## METEOROLOGY
### What can I do with this major?

<table>
<thead>
<tr>
<th>AREAS</th>
<th>EMPLOYERS</th>
<th>STRATEGIES</th>
</tr>
</thead>
</table>
| WEATHER FORECASTING (non-media) | Government:  
National Oceanic and Atmospheric Administration (NOAA) including the National Weather Service (NWS)  
Military Services:  
- Navy and Air Force  
- National Aeronautics and Space Administration (NASA):  
  - Goddard Institute for Space Studies (GISS)  
  - Goddard Space Flight Center (GSFC)  
- Department of Energy  
- Department of Agriculture  
- Department of Defense  
- Department of Homeland Security  
Utility and power companies  
Renewable energy companies (wind and solar)  
Large shipping companies  
Private consulting firms that support:  
- Agriculture (farmers, ranchers)  
- Ocean shipping agencies  
- Cruise lines  
- Highway departments  
- Ground shipping companies (truck and rail)  
- Commodities traders  
- Recreational areas and resorts  
- Airlines  
- Energy related companies  
- Insurance companies  
- Airlines  
- Insurance industry  
- NGOs (Red Cross, World Food Bank, etc.) | Build a strong theoretical background in meteorology and practical experience in forecasting.  
Take classes in computer programming and obtain programming experience through internships and summer jobs.  
Be aware that weather forecasting is a 24/7 activity and some jobs will require shift work or unpredictable hours.  
Consider developing a portfolio by writing papers about local weather events, attending conferences and training, and completing additional college coursework.  
Be prepared to serve as a liaison and voice to the community  
Plan to take classes in communication, technical writing, speaking and listening.  
Seek internships and summer opportunities to develop skills in real-world applications and to make connections.  
Participate in as many on-campus forecasting activities as possible (forecasting game, forecasting for the local community, etc.) |
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<tbody>
<tr>
<td><strong>MEDIA WEATHER FORECASTING</strong></td>
<td>Networks and cable channels</td>
<td>Build a strong theoretical background in meteorology and practical experience in forecasting.</td>
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<tr>
<td>Television broadcasting</td>
<td>Small market television stations</td>
<td>Take classes in computer programming and obtain programming experience through internships and summer jobs.</td>
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<tr>
<td>Radio broadcasting</td>
<td>Private weather firms that supply weather forecasts to newspapers, radio, television, cable companies, and supply forecasts and forecasting/graphic systems to broadcasters and digital media companies</td>
<td>Develop strong public speaking and presentation skills.</td>
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<tr>
<td>Internet broadcasting</td>
<td></td>
<td>Be prepared to serve as a liaison and voice to the community.</td>
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<td>Forecasts for digital media</td>
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<td>Take classes in journalism and broadcasting to supplement your skills for this career path.</td>
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<td>Become familiar with computer software for forecasting and web design.</td>
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<td>Consider applying for The American Meteorological Society Certified Broadcast Meteorologist program.</td>
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<td>Actively seek internships and summer opportunities to develop skills in real-world applications and to make connections.</td>
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<td>Participate in as many on-campus forecasting activities as possible (forecasting game, forecasting for the local community, etc.).</td>
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<th>CONSULTING/INFORMATION SERVICES</th>
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<tr>
<td>Weather information systems</td>
<td>Build a strong theoretical background in meteorology and practical experience in forecasting.</td>
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<tr>
<td>Forensic meteorology</td>
<td>Take classes in computer programming and obtain programming experience through internships and summer jobs.</td>
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<tr>
<td>Weather forecasting</td>
<td>Acquire additional skills in office applications such as Excel, Word, PowerPoint, and GIS applications.</td>
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<tr>
<td>Climatology</td>
<td>Seek knowledge of environmental regulations, laws and applications which may be needed for this specialization.</td>
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<td>Risk assessment</td>
<td>Develop strong communication skills for presenting reports and meteorological analyses to clients.</td>
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<tr>
<td>Decision support</td>
<td>Consider pursuing graduate studies to advance in this field.</td>
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<tr>
<td>Private weather firms that provide services to:</td>
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<tr>
<td>CONSULTING/INFORMATION SERVICES cont’d</td>
<td>Investigate earning an MBA which may be beneficial when assisting firms with business decisions in private industry. Consider applying for The American Meteorological Society Certified Consulting Meteorologist program. Actively seek internships and summer opportunities to develop skills in real-world applications and to make connections. Participate in as many on-campus forecasting activities as possible (forecasting game, forecasting for the local community, etc.).</td>
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**AIR AND ENVIRONMENTAL QUALITY**
Environmental assessments and permitting
Climatology
Air pollution
Risk assessment
Ambient monitoring
Specialized studies (photochemical modeling, acid rain, global warming)
Wildfire mitigation
Facilities management and sustainability

Government:
- U.S. Environmental Protection Agency (EPA) and state environmental agencies
- Military Services:
  - Navy and Air Force
  - National Aeronautics and Space Administration (NASA):
    - Goddard Institute for Space Studies (GISS)
    - Goddard Space Flight Center (GSFC)
- Department of Energy
- Department of Agriculture
- Department of Defense
- Department of Homeland Security
- Research laboratories
- Universities and colleges
- Private-sector consulting firms
- Non-profit environmental organizations

