DOW v. DOI 18-2572

Batch 3 SMC Release 2

Emails

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Snow Monitoring Workshop - Save the Date - Oct. 9 & 10

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:34 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Jones, Nichelle (Shelly)** <njones@blm.gov>
Date: Fri, Sep 7, 2018 at 10:07 AM
Subject: Fwd: Snow Monitoring Workshop - Save the Date - Oct. 9 & 10
To: Murphy, Ted <t75murph@blm.gov>, Eric Geisler <egeisler@blm.gov>, Nolan Heath <nheath@blm.gov>

Hey Ted:

Please make sure DOI people know about this and approve/support our involvement. I spoke to Sarah Longan about it at the RAC meeting last month and think it would be good to include NSSI to help make sure we get some industry involvement and support as well.

Shelly Jones
Acting Manager
Arctic District Office
222 University Avenue
Fairbanks, AK 99709

(907) 474-2310 (w)
(907) 460-0086 (c)

---------- Forwarded message ----------
From: **Leonard, Paul** <paul_leonard@fws.gov>
Date: Fri, Sep 7, 2018 at 9:23 AM
Subject: Snow Monitoring Workshop - Save the Date - Oct. 9 & 10
To: Paul Leonard <paul_leonard@fws.gov>

Good morning,

I have spoken with many of you in the last few months about snow conditions across the eastern Arctic Coastal Plain. Given the recent attention on this area for oil and gas exploration and development, the US Fish & Wildlife Service, Geophysical Institute at UAF, Bureau of Land Management, and Alaska Dept. of Natural Resources are co-sponsoring a snow monitoring workshop to bring together practitioners, resources managers, and scientists to discuss issues related to snow in and around the Arctic Refuge.

The main objectives of this workshop are to:

1. Examine the existing data on snow distribution and density and methods for monitoring snow on the Arctic Coastal Plain via *in situ* and remote sensing methods.
2. Identify snow monitoring needs and techniques for this region to inform management decisions related to oil and gas exploration and development.
3. Lay the groundwork for a longitudinal study that measures impacts of oil and gas exploration and development on tundra vegetation and hydrological resources.

I'm writing to solicit your interest in attending the 2-day workshop in Fairbanks on Oct. 9 & 10 at Pike's Lodge.

In addition, please see Dr. Matthew Sturm's flyer (attached). I'd be happy to answer any questions you may have about the workshop or discuss ways to bring your own ideas to the meeting.

An agenda and meeting details will be forthcoming.

Cheers,
Paul

--
Paul Leonard, PhD
Science Coordinator
Arctic LCC
101 12th Ave. Room 216

Fairbanks, AK 99701
(907) 456-0445

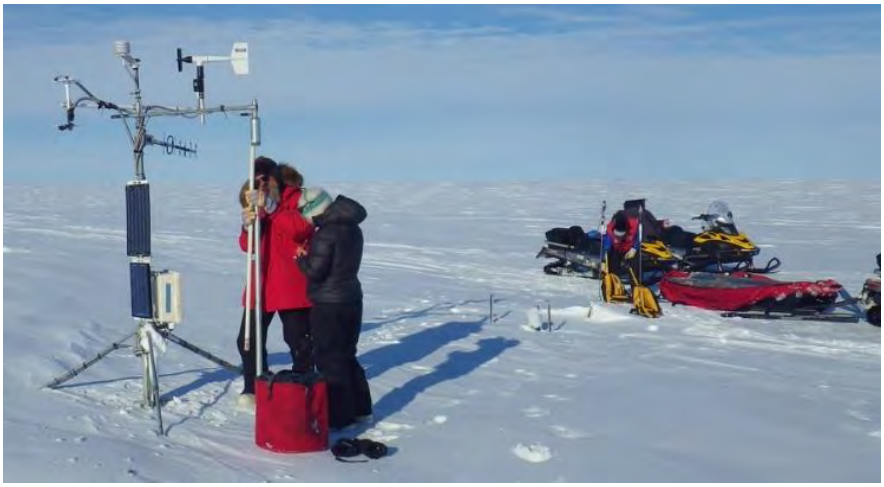
Snow Workshop Flier.pdf
571K

Workshop on the Snow Cover of the 1002 Area Conditions, Measurements, Challenges

Sponsored by the

U.S. Fish and Wildlife Service & Bureau of Land Management

October 9-10, 2018: Fairbanks, Alaska



The workshop is for state, federal agencies, industry, and other groups interested in over-snow work and conditions in the Arctic National Wildlife Refuge.

At this two-day workshop, we will discuss;

- the nature of ANWR snow cover and its properties;
- unique aspects of the 1002 area compared with other North Slope areas;
- challenges faced in operating within and over this snow cover;
- best practices, tools, and measurements,
- new tools and techniques for monitoring and working with the snow.

Our team has combined more than *half a century* of experience with snow on the North Slope .

- Dr. Matthew Sturm, University of Alaska Fairbanks Geophysical Institute
- Dr. Chris Hiemstra, U.S. Army Cold Regions Research and Engineering Laboratory-Alaska
- Mr. Frank Urban, USGS Denver
- Mr. Charlie Parr, University of Alaska Fairbanks Geophysical Institute.
- Ms. Melissa Head, DNR, State of Alaska

If Interested in Attending Contact:

Dr. Paul Leonard: paul_leonard@fws.gov
Dr. Matthew Sturm msturm1@alaska.edu
Dr. Chris Hiemstra Christopher.A.Hiemstra@usace.army.mil
Ms. Melissa Head: melissa.head@alaska.gov

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Snow Monitoring Workshop - Save the Date - Oct. 9 & 10

1 message

Geisler, Eric <egeisler@blm.gov> Tue, Sep 25, 2018 at 11:01 AM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

Eric Geisler, CF
Program Lead for Forestry, Soils, Invasive Species, Range, Botany, ES&R
BLM Alaska State Office
222 W 7th Ave #13
Anchorage, AK 99513
W 907-271-1985
C 509-220-4712

---------- Forwarded message ---------
From: **Geisler, Eric** <egeisler@blm.gov>
Date: Fri, Sep 7, 2018 at 12:02 PM
Subject: Fwd: Snow Monitoring Workshop - Save the Date - Oct. 9 & 10
To: Scott Guyer <sguyer@blm.gov>, Sara Longan <slongan@blm.gov>

Would be good to attend if you can.

Eric Geisler, CF
Program Lead for Forestry, Invasive Species, Range, Botany, ES&R
BLM Alaska State Office
222 W 7th Ave #13
Anchorage, AK 99513
W 907-271-1985
C 509-220-4712

---------- Forwarded message ----------
From: **Jones, Nichelle (Shelly)** <njones@blm.gov>
Date: Fri, Sep 7, 2018 at 10:06 AM
Subject: Fwd: Snow Monitoring Workshop - Save the Date - Oct. 9 & 10
To: "Murphy, Ted" <t75murph@blm.gov>, Eric Geisler <egeisler@blm.gov>, Nolan Heath <nheath@blm.gov>

Hey Ted:

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Shelly Jones
Acting Manager
Arctic District Office
222 University Avenue
Fairbanks, AK 99709

(907) 474-2310 (w)
(907) 460-0086 (c)

---------- Forwarded message ----------
From: **Leonard, Paul** <paul_leonard@fws.gov>
Date: Fri, Sep 7, 2018 at 9:23 AM
Subject: Snow Monitoring Workshop - Save the Date - Oct. 9 & 10
To: Paul Leonard <paul_leonard@fws.gov>

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Cheers,
Paul

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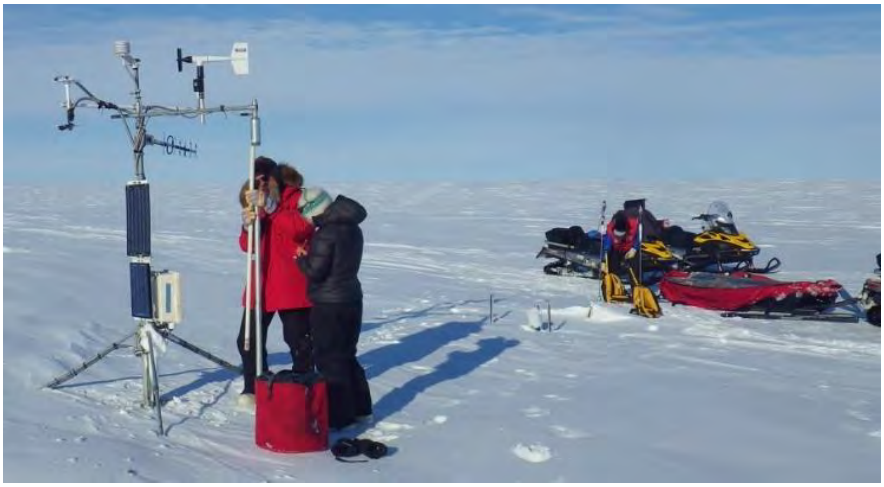

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- Mr. Charlie Parr, University of Alaska Fairbanks Geophysical Institute.
- Ms. Melissa Head, DNR, State of Alaska

If Interested in Attending Contact:

Dr. Paul Leonard: paul_leonard@fws.gov
Dr. Matthew Sturm msturm1@alaska.edu
Dr. Chris Hiemstra Christopher.A.Hiemstra@usace.army.mil
Ms. Melissa Head: melissa.head@alaska.gov

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Tundra Modeling Project

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:33 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Jones, Nichelle (Shelly)** <njones@blm.gov>
Date: Fri, Sep 7, 2018 at 10:46 AM
Subject: Tundra Modeling Project
To: Eric Geisler <egeisler@blm.gov>, Murphy, Ted <t75murph@blm.gov>, Nolan Heath <nheath@blm.gov>, Timothy Vosburgh <tvosburgh@blm.gov>, Guyer, Scott <sguyer@blm.gov>, Longan, Sara <slongan@blm.gov>

Please note this is the study/project that Melissa Head at DNR has been working on that we discussed yesterday. For some reason it seems to have been moved or possibly removed from the DNR page. I downloaded it from there in May, so I just scanned it back to use an an attachment as a .pdf. This is a whole aspect of land management in the Arctic that could use some focus and collaboration. It would be very nice to have someone at BLM that was focused and specialized in this field.

-Shelly

Shelly Jones
Acting Manager
Arctic District Office
222 University Avenue
Fairbanks, AK 99709

(907) 474-2310 (w)
(907) 460-0086 (c)

DNR_2018_Intro_Tundra_Travel_Modeling.pdf
558K

Introduction to Tundra Travel and the Modeling Project

A Serious Problem. A serious problem is confronting oil exploration in this state: the winter oil exploration season is becoming ever shorter. The Alaska Department of Natural Resources (DNR) opens the North Slope tundra to exploration when the ground is frozen enough that companies can explore over snow without significantly damaging the tundra. But these openings were coming later and later because of warming weather, regulatory changes, and changes in measuring techniques. In fact, the winter exploration season has been effectively cut in half since the early 1970s.

Serious Consequences. Shorter seasons are a real problem for the oil industry who is trying to explore new areas further from road systems on the North Slope. In order to prevent declining oil production, companies need to explore for new oil reservoirs. It's also a problem for Alaskans who rely on the oil industry: in other words, for all of us. We need to lengthen the season, but we need to do so in a way that respects the environment.

Solving the Problem. To solve this problem, DNR's Division of Mining, Land and Water worked with the US Department of Energy to develop scientifically valid, peer-reviewed research to find ways to extend the season without compromising the environment. The study analyzed the changes on tundra test plots when various equipment used for exploration were driven on the plots during various stages of tundra freeze up and snow conditions. Data was collected over a year and half and then processed through statistical analysis to understand the complicated interaction of environmental conditions and variables. We created a statistical model that helps us understand what expected tundra disturbance will be experienced as the result of using various vehicles in certain conditions.

Good News. DNR found that the Tundra is much more resistant than was anticipated. The study defined the hardness of ground needed to protect the tundra in different tundra ecosystems and what other contributing factors were important. With the better understanding of how the tundra resists disturbance, we found that we can advance the tundra opening dates. ***If the conditions were the same as the last few years, we could have opened the tundra three to six weeks earlier with no increased tundra disturbance beyond that experienced at the later opening dates.*** Last year, where we opened some areas on December 23 rd and others as late as January 28 th , we could have opened all of the North Slope areas to winter travel in early December!

Lengthening a 3-month exploration season by a month will be a very important change for the oil industry and for all Alaskans. This increase in the exploration season, combined with DNR's focus on approving ice road projects may allow companies to complete exploration wells within one season rather than two. This will allow Alaskans to receive the benefits of oil development and oil revenues sooner than would otherwise occur. It is an important win for the companies and for Alaskans.

The Next Step. DNR will closely monitor the initial vehicle use after the opening date to field test the new application of the study results. In addition DNR will work with the educational community to monitor the study plots over time to better understand the resiliency of the tundra. With the data collected and further monitoring there are more insights we can learn about the tundra resistance to disturbance. That may provide additional choices for the oil industry in how they configure their equipment in order to begin exploration activities sooner.

More Information. For more information contact Melissa Head, 451-2719 or email at melissa.head@alaska.gov.

The Technical Details of the Study

Two test locations were selected to generate a model for each of the two primary ecosystems found on the North Slope - Coastal Plain and the Foothills. Each study area was divided into rows of treatment cells, each cell measuring 100 by 50 m. containing 30 treatment cells. Within each cell, three 5 m transects were created.

Prior to the winter field tests, each of the 60 cells (30 for each study area) were sampled creating base line data along each of the three transects, in each cell, during July-August, 2003. Base line measurements included: (1) depth of active (thaw) layer, (2) vegetation community type; (3) vegetation composition by genera (established with a hybrid "point frame"/ "intersect" sampling system); (4) percent vegetation life form cover (using the same hybrid sampling system); (5) soil temperature at a depth of 10 cm; (6) soil moisture at a depth of 10 cm; (7) soil micro-topography; (8) tussock frequency and condition; (9) shrub frequency and condition; and (10) vegetation productivity as measured by chloroplast density estimated with the percent of photosynthetically active radiation (PAR) absorbed.

Each cell within a particular study area was then randomly assigned one of six treatment dates and one of five treatment types. The day before each treatment date, winter measurements were taken along each transect within the treated cells for that date. Winter measurements included: (1) snow depth; (2) ground hardness; (3) snow slab presence; and (4) snow slab thickness.

Treatments consist of an assigned vehicle type making five consecutive figure-eight passes within an assigned cell on an assigned date, passing over each of the three transects within the cell. Each treatment cell, therefore, had only a single vehicle type pass through the transects on a single date. Treatment dates were designed to span a suite of environmental conditions potentially

present during tundra travel. Treatment dates were established for: (1) October 30 2003; (2) November 14, 2003; (3) December 4, 2003; (4) December 16, 2003; (5) January 5, 2004; and January 20, 2004.

Five treatment vehicle types were used on each test date. The five vehicle types are as follows: (1) steel tracked caterpillar D-7 dozer; (2) wheeled front-end loader; (3) cleat tracked tucker snowcat; (4) rubber tracked challenger and a (5) "no treatment" treatment. Vehicle types were selected upon the basis of (1) equipment availability and transportability, and (2) type of equipment frequently used in cross tundra travel for seismic exploration and ice road construction.

After the winter field season, DNR returned to the two study areas during the following summer in July-August, 2004 to re-measure each transect in each treatment cell for change detection. Natural ecological disturbance and change will be accounted for, and calibrated, by referencing to change detected within the "no treatment" cells using the summer 2003 measurements with the subsequent summer 2004 measurements. In this fashion, disturbance is defined as a change from based line exceeding that observed for natural inter-annual variation for each of the measurements.

Data from the 2003 and 2004 field seasons is integrated into a multiple regression model enabling DNR staff to predict disturbance responses under differing combinations of environmental conditions with known types and intensity of tundra travel. This model provides enhanced information and serves the Director as an additional tool for DNR in deciding appropriate opening dates for winter tundra travel.

GO BACK!

Return to top

Department of Natural Resources
550 W. 7th Ave, Suite 1360, Anchorage, AK 99501-3557
Phone: 907-269-8400 || Fax: 907-269-8901 || TTY: 907-269-8411

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: [EXTERNAL] RE: DNR Snow Monitoring protocols

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:32 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Head, Melissa M (DNR)** <melissa.head@alaska.gov>
Date: Mon, Sep 10, 2018 at 4:09 PM
Subject: [EXTERNAL] RE: DNR Snow Monitoring protocols
To: Geisler, Eric <egeisler@blm.gov>
Cc: Shelly Jacobson <njones@blm.gov>, Nolan Heath <nheath@blm.gov>

Hi Eric,

Attached is a document that outlines our winter data collection methods. I also included a document that was put together by GW Scientific comparing sampling methods.

To address your other questions and points:

1. Interpreting snow density, snow structure, SWE

We use density, SWE, and structure to inform the snow depth measurement. Basically, all of the other snow variables help us determine whether the average snow depth is going to be protective or not. The higher the density/SWE and the slab thickness and strength provide more protection to the tundra from vehicles. We get more management "wiggle room" as well. Let's say a company is trying to reach an area with snow depths that have met our criteria, but they would need to cross an area that has not met our snow depth criteria. If that low snow area is two inches of slab over three inches of depth hoar and the SWE calculates to 3", we would be reasonably confident in saying that vehicles could cross that "low snow" area without causing unacceptable levels of damage to the tundra. All provided that soil temperature criteria has been met.

2. Contractors only collect snow depth

We are frequently dealing with companies that do not have the expertise to collect snow data accurately. They don't all have the dedicated resources to hire an outside consultant or surveyor and we don't always have time to collect that data for them. Snow depth measurements are fairly easy and with back up photos and guidance, can be collected fairly accurately. That said, we explicitly say that we will not use company provided data to open an area to off-road travel; we reserve the right to ground truth any data that they provide. We've also never tried to impose density or SWE measurements on companies since these are not part of our official opening criteria.

3. 3" SWE recommendation

I'm trying to track this down. It has been in a number of presentations given by me and predecessors and surprisingly, I can't find a specific reference to where it came from. I seem to recall my former boss saying that a SWE of 3" roughly corresponds to 6" of snow in the coastal plain at its typical wind driven density and 9" of snow in the foothills at its typical wind driven density. But I can't confirm this yet. I'll continue to do some research and let you know what I find.

Hope this helps!

Kind Regards,

Melissa

Melissa Head

Manager, Northern Oil & Gas Team

DNR/DMLW

907-451-2719

From: Geisler, Eric <egeisler@blm.gov>
Sent: Wednesday, September 5, 2018 4:49 PM
To: Head, Melissa M (DNR) <melissa.head@alaska.gov>
Cc: Shelly Jacobson <njones@blm.gov>; Nolan Heath <nheath@blm.gov>
Subject: DNR Snow Monitoring protocols

Melissa

! really appreciated your input last week on the DNR snow measurements for the Coastal Plain Seismic EA.

Can you please describe how you record, use and interpret the snow density and snow structure or crystal form/size information the state collects. We are trying to incorporate the more comprehensive suite of information in the EA and need to be able to explain how it gets used by DNR to make decisions.

I see that the contractors are only required to measure depth for state projects.

Also do you know where the 3" SWE recommendations come from. Who put forth that idea?

Eric Geisler, CF

Program Lead for Forestry, Invasive Species, Range, Botany, ES&R

BLM Alaska State Office

222 W 7th Ave #13

Anchorage, AK 99513

W 907-271-1985

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2 attachments

DNR-DMLW_WinterFieldDataCollection_20180910.pdf
460K

SNOW_DATA_COLLECTION_METHODS_RELATED_TO_TUNDRA_TRAVEL_NORTH_SLOPE_ALASKA_ATN_GWSTR0905.pdf
619K

State of Alaska
Department of Natural Resources
Division of Mining, Land & Water **Northern Regional Office**

DATA COLLECTION PROCEDURES FOR WINTER OFF-ROAD TRAVEL

SITE SELECTION

Snow and soil temperature sampling are carried out at established, vehicle accessible sites throughout state land on the North Slope. Twenty sites are located within four Tundra Opening Areas (TOA). Monitoring station sites were selected for their accessibility to the established road system, distribution within the four TOAs, and uniformity in localized landforms and vegetation.

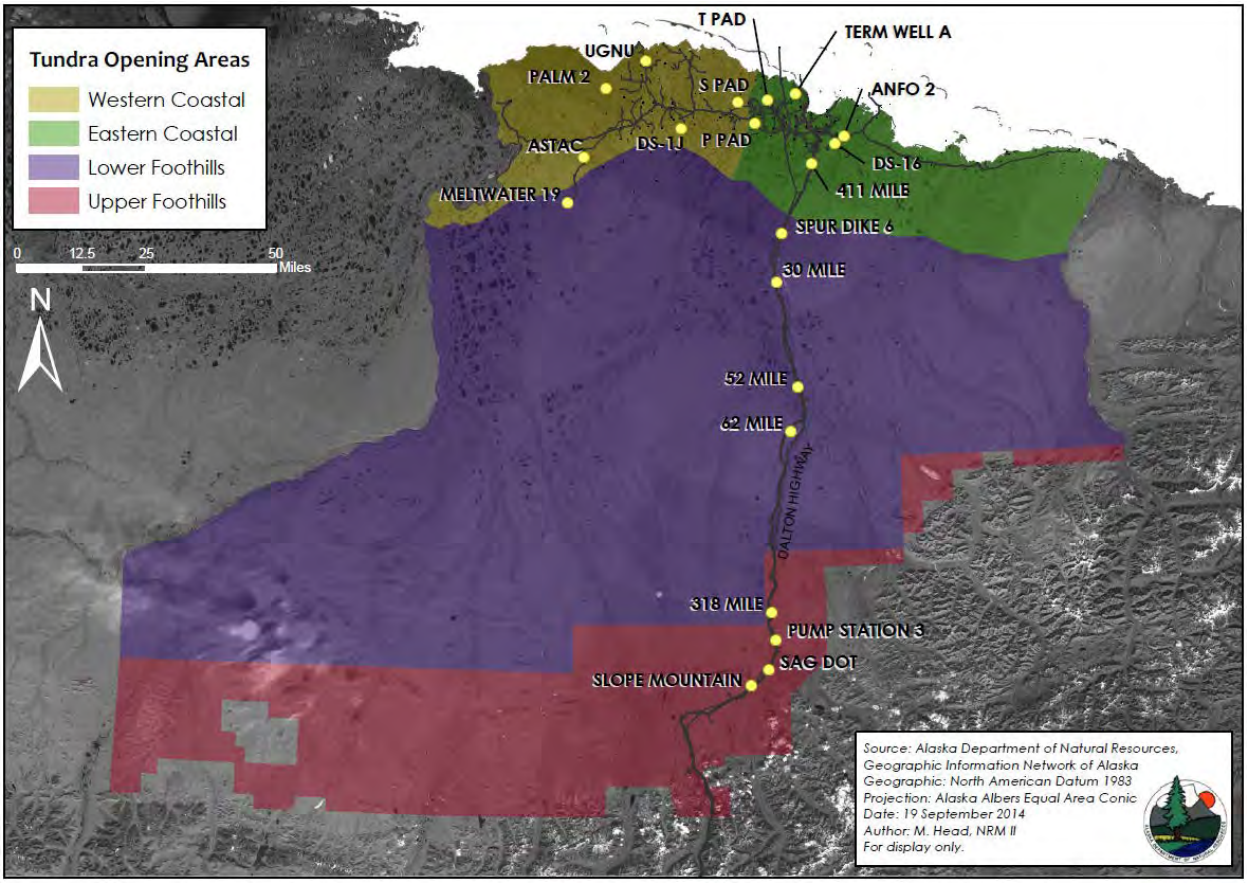

Figure 1. DNR/DMLW Tundra Opening Areas and Monitoring Stations

Each monitoring station is comprised of soil temperature equipment, a 100-meter snow transect, and an active layer transect (summer data collection only).

TUNDRA OPENING REQUIREMENTS

Soil temperature: -5˚C at 30 cm depth (measured from the top of the organic layer)
Snow depth: 6 inches within the Eastern and Western Coastal Tundra Opening Areas
9 inches within the Upper and Lower Foothills Tundra Opening Areas

GENERAL EQUIPMENT INFORMATION

A large Siglin sled is used to transport our equipment to and from the vehicle. A 5-gallon bucket is also helpful for containing smaller items. Two coolers are used, one for active snow sample collection and one that remains in the truck to collect the snow samples from a day of work. A datasheet notebook with attached pencil is provided. See Appendix 1 for a datasheet example with information on how to fill it out. Appendix 2 provides datasheet templates.

SOIL TEMPERATURE

Thermistor cables, with temperature sensors, are installed in the tundra at depths of 10 cm, 20 cm, and 30 cm below the tundra organic layer. The temperature sensors are generally located behind the black ABS housing when sites are approached from the access roadway.

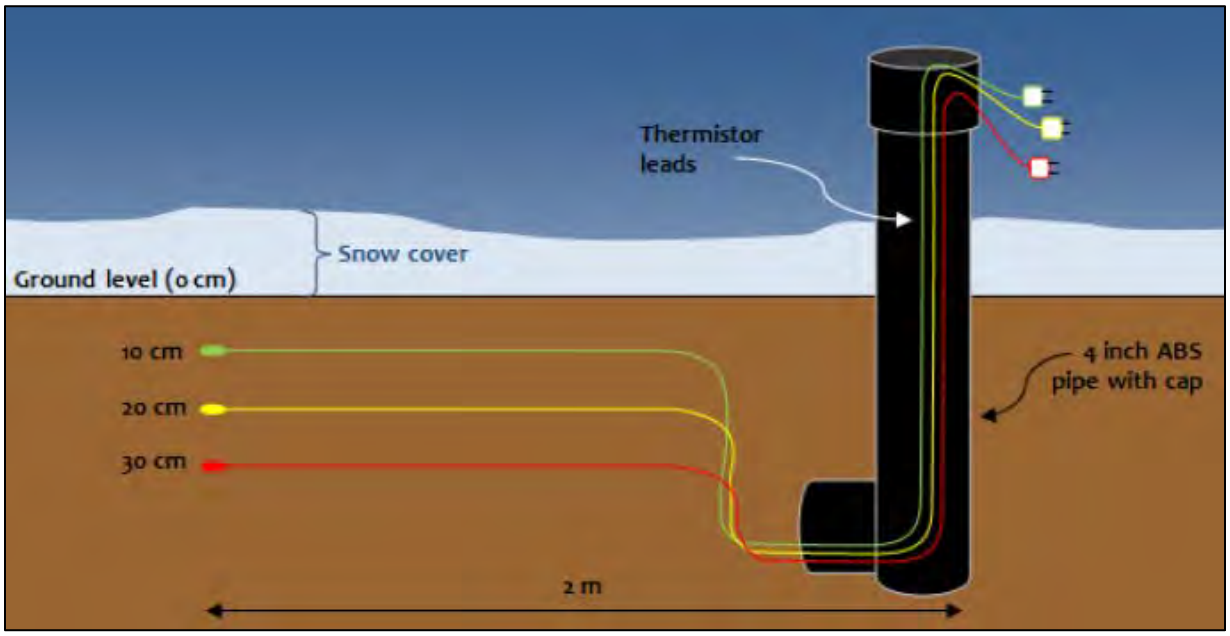

Figure 2. Diagram of monitoring station thermistor setup

Equipment

- Omega digital thermometer with small camera bag
- Hatchet (if necessary to pry off cap)
- Headlamp (if necessary)
- Datasheet notebook and pencil

Methods for Data Collection

1. Use the digital thermometer that is kept in the camera bag.
2. Plug the thermometer into each thermistor and record the temperature data corresponding to each depth.
3. Do not walk on or disturb the snow behind the ABS pipe. Compressing the snow above the temperature sensors will lead to inaccurate temperature readings and poor quality data.

SNOW DEPTH

A 100-meter snow depth transect is located at each of our monitoring stations. The transect is delineated by five reflective markers that are either white fiberglass poles with red or blue reflectors or orange fiberglass poles (Figure 3). The start of the transect is typically to the left of the ABS pipe.

