

4-15-2004

UNH Team Wins National Environmental Design Contest

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Recommended Citation

Wright, Lori and Emro, Robert, "UNH Team Wins National Environmental Design Contest" (2004). *UNH Today*. 1648.
<https://scholars.unh.edu/news/1648>

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April 15, 2004

DURHAM, N.H. -- A team of six University of New Hampshire engineering and business students won first place at the 14th annual Environmental Design Contest, a national competition held April 4-8, 2004, in New Mexico.



The team, from left to right: Pat Smart, Maureen Lewis, Tom Callo, Brandon Lavertu, Briahna Itchkavich-Levasseur, Ryan Andersen.

The team of UNH undergraduates took top honors for its effort to remove carbon dioxide (CO₂) from the atmosphere with an approach that so wowed the judges that UNH also won the competition's Intel Environmental Innovation Award for the second time in three years.

"The competition requires that students show how their technology is original, sustainable and responsive to community concerns," said team co-advisor Thomas Seager, a project engineer with [UNH's Environmental Research Group](#).

"To win the Intel award, they have to do those things better than 29 other teams."

Environmental engineering majors Ryan Andersen of West Caldwell, N.J., Thomas Callo of Centerville, Mass., Maureen Lewis of Rindge and Patrick Smart of Farmington developed the technology as their senior design project. They worked for months with Whittemore School of Business and Economics students Brandon Lavertu, a senior accounting major from Epsom, and Briahna Itchkavich-Levasseur, a junior from Alton studying entrepreneurial venture creation, writing a business plan to commercialize it.

"This is the best thing that has happened in my academic life so far. We learned so much that we wouldn't have learned if we hadn't done this," said Andersen. "We worked to solve a real-world problem from the beginning to the end and we saw it all come together in a way that doesn't happen with any other kind of project."

Sponsored by the Waste-Management Education and Research Consortium (WERC), the contest involves tackling real environmental problems provided by industry and government. Students from throughout the United States, as well as Mexico, India, Canada and the Middle East compete at a variety of tasks.

Working with Seager and Professors Kevin Gardner and Taylor Eighmy, the environmental engineering students invented a technology for removing CO₂ - the chief culprit of global warming - that achieves significant reductions in atmospheric carbon at a fraction of the cost of current technologies. Their approach uses calcium-rich materials such as coal fly ash and cement kiln dust, which are recycled in roadside embankments. If pipes and blowers are installed when these embankments are constructed, the students estimate that the natural process of carbonation, in which carbon binds with calcium, can remove carbon from the air at a cost of about \$2 per metric ton. If all of these materials are used in this way, they estimate the United States could cut its CO₂ emissions by 23 percent per year.

The students have already applied for a provisional patent for the technology and plan to submit a full patent application within a year. With many countries signed on to the Kyoto Protocol, which calls for significant reductions in CO₂ emissions, it has a ready-made market. A move by the United States to a "cap and trade" system, which would award credits for CO₂ removal that could be traded like stock, would further expand opportunities.

"This is a very promising technology that does not appear to have any known competitors," said Robert Dalton, director of the UNH Office of Intellectual Property Management. "This is a really exciting project. It could be the next spin-out business for UNH."

The full-scale business plan developed by Lavertu and Itchkavich-Levasseur is steep in detail: extensive research and financial information as well as a complete promotional campaign that included a [Web site](#), television and radio spots, and brochures and collaterals in both English and Spanish. The two business students targeted their marketing efforts at state departments of transportation.

Among the most enjoyable aspects of the project was working with a diverse group of students in engineering, Lavertu said. "I've never worked with engineers before, but we taught each other different things, which was great. Eventually I'd like to start my own business, so developing the business plan was good experience for me."

The competition also exposed Lavertu to environmental engineering - something he knew nothing about before the project. Now he says he's going to learn more about it because he has found it so interesting. That's no surprise to the faculty who mentored the students for the competition.

"The WERC competition is a fantastic opportunity that allows students from the Whittemore School to work on a multidisciplinary team of students with diverse academic interests to develop a product that can be taken to market. Their experience provides a direct tie to what many of them will face daily in the business world after graduation and helps them discover the discipline necessary to succeed," says Mike Merenda, chair of the Department of Management at the Whittemore School of Business and Economics and a faculty advisor for the business students.

The UNH WERC project was made possible thanks to the efforts of the students themselves, who raised money from outside sponsors to fund their trip to New Mexico. Sponsors included Aries Engineering, Bell Power Systems, Inc., Dragon Products Company, GeoInsight, Golder Associates, GZA, Inc., Haley & Aldrich, Inc., Hoyle, Tanner & Associates, Maguire Group, Inc., Sanborn Head & Associates, Weston and Sampson Engineers, Inc., and Wright-Pierce.

