

**AMBLER MINING DISTRICT ACCESS PROJECT
REQUEST FOR NPS PERMIT
PROPOSED STREAM GAGE and SNOW SURVEY WORK
GATES OF THE ARCTIC NATIONAL PARK & PRESERVE**

Project Proponents: DOWL HKM as Agent for:

Alaska Department of Transportation and Public Facilities (DOT&PF)
2301 Peger Road, Fairbanks, AK 99709 / 907-451-2288 and
Alaska Industrial Development and Export Authority (AIDEA)
813 West Northern Lights Boulevard, Anchorage, AK 99503 / 907-771-3000

Project Name: Ambler Mining District Access

Project Type: Establishment of Kobuk River Hydrologic Station and a Snow Survey Network in Support of a Regional Hydrologic Monitoring and Analysis Program

Project Category: Hydrologic and Hydraulic Surveys

Project Location: The project corridor begins at the Ambler River approximately 6 miles northwest of the Bornite Camp and routes southeast away from the Ambler River then east along the north side of the Cosmos Hills and through Gates of the Arctic National Park & Preserve (GANPP). From the east edge of the Preserve, the corridor continues east, remaining north of the Helpmejack Hills and the Alatna Hills, crossing the Koyukuk River downstream of the confluence with the John River, then following an existing winter trail to the east/southeast along the northern boundary of the Kanuti National Wildlife Refuge to the Dalton Highway near Milepost 136 (Figures 1 through 3). There are two potential routes under present consideration through the Preserve:

- North Option: Passes through GANPP along the north edge of Nutuvukti Lake and south of Walker Lake (25 miles within the Preserve).
- South Option: Travels south along the Reed River Valley, crossing the GANPP south of Nutuvukti Lake and exiting the Preserve just north of Norutak Lake (17 miles within Preserve).

Project Description: With the Ambler Mining District Access project, the Alaska Department of Transportation and Public Facilities (DOT&PF) and Alaska Industrial Development and Export Authority (AIDEA) propose to identify, design, and construct a transportation corridor to the Ambler mineral belt. Numerous potential access corridors were initially evaluated based on a broad range of design, construction, and environmental criteria. Evaluation of these preliminary corridors led to the refinement and selection of a single study corridor with two alignment options being carried forward for pre-NEPA process fieldwork. This corridor, referred to as Brooks East, passes through a challenging array of physical landscapes, geologic features, and varying climatic conditions within the subarctic environment. The corridor crosses numerous streams and rivers, including the Kobuk River, a federally-designated Wild and Scenic River. The corridor length is 203 miles for the north option through the Preserve and 218 miles for the south option.

Field surveys associated with data collection for fisheries, vegetation and wetlands, and river and corridor cross- sections in support of the Ambler Mining District Access project were conducted within GANPP in 2012. In order to continue to evaluate sensitive resources potentially affected by and affecting the project, DOT&PF proposes continued field investigation of wetland communities and fisheries resources within the Preserve as well as the initiation of field-based studies of additional parameters within GANPP in 2013. These include:

- Aufeis and Break-up Surveys
- Collection of hydrologic and hydraulic data for the Kobuk and Reed Rivers
- Stream Gage on the Kobuk River and Snow Surveys
- Raptor Surveys
- Cultural Resource Reconnaissance Surveys
- Geotechnical Surveys

To facilitate review, each of the aforementioned categories is presented under individual cover.

Field activities will occur intermittently between approximately March 15 and November 15, 2013 and will be primarily supported by piston-powered light aircraft and turbine-powered helicopter. It is the intent of the applicant to minimize overlap of the field investigation so as to minimize the presence of project related staff and air traffic at any one time. Approximate schedules are outlined in each Study Proposal but are subject to change based on weather and seasonal conditions. A tentative schedule of the combined field activities is appended hereto.

Stream Gage and Snow Survey Work

Please see attached responses to specific NPS comments

Objectives: The Water and Environmental Research Center (WERC) at the University of Alaska Fairbanks has been awarded a research grant by the Alaska Department of Transportation & Public Facilities (ADOT&PF) to assess the surface hydrology and meteorology in several watersheds located between the Dalton Highway in the east and the village of Kobuk in the west. The research effort is intended to provide hydrologic and meteorological background information necessary to develop a planned transportation corridor between the Dalton Highway and the Ambler Mining District. The first funded phase of this research effort includes the period between the present and September 30, 2013. The objectives of the study are as follows:

- 1) Develop gauging stations on major rivers in the study area (currently observed are Reed River, Alatna River, and a smaller tributary of the Alatna River, all south of Preserve boundary), and measure summer discharge in 2012, snowmelt discharge in Spring 2013 and summer discharge in 2013 at all rivers;
- 2) Collect additional streamflow measurements on the Koyukuk River near the confluence with the John River during summer 2012 and spring and summer 2013 in cooperation with US Fish and Wildlife Service;
- 3) Measure spring snowpack conditions in all related watersheds during Spring 2013 and future years if funding by ADOT&PF is continued;

- 4) Install and maintain meteorological stations within the watersheds to provide basic weather data related to the watershed hydrology, and
- 5) Develop surface water flow models and provide hydrologic simulations for related watersheds using data gathered from the each observed river along with existing long-term data being collected on other nearby rivers.

One specific watershed we would like to observe is the Kobuk River, at a location within the GANPP boundary. **This permit request is intended to address study Objectives #1 and #3 above. It is expected that this monitoring effort will continue beyond Fall 2013.**

Timing: Stream Gage Installation: 3 days between May 1 and May 15, 2013

Snow Survey: One week, late winter, 2013 depending on seasonal conditions.
This study will be recurring annually thereafter depending on funding.

Spring Breakup River Gaging: daily for two weeks between approximately May 15 – May 30, 2013. This study will be recurring annually thereafter depending on funding.