Equipment

- Stainless steel ruler, 36-inch
- Digital voice recorder (if using)
- Headlamp (if necessary)
- Datasheet notebook and pencil

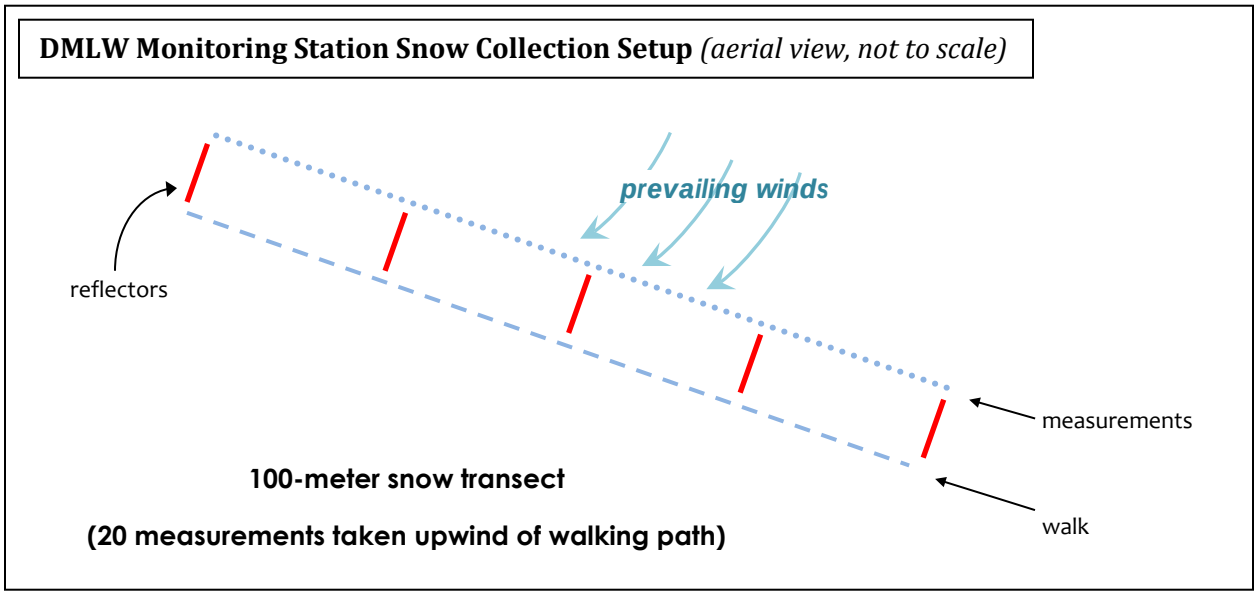

Figure 3. Snow collection setup

Methods for Data Collection

1. Measurements must be taken UPWIND of the walking path.
2. Collect 20 depth measurements along the transect. It is appropriate to pace out measurements evenly along the transect (i.e. 5 measurements between each marker). Record depths to the nearest 0.25 inch.
3. If you recorded depth measurements on the voice recorder, transfer these measurements to the datasheet when you return to the truck.

SNOW DENSITY (AND SNOW WATER EQUIVALENT)

Snow density samples are not taken in a fixed location. A survey lath located at each monitoring station resides in front of the ABS pipe (approximate location). This lath is used to mark the transect location of the previous snow density samples collection. Unless you are the first to collect snow samples in a season, the snow density transect moves upwind each sampling date.

Equipment

- SnowHydro SWE snow coring tube (http://www.snowhydro.com/products/column3.html)
- Large cooler with internal file frame for holding bags
- Binder clips
- Headlamp (if necessary)
- Datasheet notebook and pencil
- Digital balance
- 1-gallon plastic freezer bags
- Square plastic container

Methods for Data Collection

In the field…

1. It is recommended to set up the cooler with bags clipped into the file frame prior to walking out to a monitoring site. Doing this at the vehicle reduces the potential of losing bags in the wind and it reduces the amount of time that you may be hanging out in the cold. Five snow samples are taken at each site, so five bags and five binder clips are needed.
2. Locate the survey lath and move it approximately 1-meter UPWIND of its current location.
3. Snow samples should be taken approximately 5-meters apart. Pacing our sample locations is appropriate.
4. Using the SnowHydro SWE snow coring tube, push and rotate the sampler through the snowpack to the ground surface.
5. Record the snow depth of the collected snow in the sampler to the nearest 0.5 cm.
6. Push down on the sampler and rotate to cut a shallow tundra plug to ensure all snow is captured. If a tundra plug can't be obtained, use a shovel or your hand to ensure that no snow falls from the sampler when taking it to be bagged.
7. Pour the snow sample into a bag and note the bag number. Record the bag number and depth on the data sheet. If you obtained a tundra plug, remove it from the bag leaving only snow. (Note: Small amounts of tundra vegetation may be present with the snow. Statistically, this debris is not significant and does not need to be removed. Just be sure to remove larger clumps particularly if they are soil.)
8. Unclip the bag from the frame and close the top or roll the bag tightly. Place the sample in bottom of the cooler.
9. When five samples are completed, place the snow samples in the other cooler located in the truck. This helps to keep the working cooler less cluttered and spacious for sampling.

Back at the office…

10. Using the digital scale, zero the scale with the plastic container and an empty gallon plastic bag.
11. Weigh each snow sample in its bag and record the weight with the corresponding bag number and depth.
12. Empty the snow from each bag into the 5-gallon bucket in the office. The bucket should be emptied at the end of the week before leaving the office.

SNOW PITS

Snow pits are used to analyze snow slab formation and snow hardness. Data from snow pits are useful but are not required.

Equipment

- Shovel
- Stainless steel ruler, 36-inch
- Small dust brush
- Headlamp (if necessary)
- Datasheet notebook and pencil

Methods for Data Collection

1. Locate snow pits on either end of snow density transect.
2. Dig a pit the width of the shovel.
3. Using the ruler, record and measure the following to the nearest 0.25 inch:
    - Total snow depth
    - Loose snow presence and thickness
    - Slab presence and thickness (if there is more than one slab, record the total slab thickness)
    - Depth hoar presence and thickness
    - Does the slab cap the tussocks (in tussock tundra only)?
4. The strength of each snow layer is measured using the following table (Table 1). The index applies when firm, steady pressure breaks through the layer being tested.

Table 1. Snow strength index

None	Fist	3 Fingers	1 Finger	Pencil	Knife
0	1	2	3	4	5

APPENDIX 1. Example Datasheet

Date 1						Inspector 2					
Monitoring Station 3						**SOIL TEMPERATURE (˚C)**					
Sampling Site 4						10 cm		20 cm		30 cm	
SNOW DEPTHS (in) 5											

SNOW PITS						**SNOW DENSITY**		
	Total	Hoar	Slab	Loose	Comments/Drawing	Bag #	Depth (cm)	Weight (g)
#1 Depth (in) →		6			7	8		9
#1 Strength								
#2 Depth (in) →								
#2 Strength								
Tussocks Capped? #1- Yes No n/a #2- Yes No n/a								
STRENGTH Fist = **1** 3 Fingers = **2** 1 Finger = **3** Pencil = **4** Knife = **5**								

1. Sampling date
2. Name(s) of all participating in data collection
3. Name of the established monitoring station
4. Sampling sites are named based on order of visit. Each visit is labeled in alphabetical order. For example, the third visit to a monitoring station is labeled "Sampling Site C."
5. Snow depths are currently recorded to the nearest 0.25 inch since we are still using a 36-inch imperial ruler.
6. If multiple layers of the same snow type are present (e.g. 2 distinct slabs), it may be helpful to split the box diagonally and record the data for both layers.
7. Drawings of snow pit layers are often helpful. Use this area to note other anomalies or points of interest.
8. Plastic bags should be pre-labeled. The bag labels need not be sequential or related in any way. There should be no duplicate labels.
9. Snow weight is recorded back at the office.

APPENDIX 2. Datasheet Templates

Datasheet with Snow Pits

Date						Inspector					
Monitoring Station						**SOIL TEMPERATURE (˚C)**					
Sampling Site						10 cm		20 cm		30 cm	
SNOW DEPTHS (cm)											

SNOW PITS						**SNOW DENSITY**		
	Total	Hoar	Slab	Loose	Comments/Drawing	Bag #	Depth (cm)	Weight (g)
#1 Depth (in) →								
#1 Strength								
#2 Depth (in) →								
#2 Strength								
Tussocks Capped? #1- Yes No n/a #2- Yes No n/a								
STRENGTH Fist = **1** 3 Fingers = **2** 1 Finger = **3** Pencil = **4** Knife = **5**								

Datasheet without Snow Pits

Date						Inspector					
Monitoring Station						**SOIL TEMPERATURE (˚C)**					
Sampling Site						10 cm		20 cm		30 cm	
SNOW DEPTHS (cm)											

SNOW DENSITY			**NOTES**
Bag #	Depth (cm)	Weight (g)	

Snow Data Collection Methods Related to Tundra Travel, North Slope, Alaska: 2009

Field Crew at 2L Pad Snow Measurement Site, Kuparuk Operating Field, photo by Michael Lilly.

by

Jeff Derry, Michael Lilly, Gary Schultz, and Jessie Cherry

December 2009

Arctic Transportation Networks Project

Report GWS.TR.09.05

Snow Data Collection Methods Related to Tundra Travel, North Slope, Alaska: 2009

by

Jeff Derry[1], Michael Lilly[1], Gary Schultz[2], and Jessie Cherry[3]

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[1]Geo-Watersheds Scientific, Fairbanks, Alaska
[2]Department of Natural Resources
[3]University of Alaska Fairbanks, International Arctic Research Center

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Fairbanks, Alaska

December 2009

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UNITS, CONVERSION FACTORS, WATER QUALITY UNITS, VERTICAL AND HORIZONTAL DATUM, ABBREVIATIONS AND SYMBOLS

Conversion Factors

Multiply	By	To obtain
	Length	
inch (in)	25.4	millimeter (mm)
inch (in)	2.54	centimeter (cm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
Acre	43559.826	square feet (ft^2)
Acre	0.407	hectare (ha)
square foot (ft^2)	2.590	square mile (mi^2)
square mile (mi^2)	2.590	square kilometer (km^2)
	Volume	
gallon (gal)	3.785	liter (L)
gallon (gal)	3785	milliliter (mL)
cubic foot (ft^3)	23.317	liter (L)
Acre-ft	1233	cubic meter (m^3)
	Velocity and Discharge	
foot per day (ft/d)	0.3048	meter per day (m/d)
Square foot per day (ft^2/d)	0.0929	square meter per day (m^2/d)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/sec)
	Hydraulic Conductivity	
foot per day (ft/d)	0.3048	meter per day (m/d)
foot per day (ft/d)	0.00035	centimeter per second (cm/sec)
meter per day (m/d)	0.00115	centimeter per second (cm/sec)
	Hydraulic Gradient	
foot per foot (ft/ft)	5280	foot per mile (ft/mi)
foot per mile (ft/mi)	0.1894	meter per kilometer (m/km)
	Pressure	
pound per square inch (lb/in^2)	6.895	kilopascal (kPa)
	Density	
Slugs per cubic foot ($slug/ft^3$)	515.464	Kilograms per cubic meter (kg/m^3)

UNITS

For the purposes of this report, both English and Metric (SI) units were employed. The choice of "primary" units employed depended on common reporting standards for a particular property or variable measured. Whenever possible, the approximate value in the "secondary" units was also provided in parentheses. Thus, for instance, stream flow was reported in cubic feet per second (cfs) followed by the value in cubic meters per second (m^3/s) in parentheses.

Vertical Datum:

In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929), a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called *Sea Level Datum of 1929*.

Horizontal Datum:

The horizontal datum for all locations in this report is the North American Datum of 1983.

Snow Water Equivalent (SWE):

Water content, expressed as water depth, of a given column of snow is determined by knowing the depth of the snowpack and density.

$$SWE = d_s * \rho_s / p_w$$

where:

d_s = snow depth

ρ_s = snow density

p_w= density of water (p_w= 1)

Abbreviations, Acronyms, and Symbols

AC	Actual conductivity
AAS	Alaska's Arctic Slope
ADOT&PF	Alaska Department of Transportation and Public Facilities
ADNR	Alaska Department of Natural Resources
ASTM	American Society for Testing and Materials
atm	atmospheres
ATN	Arctic Transportation Networks
C	Celsius
cm	centimeters
DO	Dissolved oxygen
DNR	Department of Natural Resources
DVM	digital voltage multi-meter
F	Fahrenheit (^{o}F).
ft	feet
GWS	Geo-Watersheds Scientific
in	inches
kg	Kilograms
km^2	square kilometers
kPa	kilopascal
lb/in^2	pounds per square inch
m	meters
mg/L	milligrams per liter
µg/L	micrograms per liter
mi^2	square miles
mm	millimeters
µS/cm	microsiemens per centimeter
mV	Millivolt
NGVD	National Geodetic Vertical Datum
NRCS	Natural Resources Conservation Service
NWIS	National Water Information System
ORP	oxygen-reduction potential
ppm	parts per million
QA	quality assurance
QC	quality control
Sag	Sagavanirktok River
SC25	specific conductance at 25 °C
SWE	snow water equivalent
UAF	University of Alaska Fairbanks
USACE	U.S. Army Corps of Engineers, Alaska District
USGS	U.S. Geological Survey
WERC	Water and Environmental Research Center
WWW	World Wide Web
YSI	Yellow Springs Instruments

1. INTRODUCTION

A majority of oil and gas development and exploration on the North Slope takes place in winter when the tundra surface is stable (i.e. frozen). Therefore, knowledge of snow accumulation and its ablation, both temporally and spatially, in the high latitude environment of the Central North Slope Alaska is of vital importance to both industry and research scientists. DNR requirements for the opening of tundra travel in the Coastal Tundra Opening Areas is dependent on having 15.24 cm (6 in) of snow on the ground and 23° F (-5°C) soil temperatures at a depth of 30 cm (11.8 in) (Bader, 2004).

Many projects and participants collect snow data – according to their particular method - along the North Slope. The purpose of this document is to outline the current snow data collection methods as practiced by Geo-Watersheds Scientific (GWS) and the Department of Natural Resources (DNR). Documented sampling methods will allow standardized and consistent snow data collection practices and documentation to be adhered to between multiple parties. In addition - within the context of the Arctic Transportation Networks project (ATN) - clear understanding of sampling protocols is a priori to determine if results vary significantly and whether or not the data-sets can be integrated.

Accurate field observations of the snowpack are necessary before any assessment for industry or research applications can be undertaken. Having no method to forecast snow conditions, opening date is dependent on agency personnel visiting field sites to verify snow and soil conditions. From a research perspective, understanding and quantifying the role of snow in the hydrologic cycle and energy budgets is crucial for scientific research and modeling efforts. Precipitation in the form of snow is temporarily stored in the snowpack during the cold season with peak discharge for many rivers on the North Slope resulting from snowmelt runoff. The presence or absence of snow substantially affects the surface energy balance and underlying soil conditions (Kane et al., 1978). Increased understanding of the temporal and spatial distribution of snow has multifaceted benefits and applications.

2. GWS SNOW SAMPLING METHODS

GWS snow sampling methods are described in detailed below. Careful site selection, diligent measurement methods, and consistent documentation are important when interpreting snow data from various field campaigns and multiple parties.

2.1 Site Selection

Site selection of sampling locations depends on accessibility and purpose of sampling site. Sampling sites used to ascertain end-of-winter snow accumulation over a particular area of a study domain are typically visited only once in late Spring – when snow accumulation is near it's maximum – and are usually remote and accessible only by helicopter. Sampling sites established with the intent of being visited multiple times during the winter and spring season are located within vehicle or foot accessibility. These sites are often co-located with meteorological stations equipped with a snow depth sensor (SR50 or SR50A) and/or soil temperature sensors so that observed snow depths from snow-course data (having a relative larger areal extent yet lower temporal resolution) can be compared to the hourly point data of the station sensor (having a smaller areal extent yet higher temporal resolution) as well as soil conditions.

A snow-course is a particular location where an established amount of snow depths and snow densities are collected. A snow survey is defined as a field campaign designed to visit multiple snow-courses with the intent to estimate snow conditions over a given study domain. A snow depth transect is where snow depths (quantity dependent on length of transect) are collected along a linear route.

When establishing a snow-course site:

- Select a location away from the influence of any man made formation or structure.
- Select a site that represents the surrounding natural environment in terms of underlying ground surface and overlying snow distribution (Figure 1). Take into consideration vegetation, topography, snow deposition and melt patterns. A location that will be flooded prior to completion of snowmelt should be avoided.

- The directions of measurement are chosen somewhat randomly, but with consideration of snow drift frequency and direction in order to capture natural variability.
- If the sampling site is located near a meteorological station with a snow sensor, conduct measurements near station in a representative environment.
- Note coordinates of the location using a Global Positioning System (GPS) that is WAAS enabled (see GPS settings). Typical coordinate system used is NAD 83.
- When returning to a previously established site, navigate to site using GPS, landmarks detailed in field-books, and knowledge from previous field trips.
- If the site will be visited multiple times over a season it may be desirable to mark (with lathe) the beginning, corner, and ending points to ensure consistency between visits.
- If the site is marked, avoid disturbing the snowpack over multiple visits by systematically moving measurements approximately 1 m (3.3 ft) in one direction from the previous.

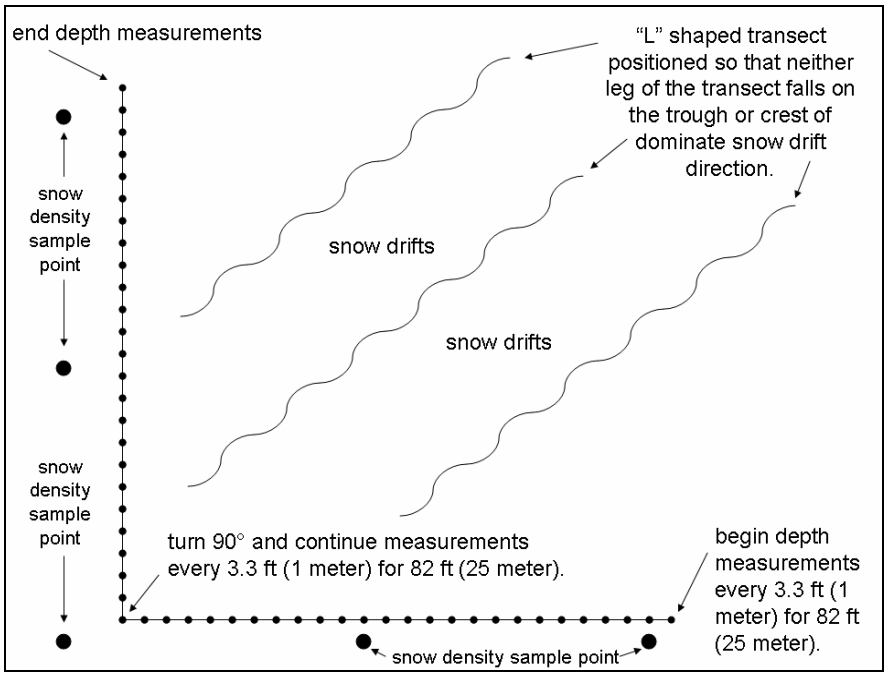

Figure 1. Diagram of an "L" shaped transect along which snow depth measurements and density samples are collected.

2.2 Snow-Course

GWS follows snow sampling procedures established in cooperation with the Water Environmental Research Center (WERC) at the University of Alaska Fairbanks (Derry et al. 2009). A snow-course, which includes collecting snow depth as well as snow density, is a method referred to as "double sampling". With this information, the snowpack density multiplied by the snow depth results in the snow water equivalent (SWE) of that particular column of snow. To calculate average SWE for a snow-course, the average of 50 snow depths are multiplied by the average of 5 snow density samples.

Snow water equivalent, in terms of water depth, is defined as:

$$SWE = d_s * \rho_s / p_w \quad (1),$$

where ρ_s is the average snow density from 5 snow core samples, and d_s is the average of 50 snow depth measurements, and $p_w = 1$ is the density of water.

The heterogeneous Arctic snowpack is more variable in depth than in density (Benson and Sturm, 1993); hence, more depth measurements are required relative to density measurements. Double sampling has been shown to improve SWE estimations, as opposed to solely collecting snow densities, with the optimum sampling ratio of 12-15 snow depths per each density measurement (Rovansek et al. 1993). To standardize sampling efforts, a ratio of 10 depths to one density is used. In total, a snow-course consists of collecting 50 snow depths and 5 densities.

Snow depths are collected at 1 m (3.3 ft) sampling intervals in a 25 m by 25 m (82 ft by 82 ft) "L" shaped transect, resulting in a total of 50 snow depth values. This method usually accounts for snowdrifts and topographic features in the sampling area.

Snow-course instructions:

- Select a direction based on mentioned criteria in previous section, take a depth measurement every meter for 25 meters (Figure 1).
- Turn 90° and take a depth measurement every meter for 25 meters.

- If the snow-course has been conducted previously at this location, orient the "L" pattern in the same direction.
- On a staked snow-course, if the 25th sample is not at the corner stake, go to the corner stake before continuing with the 26th depth measurement.

Typically, depth measurements are done using a T-shaped graduated rod (T-probe) marked in centimeters. The probe is pushed vertically into the snowpack to the snow/ground interface and the depth recorded to the nearest 0.5 centimeter. Occasionally with hard packed snow the probe penetrates the tundra surface, when this happens gently raise and lower the probe until the surface is detected and then record depth (Figure 2).

Snow density is collected with an Adirondack snow sampler preferably marked at centimeter intervals (Figure 3). The tube has an inside area of 35.7 cm² (5.53 in²) and has metallic teeth on the lower end to cut through dense snow layers. The large diameter of the Adirondack, as opposed to the Standard Federal Sampler, collects a larger sample and introduces less error in the shallow Arctic snowpack (Berezovskaya and Kane, 2007; Woo, 1997). Five densities are collected in undisturbed locations equally spaced along the "L" shaped transect. The tube is inserted vertically until the ground surface is encountered and then the snow depth is recorded. Once the snow depth has been recorded, there are two methods of collecting the snow sample which depend on the hardness of ground surface: 1) If the ground surface is not frozen, insert the tube until the ground is detected and note depth on tube, then insert further into ground thereby cutting a soil plug, remove tube and, with a zip-lock plastic bag over the top (non-cutting end), invert tube, thereby emptying the snow into the bag, and remove the soil plug from bag. 2) If the ground surface is frozen, dig down to the tube/ground interface and, slide a flat object (like a flat shovel or hand) under the tube so sintered snow particles cannot escape, empty the snow sample into a zip-lock plastic bag held over the other end of the tube (Figure 4). If possible keep snow samples below freezing until they are weighed. Remove small debris (e.g. vegetation, soil clumps) before weighing. Be sure to tare scale to account for the weight of the zip-lock bag.

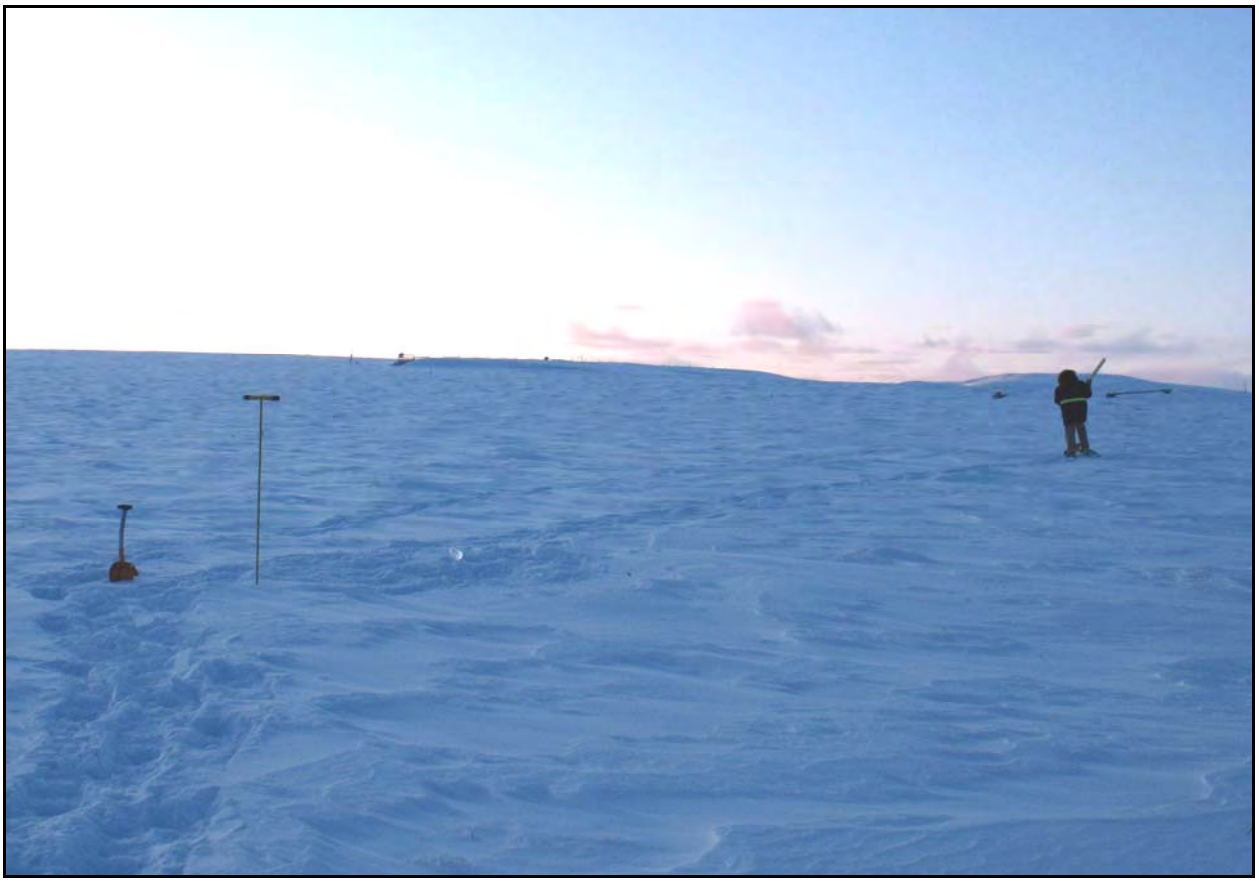

Figure 2. Jeff Derry collecting snow density samples along snow course, T-handle probe for measuring snow depth in foreground, Toolik Lake NRCS index site. Photo by Michael Lilly, November 21, 2009.

Figure 3. Adirondak snow tube inserted to snow/ground interface and snow depth recorded.

Figure 4. Jeff Derry getting ready to invert an Adirondack snow sampler to empty snow sample into plastic zip-lock bag. Site located due south of Toolik Research Camp. Photo by M. Lilly, November 21, 2009.

2.3 Data Documentation

Thorough documentation of observed conditions while in the field is critical for reporting data in an accurate and confident manner.

Procedures for data documentation are as follows:

- Fill in all information (i.e. time, weather conditions, location, personnel), as well as any relevant conditions or observations in field form "F-012" (see Appendix B) while on site.
- Ensure all applicable information is noted particularly vegetation type and amount. Example, "70% tussock tundra, 30% low lying shrubs".
- Photos are helpful. Each image should be labeled according to location and date (year, month, day). The first two digits for year, then two digits for month, and the last two digits for day. As an example, "FrankBluffs_080528.JPG". This naming convention helps to keep images organized over multiple years.

- Include specific notes that will allow future personnel to conduct snow-courses at the same location, with the "L" pattern oriented in the same direction. Besides noting cardinal directions, it is helpful to note landmarks on the horizon for direction. For example, "started just east of L9312 meteorological station, headed towards Alpine pad for 25 depth measurements, turned 90° to left (away from lake) and continued for another 25 measurements".
- Enter all information in excel spreadsheet that evening upon returning to camp, label spreadsheet keeping form label "F012" with the name, such as "Shaviovik_F012_080522.xls".
- After data is entered by person who took observations in field, have a qualified person QA/QC the entries and verify that it is complete and accurate. Both people sign their name and date at bottom of formatted spreadsheet.

3. DNR SNOW SAMPLING METHODS

Snow sampling protocols practiced by DNR personnel are detailed below.

3.1 Site Selection

Snow (and co-located soil temperature monitoring) sampling is carried out at pre-established sites accessible by vehicle throughout the winter season. A total of 20 sites cover an area south near Slope Mountain and north to the coast (Figure 5).

