EPA/600/R-15/161
June 2015

U.S. EPA Water Technology Innovation Cluster Leaders Meeting

Federal Funding Opportunities for Early-Stage Water Companies

April 27, 2015
Pittsburgh, Pennsylvania

Meeting Summary Report

Developed by:

Abt Associates
Bethesda, Maryland 20814

Under EPA Contract No. GS07F136AA/EP-G14H-00969

Environmental Technology Innovation Clusters Program
Immediate Office of the Assistant Administrator
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

DISCLAIMER

This report was funded by the U.S. Environmental Protection Agency (EPA) under EPA Contract Number GS07F136AA/EP-G14H-00969 to Abt Associates. EPA does not endorse the purchase or sale of any products or services from companies mentioned in this document. This report has been subjected to the Agency's peer and administrative reviews and has been approved for publication as an EPA document. The views expressed by individual speakers/participants, however, are their own, and do not necessarily reflect those of EPA.

ACKNOWLEDGEMENTS

The U.S. EPA Office of Research and Development (ORD) wishes to extend its appreciation to the following speakers and panelists for sharing their expertise and perspectives: Jack Adams, Calgon Carbon Corporation and Water Economy Network; Prakash Balan, National Science Foundation; Jason Bernard, Water Economy Network; Jon Capacasa, U.S. EPA Region 3; Grant Ervin, City of Pittsburgh, Pennsylvania; Phil Fatula, Lanxess; Heather Henry, National Institutes of Health/National Institute of Environmental Health Sciences; Michael Hoops, Axiall Corporation; Kelly Hunt, U.S. Small Business Administration Pittsburgh District Office; Lek Kadeli, U.S. EPA ORD; Julie Lenzer Kirk, U.S. Department of Commerce, Economic Development Administration; Ali Mohamed, National Institute of Food and Agriculture, U.S. Department of Agriculture; Manny Oliver, U.S. Department of Energy; April Richards, U.S. EPA ORD; J. Richard Schorr, MetaMateria; Devesh Sharma, Aquatech International Corporation; James Uber, CitiLogics; Ken Wolf, RedZone Robotics, Inc.; and Hanbae Yang, ABS Materials Inc.

EPA ORD would like to thank the Water Economy Network (WEN) for partnering with EPA in hosting this event. In particular, EPA would like to thank the following WEN representatives for their time and efforts in helping with the planning and execution of this event: Jack Adams, Jason Bernard, and Stephen McKnight.

The following EPA ORD staff aided in the planning, implementation and logistical coordination for the meeting: Aimee Boucher, Ryan Connair, Julius Enriquez, Bernadette Fay, Sally Gutierrez, Teresa Harten, Maggie Theroux, and Abby Waits.

Logistical support for the meeting also was provided by Jennifer Myers, EPA Conference Planning Services.

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) partnered with the Water Economy Network (WEN) to host a Water Technology Innovation Cluster Leaders Meeting on April 27, 2015, in Pittsburgh, Pennsylvania. Approximately 75 individuals attended. The meeting was organized to bring together various government staff and cluster leaders to discuss federal funding opportunities for early-stage water technology companies. Participants included federal, state, and city government officials, water technology developers and entrepreneurs, non-profit organization representatives, business and technology consultants, and university representatives—all of whom expressed an interest in sharing and learning about federal funding that is available for small water technology companies.

Several federal representatives gave presentations outlining opportunities for funding through the Small Business Innovation Research (SBIR) program. Staff from EPA, the U.S. Department of Energy, the National Institutes of Health, the U.S. Department of Agriculture, and the National Science Foundation presented on a panel. They discussed the types of projects that each agency's SBIR program funds, application process logistics, and the characteristics of good proposals and candidates. A representative from the Small Business Administration (SBA) explained the support that SBA provides for small businesses, including serving as a guarantor of loans that can help businesses grow. Ms. Julie Lenzer Kirk, Director of the Office of Innovation and Entrepreneurship at the U.S. Department of Commerce within the Economic Development Administration, provided the luncheon keynote address.

In the second panel, previous awardees of SBIR funding spoke to the importance of finding a niche market for a technology, connecting with universities to expand resources and ideas, and working with the water clusters' member companies to find demonstration platforms. A third panel provided the meeting attendees with information from water cluster anchor companies. They discussed the benefits of belonging to a water cluster, including the opportunities to become aware of new technologies that are being developed by regional businesses and to interface with academic and regulatory entities.

In addition to the primary presentations, two breakout discussion sessions allowed for the federal SBIR representatives to discuss best practices for leveraging SBIR awards with cluster leaders. They highlighted the importance of proving commercialization potential in SBIR applications, among other recommendations.

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS

DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
EDA	Economic Development Administration
EPA	U.S. Environmental Protection Agency
LIFT	Leaders Innovation Forum for Technology
LINC	Leveraging Information and Networks to access Capital
NEWIN	New England Water Innovation Network
NIH	National Institutes of Health
NIEHS	National Institute of Environmental Health Sciences
NIFA	National Institute for Food and Agriculture
NSF	National Science Foundation
ORD	Office of Research and Development (EPA)
SBA	U.S. Small Business Administration
SBDC	Small Business Development Center
SBIR	Small Business Innovation Research
SOWC	Southern Ontario Water Consortium
STTR	Small Business Technology Transfer
R&D	research & development
USDA	U.S. Department of Agriculture
WEF	Water Environment Federation
WEFTEC	Water Environment Federation's Annual Technical Exhibition and Conference
WEN	Water Economy Network

INTRODUCTION AND OVERVIEW

The U.S. Environmental Protection Agency (EPA) Water Technology Innovation Cluster Leaders Meeting was held on April 27, 2015, in Pittsburgh, Pennsylvania. Environmental technology innovation clusters are regional groupings of businesses, government, research institutions, and other organizations focused on innovative technologies for protecting the environment. As part of its efforts to support environmental technology innovation clusters, the EPA Office of Research and Development (ORD) hosts periodic water technology innovation cluster leaders meetings.

The purpose of this workshop was to focus on federal programs that support funding of water technologies. Small Business Innovation Research (SBIR) program managers from multiple federal agencies and a representative from the U.S. Small Business Administration (SBA) presented. Previous awardees of SBIR funding and water cluster anchor companies also presented at the meeting. Two breakout sessions allowed for cluster leaders to ask questions and hold discussions with the SBIR program managers.

WELCOME TO PITTSBURGH

Sally Gutierrez, Director, Environmental Technology Innovation Clusters Program, U.S. EPA Office of Research and Development; Jack Adams, Director of Government Affairs, Calgon Carbon Corporation and Chairman, Water Economy Network; Grant Ervin, Sustainability Manager, City of Pittsburgh

Ms. Sally Gutierrez welcomed participants to Pittsburgh and introduced Mr. Jack Adams, Chairman of the Water Economy Network (WEN). Mr. Adams began with a short video that showed how Pittsburgh is a center of growth and innovation. He listed the members of WEN and noted that Fourth Economy Consulting has been instrumental in keeping members of WEN focused as a regional water cluster. Mr. Adams introduced Mr. Grant Ervin, who emphasized that Pittsburgh has a strong culture of innovation. Mr. Ervin explained that much of his time as the city's Sustainability Manager is spent working on water issues, including regulation of water resources and innovative water technologies. To address water quality issues, the City of Pittsburgh has focused on creating green infrastructure by fostering water technology and innovation. They have conducted outreach to partners, such as WEN, universities, and other private-sector organizations, to unite and focus them on creating solutions for the city's most pressing water problems.

PERSPECTIVES ON WATER TECHNOLOGY INNOVATION FROM U.S. EPA OFFICE OF RESEARCH AND DEVELOPMENT AND REGION 3

Lek Kadeli, Acting Assistant Administrator, U.S. EPA Office of Research and Development; Jon Capacasa, Water Division Director, U.S. EPA Region 3

Mr. Lek Kadeli described a time when he met with a U.S. Congressman who was upset with perceived negative economic impacts of a recent EPA regulation that could affect his district's businesses. Mr. Kadeli explained to the Congressman that this was a great opportunity to usher green infrastructure development into the area.

