Minnesota Space Grant Consortium Summary

Objectives: The Minnesota Space Grant Consortium (MnSGC) supports NASA’s Strategic Goals and Outcomes in Education. As a higher education program, our primary contribution is the achievement of Outcome 1; however, we also make significant contributions to Outcomes 2 and 3. Our contributions are briefly summarized as follows:

Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA’s goals through a portfolio of objectives. MnSGC supports this outcome by financing scholarship and fellowship programs, student opportunities at NASA Centers, graduate and undergraduate research opportunities, and curricular development in physical sciences and engineering at the college level.

Outcome 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty. This outcome is supported by in-service and pre-service teacher training and with our interaction with NASA educational activities in Minnesota.

Outcome 3: Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA’s mission. This outcome is supported by our affiliation with the Minnesota Science Museum and by other informal educational activities throughout the state.

Affiliate Profile: There are currently thirteen higher-education affiliates in the MnSGC, one governmental affiliate, five industrial affiliates, and one informal education affiliate. Seven of the MnSGC higher education affiliates are small, private liberal arts colleges or universities: Augsburg College, Bethel University, Carleton College, the College of St. Catherine (a women’s college), Concordia College, Macalester College, and the University of St. Thomas. Four MnSGC higher education affiliates represent state universities: Bemidji State University (BSU), Southwest Minnesota State University (SMSU), the University of Minnesota - Twin Cities (UMTC), and the University of Minnesota - Duluth (UMD). Two MnSGC higher education affiliates are community colleges serving Native American populations: Fond du Lac Tribal and Community College and Leech Lake Tribal College. Affiliates are located in all parts of Minnesota, achieving geographic diversity. MnSGC also has one state governmental affiliate: the Minnesota Department of Transportation and five industrial affiliate members: Goodrich Aerospace, Inc., Boeing, Honeywell, Inc., Lockheed-Martin, and AllianTech Systems. The Science Museum of Minnesota is an affiliate in informal education.

Scholarships and Fellowships: The scholarship and fellowship program is one of the key components of MnSGC’s program. Through our scholarships and fellowships we support diversity, student activities at NASA Centers, and STEM students at all of MnSGC’s academic affiliates. Our diversity efforts will result in a total of approximately 26% of our scholarships this year being awarded to members of underrepresented groups (Minnesota demographics for underrepresented enrollment in higher education is 9.6%). Historically women compromise over 50% of our scholarship recipients. We have been
able to achieve these numbers by being very proactive in recruiting and by establishing strong relationships with Tribal Colleges. Last year we supported six students who participated in NASA Academies and NASA Center Activities (students enrolled in all accredited institutions of higher education in Minnesota are eligible to apply for NASA Center Programs and be funded by MnSGC). Our scholarship and fellowship awardees are exceptionally well qualified with over 65% having grade point averages of 3.5 or higher.

Higher Education: Our major higher education programs are (1) innovative aerospace design projects at the University of Minnesota and (2) student satellite programs. This year more than 70 students worked on 12 different aerospace vehicle design projects. Lockheed Martin, Boeing, AllianTech Systems, JPL, NASA Goddard, Cirrus Design, Astrium, Princeton Satellites, Honeywell, and Emerging Space Technologies provided design projects, evaluated student design presentations and reports, and provided technical advice to the students. About 85% of the students participating in this program either go to work in the aerospace field, including NASA and industry, or go on to graduate school. Student satellite programs include BalloonSat projects at the affiliates and a small satellite program directed by a minority faculty member at the University of Minnesota. This year we initiated an innovative course in Native American STEM Heritage at one of our Tribal College Affiliates.

Research: MnSGC’s main emphasis in research is support of undergraduate projects. Most of these activities are carried out under the direction of faculty at the affiliates in the areas of physics, astronomy, geology, and aerospace engineering. MnSGC provides some support to well-qualified doctoral students in physical sciences and engineering at the University of Minnesota. The University of Minnesota is the only institution of higher education in Minnesota that offers advanced degrees in the physical sciences and engineering. All research funds go directly to student support.

Pre-college: MnSGC offers training to in-service and pre-service teachers related to the integration of space science into the curricula and to the promotion of NASA educational materials. MnSGC maintains strong connection with the NASA Explorer Schools in the State. MnSGC also partners with Project Lead the Way (PLTW), a national program to promote engineering in high schools, which has been very successful in promoting engineering among minority students. The University of Minnesota is the center for PLTW in Minnesota and trains high school teachers to use the PLTW curriculum.

Informal Education: Informal education comprises a relatively small part of MnSGC’s activities. We support the Sverdrup Lecture Series and the informal educational activities at the University of Minnesota Soudan Mine Cosmic Radiation Research Facility, the Planetarium at Southwest Minnesota State University, the Minnesota Department of Transportation - Aviation Education Division, and the Minnesota Science Museum.