

William Menke, Ph. D.
Professor of Earth and Environmental Sciences
Job Description

1. (75% of time) Conducting scientific research in the Earth and Environmental Sciences.

1.1 Preparing Research Proposals and other documents that solicit external funds for research activities

1.1.1 Defining, or participating in the definition of, new and original projects designed to make scientific discoveries.

1.1.2 Organizing teams of scientists, from LDEO, other Columbia U. departments and external national and international institutions. Serving as Principal Investigator or co-Principal Investigator.

1.1.3 Writing the text of proposals, including scientific text, vitae, budget justifications, summaries of prior results, etc.

1.1.4 Preparing preliminary budgets, and working with LDEO administrative staff to ensure a correct final budget.

1.1.5 Drafting publication-quality figures and diagrams, by both mechanical and electronic means. Is familiar with major software systems for producing graphics.

1.1.6 Ensuring that proposals are submitted in a timely fashion, including the cajoling of missing material from other participants and the hand-carrying of documents from place to place, as needed.

1.2 Field Research in the Earth and Environmental sciences

1.2.1 Working out field trip logistics, with the assistance of travel agents and shipping agents. Filling out purchase orders for field supplies and tracking their delivery.

1.2.2 Travel to the field site, by whatever means is available (plane, helicopter, train, car, jeep, bus, ship, ferry, canoe, zodiac raft, horse, burro, foot, etc).

1.2.3 Maintenance of a field camp, possibly in a hotel, rented house or barn, hold of a ship, or tent.

1.2.3.1 Housekeeping, including cooking, washing dishes, washing clothes, cleaning rooms, shoveling snow, sewing, exterminating vermin, etc.

1.2.3.2 Minor maintenance, including electric and plumbing repair.

1.2.3.3 Testing and repair of field equipment by board-swapping, machining, mechanics, metalwork, rewiring, soldering, welding, etc.

1.2.3.4 Operating a computer system for the purpose of processing and archiving field data, including installation of hardware and software components, system administration, backups, programming, etc.

1.2.4 Working, hiking, carrying equipment, and making scientific measurements outdoors, during both night and day, and in sun, rain, snow, sleet and other weather conditions.

1.2.5 Installation of field equipment by appropriate methods, including bricklaying, carpentry, digging, quarrying, mountain climbing, spelunking, surveying, etc.

1.2.6 Operation of field equipment, including seismometers, GPS receivers, gravimeters, radios, computers, generators, magnetometers.

1.2.7 Collecting and documenting rock and sediment samples.

1.2.8 Maintaining detailed field notes and records of expenditures, including receipts. Filling out travel reimbursement forms.

1.2.9 Providing first aid to oneself and ones colleagues in case of accident. Assisting in emergency evacuations.

1.3 Laboratory Analysis

1.2.1 Designing, purchasing and building, with the assistance of technicians and engineers, laboratory apparatus.

1.2.2 Operating, calibrating and maintaining laboratory analytical equipment, including oscilloscopes, spectrometers, etc.

1.2.3 Operating MAC OS, UNIX and WINDOWS based laboratory computer systems.

1.2.3.1 Writing, testing and documenting new software, in an appropriate language such as FORTRAN, C, or C++ for data analysis and mathematical modeling.

1.2.3.2 Data analysis, including the use of mass-storage devices, networks, graphical display software, and advanced data manipulation algorithms.

1.2.3.3 Mathematical modeling of diverse natural phenomena by various means, including finite-element methods.

1.4 Maintaining written (paper and electronic) records of research activities

1.5 Keeping abreast of new research results through reading of scientific literature and attending lectures and seminars.

1.6 Presentation of results

1.6.1 Travel to national and international scientific meetings (e.g. American Geophysical Union Fall meeting), possibly at one's personal expense or with only partial reimbursement.

1.6.2 Preparing audio-visual material for presentations, including presentation-quality graphics, computer animations, etc.

1.6.3 Giving public lectures and seminars, presenting posters at poster-sessions, etc.

1.6.4 Maintaining a World Wide Web homepage that contains descriptions of research results.

1.7 Research Papers.

1.7.1 Writing the text of papers, drafting publication-quality figures and diagrams, by both mechanical and electronic means. Should be familiar with all major word processing and graphics software packages.

1.7.2 Submitting the paper to a journal, answering the criticisms of referees, preparing revisions, preparing camera-ready copy, editing page proofs, ordering reprints, etc.

1.8 Overseeing the administration of grants and contracts, including tracking budget expenditures, progress of employees and co-workers, filing required status reports, communicating with Program Managers, etc.

2. (75 % of Time) Teaching Earth and Environmental Sciences

2.1 Teaching courses to undergraduates and graduate students

2.1.1 Preparation of course outlines, lecture plans, assignments, etc.

2.1.2 Travel, at one's own expense, to classrooms at Columbia's main campus in Manhattan.

2.1.3 Lecturing, conducting discussions and laboratories, conferring with students, grading, etc.

2.1.4 Managing the activities of Teaching Assistants.

2.1.5 Designing and leading fieldtrips that bring undergraduate and graduate students to educationally

important rock outcrops and other sites of scientific interest.

2.1.5.1 Writing the fieldtrip guide.

2.1.5.2 Purchasing fieldtrip supplies, including poster boards, compasses, magnifying lenses, foods, beverages, etc. Preparing hot beverages in thermoses the morning of the fieldtrip.

2.1.5.3 Assuring that proper permissions are obtained for visiting the sites.

2.1.5.4 Driving the van or shuttle bus.

2.1.5.5 Assuring that proper safety procedure is followed.

2.1.6 Grading, with assistance of TA's, homework and labs, and assigning the final grade.

2.2 Developing curriculum material

2.2.1 Writing textbooks

2.2.2 Writing educational computer software (including WEB-based software).

2.2.3 Developing new courses as needed to meet changing departmental goals.

2.3 Advising graduate students

2.3.1 Raising funds through external sources that support the students educational expenses.

2.3.2 Lending the student calculators, notebook computers, boots, clothing, furniture, food, automobiles, camping equipment and other sundry items from one's personal stock.

2.3.3 Teaching the student research techniques through individualized tutoring.

2.3.4 Meeting regularly with the student to review research progress, reading draft writings, attending committee meetings, etc.

2.3.5 Writing letters of recommendation.

2.4 Serving on PhD Exam Committees

2.4.1 Advising students on what material they need to study for an exam.

2.4.1 Evaluating exam materials and performance. Voting to Pass or Fail students on the basis of

the student's exam performance.

2.4.2 Hosting parties for students who successfully defend their thesis.

3 (75% of Time) Administrative Duties

3.1 Managing employees, especially technical staff such as technicians, engineers and computer programmers and junior scientific staff such as postdoctoral research scientists.

3.1.1 Assisting in the hiring of personnel, including writing job descriptions and advertisements, reviewing applications, interviewing prospective employees.

3.1.2 Assigning tasks and tracking progress.

3.1.3 Writing evaluations of job performance. Recommending raises, promotions and termination when appropriate.

3.1.3 Serving on committees that recommend raises and promotions.

3.2 Serving on departmental committees that perform administrative functions such as space allocation, award selection, library acquisitions, planning, etc. Writing reports that summarize the results of committee findings.

3.3 Serving on Search Committees and ad hoc promotional committees that contribute to decision to hire and promote new faculty and scientific staff.

3.4 Serving on national and international science policy committees, proposal review panels, etc.

3.5 Mentoring junior scientists, and especially assisting them in obtaining grants and writing research papers.

3.6 Training employees, especially in computer-related activities.