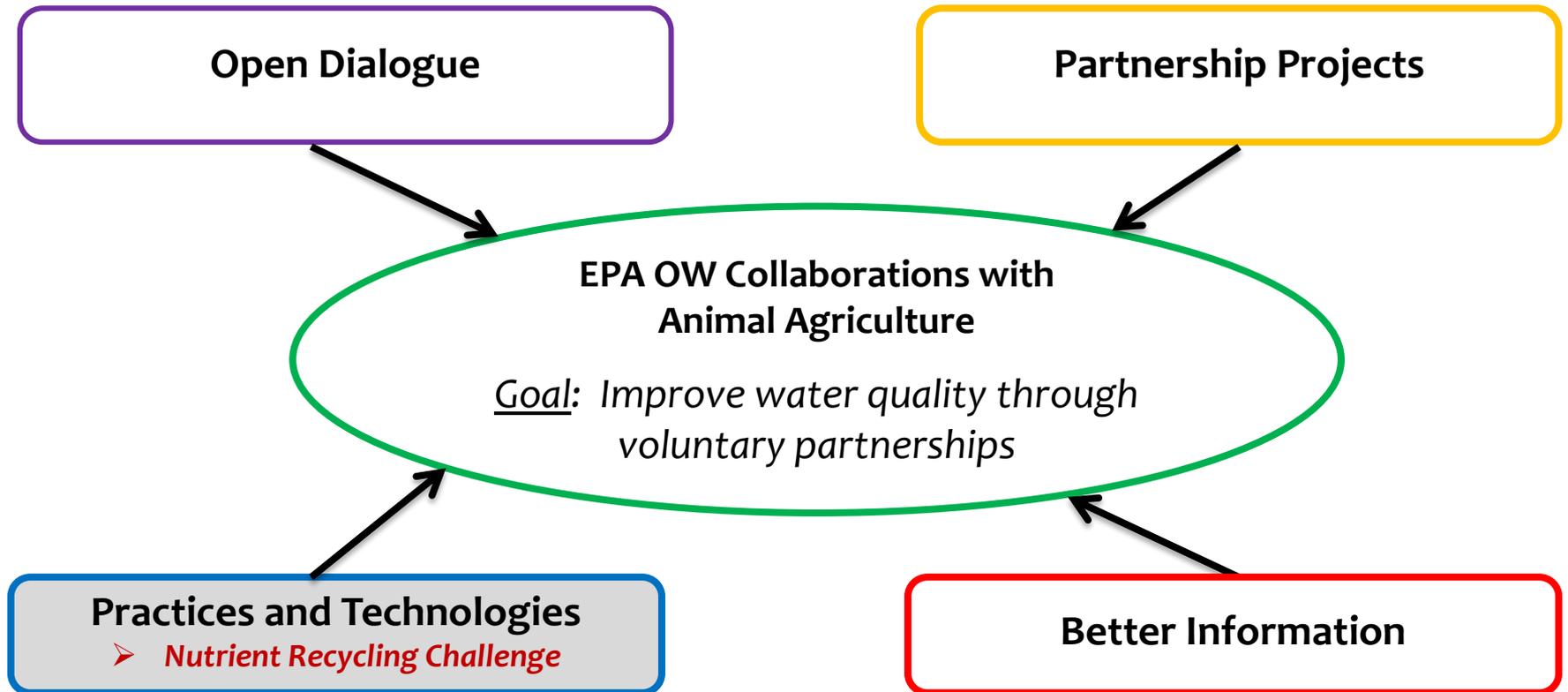
Farm, Ranch and Rural Communities Committee Meeting

Arlington, VA

May 25, 2016



EPA Office of Water Collaborations with Animal Agriculture



In 2015, EPA partnered with pork and dairy producers, U.S. Department of Agriculture, World Wildlife Fund, and environmental and scientific experts to host

The Nutrient Recycling Challenge

--a competition to find affordable technologies to recycle nutrients from livestock waste and create valuable products.



The Nutrient Recycling Challenge



Partners

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 State University

Marquette University

National Milk Producers
Federation

National Pork Producers
Council

Newtrient LLC

Smithfield Foods

Tyson Foods

USDA

Washington State University

Water Environment Research
Foundation

World Wildlife Fund

Goals of the Nutrient Recycling Challenge

- Accelerate the development of nutrient recovery technologies that are adoptable for pork and dairy farms, and can produce environmental and economic benefits.
- Increase awareness of issues and opportunities related to nutrients and manure management.
- Connect innovators and agricultural stakeholders.
- Stimulate markets for products generated by nutrient recovery technologies.