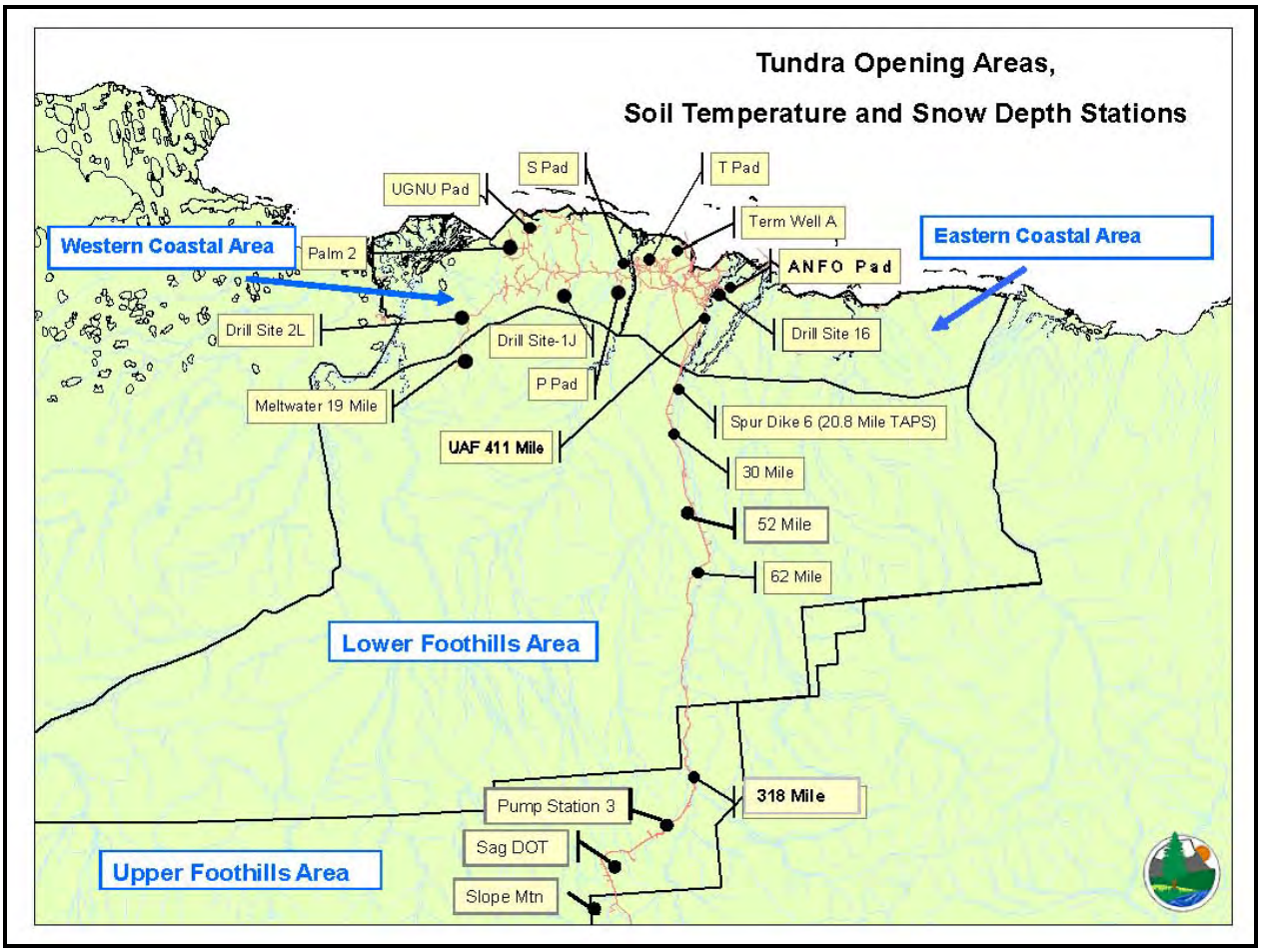

Figure 5. Map of DNR snow sampling and soil temperature sites on the North Slope, Alaska (DNR, 2009).

Sites are visited approximately nine times a season with snow sampling performed at a slightly different location each visit (Figure 6). Note that a station is not visited again once it has met the criteria for tundra opening.

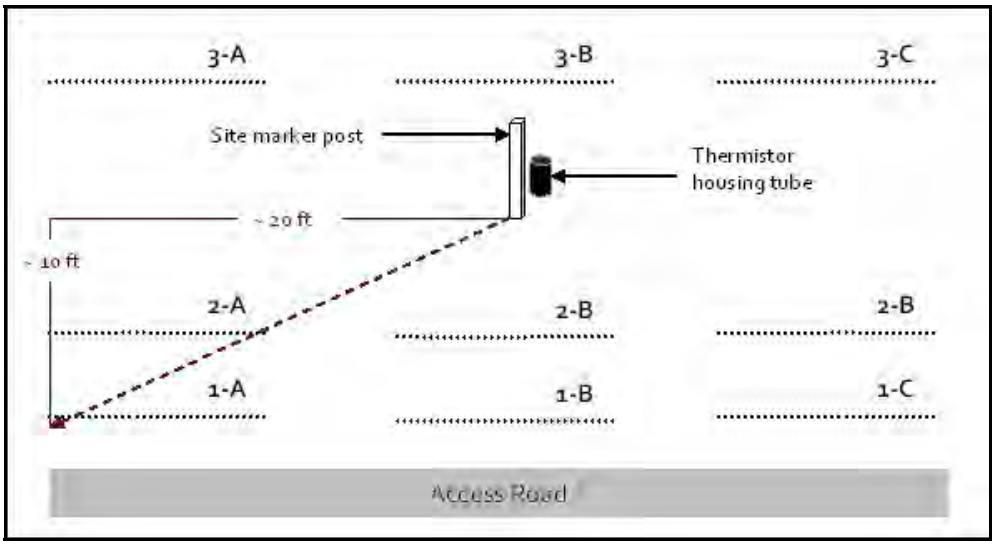

Figure 6. Typical layout of DNR snow and soil sampling site. Up to nine snow depth transects are performed throughout the winter, with the first transect starting at 1-A and final visit being at 3-C (DNR, 2009).

3.2 Snow Depth, Density, and Hardness Measurements

For each site DNR personnel collect snow depth, snow density, and snow hardness data at the appropriate transect location for each visit. Snow depth measurements are along an 11 meter transect. Transects are selected based on an assessment of typical areas that equipment would travel. Areas of large drifts or deep polygon troughs are avoided. Depths are measured every 0.5 meter (1.5 ft) totaling 20 depth values per transect. Two snow densities are collected near transect with a Federal Snow Sampler. The Sampler is pushed through the snowpack to the tundra surface and the depth is recorded to the nearest inch. The protocol includes cutting into the tundra surface, thereby collecting a tundra plug if possible, to ensure the entire snow column is collected. If the tundra is too hard then a trowel/shovel or hand is placed under the sampler to prevent snow from falling out while transferring sample into a plastic bag placed in a bucket. It is later weighed upon returning to the field office so that density can be calculated.

Snow hardness is estimated in the DNR procedures. This is accomplished by digging two snow pits (one to two meters in length) near the snow depth transect. For each pit, a column of snow is analyzed and the following items recorded:

- Total snow depth to the nearest inch from a column of snow selected in the snow pit.
- Loose surface snow presence, strength, and thickness to the nearest inch.
- Slab presence, strength, and thickness to the nearest inch. If there is more than one slab, record the combined total of slab thickness.
- Depth hoar presence, strength, and thickness to the nearest inch.
- Does the slab cap the tussocks (in tussock tundra only).

Layer strength is estimated using the following table (**Table 1**). The index applies when firm, steady pressure breaks through the slab being tested.

Table 1. Snow slab penetration method and number allocation for each (DNR, 2009).

None	Fist	3 Fingers	1 Finger	Pencil	Knife
0	1	2	3	4	5

3.3 Data Documentation

Data collected at DNR sampling locations are recorded in formatted spreadsheets. The spreadsheet includes multiple tabs, one for each of the 9 visits throughout the season. Each tab contains data collected from each field location as well as formatted cells to compute density, SWE, and mean snow depth.

3.4 DNR Sampling Methods Prior to 2009/10

Previous year's snow data collection methods varied from current methods detailed above. Prior to 2005, DNR sampled 25 monitoring stations. Variables sampled included snow depth and ground hardness (using a slide hammer penetrometer) to 30.48 cm (1 ft) depth. In 2005, DNR stopped measuring ground hardness and installed thermistors to measure soil temperature. At this time the number of sites was reduced to that currently monitored. From 2005 until 2008, 10 snow depth measurements were taken along a 10 meter (32.8 ft) transect spaced at 1 meter (3.3

ft) intervals. Density measurements were not collected until the winter of 2008/2009, when DNR began using the method currently in use.

4. METHOD COMPARISON

In an effort to increase understanding related to the applicability of different snow collection methods practiced by GWS and DNR, many GWS sampling sites for the ATN project are co-located with DNR sampling sites. Data from these co-located sites will be analyzed and compared throughout the season. The objective is to determine if the results vary significantly between the two methods described herein, and whether the data collected by using the these two different methods can be integrated, thus allowing for increased temporal and spatial coverage across the North Slope.

5. SUMMARY

Understanding the timing and amount of snow accumulation and its ablation is essential for industry, agencies, and scientific investigations. Certain snow conditions are required before industry can begin tundra travel operations, which is crucial for exploration and logistics. The snowpack is a major factor of the surface energy balance, soil and vegetation processes, and most streams experience peak discharge as a result of the snowmelt in spring. The objective of this document is to report the snow sampling protocol as practiced by GWS and DNR. Documented sampling methods will seek to improve understanding of procedures to be carried out in the field and applicability of integration of data from multiple entities.

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APPENDIX A. GWS Snow-Course Standard Operating Procedure

The following page is condensed snow-course standard operating procedures and is intended to be printed and inserted into field notebook.

SNOW-COURSE STANDARD OPERATING PROCEDURES

GW Watershed Scientific

OBJECTIVE: To collect snow depth and density measurements that best represent the surrounding area, in terms of topography and spatial extent.

METHODS:

Site Selection

- For established, yet unmarked, snow-course sites, navigate to the point using a combination of knowledge from previous field trips, landmarks detailed in fieldbooks and utilization of coordinates using a Global Positioning System (GPS). Ensure GPS is WAAS enabled. The typical coordinate system is NAD 83.
- If there is *not* an established, marked, snow-course site, then select a representative location for the area. Attempt to capture natural snow variability, taking into consideration vegetation, topography, deposition patterns, and melt patterns. A location that will be flooded prior to completion of snowmelt should be avoided. When documenting site location, explicitly state the coordinate system used. Record accuracy (error) if GPS reports it.
- If there is a meteorological station with a snow sensor, conduct snow-course near sensor and in a representative environment.

Conducting Snow-course

Snow depth

- Snow depths are conducted in an "L" shaped pattern. Pick a direction (note on snow form), take depth measurements, then turn 90 degrees and continue (noting direction on form). If this snow-course has been conducted previously, orient the "L" pattern in the same direction as previously noted.
- Snow depth measurements are taken every meter for twenty-five meters, turning 90 degrees, and continuing for another twenty-five meters – for a total of 50 depth measurements. On a staked snow-course, if the 25th sample is not at the corner stake, return to the corner stake before continuing with the 26th sample.
- Record depths to the half centimeter.

Density

- Snow densities are collected with an Adirondack snow sampler, preferably with centimeter depth markings. Five densities should be collected from undisturbed points along representative locations near, but not on the "L" shaped transect. Minimize disturbance to the "L" shaped transect so that future measurements will be of a minimally disturbed snowpack.
- When taking densities, make sure that snow does not fall out of the tube and that all sintered snow is collected near bottom of snowpack.
- There are two ways to collect snow in a sample bag: 1) Insert tube until it sits on ground surface, note depth on outside of tube, push tube further into the ground cutting a soil plug, remove tube and, with a ziplock bag over the top (or none cutting end), invert tube emptying snow into bag, remove soil plug from bag. 2) If ground surface is frozen, do as in previous instructions but instead of collecting a soil plug, dig down to tube/soil interface and while holding snow in place with a hand, empty snow into bag that is placed on opposite end of tube.
- Put snow in plastic bag and weigh whenever convenient, tare the bag weight, record weight in grams. Densities are averaged to ascertain a representative density.

Field Forms

- Fill in all required information in the most current formatted field form (UAF-WERC F012), i.e. time, weather conditions, location, personnel.
- Fill in all information while on site.
- Ensure information is noted as to vegetation type and amount. Example, "70% tussock tundra, 30% low lying shrubs".
- Photos are helpful. Each image should be labeled according to location and date (year, month, day). As an example, "FrankBluffs_070528.JPG".
- Any and all conditions or observations please note on form.
- Include specific notes that will allow future personnel to conduct snow-courses at the same location, with an "L" pattern oriented in the same direction. Besides noting cardinal directions, it is helpful to note landmarks on the horizon for direction.

APPENDIX B. Example GWS Snow-Course Data Entry Spreadsheet and Filled in Spreadsheet for Illustrative Purposes.

A formatted excel spreadsheet like the one shown below can be downloaded from the Arctic Transportation Networks Project website. Following the blank spreadsheet is a real, completed spreadsheet for illustrative purposes. An example spreadsheet can also be requested from the main author of this report by contacting Jeff Derry at jderry@gwscientific.com.

Arctic Transportation Networks Project
Form F-012: Snow Survey Form

Project ID: **ATN Project** Site Location/Lake ID: _____
Survey Purpose: **Determine Snow Depth and SWE** Date: _____ Time: _____

Location Description:					
Survey objective:				Weather Observations:	
Latitude:		Longitude:		Datum:	
Elevation:		Elevation Datum:		Reference Markers:	
Drainage Basin:		Slope Direction:		Vegetation Type:	
Slope Angle:		Access Notes:		Other:	
Snow Depth Probe Type:				Snow-Survey Team Names:	
Snow Tube Type:					

Snow Course Depths (cm)

	1	2	3	4	5
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

(cm)
Average snow depth = _____
Maximum snow depth = _____
Minimum snow depth = _____
Standard variation = _____

(inches)
Average snow depth = _____
Maximum snow depth = _____
Minimum snow depth = _____
Standard variation = _____

Snow Sample Depths and Weights

Bag #	Snow Depth (cm)	Weight (g)	Volume (cm^3)	Density (g/cm^3)	Organic Plug (cm)

Average Density =
Average Snow Water Equivalent (SWE) = _____ cm H2O
Average Snow Water Equivalent = _____ inches H2O
Average Snow Water Equivalent = _____ feet H2O

SWE = avg. snow depth*(density snow/density water)

Data entered by: Date:
Data QA/QC by: Date:

The Excel entry spreadsheet is formatted to calculate summary statistics. An actual snow-course form from an ATN project field campaign is shown below. A few items to consider:

- Cells highlighted in light green require information be entry from field person(s) collecting the data. For some sites, much of this information – site name, survey objective, coordinates, elevation, drainage basin, vegetation type – can be supplied to field crew by ATN personnel and this information can be used for all subsequent sampling for a given location.
- Cells highlighted in peach color are information automatically calculated in the spreadsheet from the information supplied in the light green cells.
- "Slope Direction and Slope Angle" is intended to communicate if sampling was done on a hill, and if so then the angle and direction of the slope estimated by field crew. For sampling in the Coastal Region this will almost always be "Flat".
- "Weather Observations" is the general conditions while sampling, including actual temperature and wind values is not required.
- "Snow-Survey Team Names" is needed in case questions or clarification is required for processing and analyzing the information.
- "Data Entered By and Data QA/QC" cells denotes the person who entered the data in the spreadsheet and who double checked the entries and verified they are correct based on what was recorded in the field book.
- "Reference Markers" refers to if the sampling is done at a marked location.
- "Other" is a good location to note anything that may be of interest or informative, such as condition of snowpack, "snow extremely hard packed", for example.

Arctic Transportation Networks Project
Form F-012: Snow Survey Form

Project ID:	**ATN**	Site Location/Lake ID:	**L9312 - Tundra**
Survey Purpose:	**Determine snow depth/SWE**	Date: 11/19/2009	Time: 9:00

Location Description:	On tundra on staked course, adjacent and north of L9312 weather station.				
Survey objective:	Determine snow depth and density for application to lake recharge studies, and tundra travel management.			Weather Observations:	Dark, cold
Latitude:	N 70° 19.995'	Longitude:	W 150° 56.918'	Datum:	NAD 83
Elevation:	7 ft	Elevation Datum:	BPMSL	Reference Markers:	Orange stakes
Drainage Basin:	Colville River	Slope Direction:	Flat	Vegetation Type:	Lowland Wet Sedge Tundra
Slope Angle:	Flat	Access Notes:	snowmobile	Other:	Snow pack was fairly uniform, some slabbing
Snow Depth Probe Type:		T-probe		Snow-Survey Team Names:	
Snow Tube Type:	Adirondack Snow Tube			Jeff Derry, Jack (LCMF)	

Snow Course Depths (cm)

	1	2	3	4	5
1	16.0	10.0	21.0	19.0	21.0
2	22.0	9.0	18.0	18.0	35.0
3	26.0	9.0	19.0	14.0	58.0
4	21.0	15.0	17.0	14.0	56.0
5	47.0	18.0	10.0	10.0	51.0
6	22.0	20.0	19.0	21.0	45.0
7	14.0	29.0	11.0	17.0	47.0
8	15.0	27.0	11.0	11.0	38.0
9	13.0	24.0	29.0	13.0	34.0
10	12.0	17.0	21.0	17.0	32.0

	(cm)
Average snow depth =	**22.7**
Maximum snow depth =	58.0
Minimum snow depth =	9.0
Standard variation =	12.6

	(inches)
Average snow depth =	**8.9**
Maximum snow depth =	22.8
Minimum snow depth =	3.5
Standard variation =	5.0

Snow Sample Depths and Weights

Bag #	Snow Depth (cm)	Weight (g)	Volume (cm^3)	Density (g/cm^3)	Organic Plug (cm)
D5	18	197.3	642.6	0.31	
D1	16	110.8	571.2	0.19	
D2	14	93.4	499.8	0.19	
D3	22	205.1	785.4	0.26	
D4	55	671.9	1963.5	0.34	

Average Density =	**0.258**	
Average Snow Water Equivalent (SWE) =	**5.9**	cm H2O
Average Snow Water Equivalent =	**2.30**	inches H2O
Average Snow Water Equivalent =	**0.19**	feet H2O

SWE = avg. snow depth*(density snow/density water)

Data entered by: Jeff Derry	Date: 11/19/09
Data QA/QC by: Michael Lilly	Date: 11/19/09

APPENDIX C. Snow Depth Measurement Standard Operating Procedure

Below is a snow depth measurement procedure and is intended to be printed and inserted into field notebook.

SNOW DEPTH COLLECTION PROCEDURE

GW Watershed Scientific

OBJECTIVE: To collect snow depth measurements that best represent the surrounding area, in terms of topography and spatial extent.

METHODS:

Site Selection

- For established, yet unmarked, sites, navigate to the point using a combination of knowledge from previous field trips, landmarks detailed in fieldbooks and utilization of coordinates using a Global Positioning System (GPS). Ensure GPS is WAAS enabled. The typical coordinate system is NAD 83.
- If there is *not* an established and marked site, then select a representative location for the area. Attempt to capture natural snow variability, taking into consideration vegetation, topography, deposition patterns, and melt patterns. When documenting site location, explicitly state the coordinate system used. Record accuracy (error) if GPS reports it.
- If there is a meteorological station with a snow sensor, conduct snow measurements near sensor and in a representative environment.

Snow Depth Measurements

- Snow depths are conducted in an "L" shaped pattern. Pick a direction (note on snow form), take depth measurements, then turn 90 degrees and continue (noting direction on form). Orient the "L" pattern in the same direction as done in previous visits.
- Snow depth measurements are taken every meter for twenty-five meters, turning 90 degrees, and continuing for another twenty-five meters – for a total of 50 depth measurements. On a staked snow-course, if the 25^{th} sample is not at the corner stake, return to the corner stake before continuing with the 26^{th} sample.
- Record depths to the half centimeter.

Field Forms

- Fill in all required information in the most current formatted field form (APPENDIX D), i.e. time, weather conditions, location, personnel.
- Fill in all information while on site.
- Ensure information is noted as to vegetation type and amount. Example, "70% tussock tundra, 30% low lying shrubs".
- Copy and paste two photos of the overall sampling area in the field form. If photos are sent separately in an e-mail, each image should be labeled according to location and date (year, month, day). As an example, "FrankBluffs_070528.JPG".
- Any and all conditions or observations please note on form.
- Include specific notes that will allow future personnel to conduct snow depth measurements at the same location, with an "L" pattern oriented in the same direction. Besides noting cardinal directions, it is helpful to note landmarks on the horizon for direction.

APPENDIX D. Example Snow Depth Data Entry Spreadsheet and Filled in Spreadsheet for Illustrative Purposes.

A blank formatted excel spreadsheet like the one shown below can be downloaded from the Arctic Transportation Networks Project website. Following the blank spreadsheet is a real, completed spreadsheet for illustrative purposes. An example spreadsheet can also be requested from the main author of this report by contacting Jeff Derry at jderry@gwscientific.com.

Arctic Transportation Networks Project
Snow Depth Form

Project ID: _____ Site Location/Lake ID: _____
Survey Purpose: **Determine Snow Depth** Date: _____ Time: _____

Location Description:					
Survey objective:				Weather Observations:	
Latitude:		Longitude:		Datum:	
Elevation:		Elevation Datum:		Reference Markers:	
Drainage Basin:		Slope Direction:		Vegetation Type:	
Slope Angle:		Access Notes:		Other:	
Snow Depth Probe Type:					
Snow Measurement Team Names:					

Snow Course Depths (cm)

	1	*2*	*3*	*4*	*5*
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

(cm)
Average snow depth = _____
Maximum snow depth = _____
Minimum snow depth = _____
Standard variation = _____

(inches)
Average snow depth = _____
Maximum snow depth = _____
Minimum snow depth = _____
Standard variation = _____

Photographs of Sampling Area

Data entered by: Date:
Data QA/QC by: Date:

The Excel entry spreadsheet is formatted to calculate summary statistics. An actual snow-course form from an ATN project field campaign is shown below. A few items to consider:

- Cells highlighted in light green require information be entry from field person(s) collecting the data. For some sites, much of this information – site name, survey objective, coordinates, elevation, drainage basin, vegetation type – can be supplied to field crew by ATN personnel and this information can be used for all subsequent sampling for a given location.
- Cells highlighted in peach color are information automatically calculated in the spreadsheet from the information supplied in the light green cells.
- "Slope Direction and Slope Angle" is intended to communicate if sampling was done on a hill, and if so then the angle and direction of the slope estimated by field crew. For sampling in the Coastal Region this will almost always be "Flat".
- "Weather Observations" is the general conditions while sampling, including actual temperature and wind values is not required.
- "Snow-Survey Team Names" is needed in case questions or clarification is required for processing and analyzing the information.
- "Data Entered By and Data QA/QC" cells denotes the person who entered the data in the spreadsheet and who double checked the entries and verified they are correct based on what was recorded in the field book.
- "Reference Markers" refers to if the sampling is done at a marked location.
- "Other" is a good location to note anything that may be of interest or informative, such as condition of snowpack, "snow extremely hard packed", for example.
- Insert two photographs of general sampling environment (e.g. general landscape, footprints showing sampling directions, drifting, weather conditions, etc) .

Arctic Transportation Networks Project

Form F-012: Snow Survey Form

Project ID:	**ATN**	Site Location/Lake ID:	**L9312 - Tundra**
Survey Purpose:	**Determine snow depth/SWE**	Date: 11/19/2009	Time: 9:00

Location Description:	On tundra on staked course, adjacent and north of L9312 weather station.				
Survey objective:	Determine snow depth and density for application to lake recharge studies, and tundra travel management.			Weather Observations:	Dark, cold
Latitude:	N 70° 19.995'	Longitude:	W 150° 56.918'	Datum:	NAD 83
Elevation:	7 ft	Elevation Datum:	BPMSL	Reference Markers:	Orange stakes
Drainage Basin:	Colville River	Slope Direction:	Flat	Vegetation Type:	Lowland Wet Sedge Tundra
Slope Angle:	Flat	Access Notes:	snowmobile	Other:	Snow pack was fairly uniform, some slabbing
Snow Depth Probe Type:		T-probe		Snow-Survey Team Names:	
Snow Tube Type:	Adirondack Snow Tube			Jeff Derry, Jack (LCMF)	

Snow Course Depths (cm)

	1	2	3	4	5
1	16.0	10.0	21.0	19.0	21.0
2	22.0	9.0	18.0	18.0	35.0
3	26.0	9.0	19.0	14.0	58.0
4	21.0	15.0	17.0	14.0	56.0
5	47.0	18.0	10.0	10.0	51.0
6	22.0	20.0	19.0	21.0	45.0
7	14.0	29.0	11.0	17.0	47.0
8	15.0	27.0	11.0	11.0	38.0
9	13.0	24.0	29.0	13.0	34.0
10	12.0	17.0	21.0	17.0	32.0

(cm)	
Average snow depth =	**22.7**
Maximum snow depth =	58.0
Minimum snow depth =	9.0
Standard variation =	12.6

(inches)	
Average snow depth =	**8.9**
Maximum snow depth =	22.8
Minimum snow depth =	3.5
Standard variation =	5.0

Photographs of Sampling Area

Data entered by: Jeff Derry Date: 11/19/09

Data QA/QC by: Michael Lilly Date: 11/19/09

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Snow Measurement course

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:24 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Geisler, Eric** <egeisler@blm.gov>
Date: Thu, Sep 27, 2018 at 8:52 AM
Subject: Snow Measurement course
To: Shelly Jacobson <njones@blm.gov>, Sarah LaMarr <slamarr@blm.gov>, Nolan Heath <nheath@blm.gov>

I met with Dr. Matthew Sturm, Charlie Rapp (grad student) and Paul Leonard (USFWS) at UAF yesterday and talked about the the agenda for the upcoming Snow workshop at Pike's Landing on Oct 9 & 10 (8;00 - 5:30 daily).

He suggested we should send a couple of people to the snow measurement course this winter January 6 to 11 (info attached). One of the people he suggested sending was Eric Yeager since he has done a lot of work with Frank Urban on the north slope already. I am willing and interested in going as well.

Eric Geisler, CF
Program Lead for Forestry, Soils, Invasive Species, Range, Botany, ES&R
BLM Alaska State Office
222 W 7th Ave #13
Anchorage, AK 99513
W 907-271-1985
C 509-220-4712

2 attachments

Snow Measurement Field School - Field School Summary _ Online Registration by Cvent.html
69K

Snow Measurement Course CUAHSI.pdf
384K

Snow Measurement Field School Schedule

Day 1 – Sunday, January 6

1530 1st Shuttle Departs
2030 2nd Shuttle Departs

Day 2 – Monday, January 7: Snow Grains, Layers, and Layer Properties

0800 – 0900 Lab
- Participant Introductions, safety, logistics, course overview
- Introduction to CUAHSI

0900 – 1000 Lab
- Introduction to snow pit tools & use
- Shovel, whisks, density cutters, microscopes, crystal cards; SSA, NIR)
- Hand out cards & International Class. Snow

1000 – 1230 Field
- Six groups – students rotate about every 15 min
- Exploratory snow pits in different environments
- Practice using tools without recording any data
- Examine/feel snow stratigraphy; try photography
- Grain ID and quantification; recording with digital cameras IRIS etc.

1230 – 1315 Lunch

1315 – 1630 Field
- Full snow pits with complete data collection and recording
- (each group to dig & measure 2 pits)
- Include all data, all parameters, and photos

1630 – 1700 Lab
- Snow grains and metamorphism (Int. Class. Snow on Ground)

1700 – 1800 Lab
- Snow pit data reduction and analyses in groups

1800 – 1900 Dinner

1900 – 2000 Lab
- Finish data reduction; group presentations

Day 3 – Tuesday, January 8: Depth and SWE Measurements

0800 – 0900 Lab –
- Introduction to snow depth & SWE coring tools
- Manual probes: assembly, care, dos and don'ts
- Magnaprobes: assembly, care, dos and don'ts
- Coring samplers (Federal and Snow-Hydro)
- Dry run using tools in lab

0900 – 0930 Lab –
- Introduction to Snow Sampling Design

0945 – 1200 Field –
- Snow depth & SWE trials—learning to handle the tools
- 6 groups & stations: Manual probes, Magnaprobe, core samplers
- Probing and sampling - digging out probes to see what tip is doing
  - Short transect practice
  - Problems and solutions
  - Ground cover and condition – frozen, organic layer, vegetation
  - Stratigraphic and basal ice lens and crusts
  - Over- and under-measurement

1200 – 1315 Lunch

1330 – 1630 Field Probe-A-Thon: Working in groups, measure snow depth and SWE courses
Data sheets
- Depth probes
- Magna probe
- Federal sampler

1630 – 1730 Lab – Dump Magnaprobe data
Enter manual probe and Federal sampler data into Excel; compute
Compare data with previous day pit densities; discussion

1800 – 1930 Dinner

1930 – 2030 Finish data reduction; group presentations

Day 4 – Wednesday, January 9: Snow Pit & Probe/Core Measurements in Campaigns

0800 – 0930 Lab
Designing a snow survey and field program including logistics and safety
Lessons from real field campaigns

0930 – 1000 Lab
Assign six groups snow research objective, groups design mini-field campaigns for environs near Fraser

1000 – 1200 Field
Students begin research campaigns

1200 - 1300 Lunch

1300 – 1430 Continue student team field campaigns

1430 – 1730 Data reduction and create group reports of campaigns

1800 – 1900 Dinner

1900 – 2100 Class Evaluations
Outstanding questions and/or comments
CUAHSI course evaluation
Certificate Awards
Introduction to iSWGR

Day 4 – Thursday, January 10: TBD

Day 5 - Friday, January 11

0800* 1st Shuttle Departs

1200* 2nd Shuttle Departs

*Times may change depending on weather.

