Request For Proposal

Contract Drill Operator

2016 Field Crew Support

Alaska Transportable Array

February 25, 2016

1200 New York Ave.
Suite 400
Washington, DC 20005

1.0 INTRODUCTION

The Alaska Transportable Array (ATA) project is soliciting proposal responses from companies to provide one or more contract drillers for to operate IRIS-owned ultra-light drills during the summer 2016 field season. The 2016 ATA project will involve the construction of up to 63 boreholes at seismic monitoring installations in remote areas of Alaska, each requiring the construction of a shallow 7 in dia. borehole for instrument construction

Project management and instrument construction personnel will be provided by Incorporated Research Institutions for Seismology (IRIS).

It is expected that this solicitation will results in a contract for services between IRIS and the successful proposing company.

1.1 Project Description

The ATA seismic monitoring stations will be installed on an approximate 50-mile grid pattern throughout Alaska over the next two years. The project at-large includes approximately 250 installations with helicopter, fixed-wing, marine, off-road, and road system deployments. The 63 stations scheduled for installation in 2016 are shown on the attached map in section 2 of this request. Approximately 45 sites are expected to be reached by helicopter, 10 by combination fixed-wing aircraft and road, and 8 from the road system.

Each station site will require a borehole approximately 7 inches in diameter and 10-15 feet deep in which an installation technician will install a seismometer.

1.2 Drill Description-IRIS Provided Drills

Project parameters necessitated the development and construction of an extremely lightweight, high performance heliportable air rotary drill weighing less than 1400# and capable of installing a 6" steel casing 2.7m deep in any type of ground including solid rock, frost shattered overburden, cobbles and frozen soils.

Based on these parameters, a custom drill rig system was commissioned and tested by IRIS for specific use on the project. Currently there are two versions (Gen 1 – Red Drill and Gen 2 – Silver Drill) of this drill available for use on the project. A third Gen 3 (Blue Drill) drill is currently under construction and is expected to be fully operational prior to the start of the 2016 field season. All three generations of drills are expected to be used at various times during 2016.

The first drill (Gen 1 – Red Drill) is a modified version of the Mobil V2200 ultra-light mobile drill, mounted on a skid frame and adapted to run either

solid stem auger or air rotary with DTH hammer. In order to run the DTH system, an additional sling load is required for the air compressor. This drill has seen extensive testing, refinement and field use during 2014 and 2015 has proven to be a reliable and robust unit.

The second drill (Gen 2 – Silver Drill) is a custom built dedicated air rotary drill, which incorporates the air compressor and hydraulic power unit into a single package, which can be moved in one helicopter sling load. Drill mast and rotation head are the same as Gen1 drill. This drill has seen extensive testing, refinement and field use during 2015 has proven to be a reliable and robust unit, but requires an experienced operator for successful operation.

The third drill (Gen 3 – Blue Drill) is similar to the Silver Drill in that it is a custom built dedicated air rotary drill incorporating the air compressor and hydraulic power unit into a single package which can be moved in one helicopter sling load. Unlike the Silver Drill the Blue Drill utilizes all off the shelf components and its core component is a Twister T185 Diesel Air Compressor manufactured by Airworks Compressors Corp. All three drills have identical mast and rotation heads.

To install casings in virtually any ground type, a "lost crown" overburden system was developed powered by a small DTH air hammer encased in a 5.5" OD sleeve, which runs inside a 6.5" OD x 8.5' long casing. Hole is completed in one stroke with no additional casing being added. A 3' extension rod is used to drill casing down to ground level. After completion of hole, pilot bit is unlocked from ring bit and hammer assembly is withdrawn, leaving casing and ringbit in the hole. Approximate time required for setup and drilling typically does not exceed two hours to four hours.

General notes on drill system:

- One person operation
- Ultra-light: 1400# with tooling
- Skid mounted, compact: 42 x 48 x 36 inches, with a 10-foot fold-up mast that stores flat over power unit during transport
- Mast is raised from horizontal to vertical hydraulically, then fine-tuned by hand
- Mast has screw adjustment for angle (front/back, side/side)
- Two outriggers in front of unit fold out and lock
- Outriggers are anchored to ground with angled stakes, either hand-driven or drilled in place
- Engines are air-cooled gas engine(s) or diesel engine depending on the drill system.
- Hydraulic system is fixed displacement with open center controls.

Flow is divided between feed and rotation with a variable flow divider (splitter). Adjustable relief controls for feed and retract pressure. Air valve for DTH remote-controlled from console.

Based on previous experience, IRIS expects the construction of each borehole to take no more than one field day to complete, including mobilization. An IRIS station specialist will be available to assist the drill operator during the construction process.

1.3 Responsibilities of Driller

The driller provided by the company will be responsible for the following:

- Managing the in-field mobilization of the drill from site to site
- Set up of the drill rig on site
- Construction of drill hole (3m depth typ.) and grouting in casing
- In-field maintenance and repairs
- Routine out of the field maintenance of the drill rig (oil/hydraulic fluid changes etc.).
- Cleaning and upkeep of drills between deployments.
- Pre-deployment repairs to ensure drill is fully operable and in good condition prior to deployment.
- Identification of parts and supplies needed for drill repair for purchase by IRIS.
- Preparation of drills for transport.
- A site report shall be delivered to the IRIS specialist within 24 hours of completion of the site

IRIS will be responsible for the supply of tooling, parts and consumables. Drill maintenance while out of field is a separate task, quoted separately, but a preference is for the drill operators to perform this task as well.