Mr. Kadeli commended Pittsburgh and other cities for highlighting their investments in green infrastructure, and thanked all participants for attending and WEN for their innovative efforts. He went on to explain that small businesses are a vital part of the American economy, generating 60 to 80 percent of new jobs, creating new technologies, and turning these innovations into market-ready solutions. At EPA, the SBIR funding program is enabling small businesses to translate innovative technologies into commercial products that solve pressing environmental problems in our nation's communities. Through this program, entrepreneurs are able to turn environmental challenges into business opportunities.

Mr. Kadeli gave several examples of SBIR grant recipients, including a Massachusetts-based company that has created a technology that transforms wastewater into energy. Small businesses need more than just funding in order to bring new technologies to the marketplace, according to Mr. Kadeli. They need access to incubators, test-beds, venture capital, potential end-users, and other resources. With the help of clusters, SBIR awardees are more likely to connect with these resources and turn their technologies into commercial products. Mr. Kadeli stated that he hoped the day's meeting would provide attendees with the tools to help small businesses successfully compete for SBIR funding.

Next, Mr. Jon Capacasa welcomed the attendees to the region. He discussed issues in EPA Region 3, which includes the city of Pittsburgh, that drive the need for new water technology innovation, including:

1. *Sustainability/climate change/resilience:* Mr. Capacasa explained that sustainability embodies the principles of taking a longer view, achieving multiple benefits, preventing pollution at the source, reducing footprints (water, carbon, and energy), and preserving precious, limited resources. Advanced water technologies are needed to make communities more resilient to climate change.

2. *Excess nutrient pollution:* He highlighted the need for green infrastructure to promote clean water. These technologies relate to bioretention, infiltration, and evaporation processes. He stated that leaders in these techniques include Philadelphia, Pennsylvania; Washington, D.C.; and Prince George's County, Maryland, among others. Region 3 has focused on the concept of "net-zero energy" including a new vision for local wastewater treatment facilities to function instead as resource recovery facilities. Next, he noted that algal blooms are a huge concern in the region, especially in the Chesapeake Bay, and that manure runoff must be minimized. There is a great need for more real-time monitoring technologies with respect to this issue.

3. *Safeguarding drinking water sources:* Region 3 features vital water resources that need to be kept clean. There is a need for further development of contaminant warning systems to safeguard against security threats to water quality. Source water protection requirements are also a priority in Region 3, especially in light of the recent Charleston, West Virginia spill. Further development of early detection systems for monitoring emerging contaminants and spills is needed.

4. *Energy/water nexus:* Region 3 is partnering with states to try to reduce the water footprint of energy extraction and processing and increase water recycling and reuse. These efforts also require technological innovation.

WATER CLUSTER LEADERS ROUND-THE-ROOM INTRODUCTIONS AND UPDATES

Ms. Sally Gutierrez asked the cluster leaders to discuss progress and accomplishments since the September 2014 meeting:

- *Jason Bernard, Director, Emerging Partnerships, Fourth Economy Consulting and WEN:* Since the last meeting, WEN re-tooled its work plan. It implemented a three-pronged approach towards service delivery to their member companies: (1) technology acceleration by identifying new technologies, systems, and vendors; (2) policy barrier elimination by working through regulations that impede small business progress; and (3) communication of their issues and needs.
- *Jeff Bronowski, City of Akron, Ohio and Akron Global Water Alliance*: Mr. Bronowski explained that the Akron Global Water Alliance is a new initiative that kicked off last year with the intent to promote new technologies domestically and internationally. They have partnered with several different international organizations to demonstrate water technologies at U.S. water utilities. These activities help identify new water technologies that could be established at U.S. water utility systems, including in Akron, Ohio.
- *Karl Mundorff, Director of Research Programs, Oregon BEST:* Mr. Mundorff's organization is just starting a regional water cluster. They attended the Water Environment Federation's Technical Exhibition and Conference (WEFTEC), held meetings at Portland State University, and established two new water laboratories at Oregon State University where stormwater management technologies are being developed.
- *Acharya Kumud, Research Professor, Desert Research Institute:* Mr. Kumud was at the meeting to represent the Nevada Center of Excellence for Water, a new initiative started by the Governor's Office of Economic Development. The recent economic recession prompted the Nevada government to diversify the state's economy, which led to a focus on water issues. The Nevada Center of Excellence for Water brings stakeholder groups together to address water challenges.
- *Thomas Schumann, Managing Member, L.A. Water Cluster LLC:* Mr. Schumann discussed the recent creation of L.A. Water Cluster LLC. He has attended recent water technology events and is interested in furthering a partnership between California and Israel to advance water technologies. Mr. Schumann is seeking $100,000 in seed funding for the cluster.
- *Alan Vicory, President, Confluence:* Mr. Vicory stated that Confluence has been a cluster for four years and that they are developing a virtual campus for Confluence members to access technology development information. Confluence is also focused on connecting to utility companies and enhancing technology development for addressing algal toxins. The organization is receiving an award from the Federal Laboratories Consortium.
- *Dan Page, Southeastern Water Coalition:* Mr. Page's engineering firm is involved in a methane-recovery project with BMW. They have additionally set-up operations in Research Triangle Park, North Carolina for manufacturing of new technologies under the direction of a scientist from Europe. One of their projects is a technology that removes pathogens and nutrients from water. The Southeastern Water Coalition is trying to expand and build partnerships with universities in

the Southeastern United States. He emphasized the need for both profitability and sustainability in water technology industries.

- *Gary Keller, CEO, Xomix Ltd.:* Xomix is a biotechnology accelerator that builds and funds start-up companies relating to technology and economic development. Mr. Keller is the industry leader for GSU H2O Tech, a water cluster that is based out of Georgia State University. Mr. Keller serves on the financial committee for an online portal of service technology providers called WIPO Green. WIPO Green works with the National Center for Environmental Health to look at their objectives and how business can enhance environmental health technologies.
- *Karen Golmer, Executive Director, New England Water Innovation Network (NEWIN):* Ms. Golmer explained that NEWIN incorporated about a year ago, and has about 30 start-up business members. Their focus is on local innovation for global impact. NEWIN hosts symposiums regarding water innovation in Massachusetts, and is focusing on establishing a test-bed network to accelerate innovation and commercialize products.
- *Brenda Lucas, Executive Director, Southern Ontario Water Consortium (SOWC):* Since 2010, the City of Ontario has focused on enhancing the water technology sector. SOWC was created to establish the physical facilities in which companies can do real-world demonstrations, specifically of wastewater treatment technologies for municipal facilities and watershed quality monitoring.
- *Elizabeth Thelen, Director of Entrepreneurship & Talent, The Water Council:* Ms. Thelen mentioned several of the Water Council's initiatives including The BREW, a global seed accelerator for water technology start-up businesses. The Water Council also focuses on outreach to schools to help make students aware that water is an industry and profession they can choose.
- *Louann DeCoursey, Executive Director, Colorado Water Innovation Cluster:* This water cluster has historically served as a consulting-based association but has recently stepped back to create a membership model and open-source data cooperative.

SMALL BUSINESS ADMINISTRATION OVERVIEW

Kelly Hunt, District Director, U.S. Small Business Administration Pittsburgh District Office

Ms. Kelly Hunt described SBA and the resources it provides to small business owners and entrepreneurs. SBA was established in 1953 and is a Cabinet-level agency. It was designed to help small businesses start, grow, and succeed. The Agency is headquartered in Washington, D.C., and has 10 regional offices and 68 District offices across the country. Seven disaster-center offices are also part of SBA. The teams at these offices are available to help small businesses that are impacted by disasters.

SBA focuses on counseling, capital access, and contracting. Counseling is conducted through SBA's resource partners. SBA has three resource partners who receive funding from SBA to provide counseling: Small Business Development Centers (SBDCs), Women's Business Centers, and SCORE Counseling. In Pennsylvania, the SBDCs are all based out of colleges and universities, but that varies from state-to-state. SCORE chapters are groups of retired professionals who volunteer to counsel and work with small businesses to provide them with business insight. Additionally, the resource partners provide trainings

and courses at a small cost. Ms. Hunt encouraged meeting attendees to direct start-up businesses and entrepreneurs to SBA's resource partners.

