

Education & Outreach Working Group Summary  
DUSEL Town Meeting  
Washington, DC  
November 3-4, 2007

**Opportunity:** As documented extensively elsewhere, a great need exists to improve science and engineering education. Creation of a Deep Underground Science and Engineering Laboratory (DUSEL) at Homestake presents a magnificent opportunity to leverage captivating, multidisciplinary content to improve the education pipeline and to raise scientific literacy -- throughout the region and around the world.

**Focus of the Working Group:** In preparation for the DUSEL at Homestake, the Education and Outreach (E&O) Working Group chose to focus its attention on developing a roadmap for the next 3(+) years, from early implementation of the Sanford Lab up through DUSEL construction. This period is a critical time for developing E&O plans for the DUSEL, pilot-testing prototype programs, refining facility requirements, and of providing technical support related to E&O as individual scientific collaborations are designing their experiments.

**E&O Program Components:** The Working Group endorses the overall E&O program components and goals outlined within *Deep Science* and the Homestake Conceptual Design Report (see references). Among these components and goals are:

- 1) Sparking public interest
- 2) Involving K-12 students, teachers, and undergraduates in research
- 3) Providing other forms of support for K-12 schools and teachers
- 4) Engaging and collaborating with historically underrepresented communities
- 5) Promoting and supporting scientist participation in E&O
- 6) Connecting with remote audiences through the internet and other distance education technologies

**3-Year Vision & Mission:**

- 1) Build a portfolio of sample and pilot E&O projects that spans the general categories of programs envisioned for DUSEL;
- 2) Support scientists in the development and implementation of experiment-based E&O;
- 3) Develop the plan for scaling up and broadening laboratory-wide E&O activity after the transition to DUSEL

**Staffing:**

- 1) A dedicated staff of 1 to 2 FTE now!! (within 6 months); a staff of 3 to 5 within 3 years; and a staff of 5 to 10 for DUSEL
- 2) Early staff would include an E&O Director, Administrative Assistant, and Program Coordinator. As additional staff members come aboard, there could be greater specialization in the areas of exhibit development, K-12 teacher and student programs, and partnerships with regional institutions of higher education.

**Organizational Structures:**

- 1) Advisory Board: 5 to 15 highly trusted and diverse leaders from the scientific community, science education, the K-12 system, and science museums. Board composition should include regional and national (perhaps even international) representation, be diverse in race, culture, and gender, and span the sectors of academia, K-12, industry, and major user facilities.
- 2) "E&O Collaboration:" This would be the subset of the scientific community (a large subset of 100 members or more, we hope) that's especially interested in E&O. These would be self-identified members who are eager to contribute E&O ideas and to act on them. The "E&O Collaboration" would meet once or twice per year, help to guide the overall E&O direction, pursue funding opportunities, and serve as the "go-to" scientific leaders within E&O projects.

**Program Priorities and Other Immediate Needs:**

- 1) Focus on projects uniquely suited to an underground facility at Homestake, as opposed to trying to address broader challenges in science education
- 2) Develop hands-on experiments that visitors can see and do at the surface and at the 300-foot level (note that an Interim Visitor Center is projected to open at the surface within the coming year)
- 3) Foster increased collaboration and cultural exchange with members of historically underrepresented communities, especially Native Americans
- 4) Focus special attention on serving local audiences. The Governor and citizenry of South Dakota have been tremendously supportive of the lab thus far and especially passionate about its role in furthering education.
- 5) Collaborate with the experimental groups (teams of scientists who work together on a single experiment at the facility), both in developing E&O components to include in scientific proposals (pre-award) and in implementing E&O components once an experiment is funded (post-award).
- 6) Enhance the E&O website
- 7) Study existing projects and programs at other national and international facilities, science museums, and laboratories with a view toward adapting to Homestake as appropriate
- 8) Collect, organize, prioritize, and serve as a clearinghouse of E&O suggestions
- 9) Partner with local, regional, and national museums (science, history, & mining)
- 10) Secure outside resources to supplement base-funding for the E&O Office
- 11) Initiate rigorous program evaluation

**Budget Estimate:**

The operating budget for the E&O Office is envisioned to be in the neighborhood of \$300k/yr to start, scaling up to something in the neighborhood of \$1M/yr within 3 to 5 years. Part of this funding should be a dependable stream of base-funding, which would likely emanate from the state of South Dakota. The rest could come from a variety of stand-alone grants and donations that the E&O Office would pursue.

**Potential Sources of Funding and Material Support:**

- 1) South Dakota Science and Technology Authority (SDSTA)/Sanford Lab
- 2) SD Board of Regents/SD Legislature
- 3) Stand-alone proposals to federal agencies (NSF, US Dept. of Ed, NASA)
- 4) Extensions and/or supplements to existing grant-funded education projects
- 5) EPSCoR Programs (federal funding to build capacity and competitiveness in less research-intensive states -- South Dakota qualifies)
- 6) Scientific societies (e.g., American Geological Institute)
- 7) Private foundations, corporations, and individual donors
- 8) In-kind support (e.g., employees' time and expertise from other national labs, display materials, etc.)

Note: Moving forward, it will be important to be strategic about what educational infrastructure could be funded through the NSF Facility Award (MREFC). Possibilities include exhibits for the visitor center, classrooms, laboratory space, dormitories, a distance education studio, and workshop space. Consideration should also be given to operating budget requirements beyond DUSEL construction.

**Recommendations to the Sanford Lab Director and the South Dakota Science and Technology Authority (governing body for the Lab):**

- 1) The first meeting of the "E&O Collaboration" should happen this coming April (2008) in Lead in conjunction with other scientific workshops that are planned. This meeting should be adjacent to, not in parallel with, disciplinary workshops.
- 2) South Dakota's Center for the Advancement of Mathematics and Science Education (CAMSE) currently coordinates E&O efforts for the SDSTA, and CAMSE's Director serves as Director of E&O for the SDSTA through a memorandum of understanding. CAMSE brings strong relationships with K-12 schools, existing infrastructure, capacity in program development, and experience in DUSEL planning. Expanding on the collaboration between CAMSE and the SDSTA to create the Sanford Lab's E&O Office seems like a promising approach and significantly preferable to starting an E&O Office for the Sanford Lab from scratch.
- 3) The E&O Working Group feels it is vital to create a laboratory-wide Cultural Diversity Advisory Group as soon as possible. This group should include the E&O Director as a member, and a few group members might serve as representatives on the E&O Advisory Board, but fundamentally, this group's purview is broader than just E&O. Inclusion of diverse perspectives and promotion of true collaboration across cultures will bring great benefit to the entire enterprise.

**References:**

*Deep Science*, [www.deepscience.org](http://www.deepscience.org)  
Homestake Conceptual Design Report, [www.lbl.gov/nsd/homestake/conceptualdesign.html](http://www.lbl.gov/nsd/homestake/conceptualdesign.html)

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**Comments and Questions:**

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