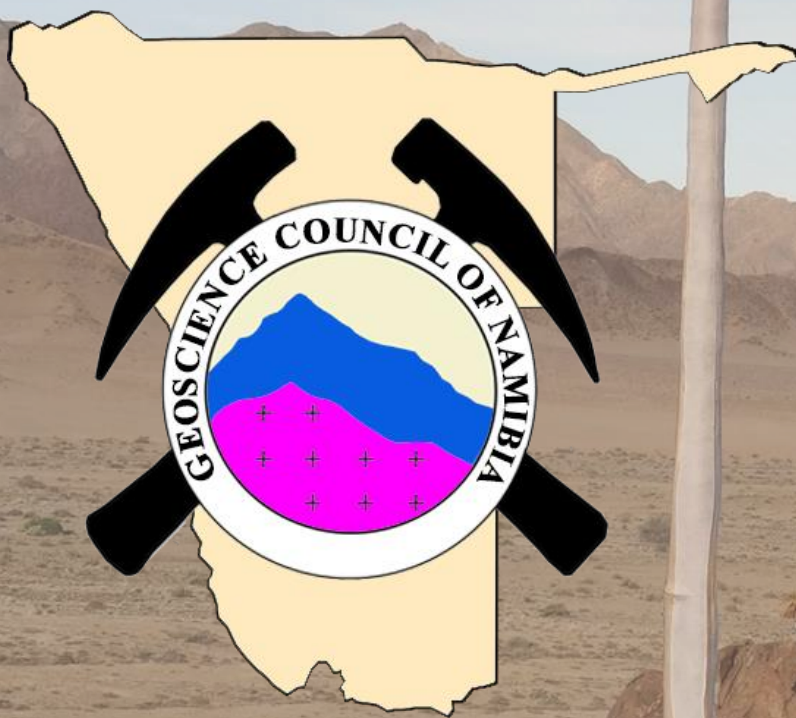


GEOSCIENCE COUNCIL OF NAMIBIA



STRATEGIC PLAN

2020 - 2023



The Council Members (2020 – 2023)



Mrs Anna Nguno
President
Mapping, GIS & Remote
Sensing Geologist



Mr Bertram Swartz
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Hydrogeologist