In terms of capital access, SBA does not lend money, but guarantees loans through lenders. SBA can provide guarantees to banks for newer businesses to receive loans. When looking for lending, the best first-step for businesses is to approach their local lender, who would have knowledge of SBA programs, as well as state-level programs. These lenders can help start-ups apply for and obtain packages of loans.

Recently, SBA rolled out a new online portal called LINC, which stands for "leveraging information and networks to access capital." This portal is designed to connect small business borrowers to lenders. Currently, only non-profit lenders are a part of the LINC system, but eventually, banks and other entities will be added. The portal can be accessed from the SBA website. To begin using the portal, entrepreneurs must fill out a short profile with information about their business. This information is then sent to non-profit lenders who cover the area where a given business is located. Lenders will contact entrepreneurs whose businesses they are interested in funding.

SBA has staff members that help small businesses who are interested in doing business with the government via contracting. The U.S. government is the largest purchaser of goods and services and is an advantageous partner for small businesses, according to Ms. Hunt. There are certain programs that feature "set-aside" contracts that are designed to help typically socially and economically disadvantaged groups, such as veterans.

The SBA Awards Program recognizes local and state business winners, including Small Business of the Year, among others. Three businesses in the Pittsburgh district will be recognized in 2015. Winning businesses at the district level then go on to compete at the state and national levels.

Last year, there were just over 5,000 recipients of the SBIR/Small Business Technology Transfer (STTR) investment programs nationally. The SBDC network in Pennsylvania is a member of the Innovation Partnership, and can help businesses receive SBIR/STTR funds. Ms. Hunt encouraged attendees to visit www.SBA.gov for more information.

OVERVIEW OF FEDERAL SMALL BUSINESS INNOVATION RESEARCH (SBIR) WATER AWARDS

Maggie Theroux, Senior Cluster Development Specialist, U.S. EPA Office of Research and Development

Ms. Maggie Theroux explained that in her earlier career, she was an entrepreneur. She then made a career change and was hired by EPA Region 1, where she focused on encouraging small businesses to develop environmental technologies. She worked with the EPA SBIR program manager to create an SBIR proposal preparation workshop. In 2008, Ms. Theroux moved to the Office of Research and Development and after that, began focusing on water technologies in the context of SBIR.

Ms. Theroux found that across all agencies, there is a large amount of funding available in SBIR awards. She explained that from 2012 to 2014, eight federal agencies awarded $90 million to 244 projects. Ms. Theroux has compiled information relating to SBIR awards since 2006 across eight federal agencies. She brought together the SBIR program managers from five agencies for this meeting to help water clusters

understand the SBIR process. These agencies awarded $74.2 million across 194 projects from 2012 to 2014. As shown in Ms. Theroux's PowerPoint slides, water quality monitoring and energy and water efficiency were the two types of projects most heavily funded by SBIR from 2012 to 2014. Ms. Theroux also showed graphs revealing which agencies funded specific types of technologies the most. For example, the U.S. Department of Energy (DOE) is the biggest funder of energy and water efficiency awards, and EPA is the sole funder of stormwater technologies.

This information can help cluster leaders guide small businesses towards the agencies that are most likely to fund their type of technology. Ms. Theroux also has detailed instructions for searching www.SBIR.gov to find SBIR water technology awardees in a given region (see Appendix C for the instructions). Data from www.SBIR.gov can reveal areas of research concentration, which can help water clusters connect to groups of companies that are developing technologies that have been funded by the federal government. Cluster leaders can also connect universities to these technology industries to further expand water clusters.

PANEL: SBIR PROGRAM MANAGERS

Panel Moderator: Jack Adams, Director of Government Affairs, Calgon Carbon Corporation

Mr. Jack Adams introduced each of the panel members, listing their agency, their title, their primary projects, and previous relevant experiences.

April Richards, SBIR Program Manager, U.S. EPA Office of Research and Development

Ms. April Richards provided an overview of the federal SBIR/STTR program. SBIR funding goes to small businesses, while STTR funds partnerships between businesses and universities. The EPA does not award STTR funds because their budgeting does not meet the threshold for that program. The SBIR program is a "set-aside" program (meaning that there is always a budget for it, although it may fluctuate) for small businesses to engage in federal research and development (R&D). The main goal for the SBIR program is to promote commercialization of technology. Whereas other federal R&D programs aim to foster scientific discovery or build academic capacity, SBIR helps to expand businesses. Eleven federal agencies have SBIR programs that work to promote their individual missions.

SBIR funds critical early-stage and high-risk innovative projects that otherwise may not be funded by organizations such as venture capital firms. Ms. Richards stated that SBIR programs are a "good deal" for the small business because there is no repayment, no dilution of company equity, and no cost sharing required for Phases I and II. She then listed the goals of the SBIR program, including stimulating technological innovation, and the STTR program, including stimulating and fostering scientific and technological innovation through cooperative R&D.

There are three phases of the SBIR program:

- *Phase I: Feasibility and Proof of Concept* provides smaller grants ranging from $150,000-225,000 that are given to numerous businesses. This phase lasts 6-12 months. The agencies then select the projects with the greatest chances of success for Phase II funding.

- *Phase II: Continue Research/R&D towards Commercialization* provides $1-1.5 million for two years.
- *Phase III: Commercialization* focuses on businesses building partnerships to further commercialize their technology.

The EPA SBIR program works to further EPA's mission of protecting human health and the environment. The EPA award budget is roughly $4.2 million and is awarded through contracts. Phase I offers $100,000 for six months and Phase II provides $300,000 for two years with a commercialization option of $100,000. EPA provides commercialization support to all Phase I and Phase II companies. They release one solicitation per year, and the next is scheduled for Spring 2015. In terms of topic development, the SBIR program works across the Agency to gather information from the various regional offices and laboratories on potential topics—water is generally one of these topics.

EPA is using FedConnect, an electronic submission system, for SBIR application submissions. The Agency does a two-stage review process. During external peer review, EPA assesses whether technologies are innovative and disruptive. This review stage prioritizes management and technical capabilities in the proposed team, as well as technical soundness, lifecycle environmental impacts, and commercialization potential. Internal review criteria include EPA needs and program priorities, significant environmental benefits, and broad application and impact. Ms. Richards concluded with some tips for submitting a successful proposal, including putting together an effective team of technical and business experts, as well as examples of past success stories.

Ali Mohamed, Director, Division of Environmental Systems, National Institute of Food and Agriculture, U.S. Department of Agriculture

Mr. Ali Mohamed started his talk by stating that the U.S. Department of Agriculture (USDA) has a very broad reach in terms of water issues. Like EPA, USDA awards grants only for SBIR. Their awards are based on scientific and technical merit, company qualifications, and commercial potential. Proposals are reviewed through confidential peer review using outside experts. Funds are allocated to topic areas in proportion to the number of proposals received. USDA permits and encourages subcontracting to universities and USDA laboratories; companies can save money by harnessing the services of pre-existing laboratory and technical facilities.

Phase I grants are for eight months at $100,000, and Phase II grants are for $500,000. Twelve-month, no-cost extensions are also available. In terms of topic areas, "air, water, and soils" and "aquaculture" most directly relate to the technologies of the water cluster businesses. Air, water, and soils projects develop technologies for conserving and protecting air, water and soil resources while sustaining optimal farm and forest productivity. The aquaculture topic develops new technologies that will enhance the knowledge and technology base necessary for the expansion of the domestic aquaculture industry as a form of production agriculture. USDA also funds projects relating to rural community development and small and mid-size farms, both areas where water technologies are needed.

Mr. Mohamed listed the USDA SBIR program staff and technology areas supported by the program (both shown on the PowerPoint slides). He went on to explain the SBIR review process. Proposals are evaluated by confidential peer review in two phases that include panels and ad-hoc reviewers. Selection criteria include scientific and technical merit and commercial potential. All applicants receive verbatim

copies of reviews. Phase I applicants who were denied are able to reapply for Phase I funding during the next solicitation cycle, while Phase II applicants are only able to apply one time.