Build a strong theoretical background in meteorology and practical experience in forecasting. Take classes in computer programing and obtain programming experience through internships and summer jobs. Develop additional skills in office applications such as Excel, Word, PowerPoint, and GIS applications. Conduct research with professors or scientists in the field. Stay abreast of current technologies, regulations, and statutes related to air quality. Join community groups or service organizations that focus on environmental awareness; attend public meetings. Actively seek internships and summer opportunities to develop skills in real-world applications and to make connections. Take air-pollution related electives to help build knowledge of the industry, issues, and technologies.
### EMPLOYERS

- National Aeronautics and Space Administration (NASA):
  - Goddard Institute for Space Studies (GISS)
  - Goddard Space Flight Center (GSFC)
- National Oceanic and Atmospheric Administration (NOAA)
- Manufacturers of meteorological instruments
- Engineering firms
- Satellite and radar manufacturers
- Renewable energy companies

### STRATEGIES

- Build a strong theoretical background in meteorology and practical experience in forecasting.
- Take classes in computer programming and obtain programming experience through internships and summer jobs.
- Seek knowledge in areas such as computer science, electronics, optics, or radiative transfer.
- Develop strong technical skills required for operating electronic instrumentation and meteorological observational sensors.
- Take classes in engineering and design.

### AREAS

**ATMOSPHERIC INSTRUMENTATION**
- Meteorological software
- Monitoring parameters (temperature, wind velocity, humidity, etc.)
- Atmospheric chemistry sampling (of carbon dioxide, oxides of nitrogen, etc.)
- Remote-sensing operations
- Radar and Lidar
- Satellite imagery
- Equipment repair
- Mobile technologies

**RESEARCH**
- Climate science
- Weather systems
- Air-sea interactions
- Atmospheric chemistry and aerosol transport
- Polar meteorology
- Geophysical fluids dynamics
- Boundary layer meteorology
- Heliophysics
- Geophysics
- Hydrology
- Oceanography

**UNIVERSITIES AND COLLEGES**
- University affiliated research laboratories:
  - University of Wisconsin Space Science Engineering Center (SSEC)
  - MIT-Lincoln Labs
  - Cooperative Institute for Mesoscale Meteorology (CIMMS)
  - Cooperative Institute for Environmental Studies (CIRES)
  - National Center for Atmospheric Research (NCAR)
- Government:
  - National Oceanic & Atmospheric Administration (NOAA) including the National Weather Service (NWS)
  - National Aeronautics and Space Administration (NASA):
    - Goddard Institute for Space Studies (GISS)
    - Goddard Space Flight Center (GSFC)
    - Langley Research Center
    - Marshall Space Flight Center
- Military Services:
  - Navy and Air Force
- Professional and technical journal publishers
- Private weather research companies

**MANUFACTURERS OF METEOROLOGICAL INSTRUMENTS**

**ENGINEERING FIRMS**

**SATTELITE AND RADAR MANUFACTURERS**

**RENEWABLE ENERGY COMPANIES**

**GOVERNMENT**
- National Oceanic and Atmospheric Administration (NOAA) including the National Weather Service (NWS)
- National Aeronautics and Space Administration (NASA):
  - Goddard Institute for Space Studies (GISS)
  - Goddard Space Flight Center (GSFC)
  - Langley Research Center
  - Marshall Space Flight Center
- Military Services:
  - Navy and Air Force

**PRIVATE WEATHER RESEARCH COMPANIES**

**PROFESSIONAL AND TECHNICAL JOURNAL PUBLISHERS**

**PRIVATE WEATHER RESEARCH COMPANIES**

**MILITARY SERVICES**
- Navy and Air Force

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<tr>
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<td>Research</td>
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<tr>
<td>Universities and colleges</td>
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<td>Pre-K-12 schools</td>
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<td>Take classes in computer programming and obtain programming experience through internships and summer jobs.</td>
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<td>Consider obtaining a higher degree which will help you advance in this field.</td>
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<td>Research funding options such as assistantships or fellowships to help with tuition during graduate study.</td>
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<td>Meteorology is rarely taught as a stand-alone subject in schools Pre-K-12. If you plan on teaching this subject at this academic level, prepare to become a physics, earth, or general sciences teacher.</td>
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<tr>
<td>Gain experience working for students of your target population.</td>
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<td>Get certification/license to teach in the state in which you will live and work.</td>
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<tr>
<td>Complete a master’s degree for community college teaching and a Ph.D. for university level teaching.</td>
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### GENERAL INFORMATION

- Foster an inquisitive mind and imagination.
- Develop analytical skills and computer skills. An aptitude for math and science is critical.
- Consider majors such as meteorology, physics, engineering, or a science related disciplines to enter this field.
- Get experience in computer languages such as FORTRAN, C/C++, Python, and/or IDL within a UNIX environment.
- Take part in an internship, co-op, or development program with the National Weather Service (NWS).
- Look into gaining an assistantship or fellowship to help with tuition during graduate study.
- The NWS provides opportunities to pursue graduate studies through certain programs and also work for a full salary.
- Be prepared to work around the clock on evening, weekends and even holidays.
- Expect to work independently, as many meteorologists work in isolation for long amounts of time.