



Alaska Department of Transportation & Public Facilities

Dalton Highway Flood Response Disaster in the Arctic

PNS Snow Conference 2016

June 7, 2016

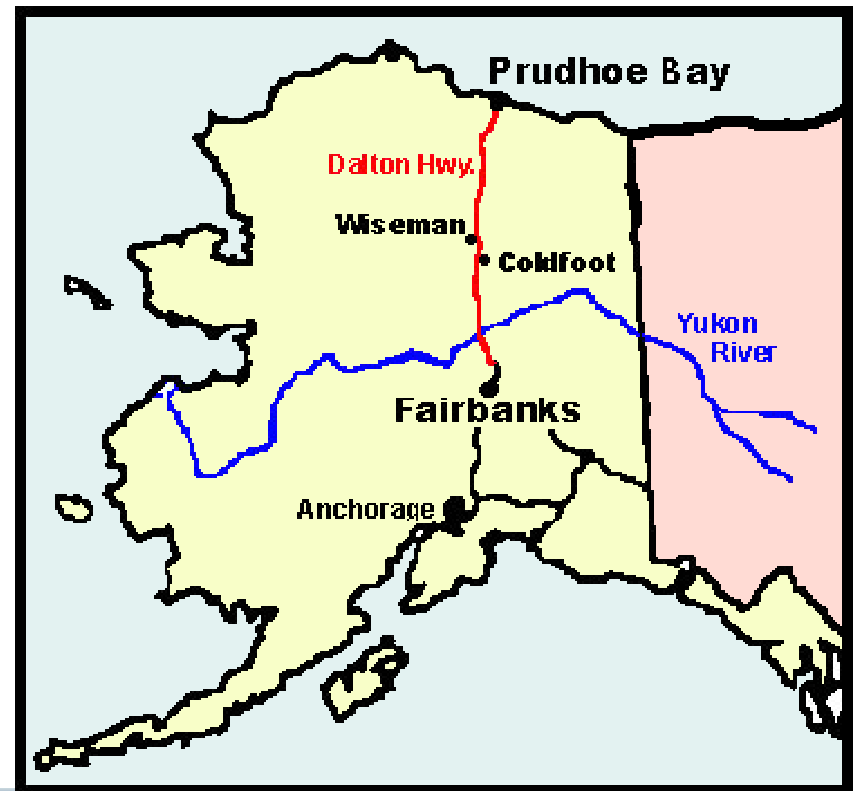
Dalton Highway Flood - Disaster in the Arctic

The impacts of the ice and flooding were dramatic:

- 24 miles of the road were impacted;
- 28 days the road was closed;
- Two state disaster declarations issued; and
- \$17 million for emergency repairs.

The James W. “Dalton” Highway

- Completed in 1975 by Alyeska Pipeline for TAPS construction and to support North Slope development. AKA “The Haul Road”
- 414-mile gravel road stretching from Livengood to Deadhorse.
- Approximately 109 miles are paved.
- State of Alaska took over maintenance in 1978.
- Opened to the public in 1994.
- 300+ vehicles/day near Fairbanks
120/day near Deadhorse



The James W. “Dalton” Highway



- One of only two roads in North America which cross the Arctic Circle
- There are only three towns along the route: Coldfoot (pop 10) at Mile 175, Wiseman (pop 22) at Mile 188, and Deadhorse (25 permanent residents).
- 3,500 – 5,000 oil field workers near Deadhorse