USDA strongly encourages involvement by universities and government scientists. Scientists may serve as consultants or receive a subcontract and continue to work full time at their home institution. Mr. Mohamed encouraged Phase I applicants to provide a vision of where they would like to be by the end of Phase II and provide a detailed experimental plan, among other recommendations. He also mentioned some factors that improve chances for commercial success, including high scientific/technical merit, good consultants, and business expertise, for example.

Other opportunities for funding can be found through the USDA's National Institute for Food and Agriculture (NIFA). NIFA offers $1.5 billion in funding, with a sizable amount of that being offered for water projects. Mr. Mohamed concluded with listing several examples of successful past USDA SBIR grant recipients.

Prakash Balan, SBIR Program Manager, National Science Foundation

Dr. Prakash Balan began with explaining that the National Science Foundation's (NSF's) SBIR program works to promote their vision of a nation that creates and exploits new concepts in science and engineering and provides global leadership in research and education. The budget for the NSF SBIR/STTR program is roughly $177 million. The federal SBIR program began at NSF in 1982 with the passing of the Small Business Innovation Development Act.

NSF has a very broad landscape of project topics that they fund. Dr. Balan listed the various topics as well as the program manager for each (this information is available on the PowerPoint slides). NSF does not allocate budget by topic. Instead, they are flexible and allocation depends on incoming proposal quality. SBIR *Phase I: Technology Proof of Concept* offers $150,000 for six months. To be granted Phase I funding, companies must be able to show how their technology will generate jobs and grow a business. Additional R&D funds are available for supporting third-party financial engagement. *Phase II: Technology Development* offers $750,000 for two years. Supplemental R&D funding is also available via a funding match for qualifying third-party funding/investment/commercial revenues, among others. Smaller businesses can additionally be granted membership fees to industry organizations, which gives them the opportunity to network with pre-existing and larger-scale companies in their respective fields. According to Dr. Balan, the beauty of the SBIR program is that the process is quick, and small businesses can get constructive feedback from experts in their technology field. The total available funding for a single technology can be from $1-1.3 million at NSF.

Interested companies can apply on the NSF website for the two solicitations that they typically release each year. Dr. Balan recommended that potential applicants first write an email to the appropriate NSF program manager discussing aspects of the project, including description of the company and team, market opportunity/value proposition, technology/innovation, the competition landscape, and a research outline. The program managers can provide support to businesses prior to the proposal submission, as well as during the feedback stage. Like the other agencies, NSF has an external peer and merit review, conducts due diligence, and then sends notification of award or decline. They highly value disruptive and discontinuous technology developments with broad impact. He encouraged the water cluster leaders to attend the NSF Phase II Conference in Atlanta, Georgia.

Heather Henry, Program Administrator, Superfund Research Program, National Institutes of Health/National Institute of Environmental Health Sciences

The National Institutes of Health (NIH) and EPA work together through the Superfund Research Program. The program, based out of the National Institute of Environmental Health Sciences (NIEHS), represents the detection and remediation technology side of NIH. Topics of interest for its May 2015 solicitation will include better detection technologies for waste sites. In order for businesses to receive funding, their technologies have to relate to Superfund projects, but are not required to function directly at Superfund sites.

The award budget for the Superfund Research Program's SBIR/STTR program is roughly $1.8 million. The SBIR *Phase I: Feasibility Study* provides $150,000 over six months, and *Phase II: Full Research/R&D* provides $1 million in direct costs over two years. They do not fund Phase III. The review process is similar to the other agencies in that it includes an external peer review and a review by the NIEHS Advisory Council. Applications are scored on significance, investigators, innovation, approach, and environment. Ms. Henry also included a slide on keys to a successful proposal, and discussed the types of work that they fund, including drinking water treatment and drinking water monitoring. She concluded with several examples of past funding recipients, including one company that focused on detection technologies to improve remediation of perchlorate in food and water supplies.

Mr. Adams closed out the panel and invited the meeting attendees to have lunch and listen to the keynote speaker.

LUNCHEON KEYNOTE SPEAKER

Julie Lenzer Kirk, Director of the Office of Innovation and Entrepreneurship, U.S. Department of Commerce, Economic Development Administration

Ms. Julie Lenzer Kirk began by noting that she appreciated the diversity of individuals who attended this cluster leaders meeting. As a former entrepreneur, she was excited to see many innovative people and projects when she began work at the Economic Development Administration (EDA). EDA works to increase the quality of life in our communities, as well as to increase the U.S. global economic competitiveness. The organization focuses on creating the conditions necessary for economic growth through their six regional offices by helping community partners and non-profit organizations build capacity to develop applications for funding. EDA has a preference for public-private partnerships and looks to catalyze investments.

Ms. Lenzer Kirk noted that economic development requires more than basic infrastructure. Technology infrastructure, including broadband coverage, and business support, such as business incubators and SBIR funding, is also necessary. Engines of innovation, including universities and R&D, create a climate that drives economic development as well.

Maryland has a vast network of business resources, including 24 incubators. The key, according to Ms. Lenzer Kirk, is connecting entrepreneurs to the resources that are available. She discussed Startup Maryland's recent bus tour which promoted awareness of entrepreneurial resources among the state's

business community members, and recommended that the water clusters hold similar events in their regions.

EDA has funded the Cluster Mapping Portal tool for economic development. On this website (http://www.clustermapping.us/), policy makers, economic development professionals, and researchers can find data and tools to understand clusters, improve institutions, and locate appropriate partners across the country. The water cluster businesses can become a part of the cluster mapping tool database as "traded clusters," which are engines of regional economies, in order to be connected to regional resources. Ms. Lenzer Kirk explained that the critical elements of an innovation culture include openness, diversity, tolerance for risk, trust, role models, and feedback loops.

Ms. Lenzer Kirk's office provides several grants; water cluster leaders can find more information on the EDA website (http://www.eda.gov/funding-opportunities/). Overall, EDA works to support technologies that have a real social impact. One participant asked what Ms. Lenzer Kirk's office's priorities are for increasing the capacity to commercialize. Ms. Lenzer Kirk stated that they are working on ways to support small businesses in activities such as applying for SBIR funding. EDA is also creating metrics to help measure commercialization outcomes. Ms. Lenzer Kirk elaborated on the i6 Challenge, a federal grant program that supports innovative initiatives to spur technology commercialization, entrepreneurship, and jobs creation at the local level. One participant noted that it is a barrier for technology development when technologies have to be approved on a state-by-state basis. Ms. Gutierrez noted that EPA is working towards promoting regional agreements so that multiple states can approve technologies and give businesses more opportunities to grow.

U.S. DEPARTMENT OF ENERGY SBIR PROGRAM

Moderator: Michael Hoops, General Manager, Axiall Corporation

Mr. Michael Hoops introduced Mr. Manny Oliver, who has been with DOE since 2010. Prior to that, he led commercialization efforts at Motorola.

Manny Oliver, SBIR Program Manager, U.S. Department of Energy

Mr. Oliver discussed DOE's SBIR program, specifically how it funds water technologies. DOE works to further its mission through its SBIR program. They focus on clean energy technologies, science and engineering, and nuclear security. The DOE Office of Science, Office of Energy Efficiency and Renewable Energy, and Office of Fossil Energy are involved in water-related topics. Topics for the next round of funding opportunities will be posted in July 2015.

Similar to the other agencies, the SBIR program at DOE has two Phases—*Phase I: Feasibility/Proof of Concept* and *Phase II: Prototype or Process Development*. Phase II awardees may also receive a second or sequential Phase II award. Phase IIA includes projects requiring more time and funding to complete their prototype or process development than what is available with a single Phase II award. Phase IIB is for projects requiring additional R&D funding to transition an innovation towards commercialization (Mr. Oliver's PowerPoint slides include the schedule for the next round of SBIR awards).

Unlike the other agencies, DOE topics are more specific. The water-related topic areas include membranes and materials for energy efficiency, bioenergy, and solar and water power. They are drafted by program managers who are aware of technology roadblocks but may not be aware of the commercialization challenges. DOE expects small businesses to address the commercialization challenges in their SBIR proposals and ensure that there is a profitable business opportunity with their technology. They perform follow-up surveys to track commercialization outcomes. Review criteria include strength of the scientific/technical approach, ability to carry out the project in a cost-effective manner, and potential for positive impact. Additionally, they have recently implemented a Phase 0 Assistance Program to increase the number of responsive, high quality proposals submitted to DOE from businesses in states with historically low SBIR/STTR application numbers from women- and minority-owned businesses.