1.4 Field Support

During the 2016 field season, field crews will base temporarily at a remote hub to complete site installations near that hub. From each hub, only one drill will be used for the associated sites. For helicopter-accessible sites, an A-Star B2 or equivalent will transport personnel and sling the drill between sites, with a light helicopter to provide additional support for crew transportation at some locations. The drill will be transported between hubs via fixed-wing cargo (e.g. Skyvan or CASA) or via helicopter sling. For road-accessible sites, crews will travel in passenger trucks with the drill transported on a flatbed truck equipped with a knuckle boom crane.

Drill operators will be expected to operate the drills for successful installations, maintain the drills to ensure continued performance, and assist with drill transportation during field operations. Drill operators will be expected to send and/or receive the drill during fixed-wing, helicopter, and other deployments, and to accompany the drill during road travel.

1.5 Schedule

Drill operator services are required from the middle of April 2016 until early September 2016 in order to drill approximately 55 sites. Typical field days are expected to last 10-12 hours per day and may include significant travel. The anticipated total number of field days is approximately 90 days. Additional pre-season days may be required for training, maintenance, or other drill-related work.

IRIS may choose more than one drill operator to complete the planned program or not select any offers. Drill operators may be assigned to use either or all types of drills for the project.

1.6 Base of Operations

Primary base of operations and point-of-hire for the ATA project is Anchorage, Alaska. Preferred base for the company and/or drill operators is Southcentral Alaska, but alternate locations may be considered in discussions with the company.

During the field effort, the drill operator will be based in the field and will travel in sync with the field team they are deployed with. Travel will be directed by the IRIS field operations manager. Typical deployments last 2-3 weeks. Primary field hubs for this contract are expected to include Anchorage Yakutat, Cordova, Kodiak, King Salmon, Dillingham, Sand Point, Central, Fort Yukon, Arctic

Village, Kavik Camp, Deadhorse, Bettles, and Happy Valley Camp. A variety of other communities and locations may also be used on a short-term basis. Lodging, accommodations, and travel arrangements will be provided to the drill operator while working away from the base.

2.0 DRILL OPERATOR REQUIREMENTS

2.1 Company Requirements

The drilling company must have demonstrated experience with the support of projects in remote areas of Alaska. The ATA project includes installations in every region of the state. The company must be able to support a drill operator working in areas far from the primary base.

The company must maintain Workers' Compensation Insurance including Unlimited Common Law Liability for personnel. Certificate of Insurance will be required prior to contract.

2.2 Drill Operator Requirements

A successful drill operator will have demonstrated experience with auger and DTH drilling methods (other methods considered a plus) in arctic and subarctic ground conditions and will have demonstrated experience with helicopter-supported remote- site drilling operations in potentially harsh weather conditions over multiple seasons. He or she will have good troubleshooting and mechanical skills (including welding), and be able to make minor repairs in the field.

The drills have been designed and constructed to be as simple and robust as possible, but it should be noted that they are small machines with limited power, requiring a skilled operator who has experience with ultra-light drilling. Drilling will be performed at the minimum threshold of torque and air, and finesse and a light touch are required. Experience with Winkies, Minuteman, hand-portable coring rigs and jacklegs will be more relevant than experience with larger truck-mounted drills.

The ATA project will require self-driven work, long travel hours, possibly helicopter long-line operations, and the ability to operate in field locations with minimal support. Remote project experience is required. In addition, a minimum of four seasons of experience with drill operation in Alaska is expected. IRIS reserves the right to remove any individual from the ATA project at the sole discretion of the TA Manager. Availability of multiple experienced drill operators within a company is preferred.

Minimum of a high school diploma with 10 or more years of progressive experience is expected, 5 of which must be as lead operator. Drill operator must be capable of travel within Alaska. A drug screening may be required prior to any new operator's deployment.

Drill operator will be required to report field progress and drill condition to the IRIS Field Operations Manager at the end of each working day. See example site report in appendix A.

3.0 EVALUATION

3.1 Information to Be Provided by Company

The drilling company will provide the following information in a letter format for the purposes of evaluation by IRIS:

- Company safety record.
- Experience on similar remote drilling projects in Alaska or other regions.
- Availability of drill operators meeting the outlined qualifications
- Resumes for each proposed drill operator, assistant, and/or backup operators (please note specific experience relevant to the ATA project, including helicopter and remote project operations)
- A bid sheet describing costs for services including labor, equipment, materials and supplies and travel should be provided. Rates may differ for equipment use when drilling or not and/or include costs related to travelling. Rates can be based on daily, monthly or hourly commitments. Alternatively, a fixed fee per site drilled can be proposed. In any case, a simple fee basis is preferred.
- Please note that a fixed fee, or cost plus fee contract is anticipated – meaning reimbursement of costs incurred, and, if required, any additional fee. The fee cannot scale with the total cost of the contract.
- Costs and fee should be specified in US Dollars.

