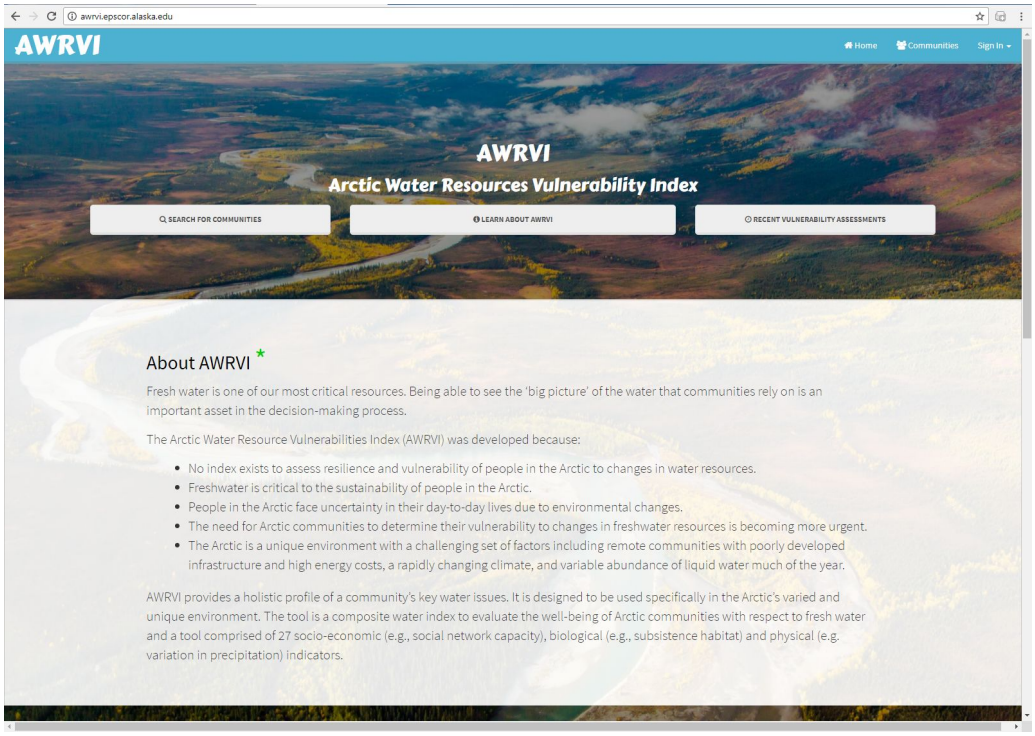
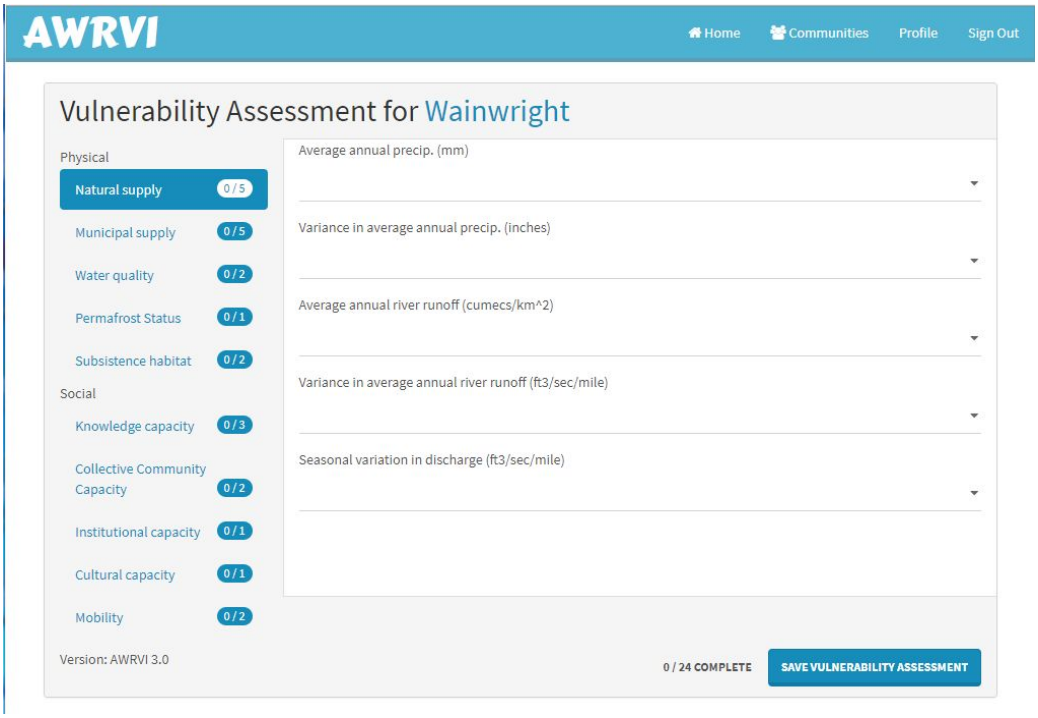
AWRVI Index Guide