Questions and Discussion

The floor was then opened up for questions for Mr. Oliver as well the prior panel of SBIR program managers. Mr. Oliver confirmed for one participant that the list of states with low numbers of applications by women- and minority-owned businesses is determined by numbers of previous SBIR applications numbers to DOE only. Another participant asked Mr. Oliver if DOE is open to SBIR applications that cover multiple topics or if they must exclusively cover one topic. Mr. Oliver explained that it is sometimes difficult to fund technologies that are multidisciplinary, but it is possible. Ms. Henry stated that for the NIH program, as long as a technology primarily focuses on Superfund, it is acceptable to cover different topics. She went on to note that so far, the status-quo has not been for the various agencies to co-fund the same project with SBIR funds, but that that could be a possibility in the future.

Another participant expressed concern over the regulatory barriers that vary from state-to-state. Additionally, clusters are facing the challenge of helping equip technology companies with long-term funding streams. Dr. Balan explained that there must be strong market demand for new technologies, and that entrepreneurs must prove how their idea will succeed in the marketplace. He emphasized that the role of the agencies should be to catalyze a technology that already has a strong likelihood of succeeding. Mr. Oliver noted that SBIR is concentrated on funding early stages of technologies as opposed to demonstration activities, which are often funded by private-sector entities.

PANEL: SBIR AWARDEES AND PERSPECTIVES ON APPLICATION PROCESS AND EXPERIENCE WITH AWARDS

Panel Moderator: Devesh Sharma, Managing Director, Aquatech International Corporation

Mr. Devesh Sharma introduced the panel and explained that the speakers represent companies that have previously been awarded SBIR funding.

James Uber, Principal, CitiLogics (NSF Awardee), Covington, Kentucky

Mr. James Uber explained that CitiLogics is a member of the Confluence water cluster and is a company that is in the smart water infrastructure space. With regard to SBIR, he stated that there are many opportunities for small businesses to get help with the proposal writing and editing process. From the water cluster perspective, however, he stated that the greatest need is assistance with turning an idea into a business. Especially at universities, there are people who need encouragement and assistance with

commercializing ideas. Mr. Uber stated that cluster leaders can identify people who built successful water-sector technologies and can share information with people who have ideas. He also advised that regional water clusters work with university administrators and regional water utilities. Bringing these types of people together can lead to company formation. According to Mr. Uber, SBIR is a great program, but it should not mean that cluster leaders can take their eyes off of helping to advance their member businesses in other ways.

Hanbae Yang, Product Engineering Team Leader, ABS Materials Inc. (NSF, DOE Awardee), Wooster, Ohio

Mr. Hanbae Yang explained that ABS Materials has received SBIR grants for technologies relating to water purification, stormwater treatment, and refinery water purification, among others. Several benefits of SBIR awards, from his company's perspective, include the ability to develop products or technology to sell, increased credibility, and publicity that comes with validation from a federal agency. Mr. Yang advised that water cluster businesses ensure that their technologies have market validation and a niche market. He stated that innovations and technologies are only worth what the market is willing to pay. Finally, Mr. Yang recommended that water clusters focus on assisting companies with achieving demonstration projects and introducing companies to potential users of their technologies.

J. Richard Schorr, Founder and CEO, MetaMateria (EPA, NSF, USDA Awardee), Columbus, Ohio

Mr. Richard Schorr's company has focused on phosphorus development technologies and has benefitted from the SBIR program. The funding and assistance has helped with proposal development and expanding business knowledge. In terms of the technology, the program supported his company in developing new capabilities to make nano-enabled materials with enhanced properties for water cleanup. He explained some of the differences he has seen between the types of projects the various agencies fund with SBIR. In his opinion, the U.S. Department of Defense (DOD) and DOE look for clearly defined problems to be solved, NSF prioritizes new technology with commercial potential, and EPA accepts a broad range of ideas for technology that can be commercialized in the near term. USDA is tied mostly to issues of the farming community. Overall, the SBIR program can be instrumental to company growth by providing a forum to establish credibility, helping the business team to develop knowledge of the process, and launching the company towards market acceptance and expansion.

Ken Wolf, Executive Vice President of Business Development and Strategy, RedZone Robotics, Inc. (DOE, DOD, NASA Awardee), Pittsburgh, Pennsylvania

Mr. Ken Wolf stated that RedZone is a well-recognized wastewater technology company founded in 1987. They have expanded their technologies beyond Pittsburgh to other cities with sewer system issues as well. It has been roughly 20 years since RedZone received an SBIR grant, and since then, they have greatly expanded their businesses and have been involved with venture capital firms.

Questions and Discussion

Mr. Sharma then opened the floor for questions. One participant commented that bringing together certain technologies that he knows of with Mr. Schorr's pathogen removal technology could be beneficial. He also asked Mr. Uber how he made his personal transition from university to business and if he had used grant writers for SBIR proposals in the process. Mr. Uber commented that he had a very supportive

graduate student and EPA team that assisted with the transition, and that he has not used grant writers for his proposals. Mr. Oliver noted that SBIR funds cannot be used for consulting services, such as grant writing, prior to being awarded the funding. Dr. Balan commented that plain and simple language is appreciated in SBIR proposals, and that business owners should be able to easily write them. Another audience member was curious how, as innovators and inventors, the panel members think through the issue of blending technologies. Mr. Uber noted that he thinks the way to advance is to find the right partnerships. Mr. Yang explained that his company has used SBIR funding to grow and gain partners who prefer to work with larger companies; Mr. Schorr echoed this sentiment.

BREAKOUT SESSIONS AND IN-DEPTH DISCUSSIONS: "COMPANY EXPERIENCES AND RECOMMENDATIONS FOR CLUSTER LEADERS—SHARING BEST PRACTICES ON LEVERAGING SBIR AWARDS, PERSPECTIVES OF ANCHOR COMPANIES, ETC."

The SBIR program managers and meeting attendees were divided into two breakout groups. The breakouts were open-ended question and answer sessions that allowed participants to voice questions regarding funding opportunities. The SBIR program managers then switched groups so they could field questions from the other half of the attendees.

Breakout A: EPA, USDA, NIH SBIR funded companies, anchor companies

Session 1: One participant asked why the Department of the Interior is not in the SBIR program, and Ms. Richards explained that that they do not have an R&D budget, which is necessary to participate in the program.

Another individual brought up the point that he is not aware of a national organization that advocates for SBIR expansion. Ms. Richards noted that Congressional representatives do listen to constituents, and value small business owners, so cluster leaders could advocate for their member businesses in this way.

Mr. Schumann noted that water is such a pressing issue and that on a national scale, the United States does not have the luxury of time to address issues such as shortages. Mr. Vicory posed the idea of the water cluster community developing a letter that could be sent to Congress to advocate for enhancement of SBIR funding.

Ms. Henry promoted water cluster organizations interfacing with the Interstate Technology and Regulatory Council, which is essentially a public-private partnership that could help to advance the technologies of the water clusters. One participant noted that the water clusters should work to have a broader dialogue with stakeholders. Ms. Golmer stated that her organization, NEWIN, recently held a conference with municipal leaders to establish a conversation around water technology needs, and that a similar event could be organized by cluster leaders in their respective regions. The breakout session concluded with Mr. Vicory explaining that Confluence has grown organically because the participants see the value and identify what the businesses can achieve together as a team. Confluence is not an incubator, but they connect technologies to incubator opportunities.

Session 2: The session began with a discussion of peer reviewers. If an individual is interested in serving as a peer reviewer for SBIR proposals, they should reach out to the appropriate SBIR program manager who leads efforts for the topic with which a peer reviewer would like to be involved. One participant

asked if there is a list of funding for technologies. Mr. Mohamed stated that for USDA, there is a website for the Office of Technology Transfer where users can get information about all patents to see which one would be a fit for their given technology. Mr. Mohamed was also prompted to discuss that technologies are needed to address the contamination of agricultural water supplies by fracking chemicals.

