

Marine Geologist

ROLE OVERVIEW

You are a key technical scientist, responsible for studying the composition, structure, and history of the earth's physical properties.

You will utilize your knowledge in geology to examine rocks, minerals, and fossil remains to identify and determine the sequence of processes affecting the earth's development.

As a marine geologist, your secondary expertise in chemistry, physics, biology, and mathematics will support your ability to explain the earth's development and prepare geological reports, locate mineral reserves, and interpret research data to recommend further studies and activities.

You may work for a variety of different organizations, from resource exploration and development to a research-based environment for a university. You will work to understand the results of geological formations, from long-form processes such as plate tectonics to short-term processes such as volcanic activity and earthquakes beneath the ocean surface.

You must have exceptional communication skills to ensure the team relying on your expertise have all the support and knowledge required. Computer proficiency is essential to deliver proper research and comfortably utilize programs, software and any equipment that depends on computer knowledge.

STRATA LEVEL: 3B – Technical Specialist

Also Known as:

- Development Geologist
- Environmental Geologist
- Exploration Geologist
- Geophysicist
- Groundwater Geologist

Education and Experience:

- Bachelor of Science in geology, earth science geochemistry, geophysics or a related discipline.
- Master's or doctoral degree in geology, geophysics marine geology, geological oceanography or related field of study may be preferred.
- Licensed by, or eligible to register as a professional in a provincial or territorial association.

Associated NOC(s):

- **2113** – Geoscientists and Oceanographers



TECHNICAL



Scientific Research Projects

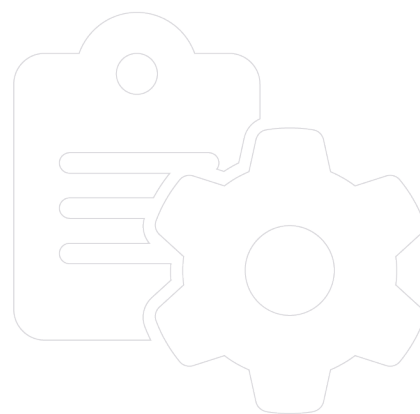
Designs and implements research projects that follow the scientific methods using empirical and/or measurable observation in their research to improve, correct or increase knowledge in a field of study to solve specific problems.

- Identify and define the project purpose, scope, and objectives to plan project resourcing, risks, and techniques to effectively manage project throughout lifecycle.
- Identify appropriate formats and system to capture and store scientific data to conform with relevant standards.
- Oversees requests for proposals to submit proposals to funders to obtain project funding.
- Review proposals, progress, impacts, and outcomes of STEM peers to evaluate research activities to provide feedback and improve scientific deliberation.

Scientific Research

Applies scientific methods and techniques using empirical and/or measurable observation in their research to improve, correct or increase knowledge in a field of study to solve specific problems.

- Communicate geological findings through research papers, conference presentations, or other means to disseminate information.
- Researches the environmental effects on aquatic environments to determine the impacts of departmental initiatives, plans and activities.
- Plans and conducts seismic, geodetic, electromagnetic, magnetic, gravimetric, radiometric, radar and other remote sensing programs to identify and advise on anticipated natural risks.
- Plans and conducts analytical studies of core samples, drill cuttings and rock samples to identify chemical, mineral, hydrocarbon, and biological composition.



Geospatial Surveys

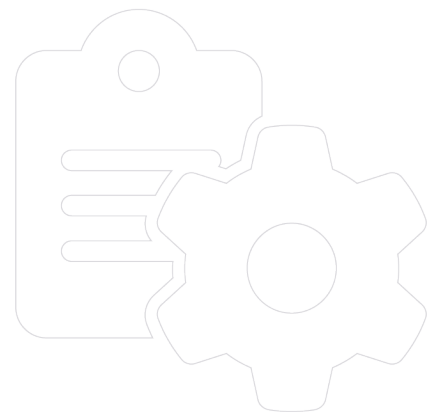
Uses geospatial data and digital systems to map and analyze characteristics of the earth's surface to facilitate development activities.

- Prepare and deploy satellite positioning or drone equipment to collect survey data.
- Acquire raster imagery to inform survey maps to interpret aspects of collected geospatial data.
- Report and archive data sets as latitude, longitude, and Cartesian coordinates to two different datums.
- Enter datasets into GIS or CAD software to prepare layered maps at effective scales, extension, and orientation to describe the data.
- Use manual methods to generate new map layers to meet survey specifications and requirements.

