



Penn State Department of Meteorology and Atmospheric Science

Dr. Jon Nese
j2n@psu.edu
@jmnese

Associate Head,
Undergraduate Programs

June 29, 2023





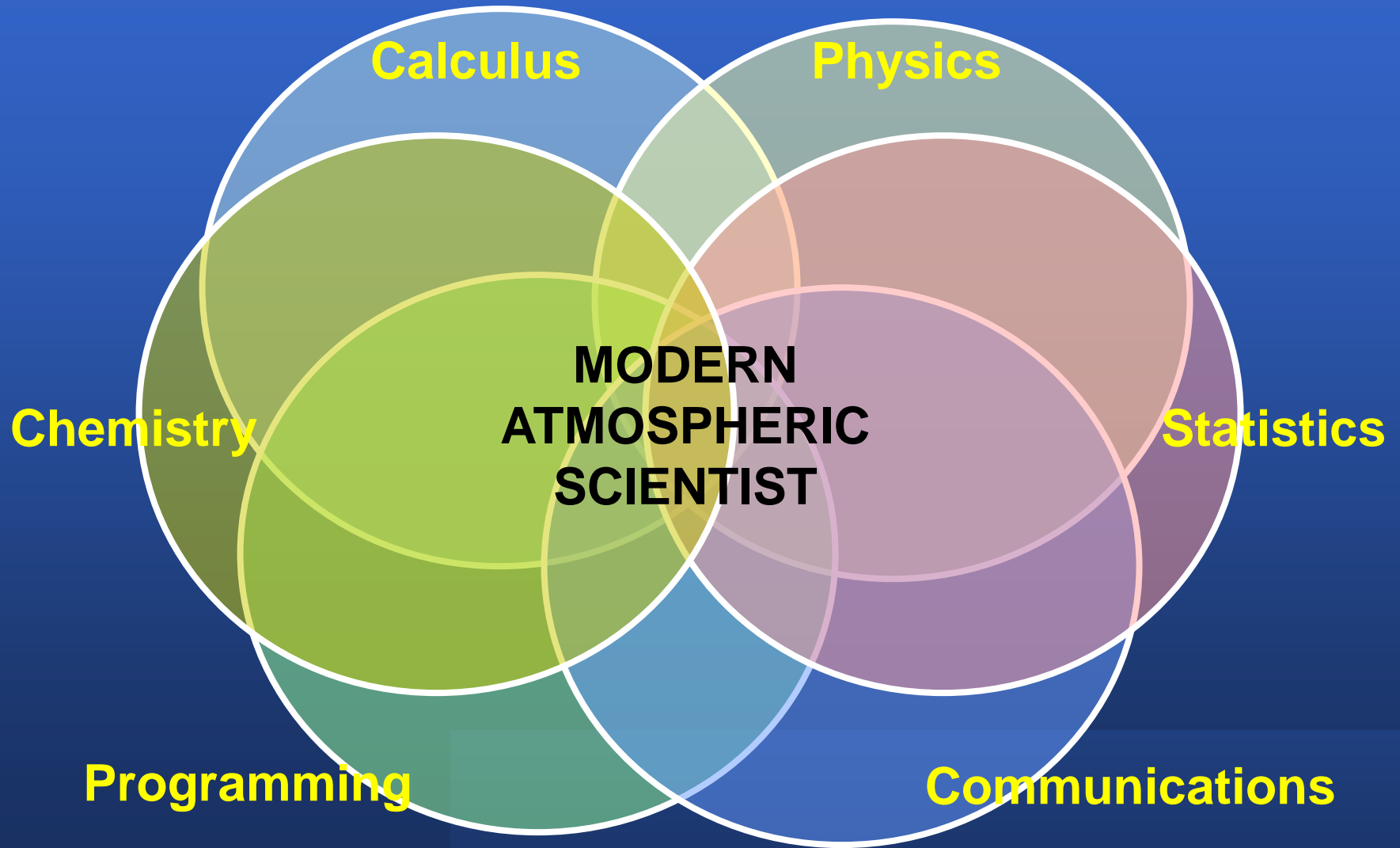
Meteorology and Atmospheric Science

Modern atmospheric scientists do a lot more than just forecasting on TV !

