ORD's Office of Science Policy Update

July 2006

A Letter from the Director, Office of Science Policy

Greetings OSP Staff:

Summer is here, and you know what that means—free Ben & Jerry's ice cream and Washington Nats baseball! Here in OSP, our dedicated staff has been working hard (and playing hard) right through the baseball off-season.

Once again, our communications team did a top-notch job helping to coordinate EPA's fifth annual Science Forum. Numerous staff members represented OSP on important Agency activities, including Regional and Tribal Science, the Federal Technology Transfer Act (FTTA) Program, the EPA Group on Earth Observations, the National Ambient Air Quality Standards process, and methamphetamines. In addition, the Board of Scientific Counselors (BOSC) has been busier than ever this spring. Also, thanks to OSP's leadership, EPA has played an important role in shaping the results of Project Horizon, an interagency strategic planning effort. Again with OSP's leadership, ORD has partnered with the Office of Prevention, Pesticides and Toxic Substances (OPPTS) and the Office of Solid Waste and Emergency Response (OSWER) to continue an acclaimed series of seminars on a variety of relevant, cutting-edge science issues. Meanwhile, our Program Support Staff has continued to provide critical scientific and technical support to EPA's program and regional offices. Thank you all for ensuring that sound science plays a prominent role in Agency decision making.

Indeed, it has been a prolific spring for OSP. We join Heather and Monica in welcoming

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2006 EPA Science Forum

The 2006 EPA Science Forum was held on May 16-18, 2006, in the Ronald Reagan Building and International Trade Center in Washington, DC. This fifth annual event featured the collaborative efforts of the Centers for Disease Control and Prevention, the Agency for Toxic Substances and Disease Registry, and the National Institute of Environmental Health Sciences. This year's Forum highlighted the relationship between our environment and public health and included discussions on issues as diverse as the impact of understanding the human genome and the impacts of the built environment. The Forum also examined the complementary roles of federal public health agencies.

With more than 220 posters and 22 exhibits, this year's Science Forum provided an excellent opportunity to showcase

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Tribal Science Council

The Tribal Science Council (TSC) held a face-to-face meeting in Denver, Colorado, the week of March 21, 2006. The meeting of Tribal and Agency representatives, as well as invited guests from the American Indian Higher Education Consortium, Quinault Indian Nation, National Tribal Caucus, and EPA Region 8, served to officially kick off planning for the National Tribal Science Conference to be held in September. The main objective of the Tribal Science Conference is to showcase Tribal success stories, train Tribal scientists on priority environmental science topics, and provide opportunities for networking and information sharing among tribes.

The week-long meeting in Denver was fast-paced as each day focused on a specific session of the September conference. On the first day, our Region 8 contacts, Kerry Clough, the Deputy Regional Administrator; Patti Tyler, the Regional Science Liaison (RSL); and Brian Caruso, the Hazardous Substances Technical Liaison (HSTL), provided regional perspectives on Tribal science policy and programs. Designated speakers for each of the four theme subcommittees of air, water, earth, and community health gave presentations to inform the group of priority topics that should be included in the call for session proposals. The focus later shifted to Tribal training priorities and technical assistance, ideas for session topics, and the TSC Work Plan.

For additional information on the Tribal Science Council, please contact Monica Rodia at rodia.monica@epa.gov or 202-564-8322.

What's Inside

OPPTS/ORD Seminar Series

The Susceptibility of the Developing Murine Immune System

As part of a larger series, OPPTS and ORD held a seminar on March 15, 2006, featuring Ralph Smialowicz of ORD's National Health and Environmental Effects Research Laboratory (NHEERL) in Research Triangle Park, North Carolina. His presentation was entitled "The Susceptibility of the Developing Murine Immune System to Environmental Contaminants."

Future challenges for neurotoxicity risk assessment activity include screening and prioritization of large numbers of chemicals for additional testing, predicting potential neurotoxicity of mixtures, and protecting sensitive human populations and other species. Over the last 2 decades, there have been tremendous advances in scientific knowledge regarding the structure and function of cellular and subcellular components of neurons. This explosion of knowledge has been driven by increased capability to study the nervous system at the cellular and subcellular levels. Research in NHEERL currently is utilizing some of these approaches to contribute towards contemporary risk assessment problems, and beginning to evaluate the usefulness of other approaches.

This presentation provided an overview of the advances in understanding cellular and subcellular components of neurons by focusing on ion channels. Ion channels are known targets for the action of many different classes of pesticides, metals, solvents, and other compounds, and are the principle entities that underlie and control communication between neurons. In addition to presenting recent information regarding basic neurobiology and toxicology of ion channels, approaches to studying ion channel function were discussed, particularly in the context of how those approaches can be employed to address current and future problems related to risk assessment of neurotoxic compounds.