Go to http://awrvi.epscor.alaska.edu.



To start a new index for a community, click **Search for Communities** and type the name of your community. If no index exists for that community, you can **Start a New Vulnerability Assessment.**

You will then be taken to this page.



The following steps will guide you through each indicator.

Natural Supply

Average Annual Precipitation and Variance in Average Annual Precipitation- A community that experiences low precipitation with higher variability is likely to exhibit greater vulnerability.

Go to https://www.ncdc.noaa.gov/cdo-web/search and select **Normals Annual/Seasonal** under Dataset. Search for **Station.** Enter your information and submit request. Download data from your email, open the table in Excel and locate ANN-PRECIP-NORMAL and ANN-SNOW-NORMAL.

The variance (σ^2) is a measure of how far each value in the data set is from the mean. Here is how it is defined:

1. Subtract the mean from each value in the data. This gives you a measure of the distance of each value from the mean.
2. Square each of these distances (so that they are all positive values), and add all of the squares together.
3. Divide the sum of the squares by the number of values in the data set.

To convert inches of snowfall to inches of precipitation, 1 inch rain = 10 inches snow
To convert inches total precipitation to millimeters, 1 inch = 25.4 millimeters

Average Annual River Runoff and Variance in Average Annual River Runoff- Watersheds with higher annual runoff and less variability in runoff are more resilient. Go to https://maps.waterdata.usgs.gov/mapper/ and search for the water body nearest your community in **Search By Place Name**. Select the site nearest your community and click **Access Data**. You will be taken to a page with several different types of data.

USGS 15453500 YUKON R NR STEVENS VILLAGE AK

Available data for this site SUMMARY OF ALL AVAILABLE DATA GO

Stream Site

DESCRIPTION:

Latitude 65°52'32", Longitude 149°43'04" NAD27
Yukon-Koyukuk Census Area County, Alaska, Hydrologic Unit 19080404
Drainage area: 194,000 square miles
Datum of gage: 243.8 feet above NAVD88.

AVAILABLE DATA:

Data Type	Begin Date	End Date	Count
Current / Historical Observations (availability statement)	1991-10-01	2017-12-01	
Daily Data			
Discharge, cubic feet per second	1976-10-01	2017-11-30	15036
Daily Statistics			
Discharge, cubic feet per second	1976-10-01	2017-04-05	14797
Monthly Statistics			
Discharge, cubic feet per second	1976-10	2017-04	
Annual Statistics			
Discharge, cubic feet per second	1977	2017	
Peak streamflow	1964-06-15	2016-05-17	41
Field measurements	1972-09-11	2017-10-05	142
Field/Lab water-quality samples	1970-09-15	2005-08-22	216
Water-Year Summary	2006	2016	11

Click **Annual Statistics**.

