ALASKA RISK MAP DATA ACQUISITION, ANALYSIS AND PRIORITIZATION OF FUTURE STUDY NEEDS

In order to better align the goals and vision of the State of Alaska's Risk MAP Program with the goals and vision of FEMA's Risk MAP Program, DCRA established the FY2010 task of acquiring relevant mapping data, analyzing that data, and prioritizing the State of Alaska's future study needs.

To accomplish this, state agencies and local communities were coordinated with to obtain information and data necessary for the prioritization of mapping needs. A consulting firm, URS, Inc., was hired to carry out this process. The process of data acquisition, analysis, and prioritization of future study needs is discussed in the sections that follow.

Alaska Mapping Data

The first step in the development of a tool to prioritize Alaska's future study needs is the collection of the appropriate data. State, Federal, regional, local and private entities were contacted to obtain information and data necessary for the prioritization of mapping needs in Alaskan communities participating in the NFIP. The information collected includes previously unidentified needs, significant climatological changes, planned future development, available topographic data, and available digital data depicting the built environment that are necessary for flood risk assessments. Depending on the nature of the information, the collected information was catalogued within an Excel Workbook, *AK-Data_Summary.xlxs*, or an ESRI ArcGIS geodatabase.

State and Local Data

The Alaska Mapping Business Plan recognizes 163 incorporated municipalities of which only 32 participate in the NFIP. Since the current Risk MAP focus is to update flood maps, data collection, analysis and prioritization of mapping needs focuses on NFIP-participating communities. A variety of state and local sources were utilized to acquire needed data.

Community Specific Data Collection

This effort focused on fulfilling the Mapping Business Plan's stated purpose and objectives identified in "Future DCRA Risk MAP Business Plan (MBP) Goals, Task 1B:

- Compile and update data on flood and other hazards
- Determine community specific previously unidentified needs
- Determine climatological changes and unidentified impacts
- Identify future planned development which could impact floodplains
- Identify the availability of newly acquired community specific topographic data
- Identify built environment dataset availability and quality

- Determine mitigation plan quality

The data collection and analysis effort entailed contacting State, Federal and local governments participating in the NFIP along with private entities to gather required data to fill the MBP data gaps. For the most part, community representatives willingly and enthusiastically supplied needed information viewing their involvement as having a two-fold benefit – the opportunity to potentially receive funding while simultaneously improving their ability to fulfill their floodplain management responsibilities.

The project included developing individual NFIP participant questionnaires to assess data gaps addressed in the first MBP Goal and its associated Task 1B. The completed questionnaires will provide essential data to support MBP updates and/or inclusion within the plan.

A review of the questionnaire responses reveals that planning, zoning, geographic information systems (GIS), topographic data availability, and community resource capability or capacity is directly related to the community size, affected population, rural location, and hazard risk. The smaller, more rural communities have severely limited capacity to develop or regulate building construction. However, most all communities do guide land-use to ensure new construction does not occur within known hazard zones. The completed questionnaires demonstrate these building code or land-use regulation and enforcement inconsistencies.

It is imperative to the majority of the participating communities that new flood hazard assessments be accomplished to obtain up-to-date flood hazard maps. Their maps are 20 to 60 years old, topography, development, and populations have changed along with associated infrastructure improvements. Consequently the current flood maps do not reflect current conditions and associated hazard risks. Most of these communities rely on historical flood impact knowledge to manage their floodplain because their paper maps no longer adequately identify impact areas. Digitized maps will not make a difference for rural communities with limited technological capabilities, because they cannot afford GIS, staff to manipulate the information, or in some cases the capability to contract this service out.

Additionally, a need was identified for a mechanism to re-adjust ongoing flood map updates to incorporate newly available data that would in some cases drastically change the in-progress map's impact areas, especially as the schedules for these flood map updates span multiple years. For example, the following is an excerpt from the Fairbanks North Star Borough questionnaire response:

> *"The current restudy effort was started in 2006 and is one of FEMAs last MAP Mod projects. Only a portion of the FIRM is being restudied and will be digital upon final adoption. FNSB successfully appealed certain elements of the revision upon review of the initial drafts first released in June of 2009.*

The successful appeal was possible in large part due to updated hydrology gathered by the Alaska Railroad in their Conditional Letter of Map Revision (CLOMR) application associated with their proposed new bridge crossing of the Tanana River."

The [Alaska Railroad] ARRC CLOMR process uncovered previous mapping shortfalls on the part of the FEMA mapping contractor which has delayed finalizing the FIRM updates. The CLOMR application essentially showed how the model used by FEMA in their mapping was flawed. As well, FEMA underwent a contractor change-over, which has further delayed release of the new DFIRMS. Additionally, FEMA headquarters made a "levee policy" change nationwide, which has also adversely affected the timely adoption of the DFIRMs.

In the meantime, [Fairbanks North Star Borough] FNSB has since acquired new LIDAR (very accurate with 2' contours which includes the Boroughs unnumbered "A Zones") from the Corps of Engineers. FEMA has stated that is simply not possible due to funding and time constraints. It is essential that this new LIDAR information be included in this current map revision. Risk MAP restudies for large areas of populated unnumbered A zone areas will take years to accomplish."

The collected information and data is compiled and available and included in ***AK_data_summary.xlsx*** and supports the MBP's future study needs assessment for the participating NFIP participating communities.

Federal and Regional Data

Average Annualized Loss

In 2009 FEMA initiated the Average Annualized Loss (AAL) Study to provide a Nationwide Loss Dataset. The analysis was performed using HAZUS-MH for every county in the contiguous United States. Annualized losses are maximum potential losses for a given year based on five return periods (10, 50, 100, 200, and 500yr). Unfortunately, the State of Alaska was not included in this analysis. Even though no AAL exists for the State of Alaska, it is mentioned and being considered as a potential future dataset as it is an important data gap in the current FEMA prioritization methodology.

- 2009 Population
- Population Increase 1980-2009
- Population Increase 2009-2019
- 2009 Housing Units
- Single Claims
- Policies
- Number of Repetitive Losses
- Number of Repetitive Loss Properties
- Average County Fed Disasters (As Of 7/2009)
- Total NHD Miles + Coastal W Inlets - Federal NHD Miles

Non-Average Annualized Loss

This dataset was used to generate the flood risk deciles used in the Flood Map Modernization (Map Mod) program. The decile calculations included the use of several national datasets including:This data is summarized on a HUC-8 watershed basis and is included in AK_data_summary.xlsx

Census Data

The most recent 2010 census data was collected as supporting information to the Community Boundaries and Information. Some of the parameters that will be used in the prioritization of future studies may be weighted by population in order to determine relative risk. This data is organized by census block and is presented in the ***AK_Sequencing.gdb***.

Community Boundaries and Information

Community information from three separate sources (State Data, Census Data, and FEMA); was collected and compared. The State uses FIPS and CID numbers found in FEMA's CIS database. However, many communities do not have a number because they are outside a designated borough but are located in Alaska's "Unorganized Borough." The databases also had misspellings, incomplete community names, and other inconsistencies exacerbating database search difficulties. NFIP participating municipalities located in the Unorganized Borough are listed by census area and contiguous boundaries have been developed by FEMA. These boundaries are located as the feature class *AK_Communities_FEMA* found within the ***AK_Sequencing.gdb*** geodatabase. These contiguous boundaries will be used in the prioritization of future studies.

Data Comparison

A comparison of the three data sources is shown in the table on the next page and the resolution to the inconsistencies is noted in the last column.

Table 25: Comparison of Data Sources on Alaska Communities

Community FIPS from State Data Community List & FEMA's Community Status Book		Community FIPS from 2010 Census Data		Community FIPS from FEMA		Notes
Borough	FIPS	Borough	FIPS	Borough	FIPS	
Aleutian Islands	02010					FIPS 02010 covered by STCOFIPS 02013 and 02016
		Aleutians East	02013	Aleutians East	02013	
		Aleutians West Census Area	02016	Aleutians West	02016	
Anchorage Division	02020	Anchorage Municipality	02020	Anchorage	02020	
Angoon Division	02030					FIPS 02030 covered by STCOFIPS 02232
Barrow-North Slope Division	02040					FIPS 02030 covered by STCOFIPS 02185
Bethel Div.	02050	Bethel Census Area	02050	Bethel	02050	
Bristol Bay	02060	Bristol Bay	02060	Bristol Bay	02060	
		Denali	02068	Denali	02068	
Dillingham	02070	Dillingham Census Area	02070	Dillingham	02070	
Emmonak-Unorganized Borough	02999					FIPS 02999 covered by STCOFIPS 02270
Fairbanks North Star	02090	Fairbanks North Star	02090	Fairbanks North Star	02090	
Haines	02100	Haines	02100	Haines	02100	
		Hoonah-Angoon Census Area	02105			02105 C. A. covered by STCOFIPS 02232
Juneau Division	02110	Juneau	02110	Juneau	02110	
Kenai Peninsula	02122	Kenai Peninsula	02122	Kenai Peninsula	02122	
Ketchikan Gateway	02130	Ketchikan Gateway	02130	Ketchikan Gateway	02130	
Outer Ketchikan Division	02190					FIPS 02190 covered by STCOFIPS 02201
Kobuk Division	02140					FIPS 02140 covered by STCOFIPS 02188
Kodiak Island	02150	Kodiak Island	02150	Kodiak Island	02150	
Kuskokwim Division	02160					FIPS 02160 covered by STCOFIPS 02290
Lake and Peninsula	02164	Lake And Peninsula	02164	Lake and Peninsula	02164	
Matanuska-Susitna	02170	Matanuska-Susitna	02170	Matanuska-Susitna	02170	
Nome Division	02180	Nome Census Area	02180	Nome	02180	
North Slope	02185	North Slope	02185	North Slope	02185	
Northwest Arctic	02188	Northwest Arctic	02188	Northwest Arctic	02188	
Prince of Wales Div.	02201			Prince of Wales-Outer Ketchikan	02201	
Sitka Division	02220	Sitka City and Borough	02220	Sitka	02220	
Skagway-Yakutat Division	2230	Skagway Municipality	02230			02230 Census Area covered by STCOFIPS 02232
				Skagway-Hoonah-Angoon	02232	