We work in air quality, data analysis, risk management, scientific programming, environmental planning, energy forecasting, commodity trading, remote sensing, emergency management, forensic science, and a whole host of other applied fields!



Atmospheric Science





If you look at the job title of recent graduates of our department, “meteorologist” is the most common word in their titles (no surprise, right?) What is the second most common word in the job title of our recent graduates?

- a. teacher
- b. risk
- c. analyst
- d. writer



Who is “officially” a meteorologist?

AMERICAN METEOROLOGICAL SOCIETY

[About](#) | [Affiliations](#) | [Contact](#) | [FAQ](#) | [Science, Service, Society](#) | [Search](#) | [Volunteer](#)

[Education](#) | [Career Center](#) | [Exhibits](#) | [Meetings](#) | [Member Services](#) | [News](#) | [Policy Program](#) | [Publications](#) | [Students](#)

Professional Guideline on Use of the Term “Meteorologist”

While members of the American Meteorological Society (AMS) span a variety of scientific and other disciplines related to meteorology, the Society is occasionally asked to clarify, specifically, the use of the term “meteorologist.” A meteorologist is an individual with specialized education who uses scientific principles to observe, understand, explain, or forecast phenomena in Earth’s atmosphere and/or how the atmosphere affects Earth and life on the planet. This specialized education is most typically in the form of a bachelor’s or higher degree in, or with a major or specialization in, meteorology or atmospheric science consistent with the AMS Statement on a Bachelor’s Degree in Atmospheric Science.

There are cases where an individual has not obtained a degree in meteorology or atmospheric science but has gained sufficient knowledge through coursework and/or professional experience to successfully fill professional positions, such as military weather forecasters or positions typically held by degreed meteorologists. These individuals can also be referred to as meteorologists. This includes individuals who have obtained and maintain either the AMS Radio or Television Seal of Approval or the AMS Certified Broadcast Meteorologist designation. Individuals who have little formal education in the atmospheric sciences, and who disseminate weather information and forecasts prepared by others, are properly designated weathercasters.

[This guideline was adopted by the AMS Council on 20 September 2012, and remains in force until modified by the Council.]



What's the average number of students per year who graduate from the Penn State Meteorology and Atmospheric Science program with a B.S. degree?

a. 25

b. 34

c. 42

d. 50

What's important as you consider where to go to college?

Faculty
Curriculum
Facilities
Reputation
Alumni
Cost

Extracurriculars



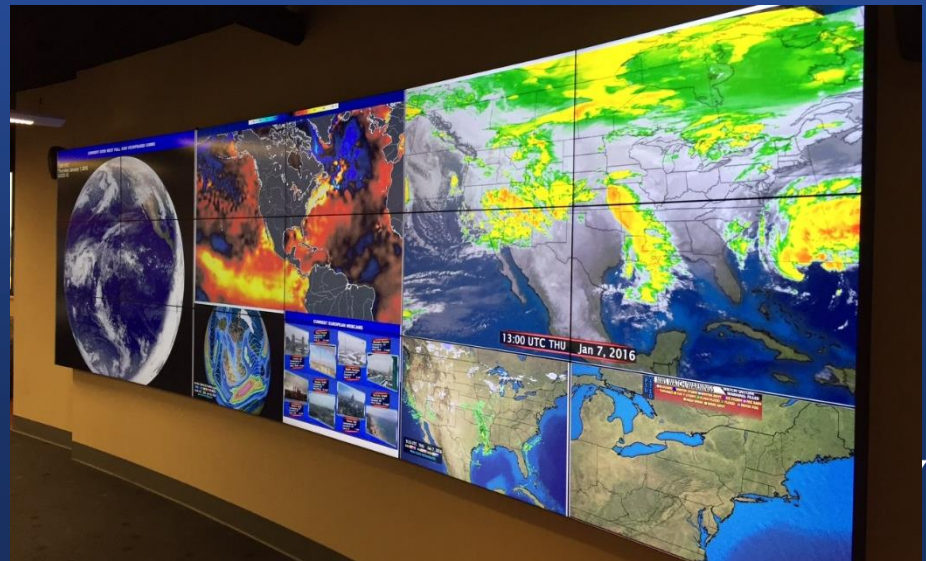


Walker Building

Home of the Penn
State Department of
Meteorology and
Atmospheric Science
since 1977