Timeline

Launch

November 12, 2015

Website launch

EPA and Smithfield Press Releases

National Farm Broadcasters Convention, Kansas City

Phase I: Concept Papers

Nov. 16, 2015 – Jan. 15, 2016

**DC Summit and Awards*

March 30-31, 2016

Phase II: Technology Designs

Launch late Summer 2016

Phase III: Prototypes/Proof of Concept

Launch early 2017

Phase IV: Demonstration Pilots on farms

Launch late 2017

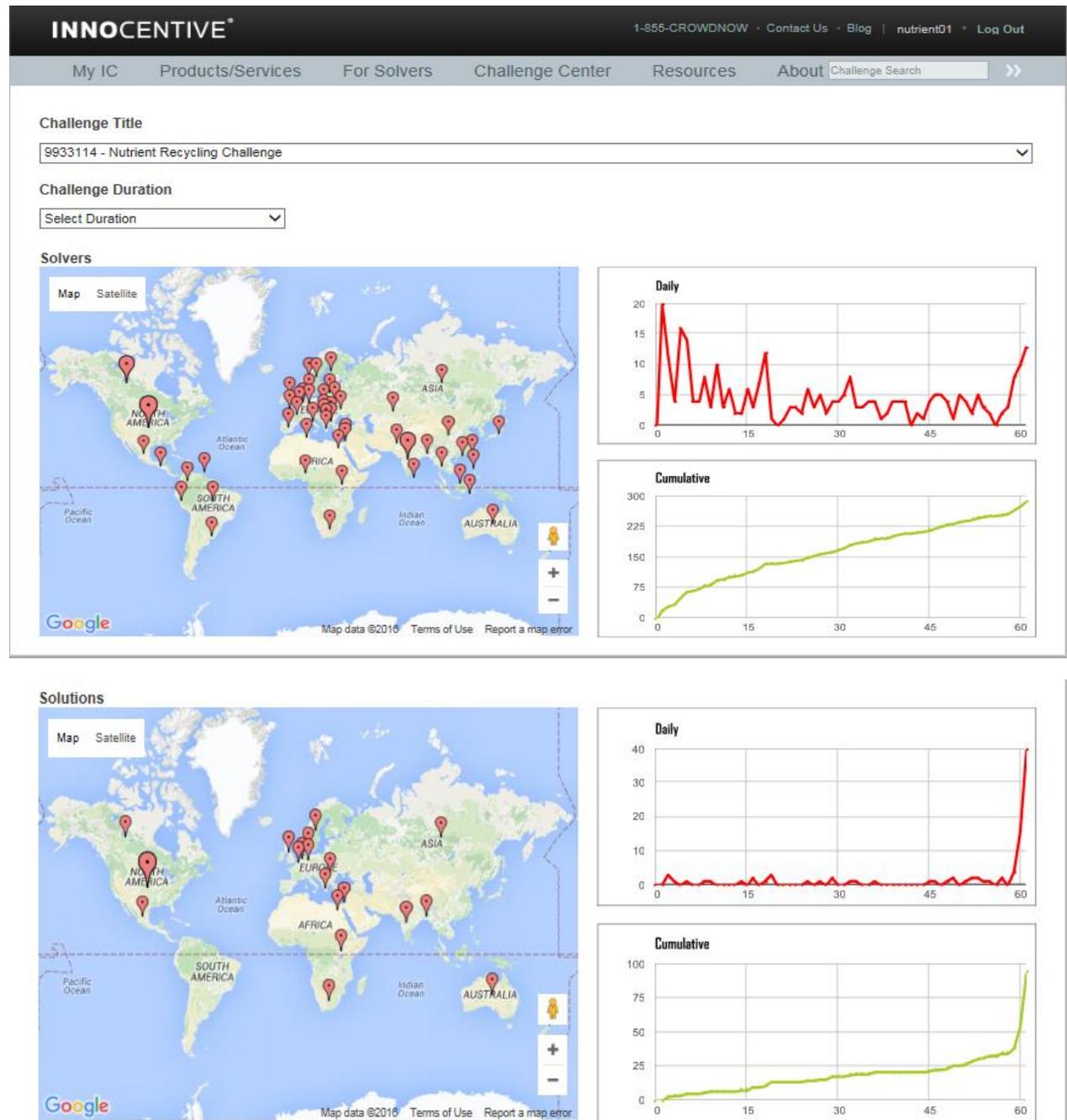
How did it go?