Dr Gabi Schneider
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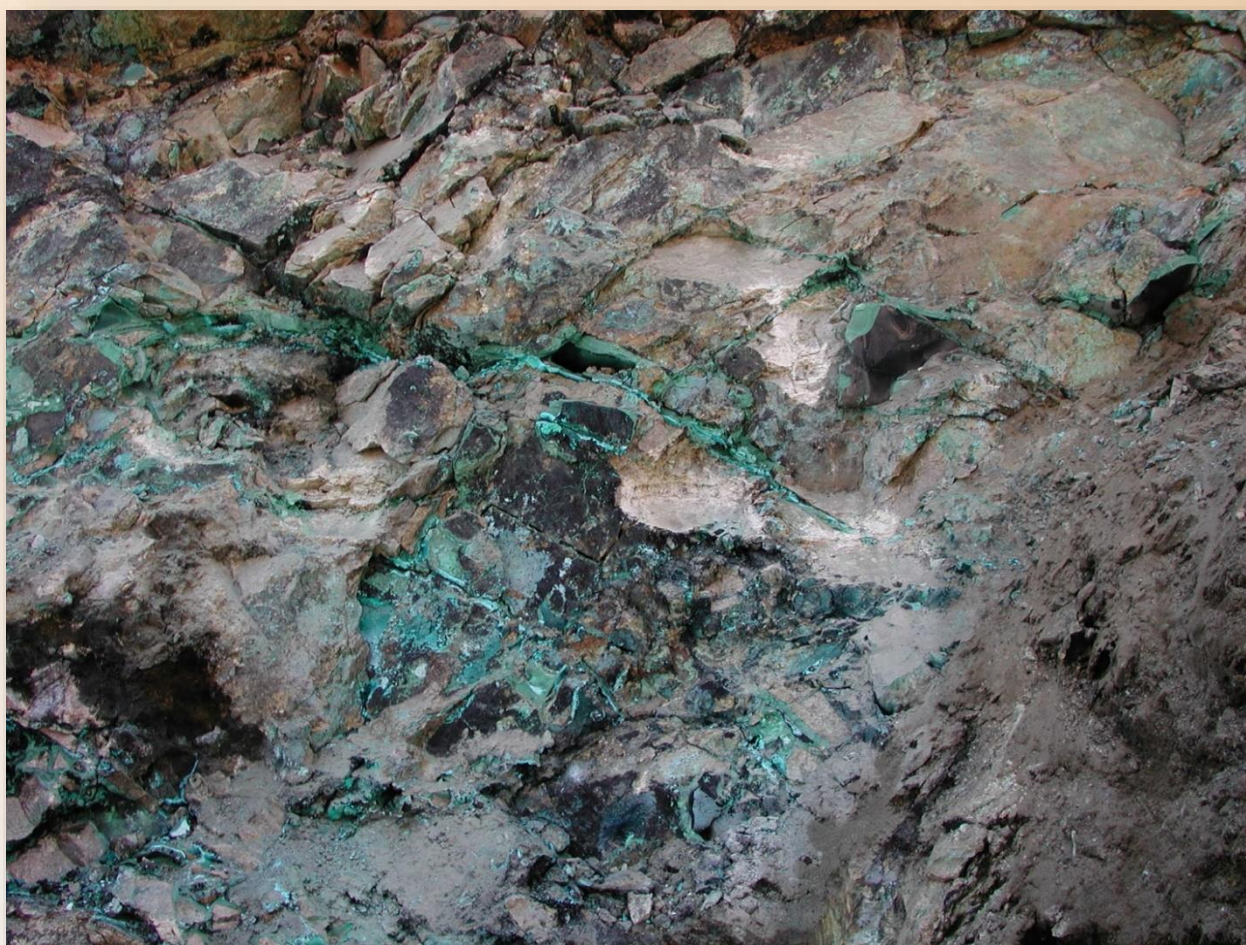
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We wish to thank all parties that contributed to this document.

Layout and design by Tolene Kruger

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Promoting Professional Excellence in Geoscience for Society

Who we are

The Geoscience Council of Namibia is a juristic body established in accordance with the Geoscience Professions Act, 2012 (Act No. 3 of 2012). However, it was not until 1st of September 2017 when the Act came into operation along with the announcement of the appointment of the first members of the Geoscience Council of Namibia as published in Government Gazette no. 6397 (Government Notice 228 & 289 of 2017). The Council's essential mandate is to promote and protect the public interest through the governing and regulating of the professional and ethical practice of our members.

Vision:

For Namibians to enjoy the full benefit of our geological endowment through excellence in geoscientific research and practices.

Mission:

To ensure high professional and ethical standards in geoscientific research and services for the Namibian society.

Values:

- Impartiality:** We are absolutely unbiased in assessing membership applications, geoscientific work performance and ethical behaviour
- Dedication:** We are committed to serve the Namibian geoscience community and the public

- Loyalty:** We uphold the Code of Conduct of the Namibian Geoscience Council at all times
- Excellence:** We always strive for excellence and continuous improvement

Our Objectives

The Geoscience Council of Namibia's objectives are to:

- promote geoscience professions in Namibia by providing a self-regulatory juristic body, registration which confirms a qualified geoscientist as having a recognized level of professional competence and subscribing to a code of professional conduct
- control and exercise authority in respect of all matters affecting levels of competence and codes of conduct with respect to geoscience professions
- promote the interest of geoscience as a profession in its entirety by any other means available to the Council
- communicate to the Minister information on matters of public interest acquired by the Council in the course of the performance of its functions under the Geoscience Professions Act No 3 of 2012.





Linkage to National and International High-Level Initiatives

Geoscience professions have played a key role in the implementation of national initiatives such as the National Development Plans, the Harambee Prosperity Plan and Vision 2030, and will continue to do so.

