MOODY'S MEGA MATH CHALLENGE:

Colorado River Water: Good to the Last Acre-Foot

In March 2011, teams of 11th and 12th grade students competing in Moody's Mega Math (M^3) Challenge were given a problem statement that asked: If a persistent drought continues, what should be done to ensure that Colorado River basin water resources will be sufficient to meet the household, agricultural and electric power needs of the American Southwest? The problem required students to use a model to estimate the effects on the water supply and the economy of the Lower Basin, including the impact on power generation, discuss how small changes in the assumed inflow rates affect the model and these estimates, and make recommendations on potential reductions to the amount of water that might be removed from the Colorado River in order to maintain a minimal capacity in Lake Powell.

The 2012 Challenge will take place on March 3-4; registration deadline in February 24.

Sponsored by The Moody's Foundation and organized by the Society for Industrial and Applied Mathematics (SIAM), the M^3 Challenge is an annual competition that spotlights applied mathematics as a powerful problem-solving tool, as a vibrant and challenging profession, and as a vital contributor to advances in an increasingly technology oriented society. Entirely Internet-based and free of entrance and participation fees, the M^3 Challenge requires teams of high school students to solve a real-world problem in 14 hours or less using mathematical modeling and analysis and then submit a solution that meets the stated criteria. The top six teams are awarded scholarships ranging from $2,500 to $20,000, with a total of $115,000 in prizes for 2012. Complete information about the M3 Challenge is available at http://m3challenge.siam.org.

For the 2011 Challenge, 81 professional applied mathematicians read and ranked the 568 submissions in the first round of judging. The best 120 papers moved into a second judging round, where 16 math professionals gathered at SIAM headquarters in Philadelphia to read, score, discuss, and debate the submissions. This resulted in a tentative rank of the top six winning teams, identification of the six finalist teams (ranked 7 -12 overall), and selection of an additional 31 honorable mention" teams. The top six teams were required to present their papers at the Moody's Corporation in Manhattan, and answer questions about their work from a panel of four judges.

Further information about the Moody's Foundation is available at http://philanthropy.moodys.com. Further information about the Society for Industrial and Applied Mathematics is available at http://www.siam.org.

The following is the Champion paper in the 2011 Moody's Mega Math Challenge in essentially the same form as was originally submitted. The paper was awarded a $20,000 team scholarship prize.