4th, 5th, 6th floors &
Basement Labs

6th floor Myers
Weather Center





**Approximately how many degrees
(BS + MS + PhD) has the Penn State
Department of Meteorology and
Atmospheric Science granted in its history?**

a. 1500

b. 3000

c. 4000

d. 6000



Penn State Department of Meteorology and Atmospheric Science

Students

- ☉ At any given time, about 200 undergraduates and 60 graduate students.
- ☉ Typical upper-division Meteorology class will have 10-30 students.
- ☉ Graduate ~45 B.S. per year ... Since 1942, ~3000 B.S. degrees, 750 M.S. and 230 PhD.
- ☉ Our alumni are EVERYWHERE!





Penn State Department of Meteorology and Atmospheric Science

- ☉ Required: Meteorology (9-10 courses), Calculus (4), Physics (2), Comp Sci, Statistics, Chemistry
- ☉ Plus professional electives (significant flexibility)
- ☉ **Five “Options” available:**
 - ☉ Atmospheric Sciences
 - ☉ Environmental Meteorology
 - ☉ Weather Forecasting and Communications
 - ☉ Weather Risk Management
 - ☉ “General” Option



Which of the following is NOT a course offered by the Penn State Department of Meteorology and Atmospheric Science?

- a. Planetary Atmospheres
- b. Weather Risk and Financial Markets
- c. Physical Oceanography
- d. Satellite Climatology



Penn State Department of Meteorology and Atmospheric Science

Sampling of Professional Electives

- ☉ Tropical Meteorology
- ☉ Weather Risk and Financial Markets
- ☉ Planetary Atmospheres
- ☉ Computer Methods of Meteorological Analysis
- ☉ Professional Development in the Atmospheric Sciences
- ☉ Advanced Forecasting
- ☉ Radar Meteorology
- ☉ Atmospheric Chemistry and Cloud Physics
- ☉ Introduction to Physical Oceanography
- ☉ Weather Communications I & II & III





Penn State Meteorology

SPOTLIGHT on a COURSE:

Professional Development in the Atmospheric Sciences

- Entrepreneurship
- Interviewing skills
- Career planning
- Financial literacy
- Getting Into Graduate School
- Professionalism and ethics in the workplace
- Resumes, Cover Letters, Letters of Recommendation
- “Alumni Days” with visits from 10-15 alums
- Alumni Interview Project (many additional alums involved)



Penn State Department of Meteorology and Atmospheric Science

Our Faculty spans a wide variety of specialties ranging from atmospheric chemistry, turbulence, remote sensing, synoptic meteorology, and cloud physics to climate science, mesoscale meteorology, numerical weather prediction, severe storms, and radar meteorology.





In academic year 2022-23, how many different faculty taught Meteorology and Atmospheric Science courses at Penn State?

a. 16

b. 21

c. 26

d. 32



Career Opportunities

[OOH HOME](#) |
 [OCCUPATION FINDER](#) |
 [OOH FAQ](#) |
 [HOW TO FIND A JOB](#) |
 [A-Z INDEX](#) |
 [OOH SITE MAP](#)

OCCUPATIONAL OUTLOOK HANDBOOK

[Go](#)

Atmospheric Scientists, Including Meteorologists

[PRINTER-FRIENDLY](#)
[Summary](#)
[What They Do](#)
[Work Environment](#)
[How to Become One](#)
[Pay](#)
[Job Outlook](#)
[State & Area Data](#)
[Similar Occupations](#)
[More Info](#)

Summary

Quick Facts: Atmospheric Scientists, Including Meteorologists

2021 Median Pay ?	\$94,570 per year \$45.47 per hour
Typical Entry-Level Education ?	Bachelor's degree
Work Experience in a Related Occupation ?	None
On-the-job Training ?	None
Number of Jobs, 2021 ?	9,100
Job Outlook, 2021-31 ?	4% (As fast as average)
Employment Change, 2021-31 ?	300



What Atmospheric Scientists, Including Meteorologists Do

Atmospheric scientists study, report on, and forecast the weather and climate.