The continental and global initiatives include the African Union Vision through Agenda 2063 and its 7 Aspirations, the African Mineral and Energy Resources Classification and Management System-Pan-African Resource Reporting Code, and the 2030 Global Sustainable Development Agenda and its 17 Sustainable Development Goals (SDGs) that aim to eradicate poverty, ensure universal access to basic services, tackle inequality, end unsustainable consumption patterns, and facilitate inclusive economic growth, social development and environmental protection.

Gill (2017) describes eight aspects of Geological Science Application (earth materials, processes and management) identified within the set of the 17 SDGs (Table 1 & 2).

Table 1: The eight aspects of geological science application identified within the set of the 17 sustainable development goals (SDGs) and their descriptions*.

1. Minerals and rock materials (SDG 1, 2, 7, 8, 11, 12)
2. Hydrogeology & contaminant geology understanding and sustainability (SDG 1, 2, 3, 6, 11, 12, 13, 14, 15)
3. Engineering geology (SDG 1, 2, 7, 9, 11, 13)
4. Agrogeology (SDG 1, 2, 3, 15)
5. Geoheritage & geotourism (SDG 8, 11, 12)
6. Geohazards (SDG 11, 13)
7. Energy (SDG 1, 7, 8, 12)
8. Climate change (SDG 1, 2, 11, 13, 14)

*Gill, J.C. (2017): *Geology and the Sustainable Development Goals. Episodes 40(1), 70-76.*



17 Sustainable Development Goals (Gill, 2017)

Table 2: Namibian examples of the eight geological science applications explained in Table 1.	
1. MINERALS AND ROCK MATERIALS (SDG 1, 2, 7, 8, 11, 12)	
The use of geological sciences to identify and develop mineral and rock resources, for a variety of uses (e.g. ores for the production of gold (Navachab (photo), Otjikoto), lead and zinc (Rosh Pinah, Skorpion, Namib Lead), copper (Matchless, Otjihase, Kombat, Tschudi); limestone for cement (Ohorongo, Whale Rock)), marble for dimension stone (Palisandro Marble Quarry)	
2. HYDROGEOLOGY & CONTAMINANT GEOLOGY UNDERSTANDING AND SUSTAINABILITY (SDG 1, 2, 3, 6, 11, 12, 13, 14, 15)	
Managing groundwater resources, using geological sciences to assess and monitor and remediate contamination, including understanding the origin, transportation and fate of contaminants (e.g. aquifer recharge monitoring (Omdel Dam (photo), Auas quartzites); groundwater monitoring downstream of waste disposal sites (Kupferberg Landfill))	
3. ENGINEERING GEOLOGY (SDG 1, 2, 7, 9, 11, 13)	
The application of geological sciences to engineering, supporting the design and construction of infrastructure at all scales (e.g. dams (Neckartal Dam (photo)); roads (new road behind the dunes to Walvis Bay); ports (new Walvis Bay Container Terminal); buildings (Bank of Namibia constructed on Pahl Fault))	
4. AGROGEOLOGY (SDG 1, 2, 3, 15)	
The use of rock and mineral resources to facilitate agriculture through improving soil fertility and water retention, and reducing soil erosion (e.g. apatite for slow release of phosphate (Okorusu (photo)); agricultural lime for buffering acid soils (marble quarries))	
5. GEOHERITAGE & GEOTOURISM (SDG 8, 11, 12)	
Using geology and landscapes as tourism attractions, aiding the conservation of geodiversity and building a greater understanding and appreciation of the geological sciences by local communities and tourists (e.g. outstanding geological features (Spitzkoppe (photo), Ugab folds); mine tours (Rössing))	
6. GEOHAZARDS (SDG 11, 13)	
Understanding the physical science underlying the generation of natural hazards, assessing exposure through producing hazard maps, and supporting efforts to reduce vulnerability through geo-education and capacity building initiatives (e.g. flooding (Efundjas (photo), Fish River/Mariental); coastal erosion (Mile 4 campsite, Pelican point); earthquakes (Mukorob))	
7. ENERGY (SDG 1, 7, 8, 12)	
Identifying and advising on potential energy sources and raw materials required for energy supply and infrastructure, and contributing to the safe extraction and storage of resources and the development of energy infrastructure (e.g. geothermal (underfloor heating in Windhoek, Gross Barmen); uranium ore for nuclear energy (Rössing, Langer Heinrich, Husab); development of hydropower (Ruacana (photo)); Neodymium for wind turbines (Lofdal); cadmium for photovoltaic cells (Tsumeb))	
8. CLIMATE CHANGE (SDG 1, 2, 11, 13, 14)	
Using the geological record to understand past changes to the climate and applying this knowledge to understand how the climate may change in the future and to mitigate the effects of drought (e.g. desertification (Etjo Sandstone, Tsondab Sandstone (photo)); flooding (Sesriem Canyon); ice ages (Chuoss Formation dropstones, Dwyka Group glacial striation))	