3.2 Evaluation

The proposal will be evaluated based on the following factors:

- Company safety record.
- Drill operator experience, specifically in remote operations, external load movement or experience with project.
- Availability of operators to support project, including backup operators.
- Anticipated total cost to the project, based on the supplied bid sheet and the application of the bid sheet to the supplied scenarios.

- Ability to meet project schedule.
- References, reputation, and/or prior experience with drill operator.

Companies or drill operators used in 2016 may be asked to continue work in future seasons by supplying an updated cost and statement of availability.

3.3 Proposal Submission

Proposals may be submitted by email to SPO@iris.edu. Proposals should be submitted no later than **5:00 p.m. EST** on **March 15, 2016**.

All questions should be directed to: SPO@iris.edu.
All questions will be made anonymous and the question, plus answer, posted to all potential bidders.

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Figure 1: Red Drill onsite in Hammer Drilling mode

Figure 2: Red Drill onsite in auger drilling mode

Figure 3: Silver Drill in deployed configuration

Figure 4: Silver Drill in transit configuration

Section 2 – Deployment Overview – Note that all dates indicated are preliminary and subject to change. Also, duration is only shown for guidance and may be adjusted as necessary due to unanticipated changes in schedule due to unforeseen circumstances.

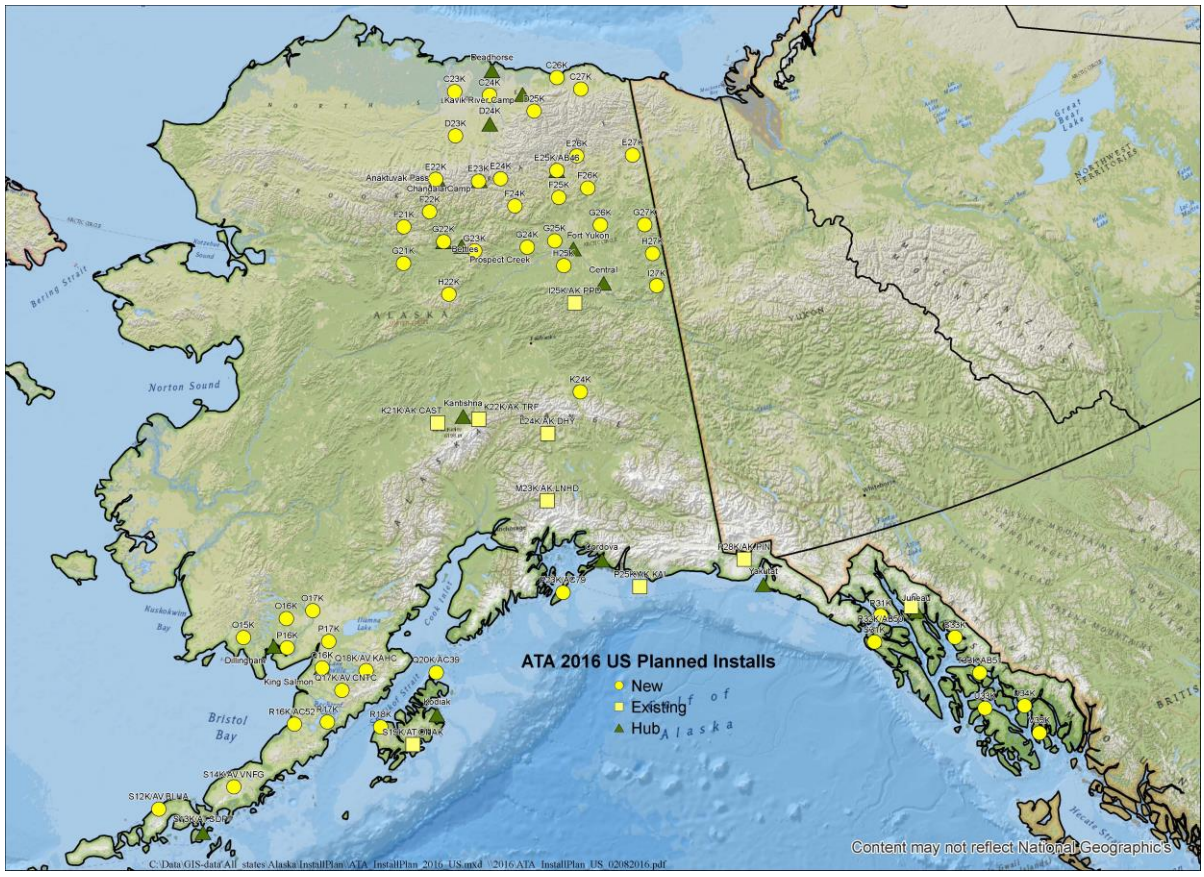


Figure 5: Map of potential drilling locations shown in yellow, hubs indicated with green triangles are for reference only

Table 1: List of Stations Planned for Installation in 2016 – Note Hubs are show in italics and are for reference only. Note: Groups B, J, and M are intentionally omitted because they reference locations not pertinent to this specific solicitation.