Field Surveys

Conduct field surveys to collect information on the area's ecosystem, landscape, or organisms to determine impacts of human activity and the intra-ecosystem relationships.

- Use survey equipment and instrumentation to collect and gather samples and data to identify characteristics.
- Apply appropriate techniques to conduct field surveys to ensure data is accurate, reproducible, and relevant to survey plan.
- Attempts to leave no trace while conducting surveys to mitigate the effects of project activities on surrounding ecosystem to prevent the loss of biodiversity.
- Identifies invasive species to take appropriate action to report or remove species harmful to the local environment.
- Adheres to protocols and procedures while using survey equipment and materials to ensure data is accurately collected.
- Adapts survey plan when data cannot be obtained to identify alternative options to collect necessary data.



Data Analysis

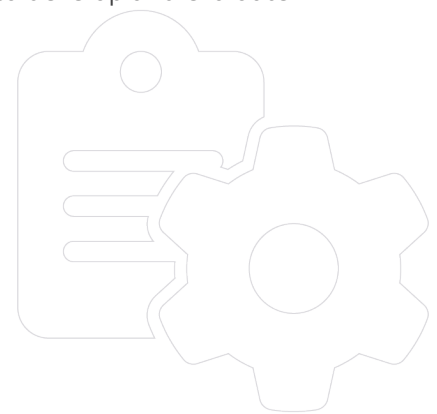
Applies recognized statistical tools and techniques to interpret and analyze data for the purposes of uncovering trends, patterns, and opportunities to enable strategic decision making.

- Confirm data is sufficient and valid prior to analysis to ensure data was collected with current legislations, survey plan, and specifications.
- Design data analysis studies that align with organizational practices to collect, compile, and analyze data.
- Use appropriate methodologies and techniques to analyze field survey data to produce accurate, reliable, and unbiased results.
- Apply mathematical models to perform analysis and derive solutions to specific problems.
- Seeks feedback from other technical specialists to confirm interpretations and ensure all conclusions are aligned with project plan.
- Prepares technical and research reports on observations, findings, and/or impacts to communicate results to stakeholders, industry, government, or the public.

Stakeholder Relations Management

Identifies the needs of relevant actors, working in partnerships with all necessary partners, to achieve a well-balanced solution to desired project, process, or program.

- Advise operation crews or supervising agencies on construction, land use, or resource management to provide information for use in regional development, site selection or development.
- Maintains working relationships, both internally and externally, to foster a network of influence and connectivity to improve prospects.
- Seeks out new partnerships with potential clients to expand the organization's network and increase future potential relationships.
- Identify and potential issues with current or proposed marine use to develop and evaluate potential solutions.



PERSONAL AND PROFESSIONAL



Communication

Positively directs outcomes by delivering communication that results in a better understanding of goals and objectives and that capture interest and gains support for immediate action.

- Communicates the project or organization mission and directive to ensure all team members share a cohesive vision for the progress of the organization.
- Prepares comprehensive reports that clearly identify project objectives, scope, research findings, alternatives, and recommendations to create a defensible assessment report.
- Actively listens to team members and managers to understand different perspectives and incorporate feedback into workplace tasks.
- Communicates with other team members to share information and resources to exploit opportunities and efficiencies.

Collaboration

Engages in professional collaborative efforts with members of the team, including sharing information and expertise, utilizing input from others, and recognizing others' contributions to work towards common goals.

- Provides operational expertise and technical direction as appropriate to ensure harmonious and efficient operations.
- Shares relevant and useful knowledge, experience, or expertise to aid team members accomplish their objectives more efficiently or effectively.
- Works cooperatively with multiple stakeholders, demonstrating a willingness to consider alternative approaches, ideas, or insights.
- Provides team members with constructive feedback and perspective to aid in the completion of a task or goal.



Problem Solving

Identifies problems and uses logic, judgement, and evidence to evaluate alternative scenarios and recommend solutions to achieve a desired goal.

- Takes an unbiased stance to interpreting new information to solve a problem in an object manner.
- Applies logical and iterative analysis to evaluate events and outcomes.
- Considers all pieces of information when attempting to solve problems to produce a cognisant and comprehensive solution.
- Identifies, evaluates, and generates solutions to concerns brought forth by team members to maintain a harmonious workflow.