Slide presentations of this and other events can be accessed by EPA employees at http://intranet.epa.gov/ospintra/features/seminars/seminars.htm. For additional information on the OPPTS/ ORD Seminar Series, please contact Jackie McQueen at mcqueen.jacqueline@epa.gov or 202-564-6639.

The Establishment of Genetically Modified Plants within Wild Populations

On May 17, 2006, ORD and OPPTS continued their Seminar Series with a presentation on the measurement of genetically modified (GM) plants within wild populations. Jay Reichman, from ORD's Western Ecology Division of NHEERL, delivered a presentation entitled, "Methods for Estimating the Frequency, Distribution, and Parentage of GM Plants Established within Wild Populations: Establishment of Transgenic Creeping Bentgrass (*Agrostis stolonifera L.*) in Non-Agronomic Habitats." This presentation was transmitted nationwide by teleconference.

Concerns about GM crops include the movement of artificially introduced genes from a GM plant species to a similar, non-modified wild species. Associated with this gene flow is the potential for unintended ecological consequences. There are few data to support this concern, but the researchers at ORD's Western Ecology Division present the first evidence for escape of "transgenes" into wild plant populations within the United States. Their research was conducted using plants that have been modified to be resistant to a herbicide called glyphosate, specifically RoundUp Ready creeping bentgrass (ASR368, Scotts Seed Co). Herbicide-resistant plants allow for the use of herbicides (RoundUp) without damage to the crop plant.

The glyphosate herbicide-resistant *Agrostis stolonifera L.* plants expressing *CP4 EPSPS* transgenes were found in Jefferson County, Oregon. Resident populations of three compatible *Agrostis* species were sampled in publicly accessible areas up to 4.8 km outside the control area designated for the test production of glyphosate-resistant *A. stolonifera* (RoundUp Ready creeping bentgrass ASR368, Scotts Seed Company). *CP4 EPSPS* protein and the corresponding transgene were found in nine *A. stolonifera* plants screened from 20,400 samples (0.04%). Even without this selective pressure, obligatory outcrossing, vegetative spread by stolons, and dispersal of seed by water, wind, wildlife, or mechanical means could further contribute to the persistence of *CP4 EPSPS* transgenes in wild *Agrostis* populations.

Experimental protocols NHEERL is developing for field monitoring will help inform regulatory decisions regarding the environmental safety of GM plants. Results to date suggest that longer isolation distances may need to be considered between compatible GM and non-GM crops as well as with their compatible non-crop relatives whose flowering periods overlap with that of the GM crops. For additional information on the OPPTS/ORD Seminar Series, please contact Jackie McQueen at mcqueen.jacqueline@epa.gov or 202-564-6639.

OSP Update Contributing Writers

- Sarah Bauer
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For more information on the *OSP Update,* contact Peter Fargo at 202-564-3746 or fargo.peter@epa.gov.

OSWER/ORD Seminar Series

Integrating Toxicity into Superfund Decisions

In March 2006, OSWER and ORD announced the continuation of their Seminar Series, which was expanded to feature ORD research pertaining to all environmental media. ORD's OSP has been coordinating the series in conjunction with OSWER's Office of Superfund Remediation and Technology Innovation (OSRTI). The title of the eighth seminar in the series, held on March 15, was "Impacting Superfund Decisions: Toxicity Assessments and Values." The ORD National Center for Environmental Assessment's (NCEA) Michael Troyer delivered the presentation.

Michael set the stage with current Superfund facts. For example, there are 1,529 sites on Superfund's National Priorities List (NPL) that are at different stages of remediation (e.g., site assessments, investigations, selection and design of cleanup plans, or final implementation of these plans). During fiscal year 2004, the Superfund Program spent $507 million to remediate sites and conduct or oversee 385 emergency response and removal actions to address immediate and substantial threats to communities. Michael discussed NCEA's role in supporting these activities—providing scientifically rigorous health risk information in support of onsite risk assessors and risk managers of these Superfund sites. EPA's Superfund Program, through OSRTI and the regional offices, primarily relies on NCEA's Integrated Risk Information System (IRIS) and Provisional Peer Reviewed Toxicity Value (PPRTV) assessments, along with field data and exposure information, to make risk assessment and management decisions. Michael's presentation demonstrated how IRIS and PPRTV assessments assist the Superfund Program in achieving its goals of protecting human health and the environment, and reducing risks to those living and working near contaminated sites.

Following the seminar, OSWER emphasized its appreciation of ORD's dedication to the following efforts:

- The "Screening-Level Literature Review Project," a cyclical search of the available literature for new studies that may impact existing chemical assessments;
- The "Literature Screening Verification Project," an in-depth review and verification of the findings of the Screening-Level Literature Review; and especially
- The "re-instatement" and "update" of provisional Peer Reviewed Toxicity Value (PPRTV) assessments rather than the expiration of PPRTVs.

