



Geography is a wide ranging and dynamic discipline concerned with exploring issues affecting the wellbeing of people and places. To Australian geographers, wellbeing includes economic welfare based on employment and incomes, as well as the core values of social justice, environmental sustainability, equity and cultural diversity. Geography provides an understanding of the diversity of environments, places and cultures on this planet, and the inequalities within and between places. Applying geographical understandings to contemporary issues allows us to integrate knowledge about the natural world, society and the humanities through the perspective of space, place and the environment. This approach plays an important role in shaping strategic directions in policy formation and in education at all levels

Introduction

Geography is a wide-ranging and dynamic discipline that investigates many of the issues affecting the wellbeing of people and places in Australia and throughout the world. These issues are often inter-disciplinary, and geography brings an ability to integrate knowledge about the natural world, the social world and the humanities, through its perspectives of space, place and environment. For example, Australian geographers research:

- past environmental change, so as to better understand present and future change
- economic change and its effects on the movement of people
- perceptions of, and responses to, natural hazards
- the causes and consequences of spatial differences in human wellbeing, such as health or educational attainment
- managing the environmental consequences of the growth of Australia's cities and regions
- repairing the effects of human modifications of river environments
- the interactions between environmental, economic and social change in Australia's Asia–Pacific neighbourhood
- the sustainability of the ways we use environmental resources.

However, geography has a broader ambition than finding answers to environmental, economic and social problems. The discipline's ultimate goal is to help us to understand the world around us, the diversity of environments, places, peoples and cultures on the planet, and the inequalities within and between places. It is also to understand our place in this world—our dependence on the environment for our survival, our attachments to the places in which we live, and our connections with and dependence on places and people throughout the world. Consequently, geography has an important role in education at all levels.

Geographers bring particular ways of thinking to these matters, which define the discipline. They can be applied to a very wide variety of biophysical and human phenomena, some of them tangible, like landforms or the built environment, and others intangible, like social attitudes or cultural diversity.

Geography as a way of thinking

Geographical thinking is based on a set of concepts that guide the choice of research topics, identify significant questions, and suggest explanations. The core concepts are space, place and environment, while interconnection and scale are important intersecting concepts. Although these concepts are also employed by other disciplines, such as ecology, archaeology, economics and sociology, in none are they as central to thinking and practice as in

geography, and in none are they used as frequently in combination. Their application in geographical research is illustrated throughout this report.

Time is another important concept that intersects with the core geographical concepts, and geographers research changes that have occurred over timescales ranging from hours to hundreds of thousands of years. Geographers also recognise that the past affects the present, which in turn, will guide the future.

Space

Spatial thinking is central to geography. One aspect of this is a focus on how physical and human phenomena are distributed across the Earth's surface. These spatial distributions have patterns, or regularities, and can be analysed to pose questions, identify relationships and suggest explanations. Spatial distributions, such as the concentration of most of the Australian population in just five cities, also have environmental, economic, social and political consequences that require explanation and evaluation

Spatial analysis of hospital admissions

A spatial study of small area variations in hospital admissions for children aged 0–4 showed an expected positive relationship between admissions and socio-economic disadvantage, but also an additional influence from location, through physical accessibility to medical services (Butler et al., 2013).

Spatial thinking is also involved in studies of economic processes and social structures. For example, the spatial segregation of socio-economic groups through the operation of the housing market or the location choices of particular social groups, can perpetuate social inequalities.

In studies of social phenomena, geographers do not view space as absolute but as produced by the relations between people and places. For example, space is experienced very differently by subsistence farmers in the highlands of Papua New Guinea compared with international bankers in New York.

Place

Geographers contend that place matters. One reason for this is that each place is unique in many of its characteristics, whether these are internal to the place (e.g. soil resources) or the result of interconnections with other places (e.g. trade, flows of people or cultural influences). Consequently, the outcomes of similar environmental or socio-economic processes are likely to be different in different places. Likewise, similar



*Suburban streets in Melbourne, Victoria.
Credit: Tom Rumble / UNSPLASH / PUBLIC DOMAIN*

problems may require different strategies in different places. Geographers are sensitive to the importance of place, and the need to adjust generic explanations and policies to the realities of individual places.

Effects of differences between places in disaster recovery

Research by geographers into how regional communities recover from a natural disaster has shown that there are significant differences between places in the ability of their communities to effectively use resources, both their own and those from outside. Assistance provided by external agencies must recognise and respond to these place-based differences (Wood et al., 2013).

Another theme is that places, through their social and economic characteristics, or people's sense of attachment to them, influence the educational and economic opportunities, aspirations, physical and mental health, and quality of life of their residents. Identifying places where the influences of place perpetuate disadvantage enables governments and agencies to direct resources to areas of greatest need.