Promoting Professional Excellence in Geoscience for Society

Strategic Themes and Focus Areas

In working towards achieving its vision of Namibians enjoying the full benefit of their geological endowment through excellence in geoscientific practice and research, the Geoscience Council of Namibia has identified three strategic themes and six focus areas to concentrate on for the next three years.

Strategic Themes

The three strategic themes are 1.) Geoscience Professional Excellence, 2.) Advocacy and Promotion, and 3.) Robust Governance and Regulatory Framework (Table 3).

Focus Areas

The Geoscience Council of Namibia's six focus areas are as follows:

1. Geoscientists are recognized as professionals
2. The regulatory role of the Geoscience Council of Namibia
3. Geosciences are applied for Namibia's sustainable development
4. Collaboration with similar and/or related organisations and bodies
5. Geoscience professions are sustainable in Namibia
6. Increasing Geoscience awareness

Table 3: The three strategic themes of the Geoscience Council of Namibia and their descriptions.

Strategic Themes	Themes Description
Geoscience Professional Excellence	This strategic theme focuses on efforts towards excellent service delivery that result in continuous improvement of all geoscientists registered with the council by focusing on the needs of the public, stakeholders, decision-makers, empowering members and optimizing existing activities in the process.
Advocacy and Promotion	This strategic theme focuses on continuously advocating for the relevance of geoscientific fields to national sustainable development initiatives, demonstrating their tangible value to decision-makers, as well as promoting the geosciences to all stakeholders and the public at large.
Robust Governance and Regulatory Framework	This strategic theme focuses on good governance and the laws and regulations that outline the legal and ethical requirements to be met or adhered to as far as geoscientific services are concerned.

