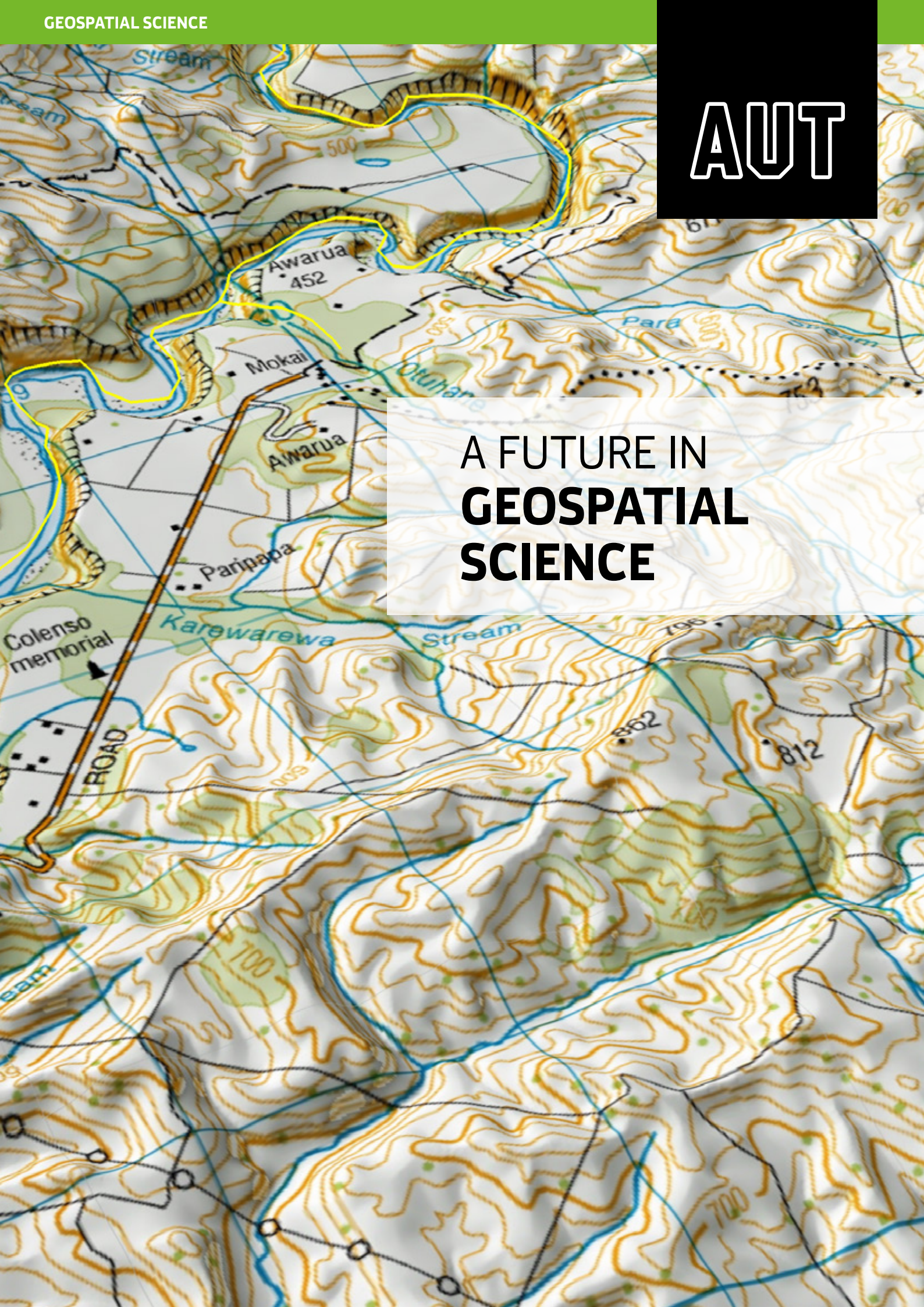


AUT

A FUTURE IN
**GEOSPATIAL
SCIENCE**





WHAT IS GEOSPATIAL SCIENCE?

How do authorities map out potential zones for the expansion of cities? By utilising geospatial scientists' expertise with geographic information science (GIS) and remote sensing.

How do we know where to put schools, hospitals or new housing areas? Geospatial scientists assess the surrounding area using their skills and technology.

Which areas of land are most in need of protection and conservation initiatives? Geospatial scientists are brought in to perform this analysis.

Geospatial science involves the collection, analysis, presentation, and dissemination of data referenced to a spatial location on the Earth's surface. Information with a spatial location, such as physical addresses, can be combined and transformed to work with other datasets to better manage current resources or to reveal new information or patterns.

Employers in a wide range of industries and public organisations need people who can apply geographical information science to the increasingly complex problems. Government is a key user of geospatial services, especially for planning and resource management purposes, while private companies can use geospatial material in anything from streamlining supply chain logistics to enhancing sustainable development.