Name	Hub	Group	Latitude	Longitude
M23K/TA.LNHD	***Anchorage***	A	61.7907	-147.6756
L24K/AK.DHY	Cantwell	A	63.0753	-147.376
K24K	Delta Junction	A	63.80362	-145.77836
Yakutat	***Yakutat***	***C***	***59.54399***	***-139.727548***
P28K/AK.PIN	Yakutat	C	60.0967	-140.2566
Cordova	***Cordova***	***C***	***60.533344***	***-145.751846***
P23K/AC79	Cordova	C	59.997869	-147.403046
P25K/AK.KAI	Cordova	C	59.9273	-144.417
Kodiak	***Kodiak***	***D***	***57.790037***	***-152.407245***
R18K	Kodiak	D	57.56647	-154.45237
S19K/AT.OHAK	Kodiak	D	57.2225	-153.2875
Q20K/AC39	Kodiak	D	58.60972	-152.39405
King Salmon	***King Salmon***	***E***	***58.683629***	***-156.664131***
Q16K	King Salmon	E	58.68157	-156.65273
Q17K/AV.CNTC	King Salmon	E	58.26	-155.89
Q18K/AV.KAHC	King Salmon	E	58.6483	-155.0081
R16K/AC52	King Salmon	E	57.567249	-157.574217
R17K	King Salmon	E	57.63981	-156.38708
Dillingham	***Dillingham***	***E***	***59.0446667***	***-158.5055***
O17K	Dillingham	E	59.77331	-157.09467

Name	Hub	Group	Latitude	Longitude
O16K	Dillingham	E	59.59378	-158.09269
O15K	Dillingham	E	59.16808	-159.67269
P16K	Dillingham	E	59.03142	-157.99023
P17K	Dillingham	E	59.19512	-156.438636
S13K/AT.SDPT	***Sand Point***	***F***	***55.3491***	***-160.4766***
S12K/AV.BLHA	Sand Point	F	55.7038	-162.0651
S14K/AV.VNFG	Sand Point	F	56.28	-159.555
Central	***Central***	***G***	***65.825456***	***-144.050229***
I25K/AK.PPD	Central/Circle, AK	G	65.52	-145.52
H22K	Central/Circle, AK	G	65.8937	-151.37741
I27K	Central/Circle, AK	G	65.60403	-141.616
Fort Yukon	***Fort Yukon***	***G***	***66.567108***	***-145.251166***
G24K	Fort Yukon	G	66.70098	-147.47465
G25K	Fort Yukon	G	66.76534	-146.10143
G26K	Fort Yukon	G	66.94923	-143.78672
G27K	Fort Yukon	G	66.80887	-141.65462
H25K	Fort Yukon	G	66.26699	-145.8196
H27K	Fort Yukon	G	66.23056	-141.5265
Arctic Village	***Arctic Village***	***G***	***68.117209***	***-145.569954***
E25K/AB46	Arctic Village	G	68.12067	-145.567869
E26K	Arctic Village	G	68.3454	-144.44919
E27K	Arctic Village	G	68.1862	-141.59575

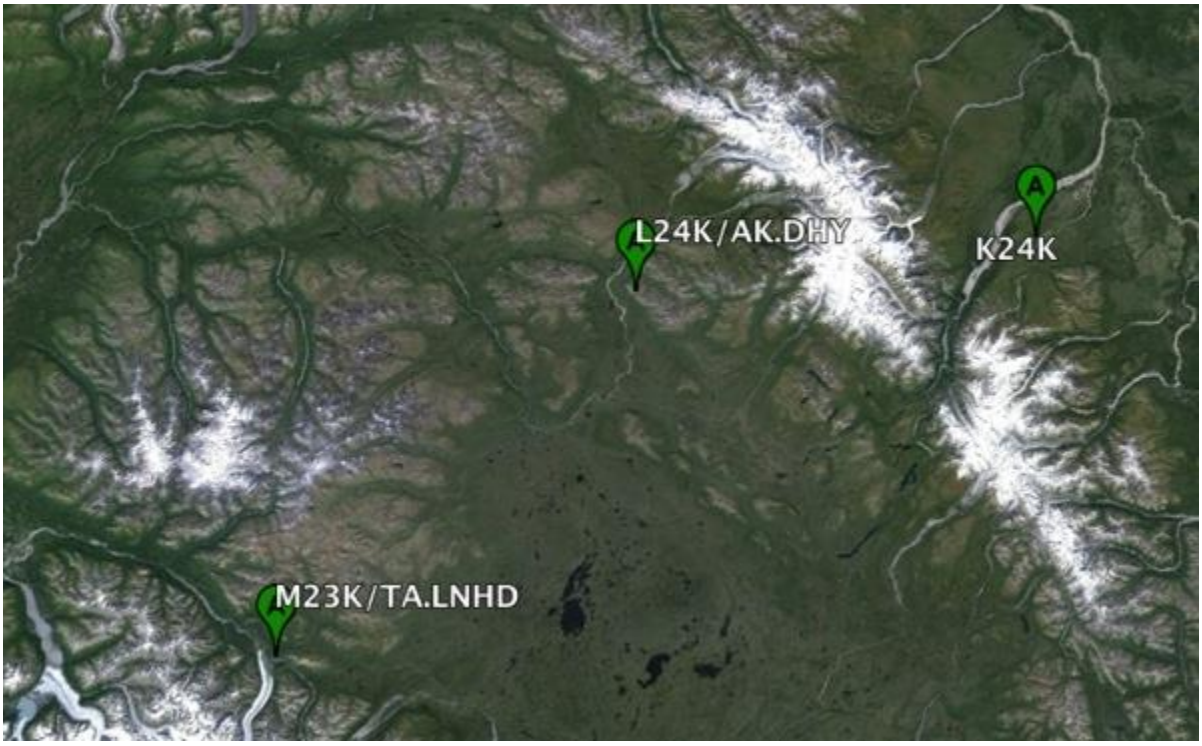
Name	Hub	Group	Latitude	Longitude
F25K	Arctic Village	G	67.59326	-145.6429
F26K	Arctic Village	G	67.69624	-144.13603
Bettles	***Bettles***	***H***	***66.917488***	***-151.522386***
Prospect Creek	***Prospect Creek***	***H***	***66.812336***	***-150.644058***
F21K	Bettles	H	67.22152	-153.48034
G23K	Prospect Creek	H	66.70997	-150.02589
F22K	Bettles	H	67.50758	-152.17894
G21K	Bettles	H	66.51553	-153.50573
G22K	Bettles	H	66.91797	-151.51914
Anaktuvak Pass	***Anaktuvak Pass***	***H***	***68.142004***	***-151.735485***
E22K	Anaktuvak Pass	H	68.13431	-151.81324
ChandalarCamp	***Chandalar Camp***	***H***	***68.065439***	***-149.579738***
E23K	Chandalar Camp	H	68.05841	-149.61642
E24K	Chandalar Camp	H	68.07476	-148.48683
F24K	Chandalar Camp	H	67.51893	-147.88715
C24K (HUB)	***Deadhorse/C24***	***I***	***69.72***	***-148.70102***
C24K	Deadhorse/C24	I	69.72	-148.70102
C23K	Deadhorse/C24	I	69.83595	-150.61252
D24K	***Happy Valley Camp***	***I***	***69.15322***	***-148.82338***
D23K	Happy Valley Camp	I	68.9656	-150.68092
Kavik River Camp	***Kavik River Camp***	***I***	***69.676371***	***-146.897277***
D25K	Kavik River Camp	I	69.32196	-146.37523