Summer River Gaging: two day in July 2013, two days September 2013. This study will be recurring annually thereafter depending on funding.

Access: Helicopter. Landing location will be in close proximity to proposed gage location on the Kobuk River downstream of the confluence of the upper Kobuk River and the Walker Lake outlet channel. Coordinates are roughly: 67.015 N, 154.365 W (WGS84), not designated as wilderness. Please see the attached map.

Snow survey sites will be determined specifically based on locations of safe landing areas but are sites are scattered throughout the Park, see the attached table and map. These sites all fall in the areas designated as wilderness.

Lodging: Survey personnel will be based out of Bettles or Dahl Creek Camp.

Personnel: 3 to 5 field personnel (2 or 4 UAF personnel, 1 pilot).

Procedures:

Stream Gauging Station

The study team proposes to install a hydrologic station within the Gates of the Arctic on the Kobuk River in early May, 2013. The station will record 15 minute water level, water temperature, barometric pressure, and turbidity. A web camera will be installed to observe the river and weather conditions. These data are sent back via Iridium telemetry and will be reported on a publicly available website. Manual measurements of streamflow will be made with Acoustic Doppler Current Profiler (ADCP) and inflatable boat such as a zodiac with 15 HP motor or a human powered cataraft or kayak, depending on the river velocities and safety, during spring breakup (once per day for a period of about two weeks in) and two to three times during the summer. In the fall, most of the sensors are removed from the water.

The hydrologic station consists of a 3-meter tall stand with datalogger, Iridium radio and a camera. Two pressure transducers and one turbidity sensor in conduit will extend into the river and be secured under the water with weights and rebar. Station power is provided by non-

spillable lead acid batteries, charged by a solar panel on the main stand. Data is retrieved by telephone telemetry on a daily basis if conditions allow, processed and posted to the web, and stored to support hydrological models and other research needs. In addition to the infrastructure used for collecting real-time data, we also deploy two ISCO samplers to collect water samples at daily intervals. These samplers collect and retain 1L water samples for later analysis. Like the instrumentation towers, it is most convenient to place the samplers close to the river above the high water mark. However they can be situated behind trees and/or brush to shield them from view. They operate on 12V non-spillable batteries, which can be contained in an enclosed container.

The location and configuration of the station is dependent upon site conditions as well as the requirements of the land owners. We attempt to situate the towers and rain gauge above the anticipated high water mark, adjacent to a long, relatively straight section of river. Where possible, we attempt to locate the station on the bank closest to the main channel (within 200 ft), above the highest terrace. The turbidity sensors and pressure transducers are anchored to the river bottom, and attached to the datalogger (on the towers) via 200 ft. conduit-enclosed cables. The total footprint of the station is variable.

Stakes (rebar) no longer than 6 feet deep will be installed to secure river sensors at the edge of the river and also above the cut-bank as temporary water level survey markers. In the fall, any rebar at the edge of the river is removed. The temporary survey markers will remain in during the duration of the project to act as a reference control point for determining water level elevation. The station will be operated remotely until the project end date (estimated to be roughly 3-5 years). The stations will then be either removed prior to the end of the project, or will remain in place if the project period is extended.

Snow Surveys

Each year that the project is funded, starting in 2013, an end-of-winter snow survey is proposed. One of the challenges of arctic hydrology is measuring solid precipitation, especially in windy environments. In our opinion, this is the best way to determine the snow water equivalent (SWE) contributing to spring runoff.

We propose to visit about 25 spatially distributed sites in the Park (see attached map and Table at the end of this request) at winter's end to measure the depth and density of the snowpack. From these measurements we can ascertain the SWE over the watersheds. Sites will be accessed at winter's end by helicopter. Generally the sites are located in valley bottoms where the helicopter can safely land. At each site, 50 snow depth measurements will be made on a randomly selected 50 m long L-shaped transect with a graduated T-shaped probe; five snow density measurements will be made randomly with an Adirondack snow sampler (snow depth varies much more than the snow density, therefore more snow depth measurements); and GPS coordinates and interesting site features (slope, aspect, vegetation, etc.) are noted.

Results/Deliverable Products:

All data collected on this project will be accessible to the public. At present, the hydrological and meteorological data being collected from stations outside GANPP resides in "raw" data files. A

user friendly site for down loading is under development and expected to be available in February 2013.

In the fall of 2013, an end-of-winter snow report will be produced; this will be repeated each year that snow surveys are conducted. Hydrological and meteorological data reports will be generated approximately each two years, starting after the 2014 summer season (not enough data will be generated in the 2013 season to produce a meaningful report).

Field data collected will be used in hydrologic models for continuous simulation of the hydrologic response of the watersheds in the study area. Then the results will be used in design of potential stream crossings.

Table 1: Location of proposed snow survey sites in Gates of the Arctic National Park and Preserve*.

Site Number	Site Waypoint Name	Elevation (ft.)	Latitude (°N)	Longitude (°W)
1	NFK SS1	830	67.15189	-150.76407
2	NFK SS2	1500	67.48320	-150.76175
3	NFK SS3	3300	67.56390	-150.67987
4	NFK SS4	3900	68.06298	-150.65163
5	NFK SS5	3400	67.97519	-150.99932
6	NFK SS6	2500	67.39356	-150.70013
7	NFK SS7	3200	67.83316	-151.42618
8	NFK SS8	1500	67.64627	-151.35635
9	NFK SS9	3100	67.95623	-151.16888
10	NFK Chimney Mountain	3700	67.71354	-150.58432
11	John SS1	2000	67.62075	-152.39372
12	John SS2 Pamichtuk Lake	3200	67.79442	-152.16361
13	John SS3	3500	67.72676	-153.06743
14	John SS4	4800	67.99849	-152.72720
15	John SS5	2400	67.96812	-152.61385
16	Alatna SS1	1100	67.33453	-153.67076
17	Alatna SS2	2600	67.34627	-154.40677
18	Alatna SS3	3300	67.43565	-153.96536
19	Alatna SS4	3700	67.53254	-153.49542
20	Alatna SS5	4000	67.24460	-154.34490
21	Alatna SS6	2080	67.72557	-154.99259
22	Alatna SS7	3100	67.75727	-154.04099
23	Alatna SS8	2100	67.76107	-153.98361
24	Reed SS1	2900	67.41264	-155.06630
25	Reed SS2	3300	67.40827	-155.13199
26	Reed SS3	1300	67.34004	-155.09838