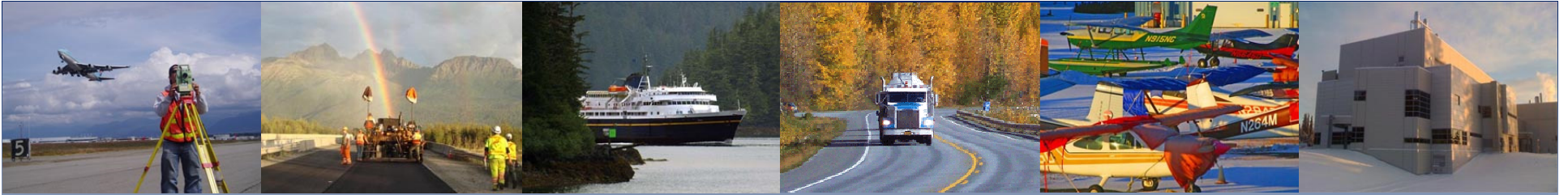




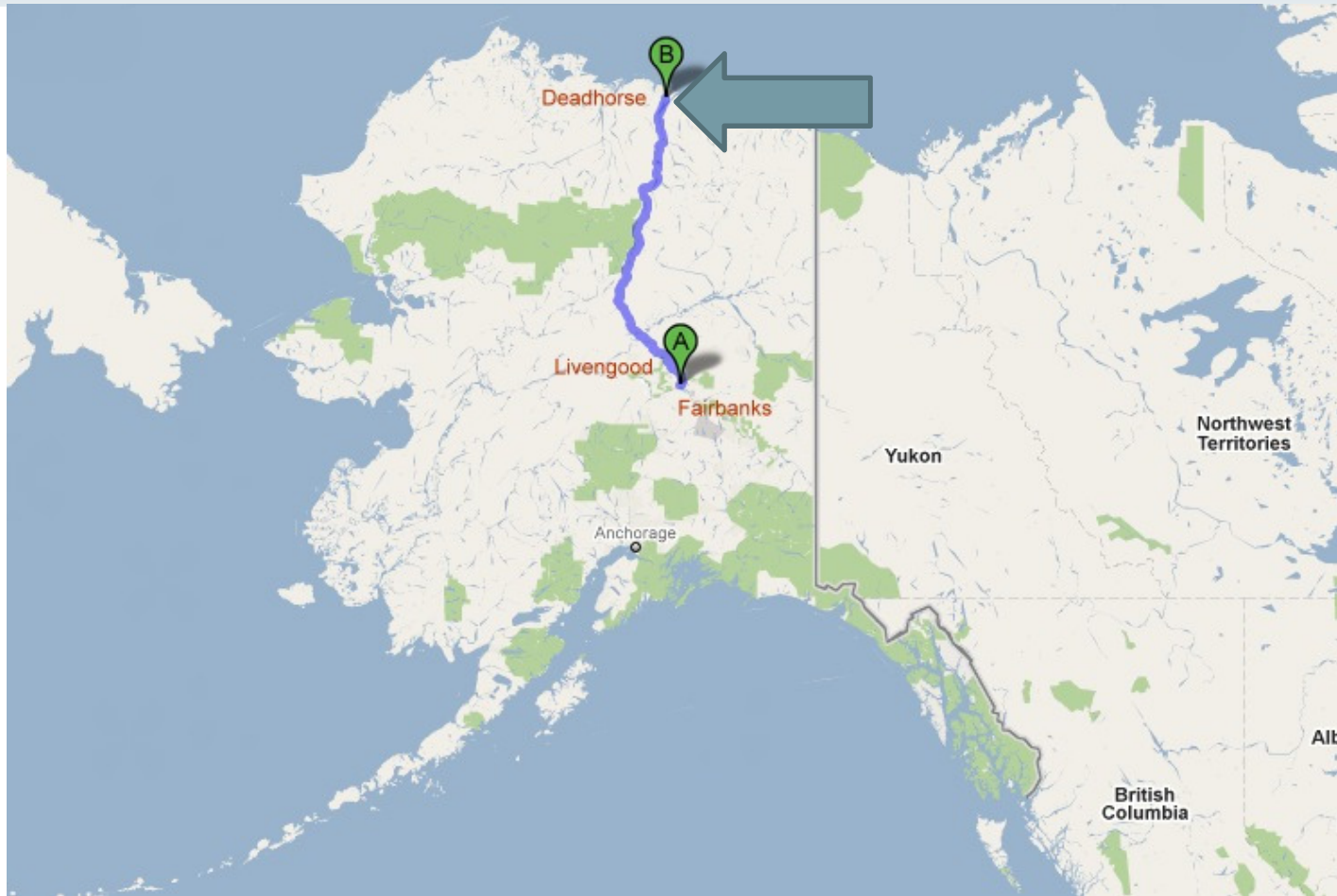
Deadhorse 74

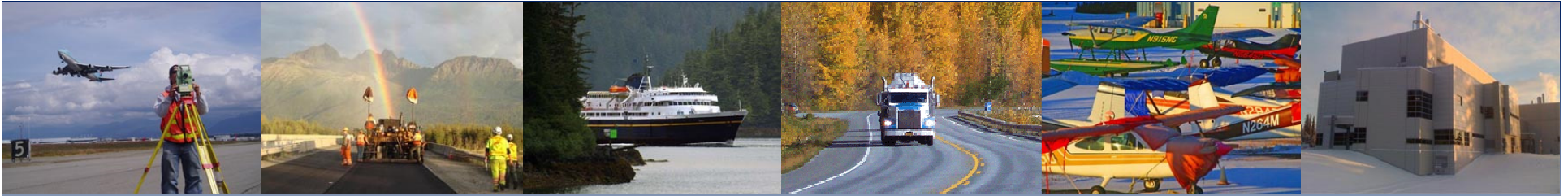






2015 Dalton Highway Flood





The Flood – Cause and Effect

Hydrology

- Heavy rain events in the Brooks Range - Fall 2014
- Sag River frozen all the way to the bottom
- Water pushed to surface, expanded beyond typical flood plain
- “A perfect sequence of snowfall, temperatures and winds lined up to create a massive sheet of ice that expanded for miles”



Dalton Hwy MP 396-405 - crews are working with Alyeska Pipeline Service Company to minimize overflow from the Sag River. The river is currently over the highway in eight locations, the largest spot is 12 inches deep and 200 feet long.

