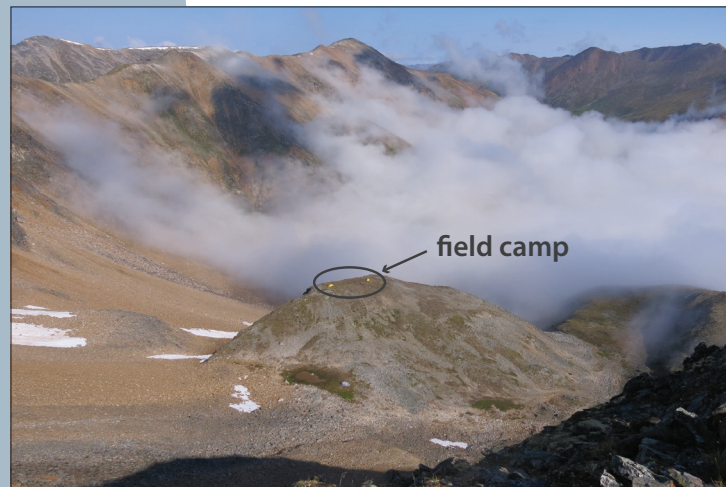




How do we make a geological map?

Making a geological map involves parties of two individuals traversing by foot over the land. Fieldwork is of very low impact and involves no mechanical work other than the use of a helicopter to access remote areas.



Geologists look for exposed bedrock and make observations about rock types and outcrop structures such as folds and faults. Observations are documented by taking notes and photos. Geologists may also use a rock hammer to collect small, fist-sized rock samples for further analysis in the lab. All data that are gathered during summer fieldwork are then analyzed in the fall and winter months and used to compile the geologic map.

The final map is a two-dimensional representation of the various rock types, the associated structures, as well as the overlying sediments that form the landscape all around us.

The Yukon Geological Survey

As a government organization, all the work that we do is available to the public. Our work is free knowledge that can be used for many different purposes.

The following include some of the activities conducted by the Yukon Geological Survey:

- bedrock and surficial mapping
- targeted geoscience studies and publications
- permafrost research
- community hazards mapping
- geoscience education and awareness
- mineral assessments



Understanding geology and Earth's systems is critical to maintaining a healthy, sustainable way of life for future generations.

For more information about the Yukon Geological Survey, or if you have questions about this document, please contact:

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The World of Geology - Why Should We Care?

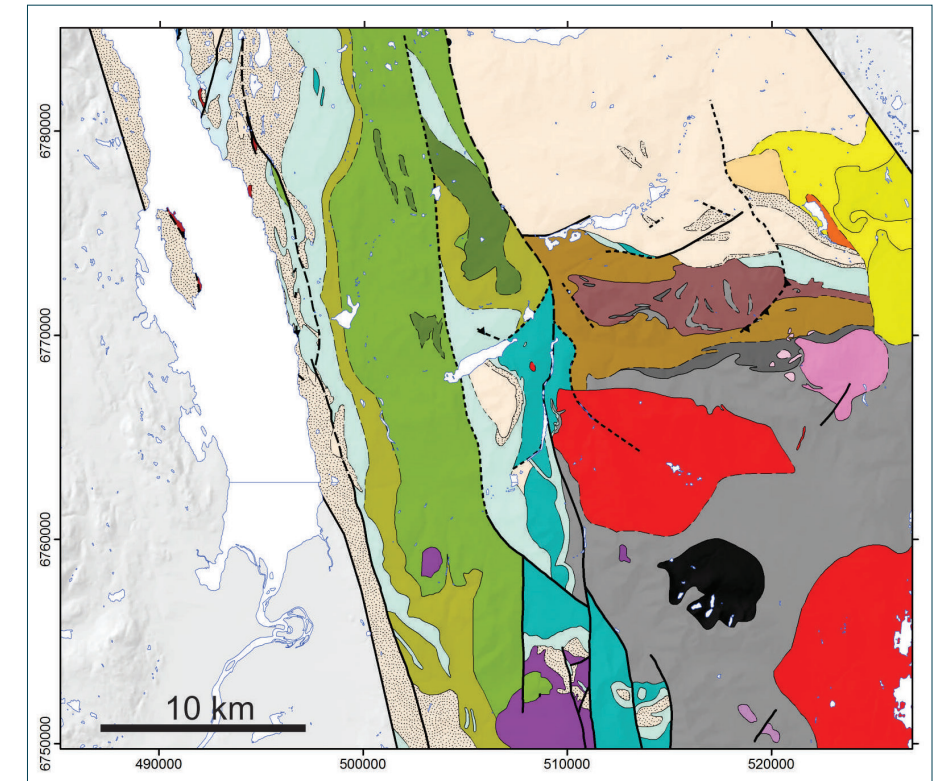
What is geology?

Geology is the science that deals with the origin, history and structure of the Earth, and the processes that shape it. It looks at physical features such as rocks, mountains and oceans. It studies how processes such as volcanoes, earthquakes and floods have shaped these features over time.

Geological mapping is the main approach used in understanding how the processes act on the Earth.

Geological maps illustrate the distribution of various rock types and the sediments that overlie them. The maps also depict structures that are visible at the Earth's surface. These rocks, sediments and structures form the landscape all around us.

