UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON D.C. 20460

OFFICE OF THE ADMINISTRATOR
SCIENCE ADVISORY BOARD

December 15, 2016

EPA-SAB-17-001

The Honorable Gina McCarthy
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Subject: SAB Recommendations for EPA's FY 2016 Scientific and Technological Achievement Awards

Dear Administrator McCarthy:

The EPA Science Advisory Board (SAB) is pleased to transmit its recommendations for the EPA's FY 2016 Scientific and Technological Achievement Awards (STAA). The STAA program was established by the agency in 1980 to recognize EPA employees who have made outstanding contributions to the advancement of science and technology through their publication of peer-reviewed articles or books. Additional objectives of the STAA program include making the general public more aware of the quality and depth of EPA science, and improving the credibility of the science underpinning agency decisions. The SAB has been asked by EPA's Office of Research and Development to review EPA's nominated scientific publications and make recommendations for awards. The SAB is pleased to continue to play this important role in the STAA program.

This year, the SAB reviewed a total of 75 nominations comprised of 130 publications within 14 science and technology categories. The SAB excluded two nominations from consideration since they did not meet the eligibility criteria. The SAB recommends: no nominations for Level I, the highest award; 8 nominations for Level II; 13 nominations for Level III; and 32 nominations for Honorable Mention. The SAB's recommendations are provided in the enclosed report.

Overall, the SAB commends the agency for its publications and finds that the 2016 STAA nominations were generally of very good quality. Although none of this year's nominations met the strict criteria for the highest level award, which speaks to the high scientific and technological standard of the STAA program, the SAB assures the EPA that its scientists are conducting high quality work that is advancing science and technology that supports the Agency's mission.

The SAB appreciates the agency's implementation of most of the SAB's recommendations from previous years for improving the nomination procedures and administration of the STAA program. In a separate report, the SAB will provide recommendations to further strengthen the STAA program and facilitate the SAB review of future STAA nominations.

The agency is to be congratulated for again successfully administering its annual STAA program and the SAB applauds the EPA's public recognition of the scientific work published in the peer-reviewed literature by scientists and engineers. Thank you for providing the SAB with the opportunity to assist the agency with this important program. The SAB looks forward to reviewing the FY 2017 STAA nominations.

Sincerely,

/signed/	**/signed/**
Dr. Peter S. Thorne Chair Science Advisory Board	Dr. Jay R. Turner Chair SAB Scientific and Technological Achievement Award Committee

Enclosure

NOTICE

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*Did not participate in development of this report.

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1. BACKGROUND

EPA's Scientific and Technological Achievement Awards program (STAA) was established in 1980 to recognize the agency's scientists and engineers who published their technical work in the peer-reviewed literature. The STAA program is administered and managed by the EPA Office of Research and Development (ORD). This year, the EPA Science Advisory Board (SAB) has been asked, once again, to review the EPA's nominated scientific publications and make recommendations for STAA awards in consideration of the EPA's criteria. The EPA announced the call for nominations for the 2016 STAA program to senior managers and employees in March 2016. ORD screened the nominations for conformance with EPA's *STAA Nomination Procedures and Guidelines*. The Guidelines describe the award levels, eligibility criteria, and factors that the SAB considers during its review of STAA nominations. In addition to the factors that are considered during the review of STAA nominations, criteria that the SAB considered for STAA Program awards are as follows:

- Level I awards are for nominees who have accomplished an exceptionally high-quality research or technological effort. The nomination should recognize the creation or general revision of a scientific or technological principle or procedure, or a highly significant improvement in the value of a device, activity, program, or service to the public. It must be at least of national significance or have high impact on a broad area of science/technology. The nomination must be of far reaching consequences and recognizable as a major scientific/technological achievement within its discipline or field of study.

- Level II awards are for nominees who have accomplished a notably excellent research or technological effort that has qualities and values similar to, but to a lesser degree, than those described under Level I. It must have timely consequences and contribute as an important scientific/technological achievement within its discipline or field of study.

- Level III awards are for nominees who have accomplished an unusually notable research or technological effort. The nomination can be for a substantial revision or modification of a scientific/technological principle or procedure, or an important improvement to the value of a device, activity, program, or service to the public. It must relate to a mission or organizational component of the EPA, or significantly affect a relevant area of science/technology.

- Honorable Mention is for nominations which are noteworthy but which do not warrant a Level I, II or III award. Honorable Mention applies to nominations that: (1) may not quite reach the level described for a Level III award; (2) show a promising area of research that the SAB wants to encourage; or (3) show an area of research that the SAB believes is too preliminary to warrant an award recommendation at this time.

2. SAB REVIEW PROCEDURE

The SAB Staff Office formed a new SAB 2016-2018 STAA Committee in 2016 to review EPA's STAA nominations. The Committee members were invited to serve for a three-year term. The SAB STAA Committee was formed in accordance with the SAB process as described in the SAB 2002 publication, *Panel Formation Process: Immediate Steps to Improve Policies and Procedures* (EPA-SAB-EC-COM-02-003).

In May 2016, ORD submitted to the SAB Staff Office 77 nominations for 2016 STAA awards in 14 science and technology categories. All EPA nominations and nomination evaluation criteria were provided to the SAB STAA Committee in advance of the review meeting.

The SAB STAA Committee review consisted of a two-step process: an initial review of each nomination, followed by a Committee discussion of all nominations. The initial review of each nomination was conducted by two Committee members, who provided their preliminary recommendation for STAA recognition and a one-to-two page written summary of the reasoning for their preliminary recommendation based on the EPA's award criteria as described in Section 1. This information was distributed to Committee members a few days before the August 15-16, 2016 Committee meeting.

During the SAB STAA Committee's meeting on August 15-16, 2016 in Washington, DC, the Committee received a briefing from the EPA on proposed changes that the agency is considering for the 2017 STAA nomination and review process. An SAB briefing is a mechanism to provide individual expert initial reactions for the agency's consideration early in the implementation of a project or action. No consensus report is provided to the agency associated with a briefing because no consensus advice is given.

During the closed sessions of the meeting on August 15-16, the Committee discussed award recommendations for the EPA's 2016 STAA program. The Committee's discussion on award recommendations was closed to the public because such discussions involved personnel matters, including the relative merits of various employees and their respective work, the disclosure of which would be a clear unwarranted invasion of personal privacy and, therefore, protected from disclosure by sections (c)(2) and (c)(6) of the Government in the Sunshine Act, specifically 5 U.S.C. 552b(c)(2) and 5 U.S.C. 552b(c)(6).

At the August 15-16, 2016 Committee meeting, Committee members separately discussed all nominations (see Table 1). During this review, each of the two assigned Committee members summarized his or her preliminary evaluation, the Committee discussed comments from other Committee members, and the Committee reached a consensus Committee position on the recommended award rating. If widely divergent recommendations for awards occur at this stage in the discussion, the chair might assign a third person to review that nomination and discuss that nomination again at the end of the meeting, or conduct a vote of the Committee on final recommendations for award. The Committee averaged approximately seven minutes total discussion for each nomination, and reached consensus on the recommendations for awards. To avoid an appearance of bias or a loss of impartiality, some members were asked to recuse themselves from the Committee deliberations on selected nominations. The Committee did not make recommendations for two submitted nominations because they did not meet the eligibility requirements (one nomination did not include the entire nomination package and instead another package was duplicated in error; another nomination included three publications for

consideration of award, one of which was published in 2012, prior to the required eligibility date for nominated publications).

On August 15-16, 2016, the SAB STAA Committee also discussed recommendations to further strengthen the STAA program and facilitate the SAB review of future STAA nominations. The SAB STAA Committee will provide these administrative recommendations in a separate report for consideration and approval by the chartered SAB at a closed meeting.