*Snow survey sites will only be impacted by footprints in the snow. Nothing will be left at the site, including marker stakes, etc.



NPS Comment:

Gage and snow survey. It's questioned that a Zodiac with a 15hp motor will be adequate to obtain good ADCP measurements during high flow (especially during breakup). Presumably they have experience doing this on large rivers? Although it isn't made explicit (estimated to be 3-5 years, possibly longer), the gaging station will need to stay in place for a number of years to get enough data for a decent hydrograph. The State requires a minimum of 5 years of data to apply for an establish a basis for a water rights application, for example. The footprint of the station is also unclear, but it sounds pretty substantial if it's going to include 2 ISCO samplers. This should be made more explicit. They say the station will be operated "remotely" but they will need to visit a number of times per year for the length of the project to maintain the station and collect discharge data. They don't say how often they intend to do this but USFWS typically tries for 7 visits per year at their gages. It's also not clear whether they intend to camp at the site during the 3-day installation and 2-week spring breakup trips or fly out each day in the helicopter. This will obviously make a big difference in terms of the number of helicopter landings? The snow survey seems fine, though some justification for the number and location of survey sites (i.e. helicopter landings) would be appropriate.

Comment responses UAF Emily Youcha ekyoucha@alaska.edu 474-2713 and Doug Kane 474-7808 2/27/13

1. There will be no camping at the station. All site visits will be made by helicopter from Bettles or Dahl Creek. It is anticipated that during the spring breakup period (approximately 2-3 weeks during May) UAF will visit the site every other day for both stage measurements and observations of ice conditions, and every 2-3 days streamflow measurement and sediment sampling will be conducted. Depending on weather, safety, and time issues, it is anticipated that we will have a minimum of 4 measurements on the river during the spring breakup period and a minimum of two additional summer measurements (during the July and September trips) each year to develop a rating curve for estimating flow. The goal is to get at least five years of data for this study; however, the amount of data collected for the project is dependent on ADOT's continued funding each year. UAF has decades of experience in discharge measurements during both high and low flow periods and the development of rating curves to estimate discharge.
2. UAF Water and Environmental Research Center specializes in measuring discharge on large and small rivers during peak flow events throughout northern Alaska using traditional current meter and ADCP methods. We strive to follow USGS procedures and guidance for the measurement of discharge. Currently we use a zodiac and cataraft with a 15 HP 4 stroke Honda motor and ADCPs such as RDI Streampro, RDI Rio Grande, and Sontek River Surveyor on similar rivers (in terms of watershed size and river gradient) and also on much larger rivers than the Kobuk during spring breakup high flow conditions.

During low flow conditions or on smaller rivers we have experience in human powered inflatable kayaks and catarafts using ADCP, along with wading or tethered and bridge measurements using ADCP and traditional cup style current meters. We are currently using these techniques to measure flows during spring breakup on larger rivers such as the Itkillik River, Anaktuvuk River, Chandler River and plan to use similar techniques on the Reed, Kobuk, Alatna, and Koyukuk Rivers. Last summer, measurements on the Koyukuk River were made with a zodiac and 15HP setup. If we determine that a zodiac is inadequate, we may decide to use an inflatable cataraft with 15HP motor for the use on the Kobuk River. Based on our experiences the 15HP motor has been sufficient for our purposes (motoring back and forth across the river slowly during a measurement). During low flow measurements a human powered inflatable kayak with ADCP may be used. Last summer low and medium flow measurements on the nearby Reed River were made with the human powered inflatable kayak and ADCP. UAF project staff, students, and faculty routinely take courses in both boating safety and Swiftwater Rescue Technician and have annual refresher safety courses.

3. Attached are three photographs and a diagram (Figures 1-4) showing a typical UAF hydrologic station. This is the station set up at the Itkillik River, located on the north side of the Brooks Range, and would be similar to the proposed Kobuk river station.