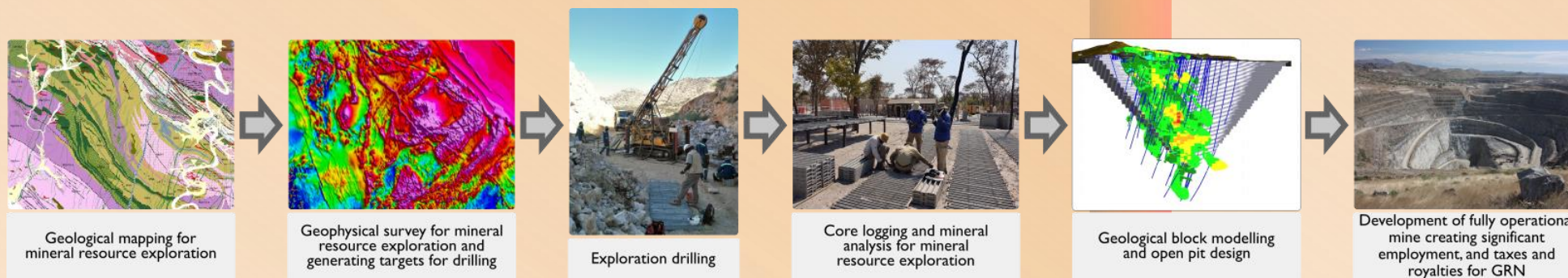


Strategic Plan Matrix – 2020 -2023

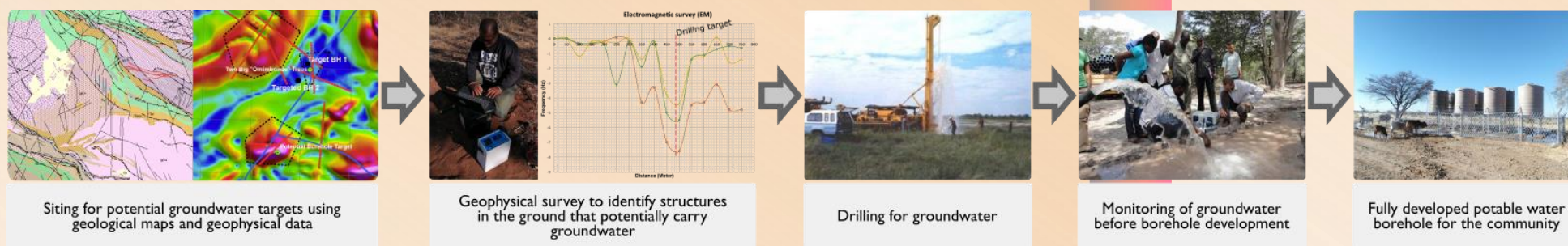
STRATEGIC THEMES	FOCUS AREAS	DESIRED OUTCOME	GOAL	ACTION STEP
Robust Governance & Regulatory Framework	Geoscience Council of Namibia regulatory role	By 2023, the role of the Geoscience Council of Namibia's as a regulator is broadly understood	To promote and protect public interest by governing and regulating the Geoscience professions	Establish a validated directory of registered, professional geoscientists to assist the public and all stakeholders in finding registered professionals. Make necessary amendments to the Act.
Geoscience Professional Excellence	Geoscientists recognized as professionals	By 2021, geoscience practitioners are recognized by decision-makers as professionals	To have the Geosciences formally recognized as professional occupation	Engage decision-makers (Public Service Commission – Office of the Prime Minister (OPM), Private Sector)
	Geoscience for Namibia's sustainable development	By 2023, Namibia is a nation where the public and decision-makers understand the requirement for Geosciences to ensure sustainable development	Enhance the decision-makers' and public's understanding for the value of using the Geosciences for Namibia's sustainable development	Compile a booklet on "Geoscience and Namibia" for the Namibian society. Translate booklet in as many Namibian languages as possible. Prepare feature articles and submit to the media. Conduct a survey to assess understanding and needs of the general public.
	Development and Sustainability of Geoscience professions	By 2022, have a strategy in-place for Geoscience professions sustainability, both in the public and the private sectors in Namibia	To have a strategy document on skills and capacity development for Geoscience professionals, both in the public and the private sectors in Namibia	Engage decision-makers and stakeholders on how to develop and maintain expertise in the various Geoscience fields in the public and the private sectors. Compile and present a strategy document on the sustainability of Geoscience professions to decision-makers and stakeholders (and other organisations) with assistance from field-specific bodies such as Namibian Geotechnical Institute (NGI).
	Collaboration with similar and/or related organisations and bodies	By 2021, a minimum of three cooperative alliances with related organisations and bodies were built.	Various professional collaborations established	Build cooperative alliances with similar professional organisations and bodies. Identify and list organisations we are interested in collaborating with.
Advocacy and Promotion	Geoscience Awareness	By 2022, the relevance of the Geosciences to national sustainable development is understood at all levels	To develop a general understanding amongst the public and decision-makers about the role of the Geoscience profession	Raise public and stakeholder awareness of the Geoscience professions and practice. Prepare feature articles and submit to the media. Translation of articles in as many Namibian languages as possible. Initiate targeted talk shows using local content on TV and radio networks and other media, where different Geoscience professions will partake.