Table 1. 2016 STAA Nominations by Topic Category

Topic	Number of Nominations Submitted to SAB
Control Systems and Technology	1
Ecological Research	12[a]
Energy and the Environment	1
Environmental Policy and Decision-making Studies	9
Health Effects Research and Human Health Risk Assessment	15
Homeland Security	1
Industry and the Environment	4
Integrated Risk Assessment	3
Monitoring and Measurement Methods	9
Other Environmental Research	6
Review Articles	2
Risk Management and Ecosystem Restoration	4
Sustainability and Innovation	1
Transport and Fate	9[b]
TOTAL	**77**

[a]The SAB excluded one nomination because the nomination was a duplication of another submitted nomination.

[b]One nomination included three publications for consideration of award, with one of these publications occurring in 2012. The SAB excluded this nomination because it did not meet the eligibility requirements (i.e., 2016 STAA nomination packages must include nominated publications that were published on or after January 1, 2013).

On October 11, 2016, the chartered SAB held a closed teleconference to consider this report of the 2016 SAB STAA Committee. The SAB approved the report with modifications for transmittal to the EPA Administrator.

3. AWARD RECOMMENDATIONS

Table 2 summarizes the awards by year for the last 10 years, including the current recommendations for 2016. For 2016, the SAB STAA Committee recommended: no nominations for Level I, the highest award; 8 nominations for Level II; 13 nominations for Level III; and 32 nominations for Honorable Mention. Appendix A lists the EPA nominations recommended for each of the award levels, I through III, and those recommended for Honorable Mention. The final rankings were agreed to by consensus at the SAB STAA Committee meeting on August 15-16, 2016 and discussed and approved by the chartered SAB on October 11, 2016.

Although none of this year's nominations met the strict criteria for the highest level award, which speaks to the high scientific and technological standard of the STAA program, the SAB assures the EPA that its scientists are conducting high quality work that is advancing science and technology that supports the Agency's mission.

Table 2. Comparison of Award Recommendations Over Time

Award Level	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
Nominations Reviewed	90	140	130	109	121	130	104	117	72	116	75
Level I	5 (6%)	5 (4%)	5 (4%)	3 (3%)	5 (4%)	3 (2%)	4 (4%)	0	1 (1%)	1 (1%)	0
Level II	11 (12%)	13 (9%)	16 (12%)	22 (20%)	14 (12%)	13 (10%)	10 (10%)	10 (9%)	2 (3%)	3 (3%)	8 (11%)
Level III	29 (32%)	37 (26%)	30 (21%)	31 (28%)	42 (35%)	35 (27%)	29 (28%)	27 (23%)	20 (28%)	38 (33%)	13 (17%)
Honorable Mention	26 (29%)	45 (32%)	43 (33%)	25 (23%)	33 (27%)	44 (34%)	36 (35%)	45 (38%)	29 (40%)	42 (36%)	32 (43%)
Not Recommended	19 (21%)	40 (29%)	36 (28%)	28 (26%)	27 (22%)	35 (27%)	25 (24%)	35 (30%)	20 (28%)	32 (27%)	22 (29%)

Table 3 summarizes the distribution of 2016 award recommendations among categories for all nominations reviewed by the Committee.

Table 3. Summary of Award Recommendations by Category for FY2016

Nomination Categories	Total Nominations Reviewed	Award Levels				Honorable Mention
		I	II	III	Total	
Control Systems and Technology	1	0	0	1	1	0
Ecological Research	11	0	1	2	3	6
Energy and the Environment	1	0	0	0	0	1
Environmental Policy and Decision-making Studies	9	0	1	1	2	5
Health Effects Research and Human Health Risk Assessment	15	0	2	3	5	7
Homeland Security	1	0	0	0	0	0
Industry and the Environment	4	0	1	1	2	1
Integrated Risk Assessment	3	0	0	2	2	0
Monitoring and Measurement Methods	9	0	1	2	3	5
Other Environmental Research	6	0	1	0	1	1
Review Articles	2	0	0	0	0	0
Risk Management and Ecosystem Restoration	4	0	0	1	1	2
Sustainability and Innovation	1	0	0	0	0	0
Transport and Fate	8	0	1	0	1	4
TOTALS:	**75**	**0**	**8**	**13**	**21**	**32**

APPENDIX A - NOMINATIONS RECOMMENDED FOR STAA AWARDS

Nominations Recommended for a Level I Award -- None

Nominations Recommended for a Level II Award -- Total of 8		
Nomination Number	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
80	Diesel Exhaust Modulates Ozone-induced Lung Function Decrements in Healthy Human Volunteers. Published in Particle & Fibre Toxicology.	Madden, Michael Stevens, Tina Case, Martin Schmitt, Michael Diaz-Sanchez, David Bassett, Maryanne Montilla, Tracey Bertsen, John Devlin, Robert **NHEERL**
103	(1) Abiotic Hydrolysis of Fluorotelomer Polymers as a Source of Perfluorocarboxylates at the Global Scale. Published in Environmental Science & Technology. (2) Identification of Unsaturated and 2H Polyfluorocarboxylate Homologous Series, and their Detection in Environmental Samples and as Polymer Degradation Products. Published in Environmental Science & Technology.	Weber, Eric Washington, John Jenkins, Thomas **NERL**
145	(1) Part 1: Laboratory Culture of *Centroptilum triangulifer* (Ephemeroptera:Baetidae) using a Defined Diet of Three Diatoms. Published in Chemosphere. (2) Part 2: Sensitivity Comparisons of the Mayfly *Centroptilum triangulifer* to *Ceriodaphnia dubia* and *Daphnia magna* using Standard Reference Toxicants: NaCl, KCl and CuSO4. Published in Chemosphere. (3) Elevated Major Ion Concentrations Inhibit Larval Mayfly Growth and Development. Published in Environmental Science & Technology.	Weaver, Paul Struewing, Katherine Nietch, Christopher Lazorchak, James Johnson, Brent Funk, David DeCelles, Susanna Buchwalter, David **NERL**

Nominations Recommended for a Level II Award -- Total of 8		
Nomination Number	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
153	(1) Effects-Based Chemical Category Approach for Prioritization of Low Affinity Estrogenic Chemicals. Published in SAR and QSAR in Environmental Research. (2) A Rule-Based Expert System for Chemical Prioritization Using Effects-Based Chemical Categories. Published in SAR and QSAR in Environmental Research.	Tapper, Mark Sheedy, Barbara Schmieder, Patricia Kolanczyk, Richard Hornung, Michael Henry, Tala Hartig, Phillip Denny, Jeffrey Aladjov, Hristo **NHEERL**
190	(1) Independent Data Validation of an In Vitro Method for the Prediction of the Relative Bioavailability of Arsenic in Contaminated Soils. Published in Environmental Science and Technology. (2) Mouse Assay for Determination of Arsenic Bioavailability in Contaminated Soils. Published in Journal of Toxicology and Environmental Health, Part A.	Thomas, David Thayer, William Smith, Euan Scheckel, Kirk Obenour, Dan Nelson, Clay Miller, Bradley Klotzbach, Julie Juhasz, Albert Hughes, Michael Diamond, Gary Casteel, Stan Bradham, Karen **NRMRL**
206	(1) Analysis of Hydraulic Fracturing Fluid Data from the FracFocus Chemical Disclosure Registry 1.0. U.S. EPA Report EPA/601/R-14/003 (2) Review of Well Operator Files for Hydraulically Fractured Oil and Gas Production Wells: Well Design and Construction. U.S. EPA Report EPA/601/R-14/001.	Wiser, Nathan Tucillo, Mary Ellen Torres, Jose Tinsley, Chuck Singer, Alison Sharkey, Susan Oberley, Gregory Meza-Cuadra, Claudia Marker, David Koplos, Jonathan Joffe, Andrea Hillenbrand, Charles Dean, Jill Cole, Guy Burden, Susan Boyd, Glen **OSP**
226	Life Cycle Assessment of Domestic and Agricultural Rainwater Harvesting Systems. Published in Environmental Science and Technology.	Johnston, John Ingwersen, Wesley Hawkins, Troy Ghimire, Santosh **NERL**