March 20, 2015



**Efforts continue through
March 30, when a storm
forces the road closed**

April 1, 2015

**Overnight closure March 30 and then
reduced to one lane traffic with traffic
control thru April 4**

March 30 - April 5, 2015





Aufeis flooding causes prolonged closure of the highway, south of Deadhorse

April 5, 2015



**Over 800 truck loads
backlogged**





Impact to North Slope Operations

- Busiest construction season in recent years
- Ice road dependent CD5 and DS2S - less than one month to go
- High levels of North Slope activities - fuel at minimum levels
- Disruption in the supply of specialty chemicals - threat to production
- Shortage of drilling fluids - potential to shut down rig operations
- Supplies of groceries getting low

Air Operations Resources

Lynden Air Cargo C-130/L-382



Everts Air Cargo DC-6



Rolligon Operations







Stieger Operations









Fuel Type	Price
UNLEADED	9.25
DIESEL	9.24

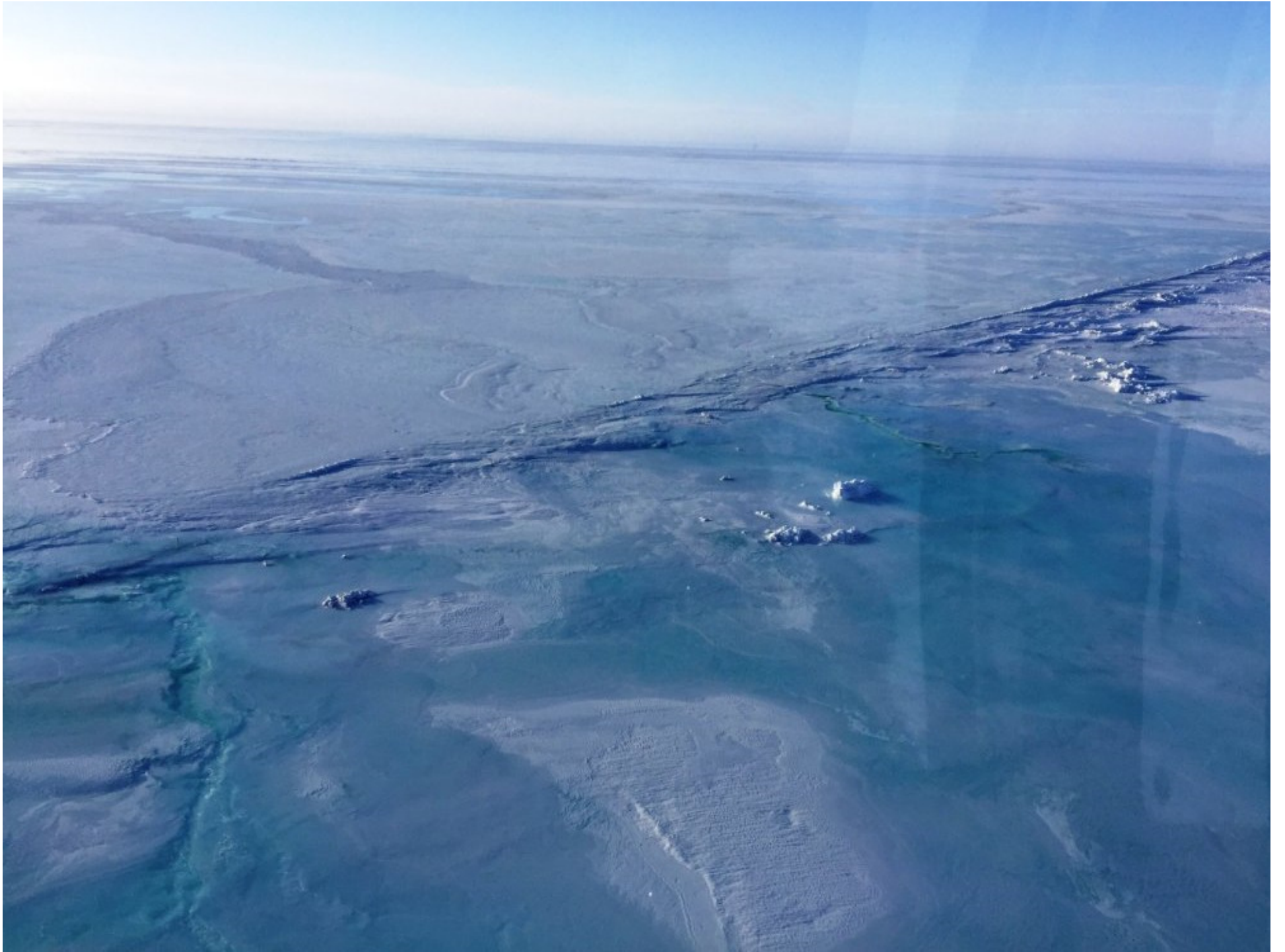
TESORO DIESEL

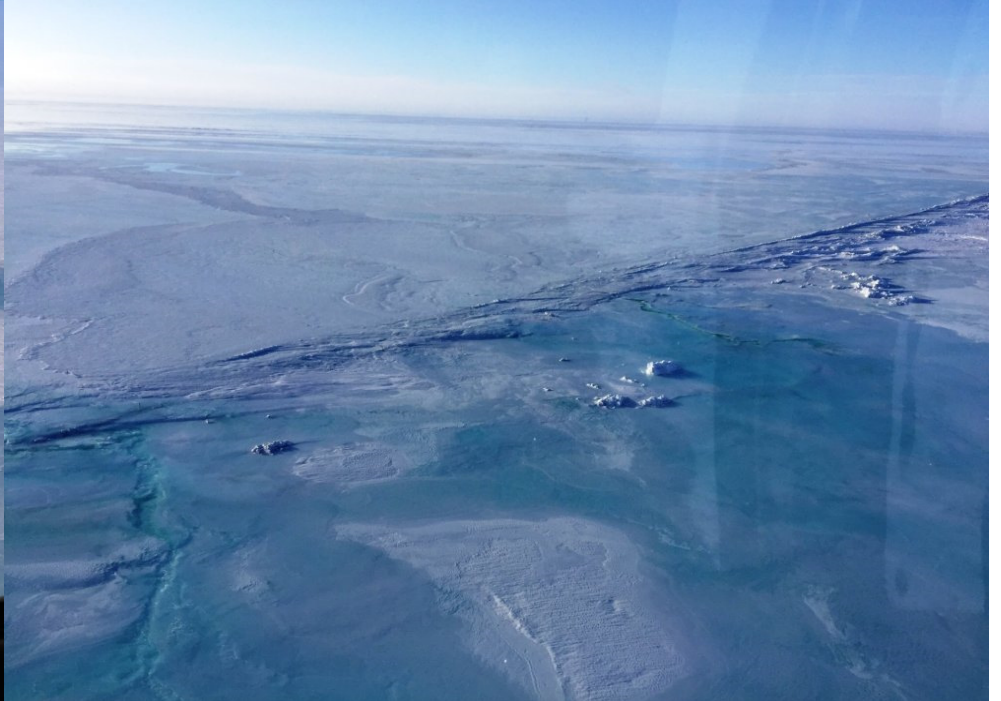
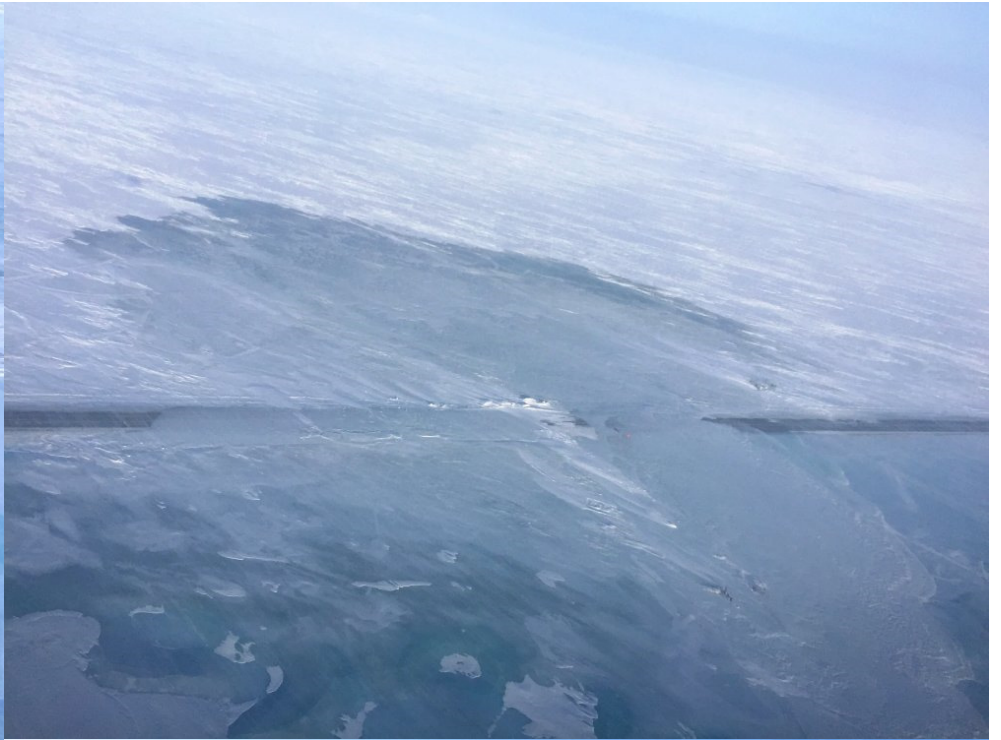
TESORO

Where is the Dalton Highway?

