

Building Strong Collaborative Relationships for a Sustainable Water Resources Future:

STATE OF ALASKA

SUMMARY OF STATE WATER PLANNING

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Civil Works Directorate
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The findings contained in this report are based on the information collected from the literature search and interviews for this initiative and should not be construed as an official Department of the Army position, policy or decision unless so designated by other official documentation.

STATE OF ALASKA



Figure 1. Size of Alaska Relative to the Continental U.S
<http://alaska.fws.gov/water/about.htm>

1. RESPONSIBLE STATE AGENCIES/REGIONAL ENTITIES

The Water Resources Section of the Division of Mining, Land and Water (<http://dnr.alaska.gov/mlw/water/index.htm>) guides the water policy in Alaska. The Division of Mining, Land and Water is located within the Alaska Department of Natural Resources. The Water Resources Section adjudicates water rights, provides technical hydrologic support, and assures dam safety.

Key Contacts include:

Alaska Department of Natural Resources

Commissioner – Tom Irwin
550 W. 7th. Ave., Suite 1400
Anchorage, AK 99501
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Division of Mining, Land & Water

Director – Dick Mylius
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Anchorage, AK 99501-3579
Phone: 907-269-8600

Water Resources Section

Chief – Gary Prokosch
(907) 269-8645

The units that make up the Water Resources Section include:

- **Water Management Unit**
 - Grants water rights and issues temporary water use authorizations.
 - Facilitates the maximum use of the water resource consistent with the public interest
 - Provides certainty and security of water rights.
 - Manages the Water Maps and Data application allowing users access to active Water Right and Temporary Water Use Authorization spatial and tabular data
- **Hydrologic Survey Unit**
 - Collects, analyzes, interprets, and reports on Alaska's waters, including wetlands, glaciers, and coastal waters
 - Provides scientific advice and hydrologic data on the quantity and quality of Alaska's surface and subsurface waters
- **Dam Safety and Construction Unit**
 - Protects public safety and property by supervising the construction and operation of jurisdictional dams in Alaska
 - Reviews periodic safety inspection reports
 - Issues permits to construct, modify, repair, operate, remove or abandon dams
 - Participates in exercises of emergency action plans.

State Water Facts

- Alaska has more than 40 percent of the entire nation's surface water resources
- About three-fourths of all fresh water in Alaska is stored as glacial ice that covers nearly 5 percent of the state
- Alaska has more than three million lakes, over 12,000 rivers, thousands of streams and creeks, and an estimated 100,000 glaciers
- Longest River - Yukon River, 1,280 miles in Alaska, draining 204,000 square miles
- Largest Lake - Iliamna Lake, 1,115 square miles
- Largest Glacier - Malaspina Glacier, 850 square miles
- Highest Average Annual Precipitation-220 inches, Little Port Walter, S.E. Alaska
- Lowest Average Annual Precipitation-4.8 inches, Barrow, Arctic Slope, Alaska
- Greatest 24-Hour Precipitation - 15.2 inches, Angoon, S.E. Alaska
- Highest Average Annual Snowfall - 540 inches, Thompson Pass
- Greatest 24-Hour Snowfall - 62 inches, Thompson Pass
- Statewide Average Annual Precipitation - 1,050,000 million gallons per day
- Statewide Average Consumptive Water Use--27 million gallons per day
- Alaska Surface Water Inflow - 152,000 million gallons per day
- Alaska Surface Water Outflow - 989,000 million gallons per day
- Normal Reservoir Storage - 1.8 million acre-feet
- Total Estimated Water Use - 406 million gallons per day, 82 percent surface water, 18 percent ground water
- Greatest Daily Tidal Range - 38.9 feet, Upper Cook Inlet
- Alaska Total Land Area - 586,000 square miles (See Figure 1)

The Alaska Department of Environmental Conservation is the agency responsible for the management of water quality, including, state water quality standards; Alaska also is in the process of assuming responsibility for the Nation Pollutant Discharge Elimination System program (NPDES).