To calculate variance, follow the same steps above.
To convert cubic feet to cubic meters, 1 cubic foot = 0.0283168 cubic meters

Seasonal Change in Discharge- Where there is little variation in month-to-month discharge, the index will tend to 0, and that community would be highly resilient to seasonal water supply changes.
To calculate seasonal change in discharge, (Max - Min) / Average

Municipal Supply

To determine indicators for Municipal Supply, go to https://www.commerce.alaska.gov/dcra/DCRAExternal/Community/Details/25bf6c14-97ff-404b-a0f6-edfe2f1b6727 and find information related to your community's water source and water and wastewater treatment technology. Government documents regarding community planning also have information on a community's water resources. Advanced water and wastewater treatment systems enhance the resilience of a community due to the decreased health risks.

Yield (L/day)- Yield or availability of municipal water is measured as the total combined yield per person per day from wells, reservoirs, tanks, and other human infrastructure used to extract or store water. The threshold range for water yield is 20–100 L per person per day; below this amount, the yield is considered vulnerable, and in excess of this, the yield is considered resilient.

Water Source Diversity- The greater the diversity of water sources available for a community, the more resilient the community will be.
Go to https://www.commerce.alaska.gov/dcra/DCRAExternal/Community/Details/25bf6c14-97ff-404b-a0f6-edfe2f1b6727 and locate your community. Under **Facilities, Utilities, and Services** you will find **Water Treatment Systems**. Find **Water supply source** under Score Category. For each degree of water treatment technology (UV, biological filtration, chlorination, etc.) add one point to indicator score.

Water Treatment Technology- Go to https://www.commerce.alaska.gov/dcra/DCRAExternal/Community/Details/25bf6c14-97ff-404b-a0f6-edfe2f1b6727 and locate your community. Under **Facilities, Utilities, and Services** you will find **Water Treatment Systems**. Add one degree for each of the water treatment technologies used (filter, chlorine, UV, membrane filtration, oxidation, biological filtration).

Wastewater Treatment Technology- Go to https://www.commerce.alaska.gov/dcra/DCRAExternal/Community/Details/25bf6c14-97ff-404b-a0f6-edfe2f1b6727 and locate your community. Under **Facilities, Utilities, and Services** you will find **Sewage Treatment Systems**. If the community uses a honey bucket lagoon, the indicator score is 0. If the community uses outhouses, the indicator score is 2. Add one point for each degree of wastewater treatment.

Hydraulic Gradient- Communities with a water source nearby that requires little energy for extraction are likely to be more resilient. Hydraulic gradient is the hydraulic head (m) divided by the distance from the source (m).
There are 3 possibilities for calculating hydraulic gradient. 1. If you have a water system (pipes coming to most homes) in your community, 2. If your community's water is supplied by wells, or 3. If your water is supplied at a Washeteria, or by trucking/barging it from another location to the community.

1. If you have a piped water system: You will need to access a topographical map of your community to calculate hydraulic gradient. You will need the highest and lowest elevations to which your community pumps water. Calculate an average of the highest and lowest values as follows: (highest value - lowest value/2).
2. For communities whose water is primarily supplied by wells, you will need to estimate the average depth of wells in your community. Contact a company that has drilled many wells in your community and ask them the average depth of water wells they have drilled in that community.
3. For those communities whose water is trucked or barged in, automatically enter a zero (0) for this value in your AWRVI assessment.