Value chain of various geoscience fields and their application in infrastructure, mineral resources, water resources and socio-economic development projects

Exploration and Mining Geology – Relevance to Mineral Resources Development



Hydrogeology – Relevance to Water Resources and Socio-economic Development



Engineering Geology/ Geotechnics – Relevance to safe and cost-effective Infrastructure Development



Geotechnical test pit excavation to inform design and depth of foundations



Collection of soil samples to determine strength of foundation soils



Geotechnical testing of soil samples to determine strength of foundation soils



Ground preparation for foundation works and confirmation of foundation conditions



Safe buildings founded on well-designed foundations



Offshore geotechnical drilling in Walvis Bay Harbour



Geotechnical core from drilling in Walvis Bay harbour



Walvis Bay harbour after construction



Exploration for road building material



Quality control geotechnical testing of road building material



Placement and compaction of tested and verified road building material



Geotechnical testing to validate compaction quality of road layers



Geotechnical testing to validate formation quality of a bridge



Safe and good quality roads and bridges, and secure road users

Environmental Geology - Relevance to safe, healthy, environmentally friendly and cost-effective infrastructure development with public health and environmental conservation as focal point

Geochemical **soil** sampling to detect and/or assess any contaminations



Geochemical **groundwater** sampling to detect and/or assess any contaminations



Geo-environmental monitoring of active and abandoned mines



Understanding of ore processing, mine tailings management and associated contamination risks



Geo-environmental monitoring of municipal waste disposal sites



Monitoring of ambient air quality to detect and/or assess airborne geogenic contaminations



Geoheritage and Geotourism - Using geology and landscapes within tourism, aiding the conservation of geodiversity and building a greater understanding and appreciation of the geological sciences by communities living and working close to outstanding geological features and by tourists visiting them.



Sossusvlei



Bogenfels



Stromatolites



Mesosaurus fossil



Petrified Forest



Spitzkoppe



Brandberg



Fish River Canyon



Touring Namibia



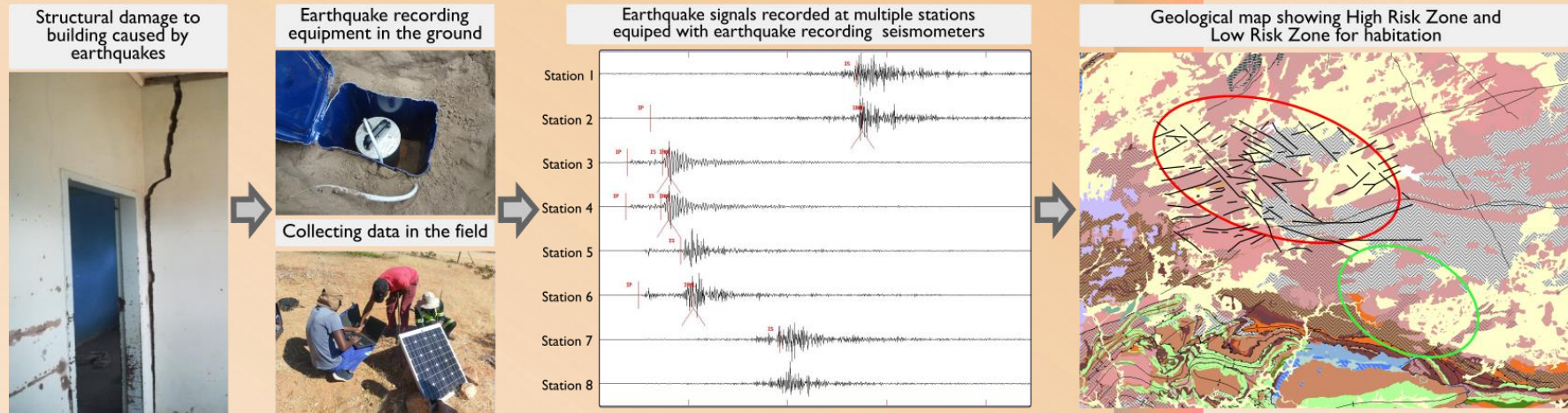
Vingerklip



Sesriem Canyon

Geohazards - Understanding the physical science underlying the generation of natural hazards, including earthquakes. Assessing exposure through producing hazard maps