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Arctic Refuge Seismic Comments

1 message

Bridget Psarianos <bpsarianos@trustees.org> Mon, Oct 15, 2018 at 1:43 PM
To: "blm_ak_coastal_plain_seismic_ea@blm.gov" <blm_ak_coastal_plain_seismic_ea@blm.gov>, "Nichelle (Shelly) Jones (njones@blm.gov)" <njones@blm.gov>
Cc: Brook Brisson <bbrisson@trustees.org>, "Rice, Stephanie" <srice@blm.gov>

Hello Shelly,

Please find attached a follow-up letter signed by several organizations raising concerns related to BLM's processing of SAE's seismic application. We've also attached a list of studies and documents that we encourage BLM to consider in its evaluation of the potential impacts of seismic exploration on the Coastal Plain. An thumb drive containing the full text of these documents will be hand-delivered to the BLM Alaska State Office for your records this afternoon. While we understand that we are not currently in a public comment period for SAE's proposal, we look forward to making additional comments on a draft environmental analysis if such an opportunity is provided.

Thank you,

Bridget

Bridget Psarianos

Staff Attorney

Trustees for Alaska

1026 W. 4th Ave., Ste. 201

Anchorage, AK 99501

(907) 433-2011

(907) 276-7110 fax

bpsarianos@trustees.org

TRUSTEES FOR ALASKA
PROTECT | DEFEND | REPRESENT

2 attachments

2018 10 15 BLM Seismic Follow-Up Letter FINAL.pdf
547K

2018 10 15 Seismic Study Index FINAL.pdf
76K

ALASKA WILDERNESS LEAGUE, CENTER FOR BIOLOGICAL DIVERSITY, DEFENDERS OF WILDLIFE, EARTHJUSTICE, FRIENDS OF ALASKA NATIONAL WILDLIFE REFUGES, GWICH'IN STEERING COMMITTEE, NATIONAL AUDUBON SOCIETY, NATIONAL WILDLIFE REFUGE ASSOCIATION, NATURAL RESOURCES DEFENSE COUNCIL, NORTHERN ALASKA ENVIRONMENTAL CENTER, SIERRA CLUB, THE WILDERNESS SOCIETY, TRUSTEES FOR ALASKA

October 15, 2018

Submitted via email & hand delivery

Shelly Jones
Acting District Manger
Arctic Field Office
Bureau of Land Management
222 University Ave.
Fairbanks, AK 99709
blm_ak_coastal_plain_seismic_ea@blm.gov

Re: SAExploration's Proposal to Conduct Seismic Exploration on the Coastal Plain of the Arctic Refuge (File No. FF097424)

Dear Ms. Jones:

On behalf of the above-listed organizations, we are writing to express our deep concerns with how the Bureau of Land Management ("BLM") is proceeding with SAExploration, Inc.'s ("SAE") proposal to conduct seismic exploration on the Coastal Plain of the Arctic National Wildlife Refuge. The rushed and non-transparent process BLM has followed in its evaluation of SAE's proposal is unacceptable.

BLM has continued to move forward with processing SAE's application without any apparent legal authority,[1] without preparing a full Environmental Impact Statement ("EIS") as required by the National Environmental Policy Act ("NEPA"), and without any clarity on opportunities for public engagement. BLM has made multiple, conflicting statements to date about whether it will allow the public to weigh in on the draft Environmental Assessment ("EA").[2] Our organizations have repeatedly reached out to BLM, but BLM staff have either not returned calls or have been

[1] BLM has still not publicly identified any source of authority for permitting pre-leasing seismic exploration anywhere in the Coastal Plain, nor is any such authority apparent.

[2] *See, e.g.*, Dermot Cole, *In a Rush to Launch Arctic Refuge Drilling, Trump Officials Are Ignoring Concerns About Seismic Testing*, ARCTIC TODAY, Aug. 27, 2018; Margaret Kriz Hobson, *Greens Decry BLM's Speed in ANWR Seismic Testing*, E&E NEWS, Aug. 24, 2018; Dino Grandoni, *The Energy 202: Trump Administration Moves Forward with Arctic Oil Plan Wildlife Officials Deem 'Not Adequate,'* WASHINGTON POST, Aug. 21, 2018; Shady Grove Oliver, *ANWR May See Seismic Surveys Ahead of Lease Sale*, THE ARCTIC SOUNDER, Aug. 5, 2018; Henry Fountain, *See the Scars That Oil Exploration Cut Across Alaska's Wilderness*, N.Y. TIMES, Aug. 3, 2018; Liz Ruskin, *BLM Projects 'Insignificant' Impact from Seismic Work in ANWR*, ALASKA PUBLIC MEDIA, July 27, 2018.

unable to confirm BLM's anticipated plans. One of the fundamental purposes of NEPA is to encourage meaningful involvement and input by the public. BLM's lack of clarity has made this nearly impossible. This is particularly egregious given the importance of the Coastal Plain to the Gwich'in People, and BLM's obligation to engage them in decisions that will affect their subsistence and cultural practices. It is critical that BLM provide an opportunity for the public to review any NEPA analysis prior to BLM making a decision.

The studies and documents we are attaching here show unequivocally that seismic exploration of the Coastal Plain demands careful, unrushed consideration, including a substantial public comment period. These documents indicate seismic activities are likely to have serious, long-term impacts to a wide range of resources on the Coastal Plain, including sensitive tundra and other vegetation, permafrost, water resources, threatened polar bears, caribou, fish, birds, subsistence and cultural resources, and more. Additionally, SAE itself is in a precarious financial position, impacting its ability to prevent or remediate resource damage that would occur as a result of its planned activities.[3] BLM must take all of this into account in making its decision regarding SAE's application. The 200+ studies and documents we are attaching here show unequivocally that seismic exploration of the Coastal Plain demands careful, unrushed consideration, including a substantial public comment period. There can be no legitimate question that the potential impacts from this seismic proposal are significant and should be considered in an EIS.

Consideration of these and related studies, and the input from a proper public comment period will, we are confident, support our staunch opposition to any oil and gas activities, including seismic exploration, on the Coastal Plain of the Arctic National Wildlife Refuge. The Arctic Refuge is the crown jewel of the National Wildlife Refuge System and the Coastal Plain is the biological heart of the Refuge. These unparalleled public lands, and the people and wildlife that depend on them, are an international treasure that must be protected for future generations. The Arctic Refuge deserves far more than a reckless and rushed decision making process.

Thank you for your consideration, and we look forward to participating in the formal comment period.

Sincerely,

Adam Kolton, Executive Director
Alaska Wilderness League

Miyoko Sakashita, Senior Counsel
Center for Biological Diversity

Mark Salvo, Vice President, Landscape Conservation
Defenders of Wildlife

[3] Press Release, SAExploration, SAExploration Announces Second Quarter 2018 Unaudited Consolidated Financial Results (Aug. 8, 2018), *available at* http://investors.saexploration.com/node/10416/pdf.

Erik Grafe, Attorney
Earthjustice

David Raskin, President
Friends of Alaska National Wildlife Refuges

Bernadette Demientieff, Executive Director
Gwich'in Steering Committee

Sarah Greenberger, Senior Vice President, Conservation Policy
National Audubon Society

Geoffrey Haskett, President
National Wildlife Refuge Association

Garett Rose, Staff Attorney
Natural Resources Defense Council

Lisa Baraff, Program Director
Northern Alaska Environmental Center

Karimah Schoenhut, Staff Attorney
Sierra Club

Benjamin Gruel, Arctic Refuge Campaign Director
The Wilderness Society

Victoria Clark, Executive Director
Trustees for Alaska

DOCUMENTS CITED IN ALASKA WILDERNESS LEAGUE ET AL.'S OCTOBER 15, 2018 LETTER RE: SAEXPLORATION'S PROPOSAL TO CONDUCT SEISMIC EXPLORATION ON THE COASTAL PLAIN OF THE ARCTIC REFUGE

Dermot Cole, *In a Rush to Launch Arctic Refuge Drilling, Trump Officials Are Ignoring Concerns About Seismic Testing*, ARCTIC TODAY, Aug. 27, 2018

Henry Fountain, *See the Scars That Oil Exploration Cut Across Alaska's Wilderness*, N.Y. TIMES, Aug. 3, 2018

Dino Grandoni, *The Energy 202: Trump Administration Moves Forward with Arctic Oil Plan Wildlife Officials Deem 'Not Adequate*,*'* WASHINGTON POST, Aug. 21, 2018

Margaret Kriz Hobson, *Greens Decry BLM's Speed in ANWR Seismic Testing*, E&E NEWS, Aug. 24, 2018

Shady Grove Oliver, *ANWR May See Seismic Surveys Ahead of Lease Sale*, THE ARCTIC SOUNDER, Aug. 5, 2018

Liz Ruskin, *BLM Projects 'Insignificant' Impact from Seismic Work in ANWR*, ALASKA PUBLIC MEDIA, July 27, 2018

Press Release, SAExploration, SAExploration Announces Second Quarter 2018 Unaudited Consolidated Financial Results (Aug. 8, 2018)

INDEX OF ADDITIONAL STUDIES AND DOCUMENTS

J. Aars, et al., *Polar Bear Mgmt. & Res. in Nor. 2001–2005, in Polar Bears: Proceedings of the 14th Working Meeting of the IUCN/SSC Polar Bear Specialist Group*, 145–53 (2006)

Alaska Dep't of Fish & Game, Species Mgmt. Rep.: Caribou Mgmt. Rep. (GMU 25A, 25B, 25D & 26C), 15-1–24 (2015)

Alaska Dep't of Fish & Game, Species Mgmt. Rep.: Caribou Mgmt. Rep. (GMU 26B & 26C), 18-1–38 (2015)

Steven C. Amstrup, et al., *Detecting Denning Polar Bears with Forward-Looking Infrared (FLIR) Imagery*, 54(4) BIOSCIENCE, 337–44 (2004)

Steven C. Amstrup, *Disturbances of Denning Polar Bears in Alaska*, 46(3) ARCTIC, 246–50 (1993)

Steven C. Amstrup, Movements, Distribution, & Population Dynamics of Polar Bears in the Beaufort Sea (May 1995) (unpublished Ph.D. thesis, Univ. of Alaska, Fairbanks)

Steven C. Amstrup, et al., *Past & Present Status of Polar Bears in Alaska*, WILDLIFE SOC'Y BULL., 241–54 (1986)

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Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Heads Up - Friday May 4

1 message

Whitman, Matt <mwhitman@blm.gov> Mon, Oct 15, 2018 at 7:14 AM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

---------- Forwarded message ---------
From: **Wixon, Donna** <dwixon@blm.gov>
Date: Fri, Apr 27, 2018 at 2:43 PM
Subject: Heads Up - Friday May 4
To: Debbie <dnigro@blm.gov>, Joseph Keeney <jkeeney@blm.gov>, kdebenham <kdebenham@blm.gov>, Lonnie Bryant <lbryant@blm.gov>, Matthew Whitman <mwhitman@blm.gov>, me <dwixon@blm.gov>, Richard Kemnitz <rkemnitz@blm.gov>, roy nageak <rnageak@blm.gov>, Sarah LaMarr <slamarr@blm.gov>, Shelly Jacobson <njones@blm.gov>, Stacey <sfritz@blm.gov>, Terra Meares <tmeares@blm.gov>, Timothy Vosburgh <tvosburgh@blm.gov>

The State Office received a seismic application for the 1002 area. Ted wants a NEPA kickoff meeting to happen next Friday May 4. Our office will be the BLM lead for the project. We have the Arctic and Steese Conference Room for the meeting. The meeting will be from 10 to 1. The people at the meeting will be all of our staff, USFWS staff, Rob, Serena, and Ted.

The application they received was marked as confidential and we are waiting for them to send one that we can use.

I will let you know when we have more information but wanted to let everyone know.

Donna

Donna L Wixon
Natural Resource Specialist
BLM Arctic District Office
222 University Ave
Fairbanks, Alaska 99709
907-474-2301 Office
907-474-2386 Fax
dwixon@blm.gov

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Air/Noise specialist

1 message

Heath, Nolan <nheath@blm.gov> Mon, Oct 15, 2018 at 8:14 AM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Niglio, Louis** <louis.niglio@boem.gov>
Date: Thu, May 24, 2018 at 12:06 PM
Subject: Re: Air/Noise specialist
To: Heath, Nolan <nheath@blm.gov>

Hello Heath,

I'll forward this to someone who should be able to help.

--Lou

On Thu, May 24, 2018 at 6:26 AM, Heath, Nolan <nheath@blm.gov> wrote:

> Louis. John Hoppe and James Whitlock passed on your contact info to me. I am reaching out to you to see if you know anyone in BOEM or BSEE who is an Air/Noise specialist that might be able to assist with drafting language in an EA for conducting seismic work on the Coastal Plain within ANWR. Thanks for any leads you may have.

--
Louis Niglio
BOEM Geophysicist
Alaska OCS Region
3801 Centerpoint Drive, Suite 500
Anchorage, AK 99503-5823
office: 907-334-5287

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Teleconference on Acoustic Support

1 message

Heath, Nolan <nheath@blm.gov> Mon, Oct 15, 2018 at 8:15 AM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: <mhovey@blm.gov>
Date: Fri, May 25, 2018 at 1:04 PM
Subject: Teleconference on Acoustic Support
To: <njones@blm.gov>, <mhovey@blm.gov>, <nheath@blm.gov>, <sharon.randall@boem.gov>

could we please reschedule to 11am your time, 1pm my time as our conference call line is busy until then

Teleconference on Acoustic Support

Shelly I will send you the conference call information as soon as Melisa sends it to me.

When	Thu May 31, 2018 10am – 11am Mountain Time
Video call	https://hangouts.google.com/hangouts/_/doi.gov/nheath
Who	• nheath@blm.gov - organizer • njones@blm.gov • mhovey@blm.gov • sharon.randall@boem.gov

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Air Assistance from CO

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:27 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Jones, Nichelle (Shelly)** <njones@blm.gov>
Date: Tue, May 29, 2018 at 12:32 PM
Subject: Re: Air Assistance from CO
To: Megan Gilbert <magilbert@blm.gov>
Cc: Nolan Heath <nheath@blm.gov>, Suzanne Mehlhoff <smehlhoff@blm.gov>, John Beck <jbeck@blm.gov>, Forrest Cook <fcook@blm.gov>

Thank you Megan. Acoustic expertise is something we are finding is increasingly in high demand. I really appreciate your willingness to help support our IDT and our upcoming seismic EA for the Coastal Plain. The environmental conditions in the Arctic Refuge are quite different than the areas we are used to in the NPRA. The Arctic Refuge has fewer lakes and more polar bears. Both of these factors will bring differences in expected impacts from the sound waves being generated by the vibrosis machine.

Looking forward to discussing with you on Thursday.

-Shelly

Shelly Jones
Acting Manager
Arctic District Office
222 University Avenue
Fairbanks, AK 99709

(907) 474-2310 (w)
(907) 460-0086 (c)

On Tue, May 29, 2018 at 11:27 AM, Megan Gilbert <magilbert@blm.gov> wrote:

> Hi Nolan and Shelly,
>
> Sue Mehlhoff passed along your request for some air and noise expertise last week. I have had one of our air specialists reach out to your Air, Water, Soil lead, Alan Peck, to get some more information and he believes he can help out. Sounds like he will participate in some upcoming calls and provide some assistance on air and noise.
>
> We are happy to help out on this one and will just monitor demands in case we need to make some calls on priorities as things go on. As the NEPA streamlining deadlines tighten we will likely be monitoring workload closely. Please let me know if you have any questions or concerns.
>
> Best,
> Megan
>
> **Megan Gilbert**
> *Branch Chief for Planning and Assessment*
> *BLM Colorado State Office*
> *(303) 239-3936 (desk)*

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Air Assistance from CO

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:26 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Megan Gilbert** <magilbert@blm.gov>
Date: Tue, May 29, 2018 at 11:27 AM
Subject: Air Assistance from CO
To: Nolan Heath <nheath@blm.gov>, Nichelle (Shelly) Jones <njones@blm.gov>
Cc: Suzanne Mehlhoff <smehlhoff@blm.gov>, John Beck <jbeck@blm.gov>, Forrest Cook <fcook@blm.gov>

Hi Nolan and Shelly,

Sue Mehlhoff passed along your request for some air and noise expertise last week. I have had one of our air specialists reach out to your Air, Water, Soil lead, Alan Peck, to get some more information and he believes he can help out. Sounds like he will participate in some upcoming calls and provide some assistance on air and noise.

We are happy to help out on this one and will just monitor demands in case we need to make some calls on priorities as things go on. As the NEPA streamlining deadlines tighten we will likely be monitoring workload closely. Please let me know if you have any questions or concerns.

Best,
Megan

Megan Gilbert
Branch Chief for Planning and Assessment
BLM Colorado State Office
(303) 239-3936 (desk)

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Updated invitation: Teleconference on Acoustic Support @ Thu May 31, 2018 1pm - 2pm (MDT) (mhovey@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Mon, Oct 15, 2018 at 8:15 AM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Hovey, Melissa** <mhovey@blm.gov>
Date: Tue, May 29, 2018 at 8:05 AM
Subject: Re: Updated invitation: Teleconference on Acoustic Support @ Thu May 31, 2018 1pm - 2pm (MDT) (mhovey@blm.gov)
To: Heath, Nolan <nheath@blm.gov>
Cc: Alan Peck <kpeck@blm.gov>

I'm so sorry but this is outside of my area of expertise. I have been providing some support to Craig Nicholls from the NOC and Alan on the air analysis for this project and I assumed this request was a continuation of that work. I fell terribly, but I'm not sure who I could even recommend to help out with this. Is it possible to obtain a contractor with expertise in seismic effects on wildlife for this project?

Melissa Hovey
Air Resource Specialist
Bureau of Land Management
Wyoming State Office
Cheyenne, WY
(307) 775-6099
mhovey@blm.gov

"Facts do not cease to exist because they are ignored." -Aldous Huxley

On Tue, May 29, 2018 at 9:59 AM, Heath, Nolan <nheath@blm.gov> wrote:

> Melissa:
> The application is for conducting 3D Seismic work across the Coastal Plain. Here is what Shelly sent me regarding what is needed.
>
> Thanks Nolan. I just put TBD on the acoustic section for now. If we do find someone, I think we might just need a high level explanation of the physics of the sound being emitted by the vibrosis machine. The distance the sound wave would be expected to be detected by different animals through different enviro conditions (water, tundra). Then it will track into the other resource sections when they describe any impacts expected. If the person has expertise in seismic work it would be interesting to include a little more about the technology and a nutshell version of how it is collected and post-processed to identify the oil and gas resources.
>
> On Tue, May 29, 2018 at 7:54 AM, Hovey, Melissa <mhovey@blm.gov> wrote:
>
> > Nolan,
> >
> > I noticed the title of this meeting is for "Acoustic Support". Are you actually looking for help with noise issues? If so, I may not be the right fit. I am an air quality specialist with very rudimentary noise experience. If you're looking for noise help only, we should discuss finding more appropriate help for your team.
> >
> > Thanks,
> >
> > ***Melissa Hovey***

Air Resource Specialist
Bureau of Land Management
Wyoming State Office
Cheyenne, WY
(307) 775-6099
mhovey@blm.gov

"Facts do not cease to exist because they are ignored." -Aldous Huxley

On Tue, May 29, 2018 at 8:36 AM, Nolan Heath <nheath@blm.gov> wrote:

This event has been changed.

Teleconference on Acoustic Support

more details »

Shelly I will send you the conference call information as soon as Melisa sends it to me.

When	**Changed:** Thu May 31, 2018 1pm – 2pm Mountain Time
Video call	https://hangouts.google.com/hangouts/_/doi.gov/nheath
Calendar	mhovey@blm.gov
Who	• nheath@blm.gov - organizer • njones@blm.gov • mhovey@blm.gov • mdraper@blm.gov • sharon.randall@boem.gov • kpeck@blm.gov

Going? **Yes** - **Maybe** - **No** more options »

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Updated invitation: Teleconference on Acoustic Support @ Thu May 31, 2018 1pm - 2pm (MDT) (mhovey@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:27 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Hovey, Melissa** <mhovey@blm.gov>
Date: Tue, May 29, 2018 at 7:54 AM
Subject: Re: Updated invitation: Teleconference on Acoustic Support @ Thu May 31, 2018 1pm - 2pm (MDT) (mhovey@blm.gov)
To: Nolan Heath <nheath@blm.gov>
Cc: Alan Peck <kpeck@blm.gov>

Nolan,

I noticed the title of this meeting is for "Acoustic Support". Are you actually looking for help with noise issues? If so, I may not be the right fit. I am an air quality specialist with very rudimentary noise experience. If you're looking for noise help only, we should discuss finding more appropriate help for your team.

Thanks,

Melissa Hovey
Air Resource Specialist
Bureau of Land Management
Wyoming State Office
Cheyenne, WY
(307) 775-6099
mhovey@blm.gov

"Facts do not cease to exist because they are ignored." -Aldous Huxley

On Tue, May 29, 2018 at 8:36 AM, Nolan Heath <nheath@blm.gov> wrote:

This event has been changed.

Teleconference on Acoustic Support

more details »

Shelly I will send you the conference call information as soon as Melisa sends it to me.

When **Changed:** Thu May 31, 2018 1pm – 2pm Mountain Time

Video call https://hangouts.google.com/hangouts/_/doi.gov/nheath

Calendar mhovey@blm.gov

Who
- nheath@blm.gov - organizer
- njones@blm.gov
- mhovey@blm.gov
- mdraper@blm.gov
- sharon.randall@boem.gov
- kpeck@blm.gov

Going? **Yes** - **Maybe** - **No** more options »

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Invitation: SAExploration Presentation @ Mon Jun 4, 2018 10am - 12pm (AKDT) (nheath@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:25 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Donna Wixon** <dwixon@blm.gov>
Date: Fri, Jun 1, 2018 at 11:49 AM
Subject: Invitation: SAExploration Presentation @ Mon Jun 4, 2018 10am - 12pm (AKDT) (nheath@blm.gov)
To: <nheath@blm.gov>, <chamfler@blm.gov>, <t75murph@blm.gov>, <gilbert_castellanos@fws.gov>, <sfritz@blm.gov>, <stephen_arthur@fws.gov>, <rgoodwin@blm.gov>, <joshua_rose@fws.gov>, <edward_decleva@fws.gov>, <christopher_latty@fws.gov>, <patrick_odell@fws.gov>, <joanna_fox@fws.gov>, <slamarr@blm.gov>, <hollis_twitchell@fws.gov>, <sheila_dufford@fws.gov>, <randy_j_brown@fws.gov>, <greta_burkart@fws.gov>, <bud_cribley@fws.gov>, <lbryant@blm.gov>, <jkeeney@blm.gov>, <steve_berendzen@fws.gov>, <dnigro@blm.gov>, <mwhitman@blm.gov>, <rbrumbau@blm.gov>, <susan_lakomski@fws.gov>, <kdebenham@blm.gov>, <charles_hamilton@fws.gov>, <ted_swem@fws.gov>, <jennifer_reed@fws.gov>, <tmeares@blm.gov>, <roger_kaye@fws.gov>, <stephanie_brady@fws.gov>, <angela_matz@fws.gov>, <njones@blm.gov>, <erin_carver@fws.gov>, <tvosburgh@blm.gov>, <rkemnitz@blm.gov>

SAExploration Presentation

more details »

SAExploration would like to give an on-line "skype" presentation to go over their proposed seismic action and answer some of the questions on the proposal that were submitted to them. I do not have the url for the meeting as of yet, but will let everyone know once we have it. I have reserved the Kobuk Room at BLM for anyone that would like to come here for the meeting.

When	Mon Jun 4, 2018 10am – 12pm Alaska Time
Where	BLM-AK FDO Kobuk Room, BLM-AK SO Bridge [redacted], BLM-AK FDO Steese White Mountains Conference Room (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/dwixon
Calendar	nheath@blm.gov
Who	• dwixon@blm.gov - organizer • chamfler@blm.gov • t75murph@blm.gov • gilbert_castellanos@fws.gov • sfritz@blm.gov • stephen_arthur@fws.gov • rgoodwin@blm.gov • joshua_rose@fws.gov • edward_decleva@fws.gov • christopher_latty@fws.gov • patrick_odell@fws.gov • joanna_fox@fws.gov • slamarr@blm.gov • hollis_twitchell@fws.gov • sheila_dufford@fws.gov • randy_j_brown@fws.gov • greta_burkart@fws.gov • bud_cribley@fws.gov • lbryant@blm.gov • jkeeney@blm.gov • steve_berendzen@fws.gov • nheath@blm.gov • dnigro@blm.gov • mwhitman@blm.gov • rbrumbau@blm.gov • susan_lakomski@fws.gov

- kdebenham@blm.gov
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- ted_swem@fws.gov
- jennifer_reed@fws.gov
- tmeares@blm.gov
- roger_kaye@fws.gov
- stephanie_brady@fws.gov
- angela_matz@fws.gov
- njones@blm.gov
- erin_carver@fws.gov
- tvosburgh@blm.gov
- rkemnitz@blm.gov

Going? **Yes** - **Maybe** - **No** more options »

invite.ics
8K

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: ePlanning page for Coastal Plain Seismic EA

1 message

Wixon, Donna <dwixon@blm.gov> Sun, Oct 28, 2018 at 7:21 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

Donna L Wixon
Natural Resource Specialist
BLM Arctic District Office
222 University Ave
Fairbanks, Alaska 99709
907-474-2301 Office
907-474-2386 Fax
dwixon@blm.gov

---------- Forwarded message ---------
From: **Wixon, Donna** <dwixon@blm.gov>
Date: Mon, Jun 25, 2018 at 1:07 PM
Subject: Re: ePlanning page for Coastal Plain Seismic EA
To: Edmonds, Joseph <jwedmonds@blm.gov>
Cc: Sarah LaMarr <slamarr@blm.gov>

Thanks Joe, I am guessing that I may need help when it is that time. I believe Shelly wants public affairs to be the contact. But we haven't gotten that far yet.

Donna L Wixon
Natural Resource Specialist
BLM Arctic District Office
222 University Ave
Fairbanks, Alaska 99709
907-474-2301 Office
907-474-2386 Fax
dwixon@blm.gov

On Mon, Jun 25, 2018 at 1:03 PM, Edmonds, Joseph <jwedmonds@blm.gov> wrote:

> Okay, thanks for letting me know, Donna. I was just checking too to make sure that specialists didn't need a NEPA number generated yet for any clearances, authorizations, etc.
>
> Joe Edmonds
> Planning and Environmental Coordinator
> Master of Science, Environmental Policy
> Diversity Change Agent
> Bureau of Land Management
> Alaska State Office
> 222 West 7th Avenue, #13
> Anchorage, AK 99513
> Office #: 907-271-3244
> Cell #: 907-290-0115
> jwedmonds@blm.gov
>
> On Mon, Jun 25, 2018 at 1:00 PM, Wixon, Donna <dwixon@blm.gov> wrote:
>
> > Hi Joe,
> >
> > We were waiting to post until we had a project description (Chapter 2) ready to go.
> >
> > Thanks,
> > Donna
> >
> > Donna L Wixon
> > Natural Resource Specialist
> > BLM Arctic District Office
> > 222 University Ave
> > Fairbanks, Alaska 99709
> > 907-474-2301 Office
> > 907-474-2386 Fax
> > dwixon@blm.gov

On Mon, Jun 25, 2018 at 12:52 PM, Edmonds, Joseph <jwedmonds@blm.gov> wrote:

Sarah and Donna,

Do you recall if anyone created an ePlanning page or site for the Seismic EA for the Coastal Plain project? If not, do you need any help creating that before Nicole returns to the office on Thursday?