Source: Bureau of Labor Statistics



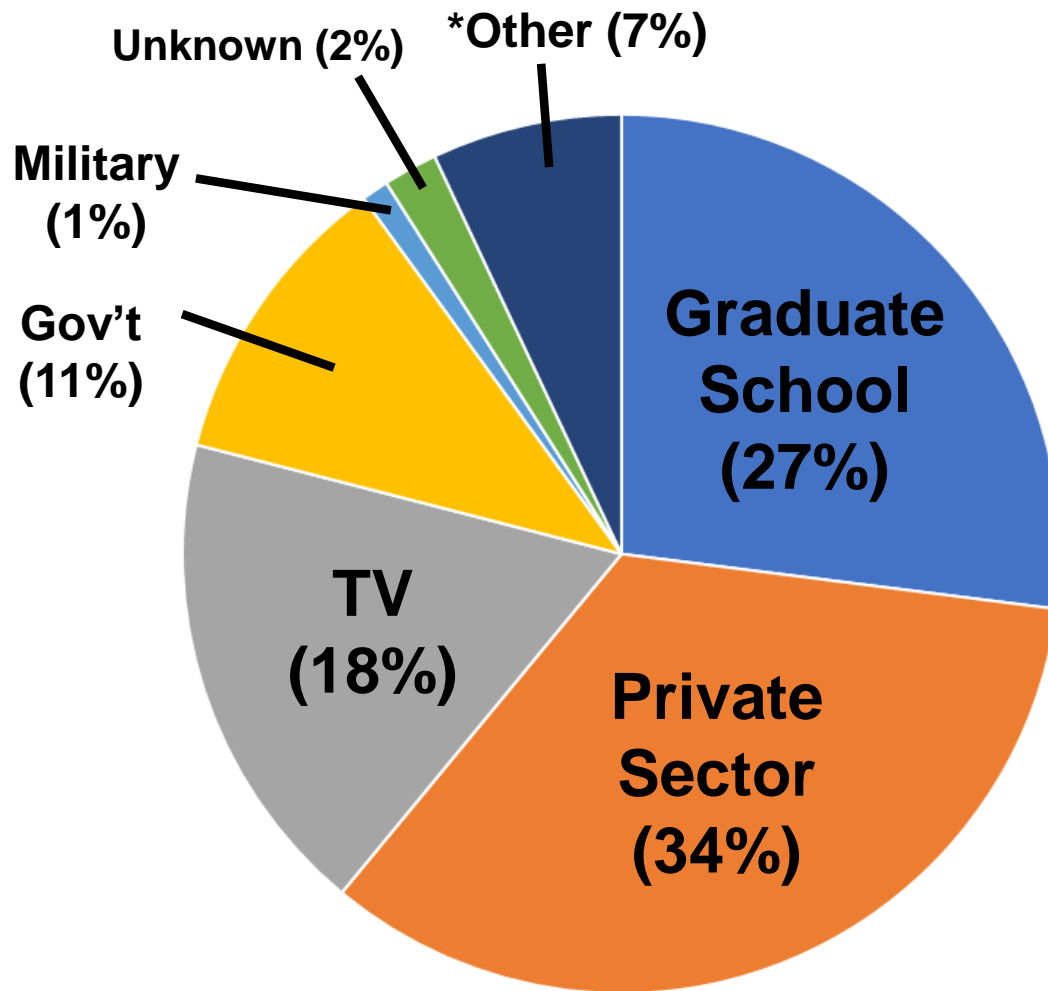
What Do our B.S. Graduates Do?