Name	Hub	Group	Latitude	Longitude
C27K	Kavik River Camp	I	69.62636	-143.71142
C26K	Kavik River Camp	I	69.91748	-144.91224
Juneau	***Juneau***	***K***	***58.300062***	***-134.420088***
R31K	Gustavus	K	58.41365	-135.73927
R32K/AB50	Juneau	K	58.416776	-134.545301
S31K	Pelican	K	57.95513	-136.21817
T33K/AB51	Petersburg	K	56.797623	-132.91356
S33K	Windham Bay	K	57.59668	-133.35581
V35K	Ketchikan	L	55.32806	-131.62474
U35K	Hyder	L	55.91553	-130.02568
U33K	Whale Pass	L	56.11441	-133.12125
U34K	Yes Bay	L	55.91691	-131.79827
Kantishna	***Kantishna***	***N***	***63.525297***	***-150.958004***
K22K/AK.TRF	Kantishna	N	63.451	-150.2872
K21K/AK.CAST	Kantishna	N	63.4193	-152.0682

Group A – Drill Test Deployment – Drill operator training with drill designer.

Stations – K24K, LNHD and Test Site (TBD possible L24K/AK.DHY, drill only at test site)

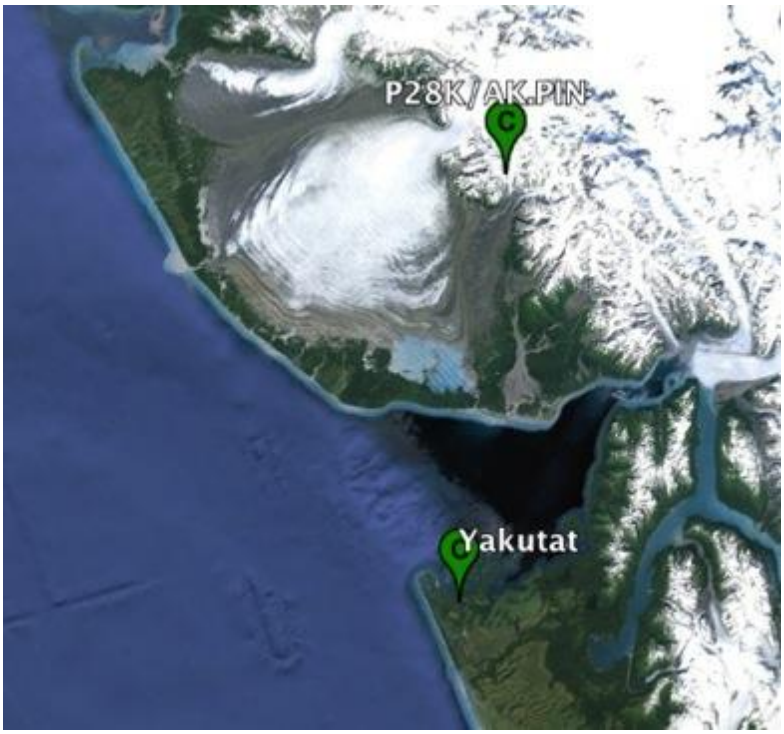
Duration Mid-April (TBD)



Group C – Yakutat and Cordova (PWS)