Water Quality

Density of Upstream Development- The following websites provide information about the number of development sites within the watershed or subsistence area of your community: http://dec.alaska.gov/spar/csp/db_search.htm, http://dec.alaska.gov/eh/sw/index.htm,

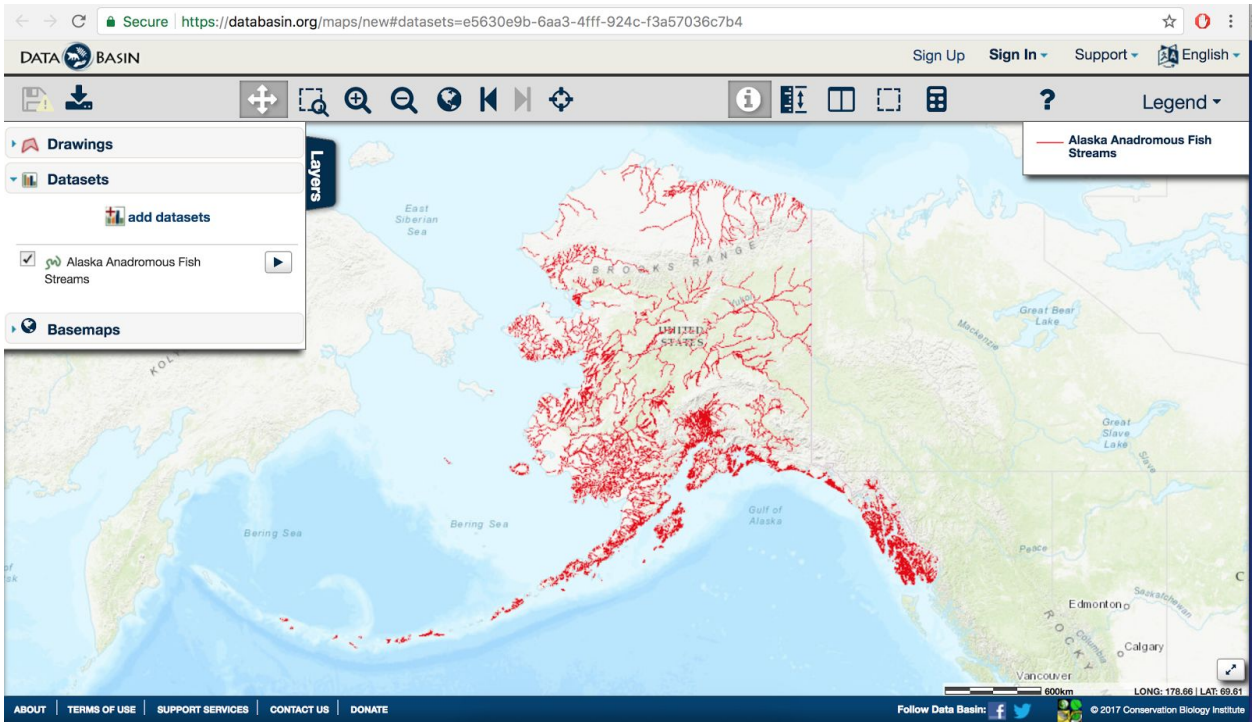
Streams with Water Quality Data- Go to http://waterdata.usgs.gov/ak/nwis/qw. If your water source has historical observations, it is annually monitored, and this indicator gets a full score. If the frequency of observations is less than every ten years, subtract one point. If the frequency is greater than every ten years, subtract one point. If there is no water quality data, the indicator score is 0.

Permafrost Status

Permafrost-

Subsistence Habitat

Anadromous Stream (%km) - Go to the Data Basin Alaska Anadromous Fish Streams dataset at https://databasin.org/maps/new#datasets=e5630e9b-6aa3-4fff-924c-f3a57036c7b4.