OSP looks forward to resuming the Seminar Series in September 2006, after a short summer recess. Slide presentations of past events can be accessed by EPA employees at http://intranet.epa.gov/ospintra/features/seminars/seminars.htm. For additional information on the seminar series, please contact Jace Cuje at cuje.jace@epa.gov or 202-564-1795.

Mercury Measurement

On April 5, 2006, OSP facilitated its ninth teleconference of the expanded OSWER/ORD Seminar Series which, since September 2005, has featured ORD research pertaining to all environmental media. This seminar, entitled "Mercury Measurements for Solids Made Rapidly, Simply, and Inexpensively," was presented by Tom Hinners of the National Exposure Research Laboratory (NERL) in Las Vegas, Nevada. It was very well attended by EPA regional and laboratory staff from across the country.

Mercury is found throughout the world in various forms and in all types of media. Traditional analytical methods for determining

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Project Horizon: Final Phase

Over the past 8 months, Project Horizon has brought together U.S. Government senior executives to conduct long-term, interagency strategic planning. Using the best practices of scenario development in the public and private sectors, participants crafted five realistic interagency scenarios to unforeseen opportunities and threats that will face the nation over the next 20 years. They identified 10 "capabilities" in which U.S. global affairs agencies should invest to prepare for the future.

In February and March of 2006, a series of three strategy workshops were held in which senior representatives from the 14 Project Horizon participating agencies and select external participants met to develop and test interagency strategies and capabilities based on five scenarios created by the Project Horizon Core Team. EPA was represented by six participants at the three workshops: Kevin Teichman (OSP), Anita Street (OSP), Michael Brody (OCFO), Walt Kovalick, (OSWER), Kathy Callahan (Region 2), and Alan Hecht (ORD). In each workshop, participants simulated working on an interagency planning team and were asked to "live" in this world and develop an in-depth understanding of the challenges and opportunities that each world presented for the U.S. Government. Each team developed strategies to address its assigned scenario. The strategies of each team were stress-tested across the other scenarios to identify those strategies that were most "robust" (in other words, worked across all scenarios). The capabilities from all three workshops were compiled, which marked the beginning of the 4-week Synthesis Phase conducted by the Project Horizon Core Team.

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BOSC Update

The BOSC Executive Committee met at Washington, DC's Grand Hyatt Hotel on February 13-14 for their first meeting of 2006. The first day of the meeting consisted primarily of BOSC subcommittee updates. Two highlights of this session were the vetting of the draft reports of the Global Change and Land Subcommittees; the Global Change final report has been posted to the BOSC Web Site (http://www.epa.gov/osp/bosc/reports.htm), and the Land report will be posted soon. ORD also gave an overview of its Sustainability Research Program to prepare the BOSC for an upcoming program review.

The second day of the meeting included a joint ORD Executive Council/BOSC session, where both agreed there would be value added in implementing "standing" BOSC subcommittees for each ORD laboratory and center. In addition, to initiate its involvement in futures analysis, the BOSC invited ORD's Executive Committee to discuss emerging science issues. OSP briefed the Executive Committee on ORD's futures activities, and the BOSC expressed an interest in addressing futures analysis in upcoming meetings. On the second day of the meeting, Dr. William Farland proposed that the BOSC consider conducting three new program reviews: (1) Safe Pesticides/Safe Products, (2) Human Health Risk Assessment, and (3) Homeland Security. ORD also offered responses to the BOSC reviews of ORD's PM-Ozone Research Program, the Mercury Multi-Year Plan, the Ecological Research Program, and EPA's National Coastal Condition Report.

ORD staff has worked to update the BOSC Executive Committee membership to fill current vacancies. The EPA Deputy Administrator has reappointed three current members to the Board and has appointed four new members. These changes will bring the BOSC closer to its 15-member capacity, which will help the Board to manage its growing workload. The Office of the Administrator also approved the renewal of the BOSC charter through May 2008.

Current/recent BOSC activities include:

- ORD and the BOSC are working together to develop a draft charge for the standing laboratory/center subcommittees that will be formed.
- The Science To Achieve Results (STAR)/Greater Research Opportunities (GRO) Fellowship Subcommittee reviewed three NCER Fellowship programs. The Subcommittee held its face-to-face meeting on March 2-3, 2006, in Washington, DC, and its final public conference call was held on April 3. The Subcommittee Chair transmitted a draft report to the Executive Committee Chair to be vetted at the June BOSC meeting.
- The Water Quality Subcommittee reviewed ORD's Water Quality Research Program. The Subcommittee held a public call on March 6, 2006, to finalize its draft report, which was approved by the Executive Committee on April 6, pending editorial changes.
- The Computational Toxicology Subcommittee held an administrative conference call on April 28, 2006, to discuss a draft agenda, charge questions, and background materials for its June 19-20 face-to-face meeting in Research Triangle Park, North Carolina.