April 7, 2015







Synthetic Aperture Radar (SAR) Images













An aerial photograph of a vast, snow-covered landscape. The terrain is uneven, with various shades of white and light blue. In the middle ground, a small yellow vehicle, possibly a snowplow or maintenance truck, is visible, moving across the snow. The overall scene depicts a winter or high-altitude environment.

Gov. Walker declares a state disaster

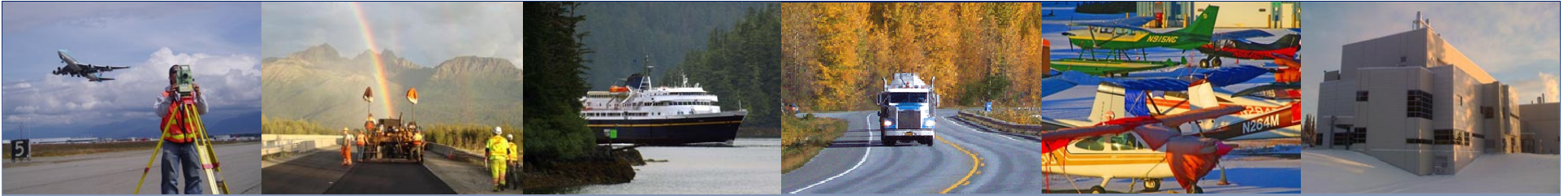
April 7, 2015



UIC Ramps Up April 10

- ADOTPF
- ConocoPhillips
- BP
- Alyeska Pipeline Service Company
- ExxonMobil
- North Slope Borough

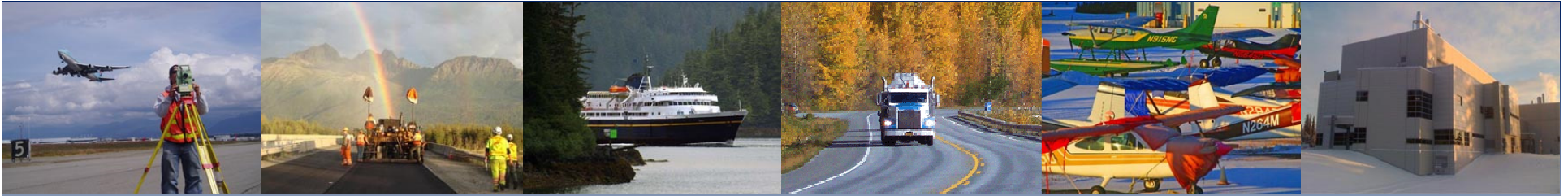




Unified Incident Command Goals

- Keep all responders and the public safe;
- Re-establish Dalton Highway traffic flow;
- Ensure accurate and timely release of information to stakeholders and the public;
- Coordinate to optimize highway traffic flow;
- Develop a logistics plan to support North Slope needs; and
- Protect infrastructure and the environment.