In terms of SBIR topics, Ms. Henry and Ms. Richards explained that for NIH and EPA, write-in topics are not permitted and applications must fit in to one of the pre-designated topics. Applicants cannot submit the same proposal to multiple agencies and receive funding from more than one. If companies want to apply for SBIR funding from more than one agency, the proposals must be at least slightly different.

The SBIR program managers also discussed that a consortium of businesses can coalesce around a technology and write an SBIR proposal together, if they wish. In fact, the agencies encourage collaboration on technologies and SBIR applications. Collaboration between businesses and universities needs to be formalized by a contractual agreement that describes the distinction of organizational roles. The discussion concluded with the SBIR program managers explaining that it is often more important to have a strong team than a good technology because technologies may unexpectedly change, but a good team can navigate these challenges.

Breakout B: NSF, DOE SBIR funded companies, anchor companies

Session 1: One participant asked what the SBIR/STTR proposal review process looks like. Mr. Oliver stated that the review process varies by agency. Contracting agencies (e.g., EPA) typically use agency personnel to perform the reviews. Granting agencies (e.g., DOE, NIH, NSF, and USDA) typically use external peer review. The reviews may be performed individually or in a panel format. The information provided by the reviewers is advisory to the agency program manager who will make a recommendation for funding. The review criteria and weighting are described in the solicitation. Another participant asked what kind of response potential applicants should receive back from SBIR program managers when they contact them directly. Mr. Oliver and Dr. Balan noted that this depends on the nature of the question and its timing. SBIR program managers are free to respond to questions about their programs, topic areas, or the application process at any time, and will usually reply within a week of receipt of the inquiry for feedback. However, once an application is submitted, they are not in a position to discuss your application prior to making a final decision.

One attendee asked how important the proof-of-concept is when applying to the SBIR/STTR program. Mr. Oliver stated that the SBIR/STTR programs fund early-stage feasibility or proof-of-concept R&D in Phase I. Therefore, it is not necessary to have completed any experiments prior to submission. If a potential applicant or team is at the idea stage, they will still need to make a compelling case for their idea based on theoretical grounds or extrapolations from related experimental work. Letters of support were also discussed. Dr. Balan stated that letters of support are a key way for companies to show the level of market interest in the proposed innovation. Depending on what is stated in the letters, they may add significant additional weight and credibility to the claims made in the proposal. It provides a way for reviewers to understand and validate the impact claims being made in the proposal.

Another individual asked if applicants can designate proposals for both SBIR and STTR. At DOE, if a business meets the requirements for both programs, they can apply to both with a single application. At NSF, an organization may submit no more than two Phase I proposals in total during the cycle, which is

defined as the SBIR Phase I solicitation and the concurrent STTR Phase I solicitation. For example, an organization may submit one SBIR Phase I and one STTR Phase I proposal, two SBIR Phase I proposals, or two STTR Phase I proposals during this cycle. These eligibility constraints will be strictly enforced. In the event that an organization exceeds this limit, the first two proposals received will be accepted, and the remainder will be returned without review. The submission of the same project idea to both the SBIR Phase I solicitation and the concurrent STTR Phase I solicitation is strongly discouraged.

Mr. Oliver and Dr. Balan also explained that when businesses apply for SBIR funding with technologies that already have patents, it demonstrates that the technology is novel, but a commercialization and business plan is still necessary.

Session 2: Mr. Oliver noted that it is sometimes difficult for small businesses to identify which agency they should approach for SBIR funding. They often have to dig into what technologies the agency has funded in the past, especially with agencies such as DOD. Mr. Oliver noted that DOD gives out more dollars in Phase III than Phase I and II, which distinguishes it from the other agencies.

One participant asked what the definition of small business is in the context of the SBIR program. Dr. Balan stated that a small business is a business that is majority U.S.-owned, majority-owned by individuals, and has 500 or less employees. He added that when businesses submit an SBIR proposal, they are self-certifying that they are a small business.

Mr. Dan Deocampo asked how the Atlanta Water Cluster can ensure that the resources are available for entrepreneurs. Dr. Balan recommended letting entrepreneurs know of their capabilities via networking. Mr. Schorr thought that more universities should look at STTR to move technology from the university with a small grant. The cluster network might be able to spread the word of SBIR funding opportunities to universities, according to Ms. Theroux.

Finally, Dr. Balan and Mr. Oliver discussed some of the reporting requirements for grant awardees. Mr. Schorr expressed that he thought these requirements were very reasonable and achievable for small businesses who receive SBIR funding.

PANEL: PERSPECTIVES FROM WATER CLUSTER ANCHOR COMPANIES

Panel Moderator: Jason Bernard, Program Manager, Water Economy Network

Mr. Jason Bernard introduced the panel members, who are all part of companies that are members of WEN. The panel members each discussed their company's role in being a member of the water cluster, technology development insights, and thoughts or suggestions for the federal agencies in working with individual companies or the clusters as a whole.

Jack Adams, Director of Government Affairs, Calgon Carbon Corporation

Mr. Jack Adams explained that Calgon Carbon has a host of technologies relating to water. They develop, manufacture and supply activated carbon, other media, and treatment systems to provide clean, safe drinking water and reduce environmental impact and allow wastewater reuse or disposal. Mr. Adams invited Mr. Arthur Kney to the microphone. Mr. Kney explained that Calgon Carbon's focus on engaging researchers in technology development has led to the establishment of a test-bed research and education

facility for wastewater treatment in eastern Pennsylvania. The facility is at the beginning stages, but Mr. Kney and his colleagues hope that manufacturers and academics can use the site to test technology ideas for wastewater.

Devesh Sharma, Managing Director, Aquatech International Corporation

Mr. Sharma explained that Aquatech promotes technologies for wastewater treatment by delivering them to the market. As an anchor company, Aquatech offers perspective on the industrial market opportunities, provides feedback such as market value proposition, and catalyzes commercialization by scaling up, testing, and piloting technologies of smaller, newer companies. Several important issues in the market of high-tech water include reducing energy consumption in any type of desalination, improving reliability of wastewater processes, and resource recovery. He recommended that technology start-ups, cluster leaders, and federal agencies need to work together to improve the cycle of technology development.

Michael Hoops, General Manager, Axiall Corporation

Mr. Michael Hoops stated that Axiall is an integrated leader in the chemicals and building products industry. They manufacture technologies such as calcium hypochlorite and equipment systems solutions for markets such as irrigation and municipal wastewater. He echoed prior sentiment that different labeling and regulations across states make it difficult for some technology companies to expand regionally. Mr. Hoops expressed that WEN has allowed Axiall to network and become aware of new technologies and products in the Pittsburgh area. He commended Ms. Gutierrez for organizing the meeting and increasing communication between the water clusters and federal agencies.

Phil Fatula, Market Manager, Lanxess

Lanxess, according to Mr. Phil Fatula, is a leading global solution supplier for liquid purification technologies. He explained that benefits of being part of WEN have included intercompany networking, local/regional networking, academic and regulatory interfacing, and technology acquisition. Lanxess will continue to work to enhance these benefits within the water cluster.

Questions and Discussion

Mr. Bernard then opened the floor up for questions. One participant asked about how to apply solutions and development to a test-bed in the Pittsburgh area. Mr. Fatula stated that companies can harness the power of the water cluster companies to expand resources. One participant requested that the various water clusters' companies start to integrate and share information. Mr. Adams confirmed that this would be helpful, but that we need to figure how to get universal permitting of technologies to reduce barriers from state-to-state. Another participant asked the anchor company representatives if they see any places in particular where companies should invest time and money. Mr. Fatula stated that his company is interested in South America, and Mr. Sharma noted that China is probably the best market in the world to adopt new technology.

FINAL COMMENTS, NEXT MEETING

Maggie Theroux, Senior Cluster Development Specialist, U.S. EPA Office of Research and Development

Ms. Theroux thanked the meeting attendees for participating. She asked the participants to comment on what EPA did well and what it could have done better for the day's meeting. One audience member noted that more breakouts with fewer people per session would be helpful. Several participants stated that they appreciated the breakouts as a chance to engage in discussion with federal representatives and ask questions.

