Careers for Mathematicians in Geophysics and other Earth Science Specialties

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Over the years, the geosciences have become more and more quantitative. This is particularly true for the field of geophysics. As computers have become cheaper, faster, and able to hold more data, both on disk and in RAM, more geoscientists and geoscience companies are able to run numerically intensive programs. These programs are both written by the individuals and companies using them, and purchased from other service companies that create them. Because of this, and the fact that many geologists do not have the quantitative background that mathematicians have, geophysical service companies, including software development companies, are hiring applied mathematicians to develop and run these software applications. Although geophysics has made use of numerically intensive programs for many years, other companies that work with the earth sciences are recently expanding their use of specialized software and quantitative methods of investigation to the point that they need more mathematicians, physicists, computer scientists, and engineers to compete and grow.

This presentation will introduce the audience to several earth science careers that a fundamental and applied knowledge of mathematics is critical to. These include careers in the petroleum industry, environmental companies, geological engineering companies, and organizations that conduct short and long term weather studies, including global climate change. The above careers are most accessible to applied mathematicians that have minors or graduate degrees in the careers they are applying for jobs in. However mathematicians with only a baccalaureate degree are being sought for certain positions in geophysics, particularly if they have programming experience and a background in physics. In order to give the audience an idea of how mathematics is applied to the earth sciences, examples from several applied geophysical methods will be given. These include potential field studies, reflection seismic methods, electromagnetic methods, and the integration of geophysical data with other geospatial information using global positioning system (GPS) instruments and geographic information systems (GIS) software.