Nominations Recommended for a Level II Award -- Total of 8		
Nomination Number	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
240	Do Environmental Regulations Disproportionately Affect Small Business? Evidence from the Pollution Abatement Costs and Expenditures Survey. Published in Journal of Environmental Economics and Management.	Shadbegian, Ronald Pasurka, Carl Becker, Randy **NCEE**

Nominations Recommended for a Level III Award (No Monetary Award) -- Total of 13		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
105	Novel Use of Time Domain Reflectometry in Infiltration-Based Low Impact Development Practices. Published in Journal of Irrigation and Drainage Engineering.	Stander, Emilie Rowe, Amy O'Connor, Thomas Borst, Michael **NERL**
142	(1) Widespread Molecular Detection of Legionella pneumophila Serogroup 1in Cold Water Taps across the United States. Published in Environmental Science and Technology (2) Increased Frequency of Nontuberculous Mycobacteria Detection at Potable Water Taps within the United States. Published in Environmental Science and Technology.	Vesper, Stephen Pfaller, Stacy Mistry, Jatin Kostich, Mitch King, Dawn O'Connell, Katharine Donohue, Maura Donohue, Joyce Covert, Terry Byran, Jules **NERL**
146	Hidden Markov Models for Estimating Animal Mortality from Anthropogenic Hazards. Published in Ecological Applications.	Etterson, Matthew **NHEERL**
156	(1) A Validation Study of a Rapid Field-Based Rating System for Discriminating Among Flow Permanence Classes of Headwater Streams in South Carolina. Published in Environmental Management. (2) Comparing the Extent and Permanence of Headwater Streams from Two Field Surveys to Values from Hydrographic Databases and Maps. Published in Journal of the American Water Resources Association. (3) Validation of Rapid Assessment Methods to Determine Streamflow Duration Classes in the Pacific Northwest, USA. Published in Environmental Management.	Wigington, Parker Wenerick, William Reif, Molly Nadeau, Tracie-Lynn Leibowitz, Scott Kostich, Mitch Hagenbuch, Elisabeth Fritz, Ken Ebersole, Joseph D'Amico, Ellen Coulombe, Robert Comeleo, Randy Blocksom, Karen **NERL**

Nominations Recommended for a Level III Award (No Monetary Award) -- Total of 13		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
162	(1) Air Pollution Exposure Model for Individuals (EMI) in Health Studies: Evaluation for Ambient PM2.5 in Central North Carolina. Published in Environmental Science and Technology. (2) GPS-based Microenvironment Tracker (MicroTrac) Model to Estimate Time-Location of Individuals for Air Pollution Exposure Assessments: Model Evaluation in Central North Carolina. Published in Journal of Exposure Science and Environmental Epidemiology. (3) Modeling Spatial and Temporal Variability of Residential Air Exchange Rates for the Near-Road Exposures and Effects of Urban Air Pollutants Study (NEXUS). Published in International Journal of Environmental Research and Public Health.	Williams, Ronald Vette, Alan Tan, Cecilia Schultz, Bradley Schneider, Alexandra Richmond-Bryant, Jennifer Meng, Qing Yu Long, Thomas Langstaff, John Isaacs, Kristin Godwin, Christopher Geller, Andrew Devlin, Robert Crooks, James Croghan, Carry Cao, Ye Burke, Janet Buckley, Timothy Breen, Miyuki Breen, Michael Batterman, Stuart **NERL**
183	(1) Concentrations of Prioritized Pharmaceuticals in Effluents from 50 Large Wastewater Treatment Plants in the US and Implications for Risk Estimation. Published in Environmental Pollution. (2) Evaluating the Extent of Pharmaceuticals in Surface Waters of the United States using a National-Scale Rivers and Streams Assessment Survey. Published in Environmental Toxicology and Chemistry.	Olsen, Anthony Lazorchak, James Kostich, Mitchell Kincaid, Thomas Batt, Angela **NERL**
186	Developing a Social Cost of Carbon for US Regulatory Analysis: A Methodology and Interpretation. Published in Review of Environmental Economics and Policy.	Wolverton, Ann Kopits, Elizabeth Greenstone, Michael **NCEE**
208	(1) What's Causing Toxicity in Sediments? Results of 20 Years of Toxicity Identification and Evaluations (TIES). Published in Environmental Toxicology and Chemistry. (2) Effects-Directed Analysis (EDA) and Toxicity Identification Evaluation (TIE): Complementary but Different Approaches for Diagnosing Causes of Environmental Toxicity. Published in Environmental Toxicology and Chemistry.	Lamoreee, Marja Ho, Kay Burgess, Robert Brack, Werner **NHEERL**

Nominations Recommended for a Level III Award (No Monetary Award) -- Total of 13		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
216	(1) Release of Silver from Nanotechnology-Based Consumer Products. Published in Environmental Science and Technology. (2) Characterization of Silver Nanoparticles in Selected Consumer Products and its Relevance for Predicting Children's Potential Exposures. Published in International Journal of Hygiene and Environmental Health.	Willis, Robert Vance (Quatros), Marina Tulve, Nicolle Thomas, Treye Stefaniak, Aleksandr Schwegler-Berry, Diane Rogers, Kim Pierson, Raymond Mwilu, Samuel Marr, Linsey Lebouf, Ryan **NERL**
219	(1) Comprehensive Assessment of a Chlorinated Drinking Water Concentrate in a Rat Multigenerational Reproductive Toxicity Study. Published in Environmental Science and Technology. (2) Reproductive Toxicity of a Mixture of Regulated Drinking-Water Disinfection By-Products in a Multigenerational Rat Bioassay. Published in Environmental Health Perspectives.	Thillainadarajah, Inthirany Teuschler, Linda Suarez, Juan Strader, Lillian Speth, Thomas Simmons, Jane Ellen Richardson, Susan Rice, Glenn Pressman, Jonathan Narotsky, Michael Murr, Ashley Moser, Virginia Miltner, Richard McDonald, Anthony Luebke, Robert Klinefelter, Gary Hunter, E. Sidney Goldman, Jerome George, Michael DeAngelo, Anthony Best, Deborah **NHEERL**

Nominations Recommended for a Level III Award (No Monetary Award) -- Total of 13		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
232	(1) Manganese, Iron, and Sulfur Cycling in Louisiana Continental Shelf Sediments. Published in Continental Shelf Research. (2) Changes in Northern Gulf of Mexico Sediment Bacterial and Archaeal Communities Exposed to Hypoxia. Published in Geobiology. (3) Microphytobenthos Production Potential and Contribution to Bottom Layer Oxygen Dynamics on the Inner Louisiana Continental Shelf. Published in Bulletin of Marine Science.	Yates, Diane Vishnivetskaya, Tatiana Palumbo, Anthony Murrell, Michael Mosher, Jennifer Lehrter, John Jarvis, Brandon Fry, Brian Devereux, Richard Brown, Steven Beddick, David **NHEERL**
234	Fifteen-year Assessment of a Permeable Reactive Barrier for Treatment of Chromate and Trichloroethylene in Groundwater. Published in Science of the Total Environment.	Woods, Leilani Wilkin, Richard Ross, Randall Puls, Robert Lee, Tony Acree, Steven **NRMRL**
242	Guidance for Product Category Rule Development. Book published by the Product Category Rule Guidance Development Initiative. ISBN: 978-0-9897737-0-6.	Subramanian, Vairavan Leith, Angie Ingwersen, Wesley **NRMRL**