Geographers recognise that places are produced and continually changed by the actions of natural processes, individuals, businesses, organisations and governments, and by their relationships with other places through economic, social, demographic, cultural and political influences. Consequently, places can be described as both local and global. This knowledge is the basis of urban and regional planning.

Although transportation and communication infrastructure have made it possible to locate economic activities that are not tied to physical resources almost anywhere in the world, many still cluster in particular locations, like Silicon Valley for information technology and Sydney for financial institutions.

Environment

Geographers' perspective of the environment is underpinned by the idea that humans are dependent on the biophysical environment for their survival, and are also an integral part of it. Geographical research linked with this idea follows several themes.

One involves basic research into the characteristics of Earth's climate, landforms, vegetation cover, water resources and other environmental features, and the processes that produce them. Recognising the significance of place, geographers are often particularly interested in the interconnections between these phenomena and processes in particular places and landscapes.

Environmental record of past cyclones

Determining the frequency of very high intensity tropical cyclones has been limited by the lack of long-term meteorological records, which extend back less than 100 years. However, studies of Queensland beach ridges provide a record of these cyclones over the past 5000 years, and show that high intensity cyclones have been more frequent than thought (Nott et al., 2009).



Gordon River Dam, SW Tasmania Credit: Lode Lagrange, Upsplash/ Public Domain

A second theme is the effects of humans on the environment. For example, geographers have led studies of the effects of human modification of rivers and floodplains, and of changes to Earth's surface through vegetation clearance and urban development. The latter has been shown to influence changes in rainfall patterns in Australia. They have also studied the ways that societies manage environmental resources, such as through land tenure systems in pastoral regions, Aboriginal and Torres Strait Islander concepts and methods on their land and sea countries, the extraction and storage of water, or the designation of terrestrial and marine protected areas.

This knowledge can be applied to issues such as natural hazards, land degradation, sea-level rise, biodiversity conservation or the management of environmental change. It also directly contributes to our understanding of the concept of the Anthropocene, the name proposed for the present era in which humans are thought to be the dominant influence on environmental change.

A third theme is the influence of the environment on humans—their activities, economies and lives. This includes the effects of the coast on population distribution in Australia, of the environment on agriculture, of water resources on regional development, of droughts or tropical cyclones on settlements and economies, and of landscape on Australian identity.

Water availability as a constraint on Australia's population growth

A study of water availability concluded that there is adequate water in Australia to meet the needs of any likely future population. Most of Australia's population growth will take place in the major capital cities, which can be supplied from new sources of water such as recycled sewage, groundwater, desalinated water and treated stormwater. Population growth is also unlikely to be restricted by a lack of water for food production, as the increasing efficiency of water use in agriculture, and the diversion of food from exports, will enable production to keep up with population. However, environmental quality and biodiversity may suffer as more water is diverted to human uses (Rutherford and Finlayson, 2011).

A final theme is people's perception and knowledge of environments. This includes studies of Aboriginal and Torres Strait Islander environmental knowledge, European perceptions of drought, how knowledge of environmental issues is constructed, or community views on the objectives of environment management. The theme also includes fundamental thinking about the concept of nature, the place of humans in it, and our relationships with other life on the planet.

Prevalent in the last three of the four environmental themes is the significance of the interconnections between humans and nature, a long-standing area of geographical research. Geographers study the processes involved in these interconnections, and the ways they interact in particular places, in order to find answers to specific and complex environmental problems.

Interconnection

Interconnection refers to the complex interrelationships between phenomena. These may be relationships within the one place, or between places, and may involve both biophysical and human elements. The concept underpins the study of processes, which are sets of cause-and-effect relationships, or interconnections, operating over time.

Interconnection is also about flows, such as the flow of migrants between countries, of water in the hydrological cycle, or of energy resources in the global economy. Flows are central to the concept of a system, a group of interconnected objects and elements linked together by flows of energy, matter and—in systems involving people—information. Systems thinking is important in geography, and can help in understanding change. Change in one element in the system can produce changes in other elements, which may be experienced in the same place as the initial change, or in different places, or at a different scale. These changes are often not anticipated, such as the salinisation of soils caused by the clearance of deep-rooted vegetation.

An awareness of interconnection prompts geographers to draw on knowledge from a variety of fields, both within geography and in other disciplines. As a result, they are well prepared for the interdisciplinary research increasingly needed to tackle complex issues.



LEFT: Sea Cliff Bridge, Clifton, NSW. Credit: Silas Baisch / Unsplash / Public domain

Scale

Scale can refer to the areal size of an investigation, a level of analysis (typically from local to regional to global), or types of interconnections. Because relationships between phenomena found at one scale may not hold at another, the choice of scale is crucial in designing research. In policy-oriented research it is important to consider the scale of the management system that will use the results of the research. For example, sustainable natural resource management is best achieved at the catchment scale.