2. STATE WATER PLANNING STATUS

Article III of the Alaska Constitution, granted Governor Walter J. Hickel under Administrative Order No. 130 on July 14, 1992, is the State Water Policy. The policy presents the position of Alaska in addressing the complex and numerous issues facing State Water Resource Managers in assuring that:

1. *Alaska's water resources are made available for maximum use consistent with the public interest.*
2. *The quality and quantity of Alaska's water resources are protected for the use and enjoyment by all Alaskans.*
3. *Water dependent resources and activities such as fish and wildlife, recreation and transportation are afforded the protection necessary to assure use by future generations.*

Alaska State Water Policy

It is the policy of the State of Alaska to efficiently manage and conserve its water resources for the maximum use and benefit of its citizens, consistent with the public's interest. In so doing, the state's goal is to maximize public benefits by improving the quality of life of its residents, conserving the natural environment, facilitating and encouraging economic development, and protecting life and property. To further this policy, the following principles will guide the management of Alaska's water resources:

1. *The state is the conservator of public water resources.*
2. *The state will permit the broadest possible access to and common use of state waters, consistent with the public interests, acknowledging that the Legislature may by general law regulate and limit access to state waters in the interest of preserving or fostering preferred beneficial uses or public purposes (Constitution of Alaska, Article VIII, Sections 3, 13 and 14).*
3. *Whenever occurring in a natural state, all surface and ground water resources are reserved to the people for common use. However, all waters are subject to appropriation to the extent permissible by law. Except for an appropriation for a public water supply, an appropriation of water shall be limited to stated purposes and subject to preferences among beneficial uses, concurrent or otherwise, as prescribed by law; and subject to the general reservation of fish and wildlife (Constitution of Alaska, Article VIII, Sections 3 and 13 and AS 46.15.030).*
4. *No person shall be involuntarily divested of his right to the use of waters, or improvements affecting that use, except for a superior beneficial use or public purpose and then only with just compensation and by operation of law (Constitution of Alaska, Article VIII, Section 16).*
5. *Water resources shall be managed to ensure that adequate supplies of water are available for public water supplies, the protection of fish and wildlife habitat, migration, and propagation, recreation and park purposes, navigation and transportation purposes, and sanitary and water quality purposes, if found to be in the public interest (AS 46.15.080(1)).*
6. *State water quality standards shall be judiciously and fairly enforced.*

7. *The quality of water resources will be maintained, or improved to minimum water quality standards when feasible and prudent, so that current and future generations of Alaskans will have access to good quality water with which to meet their basic needs.*
8. *Water resources' planning is integral to wise water management. To the extent practicable, the state shall conduct sufficient water resources planning to ensure wise use and management of its waters. The state shall also solicit public participation in the planning and management of its water resources.*
9. *The state will encourage water conservation and public education in its management of water resources.*
10. *To the extent required by law, the state shall provide for the regulation, supervision, and periodic inspection of privately-owned and state-owned dams, reservoirs, and appurtenant works in order to ensure that the design, construction, and removal of dams and reservoirs is consistent with the protection of life and property (AS 46.17.010).*
11. *The state shall work cooperatively with the public and other state, local, and Federal agencies to administer water rights, conduct navigability determinations, collect water resources data, assure water quality standards are upheld, and provide scientific and technical assistance as requested.*
12. *The state shall systematically collect, record, store, evaluate, and distribute water resources data to determine the quality, quantity, location, and use of the state's water resources. Such activities are in the public's interest and are necessary for the orderly domestic and industrial development of the state (AS 41.08.017).*
13. *State agencies shall ensure that regulatory processes involving the state's water resources are efficient as possible and that, to the extent feasible, regulatory or jurisdictional duplication among state agencies is avoided or eliminated wherever found.*
<http://www.gov.state.ak.us/admin-orders/130.html>

3. WATER RESOURCES SECTION OF THE ALASKA DIVISION OF MINING, LAND AND WATER

Alaska does not have a published statewide water resources plan. As stated above the Water Resources Program is divided into three units: 1) the Water Management Unit; 2) the Hydrologic Survey Unit; and 3) the Dam Safety and Construction unit. Each of the units is described below.