Nominations Recommended for Honorable Mention (No Monetary Award) -- Total of 32		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
81	Innovative Research Program on the Renewal of Aging Water Infrastructure Systems. Published by Journal of Water Supply: Research and Technology – AQUA.	Sterling, Raymond Selvakumar, Ariamalar Matthews, John Condit, Wendy **NRMRL**
83	(1) Associations Between Prenatal Exposure to Air Pollution, Small for Gestational Age, and Term Low Birthweight in a State-wide Birth Cohort. Published by Environmental Research. (2) Influence of Urbanicity and County Characteristics on the Association between Ozone and Asthma Emergency Department Visits in North Carolina. Published by Environmental Health Perspectives. (3) Associations of Ozone and PM2.5 Concentrations with Parkinson's Disease Among Participants in the Agricultural Health Study. Published by Journal of Occupational and Environmental Medicine.	Ward, Mary Waller, Anna Vinikoor-Imler, Lisa Tanner, Caroline Sandler, Dale Sacks, Jason Richardson, David Rappold, Ana Patel, Molini Meyer, Robert Messer, Lynne Luben, Thomas Kirrane, Ellen Kamel, Freya Hoppin, Jane Davis, Allen Chen, Honglei Bowman, Christal Blair, Aaron **NCEA**
85	A National Approach for Mapping and Quantifying Habitat-based Biodiversity Metrics across Multiple Spatial Scales. Published by Ecological Indicators/Special Issue Publication.	Samson, Elizabeth Neale, Anne Leimer, Allison Kopp, Darin Kepner, William Guy, Rachel Gergely, Kevin East, Forrest Bradford, David Boykin, Kenneth **NERL**

Nominations Recommended for Honorable Mention (No Monetary Award) -- Total of 32		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
101	(1) Predicting Submerged Aquatic Vegetation Cover and Occurrence in a Lake Superior Estuary. Published by Journal of Great Lakes Research. (2) Sediment Nitrification and Denitrification in a Lake Superior Estuary. Published by Journal of Great Lakes Research. (3) Water Quality in the St. Louis River Area of Concern, Lake Superior: Historical and Current Conditions and Delisting Implications. Published by Journal of Great Lakes Research.	Starry, Matthew Siefert-Monson, Lindey Reschke, Carol Pearson, Mark Lehto, LaRae Jicha, Terri Hoffman, Joel Hill, Brian Elonen, Colleen Bolgrien, David Bellinger, Brent Angradi, Ted Anderson, Leroy **NHEERL**
102	Below the Disappearing Marshes of an Urban Estuary: Historic Nitrogen Trends and Soil Structure. Published by Ecological Applications.	Wigand, Cathleen Watson, Elizabeth Stolt, Mark Roman, Charles Rafferty, Patricia Moran, S. Bradley Lynch, James Johnson, Roxanne Hanson, Alana Davey, Earl Cahoon, Donald **NHEERL**
111	Metabolite Profiling of Fish Skin Mucus: A Novel Approach for Minimally-Invasive Environmental Monitoring and Surveillance. Published by Environmental Science and Technology.	Villeneuve, Dan Skelton, David Schroeder, Anthony Jensen, Kathleen Ekman, Drew Davis, John Collette, Timothy Cavallin, Jenna Ankley, Gerald **NERL**

Nominations Recommended for Honorable Mention (No Monetary Award) -- Total of 32		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
123	(1) Concordance of "Transcriptional and Apical Benchmark Dose Levels for Conazole-Induced Liver Effects in Mice. Published by Toxicological Sciences. (2) Dose-response modeling of early molecular and cellular key events in the CAR-mediated hepatocarcinogenesis pathway. Published by Toxicological Sciences. (3) Developing toxicogenomics as a research tool by applying benchmark dose-response modelling to inform chemical mode of action and tumorigenic potency. Published by the International Journal of Biotechnology.	Sura, Radhakrisha Nesnow, Stephen Hester, Susan Golladpudi, Bhaskar Geter, David Eastmond, David Bhat, Virunya **NHEERL**
125	(1) In Vitro, Ex Vivo, and In Vivo Determination of Thyroid Hormone Modulating Activity of Benzothiazoles. Published by Toxicological Sciences. (2) Inhibition of the Thyroid Hormone Pathway in Xenopus laevis by 2-Mercaptobenzothiazole. Published by Aquatic Toxicology.	Tietge, Joseph Nevalainen, Erica Hornung, Michael Macherla, Chitralekha Livingston-Anderson, Annelie Kosian, Patricia Korte, Joseph Haselman, Jonathan Degitz, Sigmund Challis, Katie Butterworth, Brian Burgess, Emily Blackshear, Pamela **NHEERL**
144	The Matthew Effect and Widely Prescribed Pharmaceuticals Lacking Environmental Monitoring: Case Study of an Exposure-assessment Vulnerability. Published by Science of the Total Environment.	Daughton, Christian **NERL**
147	(1) Estimating Lifetime Risk from Spot Biomarker Data and Intra-class Correlation Coefficients (ICC). Published by Journal of Toxicology and Environmental Health. (2) Estimating Common Parameters of Log-normally Distributed Environmental and Biomonitoring Data. Published by Journal of Toxicology and Environmental Health.	Strynar, Mark Stiegel, Matthew Sobus, Jon Pleil, Joachim Oliver, Karen Olenick, Cassandra Madden, Michael Hu, Di Funk, William Clark, Mary **NERL**

Nominations Recommended for Honorable Mention (No Monetary Award) -- Total of 32		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
151	Observed and Modeled Effects of pH on Bioconcentration of Diphenhydramine, a Weakly Basic Pharmaceutical, in Fathead Minnows. Published by Environmental Toxicology and Chemistry.	Nichols, John Hoffman, Alex Erickson, Russell Du, Bowen Connors, Kristin Chambliss, Kevin Brooks, Bryan Berninger, Jason **NHEERL**
154	Modulation of Aromatase Activity as a Mode of Action for Endocrine Disrupting Chemicals in a Marine Fish. Published by Aquatic Toxicology.	Zaroogian, Gerald Mills, Lesley Laws, Susan Guthjahr-Gobell, Ruth Borsay Horowitz, Doranne **NHEERL**
181	A Systematic Proteomic Approach to Characterize the Impacts of Chemical Interactions on Protein and Cytotoxicity Responses to Metal Mixture Exposures. Published by the American Chemical Society.	Xi, Mingyu Woodard, Jonne Winnik, Witold Wallace, Kathleen Teichman, Kevin Swank, Adam Spassova, Maria Roy, Anindya Ross, Jeffrey Lefew, William Leavitt, Sharon Haykal-Coates, Najwa Ge, Yue Farraj, Aimen Chen, Chao Bruno, Maribel Andrews, Debora **NHEERL**
182	(1) Silicon Impurity Release and Surface Transformation of TiO2 Anatase and Rutile Nanoparticles in Water Environments. Published by Environmental Pollution. (2) Release of Phosphorous Impurity from TiO2 Anatase and Rutile Nanoparticles in Aquatic Environments and Its Implications. Published by Water Research. (3) Effects of Dominant Material Properties on the Stability and Transport of TiO2 Nanoparticles and Carbon Nanotubes in Aquatic Environment: From Synthesis to Fate. Published by Environmental Science.	Su, Chunming Liu, Xuyang Keller, Arturo Erwin, Justin Chen, Gexin Adam, Nadia **NRMRL**

Nominations Recommended for Honorable Mention (No Monetary Award) -- Total of 32		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
195	Historical Gaseous and Primary Aerosol Emissions in the United States from 1990 to 2010. Published by Atmospheric Chemistry and Physics.	Xing, Jia Wei, Chao Pouliot, George Pleim, Jonathan Mathur, Rohit Hogrefe, Christian Gan, C. Meei **NERL**
196	(1) Ozone induces glucose intolerance and systemic metabolic effects in young and aged Brown Norway rats. Published by Toxicology and Applied Pharmacology. (2) Episodic ozone exposure in adult and senescent Brown Norway rats: acute and delayed effect on heart rate, core temperature and motor activity. Published by Inhalation Toxicology.	Schladweiler, Mette Phillips, Pamela Miller, Desinia McPhail, Robert Ledbetter, Allen Kodavanti, Urmila Johnstone, Andrew Jarema, Kimberly Gordon, Christopher Doerfler, Donald Cascio, Wayne Bass, Virginia Aydin, Cenk Andrews, Debora **NHEERL**
198	(1) Executive Summary: Variation in Susceptibility to Ozone Induced Health Effects in Rodent Models of Cardiometabolic Disease. Published by Inhalation Toxicology. (2) Whole Body Plethysmography Reveals Differential Ventilatory Responses to Ozone in Rat Models of Cardiovascular Disease. Published by Inhalation Toxicology. (3) Pulmonary Transcriptional Response to Ozone in Healthy and Cardiovascular Compromised Rat Models. Published by Inhalation Toxicology.	William, Ward Schladweiler, Mette Ledbetter, Allen Kodavanti, Urmila Dye, Janice Costa, Daniel **NHEERL**

