WHAT WILL YOUR STUDIES TAKE YOU?

EAE will qualify you for many exciting careers as future leaders in applied or fundamental science, in industry or academia. Earth Scientists earn some of the highest graduate salaries, even higher than Medicine, Law and Economics.

Your Career Network

We have our eye on your future and we work collaboratively with industry so our students develop an early link with real-world problems.


WHAT YOU’LL STUDY

The majors offered are Earth Science (consisting of 3 streams), Atmospheric Science, and extended majors in Earth Science and Geographical Science. There are many elective units to choose from. Environmental and climate units offered by EAE also form part of the Environmental Science extended major managed by the School of Biological Sciences. For further details about the units you will study, as well as the electives available, visit the handbook: monash.edu/pubs/ handbooks.

Majors | First year units | Brief description
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Earth Science | EAE1011: Earth Atmosphere and Environment 1 | Earth Sciences is a broad discipline that addresses the major processes that have shaped our planet over time and continue to pose natural hazards to society, but also provide resources that we need to sustain a modern society.
| EAE1022: Earth Atmosphere and Environment 2 | You will learn about geological processes, plate tectonics, basin formation, volcanology, earthquakes, and the formation of ore deposits; the Earth’s physical environment (such as rivers, groundwater, soils, and landscapes) and the interaction of physical systems with the biosphere; and the Earth’s climate and how we understand and predict natural and anthropogenic climate change.
| Elective SCI100 | Atmospheric Science | Atmospheric Science is an interdisciplinary science that focuses on the systems and processes of Environmental Science, Applied Mathematics and Physical Geography. It also applies concepts derived from Physics and Chemistry. Atmospheric Science explains how the weather and climate system works, from the gust of wind to global-scale climate change. Weather and climate are both critical to understanding the natural environment and how it is changing with human influence.
| EAE1011: Earth Atmosphere and Environment 1 | Geographical Science | Geographical Science is the interdisciplinary study of understanding how natural and human processes affect our planet and its environments, including soils, vegetation, water, landsforms and climate throughout time.
| EAE1022: Earth Atmosphere and Environment 2 | You will learn to analyze and synthesize complex environmental, economic, social and political information to enable a geographical understanding of humans, environments and the planet.
| Elective SCI100 | What you’ll study in first year

EAE1011: Earth Atmosphere and Environment 1

Provides an introduction to the science involved in studying the Earth, including explanations of how and why our planet has changed since its formation 4.56 billion years ago. We will study the formation, history and anatomy of the Earth and the processes that drive change within our planet and its environmental systems, from the formation of the core to its crust, to the systems driving and sustaining the planet’s living surface to the forces and processes involved in the formation of mountains and oceans, and our changing atmosphere and climate.

EAE1022: Earth Atmosphere and Environment 2

This unit will expand your knowledge of the environmental, geological and atmospheric processes that create the unique physical environment in which we live, and will explore how these processes influence our lives from the protection of resources to natural disasters. You will examine how and why the Earth’s surface, atmosphere and vegetation have changed in the past, and are predicted to change in the future, as a result of human influences such as deforestation, agricultural practices and human-induced climate change.

ATS1310: Extreme Earth!

This unit will focus on the catastrophes of our world today, such as droughts, earthquakes, epidemics, fires, floods, hurricanes, landslides, tsunamis and weather extremes. It seeks to understand the mechanics and dynamics of these environmental phenomena and how they interact with the social contexts in which these disasters occur. We will also investigate the role of international aid and risk management using local and international case studies.

ATS1309: The Global Challenge (Elective Unit)

What can you do in a world that is challenged by questions of poverty, environmental degradation, social inequality and economic exclusion? Insight is gained to identify the new and emerging forces of social, economic and environmental change. The unit examines how changing population and migration dynamics, urban development, patterns of consumption and growth, and labour markets interact at local, national and global scales.