Water Management Unit

The Water Management Unit deals with the allocation and use of surface water and groundwater resources (water rights), and the temporary use of water (Temporary Water Use Authorization). This unit is also responsible for managing all water right records and water resource data associated with the allocation and use of water.

The Water Management Unit also is responsible for:

- Establishes a right for use of a public resource;
- Establishes a priority in use/rights (first in time, first in right);
- Establishes legal standing to assert a water right;
- Organized allocation of Alaska most used resource;

- Establishes certainty and security and protection of investment ;
- Establishes a water resource data base for management purposes (web accessible data available) and
- Protects over use/misuse of water that may effect other natural resources (fish, wildlife, recreation, and navigation).

This unit also has an active Instream Flow program in cooperation with the Alaska Department of Fish and Game. *Sec. 46.15.145. - Reservation of water.*

The state, an agency or a political subdivision of the state, an agency of the United States or a person may apply to the commissioner to reserve sufficient water to maintain a specified instream flow or level of water at a specified point on a stream or body of water, or in a specified part of a stream, throughout a year or for specified times, for:

1. Protection of fish and wildlife habitat, migration, and propagation;
2. Recreation and park purposes;
3. Navigation and transportation purposes; and
4. Sanitary and water quality purposes.

Alaska Hydrologic Survey

The Alaska Hydrologic Survey (AHS) was established under Alaska Statute - [AS 41.08.017](#). AS 41.08 is the statute defining the Division of Geological and Geophysical Surveys. This statute charges AHS with:

(a) Systematic collection, recording, evaluation, and distribution of data on the quantity, location, and quality of water of the state in the ground, on the surface of the ground, or along the coasts, are in the public interest and necessary to the orderly domestic and industrial development of the state. (1 ch 41 SLA 1977; am 1 ch 101 SLA 1983; am 3 ch 36 SLA 1987) In undertaking this Statute the AHS also:

- Collect, record, evaluate, and distribute data on the quantity, quality, and location of groundwater, surface water and coastal water of the State;
- Publish or have published data on the water resources of the State;
- Require the filing of the results and findings of surveys of water quantity and quality;
- Require of water well contractors, to file the basic water and aquifer data normally obtained, including but not limited to well location, elevation, drillers log, pump test, and flow measurements, and water quality determinations;
- Establish and maintain a well log tracking system (WELTS), which is accessible by the public through our web site.

The categories/components that make up the Alaska AHS include:

- [Surface Water](#)
- [Ground Water](#)
- [Water Databases](#)
- [Publications](#)
- [Current Projects](#)

- [Past Projects](#)

Surface Water

Approximately 40 percent of the all the surface water outflow for the entire U.S. comes from Alaska. The state receives an average of approximately 1,050,000 million gallons per day (Mgal/d) in the form of precipitation. The Yukon, Kuskokwim, and Copper Rivers are among the ten largest rivers in the U.S., and the state has over 3 million lakes. The Alaska Hydrologic Survey collects, analyzes, and interprets surface water data for the citizenry of Alaska.

Ground Water

Alaska has the greatest ground water resources of any state in the United States. Ground water resources are used for domestic needs around the state. Ground water supply aquifers range from extremely small thaw bulbs in permafrost to large regional aquifers. The extensive permafrost development around the state provides challenges to the development of ground water resources. In many parts of Alaska, steep topography limits the size of most aquifers, preventing large scale extraction. Ground water is also used for bottled water export and many industrial operations, such as mining. Warm ground water discharging to the Chilkat River allows the river to stay unfrozen in the early winter. This has allowed a late run of salmon to become established and over 3,000 bald eagles gather in the early winter to feed on the fish.

Water Quality

Most of Alaska's waters are suitable for the following beneficial uses:

- Water supply (drinking, agriculture, aquaculture, industrial);
- Water recreation;
- Growth and propagation of fish, shellfish, aquatic life, and wildlife.