The BOSC Executive Committee held its most recent meeting in Las Vegas on June 1-2. At the meeting, the BOSC reviewed the STAR/GRO Fellowship Subcommittee's draft report, heard updates from the other Subcommittees, and discussed

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EPA's work and that of other federal agencies to an audience of more than 1,000 attendees. Science Forum speakers and participants explored questions about why some people are more susceptible to disease than others, how the environment plays a role in disease, and how early childhood exposure can lead to health problems in adulthood.

Speakers included leaders and senior scientists from EPA, our collaborating organizations, academia, and the National Building Museum, along with presentations by Dr. Rita Colwell of Canon U.S. Life Sciences, and a keynote by one of the leading scientists of the 21st century, Dr. J. Craig Venter.

Participants included environmental professionals, academics, Agency partners, stakeholders, and others. Each participant learned more about the importance of promoting scientific collaboration and moving the results of our scientific efforts into action. This year's Forum reinforced the very prominent role science continues to play in achieving EPA's mission and the relationship between public health and our environment.

To learn more about the 2006 EPA Science Forum, please visit the Forum Web Site at http://www.epa.gov/ scienceforum.

"To waste, to destroy our natural resources, to skin and exhaust the land instead of using it so as to increase its usefulness, will result in undermining in the days of our children the very prosperity which we ought by right to hand down to them amplified and developed."

*- **Theodore Roosevelt**, Seventh Annual Message, December 3, 1907*

OSWER/ORD Seminar Series

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mercury levels in solid samples involve the use of aggressive chemicals to dissolve the mercury-containing media, followed by additional chemicals to properly reduce the mercury to the volatile elemental form. This seminar discussed the advantages of using an alternative method: pyrolysis-based analyzers that use heat and oxygen to decompose the sample matrix to permit direct determination of total mercury (organic and inorganic) in solids (such as biological tissues, soils, sediments, bottom deposits, and sludge-type materials) and in some liquids (such as extracts of biological tissues, digested solutions, and aqueous wastes), but such analyzers lack the volume capacity for the trace mercury levels in surface and ground waters. According to the presentation, pyrolysis-based mercury analyzers have the following advantages:

(1) **Throughput**: a measurement every 10-15 minutes (including the weighing and logging time);

(2) **Learning Curve**: operation simple enough for those with no prior analytical skills;

(3) **Low Cost**: capital cost of about $35K;

(4) **Green**: generation of waste virtually eliminated;

(5) **Sample Size**: <1 mg to 500 mg, or 0.5 mL;

(6) **Detection Limit**: 0.01 ng Hg;

(7) **Broad Application**: applications include non-lethal monitoring of fish (e.g., tissue biopsy); longitudinal analysis of hair (to locate peak-exposure periods); exposure assessments for other tissues (e.g., feathers, fur, toenails, botanicals); near real-time monitoring of contaminated soil and sediment during remediation; coal-fired power plant emissions (from difference between coal Hg and solid waste Hg); and speciation for mercury in tissues (via suitable extracts of the methyl mercury).

A follow-up Q&A session addressed a variety of practical issues—the field portability of equipment, the fact that it is not necessary to homogenize fish-tissue samples (as reported in a 2002 publication from NERL-Las Vegas), the impact on Hg concentrations from differences in moisture content of samples, and meeting the off-scale challenge of highly contaminated soil samples by dilution with chemically clean sand. OSP looks forward to resuming the Seminar Series in September 2006, with a host of new and exciting topics. For additional information on the OSWER/ORD Seminar Series, please contact Jace Cuje at cuje.jace@epa.gov or 202- 564-1795.

BOSC Update

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implementing standing laboratory/center subcommittees. Additionally, OSP's futures analyst, Anita Street, briefed the BOSC on Project Horizon, an interagency scenario development effort designed to develop strategies and identify capabilities to prepare for unforeseen threats and opportunities that will arise in the next 20 years.

To learn more about the BOSC and its subcommittees, and to review reports, meeting summaries, and other materials, please visit http://www.epa.gov/osp/bosc. If you are interested in serving as a Designated Federal Officer (DFO) for the BOSC, please contact Lori Kowalski at kowalski.lorelei@epa.gov or 202-564-3408.

Project Horizon

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In the Synthesis Phase, the Core Team pored over 147 capabilities developed by the participants in the three strategy workshops to find the most robust capabilities to present to the Senior Principals Board for its approval in June. The list of 147 was narrowed down to 12 capabilities. The Core Team members will flesh out the details of each capability, including a description of each capability, the strategic rationale for its development, implementation considerations, estimated costs associated with its implementation, and existing programs to support implementation. The capabilities were presented at the June Senior Principals Board Meeting, and the Board approved the most compelling proposals for interagency implementation.