***(continued)* Table 25: Comparison of Data Sources on Alaska Communities**

Community FIPS from State Data Community List & FEMA's Community Status Book		Community FIPS from 2010 Census Data		Community FIPS from FEMA		Notes
Borough	FIPS	Borough	FIPS	Borough	FIPS	
Southeast Fairbanks	02240	Southeast Fairbanks Census Area	02240	Southeast Fairbanks	02240	
Upper Yukon	02250					FIPS 02250 covered by STCOFIPS 02290
Valdez-Chitina	02260					FIPS 02261 covered by STCOFIPS 02261
Valdez-Cordova	02261	Valdez-Cordova Census Area	02261	Valdez-Cordova	02261	
Wade Hampton Division	02270	Wade Hampton Census Area	02270	Wade Hampton	02270	
Wrangell-Petersburg	02280			Wrangell-Petersburg	02280	
		Yakutat	02282	Yakutat	02282	
Yukon-Koyukuk	02290	Yukon-Koyukuk Census Area	02290	Yukon-Koyukuk	02290	
		Unnamed Census Area	02195			02195 Census Area covered by STCOFIPS 02280
		Unnamed Census Area	02198			02198 Census Area covered by STCOFIPS 02201
		Unnamed Census Area	02275			02275 Census Area covered by STCOFIPS 02280

Coordinated Needs Management Strategy (CNMS) data

CNMS is a FEMA initiative to update the way FEMA organizes, stores, and analyzes flood hazard mapping needs information for communities. It defines an approach and structure for the identification and management of flood hazard mapping needs that will provide support to data driven planning and the flood map update investment process in a geospatial environment. Every stream and coastal reach nationwide is currently being assessed to determine its status.

For the State of Alaska, approximately 1,000 stream miles have been inventoried and analyzed to determine whether the stream or coastal miles meets its criteria of New, Validated or Updated Engineering (NVUE). The question CNMS will address is whether a stream (or coastal) segment is NVUE compliant. The dataset provided by FEMA shows all stream miles within Alaska as either being "Not Valid" or "Requires Assessment". According to STARR, Production and Technical Services (PTS) contractor for FEMA Region X, it is important to note that for the current CNMS inventory for Alaska in general, only FEMA's digital data was evaluated so if the area didn't have a DFIRM then it was unlikely to make it into the evaluation process. This means that participating communities with paper maps only do not have their flooding sources reflected in the current CNMS database.

Because the CNMS dataset is inherently a GIS database, it has been left in its original format – as a separate geodatabase.

Available Topography

FEMA tasked the Risk MAP Production and Technical Services (PTS) contractors to develop a Geospatial Data Inventory (GDI) of available high-quality elevation data across the Nation. The results of their efforts are summarized in a report titled *Geospatial Coordination High Resolution Topographic Inventory, Version 1.0* dated May 31, 2010.

A summary for Alaska is extracted from that report is provided as follows:

> *"Alaska – A majority of existing elevation data is located within the Kenai Peninsula Borough including several LiDAR datasets for the City of Seward flown in 2006 and 2009 (15 cm RMSE vertical accuracy) as well as several USGS-provided datasets covering a majority of the peninsula. Age and vertical accuracy information for this data is currently unknown. Additional LiDAR data is available for the North Slope and Yukon-Koyukuk Boroughs in northern Alaska. Vertical accuracy (where known) for most elevation data in Alaska ranges from 5-30 cm RMSE and would support 0.5-4 foot contours. Existing datasets were created in 2007 or more recently. Major source contributors included USGS's CLICK website, OpenTopography.com, state and local contacts. Very little high-resolution topographic data exists for Alaska. Several important LiDAR projects are planned for 2011 in areas within Mat-Su Borough as well as coastal areas within the Municipality of Anchorage."*

Local communities were also questioned as to the availability of topographic data. This data is summarized on a community basis and is included in ***AK_Data_Summary.xlsx*** , and includes datasets not identified in the GDI described above such as the newly acquired LiDAR in 2011 for the Mat-Su Borough.

Letters of Map Change (LOMC)

LOMCs, specifically Letters of Map Amendments (LOMAs), can be used as an indicator that a map may need revision. Letters of Map Revision (LOMR) have been excluded from this dataset because, by definition, approved LOMRs already address the mapping need and are the effective NFIP document for the area covered by the LOMR restudy. LOMAs can be summarized on a borough, community, or flooding source basis. This dataset is included in Tab 12, ***AK_Data_Summary.xlsx*** (see also Appendix 1, Table 8).

Mitigation Plans

The latest report to FEMA regarding the status of Mitigation Plans was dated June 24, 2011. The dataset includes FIPS, CID, and population information for jurisdictions added in May 2011 from the FEMA Community Layer.

The presence of active mitigation plans indicates those communities are proactive in managing flood related risks. Therefore, those watersheds with a high percentage of their areas intersecting communities with mitigation plans in place are usually given a higher priority for future studies. Local communities were also questioned as to the availability of mitigation plans. This data is summarized on a community basis and is included in Tab 7, AK_Data_Summary.xlsx (see also Appendix 1, Table 7).

Non-Compliance with the NFIP

When attempts to resolve enforcement problems through community assistance or consultation have failed, the FEMA Regional Director may place a community on probation. The probationary period lasts at least until all program deficiencies have been corrected and violations have been remedied to the maximum extent possible, and it may be extended for up to one year after that. Probation has no effect on the continued availability of flood insurance. If the community fails to take remedial measures during the probationary period, the Regional Director may recommend suspension from the NFIP which would prevent residents from obtaining flood insurance. A community may also be reinstated on probationary status after having been suspended. This data is summarized on a community basis and is included in Tab 6, ***AK_Data_Summary.xlsx***.

Community Rating System (CRS)

The CRS is a voluntary program for NFIP-participating communities. Information on the State of Alaska's current listings of all CRS communities, their class, and insurance discount has been collected and are summarized on a community basis. It is included in Tab 4, ***AK_Data_Summary.xlsx***.

Declarations

A Major Disaster could result from a hurricane, earthquake, flood, tornado, or major fire which the President determines warrants supplemental federal aid. To be considered for this aid the impacts of such an event must clearly exceed the capability of state or local governments' resources or capability to manage the consequences alone. If declared, funding comes from the President's Disaster Relief Fund, which is managed by FEMA, and disaster aid programs of other participating federal agencies. Data for the State of Alaska was pulled from FEMA and is included in Tabs 9 and 10, ***AK_Data_Summary.xlsx*** (see also Appendix 1, Table 7).

Federal Insurance Administration (FIA)

Flood insurance information was collected from the FIA. It contains the number of single claims, the number of policies in effect, the number of repetitive losses, and the number of repetitive loss properties summarized at the borough level. The data for the State of Alaska is included in ***AK_Data_Summary.xlsx*** (see also Appendix 1, Table 4.)

Hazard Mitigation Grant Program (HMGP)

Participation in FEMA's HMGP can give a good indication that a community is willing to mitigate the risks of flood hazards. Data for the communities within the State of Alaska participating in HMGP was pulled from FEMA and is included in Tab 5, ***AK_Data_Summary.xlsx*** (see also Appendix 1, Table 8).

Alaska Prioritization and Future Studies Sequencing Decision Support System

Overview

The Alaska Prioritization and Future Studies Sequencing Decision Support System is a ranking methodology intended to provide relative comparisons between watersheds based on a number of normalized factors in the State of Alaska. It provides an analysis of information gathered on a local, state, and nationwide basis to provide a prioritization list of Alaskan watersheds to be studied under FEMA's Risk MAP Program. The term "county" used throughout this report is synonymous with the State of Alaska's "borough" and "census area" classifications.