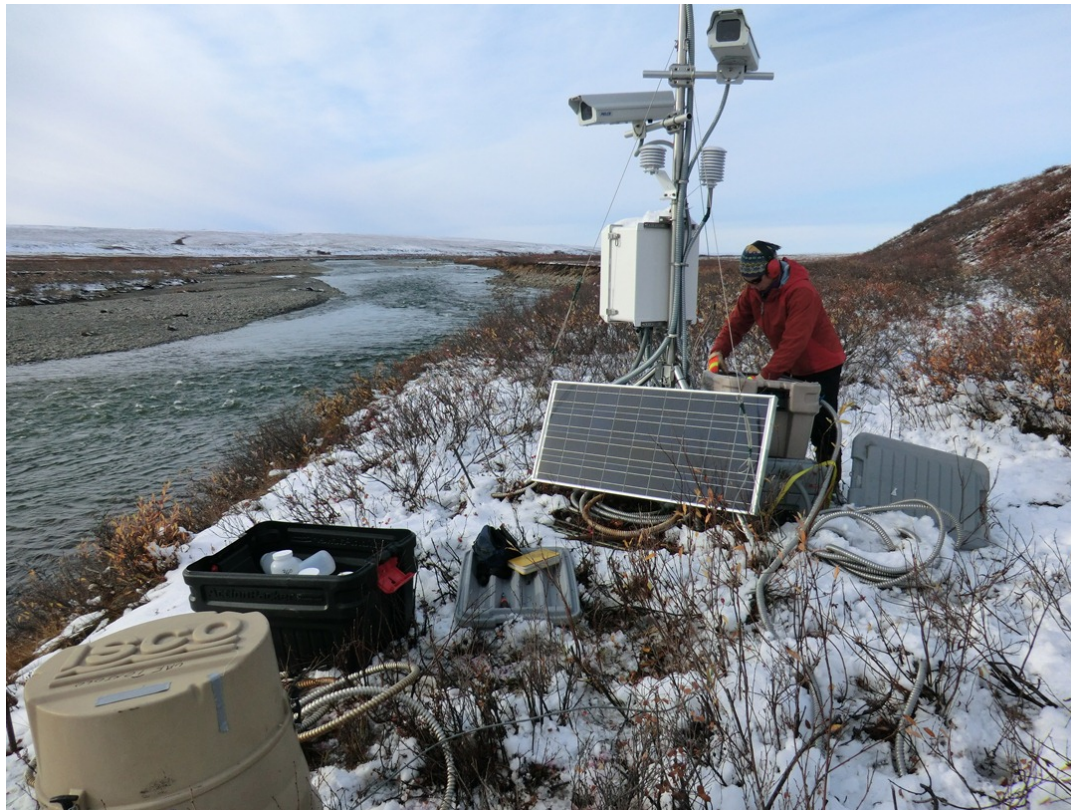


Figure 1. Itkillik River station located on north side of Brooks Range. The proposed Kobuk station would likely be near trees and could be camouflaged by painting the enclosure box and painting or covering the ISCO sampler.



Figure 2. Itkillik River Station. Rebar is used for temporary benchmarks and to secure sensors.



Figure 3. Storage unit at the river for keeping boat, motor, and safety equipment protected from weather and animals. The storage unit could be camouflaged, hidden out of site of the river, and/or placed in a location in the forest. This example shows a cataraft frame at the river but it is proposed that a zodiac would be used at the Kobuk station. The zodiac would be stored inside a container for safe keeping.

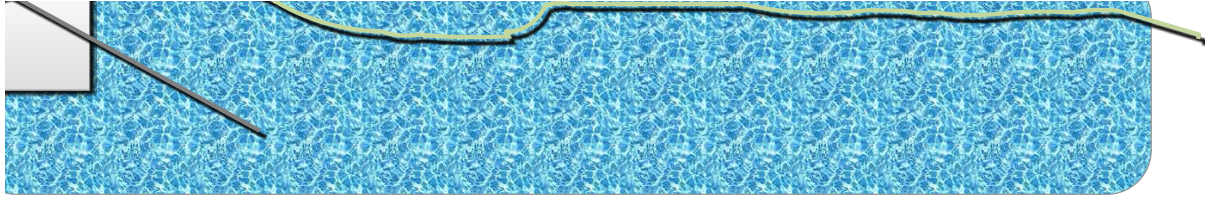


Figure 4. Diagram showing approximate location of station and sensors at a typical UAF station. Station tripod is placed well above the high water mark in order to avoid damage to the station during high flow events. Pressure transducers and turbidimeters extend into the river in order to record stage at both low and high water levels. The distance between the station and the river is typically 250 ft or less. It is preferable that the sensors in the stream are secured to more stable objects such as bedrock or very large boulders, but they may also be secured to rebar. They are housed in metal conduit/pipe. The ISCO sampler is typically located above the high water mark as close to the station as possible.

4. Station is controlled remotely via iridium modem and data is retrieved daily throughout the year via iridium modems. Updates to the datalogger programs may be sent to the station through the iridium modem as well. Raw data in plots, along with files containing hourly and 15 minute QA/QC'd data, and

project reports will be posted on the website: <http://ine.uaf.edu/werc/projects/ambler/> Station maintenance occurs during visits during spring breakup and summer trips in July and September.