For more information on Project Horizon, please contact Anita Street at street.anita@epa.gov or 202-564-3626.

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two baby boys into the OSP family. On a sadder note (for us), we also bid a warm farewell to Claudette Davis, who will retire from EPA after 30 years of faithful public service.

Thank you all for the great work you continue to do. I always enjoy the kudos I read and hear from our Assistant Administrator and others across the Agency about the quality and responsiveness of OSP's efforts.

I hope you have a safe and enjoyable summer, both inside and outside of the office.

FTTA Program Blooms with Spring Activities

EPA Patent Recipients Honored

In association with this year's Science Forum, the FTTA Program launched an inaugural ceremony recognizing EPA's fiscal year 2005 patent recipients. The event was held in conjunction with the annual ceremony recognizing the Science and Technology Achievement Award (STAA) recipients.

Deputy Administrator Marcus Peacock and EPA Science Advisor George Gray were on hand to present the patents and offer their congratulations to the scientists. Dr. Gray's message to the audience conveyed how the STAA awards and patented technologies demonstrate excellence and relevance in research and development.

This year, nine technologies were issued patents, and the inventors were recognized for their unique contributions to science. Through the FTTA and other legislation, Congress gave EPA laboratories and scientists the opportunity to patent marketable technologies. This has given EPA the ability to move technology into the economy while providing the inventor and laboratories additional incentive in the form of royalties when a patent is licensed. This year's patents address the areas of improved vehicle mileage, reduced vehicle emissions, clean up of hazardous chemicals, and homeland security, among others.

To view a list of the fiscal year 2005 patents and inventors, or for additional information on the patenting, licensing, and the cooperative research and development process at EPA, visit the FTTA Web Site at http://www.epa.gov/osp/ftta.htm or the Intranet site at http://intranet.epa.gov/ospintra/ftta/ftta.htm.

Science Forum Exhibit Highlights World's Best Technologies

EPA patented technologies, along with two patented technologies selected for the World's Best Technologies (WBT) Showcase, were prominently displayed at the 2006 EPA Science Forum. The FTTA staff developed the exhibit, and were on hand to discuss the technologies and opportunities for future collaboration. Many of these patents have been successfully licensed and are generating royalty income for the EPA inventors and laboratories.

EPA researchers may apply for patents on technologies invented at EPA laboratories. Under the authority of the FTTA, the Agency can license these patented technologies to external parties for further development and commercialization. With a license in place, the Agency receives a portion of the net sales as a royalty payment, which is split between the EPA inventor(s) and the laboratory where the technology was invented.

Below are the technologies that were highlighted at the Science Forum exhibit:

- **Saturation Air Samplers**—Jointly developed by EPA's Region 10 and the Lane Regional Air Pollution Authority, these portable, flexible, and inexpensive air samplers are used throughout the world for such purposes as sampling air toxics, monitoring air emissions compliance, and performing surveillance on airborne hazards to military personnel.

- **Method and Apparatus for Altering Ionic Interactions with Magnetic Fields**—The Ion Parametric Resonance (IPR) model uses perpendicular or combined perpendicular and parallel magnetic fields to alter the behavior of ions to achieve a desired response in a chemical or biological system. Once these predicted responses are known, combinations of magnetic fields can be applied to biological or chemical systems to achieve a desired result.

- **Identification and Quantification of Mold**—This patented technology uses the best available DNA sequences for more than 130 of the major indoor air fungi. This technology quickly identifies the types of molds present, and is particularly useful for testing molds in buildings, water, and foods.

- **MI Agar Testing Medium - Method 1604**—This process uses a membrane filter method in conjunction with MI agar or MI broth to simultaneously detect total coliforms and *Escherichia coli* in water samples in 24 hours or less. This method can be used to monitor source, drinking, and ambient water.

- **Clean Diesel Combustion**—This technology achieves the lowest engine-out NOx for a diesel engine, while maintaining engine efficiency. Installation of this engine results in a low-cost, high fuel economy vehicle (30-40% improved fuel economy over gasoline equivalents). This technology has been installed in a Ford mini-van demonstration vehicle.

- **Full-Series Hydraulic Hybrid**—This 4-wheel drive hydraulic hybrid with diesel engine demonstrates an 85 percent fuel economy improvement over gasoline equivalents, and has better acceleration. The savings in fuel costs outstrip the additional cost for the technology in about 2-3 years. This technology recently has been installed in a United Parcel Service (UPS) vehicle to test real-world performance. It has shown a 60-70 percent mpg improvement in city driving thus far.