Building upon the concept of the Risk MAP 'trifecta' approach employed in the Fiscal Year 2011 (FY11) Algorithm, this solution incorporates several additional datasets, grouping them by type, and allowing users to assign customized weighting to each of the contributing factors. While the FY11 algorithm compares absolute values of one watershed to absolute values of another watershed for Flood Risk, Need and Topographic Coverage, this new approach leverages state and local considerations based on community input to develop a ranking of Hydrologic Unit Code (HUC) 8 watersheds within Alaska. It considers the local preferences for prioritization, such as climatological change, local hazard mitigation plans, planned future development, coastal exposure, etc. Special considerations are given to communities with plans in need of updating and with an expressed interest in plan improvement or development.

A total of 16 Indicators have been considered. Individual indicators have been grouped into one of the following three factors: Flood Risk, Needs, and Action Potential. The system is built in a robust and user-friendly environment that allows users to modify the contribution of each factor (or each indicator) based on local knowledge and preference. Instructions for viewing and modifying the weights for the various ranking factors are embedded in the spreadsheet tool, ***Alaska_Risk MAP_Prioritization.xlsx .***

Acquired/Standardized Data

Various datasets were identified, collected, assembled, and analyzed through the process. Data was obtained from different sources, such as federal, regional, and state agencies, as well as local communities. The focus of this effort was to collect the best available and most up-to-date data to optimize the accuracy of the information used in the decision making process. The table below provides a detailed list of datasets which were used in the prioritization process. Each indicator was classified into one of three factors: Flood Risk, Needs, and Action Potential. These factors, as well as individual indicators, were incorporated into the algorithm after normalization by population or area weighting at the HUC-8 level. This is critical when comparing watersheds as it allows for a fair comparison between entities when population numbers and total areas are different from one to another. This evaluation is performed primarily at the HUC-8 level.

Table 26: Datasets Used in the Prioritization Process

Factor	Indicator	Source	Data Collected Date	Resolution	Notes
Flood Risk	AAL	FEMA National Discovery	June 2011	Nation-wide data on FIPS level	Not available for Alaska
	Population	FEMA	2010	Census blocks	
Needs	CNMS	FEMA (STARR)	Oct. 2010	Region-wide data on stream level	No Complete dataset for Alaska available
	Coastal Miles	FEMA		Borough/Census block	FY10 sequencing
	Topographic Coverage	State of Alaska FEMA	Nov. 2011 May, 2010	State-wide data on community level Nationwide data on community level.	
	Community Identified Needs	State of Alaska	Nov. 2011	State-wide data on community level	
	Climatologic Change	State of Alaska	Nov. 2011	State-wide data on community level	
	LOMCs	FEMA MSC	Nov 2011	State-wide data on lat., long level	
	Planned Future Development	State of Alaska	Nov. 2011	State-wide data on community level	
Action Potential	Mitigation Plans	State of Alaska FEMA	Nov. 2011 June, 2011	State-wide data on community level Nationwide data on community level	
	Interest in New Community Plans	State of Alaska	Nov. 2011	State-wide data on community level	
	CRS	FEMA CRS	Oct. 2011	Nationwide data on community level	
	Disaster Declarations	State of Alaska FEMA CRS	Nov. 2011 Aug. 2011	State-wide data on community level Nation-wide data on county level.	
	FIA	FEMA	Dec. 2009	Nationwide data on county level	
	Mitigation Grants	State of Alaska FEMA RSS	Nov. 2011 May. 2011	State-wide data on community level Nation-wide data on county level	
	In-House GIS	State of Alaska	Nov. 2011	State-wide data on community level	

Data Processing

The different types of data provided lend themselves to inclusion in a prioritization algorithm in different ways. To prepare the tables, decisions must be made on data type and normalization method – keeping in mind a consistent ranking method. For the purposes of this analysis we will assume that the lower the rank (1 being the lowest) the more likely a unit (FIPS, CID, HUC) is to be recommended for study (meaning it is considered a higher priority by our system). Since the goal is to make prioritization recommendations, each data table should evaluate how one unit compares to another for the factor described by that data table to the extent possible.

Area/Population Weighting

Depending on the resolution of the contributing datasets, each indicator was first ranked at a watershed (HUC-8), County (FIPS), or Community (CID) level. For factors that existed at a HUC-8 watershed level, the factor rankings transferred directly to the master ranking scheme. For factors ranked at the county or community level, the appropriate area or population weighting was applied to the data such that counties/ communities with a large percentage of their respective area in a given watershed would contribute more to that watershed's eventual ranking for that factor than would the ranking of counties/communities which barely had a footprint in the watershed. The majority of the datasets used are available by political boundaries (CID or FIPS) rather than at the watershed level. The abovementioned method of ranking HUC -8 watersheds based on the area of "influence" of constituent counties/communities ensures that this transition from political boundaries to watershed boundaries is made in a meaningful manner without over- or under-representing the representative strength of the constituent counties/communities.

Considering Types of Data Inclusion – Rank vs. Binary

The data sets which have been collected can contribute to a prioritization calculation in one of two ways; they can either be used to provide a relative ranking for each unit (FIPS or CID depending on the data), or they can provide a binary YES/NO (1/0) for each unit. An example of data lending itself to ranking would be the FIA data, where each unit has its own unique set of attributes (in that case rep loss, properties, etc.). An example of data lending itself to binary inclusion would be the Climate Change table, where each community listed simply as a YES/NO. Much of the locally collected data was processed as a binary data set including Planned Future Development, Topographic Coverage, Community Identified Needs, Mitigation Plans, Interest in New Community Plans, Mitigation Grants, In-House GIS, IAID, and Climatological Change.

Risk Factor

Average Annualized Loss Rank

The Average Annualized Loss (AAL) Rank is a ranking, by watershed, of the total AAL. This starts with a Rank of 1 being the watershed with the highest AAL dollar amount. However, no AAL data analysis was available for Alaska to use on this project. Therefore, all the watersheds had the same ranking and no weighting factor is applied to this indicator. When the AAL data becomes available in the future, the indicator can be introduced to the algorithm. With proper weighting factor, AAL could contribute to the Risk factor.

Population Rank

Population Rank rates the highest population with a value of 1 to indicate that it is the most important, and increases in order to the watershed of lowest population.

Needs Factor

Coordinated Needs Management Strategy (CNMS)

This ranking uses the CNMS inventory to compare mileages within each watershed, which are considered Non-NVUE. New, Validated, or Updated Engineering (NVUE) is the FEMA standard that provides a basis for assessing the engineering analysis used to develop flood elevations. FEMA developed the standard to help mapping partners determine where new study data should be collected, where updates to existing flood hazard data should be performed, and whether previously developed flood study data could still be considered valid. The Non-NVUE category is composed of all paper inventory study miles, as well as any modernized NOT VALID and REQUIRES ASSESSMENT mileage. Higher priority can be given to watersheds with more mileage in this category. The CNMS data for Alaska currently shows that ALL stream miles are Non-NVUE compliant, thus all watersheds will have the same rank for this indicator. Additionally, FEMA's contractor STARR indicated that the only streams currently included in CNMS for the State of Alaska are those currently in DFIRM format. This excludes a large number of streams and makes this dataset incomplete. When the CNMS data is updated and some distinctions between the watersheds can be made, this indicator can be introduced to the algorithm at that time. Ultimately, CNMS should contribute heavily to the Needs factor.

Coastal Miles

Since the CNMS inventory only includes riverine mileages, a significant amount of coastal shoreline mileages within the state of Alaska are not considered. The Coastal Needs indicator addresses the needs of floodplain studies for coastal communities. The indicator ranks all watersheds based on the linear distance of coastline within a watershed as it relates to the overall area of coastal communities within the state. Higher priority is given to watersheds that include more coastal communities.

Topographic Coverage Rank

Topographic data availability was part of the FY11 algorithm and is considered here as an action potential. Here watersheds are ranked based on the percentage of their area that are covered by available topographic coverage (discounting the 30m resolution National Elevation Dataset- NED), with a Rank of 1 representing the watershed(s) with the highest percentage of topographic coverage. The base NED product was discounted based on the National Academy's findings on floodplain analyses and quality elevation data and the associated applicability of this particular dataset.

Community Identified Needs Rank

Community Identified Needs ranking is a weighted value representing the needs which were previously unidentified. Several communities have expressed the need for new or updated flood studies. Higher priority was given to communities that have identified such needs.

Climatological Change Rank

This ranking utilizes local input to identify any significant climatological changes observed in a community. Several communities have reported hydrological impact caused by climatological changes, such as rising sea level, glacier recessions, flooding introduced by glacial dam breaches, melting of permafrost, etc.

This factor evaluates the relative area of a watershed where the impact of significant climatological changes was reported. The watersheds are ranked based on the percentage of their area with significant climatological changes.

LOMC Rank

The Letters of Map Change (LOMC) ranking is a combined weighted value representing the presence and number of LOMCs within communities located in specific watersheds. Higher priority was given to watersheds including communities with greater numbers of processed LOMCs.

Planned Future Development Rank

This ranking utilizes the local inputs to identify any planned future development in a community. It evaluates the area of planned future development within a watershed as it relates to the overall area within the State of Alaska. A rank of 1 indicates a watershed which has seen the highest percentage of area that has planned future development. This is considered a Need because the planned future development is an indicator of future urbanization where the new physical environment is no longer being represented appropriately in the engineering model and on the map.