SCI1300: Climate Change: From Science to Society (Elective Unit)

This unit provides the scientific background to climate change, and assesses the environmental and societal impacts, and community and political responses to climate change. Starting from the basic principles and processes that define and govern the Earth’s climate, the unit explores how the different spheres on Earth interact to produce the rich past and current variability of climate in space and time and how human influences are shaping the future of the Earth’s climate. The unit investigates what options humankind has to respond to the economic, ethical and political challenges of climate change, including global and national governance models required to mitigate and adapt to its effects. The unit will provide students with the foundation and knowledge to respond to climate change challenges throughout their career, independent of their specific discipline.

WHERE WILL YOUR CAREERS TAKE YOU?

Some career options include

- Weather and climate prediction
- Environmental management and consulting
- Resource, energy and finance sectors
- Agriculture sector, including agribusiness
- Emergency services
- Data analytics
- Research and development
- Government agencies
- Risk management
- Science communication and education
- University sector
- Mineral exploration and mining

Image courtesy of Dr Hannah Ramsey (Monash EAE)
APPLY YOUR PASSION FOR ALL SCIENCES

CHEMISTRY OF THE EARTH
The first chemists were geochemists. Studying geochemistry will give you an understanding of the building blocks of our planet, from minerals to mountains and from our ever-changing environment to the formation of the solar system.

Geochemistry has many applications in industry and scientific research. At EAE we study the chemistry of rocks, sediments, soils and waters so we can expand our understanding of our environment, how and when rocks or ores form, and processes to make use of geo-materials.

BIOLOGY OF THE EARTH
Combine your love of Biology with Earth Science to understand how life and planets develop together. The biology of the Earth embraces the investigation of all life (animals, plants, microorganisms) and its dynamic ecosystems, from the first record of fossils ~3.7 billion years ago to the present.

By studying the Biology of the Earth, you’ll examine how and why ecosystems move and change. You will search for signs of early life in the far reaches of the planet through fossil records, painting a vivid picture of ancient and unfamiliar worlds. You’ll also learn how plants and microorganisms can restore damaged and contaminated environments and how life in extreme environments on Earth informs our ongoing search for biology elsewhere in our Solar System.

PHYSICS OF THE EARTH
Did you know that the Earth behaves as one big magnet? Have you ever considered that the Earth’s resources are a consequence of the interaction between the deep mantle interior of the Earth and the movement of thin plates that form the skin of the Earth? These same plate movements are responsible for many of the natural disasters that affect modern society.

By studying the Physics of the Earth in the School of Earth, Atmosphere and Environment, you will be able to understand the world you live on and what lies below our feet. You can use your curiosity to become part of one of the great scientific challenges – how we manage our magnificent planet and its natural resources for future generations.

PHYSICS OF THE ATMOSPHERE
Ever wondered why we can make accurate weather forecasts? Do you want to know how a tornado works? What does the science really say about human-induced climate change? The answers lie in physics, and every day you are witnessing it in action in our atmosphere! By studying with EAE, you will be able to understand how the atmosphere works to make our weather and climate. You will learn the skills to do anything from weather forecasting, to untangling the intricacies of climate science for decision making in an era of human-induced climate change.

You will be taught in the award-winning Monash Earth Sciences Garden and will utilise the Augmented Reality Monash Rocks App. The app will transport you back in time to oceans brimming with now-extinct fauna that existed 410 million years ago. Download now from iTunes. The Monash Earth Sciences Garden is an outdoor teaching space comprised of more than 500 rock specimens laid out to form a ‘living’ geological map of Victoria.

Our state-of-the-art teaching laboratories and practical classes are also complemented by innovative field experiences. Some of the places you can visit include the volcanic plains of western Victoria, the You Yangs, Cape Liptrap, the Otway and Gippsland coasts, Wilsons Promontory and Lake Eildon in Victoria; and Broken Hill and Bermaquii in New South Wales. We also have a field unit based in Italy in the Cinque Terre, Liguria.