Different colours represent various rock types (or units). Faults (breaks) and folds (bends) are geological structures that occur in rocks and sediments. Slow but powerful forces that work over millions of years (plate tectonics) cause these geological structures to form.



Example of a geological map.



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 Department of Energy, Mines
 and Resources
 Government of Yukon

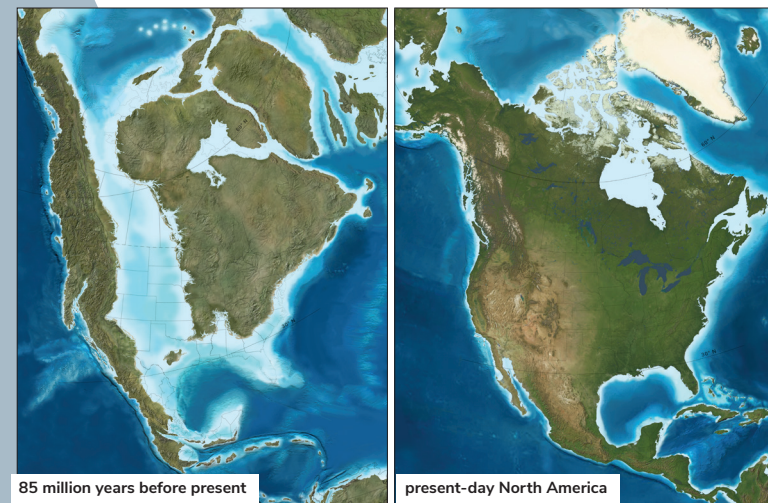
web: geology.gov.yk.ca email: geology@gov.yk.ca

Why make a geologic map?

Geological maps are tools used to communicate a wide range of geological information. We use this information in several different ways and it is critical to our well-being and our everyday lives.

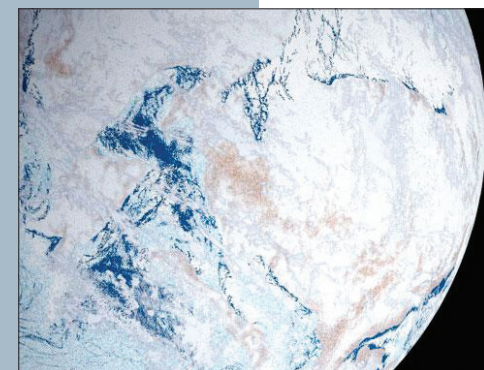
1. To understand Earth's history

Rocks record evidence of the Earth's history. Mapping the rocks helps us to understand how the Earth has changed over geologic time and more importantly, gain a better comprehension of the causes, rates, and the long and short-term effects of these changes. 'The past is the key to understanding the present.'



2. To understand past climates

Earth science research gives us clues as to how the Earth functioned in the distant past, before humans were around to record it. Yukon, and the world have undergone several major glacial events over geologic time. Approximately 18,000 years ago, ice covered nearly 60% of Yukon. The effects of this past cold climate and our current subarctic climate are visible today in the form of permafrost that underlies much of Yukon. Understanding past climate patterns can help to predict future changes.



The past is the key to understanding the present.

3. To identify potential hazards

Earth processes that occur naturally cause hazards such as earthquakes, volcanic eruptions, floods, droughts, landslides, etc. Geological mapping helps to better understand where these natural hazards may occur by identifying where major faults occur (i.e., potential for earthquakes) or areas that are vulnerable to permafrost thaw (i.e., potential for landslides). Having this geoscience knowledge is essential for reducing the risks associated with natural hazards.



4. To support infrastructure planning

Knowing what lies beneath our feet helps us to make informed decisions with respect to construction (e.g., roads, powerlines, schools) and environmental practices. For example, building on top of permafrost can lead to failure of infrastructure.



5. To support land-use planning

Land-use planning is a process to evaluate and assess lands. It is the basis for decisions on how we use the land and so it needs to be comprehensive. Assessing mineral and water resources along with economic and social conditions support effective land-use planning. Mineral potential is one of several values that are considered when making land-use decisions. Mineral potential maps provide information on which areas are most likely to have mineral deposits.



6. To effectively find and safely extract geological resources

We use natural resources daily in our lives, from recreation, to agriculture, manufacturing and building. Natural resources are limited, and are not distributed evenly around the world. Their distribution is a result of how and where geological processes have occurred in the past. Minerals and metals are often concentrated in very specific geological settings. Geological maps are useful in defining areas that have mineral potential. They also help to reduce the exploration footprint.



We rely on natural resources in our everyday lives from recreation, to agriculture, manufacturing and building.

7. To help identify potential energy sources

There is a need to reduce our dependence on non-renewable energy sources such as fossil fuels. Geothermal energy uses heat from the Earth to produce clean, renewable and sustainable energy. Geothermal energy resources can originate in hot water and rock found a few kilometres below the Earth's surface. These resources are often found near areas of volcanic activity, and they can also originate deep below the Earth's rigid crust. Hot water resources can move to the surface via major fault systems which act as conduits. In each case, geological maps can help to guide exploration for this valuable resource.



Having sound geological knowledge will help societies move toward greater sustainability and ensure the availability of resources for future generations.