

Hydrology & Surficial Geology Section at DGGs

Division of Geological & Geophysical Surveys



The Hydrology & Surficial Geology Section strengthens communities and infrastructure by collecting, analyzing, and sharing data about surface material resources and hydrology across Alaska.

- Characterizes the state's surface and groundwater resources
- Characterizes Alaska's permafrost and its distribution
- Determines the location and character of potential construction material resources
- Collects, analyzes, and compiles hydrologic and surficial geologic data that will benefit the safety and well-being of Alaskans



Hydrological & Surficial Mapping

Surficial-geologic maps show the distribution of materials on Earth's surface. They help identify construction material resources and placer mineral deposits and facilitate planning.

Engineering-geologic maps identify and characterize resources based on their engineering properties. They help identify areas that are suitable for development activities, as well as those requiring special consideration.

Aquifer models and maps are essential for ensuring an adequate and safe supply of water for development.

Learn more online: dggs.alaska.gov

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What are placer minerals?

Natural accumulations of heavy minerals in stream or beach sand and river gravel. Gold is the most common economic placer mineral in Alaska.

Hydrology & Surficial Geology Programs

Hydrology

The Hydrology Program leads research efforts that focus on interpreting and mapping groundwater resources in Alaska by:

- Working to gain a better understanding of current and future permafrost distribution
- Evaluating the quantity and quality of groundwater available for multiple state priorities
- Evaluating hazards associated with groundwater, including landslides, aufeis, and flooding



Our Toolbox Includes:

- Remote sensing
- Geophysics
- Boreholes and water wells
- Computer models



Surface Material Resources

Construction materials are naturally occurring rock and sediment—notably sand and gravel—deposits. Large-scale exploration, development, and maintenance projects will require tremendous quantities of sand and gravel for construction that could exceed the amount available from existing material sites. This program provides information about construction materials and other surface material resources and hazards through geologic mapping projects across the state, including projects along proposed transportation corridors on the North Slope and northern Cook Inlet region.

Permafrost Studies

Permafrost is ground that is frozen for two or more consecutive years. While frozen, it provides a stable foundation for structures and infrastructure, but if it thaws the ground becomes unstable. Temperature fluctuations over multiple seasons and years can also cause the ground to move as upper layers freeze and thaw.

Understanding permafrost is essential to the work done at DGGGS, because of its prevalence across the state—it occurs beneath nearly 85% of Alaska. Permafrost strongly influences surface processes, material characteristics, and landforms, and is a growing, widespread hazard.