In order of popularity ...

- Work in the Private Sector
- Go to Graduate School (pursue M.S. or Ph.D)
- Work in Television (10-20%)
- Work in the Public Sector (government)
- Go into the Military
- Work in Education



B.S. graduates ... post-graduation?



Includes all
123 B.S.
graduates
from the
classes of
2018-2020

* Other = Working, but not in scientific field.

Private Sector



- Highest-paying entry level positions with a BS in Meteorology
- Typical initial salaries \$30-60 K, depending on your skill sets
- Huge variety of employers in fields such as forecasting, energy trading, air quality consulting, climate consulting, risk management, web development, meteorological programming, and data analysis



Graduate School

- In the sciences, your tuition is usually paid and you receive a stipend when pursuing an M.S. or PhD.
- To get into graduate school, you need (at the very least) excellent grades as an undergraduate and a couple good recommendation letters.



- At Penn State, a few students per year are accepted into our IUG (Integrated Undergraduate Graduate) Program: B.S. & M.S. in 5 years.
- Graduates of Penn State are consistently held in high regard for admittance to grad school at other universities.



Approximately how many Penn State Meteorology alumni are currently doing TV weather somewhere in the United States?

- a. 85
- b. 105
- c. 150
- d. 180



Television

- Entry level jobs typically \$25-35K, but sky's the limit at the upper end !
- Entry level positions often require reporting as well as doing weather.

Currently ~145 PSU Meteorology graduates doing commercial TV



- Entry level examples: WEAU (Eau Claire, WI), WPSD (Paducah, KY), WBTW (Myrtle Beach, SC), WNDU (South Bend, IN), WGEM (Quincy, IL)
- Later ... KYW (Philadelphia), Weather Channel (3), WCBS (NYC), KTNV (Las Vegas), KDFW (Dallas), WHDH (Boston), WRC (Washington, DC), WPLG (Miami), WAGA (Atlanta), WLS (Chicago)



**Approximately how many U.S.
National Weather Service (NWS)
offices are there?**

- a. 25
- b. 60
- c. 100
- d. 125



Government

Meteorologist, GS-1340-05/07/09 (DE/CR)

National Oceanic and Atmospheric Administration

Department of Commerce

College Park, Maryland

Open 03/21/2022 to 04/04/2022

Starting at \$40,883 (GS 05-09)

Permanent • Full-time

Meteorologist, GS-1340-05/07/09 (MAP)

National Oceanic and Atmospheric Administration

Department of Commerce

College Park, Maryland

Open 03/21/2022 to 04/04/2022

Starting at \$40,883 (GS 05-09)

Permanent • Full-time

Openings posted at usajobs.gov ... very competitive ...
need to get some experience as an undergraduate

Pathways program or **summer internship** is gateway to full-time NWS employment ... there is a NWS office here !!



Extra, Extra: Outreach & Organizations

- ☞ Campus Weather Service ... @PSUWeather is #1 Student-run Meteo Department Twitter account
- ☞ Clubs: PSUBAMS, Weather Risk, PSU Chase
- ☞ Weather World, Weather or Not, Centre County Report
- ☞ Accuweather and a NWS office are in State College

**STATE COLLEGE IS A GREAT TOWN
FOR WEATHER WEENIES !!**



Advice for a high school student interested in pursuing a college degree in Atmospheric Science

- The more math you take in high school, the better ... same for physics. You want to become a problem solver!
- Employers are looking for strength in a second skill – for example, computer programming, chemistry, or communications – and love students who can write well!



More general advice for a high school student that will benefit you no matter what you do

Learn:

- Public speaking
- Writing well
- How to tell a story
- Good manners
- Critical thinking (how to assess the validity of a claim)
- Networking



Penn State Meteorology and Atmospheric Science

[@psumeteo](http://www.met.psu.edu)

Dr. Jon Nese
j2n@psu.edu
@jmnese