Note: The Alaska Department of Environmental Conservation is the agency responsible for the management of water quality, including, state water quality standards; Alaska also is in the process of assuming responsibility for the NPDES program.

Some beneficial uses are limited by natural water quality conditions in Alaska:

- Suspended sediment in glacial waterbodies
- Highly mineralized waterbodies
- Microorganisms such as giardia (beaver fever), schistosoma (swimmer's itch)
- High bacterial counts from decomposing salmon in streams

Beneficial uses can also be limited or impaired by the following human activities in Alaska, although programs are in place to monitor and prevent impairment of water under the authority of ADNR, ADF&G and ADEC:

- Natural resource development:
 - oil & gas development
 - transportation

- mining
- timber harvesting
- seafood processing
- Urban development:
 - urban runoff
 - septic systems
 - landfill leachate
- Military development:
 - abandoned installations
 - operational installations

Sediment, fecal coliform bacteria, and petroleum products are the primary pollutants of surface waters in Alaska.

Meteorology

The Alaska Hydrologic Survey performs meteorological studies, often as components of larger hydrologic investigations or projects. Precipitation (either as rain or snow), temperature, and low level, local winds are the principal elements that we study. A project usually includes on-site measurement and long-term sensing and recording, followed by data analysis and interpretation.

Water Databases

The Alaska Hydrologic Survey maintains several public information databases, in various formats. Roy Ireland is the Water Databases contact: (907)269-8639.

WELTS: This is a statewide well log tracking system database. It is an index to the files of over 25,000 well logs that have been submitted to the Hydrologic Survey, as required by state statute. Other well logs are obtained from various sources, including water rights applications. Public access is supported and encouraged. The [on-line version](#) of the WELTS database allows well logs searches, downloading of search results, and viewing and printing of well logs, and can be reached by clicking on the link above.

ARID: This database is a summary of stream characteristics resulting from an initial investigation into navigable streams within the state. The database has continued to grow as new data becomes available. This data base has been transferred to the Public Access Assertion and Defense Unit, within the Division of Mining Land and Water. This unit is responsible for navigability assertions.

STREAMS: This is an electronic record of all discharge measurements made by the Hydrologic Survey staff over the years. Many are discrete, once only measurements, while others are from sites visited repeatedly during the term of specific projects.

AKWUDS: This is an annual compilation of water use data gathered as part of the water rights management tasks performed by the Division of Mining, Land and Water. Many communities and other significant users of water are required to report their water usage.

Publications

This is a link to the publications produced by the Alaska Hydrologic Survey as well as unpublished reports on water data. <http://dnr.alaska.gov/mlw/water/hydro/puball.htm>

The AHS and the Water Management Unit have staff located in the DMLW's Northern (Fairbanks), South central (Anchorage) and Southeast regions (Juneau).

Current Projects

The databases continue to be maintained and are continually being updated. Distribution of data to the public and other users is of high priority.

- Hydrologic support for Alaska's Surface Coal Mining Program
- Hydrologic support for Large Mine Permitting and Compliance
- Database Management and Maintenance
- Support for the Water Management Section (including hydrologic analysis)
- Matanuska/Susitna Groundwater Assessment and Availability Study (2009-2011)

Past Projects

- Old Harbor Stream Gaging (DCRA, Div of Energy/AK Village Elec. Coop)
- Kenai River Mgmt Plan, Wetlands Work Group
- Water quality assessment of Ship Creek, Anchorage, AK
- Matanuska River drainage basin study
- Hydrologic assistance on Indian fuel spill (DEC Contaminated Sites Program)
- Old Hiland Dump ground-water investigation
- Nonpoint pollution impacts from agriculture in Alaska's coastal zone
- Water supply investigation at Chefornek, AK (Village Safe Water Program)
- Ground water investigation at Sterling, AK
- Water resources assessment for proposed Shepard Point road, near Cordova, AK
- Ground-water assessment at Alaska Railroad yard at Fairbanks, AK (USGS coop project)
- Ground water investigation at Nikiski, AK
- Surface water resources of Glacier Creek watershed, Girdwood, AK
- Water supply investigation at St. Paul, AK (Village Safe Water Program)
- Water resources assessment for proposed Copper River highway
- Recharge area delineation for Moonlight Springs near Nome, AK
- Aquifer mapping at Anchor Point, Alaska