Duration – 5/15 – 5/22

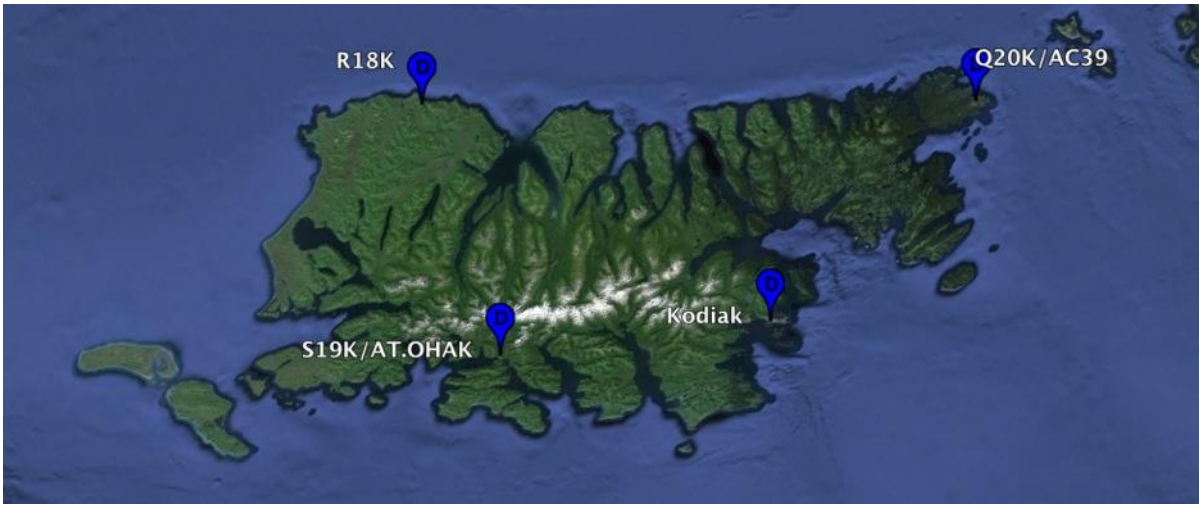
Stations – P28K (AK.PIN), P25K (AK.KAI), P23K (PB.AC79)



Group D – Kodiak

Duration – 5/21 – 5/25

Stations – S19K (AT.OHAK), Q20K (PB.AC39), R18K



Group E and F – King Salmon, Dillingham and Sand Point

Duration – 5/23-6/14

King Salmon Stations – Q16K, Q18K (AV.KAHC), Q17K (AV.CNTC), R17K, R16K (PB.AC52)

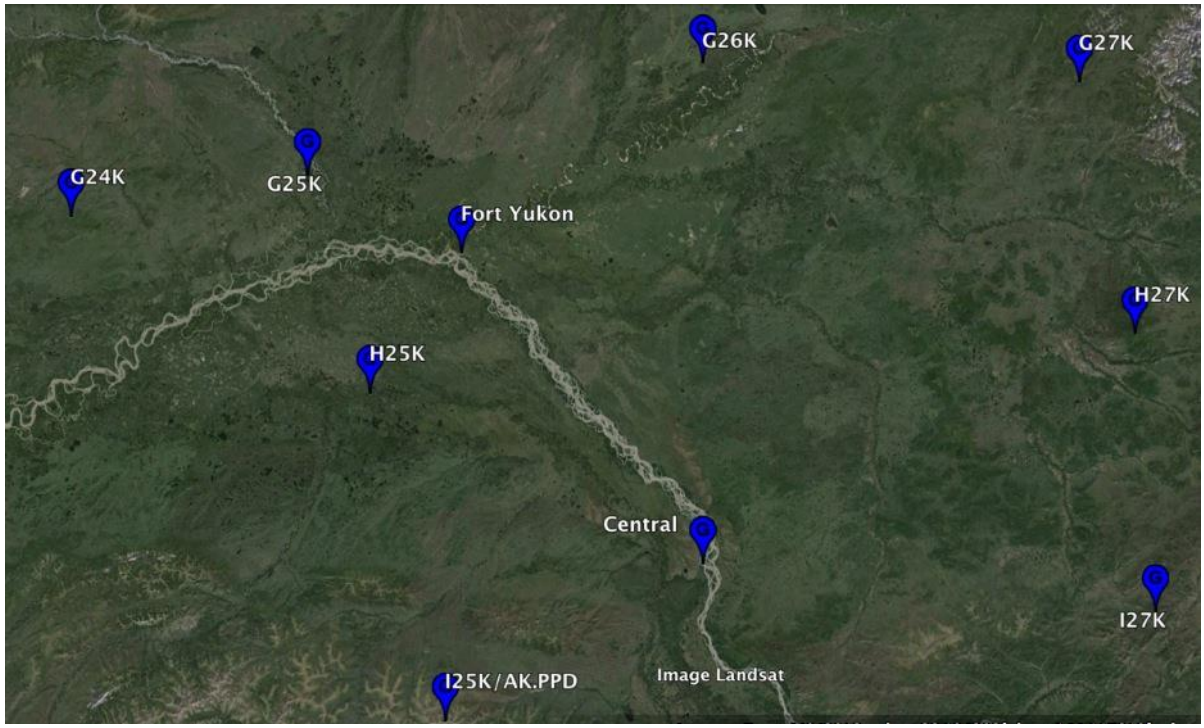
Dillingham Stations – P16K, P17K, O15K, O16K, O17K

