Meteorologist

Job Description

Meteorology is an observational science. Meteorologists are involved in the study of the causes of particular weather conditions from information obtained from the land, sea and upper atmosphere.

They use computerised and mathematical models designed to make short- and long-range forecasts concerning weather and climate patterns. Among those who use meteorological forecasts are:

- organisations and individuals involved in air travel/transport;
- organisations and individuals involved in shipping/sailing/sea fishing;
- the armed forces;
- farmers;
- public services;
- the media;
- retail businesses.

In addition to forecasting, meteorologists study the impact of the weather on the environment. They also research weather patterns and climate change and perfect models of weather prediction.

Typical Work Activities

A meteorologist's work falls into two main categories:

- forecasting;
- research.

In weather forecasting, typical work activities involve:

- collecting data from satellite images, radar, remote sensors and weather stations all over the world, and supplying this information to customers in the form of weather briefings;
- coordinating information and measuring factors such as air pressure, temperature and humidity at various atmospheric levels;
- coding weather reports for transmission over international networks;
- applying physical and mathematical relationships and sophisticated computer models to make short- and long-range weather forecasts;
- liaising with colleagues and clients from around the country and worldwide.

In research, typical work activities include:

- investigating subjects such as: airflow in the lowest kilometre of the atmosphere; the physics of clouds and precipitation; global climate change; and the development of numerical models to predict atmospheric processes;
- improving computer models for forecasting to increase accuracy;
- developing and using models of the atmosphere, oceans and other climate system components;
- monitoring climate variability and change;
- researching seasonal forecasting, ocean forecasting and climate prediction;
- monitoring and investigating changes in the stratosphere (10-50km above the Earth), including the ozone layer;
- applying the results of research in order, for example, to give flood warnings or estimate the likely effects of global warming.

Work Conditions

- The largest employer of meteorologists is the Met Office (www.metoffice.com), where salaries for graduates start at around £18,500 (job level 4). The next step is job level 3, where the salary is £24,480 (salary data collected Nov 07).
- Met Office forecasters work shifts due to the fact that forecasts need to be provided 24/7. Researchers typically work nine to five, possibly with some extra hours. Meteorologists working in the field are unlikely to have standard hours.
- Many meteorologists work in comfortable, spacious environments, but some work in remote areas, such as the Antarctic, or on military operations where conditions can be more basic. Instrument and measurement scientists often work in the field.
- For forecasters working on television, a smart appearance is essential.
- Many jobs are concentrated at the Met Office headquarters in Exeter, but you may be required to move around the country to regional weather centres if necessary. The Met Office also has bases throughout the world.
- Travel within a working day is uncommon. Absence from home overnight and overseas work may be required, for example to attend conferences, depending on the post held.
- Operational meteorologists working for the Mobile Met. Unit (MMU) (www.metoffice.gov.uk/defence/mmu.html) are attached to the Royal Air Force (RAF) and may be deployed around the world.

Entry Requirements

Most entrants to this work are graduates, with many holding higher degrees. Degree subjects most acceptable for entry include:

- mathematics;
- physics;
- computer science/software engineering;
- meteorology;
- oceanography;
- environmental science (physical).

The Met Office (www.metoffice.com) usually asks for a first or 2:1 degree in a science degree which incorporates the physical sciences and good A-level passes in physics and mathematics (or the equivalent), especially for research posts. Employers may prefer degrees in physics and mathematics, or subjects containing a strong element of these, for example computer science, electronics and physical oceanography. Graduates in subjects such as physical geography, or those containing physical elements of environmental science, may also be considered if their degree subject is combined with physics and mathematics and a Masters or relevant PhD.

Entry with HND/foundation degree only is unusual. However, entry into the Mobile Met. Unit (MMU) (www.metoffice.gov.uk/defence/mmu.html) as a forecaster is possible with a minimum of two A-levels, including maths and/or physics, five GCSEs, including maths and English language (or equivalent qualifications), and a full driving licence. The MMU is a unit of Met Office forecasters who are commissioned as reserve officers in the Royal Air Force (RAF). You must also be able to meet specified medical and fitness standards.

Postgraduate study is necessary for working in research posts and although not essential for other types of work, it may increase your chances of entry.