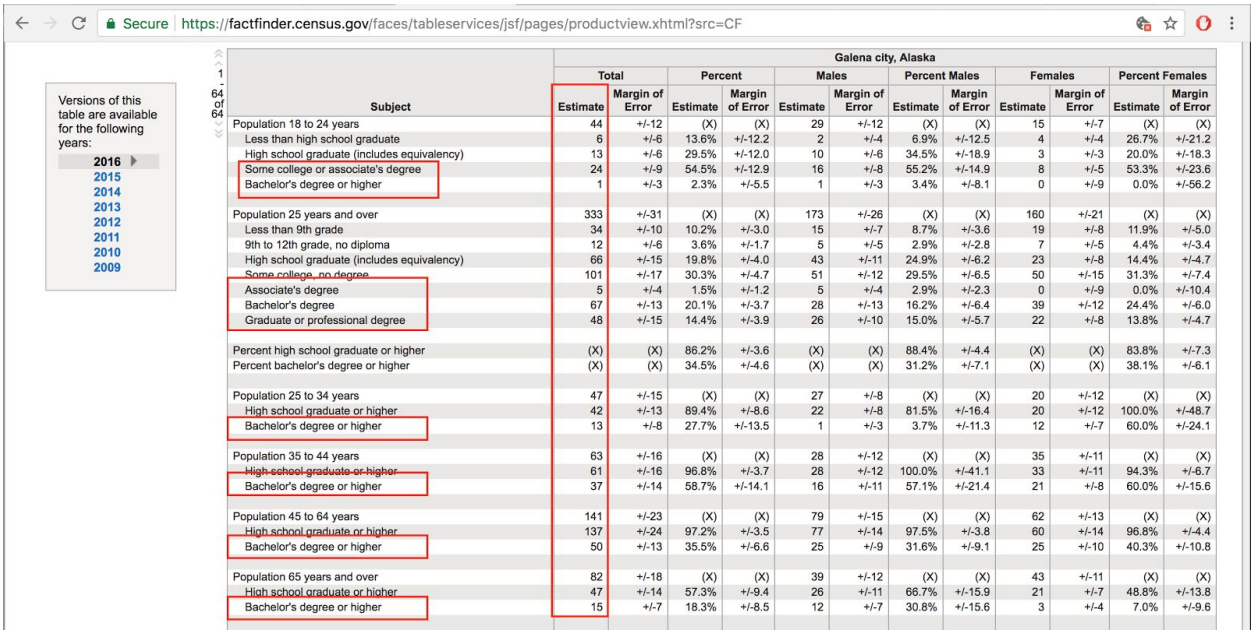
Zoom to your community. The red lines represent the anadromous portions of all the streams in Alaska.To calculate the percent anadromous stream of a watershed, measure the length of the red portions of the stream using the Measure Tool  found on the toolbar at the top of the window. Write this length down. Now measure the total length of the stream.
To calculate % Anadromous Stream, (anadromous length) / (total length)

Percent Moose + Caribou Habitat- Percent land tundra and boreal forest.

Knowledge Capacity

Traditional- Number of Indigenous language speakers per capita.

Western- College degrees per capita.
Go to 'American FactFinder' http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml
And then type in the name of your community in the box provided, then click **Go**. Under **Education** select **Educational Attainment**.



Secure | https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

Versions of this table are available for the following years:
2016
2015
2014
2013
2012
2011
2010
2009