LEGAL, REGULATORY, AND POLICY



Regulatory Compliance

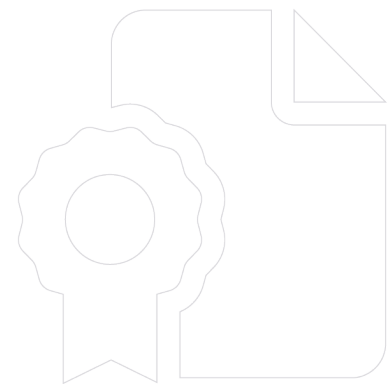
Adheres to specific regulation and legislation within a defined jurisdiction to monitor organizations compliance and implementation of best practices.

- Evaluate internal project applications to ensure compliance with environmental regulations, legislation, and policies.
- Participates in the development of internal policy and procedures to ensure assessments are conducted in accordance with all legal requirements.
- Communicates regulations and guidelines for responsible drilling activities with decision makers and other technical staff to ensure unnecessary risks are avoided.

Health and Safety Procedure

Adheres to and advocates for specific workplace safe operating procedures and occupational health and safety requirements within a defined jurisdiction to ensure the health and safety of others.

- Establishes safeguards and best practices within a project team to align with organizational health and safety plans to ensure the safety of all team members.
- Leads routine safety meetings with project team members to ensure all parties are aware of potential risks and hazards.
- Participates in safe workplace training as required to ensure an up-to-date understanding of health and safety best practices.
- Applies appropriate health and safety procedures in all aspects of work to ensure zero incidents.



ENVIRONMENTAL



Ecosystem Identification

Uses primary and secondary sources of information to identify an area's ecosystem to plan and propose development, remediation, or environmental management activities.

- Applies knowledge of storms, shoreline change and sea-level rise to transfigure data to visualize coastal changes and hazards to track seabed changes and ensure the safety of operations.
- Utilizes appropriate databases to explore and analyze coastal and seafloor images along the coast for coastal and marine hazards, and resource imaging.
- Use integrated wave, circulation, and sediment transport to create models to track coastal changes.
- Generate real-time forecasts of water levels, wave heights, coastal erosion, and flooding to inform decision-making.

Resource Identification

Use digital systems, equipment, and sensor technologies to identify natural resource deposits in marine environments to estimate resource potential and provide data to influence decision making.

- Locate and estimate probable natural gas, oil, or mineral ore deposits or other underground resources, using aerial photographs, charts, or research or survey results to conduct extraction operations.
- Applies multi-spectral remote sensing of the marine environment to ensure appropriate resource management.
- Conduct geological or geophysical studies to provide information for use in regional development, site selection, or development of public works projects.
- Interpret field surveys and laboratory research to prepare geological maps, cross-sectionals, charts, or other reports to plan mineral extraction, land use, and resource management.



Seabed Surveying

Survey subtidal marine seabed habitats to measure, interpret, and communicate seabed data to plan and develop coastal management activities.

- Plan surveys according to established policies and procedures to map specific marine seabed habitats.
- Uses remote sensing methods to identify seabed features to map specific environments to plan marine development activities.
- Apply spatial-data processing methods to reveal habitats and interpret geological properties to facilitate scientific research and coastal development.
- Perform field checks to confirm optimal data quality under different water column conditions to apply quality assurance and control procedures to data collection.
- Utilizes ground penetrating radar (GPR) to map internal structures of the ground for underground resource mapping and visualizing possible challenges.
- Links data to ground-truth information and recognized biotope substrate descriptors to identify marine habitats and explain their geospatial context.
- Presents data and findings to stakeholders and wider audiences to contribute to discussions on seabed habitats, interpretations, limitations, and significance.

Marine Research Ethics

Must be mindful of the impact that marine seismic surveys may have on animal life, especially those using sound as the primary method of communication.

- Adheres to protocols to maintain an appropriate distance between marine mammals and potential noise sources to prevent physical damage to marine life.
- Adheres to regulations to prevent low-level noise from causing temporary threshold shifts in hearing that obscure vital sounds for marine life.
- Ensures protective measures are employed to address site-specific environmental conditions of each operation to ensure that sound exposure and vessel traffic do not harm marine mammals.
- Ensures that disturbance whilst surveying is planned to avoid sensitive areas during specific time periods such as during breeding and feeding.
- Establishes exclusion zones around the seismic source to further protect marine fauna from potentially detrimental effects of sound.