Ms. Theroux stated that the next water cluster leaders meeting is planned for Sunday, September 27, 2015, in Chicago, Illinois before the Annual WEFTEC conference. The proposed topic for that meeting is private investments in water technologies.

Following the meeting, participants were invited to attend the Three Rivers to Haiti Benefit hosted by Deep Springs International at the Hotel Monaco Pittsburgh (located across the street from the meeting location).

APPENDIX A: PARTICIPANTS LIST

The following individuals attended the Water Technology Innovation Cluster Leaders Meeting on April 27, 2015.

Jack Adams
Calgon Carbon Corporation

Jon Allan
Michigan Office of the Great Lakes

Prakash Balan
National Science Foundation

Michael Berger
Aquatech International

Jason Bernard
Fourth Economy Consulting

Nehal Bhojak
Idea Foundry

Terri Billups
U.S. Small Business Administration

Aimee Boucher
U.S. Environmental Protection Agency

Jeff Bronowski
City of Akron, Ohio

Jon Capacasa
U.S. Environmental Protection Agency, Region 3

Doug Conley
Calgon Carbon Corporation

Ryan Connair
U.S. Environmental Protection Agency

Clarisse Croteau-Chonka
Xomix, Ltd.

Louann DeCoursey
Colorado Water Innovation Cluster

Dan Deocampo
Georgia State University

Julius Enriquez
U.S. Environmental Protection Agency

Grant Ervin
City of Pittsburgh, Pennsylvania

Tom Falcone
Water Recycling Corporation of America

Phil Fatula
Lanxess

Michael Gallagher
Bayer MaterialScience LLC

Ravi George
Water Environment Research Foundation

Karen Golmer
New England Water Innovation Network

Brian Gresser
Akron Global Water Alliance

Sally Gutierrez
U.S. Environmental Protection Agency

Bill Hagstrand
Team NEO

Teresa Harten
U.S. Environmental Protection Agency

Heather Henry
National Institutes of Health/National Institute of Environmental Health Sciences

Ebie Holst
SplashLink

Michael Hoops
Axiall

Kelly Hunt
U.S. Small Business Administration

Lek Kadeli
U.S. Environmental Protection Agency

Fidan Karimova
Water Environment Research Foundation

Gary Keller
GSU H2O TECH/Xomix, Ltd.

Arthur Kney
Lafayette College

Acharya Kumud
Desert Research Institute

Jeff Lape
U.S. Environmental Protection Agency

Julie Lenzer Kirk
U.S. Department of Commerce, Economic Development Administration

Brenda Lucas
Southern Ontario Water Consortium

James McCarville
McCarville Consulting

Stephen McKnight
Water Economy Network

Ali Mohamed
U.S. Department of Agriculture

Karl Mundorff
Oregon BEST

Manny Oliver
U.S. Department of Energy

John Owsiany
CONSOL Energy

Dan Page
Southeastern Water Coalition

John Patrin
Dow Water & Process Solutions

Vikram Pattarkine
PEACE USA

Cate Rahmlow
Wisconsin Economic Development Corporation

April Richards
U.S. Environmental Protection Agency

Seth Rose
Eneref Institute

David Ruppersberger
Pittsburgh Regional Alliance

Ryan Russell
U.S. Commercial Service

Richard Schorr
Metamateria Technologies

Thomas Schumann
LA Water Cluster LLC

Richard Seline
Accelerate H2O

Devesh Sharma
Aquatech International

Cat Shrier
Water Citizen News

Ernesto Silva Mojica
Bayer MaterialScience

Elizabeth Thelen
The Water Council

Maggie Theroux
U.S. Environmental Protection Agency

Marisa Tricas
Water Environment Federation

James Uber
CitiLogics

Alan Vicory
Confluence

Ken Wolf
RedZone Robotics, Inc.

Rex Woodward
MMC Inc.

Hanbae Yang
ABS Materials, Inc.

Ziyu Zhu
Blue Tech Alliance/Mandarin Environment

APPENDIX B: MEETING AGENDA

U.S. EPA Water Technology Innovation Cluster Leaders Meeting
Federal Funding Opportunities for Early-Stage Water Companies
April 27, 2015 | Pittsburgh, Pennsylvania
Omni William Penn Hotel, Monongahela Room, 17th Floor

AGENDA

Time	Event
7:30 AM	**Registration** (outside of Monongahela Room, 17th Floor)
8:00 AM	**Welcome to Pittsburgh** Jack Adams, Director of Government Affairs, Calgon Carbon Corporation; Chairman, Water Economy Network (WEN) *Introduction of the WEN Board* Grant Ervin, Sustainability Manager, City of Pittsburgh **Perspectives on Water Technology Innovation from U.S. EPA Region 3 and Office of Research and Development** Lek Kadeli, Acting Assistant Administrator, U.S. EPA Office of Research and Development (Washington, DC) Jon Capacasa, Water Division Director, U.S. EPA Region 3 (Philadelphia, PA)
8:30 AM	**Water Cluster Leaders Round-the-Room Introductions and Updates** All (2-3 minutes from each water cluster on recent updates and accomplishments)
9:30 AM	**Networking Break**
10:00 AM	**Small Business Administration Overview** Kelly Hunt, District Director, U.S. Small Business Administration Pittsburgh District Office
10:15 AM	**Overview of Federal Small Business Innovation Research (SBIR) Water Awards** Maggie Theroux, Senior Cluster Development Specialist, U.S. EPA Office of Research and Development

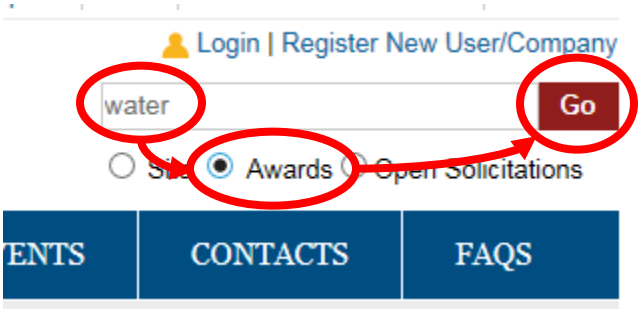
Time	Event
10:30 AM	**Panel: SBIR Program Managers** *Moderator:* Jack Adams, Director of Government Affairs, Calgon Carbon Corporation April Richards, SBIR Program Manager, U.S. EPA Office of Research and Development Ali Mohamed, Director, Division of Environmental Systems, National Institute of Food and Agriculture, U.S. Department of Agriculture Prakash Balan, SBIR Program Manager, National Science Foundation Heather Henry, Program Administrator, Superfund Research Program, National Institutes of Health/National Institute of Environmental Health Sciences
12:00 PM	**Luncheon Keynote Speaker** Julie Lenzer Kirk, Director of the Office of Innovation and Entrepreneurship, U.S. Department of Commerce, Economic Development Administration
1:15 PM	**U.S. Department of Energy SBIR Program** Manny Oliver, SBIR Program Manager, U.S. Department of Energy *Moderator:* Michael Hoops, General Manager, Axiall Corporation
1:45 PM	**Panel: SBIR Awardees and Perspectives on Application Process and Experience with Awards** *Moderator:* Devesh Sharma, Managing Director, Aquatech International Corporation James Uber, Principal, Citilogics (NSF), Covington, Kentucky Hanbae Yang, Product Engineering Team Leader, ABS Materials Inc. (NSF, DOE), Wooster, Ohio J. Richard Schorr, Founder and CEO, MetaMateria (EPA, NSF, USDA), Columbus, Ohio Ken Wolf, Executive Vice President of Business Development and Strategy, RedZone Robotics, Inc. (DOE, DOD, NASA), Pittsburgh, Pennsylvania
2:45 PM	**Networking Break**
3:00 PM	**Breakout Session and In-Depth Discussion** **"Company experiences and recommendations for Cluster Leaders—sharing best practices on leveraging SBIR awards, perspectives of anchor companies, etc."** Breakout A – EPA, USDA, NIH SBIR-funded companies, anchor companies Breakout B – NSF, DOE SBIR-funded companies, anchor companies
4:30 PM	**Panel: Perspectives from Water Cluster Anchor Companies** *Moderator:* Jason Bernard, Program Manager, Water Economy Network Jack Adams, Director of Government Affairs, Calgon Carbon Corporation Devesh Sharma, Managing Director, Aquatech International Corporation Michael Hoops, General Manager, Axiall Corporation Phil Fatula, Market Manager, Lanxess