- Additionally, the exhibit featured posters of the two EPA technologies highlighted at this year's WBT Showcase. WBT is the premier event showcasing the world's largest collection of undiscovered technologies emanating from top universities, laboratories, and research institutions from across the country and around the globe. Participating technologies are selected by, and presented to, seasoned venture investors

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Spring Activities

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and Fortune 500 licensing scouts representing a variety of industries. The two WBT Showcase technogies were:

- **Biological Water Treatment Using a Biomass Concentrator Reactor (BCR)**—The BCR effectively treats methyl tert-butyl ether (MTBE)-contaminated groundwater, or any environment where high biomass retention is desired or required for highly efficient biodegradation to occur.

- **Recovery of Volatile Organic Compounds (VOCs) from Emulsion of VOCs in Water by Pervaporation**—This technology recovers and recycles VOCs and enables the reuse of surfactants (wetting agents) from liquid emulsions in groundwater, soil washing/soil flushing solutions, and industrial waste streams by pervaporation through membranes.

For additional information on the FTTA Program, visit the Web Site at http://www.epa.gov/osp/ftta.htm or the intranet site at http://intranet.epa.gov/ospintra/ftta/ftta.htm.

FTTA Training at the Science Forum

On May 17, 2006, the FTTA staff provided a training course on cooperative research and development agreements (CRADAs), licenses, and intellectual property for Science Forum attendees. This is the first time this training has been offered to an audience of both EPA and non-EPA participants.

The training, which highlights the CRADA and licensing program, provides information on the benefits of using CRADAs to leverage and enhance research, and the process of patenting and licensing inventions. When EPA researchers patent technologies, these then can be licensed out to external parties for commercialization, thereby providing the EPA laboratory and inventor(s) with royalties. Another major component of this FTTA training focuses on how to protect intellectual property so that opportunities to patent inventions are not forfeited.

If you are interested in hosting an FTTA training session at your location, please contact the FTTA staff. An online training course also is available for EPA employees at http://intranet.epa.gov/ospintra/ftta/onlinetraining/index.html.

For more information on the FTTA Program and its activities and services, please contact Kathleen Graham at graham.kathleen or 202-564-2678 , or Sarah Bauer at bauer. sarah@epa.gov or 202-564-3267. ■

From Research to Recognition—Potential for EPA Patents

Two technologies developed and patented out of EPA's National Risk Management Research Laboratory (NRMRL) were selected for exhibition at the World's Best Technologies Showcase in Arlington, Texas. Knowing that work conceived and completed in an EPA laboratory has resulted in a patented technology that addresses environmental problems is a source of pride for the inventor and the Agency. These patented technologies also represent a business opportunity for EPA. By licensing out these patents, the inventions can be commercialized and sold in the marketplace, and both the inventor and laboratory can receive royalties. The WBT Showcase is a prime opportunity to demonstrate the capabilities of these two patents to potential licensees and investors.

The first technology selected was the Biomass Concentrator Reactor, invented by NRMRL's Albert Venosa, Ph.D., and the University of Cincinnati's Makram Suidan, Ph.D. This technology uses a porous barrier, through which treated water or wastewater permeates under the pressure of gravity. Biomass solids suspended in the water are effectively retained and concentrated, which results in a highly polished, non-toxic effluent. This is particularly well suited for cleanup of the gasoline additive methyl tert-butyl ether (MTBE) or other groundwater contaminants.

The second technology selected for exhibition was the Recovery of VOCs from Emulsion of VOCs in Water by Pervaporation, invented by NRMRL's Subhas Sikdar, Ph.D. and Leland Vane, Ph.D. This invention recovers and recycles VOCs and enables the reuse of surfactants (wetting agents) from liquid emulsions in groundwater, soil washing/soil flushing solutions, and industrial waste streams by pervaporation through membranes. This technology is cost efficient, reliable, and sustainable. It is a good alternative for traditional pump-and-treat systems, air or stream stripping, or bioremediation.

The WBT Showcase is an annual event showcasing the largest collection of "undiscovered" technologies emanating from top universities, laboratories, and research institutions across the coutry. The WBT is designed to support the movement of world-class technologies from leading laboratories and universities into the marketplace. This is achieved by providing the opportunity for scientists, researchers, and technology entre-