UIC Communications



- Daily public stakeholder meetings in Deadhorse
- Daily SITREPs



- Issued numerous Press Releases
- Numerous Media Events

Crews work to divert water and reinforce berms by the road

April 11, 2015



















Highway reopens to limited, pre-authorized traffic

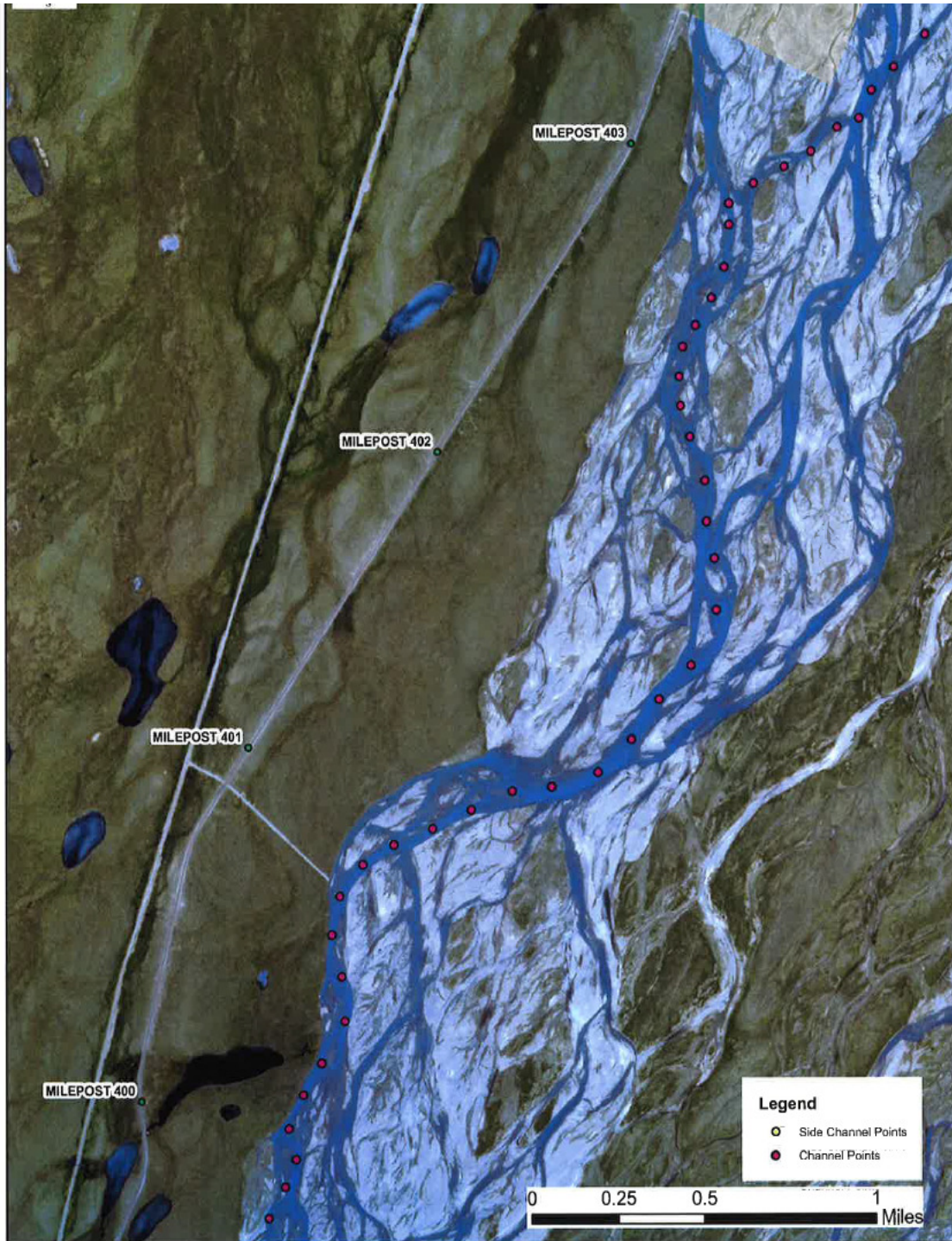
April 13, 2015





**Trench operations divert water
away from the road**

April 14, 2015










