

Aerospace Careers: Hydrology Specialist

A career in Hydrology applied to space exploration

Introduction

Hydrologists, Hydrogeologists and Geoscientists, all conduct research work on the formation, distribution, circulation, and physical properties of surface and underground water sources. They also study the intensity and form of precipitation, rate of soil penetration, movement through terrain, and flow of water to the atmosphere and oceans.



The Marshall Space Flight Center Earth Science Office (ESO) provides integrated scientific understanding of the Earth system to enable better decisions improving the global quality of life. Understanding the Earth's hydrology allows scientists to better understand our universe, as we explore it with remote sensing and spacecraft.

The ESO's many areas of study are closely related to each other. Like the climate and environment we study, no one aspect stands alone. Water vapor, winds, temperatures at different altitudes, lightning, aerosols, and other factors all connect in a complex, interactive Earth-atmosphere system. This is what makes our work both challenging and intriguing. The best way to grapple with so many questions is by scientists teaming across different disciplines and organizations. ESO scientists collaborate closely with other research centers, both in the United States and in other nations. We also work to spread awareness and understanding of our results among leaders and citizens of today and the future.

Hydrologist Duties and Responsibilities

- Evaluate data and provide recommendations regarding the feasibility of municipal projects, such as hydroelectric power plants, irrigation systems, flood warning systems, and waste treatment facilities.
- Study and analyze the physical aspects of the earth in terms of the hydrological components, including atmosphere, hydrosphere, and interior structure.
- Administer programs designed to ensure the proper sealing of abandoned wells.
- Install, maintain, and calibrate instruments, such as those that monitor water levels, rainfall, and sediments.
- Answer questions and provide technical assistance and information to contractors or the public regarding issues such as well drilling, code requirements, hydrology, and geology.
- Investigate properties, origins, and activities of glaciers, ice, snow, and permafrost.
- Review applications for site plans and permits and recommend approval, denial, modification, or further investigative action.
- Apply research findings to help minimize the environmental impacts of pollution, waterborne diseases, erosion, and sedimentation.
- Develop or modify methods of conducting hydrologic studies

At Civil Air Patrol, the volunteer auxiliary of the U.S. Air Force, we're helping develop tomorrow's aerospace workforce.

Hydrologist Skills and Specifications

- Must have the unique analytical and deductive reasoning abilities
- Must have excellent organizational skills for sorting through research data
- Must have excellent verbal and written communication skills

Hydrologist Education and Qualifications

- A master's degree in Geology and Earth Sciences, Geosciences, Mathematics or equivalent is basic for a position in research or the academe.
- A PhD in the same field is an advantage for teaching professions.
- 5-7 years of experience in the research or teaching faculty is an advantage

Hydrology students can expect a strong emphasis in mathematics, statistics, geology, physics, computer sciences, chemistry and biology. Some programs also require an interdisciplinary background in other subjects - such as economics, public finance, environmental law, and government policy - to help experts in these fields to understand the implications of their work on hydrology. Specific course seen include:

- Aqueous Geochemistry
- Contaminant Transport
- Climatology
- Groundwater Hydraulics
- Vadose Zone Hydrology
- Soil Physics and Mechanics
- Water Resources Engineering
- Water Quality Analysis
- Sediment Transport and Channel Shapes
- Drought and Floods
- Modeling of Water Systems
- Land Use Change and Assessment
- Environmental Impact Statements
- Environmental Engineering
- Hydrogeology
- Geophysics
- Geochemistry
- Geomorphology
- Soils and Nutrient Cycling
- Hydrothermal Systems
- Water Transport in Soils
- Geographic Information Systems
- Small Watershed Modeling
- Sediment Budgets
- Groundwater Pollution Assessment



Links to Hydrology Information click below:

<http://geologyonlinecourses.com/hydrology-degree-programs/>

Links to more Information click below:

<http://www.ghcc.msfc.nasa.gov/>

http://weather.msfc.nasa.gov/surface_hydrology/hydrologic_modeling.html

http://weather.msfc.nasa.gov/surface_hydrology/

<http://academic.emporia.edu/aberjame/student/present.htm>



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