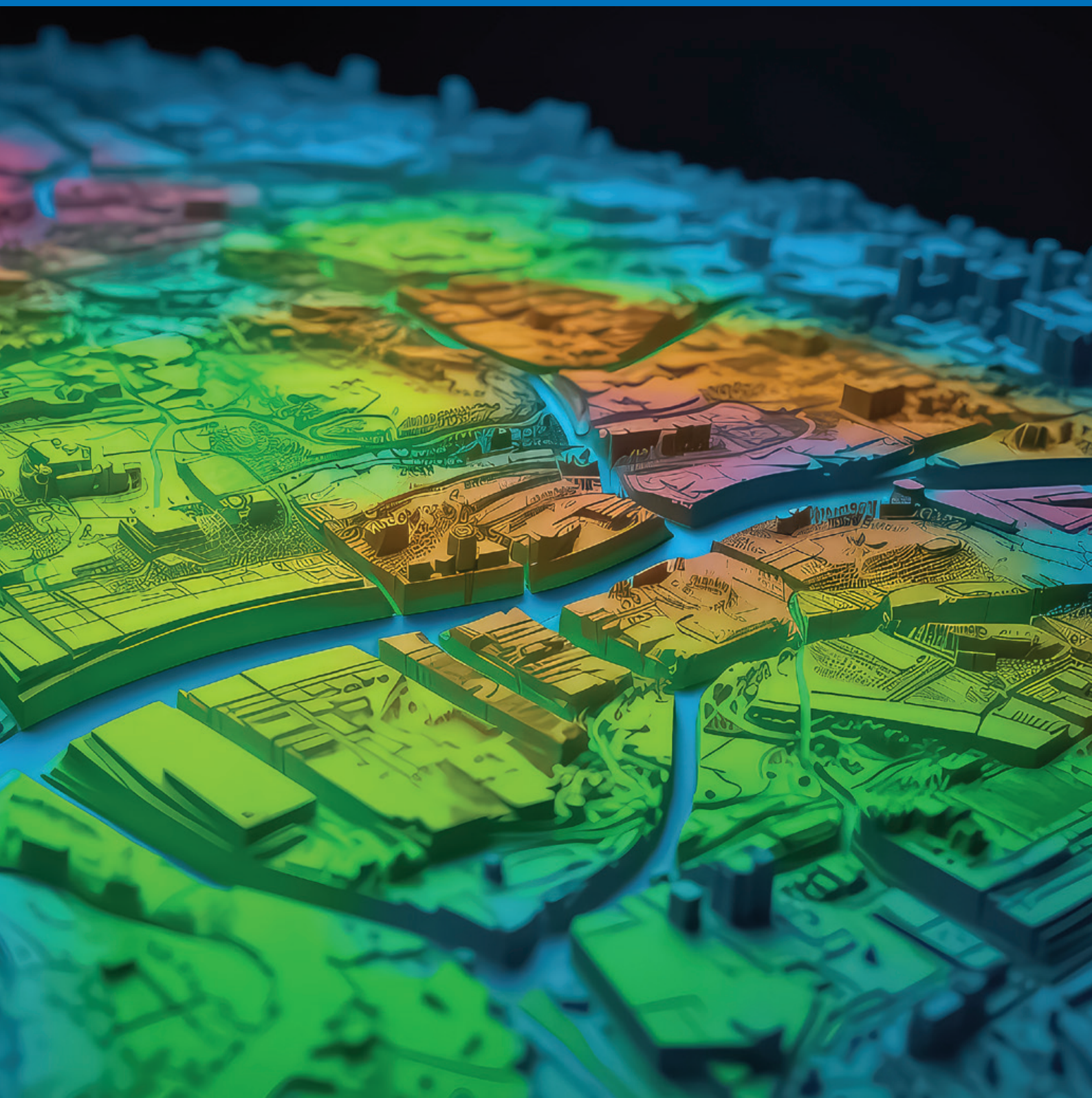
LINCOLN UNIVERSITY
Te Whare Pūrākau
Learning, Teaching & Library

Geographic Information Systems Careers



What are Geographic Information Systems (GIS)?

A Geographic Information System (GIS) is a computer system used to compile and display environmental and other data cartographically (on a map). It is an interactive system which allows users to compare and analyse chosen factors spatially, which helps the patterns and relationships between factors to be better understood. For example, environmental data such as topography can be presented alongside socioeconomic data such as population to enable very specific visual comparisons to be made. Referencing a variety of data sets to a fixed location on earth enables a bespoke visual representation of data every time, and for any purpose.