Nominations Recommended for Honorable Mention (No Monetary Award) -- Total of 32		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
200	(1) The Influence of Declining Air Lead Levels on Blood Lead-Air Lead Slope Factors in Children. Published by Environmental Health Perspectives. (2) A Multi-level Model of Blood Lead as a Function of Air Lead. Published by Science of the Total Environment. (3) Effect Measure Modification of Blood Lead-Air Lead Slope Factors. Published by Journal of Exposure Science and Environmental Epidemiology.	Vinikoor-Imler, Lisa Tuttle, Lauren Svendsgaard, David Ross, Mary Richmond-Bryant, Jennifer Rice, Joann Meng, Qingyu Lu, Shou-En Kotchmar, Dennis Kirrane, Ellen Hubbard, Heidi Hines, Erin Davis, Allen Cohen, Jonathan Brown, James **NCEA**
201	(1) Optimization of Adenovirus 40 and 41 Recovery from Tap Water Using Small Disk Filters. Published by Journal of Virological Methods. (2) A Small Volume Procedure for Viral Concentration from Water. Published by Journal of Visualized Experiments.	McMinn, Brian Korajkic, Asja **NERL**
202	Submersible Fluorometers Exposed to Chemically Dispersed Crude Oil: Wave Tank Simulations for Improved Oil Spill Monitoring. Published by Environmental Science and Technology.	Wood, Michelle Walsh, Ian Ryan, Scott Robinson, Brian Pegau, Scott Miles, Scott Lewis, Marlon Lee, Kenneth Lacoste, Jordanna Koch, Corey King, Thomas Kelble, Christopher Farr, James Conmy, Robyn Coble, Paula Abercrombie, Mary **NRMRL**

Nominations Recommended for Honorable Mention (No Monetary Award) -- Total of 32		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
203	(1) Classifying Lakes to Improve Precision of Nutrient-Chlorophyll Relationships. Published by Freshwater Science. (2) Classifying Lakes to Quantify Relationships between Epilimnetic Chlorophyll a and Hypoxia. Published by Environmental Management. (3) Deriving Nutrient Targets to Prevent Excessive Cyanobacterial Densities in U.S. Lakes and Reservoirs. Published by Freshwater Biology.	Yuan, Lester Pollard, Amina **OW**
204	Transport and Retention of Colloids in Porous Media: Does Shape Really Matter? Published by Environmental Science & Technology.	Su, Chunming Seymour, Megan Li, Yusong Chen, Gexin **NRMRL**
218	(1) Continuous Monitoring Reveals Multiple Controls on Ecosystem Metabolism in a Suburban Stream. Published by Freshwater Biology. (2) Estimating Autotrophic Respiration in Streams Using Daily Metabolism Data. Published by Freshwater Science.	Shuster, William Hall, Jr., Robert Beaulieu, Jake Balz, David Arango, Clay **NRMRL**

Nominations Recommended for Honorable Mention (No Monetary Award) -- Total of 32		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
225	(1) Concentrations of Environmental Phenols and Parabens in Milk, Urine and Serum of Lactating North Carolina Women. Published by Reproductive Toxicology. (2) Improving the Risk Assessment of Lipophilic Persistent Environmental Chemicals in Breast Milk. Published by Critical Reviews in Toxicology. (3) Environmental Chemicals and Mammary Gland Development. Book chapter published in Encyclopedia of Toxicology, published by Elsevier, Inc.	Ye, Sherry Yang, Raymond Welsh, Clem Von Ehrenstein, Ondine Verner, Marc Tornero-Velez, Rogelio Tan, Cecilia Swartout, Jeffrey Simmons, Jane Savig, Sharon Rogan, Walter Rayner, Jennifer Powers, Christina Poulson, Michael Phillips, Linda Mendola, Pauline McLanahan, Eva Marchitti, Satori Luukinen, Bryan Longnecker, Matthew Lehmann, Geniece Lakind, Judy Hines, Erin Hennig, Cara Haddad, Sami Francis, Bettina Foster, Warren Foster, Paul Fenton, Suzanne Farrer, Doug El-Masri, Hisham Davis, Matthew Campbell, John Calafat, Antonia Barnett, John Assimon, Sue **NCEA**
227	Modeling NAPL dissolution from pendular rings in idealized porous media. Published by Water Resources Research.	Huang, Junqi Goltz, Mark Demond, Avery Christ, John **NRMRL**

Nominations Recommended for Honorable Mention (No Monetary Award) -- Total of 32		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
229	(1) Estimating Surface Area of Sponges and Gorgonians as Indicators of Habitat Availability on Caribbean Coral Reefs. Published by Hydrobiologia. (2) Contrasting Responses of Coral Reef Fauna and Foraminiferal Assemblages to Human Influence in La Parguera, Puerto Rico. Published by Marine Environmental Research. (3) Regional Status Assessment of Stony Corals in the US Virgin Islands. Published by Environmental Monitoring and Assessment.	Santavy, Deborah Fisher, William Oliver, Leah Courtney, Lee Quarles, Robert Campbell, Jed Dittmar, John Fore, Leska Hallock-Muller, Pamela Harris, Peggy LoBue, Charles Hemmer, Becky Hutchins, Aaron Jordan, Stephen Parsons, Mel Rodriguez, Daniel Wilkinson (Vickery), Sherry **NHEERL**
235	Assessment of Status of White Sucker (Catostomus commersoni) Populations Exposed to Bleached Kraft Pulp Mill Effluent. Published by Environmental Toxicology and Chemistry. Linking Mechanistic Toxicology to Population Models in Forecasting Recovery from Chemical Stress: A Case Study from Jackfish Bay, Ontario, Canada. Published by Environmental Toxicology and Chemistry.	Xia, Xiangsheng Tietge, Joseph Munkittrick, Kelly Miller, David McMaster, Mark Griesmer, David Ankley, Gerald **NHEERL**
236	Incorporating "Catastrophic" Climate Change into Policy Analysis. Published by Climate Policy.	Marten, Alex Kopits, Elizabeth Wolverton, Ann **NCEE**
237	(1) A Rapid Assessment Model for Understanding the Social Cost of Carbon. Published by Climate Change Economics. (2) Further Comment on “A Rapid Assessment Model for Understanding the Social Cost of Carbon.” Published by Climate Change Economics.	Wolverton, Ann Newbold, Stephen Moore, Chris Kopits, Elizabeth Griffiths, Charles **NCEE**
238	Temporal Resolution and DICE. Published by Nature Climate Change.	Newbold, Stephen Marten, Alex **NCEE**

Nominations Recommended for Honorable Mention (No Monetary Award) -- Total of 32		
Nom.	**Titles and Citations of Submitted Papers**	**Authors and Nominating Organization**
239	Water Quality Indices and Benefit-Cost Analysis. Published by Journal of Benefit-Cost Analysis.	Wheeler, William Walsh, Patrick **NCEE**
243	(1) Cold Temperature and Biodiesel Fuel Effects on Speciated Emissions of Volatile Organic Compounds from Diesel Trucks. Published by Environmental Science & Technology. (2) Effects of Cold Temperature and Ethanol Content on VOC Emissions from Light-Duty Gasoline Vehicles. Published by Environmental Science & Technology.	Snow, Richard Preston, William Long, Thomas Herrington, Jason Hays, Michael George, Ingrid George, Barbara Faircloth, James Baldauf, Richard **NRMRL**

Key to Acronyms used in the above Tables

NCEA – ORD National Center for Environmental Assessment
NCEE – National Center for Environmental Economics
NERL – ORD National Exposure Research Laboratory
NHEERL – ORD National Health and Environmental Effects Research Laboratory
NRMRL – ORD National Risk Management Research Laboratory
OSP – ORD Office of Science Policy
ORD – Office of Research and Development
OW – Office of Water

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON D.C. 20460

OFFICE OF THE ADMINISTRATOR
SCIENCE ADVISORY BOARD

January 13, 2017

EPA-SAB-17-004

The Honorable Gina McCarthy
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Subject: Recommendations for Strengthening the Nomination and Review Process for the EPA's Scientific and Technological Achievement Awards

Dear Administrator McCarthy:

The EPA Science Advisory Board (SAB) is pleased to transmit its recommendations to further strengthen the Scientific and Technological Achievement Awards (STAA) program and facilitate the SAB review of future STAA nominations. The SAB recommendations for recognition associated with the EPA's FY 2016 STAA program are provided in a separate report (EPA-SAB-17-001).