As a student, you have the opportunity to accompany senior researchers on fieldwork expeditions, to places including Antarctica and Africa. In addition, you can also take part in student exchange programs with other Universities across North America, UK and Europe.

UNIQUE LEARNING SPACES
MASTERS

The School of Earth, Atmosphere and Environment provides opportunities for you to pursue a Master’s degree.

MASTER OF ENVIRONMENT AND SUSTAINABILITY
The Master of Environment and Sustainability is a forward-thinking, interdisciplinary, two-year course that integrates the knowledge needed to mitigate and adapt to global change with sustainability principles. Students choose one of five specialisations and have the opportunity to work in real-world contexts, to respond to local and international, corporate, government and social environmental concerns.

Graduates gain the skills needed to provide strategic leadership in a wide range of settings, such as policy formulation, regulation, advice, management, extension and capacity building.

For more information visit: monash.edu/master-environment-sustainability

MASTER OF ATMOSPHERIC SCIENCE AND MASTER OF EARTH SCIENCE
In 2019 we will also offer two new master’s degrees in Atmospheric Science and Earth Science.

For more information visit: monash.edu/master-science

“My PhD project can help to determine how climate change will affect Melbourne and its residents and how dangerous future heatwaves will be.”

STEPHANIE JACOBS

“My PhD has provided me the opportunity to work in one of the best equipped labs in Australia. I have presented at conferences and met different people from across the globe. I discovered that teaching and communicating science is my passion. But above all, I’m happy because I wake up every morning knowing that I am doing what I like the most. It’s the best decision I have ever made.”

NICOLAS MOLNAR

My PhD project focuses on what happens when continents break apart. The outermost layer of our planet is broken up into rigid fragments known as tectonic plates which are constantly moving in different directions, but at very slow speeds, so it takes millions of years to see the result of their movement. That’s why I use a cool method to speed up the process, from millions of years to just a few hours.

I have built my own miniature tectonic plates in a laboratory, by mixing different materials, which physically simulates natural processes. I stretch my model tectonic plates with a purpose-built apparatus until they fail and break. This simulates continents breaking apart and new oceans forming in between.

This method is very adaptable so it’s fantastic to test different hypotheses. By comparing my results and interpretations with natural cases I can help understand very complex processes. Knowing more about the evolution of continents breaking up can be very important, not only to estimate where certain resources are located, but also for predicting the (distant) future of our planet.

SOLID EARTH

GEOGRAPHY AND ENVIRONMENT
Geography and Environment research includes water resources, human impact on the planet, climate, soils, protecting living landscapes, environmental change, GIS and remote sensing.

ATMOSPHERE AND CLIMATE
Atmosphere and Climate focuses on weather climate and oceans. You can research clouds, climate change, bushfires, oceans, tornadoes, cyclones and the physics and maths driving weather and climate.

PROJECT: REDUCING URBAN HEAT DURING HEATWAVES TO CREATE A MORE COMFORTABLE CITY

PHD CANDIDATE: STEPHANIE JACOBS

I study urban climate, climate change and their impacts on human health. More specifically, I research how to cool cities during heatwaves by painting roofs white to reflect away sunlight and planting gardens to create a more comfortable urban environment.

I do this by using a supercomputer to model the current and future climate of Melbourne. This gives me an idea of how climate change will affect Melbourne and its residents and how dangerous future heatwaves will be. My dream job would be to work at the Bureau of Meteorology as a climate scientist or as a climate change consultant.

RESEARCH SNAPSHOT

The School of Earth, Atmosphere and Environment has an extensive and highly successful research program with research strengths in Atmosphere and Climate, Geography and Environment and Solid Earth. You can become part of our vibrant research community and undertake an Honours, Masters or PhD, being mentored by some of Australia’s best scientists.
Further information

monash.edu/earth-atmosphere-environment

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