Renewable Hydropower Program

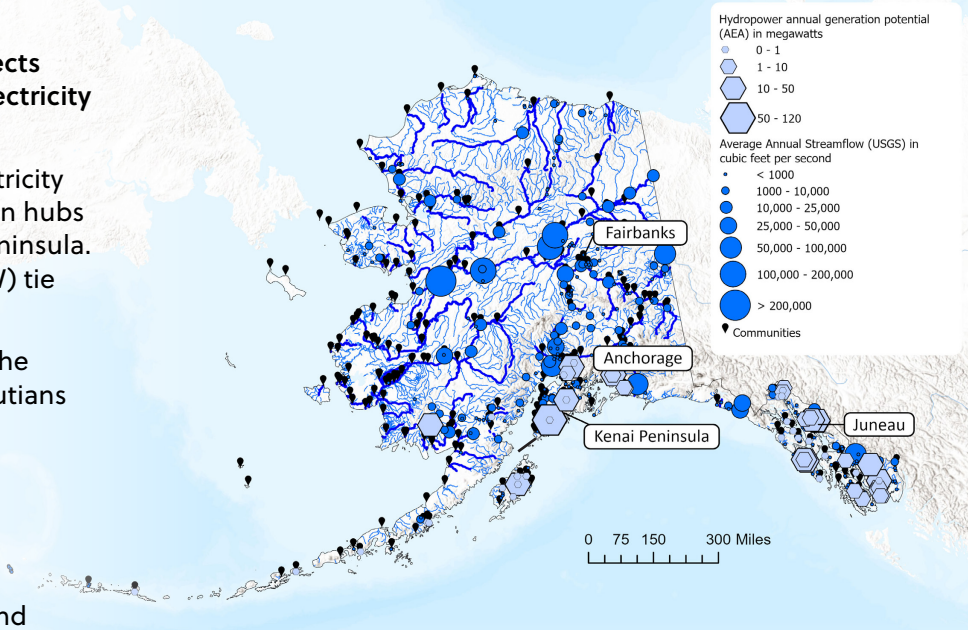
Alaska Division of Geological & Geophysical Surveys

Hydropower in Alaska

Around **50 utility-scale hydroelectric projects** contribute **20% of the State of Alaska's electricity** in an average water year (AEA, 2025).

The Alaska Intertie ('Railbelt') bridges electricity transmission between the major population hubs of Fairbanks, Anchorage, and the Kenai Peninsula. Large-scale hydroelectric projects (>50 MW) tie into the Railbelt.

Many small-scale projects (<10 MW) keep the lights on and support industries in the Aleutians and in Southeast Alaska.



Benefits for Alaska

Many remote villages rely on diesel fuel for power and heat. For those near rivers and coastlines, hydropower may be an economic and reliable alternative, reducing community dependence on expensive imported fuels.

Hydropower facility design depends on natural terrain, local climate, water availability, and electricity demand. Balancing these factors with other cultural and ecological values is key to project development and success.

Types of hydropower in Alaska

Conventional dam

Hydroelectric power stations utilize a dam to store water in a reservoir. Water from the reservoir flows through a pipe in the dam to a turbine to generate energy. The timing and amount of water flow can be controlled.

Alaska's three largest hydroelectric facilities are all conventional dams:

1. Bradley Lake (Homer) – 126 MW
2. Snettisham (Juneau) – 78 MW
3. Eklutna Lake (Anchorage) – 44 MW

Where energy demand is high, conventional dams provide the most electricity per initial investment cost. Maintenance costs can be significant.

Bradley Lake. Credit: Ian Dickson, KTOO

Run-of-the-river

Run-of-the-river projects rely on river flow to generate electricity. Like conventional dams, these systems divert flow through a large pipe to a turbine. Without large-scale reservoirs, these projects impound less water and are subject to short-term and seasonal flow fluctuations.

Run-of-the-river projects in Alaska are small to medium sized and typically produce minor to moderate impacts on hydrology and ecological function compared to conventional dams.

Power Creek. Credit: Cordova Electric Co-op

Hydrokinetic

With over 200,000 miles of river and coastline, Alaska is well situated to take advantage of hydrokinetic energy.

In-stream hydrokinetic turbines produce electricity directly from the current. Without a dam, hydrokinetic turbines offer minimal disruption to natural flow, aquatic habitats, and fish migration.