Action Potential Factor

Mitigation Plan Rank

The Mitigation Plan ranking is a weighted value indicating the presence of active mitigation plans within communities located in a watershed. Higher priority was given to those watersheds of which higher percentages of their respective areas included communities with mitigation plans in place.

Interest in New Community Plans

The Interest in New Community Plans ranking is a weighted value indicating the willingness of communities to either update their plans or develop new community plans. Higher priority was given to watersheds of which higher percentages of their respective areas included communities with community plans in place.

Community Rating System Rank

The Community Rating System (CRS) ranking is a combined weighted value representing the CRS rating of communities located in each of the watersheds. Higher priority was given to watersheds that included communities with a better overall CRS rating. In essence, communities that are more in compliance and have a better CRS rating will contribute positively to achieving the goals of Risk MAP.

Disaster Declarations Rank

The Disaster Declarations ranking is a weighted value indicating the presence of communities within the watershed that have a history of declared flood disasters. Higher priority was given to watersheds that have more disaster declarations with the thought that communities that have had disasters declared are more likely to value and implement mitigation action to limit the scope of the impact in the future. It also provides a part of the outreach communications.

Flood Insurance Administration Rank

The Flood Insurance Administration (FIA) ranking is a combined weighted value representing claims, policies, repetitive loss, and repetitive loss properties intersecting the watersheds using a per capita, per unit area normalization. Higher priority was given to watersheds that included communities with high occurrences of these factors per capita per unit area.

Mitigation Grants Rank

The Grants ranking is a combined weighted value representing presence of ongoing/recent studies within the communities or portions thereof within each of the watersheds. Higher priority was given to areas receiving greater mitigation grants. This is based on the assumption that because these communities have received mitigation funding recently, they could be more likely to improve their communities in other ways.

In-House GIS Rank

The In-House GIS ranking is an indicator of the community's capability to participate in the Risk MAP Program. A community with a strong in-house GIS program and proper supporting staff is more likely to carry out relevant aspects of the Risk MAP Program. Higher priority was been given to watersheds, which have the higher percentages of their areas intersecting communities with a confirmed In-House GIS program.

Application of the Prioritization and Future Studies Sequencing Decision Support System

The ***Alaska_Risk MAP_Prioritization.xlsx*** spreadsheet has eight tabs: Factor_Weights, HUC-8_Rankings, Scenarios, HUC_Rank, HUC_Summary, AK_Master, State_data_Summary, and NFIP.

The "Factor_Weights" tab allows the users to adjust the weighting factors based on community preferences. Initially, all editable fields (colored yellow) have been set to recommended weights. Users have the ability to evaluate the relative importance of three factors of Risk, Needs, and Action potential. In addition, users can adjust each indicator under subgroups if desired. Changing values in this tab will result in a new watershed prioritization within the 'HUC-8_Rankings' Tab.

The "HUC-8_Rankings" tab provides a summary of HUC-8 watershed's prioritization based on the user-specified weighting factors that are shown in the "WorkSheet" tab.

The "Scenarios" tab allows the user to capture certain weighting factor scenarios and compares the prioritization results side-by-side. Four pre-rendered scenarios are provided. The four scenarios are titled: Typical, Need Heavy, Risk Heavy, and Action Heavy with the most weight applied to their respective primary factor. The watershed rankings are conditionally formatted to allow for quick identification of high priority watersheds and can be sorted in a variety of ways.

Scenarios can be added using the instructions found within the "Adding Scenarios" section of this report. Both the "HUC_Summary" and "HUC_Rank" tabs show the rolled up summary watershed scores and rank tables resulting from the "AK_Master" analysis.

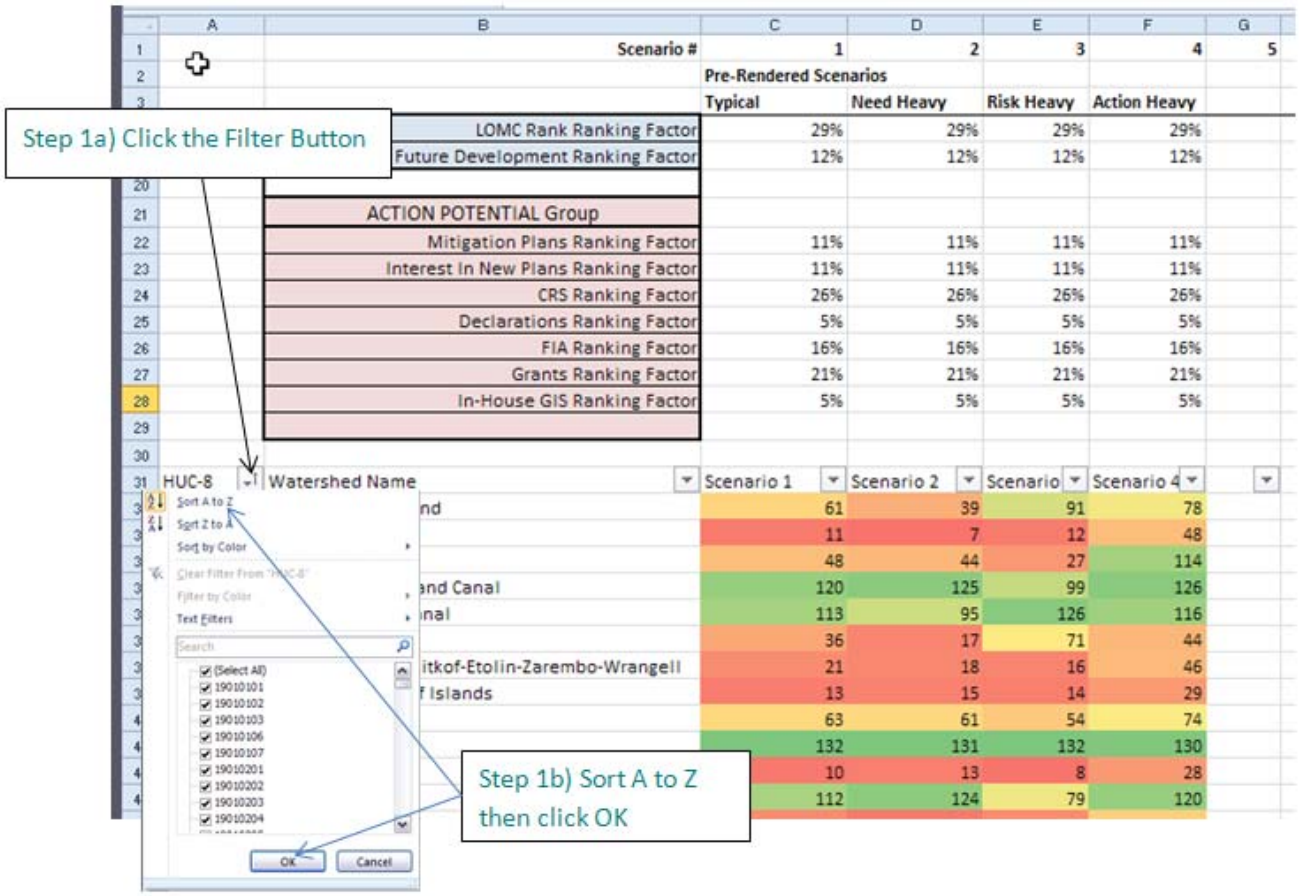
The "AK_Master" worksheet contains both the results of the GIS intersection of the Watershed, Community, FEMA borough, and Census boundaries as well as all of the required data manipulations to produce the required indicator scores.

The "State_Data_Summary" worksheet contains the summary of the local data provided by those communities participating in the NFIP. It also contains the binary and relative ranking summary data for this local data used in the "AK_Master" worksheet.

The "NFIP" worksheet summarizes the watershed rankings in relation to the NFIP participating community.

Adding Scenarios

Step 1: Ensure that the HUC-8 data and their respective rankings are sorted in ascending order. Clicking the filter tab button will generate a popup that will allow sorting in ascending order.



Step 2 and 3) Adjust the weighting factors and copy them into the Scenario's work-tab to identify the weighting scheme for this particular scenario.

Use Tier 1 Adjustments below if you desire shift the influence of each factor around.

Tier 1 Ranking Factors Weights Adjustment

Rate the following On a scale on 1-10 of relative importance between the 3 subgroups of Risk, Needs and Action Potential. Ratings directly translate to relative weights.

