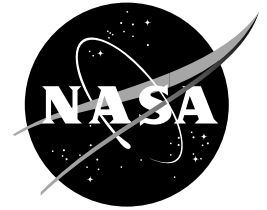


Fact Sheet

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23681-2199



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Choosing a Career in Atmospheric Science

Atmospheric science is the study of the physics and chemistry of clouds, gases, and aerosols (airborne particles) that surround the planetary bodies of the solar system. Research in atmospheric science includes such varied areas of interest as:

- **Climatology** — the study of long-term weather and temperature trends
 - **Dynamic meteorology** — the study of the motions of the atmosphere
 - **Meteorology** — the study of weather and climate.
 - **Cloud physics** — the formation and evolution of clouds and precipitation
 - **Atmospheric chemistry** — the chemical composition of the atmosphere
 - **Atmospheric physics** — the study of processes such as heating and cooling of the atmosphere
 - **Aeronomy** — the study of the upper atmosphere
 - **Oceanography** — the study of the Earth's oceans and how they affect the atmosphere
2. Data analysis and modeling — the examination of the data produced by the experiments and the development of theoretical models to interpret the data. The result is an improvement of our understanding of atmospheric motions and chemistry, climate change, and weather forecasting. This area requires experience in computer science, mathematics, chemistry, physics, meteorology, radiative transfer, or fluid dynamics.
 3. Laboratory studies — the examination of the chemical and physical processes that occur in the atmosphere, including cloud microphysics, photochemical reactions, and absorption and emission of radiation by atmospheric gases and particles. This area requires experience in quantitative laboratory techniques, chemistry, or spectroscopy.

Most atmospheric scientists study the atmosphere of the Earth, while others study the atmospheres of the planets and moons in our solar system.

Types of Jobs

In the Atmospheric Sciences research group at NASA's Langley Research Center, researchers focus their work in three main areas:

1. Instrumentation and data acquisition — the design and operation of instrument systems that measure the Earth's atmosphere from space, from within the atmosphere, and from the ground. This area requires a background in electronics, optics, computer science, or radiative transfer.

The majority of atmospheric scientists in the United States work for the Federal Government. The largest number of civilian atmospheric scientists work for the National Weather Service and other branches of the National Oceanic and Atmospheric Administration (NOAA), as well as NASA, the Environmental Protection Agency, the Forest Service, the Department of Defense, and the Department of Energy.

Atmospheric scientists may also be found working for private weather services, television and radio stations, commercial airlines, state governments, colleges and universities, public utilities, consulting firms, and aircraft and instrument manufacturing companies.

Atmospheric scientists may work in the following areas: field research, laboratory studies and/or computer analysis and modeling. Good communication skills (oral and written) are necessary as atmospheric

scientists attend conferences and workshops where they share their results with other researchers. They write papers and technical reports detailing the results of their research, give progress reports, and disseminate information to the public.

Atmospheric scientists often work in groups where their different skills and backgrounds can be combined to study specific scientific questions such as the effects of aircraft emissions on the atmosphere. These multidisciplinary teams usually include people in other related careers such as aerospace engineers, electronics engineers, computer and communications technicians, photographers, science writers, data systems analysts, astronauts, pilots, astronomers, physicists, geologists, oceanographers, and biologists.

Preparation and Training

One way to begin a career in atmospheric science is to earn a bachelor's degree in meteorology, physics, chemistry, geography, mathematics, or computer science. Some researchers in atmospheric sciences have earned their bachelor's degrees in related fields, such as astronomy, oceanography, geophysics, or engineering. Research leadership positions usually require graduate degrees, such as a master's degree or doctorate. Research teams also include technicians who hold two-year associate's degrees or have graduated from an approved apprentice program.

Work-study programs for college students majoring in meteorology or related fields are available through NASA and NOAA. These agencies also provide grants and fellowships for graduate study. The U.S. Armed Forces also provide training in meteorology for officers and enlisted personnel.

Where to Study

There are many colleges and universities in the United States, Puerto Rico, and Canada that offer degree programs in meteorology, atmospheric science, and related fields. A complete list may be obtained from the American Meteorological Society.

Professional Organizations

Most atmospheric scientists are members of the American Meteorological Society and/or the American Geophysical Union. These organizations are excellent sources of information on careers and educational programs in atmospheric science.

Other Information Sources

NASA Education Division, Mail Code FE
NASA Headquarters
Washington, DC 20546-0001
<http://www.education.nasa.gov>

NASA Earth Science Enterprise, Code Y
Washington, DC 20546-0001
<http://www.earth.nasa.gov/>

National Weather Service, NOAA
1325 East-West Highway
Silver Spring, MD 20910
<http://www.nws.noaa.gov/>

American Meteorological Society
45 Beacon Street
Boston, MA 02108-369
<http://www.ametsoc.org/AMS/>

American Geophysical Union
2000 Florida Avenue N.W.
Washington, DC 20009-1277
<http://www.agu.org>

For more information about Atmospheric Sciences at NASA Langley, please contact:
Public Inquiry Center
NASA Langley Research Center
Mail Stop 146
Hampton, VA 23681-2199
757-864-3293

Or see the Atmospheric Sciences Competency Home Page:
<http://asd-www.larc.nasa.gov/ASDhomepage.html>