Overall, the SAB commends the agency for encouraging EPA scientists and engineers to publish their work in peer-reviewed journals and books and finds that the vast majority of 2016 STAA nominations were of very good quality. In addition, the SAB appreciates the agency's implementation of most SAB recommendations from previous years to improve the nomination procedures and administration of the STAA program. Building on these past enhancements, the SAB recommends that the agency implement the following activities to further strengthen the STAA program as a means of recognizing and encouraging high quality science and engineering research at the agency:

- Continue to improve the automated system for processing nominations and awards.
- Review each nomination to ensure that all STAA eligibility requirements have been met before nominations are submitted to the SAB.
- Further clarify the criteria established by the agency for the different STAA award levels:
    - Provide a list of minimum attributes that are deserving of each level of award.
    - Consider combining Level III and Honorable Mention into a single recognition level.
    - Each year, provide the agency and the SAB with criteria that should be used to review STAA nominations.
- Clarify or adjust STAA nomination procedures and guidelines:
    - Require nominees to submit subcategory identifiers to further classify the topic area for each nomination.

    - Split Justification 1 of the STAA nomination procedures into two separate justifications that describe innovativeness of the research, and relevance and impact of the research to the agency's mission.
    - Require nominees to submit additional justification information for nominations that include review articles.
    - Explicitly state that each nominated paper(s) must have undergone peer review.
    - Develop additional requirements for submission of formal EPA publications.
    - Clarify which supplemental materials support the nomination or are part of the journal publication.
- Develop a separate awards program to recognize junior scientists.
- Consider options for increasing the number of nominations in under-represented topic areas.
- Continue to provide metrics on the journal impact factor.

The SAB understands that the agency is in the process of improving the STAA nomination and award generation process, and the SAB encourages the agency to implement such improvements as quickly as possible. During an open session of the SAB STAA Committee meeting on August 15, 2016, the Committee also received a briefing from agency staff on several preliminary proposals that the agency is considering to modify the 2017 STAA nomination and review process related to SAB's STAA Committee responsibilities. During the briefing, agency staff presented a preliminary recommendation to extend the time period of eligibility for submittal of publications within a nomination from the current requirement of manuscripts published within the last three years. The SAB is encouraged that the agency is considering such an extension of the time period of eligibility for submittal of publications within a nomination. An extension of the eligibility time period would provide opportunity to recognize prior agency research that has been demonstrated to have a significant impact towards EPA's mission and in advancing science over extended time.

Thank you for providing the SAB with the opportunity to assist the agency with this important program. The SAB looks forward to reviewing the FY 2017 STAA nominations.

Sincerely,

Dr. Peter S. Thorne

/Signed/

Chair
Science Advisory Board

Dr. Jay R. Turner

/Signed/

Chair
SAB Scientific and Technological Achievement Award Committee

Enclosure

cc: Dr. Thomas Burke, EPA Science Advisor, and Deputy Assistant Administrator, EPA Office of Research and Development

NOTICE

This report has been written as part of the activities of the EPA Science Advisory Board, a public advisory group providing extramural scientific information and advice to the Administrator and other officials of the Environmental Protection Agency. The Board is structured to provide balanced, expert assessment of scientific matters related to the problems facing the agency. This report has not been reviewed for approval by the agency and, hence, the contents of this report do not represent the views and policies of the Environmental Protection Agency, nor of other agencies in the Executive Branch of the Federal government, nor does mention of trade names or commercial products constitute a recommendation for use. Reports of the EPA Science Advisory Board are posted on the agency's website at http://www.epa.gov/sab.

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*Did not participate in development of this report.

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Science Advisory Board
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Dr. Kristina D. Mena, Associate Professor, Epidemiology, Human Genetics, and Environmental Sciences, School of Public Health, University of Texas Health Science Center at Houston, El Paso, TX

Dr. Surabi Menon, Director of Research, ClimateWorks Foundation, San Francisco, CA

Dr. James R. Mihelcic, Samuel L. and Julia M. Flom Professor, Civil and Environmental Engineering, University of South Florida, Tampa, FL

Dr. H. Keith Moo-Young, Chancellor, Office of Chancellor, Washington State University, Tri-Cities, Richland, WA

Dr. Kari Nadeau, Naddisy Family Foundation Professor of Medicine, Director, FARE Center of Excellence at Stanford University and Sean N. Parker Center for Allergy and Asthma Research at Stanford University School of Medicine, Stanford, CA

Dr. James Opaluch, Professor and Chair, Department of Environmental and Natural Resource Economics, College of the Environment and Life Sciences, University of Rhode Island, Kingston, RI

Dr. Thomas F. Parkerton, Senior Environmental Associate, Toxicology & Environmental Science Division, ExxonMobil Biomedical Science, Houston, TX

Mr. Richard L. Poirot, Independent Consultant, Burlington, VT

Dr. Kenneth M. Portier, Vice President, Department of Statistics & Evaluation Center, American Cancer Society, Atlanta, GA

Dr. Kenneth Ramos, Associate Vice-President of Precision Health Sciences and Professor of Medicine, Arizona Health Sciences Center, University of Arizona, Tucson, AZ

Dr. David B. Richardson, Associate Professor, Department of Epidemiology, School of Public Health, University of North Carolina, Chapel Hill, NC

Dr. Tara L. Sabo-Attwood, Associate Professor and Chair, Department of Environmental and Global Health, College of Public Health and Health Professionals, University of Florida, Gainesville, FL

Dr. William Schlesinger, President Emeritus, Cary Institute of Ecosystem Studies, Millbrook, NY

Dr. Gina Solomon, Deputy Secretary for Science and Health, Office of the Secretary, California Environmental Protection Agency, Sacramento, CA

Dr. Daniel O. Stram, Professor, Department of Preventive Medicine, Division of Biostatistics, University of Southern California, Los Angeles, CA

Dr. Jay R. Turner, Associate Professor of Energy, Environmental and Chemical Engineering, and Vice Dean for Education, School of Engineering & Applied Science, Washington University, St. Louis, MO

Dr. Edwin van Wijngaarden, Associate Professor, Department of Public Health Sciences, School of Medicine and Dentistry, University of Rochester, Rochester, NY

Dr. Jeanne M. VanBriesen, Professor, Department of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA

Dr. John Vena, Professor and Founding Chair, Department of Public Health Sciences, Medical University of South Carolina, Charleston, SC

Dr. Elke Weber, Gerhard R. Andlinger Professor in Energy and the Environment, and Professor of Psychology and Public Affairs, Princeton University, Princeton, NJ

Dr. Charles Werth, Professor and Bettie Margaret Smith Chair in Environmental Health Engineering, Department of Civil, Architectural and Environmental Engineering, Cockrell School of Engineering, University of Texas at Austin, Austin, TX

Dr. Peter J. Wilcoxen, Professor, Public Administration and International Affairs, The Maxwell School, Syracuse University, Syracuse, NY

Dr. Robyn S. Wilson, Associate Professor, School of Environment and Natural Resources, Ohio State University, Columbus, OH

SCIENCE ADVISORY BOARD STAFF

Mr. Thomas Carpenter, Designated Federal Officer, U.S. Environmental Protection Agency, Science Advisory Board, Washington, DC

1. BACKGROUND

EPA's Scientific and Technological Achievement Awards (STAA) program was established in 1980 to recognize the agency's scientists and engineers who published their technical work in the peer-reviewed literature. The STAA program is administered and managed by the agency's Office of Research and Development (ORD). Each year, the EPA Science Advisory Board (SAB) has been asked to review the agency's nominated scientific publications and make recommendations for awards. The SAB was charged to review nominations and provide recommendations for each nomination in consideration of the agency's criteria for STAA awards.