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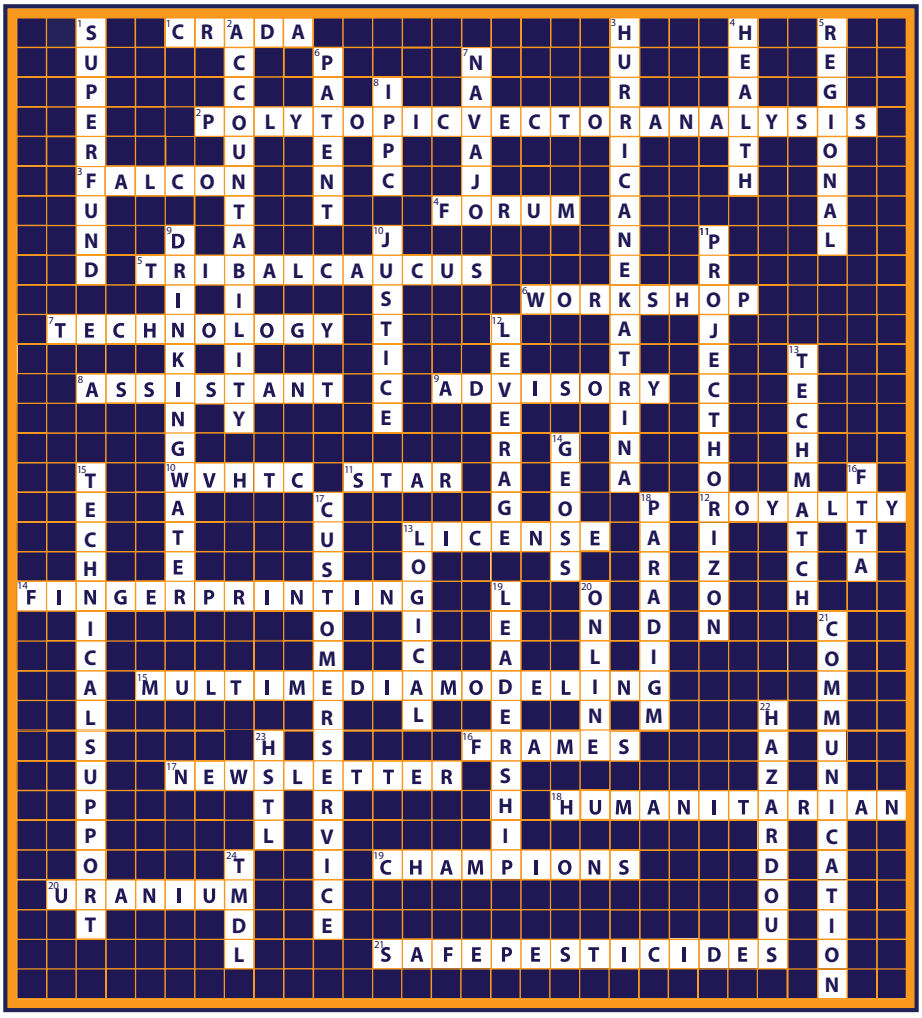
EPA FTTA Partnership Focuses on New Technologies to Reduce Fuel Consumption

Cleaner engines mean cleaner air thanks to a partnership to develop advanced automotive components for cleaner, more fuel efficient engines and vehicles. EPA and BorgWarner will examine the commercial viability of newly advanced turbochargers, air management, and electronic sensors for use with clean diesel and high-efficiency gasoline engines. Commercialization of these technologies will result in lower emissions and reduced fuel consumption, which in turn saves Americans money at the pump, improves environmental protection, and lessens dependence on foreign oil.

Diesel-powered passenger vehicles have significantly better fuel economy than their gasoline-powered counterparts. Through the partnership, BorgWarner will build and evaluate unique turbochargers that will help maintain fuel economy in clean diesel combustion systems. The company also will develop air management and combustion sensor technologies. Partnering with BorgWarner allows this "made in the USA" technology to support manufacturing jobs in the United States through the company's turbocharger manufacturing and engineering facilities located in Asheville, North Carolina.

The EPA-BorgWarner partnership was established through a CRADA under the EPA FTTA Program managed by OSP. For additional information on this technology, please visit http://www.epa.gov/otaq/technology. Further information on the FTTA Program is available on the Web at http://www.epa.gov/osp/ftta.htm or the Intranet site at http://intranet.epa.gov/ospintra/ftta/ftta.htm.

Solution to February *OSP Update* Crossword



Early Stage Research Opportunities Highlighted at Philadelphia Conference

EPA's FTTA Program was highlighted at a panel session of the jointly sponsored annual Association of University Technology Managers (AUTM) and Licensing Executive Society (LES) meeting in Philadelphia on May 11, 2006. The panel session focused on partnerships for early-stage research. Kathleen Graham, representing EPA's program, spoke about early stage research projects with universities, and emphasized EPA's laboratory strength in conducting cutting-edge research. Also on the panel were representatives from the Department of Veterans Affairs and Johns Hopkins University. AUTM is a network of university, government, and research institutions involved with managing and licensing innovations developed during research activities. LES is an association of members involved in licensing and transferring intellectual property. For additional information on the conference session, contact Kathleen Graham at graham.kathleen@epa.gov or 202-564-2678.