1 - 64 of 64

Galena city, Alaska

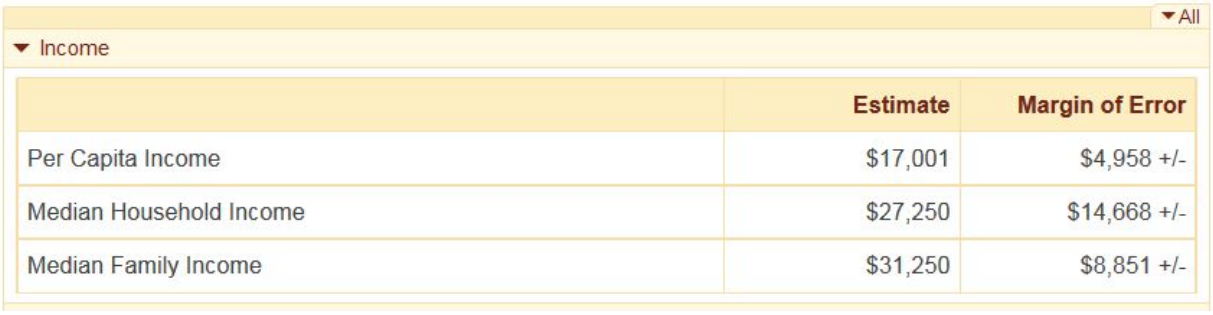
Subject	Total		Percent		Males		Percent Males		Females		Percent Females	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Population 18 to 24 years	44	+/-12	(X)	(X)	29	+/-12	(X)	(X)	15	+/-7	(X)	(X)
Less than high school graduate	6	+/-6	13.6%	+/-12.2	2	+/-4	6.9%	+/-12.5	4	+/-4	26.7%	+/-21.2
High school graduate (includes equivalency)	13	+/-6	29.5%	+/-12.0	10	+/-6	34.5%	+/-18.9	3	+/-3	20.0%	+/-18.3
Some college or associate's degree	24	+/-9	54.5%	+/-12.9	16	+/-8	55.2%	+/-14.9	8	+/-5	53.3%	+/-23.6
Bachelor's degree or higher	1	+/-3	2.3%	+/-5.5	1	+/-3	3.4%	+/-8.1	0	+/-9	0.0%	+/-56.2
Population 25 years and over	333	+/-31	(X)	(X)	173	+/-26	(X)	(X)	160	+/-21	(X)	(X)
Less than 9th grade	34	+/-10	10.2%	+/-3.0	15	+/-7	8.7%	+/-3.6	19	+/-8	11.9%	+/-5.0
9th to 12th grade, no diploma	12	+/-6	3.6%	+/-1.7	5	+/-5	2.9%	+/-2.8	7	+/-5	4.4%	+/-3.4
High school graduate (includes equivalency)	66	+/-15	19.8%	+/-4.0	43	+/-11	24.9%	+/-6.2	23	+/-8	14.4%	+/-4.7
Some college, no degree	101	+/-17	30.3%	+/-4.7	51	+/-12	29.5%	+/-6.5	50	+/-15	31.3%	+/-7.4
Associate's degree	5	+/-4	1.5%	+/-1.2	5	+/-4	2.9%	+/-2.3	0	+/-9	0.0%	+/-10.4
Bachelor's degree	67	+/-13	20.1%	+/-3.7	28	+/-13	16.2%	+/-6.4	39	+/-12	24.4%	+/-6.0
Graduate or professional degree	48	+/-15	14.4%	+/-3.9	26	+/-10	15.0%	+/-5.7	22	+/-8	13.8%	+/-4.7
Percent high school graduate or higher	(X)	(X)	86.2%	+/-3.6	(X)	(X)	88.4%	+/-4.4	(X)	(X)	83.8%	+/-7.3
Percent bachelor's degree or higher	(X)	(X)	34.5%	+/-4.6	(X)	(X)	31.2%	+/-7.1	(X)	(X)	38.1%	+/-6.1
Population 25 to 34 years	47	+/-15	(X)	(X)	27	+/-8	(X)	(X)	20	+/-12	(X)	(X)
High school graduate or higher	42	+/-13	89.4%	+/-8.6	22	+/-8	81.5%	+/-16.4	20	+/-12	100.0%	+/-48.7
Bachelor's degree or higher	13	+/-8	27.7%	+/-13.5	1	+/-3	3.7%	+/-11.3	12	+/-7	60.0%	+/-24.1
Population 35 to 44 years	63	+/-16	(X)	(X)	28	+/-12	(X)	(X)	35	+/-11	(X)	(X)
High school graduate or higher	61	+/-16	96.8%	+/-3.7	28	+/-12	100.0%	+/-41.1	33	+/-11	94.3%	+/-6.7
Bachelor's degree or higher	37	+/-14	58.7%	+/-14.1	16	+/-11	57.1%	+/-21.4	21	+/-8	60.0%	+/-15.6
Population 45 to 64 years	141	+/-23	(X)	(X)	79	+/-15	(X)	(X)	62	+/-13	(X)	(X)
High school graduate or higher	137	+/-24	97.2%	+/-3.5	77	+/-14	97.5%	+/-3.8	60	+/-14	96.8%	+/-4.4
Bachelor's degree or higher	50	+/-13	35.5%	+/-6.6	25	+/-9	31.6%	+/-9.1	25	+/-10	40.3%	+/-10.8
Population 65 years and over	82	+/-18	(X)	(X)	39	+/-12	(X)	(X)	43	+/-11	(X)	(X)
High school graduate or higher	47	+/-14	57.3%	+/-9.4	26	+/-11	66.7%	+/-15.9	21	+/-7	48.8%	+/-13.8
Bachelor's degree or higher	15	+/-7	18.3%	+/-8.5	12	+/-7	30.8%	+/-15.6	3	+/-4	7.0%	+/-9.6