Modern organisational systems produce and store a lot of data. Environmental informatics is a system that allows collection, storage, analysis and processing of environmental data - with the aim of enabling it to be applied to environmental issues.

Specialisation in GIS and environmental informatics equips students with technological skills underpinned by sound knowledge of environmental and social systems. Graduates can apply these skills to help address complex environmental problems facing communities and the world today. From building efficient transport network systems, forecasting flood zones, or finding out how a new development project will be affected by shade, GIS and environmental informatics are at the forefront.

GIS in New Zealand and the world

Organisations across the globe rely on location intelligence to make better decisions, and are increasingly using GIS technology to enable them to perform more efficiently, and to increase capabilities. Alongside this, there is more demand now for evidence-based decision-making across all organisational levels. As a consequence of both these factors, more and more information – data – is generated, and is being called on for use in planning and decision-making. Professionals are needed who can capture, manage and analyse datasets, and use data effectively to make predictions and plan for the future.

GIS and environmental informatics harness technological advancements and use them to map out and make plans for practically anywhere on earth. From professionals working in large and small urban areas, to rural industries such as forestry or agriculture, or in ocean and offshore regions, demand is growing for specialists in these fields. Graduates who manage their career to develop a specialisation can find themselves highly sought after. Until they reach that point in their career, graduates who gather experience in one, or a variety of roles, will see themselves well placed to find their niche in this exciting and fast-paced area.

Skills and knowledge developed by studying GIS

Lincoln University graduates develop a set of skills and knowledge over the course of their degree that readies them to enter the workforce as a competent graduate-level professional. By the time they graduate, students of GIS and environmental informatics are able to manage, manipulate and analyse data in a variety of software environments, operate and apply appropriate software, and develop software applications. As part of the degree, in addition to computing courses, the broader theories of social science are studied, as well as government and policy, giving graduates sound interdisciplinary perspectives on a variety of land-based issues.

Employers seek well-rounded, engaged graduates with a strong work ethic. As in any sector, employers value those with a professional attitude. This includes good communication (including the ability to communicate to groups, as well as effective interpersonal and written communication), honesty, self-motivation, initiative, time management, and flexibility. The importance of these basic skills cannot be underestimated, even in voluntary or internship roles, as future job opportunities often arise from a good reputation and a varied network of contacts.

Skills and knowledge valued in GIS roles

- Knowledge of data collection, storage and analysis methods
- Ability to read plans, maps and survey sheets
- Ability to manage and manipulate data over a variety of software environments
- Familiarity with ESRI suite of GIS products including ArcGIS Desktop, Model Builder and extensions
- 'Big-picture' thinking
- Ability to manage client relationships
- Ability to develop software applications
- Knowledge of data repository design
- People and communication skills
- Professional attitude and manner
- Analytical thinking skills
- Innovative and logical approach
- High attention to detail
- Solution-focused attitude
- Knowledge of biophysical sciences that underpin environmental management
- Modelling and cartographic design skills

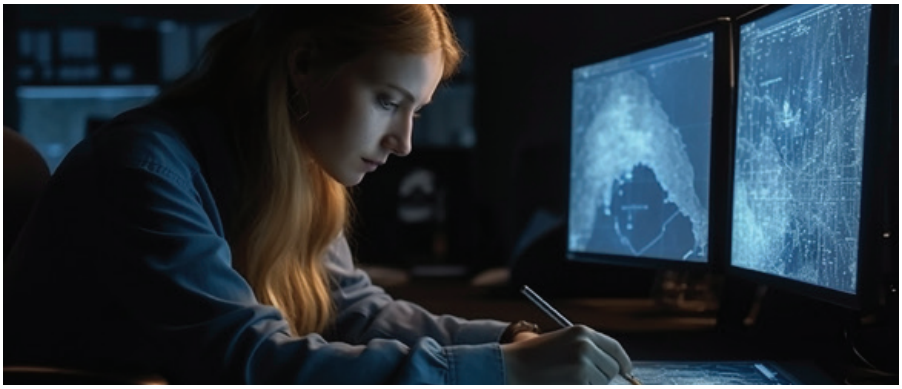
Where can GIS graduates find work?