Try to gain relevant experience or project work. The Met Office offers a small number of highly competitive summer and industrial placements. Summer placements last for approximately three months between May and October. An industrial placement will be for up to 48 weeks as part of your university course.

Computer modelling is a major part of a meteorologist's work. Try to gain some experience of this, either through relevant work experience or by completing a project which has computer modelling as a strong component as part of your undergraduate degree.

Candidates should be able to show evidence of the following:

- good problem-solving ability;
- a team orientated approach to work;
- the ability to deal with a wide range of people - this is especially important in the more customer/commercially orientated environment of operational forecasting;
- mathematical and computational ability;
- excellent communication skills;
- attention to detail and accuracy;
- ability to write scientific reports;
- adaptability;
- enthusiasm and a genuine interest in meteorology and the environment.

It is illegal for employers to discriminate against candidates on the grounds of age, gender, race, disability, sexual orientation or religious faith. For more information on equality and diversity in the job market see Handling Discrimination (www.prospects.ac.uk/links/discrimination). The Met Office displays the two ticks symbol and encourages applications from people with disabilities.

Training

The majority of meteorologists in the UK start their careers with the Met Office (www.metoffice.com), which has its own training facilities. There is an initial training period of six months which takes place at the Met Office college.

Training for meteorologists covers the following areas:

- forecasting;
- numerical weather prediction;
- general meteorology.

Following this, ongoing training is actively encouraged and is considered to be a vital part of career development. Training might include courses on programming, mathematical modelling, graphics and presentation skills.

Some meteorologists are given sponsorship to study for an MSc, MPhil or PhD.

In addition, the Royal Meteorological Society (www.rmets.org) organises professional meetings and also provides a route to qualification as a chartered meteorologist.

If you work in academic research, you will be expected to have sufficient research skills and be able to make an immediate contribution. Part of your ongoing development will be to keep up to date with advances in the field by reading the appropriate literature, attending and presenting at conferences and networking with colleagues.

Career Development

The majority of meteorologists in the UK are employed by the Met Office (www.metoffice.com) and most entrants to this field of work look to develop their careers there, not least as it actively encourages the training and development of its staff. There are also opportunities for collaborative work with other organisations throughout the world.

The Met Office encourages its staff to manage their own careers and to apply for posts within the organisation to broaden their experience and widen their skills and knowledge base. It is possible to move between functions, such as research, forecasting, teaching, personnel and more commercial roles. Most positions are located at the Met Office headquarters, but entrants to forecasting positions must be willing to move around the country to regional weather centres in order to progress.

Movement to other roles away from the Met Office is also possible: some meteorologists move into research functions with the Natural Environment Research Council (NERC) (www.nerc.ac.uk) or within university departments. With experience, others may progress to management positions, such as project or team leader, or into a training role.

In forecasting roles, meteorologists may develop their careers with organisations such as environmental consultancies, utility companies, or television or radio broadcasters - profiles of BBC weather forecasters are available at BBC (www.bbc.co.uk) > Weather.

Membership of relevant professional bodies, such as the Royal Meteorological Society (www.rmets.org), can help career development. Meteorologists can progress to chartered status, for which there are various criteria, including the requirement of relevant practical experience and a minimum of five years' recent work at an appropriate professional level (a meteorology PhD may count as two years).

Typical Employers

The largest employer of meteorologists in the UK is the Met Office (www.metoffice.com), an executive agency of the Ministry of Defence (MoD) (www.mod.uk), incorporating the Hadley Centre for Climate Prediction and Research (www.met-office.gov.uk/research/hadleycentre), a world-renowned centre for advanced climate modelling and monitoring. The Met Office headquarters are in Exeter, but there are many smaller offices in other parts of the UK and overseas. A subsidiary of the Met Office is the Mobile Met. Unit (MMU) (www.metoffice.gov.uk/defence/mmu.html), whose staff are attached to Royal Air Force (RAF) units and may be employed throughout the world on both military exercises and operations.

