

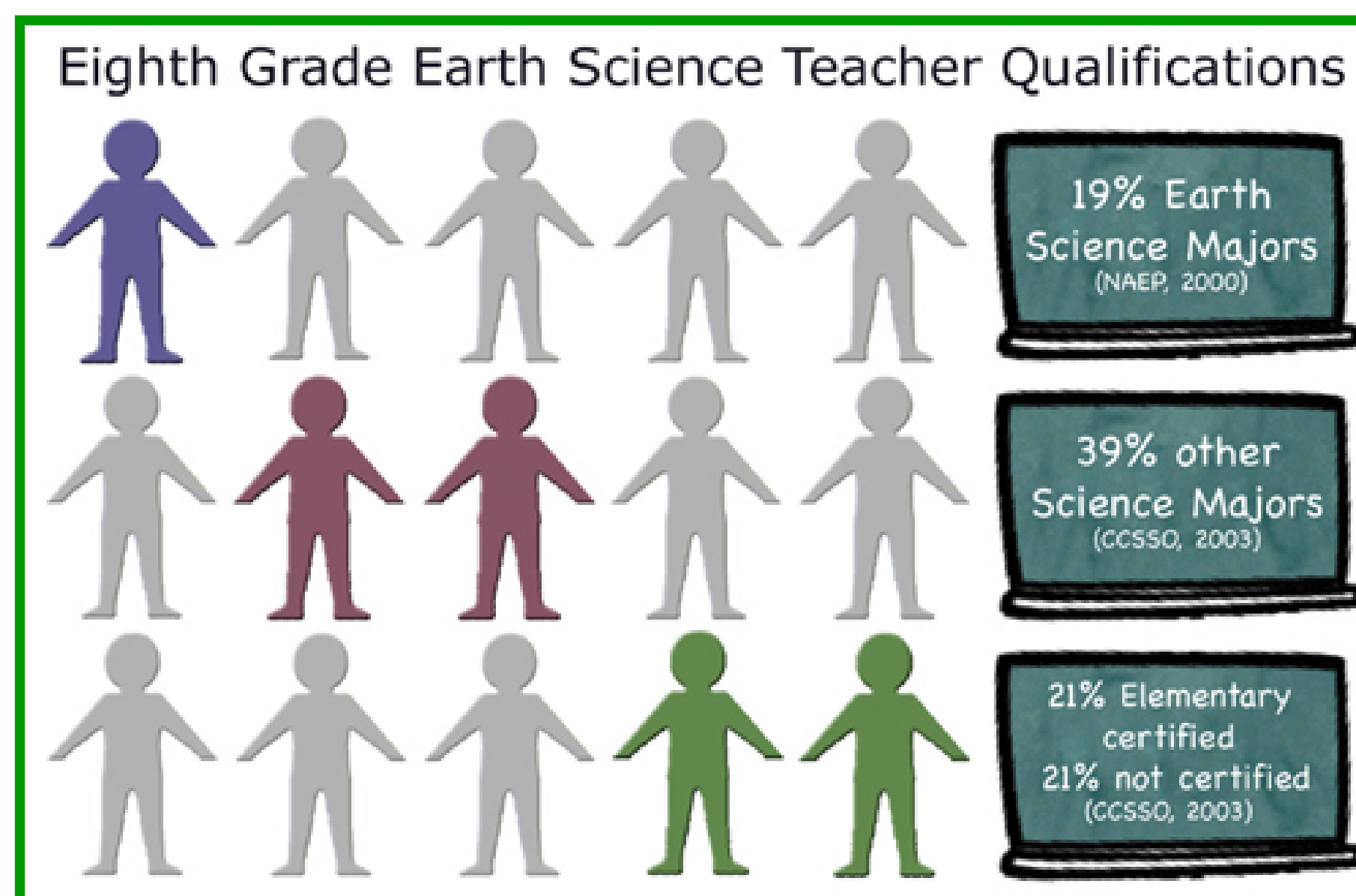
Preparing Teachers to Teach Earth Science: Resources for Geoscience Faculty

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serc.carleton.edu/teacherprep/

"Any society that is serious about the education of its children must be equally serious about supporting the continuing education of those charged with that task.... Rapid and extensive improvement of science education is unlikely to occur until it becomes clear to scientists that they have an obligation to become involved in elementary- and secondary-level science."