Environmental awareness is a fundamental concept in geospatial science, as population growth and finite resources mean that processes need to be formulated with ecological considerations in mind. Organisations of all sizes and types are increasingly aware of conservation issues, and geospatial scientists have a key role in prioritising these concerns.

Are you a hands-on practical problem solver? Do you have an interest in mapping technology and information systems like Google Earth? Would you like to influence the development of your town, city and country? If so, a career in geospatial systems could be great for you.

OUTLOOK AND TRENDS

Shortage of GIS specialists

The use of geographic information systems (GIS) to organise data and create maps/models is quickly expanding and creating strong demand for people with geospatial skills. This expansion has meant that the spatial scientist (geospatial specialist) job title appears on Immigration New Zealand's Long Term Skill Shortage List.

Specific geospatial skills required

The three most valued technical skill areas identified by employers in geospatial science are application development programming, spatial reasoning and problem solving, and geospatial database familiarity.

Source: Report on the Geospatial Skills Shortage in New Zealand prepared by Victoria University of Wellington 2012

GIS information central to economic development

Geospatial information is considered to be directly relevant to the government's goal of economic transformation. Geospatial information provides part of the infrastructure that supports emergency services, community safety, biosecurity, environmental management and defence activities.

Source: NZ Geospatial Strategy

Use of drones in geospatial research

The increased capability and commercial availability of drones has had a positive impact in the area of geospatial research. Drones or UAVs (Unmanned Aerial Vehicles) are able to carry sophisticated cameras and other specialised equipment to remote locations, as well as providing an aerial perspective that has obvious benefits for mapping and data collection. Geospatial scientists and researchers at AUT have a fleet of fixed wing and rotary drones with high tech sensors, and use these in partnership with industry to customise and develop unmanned systems for use in extreme environments such as Antarctica and offshore islands.

WORK SETTINGS

Geospatial specialists are employed by:

- local and regional councils
- government departments and agencies, such as Land Information New Zealand (LINZ) and Statistics New Zealand
- specialist GIS consultancy companies
- map and chart making companies
- large companies working in industries such as forestry, transport/logistics, construction, mining and telecommunications
- universities

Work environments can be office-based, but are more regularly on-site in any number of locations.

CAREER ROLE EXAMPLES

Geospatial specialists – gather, combine, analyse and use information that has a geographic or spatial (location-based) component and present this information in more user-friendly formats such as maps and 3D models. In some cases their work may include development of geospatial software and related online services.

GIS analyst – responsible for the delivery of geographic information systems and services to clients. This can include connections to and the delivery of key asset management systems. Works with internal and external clients, system integrity, maintenance and development, and deliver training and advice.

Environmental planner – involved with resource management policy issues, and focused on monitoring and submitting on relevant regional regulatory changes. Identifies and analyses regulatory risk and opportunities, and manages responses to ensure positive policy outcomes for the organisation.

Sustainable development planner – manages all aspects of sustainability initiatives delivery through building relationships with key stakeholders, who could include schools, community groups and businesses.



SKILLS AND KNOWLEDGE

Technical skills

- Knowledge of geospatial data analysis and visualisation
- Knowledge of specialist GIS software, such as ESRI
- Computer modelling and database design skills, such as SQL
- Knowledge of geography and mathematics – including statistics, data specification and capture
- Data integration and analysis skills
- Cartographic design skills, such as ArcGIS
- Database administration skills

General skill requirements

- Ability to work in a team
- Excellent communicator, particularly in explaining complex ideas to clients or co-workers who may not understand technical terms
- Strong project management skills
- Hands-on practical aptitude
- Competent time management and organisation, especially the ability to prioritise
- Capable problem-solver

PERSONAL QUALITIES

- Innovative and creative – thinking outside the square
- Logical, methodical and precise
- Flexible and quick to adapt to new projects or changing requirements
- Objective, enquiring and open to new ideas
- Interested in the natural environment, sustainability and geospatial planning
- Curious about using maps and GIS software like Google Earth

FURTHER STUDY OPTIONS

For those wanting more specialised study, postgraduate-level programmes include Graduate Certificate and Graduate Diploma in Science, Master of Science and Doctor of Philosophy in Geospatial Science, as well as a Postgraduate Diploma in GIS and Master in GIS.

Research areas include marine protected areas, use of GIS in conservation applications, and GIS integration of social data with environmental and biological information using decision support systems.