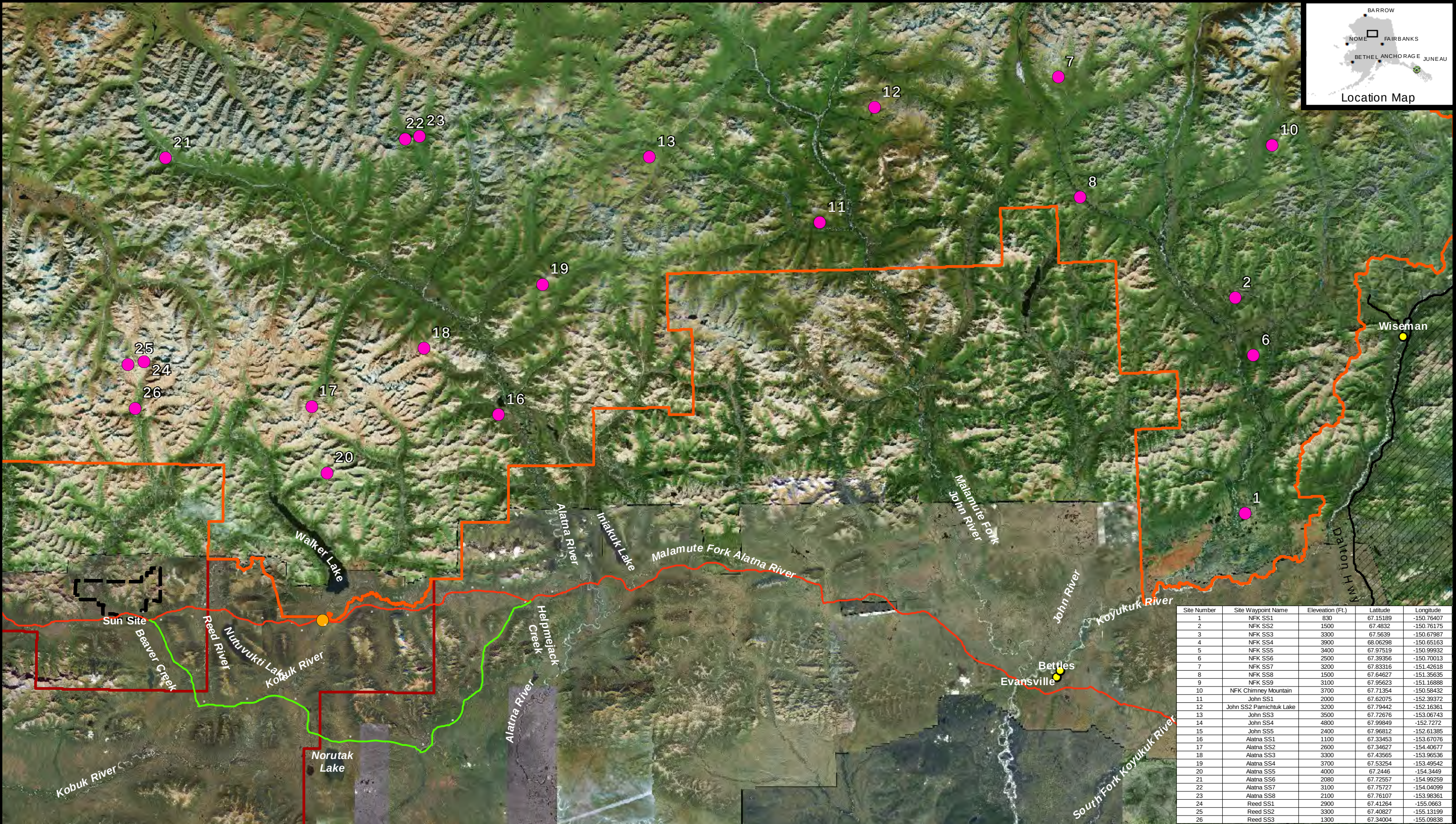
5. UAF is currently focusing on the hydrology of the following basins: Koyukuk, Alatna, S. Fork Bedrock (a small tributary of the Alatna River), Reed, and Kogoluktuk. A basin scale approach is taken for the hydrologic investigations. Quantifying the snowpack distribution and snow water equivalent at the end-of-winter is an important part of the understanding water balance of each basin. Therefore, our approach to measuring end of winter snow water equivalent was to select up to 15 locations throughout each basin (depending on basin size) and examine the snowpack spatially. We expect that the snow water equivalent will vary both spatially and with elevation. Initial results of rainfall collected by UAF in summer 2012 at stations south of the Park boundary show increases in rainfall with increasing elevation and increasing rainfall from east to west (large amounts of rain fell in the west during August storms). We would like to observe whether these same trends in summer precipitation also occur during the winter months.

We attempted to select sites in a north/south oriented transect (because most of the basins are oriented north south and elevation increases south to north). Each site must be suitable for a safe helicopter landing. Also, the site must be representative of the general area. However, we have not been to the proposed site locations so if the preselected location is not suitable due to safety or representativeness, the measurement may not occur or could be relocated nearby. In the larger basins, the number of measurements of snow water equivalent is increased. Figure 5 shows the proposed snow survey site locations within the Park boundary.

In the Koyukuk River basin, we selected sites with increasing elevation in the North Fork Koyukuk subbasin (east) and in the John subbasin (west) to look at spatial distribution from east to west and with elevation at a total of 15 sites within the Park boundary. A few additional sites at lower elevation are selected outside of the Park boundary. In the Alatna, we selected 8 sites within the Park boundary with increasing elevations from south to north and 3-4 additional snow surveys will be collected in the lower parts of the Alatna (outside of the Park boundary).. The Reed basin is much smaller than the Alatna and Koyukuk so only 3 sites were selected within the Park boundary. If we are approved to measure streamflow on the Kobuk River, we will propose to do 2 or 3 snow surveys within the Kobuk basin as well (from south to north with increasing elevation). Attached is a map showing the locations of the proposed sites within the Park boundary.

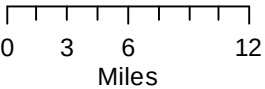
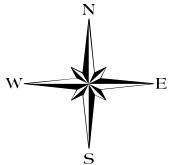
We also plan to establish snow survey sites at the Park Service stations Chimney Mountain (NFK), Pamichtuck Lake (John SS2), and Ram Creek (Alatna SS5) in coordination with Pam Sousanes' studies. We also plan to assist her group with station maintenance when we are at the station during the snow survey.

This data is used to understand the snowpack distribution throughout the basin and also on a regional scale. Additionally, this data is used to both calculate basin average snow water equivalent and utilize in hydrologic modeling of streamflow during spring breakup.