Dam Safety and Construction Unit

The mission of the Alaska Dam Safety Program is to protect life and property in Alaska through the effective collection, evaluation, understanding and sharing of the information necessary to identify, estimate and mitigate the risks created by dams. <http://dnr.alaska.gov/mlw/water/dams/index.htm>

The Alaska Dam Safety Program is administered as a cooperative effort between the Alaska Department of Natural Resources (ADNR) and the various persons, businesses, agencies, and other interests that are involved in the design, construction, and operation of dams. To foster cooperation, communication between these parties must be effective and efficient.

The Dam Safety and Construction Unit views communication as the key to the safety of dams. Design drawings, operation and maintenance manuals, inspection reports, emergency action plans, and other documents are simply methods of communicating important information directly related to the safe design, construction, and operation of dams. Because dams are typically complex, unique, engineered structures with a long service life, the specific nature of this communication will be similarly complex and unique, and will occur during a long period of time.

By anticipating the scope of the communication, all of the entities involved will better understand the level of commitment necessary to accomplish the objectives of a particular project. Safe dams are the ultimate objectives of the Alaska Dam Safety Program. If cooperative relationships can be established between all of the parties involved, the entire community will benefit.

More information about the Alaska Dam Safety Program is available in “Guidelines for Cooperation with the Alaska Dam Safety Program”. Applications for the construction, modification, repair, removal or abandonment of dams, may be submitted to the State Dam Safety Engineer, Charles Cobb at:

DEPARTMENT OF NATURAL RESOURCES

Division of Mining, Land & Water

Dam Safety and Construction Unit

550 West 7th Avenue, Suite 1020

Anchorage, AK 99501-3577

Phone: 907-269-8636

Fax: 907-269-8947

<http://dnr.alaska.gov/mlw/water/dams/index.htm>

4. PARTNERSHIPS, STAKEHOLDER, AND PUBLIC INVOLVEMENT

State	Federal
Alaska Department of Environmental Conservation: Division of Water	U.S. Geological Survey - Water Resources of Alaska
Alaska Department of Fish and Game : Fisheries, Wildlife, and Habitat information	National Weather Service, Alaska Region
Geological and Geophysical Survey – Alaska Department of Natural Resources : Hosts Publications	U.S. Fish and Wildlife Service
University of Alaska, Fairbanks and Anchorage	U.S. Army Corps of Engineers-Alaska District

The Alaska Department of Environmental Conservation hosts the Climate Change Sub-Cabinet, the Disaster Response Plan, and the Division of Water that oversees water quality standards and pollution discharge.

The U.S. Geological Survey Water Resources of Alaska monitors water resource. Their monitoring network includes:

- Surface Water - real-time water-stage, streamflow and precipitation data at 152 sites across the state
- Ground Water - 14 ground water wells are monitored and data is recorded on hourly intervals
- Water Quality - Water-quality conditions are continuously monitored 42 sites across the state
- Bridge Scour - streambed scour at bridges through scour monitoring, hydrodynamic modeling, and data collection during high flows

The U.S. Army Corps of Engineers (USACE), Alaska District, is responsible for all assigned programs in the geographical region of the State of Alaska. The Alaska District utilizes many Corps programs and authorities to perform a wide variety of civil works activities, including:

- Planning, design, construction, operation, and maintenance of rivers and harbor projects with the purposes of navigation, flood damage reduction, ecosystem restoration, hurricane and storm damage reduction, recreation, and hydropower
- Floodplain management services
- Planning assistance to states, communities, and tribes
- Interagency coordination and involvement in many national water resource program

The District also administers the requirements of the wetlands and waterways regulatory program pursuant to 33 CFR, *Regulatory Program for Corps of Engineers*, parts 320-331.