I saw the EA on a project timeline spreadsheet circulating around the State Office, and it looks like the EA has a tight timeline. So I wanted to reach out and see if my assistance is needed at this time.

Joe Edmonds
Planning and Environmental Coordinator
Master of Science, Environmental Policy
Diversity Change Agent
Bureau of Land Management
Alaska State Office
222 West 7th Avenue, #13
Anchorage, AK 99513
Office #: 907-271-3244
Cell #: 907-290-0115
jwedmonds@blm.gov

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: ePlanning page for Coastal Plain Seismic EA

1 message

Wixon, Donna <dwixon@blm.gov> Sun, Oct 28, 2018 at 7:20 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

Donna L Wixon
Natural Resource Specialist
BLM Arctic District Office
222 University Ave
Fairbanks, Alaska 99709
907-474-2301 Office
907-474-2386 Fax
dwixon@blm.gov

---------- Forwarded message ---------
From: **Edmonds, Joseph** <jwedmonds@blm.gov>
Date: Mon, Jun 25, 2018 at 1:03 PM
Subject: Re: ePlanning page for Coastal Plain Seismic EA
To: Wixon, Donna <dwixon@blm.gov>
Cc: Sarah LaMarr <slamarr@blm.gov>

Okay, thanks for letting me know, Donna. I was just checking too to make sure that specialists didn't need a NEPA number generated yet for any clearances, authorizations, etc.

Joe Edmonds
Planning and Environmental Coordinator
Master of Science, Environmental Policy
Diversity Change Agent
Bureau of Land Management
Alaska State Office
222 West 7th Avenue, #13
Anchorage, AK 99513
Office #: 907-271-3244
Cell #: 907-290-0115
jwedmonds@blm.gov

On Mon, Jun 25, 2018 at 1:00 PM, Wixon, Donna <dwixon@blm.gov> wrote:

> Hi Joe,
>
> We were waiting to post until we had a project description (Chapter 2) ready to go.
>
> Thanks,
> Donna
>
> Donna L Wixon
> Natural Resource Specialist
> BLM Arctic District Office
> 222 University Ave
> Fairbanks, Alaska 99709
> 907-474-2301 Office
> 907-474-2386 Fax
> dwixon@blm.gov
>
> On Mon, Jun 25, 2018 at 12:52 PM, Edmonds, Joseph <jwedmonds@blm.gov> wrote:
>
> > Sarah and Donna,
> >
> > Do you recall if anyone created an ePlanning page or site for the Seismic EA for the Coastal Plain project? If not, do you need any help creating that before Nicole returns to the office on Thursday?
> >
> > I saw the EA on a project timeline spreadsheet circulating around the State Office, and it looks like the EA has a tight timeline. So I wanted to reach out and see if my assistance is needed at this time.
> >
> > Joe Edmonds
> > Planning and Environmental Coordinator
> > Master of Science, Environmental Policy
> > Diversity Change Agent
> > Bureau of Land Management
> > Alaska State Office

222 West 7th Avenue, #13
Anchorage, AK 99513
Office #: 907-271-3244
Cell #: 907-290-0115
jwedmonds@blm.gov

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: ePlanning page for Coastal Plain Seismic EA

1 message

Wixon, Donna <dwixon@blm.gov> Sun, Oct 28, 2018 at 7:19 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

Donna L Wixon
Natural Resource Specialist
BLM Arctic District Office
222 University Ave
Fairbanks, Alaska 99709
907-474-2301 Office
907-474-2386 Fax
dwixon@blm.gov

---------- Forwarded message ---------
From: **Edmonds, Joseph** <jwedmonds@blm.gov>
Date: Mon, Jun 25, 2018 at 12:53 PM
Subject: ePlanning page for Coastal Plain Seismic EA
To: Sarah LaMarr <slamarr@blm.gov>, Wixon, Donna <dwixon@blm.gov>

Sarah and Donna,

Do you recall if anyone created an ePlanning page or site for the Seismic EA for the Coastal Plain project? If not, do you need any help creating that before Nicole returns to the office on Thursday?

I saw the EA on a project timeline spreadsheet circulating around the State Office, and it looks like the EA has a tight timeline. So I wanted to reach out and see if my assistance is needed at this time.

Joe Edmonds
Planning and Environmental Coordinator
Master of Science, Environmental Policy
Diversity Change Agent
Bureau of Land Management
Alaska State Office
222 West 7th Avenue, #13
Anchorage, AK 99513
Office #: 907-271-3244
Cell #: 907-290-0115
jwedmonds@blm.gov

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: [EXTERNAL] Reports From Meeting

1 message

Wixon, Donna <dwixon@blm.gov> Sun, Oct 28, 2018 at 8:04 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

Donna L Wixon
Natural Resource Specialist
BLM Arctic District Office
222 University Ave
Fairbanks, Alaska 99709
907-474-2301 Office
907-474-2386 Fax
dwixon@blm.gov

---------- Forwarded message ---------
From: **Jones, Nichelle (Shelly)** <njones@blm.gov>
Date: Mon, Jun 25, 2018 at 4:22 PM
Subject: Re: [EXTERNAL] Reports From Meeting
To: Wixon, Donna <dwixon@blm.gov>
Cc: Sarah LaMarr <slamarr@blm.gov>

We can ask Wendy about them tomorrow at 3 when we have our weekly meeting.

Shelly Jones
Acting Manager
Arctic District Office
222 University Avenue
Fairbanks, AK 99709

(907) 474-2310 (w)
(907) 460-0086 (c)

On Mon, Jun 25, 2018 at 2:39 PM, Wixon, Donna <dwixon@blm.gov> wrote:

> Do either of you know who I should ask for these reports?
>
> thanks,
> Donna
>
> Donna L Wixon
> Natural Resource Specialist
> BLM Arctic District Office
> 222 University Ave
> Fairbanks, Alaska 99709
> 907-474-2301 Office
> 907-474-2386 Fax
> dwixon@blm.gov
>
> ---------- Forwarded message ----------
> From: **Suzan Simonds** <ssimonds@contractor.saexploration.com>
> Date: Mon, Jun 25, 2018 at 2:35 PM
> Subject: [EXTERNAL] Reports From Meeting
> To: Donna Wixon <dwixon@blm.gov>
> Cc: Marsh Creek Permitting <MarshCreekPermitting@saexploration.com>
>
> Hi Donna
> When you return to the office we would like to get copies of the following:
> - FWS Hydrology Survey/Data/Studies in the 1002 Area
> - Snow Survey (FWS/UAF Collabora on)
> - USGS Thermistor data in 1002 Area (3 sites)
> - Snow Survey from Camden Bay-Marsh Creek and Eastern por on of 1002 Area (FWS)
>
> These reports were menoned during the mee ng las t week of studies that might aid us in our planning. The BLM folks menoned the y could give us copies.

Suzan Simonds
Permit and Regulatory Manager
SAExploration, Inc.
Safety – Acquisition - Experience
8240 Sandlewood Pl., Suite 102
Anchorage, AK 99507

907-331-8140 Cell
907-522-4499 Main
907-522-4498 Fax

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Reminder about setting up ePlanning page for the Seismic EA

1 message

Wixon, Donna <dwixon@blm.gov> Sun, Oct 28, 2018 at 8:26 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

Donna L Wixon
Natural Resource Specialist
BLM Arctic District Office
222 University Ave
Fairbanks, Alaska 99709
907-474-2301 Office
907-474-2386 Fax
dwixon@blm.gov

---------- Forwarded message ---------
From: **Edmonds, Joseph** <jwedmonds@blm.gov>
Date: Fri, Jun 29, 2018 at 1:54 PM
Subject: Re: Reminder about setting up ePlanning page for the Seismic EA
To: Hayes, Miriam (Nicole) <mnhayes@blm.gov>
Cc: Robert Brumbaugh <rbrumbau@blm.gov>, Nichelle (Shelly) Jones <njones@blm.gov>, Sarah LaMarr <slamarr@blm.gov>, Donna Wixon <dwixon@blm.gov>

I actually already corresponded with Donna, Shelly, and Sarah on this when you were on leave, Nicole. Sorry I didn't update you!

Joe Edmonds
Planning and Environmental Coordinator
Master of Science, Environmental Policy
Diversity Change Agent
Bureau of Land Management
Alaska State Office
222 West 7th Avenue, #13
Anchorage, AK 99513
Office #: 907-271-3244
Cell #: 907-290-0115
jwedmonds@blm.gov

On Fri, Jun 29, 2018 at 1:51 PM, Hayes, Miriam (Nicole) <mnhayes@blm.gov> wrote:

> Shelly Jones is the lead for this EA. I'm cc'ing Donna Wixon (her acting) on this message.
> Thanks!
> Nicole
>
> **Nicole Hayes**
> Project Coordinator
> Bureau of Land Management
> 222 W. 7th Avenue #13
> Anchorage, Alaska 99513
> Desk: (907) 271-4354
>
> On Mon, Jun 25, 2018 at 11:58 AM, Edmonds, Joseph <jwedmonds@blm.gov> wrote:
>
> > Nicole and Rob,
> >
> > I want to make sure we don't forget to set up an ePlanning page for the Seismic EA sometime in the near future. Will this project require a NEPA number for separate clearances, reviews, authorizations, etc. from cooperating agencies separate from the primary EIS project?
> >
> > Let me know when you will need my help setting this up. I don't know what your timeline is like for the EA yet.
> >
> > Joe Edmonds
> > Planning and Environmental Coordinator
> > Master of Science, Environmental Policy
> > Diversity Change Agent
> > Bureau of Land Management
> > Alaska State Office
> > 222 West 7th Avenue, #13
> > Anchorage, AK 99513
> > Office #: 907-271-3244
> > Cell #: 907-290-0115

jwedmonds@blm.gov

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Invitation: TED: Coastal Plain Seismic discussion @ Fri Jul 13, 2018 9:30am - 10am (AKDT) (dwixon@blm.gov)

1 message

Wixon, Donna <dwixon@blm.gov> Sun, Oct 28, 2018 at 9:18 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

Donna L Wixon
Natural Resource Specialist
BLM Arctic District Office
222 University Ave
Fairbanks, Alaska 99709
907-474-2301 Office
907-474-2386 Fax
dwixon@blm.gov

---------- Forwarded message ---------
From: **Leslie Rosenberger** <lrosenberger@blm.gov>
Date: Wed, Jul 11, 2018 at 10:11 AM
Subject: Invitation: TED: Coastal Plain Seismic discussion @ Fri Jul 13, 2018 9:30am - 10am (AKDT) (dwixon@blm.gov)
To: <dwixon@blm.gov>, <slamarr@blm.gov>, <rbrumbau@blm.gov>, <t75murph@blm.gov>, <lellis@blm.gov>, <jehart@blm.gov>

TED: Coastal Plain Seismic discussion

more details »

Scheduled by Leslie R. 7/11 @ 10:11 am per Ted's request

When	Fri Jul 13, 2018 9:30am – 10am Alaska Time
Where	BLM-AK SD Bridgeport [redacted], BLM-AK SD State Directors Conference Room (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/lrosenberger
Calendar	dwixon@blm.gov
Who	• lrosenberger@blm.gov - organizer • slamarr@blm.gov • dwixon@blm.gov • rbrumbau@blm.gov • t75murph@blm.gov • lellis@blm.gov • jehart@blm.gov

Going? **Yes** - **Maybe** - **No** more options »

invite.ics
3K

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Invitation: Tentative: Interview with ADN @ Fri Jul 13, 2018 11am - 12pm (AKDT) (dwixon@blm.gov)

1 message

Wixon, Donna <dwixon@blm.gov> Sun, Oct 28, 2018 at 9:13 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

Donna L Wixon
Natural Resource Specialist
BLM Arctic District Office
222 University Ave
Fairbanks, Alaska 99709
907-474-2301 Office
907-474-2386 Fax
dwixon@blm.gov

---------- Forwarded message ---------
From: **Lesli Ellis-Wouters** <lellis@blm.gov>
Date: Wed, Jul 11, 2018 at 9:21 AM
Subject: Invitation: Tentative: Interview with ADN @ Fri Jul 13, 2018 11am - 12pm (AKDT) (dwixon@blm.gov)
To: <dwixon@blm.gov>

Tentative: Interview with ADN

more details »

To discuss seismic exploration in the arctic.

When	Fri Jul 13, 2018 11am – 12pm Alaska Time
Where	Lesli's Office, BLM-AK SO Bridge [redacted] (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/lellis
Calendar	dwixon@blm.gov
Who	(Guest list has been hidden at organizer's request)

Going? **Yes** - **Maybe** - **No** more options »

invite.ics
2K

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Seismic in the Refuge: Shame on the Sham

1 message

Julianne Warren <coyotetrail.net@gmail.com> Sun, Aug 12, 2018 at 4:57 PM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

Dear BLM,

The reckless haste of this proposal makes all claims of care farcical. There is no way, within the next few weeks, that researchers could do the work needed to assure no harm be done to the values for which the Refuge has been created. To suggest so is insultingly ridiculous. No one believes it. (As an example of the farce the BLM is creating—a June 18, 2018 Oil and Gas Journal cited Balash talking about the Refuge “antelope” herd. I see that has since been corrected online [though with no public admission of the glaring mistake] to “caribou.” This “slip”—an insult to the Peoples of this nation--betrays the depth of the BLM’s ignorance and uncaring).

The values upon which the Refuge was created--and, lawfully, must still be honored--are the primary standard by which any human activities in the Refuge must be judged. The original purpose of the Refuge (ANCILA 1980) is to protect “nationally significant natural, scenic, historic, archeological, geological, scientific, wilderness, cultural, recreational, and wildlife values.” These are for the "benefit, use, education and inspiration” of present and future generations. The Refuge is "to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so.” This applies to the Gwich’in People who depend upon the Porcupine Caribou Herd who depend upon the coastal plain as their birthing ground—Iizhik Gwats’an Gwandaii Goodlit, or “the sacred place where life begins.” Oil and gas activities—including seismic testing—in the Refuge may proceed, accordingly, only with evidence-based assurance of no adverse affects on the regenerative health of this unique lifescape. This value of Refuge health, interpenetrating with climate habitability, is properly primary. It is also popular with both a majority of Alaskans and those outside.

The research of geophysicist Dr. Matt Nolan, and of ecologist Dr. Sue Natali, for example, give solid evidence that 3-d seismic testing will have long term consequences, including deep, lasting depressions in the ground causing changes in water flows and warming the ground, ground that is already warming from climate change. What would be the consequences of these changes on the Porcupine Caribou herd and other interdependent species of the Refuge, and, on the interdependence with Alaska Native life ways? These and so many other questions—for example, what consequences the booms would have on the lifescape and its members--must be thoroughly addressed ("The energy source for the seismic wave is Vibrosies which would exert 64,000 pounds of peak force on the ground”!) Only if it were determined, via rigorous research, that no harm would come to the self-renewing capacity of the Refuge, only IF that were almost certainly true, could seismic testing be lawfully allowed.

But, even then, any effort and expense of seismic testing would be ill spent, any lease purchases would also be a huge waste--given that no new drilling can take place if we are to avoid climate catastrophe beyond anything humankinds and many other species have ever encountered.

Drilling must not take place in the Refuge because it would undermine the intent of its creation, a public trust, in the first place.

No drilling can take place in the Refuge if democracy is honored. According to a 2018 Yale University study, a large majority of every day Alaskans—63%—and of U.S. voters—65%—oppose drilling in the Refuge. The whole Gwich’in Nation—whose culture, spirit, and nutrition are dependent upon the Porcupine Caribou Herd that is dependent upon the Refuges coastal plain—is opposed.

Refuge drilling makes no economic sense either.

It would be wrong to drill in the Refuge in every way, so seismic testing makes no sense in every way. This is on top of the ridiculous claims of the present application for seismic testing and the reckless attitude of the BLM in even considering it. The US Fish and Wildlife Service, in fact, has already warned against taking it seriously.

It is also dishonest for the BLM or anyone else to claim that Alaska Native Corporations speak for the values of Alaska Native Peoples. They do not. They speak first for profit. Whereas, the Refuge is for health. The Refuge is sacred. The Sacred is priceless.

Sincerely,
Julianne Warren
Fairbanks, Alaska (registered AK voter)

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Seismic testing comment

1 message

Christin Swearingen <mushroomchristin@gmail.com> Sun, Aug 12, 2018 at 6:23 PM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

I am appalled to hear that seismic testing in the most wild and pure public land in America- our Arctic Wildlife Refuge- is being fast-tracked by Trump's BLM. There is no way, within the next few weeks, that researchers could do the work needed to assure no harm be done to the values for which the Refuge has been created. To suggest so is insultingly ridiculous. No one believes it. (As an example of the farce the BLM is creating—a June 18, 2018 Oil and Gas Journal cited Balash talking about the Refuge “antelope” herd. I see that has since been corrected online [though with no public admission of the glaring mistake] to “caribou.” This “slip”—an insult to the Peoples of this nation--betrays the depth of the BLM’s ignorance and uncaring).

The values upon which the Refuge was created--and, lawfully, must still be honored--are the primary standard by which any human activities in the Refuge must be judged. The original purpose of the Refuge (ANCILA 1980) is to protect “nationally significant natural, scenic, historic, archeological, geological, scientific, wilderness, cultural, recreational, and wildlife values.” These are for the "benefit, use, education and inspiration” of present and future generations. The Refuge is "to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so.” This applies to the Gwich’in People who depend upon the Porcupine Caribou Herd who depend upon the coastal plain as their birthing ground—Iizhik Gwats’an Gwandaii Goodlit, or “the sacred place where life begins.” Oil and gas activities—including seismic testing—in the Refuge may proceed, accordingly, only with evidence-based assurance of no adverse affects on the regenerative health of this unique lifescape. This value of Refuge health, interpenetrating with climate habitability, is properly primary. It is also popular with both a majority of Alaskans and those outside.

The research of geophysicist Dr. Matt Nolan, and of ecologist Dr. Sue Natali, for example, give solid evidence that 3-d seismic testing will have long term consequences, including deep, lasting depressions in the ground causing changes in water flows and warming the ground, ground that is already warming from climate change. What would be the consequences of these changes on the Porcupine Caribou herd and other interdependent species of the Refuge, and, on the interdependence with Alaska Native life ways? These and so many other questions—for example, what consequences the booms would have on the lifescape and its members--must be thoroughly addressed ("The energy source for the seismic wave is Vibrosies which would exert 64,000 pounds of peak force on the ground”!) Only if it were determined, via rigorous research, that no harm would come to the self-renewing capacity of the Refuge, only IF that were almost certainly true, could seismic testing be lawfully allowed.

But, even then, any effort and expense of seismic testing would be ill spent, any lease purchases would also be a huge waste--given that no new drilling can take place if we are to avoid climate catastrophe beyond anything humankinds and many other species have ever encountered.

Drilling must not take place in the Refuge because it would undermine the intent of its creation, a public trust, in the first place.

No drilling can take place in the Refuge if democracy is honored. According to a 2018 Yale University study, a large majority of every day Alaskans—63%—and of U.S. voters—65%—oppose drilling in the Refuge. The whole Gwich’in Nation—whose culture, spirit, and nutrition are dependent upon the Porcupine Caribou Herd that is dependent upon the Refuges coastal plain—is opposed.

Refuge drilling makes no economic sense either.

It would be wrong to drill in the Refuge in every way, so seismic testing makes no sense in every way. This is on top of the ridiculous claims of the present application for seismic testing and the reckless attitude of the BLM in even considering it. The US Fish and Wildlife Service, in fact, has already warned against taking it seriously.

It is also dishonest for the BLM or anyone else to claim that Alaska Native Corporations speak for the values of Alaska Native Peoples. They do not. They speak first for profit. I love the Refuge. The Refuge is priceless.

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Comments re BLM scoping seismic on the Arctic Refuge

1 message

Beth Davidow <bethdavidow@gmail.com> Mon, Aug 13, 2018 at 3:32 PM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

Dear BLM,

I am writing to express my deep concern, for many reasons I'll explain herein, for the reckless manner in which the BLM is rushing the proposal to conduct seismic testing in the Arctic Refuge.

1. Fast-tracking the EIS is nothing short of foolish, short-sighted, and downright unconscionable. In light of the recent 6.4 magnitude earthquake, and it's significant aftershocks that rattled the region from the Arctic all the way south to Fairbanks, I strongly urge the BLM to slow down and take the necessary time to definitively understand how seismic testing will affect the Refuge. Even the Earthquake Center in Fairbanks stated, that "…this region is poorly understood and the behavior of the fault or faults responsible for today's earthquake are not known." We know that a significant rise in earthquakes now occurs in states such as Oklahoma, Arkansas, Texas, and Ohio due to seismic & fracking activity. There is just not enough information about the Arctic region to surmise anything different could occur on the Refuge should such activity take place.

2. 3-D seismic testing will have long-term consequences according to research conducted by geophysicist Dr. Matt Nolan and ecologist Dr. Sue Natali. Deep, lasting impressions in the ground causing changes in water flow, as well as ground-warming in an area already warming due to climate disruption, will have consequences on the intricate interdependence of the species that survive, and thrive, on the Refuge. The energy force that the Vibroseis (seismic testing device) exerts on the ground is intense. Only rigorous research can determine if such seismic pounding will harm Refuge species.

3. The Refuge was created (ANILCA, 1980) to protect "nationally significant natural, scenic, historic, archaeological, geological, scientific, wilderness, cultural, recreational, and wildlife values." These are for the "benefit, use, education and inspiration" of present and future generations. The intent of its creation is a public trust. Seismic testing, without understand its potential consequences, and drilling, undermine that trust. A 2018 Yale University study shows that the majority of everyday Alaskans (63%) and US voters (65%) oppose drilling in the Refuge. From those numbers alone it is clear that Democracy must be honored to ensure no drilling takes place in the Refuge. (We travel the world for business and everyone with whom we speak about the Refuge finds it appalling that Refuge drilling is even considered! Citizens of the world see Alaska as the greatest symbol of wilderness and wild values and to them, the act of drilling in the Refuge is like defacing the great cathedrals of the world.)

4. The Refuge was also set up to "provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so." The Gwich'in People depend upon the Porcupine caribou herd for their very sustenance, spirit, & culture. I've just completed a 2-month road trip from Arizona to Montana and am even more appalled at how we treated the Native residents of this continent. Rushing the EIS and potentially opening the Arctic Refuge to drilling is simply another profoundly shameful way that "we" treat Native people. Needless to say, the entire Gwich'in Nation is opposed to drilling in this land held so dear and sacred to them.

5. It is profoundly dishonest for the BLM or anyone else to claim that Alaska Native Corporations speak for the values of Alaska Native Peoples. They do not. The corporations speak for one thing: profit. The Refuge is for life and health: cultural, spiritual, physical and mental. The Refuge is sacred. The Sacred is priceless.

In conclusion, I again urge the BLM to stand strong against the dictatorial onslaught that seems to be forcing them into rushing due process to avoid accountability as an EIS is pushed forward under false pretenses, downright lies, and farcical claims of caring for this world-renowned American treasure.

Although I used to live and work in Alaska, and still consider it my home, I now live in Arizona. Yet, I know how connected my part of the world is to the Refuge and I remain deeply concerned for its future. I firmly believe we must uphold the original purpose of the Refuge in every way, and to honor the People who depend upon it for their cultural & spiritual lives.

Sincerely,

Beth Davidow

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Comments regarding proposed seismic exploration in Arctic Refuge

1 message

Debbie Miller <debbiesmiller@hotmail.com> Tue, Aug 14, 2018 at 11:16 AM
To: "blm_ak_coastal_plain_seismic_ea@blm.gov" <blm_ak_coastal_plain_seismic_ea@blm.gov>
Cc: "arctic_refuge@fws.gov" <arctic_refuge@fws.gov>, "steve_berendzen@fws.gov" <steve_berendzen@fws.gov>

Dear BLM reviewers,

I understand that you are considering a 3-D seismic exploration plan that would take place, beginning in December, across the entire coastal plain of the Arctic Refuge.

I urge you to conduct a full EIS and proper analysis, along with public meetings, regarding this proposed application. If this is too costly, then I urge you to immediately deny this permit request by private companies that have other investment opportunities. Just say no, and save taxpayers some money. There is a good legal reason to do so.

While the 2017 tax bill approved oil and gas leasing on 800,000 acres of the coastal plain over several years, there is nothing in this legislation that authorizes 3-D seismic exploration, involving every square mile of the 1.5 million acre 1002 area. This industrial activity involves as many as 300 people, heavy equipment, and associated loud noise that puts denning polar bears at grave risk -- a threatened species. Every acre of the 1002 area would be impacted given the nature of 3-D seismic work, the booming noise, and the dense grid lines.

There is no specific legal authority to conduct this kind of seismic activity in the Arctic Refuge — such a proposal is not compatible with the purposes why the Arctic Refuge was established. The widespread disruption to wildlife and the likely long-term damage to the tundra should negate this proposal.

First and foremost, this is a wildlife refuge. America's greatest.

It's also important to recognize that climate change has dramatically altered the season that allows seismic crews to work on the North Slope. Given the hilly topography in the arctic foothills, wind, and warmer temperatures, it may be extremely difficult, costly, if not impossible, to conduct seismic activity safely with adequate snow cover. In recent decades, there have been dramatic swings in temperature so that even if the coastal plain is covered with six inches of snow, it might melt off within days, very suddenly in mid-winter. Ground temperatures during the winter are also rising.

Climate change must be taken into serious consideration, as well as the wildlife impacts from all the noise, disruption and pollution.

As stewards of our national public lands, the USFWS and BLM are charged with protecting the values of the Arctic Refuge. Please act accordingly and deny this 3-D seismic permit.

Sincerely,

Debbie S. Miller
www.debbiemilleralaska.com
415-373-2236

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] ANWR

1 message

Heather Best <hbest25@yahoo.com> Wed, Aug 15, 2018 at 4:19 PM
Reply-To: Heather Best <hbest25@yahoo.com>
To: "blm_ak_coastal_plain_seismic_ea@blm.gov" <blm_ak_coastal_plain_seismic_ea@blm.gov>

The other federal agency in charge of managing the lands in ANWR is opposed to seismic mapping there. And so am I. And so are most Alaskans and Americans. And so the BLM should also not allow seismic mapping in the 1002 area. End of story.

Heather Best
Fairbanks, AK

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Seismic testing

1 message

Betty Dean <songbird2new@gmail.com> Wed, Aug 15, 2018 at 5:23 PM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

When you think there can be no more things done to destroy the earth,big money comes up with something like this. Is nothing sacred
They do not care abot the animals, the beauty, anything saving the earth from destruction Stop this madness

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Refuge

1 message

water eagle <watereagle301@gmail.com> Wed, Aug 15, 2018 at 11:50 PM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

Keep the refuge for the wildlife.

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Please do not drill in the Arctic Refuge

1 message

Carol Field <cleefield@sbcglobal.net> Wed, Aug 15, 2018 at 4:26 PM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

The people of Alaska do not want this. It is wrong. Pay attention.

Carol Field
805 Halibut Point Road, #4
Sitka, AK 99835

Sent from Yahoo Mail for iPhone

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] BLM SCOPING SEISMIC IN THE ARCTIC NATIONAL WILDLIFE REFUGE: COMMENT

1 message

McKibben Jackinsky <mckibben.jackinsky@gmail.com> Wed, Aug 15, 2018 at 8:20 PM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

Thank you for this opportunity to provide comments for BLM's scoping of seismic work within the Arctic National Wildlife Refuge.

It seems like the perfect time to review the mission and guiding principles of the refuge network as stated on the Fish and Wildlife Service's website:

The **Mission** of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the ish, wildlif e, and plant resources and their habitats within the United States for the beneit of pr esent and future generations of Americans.

And the **guiding principles**:

- We are land stewards, guided by Aldo Leopold's teachings that land is a community of life and that love and respect for the land is an extension of ethics. We seek to relect that land ethic in our st ewardship and to instill it in others.
- Wild lands and the perpetuation of diverse and abundant wildlife are essential to the quality of the American life.
- We are public servants. We owe our employers, the American people, hard work, integrity, fairness, and a voice in the protection of their trust resources.
- Management, ranging from preservation to active manipulation of habitats and populations, is necessary to achieve Refuge System and U.S. Fish and Wildlife Service missions.
- Wildlife-dependent uses involving hunting, ishing, wildlif e observation, photography, interpretation, and education, when compatible, are legitimate and appropriate uses of the Refuge System.
- Partnerships with those who want to help us meet our mission are welcome and indeed essential.
- Employees are our most valuable resource. They are respected and deserve an empowering, mentoring, and caring work environment.
- We respect the rights, beliefs, and opinions of our neighbors.
- We are a science-based organization. We subscribe to the highest standards of scientiic int egrity and relect this commitment in the design, delivery and evaluation of all our work.