Earthquakes



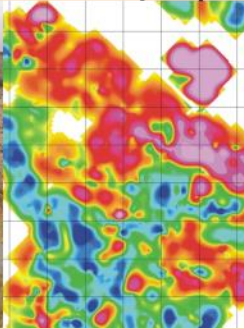
Earth cracks in various parts of the country



Effects of earth cracks on infrastructure

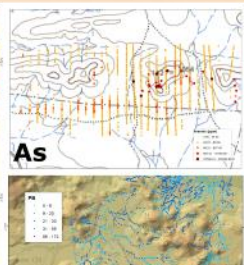
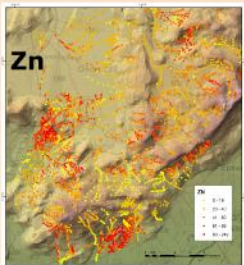


Geochemistry – Its impact on society and the environment

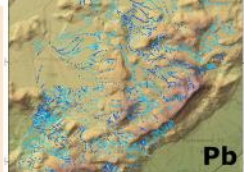
Geochemical
Soil SamplingGeochemical
Anomaly Map

Mineral Exploration & Energy

Soil geochemistry guides mineral and hydrocarbon exploration programs



Concentration of elements (e.g. zinc (Zn), arsenic (As), lead (Pb)) with concentrations in soil that are anomalous (higher than normal)

Human, Animal & Plant Health
- Agrogeology

Regions with high levels of potentially toxic compounds/elements or low levels of essential elements (listed below) in soil may have an impact on human and animal health, and plant and crop growth



Potentially Toxic Elements: Arsenic (As), Lead (Pb), Uranium (U)

Essential elements: Zinc (Zn), Iron (Fe), Iodine (I), Calcium (Ca), Fluorine (F), Selenium (Se), Magnesium (Mg), Phosphorous (P), Potassium (K)