Site Number	Site Waypoint Name	Elevation (Ft.)	Latitude	Longitude
1	NFK SS1	830	67.15189	-150.76407
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- Ambler Mineral Belt
- Gates of the Arctic National Preserve
- Gates of the Arctic National Park & Preserve
- Proposed UAF Snow Sites
- Proposed UAF Gauge Station
- Brooks East Corridor
203 Miles-25 Miles through GANPP
- Southern Brooks East Corridor Option
218 Miles-17 Miles through GANPP



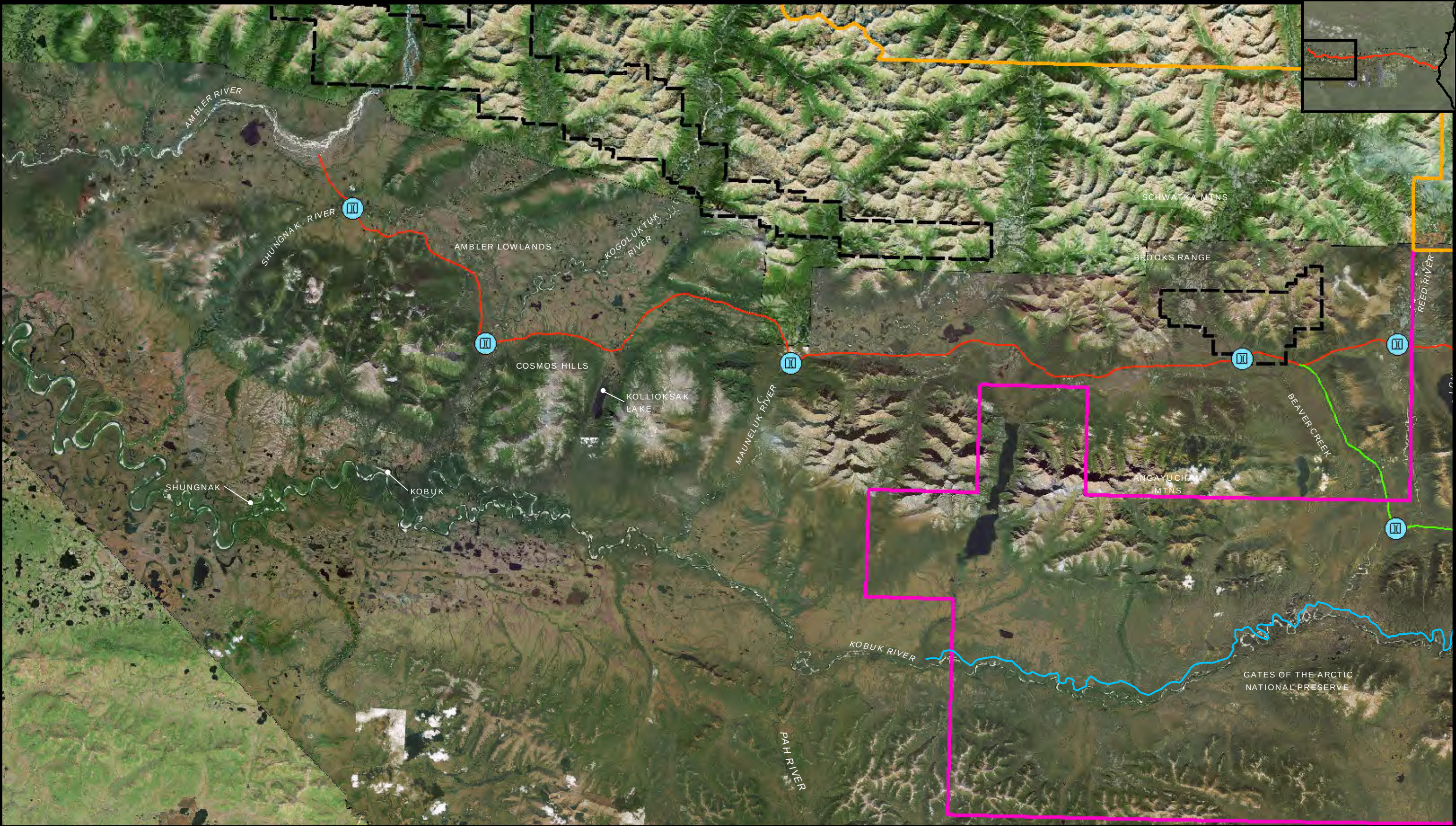
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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
NORTHERN REGION

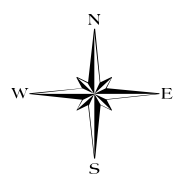
AMBLER MINING DISTRICT ACCESS

2013 BROOKS EAST CORRIDOR -GANPP
UAF PROPOSED SITES

DATE: February 19, 2013



- | | | |
|--|-----------------------|--|
| Brooks East Corridor
203 Miles-25 Miles through GANPP | Existing Roads | Gates of the Arctic National Park
(National Wilderness Preservation System) |
| Southern Brooks East Corridor Option
218 Miles-17 Miles through GANPP | Large Bridges | Gates of the Arctic National Preserve
(National Park Service) |
| Ambler Mineral Belt | Wild and Scenic River | Kanuti National Wildlife Refuge |



0 2 4 8
Miles

Source:
Gates of the Arctic: DNR
Wild and Scenic River: DNR
Aerial Imagery: i-Cubed 2012
Background Image: alaskamapped.org
Coordinate System: NAD 1983 Alaska Albers