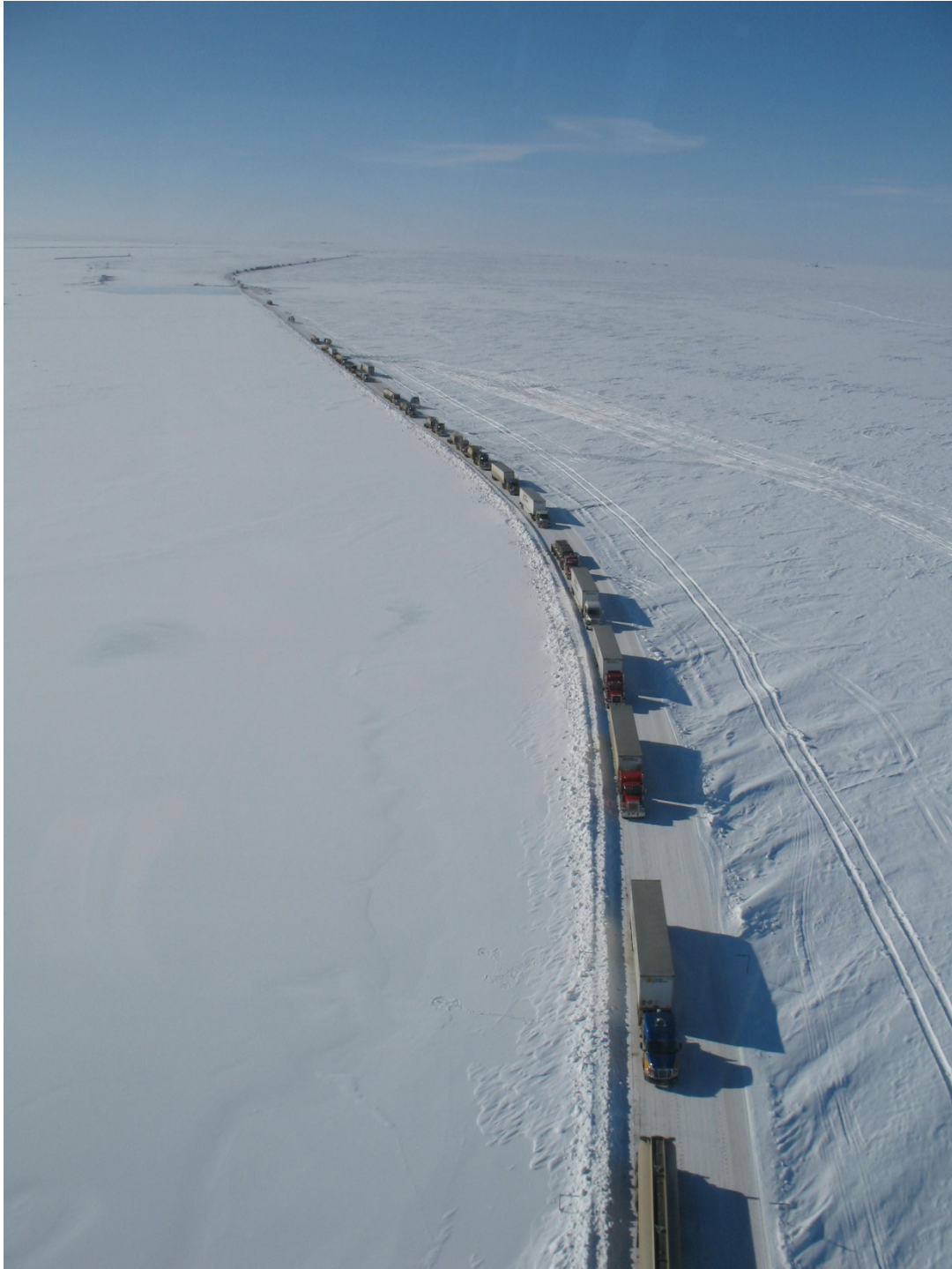
Aerial Sanding





An aerial photograph showing a long, single-file line of semi-trucks on a road that has been cleared through a vast, snow-covered landscape. The trucks are moving away from the viewer towards the top left of the frame. The surrounding area is a flat, white expanse of snow with some faint tracks and shadows. The text is overlaid on the left side of the image.