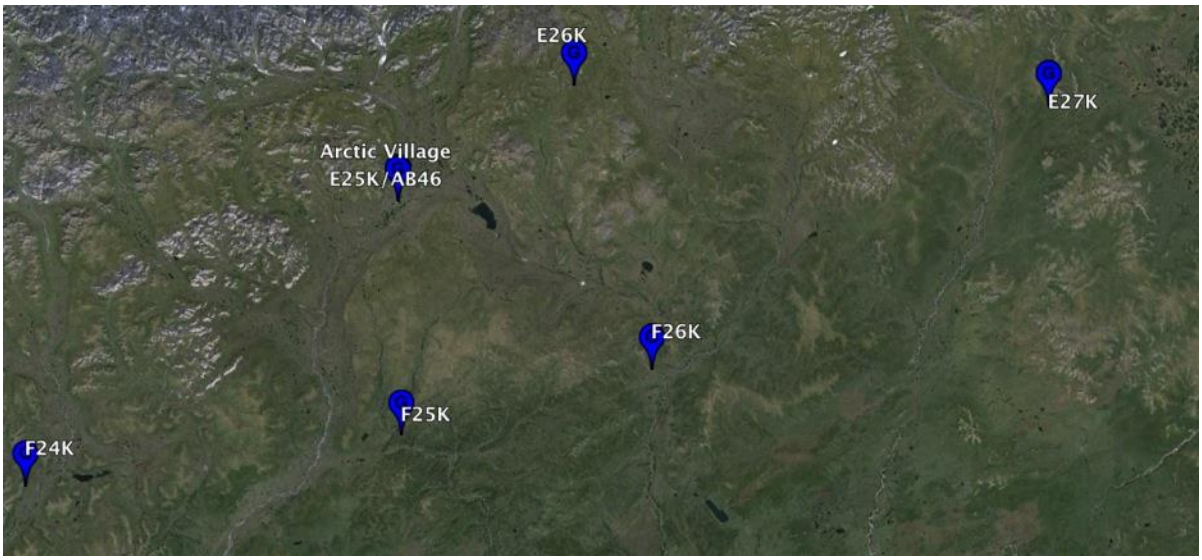
Sand Point Stations – S21K (AV.BLHA), S14K (AV.VNFG), S13K (AT.SDPT)