Other employers of meteorologists include:

- government departments, such as the Environment Agency (EA) (www.environment-agency.gov.uk);
- research centres, such as the Natural Environment Research Council (NERC) (www.nerc.ac.uk); the National Centre for Atmospheric Science (NCAS) (www.ncas.ac.uk/); the British Antarctic Survey (BAS) (www.antarctica.ac.uk/); the Dundee Satellite Receiving Station (www.sat.dundee.ac.uk/); and the Walker Institute for Climate System Research (www.walker-institute.ac.uk);
- UN technical aid programmes - see the World Meteorological Organization (WMO) (www.wmo.int/) website for a list of its partner organisations;
- agricultural and fisheries institutes;
- service industries, such as oil, gas and water suppliers;
- environmental consultancies - see the ENDS Environmental Consultancy Directory (www.endsdirectory.com/search/) for a list;
- private companies who provide weather forecasting services, such as the European Centre for Medium-Range Weather Forecasts (ECMWF) (www.ecmwf.int) and Meteo Group (www.meteogroup.co.uk);
- the BBC (www.bbc.co.uk) and other media companies.

Sources of Vacancies

- Met Office (www.metoffice.com);
- National Centre for Atmospheric Science (NCAS) (www.ncas.ac.uk/) (> Opportunities) - see listings and sign up for email notification of vacancies;
- New Scientist (www.newscientist.com);
- Nature (www.nature.com/nature/index.html);
- The Guardian (www.guardian.co.uk);
- Jobs.ac.uk (www.jobs.ac.uk);
- Civil Service Recruitment Gateway (www.careers.civil-service.gov.uk).

Recruitment agencies rarely handle vacancies.

Related Occupations

- Environmental consultant
- Geographical information systems (GIS) officer
- Geophysical data processor
- Hydrogeologist
- Hydrographic surveyor
- Hydrologist
- Oceanographer
- Research scientist (physical sciences)

Information Sources

Bibliography

AGCAS and Graduate Prospects products are available from higher education careers services.

AGCAS Publications

Environment and Agriculture Sector, AGCAS Sector Briefing
Handling Discrimination, AGCAS Information Booklet
Options with Computer Science/Information Technology, AGCAS Options Series
Options with Environmental Science, AGCAS Options Series
Options with Mathematics, AGCAS Options Series
Options with Physics, AGCAS Options Series
Science Sector, AGCAS Sector Briefing

Other Publications

The Guardian, Guardian Newspapers Ltd, Daily
Nature, Nature Publishing Group (NPG), Weekly
New Scientist, Reed Business Information, Weekly

Websites

BBC, www.bbc.co.uk
Civil Service Recruitment Gateway, www.careers.civil-service.gov.uk
Dundee Satellite Receiving Station, www.sat.dundee.ac.uk/
ENDS Environmental Consultancy Directory, www.endsdirectory.com/search/
European Centre for Medium-Range Weather Forecasts (ECMWF), www.ecmwf.int
Hadley Centre for Climate Prediction and Research, www.met-office.gov.uk/research/hadleycentre
Jobs.ac.uk, www.jobs.ac.uk
Meteo Group, www.meteogroup.co.uk
Mobile Met. Unit (MMU), www.metoffice.gov.uk/defence/mmu.html
National Centre for Atmospheric Science (NCAS), www.ncas.ac.uk/
Walker Institute for Climate System Research, www.walker-institute.ac.uk
World Meteorological Organization (WMO), www.wmo.int/

Addresses

British Antarctic Survey (BAS), High Cross, Madingley Road, Cambridge CB3 0ET Tel: 01223 221400 URL: www.antarctica.ac.uk/

Environment Agency (EA), Visit the EA website to check for details of regional offices Tel: 08708 506 506 URL: www.environment-agency.gov.uk

Institute of Physics, 76 Portland Place, London W1B 1NT Tel: 020 7470 4800 URL: www.iop.org

Met Office, FitzRoy Road, Exeter, Devon EX1 3PB Tel: 0870 900 0100 URL: www.metoffice.com

Ministry of Defence (MoD), Main Building, Whitehall, London SW1A 2HB Tel: 020 7218 9000 URL: www.mod.uk

Natural Environment Research Council (NERC), Polaris House, North Star Avenue, Swindon SN2 1EU Tel: 01793 411500 URL: www.nerc.ac.uk

Royal Meteorological Society, 104 Oxford Road, Reading, Berkshire RG1 7LL Tel: 0118 956 8500 URL: www.rmets.org

SEMTA: the Sector Skills Council for Science, Engineering and Manufacturing Technologies, Head Office, 14 Upton Road, Watford WD18 0JT Tel: 01923 238 441 URL: www.semta.org.uk

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