Factor	Suggested Weight Rating (1-10 ; 10 is heaviest weight)	User: Select Weights Below	Effective Percentage Weights used in calculations
RISK	6	3	30%
NEEDS	10	5	50%
ACTION POTENTIAL	4	2	20%

Use Tier 2 Adjustments below if you desire to further refine the weighting of ranks within each factor's sub-group

Tier 2 Ranking Factor Weights Adjustment *(optional)*

Rate the following On a scale on 1-10 of relative importance within each subgroup of Risk, Needs and Action Potential. Think of the total within each subgroup as a score. The rating number assigned to each moves the weight around as seen in the effective weighting % shown in the side in Column D

Note: For a description of the ranks below, please see documentation provided along with this spreadsheet

Sub-factors	Suggested Weight (1-10 ; 10 is heaviest weight)	User: Select Weights Below	Effective Percentage Weights used in calculations
RISK Group			
AAL Ranking Factor	8	0	0%
Population Ranking Factor	5	5	100%
NEEDS Group			
CNMS Ranking Factor	8	0	0%
Coastal Needs Ranking Factor	6	6	26%
Topo Coverage Rank Ranking Factor	6	6	26%
Community identified needs Ranking Factor	2	2	9%
Climate Change Ranking Factor	2	2	9%
LOMC Rank Ranking Factor	5	5	22%
Planned Future Development Ranking Factor	2	2	9%
ACTION POTENTIAL Group			
Mitigation Plans Ranking Factor	4	4	11%
Interest In New Plans Ranking Factor	4	4	11%
CRS Ranking Factor	10	10	28%
Declarations Ranking Factor	2	2	6%
FIA Ranking Factor	6	6	17%
Grants Ranking Factor	8	8	22%
In-House GIS Ranking Factor	2	2	6%

Step 2a) Adjust User Selected Weights to the desired weighting scheme (yellow cells)

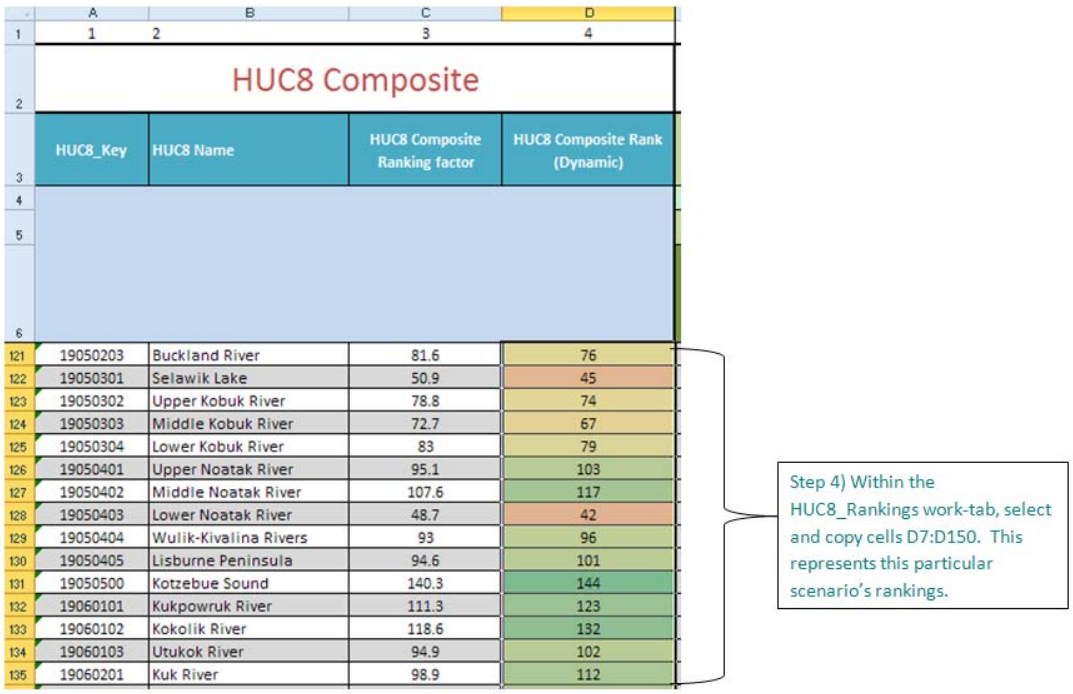
Step 2b) Copy User Selected Weights for input into Scenario's Tab

Scenario #	1	2	3	4	5	6
	Pre-Rendered Scenarios					
	Typical	Need Heavy	Risk Heavy	Action Heavy		
RISK	3	1	7	1		
NEEDS	5	8	2	2		
ACTION POTENTIAL	2	1	1	7		
RISK Group						
AAL Ranking Factor	0	0	0	0		
Population Ranking Factor	5	5	5	5		
NEEDS Group						
CNMS Ranking Factor	0	0	0	0		
Coastal Needs Ranking Factor	6	6	6	6		
Topo Coverage Rank Ranking Factor	6	6	6	6		
Community identified needs Ranking Factor	2	2	2	2		
Climate Change Ranking Factor	2	2	2	2		
LOMC Rank Ranking Factor	5	5	5	5		
Planned Future Development Ranking Factor	2	2	2	2		
ACTION POTENTIAL Group						
Mitigation Plans Ranking Factor	4	4	4	4		
Interest In New Plans Ranking Factor	4	4	4	4		
CRS Ranking Factor	10	10	10	10		
Declarations Ranking Factor	2	2	2	2		
FIA Ranking Factor	6	6	6	6		
Grants Ranking Factor	8	8	8	8		
In-House GIS Ranking Factor	2	2	2	2		

HUC-8	Watershed Name	Scenario 1	Scenario 2	Scenario	Scenario 4	Scenario 5	Scenario 5	Scena
19010101	Southeast Mainland	61	39	91	78			
19010102	Ketchikan	11	7	12	48			
19010103	Prince of Wales	48	44	27	114			
19010106	Headwaters Portland Canal	120	125	99	126			
19010107	Outlet Portland Canal	113	95	126	116			
19010201	Mainland	36	17	71	44			
19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21	18	16	46			
19010203	Baranof-Chichagof Islands	13	15	14	29			
19010204	Admiralty Island	63	61	54	74			
19010205	Lower Iskut	132	131	132	130			
19010301	Lynn Canal	10	13	8	28			

Step 3) Paste the weightings into the appropriate Scenario column for documentation and comparison

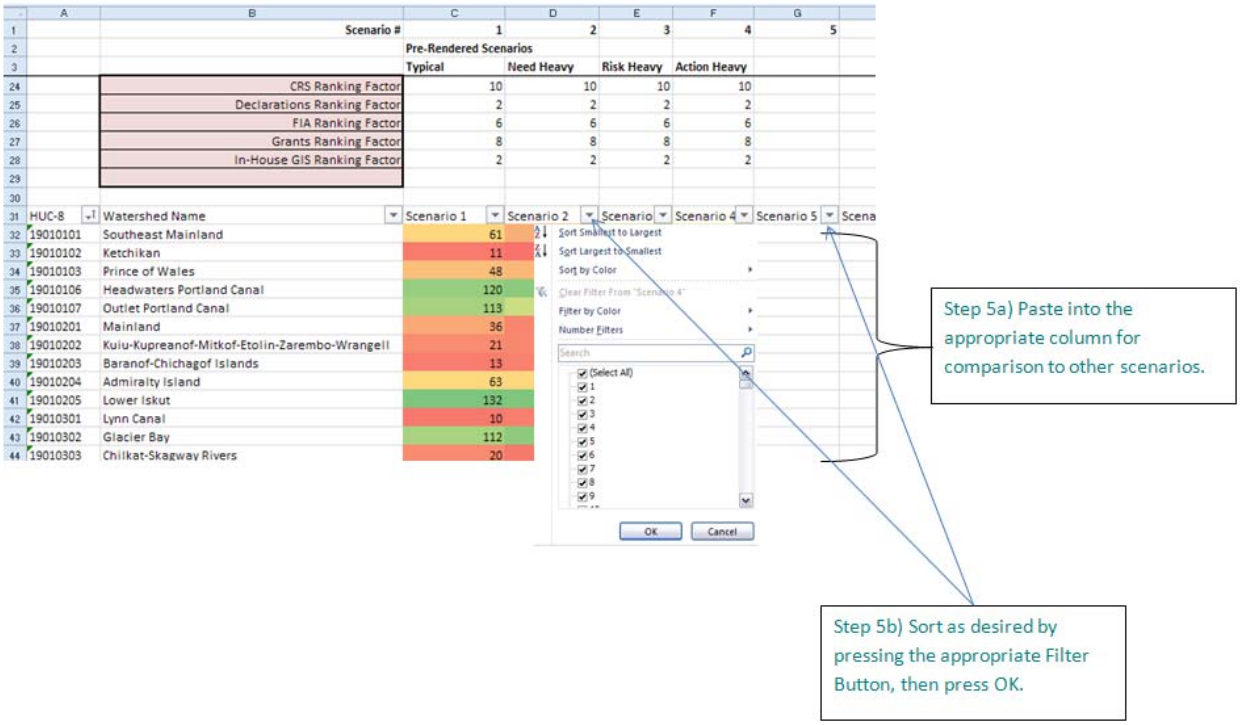
Step 4 and 5) Select and copy the watershed rankings then paste them into the Scenario worktab. Once pasted in, the results will be color coded according to the ranking. Sorting is performed by pressing the filter button and sorting as desired.