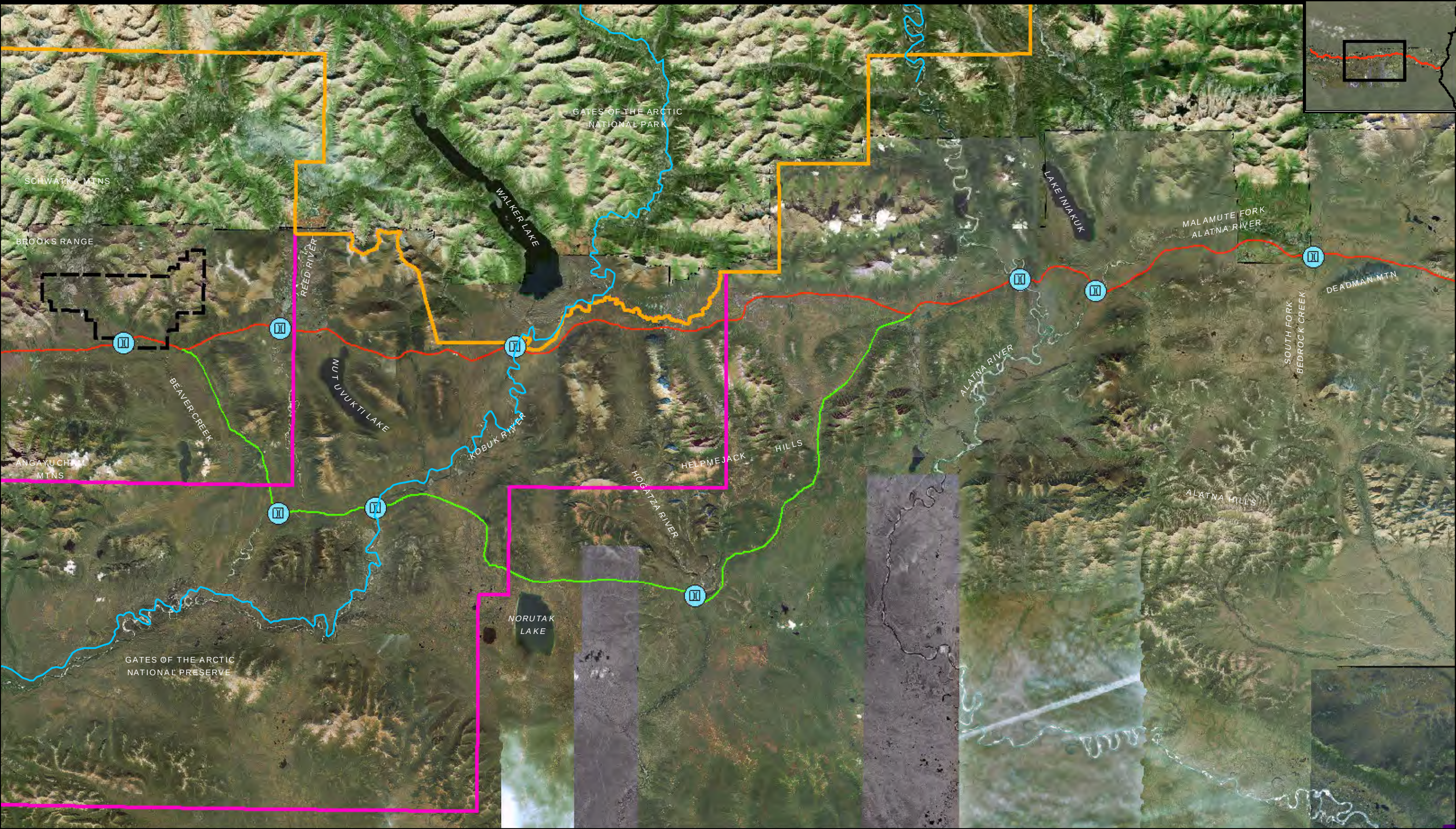
STATE OF ALASKA
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NORTHERN REGION

AMBLER MINING DISTRICT ACCESS

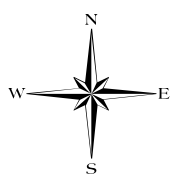
PROPOSED BROOKS EAST CORRIDOR

DATE: February 25, 2013

Figure 1



- | | | |
|--|-----------------------|--|
| Brooks East Corridor
203 Miles-25 Miles through GANPP | Existing Roads | Gates of the Arctic National Park
(National Wilderness Preservation System) |
| Southern Brooks East Corridor Option
218 Miles-17 Miles through GANPP | Large Bridges | Gates of the Arctic National Preserve
(National Park Service) |
| Ambler Mineral Belt | Wild and Scenic River | Kanuti National Wildlife Refuge |



0 2 4 8
Miles

Source:
Gates of the Arctic: DNR
Wild and Scenic River: DNR
Aerial Imagery: i-Cubed 2012
Background Image: alaskamapped.org
Coordinate System: NAD 1983 Alaska Albers