Group G – Central/Circle, Ft. Yukon and Arctic Village

Duration – 6/15-7/7

Stations – I25K (AK.PPD), I27K, H27K, G27K, G26K, H25K, G25K, G24K, F24K, F25K, F26K, E27K, E25K





Group H – Coldfoot, Bettles, Anaktuvuk and Chandalar Camp

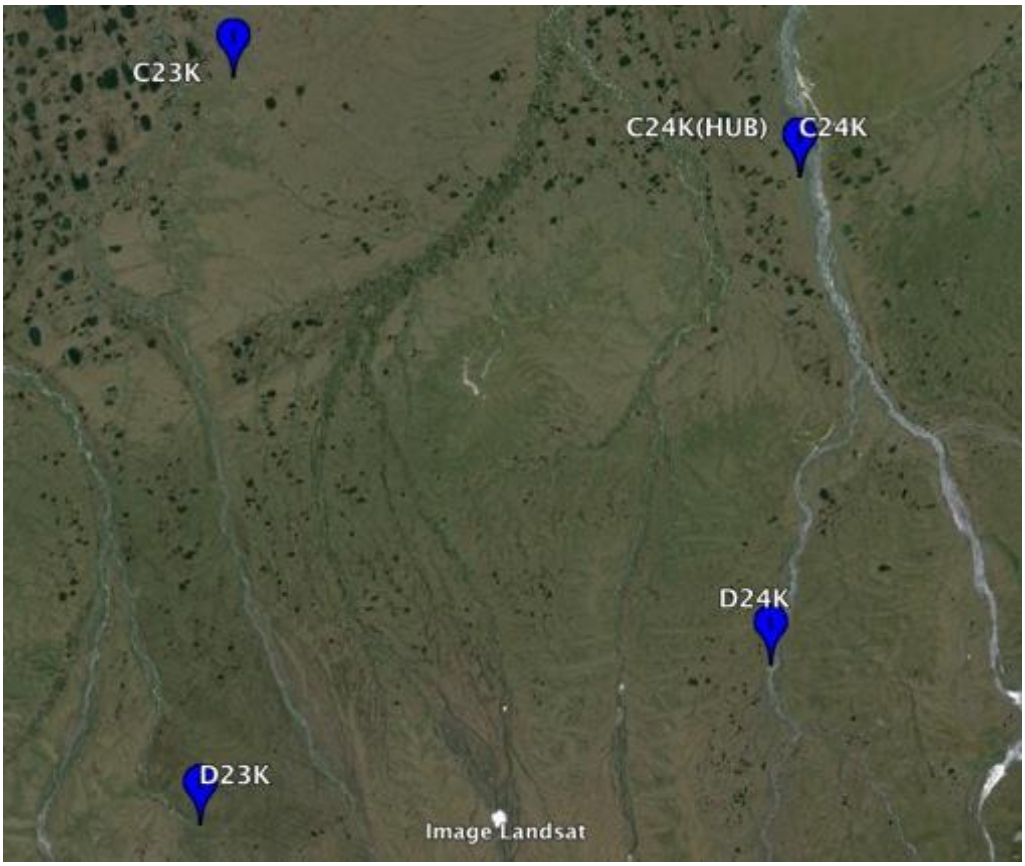
Duration – 6/27-7/11

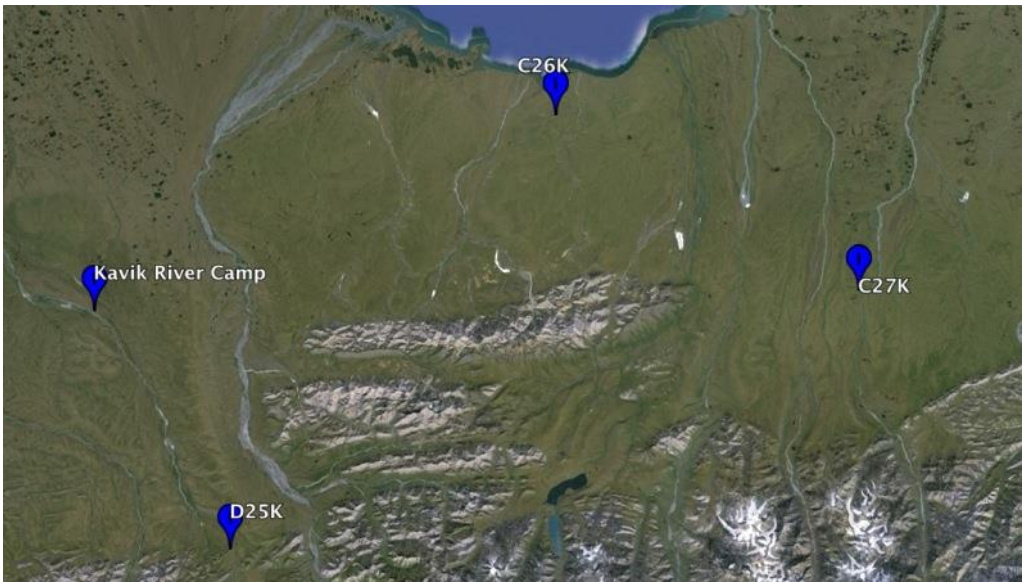
Stations – H22K, G23K, G22K, F22K, F21K, G21K

Group I – Happy Valley, Kavik Camp and Deadhorse

Duration – 7/15-8/1

Stations –D23K, D24K, D25K, C27K, C26K, C24K, C23K





Group K – Southeast AK – Juneau, Gustavus, Pelican, Windham Bay, Petersburg

Duration – 8/8-8/22

Stations – R32K, R31K, S31K, S33K or S32K, T33K

Group L – Southeast – Ketchikan, Hyder, Yes Bay, Whale Pass

Duration – 8/15-8/25

Stations – V35K, U35K, U34K, U33K

Group N – Denali Park – Kantishna, Cantwell

Duration – 8/27-9/2

Stations – K21K, K22K, L24K (Only if not completed during deployment A)

Example Daily Site Report

Operator:_____ **Date:_____**

Station Code:_____ **IRIS Specialist:_____**

Departed from: _____ **Departure Time:_____**

Arrival Onsite:_____

Start of Drilling:_____ **Completion of Drilling:_____**

Grouting completed:_____ **Weather Conditions:_____**

Comments regarding ground/hole:

Drill Condition upon arrival onsite:_____

Drill Condition during Operation: _____

Drill Condition at Completion: _____

Departure to: _____ **Time:_____**

Bid Sheet Example 1

Company Name: _____ **Person Submitting: _____**

Date Submitted: _____

Phone: _____ **Email:_____**

Drilling Services:

Driller Daily Rate	$ Per day	X Num. Days	$ Total
Maintenance Daily Rate	$ Per day	X Num. Days	$ Total
Drill Maintenance Consumables*		$	$ Total
Administrative Fee		$ Lump sum	$ Total
		Total Cost:	$

***Consumables reimbursed at actual cost.**

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Bid Sheet Example 2

Company Name: _____ **Person Submitting: _____**

Date Submitted: _____

Phone: _____ **Email:_____**

Drilling Services:

Driller Hourly Rate	$	Per hour	X Num. Hours	$	Total
Maintenance Hourly Rate	$	Per hour	X Num. Hours	$	Total
Drill Maintenance Consumables*			$	$	Total
Administrative Fee			$ Lump sum	$	Total
			Total Cost:	$	

***Consumables reimbursed at actual cost.**

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Bid Sheet Example 3

Company Name: _____ **Person Submitting: _____**

Date Submitted: _____

Phone: _____ **Email:_____**

Drilling Services:

Complete Borehole Rate*	$ Per site	X Num. Site	$ Total
Maintenance Hourly or Daily Rate	$	X Number Hours/Days	$ Total
Drill Maintenance Consumables**		$	$ Total
Administrative Fee		$ Lump sum	$ Total
		Total Cost:	$

***Note that per site rate is based on successful completion of borehole.**

****Consumables reimbursed at actual cost.**

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