HUC8 Composite

HUC8_Key	HUC8 Name	HUC8 Composite Ranking factor	HUC8 Composite Rank (Dynamic)
19050203	Buckland River	81.6	76
19050301	Selawik Lake	50.9	45
19050302	Upper Kobuk River	78.8	74
19050303	Middle Kobuk River	72.7	67
19050304	Lower Kobuk River	83	79
19050401	Upper Noatak River	95.1	103
19050402	Middle Noatak River	107.6	117
19050403	Lower Noatak River	48.7	42
19050404	Wulik-Kivalina Rivers	93	96
19050405	Lisburne Peninsula	94.6	101
19050500	Kotzebue Sound	140.3	144
19060101	Kukpowruk River	111.3	123
19060102	Kokolik River	118.6	132
19060103	Utukok River	94.9	102
19060201	Kuk River	98.9	112

Step 4) Within the HUC8_Rankings work-tab, select and copy cells D7:D150. This represents this particular scenario's rankings.



Scenario #	1	2	3	4	5
	Pre-Rendered Scenarios				
	Typical	Need Heavy	Risk Heavy	Action Heavy	
CRS Ranking Factor	10	10	10	10	
Declarations Ranking Factor	2	2	2	2	
FIA Ranking Factor	6	6	6	6	
Grants Ranking Factor	8	8	8	8	
In-House GIS Ranking Factor	2	2	2	2	

HUC-8	Watershed Name	Scenario 1	Scenario 2	Scenario	Scenario 4	Scenario 5	Scena
19010101	Southeast Mainland	61					
19010102	Ketchikan	11					
19010103	Prince of Wales	48					
19010106	Headwaters Portland Canal	120					
19010107	Outlet Portland Canal	113					
19010201	Mainland	36					
19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21					
19010203	Baranof-Chichagof Islands	13					
19010204	Admiralty Island	63					
19010205	Lower Iskut	132					
19010301	Lynn Canal	10					
19010302	Glacier Bay	112					
19010303	Chilkat-Skagway Rivers	20					

Step 5a) Paste into the appropriate column for comparison to other scenarios.

Step 5b) Sort as desired by pressing the appropriate Filter Button, then press OK.

Prioritization of Future Mapping Needs

The focus of this work is to provide a baseline for prioritizing future study needs of Alaska's NFIP participating communities. The data collection and analysis results indicate that the Upper Kenai Peninsula (HUC 19020302) should be considered a high priority. The overall ranking for this watershed was insensitive to the weighting distribution scenarios that were tested. Adjacent watersheds also had high prioritization rankings.

The NFIP communities that are located in these high prioritized watersheds include Kenai Peninsula Borough, City of Kenai, Municipality of Anchorage, City of Soldotna, City of Aniak, City of Bethel, City of Kwethluk, City of Emmonak, City of Cordova, and the Matanuska-Susitna Borough. The prioritized rankings are illustrated by the map in Figure 21, next page, and by Table 26 on pages 92 and 93. Table 27 on pages 94-95 provides a listing of NFIP-participating communities by ranked HUC-8 watershed.

In general, the watershed rankings show that the South Central Alaska portions (Anchorage, and Matanuska-Susitna Boroughs) should be given higher priority. The coastal areas for these boroughs as well as the Western Alaska coastal areas (including Bethel and Wade Hampton) also need focused Risk MAP studies.

Completing the CNMS analysis is critical to accomplishing future analysis or updates to this activity. The current CNMS indicator for Alaska currently shows all watersheds will have the same rank. When the CNMS data is updated and some distinctions between the watersheds can be made, this indicator can be introduced to the algorithm at that time. Ultimately, CNMS should contribute heavily to the Needs Factor.

Also, a statewide risk analysis needs to be performed. The risk analysis will define the average annualized losses. When the AAL data becomes available in the future, the indicator can be introduced to the algorithm. With proper weighting factor, AAL could contribute to the Risk factor.

