



Hydrologist

Job Description

Hydrologists research the effect and status of water, ranging from rain to snow, within an outdoor habitat. They work with other scientists to ensure that water supports both the people and environment of a region. Hydrologists achieve this by analyzing how water is distributed throughout a terrain, and then problem-solving to maintain ideal water flow conditions.

Salary

Entry — \$52,900

Middle — \$84,040

Top — \$130,030

Core Tasks

- Collect and analyze water samples from a stream or body of water
- Facilitate connections between the general public and water investigations conducted by scientists
- Track snow and stormwater patterns over the course of multiple years
- Research and install cutting edge technologies to support a region's water cycles
- Monitor progress towards water quality and community goals

Workplace / Environment

- **Work hours**
Approx. 40 hours/week
(At key milestones overtime work may be required to meet deadlines)
- **Environment**
Mix of work in the office and the field, using computers to **analyze data** and using mobile technology to **examine outdoor environments**
- **Travel**
Frequent visits to **outdoor site locations** to collect **samples** and **monitor equipment** set up in the field

Education / Prerequisites

Education Level

Bachelors or Masters degree in Hydrology or a Hydrology Concentration within Geosciences, Engineering or a related earth science program

Licensing

Certification sometimes required

Pre-Job Preparation

Field experience and classes in math, statistics, life science, and environmental government policy

Experience

Soft Skills

- Critical Analysis
- Systems Thinking
- Interpersonal Skills
- Persistency

Technical Skills

- Understanding of region-specific issues
- Computing water analysis software
- Physical Stamina
- Decent mathematics skills



Career Path: Jolyne Lea

About Me

Hydrologist for the USDA NRCS National Water & Climate Center

Bachelor's Degree in Natural Resources Management from the University of Connecticut

Master of Science in Watershed Management - Hydrology from the University of Nevada-Reno

Early Experiences

"I was in third grade, and I loved a science unit we had on **ecology**. That really stuck with me — it taught me how interrelated everything in nature was. I was also very interested in **animals** and **wildlife**. So, I took classes in high school focusing on the **sciences**, but I also took a lot of **Math, English** and **writing** classes too, which has become very valuable in my career."



Education Opportunities



"I went to the **University of Connecticut**, because that's where I grew up, and they had a major and classes in environmental sciences and my degree was in **Natural Resources Conservation**. The school's philosophy was to give you a broad education and a variety of natural resources

classes, so we learned about trees, plants, wildlife, water, and fish. It was really great to have that wide variety of classes so I could focus on what I wanted as a career."

"I graduated with a **concentration in Wildlife Management**, but I really liked my watershed management class. We were talking about the **watershed's** physical environment, and how the physical environment affects the animals and plants, and the water in the watershed itself. That really fascinated me. When I graduated there were **no jobs in wildlife management** — there was just nothing available."

Unexpected Turns

"I took a year off to earn money and decided that I would go back to graduate school at the **University of Nevada**, in Reno. One of my professors had told me, 'Well, you're really good in math. You should go into hydrology!' There were a lot of jobs in that field, and you will use your **math skills**. I also wanted to work **outside**, rather than in an office. So, I went into **Forest Hydrology**."

Defining Interests

"When I graduated, I first started working for the **Forest Service** at **Mount St. Helens**. We did a lot of work in the volcanic blast zone, helping the streams by **planting** riparian shrub and tree species all summer, and I also helped with the analysis of watersheds and measuring streamflow. That was a seasonal job — I could only work about six months out of the year. I was later hired on another forest in **central Idaho**. In that position I did a lot of work on **erosion along rivers**, and the preventing **sedimentation in salmon spawning grounds**."

"After that, I started my current job as a Hydrologist at the NRCS **National Water and Climate Center**, which I've been in for nearly 30 years. Our Center runs the snow survey and water supply forecasting program for the Western United States. My job is to take the snow and precipitation data that is collected by the states and use a model to forecast how much water supply will come from the melting snowpack."

About My Job

"Hydrology is used everywhere in our daily lives"

Pros

- "I love this job. Getting out and doing the **field work** is really fun. It's really good for me to have an on-the-ground look at the watersheds that I forecast for."
- "My job has broadened over the years, and I also provide climate information to our staff. This includes **helping people** know what **climate data** available and which products are created. There's one climate product that I create that's used in defining wetlands."
- "A lot of the people in my job work on **specific projects** and new technology, and that makes my job really interesting too. We do research to help in our own work or to further the science of hydrology. For example, I did a research project on snow depth, and presented the results in a paper at a science **conference**."

Cons

- "When we're working for the federal government, we're **not paid as well** as people working in the private sector. If I had my job in a private consulting company, I'd most likely be making more money. However, working for the federal government is very stable. We have good support and we have good benefits, such as vacation, sick leave and retirement."

Fieldwork

- "When I was working at the Forest Service, I worked outside almost all the time, all summer long. For my current job I work **outside two or three weeks** in the summer."
- "I do my **water supply forecasts** from January to June. Then, during the summertime, I have a few weeks to go out and I help state staffs and see watersheds — it's really important to understand how the watershed works. I take a look at the terrain and vegetative cover and see if there's anything going on in the watershed that could impact the water supply."
- "In the fall and winter, I'm busy doing model development and the **forecast** part of my job. I've gone out with others to do **snow surveys** occasionally."

Skills

- "A necessary soft skill for my job is being able to do **public speaking**. It's important to be able to relay complex scientific information to general audiences and the public."
- "In my position at the Center, we present quite a few technical professional papers to other scientists, so you really need to be able to do at least some type of **basic research** to be able to **present information** about your research findings."

Office Work

- "Most of my time is in the office, working on the computer with the **data** and **information** that others collect. Because the snow holds the water in the mountains all winter long into the spring, we can use the knowledge about the snow to help people have a good idea of how much water they're going to receive that year."
- "The most important thing that I found, and I use every day in my job, is **statistics**. Our water supply forecast models are based on a very basic statistical regression model."
- "One of my main duties is to be able to write **reports** and **papers**, and then also be able to present them. Sometimes it's easy for me to understand, but not really easy to explain."

Education/Experience

- "To get into this field, you need a **college education** with a minimum of a **bachelor's degree**."
- "In the federal government (this isn't true for private companies) there are requirements for what college classes you have to take for certain jobs. For my job, I had to have a year of **calculus**, a year of **physics**, and then have a related **Natural Resources, Hydrology, or Engineering** type of a degree."

The Future of **Hydrology**

"Water-related jobs are going to be much more valued"

"I think there's going to be a lot more people working in Hydrology. Water is one of our most valuable resources, and the changing environment causes many new water problems around the world. More extreme events are occurring, such as **droughts** and **floods** and there are concerns about **sea level rise**. I think water-related jobs are going to be much more valuable in the future and there'll be **more openings** in the hydrology field."

"There's really a lot of hydrology that hasn't had enough focus, and it would be valuable to increase our knowledge water. There's still a lot research and assistance that could be specialized to groups such as native **tribes**, or to certain aspects of the **watershed**, or to **coastal areas**, and of course, **mountain snow**. Hydrology is constantly changing and is impacted by **climate change**. There are other types of hydrology jobs that are expanding as well, such as **water quality** and **groundwater**. There are also needs for technical people to continue to provide measurements and data for our understanding of water. There's a lot of different **specialties** related to water."