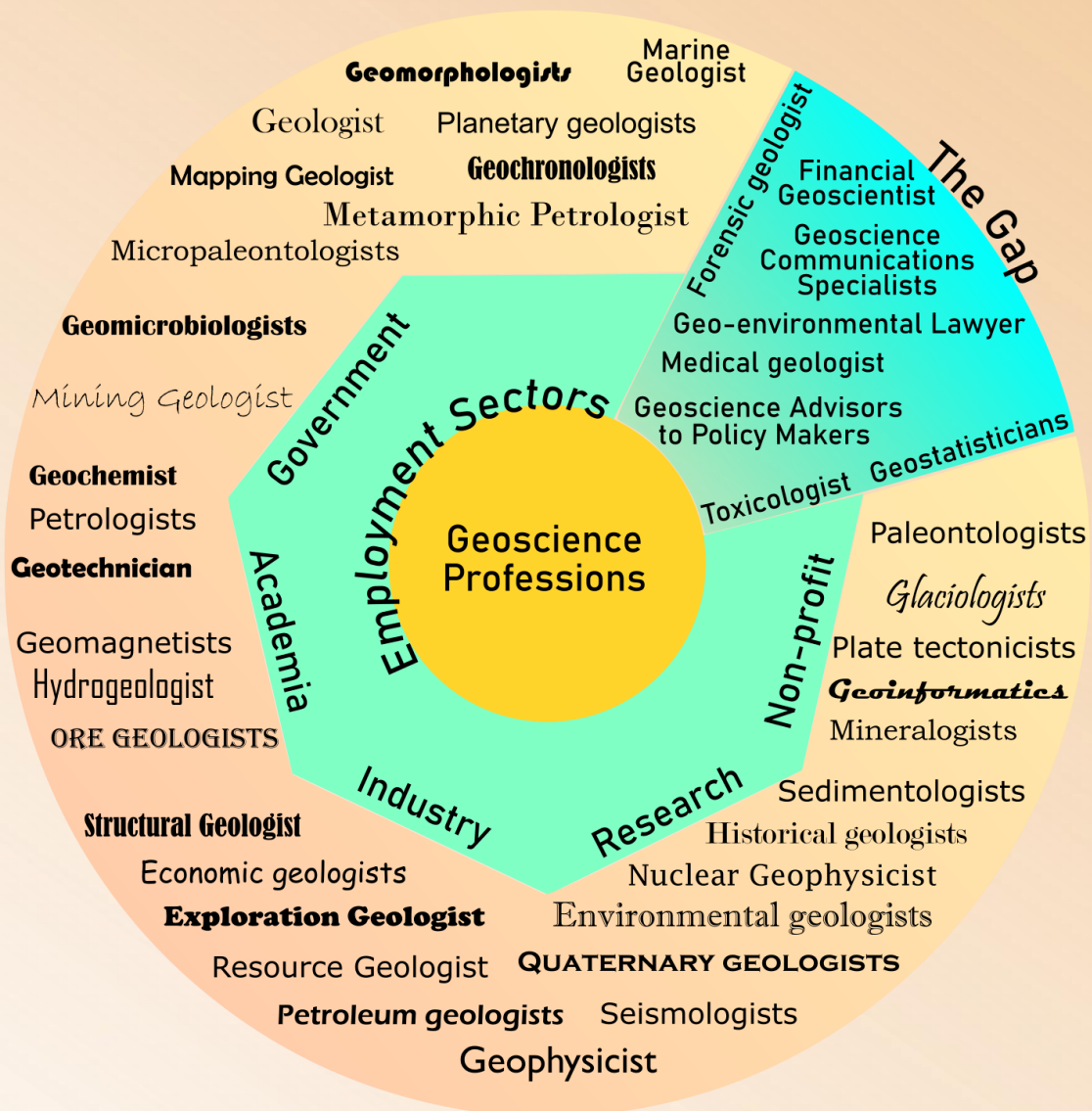
Medical Geology

Material & Exposure Pathways	Mineral Example	Health Impact	
Lead (Pb) Mineral: Galena [PbS] Ingested by hand-mouth contact		If too high: mental and developmental problems; anemia, kidney dysfunction; seizures, coma, and death	 Development problems
Arsenic (As) Mineral: Arsenumebite [Pb ₂ Cu(AsO ₄)(SO ₄)(OH)] Ingestion of As-rich drinking water and ingestion of As-bearing solids		If too high: Keratoses of skin, skin cancer, bladder cancer, diabetes, heart disease	 Keratoses
Fibrous minerals Mineral: Asbestos [Mg ₃ Si ₂ O ₅ (OH) ₄] Inhalation of mineral fibres		Asbestosis, thickening and hardening of the tissue around the lungs and diaphragm, lung cancer, laryngeal and ovarian cancer	 Thickened lung tissue
Fluorine (F) Mineral: Fluorite [CaF ₂] Ingestion		Essential element needed for strong bones and teeth If too high: fluorosis (mottling of teeth), deformed, brittle bones	 Fluorosis
Iodine (I) Associated mineral: Halite [NaCl] Ingestion		If too low: Enlarged thyroid gland (Goitre), metabolic problems	 Goitre
Uranium (U) Mineral: Boltwoodite [HK(VO ₂)(SiO ₄)*1.5(H ₂ O)] Radiation and inhalation of fine dust particles and/or ingestion		If too high: skin burns, bone marrow changes, various cancers, radiation sickness	 Radiation burn
Crystalline silica Mineral: Quartz [SiO ₂] Inhalation of fine dust particles		Silicosis, lung cancer, kidney diseases, tuberculosis	 Silicosis
Mica-rich dust associated with schistose rocks and make-up Mineral Group: Mica [KAl ₂ (Si ₃ Al)O ₁₀ (OH,F) ₂] Inhalation of fine dust particles or dermal		Allergies, sinusitis	 Allergic reaction



Promoting Professional Excellence in Geoscience for Society

Geoscience Professions – most common fields of employment for geoscientists and the employment gaps



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