How does any type of development – seismic testing or otherwise – within ANWR comply with the refuge system's mission and guiding principles? Clearly, it doesn't.

Can seismic work be done without scarring the land? No, as proven by tracks still visible across the land that were made decades ago. These tracks impact the lo w of surface water, lake drainage and speed up the thawing of permafrost as shown by Woods Hole Research Center scientists. That not only impacts wildlife, but, as science shows, results in the release of carbon dioxide and methane, which contributes to global warming. Alaska leads the nation with its rate of rising temperature. We need to put the brakes on rather than speed up that process.

Finally, development within ANWR threatens the Gwich'in people of Alaska and Canada who depend on the Porcupine caribou herd that calves and migrates within the refuge. The Gwich'in view protection of the herd and their habitat, an area they call *Iizhik Gwat'san Gwandaii Goodlit* (the sacred place where life begins), as a human rights issue and it's impossible to see it any other way.

Do not allow seismic testing within the Arctic National Wildlife Refuge.

Thank you,
McKibben Jackinsky
4001 El Sarino Court
Homer, Alaska 99603

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Seismic Testing in the Arctic Refuse Comment

1 message

Terry Cummings <cummingst44@yahoo.com> Wed, Aug 15, 2018 at 5:37 PM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

Good Day:
No seismic testing should be allowed in the Arctic Refuse. It is a Refuse, which means protecting the wilderness, wildlife, historic, geological, cultural, and scenic values.
The coastal plain will be permanently harmed by seismic tests. Tundra is very fragile and the scars remain indefinitely.

The majority of Alaskans living in the state do not want this area explored or harmed. It goes against the values of Alaska Native people; this is a sacred place.
Leave it alone; the money isn't worth destroying it. Once gone is forever.

Sincerely,
Terry Cummings
6740 East 10th
Anchorage, AK 99504

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: DD Aug 14: Public Comment Response

1 message

Nigro, Debora <dnigro@blm.gov> Tue, Sep 25, 2018 at 12:54 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Wixon, Donna** <dwixon@blm.gov>
Date: Thu, Aug 16, 2018 at 8:46 AM
Subject: Re: DD Aug 14: Public Comment Response
To: Nigro, Debora <dnigro@blm.gov>

thank you

Donna L Wixon
Natural Resource Specialist
BLM Arctic District Office
222 University Ave
Fairbanks, Alaska 99709
907-474-2301 Office
907-474-2386 Fax
dwixon@blm.gov

On Thu, Aug 16, 2018 at 8:37 AM, Nigro, Debora <dnigro@blm.gov> wrote:
> I'm done with my comment responses, all in track changes.
>
> On Thu, Aug 16, 2018 at 8:32 AM, Wixon, Donna <dwixon@blm.gov> wrote:
> > If you do it in track changes that would be helpful.
> >
> > Thanks Debbie.
> >
> > Donna L Wixon
> > Natural Resource Specialist
> > BLM Arctic District Office
> > 222 University Ave
> > Fairbanks, Alaska 99709
> > 907-474-2301 Office
> > 907-474-2386 Fax
> > dwixon@blm.gov
> >
> > On Thu, Aug 16, 2018 at 8:18 AM, Nigro, Debora <dnigro@blm.gov> wrote:
> > > OK, do you want me to put my comments directly into that table?
> > >
> > > On Wed, Aug 15, 2018 at 6:17 PM, Wixon, Donna <dwixon@blm.gov> wrote:
> > > > Debbie, if you go here:
> > > > V:\010 Arctic District Office\04 NEPA\FY18\Coastal Plain Seismic EA\Public Comments
> > > >
> > > > Comment Response table.
> > > >
> > > > you will see the comment responses that we have received from the rest of the staff.
> > > >
> > > > Thanks,
> > > > Donna
> > > >
> > > > Donna L Wixon
> > > > Natural Resource Specialist
> > > > BLM Arctic District Office
> > > > 222 University Ave
> > > > Fairbanks, Alaska 99709
> > > > 907-474-2301 Office
> > > > 907-474-2386 Fax
> > > > dwixon@blm.gov
> > > >
> > > > On Mon, Aug 13, 2018 at 2:20 PM, Nigro, Debora <dnigro@blm.gov> wrote:
> > > > > Attached is my comment response spreadsheet. I may need to update it as noted when the veg. and hydro. comment responses are received.
> > > > >
> > > > > On Thu, Aug 9, 2018 at 2:35 PM, Wixon, Donna <dwixon@blm.gov> wrote:
> > > > > > Hello All,

We have received 2 public comment letters with a total of 53 comments to address. One of the letters (attached) is very extensive and cites quite a few references. Please see the attached table and the reviewer name for the various comments and provide a response in the response table. Once you have responded in the table to all comments that have your name associated please send me your updated table. We are requesting responses to be completed by Tuesday. If you can not make this deadline please let Sarah and I know.

Every resource but cultural and hazardous materials has a comment that needs a response.

Thank-you
Donna

Donna L Wixon
Natural Resource Specialist
BLM Arctic District Office
222 University Ave
Fairbanks, Alaska 99709
907-474-2301 Office
907-474-2386 Fax
dwixon@blm.gov

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Debbie Nigro
Bureau of Land Management
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907-474-2324
dnigro@blm.gov

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907-474-2324
dnigro@blm.gov

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Hands off the Arctic National Wildlife Refuge!

1 message

CL Maxwell <maxwellcl11@gmail.com> Thu, Aug 16, 2018 at 6:35 PM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

I can't believe you are even considering it. Surely you recognize that it is fragile? Surely you recognize that it is irreplaceable? Surely you recognize that it is sacred?

What are you think of?

From an Alaska resident who cares both about people and about the world.

Clare Maxwell

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Seismic testing in arctic national wildlife refuge

1 message

Mike Sallee <mikesallee@gmail.com> Thu, Aug 16, 2018 at 12:54 AM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

Seismic testing should only take place in the arctic national wildlife refuge after adequate testing is completed upon the effects search testing will have on the ecosystem and wildlife. Science, not politics should dictate how any development should go forward.

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Seismic testing in ANWR

1 message

Ann Yates <annkyates@gmail.com> Thu, Aug 16, 2018 at 6:29 AM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

I am very concerned about seismic testing in ANWR, especially when thorough evaluation of the effects it would have on people and flora/fauna in the region. The process of seismic testing has the capacity to be significantly harm ANWR and at the very least contribute to ongoing degradation. It must be carefully assessed, which takes time, instead of jumping into it and then finding out the risks. If you're going to "manage" the land you must do it with the well-being of those who live on and with the land as the top priority. It does not seem like that is happening in this seismic testing venture.

Thank you for considering my comments.

Ann Yates
Anchorage AK

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Comments on ANWR seismic plan

1 message

Julia York <juliamyork@gmail.com> Thu, Aug 16, 2018 at 7:43 AM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

Hello,

I am a biologist and Alaskan resident. Please see below for my comments on the proposal by SAExplorations to conduct 3-D seismic mapping of the 1002 area.

1) Six inches of snow is sufficient to protect the tundra from a single passage of vehicles, but no more. Repeated passage of vehicles over the same site with insufficient snow has been shown to permanently damage the tundra in the North Slope and alter the flow of water, permanently damaging the hydrology of the entire refuge. Proposal should scientifically demonstrate the depth of snow appropriate for repeated passage that will not cause permanent tundra damage and changes to hydrology.

2) Grooming for airstrips causes permanent damage to the tundra. Grooming should be allowed on lakes or river ice only.

3) SAExploration promises to clean any and all fuel and oil spills, as well as remove all remnants of waste to Deadhorse. This needs to be verified and the company needs to be fined by BLM in case of any unremoved spills or waste.

4) Nonspecific citing of the decibel levels and duration of the seismic emissions is unacceptable. SAExplorations owes the American people specific information on what sounds will be transmitted and for how long. Otherwise properly evaluation of their effect on wildlife is impossible. Proposal should be resubmitted with this information and a new comment period should begin.

5) Sending seismic waves through water less than 10 feet deep is unacceptable. These waves would be transmitted through the water and damage any organism living in the water. This section should be amended to remove the exception for water less than 10 feet deep.

6) Seismic sites should avoid burrows of mammals such as Arctic ground squirrels and marmots, in addition to polar bears.

7) Biologists hired for wildlife issues must be paid by BLM or another entity, not SAExplorations. Allowing SAE to hire a biologist presents a conflict of interest. If possible, multiple biologists with different areas of expertise should be consulted including botanists and wildlife biologists.

8) SAE needs to estimate the time to recovery of all tundra damage that occurs and publically release this information after the exploration occurs.

Thank you for you time.

Julia York
(907) 460-1991
1170 Sundance Loop
Fairbanks, AK 99709

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] No Seismic Testing in the Arctic Refuge!

1 message

guyslopez <guyslopez@aol.com> Fri, Aug 17, 2018 at 7:52 AM
To: blm_ak_coastal_plain_seismic_ea@blm.gov

This is a rushed and ill-conceived plan. If it is a meritous plan, it should be vetted publically with ample time allowed; not some harebrained rush job for some private beneficiaries.

Sincerely,
Guy Lopez
Big Lake, Alaska

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

[EXTERNAL] Scoping comments for proposed SAE seismic program on the coastal plain of the Arctic National Wildlife Refuge

1 message

Francis Mauer <fmauer@mosquitonet.com>
To: blm_ak_coastal_plain_seismic_ea@blm.gov

Fri, Aug 17, 2018 at 1:54 PM

August 17, 2018

Shelly Jones

Acting District Manager

Arctic Field Office

Bureau of Land Management

222 University Ave.

Fairbanks, AK 99709

blm_ak_coastal_plain_seismic_ea@blm.gov

Submitted via e-mail

Dear Ms. Jones:

The following comments are provided in response to BLM's request for scoping comments for an environmental assessment of SAE's proposed 3-D seismic survey of the entire coastal plain of the Arctic National Wildlife Refuge.

For a period of 21 years (1981 to 2002) I worked as a wildlife biologist at the Arctic National Wildlife Refuge. During 1976 through 1980, I provided information and analysis of fish and wildlife resources of the northwest and arctic regions of Alaska for the legislative effort leading up to passage of the Alaska National Interest Lands Conservation Act. I was employed by the U.S. Fish and Wildlife Service during both of these periods. As a result I became familiar with the original purposes of the Arctic National Wildlife Range, ANILCA purposes and the wildlife, fish, and habitat values and conditions of the coastal plain and their relationship to the entire 19.6 million acre Refuge the international range of the Porcupine Caribou Herd in Canada.

Given the expansive scope (entire coastal plain), vast amount of heavy equipment and personnel involved, and the great intensity (survey line grids of 660 to 1320 feet apart) of the proposed seismic surveys, and considering the well-documented impacts of previous seismic surveys conducted in this area during the 1980's[1], it is clear that a full environmental impact statement is required according to the National Environmental Policy Act. An environmental assessment process would be inappropriate, inadequate and ill-advised.

I would like to point out a few of many major concerns regarding this proposed 3-D seismic exploration program.

Terrain and Snow cover characteristics

During the 21 years that I worked at the Refuge, I flew numerous aerial surveys for wildlife over the coastal plain during all seasons, including the winter, and am very familiar with the unique topography and weather conditions that make this area especially susceptible to impacts from seismic operations. To understand better, one must realize that in the Arctic Refuge, the Brooks Range arcs northward towards the Beaufort Sea coast resulting in a very narrow arctic coastal plain and foothills region ranging from only 12 to about 30 miles wide. The gradient of water courses flowing north to the sea is significantly greater than what is found to the west of the Refuge where distance from mountains to coast ranges from 100 to 150 miles. A steeper gradient of streams in the Refuge results in more narrow, incised valleys, all aligned on a north – south orientation These valleys are perpendicular to prevailing east and west winds that are generally of greater velocity due to the close proximity to the coast.

These features set the stage for consistently uneven snow cover over most of the Arctic Refuge coastal plain area. Exposed hill tops and river bluffs are often nearly bare of snow, and deep snow accumulations are found in stream bottoms. Thus the resulting snow cover patterns during

winter on the Refuge coastal plain are a complex maze of bare ground or very shallow snow cover intermingled with deep snow in the complicated branches of water tracks leading to stream and river valleys.

During 21 years of winter field work in the Refuge, I have observed this complicated pattern of snow cover to occur nearly every year. Consistently adequate snow cover that is deemed sufficient to minimize impacts of seismic operations do not exist in the Arctic Refuge. This situation is starkly different from that which is generally the found to the west where oil exploration and development occurs on State lands and in the NPRA. I believe it would be a grave error of judgement to assume that snow cover conditions found to the west of the Refuge that are familiar to industry and government regulators is the case in the Arctic Refuge. It clearly is not.

Whatever environmental analysis process that is followed (EA or EIS) must include an honest and thorough appraisal of potential impacts that are associated with the very different physical environment of the coastal plain of the Arctic Refuge. It will be essential to consider the history of 2-D seismic surveys that were conducted in the Refuge during 1983-84 and recognize the impacts that occurred. Impacts resulting from the 2-D seismic surveys have been monitored at regular intervals during the past 34 years, and some impacts remain to this date.

Your analysis must include the great expanse and intensity of the proposed 3-D seismic program, and acknowledge the impossibility of negotiating the complex labyrinth of uneven snow cover in the Refuge by heavy seismic vehicles, tractors and bulldozers pulling camp facilities. It must include both qualitative and quantitative aspects of potential impacts to vegetation, soils, water, fish and wildlife habitat, visual aspects, wilderness and recreational values. For example, your analysis must address both qualitative and quantitative impacts due to damage of vegetation such as *Eriophorum vaginatum*, which is critical food for lactating female caribou on the calving grounds of the Porcupine Caribou Herd.

Protection of denning polar bears

The special terrain and snow cover features in the Arctic Refuge coastal plain that are described above are also the most heavily used maternal denning habitat for polar bears in all of Alaska. The early fall accumulation of snow in the stream and river valleys of the Refuge coastal plain allow for pregnant female polar bears to excavate and occupy their dens in October where they give birth to young during December, and remain until March. Disturbance from seismic exploration activity has been known to cause premature evacuation of dens by maternal female polar bears and jeopardize survival of young cubs.

While the use of forward looking infra-red radar (flir) to locate maternal dens prior to initiating winter seismic operations may be helpful, there are several limitations to the efficacy of this technique.[2] Some limitations include difficult weather conditions during fall and early winter that often preclude flight operations necessary to search for maternal dens. Blowing snow and wind can interfere with establishing a clear thermal signature that is necessary to establish den locations. Dens in deep snow and the insulation of the bear's fur can prevent identifying a clear thermal signature. The complex array of water tracks and stream courses where there is sufficient snow depth for dens in the Arctic Refuge make it difficult to effectively achieve complete searches for polar bear dens.

Your environmental analysis must provide an honest, objective assessment of the limitations of flir technology, and properly appraise the potential impacts to polar bears that may occur from this intensive 3-D seismic program. The information currently provided by BLM and the permit applicants is woefully inadequate determine actual impacts to polar bears. Furthermore, the analysis must acknowledge that amount of onshore denning by polar bears is increasing because of thin, unstable ice conditions related to climate warming in the Arctic, and therefore, the significance of onshore denning by polar bears on the coastal plain of the Refuge is increasing.

Impacts of Water Use

-

Another consequence of terrain and topographic differences between the Refuge coastal plain and areas to the west, where oil industry has operated for decades, is the markedly lower availability of water during the winter season. For example, winter water availability in the coastal plain of the Refuge is less than one-tenth of that found in the north eastern portion of the NPRA. Also due to proximity of mountains to the coastal plain in the Arctic Refuge, the presence of perennial springs is much greater that for the areas to the west. Many of these springs in the Refuge provide overwinter habitat for fish, some of which are endemic to a single spring area. Springs such as Sadlerochit Spring also support unique plant communities, invertebrate species, birds such as the American dipper that remain year-round, and provide habitat for river otters. The plan provided by SAE and the BLM do not indicate what, if any measures will be used to avoid impacting these sensitive spring areas. Your analysis must address the many issues surrounding water use and the impacts of seismic operations to these vital resources.

Wilderness and recreational values

-

An objective environmental analysis of potential impacts to visual aesthetics such as long lasting scars on the tundra environments of the coastal plain resulting from the proposed action must also be presented. The purposes of the original Arctic National Wildlife Range included preservation of wildlife, wilderness and recreational values. Your analysis must address how these purposed may be violated by the 3-D seismic survey. In addition, all of the lands immediately south and east of the coastal plain are designated as wilderness according to the Wilderness Act of 1964.

These lands to the south are higher in elevation and thus, scars to the tundra vegetation and soils will be highly visible from a vast area within the designated Wilderness. The effects of visual impacts on wilderness values and recreation visitors must be explained and analyzed.

Alternatives

A full range of alternatives, including the no action option must be analyzed. Various alternatives limiting the size and location of areas to be surveyed should be provided. For example, an alternative to limit the proposed action to native corporation lands only, should be evaluated.

Thank you for the opportunity to provide these additional scoping comments. Please realize that these comments are not all inclusive, but are aimed to encourage an honest appraisal of this very important issue.

Sincerely,

Fran Mauer

Alaska Rep for Wilderness Watch

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[1] Jorgenson, J.C, J.M. VerHoef, and M.T. Jorgenson. (2010). Long-term recovery patterns of arctic tundra after winter seismic exploration. Ecological Applications, 20(1): 205-221.

[2] Amstrup, S.C., G.York, T.L. McDonald, R. Nielson, and K. Simac. (2004). Detecting denning polar bears with forward looking infra-red (FLIR) imagery. BioScience 54(4): 337-344.

Wixon, Donna <dwixon@blm.gov>

[EXTERNAL] Comments to BLM's, EA for seismic surveys within the Actic National Wildlife Refuge

1 message

Don Ross <evrevross01@gmail.com> Thu, Aug 16, 2018 at 2:09 PM
To: dwixon@blm.gov

I worked for the US Fish and Wildlife Service on the staff of the Arctic Refuge as an Assistant Manager/Pilot from 1976, until 1984 participating in reconnaissance snow surveys for the seismic program that was then undertaken. For many years thereafter operated an air taxi service within the Refuge based out of Ft. Yukon.

- Having flown both over and outside of the Refuge it is obvious to even the casual observer that oil developments and seismic exploration have had profound, detrimental and long lasting impacts on the land outside the Refuge. Within the Refuge I observed a partial healing of the landscape from the seismic surveys that occurred in the mid-80's but I also saw with great sadness and regret that in those areas where snow cover was inadequate the changes to the landscape were in some cases starkly apparent and permanent. And this survey was done with five mile grid spacing and not the intensive closely spaced grids and track lines of a 3D program. The point of all this and Professor Skip Walker in his comments points this out is that in essence there is no level of disturbance from vehicular travel over the tundra despite snow cover that will not have some impact from compaction and disruption of the delicate thermal balance of the underlying permafrost. When you couple this with the variability of terrain and snow cover and based on what has happened before within and without the Refuge a ground based survey will result in major and long lasting and likely permanent scarification of this unique landscape. To conclude that a ground based seismic program will not have significant degrading impacts on what remains as a virtually pristine landscape is disingenuous and irresponsible. An EA does not measure up to the kind of analysis that an EIS would give and is inadequate.

Steel runnered sleds and dozers have been used in the past to haul camps around in support of the DEW Line in the 50's and later the seismic survey done in the 80's. Some of these rutted trails are still visible and permanent changes to the landscape.

In other sensitive places where the impacts to the land have been judged to be severe and degrading oil companies have been compelled to conduct these surveys from the air. Studies and the experience this writer, Professor Walker and others have concluded that impacts of an intensive seismic survey of the type proposed will result in degradation of the landscape. It will in the end destroy for all time what is now a virtually pristine place and the last of its kind on the North Slope of Alaska.

An aerial seismic survey is a feasible alternative that would avoid degrading impacts. It would likely cost more in one sense but less than what taking the long view would be permanently and forever lost to future generation. Its requirement and use in this instance should be thoroughly evaluated in an EIS.

It is a sad day indeed for many of us when places like this are not given a greater value for their benefit to the human spirit instead of to someone's "bottom line."

And that brings up another point that needs to be brought to the fore and that is an evaluation of what will be lost in the long term versus what will be gained in the short run. And this analysis needs to be more than just a superficial examination of the economics using traditional models but one that takes into account the environmental services provided by a wilderness place to mankind and the wildlife that depend on it, those intangible and aesthetic values that money cannot buy but are nonetheless priceless. My impression is that there are models that do just this.

The Arctic Refuge is regarded as a sacred place by many as well as the Gwitchin who self identify as caribou people and depend on caribou for their survival both physically and psychologically. Their concerns and desires have been ignored but need to be brought to the fore in any assessment of impacts to the land, wildlife and people.

Don Ross
2532 Roland Road
Fairbanks, AK 99709

907 479-3792

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Invitation: TED: Geophysical @ Mon Aug 20, 2018 1:30pm - 2pm (AKDT) (nheath@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:20 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Leslie Rosenberger** <lrosenberger@blm.gov>
Date: Mon, Aug 20, 2018 at 11:35 AM
Subject: Invitation: TED: Geophysical @ Mon Aug 20, 2018 1:30pm - 2pm (AKDT) (nheath@blm.gov)
To: <nheath@blm.gov>, <t75murph@blm.gov>, <rbrumbau@blm.gov>, <ctburns@blm.gov>

TED: Geophysical

more details »

Scheduled by Leslie R. 8/20 @ 11:35 am per Ted's request.

When	Mon Aug 20, 2018 1:30pm – 2pm Alaska Time - Anchorage
Where	Ted's office (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/lrosenberger
Calendar	nheath@blm.gov
Who	• lrosenberger@blm.gov - organizer, optional • t75murph@blm.gov • nheath@blm.gov • rbrumbau@blm.gov • ctburns@blm.gov

Going? **Yes** - **Maybe** - **No** more options »

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Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: SAE

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:19 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Brumbaugh, Robert** <rbrumbau@blm.gov>
Date: Mon, Aug 20, 2018 at 2:04 PM
Subject: SAE
To: Nolan Heath <nheath@blm.gov>
Cc: Casey Burns <ctburns@blm.gov>

Nolan,
Rick Trupp is out on a business meeting this week. I called his cell and left him voice mail to call be back as soon as possible.

--
Rob Brumbaugh
BLM-Alaska Oil and Gas Section Chief
Division of Resources
Bureau of Land Management
222 W 7th Ave., Ste 13
Anchorage, AK 99513
907-271-4429

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Invitation: Discussion with SAE @ Wed Aug 22, 2018 9:30am - 10:30am (AKDT) (nheath@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:16 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Robert Brumbaugh** <rbrumbau@blm.gov>
Date: Tue, Aug 21, 2018 at 11:35 AM
Subject: Invitation: Discussion with SAE @ Wed Aug 22, 2018 9:30am - 10:30am (AKDT) (nheath@blm.gov)
To: <nheath@blm.gov>, <ctburns@blm.gov>
Cc: <t75murph@blm.gov>, <craig.perham@boem.gov>

Discussion with SAE

more details »

When	Wed Aug 22, 2018 9:30am – 10:30am Alaska Time - Anchorage
Where	BLM-AK SO Kodiak A Room (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/rbrumbau
Calendar	nheath@blm.gov
Who	• rbrumbau@blm.gov - organizer • ctburns@blm.gov • nheath@blm.gov • t75murph@blm.gov - optional • craig.perham@boem.gov - optional

Going? **Yes** - **Maybe** - **No** more options »

Invitation from Google Calendar

You are receiving this email at the account nheath@blm.gov because you are subscribed for invitations on calendar nheath@blm.gov.

To stop receiving these emails, please log in to https://www.google.com/calendar/ and change your notification settings for this calendar.

Forwarding this invitation could allow any recipient to modify your RSVP response. Learn More.

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Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Invitation: TED: SAE Discussion @ Wed Aug 22, 2018 8:30am - 9am (AKDT) (nheath@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:15 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Eileen Frost** <efrost@blm.gov>
Date: Tue, Aug 21, 2018 at 4:11 PM
Subject: Invitation: TED: SAE Discussion @ Wed Aug 22, 2018 8:30am - 9am (AKDT) (nheath@blm.gov)
To: <nheath@blm.gov>, <rellefso@blm.gov>, <t75murph@blm.gov>, <ctburns@blm.gov>

TED: SAE Discussion

more details »

Scheduled at Ted's request 8/21 4:11 pm ~E

When	Wed Aug 22, 2018 8:30am – 9am Alaska Time - Anchorage
Where	BLM-AK SD State Directors Conference Room (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/efrost
Calendar	nheath@blm.gov
Who	• efrost@blm.gov - organizer • nheath@blm.gov • rellefso@blm.gov • t75murph@blm.gov • ctburns@blm.gov

Going? **Yes** - **Maybe** - **No** more options »

Invitation from Google Calendar

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Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Meeting with SAE

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:16 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Brumbaugh, Robert** <rbrumbau@blm.gov>
Date: Tue, Aug 21, 2018 at 11:34 AM
Subject: Meeting with SAE
To: Casey Burns <ctburns@blm.gov>
Cc: Perham, Craig <craig.perham@boem.gov>, Nolan Heath <nheath@blm.gov>, Ted Murphy <t75murph@blm.gov>

I'm working with Jeff Hastings (CEO) on setting up a meting with SAE to come over here tomorrow at 9:30 to answer questions we may have about the operations and ringed seals. SAE plans to send us some info on previous operations and approvals from NMFS to look at prior to the meeting. Jeff mentioned we could extend the invitation to NMFS folks if they are interested. Kodiak A is booked.

--
Rob Brumbaugh
BLM-Alaska Oil and Gas Section Chief
Division of Resources
Bureau of Land Management
222 W 7th Ave., Ste 13
Anchorage, AK 99513
907-271-4429

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Updated invitation: Discussion with SAE @ Wed Aug 22, 2018 9:30am - 10:30am (AKDT) (nheath@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:15 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Robert Brumbaugh** <rbrumbau@blm.gov>
Date: Tue, Aug 21, 2018 at 3:41 PM
Subject: Updated invitation: Discussion with SAE @ Wed Aug 22, 2018 9:30am - 10:30am (AKDT) (nheath@blm.gov)
To: <nheath@blm.gov>, <dwixon@blm.gov>, <slamarr@blm.gov>, <greg.balogh@noaa.gov>, <ctburns@blm.gov>, <njones@blm.gov>
Cc: <t75murph@blm.gov>, <craig.perham@boem.gov>

This event has been changed.

Discussion with SAE

more details »

Changed: SAE will come to the federal building at 9:30 tomorrow morning, call-in number provided. We will be discussing ringed seals with a focus on seismic activities in the lagoonal areas (timing of seismic and noise level). A representative from NMFS may be present.

When	Wed Aug 22, 2018 9:30am – 10:30am Alaska Time - Anchorage
Where	**Changed:** BLM-AK SO Bridge [redacted], BLM-AK SO Kodiak A Room (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/rbrumbau
Calendar	nheath@blm.gov
Who	• rbrumbau@blm.gov - organizer • dwixon@blm.gov • slamarr@blm.gov • nheath@blm.gov • greg.balogh@noaa.gov • ctburns@blm.gov • njones@blm.gov • t75murph@blm.gov - optional • craig.perham@boem.gov - optional

Going? **Yes** - **Maybe** - **No** more options »

Invitation from Google Calendar

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Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Invitation: TED: Discussion with SAE @ Thu Aug 23, 2018 10am - 11am (AKDT) (nheath@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:11 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Eileen Frost** <efrost@blm.gov>
Date: Wed, Aug 22, 2018 at 4:40 PM
Subject: Invitation: TED: Discussion with SAE @ Thu Aug 23, 2018 10am - 11am (AKDT) (nheath@blm.gov)
To: <nheath@blm.gov>, <lrosenberger@blm.gov>, <t75murph@blm.gov>, <jhastings@usbr.gov>, <rtrupp@saexploration.com>, <njones@blm.gov>

TED: Discussion with SAE

more details »

Scheduled at the request of Mr. Murphy 8/22 4:30 pm ~E

When	Thu Aug 23, 2018 10am – 11am Alaska Time - Anchorage
Where	BLM-AK SO Bridge [redacted], BLM-AK SO Kodiak A Room (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/efrost
Calendar	nheath@blm.gov
Who	• efrost@blm.gov - organizer • lrosenberger@blm.gov • t75murph@blm.gov • jhastings@usbr.gov • rtrupp@saexploration.com • njones@blm.gov • nheath@blm.gov

Going? **Yes** - **Maybe** - **No** more options »

Invitation from Google Calendar

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invite.ics
3K

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: SAE MEETING ON CULTURAL

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:11 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Ted Murphy** <t75murph@blm.gov>
Date: Wed, Aug 22, 2018 at 3:37 PM
Subject: SAE MEETING ON CULTURAL
To: <rbrumbau@blm.gov>, <lrosenberger@blm.gov>, <nheath@blm.gov>, Shelly W Jacobson <njones@blm.gov>

Leslie

Would you reach out to Jeff Hastings at SAE for tomorrow at 10:00.