Under each age group is the level of educational attainment. In order to calculate # of Western degrees per capita, add up each estimate of educational attainment starting from 'Associate's degree' and on to the highest level. Divide this number by the total population.

30+ Years Residency- Number of people living 30+ years in the community per capita.

Collective Community Capacity

Per Capita Income- Go to 'Community Database Online': https://www.commerce.alaska.gov/dcra/DCRAExternal/community, and click on the first letter of the name of your community. Scroll to the bottom of the webpage. Click on the tab for Income and Poverty, and then on the Income tab. Per capita income appears at the top of the list. See picture below:



All

Income

	Estimate	Margin of Error
Per Capita Income	$17,001	$4,958 +/-
Median Household Income	$27,250	$14,668 +/-
Median Family Income	$31,250	$8,851 +/-

Existence of Water Action Plan- Community plan for water resources.

Institutional Capacity

Percent Land in Protected Area Status-
Go to https://sdms.ak.blm.gov/isdms/imf.jsp?site=sdms. Zoom to your community. In the panel on the right, check the **Village Lands** box under **Land Status**. Open the **Land Status - Detailed** and check the **Fish & Wildlife Service**, **National Parks Service,** and **Bureau of Land Management** boxes. Click **Refresh Map**. You can now see on the map which lands are village lands and which lands are protected. To calculate the percent of land protected, measure the total area of village lands using the measure tool  found at the top of the window. Write this number down. Then measure the area of lands under the **Fish & Wildlife Service**, **National Parks Service,** and **Bureau of Land Management** if they intersect. If no protected lands intersect with the village lands, the score for this indicator is 0.

Cultural Capacity

Subsistence- The Alaska Department of Fish and Game has estimates of the amounts of subsistence harvest for most communities. Go to this website:
http://www.adfg.alaska.gov/sb/CSIS/index.cfm?ADFG=harvInfo.harvestCommSelComm
In the drop down menu, select your community. When the subsistence information appears, click the Create Excel File button. Open the file from your downloads. At the bottom of the "Per_Capita_Lbs_Harvested" column, type: =SUM(select the entire column) press enter. This will give you the pounds per capita of subsistence harvest for your community. Be sure to pick the year with the most complete data.

Mobility

Mode Diversity- Go to https://www.commerce.alaska.gov/dcra/DCRAExternal/community. Click on General Overview, click on **Transportation**. This will give you information about the modes of transportation to and from your community, and sometimes the frequency of transportation options.

Frequency of Availability- Google the availability of each type of transportation available in your community.
Example: 'Juneau ATV seasonal use' OR '[Name of your community] off road vehicle use]'
http://www.juneau.org/parksrec/documents/JuneauOffRoadVehicleTravelPlan.pdf
The document listed here provides information about off road vehicle use in Juneau Alaska including trail closures and limits to trail use such as no motor vehicles to minimize conflict of use.

Other tips for completing a community index:

- Local government documents regarding community planning provide lots of information related to that community's water resources. Often you can find most of the indicators in these types of documents, and they offer a much closer look at the community.
- A simple google search can help you find information on whichever indicator you might have trouble answering