Places of employment for GIS and environmental informatics graduates include:

- Multi-national, national, or local consultancies (e.g., Critchlow, Aurecon, WSP, North South GIS NZ)
- Government bodies/ departments (e.g., NZ Petroleum and Minerals (NZPAM), Ministry of Business, Innovation and Employment (MBIE), Land Information New Zealand (LINZ))
- Local/ regional government (e.g., Christchurch City Council, Auckland Council, Bay of Plenty Regional Council)
- New Zealand defence forces (NZ Air Force, Army, Navy)
- Electricity or transport network organisations (e.g., Transpower NZ, Northpower, Auckland Transport)
- Crown research institutes (e.g., NIWA, SCION, Landcare Research, AgResearch, GNS Science, Plant and Food Research)
- Tech companies (e.g., Trimble Navigation, Eagle Technology, Geospatial Intelligence Organisation, Synergy Positioning Systems)
- Mineral resources industries, such as oil, gas or mining (e.g., Solid Energy, NZ Oil and Gas, OceanaGold)
- Tertiary education sector

GIS job titles

- Aerial Survey Technician
- Air Quality/ Pollution Technician
- ArcGIS Developer
- Data Collection Field Analyst
- Defence Force Survey Officer
- Geospatial Analyst
- Geospatial Consultant
- Geospatial Data Administrator
- Geospatial Developer
- Geospatial Engineer
- GIS Administrator
- GIS Analyst
- GIS Assistant
- GIS Consultant
- GIS Developer
- GIS Technician
- Hydrographic Systems Operator (Surveyor)
- Navigational Chart Developer
- Network Information Analyst
- Remote Sensing Technician
- Research and Development Officer
- Research Engineer
- Solution Architect - GIS
- Spatial Data Infrastructure Specialist
- Spatial Information Officer
- Survey Technician
- Transport Engineer
- Transport Planner/ Engineer
- Urban/ Rural Data Officer



Pay rate indications: full time equivalent (FTE) $NZ per annum[1]

Most starting salaries for graduates of bachelor degrees fall between 50,000 - 70,000. Entry level jobs are stepping stones to roles with increased responsibilities and remuneration. Your employability is enhanced by all of your life experiences, be they employment related, or the transferable skills and competencies gained from community involvement, volunteer work, or previous work or study - all of which can grow competency, expand networks, and demonstrate enthusiasm to future employers.

[1] Rates sourced from SEEK, MBIE, Careers NZ, Universities NZ, PayScale, PQOS survey data

Job title	Indicative rate
GIS Technician Specialist	45,000 - 120,000+
Remote Sensing Technician	50,000 - 130,000+
Defence Force Hydrographic Survey Officer	50,000 - 120,000
Survey Technician	45,000 - 80,000
Geospatial Data Administrator	45,000 - 70,000+
GIS/ Geospatial Analyst	50,000 - 120,000+
GIS Consultant	60,000 - 120,000+
Aerial Survey Technician/ Navigator	50,000 - 80,000+

GIS tasks

The following list includes the types of tasks that GIS graduates might undertake in a geospatial data administration role.

- Locating, evaluating and integrating data from a wide range of sources
- Data-modelling
- Design and maintenance of geodatabase
- Producing bespoke maps to cater to the needs of specific audiences
- Packaging geospatial data in accessible and visually appealing ways
- Aeronautical and hydrographic charting
- Web-mapping
- Liaising with stakeholders and colleagues
- Collating and administering geospatial and imagery datasets
- Presenting to groups in meetings, or via written reporting
- Making decisions based on environmental and other evidence

Job tasks are role-specific, so the above is an indication only. For more information on roles, registered Lincoln University students can search LU Career Centre (online) for job titles similar to those they are interested in. Job descriptions, including tasks and skills required, are often available.

Industry bodies

Membership of an industry specific body enhances the professional status of graduates. By joining a professional body, members can research career options, access training and events, and network and collaborate with industry colleagues at all levels.

Examples of GIS and environmental informatics industry bodies include:

Environment Institute of Australia and New Zealand (EIANZ)
www.eianz.org

NZ Petroleum and Minerals
www.nzpam.govt.nz

Land Information New Zealand
www.linz.govt.nz

Open Geospatial Consortium
www.opengeospatial.org

Surveying and Spatial Sciences Institute (Australia)
www.sssi.org.au

The Australia New Zealand Land Information Council (ANZLIC)
www.anzlic.gov.au

International Society for Digital Earth
www.digitalearth-isde.org

International Cartographic Association
www.icaci.org

Geospatial Information and Technology Association (GITA)
www.gita.org

Find out more:

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