SALARY GUIDE

	Salary
GIS analyst starting salary	\$40,000 – \$55,000
GIS analyst intermediate to senior roles	\$70,000 – \$100,000
Environmental planner	Starting salary \$45,000 – 50,000 Two to three years' experience: \$55,000 – 65,000 More than six years' experience: \$75,000 – 100,000

Source – www.futureintech.org.nz

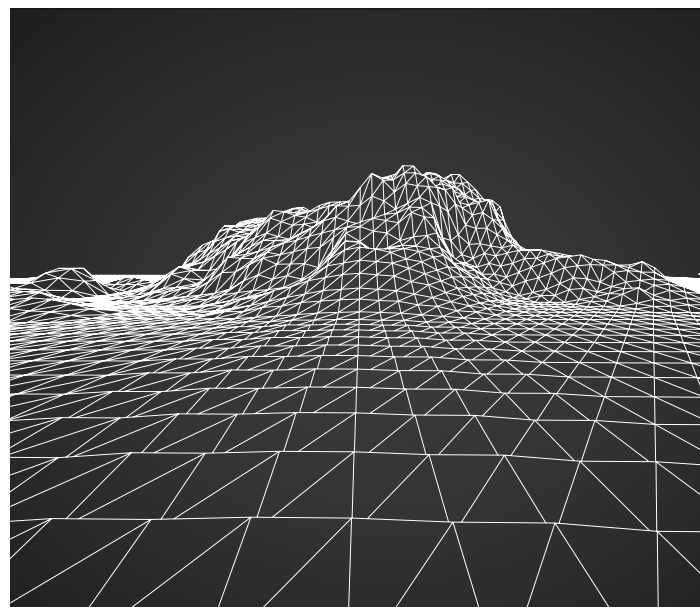
Salary range is indicative of the New Zealand job market at the time of publication (2015) and should only be used as a guideline.

THE AUT APPROACH

AUT has close ties to the geospatial industry in Auckland, including relationships with organisations like Beca, Auckland Council, Department of Conservation, GBS (Geographic Business Solutions), Land Information New Zealand (LINZ) and Statistics NZ.

Final-year students conduct a research project that may involve a placement in an employer organisation like those mentioned above.

These projects involve an investigation into a scientific problem where skills in experimental design, literature searching, the collection, treatment, interpretation and reporting of results would be necessary.



TANIA TE HIRA *Ngapuhi*

Statistical Analyst, Geospatial team

Statistics New Zealand, Wellington

Postgraduate Diploma in Geospatial Science

"My work as a statistical analyst is really broad – I create both standard and online interactive maps, I work on geospatial projects like mesh block boundary investigation and population density statistics, and I train other people in the use of GIS tools. I love the variety of it, as well as the challenge of making geospatial data interesting and relevant.

I became interested in GIS initially through some in-house courses I did while working part time for Statistics New Zealand in the contact area during my undergraduate degree. I found it really interesting, and it seemed to be an emerging area where there would be quite a lot of opportunities in terms of employment and future professional learning.

When I completed my degree I applied for and received a job as a statistical processor in the agricultural team at Statistics New Zealand. While doing that I entered the Postgraduate Diploma in Geospatial Science at AUT, where I did a really good paper in conservation and GIS, and I gained some really useful skills and knowledge.

In the future I'd like to perhaps move back into the archaeological area by getting into cultural heritage management, or to move into a GIS analysis role working with big and challenging data sets."

EMPLOYER COMMENT

"Statistics NZ has a new focus on 'unleashing the power of data to change lives'. One of the key capabilities to enable increased value of data to our customers is through the geospatial enablement of our data and processes. There is a rapidly growing demand in this field.

In addition to the prerequisite technical skills and competencies expected of the role, we are looking for a genuine person with passion and drive. The core leadership behaviours we recruit for and measure performance against include customer service, drive for results, dealing with ambiguity, interpersonal savvy, managing relationships, innovation and communication. I was looking for someone who can lead from where they stand, take ownership of their own development, and engage with their peers and the business to deliver value for our customers.

Tania has used her initiative to learn the business of statistics, and took opportunities to go beyond her role to demonstrate how geospatial tools and analysis could improve business processes."

Rochelle Morgan

Manager – Geospatial Team, Statistics New Zealand, Wellington



USEFUL WEBSITES

Department of Conservation

www.doc.govt.nz

Science New Zealand

www.sciencenewzealand.org

Land Information New Zealand

www.linz.govt.nz

National Institute of Water and Atmospheric Research

www.niwa.co.nz/education-and-training

New Zealand Esri User Group

www.nzeug.org

Geospatial Science


www.geospatialsience.com.au

FURTHER INFORMATION

For the most up-to-date information on Geospatial Science study and the Bachelor of Science, please visit our website: www.aut.ac.nz/geospatial-science


FUTURE STUDENTS

Contact the Future Student Advisory team for more information: www.aut.ac.nz/enquire
futurestudents@aut.ac.nz

 @AUTFutureStudents

CURRENT AUT STUDENTS

Contact the Student Hub Advisors team for more information: 0800 AUT UNI (0800 288 864)
www.aut.ac.nz/enquire | studenthub@aut.ac.nz

 @AUTEmployabilityandCareers

EMPLOYABILITY & CAREERS


For other Future Career Sheets visit: www.aut.ac.nz/careersheets


For employability and career support, AUT students can book an appointment through <https://elab.aut.ac.nz/>


CITY CAMPUS


55 Wellesley Street East, Auckland Central

CONNECT WITH US NOW

 @autuni

 @AUTuni

 AUTUniversity

 @autuni

The information contained in this career sheet is correct at time of printing, August 2019.