February '06 thru July '06

Intra-OSP Staff Moves!

Susan Peterson of OSP's Cross Program Staff will be working full-time with Lori Kowalski and the BOSC staff.

Peter Fargo of OSP's Cross Program Staff will be working part-time on Communications to complement his Futures responsibilities.

Monica Rodia of OSP's Regional Staff will be working on Tribal Science.

Congratulations on the New Baby!

Congratulations to **Heather Drumm** and her husband **Dustin** on the March 15th birth of their second child. **Jake**, weighing in at 8.1 lbs, joins his big sister **Riley**.

Congratulations to **Monica Alvarez** and her husband **Tom Tsang** on the March 18th birth of their first child, a son, **Miguel**, who weighed 7 lbs, 10.1 oz and was 19 inches long.

We'll Miss You!

Claudette Davis is retiring from EPA after 30 years of federal service.

Stacie Gatica is now with the Office of Air and Radiation (OAR) after bidding farewell to OSP in May.

Christine Stewart, one of OSP's SEE employees, has resigned her position.

Details/Training Assignments/ Students/Internships/Fellowships

Claudia Walters is on a detail to the Office of Resources Management and Administration (ORMA) to work with **Alan Hecht** and the Sustainability Team.

Lauryn Douglas has been hired as an intern to assist with Cross Program Staff FTTA work.

Carolyn Hammer is on rotation to ORD's NHEERL in Corvillas, Oregon through October 2006.

From Research to Recognition

Continued from p. 7

preneurs, Fortune 500 licensing professionals, and seed-stage venture capital investors to develop new relationships through a networking framework. In doing so, WBT becomes a catalyst between university and laboratory technologies and the investment community. The result is the expedient entry into the marketplace of the "Best" technologies. Each year's Showcase represents the collaborative effort of investors, licensees, and technology commercialization experts.

Both of EPA's technologies selected for this Showcase are available for licensing and commercialization. Under the authority of the FTTA and the Bayh-Dole Act, federal laboratories can patent and license federally developed technologies in exchange for royalties, which are split between the inventor(s) and the laboratory.

EPA has many more patented technologies for which there is an opportunity for licensing and/or further development. These technologies are listed on the Web at http://www.epatechmatch.com. Opportunities are not just limited to patent licensing and further development. External parties may enter into research and development projects through the FTTA Program as well. For information on potential collaborative research opportunities, please visit the EPA FTTA Web Site at http://www.epa.gov/osp/ftta.htm.

EPA's Technology Transfer staff is available to answer any questions or assist with the FTTA process. The staff can help determine suitable research for cooperative efforts and identify specific opportunities for EPA collaboration. EPA staff also can assist with market assessment of new technologies.

For more information, contact Kathleen Graham at graham.kathleen@epa.gov or 202-564-2678, or Sarah Bauer at bauer.sarah@epa.gov or 202-564-3267.

Sudoku Puzzles

To solve the puzzles, fill in the grid so that every row, every column, and every box contains the digits 1 though 9. There should be only one of each number in each row, column, and box. You do not need math to solve these puzzles; you solve them with reasoning and logic. Avoid the temptation to guess, because it could easily lead you astray.

Puzzle 1

		4					8	
		2	9					5
	6		4	7		9		1
6	7			2				9
			5		8			
5				9			6	2
3		9		4	5		2	
4					6	1		
	8					4		

Puzzle 2

9								6
	1	2				9	3	
6		7		8		5		4
			1		9			
	4	5				3	2	
			4		5			
2		8		6		4		7
	7	9				1	6	
3								2

Editor's Note: This is the photograph, which appeared in the February 2006 issue of *OSP Update,* is being reprinted in this issue to correct the caption.

Members of the Tribal Science Council

Top Row: David Charters (OSWER); **Mimi Dannel** (ORD); **David Carillo** (NCCH); **Dan Kusnierz** (Penobscot Nation); **Thomas Baugh** (Region 4); **Curtis Munoz** (Kiowa Tribe); **Claudia Walters** (ORD); **Roland Hemmett** (Region 2)
Middle Row: Rita Schoeny (OW); **Brenda Groskinsky** (Region 7); **Denise West** (Winnebago Tribe of Nebraska); **Vickie Kujawa** (Flandreau Santee Sioux Tribe); **Christine Berini** (Fond du Lac band of Lake Superior Chippewa); **Patti Tyler** (Region 8); **Michele Dineyazhe** (Region 9); **Robert Hillger** (Region 1); **Marshall Cheung** (29 Palms Band of Mission Indian)
Bottom Row (two kneeling): Linda Logan (Tonawanda Seneca Nation); **Dana Davoli** (Region 10)