Figure 21: Map of Rankings of Watersheds Based on Scenario 1

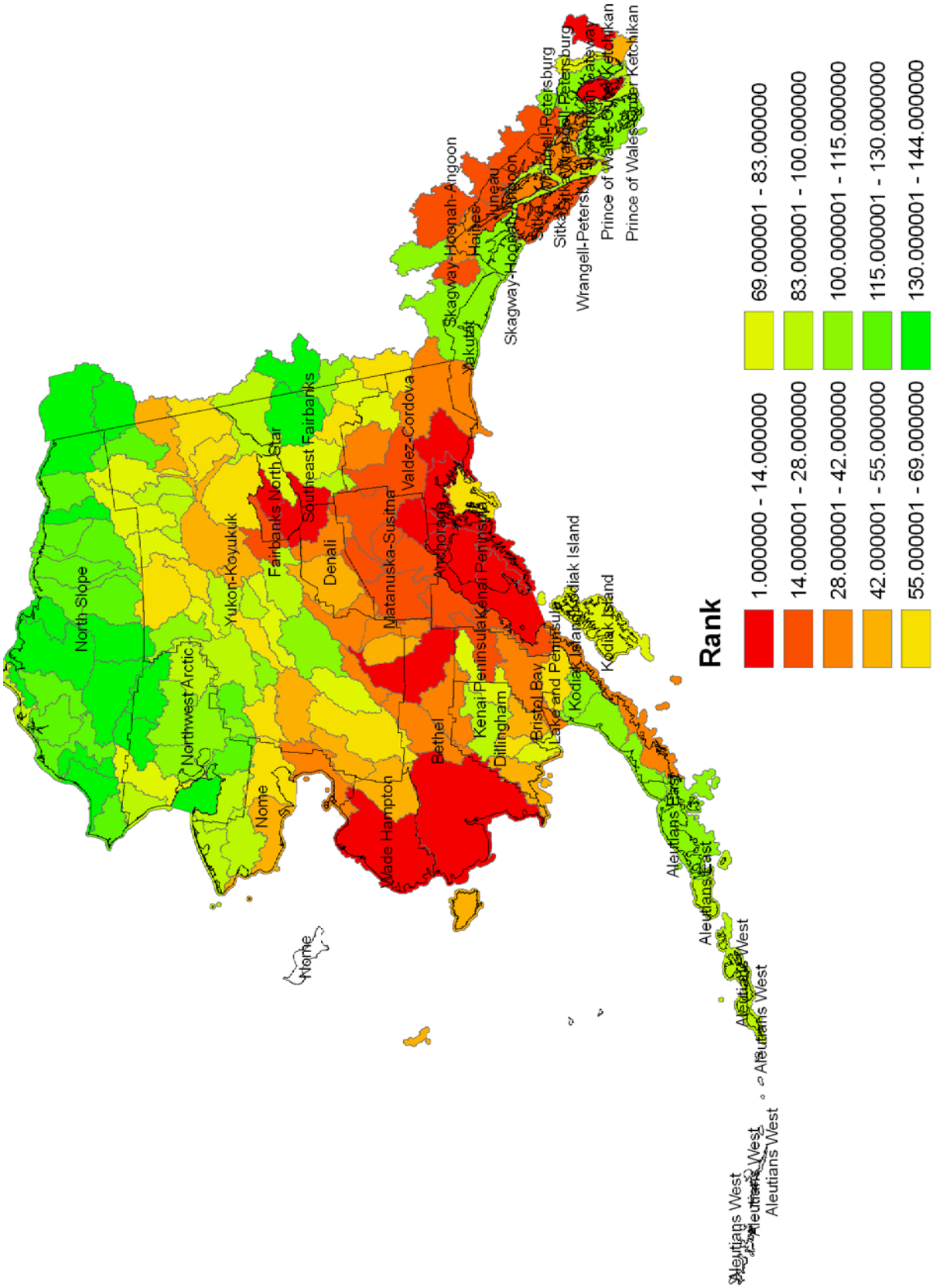


Table 27: Ranking of Alaska's HUC-8 Watersheds Based on Scenarios 1-4

HUC-8	Watershed Name	Scenario 1	Scenario 2	Scenario 3	Scenario 4
[illegible]	[illegible]	1	1	1	1
[illegible]	[illegible]	2	4	3	3
[illegible]	[illegible]	3	2	6	6
[illegible]	[illegible]	4	3	9	2
[illegible]	[illegible]	5	6	4	5
[illegible]	[illegible]	6	5	13	7
[illegible]	[illegible]	7	14	2	4
[illegible]	[illegible]	8	19	4	8
[illegible]	[illegible]	9	8	13	9
[illegible]	[illegible]	10	13	8	28
[illegible]	[illegible]	11	7	12	48
[illegible]	[illegible]	12	9	24	10
[illegible]	[illegible]	13	15	14	29
[illegible]	[illegible]	14	16	17	24
[illegible]	[illegible]	15	30	7	17
[illegible]	[illegible]	16	29	11	13
[illegible]	[illegible]	17	12	33	12
[illegible]	[illegible]	18	20	22	18
[illegible]	[illegible]	19	11	38	10
[illegible]	[illegible]	20	10	20	58
[illegible]	[illegible]	21	18	16	46
[illegible]	[illegible]	22	37	10	16
[illegible]	[illegible]	23	24	23	36
[illegible]	[illegible]	24	32	18	40
[illegible]	[illegible]	25	22	43	21
[illegible]	[illegible]	26	26	31	43
[illegible]	[illegible]	27	25	42	26
[illegible]	[illegible]	28	27	37	22
[illegible]	[illegible]	29	33	31	35
[illegible]	[illegible]	30	35	26	33
[illegible]	[illegible]	31	34	25	57
[illegible]	[illegible]	32	33	65	15
[illegible]	[illegible]	32	47	13	23
[illegible]	[illegible]	34	28	50	30
[illegible]	[illegible]	34	34	21	75
[illegible]	[illegible]	35	21	85	14
[illegible]	[illegible]	36	17	71	44
[illegible]	[illegible]	38	42	41	45
[illegible]	[illegible]	39	41	54	32
[illegible]	[illegible]	40	31	62	46
[illegible]	[illegible]	40	49	29	53
[illegible]	[illegible]	42	51	26	63
[illegible]	[illegible]	43	39	66	19
[illegible]	[illegible]	43	46	45	55
[illegible]	[illegible]	45	42	29	100
[illegible]	[illegible]	45	48	36	58
[illegible]	[illegible]	47	43	76	20
[illegible]	[illegible]	47	30	40	27
[illegible]	[illegible]	48	44	27	114
[illegible]	[illegible]	50	56	36	61
[illegible]	[illegible]	50	57	35	75
[illegible]	[illegible]	52	48	41	80
[illegible]	[illegible]	52	53	53	34
[illegible]	[illegible]	54	37	96	50
[illegible]	[illegible]	55	52	72	51
[illegible]	[illegible]	56	55	87	41
[illegible]	[illegible]	56	56	56	39
[illegible]	[illegible]	57	54	84	37
[illegible]	[illegible]	59	59	81	30
[illegible]	[illegible]	59	31	62	54
[illegible]	[illegible]	61	39	91	78
[illegible]	[illegible]	61	38	33	87
[illegible]	[illegible]	62	53	51	119
[illegible]	[illegible]	63	31	54	74
[illegible]	[illegible]	65	76	61	42
[illegible]	[illegible]	66	35	76	67
[illegible]	[illegible]	67	75	50	77
[illegible]	[illegible]	68	70	54	111
[illegible]	[illegible]	69	57	81	118
[illegible]	[illegible]	69	83	72	38
[illegible]	[illegible]	70	73	95	52

(continued) Table 27: Ranking of Alaska's HUC-8 Watersheds Based on Scenarios 1-4

HUC 8	Watershed Name	Scenario 1	Scenario 2	Scenario 3	Scenario 4
19050401	Koyukuk River	72	82	46	115
19050202	Goodnews-Togiak Bay	73	72	84	74
19050202	Upper Kobuk River	74	79	79	71
19050202	Ugashik Bay	75	70	89	106
19050503	Nenana-St. Mathew Trib. Ob	75	81	78	72
14070204	Bear Island River	76	40	68	85
19040801	Lower Tanana River	77	92	77	90
19070401	North Fork Kuskokwim River	78	81	98	55
19040106	Upper Koyukuk River	79	99	52	91
19040904	Delta River	80	103	51	89
19060106	Lower Colville River	82	88	63	122
19040203	Skagway River	83	78	109	64
19080902	Rio	84	110	49	92
19090204	Gulkana River	85	64	113	113
19080303	Chandler-Anaktuvuk Rivers	86	0	103	114
19040204	Black River	87	96	97	61
19050204	Wood River	87	104	57	108
19090404	Nowitna River	88	91	106	49
19080203	Monte River	89	87	82	123
19050301	Upper Nushagak River	89	90	82	101
19060101	Upper Colville River	90	62	125	109
19080201	Wilin River	91	84	111	69
19050106	Nushagak Bay	92	106	60	110
19050202	Naknek River	93	76	105	105
19040904	Nenana-Tanana Bay	93	116	74	66
19080202	Wilki River	95	98	129	100
19090404	Melozitna-Hodzana Rivers	96	113	67	105
19080202	Kisaan River	99	89	116	68
19080902	Cornelius Bay	100	95	85	132
19080405	Unalaska-Pribilofs	101	108	65	130
19050203	Egegik Bay	102	91	94	115
19080803	Unalaska River	102	93	93	131
19080401	Upper Noatak River	103	85	124	90
19040903	Healy Lake	104	126	48	104
19040803	Beaufort Lagoon	105	77	133	116
19080401	Eagle to Circle	106	115	88	80
19020203	Prince William Sound	106	100	95	94
19080202	Northwest Coast	107	122	47	136
19050403	Yukon River	108	106	101	79
19080301	Middle Fork-North Fork Chandler Rivers	110	100	108	87
19040802	Upper Innoko River	111	105	115	65
19080201	Oak River	112	94	102	128
19010202	Sucker Bay	112	124	79	120
19010807	Outlet Portland Canal	113	95	126	116
19070404	Middle Fork Kuskokwim River	114	104	119	69
19080105	Skilak Lake	115	126	92	100
19090404	Nenana River	116	121	107	82
19080402	Middle Noatak River	117	101	132	108
19080106	Lower Chandler River	118	127	98	98
19080403	Utukok River	120	110	110	137
19010808	Headwaters Portland Canal	120	125	99	126
19080603	Akiak River	122	118	130	73
19080801	Kalgonik River	123	108	122	135
19040104	Koyukuk River	124	116	127	86
19090402	Gisasa River	125	122	128	83
19080602	South Fork Kuskokwim River	126	131	121	97
19080604	Kanektok River	127	124	136	84
19080501	Tanana River	128	117	118	139
19080130	Kachemak River	130	135	114	94
19040503	Kalskag River	131	130	133	93
19080102	Kenai River	132	125	116	140
19080205	Lower Inlet	132	131	132	130
19080103	Skilak River	133	132	134	96
19010500	Ly Stuck-Chatham Strait	133	133	134	133
19080604	Kasigluk River	134	129	137	99
19090407	Delta River	135	137	131	118
19080205	Harrison Bay	136	120	139	141
19090204	Forty Mile River	137	139	120	129
19080701	Kalima River	138	136	140	117
19080302	Indian River	139	141	126	134
19040201	Mi Creek River	140	138	138	137
19090203	Fifty Mile River	143	144	142	143
19090500	Kalubus Sound	144	143	144	144