Geographers also recognise that there are interconnections between phenomena at different scales. For example, an understanding of climate change requires analysis at a global scale, but the effects of climate change and adaptation strategies are often most effectively investigated at a local or regional scale.

Research methods in geography

Geographers use a very wide variety of methods in their research. These include:

- collecting data through field work, which could involve the direct observation and measurement of environmental data, or interviews and discussions with human participants
- collecting data through remote sensing
- applying qualitative and/or quantitative techniques to obtain information
- using geographical information systems to manage and analyse spatial data
- analysing relationships between variables through statistical modelling, spatial modelling, laboratory experimentation or controlled comparisons of places
- using case studies to understand how processes operate and combine in particular places and at particular times to produce specific outcomes
- theorising from empirical work
- assessing how best to address a public policy problem.

At present, many areas of geographical research are being revolutionised by rapid advances in the spatial technologies that enable scientists to obtain and record very large quantities of data from precise locations. Global positioning systems, remote sensing, increased computing power, the internet, Google Earth, smartphones and drones have changed the geography of the world, and the world of geography. At the same time, developments in geographic information systems and spatial software make it possible to process, analyse

and visualise this wealth of information. Geographers have the knowledge to ask the right questions of these data and undertake appropriate types of analysis.

The branches of geography

The discipline is conventionally divided into physical geography—the geographical study of the biophysical environment—and human geography—the geographical study of populations, societies, economies and cultures. However, a growing number of geographers teach and work across this division, studying the inter-relationships between elements of the biophysical world and elements of society, a sub-discipline often called environmental geography. Many geographers also develop expertise in a related discipline like geology, biology, archaeology, anthropology, economics, urban planning, demography or sociology, and work and publish in the fertile borderlands between geography and these disciplines.

Conclusion

Geography is distinctive in its emphasis on spatial thinking, its interest in knowledge generated from the study of specific places, and its recognition of the fundamental importance of the environment to human welfare. Its vision is both local and global. It is also marked by an awareness of the interconnections between phenomena and processes both within places and across space, and its fields of study span the natural sciences, social sciences and humanities.

Places and people are increasingly interconnected globally, and society's current problems require answers that integrate different fields of knowledge. In a world in which inequalities within and between places can threaten social cohesion, and where the pressure of human impacts on the environment is a growing concern, geography has much to offer.

Geography in Australian Schools

What does geography contribute to the education of young Australians?

Geography builds a sense of national identity and Australia's place in the world. To understand Australia and ourselves we need to understand its geography—our vast area and relatively few people, the diversity of our landscapes and climates, our natural resources, the movement of peoples to and within Australia, our distance from Europe and North America and our closeness to Asia and the Pacific. We learn to understand that different cultural groups, for example, Aboriginal and Torres Strait Islander peoples and the vast waves of immigrants that enter our shores, all engage with the land differently. We also recognise the changing nature of community and identity in Australia, influenced by

waves of migration, rapidly changing information and communication technologies, increased mobility and attitudes to globalisation and our mythmaking.

Geography helps students make decisions about the big issues affecting the quality of their lives and environments. It is impossible to read a newspaper without finding reports on current issues that are studied in geography—climate change, coping with floods and droughts, liveable cities, ageing populations, engagement with our neighbours in Asia and the Pacific, and the world beyond. Geography students are encouraged and guided to observe, to seek information, to record what they find in order to understand the processes behind these issues. In doing so, they draw relevant conclusions and evaluate possible solutions.

Geography nurtures students' natural curiosity in, and appreciation of, the world's people and places. Thinking geographically and developing their innate geographical imaginations helps young people think about their own lives and their own communities, as well as people, places and environments throughout the world.

While geographical knowledge and understanding may come from students' innate interest in the world around them, the study of geography nurtures this awareness. It helps us to us to understand our place in the world. More importantly, it develops student competencies to think, reason and act in a rapidly changing world. It also fosters an environmental ethic fundamental to Australia: caring for place—caring for country.

Geography studies phenomena from the natural world, the social world and the humanities, and integrates them through the discipline's perspectives of place, space and environment. This helps students to see the interconnections between different types of knowledge, and to become open to a wide range of ways of understanding and explaining the world they observe and experience.

Finally, geography helps students to think about the future. Geography teachers develop teaching strategies that emphasise the application of geographical understanding in realistic decisionmaking contexts. In doing so, they give young people opportunities to acquire, develop and apply a range of key geographical ideas and principles. Ultimately, geography students are empowered to make judgments that are informed by extensive descriptive knowledge about the world; knowledge that is enriched by theory and deepened by abilities to think about alternative futures for people, places and environments.

Read or download a copy of the Decadal plan for *Geography: Shaping Australia's future*. Australian Academy of Science: www.science.org.au/supporting-science/science-policy-and-sector-analysis/reports-and-publications/geography-shaping