Thanks, Ted

Sent from my iPhone

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: [EXTERNAL] RE: Can you guys make time to talk about snow monitoring with me tomorrow

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:05 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Head, Melissa M (DNR)** <melissa.head@alaska.gov>
Date: Mon, Aug 27, 2018 at 11:42 AM
Subject: [EXTERNAL] RE: Can you guys make time to talk about snow monitoring with me tomorrow
To: Vosburgh, Timothy <tvosburgh@blm.gov>, Geisler, Eric <egeisler@blm.gov>
Cc: Jones, Nichelle (Shelly) <njones@blm.gov>, Guyer, Scott <sguyer@blm.gov>, Nolan Heath <nheath@blm.gov>, Paul Leonard <paul_leonard@fws.gov>, Joseph Keeney <jkeeney@blm.gov>

I am available tomorrow and then out of the office for a week. Right now, morning looks better for me.

Kind Regards,

Melissa

Melissa Head

Manager, Northern Oil & Gas Team

DNR/DMLW

907-451-2719

From: Vosburgh, Timothy [mailto:tvosburgh@blm.gov]
Sent: Monday, August 27, 2018 11:37 AM
To: Geisler, Eric <egeisler@blm.gov>
Cc: Jones, Nichelle (Shelly) <njones@blm.gov>; Guyer, Scott <sguyer@blm.gov>; Nolan Heath <nheath@blm.gov>; Paul Leonard <paul_leonard@fws.gov>; Head, Melissa M (DNR) <melissa.head@alaska.gov>; Joseph Keeney <jkeeney@blm.gov>
Subject: Re: Can you guys make time to talk about snow monitoring with me tomorrow

I'm available any time tomorrow.

Tim

On Mon, Aug 27, 2018 at 11:34 AM, Geisler, Eric <egeisler@blm.gov> wrote:

> Eric is available in the morning **except** for !0- 11 AM
>
> Eric Geisler, CF
>
> Program Lead for Forestry, Invasive Species, Range, Botany, ES&R
>
> BLM Alaska State Office
>
> 222 W 7th Ave #13
>
> Anchorage, AK 99513

W 907-271-1985

C 509-220-4712

On Mon, Aug 27, 2018 at 11:31 AM, Jones, Nichelle (Shelly) <njones@blm.gov> wrote:

> Hey All: I am hoping to get you guys to get together to have a meeting with me sometime early this week (like maybe tomorrow or Wed. if you are available), so I can get a better idea of your thoughts on the adequacy of the existing snow monitoring that is being done by DNR and others on the north slope, combined with what is being proposed by the applicant during their scouting surveys to inform the seismic EA we are working on.
>
> I am not sure exactly how the pre-packing and advance scouting is done in areas that might not yet be open. Perhaps this is why a certain amount of baseline monitoring would be needed even to inform the use by the low ground pressure vehicles?
>
> I would like to have a recommendation on whether additional monitoring would be beneficial an d if so, what and how much.
>
> I will also try to get more information from the applicant on how and when the front end loaders and D-7s are utilized to see if there are additional stips necessary to try to insure that they are not employed in situations that will actually lead to creating the impacts they are trying to avoid (damaging ridge tops and river crossings)
>
> I would like know if you have any advice or thoughts on how the applicant could avoid or cross the extensive historically low snow areas, steep terrain and river crossings without damaging them. Has anyone had time yet to review the FWS map on the low snow areas? I have heard they are extensive.
>
> I am curious if the NSB or anyone tracks the amount of tundra damage that does occur each year from permitted activities and whether they would have an opinion on what the standard or normal/acceptable level of damage is.
>
> Sorry this is a bit of a rant. I know everyone is crazy busy, but I will send out an invite to see if I can corner you tomorrow afternoon to discuss with me. If you know you wont be available, I would still appreciate your thoughts in an email.
>
> -Shelly
>
> Shelly Jones
>
> Acting Manager
>
> Arctic District Office
>
> 222 University Avenue
>
> Fairbanks, AK 99709
>
> (907) 474-2310 (w)
>
> (907) 460-0086 (c)

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Can you guys make time to talk about snow monitoring with me tomorrow

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:01 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Guyer, Scott** <sguyer@blm.gov>
Date: Mon, Aug 27, 2018 at 2:52 PM
Subject: Re: Can you guys make time to talk about snow monitoring with me tomorrow
To: Jones, Nichelle (Shelly) <njones@blm.gov>
Cc: Eric Geisler <egeisler@blm.gov>, Nolan Heath <nheath@blm.gov>, Timothy Vosburgh <tvosburgh@blm.gov>

Shelly- Sounds good are you going to send out a meeting invitation with a call in phone #? Thanks!

Scott

On Mon, Aug 27, 2018 at 12:57 PM, Jones, Nichelle (Shelly) <njones@blm.gov> wrote:
> No mutually agreeable times. I will meet with Melissa and Tim Vosburg and Scott at 10 am tomorrow and if anything comes of it we'll let you know
>
> Shelly Jones
> Acting Manager
> Arctic District Office
> 222 University Avenue
> Fairbanks, AK 99709
>
> (907) 474-2310 (w)
> (907) 460-0086 (c)
>
> On Mon, Aug 27, 2018 at 11:45 AM, Guyer, Scott <sguyer@blm.gov> wrote:
> > I am available tomorrow before 11am, then 3-4:30. Wednesday all day.
> >
> > Scott
> >
> > On Mon, Aug 27, 2018 at 11:31 AM, Jones, Nichelle (Shelly) <njones@blm.gov> wrote:
> > > Hey All: I am hoping to get you guys to get together to have a meeting with me sometime early this week (like maybe tomorrow or Wed. if you are available), so I can get a better idea of your thoughts on the adequacy of the existing snow monitoring that is being done by DNR and others on the north slope, combined with what is being proposed by the applicant during their scouting surveys to inform the seismic EA we are working on.
> > >
> > > I am not sure exactly how the pre-packing and advance scouting is done in areas that might not yet be open. Perhaps this is why a certain amount of baseline monitoring would be needed even to inform the use by the low ground pressure vehicles?
> > >
> > > I would like to have a recommendation on whether additional monitoring would be beneficial an d if so, what and how much.
> > >
> > > I will also try to get more information from the applicant on how and when the front end loaders and D-7s are utilized to see if there are additional stips necessary to try to insure that they are not employed in situations that will actually lead to creating the impacts they are trying to avoid (damaging ridge tops and river crossings)
> > >
> > > I would like know if you have any advice or thoughts on how the applicant could avoid or cross the extensive historically low snow areas, steep terrain and river crossings without damaging them. Has anyone had time yet to review the FWS map on the low snow areas? I have heard they are extensive.
> > >
> > > I am curious if the NSB or anyone tracks the amount of tundra damage that does occur each year from permitted activities and whether they would have an opinion on what the standard or normal/acceptable level of damage is.
> > >
> > > Sorry this is a bit of a rant. I know everyone is crazy busy, but I will send out an invite to see if I can corner you tomorrow afternoon to discuss with me. If you know you wont be available, I would still appreciate your thoughts in an email.
> > >
> > > -Shelly
> > >
> > > Shelly Jones
> > > Acting Manager
> > > Arctic District Office
> > > 222 University Avenue
> > > Fairbanks, AK 99709

(907) 474-2310 (w)
(907) 460-0086 (c)

--
Scott Guyer
Landscape Initiatives Coordinator
Alaska State Office
907-223-6759 (wk cell)

"Not the victory but the action, Not the goal but the game,
In the deed the Glory!"

--
Scott Guyer
Landscape Initiatives Coordinator
Alaska State Office
907-223-6759 (wk cell)

"Not the victory but the action, Not the goal but the game,
In the deed the Glory!"

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Can you guys make time to talk about snow monitoring with me tomorrow

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:01 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Jones, Nichelle (Shelly)** <njones@blm.gov>
Date: Mon, Aug 27, 2018 at 3:53 PM
Subject: Re: Can you guys make time to talk about snow monitoring with me tomorrow
To: Guyer, Scott <sguyer@blm.gov>
Cc: Eric Geisler <egeisler@blm.gov>, Nolan Heath <nheath@blm.gov>, Timothy Vosburgh <tvosburgh@blm.gov>

No. Maybe you can set that up or I will call you at your desk

Shelly Jones
Acting Manager
Arctic District Office
222 University Avenue
Fairbanks, AK 99709

(907) 474-2310 (w)
(907) 460-0086 (c)

On Mon, Aug 27, 2018 at 2:52 PM, Guyer, Scott <sguyer@blm.gov> wrote:
> Shelly- Sounds good are you going to send out a meeting invitation with a call in phone #? Thanks!
>
> Scott
>
> On Mon, Aug 27, 2018 at 12:57 PM, Jones, Nichelle (Shelly) <njones@blm.gov> wrote:
> > No mutually agreeable times. I will meet with Melissa and Tim Vosburg and Scott at 10 am tomorrow and if anything comes of it we'll let you know
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> > Shelly Jones
> > Acting Manager
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> > On Mon, Aug 27, 2018 at 11:45 AM, Guyer, Scott <sguyer@blm.gov> wrote:
> > > I am available tomorrow before 11am, then 3-4:30. Wednesday all day.
> > >
> > > Scott
> > >
> > > On Mon, Aug 27, 2018 at 11:31 AM, Jones, Nichelle (Shelly) <njones@blm.gov> wrote:
> > > > Hey All: I am hoping to get you guys to get together to have a meeting with me sometime early this week (like maybe tomorrow or Wed. if you are available), so I can get a better idea of your thoughts on the adequacy of the existing snow monitoring that is being done by DNR and others on the north slope, combined with what is being proposed by the applicant during their scouting surveys to inform the seismic EA we are working on.
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> > > > I would like know if you have any advice or thoughts on how the applicant could avoid or cross the extensive historically low snow areas, steep terrain and river crossings without damaging them. Has anyone had time yet to review the FWS map on the low snow areas? I have heard they are extensive.

I am curious if the NSB or anyone tracks the amount of tundra damage that does occur each year from permitted activities and whether they would have an opinion on what the standard or normal/acceptable level of damage is.

Sorry this is a bit of a rant. I know everyone is crazy busy, but I will send out an invite to see if I can corner you tomorrow afternoon to discuss with me. If you know you wont be available, I would still appreciate your thoughts in an email.

-Shelly

Shelly Jones
Acting Manager
Arctic District Office
222 University Avenue
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(907) 474-2310 (w)
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--
Scott Guyer
Landscape Initiatives Coordinator
Alaska State Office
907-223-6759 (wk cell)

"Not the victory but the action, Not the goal but the game,
In the deed the Glory!"

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Scott Guyer
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Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Can you guys make time to talk about snow monitoring with me tomorrow

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:00 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Jones, Nichelle (Shelly)** <njones@blm.gov>
Date: Mon, Aug 27, 2018 at 3:54 PM
Subject: Re: Can you guys make time to talk about snow monitoring with me tomorrow
To: Guyer, Scott <sguyer@blm.gov>
Cc: Eric Geisler <egeisler@blm.gov>, Nolan Heath <nheath@blm.gov>, Timothy Vosburgh <tvosburgh@blm.gov>

Also, If Melissa Head does not confirm, I will be cancelling this meeting.

Shelly Jones
Acting Manager
Arctic District Office
222 University Avenue
Fairbanks, AK 99709

(907) 474-2310 (w)
(907) 460-0086 (c)

On Mon, Aug 27, 2018 at 2:52 PM, Guyer, Scott <sguyer@blm.gov> wrote:
> Shelly- Sounds good are you going to send out a meeting invitation with a call in phone #? Thanks!
>
> Scott
>
> On Mon, Aug 27, 2018 at 12:57 PM, Jones, Nichelle (Shelly) <njones@blm.gov> wrote:
> > No mutually agreeable times. I will meet with Melissa and Tim Vosburg and Scott at 10 am tomorrow and if anything comes of it we'll let you know
> >
> > Shelly Jones
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> > Arctic District Office
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> > (907) 474-2310 (w)
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> > On Mon, Aug 27, 2018 at 11:45 AM, Guyer, Scott <sguyer@blm.gov> wrote:
> > > I am available tomorrow before 11am, then 3-4:30. Wednesday all day.
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> > > Scott
> > >
> > > On Mon, Aug 27, 2018 at 11:31 AM, Jones, Nichelle (Shelly) <njones@blm.gov> wrote:
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I am curious if the NSB or anyone tracks the amount of tundra damage that does occur each year from permitted activities and whether they would have an opinion on what the standard or normal/acceptable level of damage is.

Sorry this is a bit of a rant. I know everyone is crazy busy, but I will send out an invite to see if I can corner you tomorrow afternoon to discuss with me. If you know you wont be available, I would still appreciate your thoughts in an email.

-Shelly

Shelly Jones
Acting Manager
Arctic District Office
222 University Avenue
Fairbanks, AK 99709

(907) 474-2310 (w)
(907) 460-0086 (c)

--
Scott Guyer
Landscape Initiatives Coordinator
Alaska State Office
907-223-6759 (wk cell)

"Not the victory but the action, Not the goal but the game,
In the deed the Glory!"

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Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Can you guys make time to talk about snow monitoring with me tomorrow

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:05 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Jones, Nichelle (Shelly)** <njones@blm.gov>
Date: Mon, Aug 27, 2018 at 12:58 PM
Subject: Re: Can you guys make time to talk about snow monitoring with me tomorrow
To: Guyer, Scott <sguyer@blm.gov>
Cc: Eric Geisler <egeisler@blm.gov>, Nolan Heath <nheath@blm.gov>, Timothy Vosburgh <tvosburgh@blm.gov>

No mutually agreeable times. I will meet with Melissa and Tim Vosburg and Scott at 10 am tomorrow and if anything comes of it we'll let you know

Shelly Jones
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On Mon, Aug 27, 2018 at 11:45 AM, Guyer, Scott <sguyer@blm.gov> wrote:
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Scott Guyer

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Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Can you guys make time to talk about snow monitoring with me tomorrow

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:05 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Guyer, Scott** <sguyer@blm.gov>
Date: Mon, Aug 27, 2018 at 11:45 AM
Subject: Re: Can you guys make time to talk about snow monitoring with me tomorrow
To: Jones, Nichelle (Shelly) <njones@blm.gov>
Cc: Eric Geisler <egeisler@blm.gov>, Nolan Heath <nheath@blm.gov>, Paul Leonard <paul_leonard@fws.gov>, <melissa.head@alaska.gov>, Timothy Vosburgh <tvosburgh@blm.gov>, Joseph Keeney <jkeeney@blm.gov>

I am available tomorrow before 11am, then 3-4:30. Wednesday all day.

Scott

On Mon, Aug 27, 2018 at 11:31 AM, Jones, Nichelle (Shelly) <njones@blm.gov> wrote:

> Hey All: I am hoping to get you guys to get together to have a meeting with me sometime early this week (like maybe tomorrow or Wed. if you are available), so I can get a better idea of your thoughts on the adequacy of the existing snow monitoring that is being done by DNR and others on the north slope, combined with what is being proposed by the applicant during their scouting surveys to inform the seismic EA we are working on.
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Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Can you guys make time to talk about snow monitoring with me tomorrow

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:05 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Jones, Nichelle (Shelly)** <njones@blm.gov>
Date: Mon, Aug 27, 2018 at 11:59 AM
Subject: Re: Can you guys make time to talk about snow monitoring with me tomorrow
To: Guyer, Scott <sguyer@blm.gov>
Cc: Eric Geisler <egeisler@blm.gov>, Nolan Heath <nheath@blm.gov>

In order to meet with Melissa Head, I will have to pick a time tomorrow morning that makes one or bot of you miss the meeting. I think I will propose this meeting at 10am and if we are still meeting at 11 Eric can join us or I will fill him in.

Shelly Jones
Acting Manager
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Fairbanks, AK 99709

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On Mon, Aug 27, 2018 at 11:45 AM, Guyer, Scott <sguyer@blm.gov> wrote:

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> Scott
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Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Can you guys make time to talk about snow monitoring with me tomorrow

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:02 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Guyer, Scott** <sguyer@blm.gov>
Date: Mon, Aug 27, 2018 at 2:50 PM
Subject: Re: Can you guys make time to talk about snow monitoring with me tomorrow
To: Jones, Nichelle (Shelly) <njones@blm.gov>
Cc: Eric Geisler <egeisler@blm.gov>, Nolan Heath <nheath@blm.gov>

10 am works for me!

Scott

On Mon, Aug 27, 2018 at 11:58 AM, Jones, Nichelle (Shelly) <njones@blm.gov> wrote:
> In order to meet with Melissa Head, I will have to pick a time tomorrow morning that makes one or bot of you miss the meeting. I think I will propose this meeting at 10am and if we are still meeting at 11 Eric can join us or I will fill him in.
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Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Seismic Demo

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:03 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Burns, Casey** <ctburns@blm.gov>
Date: Mon, Aug 27, 2018 at 2:01 PM
Subject: Seismic Demo
To: Robert Ellefson <rellefso@blm.gov>
Cc: Nolan Heath <nheath@blm.gov>

Hi Rob,

If we want someone to represent the BLM SO, I recommend Craig Perham. Craig is on loan to us from BOEM and has worked on the sound issues with ringed seal closely with me. He has 20 years of experience as a biologist on oil work on the north slope, so he does not need to see a demo of the equipment, but he would be a good person to assist in the verification of the airborne sound attenuation and report back to us.

Craig's cell: 907-440-1320 and email: craig.perham@boem.gov

Casey

><-><-><-><-><-><-><-><-><-><-><-><-><-><
Casey Burns
Wildlife and Threatened & Endangered Species Lead
Bureau of Land Management - Alaska
(907) 271-3128
><-><-><-><-><-><-><-><-><-><-><-><-><-><

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Can you guys make time to talk about snow monitoring with me tomorrow

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:57 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Keeney, Joseph** <jkeeney@blm.gov>
Date: Wed, Aug 29, 2018 at 11:54 AM
Subject: Re: Can you guys make time to talk about snow monitoring with me tomorrow
To: Guyer, Scott <sguyer@blm.gov>
Cc: Jones, Nichelle (Shelly) <njones@blm.gov>, Eric Geisler <egeisler@blm.gov>, Nolan Heath <nheath@blm.gov>, Paul Leonard <paul_leonard@fws.gov>, <melissa.head@alaska.gov>, Timothy Vosburgh <tvosburgh@blm.gov>

I am available today through the rest of the week

On Mon, Aug 27, 2018 at 11:45 AM, Guyer, Scott <sguyer@blm.gov> wrote:

> I am available tomorrow before 11am, then 3-4:30. Wednesday all day.
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> Scott
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> On Mon, Aug 27, 2018 at 11:31 AM, Jones, Nichelle (Shelly) <njones@blm.gov> wrote:
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Scott Guyer
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--
Joe Keeney
Archaeologist
BLM Arctic District Office
222 University Avenue
Fairbanks, Alaska 99709
907-474-2312
jkeeney@blm.gov

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Invitation: Meeting to discuss proposed seismic requirements @ Tue Sep 4, 2018 10am - 12:30pm (AKDT) (njones@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:49 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Jones, Nichelle (Shelly)** <njones@blm.gov>
Date: Tue, Sep 4, 2018 at 9:41 AM
Subject: Fwd: Invitation: Meeting to discuss proposed seismic requirements @ Tue Sep 4, 2018 10am - 12:30pm (AKDT) (njones@blm.gov)
To: Nolan Heath <nheath@blm.gov>

Shelly Jones
Acting Manager
Arctic District Office
222 University Avenue
Fairbanks, AK 99709

(907) 474-2310 (w)
(907) 460-0086 (c)

---------- Forwarded message ----------
From: **Donna Wixon** <dwixon@blm.gov>
Date: Tue, Sep 4, 2018 at 7:34 AM
Subject: Invitation: Meeting to discuss proposed seismic requirements @ Tue Sep 4, 2018 10am - 12:30pm (AKDT) (njones@blm.gov)
To: njones@blm.gov, rbrumbau@blm.gov, t75murph@blm.gov, timm@asrc.com, rtrupp@saexploration.com, slamarr@blm.gov, jhastings@saexploration.com

Meeting to discuss proposed seismic requirements

more details »

Please call into the attached phone bridge number. Thank-you.

When	Tue Sep 4, 2018 10am – 12:30pm Alaska Time - Anchorage
Where	BLM-AK FDO Bridge [redacted] (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/dwixon
Calendar	njones@blm.gov
Who	• dwixon@blm.gov - organizer • rbrumbau@blm.gov • t75murph@blm.gov • njones@blm.gov • timm@asrc.com • rtrupp@saexploration.com • slamarr@blm.gov • jhastings@saexploration.com

Going? **Yes** - **Maybe** - **No** more options »

invite.ics
3K

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: DNR Snow Monitoring protocols

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:40 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Geisler, Eric** <egeisler@blm.gov>
Date: Wed, Sep 5, 2018 at 4:49 PM
Subject: DNR Snow Monitoring protocols
To: <melissa.head@alaska.gov>
Cc: Shelly Jacobson <njones@blm.gov>, Nolan Heath <nheath@blm.gov>

Melissa

! really appreciated your input last week on the DNR snow measurements for the Coastal Plain Seismic EA.

Can you please describe how you record, use and interpret the snow density and snow structure or crystal form/size information the state collects. We are trying to incorporate the more comprehensive suite of information in the EA and need to be able to explain how it gets used by DNR to make decisions.

I see that the contractors are only required to measure depth for state projects.

Also do you know where the 3" SWE recommendations come from. Who put forth that idea?

Eric Geisler, CF
Program Lead for Forestry, Invasive Species, Range, Botany, ES&R
BLM Alaska State Office
222 W 7th Ave #13
Anchorage, AK 99513
W 907-271-1985
C 509-220-4712

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Updated invitation: Coastal Plain EA Call @ Wed Sep 5, 2018 8:30am - 9am (AKDT) (nheath@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:47 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Ted Murphy** <t75murph@blm.gov>
Date: Wed, Sep 5, 2018 at 7:26 AM
Subject: Updated invitation: Coastal Plain EA Call @ Wed Sep 5, 2018 8:30am - 9am (AKDT) (nheath@blm.gov)
To: <nheath@blm.gov>, <dwixon@blm.gov>, <rbrumbau@blm.gov>, <lellis@blm.gov>, <slamarr@blm.gov>, <ssweet@blm.gov>, <njones@blm.gov>

This event has been changed.

Coastal Plain EA Call

more details »

Changed: Status and Check In Logistics

EA - Friday Posting, Todays Timing
FONSI - Friday Posting, Todays Timing
ROPs - Todays Timing
Press Release
Solicitor Review
Other

When	**Changed:** Wed Sep 5, 2018 8:30am – 9am Alaska Time - Anchorage
Where	SD Conference Room 3319 (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/t75murph
Calendar	nheath@blm.gov
Who	• t75murph@blm.gov - organizer • dwixon@blm.gov • rbrumbau@blm.gov • lellis@blm.gov • slamarr@blm.gov • ssweet@blm.gov • njones@blm.gov • nheath@blm.gov

Going? **Yes** - **Maybe** - **No** more options »

invite.ics
3K

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Updated invitation: Coastal Plain EA Call @ Daily from 8:30am to 9:30am from Wed Sep 5 to Fri Sep 7 (AKDT) (nheath@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:47 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Ted Murphy** <t75murph@blm.gov>
Date: Wed, Sep 5, 2018 at 5:46 AM
Subject: Updated invitation: Coastal Plain EA Call @ Daily from 8:30am to 9:30am from Wed Sep 5 to Fri Sep 7 (AKDT) (nheath@blm.gov)
To: <nheath@blm.gov>, <slamarr@blm.gov>, <rbrumbau@blm.gov>, <dwixon@blm.gov>, <lellis@blm.gov>, <njones@blm.gov>, <ssweet@blm.gov>

This event has been changed.

Coastal Plain EA Call

more details »

Status and Check In Logistics

When	**Changed:** Daily from 8:30am to 9:30am from Wed Sep 5 to Fri Sep 7 Alaska Time - Anchorage
Where	SD Conference Room 3319 (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/t75murph
Calendar	nheath@blm.gov
Who	• t75murph@blm.gov - organizer • slamarr@blm.gov • rbrumbau@blm.gov • dwixon@blm.gov • lellis@blm.gov • nheath@blm.gov • njones@blm.gov • ssweet@blm.gov

Going? All events in this series: **Yes** - **Maybe** - **No** more options »

Invitation from Google Calendar

You are receiving this email at the account nheath@blm.gov because you are subscribed for updated invitations on calendar nheath@blm.gov.

To stop receiving these emails, please log in to https://www.google.com/calendar/ and change your notification settings for this calendar.

Forwarding this invitation could allow any recipient to modify your RSVP response. Learn More.

invite.ics
3K

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Invitation: TED: Coastal Plain EA Call, continued @ Thu Sep 6, 2018 2pm - 3pm (AKDT) (nheath@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:38 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Ted Murphy** <t75murph@blm.gov>
Date: Thu, Sep 6, 2018 at 9:51 AM
Subject: Invitation: TED: Coastal Plain EA Call, continued @ Thu Sep 6, 2018 2pm - 3pm (AKDT) (nheath@blm.gov)
To: <nheath@blm.gov>, <slamarr@blm.gov>, <njones@blm.gov>, <dwixon@blm.gov>, <lellis@blm.gov>, <ssweet@blm.gov>

TED: Coastal Plain EA Call, continued

more details »

Scheduled per Serena 9/6 9:48 am ~E

When	Thu Sep 6, 2018 2pm – 3pm Alaska Time - Anchorage
Video call	https://hangouts.google.com/hangouts/_/doi.gov/t75murph
Calendar	nheath@blm.gov
Who	• t75murph@blm.gov - organizer • efrost@blm.gov - creator • slamarr@blm.gov • njones@blm.gov • nheath@blm.gov • dwixon@blm.gov • lellis@blm.gov • ssweet@blm.gov

Going? **Yes** - **Maybe** - **No** more options »

invite.ics
3K

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Updated invitation with note: Coastal Plain EA Call @ Fri Sep 7, 2018 8:15am - 9am (AKDT) (nheath@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:36 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Eileen Frost** <efrost@blm.gov>
Date: Thu, Sep 6, 2018 at 2:10 PM
Subject: Updated invitation with note: Coastal Plain EA Call @ Fri Sep 7, 2018 8:15am - 9am (AKDT) (nheath@blm.gov)
To: <nheath@blm.gov>, <njones@blm.gov>, <t75murph@blm.gov>, <lellis@blm.gov>, <rbrumbau@blm.gov>, <ssweet@blm.gov>, <slamarr@blm.gov>, <dwixon@blm.gov>

This event has been changed with this note:
"Rescheduled per Ted's request 9/6 ~E"

Coastal Plain EA Call

more details »

Status and Check In Logistics

When	**Changed:** Fri Sep 7, 2018 8:15am – 9am Alaska Time - Anchorage
Where	SD Conference Room 3319 (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/t75murph
Calendar	nheath@blm.gov
Who	• t75murph@blm.gov - organizer • njones@blm.gov • lellis@blm.gov • rbrumbau@blm.gov • ssweet@blm.gov • nheath@blm.gov • slamarr@blm.gov • dwixon@blm.gov

Going? **Yes** - **Maybe** - **No** more options »

invite.ics
3K

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: [EXTERNAL] RE: DNR Snow Monitoring protocols

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 4:32 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Head, Melissa M (DNR)** <melissa.head@alaska.gov>
Date: Fri, Sep 7, 2018 at 10:24 AM
Subject: [EXTERNAL] RE: DNR Snow Monitoring protocols
To: Geisler, Eric <egeisler@blm.gov>
Cc: Shelly Jacobson <njones@blm.gov>, Nolan Heath <nheath@blm.gov>

Hi Eric,

Your questions and all the others I've been getting recently really make me wish I had completed our guidance document that has been on the back burner. Maybe that project will finally get prioritized.