Table 28: NFIP-Participating Communities by Ranked HUC-8 Watershed

NFIP PARTICIPATING COMMUNITY	FIPS	CID	HUC_8	Watershed Name	Rank
Kenai Peninsula Borough	02122	02122X	19020302	Upper Kenai Peninsula	1
Kenai, City of	02122	020128	19020302	Upper Kenai Peninsula	1
Municipality of Anchorage	02020	020005	19020302	Upper Kenai Peninsula	1
Soldotna, City of	02122	020014	19020302	Upper Kenai Peninsula	1
Aniak, City of	02050	020033	19050302	Kuskokwim Delta	2
Bethel, City of	02050	020104	19050302	Kuskokwim Delta	2
Kwethluk, City of	02050	020130	19050302	Kuskokwim Delta	2
Emmonak, City of	02270	020125	19040805	Yukon Delta	3
Cordova, City of	02261	020037	19020201	Eastern Prince William Sound	4
Kenai Peninsula Borough	02122	02122X	19020201	Eastern Prince William Sound	4
Matanuska-Susitna, Borough of	02170	02170X	19020201	Eastern Prince William Sound	4
Municipality of Anchorage	02020	020005	19020201	Eastern Prince William Sound	4
Valdez, City of	02261	020094	19020201	Eastern Prince William Sound	4
Homer, City of	02122	020107	19020301	Lower Kenai Peninsula	5
Kenai Peninsula Borough	02122	02122X	19020301	Lower Kenai Peninsula	5
Kenai Peninsula Borough	02122	02122X	19020202	Western Prince William Sound	6
Seward, City of	02122	020113	19020202	Western Prince William Sound	6
Matanuska-Susitna, Borough of	02170	02170X	19020401	Anchorage	7
Municipality of Anchorage	02020	020005	19020401	Anchorage	7
Matanuska-Susitna, Borough of	02170	02170X	19020402	Matanuska	8
Municipality of Anchorage	02020	020005	19020402	Matanuska	8
Municipality of Anchorage	02170	020005	19020402	Matanuska	8
Matanuska-Susitna, Borough of	02170	02170X	19020102	Middle Copper River	9
City & Borough of Juneau	02110	02110X	19010301	Lynn Canal	10
Haines Borough	02100	02100X	19010301	Lynn Canal	10
Ketchikan Gateway Borough	02130	02130X	19010102	Ketchikan	11
Ketchikan Gateway Borough	02130	02130X	19010102	Ketchikan	11
Cordova, City of	02261	020037	19020104	Lower Copper River	12
City & Borough of Sitka	02220	02220X	19010208	Baranof-Chichagof Islands	13
City & Borough of Sitka	02280	02195X	19010208	Baranof-Chichagof Islands	13
Hoonah, City of	02105	020049	19010208	Baranof-Chichagof Islands	13
Wrangell City & Borough	02280	02195X	19010208	Baranof-Chichagof Islands	13
Nome, City of	02180	020068	19050104	Nome	14
Fairbanks North Star Borough	02090	02090X	19040206	Chena River	15
Fairbanks North Star Borough	02090	02090X	19040207	Tanana Flats	16
Nenana, City of	02290	025010	19040207	Tanana Flats	16
Kenai Peninsula Borough	02122	02122X	19030405	Stony River	17
Lake and Peninsula Borough	02164	02164X	19030405	Stony River	17
McGrath, City of	02290	020128	19030405	Stony River	17
Kenai Peninsula Borough	02122	02122X	19020601	Redoubt-Trading Bays	19
Lake and Peninsula Borough	02164	02164X	19020601	Redoubt-Trading Bays	19
Matanuska-Susitna, Borough of	02122	02122X	19020601	Redoubt-Trading Bays	19
Matanuska-Susitna, Borough of	02170	02170X	19020601	Redoubt-Trading Bays	19
Haines Borough	02100	02100X	19010303	Chilkat-Skagway Rivers	20
Municipality of Skagway	02232	025011	19010308	Chilkat-Skagway Rivers	20
Petersburg, City of	02280	020074	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	02280	020098	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	02280	02195X	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	02280	02275X	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Wrangell City & Borough	02280	02280X	19010202	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell	21
Matanuska-Susitna, Borough of	02170	02170X	19020203	Lower Susitna River	22
Kenai Peninsula Borough	02122	02122X	19020702	Shelikof Straight	25
Lake and Peninsula Borough	02164	02164X	19020702	Shelikof Straight	25
Kenai Peninsula Borough	02122	02122X	19050206	Lake Iliamna	26
Lake and Peninsula Borough	02164	02164X	19050206	Lake Iliamna	26
Kenai Peninsula Borough	02122	02122X	19050205	Lake Clark	27
Lake and Peninsula Borough	02164	02164X	19050205	Lake Clark	27
Northwest Arctic Borough	02188	02188X	19050201	Shishmaref	29
Shishmaref, City of	02180	020084	19050201	Shishmaref	29
Homer, City of	02122	020107	19020800	Cook Inlet	30
Kenai Peninsula Borough	02122	02122X	19020800	Cook Inlet	30
Kenai, City of	02122	020126	19020800	Cook Inlet	30
Matanuska-Susitna, Borough of	02170	02170X	19020800	Cook Inlet	30
Municipality of Anchorage	02020	020005	19020800	Cook Inlet	30
Fairbanks North Star Borough	02090	02090X	19040308	Tolovana River	32
Aniak, City of	02050	020033	19050301	Aniak	34
Kenai Peninsula Borough	02122	02122X	19020602	Tuxedni-Kamishak Bays	35
Lake and Peninsula Borough	02164	02164X	19020602	Tuxedni-Kamishak Bays	35
City & Borough of Juneau	02110	02110X	19010201	Mainland	36
Wrangell City & Borough	02280	020098	19010201	Mainland	36
Wrangell City & Borough	02280	02280X	19010201	Mainland	36
Northwest Arctic Borough	02188	02188X	19050103	Norton Bay	38
City & Borough of Juneau	02110	02110X	19010304	Taku River	40
Matanuska-Susitna, Borough of	02170	02170X	19040206	Nenana River	40
Nenana, City of	02290	025010	19040206	Nenana River	40
Kotzebue, City of	02188	020039	19050403	Lower Noatak River	42
Northwest Arctic Borough	02188	02188X	19050403	Lower Noatak River	42
Matanuska-Susitna, Borough of	02170	02170X	19020301	Upper Susitna River	43
Northwest Arctic Borough	02188	02188X	19050103	Inuruk Basin	43
Lake and Peninsula Borough	02164	02164X	19050101	Cold Bay	45
Northwest Arctic Borough	02188	02188X	19050301	Selawik Lake	45

(continued) Table 28: NFIP-Participating Communities by Ranked HUC-8 Watershed

NFIP PARTICIPATING COMMUNITY	FIPS	CID	HUC_8	Watershed Name	Rank
Fort Yukon, City of	02290	020045	19040403	Yukon Flats	47
Kenai Peninsula Borough	02122	02122X	19020504	Yentna River	47
Matanuska-Susitna, Borough of	02170	02170X	19020504	Yentna River	47
Galena, City of	02290	020124	19040705	Galena	50
Koyukuk, City of	02290	020127	19040705	Galena	50
Togiak, City of	02070	020090	19030305	Togiak	50
Fairbanks North Star Borough	02090	02090X	19040505	Salcha River	52
Kenai Peninsula Borough	02122	02122X	19030204	Naknek	52
Lake and Peninsula Borough	02164	02164X	19030204	Naknek	52
Lake and Peninsula Borough	02164	02164X	19030404	Holitna River	54
Matanuska-Susitna, Borough of	02170	02170X	19030407	South Fork Kuskokwim River	55
Matanuska-Susitna, Borough of	02170	02170X	19020503	Talkeetna River	56
Matanuska-Susitna, Borough of	02170	02170X	19020502	Chulitna River	57
Dillingham, City of	02070	020041	19030303	Lower Nushagak River	61
Ketchikan Gateway Borough	02130	02130X	19010101	Southeast Mainland	61
Ketchikan Gateway Borough	02280	02275X	19010101	Southeast Mainland	61
Lake and Peninsula Borough	02164	02164X	19030303	Lower Nushagak River	61
Wrangell City & Borough	02280	020098	19010101	Southeast Mainland	61
Wrangell City & Borough	02130	02130X	19010101	Southeast Mainland	61
Wrangell City & Borough	02280	02275X	19010101	Southeast Mainland	61
Wrangell City & Borough	02280	02280X	19010101	Southeast Mainland	61
City & Borough of Juneau	02110	02110X	19010204	Admiralty Island	63
City & Borough of Juneau	02110	02110X	19010204	Admiralty Island	63
Northwest Arctic Borough	02188	02188X	19040608	Koyukuk Flats	65
Northwest Arctic Borough	02188	02188X	19050303	Middle Kobuk River	67
Fairbanks North Star Borough	02090	02090X	19040402	Birch-Beaver Creeks	69
Lake and Peninsula Borough	02164	02164X	19030201	Port Heiden	69
Fort Yukon, City of	02290	020045	19040205	Porcupine Flats	70
Northwest Arctic Borough	02188	02188X	19050202	Goodhope-Spafarief Bay	73
Northwest Arctic Borough	02188	02188X	19050302	Upper Kobuk River	74
Lake and Peninsula Borough	02164	02164X	19030202	Ugashik Bay	75
Northwest Arctic Borough	02188	02188X	19050203	Buckland River	76
Nenana, City of	02290	025010	19040511	Lower Tanana River	77
Matanuska-Susitna, Borough of	02170	02170X	19030401	North Fork Kuskokwim River	78
Northwest Arctic Borough	02188	02188X	19050304	Lower Kobuk River	79
Delta Junction, City of	02240	020040	19040504	Delta River	80
Matanuska-Susitna, Borough of	02170	02170X	19040504	Delta River	80
Dillingham, City of	02070	020041	19030304	Wood River	87
Northwest Arctic Borough	02188	02188X	19060301	Upper Colville River	90
Dillingham, City of	02070	020041	19030306	Nushagak Bay	92
Lake and Peninsula Borough	02164	02164X	19030302	Mulchatna River	93
Northwest Arctic Borough	02188	02188X	19050404	Wulik-Kivalina Rivers	96
Northwest Arctic Borough	02188	02188X	19050405	Lisburne Peninsula	101
Lake and Peninsula Borough	02164	02164X	19030203	Egegik Bay	102
Northwest Arctic Borough	02188	02188X	19050401	Upper Noatak River	103
Delta Junction, City of	02240	020040	19040503	Healy Lake	104
Fairbanks North Star Borough	02090	02090X	19040503	Healy Lake	104
Fairbanks North Star Borough	02090	02090X	19040401	Eagle to Circle	105
Kenai Peninsula Borough	02122	02122X	19020203	Prince William Sound	106
McGrath, City of	02290	020128	19030403	Takotna River	108
Haines Borough	02100	02100X	19010302	Glacier Bay	112
Ketchikan Gateway Borough	02130	02130X	19010107	Outlet Portland Canal	113
Northwest Arctic Borough	02188	02188X	19050402	Middle Noatak River	117
Ketchikan Gateway Borough	02130	02130X	19010106	Headwaters Portland Canal	120
Northwest Arctic Borough	02188	02188X	19040603	Alatna River	122
Fort Yukon, City of	02290	020045	19040206	Grass River	124
Wrangell City & Borough	02280	02280X	19010205	Lower Iskut	132
Wrangell City & Borough	02280	020098	19010500	Icy Strait-Chatham Strait	133
Wrangell City & Borough	02280	02280X	19010500	Icy Strait-Chatham Strait	133
Northwest Arctic Borough	02188	02188X	19040606	Huslia River	134
Northwest Arctic Borough	02188	02188X	19050500	Kotzebue Sound	144