The SAB 2016 STAA Committee met on August 15-16, 2016, in Washington, DC. During the closed sessions of the meeting on August 15-16, the Committee discussed award recommendations for the EPA's 2016 STAA program. The SAB transmitted its recommendations for awards associated with the EPA's FY 2016 STAA program in a separate report (EPA-SAB-17-001).

During an open session of the meeting on August 15, the Committee received a briefing from Dr. Leonid Kopylev and Dr. Christian Daughton of the agency's Office of Research and Development on preliminary proposals that the agency is considering on modifications to the 2017 STAA nomination and review process related to SAB's STAA Committee responsibilities. At the briefing, Drs. Kopylev and Daughton presented the following three preliminary recommendations: (a) revise the SAB's charge and STAA review criteria to align with the nomination justifications; (b) extend the time period of eligibility for submittal of publications within a nomination from the current requirement of manuscripts published within the last three years; and (c) change the requirements for justifications within the STAA nomination packages, including changing the bibliometric statistics from journal-based to article-based or author-based metrics. During this briefing, individual members of the Committee provided their initial reactions related to science questions and topics that were presented. The Committee also discussed recommendations to further strengthen the STAA program and facilitate the SAB review of future STAA nominations.

2. RECOMMENDATIONS TO IMPROVE THE OVERALL STAA PROGRAM

The SAB appreciates the agency's implementation of recommendations to improve the overall STAA program from recent SAB reports to the Administrator that improve the nomination process and enhance the integrity of the STAA program. In particular, the SAB concludes that the strong majority of the 2016 nominations adhered to existing STAA program guidelines, and that these guidelines helped the STAA Committee to conduct a well-informed and balanced review of each nomination.

The SAB has the following recommendations to further strengthen the STAA program in future years:

1) *Continue to improve the automated system for generating nominations and processing awards.* The SAB understands that the agency is developing and implementing an automated nomination and award processing system to improve the STAA nomination and award generation process. Using this developing automated system, the agency submitted several 2016 STAA nominations to the SAB that were either improperly organized or incomplete (i.e., supplemental information or manuscript metrics were not included; justification information appeared after the nominated publications; portions of supplemental materials appeared before nominated publications; a nominated publication was included only as a hyperlink; a duplicate nomination package was submitted). The automated system also did not screen out nominations that did not meet all STAA nomination procedures and guidelines for eligibility. The SAB encourages the agency to continue improvements to the automated system.

   The SAB recommends that the automated system be able to perform the functions noted below. If the agency is not able to modify the automated system to provide the following information, the SAB requests that the agency separately provide the following information or assurances to the SAB:

   a) Assure that each nomination meets all eligibility requirements as provided in the STAA nomination procedures and guidelines.

   b) Assure that each nomination provides all information that is required to be included within a complete nomination package.

   c) Provide the SAB with consistent, organized nomination packages.

   d) Provide the SAB with a table that lists STAA nominations, in chronological order, for the previous five years involving each author of each nomination first sorted by nomination and then by author. Ideally this list would also denote whether an award was received. This list will help the SAB in assessing whether the current nomination is novel and whether the research is a continuation of the author's previous research in the research topic area of the current nomination under review.

2) *Review each nomination to assure that all STAA nomination procedures and eligibility requirements are met before nominations are submitted to the SAB.* Two nominations for 2016 STAA recognition were excluded from review by the SAB because they did not meet the STAA program's eligibility requirements: (a) one nomination did not include the submitted package. Instead another package was duplicated; and (b) one nomination included three publications for consideration of award, one

of which was published in 2012 which was outside the 2013-2015 eligibility window. In addition, over the previous six years, several STAA nominations did not meet other requirements described within the STAA nomination procedures and guidelines:

a) Information was not provided on previously submitted STAA nominations of the nominated authors;

b) Publications were either not included within the nomination package, or included but not identified as either a nominated or supplemental publication;

c) STAA requirements for peer-review of nominated publications were not followed;

d) Duplicate nominations were submitted; and

e) Supplemental materials that are part of the journal publication were not submitted with the nomination.

To address this concern, the SAB recommends that the agency review each nomination for adherence to all STAA nomination procedures and guidelines, and affirmatively assert to the SAB that all STAA nomination procedures and guidelines have been followed for each nomination when the nomination packages are submitted to the SAB for review.

3) *Further clarify the criteria established by the agency for the different STAA award levels.* The SAB continues to find the criteria established by the agency confusing and in need of further clarification(s).

During the agency's briefing of the Committee at the August 15, 2016 public meeting, the EPA's STAA program staff presented a preliminary recommendation to revise the criteria that the SAB uses to review nominations. Among the goals of this revision would be to align the charge and review criteria with information required to be submitted by nominees to meritoriously support the nomination (i.e., within the 'justifications' sections of the nomination). Specifically, the agency's STAA program staff noted that the agency was considering the development of a single criterion for STAA recognition. This preliminary criterion would be the degree to which each nomination meets the following three award criteria factors: science quality and innovation; scientific significance; and impact or relation to a mission or organizational component of the agency. The agency's STAA program staff noted that the SAB would assess the degree that each nomination meets these factors, and use its professional judgement to assess whether a Level I, Level II, Level III, or Honorable Mention recognition was recommended.

The SAB is encouraged that the agency is clarifying the criteria that the SAB is to use when reviewing STAA nominations. The SAB recommends that the agency provide additional information to the SAB and nominees to help the SAB distinguish among the different award levels.

The following specific recommendations are provided:

a) <u>Clarify the distinct differences between the different levels of STAA recognition.</u> There are four different levels of STAA recognition (i.e., Level I, Level II, Level III and Honorable Mention). The SAB recommends that the agency provide additional information to distinguish the

differences between these levels. The agency should also develop a list of minimum attributes that are deserving of each level of STAA recognition; each level of STAA recognition would include all attributes at the lower level as well as additional attributes associated with the higher level of recognition. The agency should provide additional, specific details to criteria descriptions for Level I. Level II should not be described as 'similar to, but to a lesser degree' than the same criteria listed for Level I recognition.

b) Consider combining Level III and Honorable Mention into a single recognition level. The SAB found it somewhat difficult to differentiate between criteria for Level III and Honorable Mention STAA recognition, and recommends the Level III and Honorable Mention STAA recognition categories be combined into a single STAA recognition category. Should the agency decide to keep the Level III and Honorable Mention STAA recognition categories, the SAB recommends clearer guidance be provided to the SAB for the criteria to distinguish between these categories.

c) Each year, provide the agency and the SAB with criteria that should be used to review STAA nominations. Since the agency may be periodically changing its criteria for STAA recognition, the SAB requests that the agency annually provide the SAB with the agency's current criteria that the SAB should use to review STAA nominations. The agency should provide this to the SAB at the time the agency provides the SAB with the nomination files for review.

