

AN EXPANDED NASA WORKFORCE DEVELOPMENT PROGRAM IN SCIENCE, ENGINEERING & TECHNOLOGY FOR SOUTH DAKOTA

Sherry O. Farwell, Ph.D.

Director, SD Space Grant Consortium

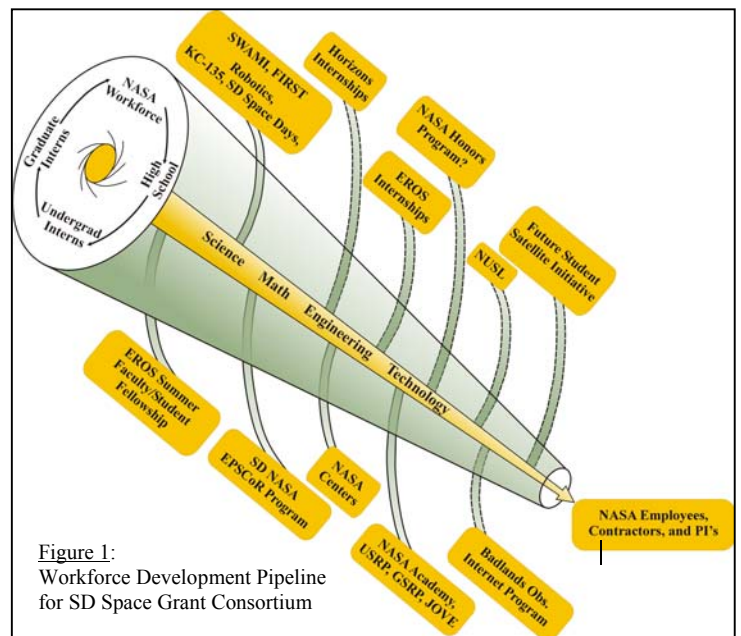
The primary goal of the South Dakota Space Grant Consortium's (SDSGC's) workforce development (WFD) project is to enlarge and enhance the resource pool, or "pipeline" of quality scientists and engineers that become involved with NASA as employees, contractors, or PI's. To attain this goal, members of the SDSGC will utilize their institutions' resources, facilities, and programs to provide students, educators, and faculty members with a) SMET education, b) exposure to NASA-relevant projects, and c) internship experiences at EDC and GSFC. This includes involving a broad range of SDSGC members and affiliates to attract highly qualified individuals into the pipeline. The program provides additional internships/fellowships for talented undergraduate and graduate students from South Dakota Space Grant member institutions, including those SD Tribal Colleges and Universities that have a strong interest in working on NASA-related SMET.

General project activities & objectives directed toward this goal include:

- Improved content knowledge of space science, earth system science, and remote sensing for secondary teachers, high school students, undergraduate and graduate students, and faculty members.
- Opportunities for hands-on educational and research experiences for program participants.
- Continued use of an expanded SDSGC Program Initiation Grant program to promote the development of NASA-based research opportunities for students and faculty members in SD.
- Additional outreach activities to increase public appreciation for the direct and indirect benefits of NASA-sponsored research and education programs.
- Encouragement for University, EDC, and NASA researchers to collaborate more with preservice education faculty to augment their science and technology backgrounds and thereby implement a "multiplier effect" because of their interactions with numerous students.
- Focusing the overall program on problem-based science and technology topics to expose students to analytical and process-oriented thinking.
- Development of two certificate programs in Astronomy and Earth Science at SDSM&T to augment a specialization in Earth System Science that was started last year in the Department of Atmospheric Sciences.
- Implementation of the NEW program model in SD to foster improved preparedness in science for teachers and students from primary and secondary schools.

Figure 1 shows a simplified schematic of the NASA pipeline envisioned under SDSGC's WFD project. By establishing connections from various feeder lines to the main NASA pipeline, the end result will be a higher number of well-trained individuals that can enter the NASA workforce directly as employees or indirectly as contractors and PI's. Creating internships and fostering eventual workforce staff at participating institutions will not only benefit NASA's workforce development goals, but will also help to bolster much needed workforce development opportunities within SD.

As stated in 2001 by Gordon Moore, cofounder of Fairchild Semiconductor and Intel Corporation, "Education, that's our Achilles' heel." The SDSGC's WFD program is designed to respond to this Achilles' heel challenge from a specific NASA-based perspective.



SDSGC was awarded \$91,882 for its WFD program. SDSGC's WFD educational framework is focused on high school, undergraduate, and graduate students. The proposed program provides a quality educational experience in space science, earth science, remote sensing and GIS through special course offerings and internships.

SDSGC awarded a total of \$32,625 in WFD fellowships from last year's funding (this includes the \$5,750 FY03 Space Grant supplement for WFD fellowships). These fellowships went to students at the SD School of Mines & Technology, SD State University, Augustana College, Black Hills State University, and Flandreau Indian School.

SDSGC's university and college members will establish expanded student and faculty internship programs with three key pipeline organizations:

- *USGS EROS Data Center (Institutional Member of SDSGC):*
The Earth Resources Observation Systems (EROS) Data Center (EDC) is a data management, systems development, and research field center for the U.S. Geological Survey's (USGS) National Mapping Division. The EDC opened in the early 1970's and now has approximately 600 governmental and contractor employees. The EDC is an EOSDIS node and is a significant partner in NASA's Earth Science Enterprise. EDC and the USGS Biospherics Branch have staff stationed at the Goddard Space Flight Center. A collaborative team from EDC and SDSM&T recently received a NASA Space Act Award for its work on writing software for the MODIS Reprojection Tool. The EDC is also involved in several joint SDSGC projects such as the "NativeView" project with Sinte Gleska University.
- *Horizons, Inc. (Industrial Affiliate of SDSGC):*
Horizons, Inc., headquartered in Rapid City, SD, specializes in providing leading-edge photogrammetric services that include aerial photography, elevation mapping, volumetrics, Light Detection and Ranging (LIDAR), and other leading edge methods in airborne remote sensing technology. Researchers at SDSM&T's Institute of Atmospheric Sciences and Horizon are actively pursuing joint R&D for potential applications of LIDAR in forestry science and fire management.
- *Goddard Space Flight Center (GSFC):*
Many SD university investigators have already developed collaborations with scientists at GSFC because of its connection to NASA's Office of Earth Sciences. These collaborations have been facilitated by the SDSGC and the new SD NASA-EPSCoR project.