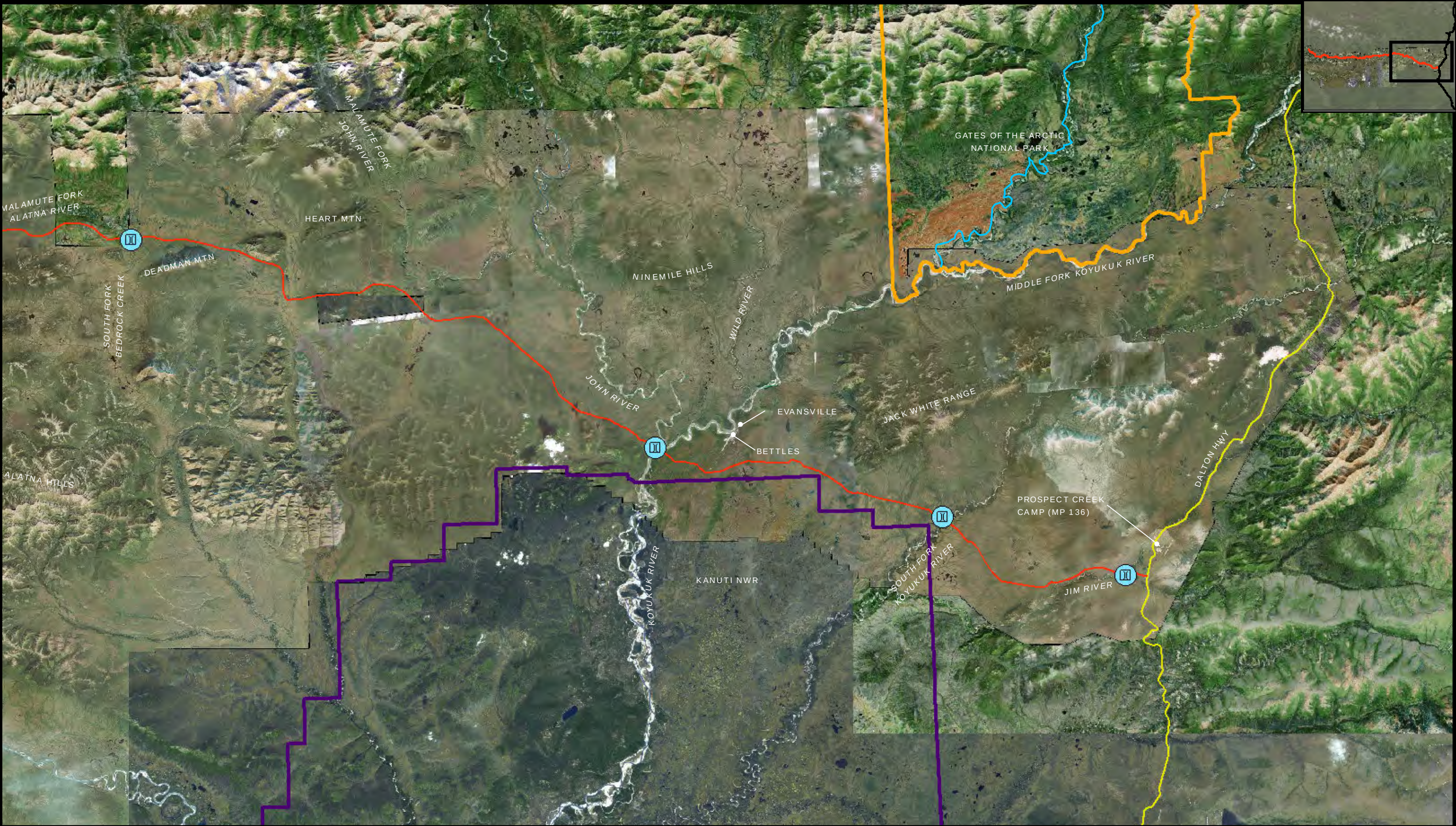
STATE OF ALASKA
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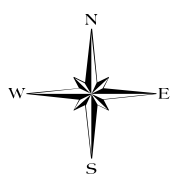
PROPOSED BROOKS EAST CORRIDOR

DATE: February 25, 2013

Figure 2



- | | | |
|--|-----------------------|--|
| Brooks East Corridor
203 Miles-25 Miles through GANPP | Existing Roads | Gates of the Arctic National Park
(National Wilderness Preservation System) |
| Southern Brooks East Corridor Option
218 Miles-17 Miles through GANPP | Large Bridges | Gates of the Arctic National Preserve
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0 2 4 8
Miles

Source:
Gates of the Arctic: DNR
Wild and Scenic River: DNR
Aerial Imagery: i-Cubed 2012
Background Image: alaskamapped.org
Coordinate System: NAD 1983 Alaska Albers

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
NORTHERN REGION

AMBLER MINING DISTRICT ACCESS

PROPOSED BROOKS EAST CORRIDOR

DATE: February 25, 2013

Figure 3

Ambler Access 2013 Fieldwork

Draft Schedule

April 3 - 10: UAF Basin Scale Snow Survey - UAF

- 7 days helicopter access; 2 staff; 1 pilot

Mid-May: Breakup Survey

- 5-day helicopter survey; 3 staff; 1 Subsistence Advisor; 1 pilot

May 8-May 26: Spring Breakup Survey River Gaging - UAF

- 10-14 day daily helicopter access; 2 staff; 1 pilot

1st week of June: Fish Surveys

- 7 days; 4 staff; 1 Subsistence Advisor; 1 pilot
- 3 days within GANPP, 8 landing sites proposed, each to be visited on two or three successive days

June 10-20: Bird surveys (Raptor Nest Aerial Surveys) – R44

- 7 days; 2 staff; 1 pilot
- No landing proposed in GANPP

July 5 -7: Additional H&H in GANPP on Kobuk and Reed Rivers

- 3-day helicopter survey within GANPP; 3 staff; 1 Subsistence Advisor; 1 pilot
- Approximately 8 landing sites proposed

July 10 – 22: JD Level Wetlands Delineation

- 14 days; 6 staff, 1 Subsistence Advisor, 1 pilot
- 5 days within GANPP

Mid July: Summer River Gaging – UAF

- 2 day helicopter access within GANPP; 2 staff; 1 pilot
- Kobuk River landing site

July 15-25: Bird surveys (Raptor Nest Aerial Surveys) – R44

- 5 days; 2 staff; 2 pilot/mechanic
- No landing proposed with GANPP

July 23 – August 1: Archaeological Reconnaissance Trip

- 10 days; 3 staff; 1 Subsistence Advisor; 1 pilot
- Approximately 5 days within GANPP, 30 landing sites proposed

August 2 - 16: JD Level Wetlands Delineation

- 14 days; 6 staff, 1 Subsistence Advisor, 1 pilot
- Approximately 5 days within GANPP

Ambler Access 2013 Fieldwork

Draft Schedule

3rd week of August 17 -24: Fish Surveys

- 7 days; 4 staff; 1 Subsistence Advisor, 2 pilot/mechanic
- 3 days within GANPP, 8 landing sites proposed, each to be visited on two or three successive days

Mid-September: Fall River Gaging/Winterizing – UAF

- 3 day helicopter access; 2 staff; 1 pilot
- Kobuk River landing site

Timing of all surveys will be coordinated with ADF&G and NPS, and will depend on local conditions. Annual variability in conditions could alter survey schedule by 2-4 weeks.