I am working on compiling answers to your questions and will hopefully have something to you by the end of the day.

Kind Regards,

Melissa

Melissa Head

Manager, Northern Oil & Gas Team

DNR/DMLW

907-451-2719

From: Geisler, Eric <egeisler@blm.gov>
Sent: Wednesday, September 5, 2018 4:49 PM
To: Head, Melissa M (DNR) <melissa.head@alaska.gov>
Cc: Shelly Jacobson <njones@blm.gov>; Nolan Heath <nheath@blm.gov>
Subject: DNR Snow Monitoring protocols

Melissa

! really appreciated your input last week on the DNR snow measurements for the Coastal Plain Seismic EA.

Can you please describe how you record, use and interpret the snow density and snow structure or crystal form/size information the state collects. We are trying to incorporate the more comprehensive suite of information in the EA and need to be able to explain how it gets used by DNR to make decisions.

I see that the contractors are only required to measure depth for state projects.

Also do you know where the 3" SWE recommendations come from. Who put forth that idea?

Eric Geisler, CF

Program Lead for Forestry, Invasive Species, Range, Botany, ES&R

BLM Alaska State Office

222 W 7th Ave #13

Anchorage, AK 99513

W 907-271-1985

C 509-220-4712

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: [EXTERNAL] [dmlw.tundra.notification] DNR NRO Spill Notification Email

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:34 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Geisler, Eric** <egeisler@blm.gov>
Date: Fri, Sep 7, 2018 at 9:39 AM
Subject: Re: [EXTERNAL] [dmlw.tundra.notification] DNR NRO Spill Notification Email
To: Wixon, Donna <dwixon@blm.gov>
Cc: t75murph <t75murph@blm.gov>, Sarah LaMarr <slamarr@blm.gov>, Robert Brumbaugh <rbrumbau@blm.gov>, Nolan Heath <nheath@blm.gov>, Shelly Jacobson <njones@blm.gov>

I have spoken with Becky just now about the SWE issue.

The DNR uses the 3" SWE to open areas when they are marginally close on snow depth. i.e If there is 5.5 inches of snow on 2 of the 5 monitoring stations in a sub area and over 6" on the other 3 and the SWE for the 5.5 inches is 3" SWE they may approve a limited opening of that sub area. They would not open the entire sub area if all 5 stations were at 5.5 inches and a SWE of 3".

Eric Geisler, CF
Program Lead for Forestry, Invasive Species, Range, Botany, ES&R
BLM Alaska State Office
222 W 7th Ave #13
Anchorage, AK 99513
W 907-271-1985
C 509-220-4712

On Fri, Sep 7, 2018 at 9:06 AM, Wixon, Donna <dwixon@blm.gov> wrote:

> Eric,
> We think this may be Melissa's back up, see below.
>
> Donna
>
> Donna L Wixon
> Natural Resource Specialist
> BLM Arctic District Office
> 222 University Ave
> Fairbanks, Alaska 99709
> 907-474-2301 Office
> 907-474-2386 Fax
> dwixon@blm.gov
>
> ---------- Forwarded message ----------
> From: **Baird, Becky (DNR)** <becky.baird@alaska.gov>
> Date: Mon, Jul 9, 2018 at 12:28 PM
> Subject: [EXTERNAL] [dmlw.tundra.notification] DNR NRO Spill Notification Email
> To: "dmlw.tundra.notification" <dmlw.tundra.notification@list.state.ak.us>
>
> Good Afternoon Tundra Travelers,
>
> Note that from this point forward we ask that you report spills on state land to the DNR spill report email (dnr.nro.spill@alaska.gov). Report the date, time, substance, quantity, and location. This email address supersedes the DNR NRO spill reporting telephone hotline (907)451-2678. This does not change the way spills are reported to DEC.
>
> Thank you for your time,
>
> Becky

Becky Baird

Natural Resource Specialist III

Division of Mining, Land & Water – North Slope Team

Department of Natural Resources

(907) 451-2732

dnr.alaska.gov/mlw/tundratravel

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: 8:00 call

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:32 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Ted Murphy** <t75murph@blm.gov>
Date: Sun, Sep 9, 2018 at 6:45 PM
Subject: 8:00 call
To: Shelly W Jacobson <s05jacobso@blm.gov>, <rbrumbau@blm.gov>, <lellis@blm.gov>, Serena Sweet <ssweet@blm.gov>, <slamarr@blm.gov>, <dwixon@blm.gov>, <nheath@blm.gov>

Lets get together for a call at 8 on Monday morning. Thanks.

Sent from my iPhone

Coastal_Plain_Seismic_EA, BLM_AK <blm_ak_coastal_plain_seismic_ea@blm.gov>

Fwd: Invitation: Coastal Plain EA @ Mon Sep 10, 2018 8am - 9am (AKDT) (nheath@blm.gov)

1 message

Heath, Nolan <nheath@blm.gov> Wed, Oct 3, 2018 at 3:32 PM
To: BLM_AK Coastal_Plain_Seismic_EA <blm_ak_coastal_plain_seismic_ea@blm.gov>

---------- Forwarded message ---------
From: **Ted Murphy** <t75murph@blm.gov>
Date: Mon, Sep 10, 2018 at 5:36 AM
Subject: Invitation: Coastal Plain EA @ Mon Sep 10, 2018 8am - 9am (AKDT) (nheath@blm.gov)
To: <nheath@blm.gov>, <ctburns@blm.gov>, <lellis@blm.gov>, <dwixon@blm.gov>, <jwedmonds@blm.gov>, <ssweet@blm.gov>, <slamarr@blm.gov>, <njones@blm.gov>

Coastal Plain EA

more details »

When	Mon Sep 10, 2018 8am – 9am Alaska Time - Anchorage
Where	State Directors Conference Room 3319 (map)
Video call	https://hangouts.google.com/hangouts/_/doi.gov/t75murph
Calendar	nheath@blm.gov
Who	• t75murph@blm.gov - organizer • ctburns@blm.gov • lellis@blm.gov • dwixon@blm.gov • jwedmonds@blm.gov • ssweet@blm.gov • slamarr@blm.gov • nheath@blm.gov • njones@blm.gov

Going? **Yes** - **Maybe** - **No** more options »

invite.ics
3K

LaMarr, Sarah <slamarr@blm.gov>

Fwd: Snow Discussion Wed Sept 26 u

1 ag

Geisler, Eric <egeisler@blm.gov> u T e, Sep 25, 2018 at 11:03 M
To: BLM_ K Coastal_ lain_Seismic_E <blm_ak_coastal_plain_seismic_ea@blm.gov>, Sarah LaMarr <slamarr@blm.gov>, Donna Wixon <dwixon@blm.gov>, Shelly Jacobson <njones@blm.gov>

Eric Geisler, CF
rogram Lead for Forestry, Soils, Invasive Species, Range, Botany, ES&R
BLM laska State Office
222 W 7th ve #13
nchorage, K 99513
W 907-271-1985
C 509-220-4712

---------- Forwarded message ---------
From: **Geisler, Eric** <egeisler@blm.gov>
Date: T e, Sep 25, 2018 at 8:03 M
S bject: Snow Disc ssion Wed Sept 26
To: Matthew St rm <mst rm1@alaska.ed >

Matthew

We had a tentative date set for tomorrow to disc ss snow conditions on the rctic Coastal Lain.

Co ld we meet at yo r office or elsewhere in town tomorrow abo t 8:00 M?

lease let me know the location and how to get there. My plane comes in aro nd 7:00 so i sho ld be able to get abo t anywhere by 8:00 u

Eric Geisler, CF u
rogram Lead for Forestry, Soils, Invasive Species, Range, Botany, ES&R
BLM laska State Office
222 W 7th ve #13
nchorage, K 99513
W 907-271-1985
C 509-220-4712 u

Guyer, Scott <sguyer@blm.gov>

Re: [EXTERNAL] veg & snow

1 message

Matthew Sturm <msturm1@alaska.edu> Wed, Sep 26, 2018 at 12:58 PM
To: Tim Cater <tcater@abrinc.com>, sguyer@blm.gov
Cc: "Melissa M Head (DNR)" <melissa.head@alaska.gov>, Paul Leonard <paul_leonard@fws.gov>

Hi Tim:

Basically, the charge (below) is on track. It would be useful (your #2) if you provided some "compare and contrast" comments between say the NPRA vegetation and the 1002 area, as the tax law opening ANWR to oil exploration mentions managing "Like NPRA". This does not need to be super-specific, but for example, given N types of tundra overall, how might the percentages of each type vary from NPRA to 1002 area?

Matthew

On 9/26/18 12:33 PM, Tim Cater wrote:

> Scott and Matthew (I added Melissa Head and Paul Leonard to this string),
>
> After reading Dr. Sturm's email, I wanted to clarify my understanding of why Melissa Head invited me to speak at the snow workshop. She requested I discuss:
> 1. vegetation considerations for off-road travel on the North Slope. She did not ask me to discuss specifics about seismic operations in the 1002 area or NPRA.
> 2. overview of tundra types that occur across the North Slope (e.g., wet sedge meadow and upland tussock tundra), and where they occur (willows will occur more frequently in creek drainages). She did not ask me to discuss specific types of vegetation in the 1002 area.
> 3. susceptibility of different tundra types to damage from off-road vehicles (e.g., one reason that wet sedge tundra is less susceptible than tussocks and willows to damage is that regenerating plant materials are mostly below ground where there is more protection).
>
> I hope my talk establishes a 'biology baseline' that people can build upon as the workshop progresses and issues specific to the 1002 area arise. If Scott's talk comes after mine, the audience should already grasp the significance of different classes of vegetation, allowing him to quickly get to the topics he described in his email.
>
> Please let me know if this seems reasonable.
>
> Tundra Tim
>
> _____
>
> Tim Cater
> **ABR, Inc.**—Environmental Research & Services
> Sr. Scientist
> Office: (907) 455-6777 ext. 139
> **www.abrinc.com**
>
> On Wed, Sep 26, 2018 at 8:24 AM Guyer, Scott <sguyer@blm.gov> wrote:
>
> > Hi Matt, I would be happy to help out where needed. I can discuss our land cover work on the north slope and the different classes of vegetation that will be effected by the seismic work in 1002. I have also researched impacts from ice roads on tundra in NPRA which can provide some perspective on impacts from seismic activities. But if these subjects are already covered by Tim or others that works for me.
> >
> > Scott

On Tue, Sep 25, 2018 at 5:40 PM Matthew Sturm <msturm1@alaska.edu> wrote:

> Hi Scott (from my NSSI days) and Tim:
>
> At the upcoming Snow Workshop, Tim will be talking about the vegetation of the ANWR/1002 area, and what it means in terms of winter operations, including distribution of tundra, heath, shrub and so on.
>
> Scott: I know you have been heading up the BLM veg. mapping on the North Slope, and (perhaps) have been charged with special veg. mapping related to management during oil exploration?
>
> Anyway, time at the two day workshop is limited, and I want the particpants to get practical useful information. CAn the two of you discuss whether there is need for Scott to speak, or if Tim can cover that. Also what to include in terms of the newest mapping etc.
>
> Do keep me in the loop as to what is relevant to the potential manageent issues.
>
> Thanks.
>
> Matthew
>
> --
> Dr. Matthew Sturm
> Geophysical Institute
> University of Alaska-Fairbanks
> 907-474-5257
> msturm1@alaska.edu

--
Scott Guyer
Landscape Initiatives Coordinator
Alaska State Office
907-223-6759 (wk cell)

"Not the victory but the action, Not the goal but the game,
In the deed the Glory!"

--
Dr. Matthew Sturm
Geophysical Institute
University of Alaska-Fairbanks
907-474-5257
msturm1@alaska.edu

Guyer, Scott <sguyer@blm.gov>

Fwd: [EXTERNAL] ANWR Snow Workshop

1 message

Guyer, Scott <sguyer@blm.gov> Tue, Oct 2, 2018 at 3:28 PM
To: Chris Noyles <christopher.noyles@ak.blm.gov>

FYI

---------- Forwarded message ---------
From: **Matthew Sturm** <msturm1@alaska.edu>
Date: Wed, Sep 26, 2018 at 9:13 PM
Subject: [EXTERNAL] ANWR Snow Workshop
To: msturm1@alaska.edu <msturm1@alaska.edu>, cparr4@alaska.edu <cparr4@alaska.edu>, furban@usgs.gov <furban@usgs.gov>, eyeager@blm.gov <eyeager@blm.gov>, sgray@usgs.gov <sgray@usgs.gov>, joshua_rose@fws.gov <joshua_rose@fws.gov>, joanna_fox@fws.gov <joanna_fox@fws.gov>, njones@blm.gov <njones@blm.gov>, slamarr@blm.gov <slamarr@blm.gov>, dwixon@blm.gov <dwixon@blm.gov>, wendy_loya@fws.gov <wendy_loya@fws.gov>, paul_leonard@fws.gov <paul_leonard@fws.gov>, sguyer@blm.gov <sguyer@blm.gov>, mwhitman@blm.gov <mwhitman@blm.gov>, tvosburgh@blm.gov <tvosburgh@blm.gov>, melissa.head@alaska.gov <melissa.head@alaska.gov>, clif.enochs@alaska.gov <clif.enochs@alaska.gov>, kimberley.maher@alaska.gov <kimberley.maher@alaska.gov>, becky.baird@alaska.gov <becky.baird@alaska.gov>, kenneth_hill@nps.gov <kenneth_hill@nps.gov>, wrbolton@alaska.edu <wrbolton@alaska.edu>, pbieniek@alaska.edu <pbieniek@alaska.edu>, rtladerjr@alaska.edu <rtladerjr@alaska.edu>, brien.e.reep@exxonmobil.com <brien.e.reep@exxonmobil.com>, Robyn.E.McGhee@conocophillips.com <Robyn.E.McGhee@conocophillips.com>, tiffany.c.carey@conocophillips.com <tiffany.c.carey@conocophillips.com>, rtrupp@saexploration.com <rtrupp@saexploration.com>, Daniel.Fisher@ak.usda.gov> <Daniel.Fisher@ak.usda.gov>, richard.thoman@noaa.gov <richard.thoman@noaa.gov>, info@akfrontiers.com <info@akfrontiers.com>, jeffmiller@cruzconstruct.com <jeffmiller@cruzconstruct.com>, eric.weiman@peakalaska.com <eric.weiman@peakalaska.com>, stewart.seaberg@asrcenergy.com <stewart.seaberg@asrcenergy.com>, jennifer.collins@bp.com <jennifer.collins@bp.com>, Steve.McKendrick@bp.com <Steve.McKendrick@bp.com>, tcater@abrinc.com <tcater@abrinc.com>, flier@allamericanoilfield.com <flier@allamericanoilfield.com>, wcrowell@hilcorp.com <wcrowell@hilcorp.com>, graham.smith@alaska.gov <graham.smith@alaska.gov>, nathaniel.emery@alaska.gov <nathaniel.emery@alaska.gov>, csbenson@alaska.edu <csbenson@alaska.edu>, mmacander@abrinc.com <mmacander@abrinc.com>, faith.martineaux@alaska.gov <faith.martineaux@alaska.gov>, jnunley@olgoonik.com <jnunley@olgoonik.com>, ffreudenberger@alaska.edu <ffreudenberger@alaska.edu>, tlthomas5@alaska.edu <tlthomas5@alaska.edu>, kdtape@alaska.edu <kdtape@alaska.edu>, jbjohnson5@alaska.edu <jbjohnson5@alaska.edu>

Hello All!

Thank you for participating in the ANWR Snow Workshop. We believe the workshop is important, timely, and will be useful and interesting.

We look forward to working with you and want to reach out to go over a bit of housekeeping and logistics. The information below, and future updates, can be found at the meeting website: gi.alaska.edu/registration.

First, a reminder that the meeting will take place on **October 9 and 10** at **Pike's Waterfront Lodge**, **1850 Hoselton Road, Fairbanks AK 99709**.

For those of you traveling out of town, there is a block room reservation at the Pike's Lodge with a discounted rate. Call **(907) 456-4500 to reserve your room** and mention you are with "ANWR Snow Training." If you are flying in and would like transportation from the airport to the hotel, please call 907-456-5200.

The meeting will run roughly from 8 a.m. – 6 p.m. each day with 20 min. breaks in-between. **Breakfast and lunch will be provided on both days** and **dinner will be provided the first evening**. Coffee, tea and water will be available throughout the day.

A draft schedule is attached and will be available on the website as it is updated. We have been in contact with speakers, and in the next few days we will be talking to each speaker with additional suggestions etc.

If you have questions about logistics, topics, or any other please contact the event coordinator, Fritz Freudenberger, at 907-474-7185 or ffreudenberger@alaska.edu.

Dr. Matthew Sturm on behalf of the full workshop organizers

AGENDA

ANWR Snow Workshop, Fairbanks, Alaska October 9-10, 2018

Pikes Waterfront Lodge

DAY 1 (October 9, 2018)

8:00 AM: Breakfast & Registration

9:00 AM: Welcome (M. Sturm)

9:15 AM: Participant Introductions ('round the room)

9:30 AM: Land Management Needs and Challenges (Joanna Fox (USFWS): Shelly Jones (BLM)

9:45 AM: History of Exploration & Oil Exploration, North Slope, Alaska (Matthew Sturm)

10:00 AM to 1:00 PM

ANWR & the 1002 Area: Comparisons to the NPRA

(Coffee Break @ 10:30 to 10:50 in Binkley Room)

- Topography and physiography (M. Macander) (30 minutes)
- Hydrology (M. Whitman; confirmation pending) (10 minutes)

BREAK

- Vegetation (Tim Cater) (30 minutes)
- Winter Climate/regional (Rick Thoman) (30 minutes)
- Winter Climate/local (Frank Urban) (20 minutes)
- Cultural & Economic Setting (Vince Matthews; pending) (25 minutes)

1:00 PM to 2:00 PM: Lunch

2:00 PM to 3:30 PM: The Nature of the Arctic Snow Cover

- The seasonal pattern of snow build-up and drifting (Frank Urban & Matt Macander)
- The resulting stratigraphy, properties and what it means (Matthew Sturm)
- Scaling and snow: spatial variations in depth, density and other properties (Charles Parr)

3:30 PM to 3:50 PM: Coffee Break, Binkley Room

3:50 PM to 5:30 PM: Snow and Vehicles

- The physics of shearing, compaction, rutting (Jerry Johnson)
- Snow as protection of tundra vs. inhibitor of frost penetration (Matthew Sturm)
- Practical results from vehicle tests: operational considerations (Tim Cater)

6:00 PM to …. Dinner at Pikes

DAY 2 (October 10, 2018)

8:00 AM: Breakfast & Registration

9:00 AM: Recap from Day 1 (Paul Leonard)

9:15 AM to 12:00 PM: Regulatory Environment & Seismic Practice

(Coffee Break @ 10:30 to 10:50 in Binkley Room)

- State of Alaska Regulation of Winter Operations (Melissa Head) (30 minutes)
- NPRA Regulation of Winter Operations (TBD) (20 minutes)
- Arctic Refuge Management Considerations (Wendy Loya) (20 minutes)

BREAK

- Winter Seismic Operations: equipment, recon, routing, camps, geophysics (Rick Trupp) (30 minutes)
- More on Seismic Practice (Tiffany Carey or alternate) (20 minutes)
- Snow & Ice Roads & Off-road Traffic (Federico Lier) (20 minutes)
- More Snow & Ice Roads (Cruz Construction....not confirmed) (20 minutes)

12:00 PM to 1:00 PM: Snow Measurements

- Measurement tools, techniques and strategies (various people in 5-minute slots)
    - Depth, density, hardness, strength
    - Remote sensing (aerial and ground-based)
    - Heterogeneity and representative measurements

1:00 PM to 2:00 PM: Lunch

2:00 PM to 5:00 PM: Monitoring Networks, Knowledge Gaps and Climate Change

Panel Discussion with Audience Participation (Panel TBD)

5:00 PM: Closing Remarks (Matthew Sturm)

5:30 PM: Adjourn

--
Dr. Matthew Sturm
Geophysical Institute
University of Alaska-Fairbanks

907-474-5257
msturm1@alaska.edu

--

Scott Guyer
Landscape Initiatives Coordinator
Alaska State Office
907-223-6759 (wk cell)

"Not the victory but the action, Not the goal but the game,
In the deed the Glory!"

Guyer, Scott <sguyer@blm.gov>

Re: [EXTERNAL] ANWR Snow Workshop

1 message

Hayes, Miriam (Nicole) <mnhayes@blm.gov> Tue, Oct 9, 2018 at 12:24 PM
To: Scott Guyer <sguyer@blm.gov>

Just checking - glad we have BLM representation there and curious to see what is learned.

Nicole Hayes
Project Coordinator
Bureau of Land Management
222 W. 7th Avenue #13
Anchorage, Alaska 99513
Desk: (907) 271-4354
Cell: (907) 290-0179

On Tue, Oct 9, 2018 at 11:44 AM Scott Guyer <sguyer@blm.gov> wrote:

> Yes! What's up?
>
> Sent from my iPhone
>
> On Oct 9, 2018, at 9:33 AM, Hayes, Miriam (Nicole) <mnhayes@blm.gov> wrote:
>
> > Are you attending this? :)
> > **Nicole Hayes**
> > Project Coordinator
> > Bureau of Land Management
> > 222 W. 7th Avenue #13
> > Anchorage, Alaska 99513
> > Desk: (907) 271-4354
> > Cell: (907) 290-0179
> >
> > ---------- Forwarded message ---------
> > From: **Wendy Loya** <wendy_loya@fws.gov>
> > Date: Thu, Oct 4, 2018 at 4:03 PM
> > Subject: FW: [EXTERNAL] ANWR Snow Workshop
> > To: Nicole Hayes <mnhayes@blm.gov>
> >
> > Hi Nicole,
> >
> > Below is the info for the snow workshop next week in Fairbanks. I think we have a good cross secon of in vitees, although I am not in the know on who has rsvp'ed. Let me know if you have any quesons.
> >
> > Thanks,
> >
> > Wendy

Dr. Wendy M. Loya,

Arctic Program Coordinator

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From: Mahe w Sturm <msturm1@alaska.edu>
Sent: Wednesday, September 26, 2018 9:13 PM
To: msturm1@alaska.edu; cparr4@alaska.edu; furban@usgs.gov; eyeager@blm.gov; sgray@usgs.gov; joshua_rose@fws.gov; joanna_fox@fws.gov; njones@blm.gov; slamarr@blm.gov; dwixon@blm.gov; wendy_loya@fws.gov; paul_leonard@fws.gov; sguyer@blm.gov; mwhitman@blm.gov; tvosburgh@blm.gov; melissa.head@alaska.gov; clif.enochs@alaska.gov; kimberley.maher@alaska.gov; becky.baird@alaska.gov; kenneth_hill@nps.gov; wrbolton@alaska.edu; pbieniek@alaska.edu; rtladerjr@alaska.edu; brien.e.reep@exxonmobil.com; Robyn.E.McGhee@conocophillips.com; tiffany.c.carey@conocophillips.com; rtrupp@saexploration.com; Daniel.Fisher@ak.usda.gov> <Daniel.Fisher@ak.usda.gov>; richard.thoman@noaa.gov; info@akfrontiers.com; jeffmiller@cruzconstruct.com; eric.weiman@peakalaska.com; stewart.seaberg@asrcenergy.com; jennifer.collins@bp.com; Steve.McKendrick@bp.com; tcater@abrinc.com; flier@allamericanoilfield.com; wcrowell@hilcorp.com; graham.smith@alaska.gov; nathaniel.emery@alaska.gov; csbenson@alaska.edu; mmacander@abrinc.com; faith.martineaux@alaska.gov; jnunley@olgoonik.com; ffreudenberger@alaska.edu; tlthomas5@alaska.edu; kdtape@alaska.edu; jbjohnson5@alaska.edu
Subject: [EXTERNAL] ANWR Snow Workshop

<image001.jpg>

Hello All!

Thank you for participating in the ANWR Snow Workshop. We believe the workshop is important, timely, and will be useful and interesting.

We look forward to working with you and want to reach out to go over a bit of housekeeping and logistics. The information below, and future updates, can be found at the meeting website: gi.alaska.edu/registration.

First, a reminder that the meeting will take place on **October 9 and 10** at **Pike's Waterfront Lodge**, **1850 Hoselton Road, Fairbanks AK 99709**.

For those of you traveling out of town, there is a block room reservation at the Pike's Lodge with a discounted rate. Call **(907) 456-4500 to reserve your room** and mention you are with "ANWR Snow

Training." If you are flying in and would like transportation from the airport to the hotel, please call 907-456-5200.

The meeting will run roughly from 8 a.m. – 6 p.m. each day with 20 min. breaks in-between. **Breakfast and lunch will be provided on both days** and **dinner will be provided the first evening**. Coffee, tea and water will be available throughout the day.

A draft schedule is attached and will be available on the website as it is updated. We have been in contact with speakers, and in the next few days we will be talking to each speaker with additional suggestions etc.

If you have questions about logistics, topics, or any other please contact the event coordinator, Fritz Freudenberger, at 907-474-7185 or ffreudenberger@alaska.edu.

Dr. Matthew Sturm on behalf of the full workshop organizers

AGENDA

ANWR Snow Workshop, Fairbanks, Alaska October 9-10, 2018

Pikes Waterfront Lodge

DAY 1 (October 9, 2018)

8:00 AM: Breakfast & Registration

9:00 AM: Welcome (M. Sturm)

9:15 AM: Participant Introductions ('round the room)

9:30 AM: Land Management Needs and Challenges (Joanna Fox (USFWS): Shelly Jones (BLM)

9:45 AM: History of Exploration & Oil Exploration, North Slope, Alaska (Matthew Sturm)

10:00 AM to 1:00 PM

ANWR & the 1002 Area: Comparisons to the NPRA

(Coffee Break @ 10:30 to 10:50 in Binkley Room)

- Topography and physiography (M. Macander) (30 minutes)
- Hydrology (M. Whitman; confirmation pending) (10 minutes)

BREAK

- Vegetation (Tim Cater) (30 minutes)
- Winter Climate/regional (Rick Thoman) (30 minutes)
- Winter Climate/local (Frank Urban) (20 minutes)
- Cultural & Economic Setting (Vince Matthews; pending) (25 minutes)

1:00 PM to 2:00 PM: Lunch

2:00 PM to 3:30 PM: The Nature of the Arctic Snow Cover

- The seasonal pattern of snow build-up and drifting (Frank Urban & Matt Macander)
- The resulting stratigraphy, properties and what it means (Matthew Sturm)
- Scaling and snow: spatial variations in depth, density and other properties (Charles Parr)

3:30 PM to 3:50 PM: Coffee Break, Binkley Room

3:50 PM to 5:30 PM: Snow and Vehicles

- The physics of shearing, compaction, rutting (Jerry Johnson)
- Snow as protection of tundra vs. inhibitor of frost penetration (Matthew Sturm)
- Practical results from vehicle tests: operational considerations (Tim Cater)

6:00 PM to …. Dinner at Pikes

DAY 2 (October 10, 2018)

8:00 AM: Breakfast & Registration

9:00 AM: Recap from Day 1 (Paul Leonard)

9:15 AM to 12:00 PM: Regulatory Environment & Seismic Practice

(Coffee Break @ 10:30 to 10:50 in Binkley Room)

- State of Alaska Regulation of Winter Operations (Melissa Head) (30 minutes)
- NPRA Regulation of Winter Operations (TBD) (20 minutes)
- Arctic Refuge Management Considerations (Wendy Loya) (20 minutes)

BREAK

- Winter Seismic Operations: equipment, recon, routing, camps, geophysics (Rick Trupp) (30 minutes)
- More on Seismic Practice (Tiffany Carey or alternate) (20 minutes)
- Snow & Ice Roads & Off-road Traffic (Federico Lier) (20 minutes)
- More Snow & Ice Roads (Cruz Construction....not confirmed) (20 minutes)

12:00 PM to 1:00 PM: Snow Measurements

- Measurement tools, techniques and strategies (various people in 5-minute slots)
    - Depth, density, hardness, strength
    - Remote sensing (aerial and ground-based)
    - Heterogeneity and representative measurements

1:00 PM to 2:00 PM: Lunch

2:00 PM to 5:00 PM: Monitoring Networks, Knowledge Gaps and Climate Change

Panel Discussion with Audience Participation (Panel TBD)

5:00 PM: Closing Remarks (Matthew Sturm)

5:30 PM: Adjourn

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Dr. Matthew Sturm

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