✓ 75 submissions from around the world in Phase I.

288 Solvers registered

Hundreds of online news/media hits, tracked on nutrientrecyclingchallenge.org

One of the most popular agency challenges on GSA's website while open.



Judges

Kraig Westerbeek, Smithfield Foods	Walter Mulbry, USDA ARS
Bill Knapke, Cooper Farms	Ariel Szogi, USDA ARS
Jamie Burr, Tyson Foods	Matias Vanotti, USDA ARS
Jed Davis, Cabot Creamery Cooperative	Glenn Carpenter, USDA NRCS
Matthew Freund, CowPots	Bill Reck, USDA NRCS
Clay Detlefsen, National Milk Producers Federation	Jeff Porter, USDA NRCS
John Monaghan, Innovation Center for US Dairy	Matthew Robert, USDA NRCS
Bruce Knight, Strategic Conservation Solutions/ Innovation Center for US Dairy	Chris Cassidy, USDA Rural Development
Steve Rowe, Newtrient LLC	Mark Philbrick, DOE Bioenergy Technologies Office
Chad Kruger, Washington State University	Jiqin Ni, Purdue University
Daniel Zitomer, Marquette University	Shafiqur Rahman, North Dakota State University
Brooke Mayer, Marquette University	Wendong Tao, SUNY College of Environmental Science and Forestry
Marlena White, World Wildlife Fund	Jeff Li, North Carolina State University
Carlos Saviani, World Wildlife Fund	Mark Rice, North Carolina State University
Sandra Vijn, World Wildlife Fund	Wei Liao, Michigan State University
Fidan Karimova, Water Environment Research Foundation	Dana Kirk, Michigan State University

Results

34 submissions selected to proceed on to Phase II, including 4 “Winners” and 6 “Honorable Mentions”

Variety of technology types and stages of development, and for various types of farms

Top four winning concepts:

- ***Slurry Separation with Coanda Effect Separator*** (by Ahimbisibwe Micheal of Bravespec Systems Ltd.) - Using centrifuge technology to separate smaller nutrient particles from manure, with fewer energy inputs and lower costs.
- ***Manure Convertor*** (by Ilan Levy of Paulee Cleantec Ltd.) - Using chemical processes to rapidly turn manure into a non-toxic, fertile ash fertilizer.
- ***Producing Nutrients Concentrated Bio-solids via AnSBEARs*** (by Bo Hu, Hongjian Lin, and Xin Zhang of the University of Minnesota) - Creating a dry biosolids fertilizer by using a novel anaerobic digestion and solid-liquid separation system.
- ***Removal of Dissolved N and P from Livestock Manure by Air Stripping*** (by Hiroko Yoshida of Centrisys Corporation) - Using CO₂ stripping and other processes to create a range of fertilizers from anaerobically digested manure.

Nutrient Recycling Challenge DC Summit, March 30-31, 2016

- ❖ Invited 34 selected innovator teams to attend a summit at the White House Eisenhower Executive Office Building and World Wildlife Fund.
- ❖ EPA awarded \$30,000 in cash prizes to the top ten submissions.
- ❖ Also a forum for solvers to meet experts and other innovators, form teams, and learn about resources to develop their ideas into real-life technologies.

EPA seeks to create a “brain trust” with these innovators, that can design nutrient recovery technologies to achieve what both farmers and the environment need.



What's next

- ❑ Phase I follow-up dialogue and sharing of resources between innovators, experts, and industry through a Listserv, File Transfer Protocol site, etc.
- ❑ EPA and Planning Committee to develop Phase II of the challenge
- ❑ Expect to launch *Phase II: Technology Designs* in late Summer 2016

How can the FRRCC be involved?

- ❑ Ideas for future Phases, markets for co-products
- ❑ Help spreading the word
- ❑ Potential partners
- ❑ Links to investors and funders



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Office of Water, Wastewater Management, Water Permits Division,
Rural Branch

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