

NEWS in Science and Technology



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The following is an Executive Summary of the Academy's quarterly Bulletin (Vol. 19,1) that includes topics and issues in science and technology deemed by the Academy to be both timely and relevant to Connecticut's interests. Each item is briefly summarized from press releases and reports of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. Hyperlinks are included to the original online source, where more detailed information is available.

NOTE: Online versions of this newsletter and the Bulletin are available on the Academy website at www.ctcase.org.

FEATURE ARTICLE: WEST NILE VIRUS

➤ West Nile Project Wins Connecticut Brothers Top National Honors

Jeffrey and Mark Schneider, brothers who attend South Windsor High School, captured first prize in the team category at the Siemens Westinghouse Science Competition for developing an analytical computer model that may aid entomologists in predicting and reducing the spread of West Nile Virus. According to the article:

- West Nile Virus (WNV) a significant health threat
 - Discovered in 1937 in Africa.
 - First occurred in Western Hemisphere in New York City in 1999.
 - 4000 cases in 44 states by 2002, 284 deaths reported.
 - 9000 cases nationwide in 2003; more than 200 deaths.
- Brothers designed analytical model to describe WNV transmission
 - Used STELLA (Structural Thinking and Experiential Learning Laboratory with Animation) computer model.
 - Model comprises four parts: mosquito life cycle, blood meal-egg laying, WNV transmission cycle, avian (bird) population dynamics.
 - Validated against 2000 Staten Island outbreak; closely matched field data.
 - Won first place in national Siemens-Westinghouse Science Competition in 2003 for their model.
- Other WNV research in Connecticut
 - Collaborative WNV Surveillance Program includes:
 - 91 permanent trapping stations statewide.
 - Ongoing efforts to evaluate trapping systems, trap locations, biological controls.
 - Human vaccine in clinical trials.
 - Ongoing research at state's universities.

[See www.ctcase.org/bulletin/19_1/westnile.html for expanded article]

BUSINESS & INDUSTRY

➤ US-Russia Science Partnership Yields Results

A partnership between the US National Academies and the Russian Academy of Sciences (RAS) to strengthen links between

Russian researchers and private companies is showing promising results, according to a recent announcement from the US National Academies. The announcement states:

- Number of Russian companies providing "tens of millions" of dollars for applied research overseen by the Russian Academy of Sciences (RAS) growing.
- Russian businesses financing hundreds of grants each year for young researchers working in cutting-edge fields.
- US, Russian specialists focused on two major efforts:
 - New innovation center at RAS Institute of Geology.
 - Expansion of existing center at RAS Center of Control Sciences.
- Goal to strengthen connections between centers' researchers and existing or potential industrial clients through workshops, consultations, and better electronic networking capabilities.

[See <http://www4.nationalacademies.org/news.nsf/isbn/12172003b?OpenDocument>]

ENERGY

➤ Hydrogen: Fuel for the Future?

A new report from the National Academy of Engineering and the National Research Council concludes that the nation's energy economy could be significantly altered, air emissions reduced and domestic energy resources expanded by increasing the use of hydrogen as a major fuel over the next 50 years, but warns that significant barriers exist. The report finds that:

- In order for hydrogen to gain widespread use, it:
 - Must be produced cost-effectively.
 - Requires development of both infrastructure to distribute it to fueling stations and storage technologies for vehicles.
- Fuel cells among most promising power sources, but:
 - Must be made more cost-effective and reliable.
 - Safer systems must be developed to transport, store, and handle hydrogen.
- Large-scale production of hydrogen from coal:
 - Must incorporate captured and stored carbon to reduce emissions.
 - DOE should speed development, evaluation of these technologies; study emission-free production methods.

[See <http://books.nap.edu/catalog/10922.html>]

➤ New Center Designed to Foster Better Understanding Between Scientists and General Public

The American Association for the Advancement of Science (AAAS) recently launched its new Center for Public Engagement with Science and Technology, designed to promote better understanding between scientists and the general public on the increasingly complex scientific issues that affect citizens on a daily basis, and to enhance the public's input into scientific research agendas by creating opportunities for dialogue among policymakers, the public and the scientific community. The Center's inaugural project, a town hall meeting on marine science issues held in February 2004 in Seattle, WA, drew a capacity crowd of 250.

According to a national survey of 2,400 adults, commissioned by the AAAS and conducted in preparation for the town hall meeting, most Americans believe that human activity is endangering the Earth's oceans, yet less than one-third feel empowered to influence positive change. Although only 31% of all survey respondents said they feel their actions could actually affect the health of the oceans, the survey also showed that Americans are nevertheless willing to try to do so. Adults living in the Northeast were significantly more likely (84%) than adults in other parts of the country to believe man-made stresses are leading to long-term damage and serious coastal damage and ocean problems. They were also the most trusting of the motives of scientists, at 38.6%. Overall, 37.7% of respondents were interested in knowing more about the impact science issues have on their lives.

HEALTH

➤ New Guidelines for Water, Salt, Potassium Intake

A new report from the Institute of Medicine (IOM) sets new guidelines for adequate daily intake levels for water, salt and potassium. The report recommends the following daily average intake levels:

- Approximately 2.7 liters, or 91 ounces, of "total water" (including water contained in beverages and the moisture in food) for women and 3.7 liters, or 125 ounces, for men.
- 1.5 grams of sodium and 2.3 grams of chloride (or 3.8 grams of salt) for healthy adults 19-50 years of age.
- 4.7 grams of potassium for adults.

[See <http://www.nap.edu/books/0309091691/html/>]

➤ Potassium Iodide Recommendations

In a new report, the National Research Council issues recommendations for distribution of potassium iodide pills, including:

- Potassium iodide pills be made available to everyone 40 or younger, especially children and pregnant and lactating women, living near a nuclear power plant.
- Pills not recommended for people over 40 because studies have not demonstrated a risk of thyroid-induced cancer.

- States and municipalities should decide how to stockpile, distribute and administer pills.
- Federal agencies should maintain backup supply and be prepared to distribute it.

[See <http://books.nap.edu/catalog/10868.html>]

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