The USACE [Civil Works Branch](#) studies potential water resource projects in Alaska. These studies analyze and solve water resource issues of concern to the local communities and may involve navigational improvements, flood control, or ecosystem restoration. They also track flood hazard data for over 300 Alaskan communities on floodplains or the sea coast.

http://www.dced.state.ak.us/dca/Planning_Alaska/CORPS_info.htm

The University of Alaska, Fairbanks assists the Northern Regional Office with water quality laboratory analysis.

Funding

Municipal grant and loans are available through the Department of Environmental Conservation, Division of Water.

5. PLAN IMPLEMENTATION STRATEGY

As previously mentioned Alaska does not have a comprehensive state water planning process and therefore they do not have a specific implementation strategy for statewide planning. Individual state programs: (1) the Water Management Unit; (2) the Hydrologic Survey Unit; and (3) the Dam Safety and Construction Unit have established responsibilities and goals for program implementation.

There are specific state land use and management plans (Department of Natural Resources) that address water but this process is limited to environmental issues such as fish and wildlife and their habitat. There are local government resource plans including: Coastal Resources Districts Plans, and tribal resource management plans and Borough Land Management (County Level) Plans. Some larger cities have water development plans that address distribution of water. (Personal communication, Gary Prokosch, Chief, Water Resources Section, Alaska Department of Natural Resources)

6. OUTCOMES ASSESSMENT PROCESS

Alaska does not have a formal outcomes assessment process for water resource planning and implementation.

7. NEEDS, CHALLENGES AND CRITICAL PRIORITIES - INTERVIEW INSIGHTS

The state of Alaska does not have a comprehensive water resource planning process. The state indicates that regional and “statewide” planning would be very beneficial but to date there have not been sufficient resources to undertake this type of planning. Alaska’s current focus is on addressing water resource management needs basis based on locally driven priorities and issues.

The state has identified the following water resource challenges, issues, and needs (not presented in order of importance):

- Areas of major population growth (Anchorage, Fairbanks, Juneau, Mat-Su valley)
- Need to conduct additional regional planning to address industrial water use needs associated with large scale mining, hydroelectric, and oil and gas development
- Need to conduct additional regional planning in Fairbanks, Mat-Su Valley, Anchorage area, Kenai area, areas in Western Alaska, and the North Slope. There is an immediate need to look at and address growth, as it relates to water use, and availability in many areas of Alaska
- Localize coastal erosion issues

- Water availability has mostly been a localized issue. For example water issues in the Anchorage area has mostly been related to localized ground water mining, water availability and quality in upland areas around Fairbanks has been identified as a concern
- Lack of historic hydrologic data sets on water resources creates challenges; this has especially been an issue when dealing with large development projects (mining, oil and gas exploration and development, and hydroelectric/hydrokinetic projects).
- Energy development (oil and gas) overall (especially on the North Slope which is very dry) can present some challenges notably in areas of permafrost where water availability is limited and environmental concerns are more prevalent
- There is a need to establish a state wide network for data collection (surface and groundwater).
- Alaska has great hydroelectric potential (20 or more new proposals in the past year) trying to keep up with those projects and the related issues associated with water use (prior appropriators, and environmental) is a challenge.

In summary there is an overall interest in obtaining more data and conducting more planning. The state would benefit from: additional funding to collect and synthesis more complete surface and groundwater data, development and use of additional modeling tools, and additional staff to address water right related development.

8. REFERENCES

Much of the language and information in this summary comes directly from reports published by the Water Resources Section of the Division of Mining, Land and Water which are referenced in the document (which in many cases are out of date: Personal Communication – Gary Prokosch, Chief, Water Resources Section, Alaska Department of Natural Resources). During interviews with state personnel it was noted that there is a need to update data and information and therefore in many cases the information presented is out of date.