4) *Clarify or adjust STAA nomination procedures and guidelines.* The SAB has several recommendations for the agency to clarify or adjust STAA nomination procedures and guidelines, and to provide additional information within STAA nomination packages:

a) Require nominees to submit subcategory identifiers for each nomination. The SAB recommends that the agency provide information on the relevant key subcategories of topic areas for each nomination (e.g., toxicology, epidemiology, and exposure for the "Health Effects Research and Human Health Risk Assessment" topic category). This information would assist the STAA Committee members when identifying preferences for review, and help the SAB identify expertise needs as it conducts panel formation activities for the STAA Committee. Members of the SAB STAA Committee are available to assist the agency in identifying these subcategory identifiers.

b) Split Justification 1 of the STAA nomination procedures into two separate justifications. Justification 1 currently requires nominees to provide the following information:

> "Justification 1: Explain how the nominated paper(s) is innovative and important in advancing the scientific knowledge or technology relevant to EPA's mission. It is important to provide a clear and compelling explanation of the relevance, and impact of the research to EPA's mission (For example, the relevance of the research to one of EPA's Strategic Goals may be described.)"

Justification 1 essentially requests information on two topics: (a) innovativeness of the research, and (b) relevance and impact of the research to the agency's mission. Some responses have not clearly distinguished whether the response is describing the innovativeness of the research, or describing the relevance of the research to the agency's mission.

To provide focused responses on each of these two topics, the SAB recommends that the agency split Justification 1 into two separate justifications, as follows:

"Justification 1: Explain how the nominated paper(s) represent research that is innovative and important in advancing scientific knowledge or technology.

Justification 2: Provide a clear and compelling explanation of the relevance and impact of the nominated paper(s) to EPA's mission (For example, the relevance of the research to one of EPA's Strategic Goals.)"

c) Require nominees to identify if review articles are included in the nomination and submit additional justification related to these review articles. As indicated in previous SAB advice regarding the STAA program, review articles that are submitted for awards should include a critical synthesis and evaluation of the literature and an assessment on future perspectives. While reviews that summarize a body of literature are useful and important, the SAB believes that review articles that critically synthesize and evaluate information and lead to new insights, with an assessment on future perspectives, are most consistent with the criteria for STAA awards. Nominations which include one or more review articles should include additional justification that requires the nominee to describe how the nominated paper(s) include a critical synthesis and evaluation of the literature; novel insights and information based on this synthesis; and an assessment on future perspectives that are important for advancing scientific knowledge or technology. Furthermore, the agency should remove "Review" as a topic area and instead the nominee should specify the appropriate scientific topic area because the latter is more useful to the nomination categorization.

d) Explicitly state that each nominated paper(s) must have undergone peer review. The current STAA nomination procedures and guidelines require that the nominated publication(s) must have been published in a high-quality peer-reviewed journal; that nominated books, book chapters, videos and other non-traditional publication techniques must have undergone peer review; and that the nomination package describes the nature and extent of peer review conducted for each nomination. However, not all publications that are nominated for STAA recognition have been peer reviewed (e.g., letters to the editor of journals have been nominated for STAA recognition, and such letters usually are not peer reviewed by the journal and are published at the discretion of the editor). To address this concern, the SAB recommends that the STAA nomination procedures and guidelines clearly state that all nominated paper(s) must have undergone peer review.

e) Develop additional requirements for submission of formal EPA publications. The SAB is concerned that formal EPA publications (e.g., those released by the agency with an EPA report number) are generally developed through a committee process involving an intensive series of inter-agency or intra-agency reviews and revisions. While such publications are commendable, it is often difficult to ascertain and ascribe authorship contribution within such nominations. For example, some agency publications are initially drafted by a task group, then reviewed and revised sequentially through an intra-agency or inter-agency workgroup process. Subsequently, they undergo an intensive peer-review process during which substantial modifications suggested by the peer reviewers are made directly to the agency's publication. The original authors of the EPA publications may not be making such revisions to the agency's publication. In addition, peer reviews of EPA publications are often not blind reviews and are not conducted with the intent to accept or reject the publication. The peer review process for publication in journals is generally different, since peer review comments are provided to the original authors and they are

responsible for making all revisions to the manuscript which ensures direct ownership of all content by the authors. To address this concern, the SAB recommends that the agency reassess the current practice of allowing EPA publications to be submitted for nomination.

If the agency continues to allow such publications to be submitted, the agency should develop clarifying requirements that would assure that the nominated author(s) wrote the strong majority of the final EPA publication, and that the final nomination accurately ascertains and ascribes authorship contribution. In addition, the agency's current STAA nomination procedures and guidance states that "nominated publication(s) must have been published in a high-quality peer-reviewed journal…or a suitable book". The procedures and guidance also states that "Nominations may include videos or other non-traditional publication techniques" and that "These non-traditional publications still need to be peer reviewed to ensure that the science is credible." If the agency continues to allow EPA publications to be submitted, the agency should clarify the agency's current STAA nomination procedures and guidance to note that the requirements for peer review also apply to EPA publications that are nominated for STAA recognition, and that such EPA publications need not also be published in a journal or book.

f) Clarify which supplemental materials support the nomination or are part of the journal publication. Some nominations include supplemental materials that do not clearly state whether the materials are to support the nomination, or were provided to journals during peer review of the publication. To help clarify this information, SAB recommends that the agency require that nominees separately include supplemental materials that are provided as part of the nomination as follows: "Additional materials in support of the nomination."

g) Clarify the eligibility date upon which an article can be nominated. The agency's current STAA nomination procedures and guidelines state that publications are eligible for three years based on publication date. Since many journals publicly release articles before releasing the journal's publication noted by volume/issue in which the nominated article is published, the agency should clarify whether the publication date referred to in the STAA nomination procedures and guidance is the date when the article is made publicly available from a journal or the date of the volume/issue of a publication in which the article is contained.

In addition, during the open session of the SAB STAA Committee meeting on August 15, 2016, the Committee received a briefing from agency staff on several preliminary proposals that the agency is considering to modify the 2017 STAA nomination and review process related to SAB's STAA Committee responsibilities. During the briefing, agency staff presented a preliminary recommendation to extend the time period of eligibility for submittal of publications within a nomination from the current requirement of manuscripts published within the last three years. The SAB is encouraged that the agency is considering such an extension of the time period of eligibility for submittal of publications within a nomination. An extension of the eligibility time period would provide opportunity to recognize prior agency research that has been demonstrated to have a significant impact towards EPA's mission and in advancing science over extended time.

5) *Develop a separate awards program to recognize early career scientists.* Authors who are early in their career at the agency and part of a team of scientists who authored a publication may need to wait many years to be recognized through the STAA program for their research contributions. To provide incentives for, and early formal recognition of, young researchers and post-doctoral

scientists at the agency for producing high quality published research, the SAB recommends that the agency develop a separate awards program to recognize early career scientists who have published within the previous two years for research carried out while employed at the agency. If the agency develops such a program, the agency should develop a definition for 'early career scientists.'

6) *Encourage submittal of more nominations in under-represented topic areas*. Over the past five years, two or fewer STAA nominations have been submitted annually in the following topic areas: Energy and the Environment, Homeland Security, Integrated Risk Assessment, and Risk Management and Ecosystem Restoration. The SAB also recognizes the agency's commitment to incorporate social and behavioral science into the agency's decision-making processes, and observes that there are few if any nominations for STAA recognition over the past several years which focused on the social and behavioral science topic area. The SAB recommends that the agency assess whether there is an under-representation of nominated publications for STAA recognition in these topic areas. If an underrepresentation is found to exist, the agency should consider options for increasing the number of such nominations, including an option to better publicize the STAA program to agency scientists and researchers who work in these under-represented topic areas.

7) *Continue to provide metrics on the journal impact factor*. During the agency's briefing of the Committee at the August 15, 2016 public meeting, the agency's STAA program staff noted that the agency was considering a change to the requirements for justifications regarding journal impact factor, and noted that the agency was considering changing the requirements for submittal of bibliometric statistics from journal-based to article-based or author-based metrics.
As the agency considers revising its criteria for required submittal of bibliometric statistics, the SAB recommends that the agency carefully consider the move from publication-based metrics to author-based metrics, since a shift to the eminence of the authoring team would shift focus from the eminence of the publication. In addition, the SAB recommends that the agency continue to require that nominees provide the publication journal's impact factor, since the SAB finds journal metric information useful as it considers the impact of a nomination. This should be provided in addition to the proposed article-based or author-based metrics.