Time	Event
5:30 PM	**Final Comments, Next Meeting** Maggie Theroux, Senior Cluster Development Specialist, U.S. EPA Office of Research and Development
5:45 PM	**Adjourn**
6:00 – 8:00 PM	Participants are invited to attend the **Three Rivers to Haiti Benefit** hosted by **Deep Springs International** at the Hotel Monaco Pittsburgh (located across the street from the meeting location)

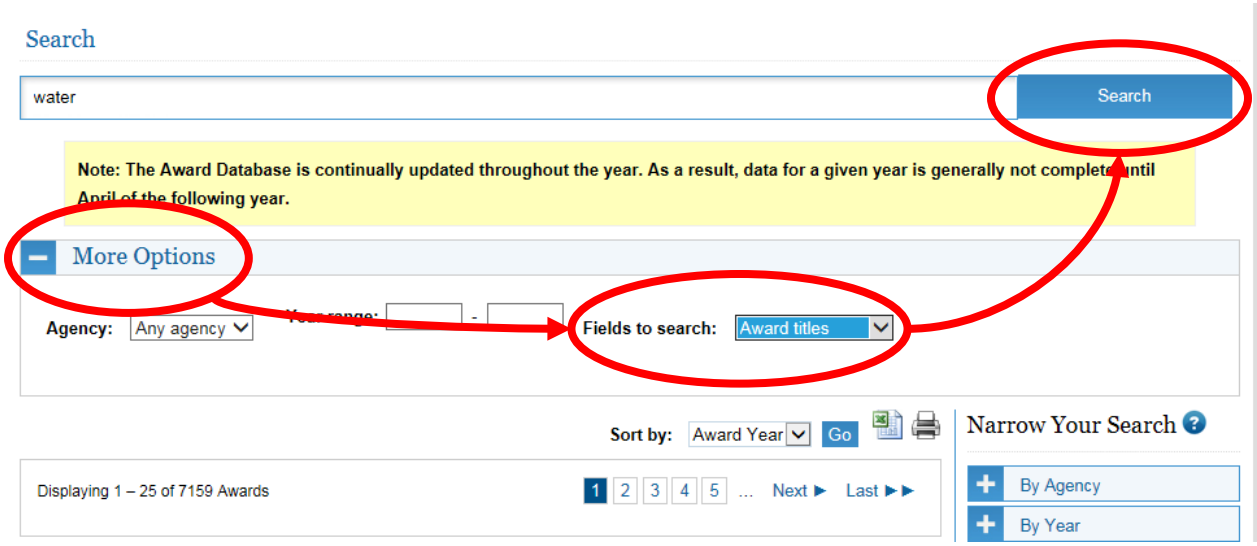
APPENDIX C: HOW TO SEARCH FOR SBIR AWARDS FOR WATER TECHNOLOGY IN YOUR AREA

1. Go to SBIR.gov

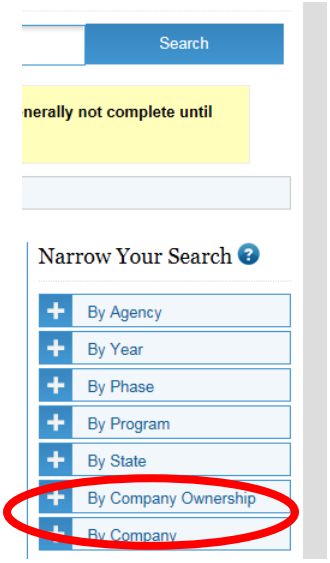
2. In the right hand corner of the page, type in your general search word into the search box, check "Awards" and click "Go"



3. Expand the "More Options" tab and set the "Field to search" to "Award titles." Then, click "Search"



4. You can further narrow down your search by going to the right hand side of the page to "Narrow Your Search." You can tailor your search by:
    a. Agency
    b. Year
    c. Phase
    d. Program
    e. State
    f. Company Ownership
    g. Company

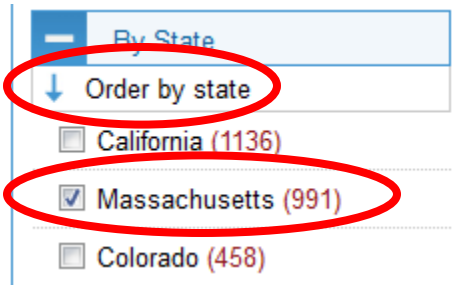


5. To narrow your search by state, under the "Narrow Your Search" header, expand the "By State" tab. This will show the states in descending order of SBIR Awards that meet your search criteria.

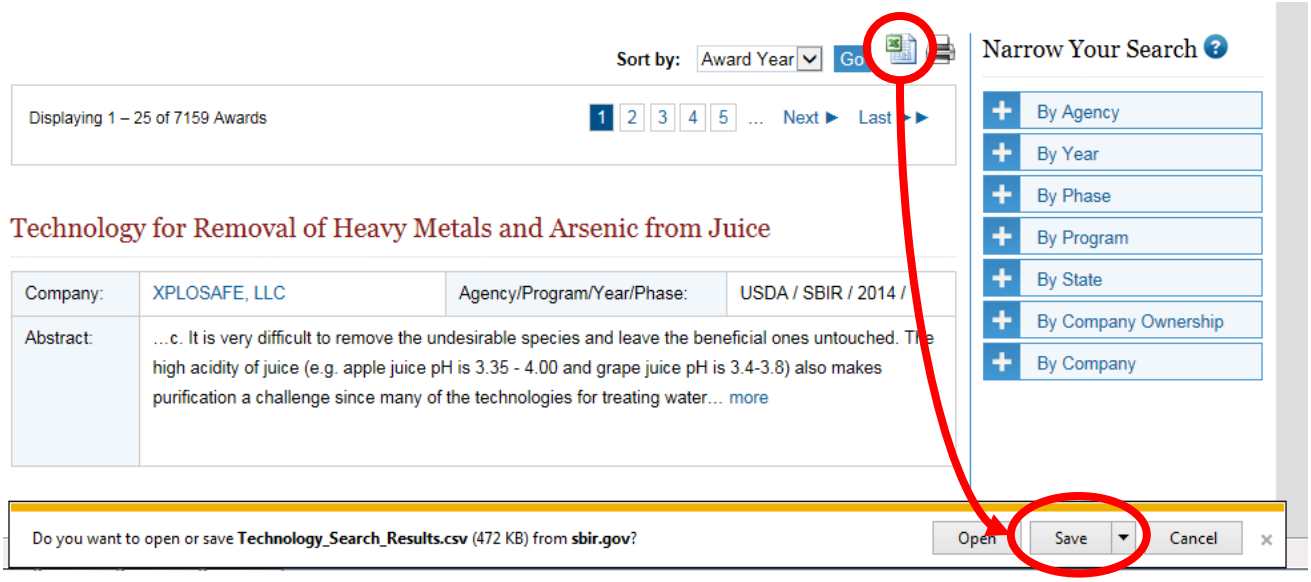
6. In order to organize the states alphabetically, click "Order by state" under the "By State" tab.

7. Click the state you would like to look at.

8. This will create a list of SBIR Awards that meet your search criteria narrowed down by state and is organized by most recent SBIR awards to oldest.



9. Once you have created your list, you can either print or export this list by clicking on the either the printer icon (to print) or spreadsheet icon to export as a .csv file.
    a. To export list, click the spreadsheet icon. At the bottom of the web page, you will receive a message asking if you would like to save a .csv file from sbir.gov. Click "Open" to open the document or "Save" to either save or save as to your computer.



    b. To print, click the printer icon. This will create a new tab in your web browser with a printer-friendly version of the list of SBIR awards you created. This will include the title, company name, agency, program, year, phase and the first two lines of the project's abstract.

    Along with the printer-friendly version, your print option should open up and be ready for you to print the page.