Kvichak River, Igiugig. Credit: ORPC RivGen

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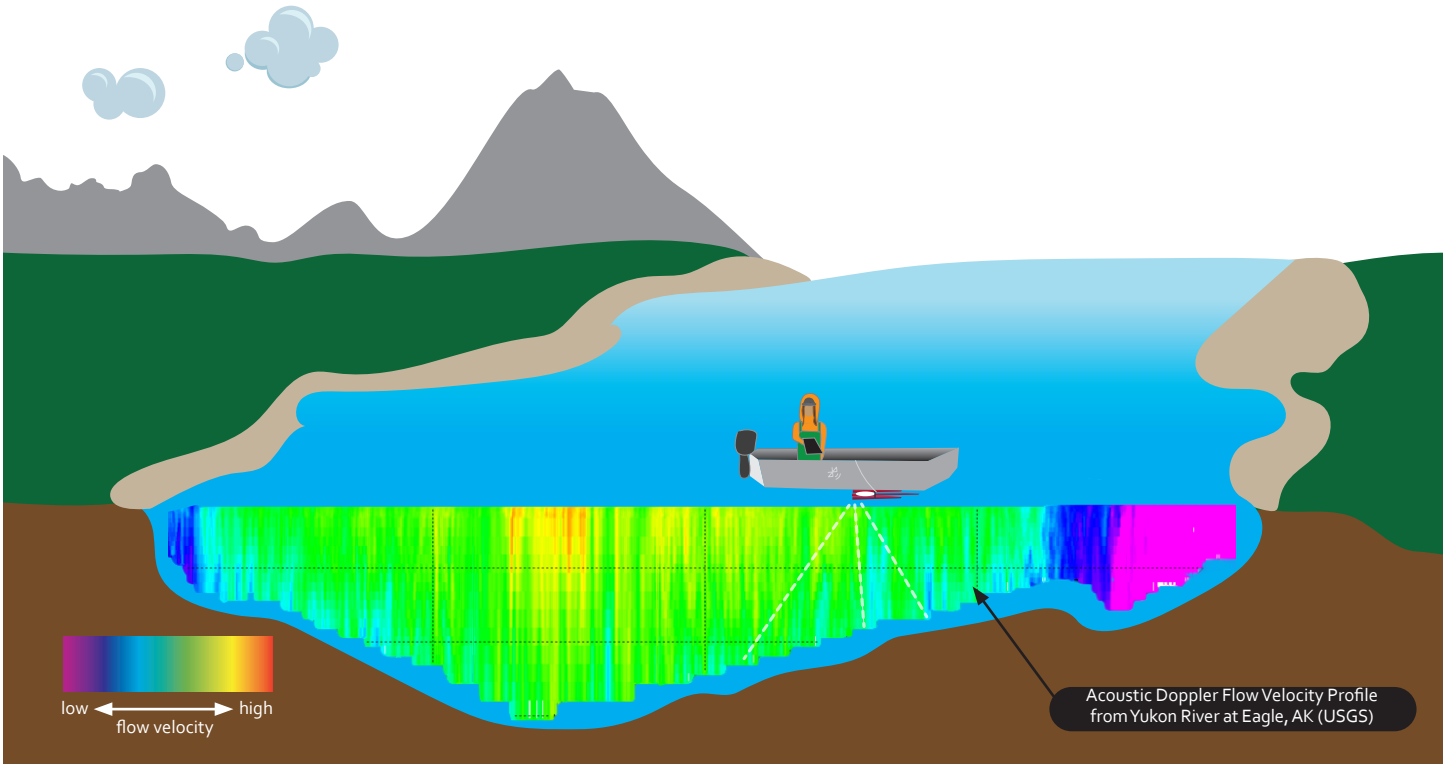
What is the DGGS Hydropower Program?

The State of Alaska Division of Geological & Geophysical Surveys (DGGS) Hydropower Program collects, compiles, and disseminates data and information related to hydropower energy resources in Alaska.

DGGS collaborates with public and private stakeholders including the University of Alaska Fairbanks, the Alaska Center for Energy and Power (ACEP), the U.S. Geological Survey (USGS), utility providers, and others to understand data needs and prioritize data collection efforts that benefit Alaskans.

Hydropower Program Objectives

- Maintain the **Alaska Hydropower Database** that includes existing and new geospatial and temporal data related to hydropower.
- **Collect field data** to monitor and characterize hydrology of potential hydropower projects.
- Spark long-term investment through the **Statewide Assessment of Hydrokinetic Energy Resources in Alaskan Rivers project** on emerging hydrokinetic turbine technology and project implementation.
- Map river bathymetry and velocity through the **Channel Mapping project**. This project utilizes sonar, lidar, and ground-penetrating radar to identify areas where hydropower may be a viable alternative.



Learn more online at https://dggs.alaska.gov/hsg/renewable-hydropower.html
Contact Matthew Scragg at matthew.scragg@alaska.gov
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