The Role of Scientists in the Professional Development of Science Teachers (NRC, 1996)



Status of K-12 Earth Science Teachers

While three out of four high school Earth Science teachers have a major or minor in a geoscience field, only three out of five middle school Earth Science teachers have a background in science and only one of those teachers is a geoscientist. This issue can be addressed in many ways by geoscience faculty who learn to work effectively with both future and current Earth Science teachers.

How Can Geoscience Faculty Get Involved?

The Science Education Resource Center (SERC) has developed an online resource for geoscience faculty interested in preparing and supporting K-12 Earth science teachers. "Preparing Teachers to Teach Earth Science" has been carefully researched and developed by a team of geoscience faculty, education specialists, and Earth science teachers. It stems from the 2003 AGU/NAGT workshop "Developing the Earth Science Teacher Workforce" where nearly 30 geoscientists, educators, and teachers came together to address the nation-wide need for improved Earth science education at all levels.

This online resource contains a wealth of information about recent science education reform initiatives, Earth science teacher needs, and the necessity for geoscience faculty to become more involved in supporting current and future Earth science teachers. In addition, well-documented examples of courses serving pre-service teachers as well as professional development programs for Earth science teachers are profiled with examples ranging from individual faculty opportunities to large university-schools partnerships. The profiles are specifically designed to provide information about how the course or program was designed so that other geoscientists can imagine how such a course or program might be implemented at their institution. Each profile is complete with contact information, helpful hints, and further references.

The benefits to faculty involved in these types of efforts are numerous. A single faculty member may work closely with an Earth science teacher who influences hundreds of students. These students will arrive at college better prepared to be citizens of the Earth and potentially geoscientists themselves. Research programs grow through education-related "broader-impact" grants, papers, and a network of colleagues across the country. Finally, faculty who work with teachers report that their own teaching improves as a result, thus extending the benefits through the entire K-16 system.

Preparing Teachers to Teach Earth Science

Teacher Preparation > Preparing and Supporting Earth Science Teachers

Teacher Preparation

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Preparing and Supporting Earth Science Teachers

Introductory Courses

Introductory courses in geology, astronomy, and meteorology for preservice elementary teachers and secondary science teachers. ([learn more here](#))

Support for Preservice Earth Science Teachers in the Geoscience Major

Coursework in the geoscience major and discipline-based teaching programs, including opportunities for research and teaching experiences as well as advising and mentoring. ([learn more here](#))

Essays from Workshop Participants

In May, 2003, a distinguished group of geoscience faculty, science educators, and teachers came together at a Washington, D.C. workshop sponsored by the American Geophysical Union, The National Association of Geoscience Teachers, and NSF. Participants contributed essays detailing their experiences with teacher preparation issues... ([learn more here](#))

Supporting Practicing Teachers

Practicing teachers participate in professional development opportunities in order to add a licensure area or deepen their knowledge of earth science and how to teach it effectively. Find out how scientists are already involved and how you can get involved in this process. ([learn more here](#))

Assisting Teachers in their Classrooms

If you would like to get into a local K-12 classroom and work directly with students and teachers, there are many opportunities available and many scientists already taking this approach. But there are also a number of important factors to take into account, such as working with school districts, administrations, individual teachers, and dealing with students. Check here for some examples and tips about this particular type of involvement. ([learn more here](#))

Being a Science Education Advocate

Scientists can provide critical advocacy for high-quality science education in their local schools and communities through a number of avenues. ([learn more here](#))

A part of the SERC Teacher Professional Development Program Collection

Page prepared for SERC by Jennifer L. B. Anderson, Ph.D.

SF-ROCKS (Reaching Out to Communities and Kids with Science in San Francisco)

Program URL: <http://sf-rocks.sfsu.edu/>

Program Type: Local University-School Partnership

Program Size: A university, community college, and five high schools

Audience: 9th grade teachers

Lisa White, Ph.D.

Project Director, Principal Investigator ([Contact Info](#))

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Lisa White, Ph.D. Photo courtesy of SF-ROCKS

Program Summary

The SF-ROCKS program works specifically with 9th grade teachers and students, focussing on incorporating the local watershed environments of San Francisco into current 9th grade curricula taught in the schools. SF-ROCKS is maintained and run by the Geosciences Department at San Francisco State University. SF-ROCKS offers a week-long summer workshop for local 9th grade science teachers that is run by faculty, students and staff of the Geosciences Department.

A [description](#) of the associated professional development workshop content and goals is also available.