**Road opens progressively to
all loads. Pilot car
operations end April 28**
April 13 - April 28, 2015



Warmer temperatures start to melt snow and ice on the road

May 5, 2015







Breakup arrives with another round of flooding

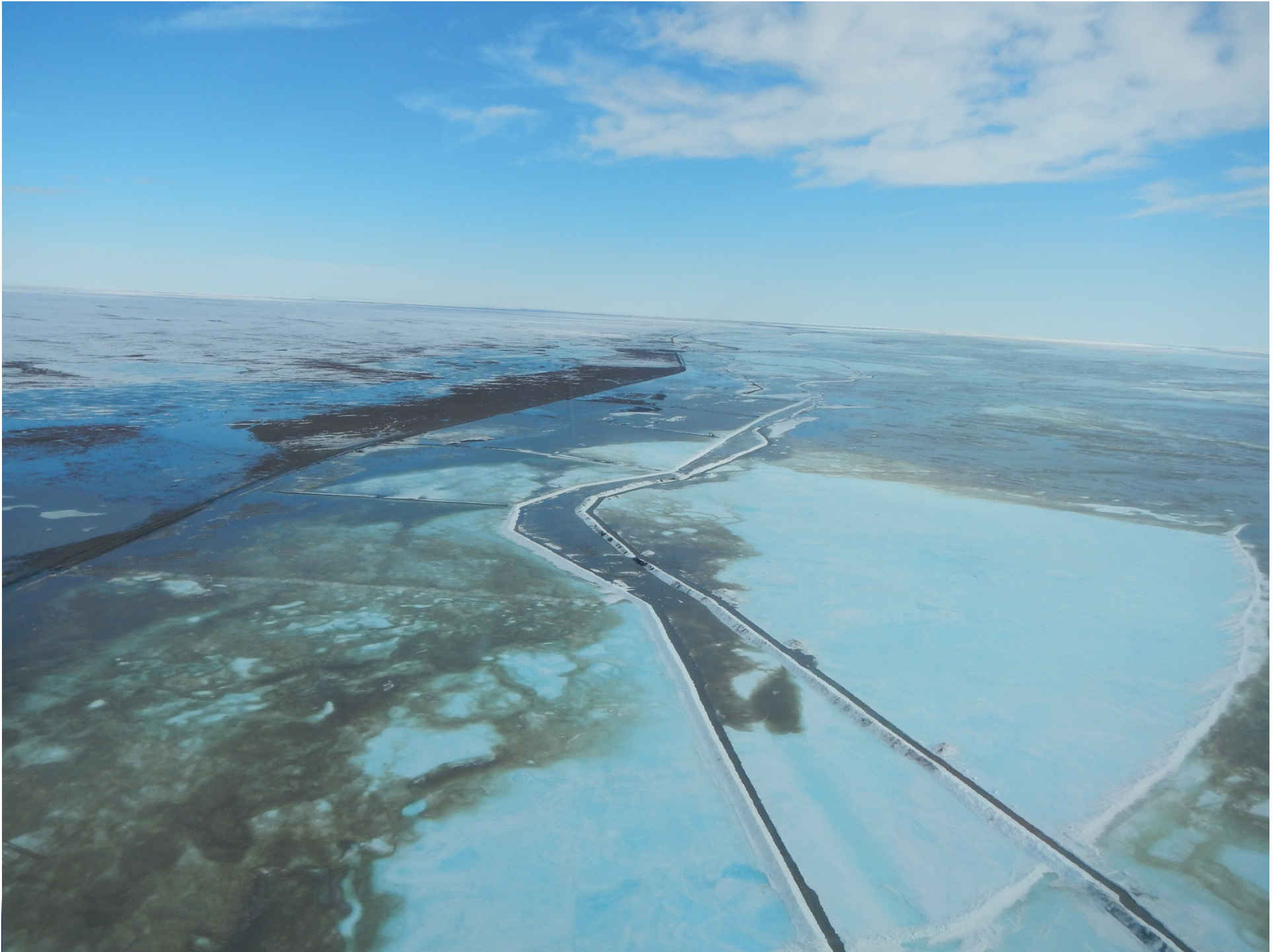
May 17, 2015



Highway closes again

May 17, 2015

















**Flooding begins in Deadhorse;
Gov. Walker declares a 2nd state disaster**

May 21, 2015



Water Relief Trenches









**Water recedes
dramatically
in a day, near
Mile 394**

May 24-25, 2015



PNS Snow Conference 2016

Repair work begins

May 28, 2015



Emergency Repairs



Emergency Repairs



Emergency Repairs



Rolling....

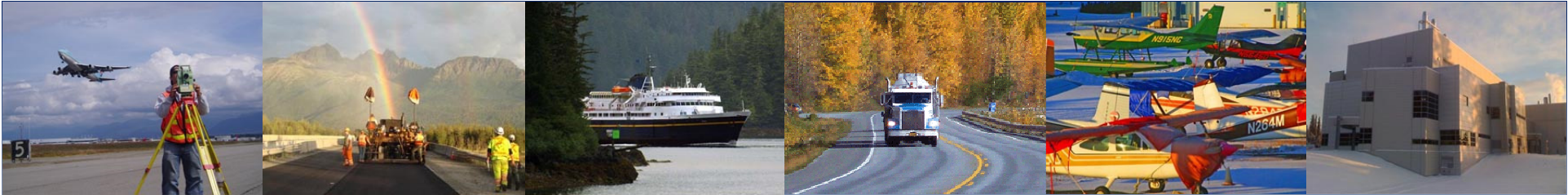
June 5, 2015



Rolling....

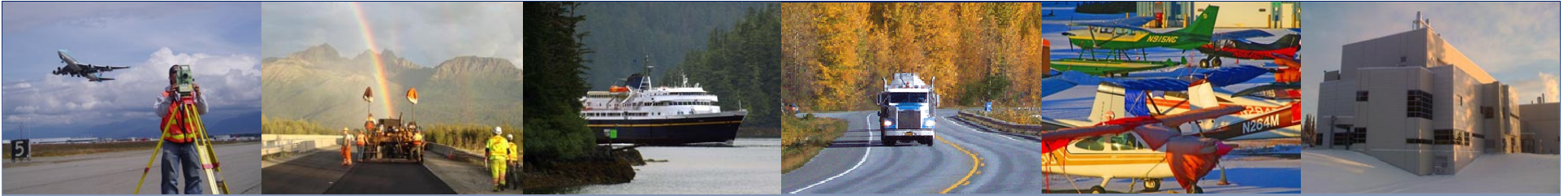
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Dalton Flood After Action Review

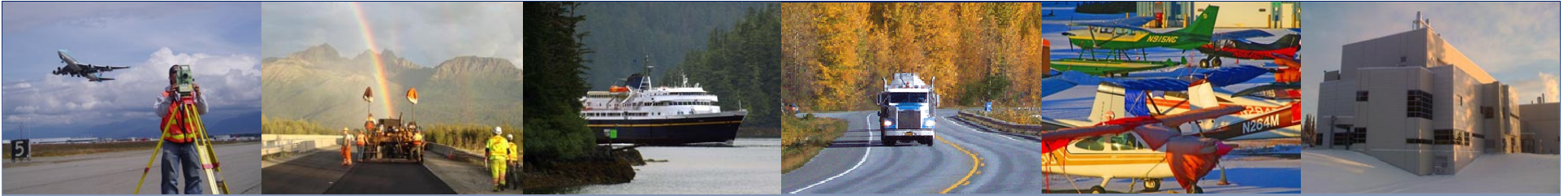




Dalton Flood After Action Review

- What actions had a positive outcome and should be replicated in future responses?
- What actions produced a negative outcome and should be avoided in future responses?
- What actions could be improved to be more efficient or effective?





Dalton Flood After Action Review



- Communication
- Internal and External Coordination
- Logistics
- Emergency Response/Unified Incident Command
- Procurement

Update

The DOT&PF continues to monitor the north end of the Dalton Highway. The gravel berms, built to protect the road, and the ice trenches, dug to facilitate the flow of water from the Sagavanirktok River, are working. The volume of water flowing in the ice trenches continues to increase; but no water has topped the road.

Temperatures are increasing. The volume of flowing water and the risk of flooding will continue to increase. If water begins to threaten the road, personnel with equipment and materials are nearby and ready to respond quickly.



Thank You

